
Detection for automation solutions

OsiSense

Catalogue



Simply easy!™

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Detection for automation solutions OsiSense

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Limit switches

OsiSense XC Standard



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Design	Miniature format	Compact format, CENELEC EN50047	
	Metal, pre-cabled	Plastic, 1 cable entry	Plastic, 2 cable entries



Enclosure	Metal		Plastic, double insulated	
Modularity	Head, body and connection modularity		Head, body and cable entry modularity	Head and body modularity
Conformity/Certifications	UL, CSA, CCC, GOST		CENELEC EN 50047 UL, CSA, CCC, GOST	
Body dimensions (w x h x d) in mm	30 x 50 x 16		31 x 65 x 30	58 x 51 x 30
Head	Linear movement (plunger) Rotary movement (lever) Rotary movement, multidirectional Same heads for ranges XCMD, XCKD, XCKP and XCKT			
Contact blocks	2 electrically separate contacts	snap action with positive opening operation	p	p
		slow break with positive opening operation	p	p
2 same polarity contacts	snap action	–	–	–
		slow break	–	–
3 electrically separate contacts	snap action with positive opening operation	p	p	p
		slow break with positive opening operation	p	p
4 electrically separate contacts	snap action with positive opening operation	p	–	–
		slow break with positive opening operation	–	–
4 contacts (2 x 2 same polarity contacts)	snap action	–	–	–
		–	–	–
Degree of protection IP/IK	IP 66, IP 67, IP 68, IK 06		IP 66, IP 67, IK 04	
Operating temperature	- 25°C... + 70°C			
Connection	Screw terminals	–	1 entry for ISO M16 or M20, Pg 11, Pg 13.5 cable gland or 1/2" NPT, PF 1/2	2 entries for ISO M16 or Pg 11 cable gland or 1/2" NPT (using adaptor)
	Pre-cabled	Ø 7.5 PvR, CEI, halogen free, depending on model	–	
	Connector	Integral or remote M12 or remote 7/8"-16UN	M12	–
Type reference	XCMD	XCKP	XCKT	
Pages	1/10	1/30 and 1/34	1/44	

Compact format, CENELEC EN50047		Compact format, with reset	
Metal, 1 cable entry	Plastic, 1 cable entry	Plastic, 2 cable entries	Metal, 1 cable entry



Metal	Plastic, double insulated		Metal
Head, body and connection modularity	-		
CENELEC EN 50047 UL, CSA, CCC, GOST	UL, CSA, GOST		
31 x 65 x 30	31 x 65 x 30	58 x 51 x 30	31 x 65 x 30
Linear movement (plunger) Rotary movement (lever) Rotary movement, multidirectional Same heads for ranges XCMD, XCKD, XCKP and XCKT	Linear movement (plunger) Rotary movement (lever)		
p	p	p	p
p	p	p	p
-	-	-	-
-	-	-	-
p	-	-	-
p	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
IP 66, IP 67, IK 06	IP 66, IP 67, IK 04 and IK06 (for XCDR)		
-25°C... +70°C			
1 entry for ISO M16 or M20, Pg 11, Pg 13.5 cable gland or 1/2" NPT, PF 1/2	1 entry for ISO M20 or Pg 13.5 cable gland or 1/2" NPT	2 entries for ISO M16 or Pg 11 cable gland or 1/2" NPT (using adaptor)	1 entry for ISO M20 or Pg 13.5 cable gland or 1/2" NPT
-			
M12	-		
XCKD	XCPR	XCTR	XCDR
1/38 and 1/42	1/52	1/58	1/56

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Design		"Classic" format		EN 50041 format	Industrial EN50041 format
		Metal, 3 cable entries	Metal, 1 cable entry	Plastic, 1 cable entry	Metal, 1 cable entry or connector
					
Enclosure		Metal		Plastic, double insulated	Metal
Modularity		Head, body and operator modularity			
Conformity/Certifications		UL, CSA, CCC (XCKM), GOST		GENELEC EN 50041 UL, CSA, CCC, GOST	
Body dimensions (w x h x d) in mm		63 x 64 x 30	52 x 72 x 30	40 x 72.5 x 36	40 x 77 x 44 42.5 x 84 x 36
Head		Linear movement (plunger) Rotary movement (lever) Rotary movement, multidirectional			
Contact blocks					
2 electrically separate contacts	snap action with positive opening operation	•	•	•	•
	slow break with positive opening operation	•	•	•	•
2 same polarity contacts	snap action	–	–	–	•
	slow break	–	–	–	–
3 electrically separate contacts	snap action with positive opening operation	•	•	•	•
	slow break with positive opening operation	•	•	•	•
4 electrically separate contacts	snap action with positive opening operation	–	–	–	–
	slow break with positive opening operation	–	–	–	–
4 contacts (2 x 2 same polarity contacts)	snap action	–	–	•	•
Degree of protection IP/IK		IP 66, IK 06		IP 65, IK 03	IP 66, IK 07
Operating temperature		- 25°C... + 70°C			- 25°C... + 70°C - 40°C or + 120°C depending on model
Connection	Screw terminals (entry for cable gland)	3 entries for ISO M20 or Pg 11 cable gland or 1/2" NPT	1 entry incorporating cable gland or tapped 1/2" NPT	1 entry for ISO M20 or Pg 13.5 cable gland	1 entry for ISO M20 or Pg 13.5 cable gland or 1/2" NPT
	Connector	–			Integral M12 or 7/8"-16UN
Type reference		XCKM	XCKL	XCKS	XCKJ
Pages		1/74	1/74	1/90	1/102

Limit switches

OsiSense XC Basic

Miniature format	Compact format EN 50047		Compact format, with reset knob	
Plastic, pre-cabled	Plastic, 1 cable entry	Plastic, 2 cable entries	Plastic, 1 cable entry	Plastic, 2 cable entries



Plastic, double insulated		Plastic, double insulated		
-				
UL, CSA, CCC, GOST		CENELEC EN 50047 UL, CSA, CCC, GOST		UL, CSA, CCC, GOST
30 x 50 x 16	31 x 65 x 30	59 x 51 x 30	31 x 65 x 30	59 x 51 x 30
Linear movement (plunger) Rotary movement (lever) Rotary movement, multidirectional				
•	•	•	•	•
-	•	•	•	•
-	-	-	-	-
-	-	•	-	•
-	•	-	•	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
IP 65, IK 04				
- 25°C... + 70°C				
-	1 entry for ISO M20 or Pg 11 cable gland Other cable entries (3): ISO M16 x 1.5 and PF 1/2 (G1/2)	2 entries for ISO M16 or Pg 11 cable gland or 1/2" NPT (using adaptor)	1 entry for ISO M20 or Pg 11 cable gland Other cable entries (3): ISO M16 x 1.5 and PF 1/2 (G1/2)	2 entries for ISO M16 or Pg 11 cable gland or 1/2" NPT (using adaptor)
Ø 7.5 PvR, CEI, halogen free, depending on model	-			
XCMN	XCKN	XCNT	XCNR	XCNTR
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Design/Applications	Very severe applications	Very severe material handling applications	For hoisting and material handling applications (XCR); for conveyor belt shift monitoring (XCRT)	For hoisting and material handling applications	Subminiature format and microswitch. Applications requiring high precision and a low operating force
	Metal, 1 cable entry	Metal, 3 cable entries	Metal or polyester, 1 cable entry	Metal or plastic, 3 cable entries	Plastic, pre-cabled



Enclosure	Metal	Metal	Metal or polyester	Metal or plastic	Polyester
Features	Head and body modularity	–	–	–	–
Conformity/Certifications	UL, CSA, GOST	CSA, GOST	CSA (XCR) CCC (XCR), GOST	CE, UL, CSA, CCC, GOST	CE, UL
Body dimensions (w x h x d) in mm	40 x 81 x 41	77 x 83 x 44	85 x 95 x 75	118 x 77 x 59 (metal) 118 x 77 x 67 (plastic)	Depending on type
Head	Linear movement (plunger) or rotary movement (lever)	Linear movement (plunger)	Rotary movement (lever)	Rotary movement (lever)	–
Contact blocks	2 electrically separate contacts snap action with positive opening operation slow break with positive opening operation	–	–	–	–
2 same polarity contacts snap action slow break	•	–	–	–	•
3 electrically separate contacts snap action with positive opening operation slow break with positive opening operation	–	–	–	–	–
4 electrically separate contacts snap action with positive opening operation slow break with positive opening operation	–	–	•	•	–
4 contacts (2 x 2 same polarity contacts), snap action	•	–	•	–	–
Degree of protection IP/IK	IP 65/IK 08	IP 65	IP 54/IK 07 or IP 65 depending on model	IP 66/IK 07 (metal) IP 65/IK 04 (plastic)	IP 67 or IP 40 depending on model IP 00 (tags)
Operating temperature	- 25°C... + 70°C; - 40° C or + 120° C (XC2J depending on model)				
Connection	1 entry with integral cable gland	3 tapped entries for Pg 13.5 cable gland	1 tapped entry for Pg 13.5 cable gland	3 tapped entries for Pg 13.5 cable gland or tapped M20 x 1.5	Tag connections or pre-wired depending on model
Screw terminals (entry for cable gland)	–	–	–	–	–
Pre-cabled	–	–	–	–	–
Connector	–	–	–	–	–
Type reference	XC2J	XC1AC	XCR XCRT	XCKMR XCKVR	XEP
Pages	1/164 et 1/176	1/182	1/188	1/189	1/202, 1/204 et 1/206

Safety limit switches and guard switches Preventa XCS							
Standard		With lever or hinge		Actuator operated			Coded magnetic for detection without contact
Miniature format	Compact format	Compact format	Miniature format	Compact format	Industrial format with or without locking	Rectangular format with solenoid interlocking	
Metal, pre-cabled	Metal or plastic, 1 cable entry	Plastic, 1 or 2 cable entries	Plastic, pre-cabled	Plastic, 1 or 2 cable entries	Metal, 1 cable entry		Coded magnetic switch or coded magnetic system, pre-cabled or connector
					Without locking	With locking, manual unlocking	



Metal	Metal or plastic	Plastic, double insulated	Plastic, double insulated		Metal		Metal	Plastic, double insulated	Plastic
–	–	–	–	–	–	–	–	–	–
UL, CSA		UL, CSA	UL, CSA	UL, CSA, GOST	UL, CSA, GOST		UL, CSA, GOST		CE, UL, CSA, TÜV, GOST depending on model
30 x 50 x 16	34 x 65 x 34.5	Depending on type		30 x 78 x 15	30 x 93 x 30 52 x 114 x 30	40 x 60 x 44	98 x 146 x 44 110 x 93.5 x 33	Depending on type	
Linear movement (plunger) or rotary movement (lever)		Rotary movement (lever)		Turret head		Turret head		–	
–	–	–	–	•	–	–	–	Depending on model	
–	–	•	•	–	–	–	–	•	–
–	–	–	–	•	–	–	–	–	–
–	–	•	•	–	•	–	–	•	–
•	–	•	–	•	–	–	–	–	–
•	–	•	•	•	•	•	•	–	–
–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–
•	–	–	–	–	–	–	–	–	–
IP 66, IP 67 IP 68 (XCSD) IK 06 (XCSD & XCSD) IK 04 (XCSP)	–	IP 67	IP 67	–	–	IP 67	IP 67	–	IP 66, IP 67 IP 69K depending on model
–25°C... +70°C		–25°C... +70°C		–25°C... +70°C		–25°C... +70°C		–25°C... +70°C	
XCSD and XCSD: 1 entry for Pg 13.5 or M20 cable gland or 1/2" NPT XCSD: Ø 7.5 cable, PvR		Depending on model: 1 or 2 entries for Pg 13.5 or ISO M20 cable gland or 1/2" NPT		Depending on model: 1 or 2 entries for ISO M16 or Pg 11 cable gland or 1/2" NPT XCSD: Ø 7.5 cable, PvR		1 entry for ISO M20 or Pg 13.5 cable gland or 1/2" NPT		Depending on model: 1 or 2 entries for Pg 13.5 or ISO M20 cable gland or 1/2" NPT	
–		–		–		–		PVC cable	
–		–		–		–		Remote M8, remote M12 or integral M12 depending on model	
XCSD	XCSD	XCSPL, XCSPR XCSTL, XCSTR	XCSMP	XCSPA XCSTA	XCSA	XCSB XCSC	XCSE	XCSTE	XCSDM/C/P/R XCSDM3/4

Limit switches

OsiSense XC

Variable composition: simplicity through innovation

1

Principle

Variable composition principle

■ The Miniature design XCMD and Compact design XCKD, XCKP and XCKT ranges benefit from the variable composition concept.

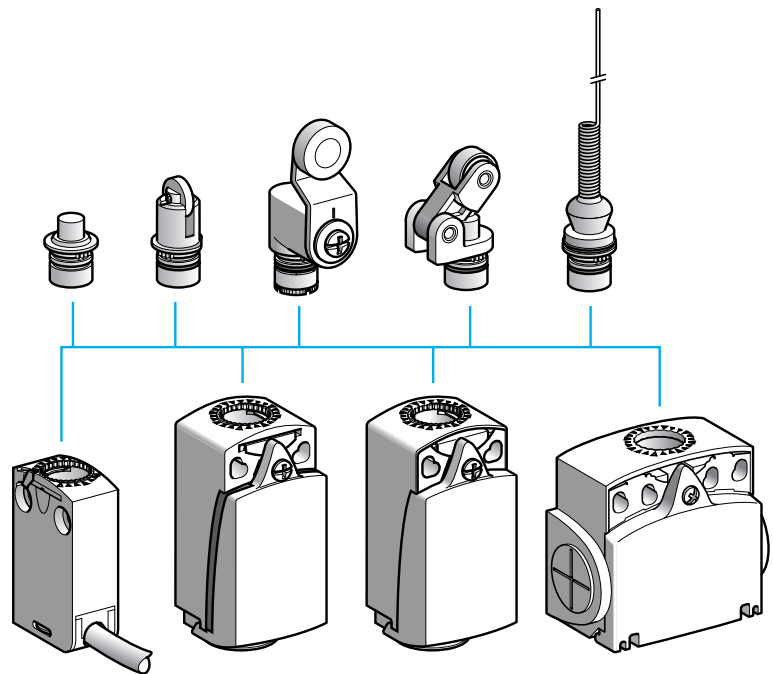
■ A worldwide detection first for improving productivity.

A complete offer for resolving the most commonly encountered detection problems:

- product selection simplified,
- product availability simplified,
- installation and setting-up simplified,
- maintenance simplified.

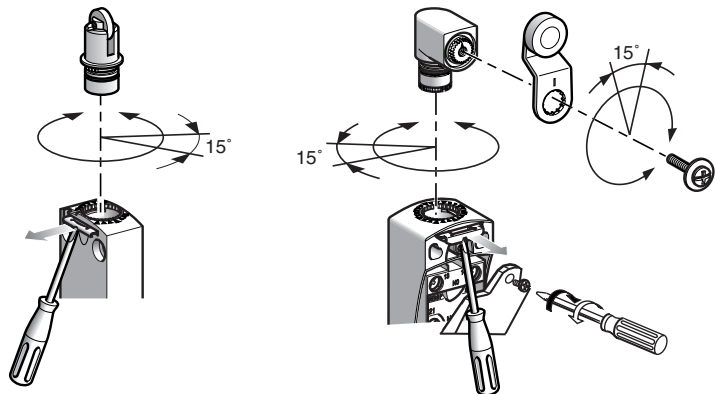
Heads

■ A single metal operating head type for the Miniature design XCMD and Compact design XCKD, XCKP and XCKT ranges.



■ Interchanging of heads achieved by simple operation of forked metal latch.

■ Adjustable in 3 planes:



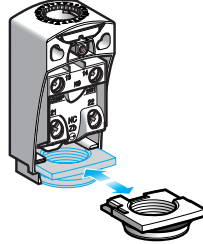
All the heads can be adjusted in 15° steps throughout 360°, in relation to the body.

All the levers can be adjusted in 15° steps throughout 360°, in relation to the horizontal axis of the head.

Principle (continued)

Cable entries

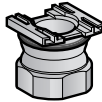
- The cable entries for Compact design XCKD and XCKP switches enable:
 - simple cabling due to unrestricted access to contacts,



- simple adaptation to the various worldwide markets:
 - 6 models are available:



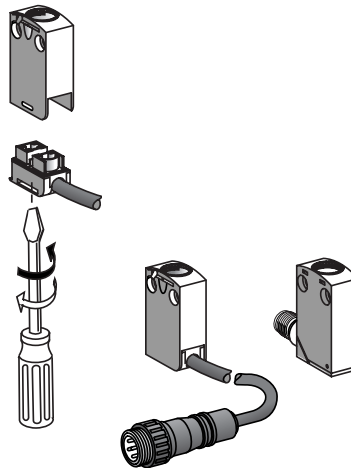
- ISO M16 x 1.5
- Pg 11



- ISO M20 x 1.5
- Pg 13.5
- 1/2" NPT
- PF 1/2 (G 1/2)

Each model is available in metal or plastic, respectively suited to Compact design XCKD and XCKP.

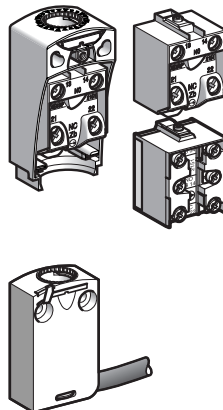
Connection components



- The miniature XCMD range allows interchanging of these pre-cabled connection components:
 - a 1/4 of a turn is all that is required for removing the connection component on XCMD bodies with 2 and 3 contacts,
 - 6 alternative cable lengths are available as standard.

- The miniature XCMD range also includes an integral or remote connector solution.

Contact block or bodies with contact



- 2 and 3 snap action and slow break contact blocks, with positive opening operation, are interchangeable between the Compact design XCKD and XCKP and Classic XCKJ, XCKS, XCKM and XCKL ranges.

- For the miniature design XCMD range, the contacts are an integral part of the body:
 - 2 and 3 snap action and slow break contacts, with positive opening operation, and interchangeable connection component,
 - 4 snap action contacts, with positive opening operation, with monolithic body and connection components.

Limit switches

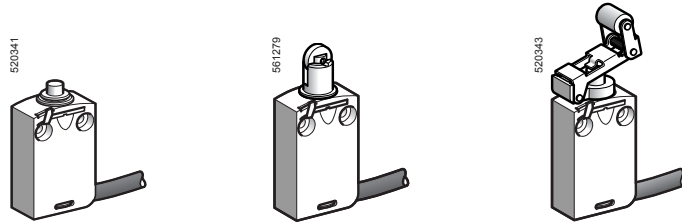
OsiSense XC Standard

Miniature design, metal, type XCMD

1

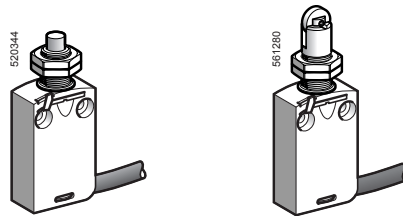
■ XCMD pre-cabled

□ With head for linear movement (plunger). Fixing by the body



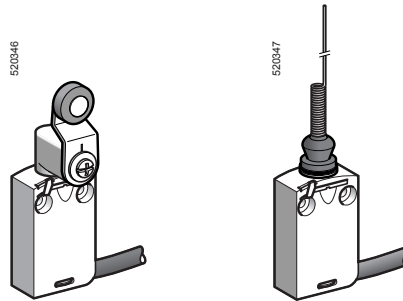
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□ With head for linear movement (plunger). Fixing by the head



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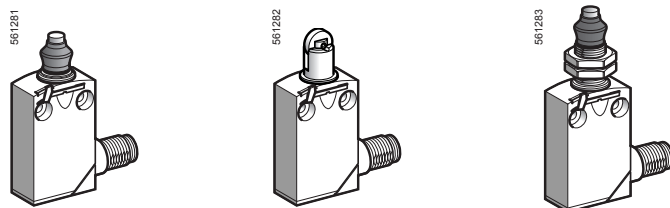
□ With head for rotary movement (lever) or multi-directional. Fixing by the body



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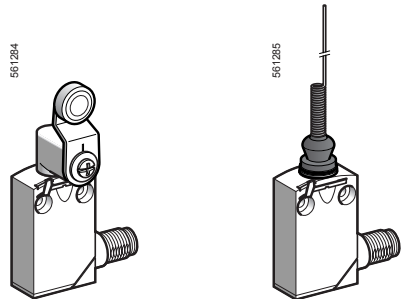
■ XCMD with connector

□ With head for linear movement (plunger)
Fixing by the body Fixing by the head



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□ With head for rotary movement (lever) or multi-directional. Fixing by the body



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Environment characteristics

Conformity to standards	Products	IEC 60947-5-1, EN 60947-5-1, UL 508, CSA C22-2 n° 14
	Machine assemblies	IEC 60204-1, EN 60204-1
Product certifications		UL, CSA (except products with special cables), CCC
Protective treatment		Standard version: "TC"
Ambient air temperature		For operation: - 25... + 70°C. For storage: - 40... + 70°C
Vibration resistance		XCMD snap action: 5 gn. XCMD slow break: 25 gn (10...500 Hz) conforming to IEC 60068-2-6
Shock resistance		25 gn (18 ms) conforming to IEC 60068-2-27 except head ZCE08: 15 gn (18 ms)
Electric shock protection		Class I conforming to IEC 61140 and NF C 20-030
Degree of protection		IP 66, IP 67 and IP 68 (1) conforming to IEC 60529; IK 06 conforming to EN 50102
Materials		Bodies: Zamak, heads: Zamak
Repeat accuracy		0.05 mm on the tripping points, with 1 million operations for head with end plunger

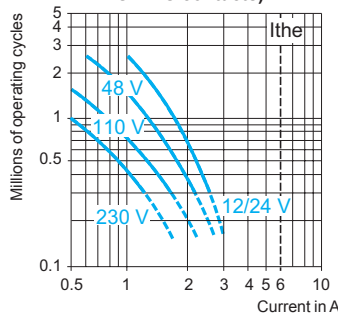
(1) Protection against prolonged immersion: the test conditions are subject to agreement between the manufacturer and the user.

Contact block characteristics

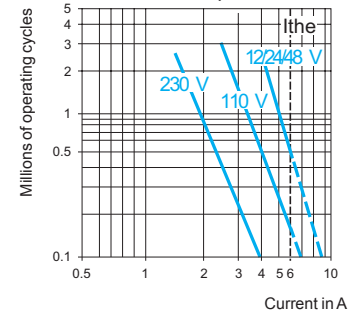
Rated operational characteristics	Switches with 2 contacts	~ AC-15; B300 (Ue = 240 V, Ie = 1.5 A) ⋮ DC-13; R300 (Ue = 250 V, Ie = 0.1 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
	Switches with 3 and 4 contacts	~ AC-15; C300 (Ue = 240 V, Ie = 0.75 A) ⋮ DC-13; R300 (Ue = 250 V, Ie = 0.1 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
	Pre-cabled switches	Ithe = 6 A for 2 contacts, 4 A for 3 contacts, 3 A for 4 contacts
	Switches with M12, 4-pin connector	Ui = 250 V, Ie = 3 A maximum, Ithe = 3 A
	Switches with M12, 5-pin connector	Ui = 60 V, Ie = 4 A maximum, Ithe = 4 A
	Switches with 7/8"-16UN, 5-pin connector	Ui = 250 V, Ie = 6 A maximum, Ithe = 6 A
Rated insulation voltage		Ui = 400 V degree of pollution 3 conforming to IEC 60947-5-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage		U imp = 4 kV conforming to IEC 60947-1, IEC 60664
Positive operation (depending on model)		NC contacts with positive opening operation conforming to IEC 60947-5-1 Appendix K, EN 60947-5-1
Resistance across terminals		≤ 25 mΩ conforming to IEC 60255-7 category 3
Short-circuit protection		6 A cartridge fuse type gG (gl)
Minimum actuation speed (for head with end plunger)		Snap action contact: 0.01 m/minute, slow break contact: 6 m/minute
Electrical durability		<ul style="list-style-type: none"> ■ Conforming to IEC 60947-5-1 Appendix C ■ Utilisation categories AC-15 and DC-13 ■ Maximum operating rate: 3600 operating cycles/hour ■ Load factor: 0.5

AC supply
50/60 Hz ~
~m inductive circuit

XCMD snap action (NC + NO, NC + NC, NC + NC + NO, NC + NC + NO + NO contacts)



XCMD slow break (NC + NO, NC + NC + NO contacts)



DC supply ⋮

Power broken in W for 5 million operating cycles				
Voltage	V	24	48	120
~m	W	3	2	1

Power broken in W for 5 million operating cycles				
Voltage	V	24	48	120
~m	W	4	3	3

Limit switches

OsiSense XC Standard
Miniature design, metal, type XCMD
Pre-cabled

1

Type of head	Plunger (fixing by the body)			Plunger (fixing by the head)			
Type of operator	Metal end plunger	Metal end plunger with elastomer boot (1)	Steel roller plunger	Retractable steel roller lever plunger	M12 with metal end plunger	M16 with metal end plunger with elastomer boot (1)	M12 with steel roller plunger

References							
2-pole NC + NO snap action 	XCMD2110L1 	XCMD2111L1 	XCMD2102L1 	XCMD2124L1 	XCMD21F0L1 	XCMD21G1L1 	XCMD21F2L1
2-pole NC + NO break before make, slow break 	XCMD2510L1 	XCMD2511L1 	XCMD2502L1 	XCMD2524L1 	XCMD25F0L1 	XCMD25G1L1 	XCMD25F2L1
2-pole NC + NC snap action 	ZCMD29L1 + ZCE10 	ZCMD29L1 + ZCE11 	ZCMD29L1 + ZCE02 	ZCMD29L1 + ZCE24 	ZCMD29L1 + ZCEF0 	ZCMD29L1 + ZCEG1 	ZCMD29L1 + ZCEF2
3-pole NC + NC + NO snap action 	ZCMD39L1 + ZCE10 	ZCMD39L1 + ZCE11 	ZCMD39L1 + ZCE02 	ZCMD39L1 + ZCE24 	ZCMD39L1 + ZCEF0 	ZCMD39L1 + ZCEG1 	ZCMD39L1 + ZCEF2
3-pole NC + NC + NO break before make, slow break 	ZCMD37L1 + ZCE10 	ZCMD37L1 + ZCE11 	ZCMD37L1 + ZCE02 	ZCMD37L1 + ZCE24 	ZCMD37L1 + ZCEF0 	ZCMD37L1 + ZCEG1 	ZCMD37L1 + ZCEF2
Weight (kg)	0.180	0.180	0.185	0.200	0.195	0.220	0.205
4-pole NC + NC + NO + NO snap action 	ZCMD41L1 + ZCE10 	ZCMD41L1 + ZCE11 	ZCMD41L1 + ZCE02 	ZCMD41L1 + ZCE24 	ZCMD41L1 + ZCEF0 	ZCMD41L1 + ZCEG1 	ZCMD41L1 + ZCEF2
Weight (kg)	0.160	0.160	0.165	0.180	0.175	0.200	0.185

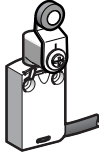
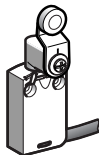
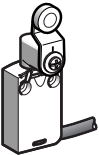
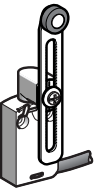
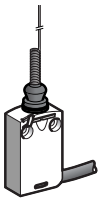
Contact operation closed open (A) = cam displacement (P) = positive opening point \Rightarrow NC contact with positive opening operation

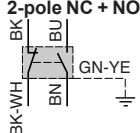
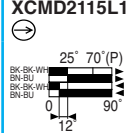
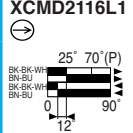
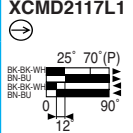
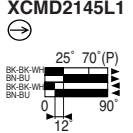
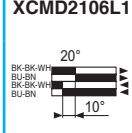
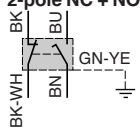
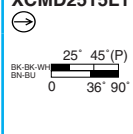
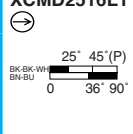
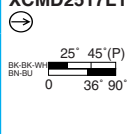
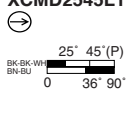
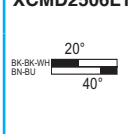
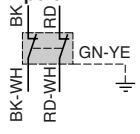
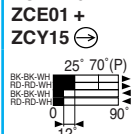
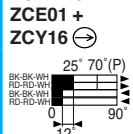
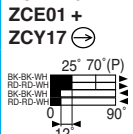
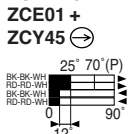
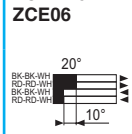
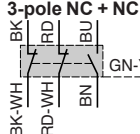
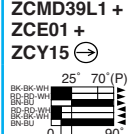
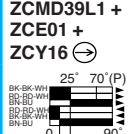
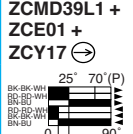
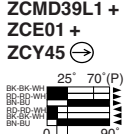
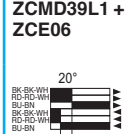
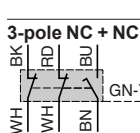
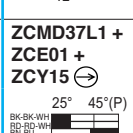
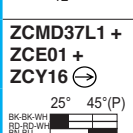
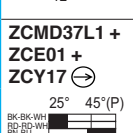
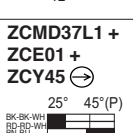

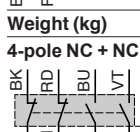
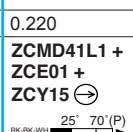
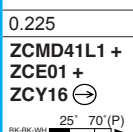
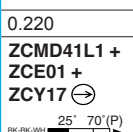
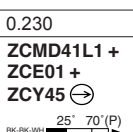
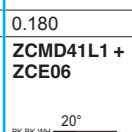
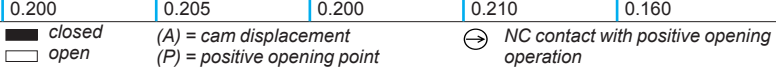
Characteristics					
Switch actuation	On end		By 30° cam		On end
Type of actuation					
Maximum actuation speed	0.5 m/s				0.1m/s
Mechanical durability	10 million operating cycles				
Minimum force or torque	For tripping	8.5 N	7 N	2.5 N	8.5 N
	For positive opening	42.5 N	35 N	12.5 N	35 N
Cabling	PvR cable, 5 x 0.75 mm ² , length 1 metre for 2-pole contact versions, 7 x 0.5 mm ² , length 1 metre for 3-pole contact versions, 9 x 0.34 mm ² , length 1 metre for 4-pole contact versions. For other lengths see page 1/22.				

(1) Nitrile for indoor use.

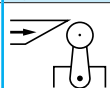
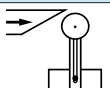
Limit switches

OsiSense XC Standard
Miniature design, metal, type XCMD
Pre-cabled

Type of head	Rotary (fixing by the body)				Multi-directional
					
Type of operator	Thermoplastic roller lever	Steel roller lever	Roller lever with ball bearing mounted roller	Variable length thermoplastic roller lever	"Cat's whisker" (1)

References					
2-pole NC + NO snap action 	XCMD2115L1 	XCMD2116L1 	XCMD2117L1 	XCMD2145L1 	XCMD2106L1 
2-pole NC + NO break before make, slow break 	XCMD2515L1 	XCMD2516L1 	XCMD2517L1 	XCMD2545L1 	XCMD2506L1 
2-pole NC + NC snap action 	ZCMD29L1 + ZCE01 + ZCY15 	ZCMD29L1 + ZCE01 + ZCY16 	ZCMD29L1 + ZCE01 + ZCY17 	ZCMD29L1 + ZCE01 + ZCY45 	ZCMD29L1 + ZCE06 
3-pole NC + NC + NO snap action 	ZCMD39L1 + ZCE01 + ZCY15 	ZCMD39L1 + ZCE01 + ZCY16 	ZCMD39L1 + ZCE01 + ZCY17 	ZCMD39L1 + ZCE01 + ZCY45 	ZCMD39L1 + ZCE06 
3-pole NC + NC + N/O break before make, slow break 	ZCMD37L1 + ZCE01 + ZCY15 	ZCMD37L1 + ZCE01 + ZCY16 	ZCMD37L1 + ZCE01 + ZCY17 	ZCMD37L1 + ZCE01 + ZCY45 	ZCMD37L1 + ZCE06 
Weight (kg) 4-pole NC + NC + NO + NO snap action 	ZCMD41L1 + ZCE01 + ZCY15 	ZCMD41L1 + ZCE01 + ZCY16 	ZCMD41L1 + ZCE01 + ZCY17 	ZCMD41L1 + ZCE01 + ZCY45 	ZCMD41L1 + ZCE06 
Weight (kg)	0.220	0.225	0.220	0.230	0.180
Contact operation					

(1) Value taken with actuation by moving part at 100 mm from the fixing.

Characteristics		By 30° cam	By any moving part
Switch actuation		By 30° cam	By any moving part
Type of actuation			
Maximum actuation speed		1.5 m/s	1 m/s
Mechanical durability		10 million operating cycles	5
Minimum force or torque	For tripping	0.1 N.m	
	For positive opening	0.5 N.m	–
Cabling		PvR cable, 5 x 0.75 mm ² , length 1 metre for 2-pole contact versions, 7 x 0.5 mm ² , length 1 metre for 3-pole contact versions, 9 x 0.34 mm ² , length 1 metre for 4-pole contact versions. For other lengths see page 1/22.	

Limit switches

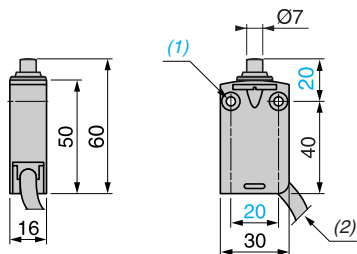
OsiSense XC Standard

Miniature design, metal, type XCMD

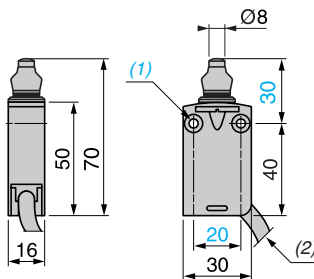
Pre-cabled

1

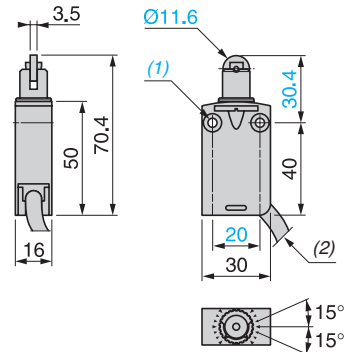
XCMD2•10L1



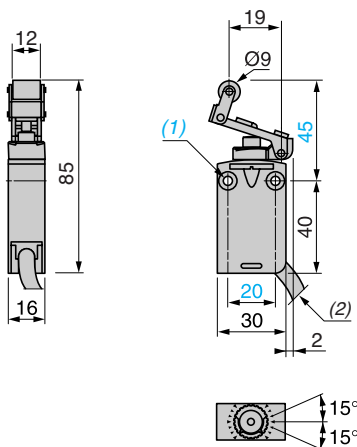
XCMD2•11L1



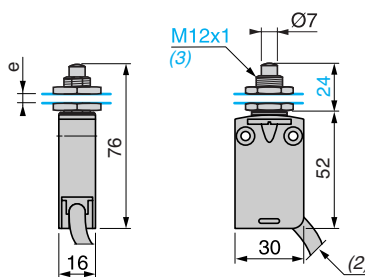
XCMD2•02L1



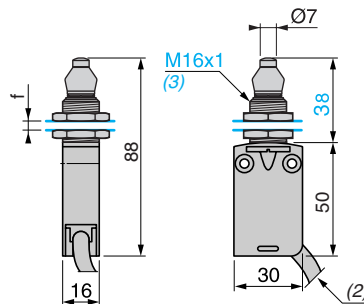
XCMD2•24L1



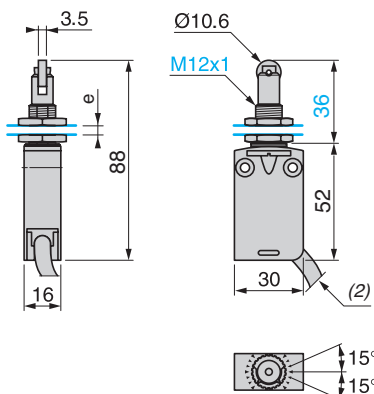
XCMD2•F0L1



XCMD2•G1L1



XCMD2•F2L1



(1) 2 fixing holes $\varnothing 4.2$ mm, counterbored $\varnothing 8$ mm by 4 mm deep.

(2) External diameter of cable 7.5 mm.

(3) Fixing nut thickness 3.5 mm.

e: 8 mm max, panel cut-out $\varnothing 12.5$ mm.

f: 8 mm max, panel cut-out $\varnothing 16.5$ mm.

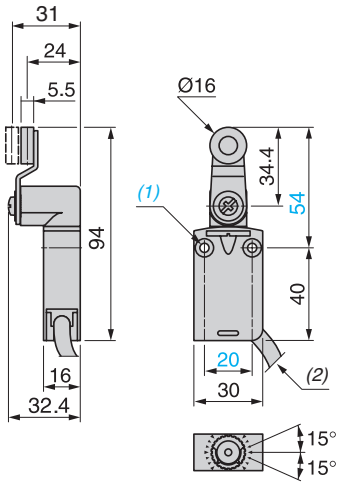
Limit switches

OsiSense XC Standard

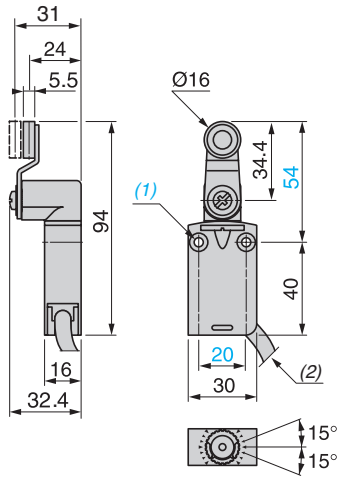
Miniature design, metal, type XCMD

Pre-cabled

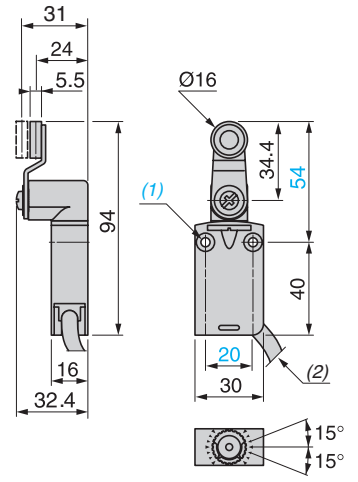
XCMD2•15L1



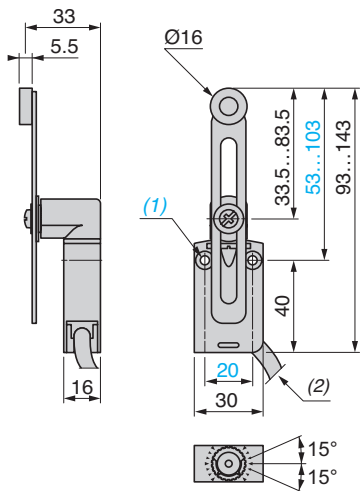
XCMD2•16L1



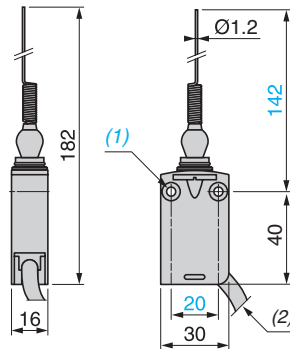
XCMD2•17L1



XCMD2•45L1



XCMD2•06L1



(1) 2 fixing holes Ø 4.2 mm, counterbored Ø 8 mm by 4 mm deep.

(2) External diameter of cable 7.5 mm.

e: 8 mm max, panel cut-out Ø 12.5 mm.

f: 8 mm max, panel cut-out Ø 16.5 mm.

Limit switches

OsiSense XC Standard

Miniature design, metal, type XCMD Connector

1

Type of head	Plunger (fixing by the body)				Plunger (fixing by the head)		
Type of operator	Metal end plunger	Metal end plunger with elastomer boot (1)	Steel roller plunger	Retractable steel roller lever plunger	M12 with metal end plunger	M16 with metal end plunger with elastomer boot (1)	M12 with steel roller plunger

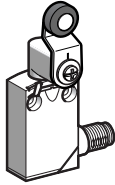
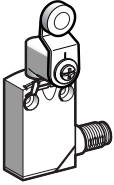
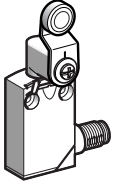
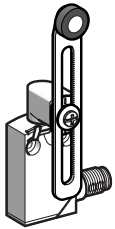
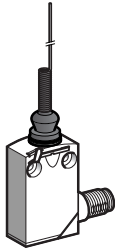
References								
	Single-pole CO snap action + integral M12 4-pin connector	XCMD2110M12	XCMD2111M12	XCMD2102M12	XCMD2124M12	XCMD21F0M12	XCMD21G1M12	XCMD21F2M12
	2-pole NC + NO snap action + integral M12 5-pin connector	XCMD2110C12	XCMD2111C12	XCMD2102C12	XCMD2124C12	XCMD21F0C12	XCMD21G1C12	XCMD21F2C12
	2-pole NC + NC snap action + integral M12 5-pin connector	ZCMD29C12 + ZCE10	ZCMD29C12 + ZCE11	ZCMD29C12 + ZCE02	ZCMD29C12 + ZCE24	ZCMD29C12 + ZCEF0	ZCMD29C12 + ZCEG1	ZCMD29C12 + ZCEF2
Weight (kg)		0.085	0.085	0.090	0.105	0.100	0.125	0.110
	2-pole NC + NO snap action + M12 5-pin connector on 0.8 m flying lead	ZCMD21L08R12 + ZCE10	ZCMD21L08R12 + ZCE11	ZCMD21L08R12 + ZCE02	ZCMD21L08R12 + ZCE24	ZCMD21L08R12 + ZCEF0	ZCMD21L08R12 + ZCEG1	ZCMD21L08R12 + ZCEF2
	2-pole NC + NO snap action + 7/8"-16UN 5-pin connector on 0.8 m flying lead	ZCMD21L08U78 + ZCE10	ZCMD21L08U78 + ZCE11	ZCMD21L08U78 + ZCE02	ZCMD21L08U78 + ZCE24	ZCMD21L08U78 + ZCEF0	ZCMD21L08U78 + ZCEG1	ZCMD21L08U78 + ZCEF2
Weight (kg)		0.150	0.150	0.155	0.170	0.165	0.190	0.175
Contact operation		closed		(A) = cam displacement		NC contact with positive opening operation		
		open		(P) = positive opening point				


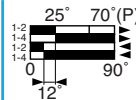
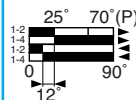
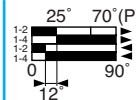
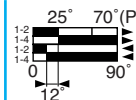
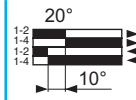

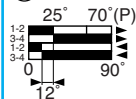
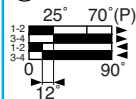
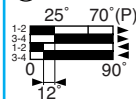
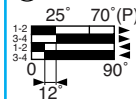
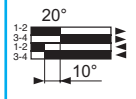

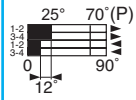
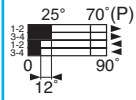
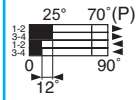
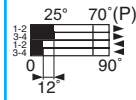
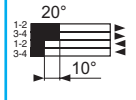
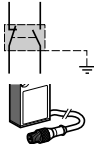
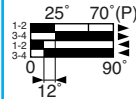
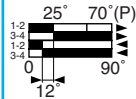
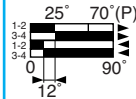
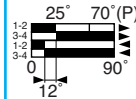
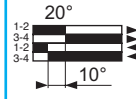
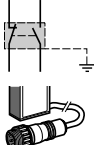
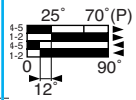
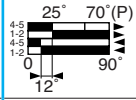
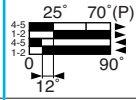
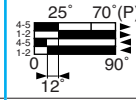
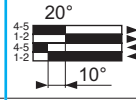

Characteristics					
Switch actuation	On end		By 30° cam		On end
Type of actuation					
Maximum actuation speed	0.5 m/s				0.1 m/s
Mechanical durability	10 million operating cycles				
Minimum force or torque	For tripping	8.5 N	7 N	2.5 N	8.5 N
	For positive opening	42.5 N	35 N	12.5 N	42.5 N
Positive operation	Although their design is identical to the pre-cabled switches, the switches incorporating an M12 4-pin connector cannot be marked with the symbol because they are single-pole CO.				

(1) Nitrile for indoor use.

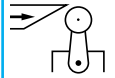

Limit switches

OsiSense XC Standard
Miniature design, metal, type XCMD
Connector

Type of head	Rotary (fixing by the body)				Multi-directional
					
Type of operator	Thermoplastic roller lever	Steel roller lever	Roller lever with ball bearing mounted roller	Variable length thermoplastic roller lever	"Cat's whisker" (1)

References					
 Single-pole CO snap action With integral M12, 4-pin connector	XCMD2115M12 	XCMD2116M12 	XCMD2117M12 	XCMD2145M12 	XCMD2106M12 
 2-pole NC + NO snap action With integral M12, 5-pin connector	XCMD2115C12 	XCMD2116C12 	XCMD2117C12 	XCMD2145C12 	XCMD2106C12 
 2-pole NC + NC snap action With integral M12, 5-pin connector	ZCMD29C12 + ZCE01 + ZCY15 	ZCMD29C12 + ZCE01 + ZCY16 	ZCMD29C12 + ZCE01 + ZCY17 	ZCMD29C12 + ZCE01 + ZCY45 	ZCMD29C12 + ZCE06 
Weight (kg)	0.125	0.130	0.125	0.135	0.085
 2-pole NC + NO snap action With M12, 5-pin connector on 0.8 m flying lead	ZCMD21L08R12 + ZCE01 + ZCY15 	ZCMD21L08R12 + ZCE01 + ZCY16 	ZCMD21L08R12 + ZCE01 + ZCY17 	ZCMD21L08R12 + ZCE01 + ZCY45 	ZCMD21L08R12 + ZCE06 
 2-pole NC + NO snap action With 7/8"-16UN, 5-pin connector on 0.8 m flying lead	ZCMD21L08U78 + ZCE01 + ZCY15 	ZCMD21L08U78 + ZCE01 + ZCY16 	ZCMD21L08U78 + ZCE01 + ZCY17 	ZCMD21L08U78 + ZCE01 + ZCY45 	ZCMD21L08U78 + ZCE06 
Weight (kg)	0.200	0.205	0.200	0.210	0.160
Contact operation					

(1) Value taken with actuation by moving part at 100 mm from the fixing.

Characteristics		
Switch actuation	By 30° cam	
Type of actuation		
Maximum actuation speed	1.5 m/s	1 m/s
Mechanical durability	10 million operating cycles	
Minimum force or torque	For tripping	0.1 N.m
	For positive opening	0.5 N.m
Positive operation	Although their design is identical to the pre-cabled switches, the switches incorporating an M12 4-pin connector cannot be marked with the ⊕ symbol because they are single-pole CO.	

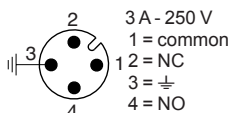
References of suitable pre-wired female connectors

Type of connector		M12 straight, 4-pin 4 A, 250 V	M12 straight, 5-pin 4 A, 24 V	M12 elbowed, 5-pin 4 A, 24 V	7/8"-16 UN straight, 5-pin, 6 A, 250 V
With cable	L = 2 m	XZCP1169L2	XZCP1164L2	XZCP1264L2	XZCP1771L2
	L = 5 m	XZCP1169L5	XZCP1164L5	XZCP1264L5	XZCP1771L5
	L = 10 m	XZCP1169L10	XZCP1164L10	XZCP1264L10	XZCP1771L10
Weight (kg)		0.105	0.115	0.115	0.190

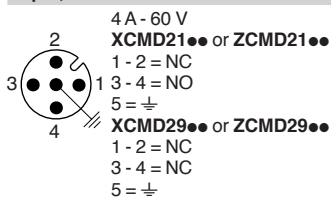
Connections

XCMD with connector

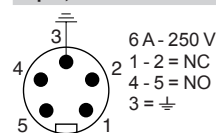
4-pin, M12



5-pin, M12

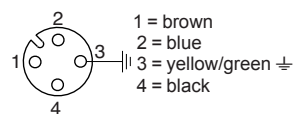


5-pin, 7/8"-16UN

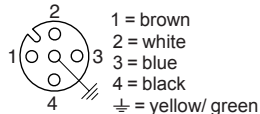


Pre-wired female connectors XZCP

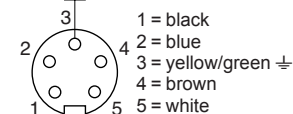
4-pin, M12



5-pin, M12

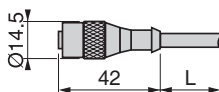


5-pin, 7/8"-16UN

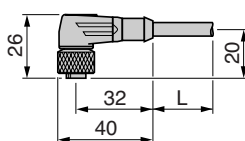


Dimensions

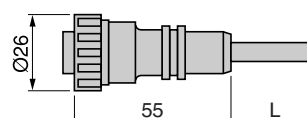
XZCP116●L●



XZCP1264L●



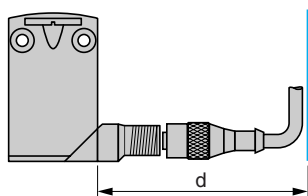
XZCP1771L●



L: cable length 2, 5 or 10 m.

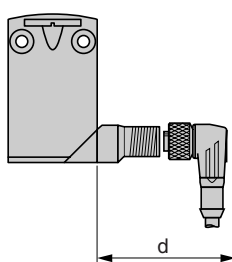
Distances required for plug-in connectors

M12 straight connector



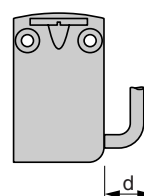
d: min. 65 mm, recommended 69 mm

M12 elbowed connector



d: min. 42 mm, recommended 45 mm

Connector on flying lead



d: min. 20 mm

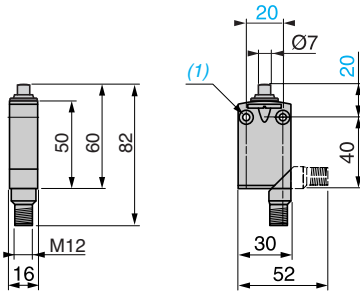
Limit switches

OsiSense XC Standard

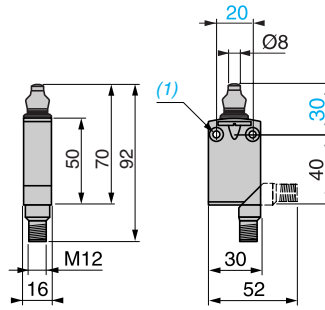
Miniature design, metal, type XCMD

Connector

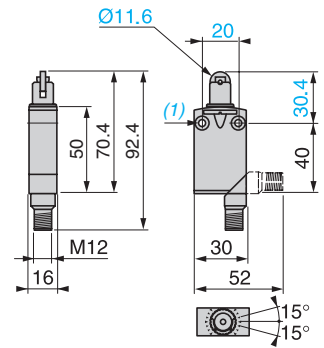
XCMD2•10M12



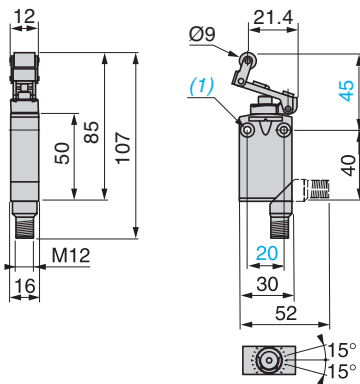
XCMD2•11M12



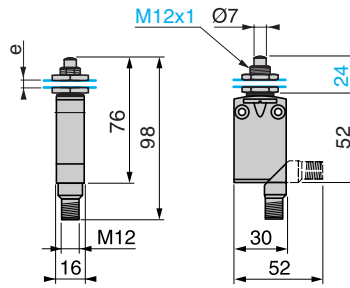
XCMD2•02M12



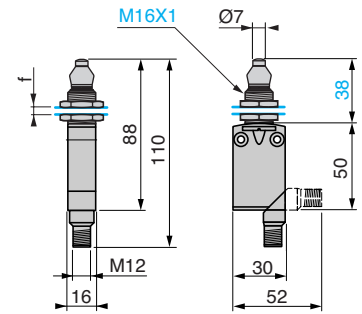
XCMD2•24M12



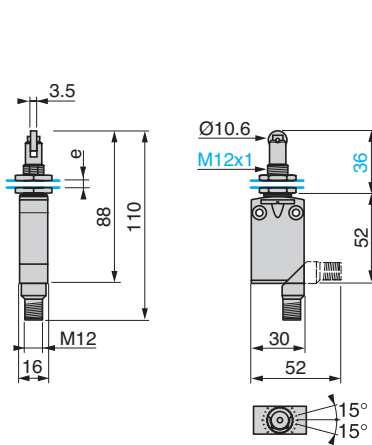
XCMD2•F0M12



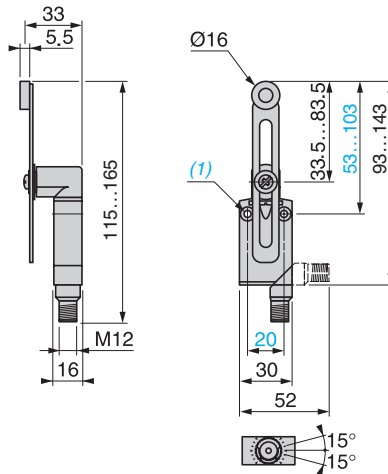
XCMD2•G1M12



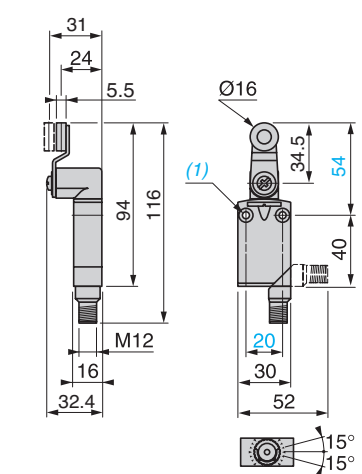
XCMD2•F2M12



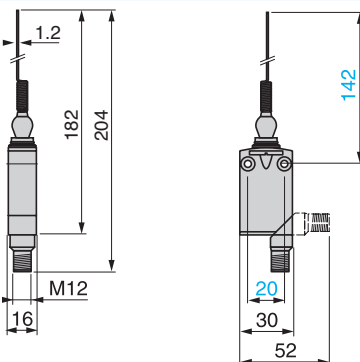
XCMD2•45M12



XCMD2•15M12/•16M12/•17M12



XCMD2•06M12



(1) 2 fixing holes Ø 4.2 mm, counterbored Ø 8 mm by 4 mm deep.

e: 8 mm max., panel cut-out Ø 12.5 mm, fixing nut thickness 3.5 mm.

f: 8 mm max., panel cut-out Ø 16.5 mm, fixing nut thickness 3.5 mm.

Limit switches

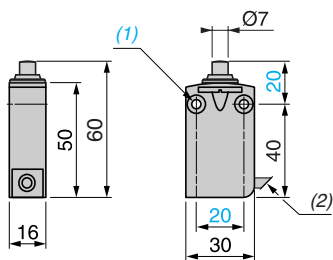
OsiSense XC Standard

Miniature design, metal, type XCMD

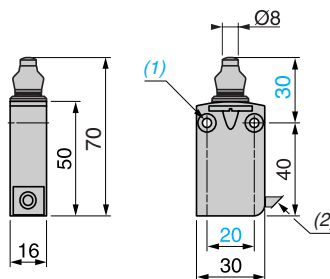
Connector

1

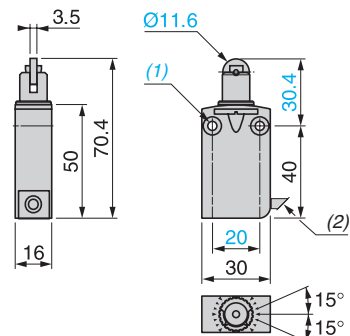
ZCMD21L08... + ZCE10



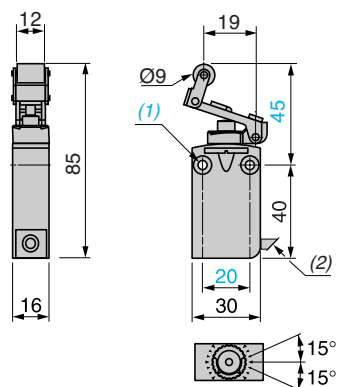
ZCMD21L08... + ZCE11



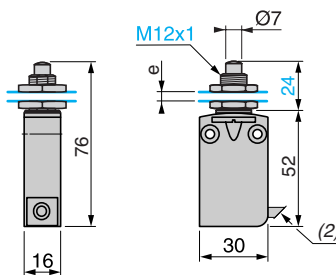
ZCMD21L08... + ZCE02



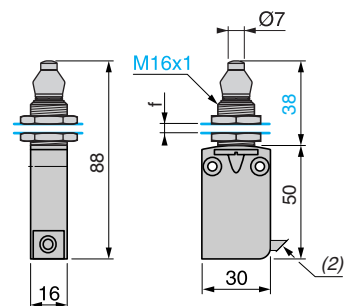
ZCMD21L08... + ZCE24



ZCMD21L08... + ZCEF0



ZCMD21L08... + ZCEG1



(1) 2 fixing holes Ø 4.2 mm, counterbored Ø 8 mm by 4 mm deep.

(2) External diameter 7.5 mm.

e: 8 mm max, panel cut-out Ø 12.5 mm, fixing nut thickness 3.5 mm.

f: 8 mm max., panel cut-out Ø 16.5 mm, fixing nut thickness 3.5 mm.

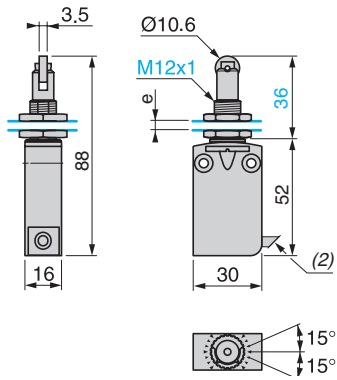
Limit switches

OsiSense XC Standard

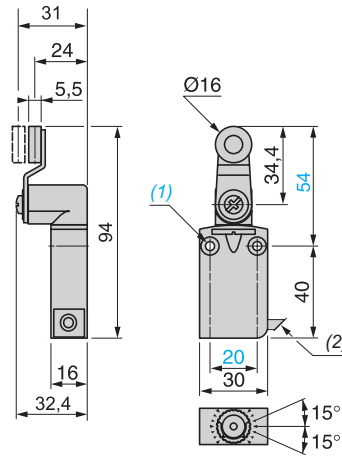
Miniature design, metal, type XCMD

Connector

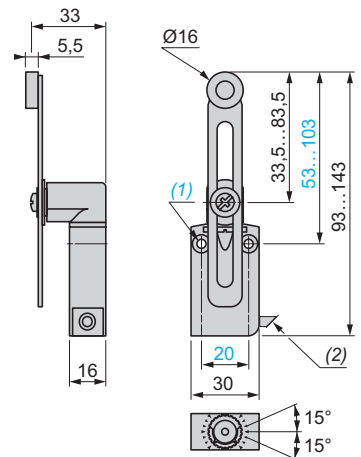
ZCMD21L08... + ZCEF2



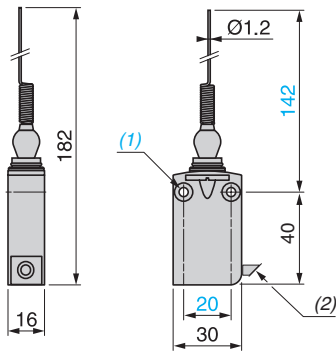
ZCMD21L08... + ZCE01 + ZCY15/16/17



ZCMD21L08... + ZCE01 + ZCY45



ZCMD21L08... + ZCE06



(1) 2 fixing holes Ø 4.2 mm, counterbored Ø 8 mm by 4 mm deep.

(2) External diameter 7.5 mm.

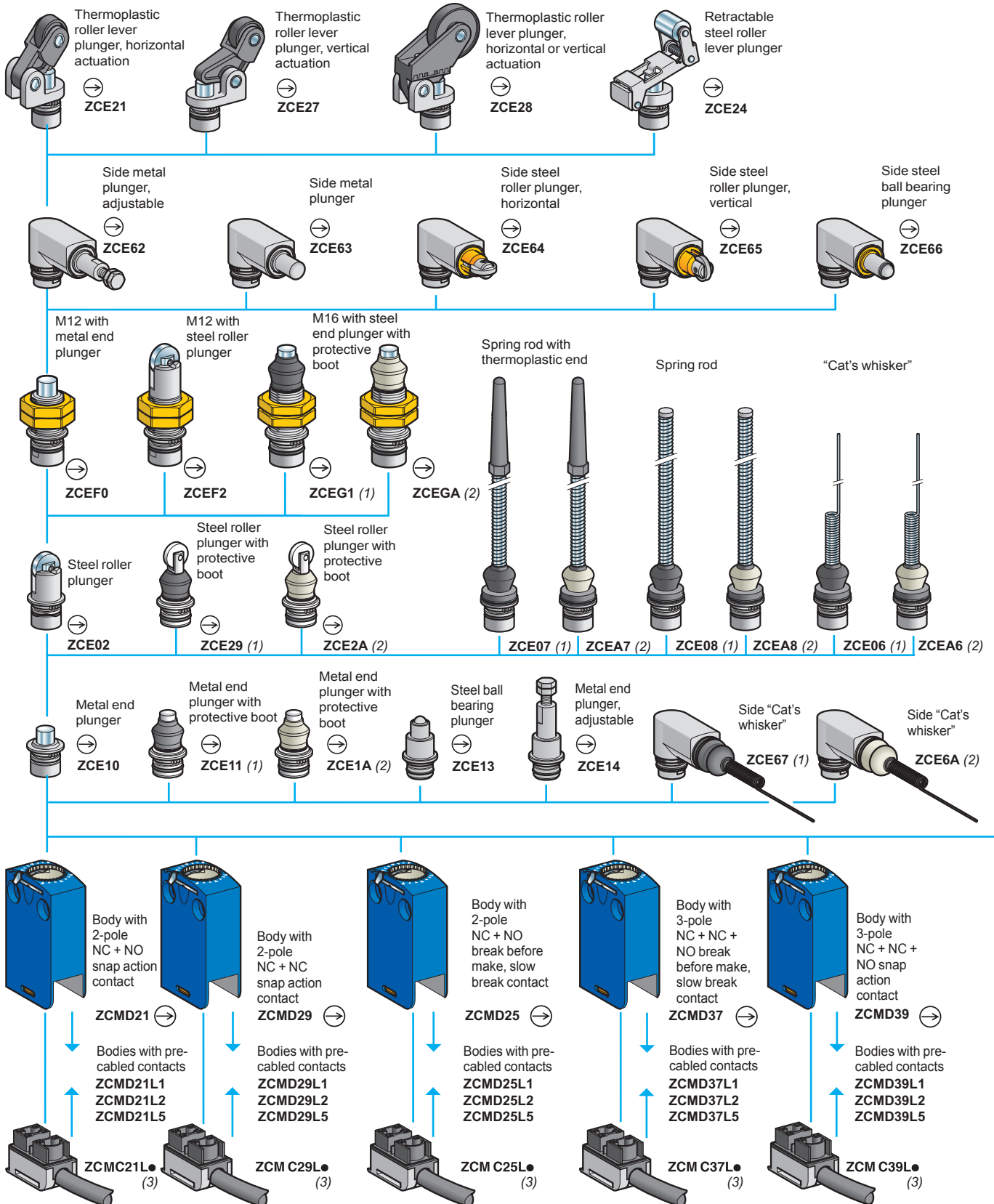
e: 8 mm max, panel cut-out Ø 12.5 mm, fixing nut thickness 3.5 mm.

f: 8 mm max, panel cut-out Ø 16.5 mm, fixing nut thickness 3.5 mm.

Limit switches

OsiSense XC Standard

Miniature design, metal, type XCMD
Variable composition



(1) Nitrile boot for indoor use.

(2) Silicone boot for outdoor use.

(3) Pre-cabled connection components: replace the "●" in the reference by the required cable length in metres, either: 1, 2, 3, 5, 7 or 10.

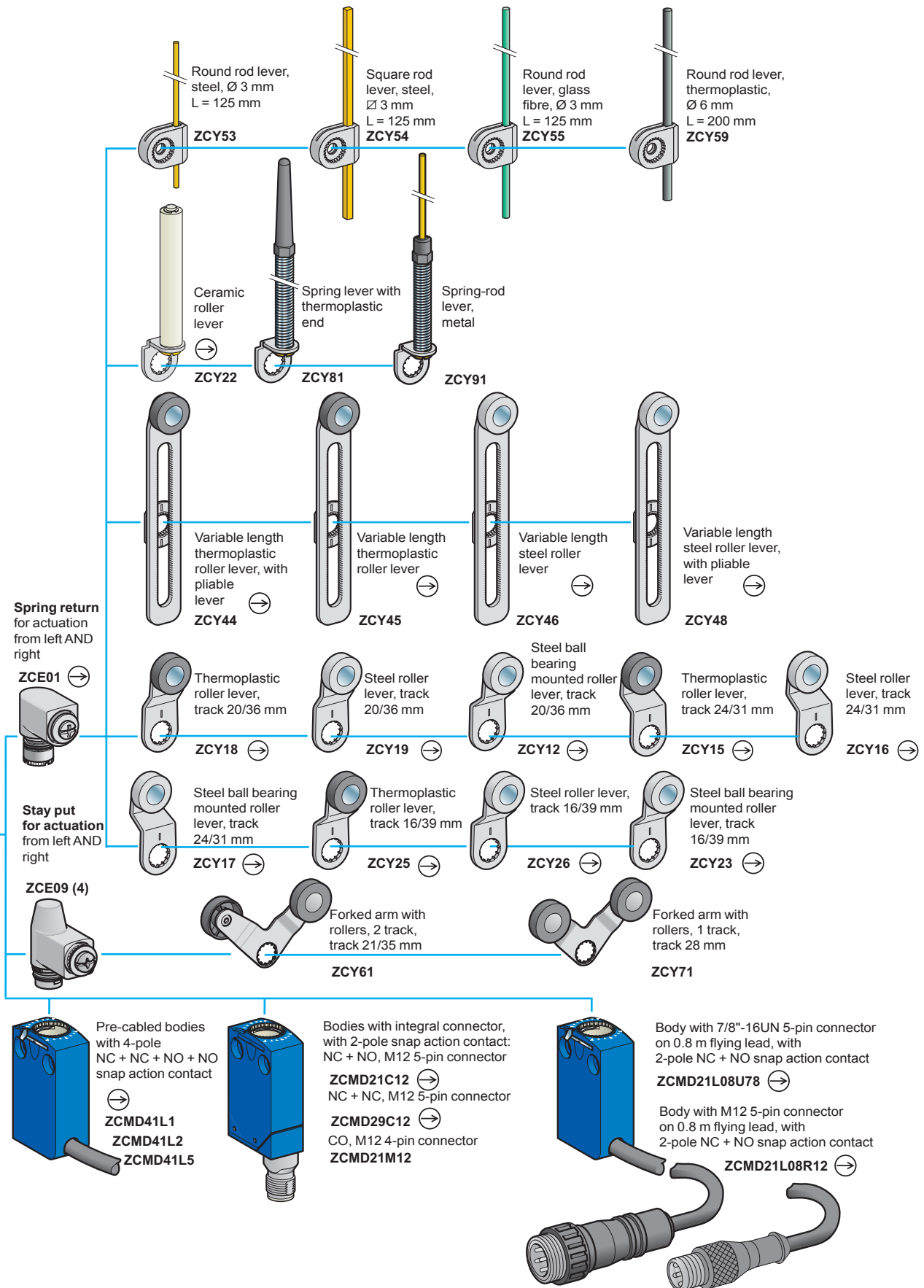
Example: **ZCMC21L●** becomes **ZCMC21L7** for a 7 metre long cable.

Note: Only cable lengths of 1, 2 and 5 metres are available for pre-cabled connection components **ZCMC37L●** and **ZCM39L●**

Limit switches

OsiSense XC Standard

Miniature design, metal, type XCMD
Variable composition



(4) Cannot be used on bodies ZCMD21, ZCMD29, ZCMD39, ZCMD41, ZCMD21C12, ZCMD21M12, ZCMD29C12, ZCMD21L08●●●.

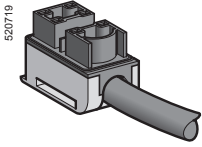
Limit switches

OsiSense XC Standard

Miniature design, metal, type XCMD

Separate components

1



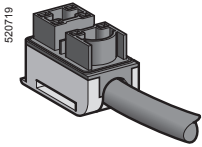
ZCMC21E●

Pre-cabled connection components with CEI cable (Connitato Elettrotecnico Italiano) (1)

Type of contact	Scheme	Length of CEI cable in metres	Reference	Weight kg
2-pole				
NC + NO snap action		1	ZCMC21E1	0.100
		2	ZCMC21E2	0.190
		3	ZCMC21E3	0.280
		5	ZCMC21E5	0.440
		7	ZCMC21E7	0.700
		10	ZCMC21E10	0.970

Pre-cabled connection components with halogen free cable

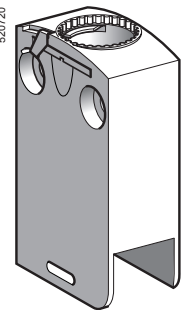
Type of contact	Positive operation (3)	Scheme	Length of cable in metres	Reference	Weight kg
2-pole					
NC + NO break before make, slow break	⊕		0.6	ZCMC25T06	0.080
NC + NO snap action	⊕		1	ZCMC21T1	0.130
			2	ZCMC21T2	0.250
			5	ZCMC21T5	0.520



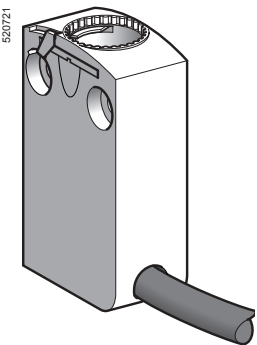
ZCMC25T06
ZCMC21T●

Bodies with gold contacts

Type of contact	Positive operation (3)	Scheme	Length of cable in metres	Reference	Weight kg
2-pole					
NC + NO snap action	⊕		-	ZCMD61	0.055
NC + NC snap action	⊕		-	ZCMD69	0.055
NC + NO break before make, slow break	⊕		-	ZCMD65	0.055
3-pole					
NC + NC + NO snap action	⊕		-	ZCMD79	0.055
NC + NC + NO break before make, slow break	⊕		-	ZCMD77	0.055
4-pole					
NC + NC + NO + NO snap action	⊕		1	ZCMD81L1	0.160
			2	ZCMD81L2	0.255
			5	ZCMD81L5	0.525



ZCMD6●
ZCMD7●



ZCMD81L●

(1) Cable not UL, CSA certified.

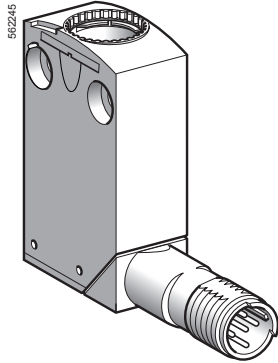
(2) Other types of contacts and cable possible. Please consult our Customer Care Centre.

(3) ⊕ bodies with contacts assuring positive opening operation.

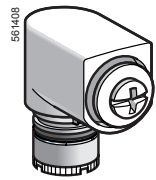
Limit switches

OsiSense XC Standard

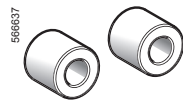
Miniature design, metal, type XCMD
Separate components



ZCMD61●●●



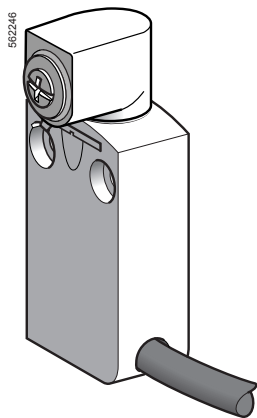
ZCE05



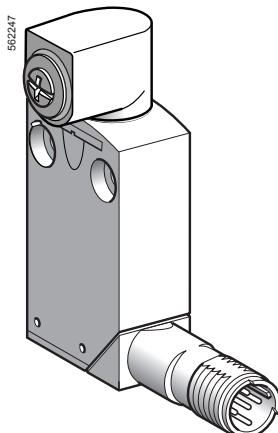
XCMZ06



XCMZ07



XCMD2●01L1



XCMD210●12

Bodies with gold contacts, connector

Type of contact	Positive operation (1)	Scheme	Connector	Reference	Weight kg
2-pole					
NC + NO snap action	–		M12, 5-pin	ZCMD61C12	0.065
NC + NC snap action	–		M12, 5-pin	ZCMD69C12	0.065
Single-pole					
CO snap action	–		M12, 4-pin	ZCMD61M12	0.065

Accessories

Description	Positive operation (1)	Suitable levers for use with head	Reference	Weight kg
Rotary head, without lever, spring return, for actuation from left AND right or from left OR right (2)		ZCY12, ZCY15, ZCY16, ZCY17, ZCY18, ZCY19, ZCY22, ZCY23, ZCY25, ZCY26, ZCY39, ZCY53, ZCY54, ZCY55, ZCY81	ZCE05	0.045
Spacer for mounting multi-track XCMD	–	–	XCMZ06	0.005
Spacer for angular positioning – of heads with adjustable levers, for values other than - 90°, 0° and 90°	–	–	XCMZ07	0.005

Bodies with contacts, with rotary head (without operating lever), pre-cabled

Type of contact	Positive operation (1)	Scheme	Length of cable in metres	Reference	Weight kg
2-pole					
NC + NO snap action			1	XCMD2101L1	0.180
NC + NO break before make, slow break			1	XCMD2501L1	0.180

Bodies with contacts, with rotary head (without operating lever), connector

Type of contact	Positive operation (1)	Scheme	Connector	Reference	Weight kg
2-pole					
NC + NO snap action			M12, 5-pin	XCMD2101C12	0.110
Single-pole					
CO snap action	–		M12, 4-pin	XCMD2101M12	0.110

(1) bodies with contacts or head assuring positive opening operation.

(2) For programming see page 1/130.

Limit switches

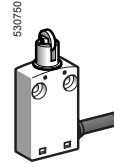
OsiSense XC Basic

Miniature design, plastic, type XCMN

1

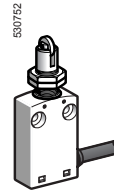
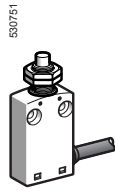
■ XCMN
pre-cabled

□ With head for linear movement (plunger). Fixing by the body



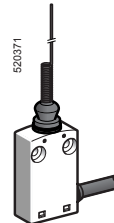
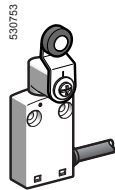
Page 1/28

□ With head for linear movement (plunger). Fixing by the head



Page 1/28

□ With head for rotary movement (lever) or multi-directional



Page 1/29

Environment characteristics

Conformity to standards	Products	IEC 60947-5-1, EN 60947-5-1, UL 508, CSA C22-2 n° 14
	Machine assemblies	IEC 60204-1, EN 60204-1
Product certifications		UL, CSA, CCC
Protective treatment	Standard version	"TC"
Ambient air temperature	For operation	- 25...+ 70°C
	For storage	- 40...+ 70°C
Vibration resistance	Conforming to IEC 60068-2-6	5 gn (10...500 Hz)
Shock resistance	Conforming to IEC 60068-2-27	25 gn (18 ms)
Electric shock protection		Class II conforming to IEC 61140 and NF C 20030
Degree of protection		IP 65 conforming to IEC 60529; IK 04 conforming to EN 50102
Materials	Bodies	Plastic
	Heads	Zamak

Contact block characteristics

Rated operational characteristics	\sim AC-15; B300 (U _e = 240 V, I _e = 1.5 A); I _{the} = 6 A $\overline{\text{---}}$ DC-13; R300 (U _e = 250 V, I _e = 0.1 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
Rated insulation voltage	U _i = 400 V degree of pollution 3 conforming to IEC 60947-1 U _i = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage	U _{imp} = 4 kV conforming to IEC 60947-1, IEC 60664
Short-circuit protection	6 A cartridge fuse type gG (gl)

Limit switches

OsiSense XC Basic

Miniature design, plastic, type XCMN

Pre-cabled

1

Type of head	Plunger (fixing by the body)				Plunger (fixing by the head)		
Type of operator	Metal end plunger	Steel roller plunger for lateral cam approach	Steel roller plunger for traverse cam approach	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	M12 with metal end plunger	M12 with steel roller plunger for lateral cam approach	M12 with steel roller plunger for traverse cam approach

References	XCMN2110L1	XCMN2102L1	XCMN2103L1	XCMN2121L1	XCMN21F0L1	XCMN21F2L1	XCMN21F3L1
 2-pole NC + NO snap action BK-BK-WH, BK-BU, BK-BK-WH, BK-BU, BK-WH, BK-BU	 1.8 4.2(P) 0 5mm 0.8	 3.1(A) 7(P) 0 1.4 mm	 3.1(A) 7(P) 0 1.4 mm	 65(A)14(P) 0 2.8 mm	 1.8 4.2(P) 0 5mm 0.8	 3.1(A) 7(P) 0 1.4 mm	 3.1(A) 7(P) 0 1.4 mm
Weight (kg)	0.080	0.080	0.080	0.090	0.065	0.095	0.095
Contact operation	closed open		(A) = cam displacement (P) = positive opening point		NC contact with positive opening operation		

Characteristics	On end		By 30° cam		On end		By 30° cam	
Switch actuation	On end		By 30° cam		On end		By 30° cam	
Type of actuation								
Maximum actuation speed	0.5 m/s		0.1 m/s		0.5 m/s		0.1 m/s	
Mechanical durability	5 million operating cycles							
Minimum force or torque	For tripping	8.5 N	7 N		2.5 N	8.5 N	7 N	
	For positive opening	42.5 N	35 N		12.5 N	42.5 N	35 N	
Cabling	PvR cable, 4 x 0.75 mm ² , length 1 metre							

Dimensions

XCMN2110L1	XCMN2102L1, XCMN2103L1	XCMN21F2L1, XCMN21F3L1

XCMN2121L1	XCMN21F0L1

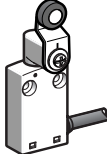
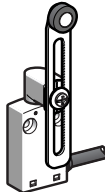
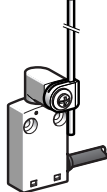
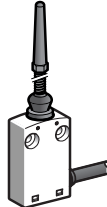
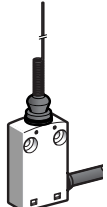
(1) 2 fixing holes Ø 4.2 mm, counterbored Ø 8 mm by 4 mm deep.
 (2) External diameter 7.5 mm.
 e: 8 mm max, panel cut-out Ø 12.5 mm.
 Fixing nut thickness 3.5 mm.

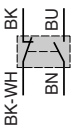
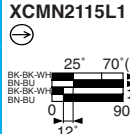
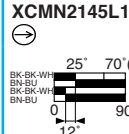
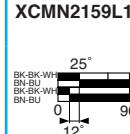
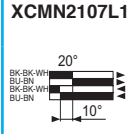
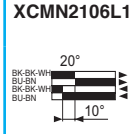

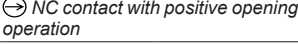
Limit switches

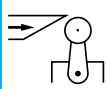
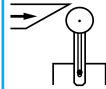
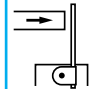
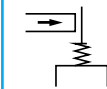
OsiSense XC Basic

Miniature design, plastic, type XCMN

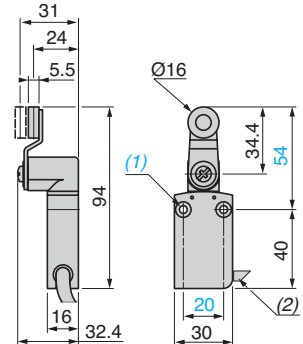
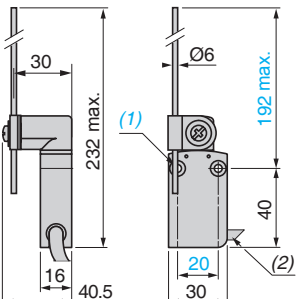
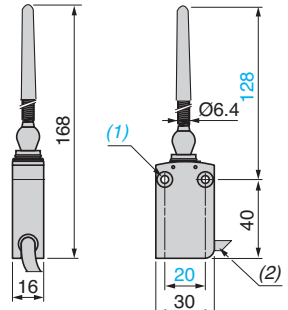
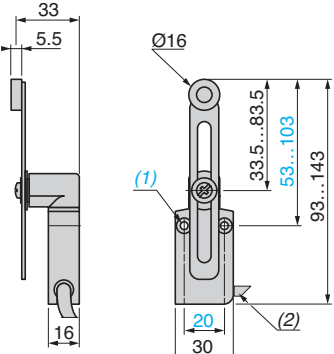
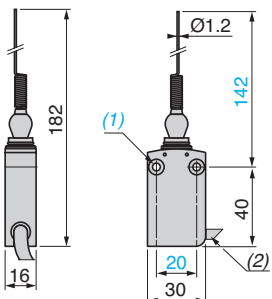
Pre-cabled

Type of head	Rotary (fixing by the body)			Multi-directional	
Type of operator					
	Thermoplastic roller lever	Variable length thermoplastic roller lever	Round thermoplastic rod lever, Ø 6 mm (1)	Spring lever with thermoplastic end (1)	"Cat's whisker" (1)

References	XCMN2115L1	XCMN2145L1	XCMN2159L1	XCMN2107L1	XCMN2106L1
 2-pole NC + NO snap action					
Weight (kg)	0.100	0.105	0.080	0.085	0.080
Contact operation	 closed (A) = cam displacement open (P) = positive opening point			 NC contact with positive opening operation	
	(1) Value taken with actuation by moving part at 100 mm from the fixing.				

Characteristics	By 30° cam		By any moving part	
Switch actuation	By 30° cam		By any moving part	
Type of actuation				
Maximum actuation speed	1.5 m/s		1 m/s	1 m/s (any direction)
Mechanical durability	5 million operating cycles			
Minimum force or torque	For tripping	0.1 N.m	-	-
	For positive opening	0.5 N.m	-	-
Cabling	PvR cable, 4 x 0.75 mm ² , length 1 metre			

Dimensions

XCMN2115L1	XCMN2159L1	XCMN2107L1
		
XCMN2145L1	XCMN2106L1	
		

(1) 2 fixing holes Ø 4.2 mm, counterbored Ø 8 mm by 4 mm deep.
 (2) External diameter 7.5 mm.

Limit switches

OsiSense XC Standard

Compact design, plastic, types XCKP and XCKT

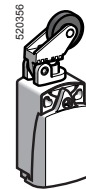
Compact design, metal, type XCKD

1

■ XCKP, XCKD

with 1 cable entry
Conforming to CENELEC EN 50047

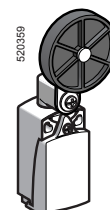
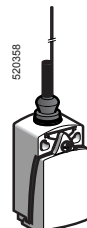
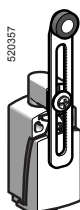
□ With head for linear movement (plunger). Fixing by the head or by the body
XCKD **XCKP**



Pages 1/38 and 1/42

Pages 1/32 and 1/34

□ With head for rotary movement (lever) or multi-directional. Fixing by the body
XCKD **XCKP**



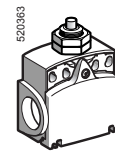
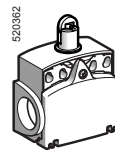
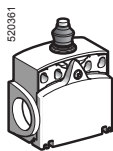
Pages 1/39 et 1/47

Pages 1/33 et 1/35

■ XCKT

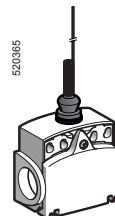
with 2 cable entries
Tripping/resetting points and fixing centres conform to CENELEC EN 50047

□ With head for linear movement (plunger). Fixing by the head or by the body
XCKT



Page 1/44

□ With head for rotary movement (lever) or multi-directional. Fixing by the body
XCKT



Page 1/44

Environment characteristics

Conformity to standards	Products	IEC 60947-5-1, EN 60947-5-1, UL 508, CSA C22-2 n° 14
	Machine assemblies	IEC 60204-1, EN 60204-1
Product certifications		UL, CSA, CCC
Protective treatment	Standard version	"TC"
Ambient air temperature	For operation	- 25...+ 70°C
	For storage	- 40...+ 70°C
Vibration resistance	Conforming to IEC 60068-2-6	25 gn (10...500 Hz) except product with head ZCE24: 20 gn
Shock resistance	Conforming to IEC 60068-2-27	50 gn (11 ms) except head ZCE08: 15 gn (11 ms) and ZCE24: 30 gn (18 ms)
Electric shock protection		Class II conforming to IEC 61140 and NF C 20-030 for XCKP and XCKT
		Class I conforming to IEC 61140 and NF C 20-030 for XCKD
Degree of protection		IP 66 and IP 67 conforming to IEC 60529; IK 04 conforming to EN 50102 for XCKP and XCKT, IK 06 conforming to EN 50102 for XCKD
Repeat accuracy		0.1 mm on the tripping points, with 1 million operating cycles for head with end plunger
Cable entry or connector	Depending on model	Either tapped entry for n° 11 or n° 13 cable gland, tapped ISO M16 x 1.5 or ISO M20 x 1.5, tapped 1/2" NPT or PF 1/2 (G1/2) or M12 connector
Materials		XCKD Zamak bodies and heads, XCKP and XCKT plastic bodies, Zamak heads

Limit switches

OsiSense XC Standard

Compact design, plastic, types XCKP and XCKT

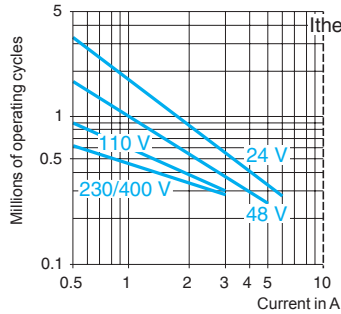
Compact design, metal, type XCKD

Contact block characteristics

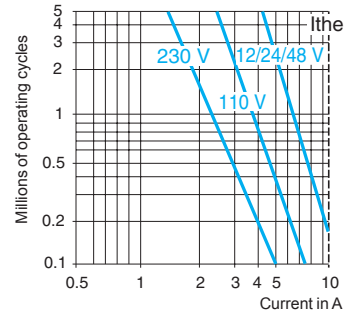
Rated operational characteristics	XE2●P	~ AC-15; A300 (Ue = 240 V, Ie = 3 A); Ithe = 10 A --- DC-13; Q300 (Ue = 250 V, Ie = 0.27 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
	XE3●P	~ AC-15; B300 (Ue = 240 V, Ie = 1.5 A); Ithe = 6 A --- DC-13; R300 (Ue = 250 V, Ie = 0.1 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
Rated insulation voltage	XE2●P	Ui = 500 V degree of pollution 3 conforming to IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
	XE3●P	Ui = 400 V degree of pollution 3 conforming to IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage	XE2●P	U imp = 6 kV conforming to IEC 60947-1, IEC 60664
	XE3●P	U imp = 4 kV conforming to IEC 60947-1, IEC 60664
Positive operation (depending on model)		NC contacts with positive opening operation conforming to IEC 60947-5-1 Appendix K, EN 60947-5-1
Resistance across terminals		≤ 25 mΩ conforming to IEC 60255-7 category 3
Short-circuit protection	XE2●P	10 A cartridge fuse type gG (gl)
	XE3●P	6 A cartridge fuse type gG (gl)
Connection (screw clamp terminals)	XE2SP●151 and XE2SP2141	Clamping capacity, min: 1 x 0.34 mm ² , max: 2 x 1.5 mm ²
	XE2NP21●1 and XE2NP31●1	Clamping capacity, min: 1 x 0.5 mm ² , max: 2 x 2.5 mm ²
	XE3NP and XE3SP	Clamping capacity, min: 1 x 0.34 mm ² , max: 1 x 1 mm ² or 2 x 0.75 mm ²
Minimum actuation speed (for head with end plunger)	XE2SP●151, XE2SP2141 and XE3SP: 0.01 m/minute	
	XE2NP21●1, XE2NP31●1 and XE3NP: 6 m/minute	
Electrical durability		<ul style="list-style-type: none"> ■ Conforming to IEC 60947-5-1 Appendix C ■ Utilisation categories AC-15 and DC-13 ■ Maximum operating rate: 3600 operating cycles/hour ■ Load factor: 0.5

AC supply
50/60 Hz ~
~m inductive circuit

XE2SP●151, XE2SP2141



XE2NP21●1, XE2NP31●1



DC supply ---

Power broken in W for 5 million operating cycles.

Voltage V	24	48	120
~m W	10	7	4

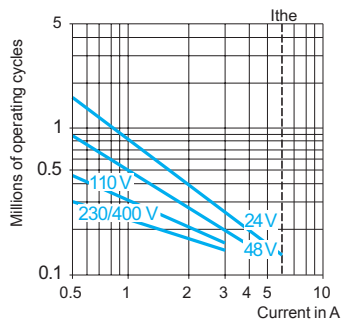
For XE2SP●151 on ~ or ---, NC and NO contacts simultaneously loaded to the values shown with reverse polarity.

Power broken in W for 5 million operating cycles.

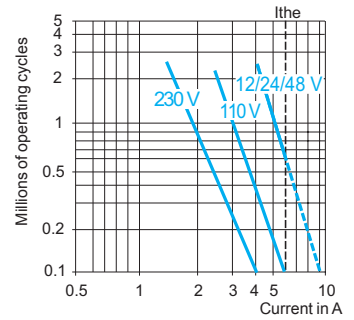
Voltage V	24	48	120
~m W	13	9	7

AC supply
50/60 Hz ~
~m inductive circuit

XE3SP●●●●



XE3NP●●●●



DC supply ---

Power broken in W for 5 million operating cycles.

Voltage V	24	48	120
~m W	3	2	1







Power broken in W for 5 million operating cycles.


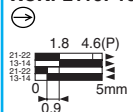
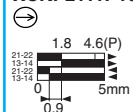
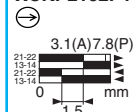
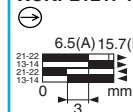
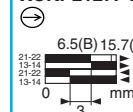
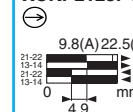

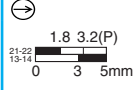
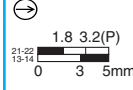
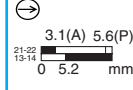
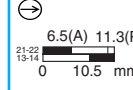
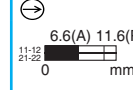
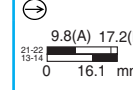

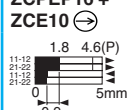
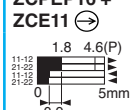
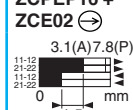
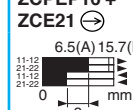
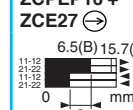
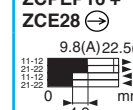

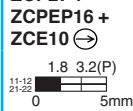
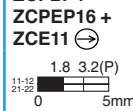

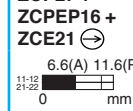
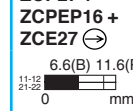
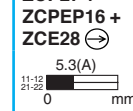






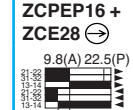

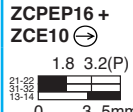
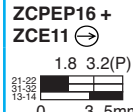
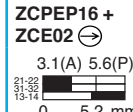
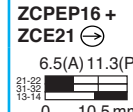
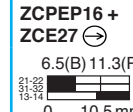
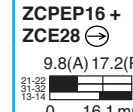
Voltage V	24	48	120
~m W	4	3	2

Limit switches

OsiSense XC Standard




Compact design, plastic, type XCKP
Complete switches with 1 cable entry








Type of head	Plunger (fixing by the body)					
	Form B (1)		Form C (1)		Form E (1)	
						
Type of operator	Metal end plunger	Metal end plunger with elastomer boot	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever plunger, vertical actuation in 1 direction	Thermoplastic roller lever plunger, horiz. or vert. actuation in 1 direction

References of complete switches with 1 ISO M16 x 1.5 cable entry (2)							
	2-pole NC + NO snap action (XE2SP2151)	XCKP2110P16 	XCKP2111P16 	XCKP2102P16 	XCKP2121P16 	XCKP2127P16 	XCKP2128P16 
	2-pole NC + NO break before make, slow break (XE2NP2151)	XCKP2510P16 	XCKP2511P16 	XCKP2502P16 	XCKP2521P16 	XCKP2527P16 	XCKP2528P16 
	2-pole NC + NC snap action (XE2SP2141)	ZCP29 + ZCPEP16 + ZCE10 	ZCP29 + ZCPEP16 + ZCE11 	ZCP29 + ZCPEP16 + ZCE02 	ZCP29 + ZCPEP16 + ZCE21 	ZCP29 + ZCPEP16 + ZCE27 	ZCP29 + ZCPEP16 + ZCE28 
	2-pole NC + NC simultaneous, slow break (XE2NP2141)	ZCP27 + ZCPEP16 + ZCE10 	ZCP27 + ZCPEP16 + ZCE11 	ZCP27 + ZCPEP16 + ZCE02 	ZCP27 + ZCPEP16 + ZCE21 	ZCP27 + ZCPEP16 + ZCE27 	ZCP27 + ZCPEP16 + ZCE28 
	3-pole NC + NC + NO snap action (XE3SP2141)	ZCP39 + ZCPEP16 + ZCE10 	ZCP39 + ZCPEP16 + ZCE11 	ZCP39 + ZCPEP16 + ZCE02 	ZCP39 + ZCPEP16 + ZCE21 	ZCP39 + ZCPEP16 + ZCE27 	ZCP39 + ZCPEP16 + ZCE28 
	3-pole NC + NC + NO break before make, slow break (XE3NP2141)	ZCP37 + ZCPEP16 + ZCE10 	ZCP37 + ZCPEP16 + ZCE11 	ZCP37 + ZCPEP16 + ZCE02 	ZCP37 + ZCPEP16 + ZCE21 	ZCP37 + ZCPEP16 + ZCE27 	ZCP37 + ZCPEP16 + ZCE28 
Weight (kg)		0.090	0.090	0.095	0.105	0.100	0.105

References of complete switches with 1 entry for n° 11 cable gland

For an entry tapped for a n° 11 cable gland, replace P16 in the reference by G11. Example: XCKP2110P16 becomes XCKP2110G11 or ZCPEP16 becomes ZCPEG11.

Contact operation	 closed  open	(A) (B) = cam displacement (P) = positive opening point	 NC contact with positive opening operation
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Characteristics		On end	By 30° cam		
Switch actuation					
Type of actuation					
Maximum actuation speed		0.5 m/s		1 m/s	
Mechanical durability (in millions of operating cycles)		15	10	15	
Minimum force or torque	For tripping For positive opening	15 N 45 N	12 N 36 N	6 N 18 N	
Cable entry (3)		1 entry tapped M16 x 1.5 mm for ISO cable gland, clamping capacity 4 to 8 mm			

(1) Form conforming to EN 50047, see page 1/136.

(2) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.

Limit switches

OsiSense XC Standard
Compact design, plastic, type XCKP
Complete switches with 1 cable entry

Type of head	Plunger (fixing by the head)	Rotary (fixing by the body)					Multi-directional
		Form A (1)					
Type of operator	M18 with metal end plunger	M18 with steel roller plunger	Thermoplastic roller lever	Variable length thermoplastic roller lever	Thermoplastic roller lever, Ø 50 mm	Variable length thermoplastic roller lever, Ø 50 mm	"Cat's whisker" (2)

References of complete switches with 1 ISO M16 x 1.5 cable entry (3)								
	2-pole NC + NO snap action (XE2SP2151)	XCKP21H0P16 	XCKP21H2P16 	XCKP2118P16 	XCKP2145P16 	XCKP2139P16 	XCKP2149P16 	XCKP2106P16
	2-pole NC + NO break before make, slow break (XE2NP2151)	XCKP25H0P16 	XCKP25H2P16 	XCKP2518P16 	XCKP2545P16 	XCKP2539P16 	XCKP2549P16 	XCKP2506P16
	2-pole NC + NC snap action (XE2SP2141)	ZCP29 + ZCPEP16 + ZCEH0 	ZCP29 + ZCPEP16 + ZCEH2 	ZCP29 + ZCPEP16 + ZCE01 + ZCY18 	ZCP29 + ZCPEP16 + ZCE01 + ZCY45 	ZCP29 + ZCPEP16 + ZCE01 + ZCY39 	ZCP29 + ZCPEP16 + ZCE01 + ZCY49 	ZCP29 + ZCPEP16 + ZCE06
	2-pole NC + NC simultaneous, slow break (XE2NP2141)	ZCP27 + ZCPEP16 + ZCEH0 	ZCP27 + ZCPEP16 + ZCEH2 	ZCP27 + ZCPEP16 + ZCE01 + ZCY18 	ZCP27 + ZCPEP16 + ZCE01 + ZCY45 	ZCP27 + ZCPEP16 + ZCE01 + ZCY39 	ZCP27 + ZCPEP16 + ZCE01 + ZCY49 	ZCP27 + ZCPEP16 + ZCE06
	3-pole NC + NC + NO snap action (XE3SP2141)	ZCP39 + ZCPEP16 + ZCEH0 	ZCP39 + ZCPEP16 + ZCEH2 	ZCP39 + ZCPEP16 + ZCE01 + ZCY18 	ZCP39 + ZCPEP16 + ZCE01 + ZCY45 	ZCP39 + ZCPEP16 + ZCE01 + ZCY39 	ZCP39 + ZCPEP16 + ZCE01 + ZCY49 	ZCP39 + ZCPEP16 + ZCE06
	3-pole NC + NC + NO break before make, slow break (XE3NP2141)	ZCP37 + ZCPEP16 + ZCEH0 	ZCP37 + ZCPEP16 + ZCEH2 	ZCP37 + ZCPEP16 + ZCE01 + ZCY18 	ZCP37 + ZCPEP16 + ZCE01 + ZCY45 	ZCP37 + ZCPEP16 + ZCE01 + ZCY39 	ZCP37 + ZCPEP16 + ZCE01 + ZCY49 	ZCP37 + ZCPEP16 + ZCE06
Weight (kg)	0.130	0.130	0.135	0.145	0.145	0.155	0.085	

References of complete switches with 1 entry for n° 11 cable gland

For an entry tapped for a n° 11 cable gland, replace P16 in the reference by G11. Example: XCKP21H0P16 becomes XCKP21H0G11 or ZCPEP16 becomes ZCPEG11.

Contact operation closed (A) = cam displacement NC contact with positive opening operation
 open (P) = positive opening point

Characteristics			
Switch actuation	On end	By 30° cam	By any moving part
Type of actuation			
Maximum actuation speed	0.5 m/s		1.5 m/s
Mechanical durability	10 million operating cycles		5 million
Minimum force or torque	For tripping: 15 N For positive opening: 45 N	10 N 36 N	0.1 N.m 0.25 N.m
Cable entry	1 entry tapped M16 x 1.5 mm for ISO cable gland, clamping capacity 4 to 8 mm		

(1) Form conforming to EN 50047, see page 1/136.
(2) Value taken with actuation by moving part at 100 mm from the fixing.
(3) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.

Limit switches

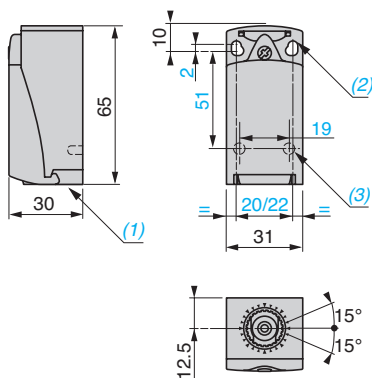
OsiSense XC Standard

Compact design, plastic, type XCKP

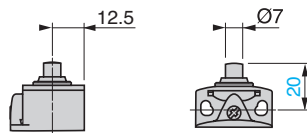
Complete switches with 1 cable entry

1

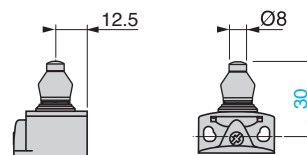
ZCP2● + ZCPEP16/ZCP3● + ZCPEP16



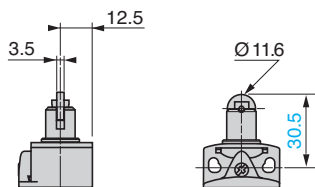
ZCE10



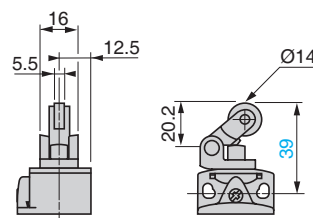
ZCE11



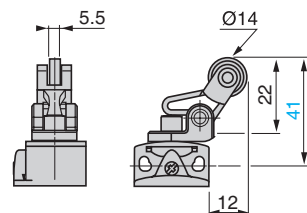
ZCE02



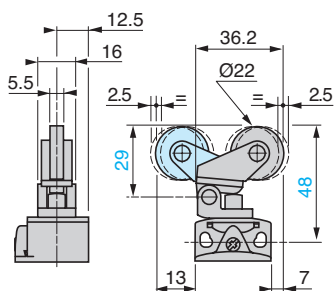
ZCE21



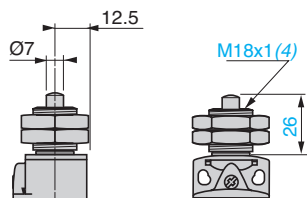
ZCE27



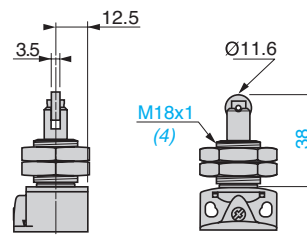
ZCE28



ZCEH0



ZCEH2



- (1) Tapped entry for ISO M16 x 1.5 or Pg 11 cable gland.
- (2) 2 elongated holes $\varnothing 4.3 \times 6.3$ mm on 22 mm centres, 2 holes $\varnothing 4.3$ on 20 mm centres.
- (3) 2 x $\varnothing 3$ holes for support studs, depth 4 mm.
- (4) Fixing nut thickness 3.5 mm.

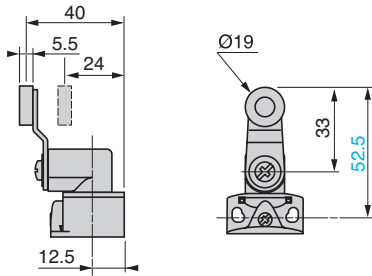
Limit switches

OsiSense XC Standard

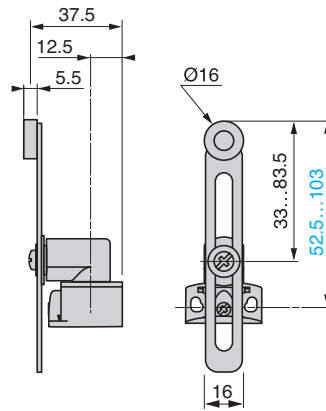
Compact design, plastic, type XCKP

Complete switches with 1 cable entry

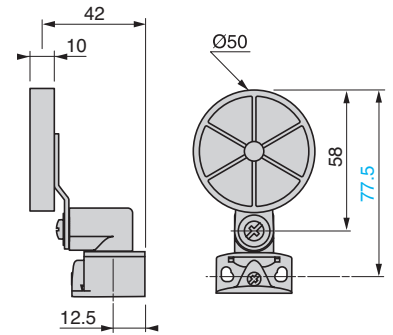
ZCE01 + ZCY18



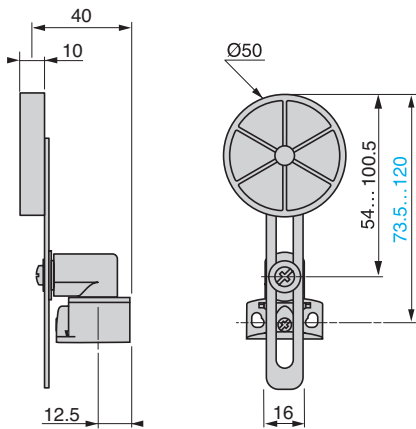
ZCE01 + ZCY45



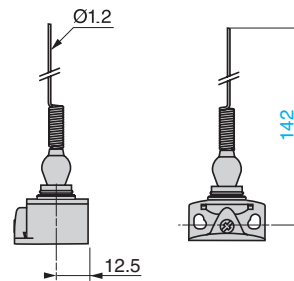
ZCE01 + ZCY39



ZCE01 + ZCY49



ZCE06



Limit switches

OsiSense XC Standard

Compact design, plastic, type XCKP
M12 connector

Type of head	Plunger (fixing by the body)					
	Form B (1)		Form C (1)		Form E (1)	
Type of operator	Metal end plunger	Metal end plunger with elastomer boot (2)	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever plunger, vertical actuation in 1 direction	Thermoplastic roller lever plunger, horiz. or vert. actuation in 1 direction

References						
2-pole NC + NO snap action (XE2SP2151)	XCKP2110M12 	XCKP2111M12 	XCKP2102M12 	XCKP2121M12 	XCKP2127M12 	XCKP2128M12
2-pole NC + NC snap action (XE2SP2141)	ZCP29M12 + ZCE10 	ZCP29M12 + ZCE11 	ZCP29M12 + ZCE02 	ZCP29M12 + ZCE21 	ZCP29M12 + ZCE27 	ZCP29M12 + ZCE28
Weight (kg)	0.100	0.100	0.100	0.110	0.110	0.110
Contact operation	closed open		(A) (B) = cam displacement (P) = positive opening point	NC contact with positive opening operation		

(1) Form conforming to EN 50047, see page 1/136.
(2) Nitrile for indoor use.

Characteristics	
Switch actuation	On end
Type of actuation	By 30° cam
Maximum actuation speed	0.5 m/s
Mechanical durability (in millions of operating cycles)	15
Minimum force or torque	15 N
For tripping	45 N
For positive opening	36 N
Connection	M12 connector, $U_i = 250$ V, $I_e = 3$ A maximum, $I_{th} = 3$ A

Connections	
M12 connector	
XE2SP2151	XE2SP2141
1-2: NC	1-2: NC
3-4: NO	3-4: NC

Dimensions	
ZCP2•M12	ZCE10
	ZCE11
	ZCE02
	ZCE21
	ZCE27
	ZCE28
	ZCEH0

(1) 2 elongated holes $\varnothing 4.3 \times 6.3$ mm on 22 mm centres, 2 holes $\varnothing 4.3$ on 20 mm centres.
(2) 2 x $\varnothing 3$ holes for support studs, depth 4 mm.
(3) Fixing nut thickness 3.5 mm.

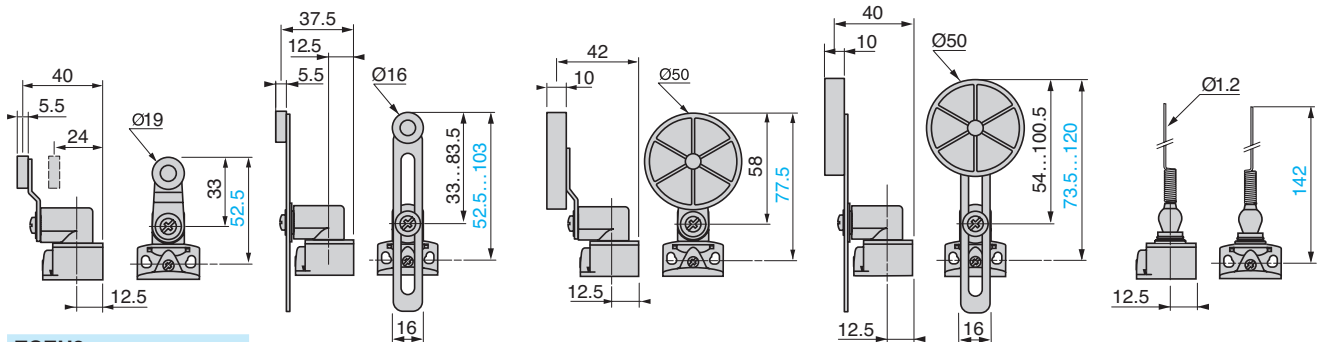
Type of head	Plunger (fixing by the head)		Rotary (fixing by the body)				Multi-directional
			Form A (1)				
Type of operator	M18 with metal end plunger	M18 with steel roller plunger	Thermoplastic roller lever	Variable length thermoplastic roller lever	Thermoplastic roller lever, Ø 50 mm	Variable length thermoplastic roller lever, Ø 50 mm	"Cat's whisker" (2)

References	XCKP21H0M12	XCKP21H2M12	XCKP2118M12	XCKP2145M12	XCKP2139M12	XCKP2149M12	XCKP2106M12
2-pole NC + NO snap action (XE2SP2151)							
2-pole NC + NC snap action (XE2S P2141)							
Weight (kg)	0.140	0.140	0.140	0.150	0.155	0.160	0.090
Contact operation	closed open		(A) = cam displacement (P) = positive opening point		NC contact with positive opening operation		

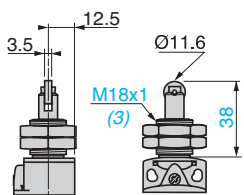
(1) Form conforming to EN 50047, see page 1/136.
(2) Value taken with actuation by moving part at 100 mm from the fixing.

Characteristics	On end		By 30° cam		By any moving part
Switch actuation	On end		By 30° cam		By any moving part
Type of actuation					
Maximum actuation speed	0.5 m/s		1.5 m/s		1 m/s (any direct.)
Mechanical durability (in millions of operating cycles)	10				5
Minimum force or torque	For tripping: 15 N For positive opening: 45 N	10 N 36 N	0.1 N.m 0.25 N.m		0.13 N.m -
Connection	M12 connector, U _i = 250 V, I _e = 3 A maximum, I _{th} = 3 A				

Dimensions	ZCE01 + ZCY18	ZCE01 + ZCY45	ZCE01 + ZCY39	ZCE01 + ZCY49	ZCE06
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ZCEH2



(3) Fixing nut thickness 3.5 mm.

Limit switches

OsiSense XC Standard

Compact design, metal, type XCKD
Complete switches with 1 cable entry

Type of head	Plunger (fixing by the body)					
	Form B (1)		Form C (1)	Form E (1)		
Type of operator	Metal end plunger	Metal end plunger with elastomer boot (2)	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever plunger, vertical actuation in 1 direction	Thermoplastic roller lever plunger, horiz. or vert. actuation in 1 direction

References of complete switches with 1 ISO M16 x 1.5 cable entry (3)							
	2-pole NC + NO snap action (XE2S P2151)	XCKD2110P16 	XCKD2111P16 	XCKD2102P16 	XCKD2121P16 	XCKD2127P16 	XCKD2128P16
	2-pole NC + NO break before make, slow break (XE2N P2151)	XCKD2510P16 	XCKD2511P16 	XCKD2502P16 	XCKD2521P16 	XCKD2527P16 	XCKD2528P16
	2-pole NC + NC snap action (XE2S P2141)	ZCD29 + ZCDEP16 + ZCE10 	ZCD29 + ZCDEP16 + ZCE11 	ZCD29 + ZCDEP16 + ZCE02 	ZCD29 + ZCDEP16 + ZCE21 	ZCD29 + ZCDEP16 + ZCE27 	ZCD29 + ZCDEP16 + ZCE28
	2-pole NC + NC simultaneous, slow break (XE2N P2141)	ZCD27 + ZCDEP16 + ZCE10 	ZCD27 + ZCDEP16 + ZCE11 	ZCD27 + ZCDEP16 + ZCE02 	ZCD27 + ZCDEP16 + ZCE21 	ZCD27 + ZCDEP16 + ZCE27 	ZCD27 + ZCDEP16 + ZCE28
	3-pole NC + NC + NO snap action (XE3S P2141)	ZCD39 + ZCDEP16 + ZCE10 	ZCD39 + ZCDEP16 + ZCE11 	ZCD39 + ZCDEP16 + ZCE02 	ZCD39 + ZCDEP16 + ZCE21 	ZCD39 + ZCDEP16 + ZCE27 	ZCD39 + ZCDEP16 + ZCE28
	3-pole NC + NC + NO break before make, slow break (XE3N P2141)	ZCD37 + ZCDEP16 + ZCE10 	ZCD37 + ZCDEP16 + ZCE11 	ZCD37 + ZCDEP16 + ZCE02 	ZCD37 + ZCDEP16 + ZCE21 	ZCD37 + ZCDEP16 + ZCE27 	ZCD37 + ZCDEP16 + ZCE28
Weight (kg)	0.180	0.180	0.185	0.195	0.190	0.195	

References of complete switches with 1 entry for n° 11 cable gland

For an entry tapped for a n° 11 cable gland, replace P16 in the reference by G11. Example: XCKD2110P16 becomes **XCKD2110G11** or ZCDEP16 becomes **ZCDEG11**.

Contact operation	closed open	(A) (B) = cam displacement (P) = positive opening point	NC contact with positive opening operation
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Characteristics						
Switch actuation	On end	By 30° cam				
Type of actuation						
Maximum actuation speed	0.5 m/s	1 m/s				
Mechanical durability (in millions of operating cycles)	15	10	15			
Minimum force or torque	For tripping: 15 N For positive opening: 45 N	12 N 36 N	6 N 18 N			
Cable entry	1 entry tapped M16 x 1.5 mm for ISO cable gland, clamping capacity 4 to 8 mm					

(1) Form conforming to EN 50047, see page 1/136.
 (2) Nitrile for indoor use.
 (3) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.

Limit switches

OsiSense XC Standard
Compact design, metal, type XCKD
Complete switches with 1 cable entry

Type of head	Plunger (fixing by the head)		Rotary (fixing by the body)				Multi-directional
			Form A (1)				
Type of operator	M18 with metal end plunger	M18 with steel roller plunger	Thermoplastic roller lever	Variable length thermoplastic roller lever	Thermoplastic roller lever, Ø 50 mm	Variable length thermoplastic roller lever, Ø 50 mm	"Cat's whisker" (2)

References of complete switches with 1 ISO M16 x 1.5 cable entry (3)								
	2-pole NC + NO snap action (XE2S P2151)	XCKD21H0P16 1.8 4.6(P) 0.9 5mm	XCKD21H2P16 3.1(A) 7.8(P) 1.5 mm	XCKD2118P16 25° 70°(P) 12° 90°	XCKD2145P16 25° 70°(P) 12° 90°	XCKD2139P16 25° 70°(P) 12° 90°	XCKD2149P16 25° 70°(P) 12° 90°	XCKD2106P16 20° 15°
	2-pole NC + NO break before make, slow break (XE2N P2151)	XCKD25H0P16 1.8 3.2(P) 0 5mm	XCKD25H2P16 3.1(A) 5.6(P) 0 5.2 mm	XCKD2518P16 25° 46°(P) 0 42° 90°	XCKD2545P16 25° 46°(P) 0 42° 90°	XCKD2539P16 25° 46°(P) 0 42° 90°	XCKD2549P16 25° 46°(P) 0 42° 90°	XCKD2506P16 20° 0 45°
	2-pole NC + NC snap action (XE2S P2141)	ZCD29 + ZCDEP16 + ZCEH0 1.8 4.6(P) 0.9 5mm	ZCD29 + ZCDEP16 + ZCEH2 3.1(A) 7.8(P) 1.5 mm	ZCD29 + ZCDEP16 + ZCE01 + ZCY18 25° 70°(P) 12° 90°	ZCD29 + ZCDEP16 + ZCE01 + ZCY45 25° 70°(P) 12° 90°	ZCD29 + ZCDEP16 + ZCE01 + ZCY39 25° 70°(P) 12° 90°	ZCD29 + ZCDEP16 + ZCE01 + ZCY49 25° 70°(P) 12° 90°	ZCD29 + ZCDEP16 + ZCE06 20° 0 15°
	2-pole NC + NC simultaneous, slow break (XE2N P2141)	ZCD27 + ZCDEP16 + ZCEH0 1.8 3.2(P) 0 5mm	ZCD27 + ZCDEP16 + ZCEH2 3.1 5.6(P) 0 5mm	ZCD27 + ZCDEP16 + ZCE01 + ZCY18 25° 46°(P) 0 90°	ZCD27 + ZCDEP16 + ZCE01 + ZCY45 25° 46°(P) 0 90°	ZCD27 + ZCDEP16 + ZCE01 + ZCY39 25° 46°(P) 0 90°	ZCD27 + ZCDEP16 + ZCE01 + ZCY49 25° 46°(P) 0 90°	ZCD27 + ZCDEP16 + ZCE06 20° 0
	3-pole NC + NC + NO snap action (XE3S P2141)	ZCD39 + ZCDEP16 + ZCEH0 1.8 4.6(P) 0.9 5mm	ZCD39 + ZCDEP16 + ZCEH2 3.1(A) 7.8(P) 1.5 mm	ZCD39 + ZCDEP16 + ZCE01 + ZCY18 25° 70°(P) 12° 90°	ZCD39 + ZCDEP16 + ZCE01 + ZCY45 25° 70°(P) 12° 90°	ZCD39 + ZCDEP16 + ZCE01 + ZCY39 25° 70°(P) 12° 90°	ZCD39 + ZCDEP16 + ZCE01 + ZCY49 25° 70°(P) 12° 90°	ZCD39 + ZCDEP16 + ZCE06 20° 0 15°
	3-pole NC + NC + NO break before make, slow break (XE3N P2141)	ZCD37 + ZCDEP16 + ZCEH0 1.8 3.2(P) 0 3 5mm	ZCD37 + ZCDEP16 + ZCEH2 3.1(A) 5.6(P) 0 5.2 mm	ZCD37 + ZCDEP16 + ZCE01 + ZCY18 25° 46°(P) 0 42° 90°	ZCD37 + ZCDEP16 + ZCE01 + ZCY45 25° 46°(P) 0 42° 90°	ZCD37 + ZCDEP16 + ZCE01 + ZCY39 25° 46°(P) 0 42° 90°	ZCD37 + ZCDEP16 + ZCE01 + ZCY49 25° 46°(P) 0 42° 90°	ZCD37 + ZCDEP16 + ZCE06 20° 0 45°
Weight (kg)	0.220	0.220	0.225	0.235	0.235	0.245	0.175	

References of complete switches with 1 entry for n° 11 cable gland

For an entry tapped for a n° 11 cable gland, replace P16 in the reference by G11. Example: XCKD21H0P16 becomes XCKD21H0G11 or ZCDEP16 becomes ZCDEG11.

Contact operation	closed	(A) = cam displacement	NC contact with positive opening operation
	open	(P) = positive opening point	

Characteristics			
Switch actuation	On end	By 30° cam	By any moving part
Type of actuation			
Maximum actuation speed	0.5 m/s	1.5 m/s	1 m/s (any direct.)
Mechanical durability	10 million operating cycles		5 million
Minimum force or torque	For tripping: 15 N For positive opening: 45 N	10 N 36 N	0.1 N.m 0.25 N.m
Cable entry	1 entry tapped M16 x 1.5 mm for ISO cable gland, clamping capacity 4 to 8 mm		

(1) Form conforming to EN 50047, see page 1/136.

(2) Value taken with actuation by moving part at 100 mm from the fixing.

(3) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.

Limit switches

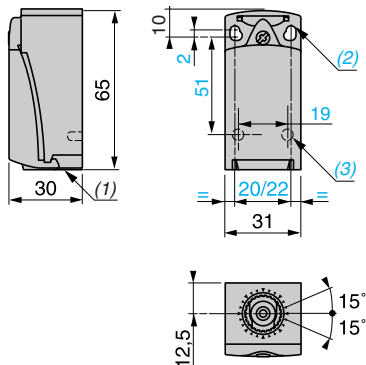
OsiSense XC Standard

Compact design, metal, type XCKD

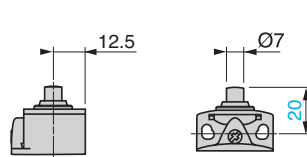
Complete switches with 1 cable entry

1

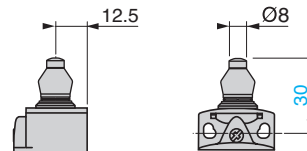
ZCD2● + ZCDEP16/ZCD3● + ZCDEP16



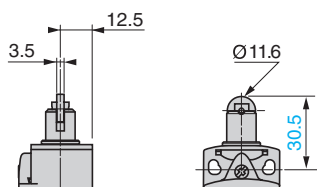
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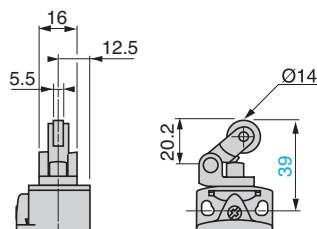
ZCE11



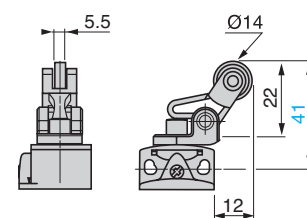
ZCE02



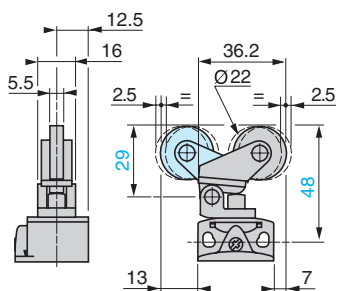
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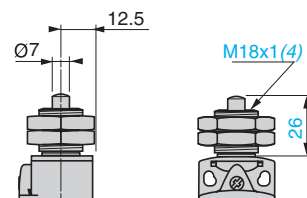
ZCE27



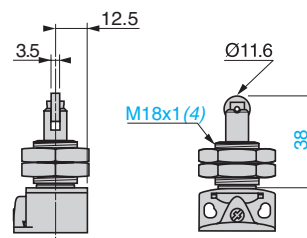
ZCE28



ZCEH0



ZCEH2



- (1) Tapped entry for ISO M16 x 1.5 or Pg 11 cable gland.
- (2) 2 elongated holes $\text{Ø} 4.3 \times 6.3$ mm on 22 mm centres, 2 holes $\text{Ø} 4.3$ on 20 mm centres.
- (3) 2 x $\text{Ø} 3$ holes for support studs, depth 4 mm.
- (4) Fixing nut thickness 3.5 mm.

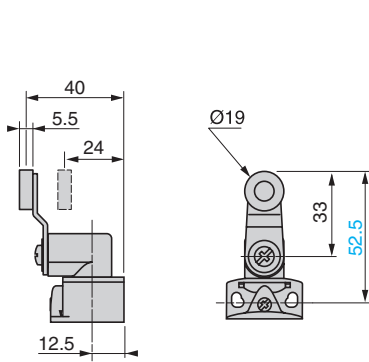
Limit switches

OsiSense XC Standard

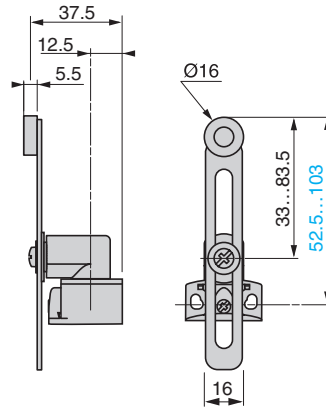
Compact design, metal, type XCKD

Complete switches with 1 cable entry

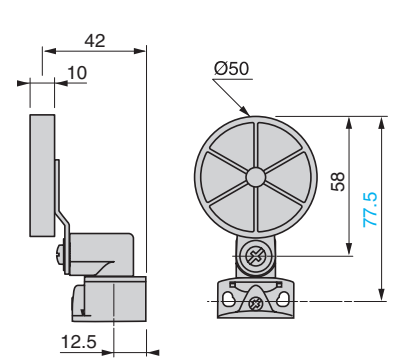
ZCE01 + ZCY18



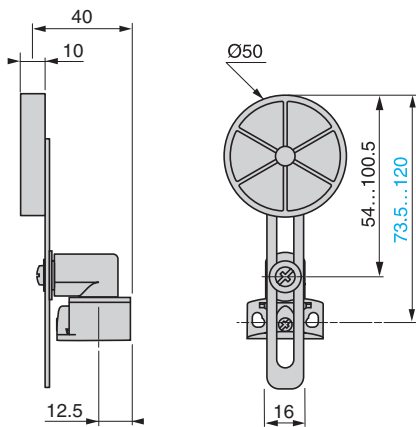
ZCE01 + ZCY45



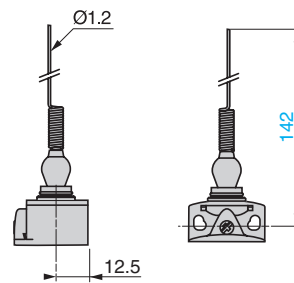
ZCE01 + ZCY39



ZCE01 + ZCY49



ZCE06



Limit switches

OsiSense XC Standard

Compact design, metal, type XCKD

M12 connector

Type of head	Plunger (fixing by the body)					
	Form B (1)		Form C (1)		Form E (1)	
Type of operator	Metal end plunger	Metal end plunger with elastomer boot (2)	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever plunger, vertical actuation in 1 direction	Thermoplastic roller lever plunger, horiz. or vert. actuation in 1 direction

References						
2-pole NC + NO snap action (XE2S P2151)	XCKD2110M12	XCKD2111M12	XCKD2102M12	XCKD2121M12	XCKD2127M12	XCKD2128M12
2-pole NC + NC snap action (XE2S P2141)	ZCD29M12 + ZCE10	ZCD29M12 + ZCE11	ZCD29M12 + ZCE02	ZCD29M12 + ZCE21	ZCD29M12 + ZCE27	ZCD29M12 + ZCE28
Weight (kg)	0.190	0.190	0.195	0.205	0.200	0.205
Contact operation	closed open		(A) (B) = cam displacement (P) = positive opening point		NC contact with positive opening operation	
	(1) Form conforming to EN 50047, see page 1/136. (2) Nitrile for indoor use.					

Characteristics		
Switch actuation	On end	By 30° cam
Type of actuation		
Maximum actuation speed	0.5 m/s	1 m/s
Mechanical durability (in millions of operating cycles)	15	10
Minimum force or torque	For tripping	15 N
	For positive opening	45 N
Connection	M12 connector, Ui = 60 V, Ie = 4 A maximum, Ith = 4 A	

Connections		
M12 connector		
	XE2S P2151	XE2S P2141
	1-2: NC	1-2: NC
	3-4: NO	3-4: NO
	5: \perp	5: \perp

Dimensions				
ZCD2●M12	ZCE10	ZCE11	ZCE02	ZCE21
(1) 2 elongated holes $\varnothing 4.3 \times 6.3$ mm on 22 mm centres, 2 holes $\varnothing 4.3$ on 20 mm centres. (2) 2 x $\varnothing 3$ holes for support studs, depth 4 mm. (3) Fixing nut thickness 3.5 mm.				

Limit switches

OsiSense XC Standard
Compact design, metal, type XCKD
M12 connector

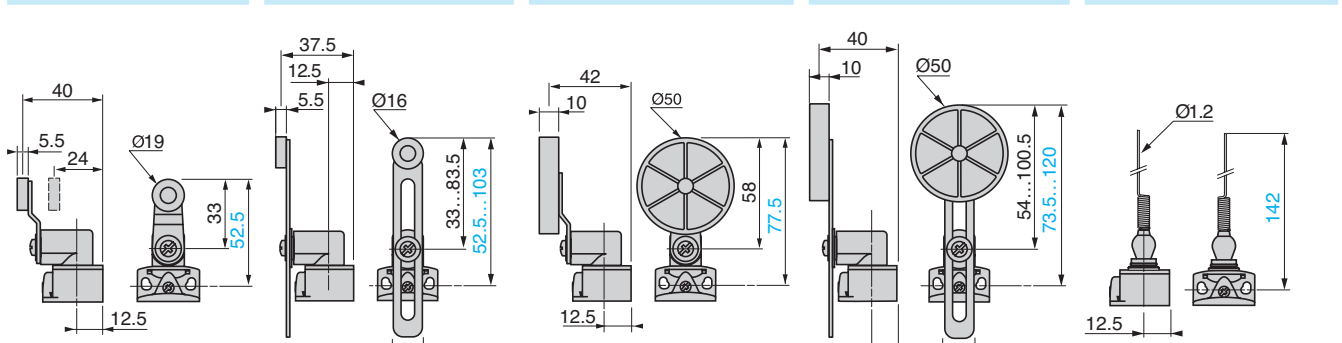
Type of head	Plunger (fixing by the head)		Rotary (fixing by the body)				Multi-directional
			Form A (1)				
Type of operator	M18 with metal end plunger	M18 with steel roller plunger	Thermoplastic roller lever	Variable length thermoplastic roller lever	Thermoplastic roller lever, Ø 50 mm	Variable length thermoplastic roller lever, Ø 50 mm	"Cat's whisker" (2)

References	XCKD21H0M12	XCKD21H2M12	XCKD2118M12	XCKD2145M12	XCKD2139M12	XCKD2149M12	XCKD2106M12
2-pole NC + NO snap action (XE2S P2151)							
2-pole NC + NC snap action (XE2S P2141)							
Weight (kg)	0.235	0.235	0.220	0.220	0.220	0.220	0.185
Contact operation	closed open		(A) = cam displacement (P) = positive opening point		NC contact with positive opening operation		

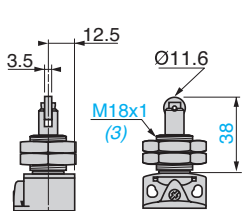
(1) Form conforming to EN 50047, see page 1/136.
(2) Value taken with actuation by moving part at 100 mm from the fixing.

Characteristics	On end	By 30° cam	By any moving part
Switch actuation	On end	By 30° cam	By any moving part
Type of actuation			
Maximum actuation speed	0.5 m/s	1.5 m/s	1 m/s (any direct.)
Mechanical durability (in millions of operating cycles)	10		5
Minimum force or torque	For tripping: 15 N For positive opening: 45 N	10 N 36 N	0.1 N.m 0.25 N.m
Connection	M12 connector, U _i = 60 V, I _e = 4 A maximum, I _{th} = 4 A		

Dimensions



ZCEH2






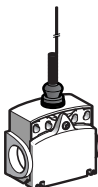
(3) Fixing nut thickness 3.5 mm.

Limit switches



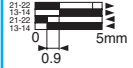

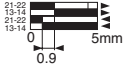

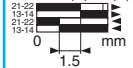

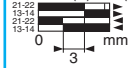
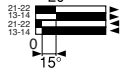








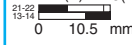
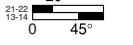









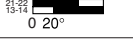




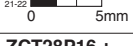







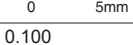
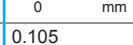
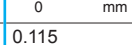
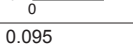
OsiSense XC Standard

Compact design, plastic, type XCKT

Complete switches with 2 cable entries




Type of head	Plunger (fixing by the body)			Multi-directional
	Form B (1)	Form C (1)	Form E (1)	
				
Type of operator	Metal end plunger	Metal end plunger with elastomer boot (2)	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction

References of complete switches with 2 ISO M16 x 1.5 cable entries (4)






 2-pole NC + NO snap action (XE2SP3151)	XCKT2110P16  1.8 4.6(P) 	XCKT2111P16  1.8 4.6(P) 	XCKT2102P16  3.1(A) 7.8(P) 	XCKT2121P16  6.5(A) 15.7(P) 	XCKT2106P16 20° 
 2-pole NC + NO break before make, slow break (XE2NP3151)	ZCT25P16 + ZCE10  1.8 3.2(P) 	ZCT25P16 + ZCE11  1.8 3.2(P) 	ZCT25P16 + ZCE02  3.1(A) 5.6(P) 	ZCT25P16 + ZCE21  6.5(A) 11.3(P) 	ZCT25P16 + ZCE06 20° 
 2-pole NC + NO make before break, slow break (XE2NP3161)	ZCT26P16 + ZCE10  3 4.4(P) 	ZCT26P16 + ZCE11  3 4.4(P) 	ZCT26P16 + ZCE02  5.2 7.6(P) 	ZCT26P16 + ZCE21  10.9(A) 16(P) 	ZCT26P16 + ZCE06 45° 20° 
 2-pole NC + NC simultaneous, slow break (XE2NP2141)	ZCT27P16 + ZCE10  1.8 3.2(P) 	ZCT27P16 + ZCE11  1.8 3.2(P) 	ZCT27P16 + ZCE02  3.1 5.6(P) 	ZCT27P16 + ZCE21  6.6(A) 11.6(P) 	ZCT27P16 + ZCE06 20° 
 2-pole NO + NO simultaneous, slow break (XE2NP3131)	ZCT28P16 + ZCE10 1.8 	ZCT28P16 + ZCE11 1.8 	ZCT28P16 + ZCE02 3.1(A) 	ZCT28P16 + ZCE21 6.6(A) 	ZCT28P16 + ZCE06 20° 
Weight (kg)	0.100	0.100	0.105	0.115	0.095

References of complete switches with 2 entries for n° 11 cable gland

For entries tapped for n° 11 cable gland, replace P16 in the reference by G11. Example: XCKT2110P16 becomes XCKT2110G11.

Contact operation  closed (A) = cam displacement  NC contact with positive opening operation
 open (P) = positive opening point

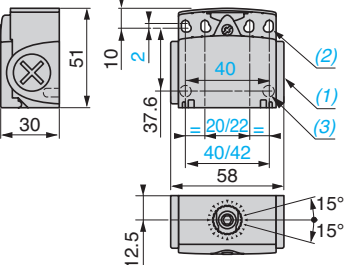
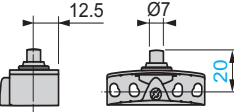
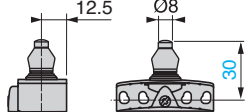
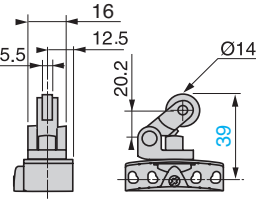
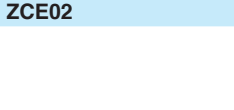
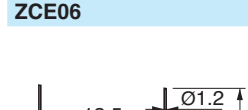
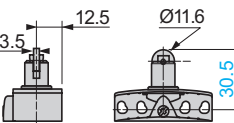
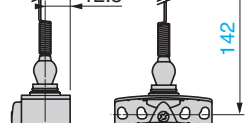
Characteristics

Switch actuation	On end	By 30° cam		By any moving part
Type of actuation				
Maximum actuation speed	0.5 m/s		1 m/s	1 m/s (any direction)
Mechanical durability (in millions of operating cycles)	15	10	15	5
Minimum force or torque	For tripping: 15 N For positive opening: 45 N	12 N 36 N	6 N 18 N	0.3 N.m -
Cable entry (3)	2 entries tapped M16 x 1.5 for ISO cable gland Clamping capacity 4 to 8 mm (1 entry fitted with blanking plug)			

(1) Form conforming to EN 50047, see page 1/136. (2) Nitrile for indoor use.

(3) Value taken with actuation by moving part at 100 mm from the fixing. (4) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.

Dimensions

ZCT2•P16	ZCE10	ZCE11	ZCE21
			
			
			

(1) Tapped entry for ISO M16 x 1.5 or Pg 11 cable gland.
 (2) 4 elongated holes Ø 4.3 x 6.3 mm on 22/42mm ctrs, 4 holes Ø 4.3 on 20/40 mm ctrs.
 (3) 2 x Ø 3 holes for support studs, depth 4 mm.

Limit switches

OsiSense XC Standard
Compact design, plastic, type XCKT
Complete switches with 2 cable entries

Type of head	Plunger (fixing by the head)		Rotary (fixing by the body) Form A (1)		
Type of operator	M18 with metal end plunger	M18 with steel roller plunger	Thermoplastic roller lever	Variable length thermoplastic roller lever	Thermoplastic roller lever, Ø 50 mm

References of complete switches with 2 ISO M16 x 1.5 cable entries (2)						
	2-pole NC + NO snap action (XE2SP3151)	XCKT21H0P16 ⊖ 	XCKT21H2P16 ⊖ 	XCKT2118P16 ⊖ 	XCKT2145P16 ⊖ 	XCKT2139P16 ⊖
	2-pole NC + NO break before make, slow break (XE2NP3151)	ZCT25P16 + ZCEH0 ⊖ 	ZCT25P16 + ZCEH2 ⊖ 	ZCT25P16 + ZCE01 + ZCY18 ⊖ 	ZCT25P16 + ZCE01 + ZCY45 ⊖ 	ZCT25P16 + ZCE01 + ZCY39 ⊖
	2-pole NO + NC make before break, slow break (XE2NP3161)	ZCT26P16 + ZCEH0 ⊖ 	ZCT26P16 + ZCEH2 ⊖ 	ZCT26P16 + ZCE01 + ZCY18 ⊖ 	ZCT26P16 + ZCE01 + ZCY45 ⊖ 	ZCT26P16 + ZCE01 + ZCY39 ⊖
	2-pole NC + NC simultaneous, slow break (XE2NP2141)	ZCT27P16 + ZCEH0 ⊖ 	ZCT27P16 + ZCEH2 ⊖ 	ZCT27P16 + ZCE01 + ZCY18 ⊖ 	ZCT27P16 + ZCE01 + ZCY45 ⊖ 	ZCT27P16 + ZCE01 + ZCY39 ⊖
	2-pole NO + NO simultaneous, slow break (XE2NP3131)	ZCT28P16 + ZCEH0 ⊖ 	ZCT28P16 + ZCEH2 ⊖ 	ZCT28P16 + ZCE01 + ZCY18 ⊖ 	ZCT28P16 + ZCE01 + ZCY45 ⊖ 	ZCT28P16 + ZCE01 + ZCY39 ⊖
Weight (kg)	0.145	0.145	0.145	0.155	0.160	0.160

References of complete switches with 2 entries for n° 11 cable gland
For entries tapped for n° 11 cable gland, replace P16 in the reference by G11. Example: XCKT21H0P16 becomes XCKT21H0G11.

Contact operation closed (A) = cam displacement ⊖ NC contact with positive opening operation
 open (P) = positive opening point

Characteristics			
Switch actuation	On end	By 30° cam	
Type of actuation			
Maximum actuation speed	0.5 m/s	1.5 m/s	
Mechanical durability	10 million operating cycles		
Minimum force or torque	For tripping	15 N	10 N
	For positive opening	45 N	36 N
Cable entry (3)	2 entries tapped M16 x 1.5 for ISO cable gland		
	Clamping capacity 4 to 8 mm (1 entry fitted with blanking plug)		

(1) Form conforming to EN 50047, see page 1/136.

(2) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.

Dimensions	ZCEH0	ZCE01 + ZCY18	ZCE01 + ZCY39	ZCE01 + ZCY45

(4) Fixing nut thickness 3.5 mm.

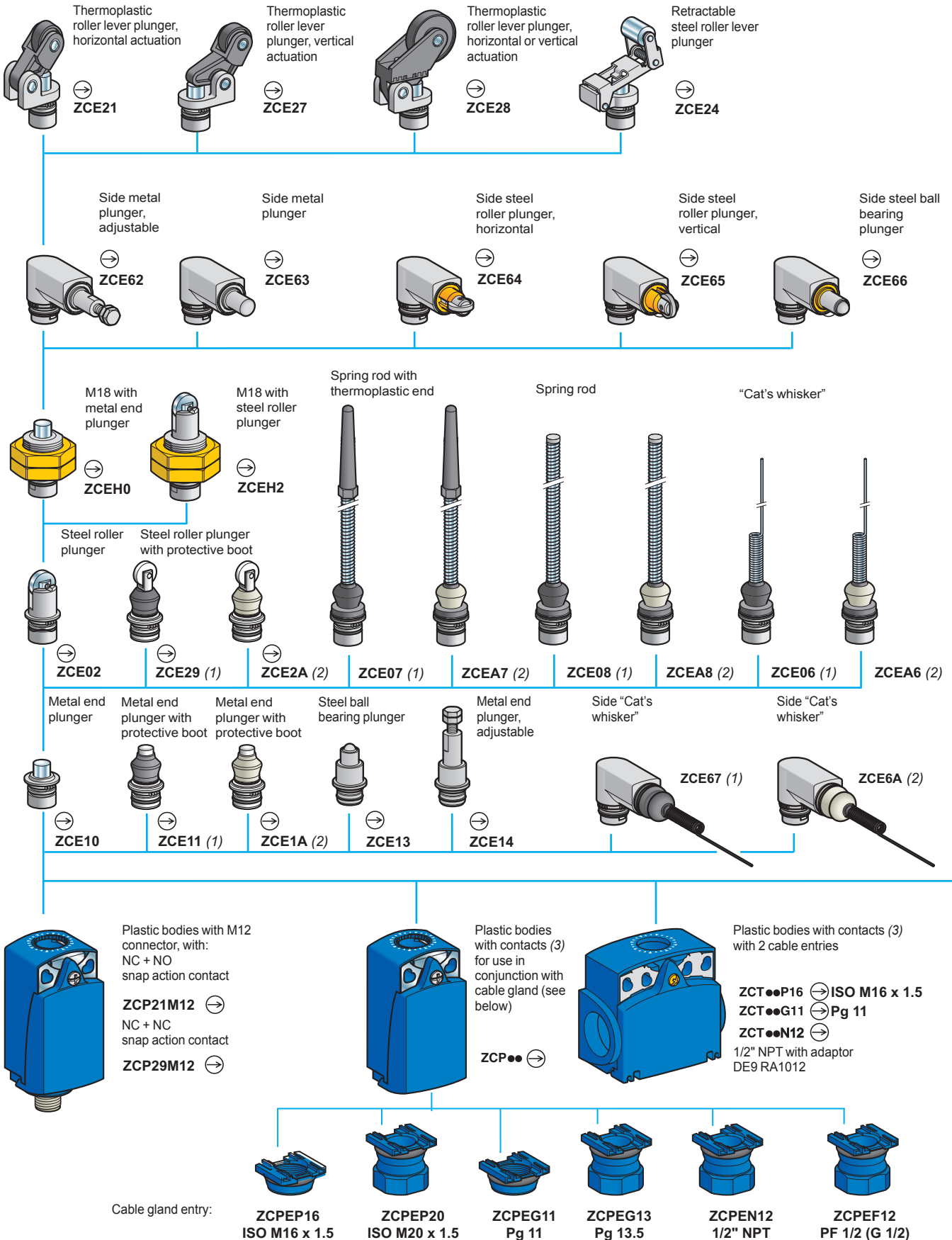
Limit switches

OsiSense XC Standard

Compact design, types XCKD, XCKP and XCKT

Variable composition

1



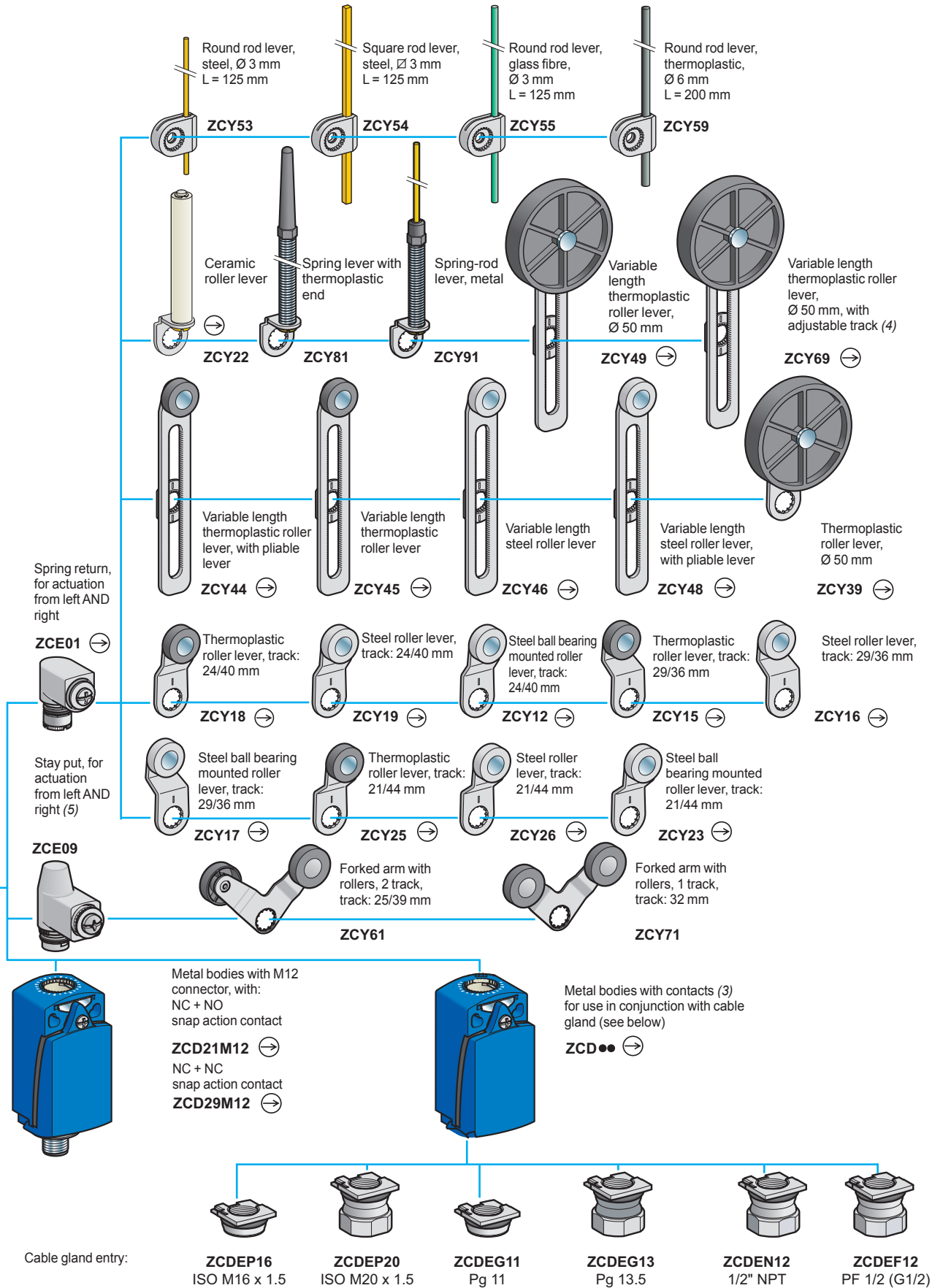
(1) Nitrile boot for indoor use.
(2) Silicone boot for outdoor use.
(3) For further information, see page 1/48.

Limit switches

OsiSense XC Standard

Compact design, types XCKD, XCKP and XCKT

Variable composition



(4) Variable length and adjustable track by lever deformation.

(5) Suitable with bodies: ZCD21, ZCP21, ZCT21, ZCD29, ZCP29, ZCD31, ZCP31, ZCD39, ZCP39, ZCD2●M12, ZCP2●M12

Limit switches

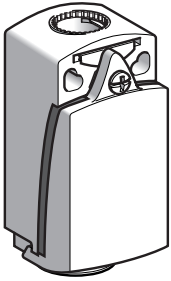
OsiSense XC Standard

Compact design, metal, type type XCKD or plastic, type XCKP

Adaptable sub-assemblies: bodies with contacts

1

520710



ZCD●●

Bodies with contacts, types XCKD and XCKP⁽¹⁾

Type of contact	Positive operation (2)	Scheme	Body material	Reference	Weight kg
2-pole					
NC + NO snap action (XE2SP2151)	⊖		Metal	ZCD21	0.140
			Plastic	ZCP21	0.070
NC + NC snap action (XE2SP2141)	⊕		Metal	ZCD29	0.140
			Plastic	ZCP29	0.070
NC + NO break before make, slow break (XE2NP2151)	⊕		Metal	ZCD25	0.140
			Plastic	ZCP25	0.070
NO + NC make before break, slow break (XE2NP2161)	⊖		Metal	ZCD26	0.140
			Plastic	ZCP26	0.070
NC + NC simultaneous, slow break (XE2NP2141)	⊕		Metal	ZCD27	0.140
			Plastic	ZCP27	0.070
NO + NO simultaneous, slow break (XE2NP2131)	-		Metal	ZCD28	0.140
			Plastic	ZCP28	0.070

3-pole

NC + NO + NO snap action (XE3SP2151)	⊖		Metal	ZCD31	0.140
			Plastic	ZCP31	0.070
NC + NC + NO snap action (XE3SP2141)	⊕		Metal	ZCD39	0.140
			Plastic	ZCP39	0.070
NC + NC + NO break before make, slow break (XE3NP2141)	⊕		Metal	ZCD37	0.140
			Plastic	ZCP37	0.070
NC + NO + NO break before make, slow break (XE3NP2151)	⊖		Metal	ZCD35	0.140
			Plastic	ZCP35	0.070

Components for connection using DEUTSCH connector

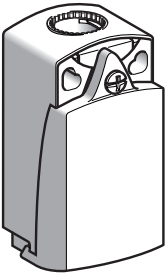
Bodies with contacts for DEUTSCH connector

Type of contact	Positive operation (2)	Scheme	Cable entry	Reference	Weight kg
2-pole					
NC + NO snap action (XE2SP2151)	⊖		Connector	ZCP21D44	0.065
DEUTSCH male connector DT04-4P				ZCPED44	0.015

(1) Bodies with gold contacts or eyelet type connections: please consult your Regional Sales Office.

(2) ⊕: bodies with contacts assuring positive opening operation.

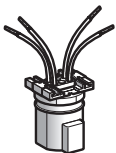
520711



ZCP●●



ZCP21D44



ZCPED44

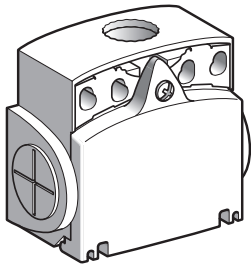
Limit switches

OsiSense XC Standard

Compact design, plastic, type XCKT

Adaptable sub-assemblies: bodies with contacts

561390



ZCT...•••

Bodies with contacts, type XCKT plastic, 2 cable entries

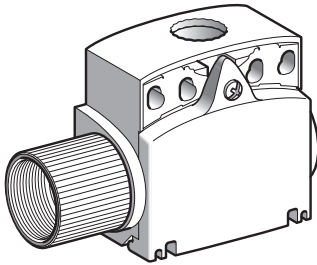
Type of contact	Positive operation (1)	Scheme	Cable entries	Reference	Weight kg
2-pole					
NC + NO snap action (XE2SP3151)	⊖		ISO M16 x 1.5	ZCT21P16	0.085
			Pg 11	ZCT21G11	0.085
NC + NO break before make, slow break (XE2NP3151)	⊕		ISO M16 x 1.5	ZCT25P16	0.085
			Pg 11	ZCT25G11	0.085
NC + NC simultaneous, slow break (XE2NP3141)	⊖		ISO M16 x 1.5	ZCT27P16	0.085
			Pg 11	ZCT27G11	0.085
NO + NO simultaneous, slow break (XE2NP3131)	-		ISO M16 x 1.5	ZCT28P16	0.085
			Pg 11	ZCT28G11	0.085
NO + NC make before break, slow break (XE2NP3161)	⊕		ISO M16 x 1.5	ZCT26P16	0.085
			Pg 11	ZCT26G11	0.085

Bodies with contacts, type XCKT plastic, 2 cable entries with 1/2" NPT adaptor

Type of contact	Positive operation (1)	Scheme	Reference	Weight kg
2-pole				
NC + NO snap action (XE2SP3151)	⊖		ZCT21N12	0.130
			ZCT25N12	0.130
NC + NO break before make, slow break (XE2NP3151)	⊕		ZCT27N12	0.130
			ZCT28N12	0.130
NC + NC simultaneous, slow break (XE2NP3141)	⊖		ZCT26N12	0.130
			ZCT26N12	0.130
NO + NO simultaneous, slow break (XE2NP3131)	-		ZCT26N12	0.130
			ZCT26N12	0.130
NO + NC make before break, slow break (XE2NP3161)	⊕		ZCT26N12	0.130
			ZCT26N12	0.130

(1) ⊖: bodies with contact assuring positive opening operation.

561387



ZCT...N12

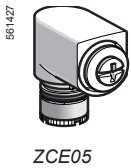
Limit switches

OsiSense XC Standard

Compact design, metal, type XCKD or plastic, types XCKP and XCKT

Adaptable sub-assemblies: bodies with contacts

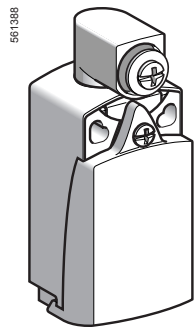
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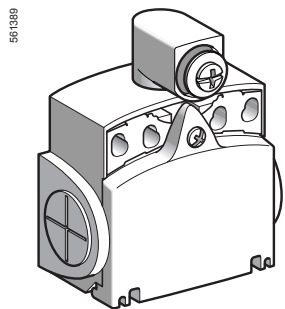
ZCE05



DE9RA1012



XCK20101



XCKT20101

Accessories

Description	Suitable levers for use with head	Unit reference	Weight kg
Rotary head, without lever, spring return, for actuation from left AND right or left OR right (1)	ZCY12, ZCY15, ZCY16, ZCY17, ZCY18, ZCY19, ZCY22, ZCY23, ZCY25, ZCY26, ZCY39, ZCY53, ZCY54, ZCY55, ZCY81	ZCE05	0.045
Tap-off terminal for XCKT	Sold in lots of 10	XALZ09	0.010
Spacer for angular positioning of heads with adjustable levers, for values other than - 90°, 0° and 90°	-	XCMZ07	0.002
Adaptor for 1/2" NPT conduit (male Pg 11 / female 1/2" NPT)	Sold in lots of 10	DE9 RA1012	0.050

Bodies with contacts, type XCKP plastic, with rotary head (without operating lever)

Type of contact	Scheme	Positive operation (2)	Cable entry	Reference	Weight kg
2-pole					
NC + NO snap action (XE2SP2151)			ISO M16 x 1.5	XCKP2101P16	0.115
			Pg 11	XCKP2101G11	0.115
			M12 connector	XCKP2101M12	0.125
NC + NO break before make, slow break (XE2NP2151)			ISO M16 x 1.5	XCKP2501P16	0.115
			Pg 11	XCKP2501G11	0.115

Bodies with contacts, type XCKD metal, with rotary head (without operating lever)

Type of contact	Scheme	Positive operation (2)	Cable entry	Reference	Weight kg
2-pole					
NC + NO snap action (XE2SP2151)			ISO M16 x 1.5	XCKD2101P16	0.185
			Pg 11	XCKD2101G11	0.185
			M12 connector	XCKD2101M12	0.195
NC + NO break before make, slow break (XE2NP2151)			ISO M16 x 1.5	XCKD2501P16	0.185
			Pg 11	XCKD2501G11	0.185

Bodies with contacts, type XCKT plastic, with rotary head (without operating lever)

Type of contact	Scheme	Positive operation (2)	Cable entry	Reference	Weight kg
2-pole					
NC + NO snap action (XE2SP3151)			ISO M16 x 1.5	XCKT2101P16	0.130
			Pg 11	XCKT2101G11	0.130
NC + NO break before make, slow break (XE2NP3151)			ISO M16 x 1.5	XCKT2501P16	0.130
			Pg 11	XCKT2501G11	0.130

(1) For programming see page 1/130.

(2) : bodies with contact assuring positive opening operation.

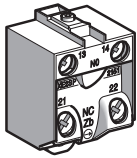
Limit switches

OsiSense XC Standard

Compact design, metal, type XCKD or plastic, types XCKP and XCKT

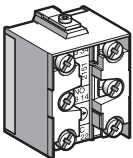
Adaptable sub-assemblies: contact blocks

561393



XE2●●21●●

561394



XE3●●21●●

Contact blocks with screw clamp terminals for XCKD and XCKP

Type of contact	Positive operation (1)	Scheme	Reference for standard contacts	Weight kg
2-pole				
NC + NO snap action	⊕		XE2SP2151	0.020
NC + NC simultaneous, snap action	⊕		XE2SP2141	0.020
NC + NO break before make, slow break	⊕		XE2NP2151	0.020
NO + NC make before break, slow break	⊖		XE2NP2161	0.020
NC + NC simultaneous, slow break	⊖		XE2NP2141	0.020
NO + NO simultaneous, slow break	-		XE2NP2131	0.020
3-pole				
NC + NO + NO snap action	⊕		XE3SP2151	0.035
NC + NC + NO snap action	⊕		XE3SP2141	0.035
NC + NC + NO break before make, slow break	⊕		XE3NP2141	0.035
NC + NO + NO break before make, slow break	⊖		XE3NP2151	0.035

Contact blocks with screw clamp terminals for XCKT

Type of contact	Positive operation (1)	Scheme	Reference for standard contacts	Weight kg
2-pole				
NC + NO snap action	⊕		XE2SP3151	0.015
NC + NO break before make, slow break	⊕		XE2NP3151	0.015
NO + NC make before break, slow break	⊕		XE2NP3161	0.015
NC + NC simultaneous, slow break	⊖		XE2NP3141	0.015
NO + NO simultaneous, slow break	-		XE2NP3131	0.015

(1) ⊕: contact blocks assuring positive opening operation.

Limit switches

OsiSense XC Standard

Compact design, plastic, with reset,
types XCPR and XCTR

Compact design, metal, with reset, type XCDR

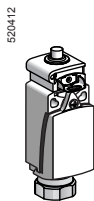
1

■ XCPR, XCDR

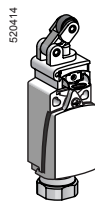
with 1 cable entry

□ With head for linear movement (plunger). Fixing by the body

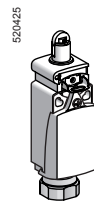
XCDR



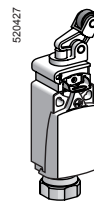
Page 1/56



XCPR

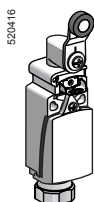


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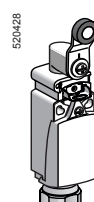
□ With head for rotary movement (lever) or multi-directional. Fixing by the body

XCDR



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XCPR



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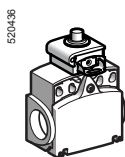
■ XCTR

with 2 cable entries

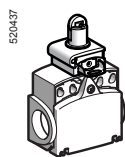
Tripping/resetting points and fixing centres
conform to CENELEC 50047

□ With head for linear movement (plunger). Fixing by the body

XCTR

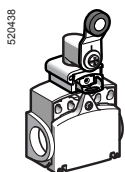


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□ With head for rotary movement (lever) or multi-directional. Fixing by the body

XCTR



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Limit switches

OsiSense XC Standard

Compact design, plastic, with reset,
types XCPR and XCTR

Compact design, metal, with reset, type XCDR

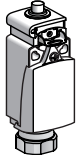
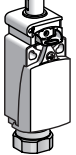
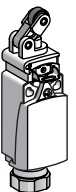
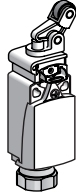

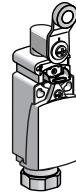
Environment characteristics		
Conformity to standards	Products	EN/IEC 60947-5-1, UL 508, CSA C22-2 n° 14
	Machine assemblies	EN/IEC 60204-1
Product certifications		UL, CSA
Protective treatment	Standard version	"TC"
Ambient air temperature	For operation	- 25...+ 70 °C
	For storage	- 40...+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6	25 gn (10...500 Hz)
Shock resistance	Conforming to IEC 60068-2-27	50 gn (11 ms)
Electric shock protection		Class II conforming to IEC 61140 and NF C 20-030 for XCPR and XCTR
		Class I conforming to IEC 61140 and NF C 20-030 for XCDR
Degree of protection		IP 66 and IP 67 conforming to IEC 60529; IK 04 conforming to EN 50102
Repeat accuracy		0.1 mm on the tripping points, with 1 million operating cycles for head with end plunger
Cable entry	Depending on model	Either: tapped entry for n° 13 cable gland, tapped ISO M20 x 1.5 or tapped 1/2" NPT
Materials		XCDR : Zamak bodies and heads, XCPR and XCTR : plastic bodies, Zamak heads
Contact block characteristics		
Rated operational characteristics		~ AC-15; A300 (Ue = 240 V, Ie = 3 A); Ithe = 10 A ::: DC-13; Q300 (Ue = 250 V, Ie = 0.27 A), conforming to EN/IEC 60947-5-1 Appendix A
Rated insulation voltage		Ui = 500 V degree of pollution 3 conforming to IEN/IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage		U imp = 6 kV conforming to EN/IEC 60947-1, IEC 60664
Positive operation (depending on model)		NC contacts with positive opening operation conforming to EN/IEC 60947-5-1 Appendix K
Resistance across terminals		≤ 25 mΩ conforming to IEC 60255-7 category 3
Short-circuit protection		10 A cartridge fuse type gG (gl)
Connection (screw clamp terminals)	XE2SP2151	Clamping capacity, min: 1 x 0.34 mm ² , max: 2 x 1.5 mm ²
	XE2NP2151	Clamping capacity, min: 1 x 0.5 mm ² , max: 2 x 2.5 mm ²
Minimum actuation speed (for head with end plunger)		XE2SP2151 : 0.01 m/minute
		XE2NP2151 : 6 m/minute


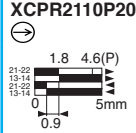
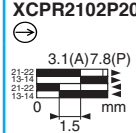
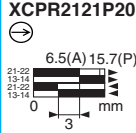
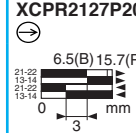
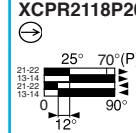
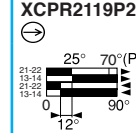

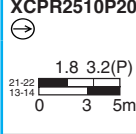
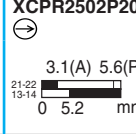
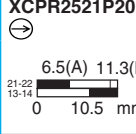
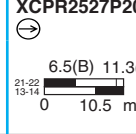
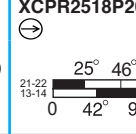
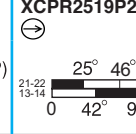

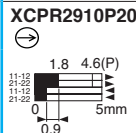
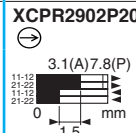
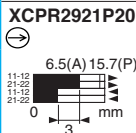
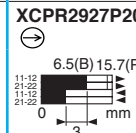
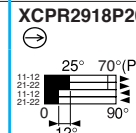
Limit switches

OsiSense XC Standard

Compact design, plastic, with reset, type XCPR

Complete switches with 1 cable entry

Type of head	Plunger (fixing by the body)				Rotary (fixing by the body)	
						
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever plunger, vertical actuation in 1 direction	Thermoplastic roller lever	Steel roller lever

References of complete switches with 1 ISO M20 x 1.5 cable entry						
 <p>2-pole NC + NO snap action (XE2SP2151)</p>	<p>XCPR2110P20</p> 	<p>XCPR2102P20</p> 	<p>XCPR2121P20</p> 	<p>XCPR2127P20</p> 	<p>XCPR2118P20</p> 	<p>XCPR2119P20</p> 
 <p>2-pole NC + NO break before make, slow break (XE2NP2151)</p>	<p>XCPR2510P20</p> 	<p>XCPR2502P20</p> 	<p>XCPR2521P20</p> 	<p>XCPR2527P20</p> 	<p>XCPR2518P20</p> 	<p>XCPR2519P20</p> 
 <p>2-pole NC + NC snap action (XE2SP2141)</p>	<p>XCPR2910P20</p> 	<p>XCPR2902P20</p> 	<p>XCPR2921P20</p> 	<p>XCPR2927P20</p> 	<p>XCPR2918P20</p> 	—
Weight (kg)	0.115	0.115	0.125	0.120	0.155	—

References of complete switches with 1 Pg 13.5 cable entry

For complete switches with 1 Pg 13.5 cable entry replace P20 by G13.

Example: XCPR2110P20 becomes **XCPR2110G13**.






References of complete switches with 1 entry for 1/2" NPT conduit

For complete switches with 1 entry for 1/2" NPT conduit replace P20 by N12.

Example: XCPR2110P20 becomes **XCPR2110N12**.

Contact operation	 closed  open	(A) (B) = cam displacement (P) = positive opening point	 NC contact with positive opening operation
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Characteristics

Switch actuation	On end	By 30° cam			
Type of actuation					
Maximum actuation speed	0.5 m/s	1 m/s			1.5 m/s
Minimum force or torque	For tripping	15 N	12 N	6 N	0.1 N.m
	For positive opening	45 N	36 N	18 N	0.25 N.m
Cable entry	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm 1 entry tapped Pg 13.5 for cable gland, clamping capacity 9 to 12 mm 1 entry tapped for 1/2" NPT (USAS B2-1) conduit				

Other versions Complete switches with cable entries other than those listed above. please consult our Customer Care Centre.

Limit switches

OsiSense XC Standard

Compact design, plastic, with reset, type XCPR

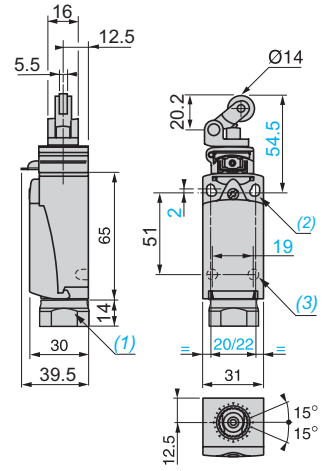
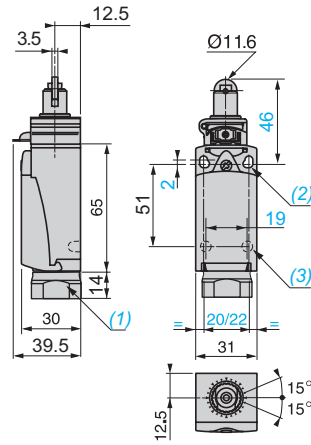
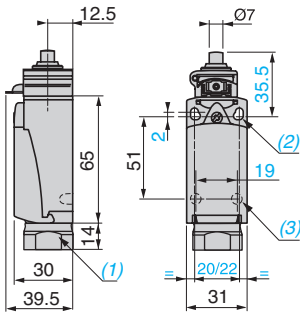
Complete switches with 1 cable entry

Dimensions

XCPR2•10•••

XCPR2•02•••

XCPR2•21•••

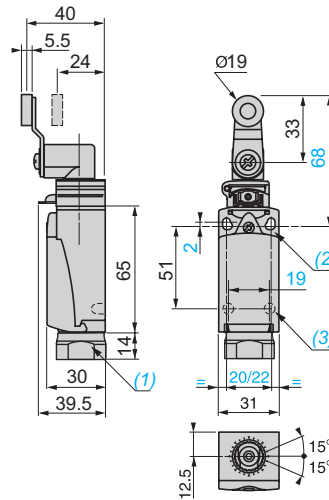
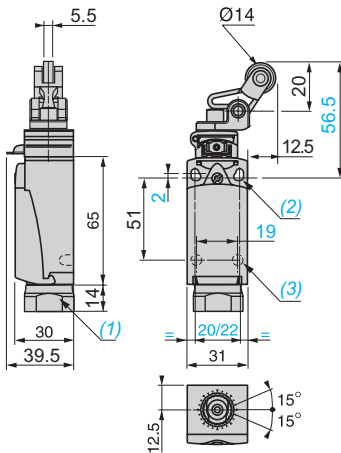


- (1) Tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland or tapped 1/2" NPT.
- (2) 2 elongated holes $\varnothing 4.3 \times 6.3$ mm on 22 mm centres, 2 holes $\varnothing 4.3$ on 20 mm centres.
- (3) 2 x $\varnothing 3$ holes for support studs, depth 4 mm.

Dimensions

XCPR2•27•••

XCPR2•18•••, XCPR2•19•••






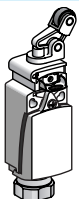
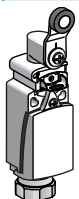

- (1) Tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland or tapped 1/2" NPT.
- (2) 2 elongated holes $\varnothing 4.3 \times 6.3$ mm on 22 mm centres, 2 holes $\varnothing 4.3$ on 20 mm centres.
- (3) 2 x $\varnothing 3$ holes for support studs, depth 4 mm.

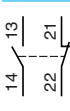
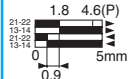
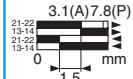
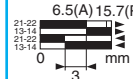
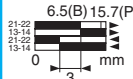
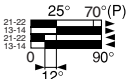
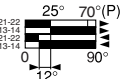
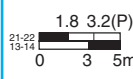
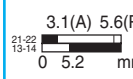
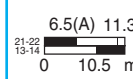
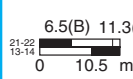
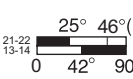
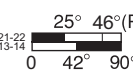
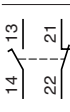
Limit switches

OsiSense XC Standard

Compact design, metal, with reset, type XCDR

Complete switches with 1 cable entry

Type of head	Plunger (fixing by the body)				Rotary (fixing by the body)	
						
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever plunger, vertical actuation in 1 direction	Thermoplastic roller lever	Steel roller lever

References of complete switches with 1 ISO M20 x 1.5 cable entry						
 <p>2-pole NC + NO snap action (XE2SP2151)</p>	XCDR2110P20 	XCDR2102P20 	XCDR2121P20 	XCDR2127P20 	XCDR2118P20 	XCDR2119P20 
	XCDR2510P20 	XCDR2502P20 	XCDR2521P20 	XCDR2527P20 	XCDR2518P20 	XCDR2519P20 
 <p>2-pole NC + NO break before make, slow break (XE2NP2151)</p>						
Weight (kg)	0.215	0.220	0.225	0.225	0.255	0.255

References of complete switches with 1 Pg 13.5 cable entry

For complete switches with 1 Pg 13.5 cable entry replace P20 by **G13**.

Example: XCDR2110P20 becomes **XCDR2110G13**.





References of complete switches with 1 entry for 1/2" NPT conduit

For complete switches with 1 entry for 1/2" NPT conduit replace P20 by **N12**.

Example: XCDR2110P20 becomes **XCDR2110N12**.

Contact operation	 closed  open	(A) (B) = cam displacement (P) = positive opening point	 NC contact with positive opening operation
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Characteristics

Switch actuation	On end	By 30° cam		
Type of actuation				
Maximum actuation speed	0.5 m/s		1 m/s	1.5 m/s
Minimum force or torque	For tripping For positive opening	15 N 45 N	12 N 36 N	6 N 18 N
Cable entry	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm 1 entry tapped Pg 13.5 for cable gland, clamping capacity 9 to 12 mm 1 entry tapped for 1/2" NPT (USAS B2-1) conduit			

Limit switches

OsiSense XC Standard

Compact design, metal, with reset, type XCDR

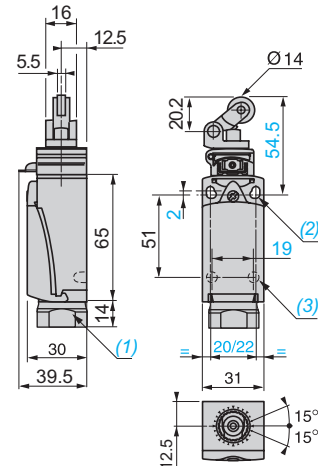
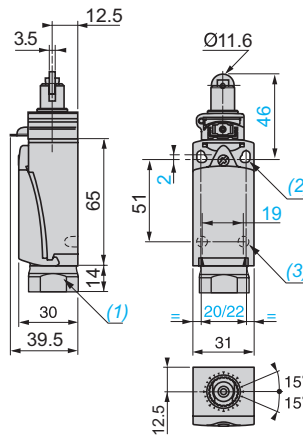
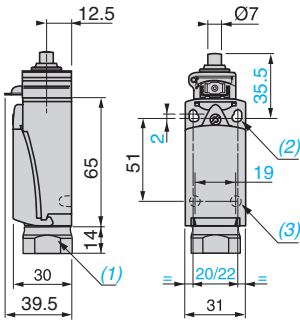
Complete switches with 1 cable entry

Dimensions

XCDR2•10•••

XCDR2•02•••

XCDR2•21•••

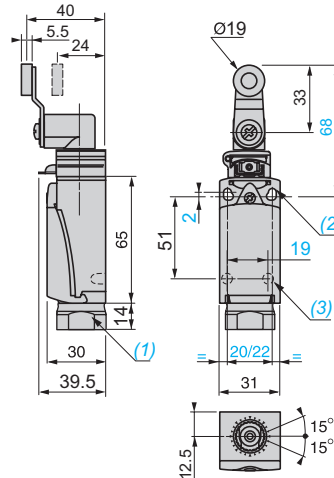
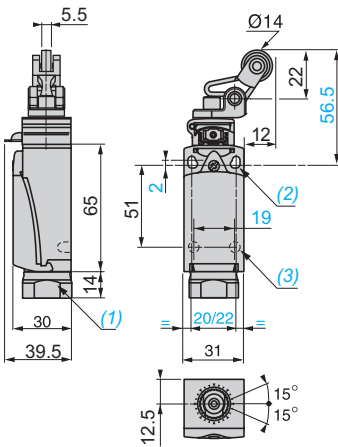


- (1) Tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland or tapped 1/2" NPT.
- (2) 2 elongated holes $\varnothing 4.3 \times 6.3$ mm on 22 mm centres, 2 holes $\varnothing 4.3$ on 20 mm centres.
- (3) 2 x $\varnothing 3$ holes for support studs, depth 4 mm.

Dimensions

XCDR2•27•••

XCDR2•18•••, XCDR2•19•••



- (1) Tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland or tapped 1/2" NPT.
- (2) 2 elongated holes $\varnothing 4.3 \times 6.3$ mm on 22 mm centres, 2 holes $\varnothing 4.3$ on 20 mm centres.
- (3) 2 x $\varnothing 3$ holes for support studs, depth 4 mm.


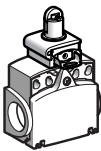

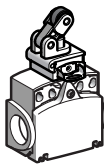
Limit switches

OsiSense XC Standard



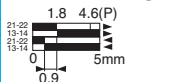

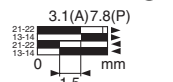

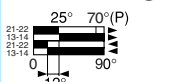

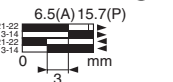

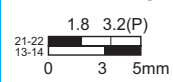

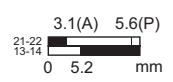

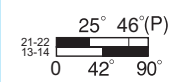

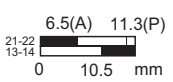
Compact design, plastic, with reset, type XCTR

Complete switches with 2 cable entries

1

Type of head	Plunger (fixing by the body)			
Type of operator				

References of complete switches with 2 ISO M16 x 1.5 cable entries




 <p>2-pole NC + NO snap action (XE2SP3151)</p>	<p>XCTR2110P16 </p> 	<p>XCTR2102P16 </p> 	<p>XCTR2118P16 </p> 	<p>XCTR2121P16 </p> 
	<p>XCTR2510P16 </p> 	<p>XCTR2502P16 </p> 	<p>XCTR2518P16 </p> 	<p>XCTR2521P16 </p> 
Weight (kg)	0.120	0.125	0.165	0.135

References of complete switches with 2 Pg 11 cable entries

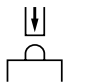
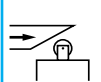
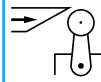

For complete switches with 2 Pg 11 cable entries replace P16 by G11.
Example: XCTR2110P16 becomes XCTR2110G11.

References of complete switches with 2 entries tapped for 1/2" NPT conduit

For complete switches with 2 entries for 1/2" NPT conduit replace P16 by N12.
Example: XCTR2110P16 becomes XCTR2110N12.

Contact operation	 closed  open	(A) = cam displacement (P) = positive opening point  NC contact with positive opening operation
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Characteristics

Switch actuation	On end	By 30° cam			
Type of actuation					
Maximum actuation speed	0.5 m/s		1.5 m/s	1 m/s	
Minimum force or torque	For tripping	15 N	12 N	0.1 N.m	6 N
	For positive opening	45 N	36 N	0.25 N.m	18 N
Cable entry (1 entry fitted with blanking plug)	2 entries tapped M16 x 1.5 mm for ISO cable gland, clamping capacity 4 to 8 mm 2 entries tapped Pg 11 for cable gland, clamping capacity 7 to 10 mm 2 entries tapped for 1/2" NPT (USAS B2-1) conduit using Pg 11 - 1/2" NPT adaptor DE9RA1012				

Limit switches

OsiSense XC Standard

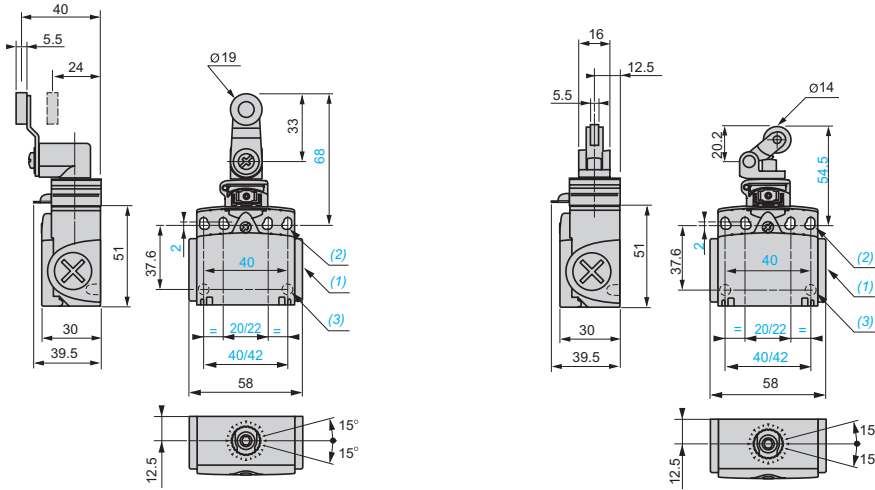
Compact design, plastic, with reset, type XCTR

Complete switches with 2 cable entries

Dimensions

XCTR2●18●●●

XCTR2●21●●●



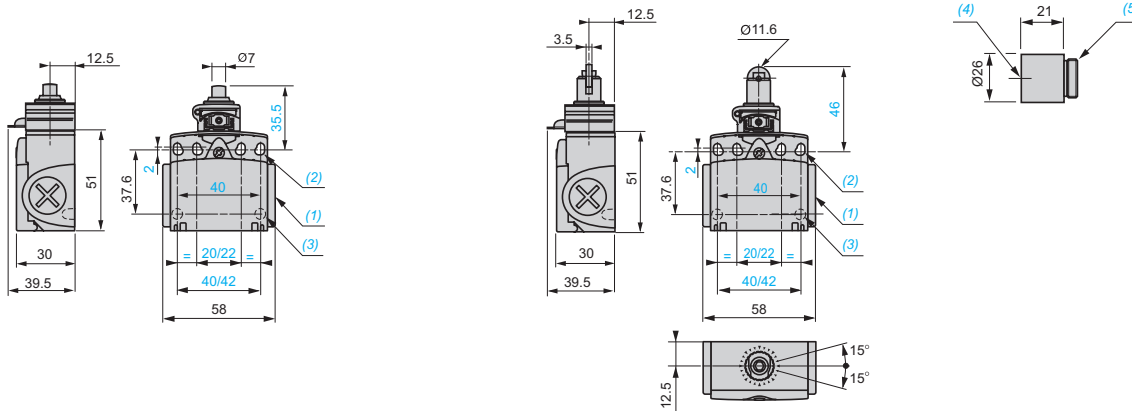
- (1) Tapped entry for ISO M16 x 1.5 or Pg 11 cable gland or 1/2" NPT conduit.
- (2) 4 elongated holes $\varnothing 4.3 \times 6.3$ mm on 22/42 mm centres, 4 holes $\varnothing 4.3$ on 20/40 mm centres.
- (3) 2 x $\varnothing 3$ holes for support studs, depth 4 mm.

Dimensions

XCTR2●10●●●

XCTR2●02●●●

DE9RA1012



- (1) Tapped entry for ISO M16 x 1.5 or Pg 11 cable gland or tapped 1/2" NPT.
- (2) 4 elongated holes $\varnothing 4.3 \times 6.3$ mm on 22/42 mm centres, 4 holes $\varnothing 4.3$ on 20/40 mm centres.
- (3) 2 x $\varnothing 3$ holes for support studs, depth 4 mm.
- (4) Tapped entry for 1/2" NPT conduit.
- (5) Pg 11 threaded sleeve.

Limit switches

OsiSense XC Basic

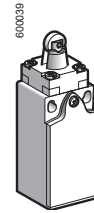
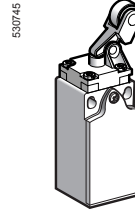
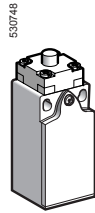
Compact design, plastic, types XCKN and XCNT

1

■ XCKN

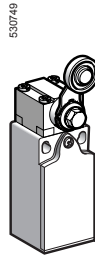
with 1 cable entry
Conforming to CENELEC EN 50047

□ With head for linear movement (plunger)



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□ With head for rotary movement (lever) or multi-directional

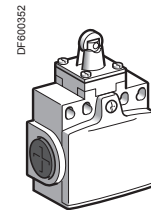
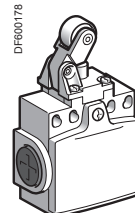
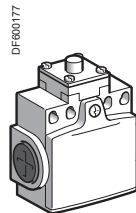


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■ XCNT

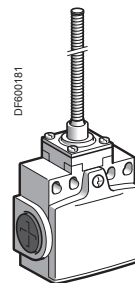
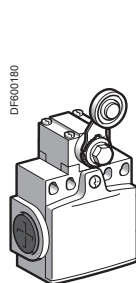
with 2 cable entries
Conforming to CENELEC EN 50047

□ With head for linear movement (plunger)



Page 1/64

□ With head for rotary movement (lever) or multi-directional



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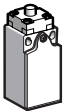
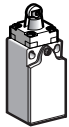



Environment characteristics		
Conformity to standards	Products	IEC 60947-5-1, EN 60947-5-1, UL 508, CSA C22-2 n° 14
	Machine assemblies	IEC 60204-1, EN 60204-1
Product certifications		UL, CSA, CCC
Protective treatment	Version	Standard: "TC"
Ambient air temperature	For operation	- 25...+ 70°C
	For storage	- 40...+ 70°C
Vibration resistance	Conforming to IEC 60068-2-6	25 gn (10...500 Hz) except XCKN●●08: 10 gn, XCKN●●39 and XCKN●●49: 15 gn
Shock resistance	Conforming to IEC 60068-2-27	50 gn (11 ms) except XCKN2●49●● and XCKN●●39: 15 gn, XCKN2●08●●: 20 gn and XCKN2●45●●: 35 gn
Electric shock protection		Class II conforming to IEC 61140 and NF C 20030
Degree of protection		IP 65 conforming to IEC 60529; IK 04 conforming to EN 50102
Cable entry		Depending on model: tapped entry for ISO M20 x 1.5 or Pg 11 cable gland, ISO M 16 x 1.5 cable gland or PF 1/2 (G 1/2).
Materials	Bodies	Plastic
	Heads	Plastic
Contact block characteristics		
Rated operational characteristics		~ AC-15; A300 (Ue = 240 V, Ie = 3 A); Ithe = 10 A ⎓ DC-13; R300 (Ue = 250 V, Ie = 0.1 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
Rated insulation voltage	2-pole contact	Ui = 500 V degree of pollution 3 conforming to IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage	2-pole contact	U imp = 6 kV conforming to IEC 60947-1, IEC 60664
Positive operation		NC contacts with positive opening operation conforming to IEC 60947-5-1 Appendix K, EN 60947-5-1
Short-circuit protection		10 A cartridge fuse type gG (gl)
Connection	Screw clamp terminals	Clamping capacity, min: 1 x 0.34 mm ² , max: 2 x 1.5 mm ²

Limit switches

OsiSense XC Basic


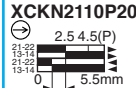
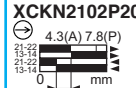
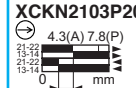
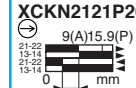
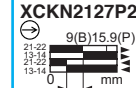

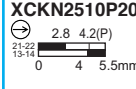
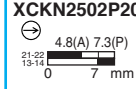
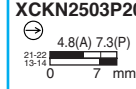
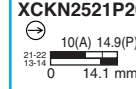
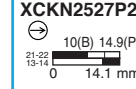

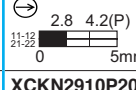
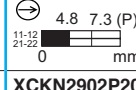
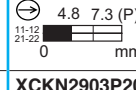
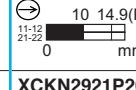
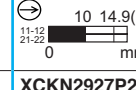

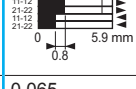
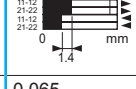

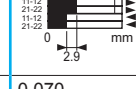
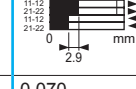



Compact design, plastic, type XCKN

Complete switches with 1 cable entry





Type of head	Plunger (fixing by the body)				
Type of operator					

Sold and packed in lots of	20	20	20	20	20
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References of complete switches with 1 ISO M20 x 1.5 cable entry

	2-pole NC + NO snap action					
	2-pole N/C + N/O break before make, slow break					
	2-pole NC + NC simultaneous, slow break					
	2-pole NC + NC snap action					
Weight (kg)	0.065	0.065	0.065	0.070	0.070	0.070
Contact operation	 closed  open	(A) (B) = cam displacement (P) = positive opening point		 NC contact with positive opening operation		

Characteristics

Switch actuation	On end	By 30° cam		
Type of actuation				
Maximum actuation speed	0.5 m/s	0.3 m/s	1 m/s	
Mechanical durability (in millions of operating cycles)	10			
Minimum force or torque	For tripping	15 N	12 N	6 N
	For positive opening	30 N	20 N	10 N
Cable entry	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm			

References of complete switches with 1 Pg 11 cable entry

For complete switches with 1 Pg 11 cable entry replace P20 by G11.

Example: XCKN2110P20 becomes XCKN2110G11.

Other cable entries

For complete switches with ISO M16 x 1.5 or PF 1/2 (G 1/2) cable entry, please consult our Customer Care Centre.

Other contacts

For complete switches with 2-pole contacts:
NO + NC make before break, slow break,
NO + NO simultaneous, slow break, please consult our Customer Care Centre.

For complete switches with 3-pole contacts:
NC + NO + NO snap action,
NC + NC + NO snap action,
NC + NC + NO break before make, slow break,
NC + NO + NO break before make, slow break, please consult our Customer Care Centre.

Limit switches

OsiSense XC Basic

Compact design, plastic, type XCKN

Complete switches with 1 cable entry

Type of head	Rotary (fixing by the body)				Multi-directional	
Type of operator	Thermoplastic roller lever	Variable length thermoplastic roller lever	Thermoplastic roller lever, Ø 50 mm	Variable length thermoplastic roller lever, Ø 50 mm	Spring rod	"Cat's whisker"
Sold and packed in lots of	20	20	20	20	20	20

References of complete switches with 1 ISO M20 x 1.5 cable entry							
	2-pole NC + NO snap action	XCKN2118P20 	XCKN2145P20 	XCKN2139P20 	XCKN2149P20 	XCKN2108P20 	XCKN2106P20
	2-pole N/C + N/O break before make, slow break	XCKN2518P20 	XCKN2545P20 	XCKN2539P20 	XCKN2549P20 	XCKN2508P20 	XCKN2506P20
	2-pole NC + NC simultaneous, slow break	XCKN2718P20 	XCKN2745P20 	XCKN2739P20 	XCKN2749P20 	XCKN2708P20 	XCKN2706P20
	2-pole NC + NC snap action	XCKN2918P20 	XCKN2945P20 	XCKN2939P20 	XCKN2949P20 	XCKN2908P20 	XCKN2906P20
Weight (kg)		0.085	0.090	0.110	0.115	0.085	0.075
Contact operation				(A) (B) = cam displacement (P) = positive opening point			

Characteristics		
Switch actuation	By 30° cam	By any moving part
Type of actuation		
Maximum actuation speed	1.5 m/s	1 m/s (any direction)
Mechanical durability	10 million operating cycles	5 million operating cycles
Minimum force or torque	For tripping: 0.1 N.m For positive opening: 0.15 N.m	0.13 N.m
Cable entry	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	

References of complete switches with 1 Pg 11 cable entry

For complete switches with 1 Pg 11 cable entry replace P20 by G11.
Example: XCKN2118P20 becomes XCKN2118G11.

Other cable entries

For complete switches with ISO M16 x 1.5 or PF 1/2 (G 1/2) cable entry, please consult our Customer Care Centre.

Other contacts

For complete switches with 2-pole contacts:
NO + NC make before break, slow break,
NO + NO simultaneous, slow break, please consult our Customer Care Centre.

For complete switches with 3-pole contacts:
NC + NO + NO snap action,
NC + NC + NO snap action,
NC + NC + NO break before make, slow break,
NC + NO + NO break before make, slow break, please consult our Customer Care Centre.

Limit switches

OsiSense XC Basic

Compact design, plastic, type XCNT

Complete switches with 2 cable entries

1

Type of head	Plunger (fixing by the body)			
Type of operator	Metal end plunger	Plastic roller plunger for lateral cam approach	Plastic roller plunger for traverse cam approach	Thermoplastic roller lever plunger, horizontal actuation in 1 direction
Sold and packed in lots of	10	10	10	10



References of complete switches with 2 ISO M16 x 1.5 cable entries

<p>2-pole NC + NO snap action</p>	<p>XCNT2110P16</p> <p>1.8 4.6(P)</p>	<p>XCNT2102P16</p> <p>3.1(A) 7.8(P)</p>	<p>XCNT2103P16</p> <p>3.1(A) 7.8(P)</p>	<p>XCNT2121P16</p> <p>6.5(A) 15.7(P)</p>
<p>2-pole N/C + N/O break before make, slow break</p>	<p>XCNT2510P16</p> <p>1.8 3.2(P)</p>	<p>XCNT2502P16</p> <p>3.1(A) 5.6(P)</p>	<p>XCNT2503P16</p> <p>3.1(A) 5.6(P)</p>	<p>XCNT2521P16</p> <p>6.5(A) 11.3(P)</p>
<p>2-pole NC + NC simultaneous, slow break</p>	<p>XCNT2710P16</p> <p>1.8 3.2(P)</p>	<p>XCNT2702P16</p> <p>3.1 5.6(P)</p>	<p>XCNT2703P16</p> <p>3.1 5.6(P)</p>	<p>XCNT2721P16</p> <p>6.5 11.3(P)</p>
Weight (kg)	0.085	0.085	0.085	0.090
Contact operation	<p>(A) (B) = cam displacement (P) = positive opening point ⊕ NC contact with positive opening operation</p>			

Characteristics

Switch actuation	On end	By 30° cam	
Type of actuation			
Maximum actuation speed	0.5 m/s	0.3 m/s	1 m/s
Mechanical durability (in millions of operating cycles)	10		
Minimum force or torque	For tripping	15 N	12 N
	For positive opening	30 N	20 N
Cable entry	2 entries tapped M16 x 1.5 mm for ISO cable gland, clamping capacity 4 to 8 mm		

References of complete switches with 2 Pg 11 cable entries

For complete switches with 2 Pg 11 cable entries replace P16 by G11.
Example: XCNT2110P16 becomes XCNT2110G11.

Complete switches with 1/2" NPT cable entry

For complete switches with 1/2" NPT cable entry use adaptor DE9 RA1012 (compatible with XCNT●●●G11).



DE9RA1012

Description	Sold in lots of	Unit reference	Weight kg
Adaptor for 1/2" NPT conduit (male Pg 11 / female 1/2" NPT)	10	DE9RA1012	0.050

Other contacts

For complete switches with 2-pole contacts:
NO + NC make before break, slow break,
NO + NO simultaneous, slow break, please consult our Customer Care Centre.

Limit switches

OsiSense XC Basic

Compact design, plastic, type XCNT

Complete switches with 2 cable entries

Type of head	Rotary (fixing by the body)				Multi-directional	
Type of operator	Thermoplastic roller lever	Variable length thermoplastic roller lever	Thermoplastic roller lever, Ø 50 mm	Variable length thermoplastic roller lever, Ø 50 mm	Spring rod	"Cat's whisker"
Sold and packed in lots of	10	10	10	10	8	8

References of complete switches with 2 ISO M16 x 1.5 cable entries

	XCNT2118P16 25° 70°(P) 	XCNT2145P16 25° 70°(P) 	XCNT2139P16 25° 70°(P) 	XCNT2149P16 25° 70°(P) 	XCNT2108P16 20° 	XCNT2106P16 20°
	XCNT2518P16 25° 46°(P) 	XCNT2545P16 25° 46°(P) 	XCNT2539P16 25° 46°(P) 	XCNT2549P16 25° 46°(P) 	XCNT2508P16 20° 	XCNT2506P16 20°
	XCNT2718P16 25° 46°(P) 	XCNT2745P16 25° 46°(P) 	XCNT2739P16 25° 46°(P) 	XCNT2749P16 25° 46°(P) 	XCNT2708P16 20° 	XCNT2706P16 20°
Weight (kg)	0.105	0.120	0.120	0.120	0.100	0.090
Contact operation				(A) (B) = cam displacement (P) = positive opening point		

Characteristics

Switch actuation	By 30° cam	By any moving part
Type of actuation		
Maximum actuation speed	1.5 m/s	1 m/s (any direction)
Mechanical durability	10 million operating cycles	5 million operating cycles
Minimum force or torque	For tripping: 0.1 N.m For positive opening: 0.15 N.m	0.13 N.m
Cable entry	2 entries tapped M16 x 1.5 mm for ISO cable gland, clamping capacity 4 to 8 mm	

References of complete switches with 2 Pg 11 cable entries

For complete switches with 2 Pg 11 cable entries replace P16 by G11.
Example: XCNT2118P16 becomes XCNT2118G11.

Complete switches with 1/2" NPT cable entry

For complete switches with 1/2" NPT cable entry use adaptor DE9 RA1012 (compatible with XCNT●●●●G11).



DE9RA1012

Description	Sold in lots of	Unit reference	Weight kg
Adaptor for 1/2" NPT conduit (male Pg 11 / female 1/2" NPT)	10	DE9RA1012	0.050

Other contacts

For complete switches with 2-pole contacts:
NO + NC make before break, slow break,
NO + NO simultaneous, slow break, please consult our Customer Care Centre.

Limit switches

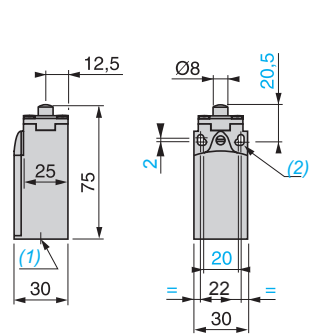
OsiSense XC Basic

Compact design, plastic, type XCKN

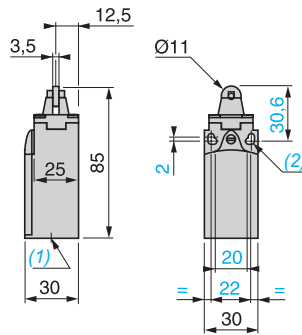
Complete switches with 1 cable entry

Dimensions

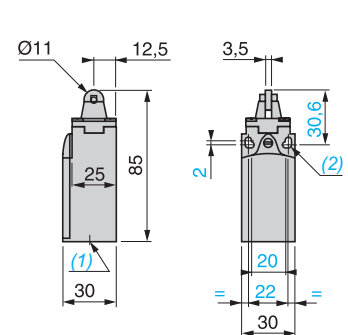
XCKN2•10P20



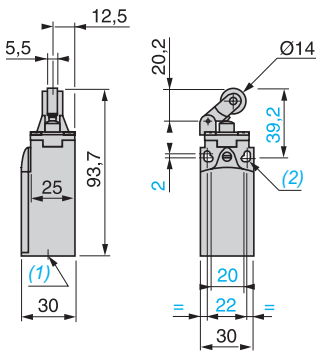
XCKN2•02P20



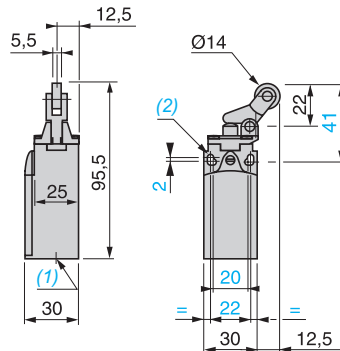
XCKN2•03P20



XCKN2•21P20

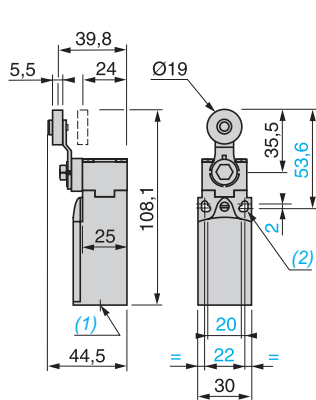


XCKN2•27P20

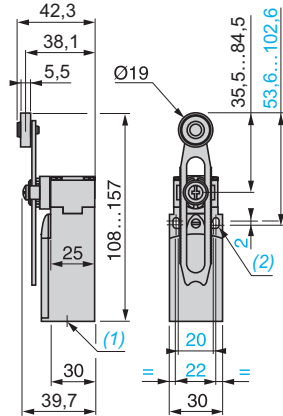


(1) 1 tapped entry for ISOM20 x 1.5 or Pg 11 cable gland.
 (2) Ø: 2 elongated holes Ø 4.3 x 6.3 on 22 mm centres, 2 holes Ø 4.3 on 20 mm centres.

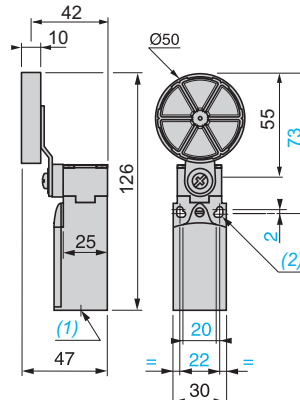
XCKN2•18P20



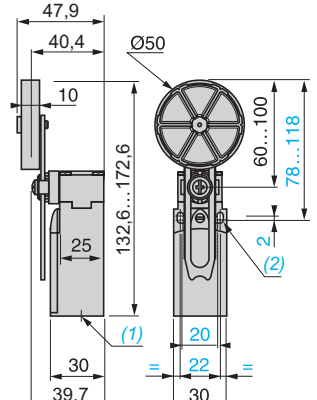
XCKN2•45P20



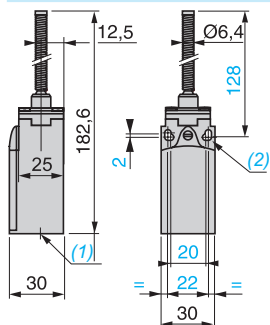
XCKN2•39P20



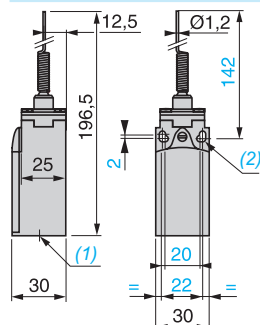
XCKN2•49P20



XCKN2•08P20



XCKN2•06P20



(1) 1 tapped entry for ISOM20 x 1.5 or Pg 11 cable gland.
 (2) Ø: 2 elongated holes Ø 4.3 x 6.3 on 22 mm centres, 2 holes Ø 4.3 on 20 mm centres.

Limit switches

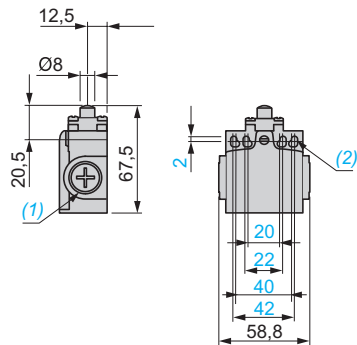
OsiSense XC Basic

Compact design, plastic, type XCNT

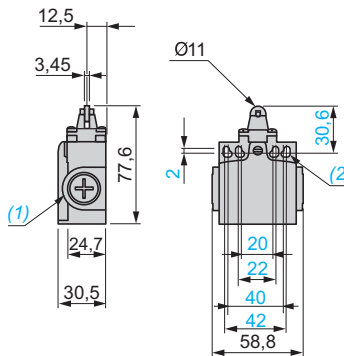
Complete switches with 2 cable entries

Dimensions

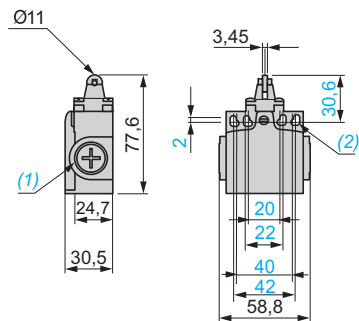
XCNT2•10P20



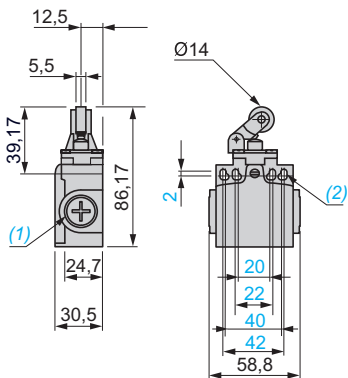
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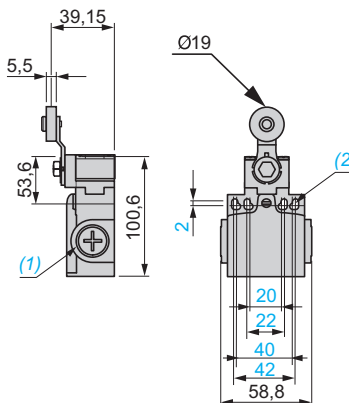
XCNT2•03P20



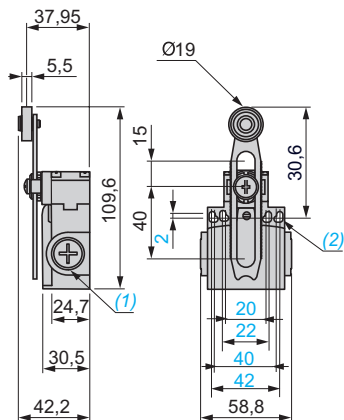
XCNT2•21P20



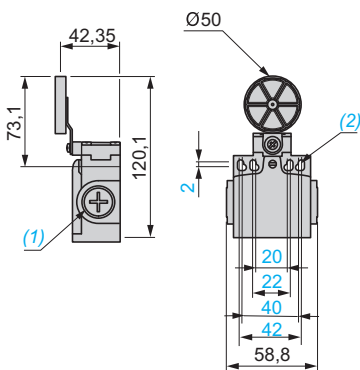
XCNT2•18P16



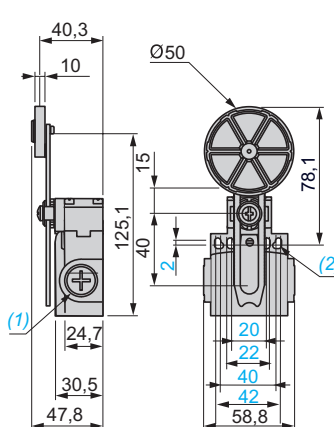
XCNT2•45P16



XCNT2•39P16

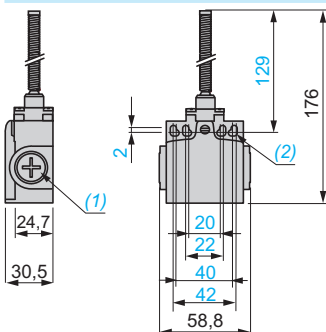


XCNT2•49P16

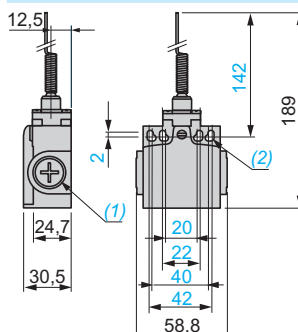


(1) 2 tapped entries for ISOM16 x 1.5 or Pg 11 cable gland.
 (2) Ø: 4 elongated holes Ø 4.3 x 6.3

XCNT2•08P16



XCNT2•06P16



Limit switches

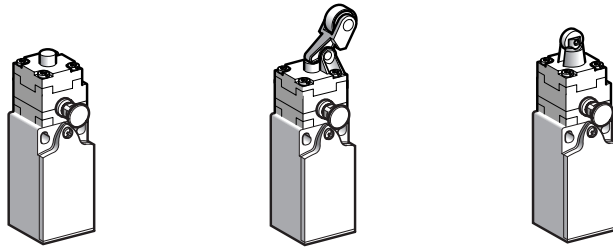
OsiSense XC Basic

Compact design, plastic, with reset knob,
types XCNR and XCNTR

1

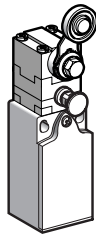
■ XCNR
with 1 cable entry

□ With head for linear movement (plunger)



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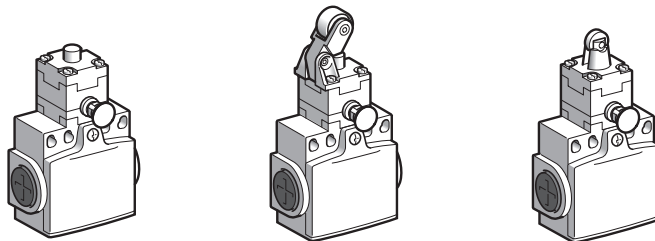
□ With head for rotary movement (lever)



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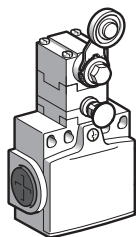
■ XCNTR
with 2 cable entries

□ With head for linear movement (plunger)



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□ With head for rotary movement (lever)



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Limit switches

OsiSense XC Basic

Compact design, plastic, with reset knob, types XCNR and XCNTR

Environment characteristics

Conformity to standards	Products	IEC 60947-5-1, EN 60947-5-1, UL 508, CSA C22-2 n° 14
	Machine assemblies	IEC 60204-1, EN 60204-1
Product certifications		UL, CSA, CCC (pending)
Protective treatment	Version	Standard: "TC"
Ambient air temperature	For operation	- 25...+ 70°C
	For storage	- 40...+ 70°C
Vibration resistance	Conforming to IEC 60068-2-6	25 gn (10...500 Hz)
Shock resistance	Conforming to IEC 60068-2-27	50 gn (11 ms)
Electric shock protection		Class II conforming to IEC 61140 and NF C 20030
Degree of protection		IP 65 conforming to IEC 60529; IK 04 conforming to EN 50102
Cable entry		Depending on model: tapped entry, for ISO M20 x 1.5 or Pg 11 cable gland, ISO M16 x 1.5 cable gland or PF 1/2 (G 1/2)
Materials	Bodies	Plastic
	Heads	Plastic

Contact block characteristics

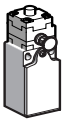
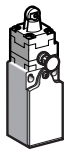


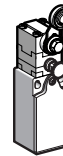
Rated operational characteristics		<p>~ AC-15; A300 (Ue = 240 V, Ie = 3 A); Ithe = 10 A</p> <p>⋯ DC-13; R300 (Ue = 250 V, Ie = 0.1 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1</p>
Rated insulation voltage	2-pole contact	<p>Ui = 500 V degree of pollution 3 conforming to IEC 60947-1</p> <p>Ui = 300 V conforming to UL 508, CSA C22-2 n° 14</p>
Rated impulse withstand voltage	2-pole contact	U imp = 6 kV conforming to IEC 60947-1, IEC 60664
Positive operation		NC contacts with positive opening operation conforming to IEC 60947-5-1 Appendix K, EN 60947-5-1
Short-circuit protection		10 A cartridge fuse type gG (gl)
Connection	Screw clamp terminals	Clamping capacity, min: 1 x 0.34 mm ² , max: 2 x 1.5 mm ²

Limit switches


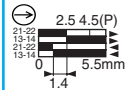
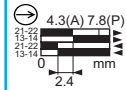
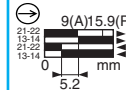
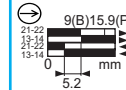
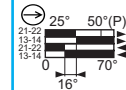

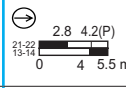
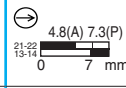
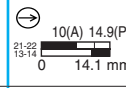
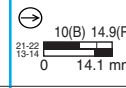
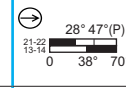


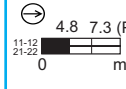

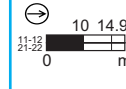
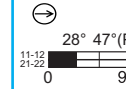

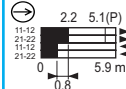
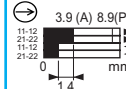
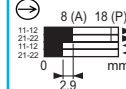
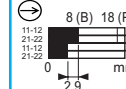
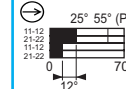



OsiSense XC Basic

Compact design, plastic, with reset knob, type XCNR






Complete switches with 1 cable entry

Type of head	Plunger (fixing by the body)					Rotary (fixing by the body)
						
Type of operator	Metal end plunger	Plastic roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever plunger, vertical actuation in 1 direction	Thermoplastic roller lever	
Sold and packed in lots of	10	10	10	10	10	

References of complete switches with 1 ISO M20 x 1.5 cable entry

 2-pole NC + NO snap action	XCNR2110P20 	XCNR2102P20 	XCNR2121P20 	XCNR2127P20 	XCNR2118P20 
 2-pole N/C + N/O break before make, slow break	XCNR2510P20 	XCNR2502P20 	XCNR2521P20 	XCNR2527P20 	XCNR2518P20 
 2-pole NC + NC simultaneous, slow break	XCNR2710P20 	XCNR2702P20 	XCNR2721P20 	XCNR2727P20 	XCNR2718P20 
 2-pole NC + NC snap action	XCNR2910P20 	XCNR2902P20 	XCNR2921P20 	XCNR2927P20 	XCNR2918P20 
Weight (kg)	0.080	0.080	0.085	0.090	0.100
Contact operation	 closed  open		(A) (B) = cam displacement (P) = positive opening point	 NC contact with positive opening operation	

Characteristics

Switch actuation	On end	By 30° cam			
Type of actuation					
Maximum actuation speed	0.5 m/s	0.3 m/s	1 m/s	1.5 m/s	
Mechanical durability	100,000 operating cycles				
Minimum force or torque	For tripping	15 N	12 N	6 N	0.1 N.m
	For positive opening	30 N	20 N	10 N	0.15 N.m
Cable entry	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm				

References of complete switches with 1 Pg 11 cable entry

For complete switches with 1 Pg 11 cable entry replace P20 by G11.
Example: XCNR2110P20 becomes **XCNR2110G11**.

Other cable entries

For complete switches with ISO M16 x 1.5 or PF 1/2 (G 1/2) cable entry, please consult our Customer Care Centre.

Other contacts

For complete switches with 2-pole contacts:
NC + NO make before break, slow break,
NO + NO simultaneous, slow break, please consult our Customer Care Centre.

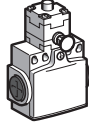
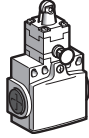

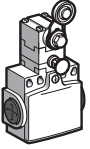
For complete switches with 3-pole contacts:
NC + NO + NO snap action,
NC + NC + NO snap action,
NC + NC + NO break before make, slow break,
NC + NO + NO break before make, slow break, please consult our Customer Care Centre.

Limit switches


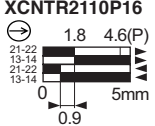
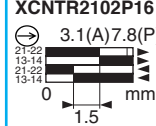
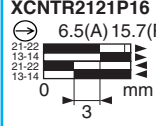
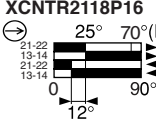

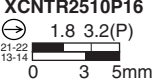
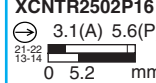
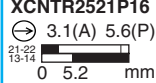
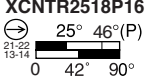

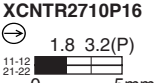
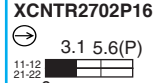
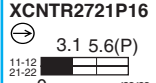
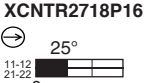



OsiSense XC Basic

Compact design, plastic, with reset knob, type XCNTR





Complete switches with 2 cable entries

Type of head	Plunger (fixing by the body)	Rotary (fixing by the body)		
				
Type of operator	Metal end plunger	Plastic roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever
Sold and packed in lots of	10	10	10	10

References of complete switches with 2 ISO M16 x 1.5 cable entries

 2-pole NC + NO snap action	 XCNTR2110P16 1.8 4.6(P) 0.9 5mm	 XCNTR2102P16 3.1(A) 7.8(P) 1.5 mm	 XCNTR2121P16 6.5(A) 15.7(P) 3 mm	 XCNTR2118P16 25° 70°(P) 12° 90°
 2-pole N/C + N/O break before make, slow break	 XCNTR2510P16 1.8 3.2(P) 0 3 5mm	 XCNTR2502P16 3.1(A) 5.6(P) 0 5.2 mm	 XCNTR2521P16 3.1(A) 5.6(P) 0 5.2 mm	 XCNTR2518P16 25° 46°(P) 0 42° 90°
 2-pole NC + NC simultaneous, slow break	 XCNTR2710P16 1.8 3.2(P) 0 5mm	 XCNTR2702P16 3.1 5.6(P) 0 mm	 XCNTR2721P16 3.1 5.6(P) 0 mm	 XCNTR2718P16 25° 0 mm
Weight (kg)	0.105	0.110	0.135	0.095
Contact operation	 closed  open	(A) (B) = cam displacement (P) = positive opening point		 NC contact with positive opening operation

Characteristics

Switch actuation	On end	By 30° cam			
Type of actuation					
Maximum actuation speed	0.5 m/s	0.3 m/s	1 m/s	1.5 m/s	
Mechanical durability	100 000 operating cycles				
Minimum force or torque	For tripping	15 N	12 N	6 N	0.1 N.m
	For positive opening	30 N	20 N	10 N	0.15 N.m
Cable entry	2 entries tapped M16 x 1.5 mm for ISO cable gland, clamping capacity 4 to 8 mm				

References of complete switches with 2 Pg 11 cable entries

For complete switches with 2 Pg 11 cable entries replace P16 by G11.

Example: XCNTR2110P16 becomes XCNTR2110G11.

Complete switches with 1/2" NPT cable entry

For complete switches with 1/2" NPT cable entry use adaptor DE9 RA1012 (compatible with XCNTR●●●●G11).



DE9RA1012

Description	Sold in lots of	Unit reference	Weight kg
Adaptor for 1/2" NPT conduit (male Pg 11 / female 1/2" NPT)	10	DE9RA1012	0.050

Other contacts

For complete switches with 2-pole contacts:

NO + NC make before break, slow break,

NO + NO simultaneous, slow break, please consult our Customer Care Centre.

Limit switches

OsiSense XC Basic

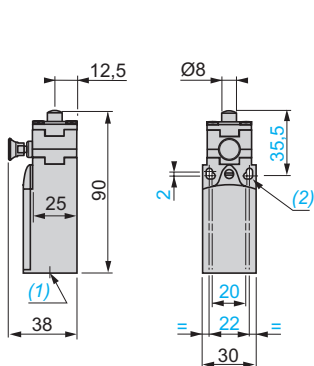
Compact design, plastic, with reset knob, type XCNR

Complete switches with 1 cable entry

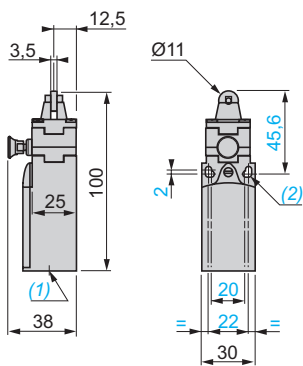
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Dimensions

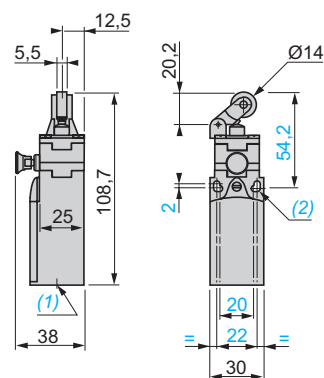
XCNR2●10P20



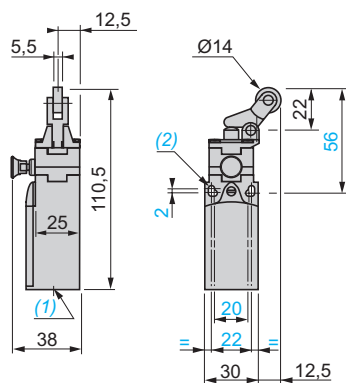
XCNR2●02P20



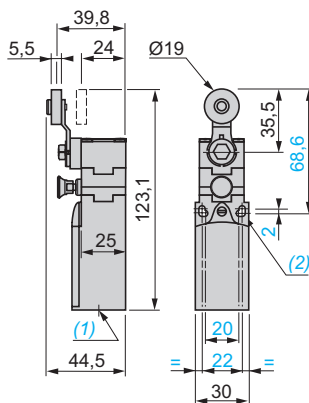
XCNR2●21P20



XCNR2●27P20



XCNR2●18P20



(1) 1 tapped entry for ISO M20 x 1.5 or Pg 11 cable gland.

(2) 2 elongated holes Ø 4.3 x 6.3 on 22 mm centres, 2 holes Ø 4.3 on 20 mm centres.

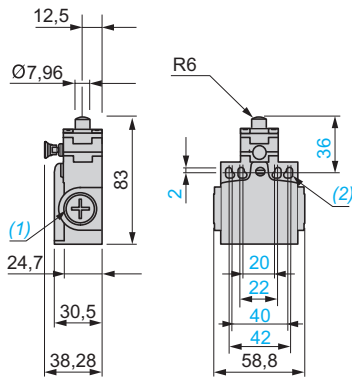
Limit switches

OsiSense XC Basic

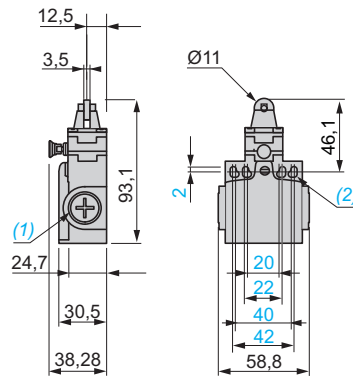
Compact design, plastic, with reset knob, type XCNTR
Complete switches with 2 cable entries

Dimensions

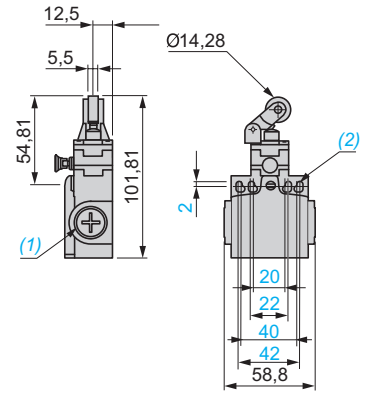
XCNTR2●10P16



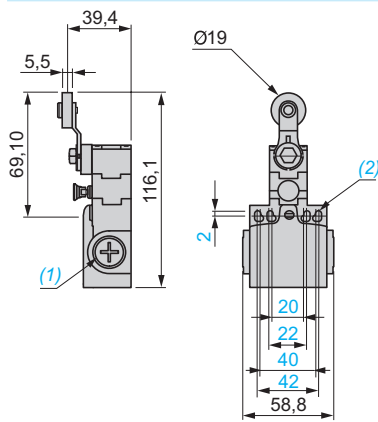
XCNTR2●02P16



XCNTR2●21P16



XCNTR2●18P16



(1) 2 tapped entries for ISO M16 x 1.5 or Pg 11 cable gland.
(2) \varnothing : 4 elongated holes $\varnothing 4.3 \times 6.3$.

Limit switches

OsiSense XC Standard, Classic format
Metal, types XCKM, XCKL and XCKML

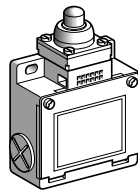
1

■ **XCKM**,
with 3 cable entries

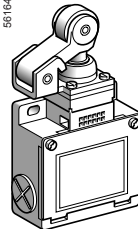
□ With head for linear movement
(plunger)

□ With head for rotary movement
(lever) or multi-directional

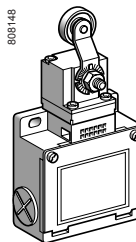
561643



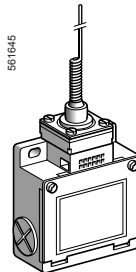
561644



808148



561645



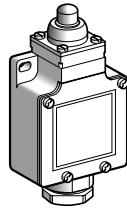
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■ **XCKL**,
with 1 cable entry

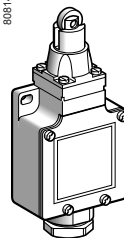
□ With head for linear movement
(plunger)

□ With head for rotary movement
(lever) or multi-directional

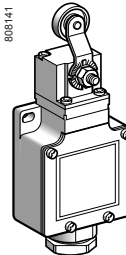
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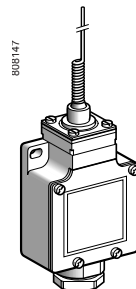
808145



808141



808147



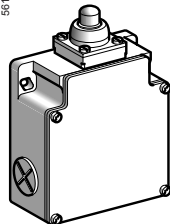
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■ **XCKML**,
with 3 cable entries and 2 x 2-pole contacts

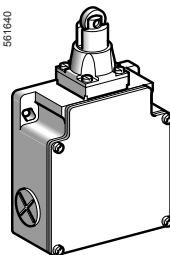
□ With head for linear movement
(plunger)

□ With head for rotary movement
(lever)

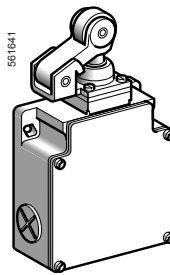
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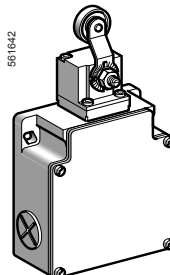
561640



561641



561642



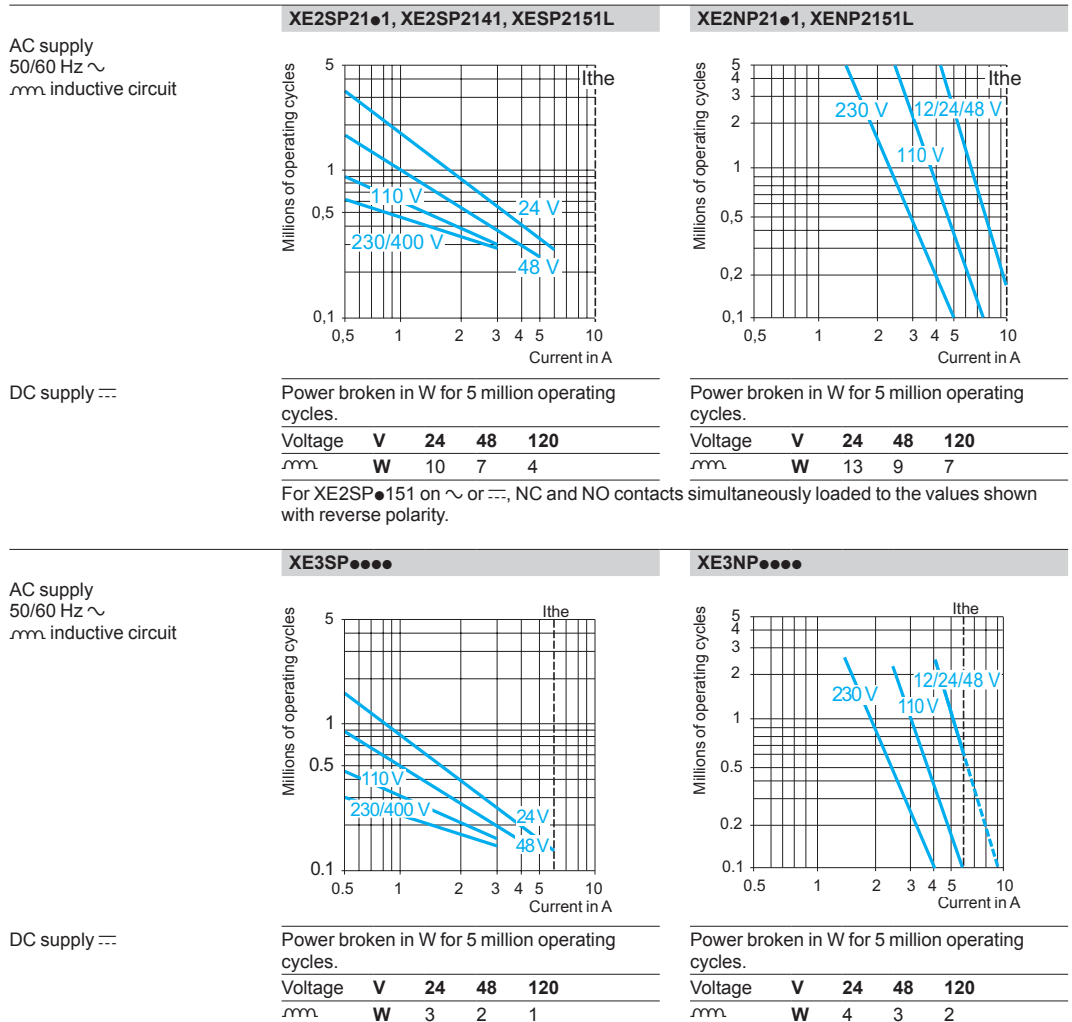
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Environment characteristics

Conformity to standards	Products	IEC 60947-5-1, EN 60947-5-1, UL 508, CSA C22-2 n° 14
	Machine assemblies	IEC 60204-1, EN 60204-1
Product certifications		UL, CSA CCC (only for XCKM) BV (only for XCKM and XCKL)
Protective treatment	Version	Standard: "TC". Special: "TH"
Ambient air temperature	For operation	-25...+70°C
	For storage	-40...+70°C
Vibration resistance	Conforming to IEC 60068-2-6	25 gn (10...500 Hz)
Shock resistance	Conforming to IEC 60068-2-27	50 gn (11 ms)
Electric shock protection		Class I conforming to IEC 61140 and NF C 20-030
Degree of protection		IP 66 conforming to IEC 60529; IK 05 conforming to EN 50102
Repeat accuracy		XCKML 0.1 mm; XCKM and XCKL 0.05 mm on the tripping points, with 1 million operating cycles for head with end plunger
Cable entry or connector	Depending on model	XCKM : 3 tapped entries for Pg 11 cable gland or tapped ISO M20, or with 1/2" NPT adaptor XCKL : 1 tapped entry incorporating Pg 13.5 cable gland or 1 entry tapped 1/2" NPT XCKML : 3 tapped entries for Pg 13.5 cable gland or tapped ISO M20
Materials		Bodies: Zamak. Rotary heads: Zamak or plastic, depending on product reference. Other heads: plastic

Contact block characteristics		
Rated operational characteristics	XE2●P	~ AC-15; A300 (Ue = 240 V, Ie = 3 A); Ithe = 10 A --- DC-13; Q300 (Ue = 250 V, Ie = 0.27 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
	XE3●P	~ AC-15; B300 (Ue = 240 V, Ie = 1.5 A); Ithe = 6 A --- DC-13; R300 (Ue = 250 V, Ie = 0.1 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
Rated insulation voltage	XE2●P	Ui = 500 V degree of pollution 3 conforming to IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
	XE3●P	Ui = 400 V degree of pollution 3 conforming to IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage	XE2●P	U imp = 6 kV conforming to IEC 60947-1, IEC 60664
	XE3●P	U imp = 4 kV conforming to IEC 60947-1, IEC 60664
Positive operation (depending on model)		NC contacts with positive opening operation conforming to IEC 60947-5-1 Appendix K, EN 60947-5-1
Resistance across terminals		≤ 25 mΩ conforming to IEC 60255-7 category 3
Short-circuit protection	XE2●P	10 A cartridge fuse type gG (gl)
	XE3●P	6 A cartridge fuse type gG (gl)
Connection (screw clamp terminals)	XE2SP21●1	Clamping capacity, min: 1 x 0.34 mm ² , max: 2 x 1.5 mm ²
	XE2NP21●1	Clamping capacity, min: 1 x 0.5 mm ² , max: 2 x 2.5 mm ²
	XESP2151L and XENP2151L	Clamping capacity, min: 1 x 0.34 mm ² , max: 2 x 1.5 mm ² or 1 x 2.5 mm ²
	XE3NP and XE3SP	Clamping capacity, min: 1 x 0.34 mm ² , max: 1 x 1 mm ² or 2 x 0.75 mm ²
Minimum actuation speed		XE2SP21●1, XESP2151L and XE3SP: 0.01 m/minute XE2NP21●1, XENP2151L and XE3NP: 6 m/minute

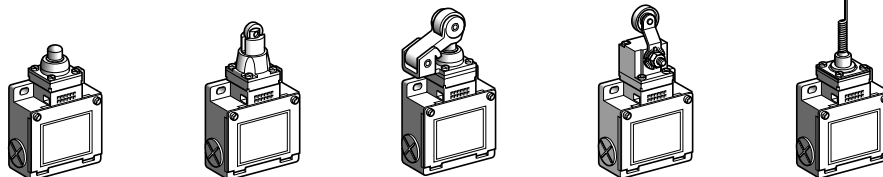
- Electrical durability
- Conforming to IEC 60947-5-1 Appendix C
 - Utilisation categories AC-15 and DC-13
 - Maximum operating rate: 3600 operating cycles/hour
 - Load factor: 0.5



Limit switches

OsiSense XC Standard, Classic format
Metal, type XCKM
Complete switches with 3 cable entries

Type of head	Plunger (fixing by the body)	Rotary (fixing by the body)	Multi-directional, (fixing by the body)
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Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever (1)	"Cat's whisker" (2)
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References of complete switches with 3 ISO M20 x 1.5 cable entries (3)

2-pole NC + NO snap action (XE2SP2151)		XCKM110H29 ⊕		XCKM102H29 ⊕		XCKM121H29 ⊕		XCKM115H29 ⊕		XCKM106H29
2-pole NC + NO break before make, slow break (XE2NP2151)		XCKM510H29 ⊕		XCKM502H29 ⊕		XCKM521H29 ⊕		XCKM515H29 ⊕		XCKM506H29
2-pole NC + NC snap action (XE2SP2141)		ZCKM9H29 + ZCKD10 ⊕		ZCKM9H29 + ZCKD02 ⊕		ZCKM9H29 + ZCKD21 ⊕		ZCKM9H29 + ZCKD15 ⊕		ZCKM9H29 + ZCKD06
2-pole NC + NC simultaneous, slow break (XE2NP2141)		ZCKM7H29 + ZCKD10 ⊕		ZCKM7H29 + ZCKD02 ⊕		ZCKM7H29 + ZCKD21 ⊕		ZCKM7H29 + ZCKD15 ⊕		ZCKM7H29 + ZCKD06
3-pole NC + NC + NO snap action (XE3SP2141)		ZCKMD39H29 + ZCKD10 ⊕		ZCKMD39H29 + ZCKD02 ⊕		ZCKMD39H29 + ZCKD21 ⊕		ZCKMD39H29 + ZCKD15 ⊕		ZCKMD39H29 + ZCKD06
3-pole NC + NC + NO break before make, slow break (XE3NP2141)		ZCKMD37H29 + ZCKD10 ⊕		ZCKMD37H29 + ZCKD02 ⊕		ZCKMD37H29 + ZCKD21 ⊕		ZCKMD37H29 + ZCKD15 ⊕		ZCKMD37H29 + ZCKD06
Weight (kg)	0.250	0.255	0.300	0.280	0.250					
Contact operation	closed open	(A) = cam displacement (P) = positive opening point			⊕ NC contact with positive opening operation					

References of complete switches with 3 Pg 11 cable entries

For complete switches with 3 Pg 11 cable entries, delete H29 from the end of the reference. Example: XCKM110H29 becomes XCKM110.

Characteristics	On end	By 30° cam	By any moving part
Switch actuation			
Type of actuation			
Maximum actuation speed	0.5 m/s	1.5 m/s	1 m/s (any direction)
Mechanical durability (4) (in millions of operating cycles)	20	15	10
Minimum force or torque	15 N For tripping 45 N For positive opening	12 N 36 N	8 N 24 N
		0.1 N.m 0.25 N.m	0.13 N.m -
Cable entry	3 entries tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm		

(1) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer.

(2) Value taken with actuation by moving part at 100 mm from the fixing.

(3) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.

(4) Limited to 15 million operating cycles for switches with contacts XE3•P.

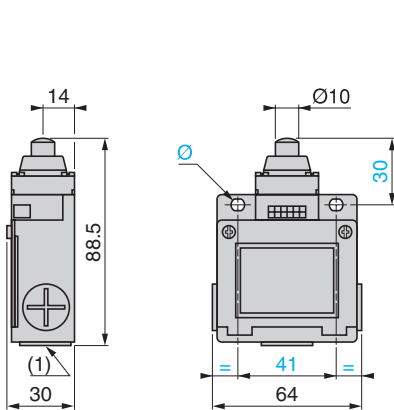
Limit switches

OsiSense XC Standard, Classic format

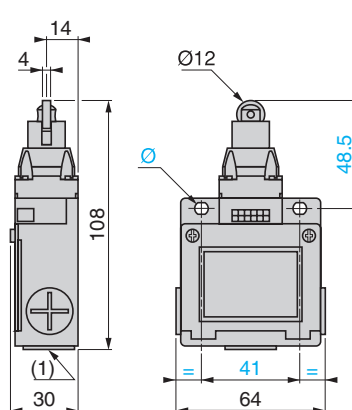
Metal, type XCKM

Complete switches with 3 cable entries

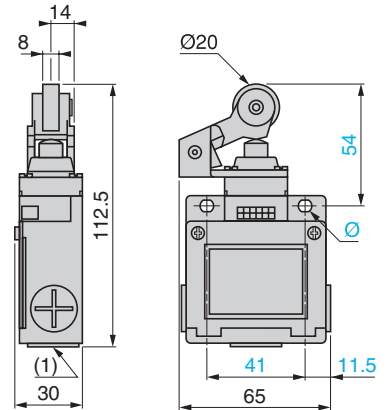
XCKM●10
ZCKMD3● + ZCKD10



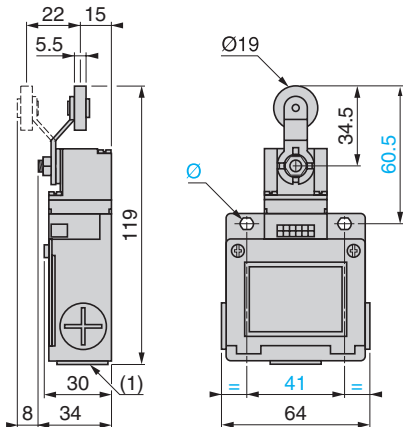
XCKM●02
ZCKMD3● + ZCKD02



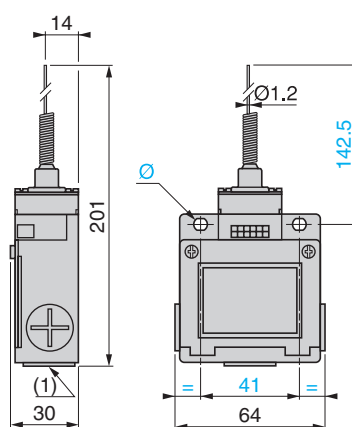
XCKM●21
ZCKMD3● + ZCKD21



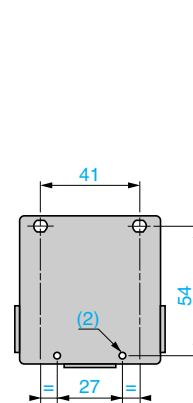
XCKM●15
ZCKMD3● + ZCKD15



XCKM●06
ZCKMD3● + ZCKD06



Rear view XCKM●●●, ZCKM●, ZCKMD3●



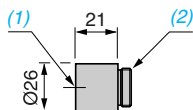
(1) 3 tapped entries for ISO M20 x 1.5 or Pg 11 cable gland or with 1/2" NPT conduit adaptor DE9RA1012.

(2) 2 x Ø 4 H 11, depth 10.

Ø: 2 elongated holes Ø 5.2 x 6.2

Adaptor for 1/2" NPT conduit

DE9RA1012



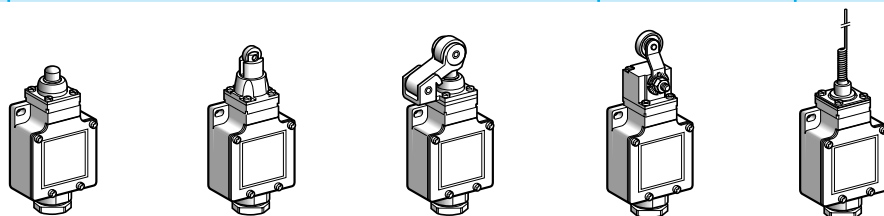
(1) Tapped entry for 1/2" NPT conduit.

(2) Pg 11 threaded sleeve.

Limit switches

OsiSense XC Standard, Classic format
Metal, type XCKL
Complete switches incorporating Pg 13.5 cable gland

Type of head	Plunger (fixing by the body)	Rotary (fixing by the body)	Multi-directional, (fixing by the body)
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Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever (1)	"Cat's whisker" (2)
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References (3)

2-pole NC + NO snap action (XE2SP2151)	 XCKL110 (↻)	 XCKL102 (↻)	 XCKL121 (↻)	 XCKL115 (↻)	 XCKL106
2-pole NC + NO break before make, slow break (XE2NP2151)	 XCKL510 (↻)	 XCKL502 (↻)	 XCKL521 (↻)	 XCKL515 (↻)	 XCKL506
3-pole NC + NC + NO snap action (XE3SP2141)	 ZCKLD39 + ZCKD10 (↻)	 ZCKLD39 + ZCKD02 (↻)	 ZCKLD39 + ZCKD21 (↻)	 ZCKLD39 + ZCKD15 (↻)	 ZCKLD39 + ZCKD06
2-pole NC + NC simultaneous, slow break (XE2NP2141)	 ZCKL7 + ZCKD10 (↻)	 ZCKL7 + ZCKD02 (↻)	 ZCKL7 + ZCKD21 (↻)	 ZCKL7 + ZCKD15 (↻)	 ZCKL7 + ZCKD06
3-pole NC + NC + NO break before make, slow break (XE3NP2141)	 ZCKLD37 + ZCKD10 (↻)	 ZCKLD37 + ZCKD02 (↻)	 ZCKLD37 + ZCKD21 (↻)	 ZCKLD37 + ZCKD15 (↻)	 ZCKLD37 + ZCKD06
Weight (kg)	0.255	0.260	0.305	0.285	0.255

Contact operation	closed open	(A) = cam displacement (P) = positive opening point	↻ NC contact with positive opening operation		
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Characteristics

Switch actuation	On end	By 30° cam			By any moving part
Type of actuation					
Maximum actuation speed	0.5 m/s	1.5 m/s			1 m/s (any direction)
Mechanical durability (4) (in millions of operating cycles)	20	15			10
Minimum force or torque	For tripping For positive opening	15 N 45 N	12 N 36 N	8 N 24 N	0.1 N.m 0.25 N.m
Cable entry	1 entry incorporating metal cable gland. Clamping capacity 6 to 13.5 mm.				

(1) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer.
 (2) Value taken with actuation by moving part at 100 mm from the fixing.
 (3) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.
 (4) Limited to 15 million operating cycles for switches with contacts XE3●P.

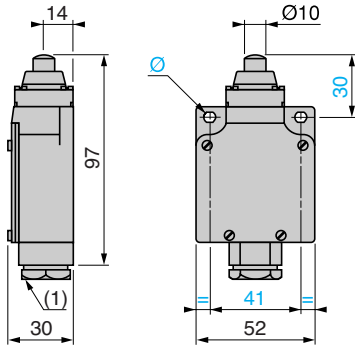
Limit switches

OsiSense XC Standard, Classic format

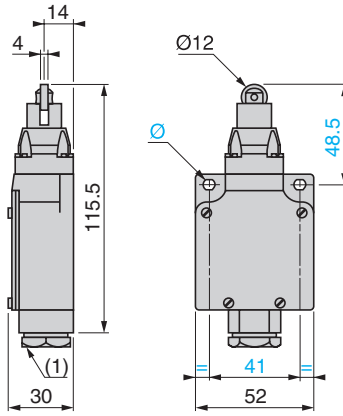
Metal, type XCKL

Complete switches incorporating Pg 13.5 cable gland

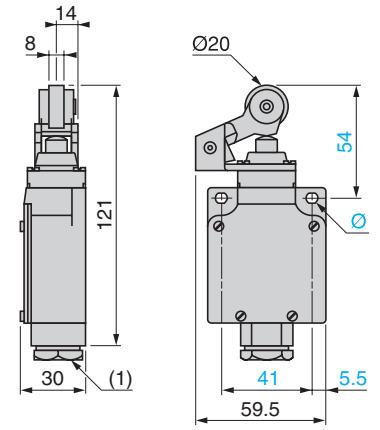
XCKL●10
ZCKL● + ZCKD10
ZCKLD3● + ZCKD10



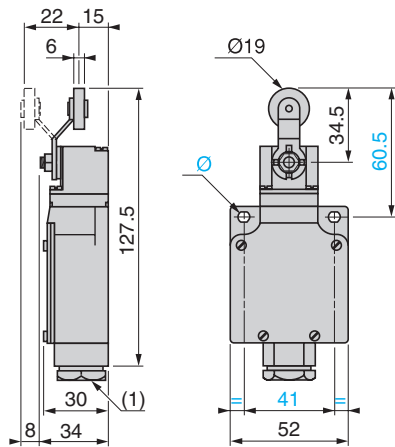
XCKL●02
ZCKL3● + ZCKD02
ZCKLD3● + ZCKD02



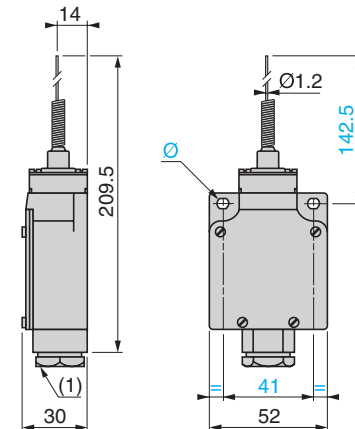
XCKL●21
ZCKL● + ZCKD21
ZCKLD3● + ZCKD21



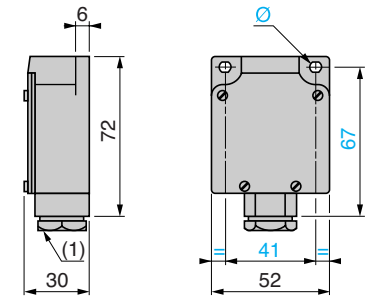
XCKL●15
ZCKL● + ZCKD15
ZCKLD3● + ZCKD15



XCKL●06
ZCKL● + ZCKD06
ZCKLD3● + ZCKD06



Body fixings



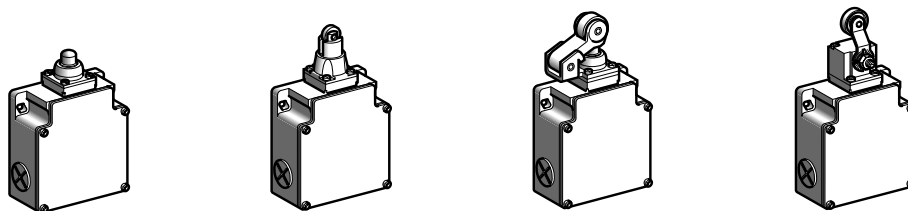
(1) Incorporated Pg 13.5 cable gland
Ø: 2 elongated holes Ø 5.2 x 6.2

Limit switches

OsiSense XC Standard, Classic format
Metal, 2 x 2-pole contacts, type XCKML
Complete switches with 3 cable entries

1

Type of head	Plunger (fixing by the body)	Rotary (fixing by the body)
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Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever (1)
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References of complete switches with 3 ISO M20 x 1.5 cable entries (2)

2 x 2-pole NC + NO snap action (XESP2151L)	XCKML110H29	XCKML102H29	XCKML121H29	XCKML115H29
2 x 2-pole NC + NO break before make, slow break (XENP2151L)	XCKML510H29	XCKML502H29	XCKML521H29	XCKML515H29

References of complete switches with 3 entries tapped for n° 13 cable gland (2)

2 x 2-pole NC + NO snap action (XESP2151L)	XCKML110	XCKML102	XCKML121	XCKML115
2 x 2-pole NC + NO break before make, slow break (XENP2151L)	XCKML510	XCKML502	XCKML521	XCKML515

Weight (kg)	0.400	0.405	0.450	0.430
Contact operation	closed open	(A) = cam displacement (P) = positive opening point	NC contact with positive opening operation	

Characteristics

Switch actuation	On end	By 30° cam		
Type of actuation				
Maximum actuation speed	0.5 m/s	1.5 m/s		
Mechanical durability	3 million operating cycles			
Minimum force	For tripping: 15 N For positive opening: 60 N	12 N 50 N	8 N 50 N	0.2 N.m 0.5 N.m
Cable entry	3 entries tapped ISO M20 x 1.5, clamping capacity 7 to 13 mm, or 3 entries tapped for n° 13 cable gland conforming to NF C 68-300 (DIN Pg 13.5), clamping capacity 9 to 12 mm.			

(1) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer.
(2) Switches available with other 2-pole slow break contact blocks: NO + NC make before break, NC + NC simultaneous (with positive opening operation), NO + NO simultaneous. Please consult our Customer Care Centre.

Note: replacement parts
The heads of limit switches type XCKML are the same as those for types XCKM and XCKL (see heads ZCKD10, ZCKD02, ZCKD21 and ZCKD15 on page 1/82).

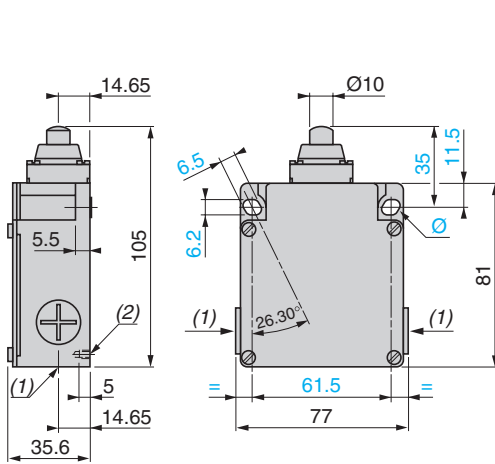
Limit switches

OsiSense XC Standard, Classic format

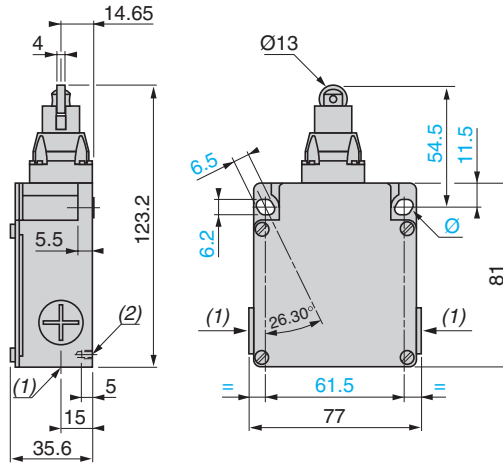
Metal, 2 x 2-pole contacts, type XCKML

Complete switches with 3 cable entries

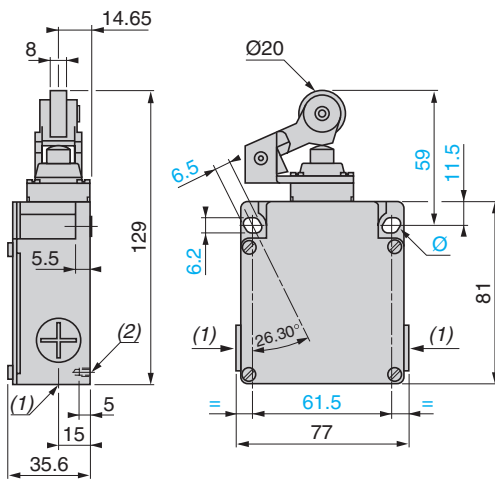
XCKML110H29, XCKML510H29, XCKML110, XCKML510



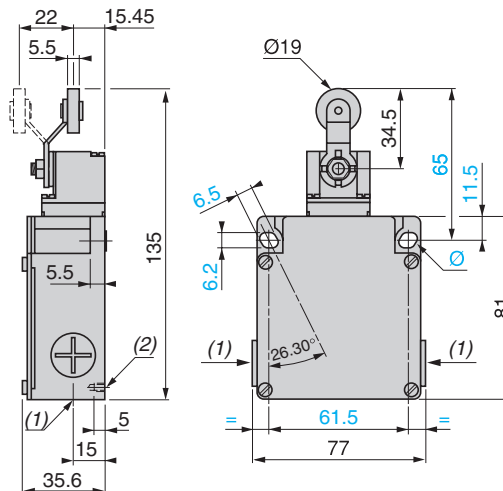
XCKML102H29, XCKML502H29, XCKML102, XCKML502



XCKML121H29, XCKML521H29, XCKML121, XCKML521



XCKML115H29, XCKML515H29, XCKML115, XCKML515



(1) XCKML●●●H29: 3 entries tapped M20 x 1.5. XCKML●●●: 3 tapped entries for n° 13 cable gland.

(2) 2 centring holes Ø 3.9 ± 0.2, for cover fixing holes alignment.

Ø 2 elongated holes 6.2 x 6.5, inclined at 26° 30' to the vertical axis, for M5 screws.

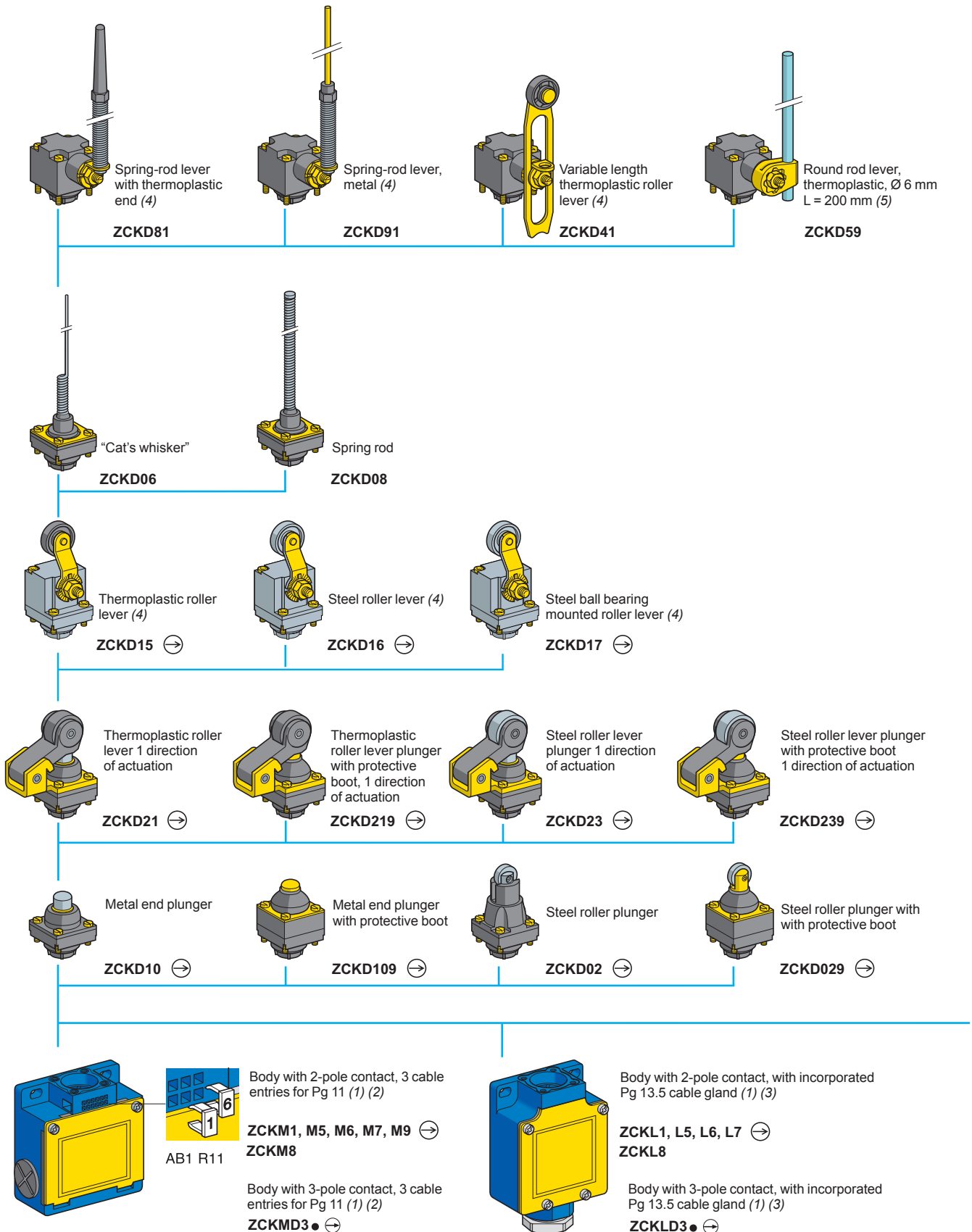
Limit switches

OsiSense XC Standard, Classic format

Metal, types XCKM and XCKL

Variable composition

1



(1) For further information, see page 1/84.

(2) For 3 cable entries tapped ISO M20 x 1.5, add H29 to the reference. Example: ZCKM1 becomes ZCKM1H29.

For one cable entry with 1/2" NPT adaptor, add H7 to the reference. Example: ZCKM1 becomes ZCKM1H7.

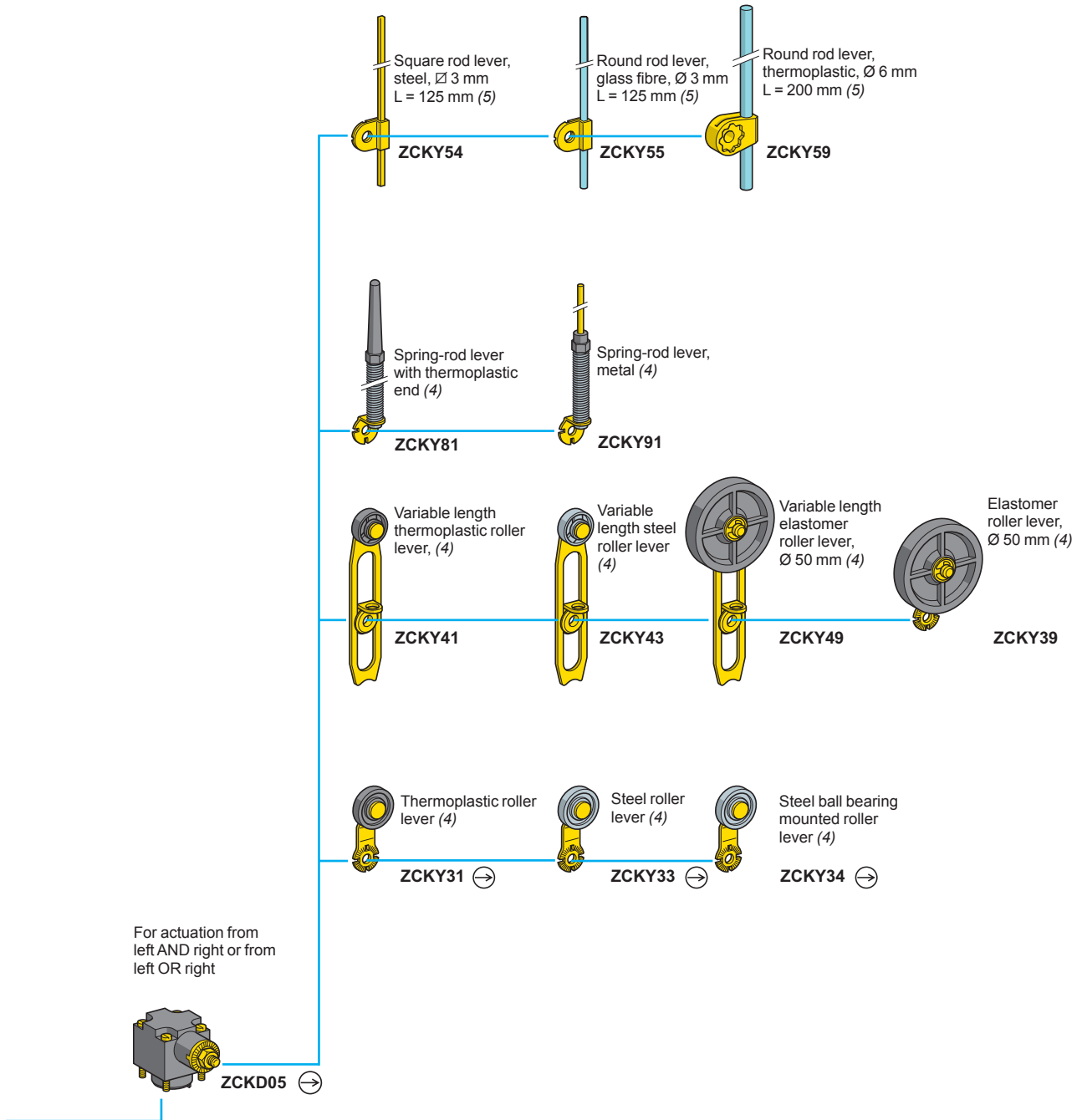
(3) For one cable entry tapped 1/2" NPT, add H7 to the reference. Example: ZCKL1 becomes ZCKL1H7.

Limit switches

OsiSense XC Standard, Classic format

Metal, types XCKM and XCKL

Variable composition



→: head assuring positive opening operation.

(4) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer.

(5) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever mounting.

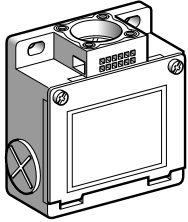
Limit switches

OsiSense XC Standard, Classic format

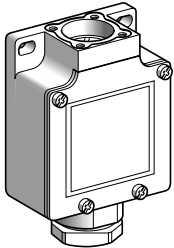
Metal, types XCKM and XCKL

Adaptable sub-assemblies

1



ZCKM●



ZCKL●

Bodies with 2-pole contact

With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
For limit switches type XCKM					
NC + NO snap action (XE2SP2151)		⊕	Pg 11	ZCKM1	0.210
			ISO M20 x 1.5	ZCKM1H29	0.210
			1/2" NPT (2)	ZCKM1H7	0.210
NC + NO break before make, slow break (XE2NP2151)		⊕	Pg 11	ZCKM5	0.210
			ISO M20 x 1.5	ZCKM5H29	0.210
			1/2" NPT (2)	ZCKM5H7	0.210
NO + NC make before break, slow break (XE2NP2161)		⊕	Pg 11	ZCKM6	0.210
			ISO M20 x 1.5	ZCKM6H29	0.210
			1/2" NPT (2)	ZCKM6H7	0.210
NC + NC simultaneous, slow break (XE2NP2141)		⊕	Pg 11	ZCKM7	0.210
			ISO M20 x 1.5	ZCKM7H29	0.210
			1/2" NPT (2)	ZCKM7H7	0.210
NO + NO simultaneous, slow break (XE2NP2131)		-	Pg 11	ZCKM8	0.210
			ISO M20 x 1.5	ZCKM8H29	0.210
			1/2" NPT (2)	ZCKM8H7	0.210
NC + NC snap action (XE2SP2141)		⊕	Pg 11	ZCKM9	0.210
			ISO M20 x 1.5	ZCKM9H29	0.210
			For limit switches type XCKL		
NC + NO snap action (XE2SP2151)		⊕	Pg 13.5	ZCKL1 (3)	0.210
			1/2" NPT	ZCKL1H7	0.210
NC + NO break before make, slow break (XE2NP2151)		⊕	Pg 13.5	ZCKL5 (3)	0.210
			1/2" NPT	ZCKL5H7	0.210
NO + NC make before break, slow break (XE2NP2161)		⊕	Pg 13.5	ZCKL6 (3)	0.210
			1/2" NPT	ZCKL6H7	0.210
NC + NC simultaneous, slow break (XE2NP2141)		⊕	Pg 13.5	ZCKL7 (3)	0.210
			1/2" NPT	ZCKL7H7	0.210
NO + NO simultaneous, slow break (XE2NP2131)		-	Pg 13.5	ZCKL8 (3)	0.210
			1/2" NPT	ZCKL8H7	0.210

(1) ⊕: NC contact with positive opening operation.

(2) 3 tapped entries, one with metal adaptor for 1/2" NPT (USASB2-1) conduit.

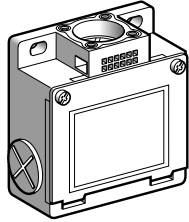
(3) Pg 13.5 cable gland included with switch.

Limit switches

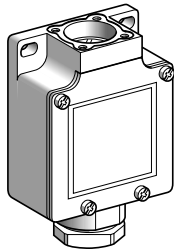
OsiSense XC Standard, Classic format

Metal, types XCKM and XCKL

Adaptable sub-assemblies



ZCKMD3●



ZCKLD3●

Bodies with 3-pole contact					
With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
For limit switches type XCKM					
NC + NO + NO snap action (XE3SP2151)		⊖	Pg 11	ZCKMD31	0.210
			ISO M20 x 1.5	ZCKMD31H29	0.210
			1/2" NPT (2)	ZCKMD31H7	0.210
NC + NC + NO snap action (XE3SP2141)		⊖	Pg 11	ZCKMD39	0.210
			ISO M20 x 1.5	ZCKMD39H29	0.210
			1/2" NPT (2)	ZCKMD39H7	0.210
NC + NC + NO break before make, slow break (XE3NP2141)		⊖	Pg 11	ZCKMD37	0.210
			ISO M20 x 1.5	ZCKMD37H29	0.210
			1/2" NPT (2)	ZCKMD37H7	0.210
NC + NO + NO break before make, slow break (XE3NP2151)		⊖	Pg 11	ZCKMD35	0.210
			ISO M20 x 1.5	ZCKMD35H29	0.210
			1/2" NPT (2)	ZCKMD35H7	0.210
For limit switches type XCKL					
NC + NO + NO snap action (XE3SP2151)		⊖	Pg 13.5	ZCKLD31 (3)	0.210
			1/2" NPT	ZCKLD31H7	0.210
NC + NC + NO snap action (XE3SP2141)		⊖	Pg 13.5	ZCKLD39 (3)	0.210
			1/2" NPT	ZCKLD39H7	0.210
NC + NC + NO break before make, slow break (XE3NP2141)		⊖	Pg 13.5	ZCKLD37 (3)	0.210
			1/2" NPT	ZCKLD37H7	0.210
NC + NO + NO break before make, slow break (XE3NP2151)		⊖	Pg 13.5	ZCKLD35 (3)	0.210
			1/2" NPT	ZCKLD35H7	0.210

(1) ⊖: NC contact with positive opening operation.

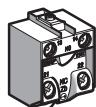
(2) 3 tapped entries, one with metal adaptor for 1/2" NPT (USASB2-1) conduit.

(3) Pg 13.5 cable gland included with switch.

Limit switches

OsiSense XC Standard, Classic format
Metal, types XCKM and XCKL
Adaptable sub-assemblies

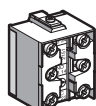
1



XE2SP21●1



XE2NP21●1



XE3●P21●●

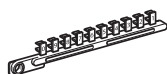
Contact blocks					
Type of contact	Scheme	For bodies	Positive operation (1)	Reference	Weight kg
2-pole contact					
NC + NO snap action		ZCKM1 ZCKL1	⊕	XE2SP2151	0.020
NC + NO break before make, slow break		ZCKM5 ZCKL5	⊕	XE2NP2151	0.020
NO + NC make before break, slow break		ZCKM6 ZCKL6	⊕	XE2NP2161	0.020
NC + NC simultaneous, slow break		ZCKM7 ZCKL7	⊕	XE2NP2141	0.020
NO + NO simultaneous, slow break		ZCKM8 ZCKL8	-	XE2NP2131	0.020
NC + NC snap action		ZCKM9	⊕	XE2SP2141	0.020
3-pole contact					
NC + NO + NO snap action		ZCKMD31 ZCKLD31	⊕	XE3SP2151	0.035
NC + NC + NO snap action		ZCKMD39 ZCKLD39	⊕	XE3SP2141	0.035
NC + NC + NO break before make, slow break		ZCKMD37 ZCKLD37	⊕	XE3NP2141	0.035
NC + NO + NO break before make, slow break		ZCKMD35 ZCKLD35	⊕	XE3NP2151	0.035

(1) ⊕: NC contact with positive opening operation or sub-assembly assuring positive opening operation.

Accessories for limit switches type XCKM			
Description	Sold in lots of	Unit reference	Weight kg
Tap-off terminal for cabling continuity	1	XCKZ09	0.010
Clip-in markers (strips of 10 numbers: 0 to 9) Other markers, please consult our Customer Care Centre.	25	AB1R11	0.002



XCKZ09



AB1R11

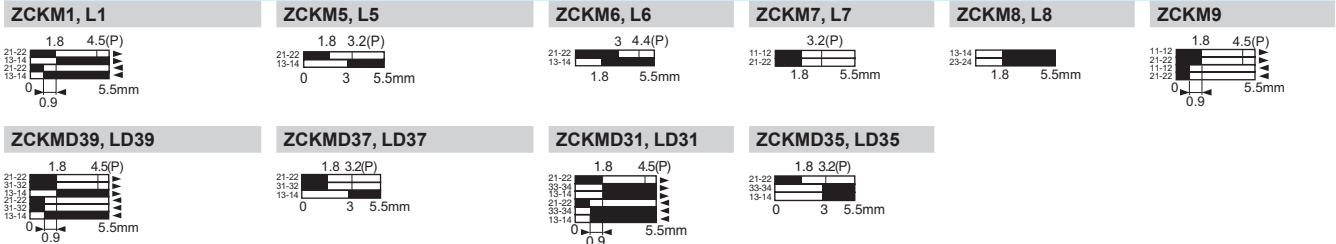
Other versions Gold flashed contacts.
Please consult our Customer Care Centre.

Limit switches

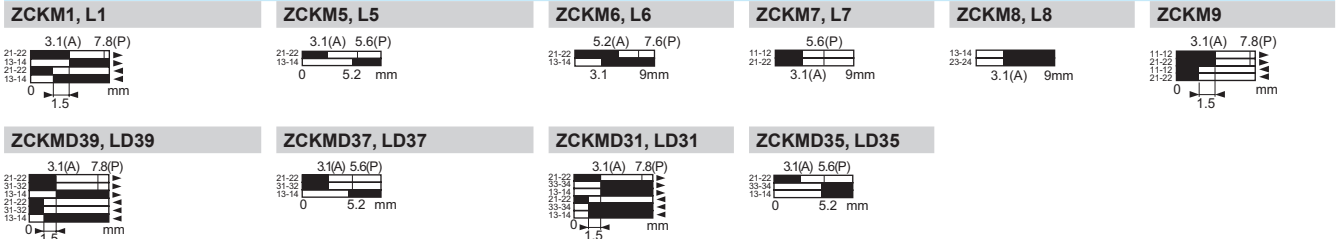
OsiSense XC Standard, Classic format
Metal, types XCKM and XCKL
Adaptable sub-assemblies



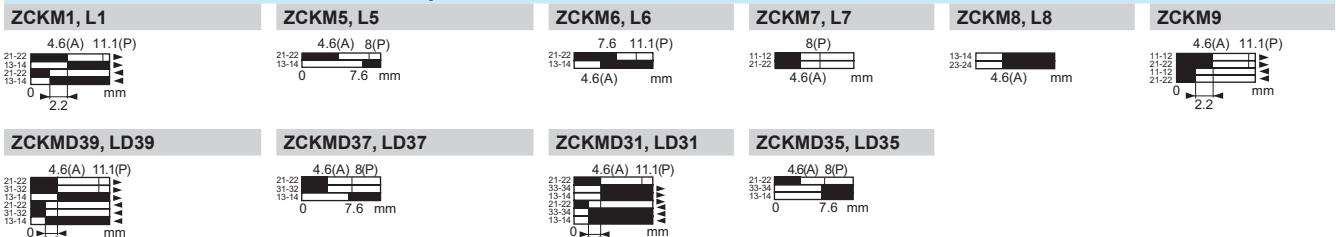
Heads ZCKD10, D109 with body



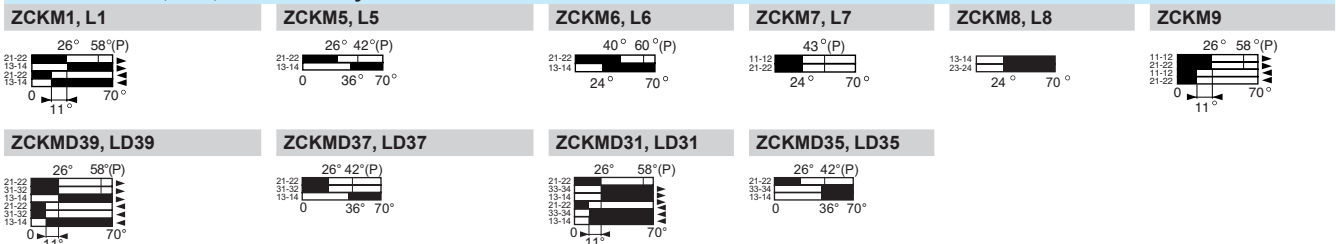
Heads ZCKD02, D029 with body



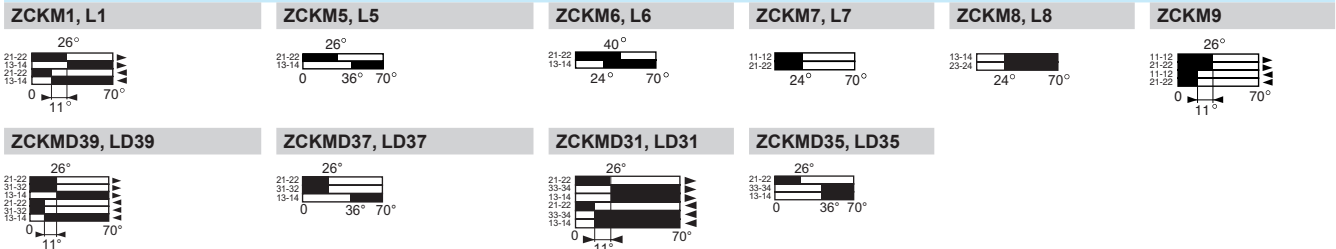
Heads ZCKD21, D23, D219, D239 with body



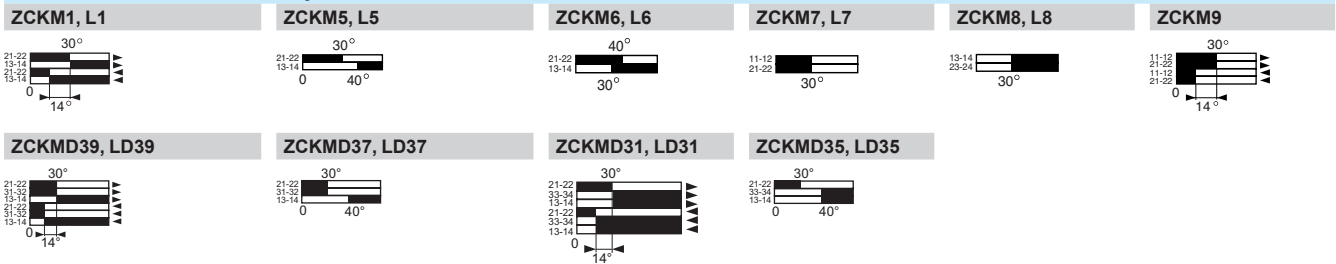
Heads ZCKD15, D16, D17 with body



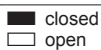
Heads ZCKD41, D59, D81, D91 with body



Heads ZCKD06, D08 with body



Contact operation



(A) = cam displacement
(P) = positive opening point

Limit switches

OsiSense XC Standard, Classic format

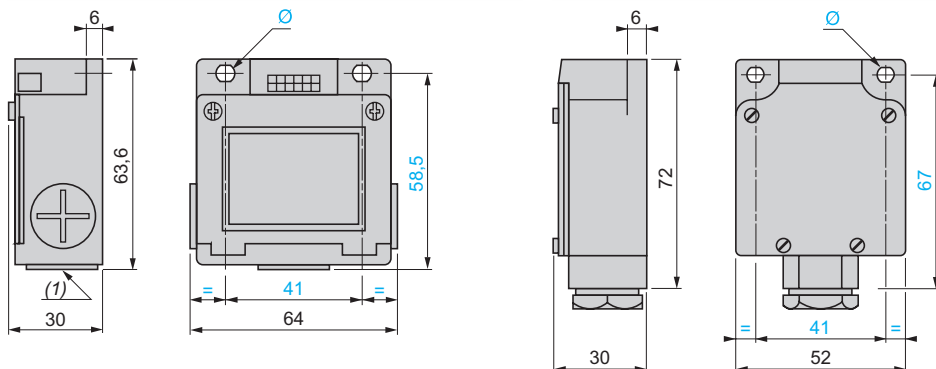
Metal, types XCKM and XCKL

Adaptable sub-assemblies

Bodies with contacts

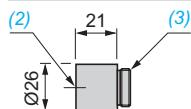
ZCKM1, M5, M6, M7, M8, M9, MD3●, MD3H●29, MD3●H7
ZCKM1H29, M5H29, M6H29, M7H29, M8H29, M9H29
ZCKM1H7, M5H7, M6H7, M7H7, M8H7

ZCKL1, L5, L6, L7, L8, LD3● (with incorporated Pg 13.5 cable gland)
ZCKL1H7, L5H7, L6H7, L7H7, L8H7, LD3●H7 (with 1/2" NPT cable entry)



Adaptor for 1/2" NPT conduit

DE9RA1012



(1) 3 tapped entries for ISO M20 x 1.5 or Pg 11 cable gland.

Ø: 2 elongated holes Ø 5.2 x 6.2

(2) Tapped entry for 1/2" NPT conduit.

(3) Pg 11 threaded sleeve.

Limit switches

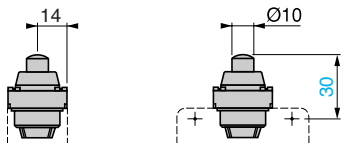
OsiSense XC Standard, Classic format

Metal, types XCKM and XCKL

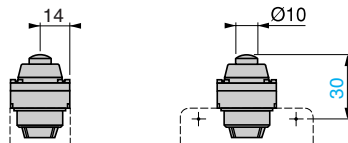
Adaptable sub-assemblies

Plunger heads

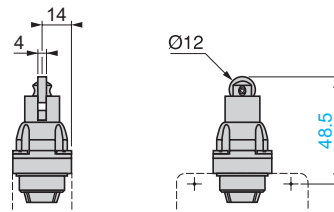
ZCKD10



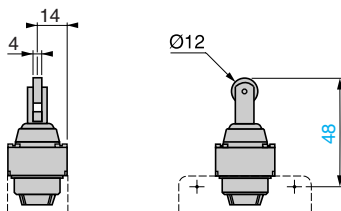
ZCKD109



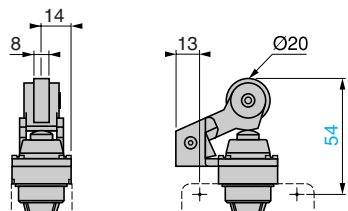
ZCKD02



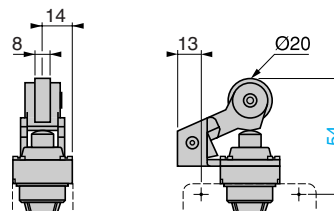
ZCKD029



ZCKD21, D23

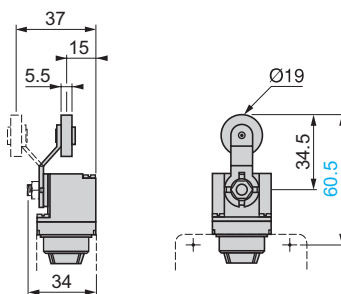


ZCKD219, D239

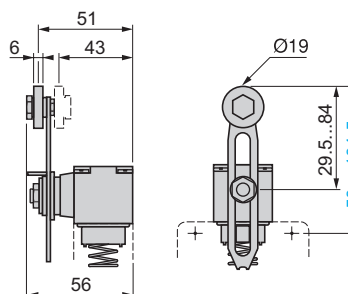


Rotary heads

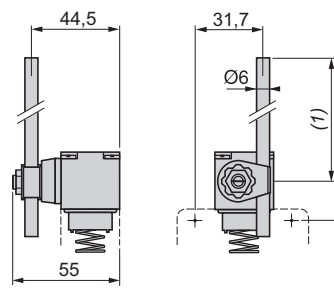
ZCKD15, D16, D17



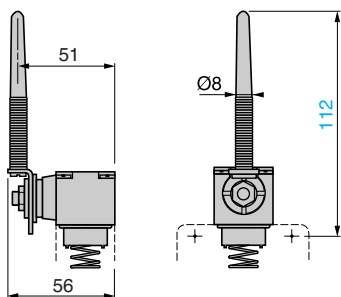
ZCKD41



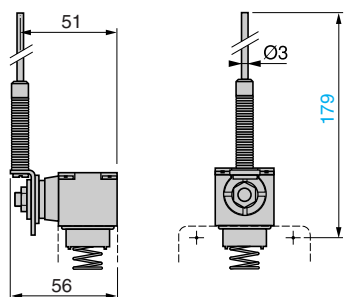
ZCKD59



ZCKD81

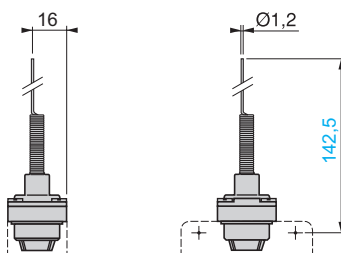


ZCKD91

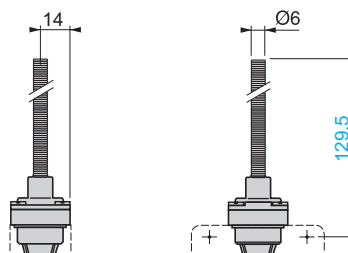


Multi-directional heads

ZCKD06



ZCKD08



(1) 190 max.

(2) 215.5 max.

Note: operating lever spindle threaded M6.

Limit switches

OsiSense XC Standard, format EN 50041
Plastic, double insulated, XCKS

1

Complete switch

with 2 contacts (NO + NC) and 1 cable entry

■ The OsiSense XCKS limit switches range, with 2 integrated contacts, offers “all-in-one”, ready to use products.

□ XCKS, with head for linear (plunger) and rotary (lever) movement



Variable composition switch

with 2, 3 or 4 contacts and 1 cable entry

■ The variable composition range expands the offer up to 4 contacts and choice among 18 different actuators.

□ ZCKD: complete head with linear or rotary actuator
□ ZCKS: bodies with 2, 3 or 4 contacts



Environment characteristics

Conformity to standards	Products	EN/IEC 60947-5-1, UL 508, CSA C22-2 n°14, CCC, EAC
	Machine assemblies	EN/IEC 60204-1
Product certifications		UL, CSA, CCC, EAC
Protective treatment	Version	Standard “TC”, special “TH”
Ambient air temperature	For operation	- 25...+ 70 °C
	For storage	- 40...+ 70 °C
Vibration resistance	Conforming to EN/IEC 60068-2-6	25 gn (10...500 Hz)
Shock resistance	Conforming to EN/IEC 60068-2-27	XCKS1●● : 40 gn (11 ms) XCKS5●● : 50 gn (11 ms)
Electric shock protection	Conforming to EN/IEC 61140	Class II
Degree of protection	Conforming to EN/IEC 60529	XCKS1●●, XCKS5●● : IP 66 and IP 67 ZCKS : IP 65
	Conforming to EN 62262	XCKS1●●, XCKS5●● : IK 05 ZCKS : IK 03
Cable entry	Depending on model	Tapped entry for n° 13 cable gland or tapped ISO M20 x 1.5
Materials		Bodies and heads: plastic



Contact block characteristics

Type of contacts	Conforming to EN/IEC 60947-5-1	Type Zb, electrically separate double break contacts
Positive operation (depending on model)		NC contacts with positive opening operation conforming to EN/IEC 60947-5-1 Appendix K
Rated operational characteristics	XCKS1●●, XCKS5●● XE2●P●, XESP●	~ AC-15 ; A300 (U _e = 240 V, I _e = 3 A) ; I _{the} = 10 A --- DC-13 ; Q300 (U _e = 250 V, I _e = 0.27 A), conforming to EN/IEC 60947-5-1 Appendix A
	XE3●P●	~ AC-15 ; B300 (U _e = 240 V, I _e = 1.5 A) ; I _{the} = 6 A --- DC-13 ; R300 (U _e = 250 V, I _e = 0.1 A), conforming to EN/IEC 60947-5-1 Appendix A
Rated insulation voltage	XCKS1●●, XCKS5●● XE2●P●, XESP●	U _i = 500 V degree of pollution 3 conforming to EN/IEC 60947-5-1
	XE3●P●	U _i = 300 V conforming to UL 508 and CSA C22-2 n° 14
Rated impulse withstand voltage	XCKS1●●, XCKS5●● XE2●P●, XESP●	U _{imp} = 6 kV conforming to EN/IEC 60947-1, IEC 60664
	XE3●P●	U _{imp} = 4 kV conforming to EN/IEC 60947-1, IEC 60664
Short-circuit protection	XCKS1●●, XCKS5●● XE2●P●, XESP●	10 A cartridge fuse type gG (gl)
	XE3●P●	6 A cartridge fuse type gG (gl)
Resistance across terminals		≤ 25 mΩ conforming to EN/IEC 60255-7 category 3
Connection (screw clamp terminals)	XCKS1●●, XCKS5●● XE2SP21●1	Clamping capacity, min: 1 x 0.34 mm ² / AWG 22, max: 2 x 1.5 mm ² / AWG 16
	XE2NP21●1	Clamping capacity, min: 1 x 0.5 mm ² / AWG 20, max: 2 x 2.5 mm ² / AWG 14
	XESP●	Clamping capacity, min: 1 x 0.75 mm ² / AWG 20, max: 2 x 1.5 mm ² / AWG 16
	XE3●P●	Clamping capacity, min: 1 x 0.34 mm ² / AWG 22, max: 1 x 1 mm ² / AWG 18 or 2 x 0.75 mm ² / AWG 20
Minimum actuation speed		Snap action contacts (XCKS1●, XE●SP● and XESP●): 0.01 m/minute Slow break contacts (XCKS5●, XE2NP● and XE3NP●): 6 m/minute
Electrical durability	XCKS1●● + LC1D38 / ~ 230 V	15 million operating cycles
	XCKS5●● + LC1D38 / ~ 230 V	20 million operating cycles
	ZCKS	<ul style="list-style-type: none"> ■ Conforming to IEC 60947-5-1 Appendix C ■ Utilisation categories AC-15 and DC-13 ■ Maximum operating rate: 3600 operating cycles/hour ■ Load factor: 0.5

	XE2SP21●1, XE2SP2141	XE2NP21●1	XESP3021																								
AC supply 50/60 Hz ~ mm inductive circuit																											
DC supply ---	Power broken in W for 5 million operating cycles. <table border="1"> <tr><th>Voltage V</th><th>24</th><th>48</th><th>120</th></tr> <tr><th>mm W</th><td>10</td><td>7</td><td>4</td></tr> </table>	Voltage V	24	48	120	mm W	10	7	4	Power broken in W for 5 million operating cycles. <table border="1"> <tr><th>Voltage V</th><th>24</th><th>48</th><th>120</th></tr> <tr><th>mm W</th><td>13</td><td>9</td><td>7</td></tr> </table>	Voltage V	24	48	120	mm W	13	9	7	Power broken in W for 5 million operating cycles. <table border="1"> <tr><th>Voltage V</th><th>24</th><th>48</th><th>120</th></tr> <tr><th>mm W</th><td>10</td><td>7</td><td>4</td></tr> </table>	Voltage V	24	48	120	mm W	10	7	4
Voltage V	24	48	120																								
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Voltage V	24	48	120																								
mm W	10	7	4																								
For XE2S P●151 on ~ or ---, NC and NO contacts simultaneously loaded to the values shown with reverse polarity.																											

	XE3SP●●●●	XE3NP●●●●																
AC supply 50/60 Hz ~ mm inductive circuit																		
DC supply ---	Power broken in W for 5 million operating cycles. <table border="1"> <tr><th>Voltage V</th><th>24</th><th>48</th><th>120</th></tr> <tr><th>mm W</th><td>3</td><td>2</td><td>1</td></tr> </table>	Voltage V	24	48	120	mm W	3	2	1	Power broken in W for 5 million operating cycles. <table border="1"> <tr><th>Voltage V</th><th>24</th><th>48</th><th>120</th></tr> <tr><th>mm W</th><td>4</td><td>3</td><td>2</td></tr> </table>	Voltage V	24	48	120	mm W	4	3	2
Voltage V	24	48	120															
mm W	3	2	1															
Voltage V	24	48	120															
mm W	4	3	2															

Limit switches

OsiSense XC Standard, format EN 50041

Plastic, double insulated, XCKS

Complete switches with 1 cable entry

1

Type of head	Plunger (fixing by the body)	Rotary (fixing by the body)
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Form conforming to EN 50041 (1)	B	C	A	A	A	A	D
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic or steel roller lever (2)	Elastomer roller lever, Ø 50 mm (2)	Variable length thermoplastic or steel roller lever (2)	Variable length elastomer roller lever, Ø 50 mm (2)	Round thermoplastic rod lever, Ø 6 mm (3) (4)
Positive operation	⊕	⊕	⊖	–	⊕	–	–

References of complete switches with 1 ISO M20 x 1.5 cable entry

<p>2-pole NC + NO snap action</p>	XCKS101H29	XCKS102H29	XCKS131H29 (thermoplastic) XCKS133H29 (steel)	XCKS139H29	XCKS141H29 (thermoplastic) XCKS143H29 (steel)	XCKS149H29	XCKS159H29
<p>2-pole NC + NO break before make, slow break</p>	XCKS501H29	XCKS502H29	XCKS531H29 (thermoplastic) XCKS533H29 (steel)	XCKS539H29	XCKS541H29 (thermoplastic) XCKS543H29 (steel)	XCKS549H29	XCKS559H29
Weight (kg)	0.125	0.135	0.160	0.175	0.165	0.180	0.170
Contact operation			(A) = cam displacement (P) = positive opening point		⊕ NC contact with positive opening operation		

References of complete switches with 1 Pg 13.5 cable entry

For an entry tapped for a Pg 13.5 cable gland, delete H29 from the end of the reference. (Except XCKS133H29, XCKS143H29, XCKS533H29 and XCKS543H29). Example: XCKS101H29 becomes XCKS101.

Characteristics

Switch actuation	On end	By 30° cam		By any moving part		
Type of actuation						
Maximum actuation speed	0.5 m/s	1.5 m/s		1 m/s		
Mechanical durability (in millions of operating cycles)	25	15	20			
Minimum force or torque	For tripping	15 N	12 N	0.10 N.m		
	For positive opening	30 N	20 N	0.15 N.m	–	0.15 N.m
Cable entry	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm					

(1) Form conforming to EN 50041, see page 1/137.
 (2) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer.
 (3) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever mounting.
 (4) Value taken with actuation by moving part at 100 mm from the fixing.

Limit switches

OsiSense XC Standard, format EN 50041

Plastic, double insulated, XCKS

Variable composition switches with 1 cable entry



Note: ZCKD heads can only be used with ZCKS bodies.

References of variable composition switches (ZCKS bodies and ZCKD heads) with 1 ISO M20 x 1.5 cable entry (3)							
Form conforming to EN 50041 (1)	B	C	A	A	A	A	D
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever (2)	Elastomer roller lever, Ø 50 mm (2)	Variable length thermoplastic roller lever (2)	Variable length elastomer roller lever, Ø 50 mm (2)	Round thermoplastic rod lever, Ø 6 mm (4) (5)
Positive operation				—		—	—
2-pole NC + NC snap action (XE2SP2141)	ZCKS9H29 + ZCKD01 	ZCKS9H29 + ZCKD02 	ZCKS9H29 + ZCKD31 	ZCKS9H29 + ZCKD39 	ZCKS9H29 + ZCKD41 	ZCKS9H29 + ZCKD49 	ZCKS9H29 + ZCKD59
2-pole NC + NC simultaneous, slow break (XE2NP2141)	ZCKS7H29 + ZCKD01 	ZCKS7H29 + ZCKD02 	ZCKS7H29 + ZCKD31 	ZCKS7H29 + ZCKD39 	ZCKS7H29 + ZCKD41 	ZCKS7H29 + ZCKD49 	ZCKS7H29 + ZCKD59
3-pole NC + NC + NO snap action (XE3SP2141)	ZCKSD39H29 + ZCKD01 	ZCKSD39H29 + ZCKD02 	ZCKSD39H29 + ZCKD31 	ZCKSD39H29 + ZCKD39 	ZCKSD39H29 + ZCKD41 	ZCKSD39H29 + ZCKD49 	ZCKSD39H29 + ZCKD59
3-pole NC + NC + NO break before make, slow break (XE3NP2141)	ZCKSD37H29 + ZCKD01 	ZCKSD37H29 + ZCKD02 	ZCKSD37H29 + ZCKD31 	ZCKSD37H29 + ZCKD39 	ZCKSD37H29 + ZCKD41 	ZCKSD37H29 + ZCKD49 	ZCKSD37H29 + ZCKD59
Weight (kg)	0.095	0.105	0.145	0.150	0.155	0.155	0.150
Contact operation			(A) = cam displacement (P) = positive opening point				

References of variable composition switches (ZCKS bodies and ZCKD heads) with 1 Pg 13.5 cable entry
For ZCKS bodies with 1 Pg 13.5 cable entry, delete H29 from the end of the reference. Example: ZCKS1H29 becomes ZCKS1.

Characteristics							
Switch actuation	On end	By 30° cam		By any moving part			
Type of actuation				or			
Maximum actuation speed	0.5 m/s	1.5 m/s		1 m/s			
Mechanical durability (6) (in millions of operating cycles)	25	15	20				
Minimum force or torque	For tripping 45 N	12 N	36 N	0.15 N.m	0.3 N.m	—	—
Cable entry	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm						

(1) Form conforming to EN 50041, see page 1/137.
 (2) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer.
 (3) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.
 (4) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever mounting.
 (5) Value taken with actuation by moving part at 100 mm from the fixing.
 (6) Limited to 15 million operating cycles for switches with contacts XE3•P.

Limit switches

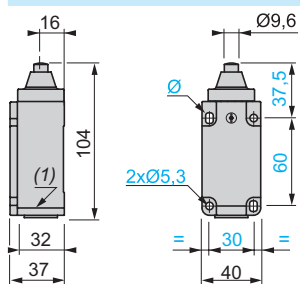
OsiSense XC Standard, format EN 50041

Plastic, double insulated, XCKS

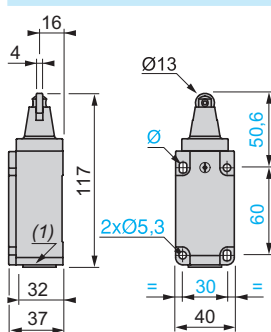
Complete switches with 1 cable entry

Dimensions

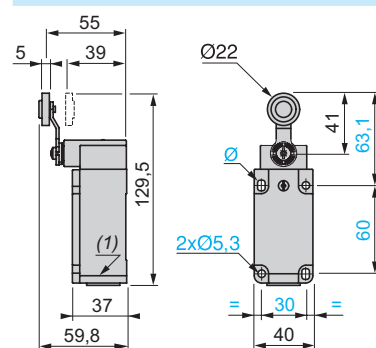
XCKS●01●●



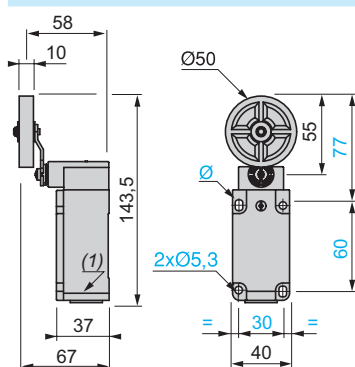
XCKS●02●●



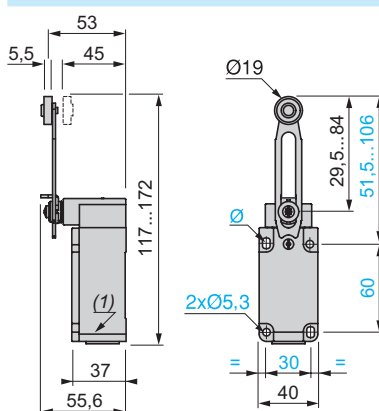
XCKS●31●● / XCKS●33●●



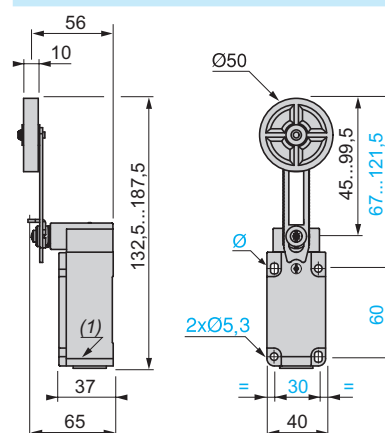
XCKS●39●●



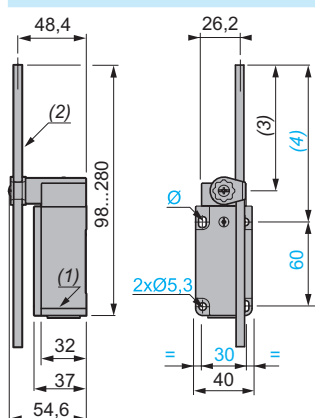
XCKS●41●● / XCKS●43●●



XCKS●49●●



XCKS●59●●



(1) 1 tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland.

(2) Ø 6 rode, lenght 200 mm.

(3) 190 max.

(4) 212 max.

Ø : 2 elongated holes 5.3 x 7.3 mm.

Limit switches

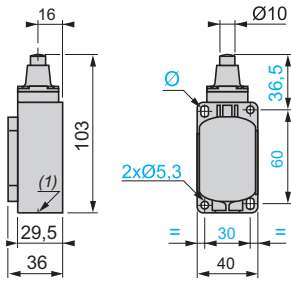
OsiSense XC Standard, format EN 50041

Plastic, double insulated, XCKS

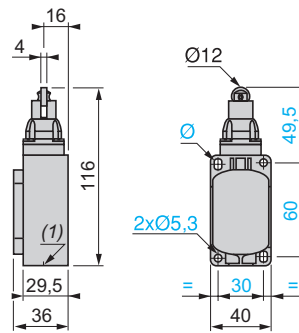
Variable composition switches with 1 cable entry

Dimensions

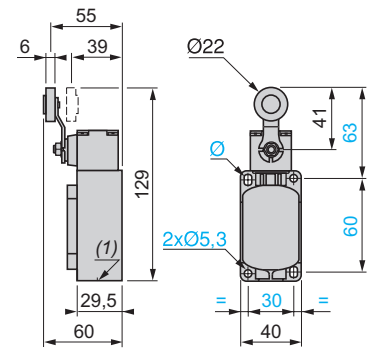
ZCKS● + ZCKD01



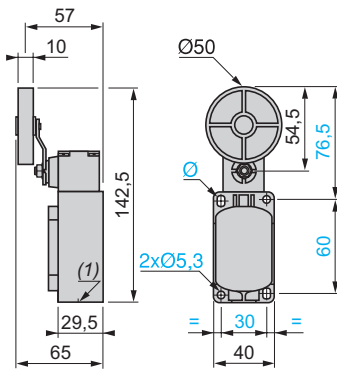
ZCKS● + ZCKD02



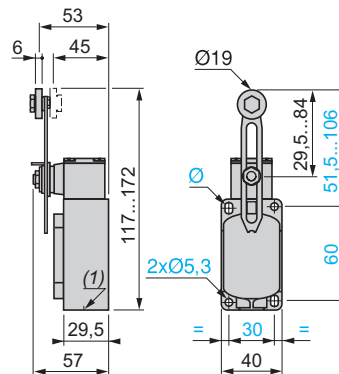
ZCKS● + ZCKD31



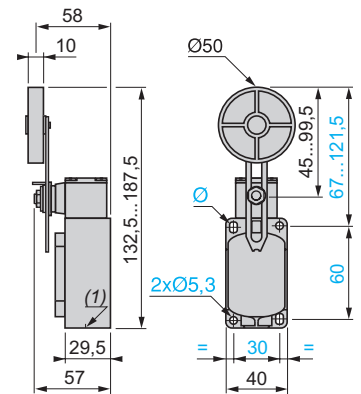
ZCKS● + ZCKD39



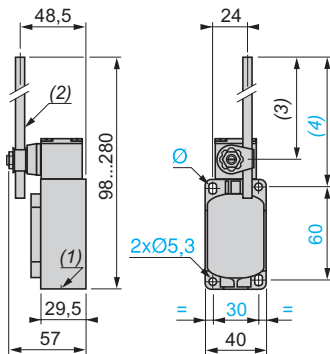
ZCKS● + ZCKD41



ZCKS● + ZCKD49



ZCKS● + ZCKD59



(1) 1 tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland.

(2) Ø 6 rode, lenght 200 mm.

(3) 190 max.

(4) 212 max.

Ø : 2 elongated holes 5.3 x 7.3 mm.

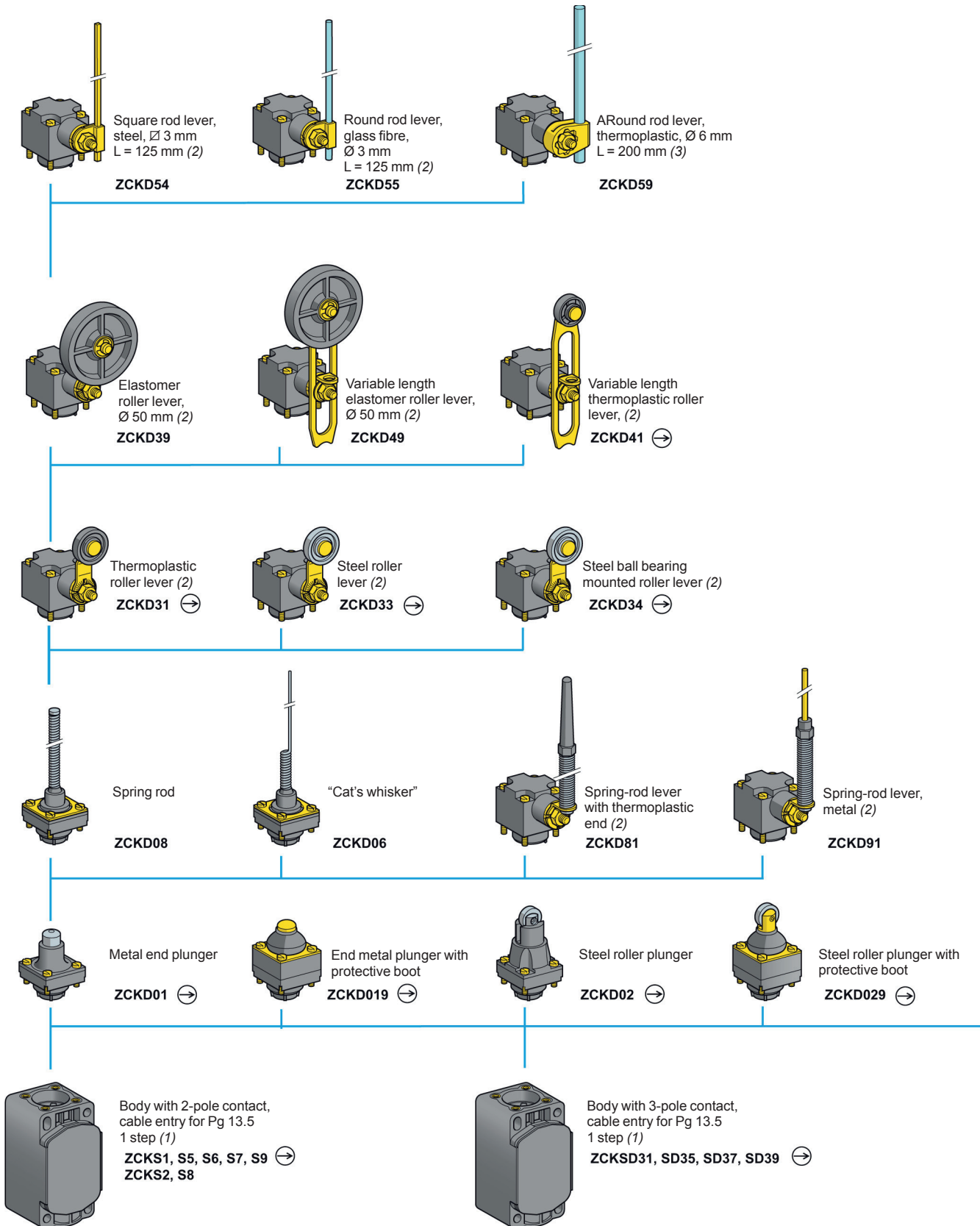
Limit switches

OsiSense XC Standard, format EN 50041

Plastic, double insulated, XCKS

Variable composition

1



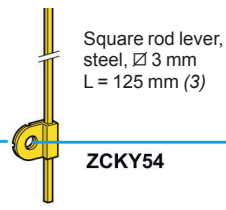
(1) For further details see page 1/98. For a cable entry tapped ISO M20 x 1.5, add **H29** to the reference.

Example: ZCKS1 becomes **ZCKS1H29**.

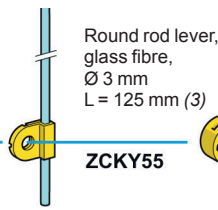
(2) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer.

(3) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever mounting.

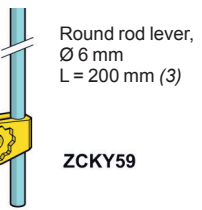
Note: ZCKD heads can only be used with ZCKS bodies.



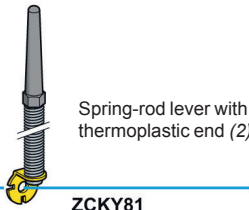
ZCKY54



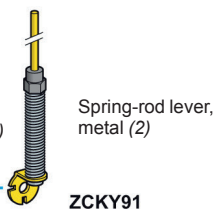
ZCKY55



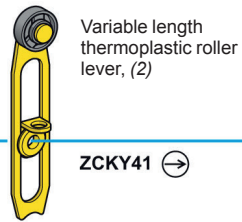
ZCKY59



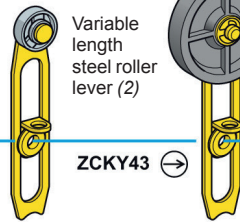
ZCKY81



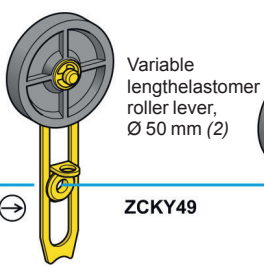
ZCKY91



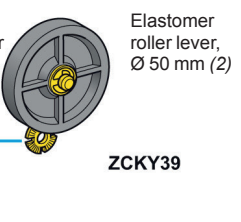
ZCKY41 →



ZCKY43 →



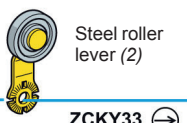
ZCKY49



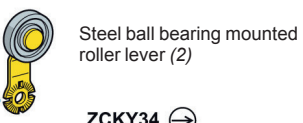
ZCKY39



ZCKY31 →

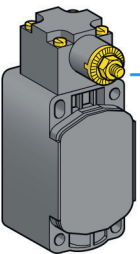
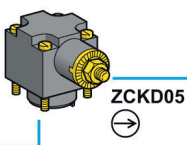


ZCKY33 →



ZCKY34 →

For actuation from
left AND right or from
left OR right



Body with double-pole 2 CO,
staggered, snap action contact cable
entry for Pg 13.5
2 step, 1 from left AND 1 from right (1)

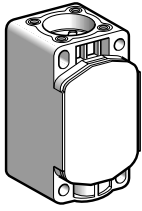
Limit switches

OsiSense XC Standard, format EN 50041

Plastic, double insulated, XCKS

Variable composition switches

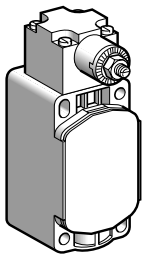
1



ZCKS●

Bodies with 2-pole contact

Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
1 step	NC + NO snap action (XE2SP2151)		⊕	Pg 13.5	ZCKS1	0.080
				ISO M20 x 1.5	ZCKS1H29	0.080
	2 CO simultaneous, snap action (XESP3021)		-	Pg 13.5	ZCKS2	0.080
				ISO M20 x 1.5	ZCKS2H29	0.080
	NC + NO break before make, slow break (XE2NP2151)		⊕	Pg 13.5	ZCKS5	0.080
				ISO M20 x 1.5	ZCKS5H29	0.080
	NO + NC make before break, slow break (XE2NP2161)		⊕	Pg 13.5	ZCKS6	0.080
ISO M20 x 1.5				ZCKS6H29	0.080	
NC + NC simultaneous, slow break (XE2NP2141)		⊕	Pg 13.5	ZCKS7	0.080	
			ISO M20 x 1.5	ZCKS7H29	0.080	
NO + NO simultaneous, slow break (XE2NP2131)		-	Pg 13.5	ZCKS8	0.080	
			ISO M20 x 1.5	ZCKS8H29	0.080	
NC + NC snap action (XE2SP2141)		⊕	Pg 13.5	ZCKS9	0.080	
			ISO M20 x 1.5	ZCKS9H29	0.080	



ZCKS404

Bodies with double-pole contact and spring return rotary head

Without operating lever

Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
2 step 1 from left and 1 from right	2 CO staggered snap action		-	Pg 13.5	ZCKS404	0.150
				ISO M20 x 1.5	ZCKS404H29	0.150

Bodies with 3-pole contact and 1 cable entry

Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
-	NC + NO + NO snap action (XE3SP2151)		⊕	Pg 13.5	ZCKSD31	0.080
				ISO M20 x 1.5	ZCKSD31H29	0.080
-	NC + NC + NO snap action (XE3SP2141)		⊕	Pg 13.5	ZCKSD39	0.080
				ISO M20 x 1.5	ZCKSD39H29	0.080
-	NC + NC + NO break before make, slow break (XE3NP2141)		⊕	Pg 13.5	ZCKSD37	0.080
				ISO M20 x 1.5	ZCKSD37H29	0.080
-	NC + NO + NO break before make, slow break (XE3NP2151)		⊕	Pg 13.5	ZCKSD35	0.080
				ISO M20 x 1.5	ZCKSD35H29	0.080

(1) ⊕: NC contact with positive opening operation or head assuring positive opening operation.

Limit switches

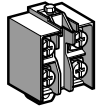
OsiSense XC Standard, format EN 50041

Plastic, double insulated, XCKS

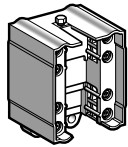
Variable composition switches



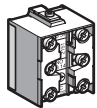
XE2SP21●1



XE2NP21●1



XESP3021



XE3●P21●●



DE9RA●●12

Contact blocks for ZCKS●● bodies

Type of contact	Scheme	For body	Positive operation (1)	Reference	Weight kg
2-pole contact					
NC + NO snap action		ZCKS1	⊙	XE2SP2151	0.020
NC + NO break before make, slow break		ZCKS5	⊙	XE2NP2151	0.020
2 CO simultaneous snap action		ZCKS2	-	XESP3021	0.045
NO + NC make before break, slow break		ZCKS6	⊙	XE2NP2161	0.020
NC + NC simultaneous, slow break		ZCKS7	⊙	XE2NP2141	0.020
NO + NO simultaneous, slow break		ZCKS8	-	XE2NP2131	0.020
NC + NC snap action		ZCKS9	⊙	XE2SP2141	0.020
3-pole contact					
NC + NO + NO snap action		ZCKSD31	⊙	XE3SP2151	0.035
NC + NC + NO snap action		ZCKSD39	⊙	XE3SP2141	0.035
NC + NC + NO break before make, slow break		ZCKSD37	⊙	XE3NP2141	0.035
NC + NO + NO break before make, slow break		ZCKSD35	⊙	XE3NP2151	0.035

Accessories for ZCKS●● and XCKS●●

Description	Minimum order quantity	Reference	Weight kg
Adaptator for 1/2" NPT conduit (male Pg 13.5 / female 1/2" NPT)	10	DE9RA1212	0.035
Adaptator for 1/2" NPT conduit (male M20 x 1.5 / female 1/2" NPT)	5	DE9RA2012	0.050

(1) ⊙ : NC contact with positive opening operation or sub-assembly assuring positive opening operation.

Other versions

Gold flashed contacts.

Please consult our Customer Care Centre.

Limit switches

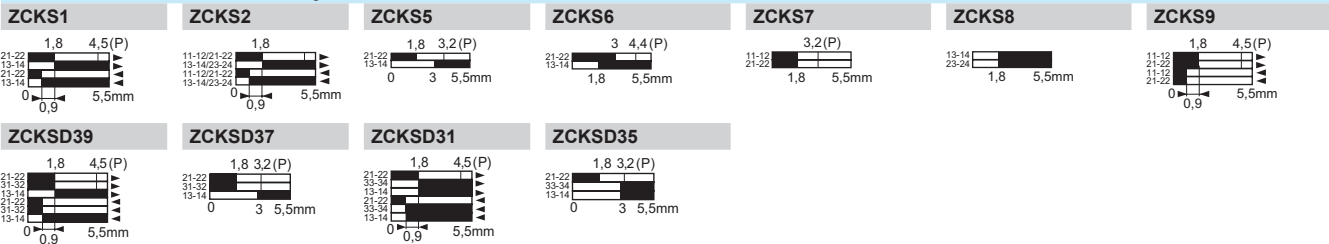
OsiSense XC Standard, format EN 50041

Plastic, double insulated, XCKS

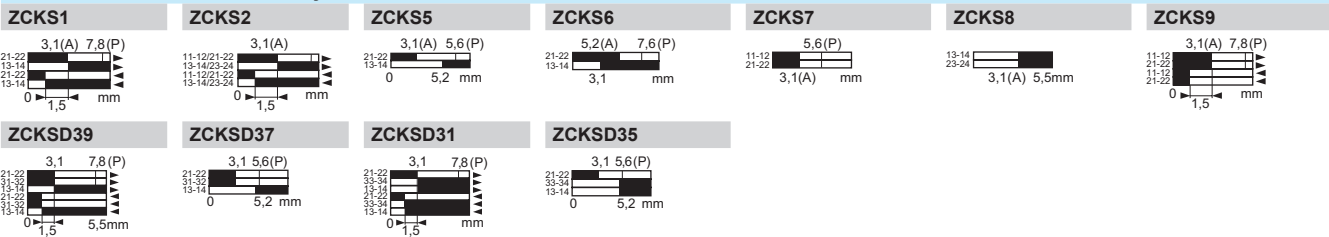
Variable composition switches

1

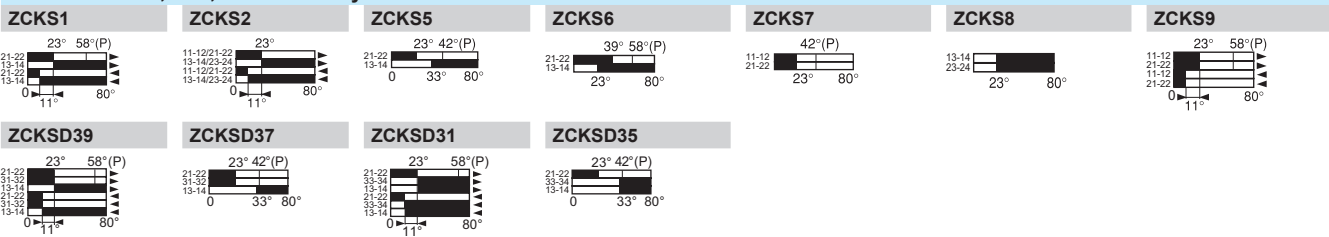
Heads ZCKD01, D109 with body



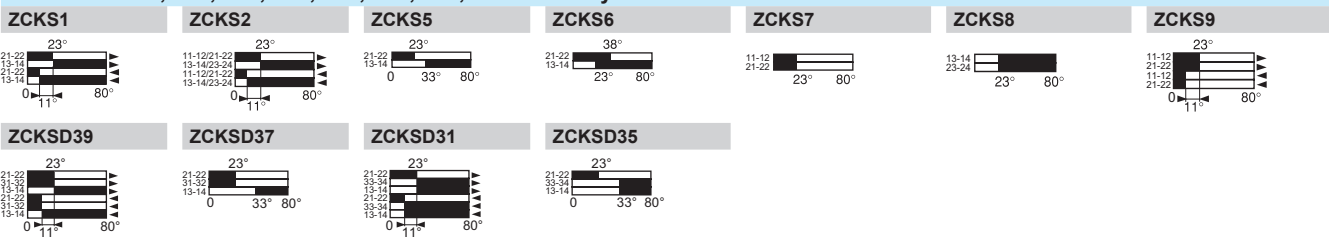
Heads ZCKD02, D029 with body



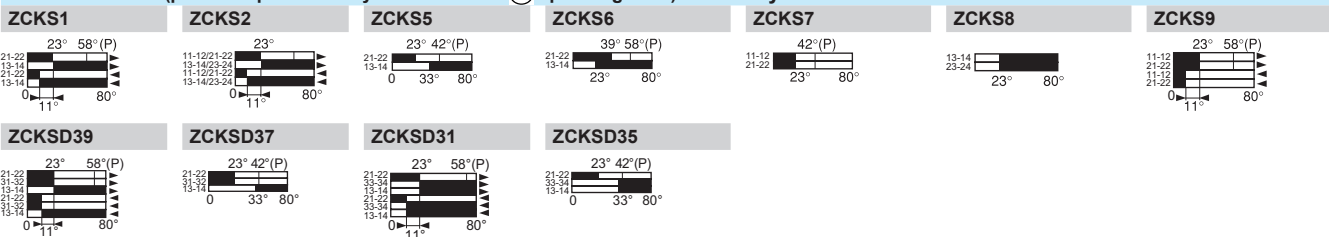
Heads ZCKD31, D33, D34 with body



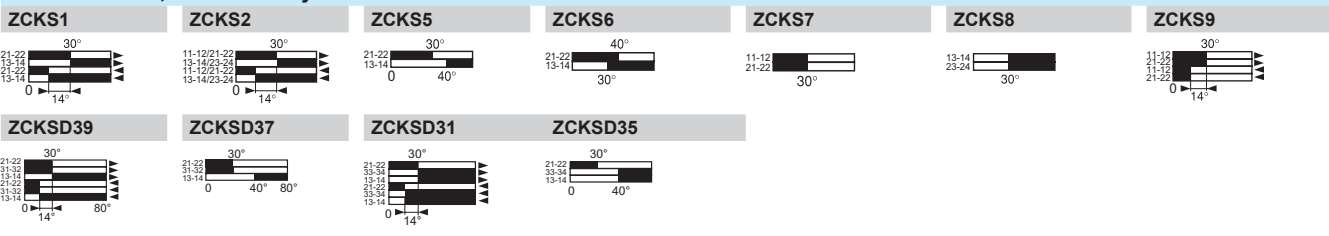
Heads ZCKD39, D41, D49, D54, D55, D59, D81, D91 with body



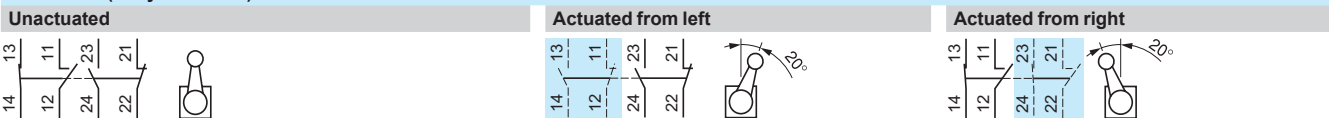
Heads ZCKD05 (positive operation only assured with a ↻ operating lever) with body



Heads ZCKD06, D08 with body



ZCKS404 (body with head)



Contact operation

■ closed

□ open

(A) = cam displacement

(P) = positive opening point

Limit switches

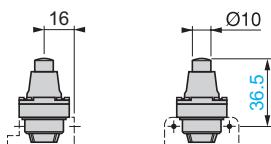
OsiSense XC Standard, format EN 50041

Plastic, double insulated, XCKS

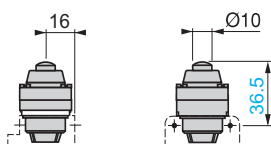
Variable composition switches

Plunger heads

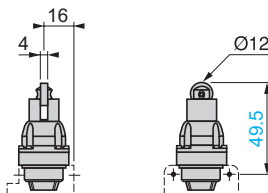
ZCKD01



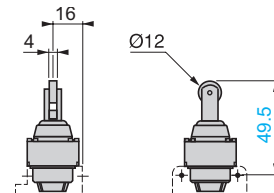
ZCKD019



ZCKD02

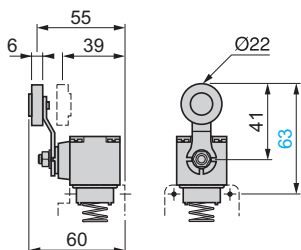


ZCKD029

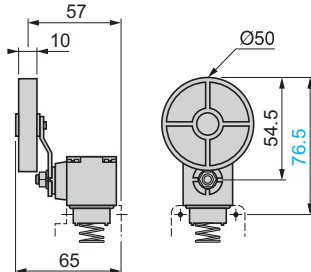


Rotary heads

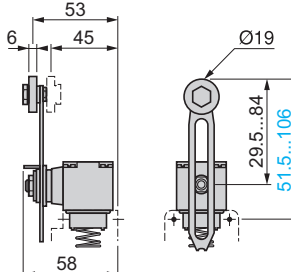
ZCKD31, ZCKD33, ZCKD34



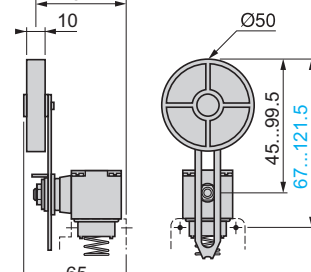
ZCKD39



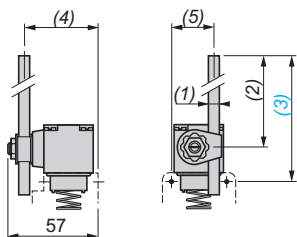
ZCKD41, ZCKD43



ZCKD49

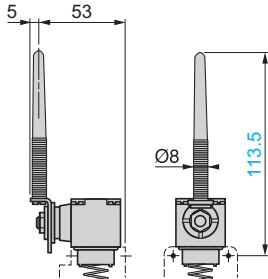


ZCKD54, ZCKD55, ZCKD59

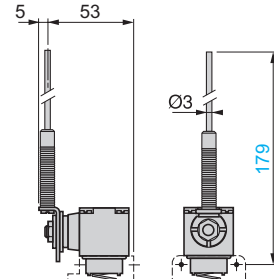


ZCK	(1) rod	(2)	(3)	(4)	(5)
D54	Ø 3, L = 125	115 max.	137 max.	49	24
D55	Ø 3, L = 125	115 max.	137 max.	49	24
D59	Ø 6, L = 200	190 max.	212 max.	46.5	26.2

ZCKD81



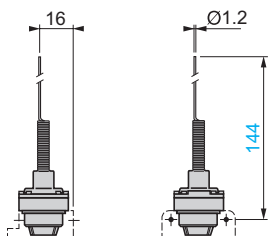
ZCKD91



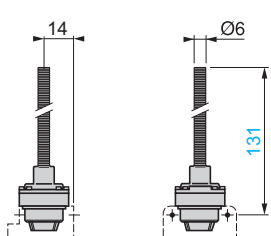
Note: operating lever spindle threaded M6.

Multi-directional heads

ZCKD06



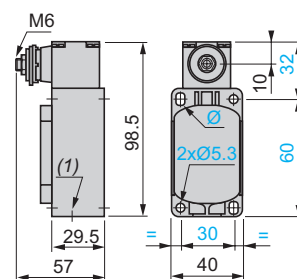
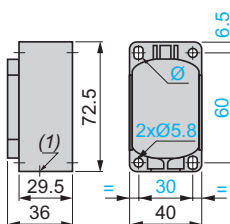
ZCKD08



Bodies with contacts

ZCKS1, S2, S5, S6, S7, S8, S9
ZCKS1H29, S2H29, S5H29,
S6H29, S7H29, S8H29, S9H29
ZCKSD3●, SD3●H29

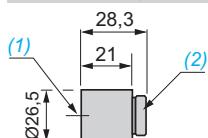
ZCKS404, S404H29



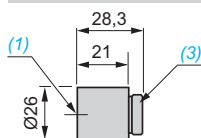
(1) 1 tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland.
Ø: 2 elongated holes 5.3 x 7.3.

Adaptators for 1/2" NPT conduit

DE9RA1212 (Pg 13.5)



DE9RA2012 (M20)



(1) Tapped entry for 1/2" NPT conduit.

(2) Pg 13.5 threaded sleeve.

(3) M20 x 1.5 threaded sleeve.

Limit switches

OsiSense XC Standard
Industrial format EN 50041

Metal, type XCK J

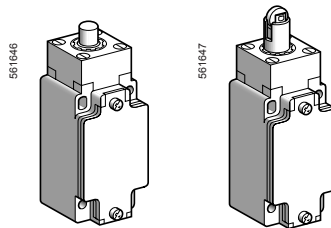
Conforming to CENELEC EN 50041

1

■ XCKJ

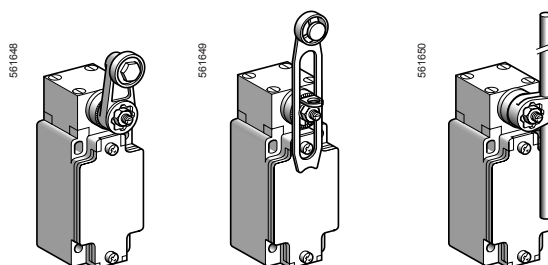
fixed body with 1 cable entry

□ With head for linear movement (plunger)



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□ With head for rotary movement (lever)

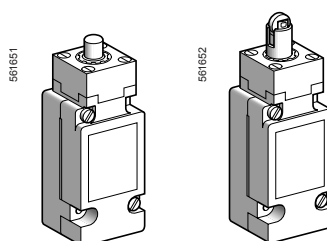


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■ XCKJ

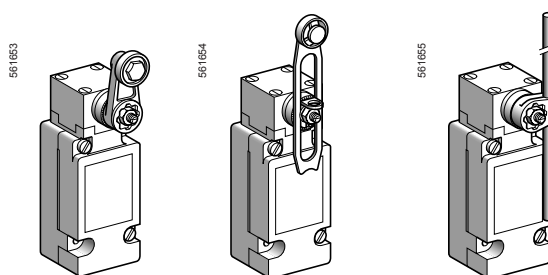
plug-in body with 1 cable entry

□ With head for linear movement (plunger)



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□ With head for rotary movement (lever)



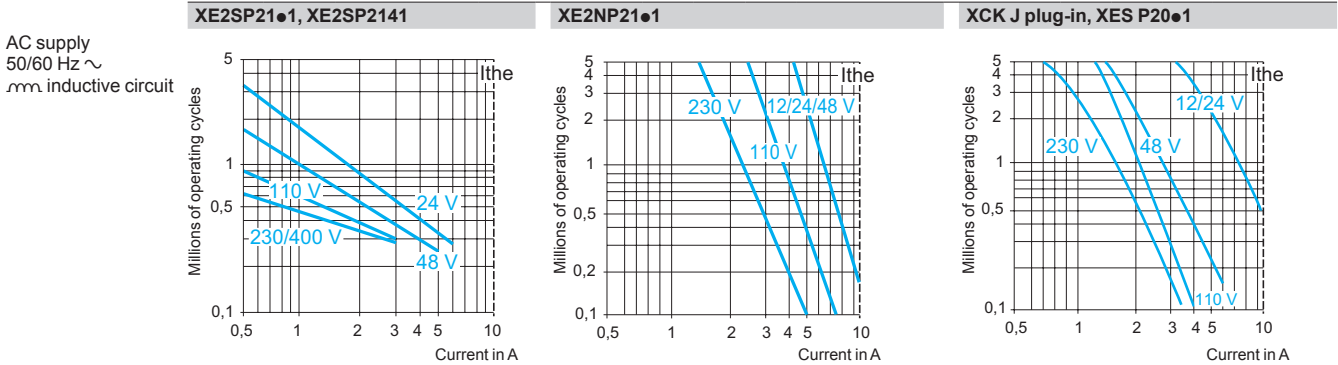
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Environment characteristics

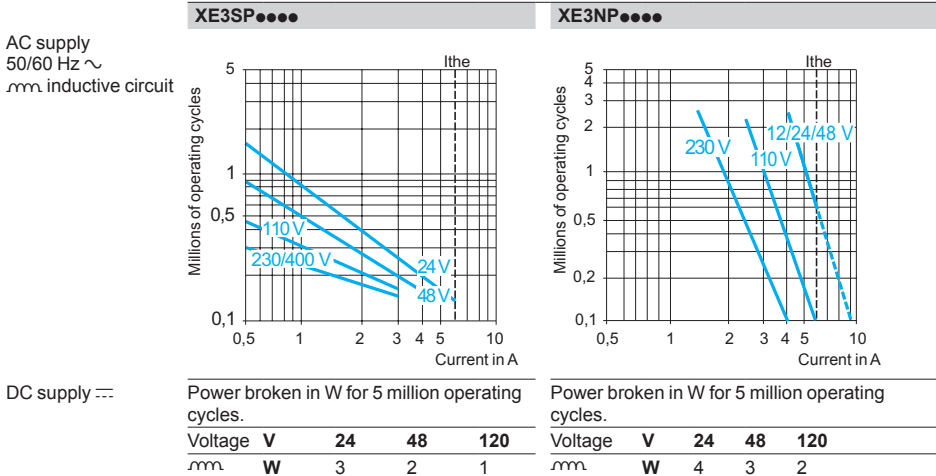
Conformity to standards	Products	IEC 60947-5-1, EN 60947-5-1, UL 508, CSA C22-2 n° 14
	Machine assemblies	IEC 60204-1, EN 60204-1
Product certifications		UL, CSA, CCC, BV, GOST
Protective treatment	Version	Standard: "TC", special: "TH"
Ambient air temperature	For operation	- 25...+ 70°C, special sub-assemblies for use at - 40°C or + 120°C
	For storage	- 40...+ 70°C
Vibration resistance	Conforming to IEC 60068-2-6	25 gn (10...500 Hz)
Shock resistance	Conforming to IEC 60068-2-27	50 gn (11 ms)
Electric shock protection		Class I conforming to IEC 61140 and NF C 20-030
Degree of protection		IP 66 conforming to IEC 60529; IK 07 conforming to EN 50102
Repeat accuracy		0.01 mm on the tripping points, with 1 million operating cycles for head with end plunger
Cable entry or connector	Depending on model	Tapped entry for Pg 13.5 cable gland, tapped ISO M20 x 1.5 or tapped 1/2" NPT, or M12 connector
Materials		Bodies and heads in Zamak

Contact block characteristics		
Rated operational characteristics	XE2●P	~ AC-15; A300 (Ue = 240 V, Ie = 3 A); Ithe = 10 A --- DC-13; Q300 (Ue = 250 V, Ie = 0.27 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
	XE3●P	~ AC-15; B300 (Ue = 240 V, Ie = 1.5 A); Ithe = 6 A --- DC-13; R300 (Ue = 250 V, Ie = 0.1 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
Rated insulation voltage	XE2●P	Ui = 500 V degree of pollution 3 conforming to IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
	XE3●P	Ui = 400 V degree of pollution 3 conforming to IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage	XE2●P	U imp = 6 kV conforming to IEC 60947-1, IEC 60664
	XE3●P	U imp = 4 kV conforming to IEC 60947-1, IEC 60664
Positive operation (depending on model)		NC contacts with positive opening operation conforming to IEC 60947-5-1 Appendix K, EN 60947-5-1
Resistance across terminals		≤ 25 mΩ conforming to IEC 60255-7 category 3
Short-circuit protection	XE2●P	10 A cartridge fuse type gG (gl)
	XE3●P	6 A cartridge fuse type gG (gl)
Connection (screw clamp terminals)	XE2SP21●1	Clamping capacity, min: 1 x 0.34 mm ² , max: 2 x 1.5 mm ²
	XE2NP21●1	Clamping capacity, min: 1 x 0.5 mm ² , max: 2 x 2.5 mm ²
	XCKJ plug-in and XESP20●1	Clamping capacity, min: 1 x 0.75 mm ² , max: 2 x 1.5 mm ²
	XE3NP and XE3SP	Clamping capacity, min: 1 x 0.34 mm ² , max: 1 x 1 mm ² or 2 x 0.75 mm ²
Minimum actuation speed		XE2SP21●1 and XE3SP : 0.01 m/minute XE2NP21●1 and XE3NP : 6 m/minute

- Electrical durability**
- Conforming to IEC 60947-5-1 Appendix C
 - Utilisation categories AC-15 and DC-13
 - Maximum operating rate: 3600 operating cycles/hour
 - Load factor: 0.5



For XE2S P●151 on ~ or ---, NC and NO contacts simultaneously loaded to the values shown with reverse polarity.



Limit switches

OsiSense XC Standard

Industrial format EN 50041

Metal, conforming to CENELEC EN 50041, type XCKJ

Complete fixed body switches with 1 cable entry

Type of head	Plunger (fixing by the body)		Rotary (fixing by the body) (switches supplied for actuation from left AND right)			
	Form B (1)	Form C (1)	Form A (1)		Form D (1)	
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever (2)	Steel roller lever (2)	Variable length thermoplastic roller lever (2)	Round thermoplastic rod lever, Ø 6 mm (2) (4)

References of complete switches with 1 ISO M20 x 1.5 cable entry (3)

	2-pole NC + NO snap action (XE2SP2151)	XCKJ161H29 	XCKJ167H29 	XCKJ10511H29 	XCKJ10513H29 	XCKJ10541H29 	XCKJ10559H29
	2-pole NC + NO break before make, slow break (XE2NP2151)	XCKJ561H29 	XCKJ567H29 	XCKJ50511H29 	XCKJ50513H29 	XCKJ50541H29 	XCKJ50559H29
	2-pole NC + NC snap action (XE2SP2141)	ZCKJ9H29 + ZCKE61 	ZCKJ9H29 + ZCKE67 	ZCKJ9H29 + ZCKE05 + ZCKY11 	ZCKJ9H29 + ZCKE05 + ZCKY13 	ZCKJ9H29 + ZCKE05 + ZCKY41 	ZCKJ9H29 + ZCKE05 + ZCKY59
	2-pole NC + NC simultaneous, slow break (XE2NP2141)	ZCKJ7H29 + ZCKE61 	ZCKJ7H29 + ZCKE67 	ZCKJ7H29 + ZCKE05 + ZCKY11 	ZCKJ7H29 + ZCKE05 + ZCKY13 	ZCKJ7H29 + ZCKE05 + ZCKY41 	ZCKJ7H29 + ZCKE05 + ZCKY59
	3-pole NC + NC + NO snap action (XE3SP2141)	ZCKJD39H29 + ZCKE61 	ZCKJD39H29 + ZCKE67 	ZCKJD39H29 + ZCKE05 + ZCKY11 	ZCKJD39H29 + ZCKE05 + ZCKY13 	ZCKJD39H29 + ZCKE05 + ZCKY41 	ZCKJD39H29 + ZCKE05 + ZCKY59
	3-pole NC + NC + NO break before make, slow break (XE3NP2141)	ZCKJD37H29 + ZCKE61 	ZCKJD37H29 + ZCKE67 	ZCKJD37H29 + ZCKE05 + ZCKY11 	ZCKJD37H29 + ZCKE05 + ZCKY13 	ZCKJD37H29 + ZCKE05 + ZCKY41 	ZCKJD37H29 + ZCKE05 + ZCKY59
Weight (kg)	0.430	0.455	0.480	0.490	0.485	0.485	0.485
Contact operation			(A) = cam displacement (P) = positive opening point				

References of complete switches with 1 Pg 13.5 cable entry (2)

For complete switches with entry for Pg 13.5 cable gland, delete H29 from the end of the reference. Example: XCKJ161H29 becomes XCKJ161.

References of complete switches with 1 entry for 1/2" NPT conduit (2)

For complete switches with entry for 1/2" NPT (USAS B2-1) conduit, replace H29 at the end of the reference by H7. Example: XCKJ161H29 becomes XCKJ161H7.

(1) Form conforming to EN 50041, see page 1/137.

(2) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever or its mounting.

(3) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.

(4) Value taken with actuation by moving part at 100 mm from the fixing.

Limit switches



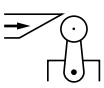
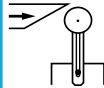

OsiSense XC Standard

Industrial format EN 50041

Metal, conforming to CENELEC EN 50041, type XCKJ

Complete fixed body switches with 1 cable entry

Characteristics

Switch actuation	On end	By 30° cam			By any moving part
Type of actuation					
Maximum actuation speed	0.5 m/s	1 m/s	1.5 m/s		
Mechanical durability (1) (in millions of operating cycles)	30	25	30		
Minimum force or torque	For tripping	20 N	16 N	0.25 N.m	
	For positive opening	50 N	40 N	0.50 N.m	-
Cable entry (3)	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 9 to 12 mm				

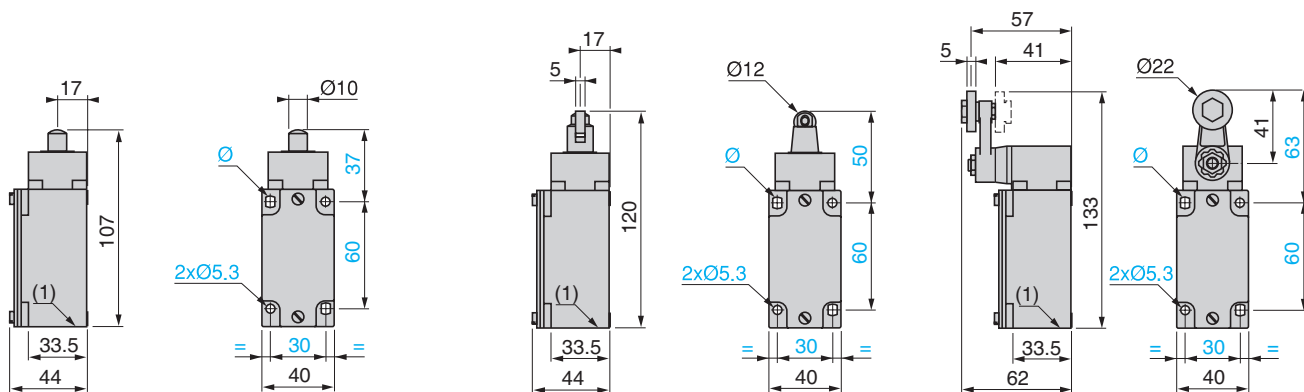
(1) Limited to 15 million operating cycles for switches with contacts XE3●P.

Dimensions

XCKJ●61H29
ZCKJ● + ZCKE61

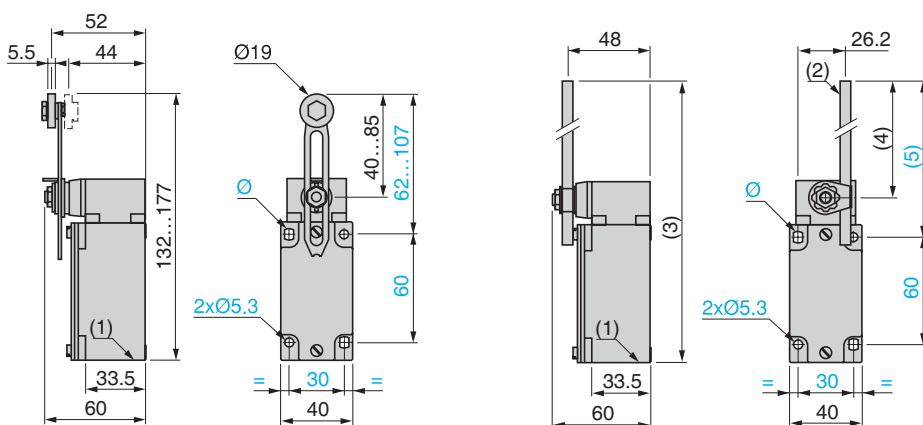
XCKJ●67H29
ZCKJ● + ZCKE67

XCKJ●051●H29
ZCKJ● + ZCKE05 + ZCKY11 or Y13



XCKJ●0541H29
ZCKJ● + ZCKE05 + ZCKY41

XCKJ●0559H29
ZCKJ● + ZCKE05 + ZCKY59



(1) 1 tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland or tapped 1/2" NPT.

(2) Ø 6 rod, length 200 mm.

(3) 282 max.

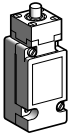
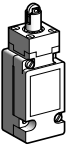


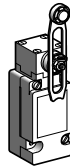

(4) 190 max.


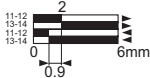
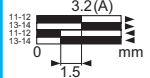
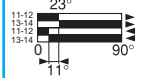
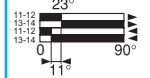
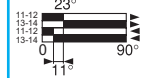
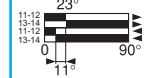


(5) 212 max.

Ø: 2 elongated holes Ø 5.3 x 7.3.

Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Complete switches, plug-in body
With 1 cable entry

Type of head	Plunger (fixing by the body)		Rotary (fixing by the body) (switches supplied for actuation from left AND right)			
	Form B (1)	Form C (1)	Form A (1)		Form D (1)	
						
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever (2)	Steel roller lever (2)	Variable length thermoplastic roller lever (2)	Round thermoplastic rod lever, Ø 6 mm (2) (4)

References of complete switches with 1 ISO M20 x 1.5 cable entry (3)						
 Single-pole CO snap action	XCKJ1161H29	XCKJ1167H29	XCKJ110511H29	XCKJ110513H29	XCKJ110541H29	XCKJ110559H29
						
Weight (kg)	0.430	0.455	0.480	0.490	0.485	0.485
Contact operation	 closed  open		(A) = cam displacement			



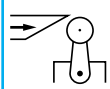
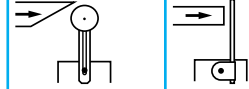
References of complete switches with 1 Pg 13.5 cable entry (3)

For complete switches with entry for Pg 13.5 cable gland, delete **H29** from the end of the reference.
Example: **XCKJ1161H29** becomes **XCKJ1161**.

References of complete switches with 1 entry for 1/2" NPT conduit (3)

For complete switches with entry for 1/2" NPT (USAS B2-1) conduit, replace **H29** at the end of the reference by **H7**.
Example: **XCKJ1161H29** becomes **XCKJ1161H7**.

Characteristics

Switch actuation	On end	By 30° cam		By any moving part
Type of actuation				
Maximum actuation speed	0.5 m/s	1 m/s	1.5 m/s	
Mechanical durability (in millions of operating cycles)	30	25	30	
Minimum tripping force or torque	20 N	16 N	0.25 N.m	
Cable entry	1 entry tapped M20 x 1.5 for ISO cable gland Clamping capacity 7 to 13 mm			

(1) Form conforming to EN 50041, see page 1/137.

(2) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever or its mounting.

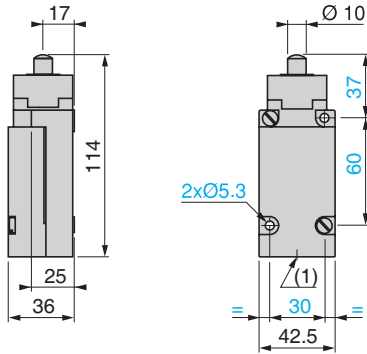
(3) Switches with gold contacts: please consult our Customer Care Centre.

(4) Value taken with actuation by moving part at 100 mm from the fixing.

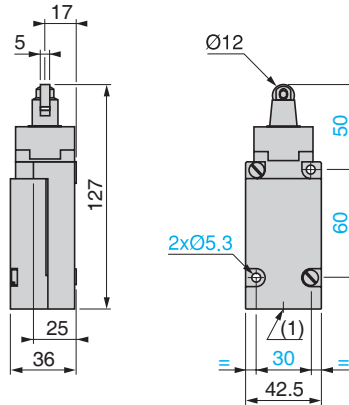
Limit switches

OsiSense XC Standard, industrial format EN 50041
 Metal, conforming to CENELEC EN 50041, type XCKJ
 Complete switches, plug-in body
 With 1 cable entry

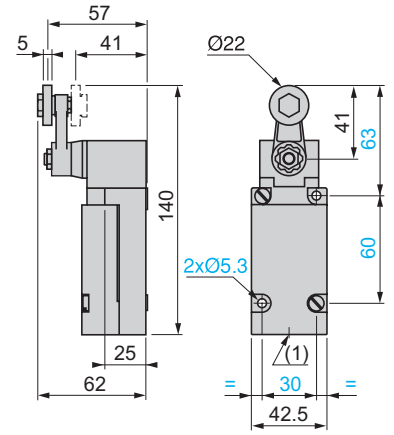
XCKJ1611H29



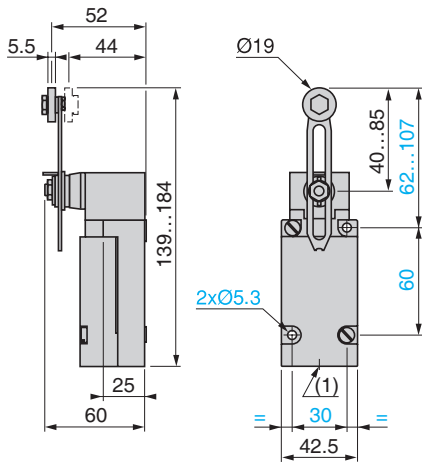
XCKJ1167H29



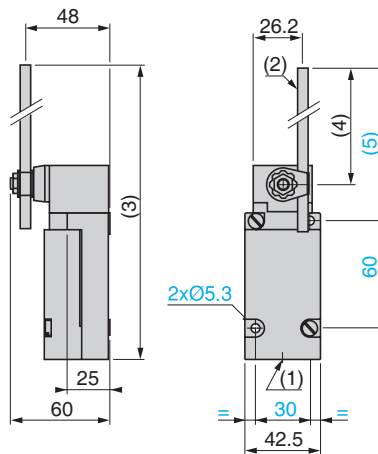
XCKJ110511H29, XCKJ110513H29



XCKJ110541H29



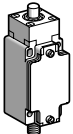
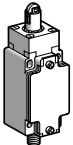
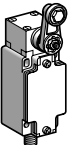
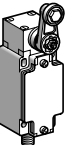
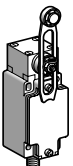

XCKJ110559H29


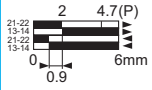
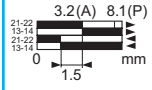
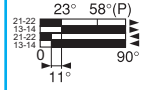
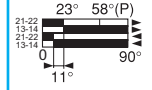
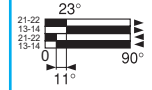
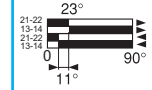






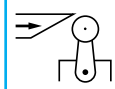
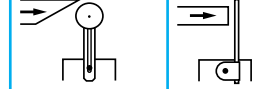
(1) 1 tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland or for 1/2" NPT conduit.
 (2) Ø 6 rod, length 200 mm.
 (3) 289 max.
 (4) 190 max.
 (5) 212 max.

Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Complete switches, fixed body
M12 connector

Type of head	Plunger (fixing by the body)		Rotary (fixing by the body) (switches supplied for actuation from left AND right)			
	Form B (1)	Form C (1)	Form A (1)		Form D (1)	
						
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever (2)	Steel roller lever (2)	Variable length thermoplastic roller lever (2)	Round thermoplastic rod lever, Ø 6 mm (2) (3)

References (4)						
 2-pole NC + NO snap action (XE2S P2151)	XCKJ161D 	XCKJ167D 	XCKJ10511D 	XCKJ10513D 	XCKJ10541D 	XCKJ10559D 
	Weight (kg)	0.430	0.455	0.480	0.490	0.485
Contact operation	 closed  open		(A) = cam displacement (P) = positive opening point			

Characteristics				
Switch actuation	On end	By 30° cam		By any moving part
Type of actuation				
Maximum actuation speed	0.5 m/s	1 m/s	1.5 m/s	
Mechanical durability (in millions of operating cycles)	30	25	30	
Minimum force or torque	For tripping	20 N	16 N	0.25 N.m
	For positive opening	50 N	40 N	0.50 N.m
Connection	M12 connector, U _i = 60 V, I _e = 4 A (see suitable pre-wired female connectors below).			

(1) Form conforming to EN 50041, see page 1/137.
 (2) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever or its mounting.
 (3) Value taken with actuation by moving part at 100 mm from the fixing.
 (4) Switches with gold contacts: please consult our Customer Care Centre.

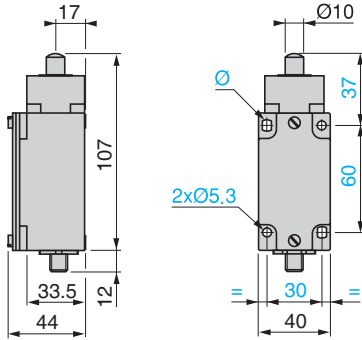
References of suitable pre-wired female connectors			
Type of connector		M12 straight, 5-pin, 4 A/24 V max.	M12 elbowed, 5-pin, 4 A/24 V max.
With cable, Ø 5.8 mm (4 x 0.34 mm ² + 1 x 0.5 mm ²)	L = 2 m	XZCP1164L2	XZCP1264L2
	L = 5 m	XZCP1164L5	XZCP1264L5
	L = 10 m	XZCP1164L10	XZCP1264L10
Weight (kg)	L = 2 m	0.115	
	L = 5 m	0.270	
	L = 10 m	0.520	

Limit switches

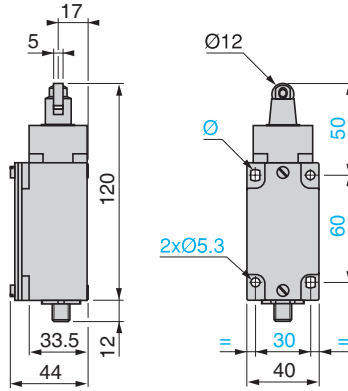
OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Complete switches, fixed body
M12 connector

Dimensions

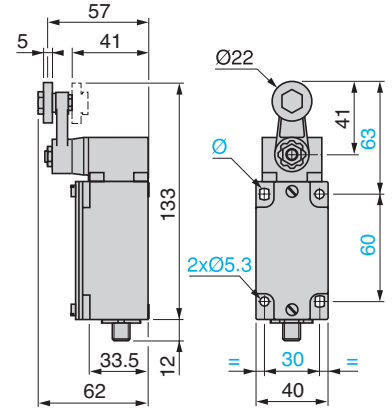
XCKJ161D



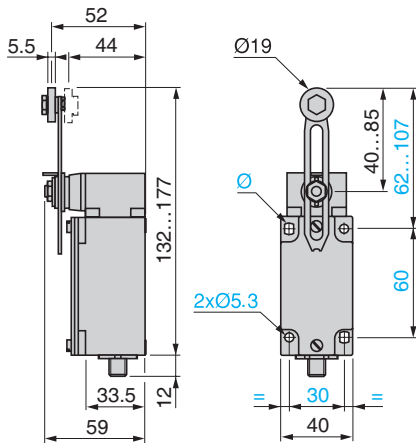
XCKJ167D



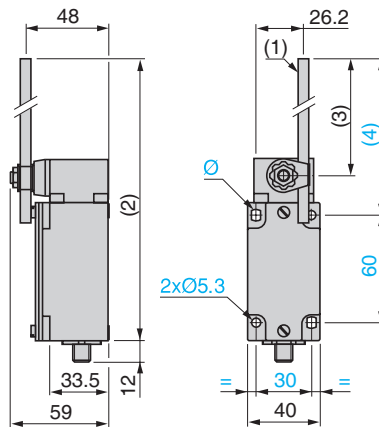
XCKJ1051●D



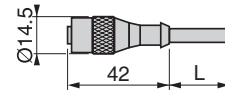
XCKJ10541D



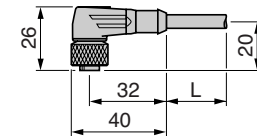
XCKJ10559D



XZCP1164L●



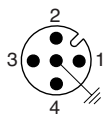
XZCP1264L●



- (1) Ø 6 rod, length 200 mm.
- (2) 282 max.
- (3) 190 max.
- (4) 212 max.
- Ø: 2 elongated holes Ø 5.3 x 7.3.
- L: Cable length 2, 5 or 10 m.

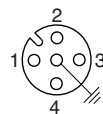
Connections

Limit switch XCKJ●●●●D



1-2 = NC
3-4 = NO
5 = \perp
4 A / 24 V max.

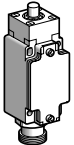
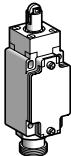
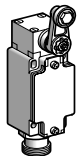
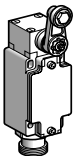
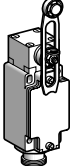
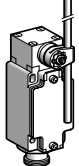
Pre-wired female connector XZCP1●64L●


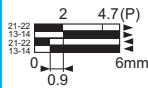
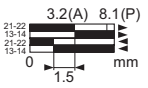
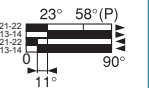
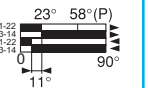
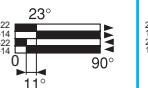
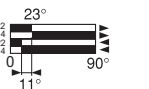







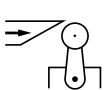
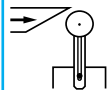

1 = brown
2 = white
3 = blue
4 = black
5 = \perp yellow/green

Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Complete switches, fixed body
7/8"-16UN connector

Type of head	Plunger (fixing by the body)		Rotary (fixing by the body) (switches supplied for actuation from left AND right)			
	Form B (1)	Form C (1)	Form A (1)		Form D (1)	
						
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever (2)	Steel roller lever (2)	Variable length thermoplastic roller lever (2)	Round thermoplastic rod lever, Ø 6 mm (2) (3)

References (4)	XCKJ161A	XCKJ167A	XCKJ10511A	XCKJ10513A	XCKJ10541A	XCKJ10559A
 <p>2-pole NC + NO snap action (XE2SP2151)</p>	 <p>2 4.7(P) 0 6mm 0.9</p>	 <p>3.2(A) 8.1(P) 0 1.5 mm</p>	 <p>23° 58°(P) 0 11° 90°</p>	 <p>23° 58°(P) 0 11° 90°</p>	 <p>23° 0 11° 90°</p>	 <p>23° 0 11° 90°</p>
Weight (kg)	0.430	0.455	0.480	0.490	0.485	0.485
Contact operation	 closed  open		(A) = cam displacement (P) = positive opening point		 NC contact with positive opening operation	

Characteristics					
Switch actuation	On end	By 30° cam		By any moving part	
Type of actuation					
Maximum actuation speed	0.5 m/s	1 m/s	1.5 m/s		
Mechanical durability (in millions of operating cycles)	30	25	30		
Minimum force or torque	For tripping For positive opening	20 N 50 N	16 N 40 N	0.25 N.m 0.50 N.m	- -
Connection	7/8"-16UN connector, U _i = 250 V; I _e = 6 A (see suitable pre-wired female connectors below).				

(1) Form conforming to EN 50041, see page 1/137.
 (2) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever or its mounting.
 (3) Value taken with actuation by moving part at 100 mm from the fixing.
 (4) Switches with gold contacts: please consult our Customer Care Centre.

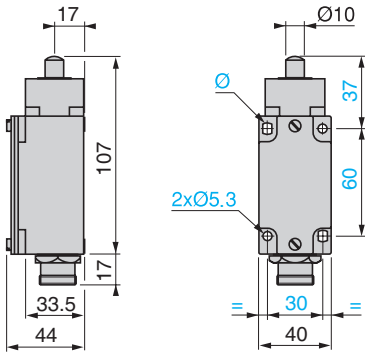
References of suitable pre-wired female connectors		
Type of connector	7/8"-16UN straight, 5-pin, 4 A/250 V max.	
With cable, Ø 5.9 mm (5 x 0.34 mm ²)	L = 2 m	XZCP1764L2
	L = 5 m	XZCP1764L5
	L = 10 m	XZCP1764L10
Weight (kg)	L = 2 m	0.185
	L = 5 m	0.460
	L = 10 m	0.900

Limit switches

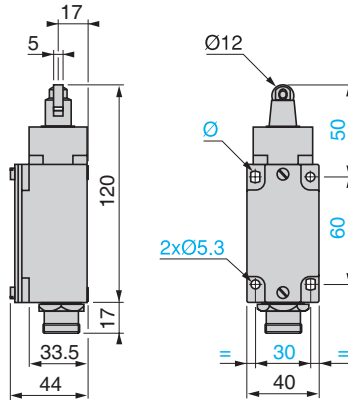
OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Complete switches, fixed body
7/8"-16UN connector

Dimensions

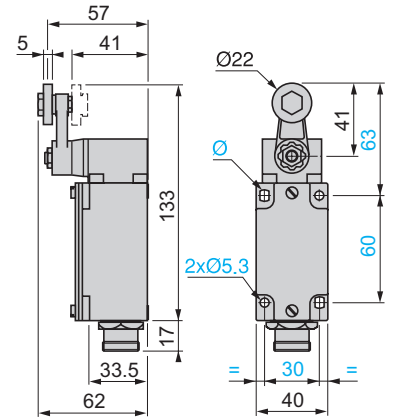
XCKJ161A



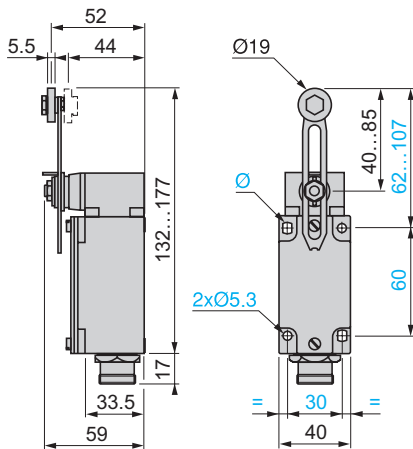
XCKJ167A



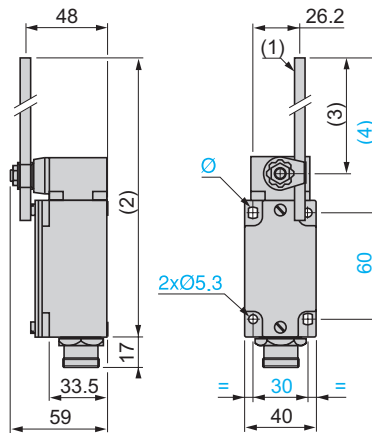
XCKJ1051●A



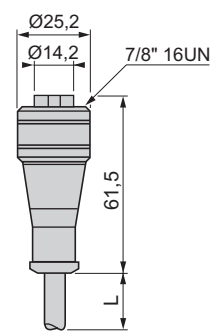
XCKJ10541A



XCKJ10559A



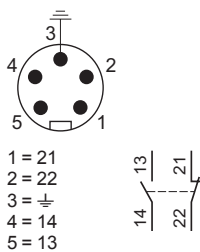
XZCP1764L●



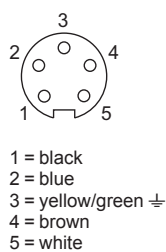
- (1) Ø 6 rod, length 200 mm.
- (2) 282 max.
- (3) 190 max.
- (4) 212 max.
- Ø: 2 elongated holes Ø 5.3 x 7.3.
- L: Cable length 2, 5 or 10 m.

Connections

Limit switch XCKJ●●●●A



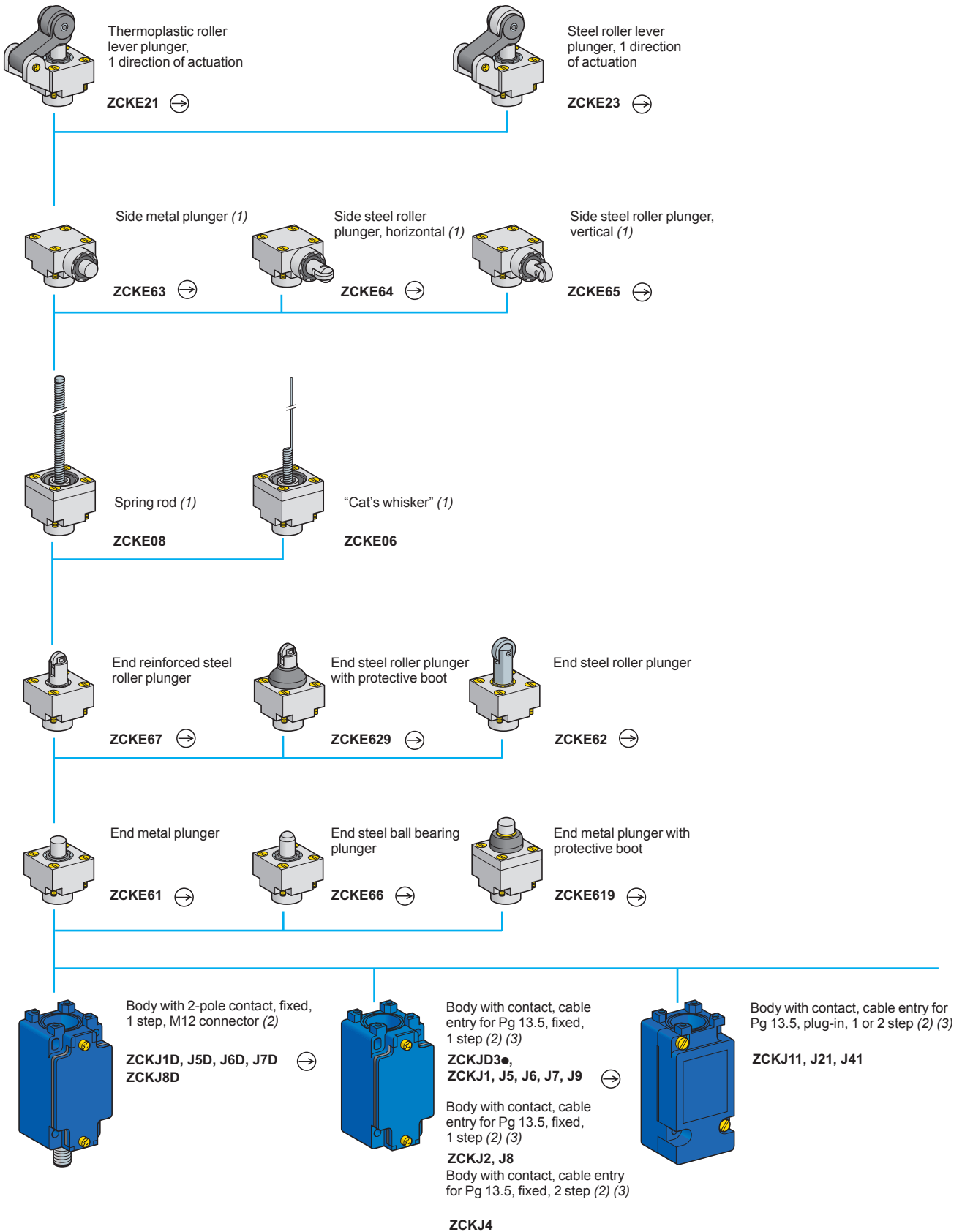
Pre-wired female connector XZCP1764L●



Limit switches

OsiSense XC Standard, industrial format EN 50041
 Metal, conforming to CENELEC EN 50041, type XCKJ
 Fixed or plug-in body
 Variable composition: standard bodies

1



(1) Cannot be used with bodies ZCKJ4 and ZCKJ41.

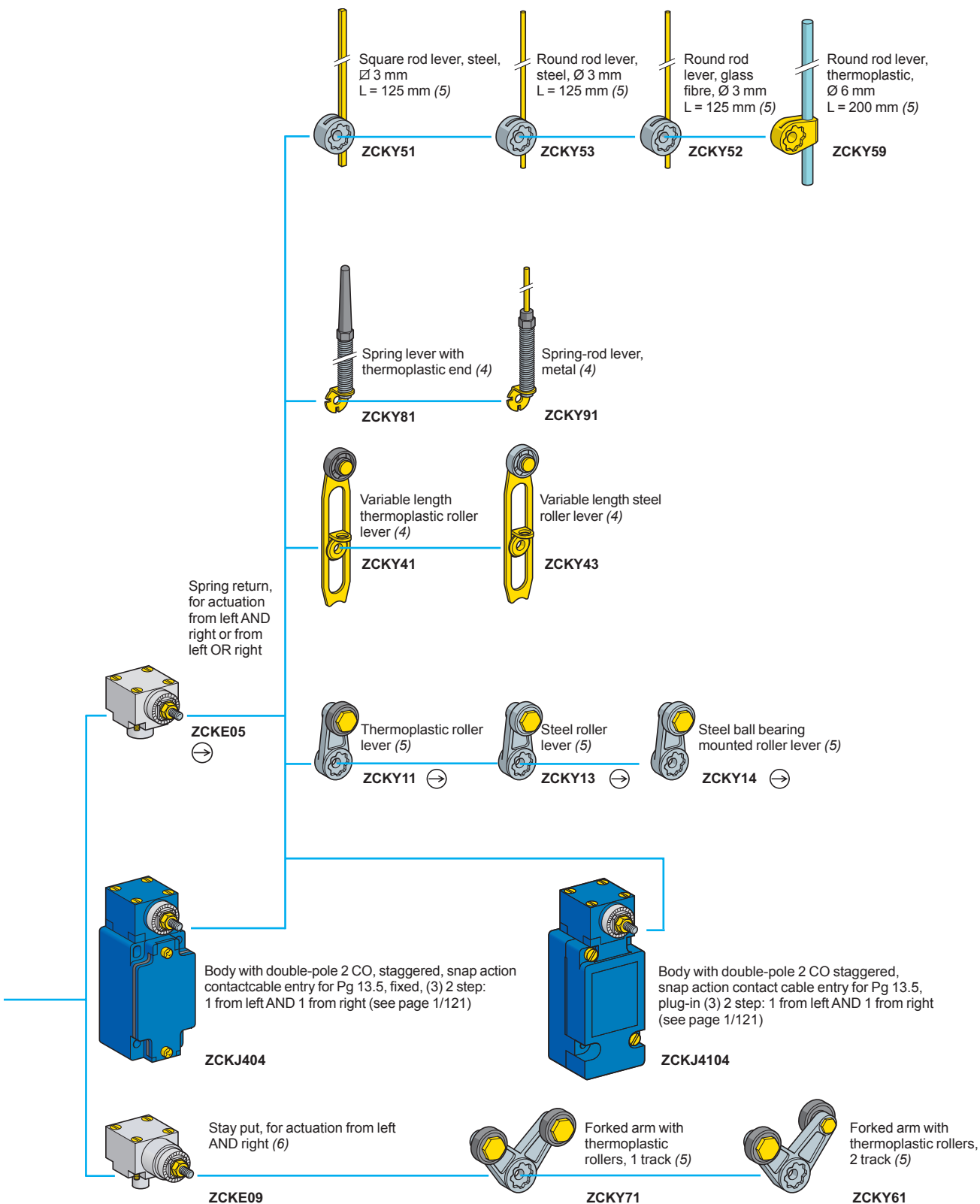
(2) For further information, see page 1/114.

(3) For a cable entry tapped ISO M20 x 1.5, add H29 to the reference. Example: ZCKJ1 becomes ZCKJ1H29.

For a cable entry tapped 1/2" NPT, add H7 to the reference. Example: ZCKJ1 becomes ZCKJ1H7.

Limit switches

OsiSense XC Standard, industrial format EN 50041
 Metal, conforming to CENELEC EN 50041, type XCKJ
 Fixed or plug-in body
 Variable composition: standard bodies



\rightarrow : head assuring positive opening operation.

(4) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer.

(5) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever mounting.

(6) Suitable for bodies with contacts ZCKJ1●, J2●, J31, J39.

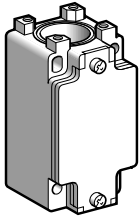
Limit switches

OsiSense XC Standard, industrial format EN 50041

Metal, conforming to CENELEC EN 50041, type XCKJ

Fixed or plug-in body

Adaptable sub-assemblies: standard bodies



ZCKJ●

Fixed bodies with 2-pole contact

Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
1 step	1 NC + 1 NO snap action (XE2SP2151)		⊕	Pg 13.5	ZCKJ1	0.310
				ISO M20 x 1.5	ZCKJ1H29	0.310
	1/2" NPT	ZCKJ1H7	0.310			
		2 CO simultaneous, snap action (XESP2021)		-	Pg 13.5	ZCKJ2
	ISO M20 x 1.5				ZCKJ2H29	0.310
	1/2" NPT	ZCKJ2H7	0.310			
		1 NC + 1 NO break before make, slow break (XE2NP2151)		⊕	Pg 13.5	ZCKJ5
	ISO M20 x 1.5				ZCKJ5H29	0.310
	1/2" NPT	ZCKJ5H7	0.310			
		1 NO + 1 NC make before break, slow break (XE2NP2161)		⊕	Pg 13.5	ZCKJ6
ISO M20 x 1.5	ZCKJ6H29				0.310	
1/2" NPT	ZCKJ6H7	0.310				
	2 NC simultaneous, slow break (XE2NP2141)		⊕	Pg 13.5	ZCKJ7	0.310
ISO M20 x 1.5				ZCKJ7H29	0.310	
1/2" NPT	ZCKJ7H7	0.310				
	2 NO simultaneous, slow break (XE2NP2131)		-	Pg 13.5	ZCKJ8	0.310
ISO M20 x 1.5				ZCKJ8H29	0.310	
1/2" NPT	ZCKJ8H7	0.310				
	2 NC snap action (XE2SP2141)		⊕	Pg 13.5	ZCKJ9	0.310
ISO M20 x 1.5				ZCKJ9H29	0.310	
1/2" NPT	ZCKJ9H7	0.310				
	2 step	2 CO staggered snap action (XESP2031)	-	Pg 13.5	ZCKJ4	0.310
ISO M20 x 1.5				ZCKJ4H29	0.310	
1/2" NPT				ZCKJ4H7	0.310	

Fixed bodies with 3-pole contact

Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
-	1 NC + 2 NO snap action (XE3SP2151)		⊕	Pg 13.5	ZCKJD31	0.310
				ISO M20 x 1.5	ZCKJD31H29	0.310
				1/2" NPT	ZCKJD31H7	0.310
-	2 NC + 1 NO snap action (XE3SP2141)		⊕	Pg 13.5	ZCKJD39	0.310
				ISO M20 x 1.5	ZCKJD39H29	0.310
				1/2" NPT	ZCKJD39H7	0.310
-	2 NC + 1 NO break before make, slow break (XE3NP2141)		⊕	Pg 13.5	ZCKJD37	0.310
				ISO M20 x 1.5	ZCKJD37H29	0.310
				1/2" NPT	ZCKJD37H7	0.310
-	1 NC + 2 NO break before make, slow break (XE3NP2151)		⊕	Pg 13.5	ZCKJD35	0.310
				ISO M20 x 1.5	ZCKJD35H29	0.310
				1/2" NPT	ZCKJD35H7	0.310

(1) ⊕: NC contact with positive opening operation.

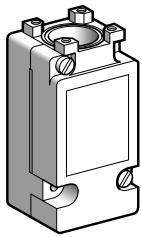
Limit switches

OsiSense XC Standard, industrial format EN 50041

Metal, conforming to CENELEC EN 50041, type XCKJ

Fixed or plug-in body

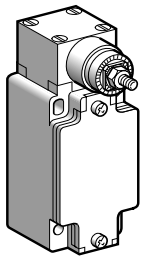
Adaptable sub-assemblies: standard bodies



ZCKJ11

Plug-in bodies with contact

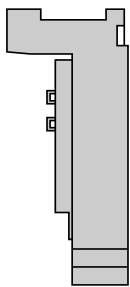
Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
1 step	Single-pole 1 CO snap action		-	Pg 13.5	ZCKJ11	0.300
				ISO M20 x 1.5	ZCKJ11H29	0.300
				1/2" NPT	ZCKJ11H7	0.300
2 step	Double-pole 2 CO simultaneous, snap action		-	Pg 13.5	ZCKJ21	0.300
				ISO M20 x 1.5	ZCKJ21H29	0.300
				1/2" NPT	ZCKJ21H7	0.300
2 step	Double-pole 2 CO staggered, snap action		-	Pg 13.5	ZCKJ41	0.300
				ISO M20 x 1.5	ZCKJ41H29	0.300
				1/2" NPT	ZCKJ41H7	0.300



ZCKJ404

Bodies with contact, with rotary head (without operating lever)

Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
Fixed body						
2 step 1 from left AND 1 from right (see page 1/125)	Double-pole 2 CO staggered, snap action		-	Pg 13.5	ZCKJ404	0.455
				ISO M20 x 1.5	ZCKJ404H29	0.455
				1/2" NPT	ZCKJ404H7	0.455
Plug-in body						
2 step 1 from left AND 1 from right (see page 1/125)	Double-pole 2 CO staggered, snap action		-	Pg 13.5	ZCKJ4104	0.465
				ISO M20 x 1.5	ZCKJ4104H29	0.465
				1/2" NPT	ZCKJ4104H7	0.465



ZCKJ01

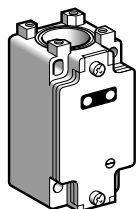
Plug-in housing only

Description	For use with	Contacts	Reference	Weight kg
Single-pole 1 CO with positive opening operation	ZCKJ11	Silver	ZCKJ01	0.150
Double-pole 2 CO with positive opening operation	ZCKJ21	Silver	ZCKJ02	0.160
Double-pole 2 CO staggered	ZCKJ41	Silver	ZCKJ04	0.160

(1) : NC contact with positive opening operation.

Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body. Adaptable sub-assemblies:
bodies with indicator light module



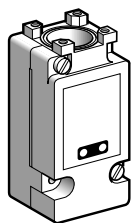
ZCKJ...●●●

Fixed bodies with 2-pole contact

Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
With module comprising 1 LED, 24 V $\overline{\text{---}}$						
1 step	1 NC + 1 NO snap action (XE2SP2151)			Pg 13.5	ZCKJ120	0.320
	1 NC + 1 NO break before make, slow break (XE2NP2151)			Pg 13.5	ZCKJ520	0.320
With module comprising 2 LEDs, 24 V $\overline{\text{---}}$						
1 step	1 NC + 1 NO snap action (XE2SP2151)			Pg 13.5 ISO M20 x 1.5	ZCKJ121 ZCKJ121H29	0.320 0.320
	1 NC + 1 NO break before make, slow break (XE2NP2151)			Pg 13.5 ISO M20 x 1.5	ZCKJ521 ZCKJ521H29	0.320 0.320
With module comprising 2 LEDs, 110/240 V \sim						
1 step	1 NC + 1 NO snap action (XE2SP2151)			Pg 13.5 ISO M20 x 1.5	ZCKJ134 ZCKJ134H29	0.320 0.320
	1 NC + 1 NO break before make, slow break (XE2NP2151)			Pg 13.5 ISO M20 x 1.5	ZCKJ534 ZCKJ534H29	0.320 0.320

Plug-in bodies with single-pole contact

Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
With module comprising 2 LEDs, 24 V $\overline{\text{---}}$						
1 step	CO snap action		—	Pg 13.5 ISO M20 x 1.5	ZCKJ1121 ZCKJ1121H29	0.340 0.340
With module comprising 2 LEDs, 110/240 V \sim						
1 step	CO snap action		—	Pg 13.5 ISO M20 x 1.5	ZCKJ1134 ZCKJ1134H29	0.340 0.340



ZCKJ1...●●●

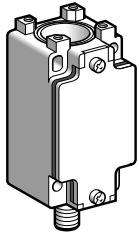
(1) : NC contact with positive opening operation.

Indicator light module characteristics

Type of indicator	1 LED or 2 LEDs	2 LEDs
Rated insulation voltage	50 V $\overline{\text{---}}$, conforming to IEC 60947-1	250 V \sim , conforming to IEC 60947-1
Current consumption	7 mA per LED	9 mA per LED
Rated operational voltage	24 V $\overline{\text{---}}$	110/240 V \sim
Voltage limits	20...30 V $\overline{\text{---}}$ (including ripple)	95...264 V \sim
Service life	100 000 hours	100 000 hours
Reverse polarity protection	Yes	—

Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body. Adaptable sub-assemblies:
bodies with M12 connector



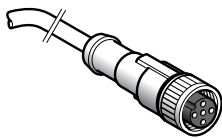
ZCKJxD

Fixed bodies with 2-pole contact

Type	With contact block	Scheme	Positive operation (1)	Reference	Weight kg
1 step	1 NC + 1 NO snap action (XE2SP2151)			ZCKJ1D	0.320
	1 NC + 1 NO break before make, slow break (XE2NP2151)			ZCKJ5D	0.320
	1 NO + 1 NC make before break, slow break (XE2NP2161)			ZCKJ6D	0.320
	2 NC simultaneous, slow break (XE2NP2141)			ZCKJ7D	0.320
	2 NO simultaneous, slow break (XE2NP2131)		-	ZCKJ8D	0.320

Female pre-wired connectors

Description	Cable length	Reference	Weight kg
Female pre-wired connectors, M12, straight Ø 5,0 mm cable Conductor c.s.a: 5 x 0.34 mm ² Nominal current : 4 A Nominal voltage: ~ 30 V, ~ 36 V	1 m	XZCP1164L2	0.115
	5 m	XZCP1164L5	0.270
	10 m	XZCP1164L10	0.520



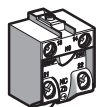
XZCP1164L

(1) NC contact with positive opening operation.

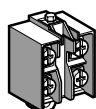
Limit switches

OsiSense XC Standard, industrial format EN 50041
 Metal, conforming to CENELEC EN 50041, type XCKJ
 Fixed or plug-in body
 Adaptable sub-assemblies: contact blocks

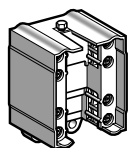
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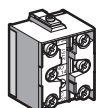
XE2SP21●1



XE2NP21●1



XE3P21●1



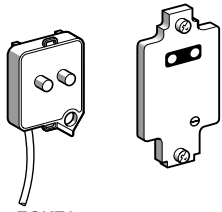
XE3NP21●1

Contact blocks					
Type of contact	Scheme	For bodies	Positive operation (1)	Reference	Weight kg
2-pole contact					
1 NC + 1 NO snap action		ZCKJ1 ZCKJ1D	⊕	XE2SP2151	0.020
1 NC + 1 NO break before make, slow break		ZCKJ5 ZCKJ5D	⊕	XE2NP2151	0.020
2 CO simultaneous snap action		ZCKJ2	-	XE2SP2021	0.045
2 CO staggered, snap action		ZCKJ4	-	XE2SP2031	0.045
1 NO + 1 NC make before break, slow break		ZCKJ6 ZCKJ6D	⊕	XE2NP2161	0.020
2 NC simultaneous, slow break		ZCKJ7 ZCKJ7D	⊕	XE2NP2141	0.020
2 NO simultaneous, slow break		ZCKJ8 ZCKJ8D	-	XE2NP2131	0.020
2 NC snap action		ZCKJ9	⊕	XE2SP2141	0.020
3-pole contact					
1 NC + 2 NO snap action		ZCKJD31	⊕	XE3SP2151	0.035
2 NC + 1 NO snap action		ZCKJD39	⊕	XE3SP2141	0.035
2 NC + 1 NO break before make, slow break		ZCKJD37	⊕	XE3NP2141	0.035
1 NC + 2 NO break before make, slow break		ZCKJD35	⊕	XE3NP2151	0.035

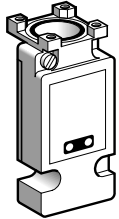
(1) ⊕: NC contact with positive opening operation.

Limit switches

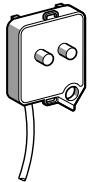
OsiSense XC Standard, industrial format EN 50041
 Metal, conforming to CENELEC EN 50041, type XCKJ
 Fixed or plug-in body
 Adaptable sub-assemblies: add-ons



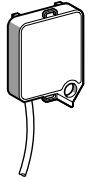
ZCKZ0●●



ZCKJ01●●



ZCKJ90●



ZCKJ82A

Covers + indicator light module

For use with	Number and type of indicators	Voltage	Reference	Weight kg
Fixed body	1 LED	24 V $\overline{\text{---}}$	ZCKZ020	0.060
	2 LEDs	24 V $\overline{\text{---}}$	ZCKZ021	0.060
	2 LEDs	110/240 V \sim	ZCKZ034	0.060
Plug-in body	2 LEDs	24 V $\overline{\text{---}}$	ZCKJ0121	0.200
	2 LEDs	110/240 V \sim	ZCKJ0134	0.200

Indicator light modules

For use with	Number and type of indicators	Voltage	Reference	Weight kg
Fixed body	1 LED	24 V $\overline{\text{---}}$	ZCKJ902	0.030
	2 LEDs	24 V $\overline{\text{---}}$	ZCKJ906	0.030
	2 LEDs	110/240 V \sim	ZCKJ904	0.030

Module with resistor for machine diagnostics

For use with	Resistor value	Reference	Weight kg
Fixed body (ZCKJ1 only)	15 k Ω , 1/4 W	ZCKJ82A	0.030

Other versions

Covers + indicator light module for other supply voltages.
 Please consult our Customer Care Centre.

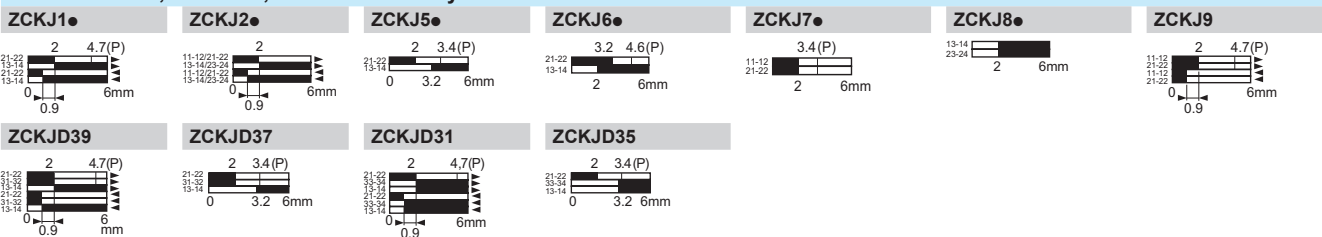
Limit switches

OsiSense XC Standard, industrial format EN 50041
 Metal, conforming to CENELEC EN 50041, type XCKJ
 Fixed or plug-in body
 Adaptable sub-assemblies

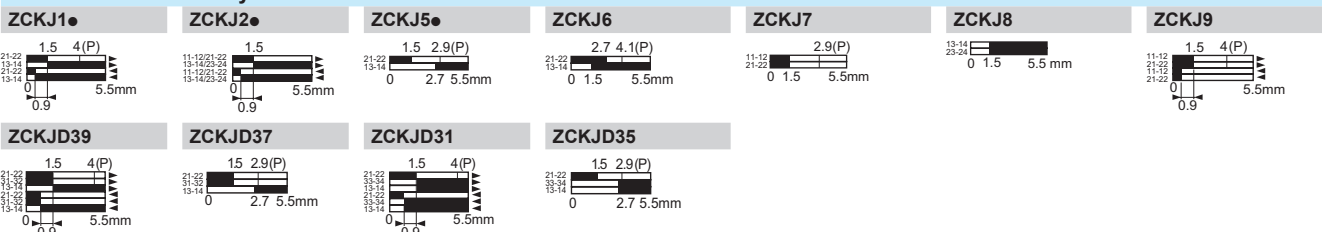
1

Function diagrams (positive operation assured only if the associated sub-assemblies are)

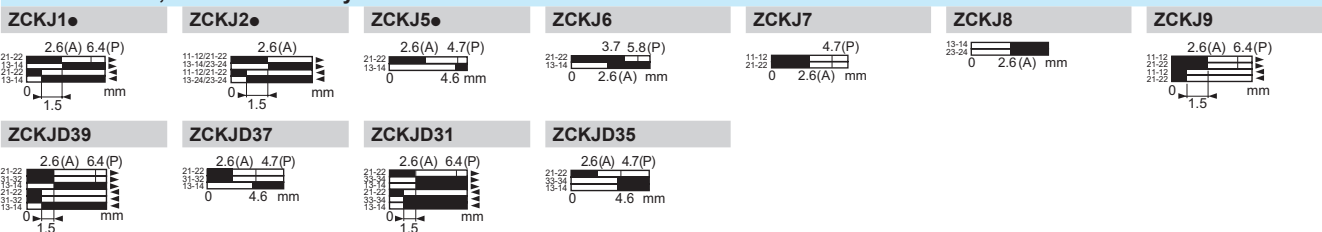
Heads ZCKE61, ZCKE619, ZCKE66 with body



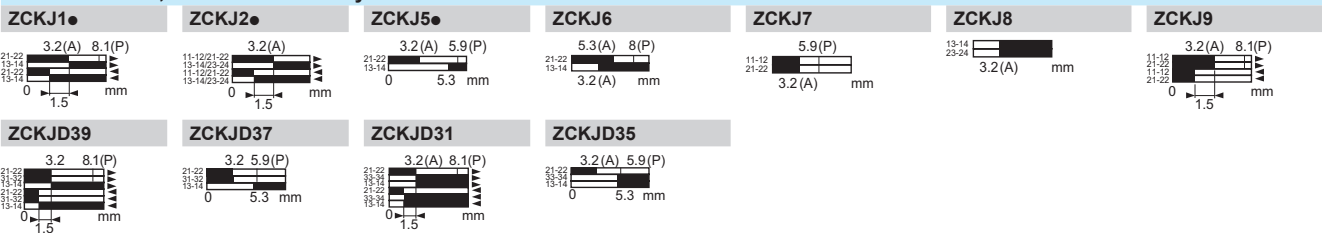
Head ZCKE63 with body



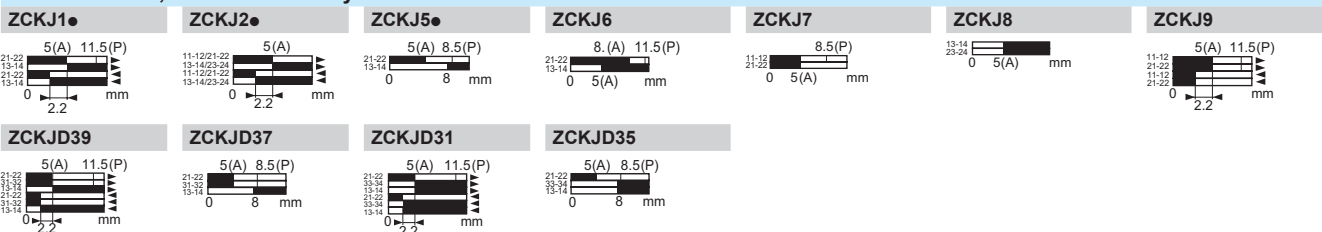
Heads ZCKE64, ZCKE65 with body



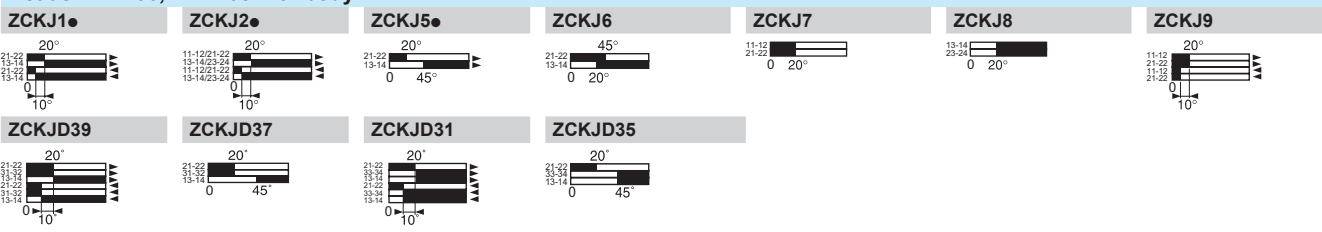
Heads ZCKE67, ZCKE629 with body



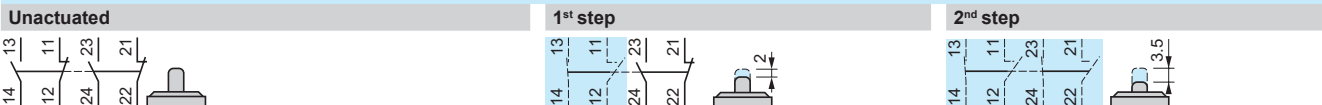
Heads ZCKE21, ZCKE23 with body



Heads ZCKE06, ZCKE08 with body



ZCKJ4●



Contact operation

closed
 open

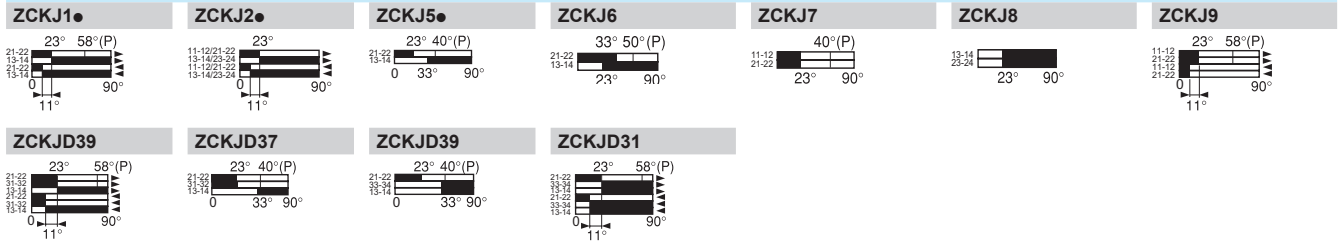
(A) = cam displacement
 (P) = positive opening point

Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body
Adaptable sub-assemblies

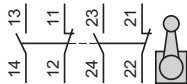
Function diagrams (positive operation assured only if the associated sub-assemblies are \rightarrow)

Head ZCKE05 with body

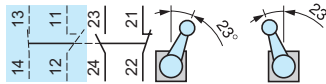


ZCKJ4

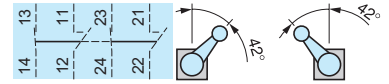
Unactuated



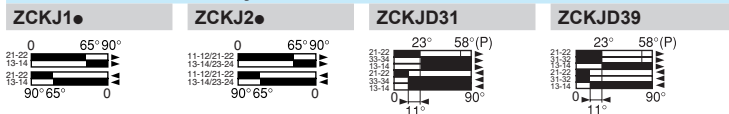
1st step, actuated from left or right



2nd step, actuated from left or right

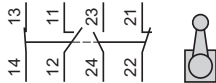


Head ZCKE09 with body

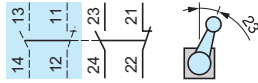


ZCKJ404, J4104 (body with head)

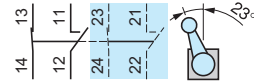
Unactuated



Actuated from left



Actuated from right



Contact operation

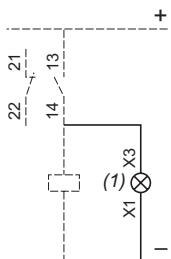


(P) = positive opening point

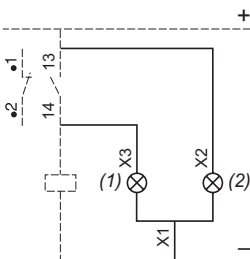
Wiring schemes

Indicator light modules

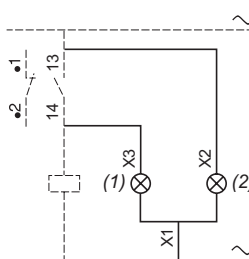
1 LED, 24 V \sim



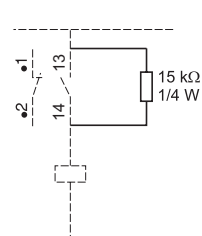
2 LEDs, 24 V \sim



2 LEDs, 110/240 V \sim

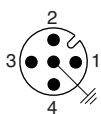


Module with resistor



(1) Orange indicator
(2) Green indicator

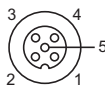
ZCKJ \bullet D



1 - 2 = NC
3 - 4 = NO
5 = \perp
4 A / 24 V max.



Pre-wired connectors XZCP1164



1 = brown
2 = white/black
3 = blue
4 = black
5 = yellow/green

Limit switches

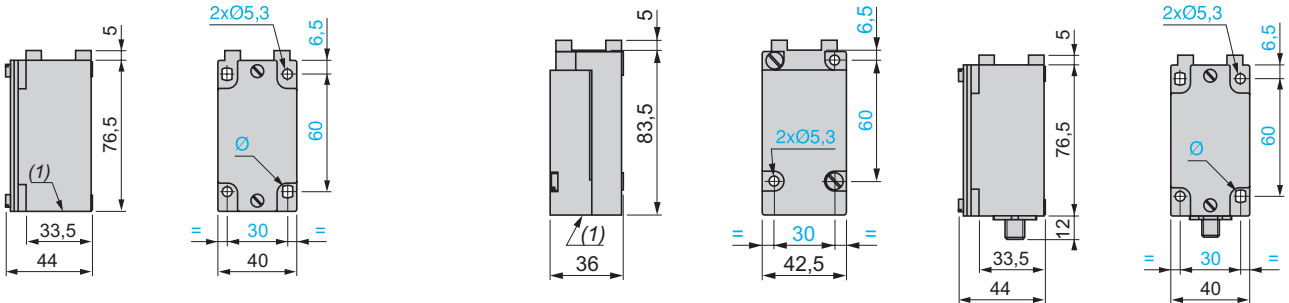
OsiSense XC Standard, industrial format EN 50041
 Metal, conforming to CENELEC EN 50041, type XCKJ
 Fixed or plug-in body
 Adaptable sub-assemblies

Bodies

ZCKJ1, J2, J5, J4, J2●, J3●, J6, J7, J8, J9
 ZCKJ1H29, J2H29, J5H29, J4H29, J2●H29, J3●H29,
 J6H29, J7H29, J8H29, J9H29
 ZCKJ1H7, J2H7, J5H7, J4H7, J2●H7, J3●H7, J6H7,
 J7H7, J8H7, J9H7

ZCKJ11, J21, J41, J11●●
 ZCKJ11H29, J21H29, J41H29, J11●●H29
 ZCKJ11H7, J21H7, J41H7, J11●●H7

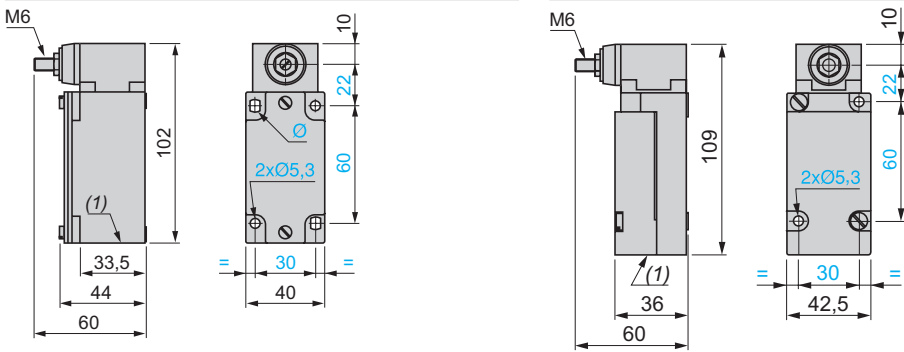
ZCKJ1D, J5D, J6D, J7D, J8D



Bodies with rotary head mounted

ZCKJ404, ZCKJ404H29, ZCKJ404H7

ZCKJ4104, ZCKJ4104H29, ZCKJ4104H7

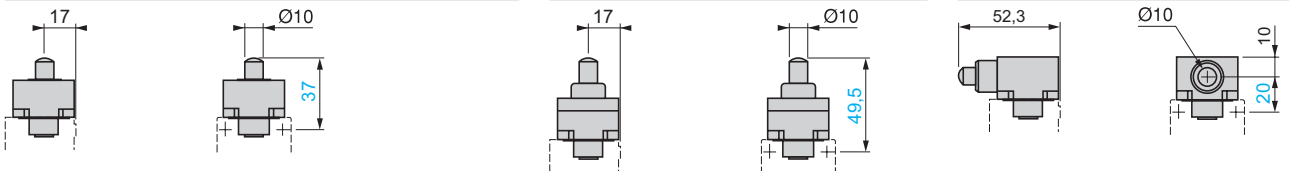


Plunger heads

ZCKE61

ZCKE619

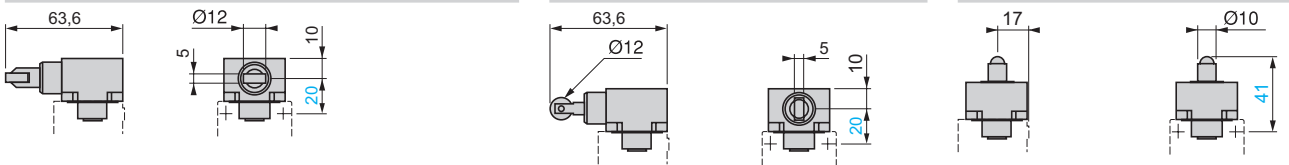
ZCKE63



ZCKE64

ZCKE65

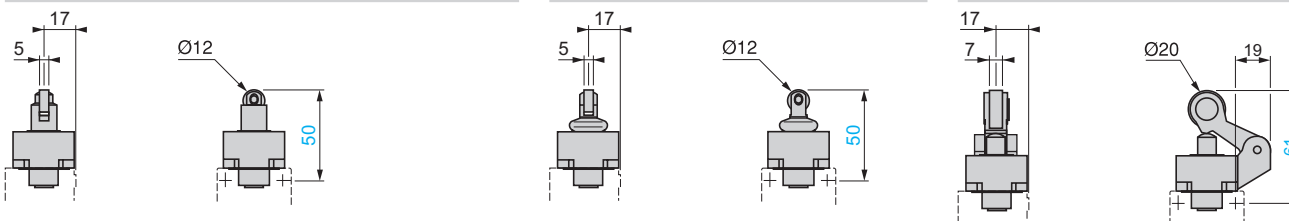
ZCKE66



ZCKE62, ZCKE67

ZCKE629

ZCKE21, ZCKE23



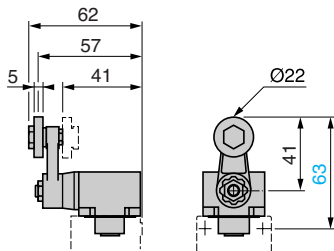
(1) 1 tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland or tapped 1/2" NPT.
 Ø: 2 elongated holes Ø 5.3 x 7.3.

Limit switches

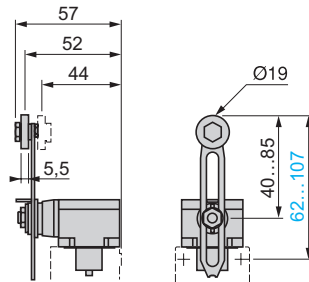
OsiSense XC Standard, industrial format EN 50041
 Metal, conforming to CENELEC EN 50041, type XCKJ
 Fixed or plug-in body
 Adaptable sub-assemblies

Rotary head ZCKE05 with operating lever

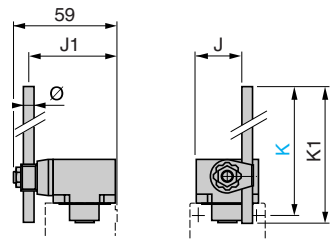
ZCKY11, Y13, Y14



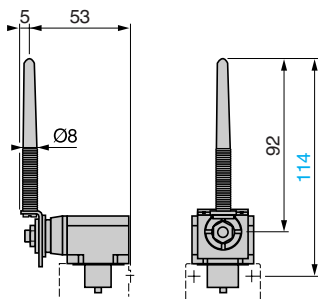
ZCKY41, Y43



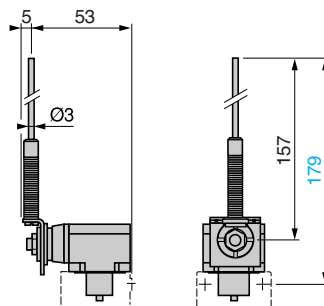
ZCKY51, Y52, Y53, Y59



ZCKY81



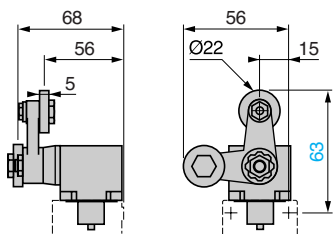
ZCKY91



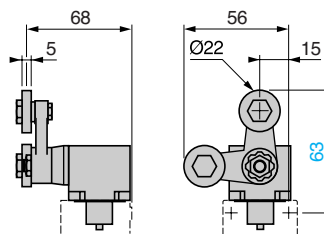
	J	J1	K max.	K1	Ø
ZCKY51	20	49	137	123	∅ 3
ZCKY52	20	49	137	125	∅ 3
ZCKY53	20	49	137	125	∅ 3
ZCKY59	26.2	48	212	200	∅ 6

Rotary head ZCKE09 with operating lever

ZCKY61

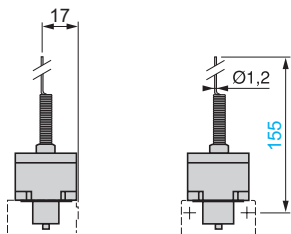


ZCKY71

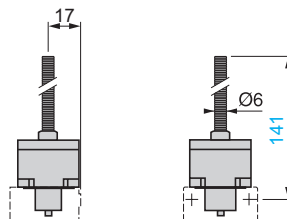


Multi-directional heads

ZCKE06

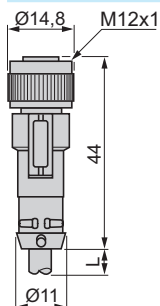


ZCKE08



Note: operating lever spindle threaded M6.

Pre-wired connectors XZCP1164●

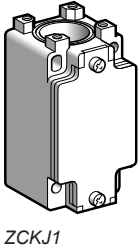


L = 2, 5 or 10 m.

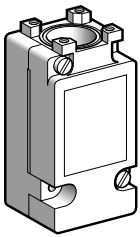
Limit switches

OsiSense XC Standard, industrial format EN 50041
 Metal, conforming to CENELEC EN 50041, type XCKJ
 Fixed or plug-in body
 Adaptable sub-assemblies for low temperature applications (- 40°C)

1



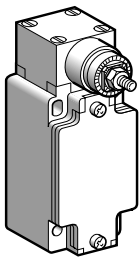
ZCKJ1



ZCKJ11

Bodies with contacts For plunger or rotary head						
Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
Fixed bodies						
1 step	2-pole NC + NO snap action (XE2SP2151)		⊖	Pg 13.5	ZCKJ1	0.310
				ISO M20 x 1.5	ZCKJ1H29	0.310
				1/2" NPT	ZCKJ1H7	0.310
	Double-pole 2 CO simultaneous, snap action (XESP2021)		-	Pg 13.5	ZCKJ2	0.310
				ISO M20 x 1.5	ZCKJ2H29	0.310
				1/2" NPT	ZCKJ2H7	0.310
	2-pole NC + NO break before make, slow break (XE2NP2151)		⊖	Pg 13.5	ZCKJ5	0.310
ISO M20 x 1.5				ZCKJ5H29	0.310	
2-pole NO + NC make before break, slow break (XE2NP2161)		⊖	Pg 13.5	ZCKJ6	0.310	
			ISO M20 x 1.5	ZCKJ6H29	0.310	
2-pole NC + NC simultaneous, slow break (XE2NP2141)		⊖	Pg 13.5	ZCKJ7	0.310	
			ISO M20 x 1.5	ZCKJ7H29	0.310	
2-pole NO + NO simultaneous, slow break (XE2NP2131)		-	Pg 13.5	ZCKJ8	0.310	
			ISO M20 x 1.5	ZCKJ8H29	0.310	
2-pole NC + NC snap action (XE2SP2141)		⊖	Pg 13.5	ZCKJ9	0.310	
			ISO M20 x 1.5	ZCKJ9H29	0.310	
1/2" NPT				ZCKJ9H7	0.310	
				ZCKJ9H7	0.310	
2 step	Double-pole 2 CO staggered, snap action (XESP2031)		-	Pg 13.5	ZCKJ4	0.310
				ISO M20 x 1.5	ZCKJ4H29	0.310
				1/2" NPT	ZCKJ4H7	0.310
Plug-in bodies						
1 step	Single-pole CO snap action		-	Pg 13.5	ZCKJ11	0.300
				ISO M20 x 1.5	ZCKJ11H29	0.300
				1/2" NPT	ZCKJ11H7	0.300
Double-pole 2 CO simultaneous snap action		-	Pg 13.5	ZCKJ21	0.300	
			ISO M20 x 1.5	ZCKJ21H29	0.300	
			1/2" NPT	ZCKJ21H7	0.300	
2 step	Double-pole 2 CO staggered, snap action		-	Pg 13.5	ZCKJ41	0.300
				ISO M20 x 1.5	ZCKJ41H29	0.300
				1/2" NPT	ZCKJ41H7	0.300
Bodies with contacts With spring return rotary head (without operating lever)						
Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
Fixed body						
2 step 1 from the left AND 1 from the right	Double-pole 2 CO staggered, snap action		-	Pg 13.5	ZCKJ4046	0.455
				ISO M20 x 1.5	ZCKJ4046H29	0.455
				1/2" NPT	ZCKJ4046H7	0.455
Plug-in body						
2 step 1 from the left AND 1 from the right	Double-pole 2 CO staggered, snap action		-	Pg 13.5	ZCKJ41046	0.465
				ISO M20 x 1.5	ZCKJ41046H29	0.465
				1/2" NPT	ZCKJ41046H7	0.465

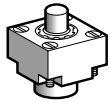
(1) ⊖: head assuring positive opening operation.



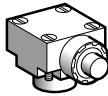
ZCKJ4046

Limit switches

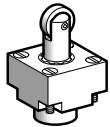
OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body
Adaptable sub-assemblies for low temperature applications (- 40°C)



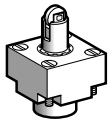
ZCKE616



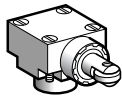
ZCKE636



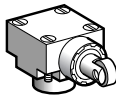
ZCKE626



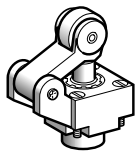
ZCKE676



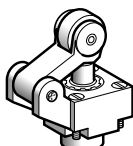
ZCKE646



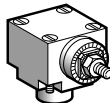
ZCKE656



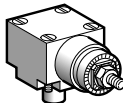
ZCKE216



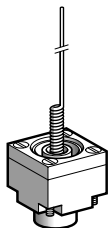
ZCKE236



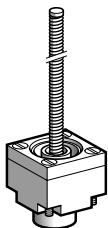
ZCKE056



ZCKE096



ZCKE066



ZCKE086

Plunger heads

Type of operator	Compatible bodies	Maximum actuation speed	Positive operation (1)	Reference	Weight kg	
For actuation on end						
End plunger metal	ZCKJ●, ZCKJ●●	0.5 m/s	→	ZCKE616	0.140	
Side plunger metal	ZCKJ●, ZCKJ●●, except ZCKJ4 and J41	0.5 m/s	→	ZCKE636	0.200	
For actuation by 30° cam						
Roller plunger steel	ZCKJ●, ZCKJ●●	1 m/s	→	ZCKE626	0.155	
End reinforced roller plunger steel	ZCKJ●, ZCKJ●●	1 m/s	→	ZCKE676	0.155	
Side roller plunger steel	Horizontal	ZCKJ●, ZCKJ●●, except ZCKJ4 and J41	0.6 m/s	→	ZCKE646	0.205
	Vertical	ZCKJ●, ZCKJ●●, except ZCKJ4 and J41	0.6 m/s	→	ZCKE656	0.205
Roller lever plunger (1 direction of actuation)	Thermoplastic	ZCKJ●, ZCKJ●●	1.5 m/s	→	ZCKE216	0.185
	Steel	ZCKJ●, ZCKJ●●	1.5 m/s	→	ZCKE236	0.195

Rotary heads (without operating lever)

Type	Compatible bodies	Maximum actuation speed	Positive operation (1)	Reference	Weight kg
Spring return, for actuation from left AND right or from left OR right (see page 1/136)	ZCKJ●, ZCKJ●●	1.5 m/s by 30° cam	→	ZCKE056	0.165
Stay put, for actuation from left AND right (see page 1/136)	ZCKJ1, J11 ZCKJ2, J21	0.5 m/s	–	ZCKE096	0.190

Multi-directional heads

Type of operator	Compatible bodies	Maximum actuation speed	Positive operation (1)	Reference	Weight kg
For actuation by any moving part					
“Cat’s whisker”	ZCKJ●, ZCKJ●●, except ZCKJ4 and ZCKJ41	1 m/s in any direction	–	ZCKE066	0.115
Spring rod	ZCKJ●, ZCKJ●●, except ZCKJ4 and ZCKJ41	0.5 m/s in any direction	–	ZCKE086	0.125

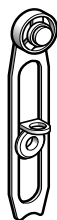
(1) →: head assuring positive opening operation.

Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body
Adaptable sub-assemblies for low temperature applications (- 40°C)



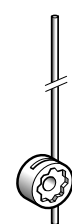
ZCKY1●



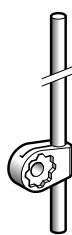
ZCKY4●



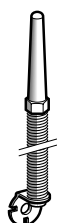
ZCKY51



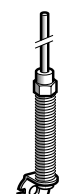
ZCKY5●



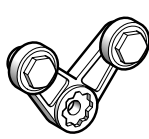
ZCKY59



ZCKY81



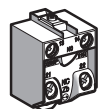
ZCKY91



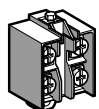
ZCKY71



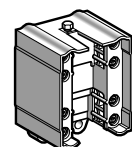
ZCKY61



XE2SP21●1



XE2NP21●1



XES P20●1

Operating levers for rotary heads

Description		Positive operation (1)	Reference	Weight kg
For actuation by 30° cam				
Roller lever (2)	Thermoplastic	⊖	ZCKY11	0.025
	Steel	⊖	ZCKY13	0.035
	Steel, ball bearing mounted	⊖	ZCKY14	0.030
Variable length roller lever (3)	Thermoplastic	-	ZCKY41	0.030
	Steel	-	ZCKY43	0.040

For actuation by any moving part

Square rod (2)	∅ 3 mm steel, L = 125 mm	-	ZCKY51	0.025
Round rod (2)	∅ 3 mm steel, L = 125 mm	-	ZCKY53	0.025
	∅ 3 mm glass fibre, L = 125 mm	-	ZCKY52	0.020
	∅ 6 mm thermoplastic, L = 200 mm	-	ZCKY59	0.030
Spring lever (3)		-	ZCKY81	0.020
Spring-metal rod lever (3)		-	ZCKY91	0.025

For actuation by specific cam (only for operation with head ZCKE096)

Forked arm with rollers (2)	1 track thermoplastic	-	ZCKY71	0.035
	2 track	-	ZCKY61	0.035

2-pole and double-pole contact blocks

Type of contact	Scheme	For body	Positive operation (1)	Reference	Weight kg
NC + NO snap action		ZCKJ1	⊖	XE2SP2151	0.020
NC + NO break before make, slow break		ZCKJ5	⊖	XE2NP2151	0.020
2 CO simultaneous, snap action		ZCKJ2	-	XESP2021	0.045
2 CO staggered, snap action		ZCKJ4	-	XESP2031	0.045
NC + NO make before break, slow break		ZCKJ6	⊖	XE2NP2161	0.020
NC + NC simultaneous, slow break		ZCKJ7	⊖	XE2NP2141	0.020
NO + NO simultaneous, slow break		ZCKJ8	-	XE2NP2131	0.020
NC + NC snap action		ZCKJ9	⊖	XE2SP2141	0.020

(1) ⊖: NC contact with positive opening operation or sub-assembly assuring positive opening operation.

(2) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever or its mounting.

(3) Adjustable throughout 360° in 5° steps.

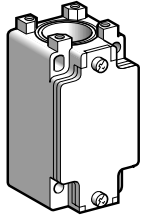
Limit switches

OsiSense XC Standard, industrial format EN 50041

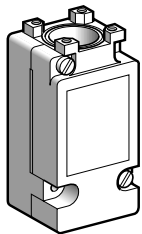
Metal, conforming to CENELEC EN 50041, type XCKJ

Fixed or plug-in body

Adaptable sub-assemblies for high temperature applications (+ 120°C)



ZCKJ●



ZCKJ●15

Bodies with contacts		For plunger or rotary head				
Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
Fixed bodies						
1 step	2-pole NC + NO snap action (XE2SP2151)		⊕	Pg 13.5	ZCKJ1	0.310
				ISO M20 x 1.5	ZCKJ1H29	0.310
				1/2" NPT	ZCKJ1H7	0.310
	Double-pole 2 CO simultaneous, snap action (XESP20215)		-	Pg 13.5	ZCKJ25	0.310
				ISO M20 x 1.5	ZCKJ25H29	0.310
				1/2" NPT	ZCKJ25H7	0.310
	2-pole NC + NO break before make, slow break (XE2NP2151)		⊖	Pg 13.5	ZCKJ5	0.310
				ISO M20 x 1.5	ZCKJ5H29	0.310
				1/2" NPT	ZCKJ5H7	0.310
2-pole NO + NC make before break, slow break (XE2NP2161)		⊖	Pg 13.5	ZCKJ6	0.310	
			ISO M20 x 1.5	ZCKJ6H29	0.310	
				1/2" NPT	ZCKJ6H7	0.310
2-pole NC + NC simultaneous, slow break (XE2NP2141)		⊖	Pg 13.5	ZCKJ7	0.310	
			ISO M20 x 1.5	ZCKJ7H29	0.310	
				1/2" NPT	ZCKJ7H7	0.310
2-pole NO + NO simultaneous, slow break (XE2NP2131)		-	Pg 13.5	ZCKJ8	0.310	
			ISO M20 x 1.5	ZCKJ8H29	0.310	
				1/2" NPT	ZCKJ8H7	0.310
2-pole NC + NC snap action (XE2SP2141)		⊖	Pg 13.5	ZCKJ9	0.310	
			ISO M20 x 1.5	ZCKJ9H29	0.310	
				1/2" NPT	ZCKJ9H7	0.310
2 step	Double-pole 2 CO staggered, snap action (XESP20315)		-	Pg 13.5	ZCKJ45	0.310
				ISO M20 x 1.5	ZCKJ45H29	0.310
				1/2" NPT	ZCKJ45H7	0.310
Plug-in bodies						
1 step	Single-pole CO snap action		-	Pg 13.5	ZCKJ115	0.300
				ISO M20 x 1.5	ZCKJ115H29	0.300
				1/2" NPT	ZCKJ115H7	0.300
Double-pole 2 CO simultaneous, snap action		-	Pg 13.5	ZCKJ215	0.300	
			ISO M20 x 1.5	ZCKJ215H29	0.300	
			1/2" NPT	ZCKJ215H7	0.300	
2 step	Double-pole 2 CO staggered, snap action		-	Pg 13.5	ZCKJ415	0.300
				ISO M20 x 1.5	ZCKJ415H29	0.300
				1/2" NPT	ZCKJ415H7	0.300
Bodies with contacts		With spring return rotary head (without operating lever)				
Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
Fixed body						
2 step 1 from the left AND 1 from the right	Double-pole 2 CO staggered, snap action		-	Pg 13.5	ZCKJ4045	0.455
				ISO M20 x 1.5	ZCKJ4045H29	0.455
				1/2" NPT	ZCKJ4045H7	0.455
Plug-in body						
2 step 1 from the left AND 1 from the right	Double-pole 2 CO staggered, snap action		-	Pg 13.5	ZCKJ41045	0.465
				ISO M20 x 1.5	ZCKJ41045H29	0.465
				1/2" NPT	ZCKJ41045H7	0.465

(1) ⊕: head assuring positive opening operation.

Limit switches

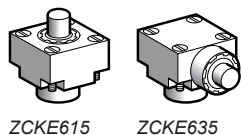
OsiSense XC Standard, industrial format EN 50041

Metal, conforming to CENELEC EN 50041, type XCKJ

Fixed or plug-in body

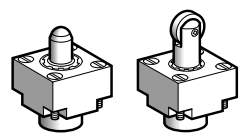
Adaptable sub-assemblies for high temperature applications (+ 120°C)

1



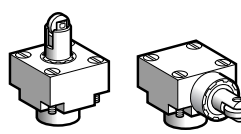
ZCKE615

ZCKE635



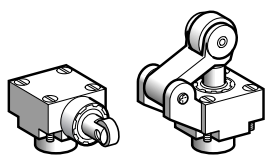
ZCKE665

ZCKE625



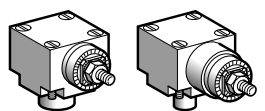
ZCKE675

ZCKE645



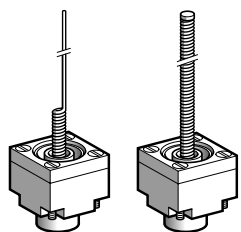
ZCKE655

ZCKE235



ZCKE055

ZCKE095



ZCKE065

ZCKE085

Plunger heads

Type of operator		Compatible bodies	Maximum actuation speed	Positive operation (1)	Reference	Weight kg
For actuation on end						
End plunger	Metal	ZCKJ1, J2, J4, ZCKJ115, J215, J415, ZCKJ5, J6, J7, J8, J9	0.5 m/s	⊕	ZCKE615	0.140
Side plunger	Metal	ZCKJ1, J2, ZCKJ115, J215, ZCKJ5, J6, J7, J8, J9	0.5 m/s	⊕	ZCKE635	0.200
For actuation by 30° cam						
End ball bearing plunger	Steel	ZCKJ1, J2, J4, ZCKJ115, J215, J415, ZCKJ5, J6, J7, J8, J9	0.1 m/s	⊕	ZCKE665	0.150
End roller plunger	Steel	ZCKJ1, J2, J4, ZCKJ115, J215, J415, ZCKJ5, J6, J7, J8, J9	1 m/s	⊕	ZCKE625	0.155
End reinforced roller plunger	Steel	ZCKJ1, J2, J4, ZCKJ115, J215, J415, ZCKJ5, J6, J7, J8, J9	1 m/s	⊕	ZCKE675	0.155
Side roller plunger	Steel Horizontal	ZCKJ1, J2, ZCKJ115, J215, ZCKJ5, J6, J7, J8, J9	0.6 m/s	⊕	ZCKE645	0.205
	Steel Vertical	ZCKJ1, J2, ZCKJ115, J215, ZCKJ5, J6, J7, J8, J9	0.6 m/s	⊕	ZCKE655	0.205
Roller lever plunger (1 direction of actuation)	Steel	ZCKJ1, J2, J4, ZCKJ115, J215, J415, ZCKJ5, J6, J7, J8, J9	1.5 m/s	⊕	ZCKE235	0.195
	Thermoplastic	ZCKJ1, J2, J4, ZCKJ115, J215, J415, ZCKJ5, J6, J7, J8, J9	1.5 m/s	⊕	ZCKE215	0.185

Rotary heads (without operating lever)

Type		Compatible bodies	Maximum actuation speed	Positive operation (1)	Reference	Weight kg
Spring return, for actuation from left AND right or from left OR right (see page 1/136)		ZCKJ1, J2, J4, ZCKJ115, J215, ZCKJ415, ZCKJ5, J6, J7, J8, J9	1.5 m/s by 30° cam	⊕	ZCKE055	0.165
Stay put, actuation from left AND right (see page 1/136)		ZCKJ1, J2, ZCKJ115, J215	0.5 m/s	–	ZCKE095	0.190

Multi-directional heads

Type of operator		Compatible bodies	Maximum actuation speed	Positive operation (1)	Reference	Weight kg
For actuation by any moving part						
"Cat's whisker"		ZCKJ1, J2, ZCKJ115, J215, ZCKJ5, J6, J7, J8, J9	1 m/s in any direction	–	ZCKE065	0.115
Spring rod		ZCKJ1, J2, ZCKJ115, J215, ZCKJ5, J6, J7, J8, J9	0.5 m/s in any direction	–	ZCKE085	0.125

(1) ⊕: head assuring positive opening operation.

Limit switches

OsiSense XC Standard, industrial format EN 50041

Metal, conforming to CENELEC EN 50041, type XCKJ

Fixed or plug-in body

Adaptable sub-assemblies for high temperature applications (+ 120°C)



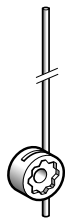
ZCKY1●



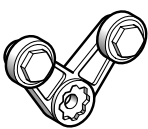
ZCKY43



ZCKY51



ZCKY5●



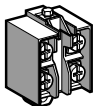
ZCKY715



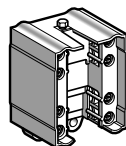
ZCKY615



XE2SP21●1



XE2NP21●1



XESP20●15

Operating levers for rotary heads

Description		Positive operation (1)	Reference	Weight kg
For actuation by 30° cam				
Roller lever (2)	Thermoplastic	⊕	ZCKY115	0.025
	Steel	⊕	ZCKY13	0.035
	Steel, ball bearing mounted	⊕	ZCKY14	0.030
Variable length roller lever (3)	Thermoplastic	–	ZCKY415	0.030
	Steel	–	ZCKY43	0.040
For actuation by any moving part				
Square rod (2)	∅ 3 mm steel, L = 125 mm	–	ZCKY51	0.025
Round rod (2)	∅ 3 mm steel, L = 125 mm	–	ZCKY53	0.025
	∅ 3 mm glass fibre, L = 125 mm	–	ZCKY52	0.020

For actuation by specific cam (only for operation with head ZCKE095)

Forked arm with rollers (2)	1 track	–	ZCKY715	0.035
thermoplastic	2 track	–	ZCKY615	0.035

2-pole and double-pole contact blocks

Type of contact	Scheme	For bodies	Positive operation (1)	Reference	Weight kg
NC + NO snap action		ZCKJ1	⊕	XE2SP2151	0.020
NC + NO break before make, slow break		ZCKJ5	⊕	XE2NP2151	0.020
2 CO simultaneous, snap action		ZCKJ25	–	XESP20215	0.045
2 CO staggered, snap action		ZCKJ45	–	XESP20315	0.045
NC + NO make before break, slow break		ZCKJ6	⊕	XE2NP2161	0.020
NC + NC simultaneous, slow break		ZCKJ7	⊕	XE2NP2141	0.020
NO + NO simultaneous, slow break		ZCKJ8	–	XE2NP2131	0.020
NC + NC snap action		ZCKJ9	⊕	XE2SP2141	0.020

(1) ⊕: NC contact with positive opening operation or sub-assembly assuring positive opening operation.

(2) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever or its mounting.

(3) Adjustable throughout 360° in 5° steps.

Presentation

Electromechanical detection

Limit switches are used in all automated installations and also in a wide variety of applications, due to the numerous advantages inherent to their technology.

They transmit data to the logic processing system regarding:

- presence/absence,
- passing,
- positioning,
- end of travel.

Simplicity of installation, advantages

■ From an electrical viewpoint

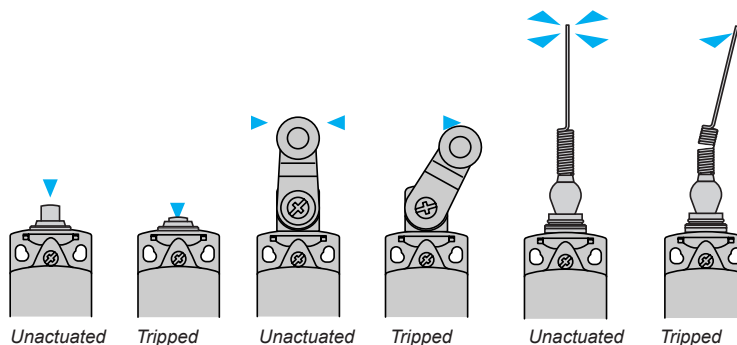
- galvanic separation of circuits,
- models suitable for low power switching combined with good electrical durability,
- very good short-circuit withstand in coordination with appropriate fuses,
- total immunity to electromagnetic interference,
- high rated operational voltage.

■ From a mechanical viewpoint

- NC contacts with positive opening operation,
- high resistance to the different ambient conditions encountered in industry (standard tests and specific tests under laboratory conditions),
- high repeat accuracy, up to 0.01 mm on the tripping points.

Detection movements

- Linear movement (plunger)
- Rotary movement (lever)
- Multi-directional movement



Terminology

Rated value of a quantity

- This replaces the term “nominal value”.
- It is the fixed value for a specific function.

Utilisation categories:

- AC-15 replaces AC-11: control of an electromagnet on AC, test 10 le/le.
- AC-12: control of a resistive load on AC or static load isolated by opto-coupler.
- DC-13 replaces DC-11: control of an electromagnet on DC, test le/le.

Positive opening travel

- Minimum travel from the initial movement of contact actuator to the position required to accomplish positive opening operation.

Positive opening force

- The force required on the contact actuator to accomplish positive opening operation.

Switching capacity

- Ithe is no longer a rated value but a conventional current used for heating tests.
- Example:** for category A300 the corresponding operational current, Ithe maximum, is 6 A-120 V or 3 A-240 V, the equivalent Ithe being 10 A.

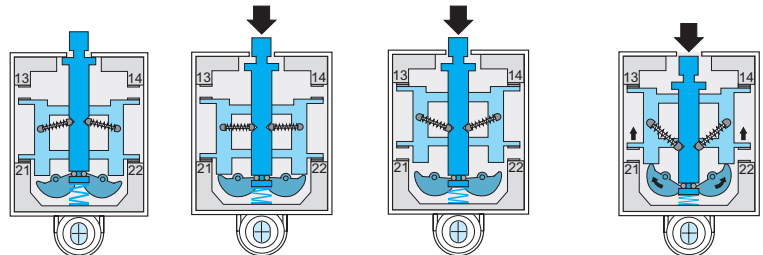
Positive opening operation

- A limit switch complies to this specification when all the closed contact elements of the switch can be changed, with certainty, to the open position (no flexible link between the moving contacts and the operator of the switch, to which an actuating force is applied).
- All limit switches incorporating either a slow break contact block or a snap action NC + NO (form Zb), NC + NO + NO, NC + NC + NO, NC + NC + NO + NO contact block are positive opening operation, in complete conformity with standard IEC 60947-5-1 Appendix K.

Contact blocks

Snap action contacts

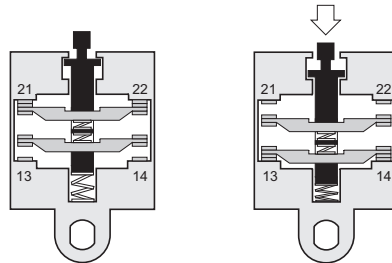
- Snap action contacts are characterised by different tripping and reset points (differential travel).
- The displacement speed of the moving contacts is not related to the speed of the operator.
- This feature ensures satisfactory electrical performance in applications involving low speed actuators.



Unactuated state Approach travel Contact change of state Positive opening

Slow break contacts

- Slow break contacts are characterised by identical tripping and resetting points.
 - The displacement speed of the moving contacts is equal, or proportional, to the speed of the operator (which must not be less than 0.1 m/s = 6 m/minute).
- The opening distance is also dependent on the distance travelled by the operator.



Electrical durability for normal loads

- Normally, for inductive loads, the current value is less than 0.1 A (sealed), i.e. values of 3 to 40 VA sealed and 30 to 1000 VA inrush, depending on the voltage.
- For this type of application the electrical durability will exceed 10 million operating cycles.
- Application example: XCKJ161 + LC1D12●●●** (7 VA sealed, 70 VA inrush).
Electrical durability = 10 million operating cycles.

Switching capacity

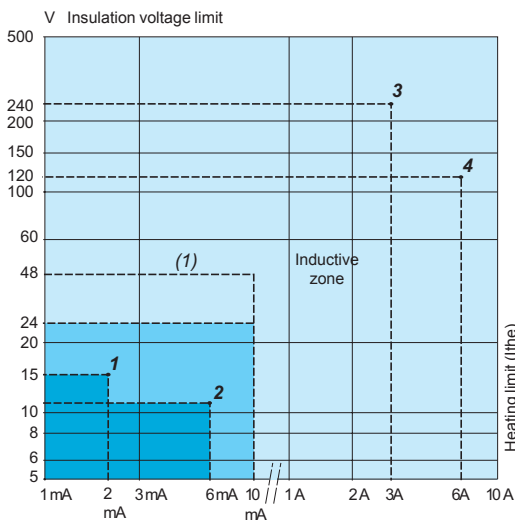
- 1 Normal industrial PLC input type 1 (PLC: industrial programmable logic controllers)
- 2 Normal industrial PLC input type 2
- 3 Switching capacity conforming to IEC 60947-5-5, utilisation category AC-15, DC-13

A300	240 V	3 A	B300	240 V	1.5 A
Q300	250 V	0.27 A	R300	250 V	0.13 A
- 4 Switching capacity conforming to IEC 60947-5-1, utilisation category AC-15, DC-13

A300	120 V	6 A	B300	120 V	3 A
Q300	125 V	0.55 A	R300	125 V	0.27 A

Electrical durability for small loads

- The use of limit switches with programmable controllers is becoming more common.
- With small loads, limit switches offer the following levels of reliability:
 - failure rate of less than 1 for 100 million operating cycles using snap action contacts (contacts XE2SP),
 - failure rate of less than 1 for 20 million operating cycles using slow break contacts (contacts XE●NP and XE3SP).
 - failure rate of less than 1 for 5 million operating cycles using contacts XCMD.

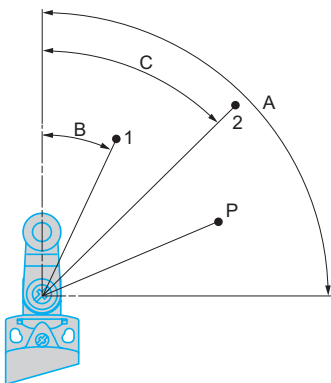
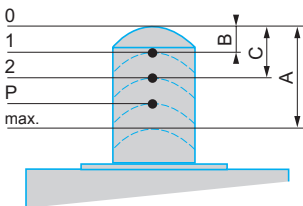
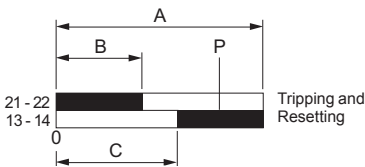
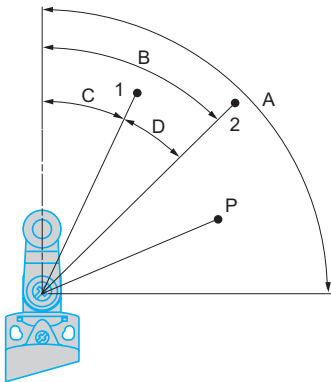
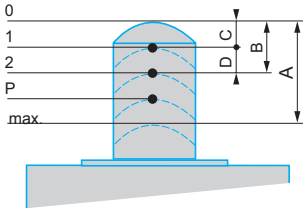
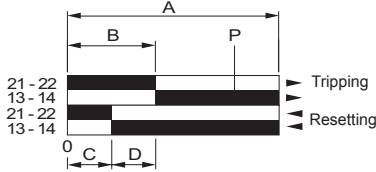


		Range of use	
Standard contacts	XE2SP2151, P3151	Standard	Standard
	XE2NP●●●●	Standard	Standard
Continuous service (frequent switching)	Contacts of XCMD	Standard	Standard
	XE3●P●●●●	Standard	Standard
Gold flashed contacts on resistive load	Occasional service Infrequent switching, ≤ 1 operating cycle/day, and/or corrosive atmosphere	Standard	(1)

(1) Usable up to 48 V/10 mA.

1

Contact blocks (continued)



Functional diagrams of snap action contacts

■ Example: NC + NO

A - Maximum travel of operator in millimetres or degrees.
 B - Tripping travel of contact.
 C - Resetting travel of contact.
 D - Differential travel = B - C.
 P - Point from which positive opening is assured.

□ Linear movement (plunger)

1 - Resetting point of contact.
 2 - Tripping point of contact.
 A - Maximum travel of operator in millimetres.
 B - Tripping travel of contact.
 C - Resetting travel of contact.
 D - Differential travel = B - C.
 P - Point from which positive opening is assured.

□ Rotary movement (lever)

1 - Resetting point of contact.
 2 - Tripping point of contact.
 A - Maximum travel of operator in degrees.
 B - Tripping travel of contact.
 C - Resetting travel of contact.
 D - Differential travel = B - C.
 P - Point from which positive opening is assured.

Functional diagrams of slow break contacts

■ Example: NC + NO break before make

A - Maximum travel of operator in millimetres or degrees.
 B - Tripping and resetting travel of contact 21-22.
 C - Tripping and resetting travel of contact 13-14.
 P - Point from which positive opening is assured.

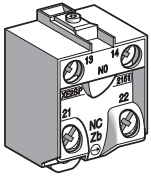
□ Linear movement (plunger)

1 - Tripping and resetting points of contact 21-22.
 2 - Tripping and resetting points of contact 13-14.
 A - Maximum travel of operator in millimetres.
 B - Tripping and resetting travel of contact 21-22.
 C - Tripping and resetting travel of contact 13-14.
 P - Positive opening point.

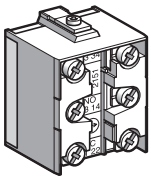
□ Rotary movement (lever)

1 - Tripping and resetting points of contact 21-22.
 2 - Tripping and resetting points of contact 13-14.
 A - Maximum travel of operator in degrees.
 B - Tripping and resetting travel of contact 21-22.
 C - Tripping and resetting travel of contact 13-14.
 P - Positive opening point.

Contact blocks (continued)



XE2•P screw clamp terminal connections

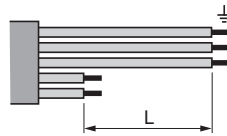


XE3•P screw clamp terminal connections

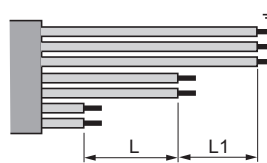
Mounting

Contact connections

- Tightening torque:
 - minimum tightening torque ensuring the nominal characteristics of the contact: 0.8 N.m,
 - maximum tightening torque without damage to the terminals: 1.2 N.m for XE2•P, 1 N.m for XE3•P.
- Connecting cable: cable preparation lengths:
 - for XE2•P, L = 22 mm,
 - for XE2•P3•••, L = 45 mm,

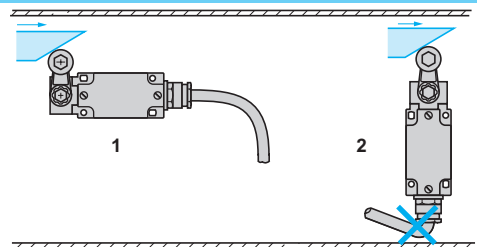


- for XE3•P, L = 14 mm, L1 = 11 mm.



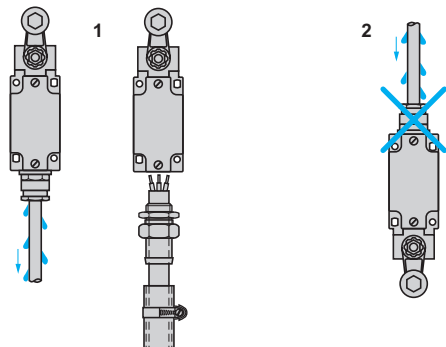
Sweep of connecting cable

- 1 Recommended
- 2 To be avoided



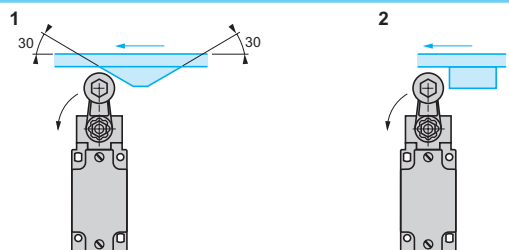
Position of cable gland

- 1 Recommended
- 2 To be avoided



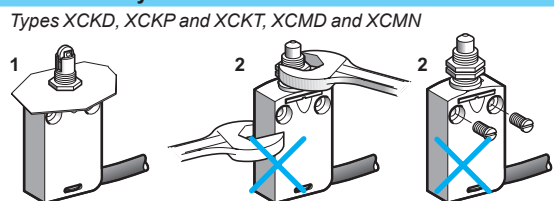
Type of cam

- 1 Recommended
- 2 To be avoided



Mounting and fixing limit switches by the head

- 1 Recommended
- 2 Forbidden



Types XCKD, XCKP and XCKT, XCMD and XCMN

Setting-up

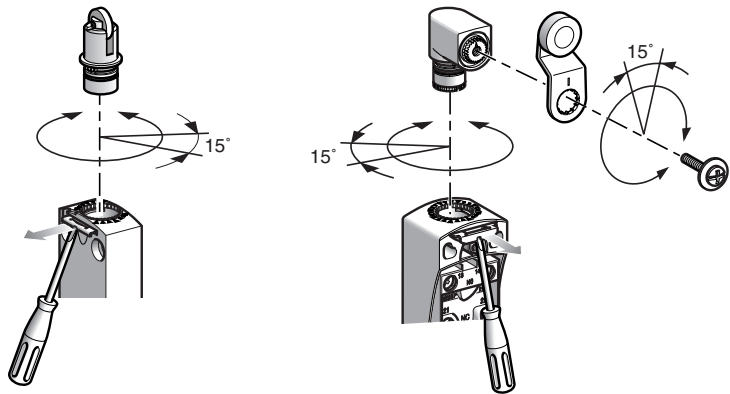
Tightening torque

- The minimum torque is that required to ensure correct operation of the switch.
- The maximum torque is the value which, if exceeded, will damage the switch.

Range	Item	Torque (N.m)	
		Min.	Max.
Compact design XCKD, XCKP, XCKT	Cover	0.8	1.2
	Fixing screw for lever on rotary head	1	1.5
Miniature design XCMD, XCMN	–	–	–
	Fixing screw for lever on rotary head	1	1.5
Compact design XCKN	Cover	0.8	1.2
	Fixing screw for lever on rotary head	1	1.5
Classic design XCKJ	Cover	1	1.5
	Fixing nut for lever on rotary head	1	1.5
Classic design XCKS	Cover	0.8	1.2
	Fixing nut for lever on rotary head ZCKD	1	1.5
	Fixing nut for lever on rotary head XCKS	0.8	1.2
	Fixing head on body	0.8	1.2
Classic design XCKM, XCKML, XCKL	Cover	0.8	1.2
	Fixing nut for lever on rotary head	1	1.5

Types XCKD, XCKP, XCKT, XCMD

- Adjustable in 3 planes:

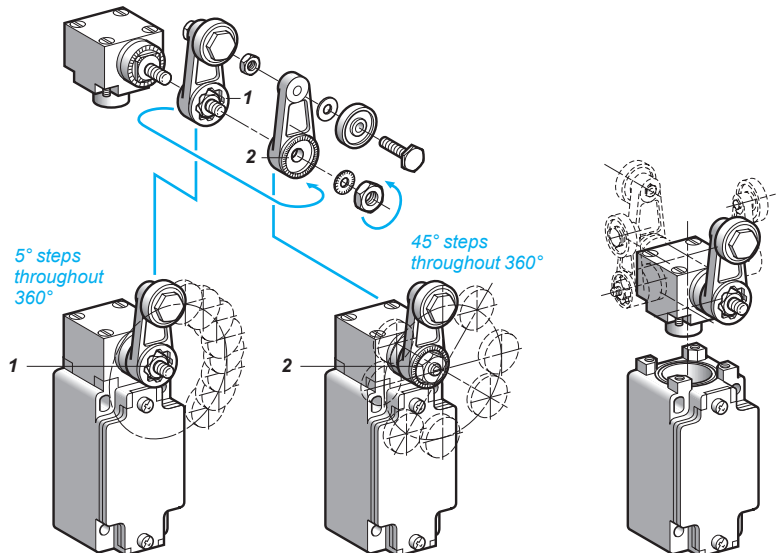


All the heads can be adjusted in 15° steps throughout 360°, in relation to the body.

All the levers can be adjusted in 15° steps throughout 360°, in relation to the horizontal axis of the head.

Type XCKJ

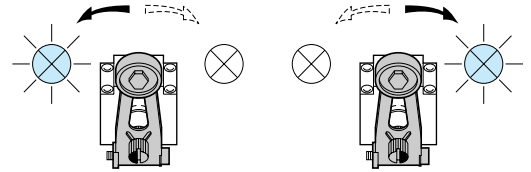
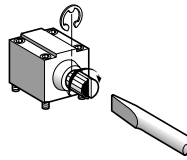
- Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever or its mounting.
- 1 Reversed $\alpha = 5^\circ$
 - 2 Forward $\alpha = 45^\circ$



Setting-up (continued)

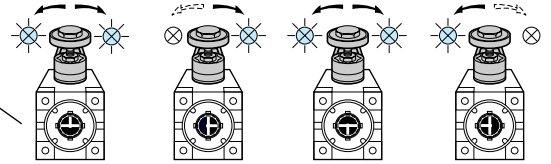
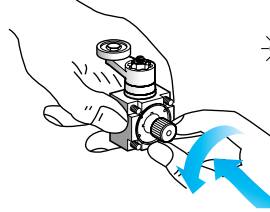
Direction of actuation programming

■ XC2J



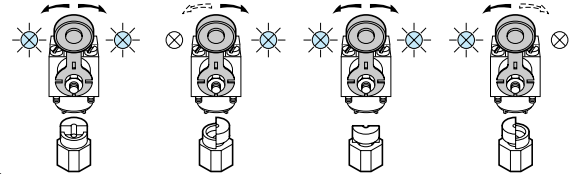
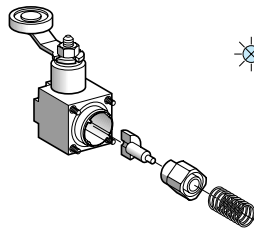
Head ZC2JE05

■ XCKJ



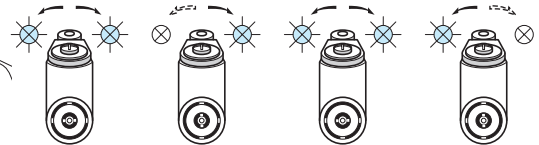
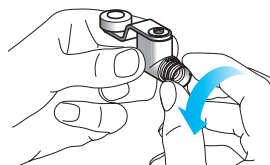
Head ZCKE05

■ XCKS



Head ZCKD05

■ XCKD, XCKP, XCKT and XCMD



Head ZCE05

Specific cams for heads ZCKE09 and ZC2JE09

- 1 0.5 mm min.
- 2 2 mm min.



A = length of lever + 11 mm
ZCKE09: $13 < h < 18$ mm and $B = 12$ mm max.
ZC2JE09: $14 < h < 24$ mm and $B = 6$ mm max.

1

Reminder of the standards

The majority of Schneider Electric products comply to national standards (for example French NF C standards, German DIN standards), European standards (for example CENELEC) or international standards (for example IEC). These standards rigidly stipulate the characteristic requirements of the designated products (for example IEC 60947 relating to low voltage switchgear and control gear). These products, when correctly used, enable the production of control equipment assemblies, machine control equipment or installations conforming to their own specific standards (for example IEC 60204 for the electrical equipment of industrial machines).

IEC 60947-5-1

Insulation coordination (and dielectric strength)

- The standard IEC 60664 defines 4 categories of prospective transient overvoltages. It is important for the user to select control circuit components which are able to withstand these overvoltages. To these ends, the manufacturer states the rated impulse withstand voltage (U imp) applicable to the product.

Terminal connections

- The cabling capacity, mechanical robustness and durability of the terminals, as well as the ability to resist loosening, are verified by standardised tests.
- Terminal reference marking conforms to standard IEC 60947-5-1 Appendix M.

Switching capacity

- With maximum electrical load. A single designation (A300 for example) enables indication of the contact block characteristics related to its utilisation category.

Positive opening operation (IEC 60947-5-1 Appendix K)

- For contacts used in safety applications (end of travel, emergency stop device, etc.) the assurance of positive opening is required (see IEC 60204, EN 60204) after each test, the opening of the contact being verified by testing with an impulse voltage (2500 V).

Electrical symbols for contacts



- Form Za, the 2 contacts (NO + NC) are the same polarity.



- Form Zb, the 2 contacts (NO + NC) are electrically separate.

Symbol for positive opening



- Simplified version



- Complete symbol

CENELEC EN 50047

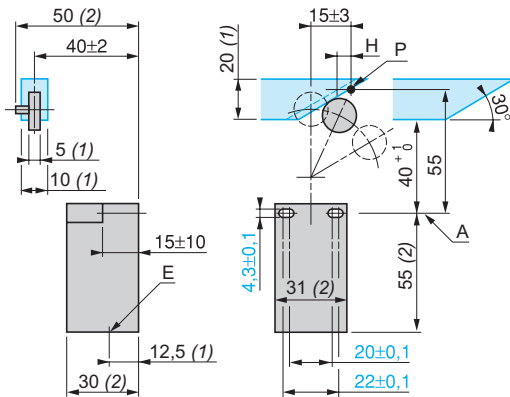
The European standards organisation CENELEC, which has 14 member countries, has defined in this standard the first type of limit switch.

It defines 4 variants of devices (forms A, B, C, E).
Limit switches XCKP, XCKD and XCKT conform to standard EN 50047.

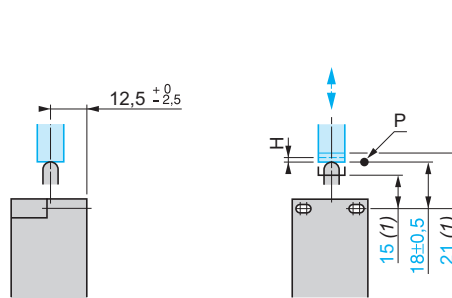
(1) Minimum value
(2) Maximum value

A: reference axis
H: differential travel
P: tripping point
E: cable entry

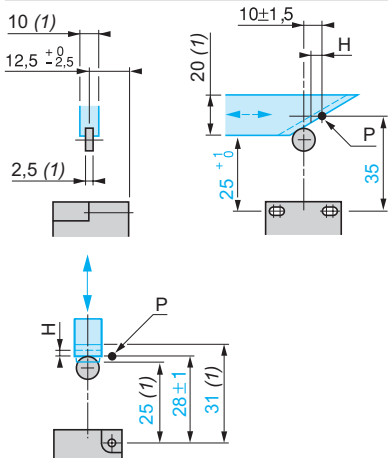
Form A, with roller lever



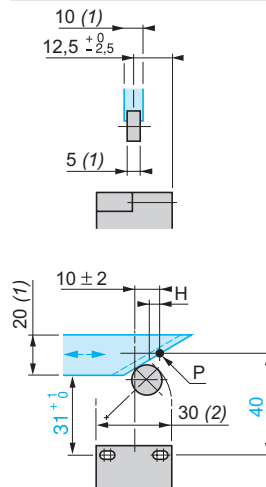
Form B, with end plunger (rounded)



Form C, with end roller plunger



Form E, with roller lever for 1 direction of actuation



Reminder of the standards (continued)

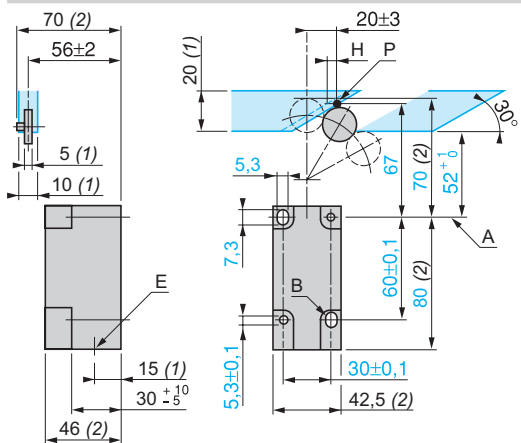
CENELEC EN 50041
The European standards organisation CENELEC, which has 14 member countries, has defined in this standard the second type of limit switch.

It defines 6 variants of devices (forms A, B, C, D, F, G).
Limit switches XCKJ and XCKS conform to standard EN 50041.

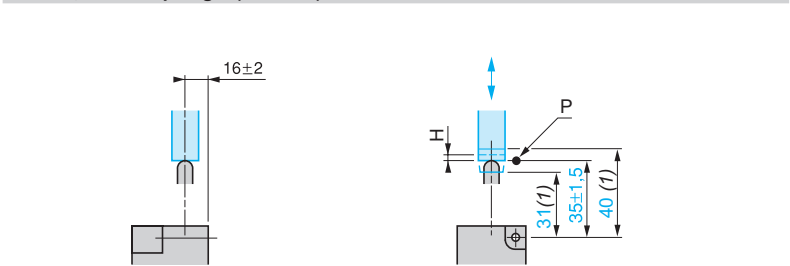
(1) Minimum value
(2) Maximum value

A: reference axis
B: optional elongated holes
H: differential travel
P: tripping point
E: cable entry
Za: tripping zone
Sa: tripping threshold

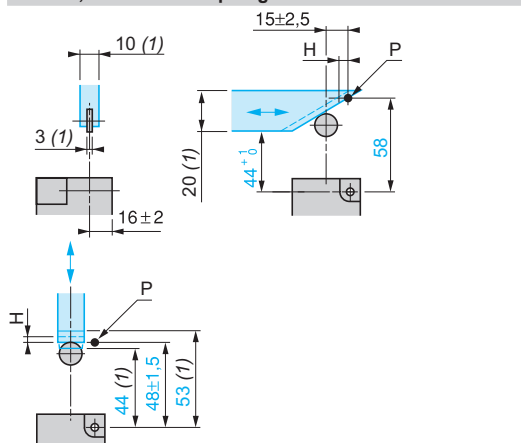
Form A, with roller lever



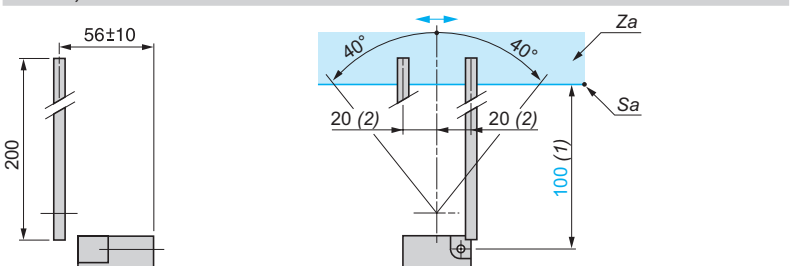
Form B, with end plunger (rounded)



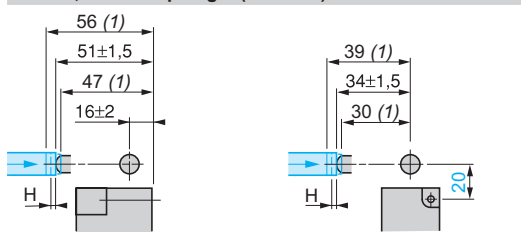
Form C, with end roller plunger



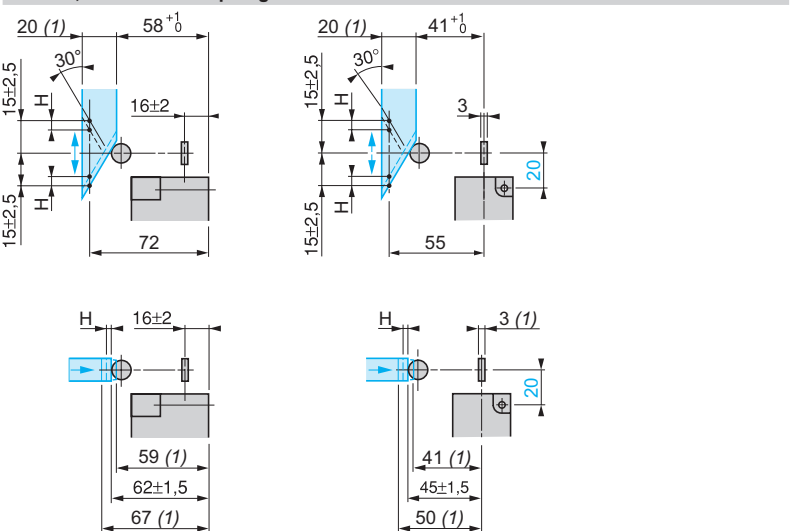
Form D, with rod lever



Form F, with side plunger (rounded)



Form G, with side roller plunger



Limit switches

OsiSense XCKW

Wireless and batteryless limit switches

1

Product type

Transmitters: plunger head and rotary head limit switches



Actuator type

Metal end plunger	Steel roller plunger	Thermoplastic roller lever	Steel roller lever
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Radio transmission

Transmission protocol

Maximum range

Transmission power

Activation time

Transmission time

ZigBee® Green Power at 2.4 GHz (IEEE 802.15.4)

100 m in free field.
300 m with a relay antenna in free field.
25 m when the receiver is placed in a metal enclosure.

3 mW

2 ms

< 2 ms

Certifications and directives

Product certifications

Radio approvals

EN/IEC 60947-5, EMC 2004/108/EC directive, R&TTE 1999/5/EC directive, EAC, CE

FCC (USA), IC (Canada), RCM (Australia)

Mechanical characteristics

Mechanical life

Maximum operating rate

Maximum tripping force

Materials

400,000 operating cycles

3600 operating cycles per hour

50 N | 0.5 N.m

Plastic bodies and heads

Environment

Ambient air temperature

Degree of protection

Degree of protection

Operation: - 25...+ 55°C
Storage: - 40...+ 70°C

IP 66 and IP 67 conforming to EN/IEC 60529

IK 05 conforming to EN/IEC 50102

Electromagnetic compatibility (EMC)

Electrostatic discharges

Electromagnetic fields

Radiated emissions

8 kV (air) and 6 kV (contact) conforming to IEC 61000-4-2

10 V/m from 80 to 2000 MHz, conforming to EN/IEC 61947-5-1 and IEC 61000-4-3

3 V/m from 80 to 2700 MHz and a distance of 20 m, conforming to IEC 61000-4-3, EN 301-489-1 and EN 301-489-3

Conforming to standards EN 300-440-1 and EN 300-440-2

References

XCKW101	XCKW102	XCKW131	XCKW133
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Pages

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(1) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer.
(2) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever mounting.



Variable length thermoplastic roller lever (1)	Variable length steel roller lever (1)	Elastomer roller lever, Ø 50 mm	Variable length elastomer roller lever, Ø 50 mm (1)	Round thermoplastic rod lever, Ø 6 mm (2)
------------------------------------------------	----------------------------------------	---------------------------------	-----------------------------------------------------	-------------------------------------------

ZigBee® Green Power at 2.4 GHz (IEEE 802.15.4)
 100 m in free field.
 300 m with a relay antenna in free field.
 25 m when the receiver is placed in a metal enclosure.
 3 mW
 2 ms
 < 2 ms

EN/IEC 60947-5, EMC 2004/108/EC directive, R&TTE 1999/5/EC directive, EAC, CE
 FCC (USA), IC (Canada), RCM (Australia)

400,000 operating cycles
 3600 operating cycles per hour
 0.5 N.m
 Plastic bodies and heads

Operation: - 25...+ 55°C
 Storage: - 40...+ 70°C
 IP 66 and IP 67 conforming to EN/IEC 60529
 IK 05 conforming to EN/IEC 50102

8 kV (air) and 6 kV (contact) conforming to IEC 61000-4-2
 10 V/m from 80 to 2000 MHz, conforming to EN/IEC 61947-5-1 and IEC 61000-4-3
3 V/m from 80 to 2700 MHz and a distance of 20 m, conforming to IEC 61000-4-3, EN 301-489-1 and EN 301-489-3
 Conforming to standards EN 300-440-1 and EN 300-440-2

XCKW141	XCKW143	XCKW139	XCKW149	XCKW159
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1/144

Limit switches

OsiSense XCKW

Wireless and batteryless limit switches

1

Product type	Receivers for wireless radio communication		
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Maximum number of transmitters	2	32	32
Number and type of outputs	2 PNP outputs	4 PNP outputs	2 relays C/O type outputs
Radio transmission	ZigBee® Green Power at 2.4 GHz (IEEE 802.15.4)		
Transmission protocol			
Maximum range	100 m in free field. 300 m with a relay antenna in free field. 25 m when the receiver is placed in a metal enclosure.		
Response time	< 30 ms		
Certifications and directives	Product certifications and radio approvals		
EN/IEC 60947-5-1 CE	EN/IEC 60947-5, UL 508, CSA C22.2 no. 14, CCC, GOST, EMC 2004/108/EC directive, R&TTE 1999/5/EC directive, FCC, RSS, C-Tick, ANATEL, SRRC, CE		
Power supply	Nominal supply voltage		
24 V $\overline{\text{---}}$ (-15...+ 15%)	24...240 V $\sim/\overline{\text{---}}$ (-10...+ 10%)		
Output characteristics	Nominal current and voltage		
0.2 A/24 V $\overline{\text{---}}$	0.3 A/48 V $\overline{\text{---}}$ 3 A/120 V \sim conforming to IEC 60947-5-1 3 A/250 V \sim conforming to UL 508 and CSA C22.14		
Environment	Ambient air temperature		
Operation: - 25...+ 55°C Storage: - 40...+ 70°C			
Degree of protection	IP 20 conforming to EN/IEC 60529	IP 20 conforming to EN/IEC 60529	
References	XZBWR2STT24	ZBRRC (1)	ZBRRD (1)
Pages	1/145		

(1) Schneider Electric products.

Access points for wireless and batteryless limit switches	Accessories			
		Relay antenna	External antenna for ZBRN1 and ZBRN2	Communication module for ZBRN1



60	60	-	-	-
Ethernet Modbus/TCP communication protocol	Communication via Modbus serial link 2 RS485 ports	-	-	-
ZigBee® Green Power at 2.4 GHz (IEEE 802.15.4)		ZigBee® Green Power at 2.4 GHz (IEEE 802.15.4)		-
100 m in free field 300 m with a relay antenna in free field 25 m when the receiver is placed in a metal enclosure		300 m maximum depending on environment	100 m in free field	-
< 30 ms		-	-	-
EN/IEC 60947-5, UL 508, CSA C22.2 no. 14, CCC, GOST, EMC 2004/108/EC directive, R&TTE 1999/5/EC directive, FCC, RSS, C-Tick, ANATEL, SRRC, CE		CCC, CSA, C-Tick, GOST, UL 508, BT 2006/95/EC, CE	-	CSA, UL 508, UL 873, UL 60730-1, BTL, CE
24...240 V ~/- (-10...+ 10%)		24...240 V ~/-	-	-
-	-	-	-	-
Operation: - 25...+ 55°C Storage: - 40...+ 70°C		Operation: - 25...+ 55°C Storage: - 40...+ 70°C	-	Operation: - 20...+ 65°C Storage: - 25...+ 70°C
IP 20 conforming to EN/IEC 60529		IP 65 conforming to EN/IEC 60529 IK 05 conforming to EN/IEC 50102	-	IP 20 conforming to EN/IEC 60529
ZBRN1 (1)	ZBRN2 (1)	ZBRA1 (1)	ZBRA2 (1)	ZBRCETH (1)
1/146		1/147		

Limit switches

OsiSense XCKW

Wireless and batteryless limit switches

1

OsiSense XCKW

Telemecanique Sensors has expanded its offer of wireless products with the launch of a range of limit switches based on an automatic radio wave generator system.

This range includes transmitters and receivers which communicate via 2.4 GHz radio transmission.

There is no need to use batteries, as the radio pulse is emitted while the actuator moves.

Operation is therefore one-way towards the receiver.

The OsiSense XCKW offer can be used to find the position of an item or part of a machine remotely, without a wired connection. The transmitter is equipped with a "dynamo" generator which converts the mechanical energy produced by the actuator movement to electrical energy. A radio-encoded message (2.4 GHz ZigBee protocol) is then sent, by a single pulse, to one or more receivers located several dozen metres away.

There are therefore no batteries, as the system is self-powered.

Each transmitter has a unique identification code, which enables optimum management of each one. To incorporate this code, a simple teach sequence should be performed on the receiver using 2 buttons on the front face.

Thanks to this technology, the industrial applications field has diversified and now meets the requirements of machine manufacturers in terms of flexibility and modularity. It is the ideal product for confirming the position of a part remotely after a manual operation by an operator (1).

OsiSense XCKW wireless limit switches are therefore particularly suitable (2) for:

- automatic doors
- expandable conveyors
- wheel checks for lorries
- rotary machines
- turntables

Reminder: With the XZBWE112A24 multi-sensors transmitter, our "less-wire" offer allows continuous communication between the transmitter and the receiver.

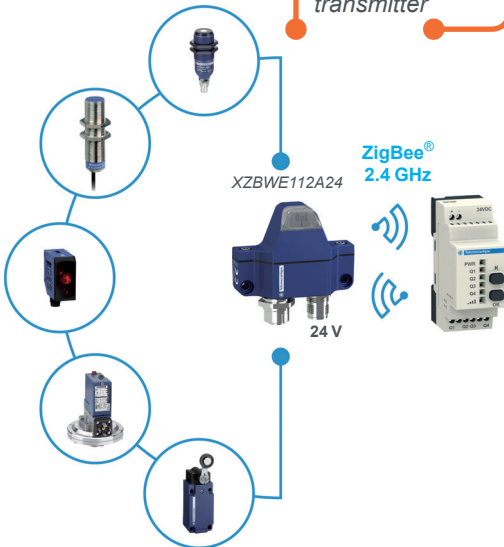
NB: Receivers can be actuated by Schneider Electric's OsiSense XCKW limit switches or ZB•RTA• pushbuttons.

Wave generated automatically without a battery



Wireless offer: one-way **pulsed** transmission

"Multi-sensors" transmitter



"Less-wire" offer: two-way **continuous** transmission



Simplified installation

- > Faster installation: no wiring between the limit switch and the receiver.
- > No configuration necessary, thanks to the Plug and Play ready-to-use solution.
- > Freedom of movement around the machine or process, in order to detect parts that are moving or difficult to access.

Reduced maintenance

- > No battery maintenance required.
- > Optimum availability of control functions.
- > Minimal post-installation maintenance (no need for periodic retightening of contact terminal connections, no cables to be replaced or repaired).

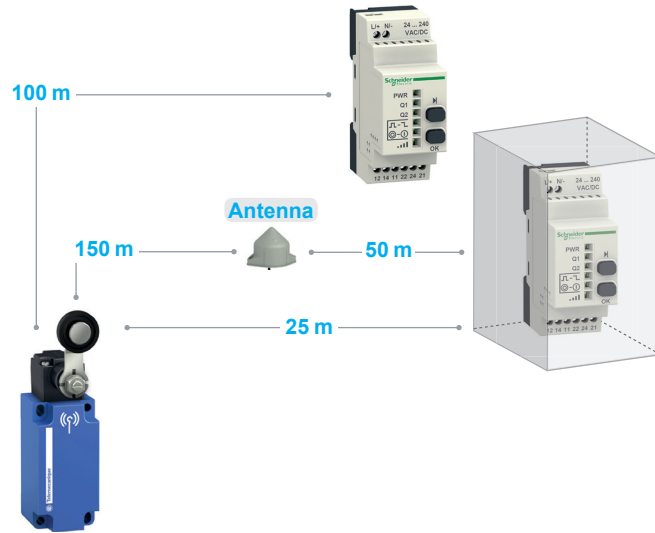
(1) The operating speed must be faster than 10 mm/s.
 (2) OsiSense XCKW wireless and batteryless limit switches are not suitable for hoisting applications or dangerous machines. For these applications and machines, OsiSense XC Standard cabled switches are ideal. Please contact our Customer Care Centre.

Wireless and batteryless switches for simplified installation

Improved performance

A relay antenna to increase the signal range

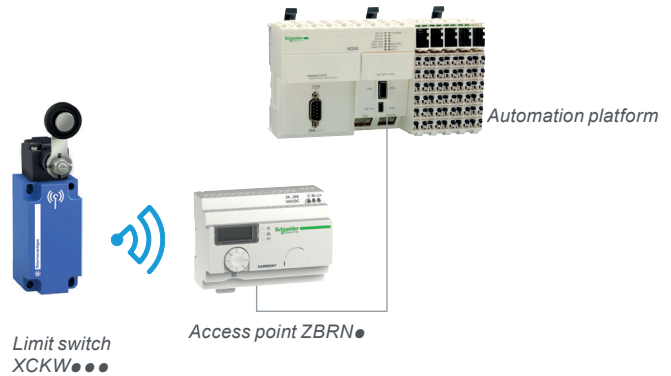
- > Range of 300 metres, in free field, using an external relay antenna.
- > Range of 200 metres when the receiver is installed in a metal enclosure, using an external relay antenna.
- > Range of 100 metres in free field.
- > Range of 25 metres when the receiver is installed in a metal enclosure (1).



Open protocols for easy integration

Large I/O capacity

- > The offer includes a receiver that can manage up to 60 transmitters. The signals received are converted to communication protocols.
- > The proposed access points can be connected to an automation platform by either Modbus RS485 serial link or Modbus/TCP protocol.



(1) The distances stated may vary depending on the environment.

Limit switches

OsiSense XCKW

Wireless and batteryless limit switches

1



ZigBee®
2.4 GHz



Description

"Components" offer

The OsiSense XCKW offer is available as separate parts and consists of:

- **9 wireless and batteryless limit switches**, consisting of a plastic body and an actuator head taken from existing ranges (OsiSense XCKS and OsiSense XCKM).

- **3 receivers**, which can be programmed using buttons on the front face.

- with 2 contact relay outputs, 24...240 V ~/---.

- with 2 or 4 PNP transistor outputs, 24 V ---.

- **2 access points** which provide network connectivity openness by operating as an intermediate device between the transmitter and the PLC. The access point receives radio signals from the OsiSense XCKW limit switches and converts them to communication protocols.

The access point is connected to the PLC using:

- an Ethernet Modbus/TCP communication protocol, for ZBRN1.

- a Modbus RS485 serial link communication, for ZBRN2.

- **accessories:**

- 1 active relay antenna to boost the signal when the receiver is in a metal enclosure or to get round obstacles in the case of a complex installation.

- 1 external antenna for entry points ZBRN1 or ZBRN2 to increase the range.

- 1 communication module for Ethernet Modbus/TCP network.

Ready-to-use pack offer

To make it easier to install OsiSense XCKW switches, ready-to-use packs are also available.

The transmitter (limit switch) and receiver are factory-paired.

Each pack contains:

- a limit switch
 - a version with steel roller plunger
 - a version with plastic roller lever

- a receiver with 2 relay outputs



XCKW101



XCKW102



XCKW159



XCKW131



XCKW133



XCKW139



XCKW141



XCKW143



XCKW149

References

Limit switches

Actuator type	Reference	Weight kg
Metal plunger	XCKW101	0.210
Steel roller plunger	XCKW102	0.220
Thermoplastic roller lever	XCKW131	0.240
Steel roller lever	XCKW133	0.245
Variable length thermoplastic roller lever	XCKW141	0.260
Variable length steel roller lever	XCKW143	0.265
Elastomer roller lever, Ø 50 mm	XCKW139	0.220
Variable length elastomer roller lever, Ø 50 mm	XCKW149	0.270
Round thermoplastic rod lever, Ø 6 mm	XCKW159	0.230

Limit switches

OsiSense XCKW

Wireless and batteryless limit switches



XCKWD02



XCKWD31



ZBRRC

ZBRRD

XZBWR2STT24

References (continued)

Ready-to-use packs

Composition	Reference	Weight kg
<ul style="list-style-type: none"> 1 limit switch with steel roller plunger XCKW102. 1 receiver with 2 relay outputs ZBRRD. 	XCKWD02 (1)	0.410
<ul style="list-style-type: none"> 1 limit switch with thermoplastic roller lever XCKW131. 1 receiver with 2 relay outputs ZBRRD. 	XCKWD31 (1)	0.410

NB: The transmitter (limit switch) and receiver are factory-paired.

Receivers

Configurable receivers are equipped with:

- 2 buttons (teach and parameter setting).
- 6 LED indicators (power ON, output status, signal strength).

Number and type of outputs	Power supply	Number of transmitters	Reference	Weight kg
4 PNP outputs 200 mA/24 V	24 V ---	32	ZBRRC (1)	0.130
2 relay outputs type C/O 3A	24...240 V ~/----	32	ZBRRD (1)	0.130
2 PNP outputs 200 mA/24 V	24 V ---	2	XZBWR2STT24 (2)	0.130

(1) Schneider Electric product, also compatible with ZB•RTA• wireless pushbuttons (with a software version above or equal to V2.0).

(2) Also compatible with ZB•RTA• wireless pushbuttons and the XZBWE112A24 wireless "multi-sensors" transmitter (with a software version above or equal to V1.0).

1

Description

Standard access point with communication module

Access point **ZBRN1** has an empty slot for the **ZBRCETH** communication module to support Modbus/TCP protocol.

This communication module has 2 standard Ethernet RJ45 connectors that provide connectivity for daisy chain operation and daisy chain loop operation (when used with Schneider Electric ConneXium Ethernet switches) and thus avoids the use of a hub or an external switch.

Access point for Modbus serial link protocol

Access point **ZBRN2** has 2 embedded RS485 connectors that avoid the use of an external hub for an RS485 serial link connection. The supported bps are 2400 bps, 4800 bps, 9200 bps, 9600 bps, 38,400 bps, and 115,200 bps.

References

Access points

Description	Data function	Output type	Receiver voltage	Reference	Weight
			V		
Configurable access points equipped with: - 7-segment display - jog dial - 8 LED indicators (power ON, function modes, communication status, signal strength) - external antenna connector and protective cap - for 60 transmitters max.	Set/Reset	2 RS485 connectors that provide Modbus RS485 serial link connectivity	24...240 ~/□	ZBRN2 (1)	0.270
	Set/Reset	1 slot for communication module ZBRCETH (to be ordered separately)	24...240 ~/□	ZBRN1 (1)	0.270

(1) Schneider Electric product, also compatible with **ZB•RTA•** wireless pushbuttons (with a software version above or equal to V1.5).



ZBRN2



ZBRN1

Limit switches

OsiSense XCKW

Wireless and batteryless limit switches

Accessories

PF121506B



ZBRCETH

PF121508A



ZBRA2

PF1100707



ZBRA1

References

Modbus/TCP network communication module

Description	Communication port	Reference	Weight kg
Communication module for access point ZBRN1 Modbus/TCP protocol with embedded web pages, available in 5 languages, for configuration, monitoring and diagnostics	2 RJ45 connectors for daisy chain or daisy chain loop operation	ZBRCETH (1)	0.044

Relay antenna

Use	Description	Reference	Weight kg
Increases the distance between the limit switches and the receivers	24...240 V ~/DC 5 m cable 1 power ON LED 2 reception/ transmission LEDs	ZBRA1 (2)	0.200

External antenna

Use	Description	Reference	Weight kg
Connected to access point (ZBRN1 or ZBRN2) to increase the transmission distance	2 m cable 1 RF connector	ZBRA2 (1)	0.040

(1) Schneider Electric product.

(2) Schneider Electric product, also compatible with **ZB•RTA•** wireless pushbuttons.

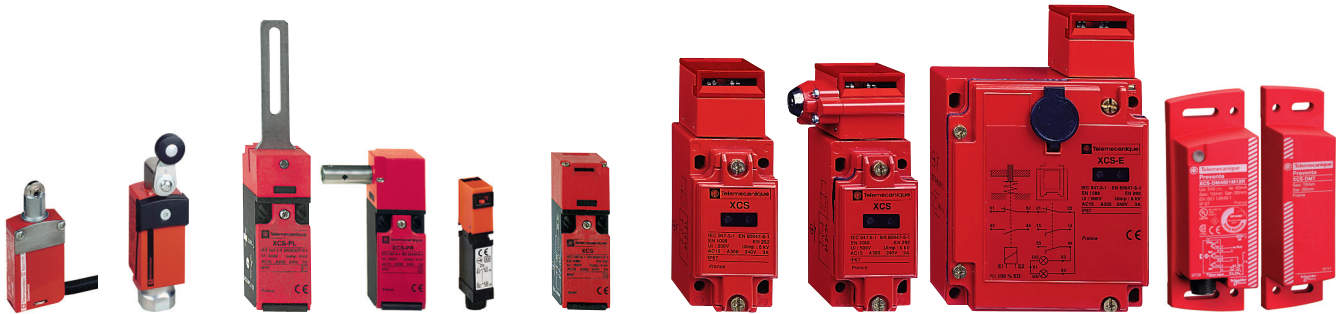
1

Design/Applications	Very severe applications	Very severe material handling applications	For hoisting and material handling applications (XCR); for conveyor belt shift monitoring (XCRT)	For hoisting and material handling applications	Subminiature format and microswitch. Applications requiring high precision and a low operating force
	Metal, 1 cable entry	Metal, 3 cable entries	Metal or polyester, 1 cable entry	Metal or plastic, 3 cable entries	Plastic, pre-cabled



Enclosure	Metal	Metal	Metal or polyester	Metal or plastic	Polyester
Features	Head and body modularity	–	–	–	–
Conformity/Certifications	UL, CSA, GOST	CSA, GOST	CSA (XCR), CCC (XCR), GOST	CE, UL, CSA, CCC, GOST	CE, UL
Body dimensions (w x h x d) in mm	40 x 81 x 41	77 x 83 x 44	85 x 95 x 75	118 x 77 x 59 (metal) 118 x 77 x 67 (plastic)	Depending on type
Head	Linear movement (plunger) or rotary movement (lever)	Linear movement (plunger)	Rotary movement (lever)	Rotary movement (lever)	–
Contact blocks	2 electrically separate contacts snap action with positive opening operation slow break with positive opening operation	–	–	–	–
2 same polarity contacts	• –	– •	– –	– –	• –
3 electrically separate contacts	– –	– –	– –	– –	– –
4 electrically separate contacts	– –	– –	• •	• •	– –
4 contacts (2 x 2 same polarity contacts), snap action	•	–	•	–	–
Degree of protection IP/IK	IP 65/IK 08	IP 65	IP 54/IK 07 or IP 65 depending on model	IP 66/IK 07 (metal) IP 65/IK 04 (plastic)	IP 67 or IP 40 depending on model IP 00 (tags)
Operating temperature	- 25°C... + 70°C; - 40° C or + 120° C (XC2J depending on model)				
Connection	1 entry with integral cable gland	3 tapped entries for Pg 13.5 cable gland	1 tapped entry for Pg 13.5 cable gland	3 tapped entries for Pg 13.5 cable gland or tapped M20 x 1.5	Tag connections or pre-wired depending on model
Screw terminals (entry for cable gland)	–	–	–	–	–
Pre-cabled	–	–	–	–	–
Connector	–	–	–	–	–
Type reference	XC2J	XC1AC	XCR XCRT	XCKMR XCKVR	XEP
Pages	1/152, 1/178	1/170	1/176	1/177	

Safety limit switches and guard switches Preventa XCS							
Standard		With lever or hinge		Actuator operated			Coded magnetic for detection without contact
Miniature format	Compact format	Compact format	Miniature format	Compact format	Industrial format with or without locking	Rectangular format with solenoid interlocking	
Metal, pre-cabled	Metal or plastic, 1 cable entry	Plastic, 1 or 2 cable entries	Plastic, pre-cabled	Plastic, 1 or 2 cable entries	Metal, 1 cable entry		Coded magnetic switch or coded magnetic system, pre-cabled or connector
					Without locking	With locking, manual unlocking	



Metal	Metal or plastic	Plastic, double insulated	Plastic, double insulated		Metal		Metal	Plastic, double insulated	Plastic
–	–	–	–	–	–	–	–	–	–
UL, CSA		UL, CSA	UL, CSA	UL, CSA, GOST	UL, CSA, GOST		UL, CSA, GOST		CE, UL, CSA, TÜV, GOST depending on model
30 x 50 x 16	34 x 65 x 34.5	Depending on type		30 x 78 x 15	30 x 93 x 30 52 x 114 x 30	40 x 60 x 44	98 x 146 x 44 110 x 93.5 x 33		Depending on type
Linear movement (plunger) or rotary movement (lever)		Rotary movement (lever)		Turret head		Turret head		–	
–	–	–	–	•	–	–	–	–	Depending on model
–	–	•	•	–	–	–	–	•	–
–	–	–	–	•	–	–	–	–	–
–	–	•	•	–	–	–	–	•	–
•	–	•	–	•	–	–	–	–	–
•	–	•	•	•	•	•	•	–	–
–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–
•	–	–	–	–	–	–	–	–	–
IP 66, IP 67 IP 68 (XCSP) IK 06 (XCSP & XCSD) IK 04 (XCSP)		IP 67	IP 67	IP 67		IP 67	IP 67		IP 66, IP 67 IP 69K depending on model
-25°C... +70°C		-25°C... +70°C	-25°C... +70°C		-25°C... +70°C		-25°C... +70°C		-25°C... +70°C
XCSP and XCSD: 1 entry for Pg 13.5 or M20 cable gland or 1/2" NPT XCSP: Ø 7.5 cable, PvR		Depending on model: 1 or 2 entries for Pg 13.5 or ISO M20 cable gland or 1/2" NPT	Depending on model: 1 or 2 entries for ISO M16 or Pg 11 cable gland or 1/2" NPT XCSP: Ø 7.5 cable, PvR		1 entry for ISO M20 or Pg 13.5 cable gland or 1/2" NPT		Depending on model: 1 or 2 entries for Pg 13.5 or ISO M20 cable gland or 1/2" NPT		–
–		–	–		–		–		PVC cable
–		–	–		–		–		Remote M8, remote M12 or integral M12 depending on model
XCSP	XCSD	XCSPL, XCSPR XCSTL, XCSTR	XCSMP	XCSPA XCSTA	XCSA	XCSB XCSC	XCSE	XCSTE	XCSDM/C/P/R XCSDM3/4

Limit switches

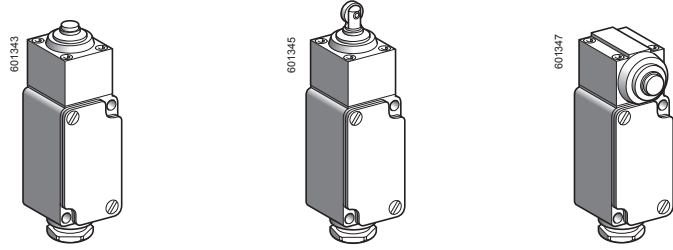
OsiSense XC Special

For very severe applications, type XC2J

1

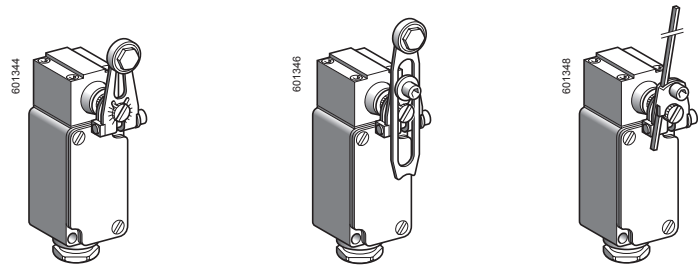
■ XC2J
with 1 cable entry

□ With head for linear movement (plunger)



Page 1/152

□ With head for rotary movement (lever)



Page 1/152

Limit switches

OsiSense XC Special

For very severe applications, type XC2J


Environment characteristics

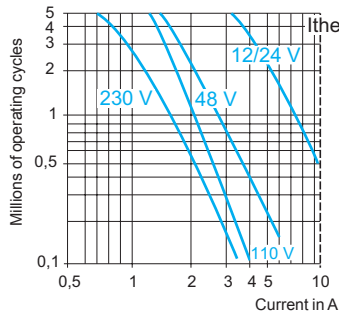
Conformity to standards	Products	IEC/EN 60947-5-1, IEC 60337-1, VDE 0660-200, UL 508, CSA C22-2 n° 14
	Machine assemblies	IEC/EN 60204-1, NF C 79-130
Product certifications	Standard version	CSA 300 V $\overline{\text{---}}$ HD, 60 W \sim
	Special version	UL 250 V \sim HD Listed, CSA 300 V \sim HD, 60 W with 1/2" NPT tapped cable entry
Protective treatment	Standard version	"TC"
Ambient air temperature	For operation	- 25...+ 70°C. Special adaptable sub-assemblies: - 40°C or + 120°C
	For storage	- 40...+ 70°C
Vibration resistance		10 gn (10...500 Hz) conforming to IEC 60068-2-6
Shock resistance		25 gn (18 ms) conforming to IEC 60068-2-27
Electric shock protection		Class I conforming to IEC 60536 and NF C 20-030
Degree of protection		IP 65 conforming to IEC 60529, IP 657 conforming to NF C 20-010
Repeat accuracy		0.01 mm on the tripping points, with 1 million operating cycles for head with end plunger
Cable entry		1 entry incorporating cable gland. Clamping capacity: 6...13.5 mm


Contact block characteristics

Rated operational characteristics		\sim AC-15; A300 ($U_e = 240\text{ V}$, $I_e = 3\text{ A}$) $\overline{\text{---}}$ DC-13; Q300 ($U_e = 250\text{ V}$, $I_e = 0.27\text{ A}$), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
Rated insulation voltage		500 V conforming to IEC 60947-5-1, group C conforming to NF C 20-040, 300 V conforming to CSA C22-2 n° 14
Resistance across terminals		$\leq 25\text{ m}\Omega$ conforming to NF C 93-050 method A or IEC 60255-7 category 3
Short-circuit protection		10 A cartridge fuse type gG (gl)
Connection	Screw clamp terminals	XCKZ01 : clamping capacity, min: 1 x 0.5 mm ² , max: 2 x 2.5 mm ² XESP10e1 : clamping capacity, min: 1 x 0.75 mm ² , max: 2 x 1.5 mm ²
Minimum actuation speed		0.001 m/minute
Electrical durability		<ul style="list-style-type: none"> ■ Conforming to IEC 60947-5-1 Appendix C ■ Utilisation categories AC-15 and DC-13 ■ Maximum operating rate: 3600 operating cycles/hour ■ Load factor: 0.5

XCKZ01, XESP1021, XESP1031

AC supply
50/60 Hz \sim
 inductive circuit



DC supply $\overline{\text{---}}$	Voltage V	24	48	120
	Power broken in W for 5 million operating cycles	10	7	4
				

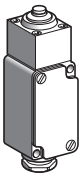
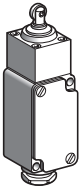
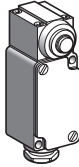
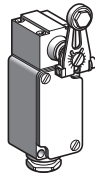
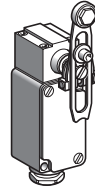
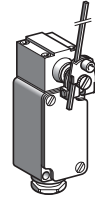
Limit switches

OsiSense XC Special

For very severe applications, type XC2J

Complete switches, fixed body,

1 cable entry incorporating cable gland



Type of head	Plunger			Rotary		
						
Type of operator	Metal end plunger	Steel roller plunger	Metal side plunger	Thermoplastic roller lever (1)	Variable length thermoplastic roller lever (1)	Steel rod lever Ø 3 mm (1)

(1) Adjustable throughout 360°.




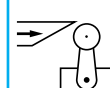

References

Single-pole CO
snap action XCKZ01



	ZC2JC1 + ZC2JE61	ZC2JC1 + ZC2JE62	ZC2JC1 + ZC2JE63	Actuation from left AND right		
				Actuation from left OR right		
Weight (kg)	0.555	0.560	0.600	0.605	0.620	0.605
Contact operation	 closed  open			(A) = cam displacement		

Complementary characteristics not shown under general characteristics (page 1/151)

Switch actuation	On end	By 30° cam	On end	By 30° cam	By any moving part
Type of actuation					
Maximum actuation speed	0.5 m/s			1.5 m/s	
Mechanical durability (in millions of operating cycles)	30	25	30		
Minimum tripping force or torque	18 N		26 N	With head ZC2JE01: 0.30 N.m With head ZC2JE05: 0.20 N.m	
Cable entry	1 tapped entry incorporating metal cable gland. Clamping capacity 6 to 13.5 mm				

Other versions

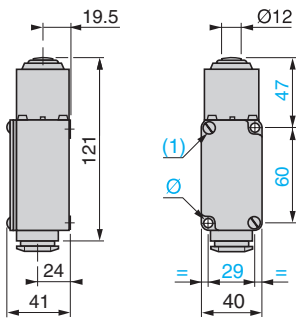
Switches with gold flashed contacts. Special protective treatments.
Please consult our Customer Care Centre.

Limit switches

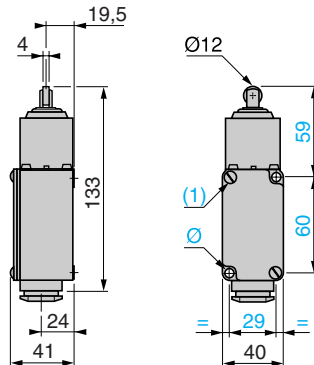
OsiSense XC Special

For very severe applications, type XC2J
Complete switches, fixed body,
1 cable entry incorporating cable gland

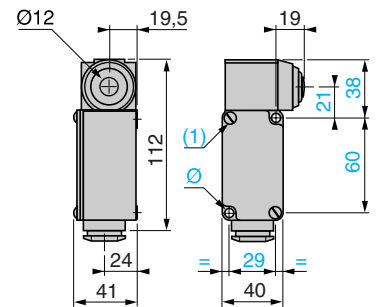
ZC2JC1 + ZC2JE61



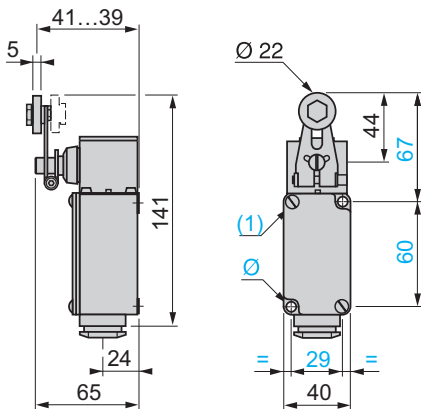
ZC2JC1 + ZC2JE62



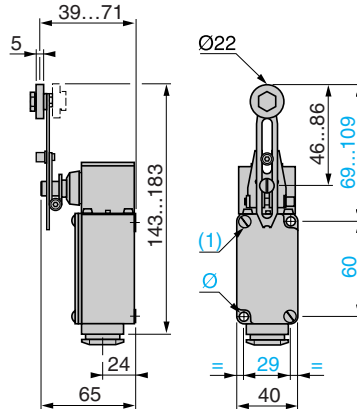
ZC2JC1 + ZC2JE63



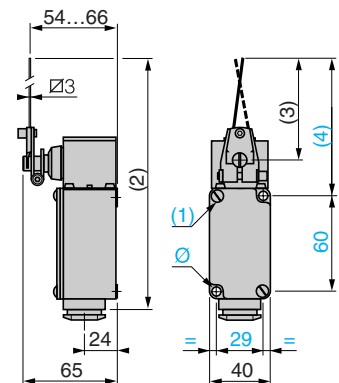
ZC2JC1 + ZC2JE0● + ZC2JY11



ZC2JC1 + ZC2JE0● + ZC2JY31



ZC2JC1 + ZC2JE0● + ZC2JY51



(1) Fixing from the rear: by 2 M5 screws.
Depth of thread on switch: 10 mm.

(2) 222 max.

(3) 125 max.

(4) 148 max.

Ø: Fixing from the front via 2 holes Ø 5.5.

Cable gland incorporated (all XC2JC models).

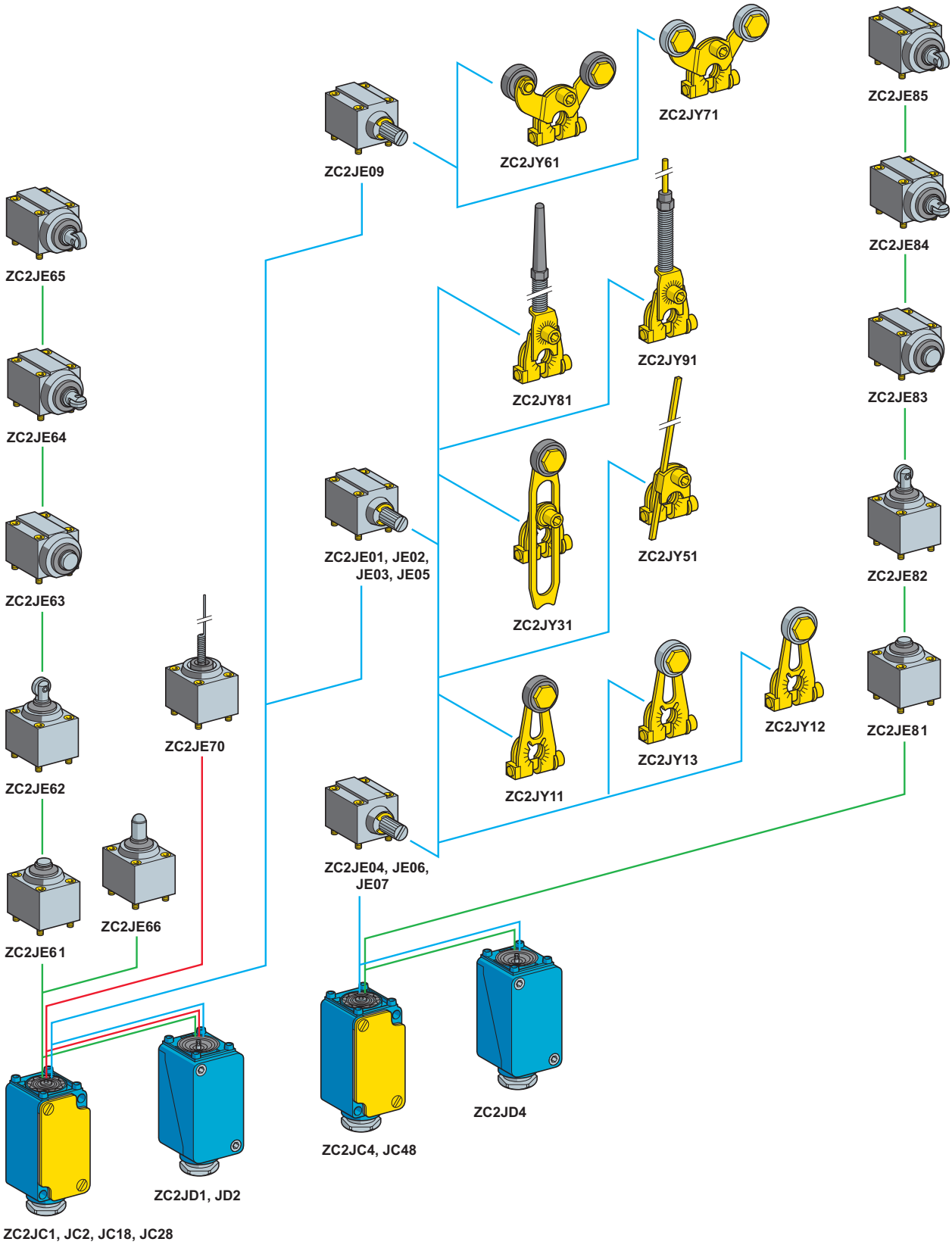
Limit switches

OsiSense XC Special

For very severe applications, type XC2J

Fixed or plug-in body

Variable composition



1

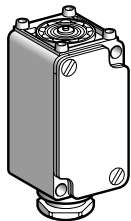
Limit switches

OsiSense XC Special

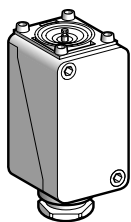
For very severe applications, type XC2J

Fixed or plug-in body

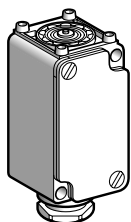
Adaptable sub-assemblies



ZC2JC●



ZC2JD●



ZC2JC●8

Bodies with contacts for plunger or rotary head

Type	With contact block	Scheme	Reference	Weight kg
Fixed bodies (see operation page 1/160)				
1 step	Single-pole 1 CO snap action (XCKZ01)		ZC2JC1	0.355
	Double-pole 2 CO simultaneous, snap action (XESP1021)		ZC2JC2	0.355
2 step	Double-pole 2 CO staggered, snap action (XESP1031)		ZC2JC4	0.355

Plug-in bodies

Plug-in bodies (see operation page 1/160)				
1 step	Single-pole CO snap action		ZC2JD1	0.380
	Double-pole 2 CO simultaneous, snap action		ZC2JD2	0.380
2 step	Double-pole 2 CO staggered, snap action		ZC2JD4	0.380

Bodies incorporating gold flashed contacts, for plunger or rotary head

Type	With contact block	Scheme	Reference	Weight kg
Fixed bodies (see operation page 1/160)				
1 step	Single-pole 1 CO snap action (XCKZ018)		ZC2JC18	0.355
	Double-pole 2 CO simultaneous, snap action (XESP1028)		ZC2JC28	0.360
2 step	Double-pole 2 CO staggered, snap action (XESP1038)		ZC2JC48	0.360

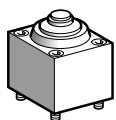
Limit switches

OsiSense XC Special

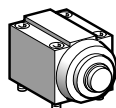
For very severe applications, type XC2J

Fixed or plug-in body

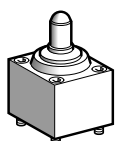
Adaptable sub-assemblies



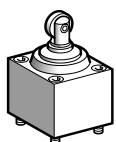
ZC2JE•1



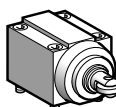
ZC2JE•3



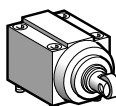
ZC2JE66



ZC2JE•2



ZC2JE•4



ZC2JE•5

Plunger heads

Type of operator	Compatible bodies	Maximum actuation speed	Reference	Weight kg
For actuation on end				
End plunger metal	ZC2J•1 ZC2J•2	0.5 m/s	ZC2JE61	0.195
	ZC2J•4	0.5 m/s	ZC2JE81	0.195
Side plunger metal	ZC2J•1 ZC2J•2	0.5 m/s	ZC2JE63	0.240
	ZC2J•4	0.5 m/s	ZC2JE83	0.240
For actuation by 30° cam				
End ball bearing plunger	ZC2J•1 ZC2J•2	0.1 m/s	ZC2JE66	0.205
End roller plunger steel	ZC2J•1 ZC2J•2	1 m/s	ZC2JE62	0.200
	ZC2J•4	1 m/s	ZC2JE82	0.200
Side plunger with horizontal roller steel	ZC2J•1 ZC2J•2	0.6 m/s	ZC2JE64	0.245
	ZC2J•4	0.6 m/s	ZC2JE84	0.245
Side plunger with vertical roller steel	ZC2J•1 ZC2J•2	0.6 m/s	ZC2JE65	0.245
	ZC2J•4	0.6 m/s	ZC2JE85	0.245

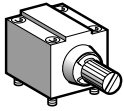
Limit switches

OsiSense XC Special

For very severe applications, type XC2J

Fixed or plug-in body

Adaptable sub-assemblies



ZC2JE01

Rotary heads (without operating lever)

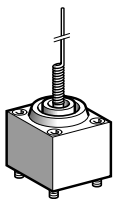
Type	Compatible bodies	Maximum actuation speed	Reference	Weight kg
Spring return (see operation page 1/160)				
Actuation from left AND right	ZC2J●1	1.5 m/s	ZC2JE01	0.210
	ZC2J●2			
	ZC2J●4	1.5 m/s	ZC2JE04	0.210
Actuation from left	ZC2J●1	1.5 m/s	ZC2JE02	0.210
	ZC2J●2			
	ZC2J●4	1.5 m/s	ZC2JE06	0.210
Actuation from right	ZC2J●1	1.5 m/s	ZC2JE03	0.210
	ZC2J●2			
	ZC2J●4	1.5 m/s	ZC2JE07	0.210
Actuation from left OR right (see page 1/136)	ZC2J●1	1.5 m/s	ZC2JE05	0.210
	ZC2J●2			

Stay put (see page 1/136)

Actuation from left AND right	ZC2J●1 ZC2J●2	1.5 m/s	ZC2JE09	0.210
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Multi-directional head (with operator)

Type of operator	Compatible bodies	Maximum actuation speed	Reference	Weight kg
For actuation by any moving part (see operation page 1/160)				
"Cat's whisker"	ZC2J●1 ZC2J●2	1 m/s in any direction	ZC2JE70	0.190



ZC2JE70

Limit switches

OsiSense XC Special

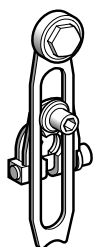
For very severe applications, type XC2J

Fixed or plug-in body

Adaptable sub-assemblies



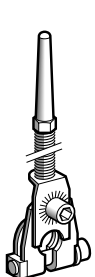
ZC2JY1



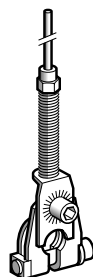
ZC2JY31



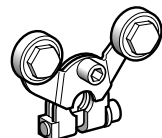
ZC2JY51



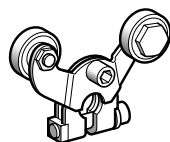
ZC2JY81



ZC2JY91



ZC2JY71



ZC2JY61

Operating levers for rotary heads

Description	Reference	Weight kg
For actuation by 30° cam		
Roller lever (1)	Thermoplastic	ZC2JY11 0.030
	Steel	ZC2JY13 0.040
	Steel, ball bearing mounted	ZC2JY12 0.040
Variable length roller lever (1)	Thermoplastic	ZC2JY31 0.045

For actuation by any moving part

Rigid rod lever	Steel \varnothing 3 mm, L = 125 mm (1)	ZC2JY51 0.035
Spring lever (1)		ZC2JY81 0.040
Spring-rod lever (1)		ZC2JY91 0.040

For actuation by specific cam (only for operation with head ZC2 JE09, see page 1/190)

Forked arm with rollers thermoplastic (1)	1 track	ZC2JY71 0.055
	2 track	ZC2JY61 0.055

(1) Adjustable throughout 360°

Other versions

Other operating levers for rotary heads.
Please consult our Customer Care Centre.

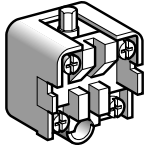
Limit switches

OsiSense XC Special

For very severe applications, type XC2J

Fixed or plug-in body

Adaptable sub-assemblies



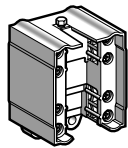
XCKZ01

Contact blocks

Type of contact	Scheme	For body	Reference	Weight kg
Single-pole 1 CO snap action		ZC2JC1	XCKZ01	0.050

Double-pole 2 CO simultaneous, snap action		ZC2JC2	XESP1021	0.045
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Double-pole 2 CO staggered, snap action		ZC2JC4	XESP1031	0.045
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XESP1031

Contact blocks with gold flashed contacts

Type of contact	Scheme	For body	Reference	Weight kg
Single-pole 1 CO snap action		ZC2JC18	XCKZ018	0.050

Double-pole 2 CO simultaneous, snap action		ZC2JC28	XESP1028	0.055
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Double-pole 2 CO staggered, snap action		ZC2JC48	XESP1038	0.055
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Limit switches

OsiSense XC Special

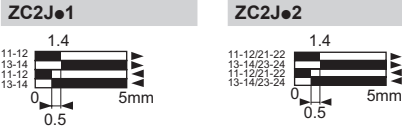
For very severe applications, type XC2J

Fixed or plug-in body

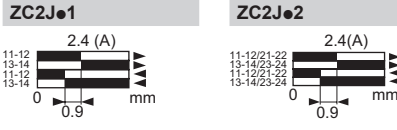
Adaptable sub-assemblies

Operation (function diagrams)

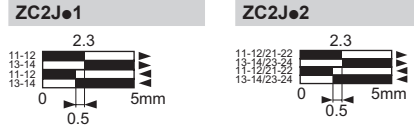
Heads ZC2JE61, ZC2JE66 with body



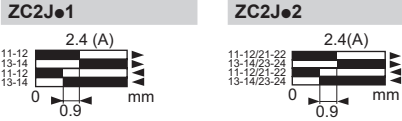
Head ZC2JE62 with body



Head ZC2JE63 with body



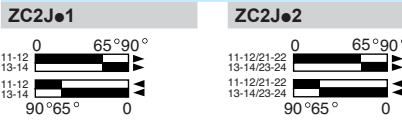
Heads ZC2JE64, ZC2JE65 with body



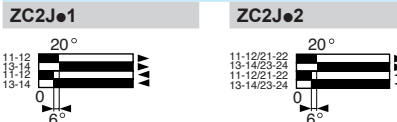
Heads ZC2JE01, ZC2JE02, ZC2JE03, ZC2JE05 with body



Head ZC2JE09 with body

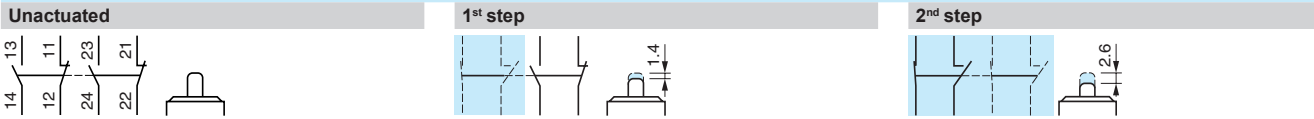


Head ZC2JE70 with body

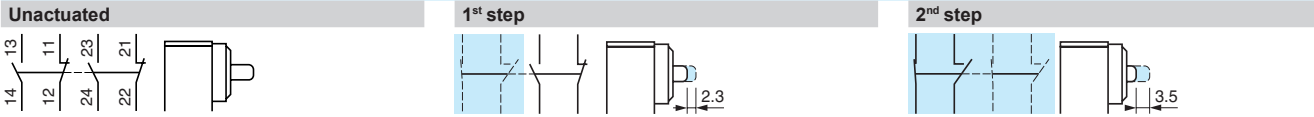


Contact operation closed open (A) = cam displacement

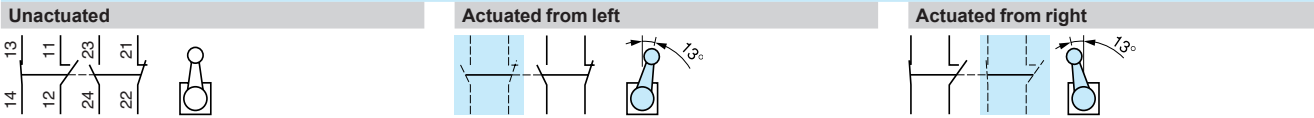
Heads ZC2JE81, ZC2JE82 with body ZC2J•4



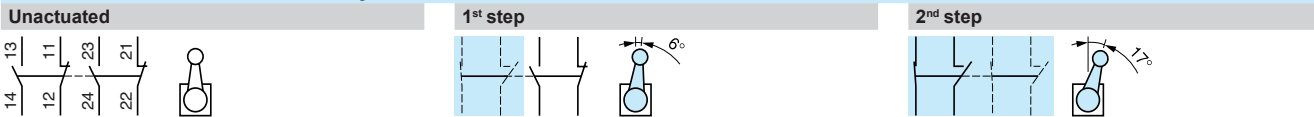
Heads ZC2JE83, ZC2JE84, ZC2JE85 with body ZC2J•4



Heads ZC2JE04 with body ZC2J•4



Heads ZC2JE06, ZC2JE07 with body ZC2J•4



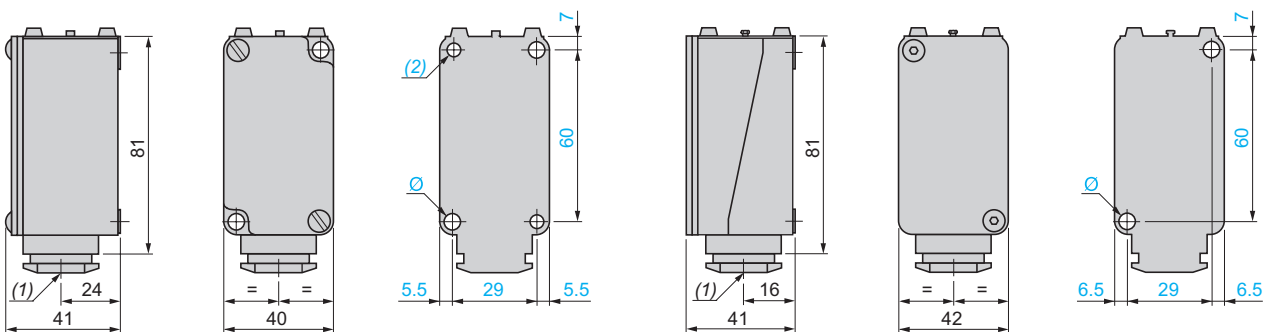
Dimensions

Fixed bodies

ZC2JC1, ZC2JC2, ZC2JC4

Plug-in bodies

ZC2JD1, ZC2JD2, ZC2JD4



(1) Incorporated cable gland
(2) Fixing from the rear by 2 M5 screws, depth of thread on switch: 10 mm
Ø: Fixing from the front via 2 holes Ø 5.5

(1) Incorporated cable gland
Ø: Fixing from the rear by 2 M6 screws
Fixing from the front via 2 holes Ø 5.5 (remove front part of switch for access)

Limit switches

OsiSense XC Special

For very severe applications, type XC2J

Fixed or plug-in body

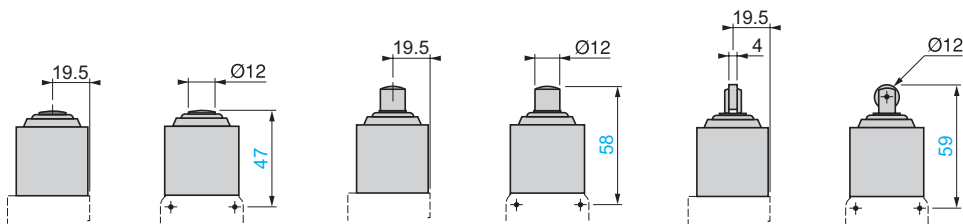
Adaptable sub-assemblies

Plunger heads

ZC2JE61, ZC2JE81

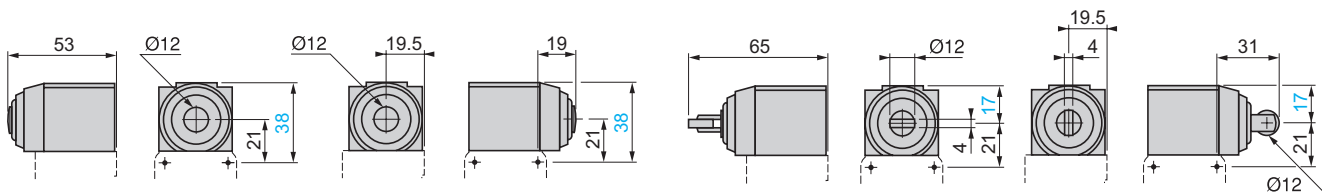
ZC2JE66

ZC2JE62, ZC2JE82



ZC2JE63, ZC2JE83 (2 position)

ZC2JE64, ZC2JE84, ZC2JE65, ZC2JE85 (2 position)

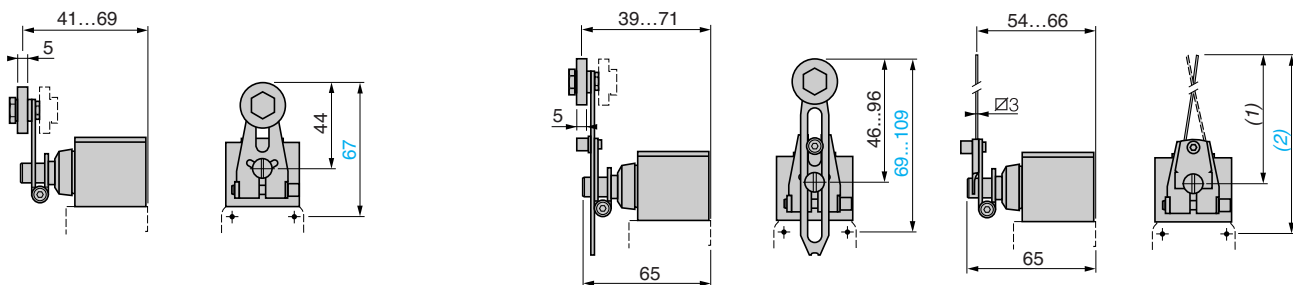


Rotary heads (ZC2JE01 to ZC2JE07) with operating lever

ZC2JY11, ZC2JY12, ZC2JY13

ZC2JY31

ZC2JY51

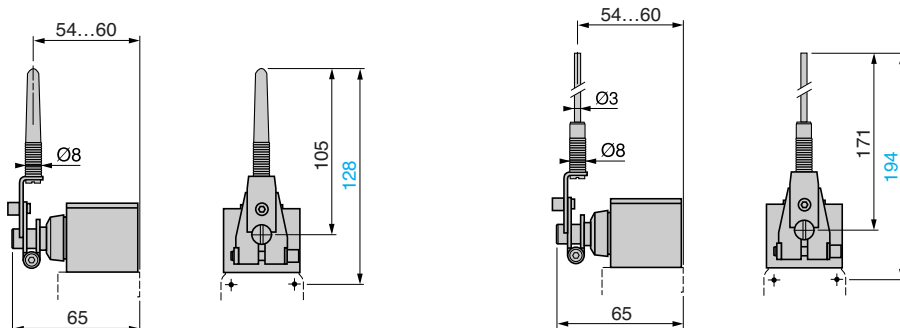


(1) 125 max.

(2) 148 max.

ZC2JY81

ZC2JY91



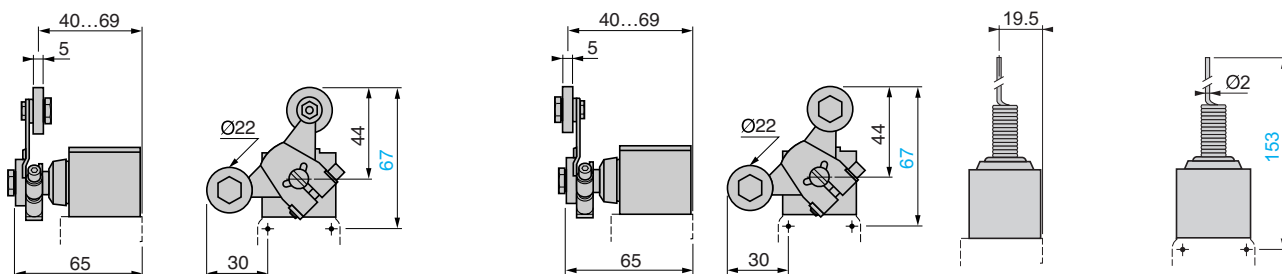
Rotary heads (ZC2JE09) with operating lever

ZC2JY61

ZC2JY71

Multi-directional heads

ZC2JE70

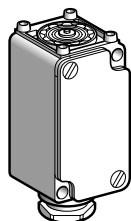


Limit switches

OsiSense XC Special

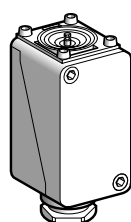
For very severe applications, type XC2J

Fixed or plug-in body, adaptable sub-assemblies for low temperature applications (-40°C)



ZC2JC•6

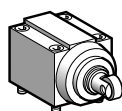
Bodies with contacts for plunger or rotary head				
Type	With contact block	Scheme	Reference	Weight kg
Fixed bodies				
1 step	Single-pole 1 CO snap action (XCK Z01)		ZC2JC16	0.355
	Double-pole 2 CO simultaneous, snap action (XES P1021)		ZC2JC26	0.355
2 step	Double-pole 2 CO staggered, snap action (XES P1031)		ZC2JC46	0.355



ZC2JD•6

Plug-in bodies				
Type	With contact block	Scheme	Reference	Weight kg
1 step	Single-pole CO snap action		ZC2JD16	0.380
	Double-pole 2 CO simultaneous, snap action		ZC2JD26	0.380
2 step	Double-pole 2 CO staggered, snap action		ZC2JD46	0.380

Plunger heads				
Type of operator	Compatible bodies	Maximum actuation speed	Reference	Weight kg
For actuation on end				
End plunger metal	ZC2J•16	0.5 m/s	ZC2JE616	0.195
	ZC2J•26			
	ZC2J•46	0.5 m/s	ZC2JE816	0.195
Side plunger metal	ZC2J•16	0.5 m/s	ZC2JE636	0.240
	ZC2J•26			
	ZC2J•46	0.5 m/s	ZC2JE836	0.240
For actuation by 30° cam				
End ball bearing plunger	ZC2J•16	0.1 m/s	ZC2JE666	0.205
	ZC2J•26			
End roller plunger steel	ZC2J•16	1 m/s	ZC2JE626	0.200
	ZC2J•26			
	ZC2J•46	1 m/s	ZC2JE826	0.200
Side plunger with horizontal roller steel	ZC2J•16	0.6 m/s	ZC2JE646	0.245
	ZC2J•26			
Side plunger with vertical roller steel	ZC2J•16	0.6 m/s	ZC2JE656	0.245
	ZC2J•26			
	ZC2J•46	0.6 m/s	ZC2JE856	0.245



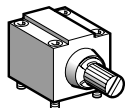
ZC2JE•56

Limit switches

OsiSense XC Special

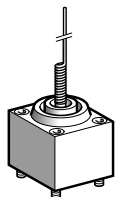
For very severe applications, type XC2J

Fixed or plug-in body, adaptable sub-assemblies for low temperature applications (-40°C)



ZC2JE06

Rotary heads (without operating lever)				
Type	Compatible bodies	Maximum actuation speed	Reference	Weight kg
Spring return				
Actuation from left AND right	ZC2J●16	1.5 m/s	ZC2JE016	0.210
	ZC2J●26			
	ZC2J●46	1.5 m/s	ZC2JE046	0.210
Actuation from left	ZC2J●16	1.5 m/s	ZC2JE026	0.210
	ZC2J●26			
	ZC2J●46	1.5 m/s	ZC2JE066	0.210
Actuation from right	ZC2J●16	1.5 m/s	ZC2JE036	0.210
	ZC2J●26			
	ZC2J●46	1.5 m/s	ZC2JE076	0.210
Actuation from left OR right (see page 1/190)	ZC2J●16	1.5 m/s	ZC2JE056	0.210
	ZC2J●26			
Stay put (see page 1/190)				
Actuation from left AND right	ZC2J●16	1.5 m/s	ZC2JE096	0.210
	ZC2J●26			



ZC2JE706

Multi-directional head (with operator)				
Type of operator	Compatible bodies	Maximum actuation speed	Reference	Weight kg
For actuation by any moving part				
"Cat's whisker"	ZC2J●16	1 m/s in any direction	ZC2JE706	0.190
	ZC2J●26			

Limit switches

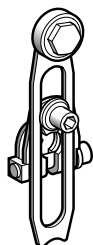
OsiSense XC Special

For very severe applications, type XC2J

Fixed or plug-in body, adaptable sub-assemblies for low temperature applications (- 40°C)



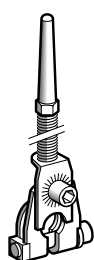
ZC2JY1



ZC2JY31



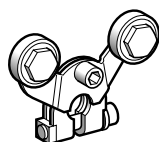
ZC2JY51



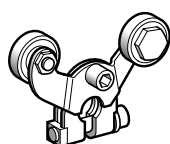
ZC2JY81



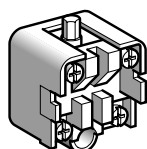
ZC2JY91



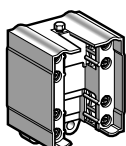
ZC2JY71



ZC2JY61



XCKZ01



XESP10.1

Operating levers for rotary heads

Description	Reference	Weight kg
For actuation by 30° cam		
Roller lever (1)	Thermoplastic	ZC2JY11 0.030
	Steel	ZC2JY13 0.040
	Steel, ball bearing mounted	ZC2JY12 0.040
Variable length roller lever (1)	Thermoplastic	ZC2JY31 0.045

For actuation by any moving part

Rigid rod lever	Steel \varnothing 3 mm, L = 125 mm (1)	ZC2JY51 0.035
Spring lever (1)		ZC2JY81 0.040
Spring-rod lever (1)		ZC2JY91 0.040

For actuation by specific cam (only for operation with head ZC2 JE096, see page 1/190)

Forked arm with rollers thermoplastic (1)	1 track	ZC2JY71 0.055
	2 track	ZC2JY61 0.055

Contact blocks

Type of contact	Scheme	For body	Reference	Weight kg
Single-pole 1 CO snap action		ZC2JC16	XCKZ01	0.050
Double-pole 2 CO simultaneous, snap action		ZC2JC26	XESP1021	0.045
Double-pole 2 CO staggered, snap action		ZC2JC46	XESP1031	0.045

(1) Adjustable throughout 360°

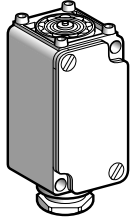
Other versions

Other operating levers for rotary heads. Please consult our Customer Care Centre.

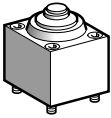
Limit switches

OsiSense XC Special

For very severe applications, type XC2J
Fixed body, adaptable sub-assemblies for high
temperature applications (+ 120°C)



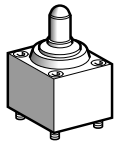
ZC2JC•5



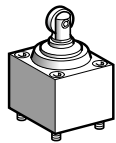
ZC2JE•15



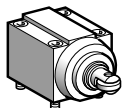
ZC2JE•35



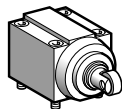
ZC2JE665



ZC2JE•25



ZC2JE•45



ZC2JE•55

Bodies with contacts for plunger or rotary head

Type	With contact block	Scheme	Reference	Weight kg
Fixed bodies				
1 step	Single-pole 1 CO snap action (XCK Z015)		ZC2JC15	0.355
	Double-pole 2 CO simultaneous, snap action (XES P10215)		ZC2JC25	0.355
2 step	Double-pole 2 CO staggered, snap action (XES P10315)		ZC2JC45	0.355

Plunger heads

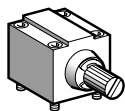
Type of operator	Compatible bodies	Maximum actuation speed	Reference	Weight kg
For actuation on end				
End plunger metal	ZC2JC15 ZC2JC25	0.5 m/s	ZC2JE615	0.195
	ZC2JC45	0.5 m/s	ZC2JE815	0.195
Side plunger metal	ZC2JC15 ZC2JC25	0.5 m/s	ZC2JE635	0.240
	ZC2JC45	0.5 m/s	ZC2JE835	0.240
For actuation by 30° cam				
End ball bearing plunger	ZC2JC15 ZC2JC25	0.1 m/s	ZC2JE665	0.205
End roller plunger steel	ZC2JC15 ZC2JC25	1 m/s	ZC2JE625	0.200
	ZC2JC45	1 m/s	ZC2JE825	0.200
Side plunger with horizontal roller steel	ZC2JC15 ZC2JC25	0.6 m/s	ZC2JE645	0.245
	ZC2JC45	0.6 m/s	ZC2JE845	0.245
Side plunger with vertical roller steel	ZC2JC15 ZC2JC25	0.6 m/s	ZC2JE655	0.245
	ZC2JC45	0.6 m/s	ZC2JE855	0.245

Limit switches

OsiSense XC Special

For very severe applications, type XC2J

Fixed body, adaptable sub-assemblies for high temperature applications (+ 120°C)

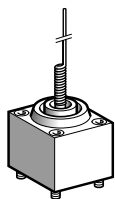


ZC2JE05

Rotary heads (without operating lever)				
Type	Compatible bodies	Maximum actuation speed	Reference	Weight kg
Spring return				
Actuation from left AND right	ZC2JC15 ZC2JC25	1.5 m/s	ZC2JE015	0.210
	ZC2JC45	1.5 m/s	ZC2JE045	0.210
Actuation from left	ZC2JC15 ZC2JC25	1.5 m/s	ZC2JE025	0.210
	ZC2JC45	1.5 m/s	ZC2JE065	0.210
Actuation from right	ZC2JC15 ZC2JC25	1.5 m/s	ZC2JE035	0.210
	ZC2JC45	1.5 m/s	ZC2JE075	0.210

Stay put (see page 1/190)

Actuation from left AND right	ZC2JC15 ZC2JC25	1.5 m/s	ZC2JE095	0.210
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ZC2JE705

Multi-directional head (with operator)				
Type of operator	Compatible bodies	Maximum actuation speed	Reference	Weight kg
For actuation by any moving part				
"Cat's whisker"	ZC2JC15 ZC2JC25	1 m/s in any direction	ZC2JE705	0.190

Limit switches

OsiSense XC Special

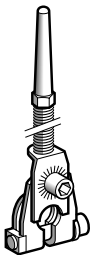
For very severe applications, type XC2J
Fixed body, adaptable sub-assemblies for high
temperature applications (+ 120°C)



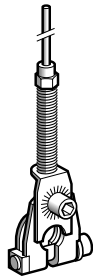
ZC2JY1●



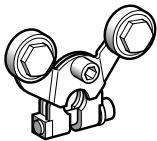
ZC2JY51



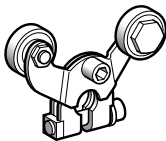
ZC2JY815



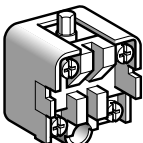
ZC2JY915



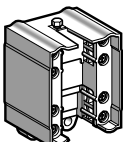
ZC2JY715



ZC2JY615



XCKZ015



XESP10●15

Operating levers for rotary heads

Description	Reference	Weight kg	
For actuation by 30° cam			
Roller lever (1)	Thermoplastic	ZC2JY115	0.030
	Steel	ZC2JY13	0.040
	Steel, ball bearing mounted	ZC2JY12	0.040
Offset roller lever (1)	Thermoplastic	ZC2JY215	0.035
Variable length roller lever (1)	Thermoplastic	ZC2JY315	0.035
Variable length offset roller lever (1)	Thermoplastic	ZC2JY415	0.040

For actuation by any moving part

Rigid rod lever	Steel \varnothing 3 mm, L = 125 mm (1)	ZC2JY51	0.035
Spring lever (1)		ZC2JY815	0.040
Spring-rod lever (1)		ZC2JY915	0.040

For actuation by specific cam (only for operation with head ZC2JE095, see page 1/190)

Forked arm with rollers thermoplastic (1)	1 track	ZC2JY715	0.055
	2 track	ZC2JY615	0.055

Contact blocks

Type of contact	Scheme	For body	Reference	Weight kg
Single-pole 1 CO snap action		ZC2JC15	XCKZ015	0.050
Double-pole 2 CO simultaneous, snap action		ZC2JC25	XESP10215	0.045
Double-pole 2 CO staggered, snap action		ZC2JC45	XESP10315	0.045

(1) Adjustable throughout 360°

Other versions

Other operating levers for rotary heads.
Please consult our Customer Care Centre.

Limit switches

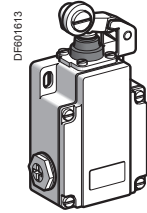
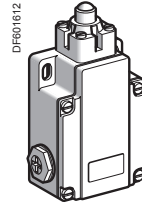
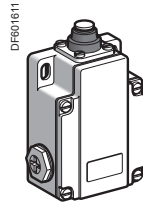
OsiSense XC Special

For material handling applications, type XC1AC

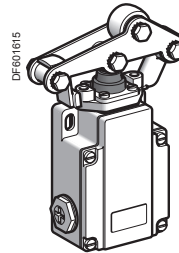
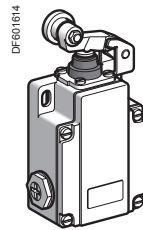
1

■ XC1AC
with slow break contacts

□ With head for linear movement (plunger)



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Limit switches



OsiSense XC Special

For material handling applications, type XC1AC

Environment characteristics

Conformity to standards		IEC/EN 60947-5-1, IEC 60337-1, VDE 0660-200, CSA C22-2 n° 14
Product certifications	Special version	CSA 600 V (ac) HD
Protective treatment	Version	Standard: "TC". Special: "TH"
Ambient air temperature	For operation	- 25...+ 70°C
	For storage	- 40...+ 70°C
Operating position		All positions
Vibration resistance		9 gn (10...500 Hz) conforming to IEC 60068-2-6
Shock resistance		95 gn (11 ms) conforming to IEC 60068-2-27
Electric shock protection		Class I conforming to IEC 60536 and NF C 20-030
Degree of protection		IP 65 conforming to IEC 60529 and NF C 20-010
Mechanical durability		10 million operating cycles
Cable entry		3 tapped entries for n° 13 cable gland

Contact block characteristics


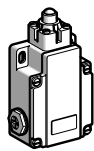
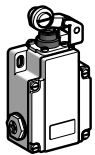
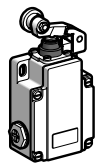
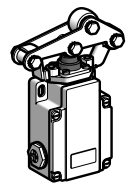
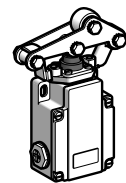
Conventional thermal current		10 A																
Rated insulation voltage	Slow break contact blocks	500 V ~ and 600 V ∴ conforming to IEC 60947-5-1, NF C 20-040 ~ and 600 V ∴ conforming to CSA C22-2 n° 14																
Resistance across terminals		≤ 8 mΩ																
Minimum tripping force		XC1AC1●1 : 33 N, XC1AC1●6 : 23 N, XC1AC1●7 : 29 N																
Terminal referencing		Conforming to CENELEC EN 50013																
Short-circuit protection		10 A cartridge fuse type gG (gl)																
Electrical durability		<ul style="list-style-type: none"> ■ Conforming to IEC 60947-5-1 Appendix C ■ Utilisation categories AC-15 and DC-13 ■ Maximum operating rate: 3600 operating cycles/hour ■ Load factor: 0.5 																
		Slow break contact blocks																
	AC supply 50/60 Hz ~  inductive circuit	<table border="1"> <thead> <tr> <th colspan="4">Power broken in VA</th> </tr> <tr> <th>Voltage V</th> <th>48</th> <th>110</th> <th>230</th> </tr> </thead> <tbody> <tr> <td>For 1 million operating cycles</td> <td>450</td> <td>900</td> <td>1900</td> </tr> <tr> <td>For 3 million operating cycles</td> <td>170</td> <td>350</td> <td>430</td> </tr> </tbody> </table>	Power broken in VA				Voltage V	48	110	230	For 1 million operating cycles	450	900	1900	For 3 million operating cycles	170	350	430
Power broken in VA																		
Voltage V	48	110	230															
For 1 million operating cycles	450	900	1900															
For 3 million operating cycles	170	350	430															
	DC supply ∴  inductive circuit	<table border="1"> <thead> <tr> <th colspan="4">Power broken in W</th> </tr> <tr> <th>Voltage V</th> <th>48</th> <th>110</th> <th>230</th> </tr> </thead> <tbody> <tr> <td>For 1 million operating cycles</td> <td>100</td> <td>100</td> <td>95</td> </tr> <tr> <td>For 3 million operating cycles</td> <td>35</td> <td>40</td> <td>33</td> </tr> </tbody> </table>	Power broken in W				Voltage V	48	110	230	For 1 million operating cycles	100	100	95	For 3 million operating cycles	35	40	33
Power broken in W																		
Voltage V	48	110	230															
For 1 million operating cycles	100	100	95															
For 3 million operating cycles	35	40	33															


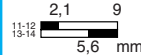

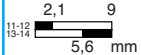

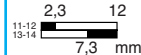

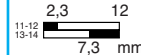

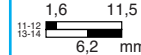

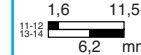

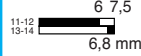

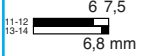

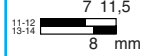

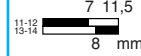

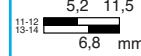

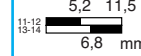

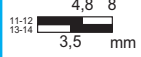

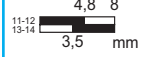

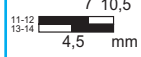

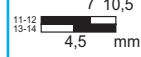

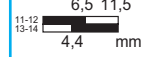



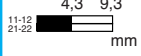

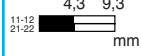

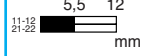

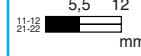



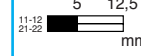

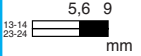

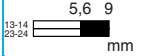



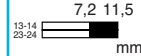

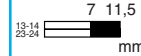

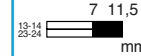

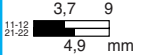

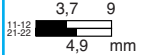

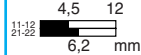

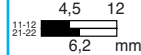



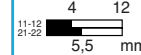





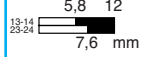

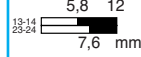

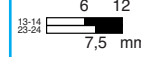

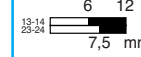
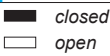
Limit switches


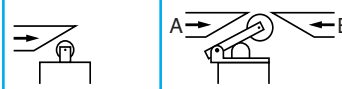
OsiSense XC Special

For material handling applications, type XC1AC

Complete switches with slow break contacts

Type of head	Plunger					
						
Type of operator	End plunger	End ball bearing plunger	Roller lever plunger	Offset roller lever plunger	Reinforced roller lever plunger	Needle bearing mounted roller lever plunger

References of complete switches						
Single-pole CO slow break ZC1AZ11	 XC1AC111 	 XC1AC115 	 XC1AC116 	 XC1AC118 	 XC1AC117 	 XC1AC119 
2-pole NC + NO break before make, slow break ZC1AZ12	 XC1AC121 	 XC1AC125 	 XC1AC126 	 XC1AC128 	 XC1AC127 	 XC1AC129 
2-pole NO + NC make before break ZC1AZ13	 XC1AC131 	 XC1AC135 	 XC1AC136 	 XC1AC138 	 XC1AC137 	 XC1AC139 
2-pole NC + NC simultaneous, slow break ZC1AZ14	 XC1AC141 	 XC1AC145 	 XC1AC146 	 XC1AC148 	 XC1AC147 	 XC1AC149 
2-pole NO + NO simultaneous, slow break ZC1AZ15	 XC1AC151 	 XC1AC155 	 XC1AC156 	 XC1AC158 	 XC1AC157 	 XC1AC159 
2-pole NC + NC staggered, slow break ZC1AZ16	 XC1AC161 	 XC1AC165 	 XC1AC166 	 XC1AC168 	 XC1AC167 	 XC1AC169 
2-pole NO + NO staggered, slow break ZC1AZ17	 XC1AC171 	 XC1AC175 	 XC1AC176 	 XC1AC178 	 XC1AC177 	 XC1AC179 
Weight (kg)	0.530	0.530	0.595	0.595	0.870	0.870
Contact operation						

Complementary characteristics		
Switch actuation	On end	By 30° cam
Type of actuation		
Maximum actuation speed	0.5 m/s	1 m/s (direction A), 0.5 m/s (direction B) (1)
Cable entry	3 tapped entries for n° 13 (DIN Pg 13.5) cable gland, clamping capacity 9 to 12 mm (2 entries fitted with blanking plug)	
Connection	Screw terminals. Clamping capacity: min. 1 x 0.5 mm ² , max. 1 x 2.5 mm ²	

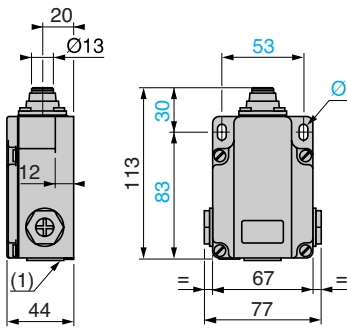
(1) For a 45° cam the maximum actuation speed becomes 0.5 m/s and for a 15° cam, 1 m/s.

Limit switches

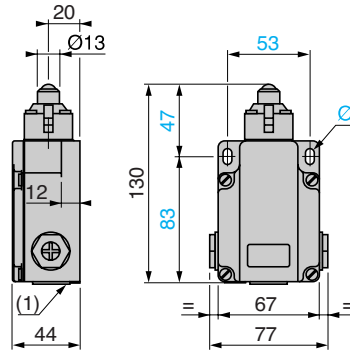
OsiSense XC Special

For material handling applications, type XC1AC
Complete switches with slow break contacts

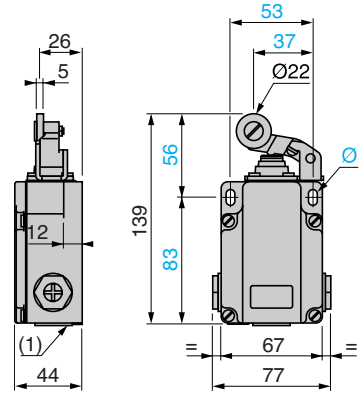
XC1AC1●1



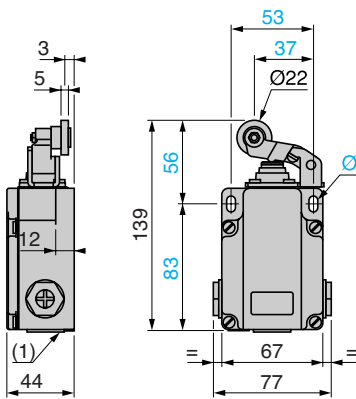
XC1AC1●5



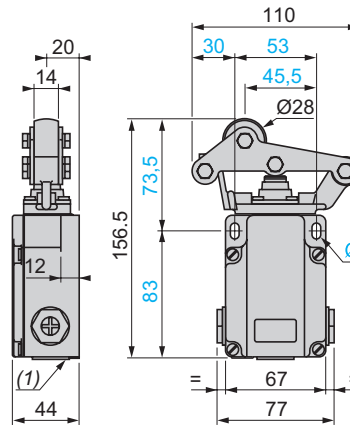
XC1AC1●6



XC1AC1●8



XC1AC1●7, XC1AC1●9

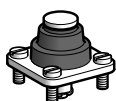


(1) 3 tapped entries for n° 13 cable gland or ISO 20 with adaptor DE9RA1620.
Ø: 2 elongated holes Ø 6.5 x 10.

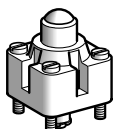
Limit switches

OsiSense XC Special

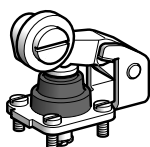
For material handling applications, type XC1AC
Replacement parts



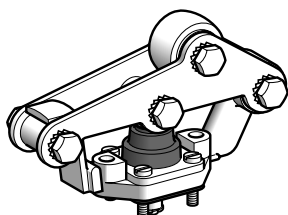
ZC1AC001



ZC1AC005

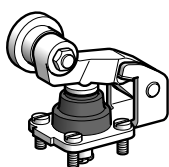


ZC1AC006

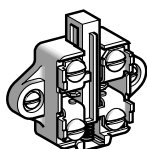


ZC1AC007

ZC1AC009



ZC1AC008



ZC1AZ1

Plunger heads

Type of operator	Maximum actuation speed	Type of actuation	Reference	Weight kg
For actuation on end				
End plunger	0.5 m/s		ZC1AC001	0.035
For actuation by 30° cam				
End ball bearing plunger	0.5 m/s		ZC1AC005	0.050
Roller lever plunger	1 m/s (direction A) 0.5 m/s (direction B)		ZC1AC006	0.100
Reinforced roller lever plunger	1 m/s (direction A) 0.5 m/s (direction B)		ZC1AC007	0.375
Offset roller lever plunger	1 m/s (direction A) 0.5 m/s (direction B)		ZC1AC008	0.100
Needle bearing mounted roller lever plunger	1 m/s (direction A) 0.5 m/s (direction B)		ZC1AC009	3.380

Contact blocks

Type of contact	Scheme	Reference	Weight kg
CO, single-pole		ZC1AZ11	0.040
NC + NO break before make		ZC1AZ12	0.045
NO + NC make before break		ZC1AZ13	0.040
NC + NC simultaneous		ZC1AZ14	0.045
NO + NO simultaneous		ZC1AZ15	0.045
NC + NC staggered		ZC1AZ16	0.040
NO + NO staggered		ZC1AZ17	0.040

Adaptation plate

Description	Reference	Weight kg
Mounting plate (For replacing an old version type RN-67522 limit switch by an XC1AC limit switch)	ZC1AZ8	3.380

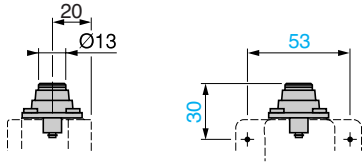
Limit switches

OsiSense XC Special

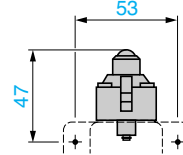
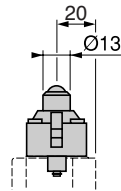
For material handling applications, type XC1AC
Replacement parts

Dimensions

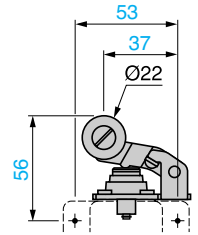
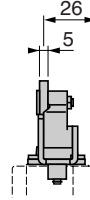
ZC1AC001



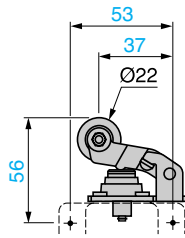
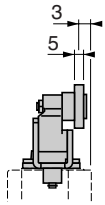
ZC1AC005



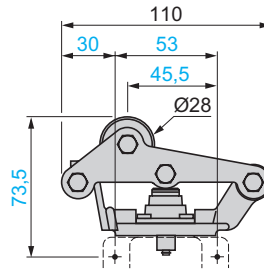
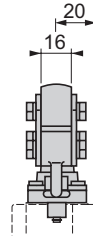
ZC1AC006



ZC1AC008



ZC1AC007, ZC1AC009



Limit switches

OsiSense XC Special

For hoisting and material handling applications XCR

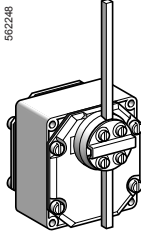
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■ XCR

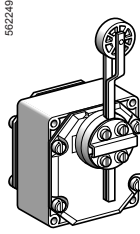
□ With head for rotary movement operators, spring return to off position

1 contact actuation position per direction

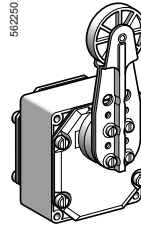
562248



562249



562250

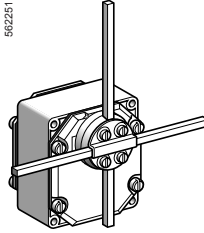


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□ With head for rotary movement operators, stay put

1 contact actuation position per direction

562251



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Limit switches

OsiSense XC Special

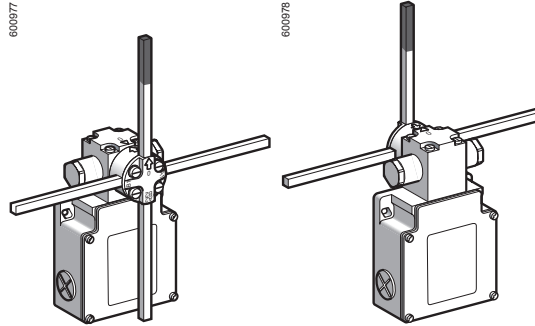
For hoisting and material handling applications XCKMR and XCKVR

For conveyor belt shift monitoring applications XCRT

■ XCKMR (metal)

□ With head for rotary movement operators, stay put

4 mechanical actuation positions of 4 contacts
From 2 to 5 electrical positions depending on model

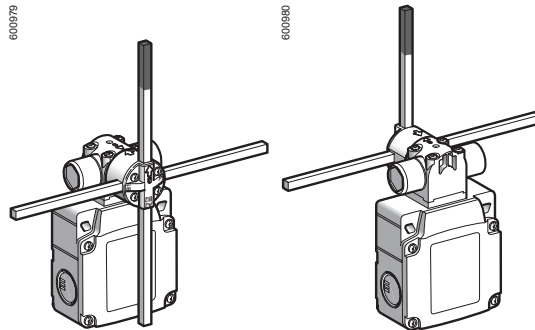


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■ XCKVR (plastic)

□ With head for rotary movement operators, stay put

4 mechanical actuation positions of 4 contacts
From 2 to 5 electrical positions depending on model

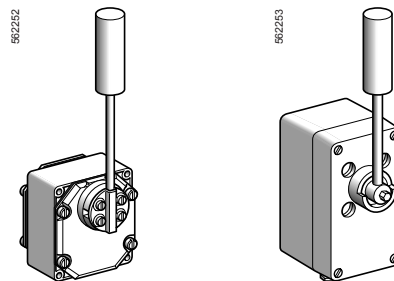


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■ XCRT

□ With head for rotary movement operators, spring return to off position

2 contact actuation positions per direction
1 contact actuated at 10°, other contact at 18°



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Limit switches

OsiSense XC Special

For hoisting and material handling applications XCR, XCKMR and XCKVR

For conveyor belt shift monitoring applications XCRT

1

Environment characteristics				
Limit switches		XCR and XCRT	XCKMR (metal)	XCKVR (plastic)
Conformity to standards	Products	EN/IEC 60947-5-1, CSA C22-2 n° 14, CCC	EN/IEC 60947-5-1, CSA C22-2 n° 14, UL 508, CCC	
	Machine assemblies	EN/IEC 60204-1		
Product certifications		XCRA, B, E, F: CE, CSA, CCC, GOST XCRT: GOST		
Protective treatment	Standard version	"TC"		
Ambient air temperature	For operation	- 25...+ 70 °C	- 25...+ 70 °C	- 25...+ 70 °C
	For storage	- 40...+ 70 °C	- 40...+ 85 °C	- 40...+ 70 °C
Vibration resistance	Conforming to EN/IEC 60068-2-6	9 gn (10...500 Hz)	25 gn (10...500 Hz)	25 gn (10...500 Hz)
Shock resistance	Conforming to EN/IEC 60068-2-27	XCRA, B, E, F: 68 gn, XCRT: 30 gn (18 ms)	50 gn	50 gn
Electric shock protection		Class I conforming to IEC 60536		Class II conforming to IEC 60536
Degree of protection	Conforming to EN/IEC 60529	XCRA, B, E, F: IP 65 XCRT: IP 65	IP 66	IP 65
Degree of protection against mechanical impacts	Conforming to EN 50102	IK 07	IK 07	IK 04
Materials	Enclosure	Metal (except XCRT315: polyester)	Zamak ZP3	(PBT + PC) - GF 30 FR (Valox)
	Cover	Metal (except XCRT315: polyester)	DC03 steel	(PBT + PC) - GF 30 FR (Valox)
	Head	Metal	Zamak ZP3	(PBT + PC) - GF 30 FR (Valox)
Cable entry		1 tapped entry for n°13 cable gland	3 tapped entries for n°13 cable gland or tapped M20 x 1.5	1 tapped entry M20 x 1.5. 2 breakout holes for ISO M20 cable gland
Contact block characteristics				
Rated operational characteristics	Conforming to EN/IEC 60947-5-1 Appendix A	XCRA, B, E, F: ~ AC-15; A300 (Ue = 240 V, Ie = 3 A), Ithe = 10 A --- DC-13 ; Q300 (Ue = 250 V, Ie = 0.27 A) XCRT: ~ AC-15; B300 (Ue = 240 V, Ie = 1.5 A/ Ue = 120 V, Ie = 3 A) --- DC-13 ; R300 (Ue = 250 V, Ie = 0.1 A)	~ AC-15 ; A300 (Ue = 240 V, Ie = 3 A), Ithe = 10 A --- DC-13 ; Q150 (Ue = 125 V, Ie = 0.55 A)	
Rated insulation voltage		Ui = 500 V degree of pollution 3 conforming to EN/IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14		
Rated impulse withstand voltage		U imp = 6 kV conforming to EN/IEC 60947-1, IEC 60664		
Positive operation (depending on model)		NC contacts with positive opening operation conforming to EN/IEC 60947-5-1 Section 3 (except XCRT)	NC contacts with positive opening operation conforming to EN/IEC 60947-5-1 Section 3 (contacts 21-22)	
Resistance across terminals		≤ 25 m Ω conforming to NF C 93-050 method A or IEC 60255-7 category 3		
Short-circuit protection		10 A cartridge fuse type gG (gl)		
Connection	Screw clamp terminals	Clamping capacity	Clamping capacity	
		XE2N P2151 ou XCRT: min: 1 x 0.5 mm ² , max: 2 x 2.5 mm ² XE2S P2151: min: 1 x 0.34 mm ² , max: 2 x 1.5 mm ²	min: 1 x 0.5 mm ² max: 2 x 2.5 mm ²	

Limit switches

OsiSense XC Special

For hoisting and material handling applications XCR, XCKMR and XCKVR

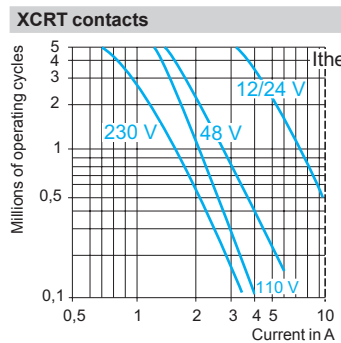
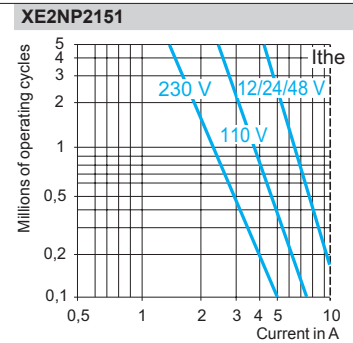
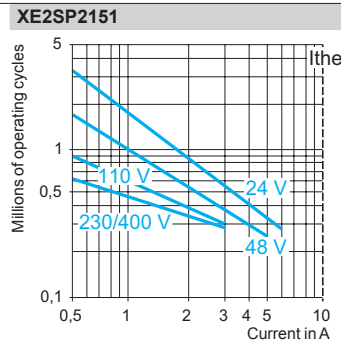
For conveyor belt shift monitoring applications XCRT

Contact block characteristics (continued)

Electrical durability

- Conforming to EN/IEC 60947-5-1 Appendix C
- Utilisation categories AC-15 and DC-13
- Maximum operating rate: 3600 operating cycles/hour
- Load factor: 0.5

AC supply
~ 50/60 Hz
~ inductive circuit



DC supply ---

	Voltage V	24	48	120
Power broken in W for 5 million operating cycles	XE2S P2151	10	7	4
	XE2N P2151	13	9	7
W ~ inductive circuit	XCRT contacts	10	7	4

For XE2SP2151 on ~ or --- NC and NO contacts simultaneously loaded to the values shown with reverse polarity.

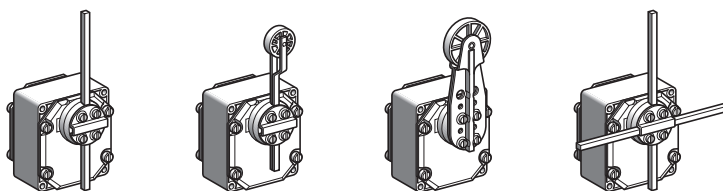
Limit switches

OsiSense XC Special

For hoisting and material handling applications XCR

Complete switches with 1 cable entry

Type of head	Rotary with spring return to off position	Stay put
Maximum displacement	55° in each direction	90° in each direction



Type of operator	Metal rod, \varnothing 6 mm	Thermoplastic roller lever	Large thermoplastic roller lever	Metal rods, \varnothing 6 mm, crossed rods for XCRE●8, "T" rods for XCRF●7
Rod length	1 rod of 200 mm	–	–	XCRE●●: 2 rods of 200 mm XCRF●●: 1 rod of 200 mm and 1 rod of 300 mm

References of complete switches (⊖ NC contact with positive opening operation)

<p>Two 2-pole NC + NO snap action XE2SP2151</p> <p>1st contact 2^e contact</p>	Both contacts operate in each direction	<p>X CRA11 ⊖ (3)</p>	<p>X CRA12 ⊖ (3)</p>	<p>X CRA15 ⊖ (3)</p>	<p>X CRE18 ⊖ (3)</p>
	1 contact operates in each direction	<p>X CRB11 ⊖ (3)</p>	<p>X CRB12 ⊖ (3)</p>	<p>X CRB15 ⊖ (3)</p>	<p>X CRF17 ⊖ (3)</p>
<p>Two 2-pole NC + NO break before make, slow break XE2NP2151</p> <p>1st contact 2^e contact</p>	Both contacts operate in each direction	<p>X CRA51 ⊖ (3)</p>	<p>X CRA52 ⊖ (3)</p>	<p>X CRA55 ⊖ (3)</p>	<p>X CRE58 ⊖ (3)</p>
	1 contact operates in each direction	<p>X CRB51 ⊖ (3)</p>	<p>X CRB52 ⊖ (3)</p>	<p>X CRB55 ⊖ (3)</p>	<p>X CRF57 ⊖ (3)</p>
Weight (kg)	1.110	1.145	1.155	1.135	
Contact operation	<p>closed (P) = positive opening point open (1) 1st contact (2) 2nd contact</p>				

Complementary characteristics

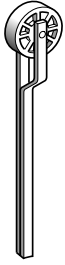
Lever maximum actuation speed	1.5 m/s	
Mechanical durability	10 million operating cycles	
Minimum torque	For tripping	0.45 N.m
	For positive opening	0.75 N.m
Cable entry	1 entry tapped for n° 13 cable gland conforming to NF C 68-300 (DIN Pg 13.5)	
	Clamping capacity 9 to 12 mm	

(3) For a limit switch with watertight reinforced seal (IP 65), add 1 to the end of the reference. Example: XCRF17 becomes XCRF171.

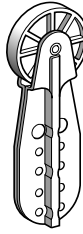
Limit switches

OsiSense XC Special

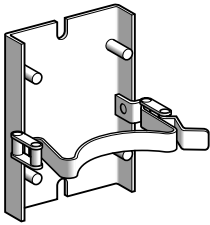
For hoisting and material handling applications XCR



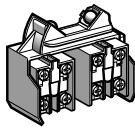
XCRZ02



XCRZ05



XCRZ09



XCRZ1

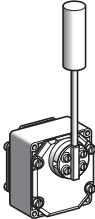
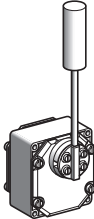
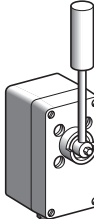
Separate components

Description	For switches	Type	Reference	Weight kg
Rod, \varnothing 6 mm	XCRA XCRB XCRE XCRF	L = 200 mm	XCRZ03	0.020
	XCRF	L = 300 mm	XCRZ04	0.030
Roller lever thermoplastic roller	XCRA XCRB	–	XCRZ02	0.050
	XCRA XCRB	–	XCRZ05	0.090
Quick fixing/ release bracket	XCRA, XCRB XCRE, XCRF	–	XCRZ09	0.520
Contact block (2 contacts) with mounting plate	XCRA, XCRB XCRE, XCRF	2-pole NC + NO snap action	XCRZ12	0.135
		2-pole NC + NO break before make, snap action	XCRZ15	0.135
Description	Application	Sold in lots of	Unit reference	Weight kg
Adaptor	Pg 13.5 to ISO M20 x 1.5	5	DE9RP13520	0.032

Limit switches

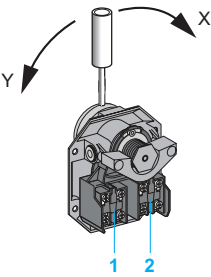
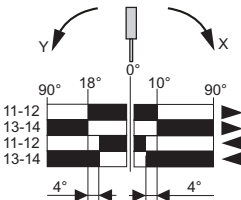
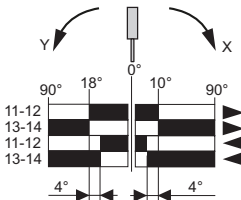
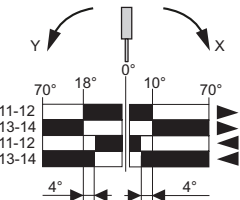
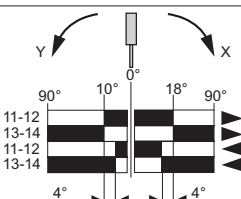
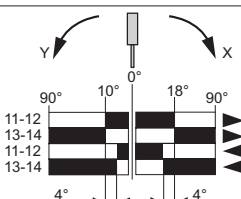
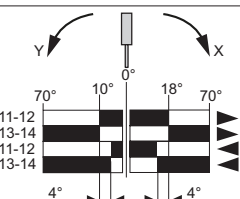
OsiSense XC Special

For conveyor belt shift monitoring applications XCRT
Complete switches with 1 cable entry

Type of switch	Standard	For corrosive atmospheres	
			

Features	Standard	For corrosive atmospheres	For corrosive atmospheres
	Zinc alloy enclosure Colour: industrial blue Zinc plated steel lever, spring return to off position Cam angles: 10° and 18° Maximum displacement: 90°	Zinc alloy enclosure Colour: blue Stainless steel lever, spring return to off position Cam angles: 10° and 18° Maximum displacement: 90°	Glass reinforced polyester enclosure Colour: grey Stainless steel lever, spring return to off position Cam angles: 10° and 18° Maximum displacement: 70°

References of complete switches

2 single-pole CO snap action	XCRT115	XCRT215	XCRT315
 <p>1: 1st contact</p> <p>2: 2nd contact</p>			
			
Weight (kg)	1.170	1.170	1.520

Contact operation

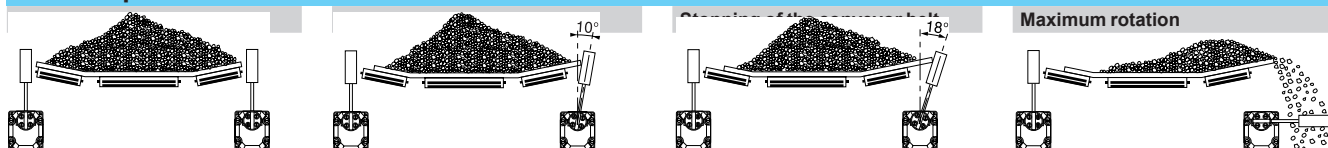
 closed

 open

Complementary characteristics

Lever maximum actuation speed	1.5 m/s
Belt maximum speed	4 m/s
Machnical durability	0.3 million operating cycles
Minimum tripping torque	1.7 N.m
Cable entry	1 entry tapped for n° 13 cable gland conforming to NF C 68-300 (DIN Pg 13.5) Clamping capacity 9 to 12 mm

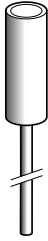
Switch operation



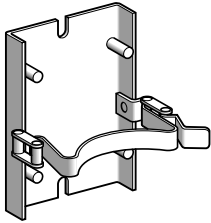
Limit switches

OsiSense XC Special

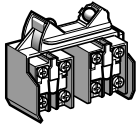
For conveyor belt shift monitoring applications XCRT



XCRZ9●●



XCRZ09



XCRZ42

Separate components

Description	Type	For switches	Reference	Weight kg
Roller with lever	Zinc plated steel	XCRT115 XCRT215	XCRZ901	0.230
	Stainless steel	XCRT115 XCRT215	XCRZ902	0.230
		XCRT315	XCRZ903	0.230
Quick fixing/release bracket	–	XCRT115 XCRT215	XCRZ09	0.520
Contact block (2 contacts) with mounting plate	Single-pole CO snap action	XCRT●15	XCRZ42	0.135
Description	Application	Sold in lots of	Unit reference	Weight kg
Adaptor	Pg 13.5 to ISO M20 x 1.5	5	DE9RP13520	0.032

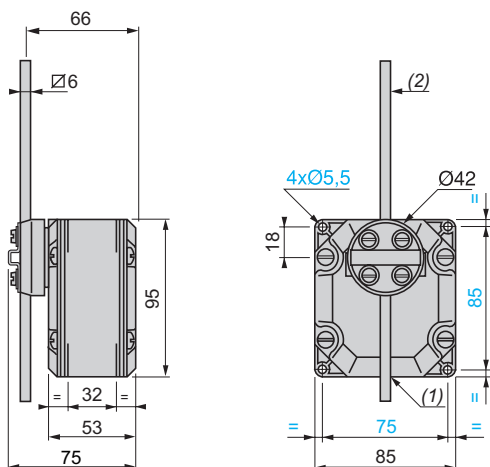
Limit switches

OsiSense XC Special

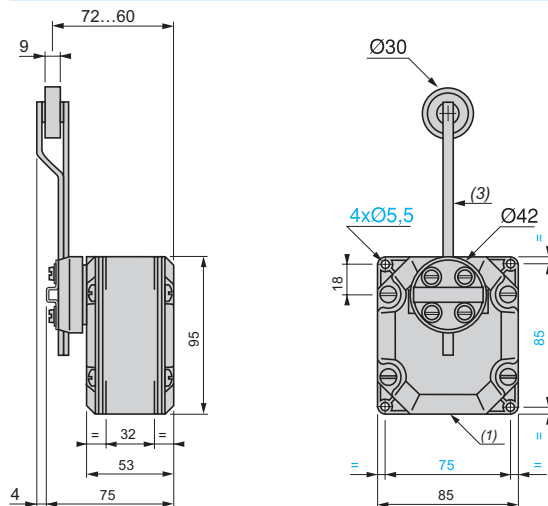
For hoisting and material handling applications XCR

1

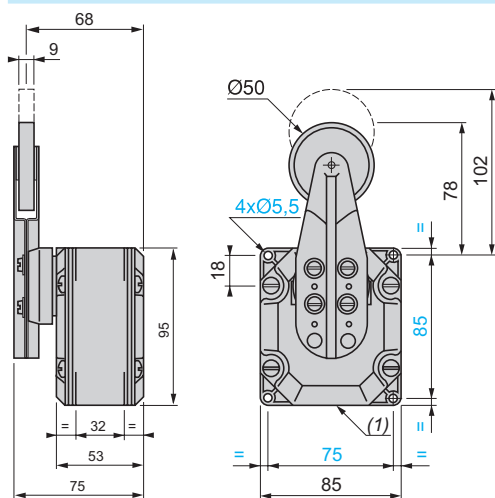
XCRA11, XCRB11, XCRA51, XCRB51



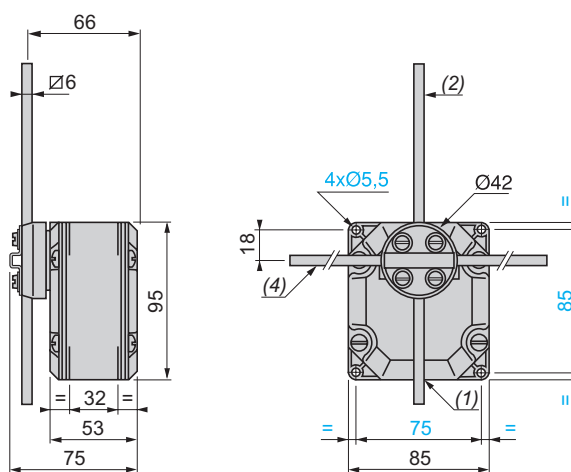
XCRA12, XCRB12, XCRA52, XCRB52



XCRA15, XCRB15, XCRA55, XCRB55



XCRE18, XCRE58, XCRF17, XCRF57

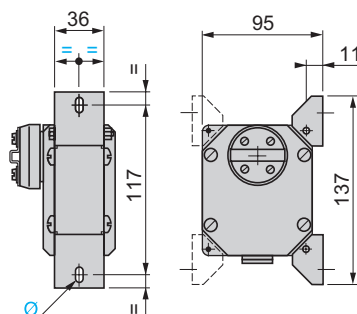
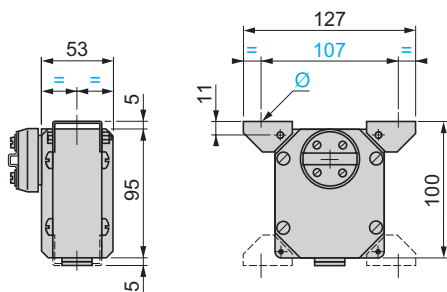


- (1) 1 tapped entry for n° 13 cable gland.
- (2) Rod length: 200 mm.
- (3) Rod + roller length: 160 mm.
- (4) Rod length: 300 mm for XCRF17 and XCRF57, 200 mm for XCRE18 and XCRE58.

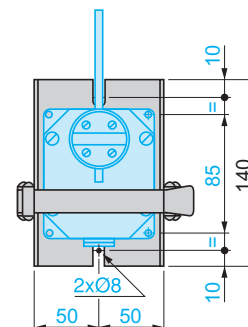
Supplementary fixing using 2 adjustable lugs (included with switch)

Horizontally positioned

Vertically positioned



Quick fixing/release bracket XCRZ09



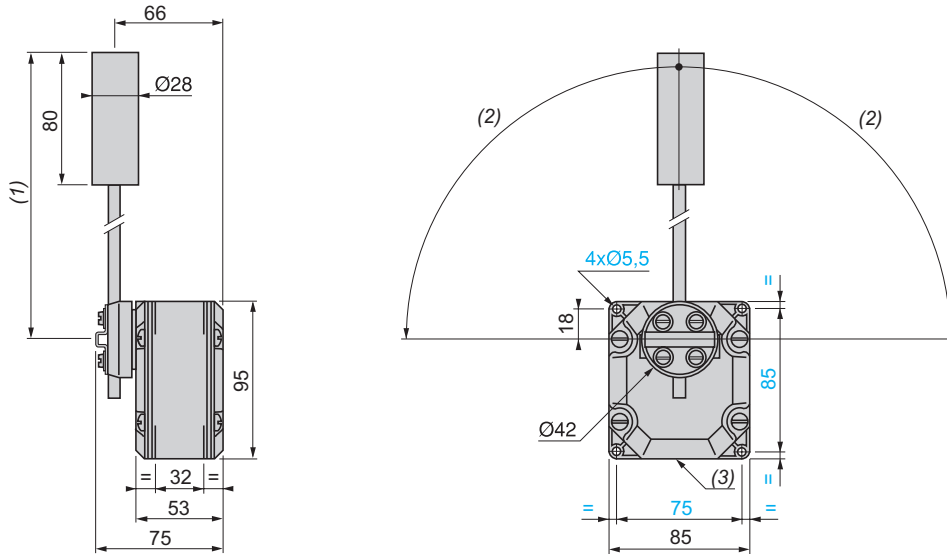
Ø: 1 elongated hole Ø 6 x 8.

Limit switches

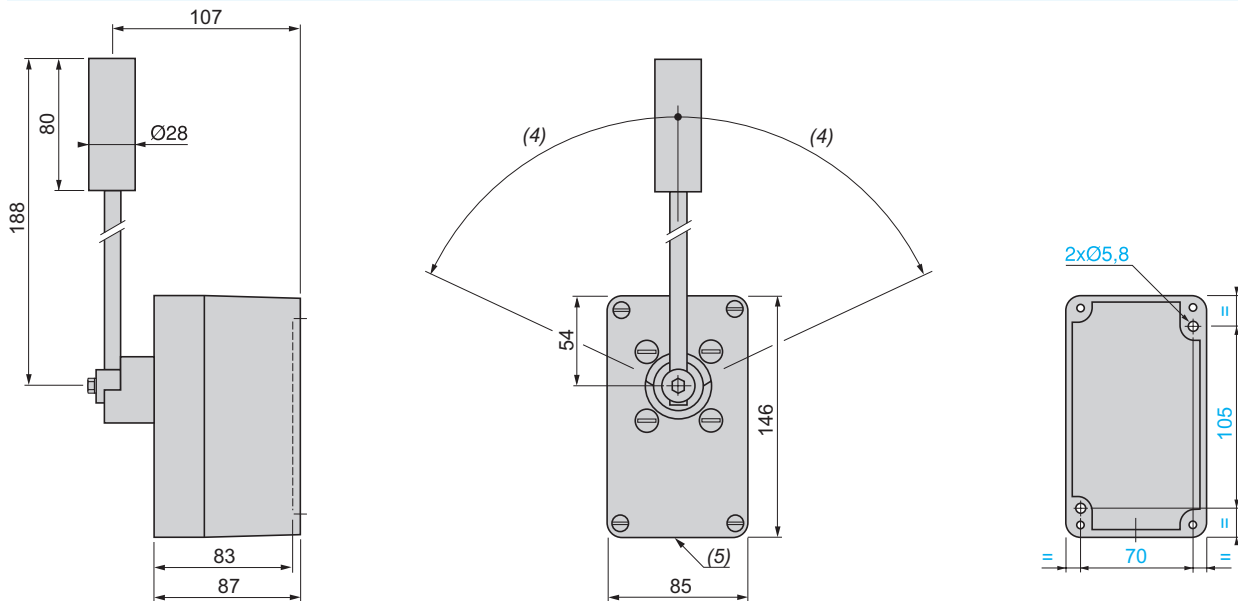
OsiSense XC Special

For conveyor belt shift monitoring applications XCRT

XCRT115, XCRT215



XCRT315



(1) 200 max., 104 min.

(2) 90° max.

(3) 1 tapped entry for n° 13 cable gland.

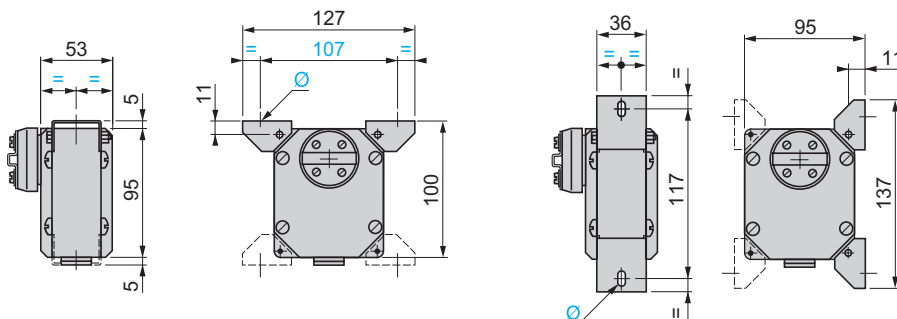
(4) 70° max.

(5) 1 plain entry for n° 13 cable gland.

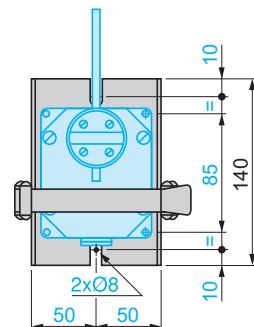
Supplementary fixing using 2 adjustable lugs (included with XCRT115 and XCRT215)

Horizontally positioned

Vertically positioned



Quick fixing/release bracket XCRZ09



Ø: 1 elongated hole Ø 6 x 8.

Limit switches

OsiSense XC Special

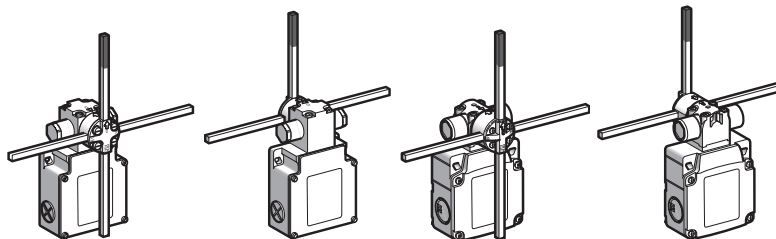
For hoisting and material handling applications

XCKMR and XCKVR

Complete switches with 3 cable entries

1

Type of operating head	Rotary			
------------------------	--------	--	--	--



Material	Metal		Plastic	
Type of operator	With cruciform metal rods	With cruciform metal rods, reversed head	With cruciform metal rods	With cruciform metal rods, reversed head

References

“By pass” switches

<p>2 x 2-pole NC+NO break before make, slow break (XE2NP2151)</p>	XCKMR24SR1H29	–	XCKVR24SR1H29	–
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“Single speed” switches

<p>2 x 2-pole NC+NO break before make, slow break (XE2NP2151)</p>	XCKMR44D1H29	XCKMR44D2H29	XCKVR44D1H29	XCKVR44D2H29
---------------------------------------------------------------------------	--------------	--------------	--------------	--------------

“Double speed” switches (⊖ NC contact with positive opening operation on contacts 21-22)

<p>2 x 2-pole NC+NC break before make, slow break (non interchangeable contacts)</p>	XCKMR54D1H29 (1)	XCKMR54D2H29 (1)	XCKVR54D1H29	XCKVR54D2H29
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Weight (kg)	0.684	0.684	0.320	0.320
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Complementary characteristics

Switch actuation	Horizontal	
Permissible actuation area on the rods	Between 65 and 95 mm from the axis of the fixing screws on the body	
Minimum actuation speed	0.1 m/mn	0.1 m/mn
Maximum actuation speed (2)	1.5 m/s	1.5 m/s
Minimum force or torque	For tripping	0.5 N.m
	For positive opening	0.75 N.m
Mechanical durability	2 million operating cycles	1 million operating cycles
Setting up	Rods included with the switch: for customer assembly	

References of separate components

	Description	Reference	Weight kg
	Rod \varnothing 6 mm, L = 200 mm	XCRZ03	0.020
	Rod \varnothing 6 mm, L = 200 mm with red mark	XCRZ03R	0.020
	Plastic cable gland ISO M20	DE9PEM20010	0.010

DE9PEM20010

(1) For complete switches with entry for Pg 13.5 cable gland, delete H29 from the end of the reference. Example: XCKMR54D1H29 becomes XCKMR54D1.

(2) For an actuation point on the rod between 65 and 95 mm from the axis of the fixing screws on the body.

Limit switches

OsiSense XC Special

For hoisting and material handling applications

XCKMR and XCKVR

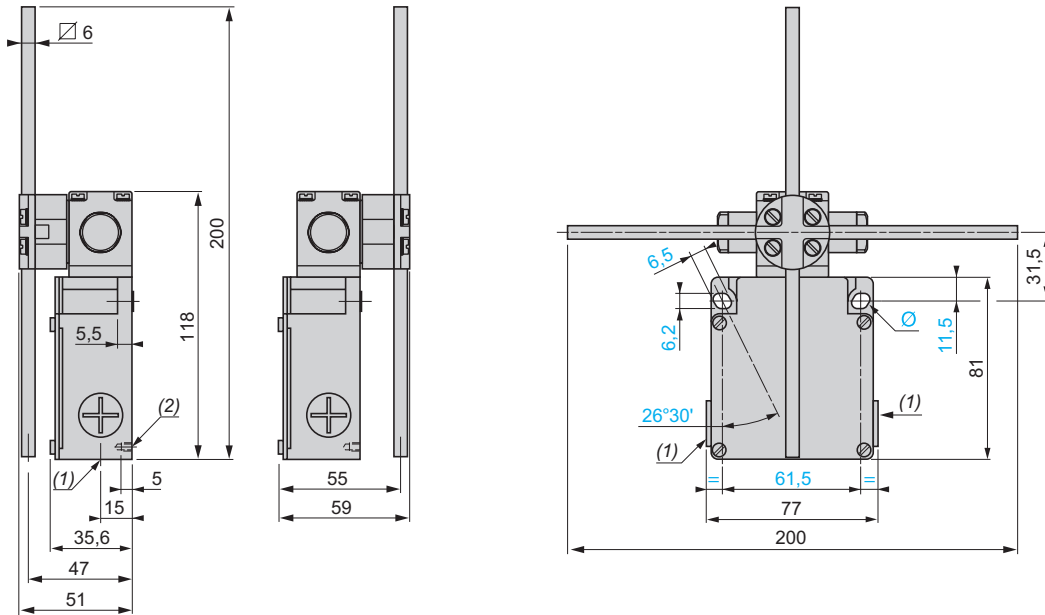
Complete switches with 3 cable entries

Dimensions

Metal limit switches

XCKMR24SR1H29,
XCKMR44D1H29 and
XCKMR54D1H29

XCKMR44D2H29 and XCKMR54D2H29

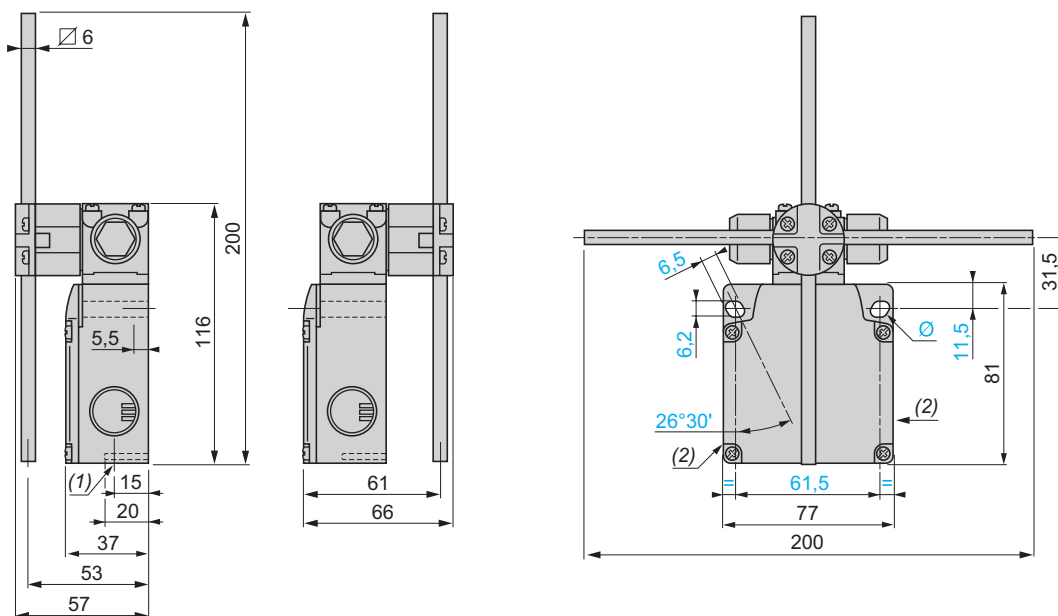


- (1) XCKMR●●●H29 = 3 tapped entries ISO M20 x 1.5.
XCKMR●●● = 3 tapped entries for Pg 13.5 cable gland.
(2) 2 centring holes $\varnothing 3.9 \pm 0.2$, for cover fixing holes alignment.
 \varnothing : 2 elongated holes 6.2 x 6.5, inclined at 26°30' to the vertical axis, for M5 screws.

Plastic limit switches

XCKVR24SR1H29,
XCKVR44D1H29 and
XCKVR54D1H29

XCKVR44D2H29 and XCKVR54D2H29



- (1) 1 tapped entry ISO M20 x 1.5.
(2) 2 knock-out holes for ISO M20 cable gland (reference: DE9 PEM20010).
 \varnothing : 2 elongated holes 6.2 x 6.5, inclined at 26°30' to the vertical axis, for M5 screws.

Limit switches

OsiSense XC Special

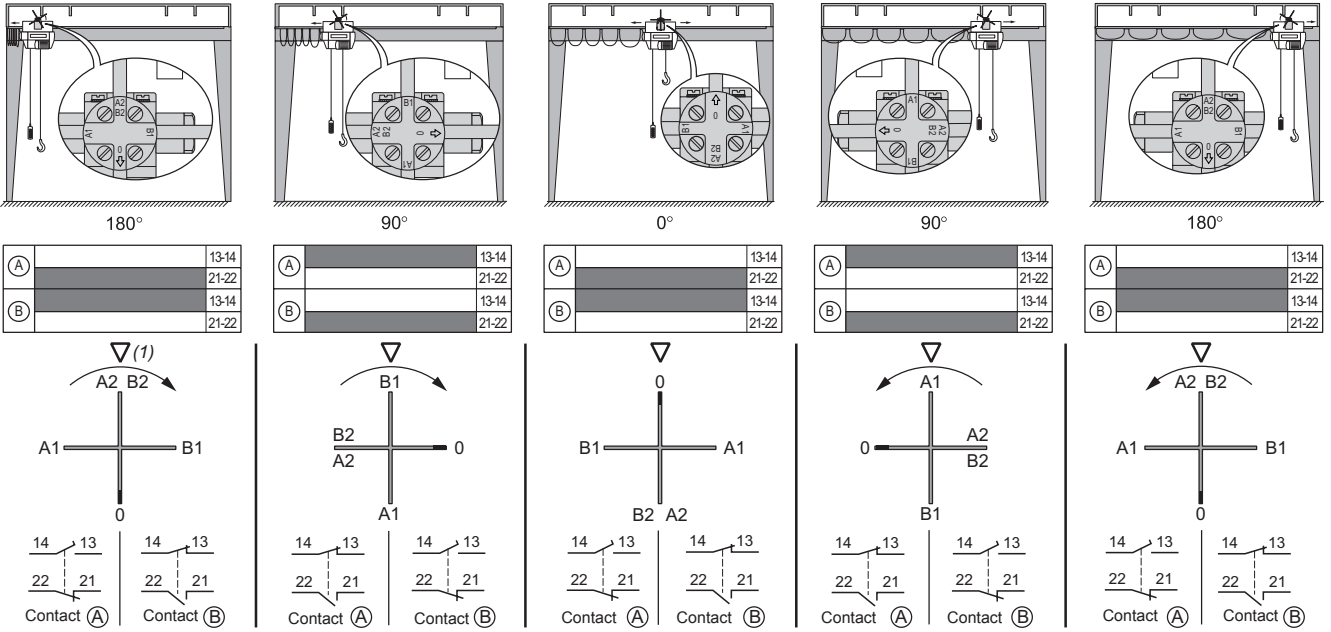
For hoisting and material handling applications

XCKMR and XCKVR

Complete switches with 3 cable entries

Operation

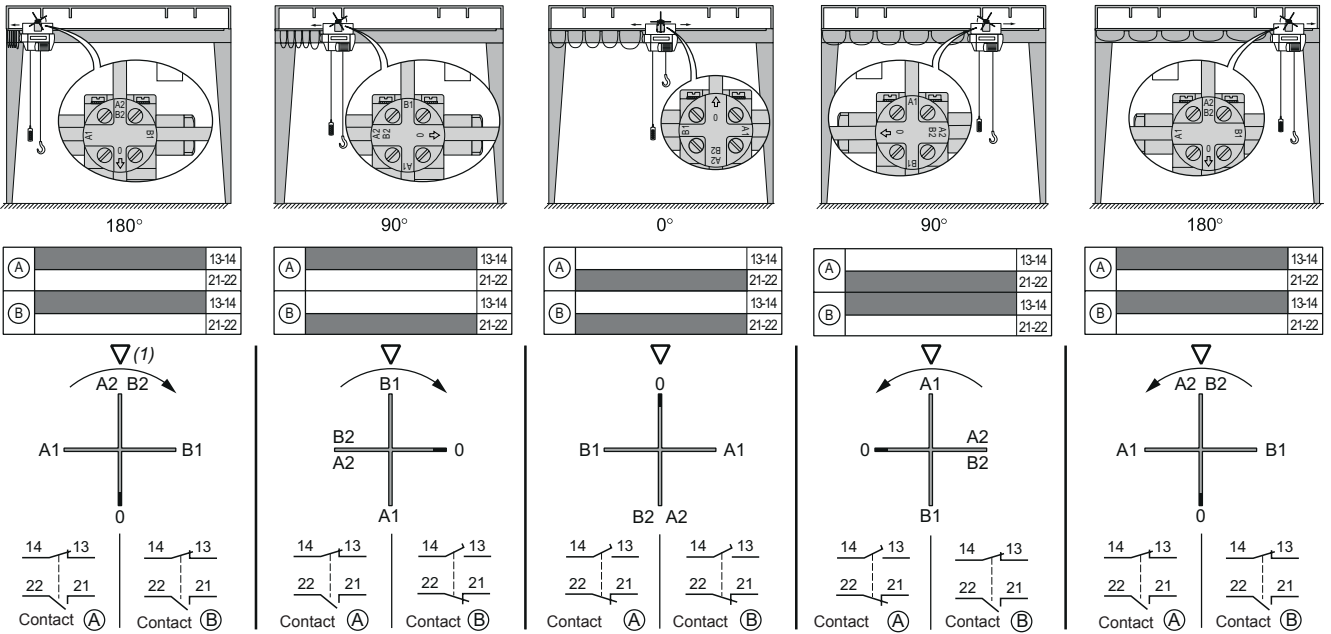
Limit switches XCK●R24SR1H29: "By pass"



(1) Triangle symbol marked on top of head.

or ↻ : direction of rotation.

Limit switches XCK●R44D●H29: "Single speed"



(1) Triangle symbol marked on top of head.

or ↻ : direction of rotation.

Limit switches

OsiSense XC Special

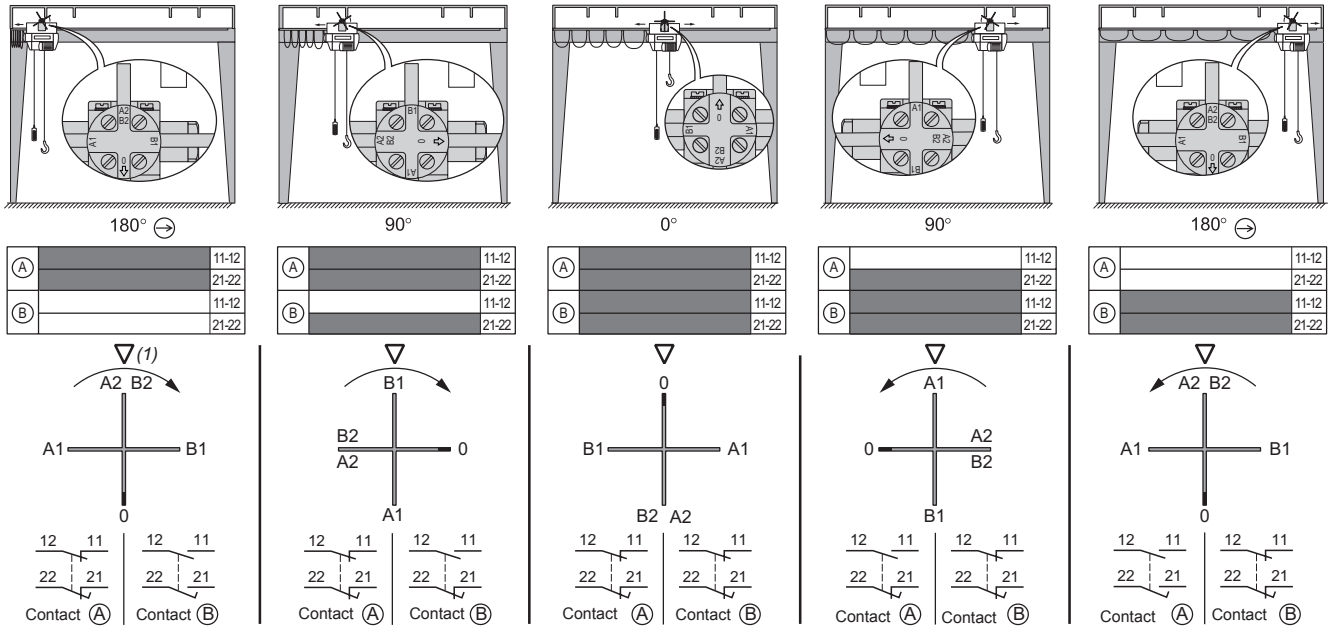
For hoisting and material handling applications

XCKMR and XCKVR

Complete switches with 3 cable entries

Operation (continued)

Limit switches XCK●R54D●●●●: "Double speed"



(1) Triangle symbol marked on top of head.

or : direction of rotation.

Miniature snap switches

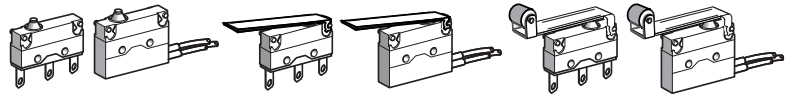
OsiSense XC Special

Subminiature design, DIN 41635 B format, sealed

Sub-subminiature design, DIN 41635 D format

References

Subminiature design, DIN 41635 B format, sealed



Type of operator		Plunger	Flat lever (1)	Roller lever (1)
<p>Single-pole CO snap action</p> <p>Wiring: 1 Black 2 Grey 4 Blue</p>	2.8 mm cable clip tag connections	XEP4E1W7 (3)	XEP4E1W7A326 (3)	XEP4E1W7A454 (3)
	Weight (g)	2.4	3.1	3.2
	Pre-cabled connections	XEP4E1FD (3)	XEP4E1FDA326 (3)	XEP4E1FDA454 (3)
	Weight (g)	14.1	14.8	14.9
Separate components	Flat lever (2)	ZEP4L326 (3)	-	-
	Weight (g)	0.7	-	-
	Roller lever (2)	ZEP4L454 (3)	-	-
	Weight (g)	0.8	-	-

Sub-subminiature design, DIN 41635 D format



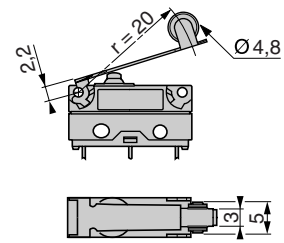
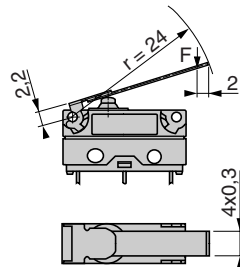
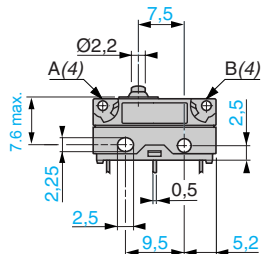
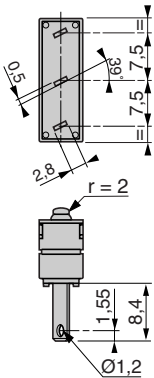
Type of operator		Plunger	Flat lever (1)
<p>Single-pole CO snap action</p>	Solder tag connections	XEP5P1W2 (3)	XEP5P1W2Z55B (3)
	Weight (g)	1.4	1.9

Dimensions

XEP4E1W7

XEP4E1W7A326

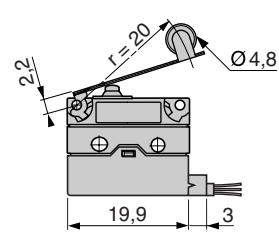
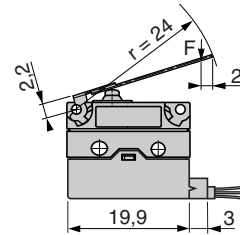
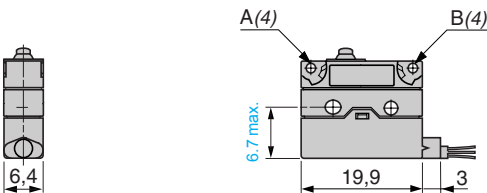
XEP4E1W7A454



XEP4E1FD

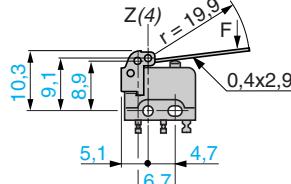
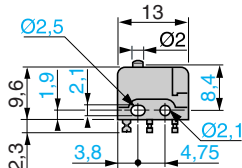
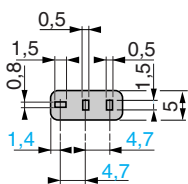
XEP4E1FDA326

XEP4E1FDA454



XEP5P1W2

XEP5P1W2Z55B



(1) In order to avoid damage to the fixing spigots, removal of the lever from complete products is not recommended.

(2) Levers only for mounting on basic (plunger) snap switches (XEP4E1W7 and XEP4E1FD).

(3) Switches sold in lots of 5.

(4) A, B, Z: lever fixing positions.

Miniature snap switches

OsiSense XC Special

Subminiature design, DIN 41635 B format, sealed
Sub-subminiature design, DIN 41635 D format

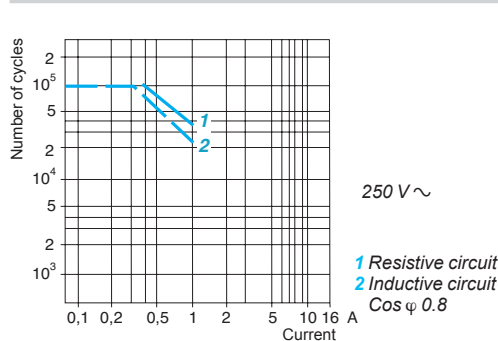
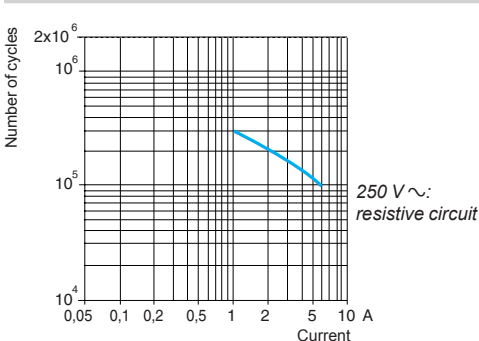
Switch type	XEP4E1●●, XEP5P1W2 Plunger	XEP4E1●●A326, XEP5P1W2Z55B Flat lever	XEP4E1●●A454 Roller lever
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Environment characteristics			
Lever fixing position (1)	–		A
Switch actuation	On end		Horizontal
Product certifications	CE, IEC 60947-5-1, EN 60947-5-1, c UR us, UL 1054, EN 61058		
Degree of protection	IP 67 XEP4E1FD●●, case IP 67 and tags IP 00 XEP4E1W7●●, case IP 40 and tags IP 00 XEP5P1W2●●		
Operating temperature	– 40...+ 105°C XEP4E1FD●●, – 40...+ 125°C XEP4E1W●●●● and XEP5P1●●●		
Materials	Case	Polyester XEP4, diallyl-phthalate XEP5	
	Lever	–	Stainless steel
	Contact	AgCdO XEP4E1●●, Ag XEP5	
	Tags	Tinned brass XEP4E1W●●●, gold plated brass XEP5P1●●	

Mechanical characteristics					
		Lever fixing position (1)			
Maximum tripping force	XEP4	A	2.5 N	0.63 N	0.83 N
		B	2.5 N	1.25 N	1.67 N
	XEP5		2 N	0.80 N	–
Minimum release force	XEP4	A	0.80 N	0.20 N	0.27 N
		B	0.80 N	0.40 N	0.53 N
	XEP5		0.40 N	0.15 N	–
Maximum permissible end of travel force	XEP4	A	10 N	2.5 N	3.33 N
		B	10 N	5 N	6.67 N
	XEP5		10 N	–	–
Tripping point (TP) (2)	XEP4	A	8.40 \pm 0.3 mm	10.7 \pm 1.7 mm	15.5 \pm 1.4 mm
		B	8.40 \pm 0.3 mm	9.6 \pm 1.0 mm	14.5 \pm 0.9 mm
	XEP5		8.40 mm	9.20 mm	–
Maximum differential travel	XEP4	A	0.13 mm	0.52 mm	0.39 mm
		B	0.13 mm	0.26 mm	0.20 mm
	XEP5		0.06 mm	0.25 mm	–
Minimum overtravel	XEP4	A	0.60 mm	2.40 mm	1.80 mm
		B	0.60 mm	1.20 mm	0.90 mm
	XEP5		0.10 mm	–	–
Inter-contact distance	XEP4		0.4 mm		
	XEP5		0.3 mm		
Mechanical durability	XEP4		2 million operating cycles		
	XEP5		0.1 million operating cycles		

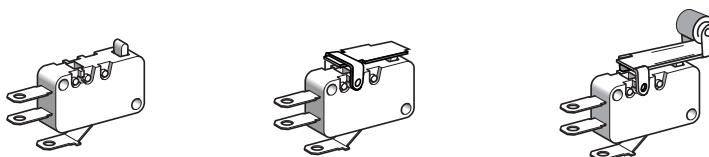
Electrical characteristics		
Operational characteristics	XEP4	AC-15: B300 (Ue: 240 V, Ie: 1.5 A) DC-13: R300 (Ue: 250 V, Ie: 0.1 A) conforming to IEC 60947-5-1, EN 60947-5-1 Appendix A 125-250 V AC 6.0 A conforming to UL 1054 6 (1) A 250 V AC 10 000 cycles conforming to EN 61058
	XEP5	AC-15: D300 (Ue: 240 V, Ie: 0.3 A) conforming to IEC 60947-5-1, EN 60947-5-1 Appendix A
Thermal current	XEP4	7.5 A on 250 V (50/60 Hz)
	XEP5	8.5 A on 250 V (50/60 Hz)
Connection	XEP4	XEP4E1W7●: 2.8 mm clip tags XEP4E1FD: Pre-cabled (horizontally in-line), 3 x 0.5 mm ² , length 0.5 m
	XEP5	Solder tags

Operating curves



(1) Miniature snap switches fitted with a lever are supplied with the lever fixed in position A (see page 1/188). For basic (plunger) snap switches, it is possible to fix the lever in position A or B, depending on the required tripping conditions (see page 1/188).
(2) Position of the operator in relation to the switch fixings (fixing hole centre line) at the instant the switch contact changes state.

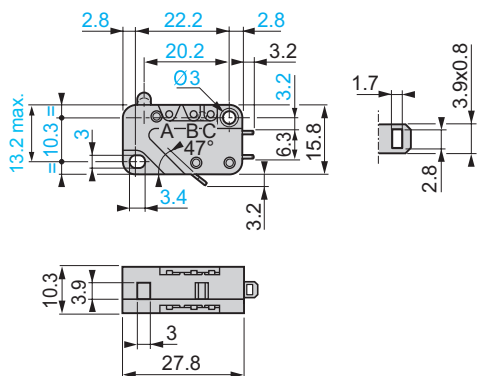
References



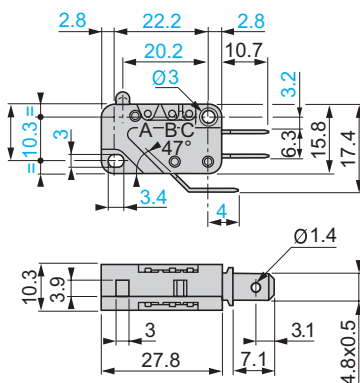
Type of operator		Plunger	Flat lever (1)	Roller lever (1)	
<p>Single-pole CO snap action</p>	Standard contacts	Solder tags	XEP3S1W2 (2)	XEP3S1W2B529 (2)	
		4.8 mm cable clip tags	XEP3S1W6 (2)	XEP3S1W6B529 (2)	
		6.35 mm cable clip tags	XEP3S1W3 (2)	XEP3S1W3B529 (2)	
	Very low operating force	Solder tags	XEP3S2W2 (2)	XEP3S2W2B529 (2)	XEP3S2W2B529 (2)
		4.8 mm cable clip tags	XEP3S2W6 (2)	XEP3S2W6B529 (2)	XEP3S2W6B529 (2)
		6.35 mm cable clip tags	XEP3S2W3 (2)	XEP3S2W3B529 (2)	XEP3S2W3B529 (2)
Weight (g)	5.6	6.3	6.6		
Separate components	Flat lever (3)	ZEP3L524 (2)			
	Weight (g)	0.7			
	Roller lever (3)	ZEP3L529 (2)			
	Weight (g)	1			

Dimensions

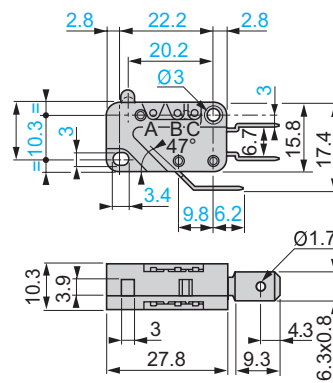
XEP3S●W2



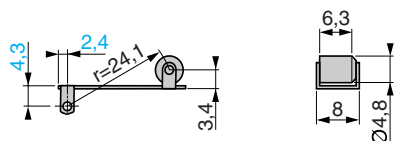
XEP3S●W6



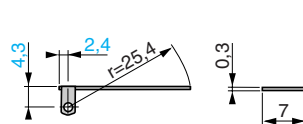
XEP3S●W3



ZEP3L529



ZEP3L524



(1) In order to avoid damage to the fixing spigots, removal of the lever from complete products is not recommended.

(2) Switches sold in lots of 10.

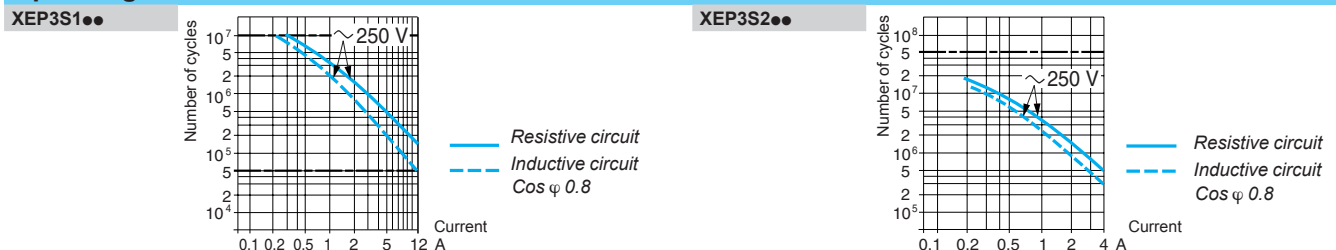
(3) Levers only for mounting on basic (plunger) snap switches (XEP3S●W2, XEP3S●W3, XEP3S●W6), in fixing positions A, B or C.

Switch type	XEP3S●W2	XEP3S●W2B254	XEP3S●W2B259	
Type of operator	Plunger	Flat lever	Roller lever	
Environment characteristics				
Lever fixing position (1)	–	B	B	
Switch actuation	On end	Horizontal		
Product certifications	UR us, CE, IEC/EN 60947-5-1, UL 1054, EN 61058-1			
Degree of protection	Case IP 40 and tags IP 00			
Operating temperature	- 25...+ 125°C			
Materials	Case	Polyester		
	Lever	–	Stainless steel	Stainless steel, glass reinforced polyamide roller
	Contact	AgNi		

Mechanical characteristics					
		Lever fixing position (1)			
Maximum tripping force	Standard	A	0.8 N	0.2 N	
		B	0.8 N	0.4 N	
		C	0.8 N	0.53 N	
	Very low force	A	0.25 N	0.06 N	
		B	0.25 N	0.13 N	
		C	0.25 N	0.17 N	
Minimum release force	Standard	A	0.20 N	0.05 N	
		B	0.20 N	0.10 N	
		C	0.20 N	0.13 N	
	Very low force	A	0.05 N	0.01 N	
		B	0.05 N	0.03 N	
		C	0.05 N	0.03 N	
Maximum permissible end of travel force	Standard, very low force	A	20 N	5 N	
		B	20 N	10 N	
		C	20 N	13 N	
Tripping point (TP) (2)	Standard, very low force	A	14.70 ^{+/-0.4} mm	15.20 ^{+/-2.5} mm	20.5 ^{+/-2.9} mm
		B	14.70 ^{+/-0.4} mm	15.20 ^{+/-1.0} mm	20.5 ^{+/-1.5} mm
		C	14.70 ^{+/-0.4} mm	15.20 ^{+/-0.8} mm	20.5 ^{+/-1.2} mm
Maximum differential travel	Standard, very low force	A	0.35 mm	1.40 mm	
		B	0.35 mm	0.70 mm	
		C	0.35 mm	0.53 mm	
Minimum overtravel	Standard	A	1.20 mm	4.80 mm	
		B	1.20 mm	2.40 mm	
		C	1.20 mm	1.80 mm	
	Very low force	A	1.10 mm	4.40 mm	
		B	1.10 mm	2.20 mm	
		C	1.10 mm	1.65 mm	
Inter-contact distance			0.40 mm		
Mechanical durability for 2/3 overtravel	Standard		20 million operating cycles		
	Very low force		50 million operating cycles		

Electrical characteristics			
Operational characteristics	Standard	AC-15: B300 (Ue: 240 V, Ie: 1.5 A) DC-13: R300 (Ue: 250 V, Ie: 0.1 A) conforming to IEC/EN 60947-5-1 Appendix A 125-250 V AC 10,1 A - 1/2 HP conforming to UL 1054 12 (3) A 250 V AC 10 000 cycles conforming to EN 61058-1	
	Very low force	AC-15: D300 (Ue: 240 V, Ie: 0.3 A) conforming to IEC/EN 60947-5-1 Appendix A 125-250 V AC 4 A - 1/10 HP conforming to UL 1054 4 (1) A 250 V AC 50 000 cycles conforming to EN 61058-1	
Thermal current	Standard	15 A on 250 V (50/60 Hz)	
	Very low force	5 A on 250 V (50/60 Hz)	
Connection		XEP3S●W2: solder tags, XEP3S●W6: 4.8 mm cable clip tags, XEP3S●W3: 6.35 mm cable clip tags	

Operating curves



(1) Miniature snap switches fitted with a lever are supplied with the lever fixed in position B (see page 1/190). For basic (plunger) snap switches, it is possible to fix the lever in position A, B or C, depending on the required tripping conditions (see page 1/190).

(2) Position of the operator in relation to the switch fixings (fixing hole centre line) at the instant the switch contact changes state.

Miniature snap switches

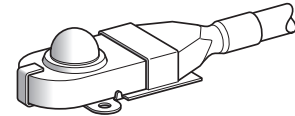
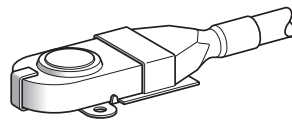
OsiSense XC Special

Sealed design

Pre-cabled

1

Type of head	Plunger (fixing by the body)	
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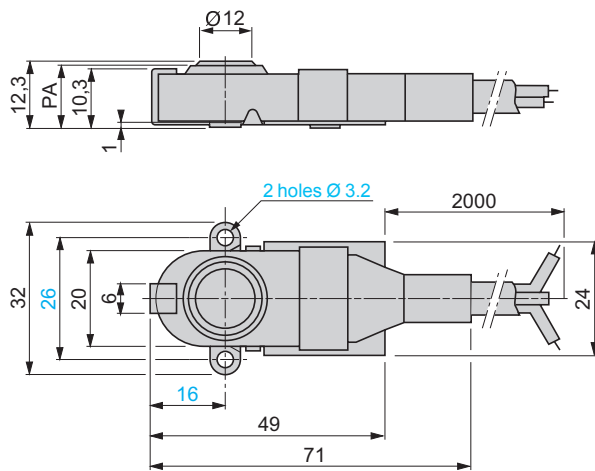
Type of operator	Head with flat plunger	Head with domed enclosed plunger
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References

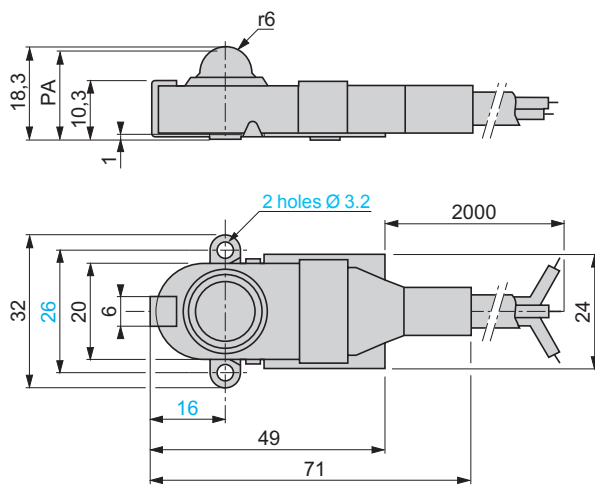
<p>Single-pole CO snap action Wiring: 1 Black 2 Brown 3 Blue 4 Blue</p>	XC010L2	XC011L2
	Weight (kg)	0.145

Dimensions

XC010L2



XC011L2



Miniature snap switches

OsiSense XC Special

Sealed design

Pre-cabled

Switch type		XC010L2	XC011L2
Environment characteristics			
Switch actuation		On end, flat plunger (1)	On end, domed plunger (1)
Product certifications		CE, IEC 60947-5-1	
Degree of protection		IP 66	
Operating temperature		0...+ 85°C	
Materials	Internal housing	Metal	
	Casing	Nitrile	
	Fixing support	Steel, zinc passivated	
	Contact	Ag	
Mechanical characteristics			
Maximum tripping force		5.3 N	
Minimum release force		1.5 N	
Maximum permissible end of travel force		30 N	
Tripping point (TP) (2)		11.4 ^{+0.4} mm	17.4 ^{+0.5} mm
Maximum differential travel		0.2 mm	
Minimum overtravel		0.2 mm	
Inter-contact distance		0.5 mm	
Mechanical durability		2 million operating cycles	
Electrical characteristics			
Operational current		1 A on 24 V (50/60 Hz)	
Thermal current/insulation voltage		12 A/60 V	
Connection		A05 VVF cable, 3 x 0.75 mm ² , length 2 metres, external diameter ≤ 7.6 mm	
Electrical durability		AC-15: 0.5 million operating cycles	

(1) Manual actuation must be made by an intermediate insulated part, in order to meet basic safety requirements.

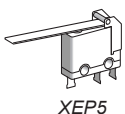
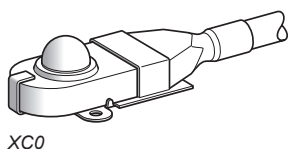
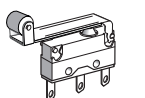
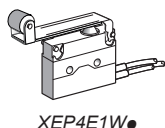
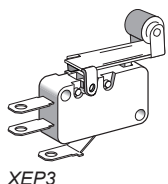
One of the two fixing holes must also be used as an earth protection terminal.

(2) Distance between the base of the switch and the top of the plunger at the instant the contact changes state (see dimensions, page 1/192).

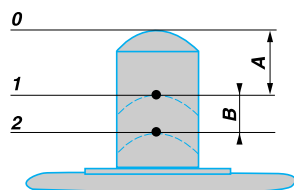
Miniature snap switches

OsiSense XC
Miniature design
General

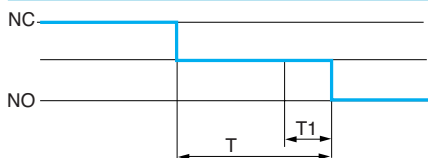
Presentation



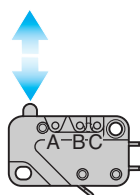
Terminology



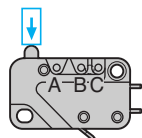
Mechanical characteristics



T1: bounce time
T: changeover time



Mounting



Electromechanical detection

■ OsiSense XC miniature snap switches, featuring electromechanical technology, assure the following functions:

- detection of presence or absence,
- detection of position.

Actuation of the operator (plunger or lever) on the miniature snap switch causes the electrical contact to change state. This information can then be processed by a PLC controlling the installation. OsiSense XC miniature snap switches can be used both in industrial applications and the building sector.

Features

■ OsiSense XC miniature snap switches incorporate a CO snap action, single break, contact.

They are characterised by:

- high electrical ratings for their very small size,
- short tripping travel,
- low tripping force,
- high repeat accuracy on the tripping points,
- long service life.

Forces

- Maximum tripping force:
maximum force which must be applied to the operator to move it from the rest (unactuated) position to the trip position (tripping point).
- Minimum release force:
value to which the force on the operator must be reduced to allow the snap action mechanism to return to its rest (unactuated) position.
- Maximum permissible end of travel force:
maximum force that can be applied to the operator at the end of its travel without damaging the switch.

Position/Travel

- 1 **Tripping point:** position of the operator in relation to the switch fixings (fixing hole centre line) at the instant the switch contact changes state.
- A **Differential travel:** distance between the tripping point and the position at which the snap action mechanism returns to its initial state on release of the operator.
- 2 **Overtravel limit:** position of the operator when an extreme force has moved it to the effective end of its available travel.
- B **Overtravel:** distance between the tripping point and the overtravel limit.

The reference point for the figures given for forces and travel is a point F, which is situated on the plunger in the case of a basic switch or at 3 mm from the end of the plain lever in the case of a lever operated switch.

Changeover time

- This is the time taken by the moving contact when moving from one fixed contact to another until it becomes fully stable (contact bounce included).
- This time is related to the inter-contact distance, the mechanical characteristics of the snap action mechanism and the mass of the moving element. However, due to the snap action mechanisms used, the time is largely independent to the speed of operation. It is normally less than 20 milliseconds (including bounce times of less than 5 ms).

Operating speed and maximum usable operating rate

- Our miniature snap switches are suitable for a wide range of operating speeds: generally, from 1 mm/mn to 1 m/s.
- The maximum usable operating rate on a light electrical load may be as high as 10 operations/second.

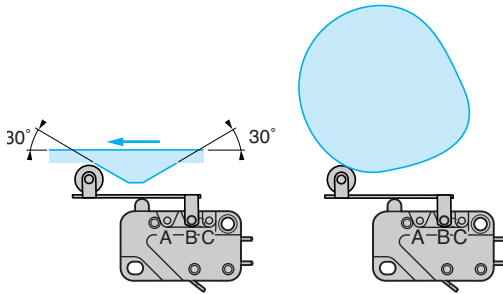
Mounting and operation

- To conform to the leakage paths and air gaps in standards EEC 24 - EN/IEC 61058 - EN/IEC 60947:
 - an insulation pad must be inserted between the snap switch and the fixing surface if the latter is metal.
 - manual operation of a metal actuator must only be carried out with the aid of an intermediate actuator made of an insulating material.
- The installer must ensure adequate protection against direct contact with the output terminals.

Actuation method

- Direct operation:
 - the plunger should preferably be actuated along its axis. However, the majority of our miniature snap switches will accept skewed operation provided the angle of actuation is not more than 45°.
- The travel of the actuator must not be limited to only reaching the tripping point. The actuator must always be operated in such a manner so that the plunger reaches a point at least 0.5 times the stated overtravel value of the switch. Steps must also be taken to ensure that it does not reach its end of travel nor exceed the maximum permissible end of travel force.

Characteristics (continued)



Actuation method (continued)

- Lever operators
- when actuation is by a roller lever, force should preferably be applied in the direction shown in the diagrams opposite.
- where the movements involved are fast, the ramp should be so designed as to ensure that the operator is not subjected to any violent impact or abrupt release.

Fixing - Tightening torque

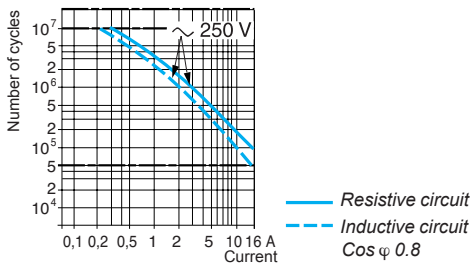
- The tightening torque of the fixing screws must conform to the following values:

Ø of fixing screw		2	2.5	3	3.5	4
Tightening torque (cm.N)	Maximum	25	35	60	100	150
	Minimum	15	25	40	60	100

Resistance to mechanical shock and vibration

- Resistance to shock and vibration depends on the mass of the moving parts and on the forces holding the contacts together.
- In general, for a miniature snap switch without accessory:
 - vibration > 10 gn, 10 to 500 Hz,
 - shock > 50 gn, 11 ms 1/2 sine wave.

Electrical characteristics



Operating curves

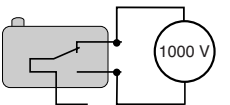
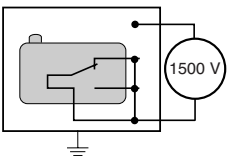
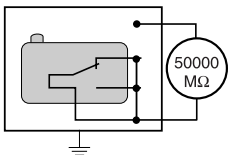
- These indicate the electrical life of the miniature snap switches under standard conditions (20°C, 1 cycle/2 seconds), by showing the number of switching operations which can be performed with given types of load. For sealed snap switches, the operating rate is 1 cycle/6s.

Insulation resistance

- The insulation resistance of the miniature snap switches is generally greater than 50,000 MΩ, measured at 500 V DC.

Dielectric strength

- The dielectric strength of our miniature snap switches is generally superior to:
 - 1500 Volts between live parts and earth,
 - 1000 Volts between contacts,
 - 600 Volts between contacts for switches with an inter-contact distance less than 0.3 mm.



Presentation

Electromechanical detection

Limit switches are used in all automated installations and also in a wide variety of applications, due to the numerous advantages inherent to their technology.

They transmit data to the logic processing system regarding:

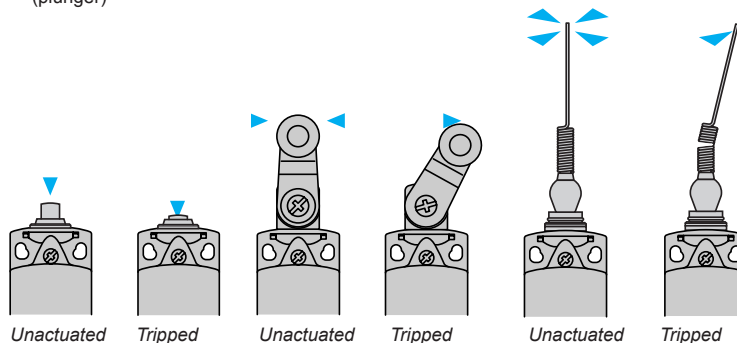
- presence/absence,
- passing,
- positioning,
- end of travel.

Simplicity of installation, advantages

- From an electrical viewpoint
 - galvanic separation of circuits,
 - models suitable for low power switching combined with good electrical durability,
 - very good short-circuit withstand in coordination with appropriate fuses,
 - total immunity to electromagnetic interference,
 - high rated operational voltage.
- From a mechanical viewpoint
 - NC contacts with positive opening operation,
 - high resistance to the different ambient conditions encountered in industry (standard tests and specific tests under laboratory conditions),
 - high repeat accuracy, up to 0.01 mm on the tripping points.

Detection movements

- Linear movement (plunger)
- Rotary movement (lever)
- Multi-directional movement



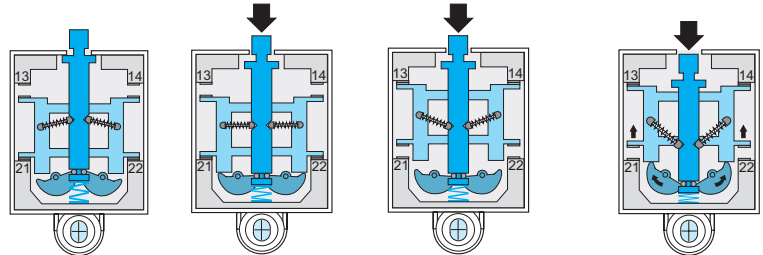
Terminology

Rated value of a quantity	<ul style="list-style-type: none"> ■ This replaces the term “nominal value”. ■ It is the fixed value for a specific function.
Utilisation categories:	<ul style="list-style-type: none"> ■ AC-15 replaces AC-11: control of an electromagnet on AC, test 10 le/le. ■ AC-12: control of a resistive load on AC or static load isolated by opto-coupler. ■ DC-13 replaces DC-11: control of an electromagnet on DC, test le/le.
Positive opening travel	<ul style="list-style-type: none"> ■ Minimum travel from the initial movement of contact actuator to the position required to accomplish positive opening operation.
Positive opening force	<ul style="list-style-type: none"> ■ The force required on the contact actuator to accomplish positive opening operation.
Switching capacity	<ul style="list-style-type: none"> ■ I_{th} is no longer a rated value but a conventional current used for heating tests. <p>Example: for category A300 the corresponding operational current, I_e maximum, is 6 A-120 V or 3 A-240 V, the equivalent I_{th} being 10 A.</p>
Positive opening operation	<ul style="list-style-type: none"> ■ A limit switch complies to this specification when all the closed contact elements of the switch can be changed, with certainty, to the open position (no flexible link between the moving contacts and the operator of the switch, to which an actuating force is applied). ■ All limit switches incorporating either a slow break contact block or a snap action NC + NO (form Zb), NC + NO + NO, NC + NC + NO, NC + NC + NO + NO contact block are positive opening operation, in complete conformity with standard IEC 60947-5-1 Appendix K.

Contact blocks

Snap action contacts

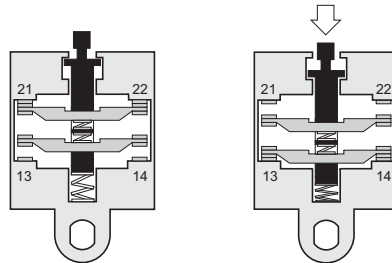
- Snap action contacts are characterised by different tripping and reset points (differential travel).
- The displacement speed of the moving contacts is not related to the speed of the operator.
- This feature ensures satisfactory electrical performance in applications involving low speed actuators.



Unactuated state Approach travel Contact change of state Positive opening

Slow break contacts

- Slow break contacts are characterised by identical tripping and resetting points.
 - The displacement speed of the moving contacts is equal, or proportional, to the speed of the operator (which must not be less than 0.1 m/s = 6 m/minute).
- The opening distance is also dependent on the distance travelled by the operator.



Electrical durability for normal loads

- Normally, for inductive loads, the current value is less than 0.1 A (sealed), i.e. values of 3 to 40 VA sealed and 30 to 1000 VA inrush, depending on the voltage.
 - For this type of application the electrical durability will exceed 10 million operating cycles.
- Application example: XCKJ161 + LC1D12●●●●** (7 VA sealed, 70 VA inrush).
Electrical durability = 10 million operating cycles.

Switching capacity

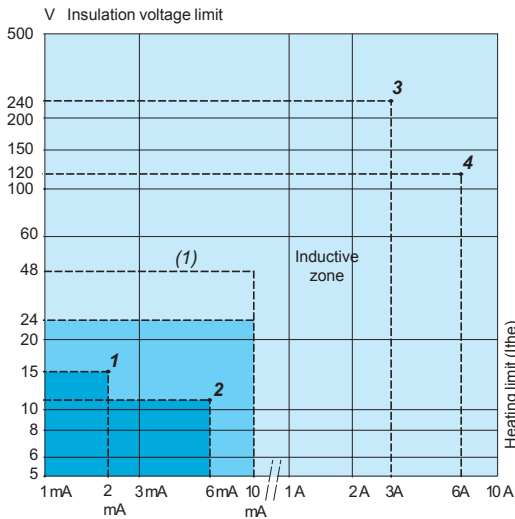
- 1 Normal industrial PLC input type 1 (PLC: industrial programmable logic controllers)
- 2 Normal industrial PLC input type 2
- 3 Switching capacity conforming to IEC 60947-5-5, utilisation category AC-15, DC-13

A300	240 V	3 A	B300	240 V	1.5 A
Q300	250 V	0.27 A	R300	250 V	0.13 A
- 4 Switching capacity conforming to IEC 60947-5-1, utilisation category AC-15, DC-13

A300	120 V	6 A	B300	120 V	3 A
Q300	125 V	0.55 A	R300	125 V	0.27 A

Electrical durability for small loads

- The use of limit switches with programmable controllers is becoming more common.
- With small loads, limit switches offer the following levels of reliability:
 - failure rate of less than 1 for 100 million operating cycles using snap action contacts (contacts XE2SP),
 - failure rate of less than 1 for 20 million operating cycles using slow break contacts (contacts XE●NP and XE3SP).
 - failure rate of less than 1 for 5 million operating cycles using contacts XCMD.

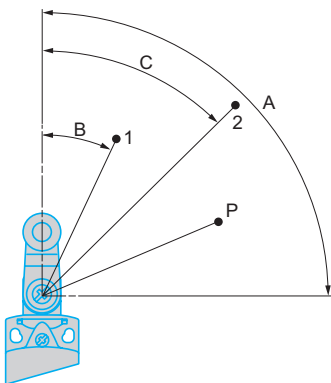
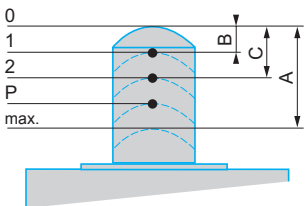
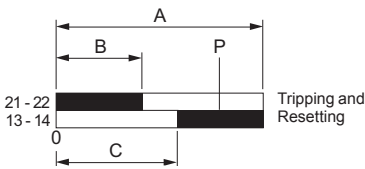
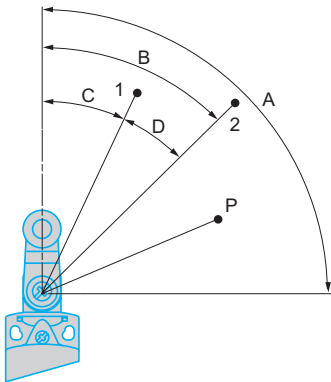
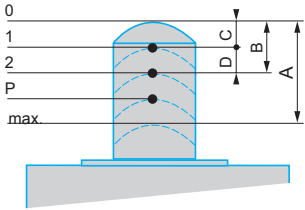
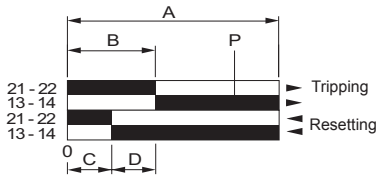


		Range of use	
Standard contacts	XE2SP2151, P3151	1	2
	XE2NP●●●●	1	2
Continuous service (frequent switching)	Contacts of XCMD	1	2
	XE3●P●●●●	1	2
Gold flashed contacts on resistive load	Occasional service Infrequent switching, ≤ 1 operating cycle/day, and/or corrosive atmosphere	1	2

(1) Usable up to 48 V/10 mA.

1

Contact blocks (continued)



Functional diagrams of snap action contacts

■ Example: NC + NO

- A - Maximum travel of operator in millimetres or degrees.
- B - Tripping travel of contact.
- C - Resetting travel of contact.
- D - Differential travel = B - C.
- P - Point from which positive opening is assured.

□ Linear movement (plunger)

- 1 - Resetting point of contact.
- 2 - Tripping point of contact.
- A - Maximum travel of operator in millimetres.
- B - Tripping travel of contact.
- C - Resetting travel of contact.
- D - Differential travel = B - C.
- P - Point from which positive opening is assured.

□ Rotary movement (lever)

- 1 - Resetting point of contact.
- 2 - Tripping point of contact.
- A - Maximum travel of operator in degrees.
- B - Tripping travel of contact.
- C - Resetting travel of contact.
- D - Differential travel = B - C.
- P - Point from which positive opening is assured.

Functional diagrams of slow break contacts

■ Example: NC + NO break before make

- A - Maximum travel of operator in millimetres or degrees.
- B - Tripping and resetting travel of contact 21-22.
- C - Tripping and resetting travel of contact 13-14.
- P - Point from which positive opening is assured.

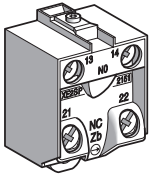
□ Linear movement (plunger)

- 1 - Tripping and resetting points of contact 21-22.
- 2 - Tripping and resetting points of contact 13-14.
- A - Maximum travel of operator in millimetres.
- B - Tripping and resetting travel of contact 21-22.
- C - Tripping and resetting travel of contact 13-14.
- P - Positive opening point.

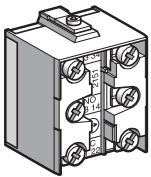
□ Rotary movement (lever)

- 1 - Tripping and resetting points of contact 21-22.
- 2 - Tripping and resetting points of contact 13-14.
- A - Maximum travel of operator in degrees.
- B - Tripping and resetting travel of contact 21-22.
- C - Tripping and resetting travel of contact 13-14.
- P - Positive opening point.

Contact blocks (continued)



XE2P screw clamp terminal connections

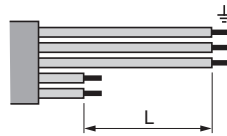


XE3P screw clamp terminal connections

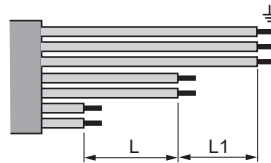
Mounting

Contact connections

- Tightening torque:
 - minimum tightening torque ensuring the nominal characteristics of the contact: 0.8 N.m,
 - maximum tightening torque without damage to the terminals: 1.2 N.m for XE2pP, 1 N.m for XE3pP.
- Connecting cable: cable preparation lengths:
 - for XE2pP, L = 22 mm,
 - for XE2pP3●●●, L = 45 mm,

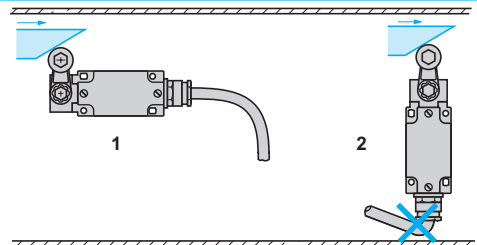


- for XE3pP, L = 14 mm, L1 = 11 mm.



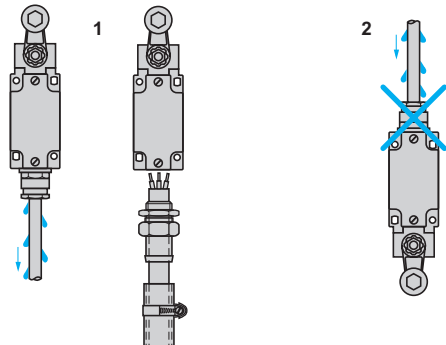
Sweep of connecting cable

- 1 Recommended
- 2 To be avoided



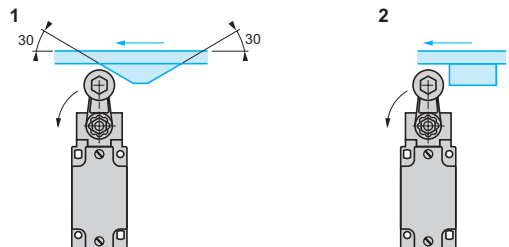
Position of cable gland

- 1 Recommended
- 2 To be avoided



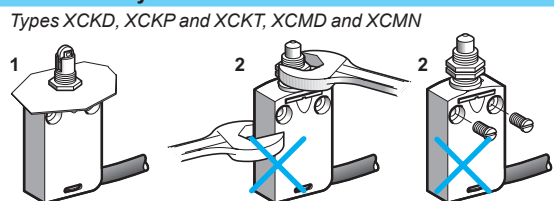
Type of cam

- 1 Recommended
- 2 To be avoided



Mounting and fixing limit switches by the head

- 1 Recommended
- 2 Forbidden



Types XCKD, XCKP and XCKT, XCMD and XCMN

Setting-up

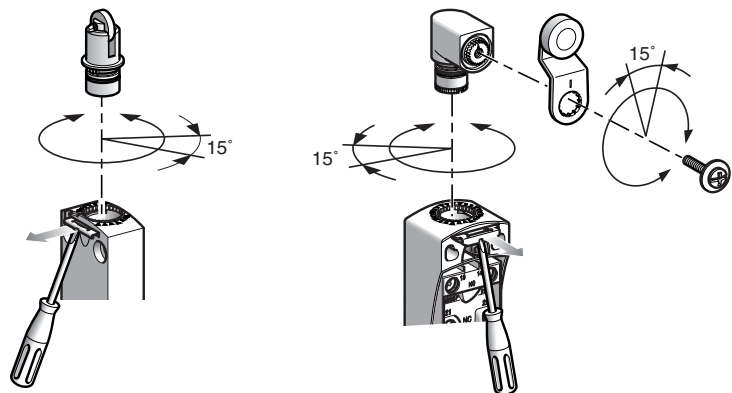
Tightening torque

- The minimum torque is that required to ensure correct operation of the switch.
- The maximum torque is the value which, if exceeded, will damage the switch.

Range	Item	Torque (N.m)	
		Min.	Max.
Compact design XCKD, XCKP, XCKT	Cover	0.8	1.2
	Fixing screw for lever on rotary head	1	1.5
Miniature design XCMD, XCMN	–	–	–
	Fixing screw for lever on rotary head	1	1.5
Compact design XCKN	Cover	0.8	1.2
	Fixing screw for lever on rotary head	1	1.5
Classic design XCKJ	Cover	1	1.5
	Fixing nut for lever on rotary head	1	1.5
Classic design XCKS	Cover	0.8	1.2
	Fixing nut for lever on rotary head ZCKD	1	1.5
	Fixing nut for lever on rotary head XCKS	0.8	1.2
	Fixing head on body	0.8	1.2
Classic design XCKM, XCKML, XCKL	Cover	0.8	1.2
	Fixing nut for lever on rotary head	1	1.5

Types XCKD, XCKP, XCKT, XCMD

- Adjustable in 3 planes:

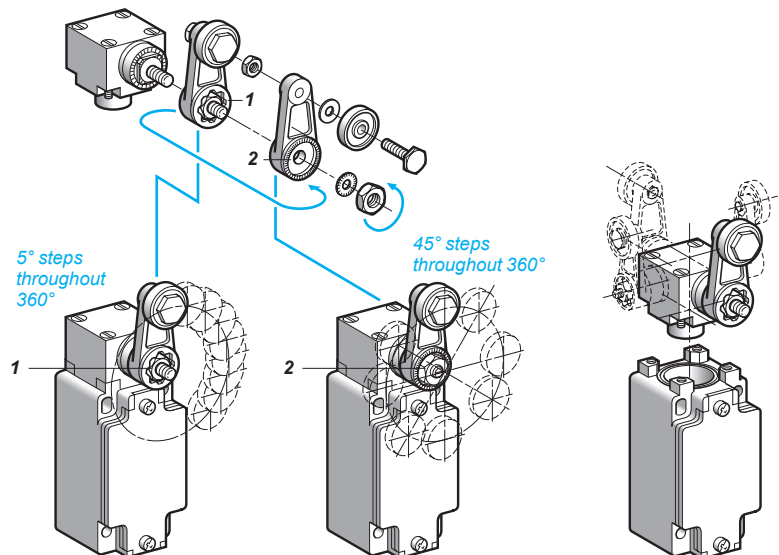


All the heads can be adjusted in 15° steps throughout 360°, in relation to the body.

All the levers can be adjusted in 15° steps throughout 360°, in relation to the horizontal axis of the head.

Type XCKJ

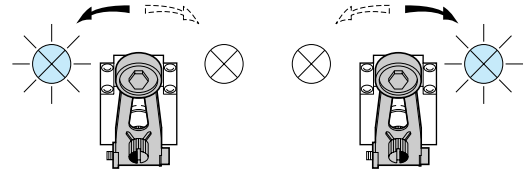
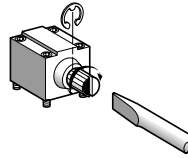
- Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever or its mounting.
- 1 Reversed $\alpha = 5^\circ$
 - 2 Forward $\alpha = 45^\circ$



Setting-up (continued)

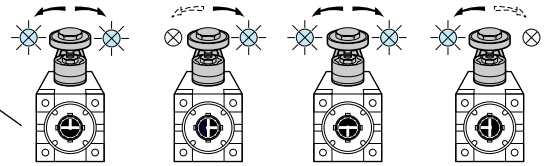
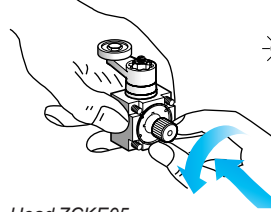
Direction of actuation programming

■ XC2J



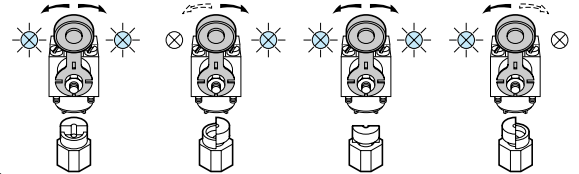
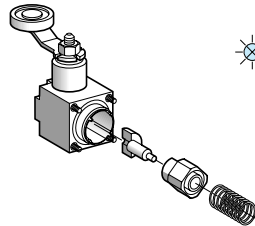
Head ZC2JE05

■ XCKJ



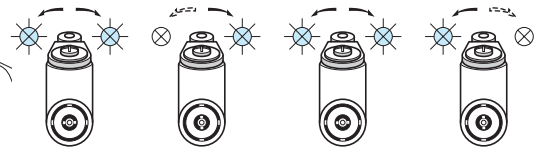
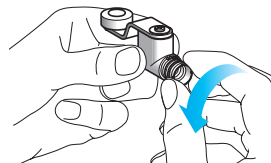
Head ZCKE05

■ XCKS



Head ZCKD05

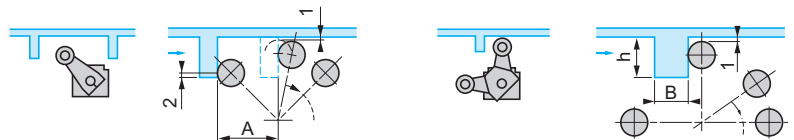
■ XCKD, XCKP, XCKT and XCMD



Head ZCE05

Specific cams for heads ZCKE09 and ZC2JE09

- 1 0.5 mm min.
- 2 2 mm min.



A = length of lever + 11 mm
ZCKE09: $13 < h < 18$ mm and $B = 12$ mm max.
ZC2JE09: $14 < h < 24$ mm and $B = 6$ mm max.

1

Reminder of the standards

The majority of Schneider Electric products comply to national standards (for example French NF C standards, German DIN standards), European standards (for example CENELEC) or international standards (for example IEC). These standards rigidly stipulate the characteristic requirements of the designated products (for example IEC 60947 relating to low voltage switchgear and control gear). These products, when correctly used, enable the production of control equipment assemblies, machine control equipment or installations conforming to their own specific standards (for example IEC 60204 for the electrical equipment of industrial machines).

IEC 60947-5-1

Insulation coordination (and dielectric strength)

- The standard IEC 60664 defines 4 categories of prospective transient overvoltages. It is important for the user to select control circuit components which are able to withstand these overvoltages. To these ends, the manufacturer states the rated impulse withstand voltage (U imp) applicable to the product.

Terminal connections

- The cabling capacity, mechanical robustness and durability of the terminals, as well as the ability to resist loosening, are verified by standardised tests.
- Terminal reference marking conforms to standard IEC 60947-5-1 Appendix M.

Switching capacity

- With maximum electrical load. A single designation (A300 for example) enables indication of the contact block characteristics related to its utilisation category.

Positive opening operation (IEC 60947-5-1 Appendix K)

- For contacts used in safety applications (end of travel, emergency stop device, etc.) the assurance of positive opening is required (see IEC 60204, EN 60204) after each test, the opening of the contact being verified by testing with an impulse voltage (2500 V).

Electrical symbols for contacts



- Form Za, the 2 contacts (NO + NC) are the same polarity.



- Form Zb, the 2 contacts (NO + NC) are electrically separate.

Symbol for positive opening



- Simplified version



- Complete symbol

CENELEC EN 50047

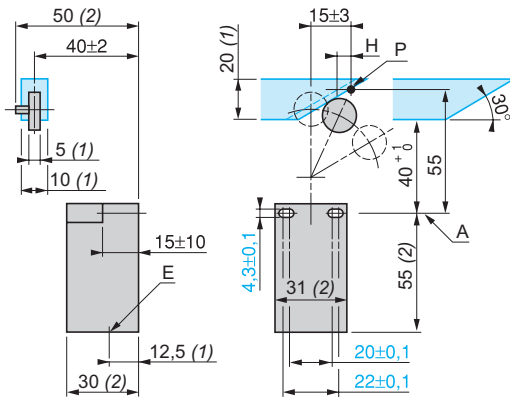
The European standards organisation CENELEC, which has 14 member countries, has defined in this standard the first type of limit switch.

It defines 4 variants of devices (forms A, B, C, E).
Limit switches XCKP, XCKD and XCKT conform to standard EN 50047.

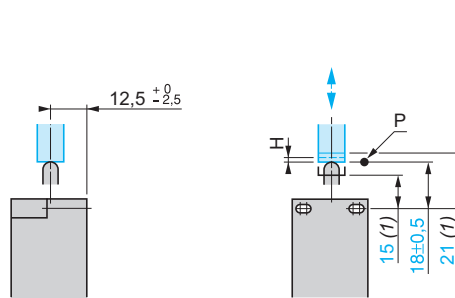
(1) Minimum value
(2) Maximum value

A: reference axis
H: differential travel
P: tripping point
E: cable entry

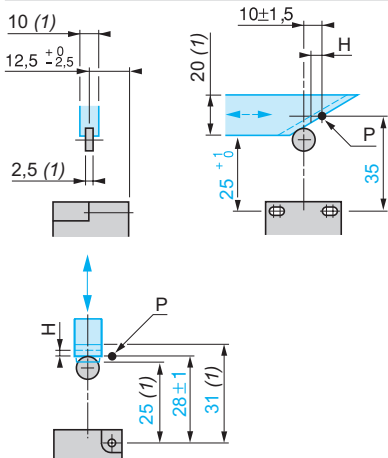
Form A, with roller lever



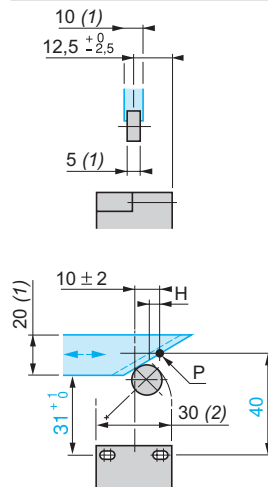
Form B, with end plunger (rounded)



Form C, with end roller plunger



Form E, with roller lever for 1 direction of actuation



Reminder of the standards (continued)

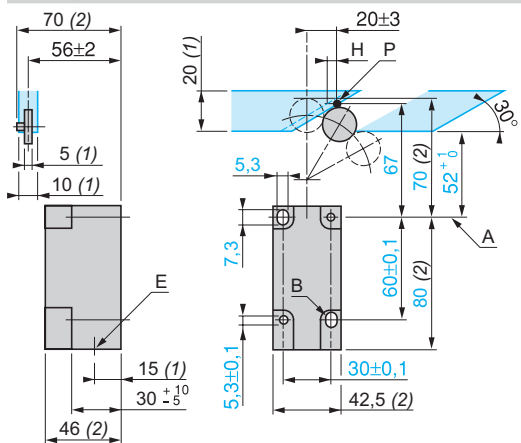
CENELEC EN 50041
The European standards organisation CENELEC, which has 14 member countries, has defined in this standard the second type of limit switch.

It defines 6 variants of devices (forms A, B, C, D, F, G).
Limit switches XCKJ and XCKS conform to standard EN 50041.

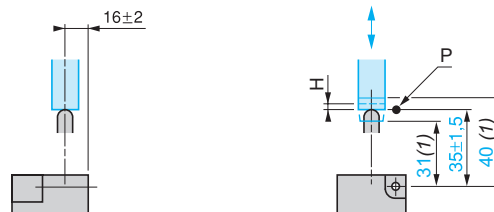
(1) Minimum value
(2) Maximum value

A: reference axis
B: optional elongated holes
H: differential travel
P: tripping point
E: cable entry
Za: tripping zone
Sa: tripping threshold

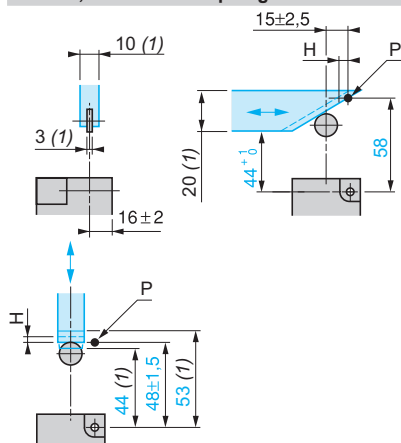
Form A, with roller lever



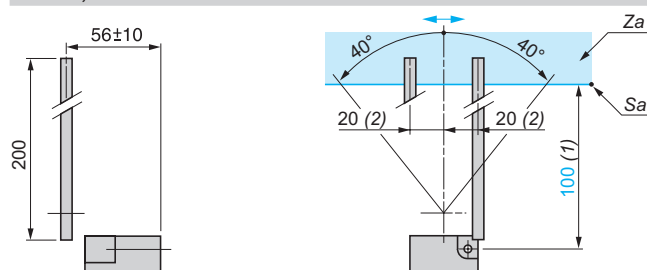
Form B, with end plunger (rounded)



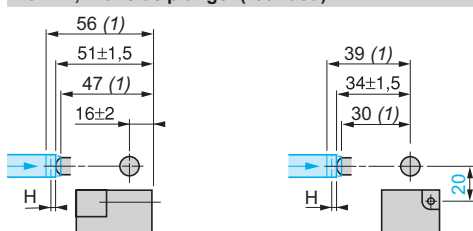
Form C, with end roller plunger



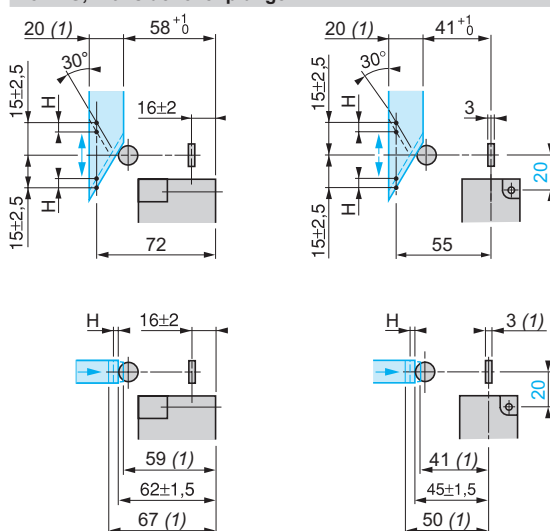
Form D, with rod lever



Form F, with side plunger (rounded)

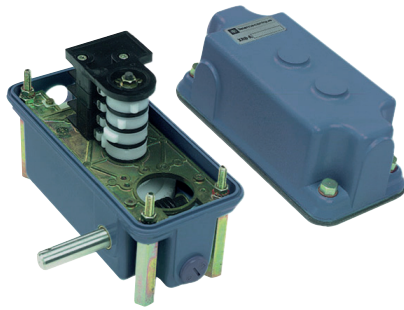
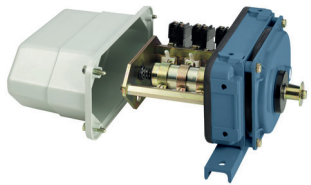


Form G, with side roller plunger



Screw limit switches OsiSense XRBA and XR2

1

Applications	Standard duty ~ or ☰ (Ithe = 10 A)	Heavy duty ~ or ☰ (Ithe = 10 A)
		
Number of contacts	4 or 6	3, 4, 6, 10, 14, 20, 24 or 28
Conventional thermal current (Ithe)	10 A	10 A
Type of contacts	Single-pole C/O, snap action	Single-pole C/O, snap action
Reduction gear ratio	For 1 revolution of cams: 13/1, 17/1, 46/1, 60/1, 78/1, 210/1, 274/1 or 960/1	For 6 turns of threaded shaft: 0.4/6, 0.8/6, 1.6/6, 3/6, 6/6, 10/6, 20/6, 40/6, 80/6, 150/6, 300/6, 560/6 or 1100/6
Adaptation for potentiometer	•	–
Conformity to standards	IEC/EN 60947-5-1	IEC/EN 60947-5-1
Degree of protection	XRBA4: IP 55 conforming to IEC/EN 60529, IP 557 conforming to NF C 20-010 XRBA6: IP 55 conforming to IEC/EN 60529, IP 555 conforming to NF C 20-010	IP 54 conforming to IEC/EN 60529
Cable entry	1 tapped entry for n° 9 cable gland Clamping capacity 5 to 8 mm 1 tapped entry for n° 16 cable gland Clamping capacity 10 to 14 mm	2 tapped entries for n° 13 cable gland Clamping capacity 9 to 12 mm
Materials	Stainless steel input drive shaft Aluminium alloy body housing XRBA4: aluminium alloy cover XRBA6: polyphenylene oxide cover	Aluminium alloy body housing, insulated cover
Type reference	XRBA	XR2AA
Pages	1/208	1/215

Heavy duty ~ or ☐ (Ithe = 10 A)



3, 4, 6, 10, 14, 20, 24 or 28

10 A

Single-pole C/O, snap action

For 6 turns of threaded shaft: 0.4/6, 0.8/6, 1.6/6, 3/6, 6/6, 10/6, 20/6, 40/6, 80/6, 150/6, 300/6, 560/6 or 1100/6

–

IEC/EN 60947-5-1

IP 54 conforming to IEC/EN 60529

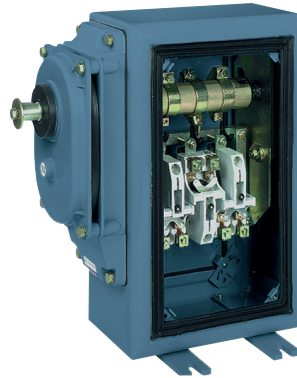
Removable gland plate

Sheet steel enclosure

XR2AB

1/215

Heavy duty ~ or ☐ (Ithe = 20 A)



3, 5, 9, 13, 19, 23 or 27

20 A

Single-pole N/C or N/O, with snap action mechanism

For 6 turns of threaded shaft: 0.4/6, 0.8/6, 1.6/6, 3/6, 6/6, 10/6, 20/6, 40/6, 80/6, 150/6, 300/6, 560/6 or 1100/6

–

IEC/EN 60947-5-1

IP 54 conforming to IEC/EN 60529

Removable gland plate

Sheet steel enclosure

XR2B

1/215

Screw limit switches

Standard duty, OsiSense XRBA

1

Functions

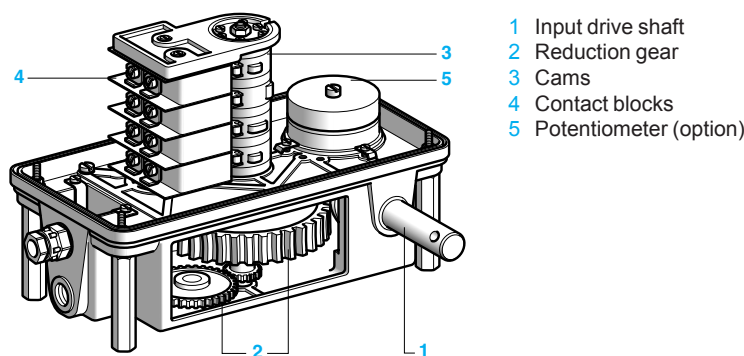
These switches are designed to monitor the movement of an object via an input drive shaft coupled to the actuator. Detection of position is ensured by a system of independently adjustable cams which actuate the electrical contact blocks.

They are usually used for applications where it is either impossible or impractical to mount standard type position sensors that are actuated directly by the moving object.

Main applications:

- position control of moving parts of hoisting or materials handling equipment (winches, travelling cranes, gantries, cranes, rotary excavators, etc.).
- liquid level control in pumping systems.

Description



Operation

The input drive shaft, which is coupled to the machine part being controlled, is normally fitted on the right-hand side. This transmits the movement by means of a worm screw and reduction gear to a set of 4 or 6 independent cams which, in turn, operate the contact blocks.

A choice of 3 cam types (20°, 50° and 80°) enables a wide range of cam arrangements to be achieved.

The cams are easily accessible and individual adjustment of the cams is a simple operation, without risk of affecting the setting of adjacent cams.

As an option, a potentiometer can be fitted in order to provide an analogue output.

Environment			
Conformity to standards			IEC/EN 60947-5-1
Protective treatment	Standard version		"TC"
	Special version		"TH" on request
Ambient air temperature	For storage	°C	- 40...+ 70
	For operation	°C	- 25...+ 70
Shock resistance			80 gn (11 ms)
Vibration resistance			> 5 gn (10...60 Hz)
Degree of protection			XRBA4: IP 55 conforming to IEC/EN 60529, IP 557 conforming to NF C 20-010 XRBA6: IP 55 conforming to IEC/EN 60529, IP 555 conforming to NF C 20-010
Materials			Stainless steel input shaft. Aluminium alloy body housing. Aluminium alloy cover for XRBA4 Polyphenylene oxide cover for XRBA6
Cable entry			1 tapped entry for n° 9 cable gland (clamping capacity 5 to 8 mm) and 1 tapped entry for n° 16 cable gland (clamping capacity 10 to 14 mm)

Mechanical characteristics			
Reduction gear ratio	For 1 revolution of cams		13/1, 17/1, 46/1, 60/1, 78/1, 210/1, 274/1 or 960/1
Average drive torque	At 20°C	N.cm	5
Maximum speed of input drive shaft		rpm	1000
Mechanical durability			15 x 10 ⁶ drive shaft revolutions

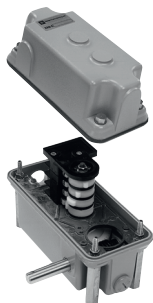
Electrical characteristics of contacts			
Type of contacts			Single-pole C/O, snap action
Rated operational characteristics	Conforming to IEC/EN 60947-5-1		~ AC-15, A300 (U _e = 240 V, I _e = 3 A), --- DC-13, Q300 (U _e = 250 V, I _e = 0.27 A)
Conventional thermal current		A	I _{th} = 10
Rated insulation voltage	Conforming to IEC/EN 60947-1	V	U _i = 250
Rated impulse withstand voltage	Conforming to IEC/EN 60947-1	kV	U _{imp} = 6
Resistance across terminals		mW	≤ 25
Short-circuit protection			10 A cartridge fuse type gG
Connection			Screw and captive cable clamp terminals. Clamping capacity: 2 x 1.5 mm ² with cable end Clips or solder tags available on request

Electrical durability		a.c. supply ~ 50/60 Hz					d.c. supply ---						
Conforming to IEC/EN 60947-5-1		Power broken in VA for 0.5 million operating cycles					Power broken in W for 0.5 million operating cycles						
Utilisation categories: AC-15 and DC-13													
Operating rate: 3600 operating cycles/hour													
Load factor: 0.5													
		Voltage (V)	12	24	48	127	220	Voltage (V)	12	24	48	110	220
		mm	18	35	700	165	220	mm	27	39	50	65	67
		mm	65	108	216	450	530	mm	55	84	110	130	135

Optional potentiometer characteristics (analogue output)	
Rotation ratio between cams and potentiometer	1, 1.5 (1.333) or 2 (1.933)
Maximum rotation angle of potentiometer	350°
Potentiometer type	Type SI, size 15, ball bearing mounted Power: 3 W Withstand voltage: 1500 V Ohmic value: 10 000 Ω (other values available on request)

1

534926



XRBA4●●●●



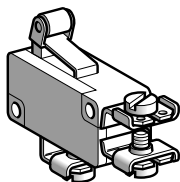
XRBA901



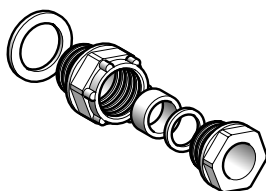
XRBA902



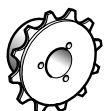
XRBA903



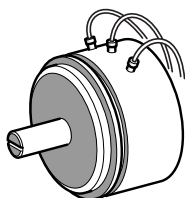
XEPA10801D64



DE9PL116044



XRZ91●



XRZ9●●

Screw limit switches

Description	Number of contacts	Basic reference, to be completed (1)	Weight kg
Screw limit switches (with bare drive shaft)	4	XRBA4●●●●	1.500
	6	XRBA6●●●●	1.350

Separate components and replacement parts

Description	Type	Reference	Weight kg
Cams	20° (2)	XRBA901	0.002
	50° (2)	XRBA902	0.002
	80° (2)	XRBA903	0.002

Contact block Short roller lever actuator 1 C/O snap action contact		XEPA1081D64	0.011
----------------------------------------------------------------------------------	--	-------------	-------

Cable glands	N° 16 plastic, clamping capacity 10 to 14 mm	DE9PL116044	0.008
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Chain sprockets 12.7 mm pitch, for switch input drive shaft	12 teeth	XRZ912	0.080
	14 teeth	XRZ914	0.090
	16 teeth	XRZ916	0.100

Chains (12.7 mm pitch) conforming to standard NF E 26-101, chromium plated, with joining link (3)	L = 2 metres	XR2AZ302	0.600
	L = 5 metres	XR2AZ305	1.500
	L = 10 metres	XR2AZ310	3.000

Potentiometer Type SI, size 15, 3 W	10 000 Ω	XRZ9100	0.060
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Other Ohmic values: please consult our Customer Care Centre.

(1) For completion of the basic reference, please refer to Order form on page 1/209.

(2) Average values.

(3) For liquid level control applications, the length of the chain should at least be equal to the difference between the upper and lower liquid levels + 0.50 m.

Customer		Schneider Electric		
Company	Order N°	Delivery date	Sales Office - Subsidiary Co.	Order N°

To use this order form:

- State the number of identical screw limit switches required
- Complete the basic reference with the 9 or 11 digits indicating the various switch options
- Mark the required cam arrangement on the drawing below.

For examples showing completion of the basic reference, refer to pages 1/224 and 1/225.

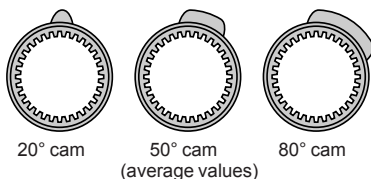
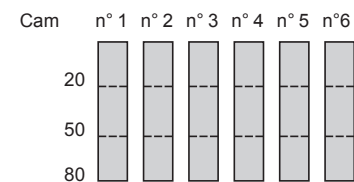
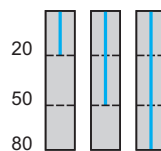
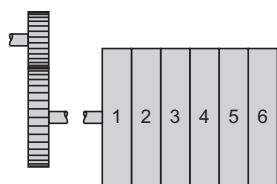
Number of identical switches	Basic reference, to be completed	Number of contacts	Reduction gear ratio	Drive shaft position	Adaptation for 10 kΩ potentiometer	Option cam					
						N°1	N°2	N°3	N°4	N°5 (1)	N°6 (1)
	XRBA										
Number of contacts											
Switch with 4 contacts		4									
Switch with 6 contacts		6									
Reduction gear ratio (for 1 revolution of cams)											
13/1											
17/1											
46/1											
60/1											
78/1											
210/1											
274/1											
960/1											
Drive shaft position											
Right-hand side (standard model)											
Left-hand side											
Adaptation for 10 kΩ potentiometer											
Without adaptation											
With adaptation, ratio 1											
With adaptation, ratio 1.5 (1.333)											
With adaptation, ratio 2 (1.933)											
Choice of cams (3 different angles, 4 or 6 positions)											
To select a cam, add 4 digits for XRBA4 switches or 6 digits for XRBA6 switches.											
20° cam						2	2	2	2	2 (1)	2 (1)
50° cam						5	5	5	5	5 (1)	5 (1)
80° cam						8	8	8	8	8 (1)	8 (1)

Required cam arrangement

The cam positioned nearest to the plate is considered as cam n° 1

Marking guide for cam arrangement diagram

Mark the required cam arrangement



(1) Do not add these digits for XRBA4 switches (with 4 contacts).

Note: If the above cam arrangement is left blank, the cams will be factory-mounted as standard as shown below:

Cam n°	1	2	3	4	5	6
XRBA4●●●●	20°	50°	80°	20°	—	—
XRBA6●●●●	20°	20°	50°	50°	80°	80°

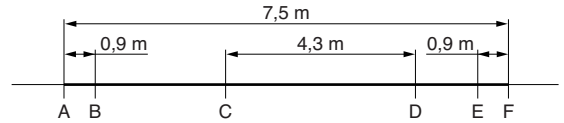
Example of a standard product: reference **XRBA45100** corresponds to a switch with 4 contacts, a reduction gear ratio of 78/1, a right-hand side shaft input and no potentiometer. The cams are positioned in the following order: 20°, 50°, 80° and 20°.

1

Application: monitoring the movement of a machine part

Example:
Monitoring the movement of a machine part from A to F (AF = 7.5 m) with potentiometer linked display.
Chain sprocket on switch input drive shaft: 16 teeth on 12.7 mm pitch.

- Point A** Stop position, direction F → A
- Point B** Slow-down position, direction F → A
- Points C and D** Specific points
- Point E** Slow-down position, direction A → F
- Point F** Stop position, direction A → F



Selection of switch and completion of basic reference

- **Number of contacts: 6 positions to monitor, therefore, 6 contacts.** **1st digit of reference: 6**
- **Reduction gear ratio: Distance AF = 7.5 m, therefore, number of turns of input drive shaft:** $\frac{7.5}{16 \times 0.0127} = 37$
- **Select a reduction ratio whereby the number of turns of the input drive shaft is greater than 37**

	Reduction ratio between number of turns of drive shaft and 1 revolution of cams	Rotation ratio between cams and the potentiometer (actual value)	Maximum rotation of cams for 37 turns of switch input drive shaft	Maximum rotation of potentiometer
1 st solution	46/1	1	$\frac{360 \times 37}{46} = 289^\circ$	$\frac{360 \times 37}{46} \times 1 = 269^\circ$
2 nd solution	60/1	1.5 (1,333)	$\frac{360 \times 37}{60} = 222^\circ$	$\frac{360 \times 37}{60} \times 1.333 = 296^\circ$
3 rd solution	78/1	2 (1,933)	$\frac{360 \times 37}{78} = 171^\circ$	$\frac{360 \times 37}{78} \times 1.933 = 330^\circ$

Assume the 3rd solution is best suited for the application, which offers a wide potentiometer operating angle (330°) whilst maintaining cam setting flexibility (171° operating angle).

- **Reduction gear ratio: 78/1** **2nd digit of reference: 5**
- **Input drive shaft position: Right-hand side preferred** **3rd digit of reference: 1**
- **Adaptation for potentiometer: Value of 10 kΩ and a ratio of 2** **4th and 5th digits of reference: 33**

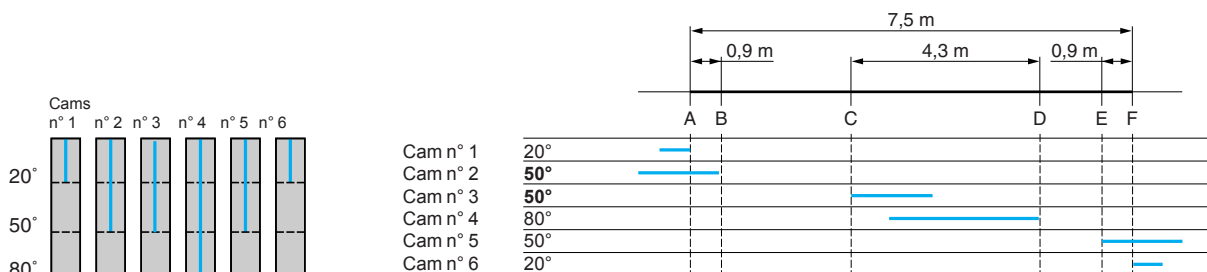
Reference of screw limit switch to be entered on Order form on page 1/209

XRBA

6	5	1	33
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Selection of cams, marking cam arrangement diagram

- **Point A - cam n° 1:** 20° cam (stop cam).
- **Point B - cam n° 2:** The selection of cam n° 2 is determined by the distance BA (0.90 m), giving:
A 20° cam could be used, but a 50° cam is more suitable in order to ensure an overlap with the stop cam. $\frac{171^\circ \times 0.90}{7.5} \approx 20^\circ$
- **Points C and D - cams n° 3 and 4:** The distance CD = 4.30 m, giving:
2 overlapping cams are required, for example: cam n° 3 = 50°, cam n° 4 = 80°. $\frac{171^\circ \times 4.30}{7.5} \approx 98^\circ$
- **Point E - cam n° 5:** The selection of cam n° 5 is determined by the distance EF (0.9 m), giving:
A 50° cam is therefore selected, for the same reasons as the cam for point B. $\frac{171^\circ \times 0.90}{7.5} \approx 20^\circ$
- **Point F - cam n° 6:** 20° cam (stop cam).



Specific application: liquid level control (1)

Selection guide table for reduction ratio between number of turns of switch input drive shaft and 1 revolution of the cams and chain sprocket size to be fitted to switch input drive shaft.

Change in level to be controlled (in metres)	Screw limit switches without potentiometer			Screw limit switches with potentiometer				
	Reduction gear ratio	Chain sprocket Number of teeth (12.7 mm pitch)	Cam rotation angle	Reduction gear ratio	Chain sprocket Number of teeth (12.7 mm pitch)	Adaptation for potentiometer Ratio	Cam rotation angle	Potentiometer rotation angle
0.5	13/1	12	91°	13/1	12	2	91°	182°
1	13/1	12	182°	13/1	14	2	156°	312°
1.5	13/1	12	273°	13/1	14	1.5	233°	350°
2	13/1	14	311°	17/1	16	1.5	208°	312°
2.5	17/1	12	347°	46/1	12	2	128°	256°
3	17/1	16	313°	46/1	12	2	154°	308°
3.5	46/1	12	180°	46/1	14	2	154°	308°
4	46/1	12	205°	46/1	16	2	154°	308°
4.5	46/1	12	231°	46/1	12	1.5	231°	347°
5	46/1	12	257°	60/1	14	2	169°	338°
5.5	46/1	12	282°	78/1	12	2	167°	334°
6	46/1	12	308°	60/1	14	1.5	202°	303°
6.5	46/1	12	334°	78/1	14	2	169°	339°
7	46/1	14	308°	78/1	16	2	159°	318°
7.5	60/1	12	295°	78/1	12	1.5	227°	341°
8	60/1	12	315°	78/1	14	1.5	208°	312°
8.5	60/1	12	335°	78/1	14	1.5	221°	331°
9	46/1	16	347°	78/1	16	1.5	204°	306°
9.5	60/1	14	321°	78/1	16	1.5	216°	324°
10	60/1	14	337°	78/1	16	1.5	227°	341°
10.5	78/1	12	318°	78/1	12	1	318°	318°
11	78/1	12	333°	78/1	12	1	333°	333°
11.5	78/1	12	348°	78/1	12	1	348°	348°
12	78/1	14	311°	78/1	14	1	311°	311°
12.5	78/1	14	324°	78/1	14	1	324°	324°
13	78/1	14	337°	78/1	14	1	337°	337°
13.5	78/1	16	307°	78/1	16	1	307°	307°
14	78/1	16	318°	78/1	16	1	318°	318°
14.5	78/1	16	329°	78/1	16	1	329°	329°
15	78/1	16	341°	78/1	16	1	341°	341°

Example: Controlling a change in liquid level of 5.30 m

Selection of reduction gear ratio

From the above table, select the value immediately superior to 5.30 m, i.e. 5.50 m

■ **Case n° 1: without potentiometer. Recommended solution:**

- Reduction gear ratio: 46/1, chain sprocket with 12 teeth on 12.7 mm (0.0127 m) pitch.
- Cam rotation angle:

using above table: $\frac{282 \times 5.30}{5.50} = 272^\circ$ or, by calculation: $\frac{5.30}{12 \times 0.0127} \times 360 = 272^\circ$

- Completion of basic switch reference: **2nd digit of reference: 3**
- 4th and 5th digits of reference: 00**

■ **Case n° 2: with potentiometer. Recommended solution:**

- Reduction gear ratio: 78/1, chain sprocket with 12 teeth on 12.7 mm (0.0127 m) pitch.
- Ratio of potentiometer adaptation: 2
- Cam rotation angle:

using above table: $\frac{167 \times 5.30}{5.50} = 161^\circ$ or, by calculation: $\frac{5.30}{12 \times 0.0127} \times 360 = 161^\circ$

- Potentiometer rotation angle:
- using above table: $\frac{334 \times 5.30}{5.50} = 322^\circ$ or, by calculation: $2 \times \left(\frac{5.30}{12 \times 0.0127} \times 360 \right) = 322^\circ$

- Completion of basic switch reference: **2nd digit of reference: 5**
- 4th and 5th digits of reference: 33**
(10 kΩ potentiometer)

(1) Accessories for liquid level control: see page 1/218.

Screw limit switches

Heavy duty, OsiSense XR2

1

Functions

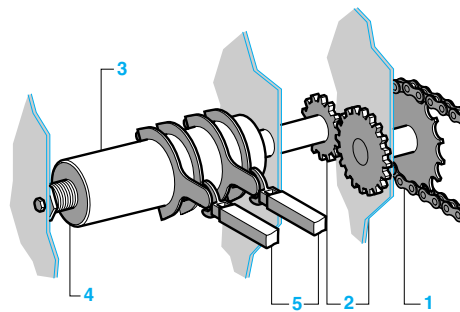
These switches are designed to monitor the movement of an object via an input drive shaft coupled to the actuator. Detection of position is ensured by a system of adjustable fingers which actuate the electrical contact blocks.

They are usually used for applications where it is either impossible or impractical to mount standard type position sensors that are actuated directly by the moving object.

Main applications:

- position control of moving parts of hoisting or materials handling equipment (winches, travelling cranes, gantries, cranes, rotary excavators, etc.),
- liquid level control in pumping systems.

Description



- 1 Input drive shaft, with facilities for attaching chain sprocket.
- 2 2-pin primary gearbox, with choice of reduction ratio.
- 3 Internally threaded shaft, driven via gearbox, fitted with adjustable fingers which actuate the electrical contact blocks.
- 4 Fixed lead screw, along which threaded shaft travels.
- 5 Snap action contact blocks, actuated by fingers.

Operation

Due to the variable composition 2-pin primary gearbox, multiple choices of reduction ratio between the input drive shaft and the threaded shaft, which operates the finger actuators, are possible.

The finger actuators, clamped to the rotating threaded shaft, describe a helical path and operate the contacts as and when they are engaged along its length of travel (6 turns maximum).

To avoid damage at the end of travel of the threaded shaft, a clutch is incorporated in the drive mechanism (patented feature).

Environment			
Conformity to standards			IEC/EN 60947-5-1
Protective treatment	Standard version		"TC"
	Special version		"TH" on request
Ambient air temperature	For storage	°C	- 40... + 70
	For operation	°C	- 25... + 70
Shock resistance			50 gn (11 ms)
Vibration resistance			> 5 gn (10...55 Hz)
Degree of protection			IP 54 conforming to IEC/EN 60529
Materials			XR2AA: Aluminium alloy body housing, insulated cover XR2AB and XR2BB: Sheet steel enclosure
Cable entry			XR2AA: 2 tapped entries for n° 13 cable gland (clamping capacity 9 to 12 mm) XR2AB and XR2BB: Removable gland plate

Mechanical characteristics			
Maximum number of turns of threaded shaft			6
Threaded shaft screw pitch		mm	4
Operating finger radius		mm	40
Length of developed helical travel		mm	4
Contact actuators differential snap-over angle (measured at finger)			30°
Tripping point repeat accuracy			0.02% between 2 successive operations
Number of turns of input drive shaft			For 6 turns of threaded shaft: 0.4, 0.8, 1.6, 3, 6, 10, 20, 40 or 80
Mechanical durability			10 x 10 ⁶ drive shaft revolutions

Electrical characteristics of contacts			
Type of contacts			XR2A: single-pole C/O, snap action XR2B: single-pole N/C or N/O, with snap action mechanism
Rated operational characteristics			~ AC-15, A300 (Ue = 240 V, Ie = 3 A), --- DC-13, Q300 (Ue = 250 V, Ie = 0.27 A), conforming to IEC/EN 60947-5-1
Conventional thermal current		A	XR2A: Ithe = 10 XR2B: Ithe = 20
Rated insulation voltage		V	Ui = 500, conforming to IEC/EN 60947-1 Ui = --- 600, conforming to CSA C 22-2 n° 14
Rated impulse withstand voltage		kV	Uimp = 6, conforming to IEC/EN 60947-1
Resistance across terminals		mW	≤ 25
Short-circuit protection			XR2A: 10 A cartridge fuse type gG XR2B: 20 A cartridge fuse type gG
Connection			Screw clamp terminals. Clamping capacity: 2 x 1.5 mm ² with or without cable end, 2 x 2.5 mm ² without cable end

Electrical durability

Conforming to IEC/EN 60947-5-1
 Utilisation categories: AC-15 and DC-13
 Operating rate: 3600 operating cycles/hour
 Load factor: 0.5

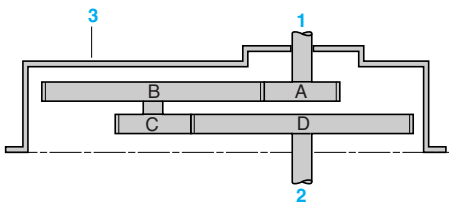
		a.c. supply ~ 50/60 Hz							d.c. supply ---						
		Power broken in VA													
		12	24	48	127	220	380	500	12	24	48	110	220	440	
For 3 million operating cycles	XR2A	~mm	100	200	400	700	750	800	800	100	120	110	95	80	45
		~UL	100	220	480	1050	1150	1150	1200	100	140	130	110	95	65
	XR2B	~mm	240	450	800	1300	1500	1500	1500	135	115	105	95	90	85
		~UL	240	450	800	1900	2200	2200	2200	220	450	400	330	280	240
For 10 million operating cycles	XR2A	~mm	45	75	120	180	200	200	200	45	40	35	30	20	7.5
		~UL	70	120	180	270	290	300	300	100	90	85	80	60	33
	XR2B	~mm	220	350	450	500	500	520	520	55	45	38	35	32	30
		~UL	220	440	600	740	750	750	750	220	450	400	330	280	240

1

Variable composition primary gearbox characteristics

Primary gearbox reference code (1) (2)	04	08	16	3	6	10	20	40	80	
Primary gearbox type	Single-stage									
Theoretical number of turns of input drive shaft "K"	0.4	0.8	1.6	3	6	10	20	40	80	
Number of teeth per pinion	A	59	59	49	59	Direct drive	49	26	26	16
	B	16	16	26	16		26	49	49	59
	C	59	49	49	26		16	26	16	16
	D	16	26	26	49		59	49	59	59
Number of turns of threaded shaft	6	6	6	6	6	6	6	6	6	
Actual number of turns of input drive shaft	0.441	0.863	1.689	3.066	6	11.739	21.3	41.697	81.586	
Maximum speed of input drive shaft in rpm	12	25	50	75	150	200	250	300	350	

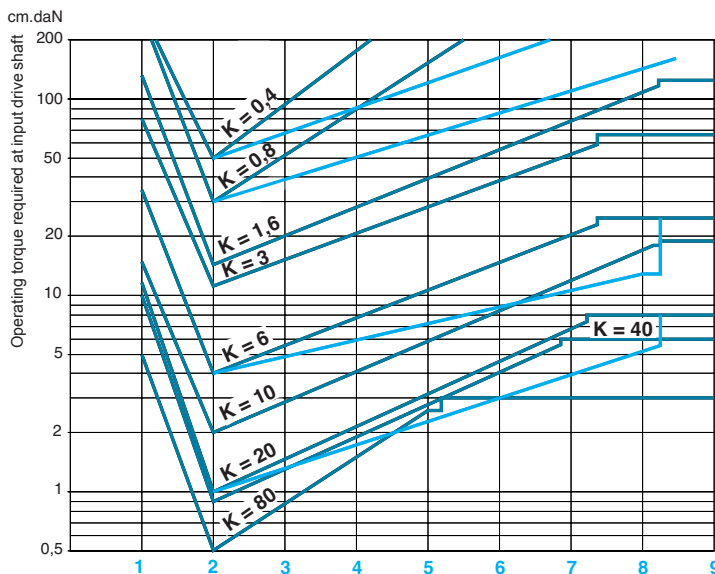
Primary gearbox arrangement (for references of the gearbox only, see page 1/216)



- 1 Input drive shaft
- 2 Threaded shaft (6 turns) and contact side
- 3 Casing

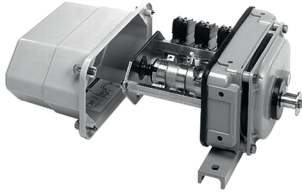
(1) Code required to complete the basic reference of the screw limit switch.
 (2) For ratios greater than 80 turns, please consult our Customer Care Centre.

Average drive torque



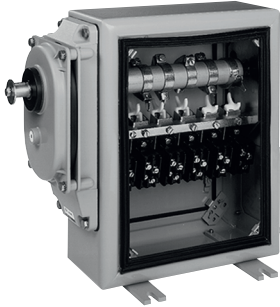
- 1 Clutch torque (at front mechanical stop/end of travel)
- 2 Nominal torque required to drive switch
- 3 Torque required to operate 1 contact
- 4 Torque required to operate 2 contacts simultaneously
- 5 Torque required to operate 3 contacts simultaneously
- 6 Torque required to operate 4 contacts simultaneously
- 7 Torque required to operate 6 contacts simultaneously
- 8 Torque required to operate 8 contacts simultaneously
- 9 Clutch torque (at rear mechanical stop/end of travel)

534911



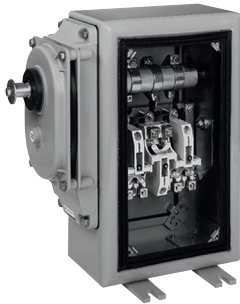
XR2AA03K●●

534912



XR2AB06K●●

534913



XR2BB03K●●

Switches with C/O contacts (Ithe = 10 A) (ZC1ZB211)

Presentation	Drive shaft end fittings	Number of contacts	Basic reference, to be completed by adding primary gearbox code (1)	Weight kg
Aluminium alloy body housing, plastic cover	Sprocket key and washer (2)	3	XR2AA03K●●	6.000
Sheet steel enclosure	Sprocket key and washer (2)	4	XR2AB04K●●	10.000
		6	XR2AB06K●●	12.000
		10	XR2AB10K●●	15.000
		14	XR2AB14K●●	18.000
		20	XR2AB20K●●	23.000
		24	XR2AB24K●●	28.000
		28	XR2AB28K●●	35.000

Switches with N/C contacts (Ithe = 20 A) (ZC4CB2) (3)

Presentation	Drive shaft end fittings	Number of contacts	Reference (1)	Weight kg
Sheet steel enclosure	Sprocket key and washer (2)	3	XR2BB03K●●	10.000
		5	XR2BB05K●●	12.000
		9	XR2BB09K●●	15.000
		13	XR2BB13K●●	18.000
		19	XR2BB19K●●	23.000
		23	XR2BB23K●●	28.000
		27	XR2BB27K●●	35.000

(1) Code corresponding to the required primary gearbox, selected according to number of turns of the switch input drive shaft.

See page 1/214.

Example: for a screw limit switch with 3 C/O contacts and a theoretical number of input shaft turns "K" = 0.4, the reference becomes: **XR2AA03K04**.

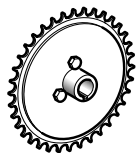
(2) Switches supplied without input drive shaft chain sprocket. For suitable sprockets and chains, see page 1/216.

(3) For switches fitted with N/O contacts, please consult your Regional Sales Office.

Screw limit switches

Heavy duty, OsiSense XR2

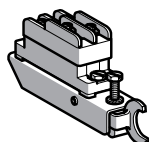
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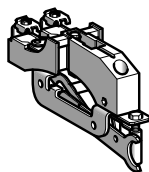
XR2AZ2●●



XR2AZ001



ZC1ZB211



ZC4CB2

534927



XR2AZ●●●

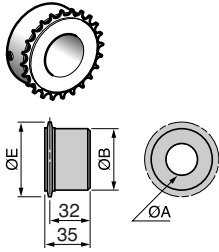
Separate components and replacement parts

Description	Type	Reference	Weight kg	
Chain sprockets, 12.7 mm pitch, for switch input drive shaft	Flat sprocket with fixing hub	12 teeth	XR2AZ212	0.180
		16 teeth	XR2AZ216	0.200
		24 teeth	XR2AZ224	0.230
		36 teeth	XR2AZ236	0.450
		48 teeth	XR2AZ248	0.770
		56 teeth	XR2AZ256	1.130
Operating finger		XR2AZ001	0.030	
Contact blocks with snap-over actuator	C/O (for XR2A)	ZC1ZB211	0.120	
	N/C (for XR2B)	ZC4CB2	0.140	
Chains (12.7 mm pitch) conforming to standard NF E 26-101, chromium plated, with joining link (1)	L = 2 metres	XR2AZ302	0.600	
	L = 5 metres	XR2AZ305	1.500	
	L = 10 metres	XR2AZ310	3.000	
Replacement primary gearbox kit comprising: - casing with input drive shaft (fitted with sprocket key, washer and screw) - steel pinions	Single-stage	K04	XR2AZ804	1.520
		K08	XR2AZ808	1.520
		K16	XR2AZ816	1.520
		K3	XR2AZ83	1.470
		K6	XR2AZ86	1.470
		K10	XR2AZ810	1.470
		K20	XR2AZ820	1.520
		K40	XR2AZ840	1.470
	K80	XR2AZ880	1.520	

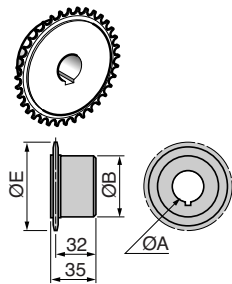
(1) For liquid level control applications, the length of the chain should at least be equal to the difference between the upper and lower liquid levels + 0.50 m.

Screw limit switches

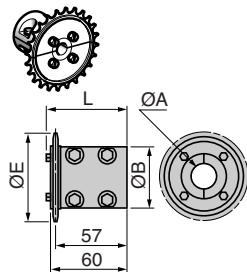
Winch shaft chain sprockets,
conforming to standard NF E 23-111,
12.7 mm pitch



XR2AZ3●●●5



XR2AZ4●●●5



XR2AZ52450

Monobloc sprockets with through hub

Number of teeth	ØE	ØA (bore Ø in mm)		Reference	Weight kg
		0...25	26...35		
		ØB	ØB		
12	57	50	–	XR2AZ31225	0.386
16	73	50	55	XR2AZ31625	0.424
24	105	50	–	XR2AZ32425	0.632
			–	55	XR2AZ32435
48	202	50	55	XR2AZ34825	1.000

Monobloc sprockets with keyed through hub

Number of teeth	ØE	ØA (bore Ø in mm)		Reference	Masse kg
		0...25	26...35		
		ØB	ØB		
16	73	50	55	XR2AZ41625	0.421
24	105	50	–	XR2AZ42425	0.580
			–	55	XR2AZ42435
36	153	50	55	XR2AZ43625	0.750

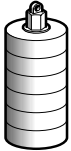
Split sprockets with through hub

Number of teeth	ØE	L	ØA (bore Ø in mm)		Reference	Masse kg
			21...50			
			ØB			
24	105	64.5	80		XR2AZ52450	0.680

1



XL1DB0111



XR2AZ002

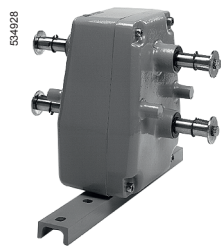


XL1DB04

Accessories

Description	Type	Material	Reference	Weight kg
Ballast float, Ø 270 mm for change in level less than 4.50 m	Without guide lugs	Stainless steel	XL1DB0111	5.900
Counterweights	For Ø 270 mm float	–	XR2AZ002	2.540
	For Ø 350 mm float	–	XR2AZ003	7.500
Pulley assembly	–	–	XL1DB04	1.050
Cable, Ø 37 mm, length 6 m (with attachment clamp)	–	Stainless steel	XL1DB05	0.250

(1) For mounting example, see page 1/233.



ZR2FA●

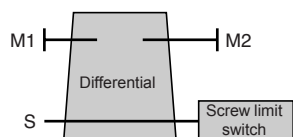
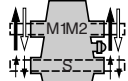
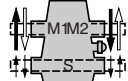


Figure 1



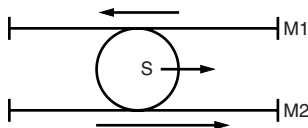
ZR2FA1: same direction

Figure 2



ZR2FA2: opposing directions

Schematic representation



ZR2FA005

Functions

This unit enables the monitoring of any speed difference between 2 movements which, under normal circumstances, should be identical. Any difference in speed is transmitted to an OsiSense XR2 screw limit switch which, in turn, re-establishes correct operation.

Main applications:

- Controlling movement of grabs on cranes and travelling cranes.
- Liquid level control in decantation tanks.
- Monitoring relative difference between 2 moving parts.

Operation

The difference in rotational speeds of shafts M1 and M2, which are connected to motors or capstans, is transferred to a set of internal pinions which, in turn, control the rotation of shaft S which is connected to one or more screw limit switches.

Relationship between rotational directions

If the rotation of shafts M1 and M2 is synchronised, shaft S does not turn.
If the rotation of shafts M1 and M2 is out of synchronisation, shaft S turns.

This relationship is indicated either by white arrows or black arrows (each shaft having 2 possible directions of rotation).

The rotational direction of shaft S is indicated by the arrow on shaft S immediately below the arrow on shaft M which represents the highest rotational speed (see figures 1 and 2).

$M1 = M2$: S does not turn

$M1 \neq M2$: S turns

Note

In both cases, the rotational speed ratio between shafts M and S is 2/1. It is important to know the maximum number of turns or differential travel that the screw limit switch must control (if necessary, both sides of its initial setting).

References

The differential units are supplied with "bare shafts" fitted with keyed discs, ready for the attachment of numerous types of coupling. They are dust and damp-proof and the internal mechanism is maintenance free. All 3 shafts are steel and are needle roller bearing mounted. A set of duplicate cast steel pinions ensure the accuracy of the differential. The cover is both glued and screwed to the housing.

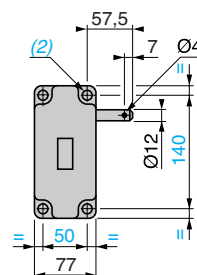
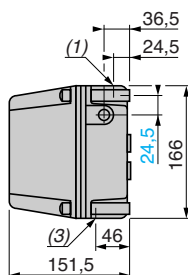
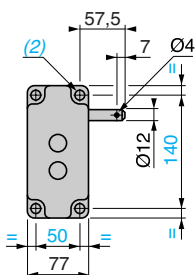
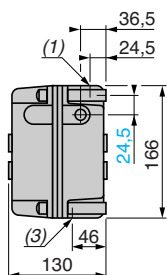
Description	Type	Reference	Weight kg
Differential units	For input shafts turning in the same direction	ZR2FA1	6.510
	For input shafts turning in opposing directions	ZR2FA2	6.510
Flexible coupling		ZR2FA005	0.120
Winch shaft chain sprockets		See page 1/229	–

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Screw limit switches

XRBA4●●●●

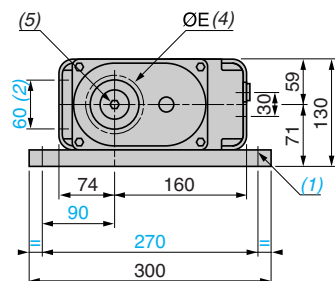
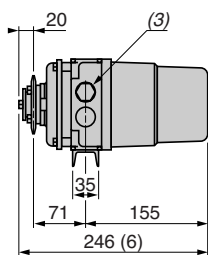
XRBA6●●●●



- (1) 1 tapped entry for n° 9 cable gland.
- (2) 4 tapped fixing holes for M5 screws, depth 20.
- (3) 1 tapped entry for n° 16 cable gland.

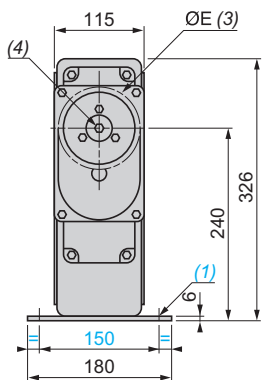
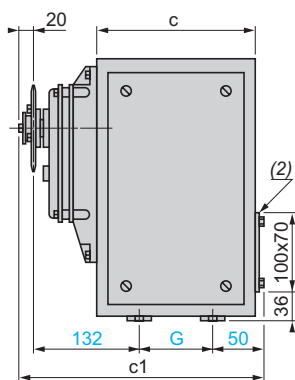
- (1) 1 tapped entry for n° 9 cable gland.
- (2) 4 tapped fixing holes for M5 screws, depth 20.
- (3) 1 tapped entry for n° 16 cable gland.

XR2AA●●●● with chain sprocket XR2AZ2● fitted



- (1) 2 elongated fixing holes Ø 9 x 11.
- (2) Alternative fixings: 2 x M8 threaded holes on same axis as cable glands.
- (3) 2 tapped entries for n° 13 cable gland.
- (4) Ø E of chain sprocket XR2AZ2● (see next page).
- (5) Bore Ø of chain sprocket XR2AZ2●: Ø 16, 2 x 5 keyway.
- (6) + 125 mm for removal of cover.

XR2AB●●●●, XR2BB●●●● with chain sprocket XR2AZ2● fitted

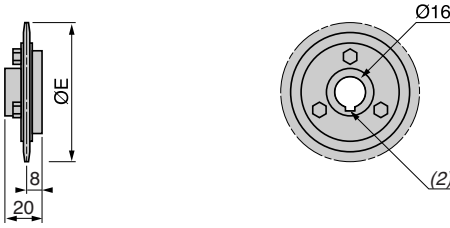


- (1) 4 elongated fixing holes Ø 9 x 11.
- (2) Removable plate for connections or for mounting cable glands.
- (3) Ø E of chain sprocket XR2AZ2● (see next page).
- (4) Bore Ø of chain sprocket XR2AZ2●: Ø 16, 2 x 5 keyway.

Reference	Number of contacts	c	c1	G
XR2AB04K●●	4	200	310	100
XR2AB06K●●	6	260	370	160
XR2AB10K●●	10	440	550	340
XR2AB14K●●	14	560	670	460
XR2AB20K●●	20	800	910	700
XR2AB24K●●	24	980	1090	880
XR2AB28K●●	28	1100	1210	1000

Reference	Number of contacts	c	c1	G
XR2BB03K●●	3	200	310	100
XR2BB05K●●	5	260	370	160
XR2BB09K●●	9	440	550	340
XR2BB13K●●	13	560	670	460
XR2BB19K●●	19	800	910	700
XR2BB23K●●	23	980	1090	800
XR2BB27K●●	27	1100	1210	1000

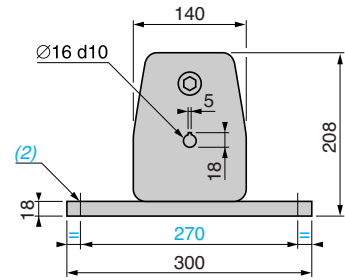
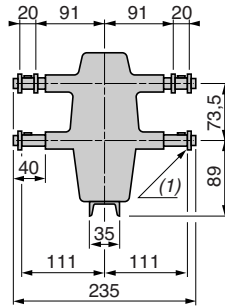
Chain sprockets (1) for switch input drive shaft
XR2AZ2●●



Reference	Number of teeth	Ø E
XR2AZ212	12	57
XR2AZ216	16	73
XR2AZ224	24	105
XR2AZ236	36	153
XR2AZ248	48	202
XR2AZ256	56	234

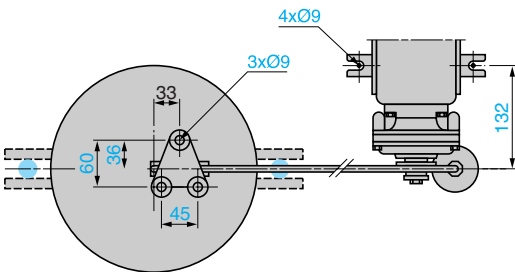
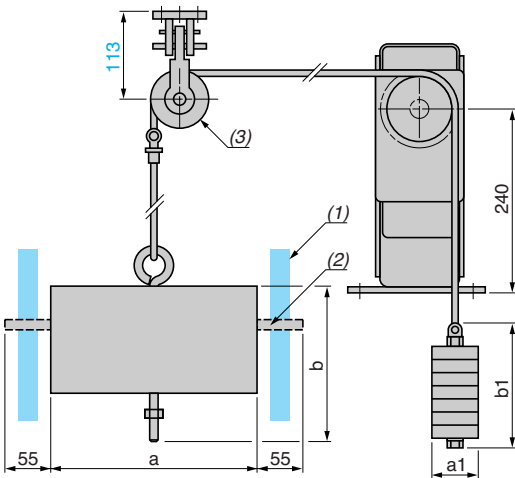
(1) Chain pitch: 12.7 mm.
(2) Keyway: 2 x 5 mm.

Differential units
ZR2FA●



(1) Removable circlips.
(2) 2 elongated fixing holes Ø 9 x 11 for Ø 8 screws.

Application: liquid level control
Mounting details using an XR2●B●●●● screw limit switch



	a	a1	b	b1
Change in liquid level up to 4.5 m (using XL1DB01●1 and XR2AZ002)	270	60	200	160
Change in liquid level greater than 4.5 m 350 (using XL1DB02●1 and XR2AZ003)		148	245	110

(1) Guide rods.
(2) Guide rod lugs.
(3) Pulley, internal Ø 65 mm.

Functions

The overtravel limit switches for power circuit switching are specifically designed to ensure the safety of hoisting equipment.

They directly break the power supply to the hoist motor if the load being handled accidentally exceeds the operating limits of the equipment.

Their mechanism is designed to ensure breakage of the power supply in the event of a malfunction and therefore, an overtravel limit switch cannot be used in place of an end of travel limit switch. It must only be used as a back-up device in the event of failure of the latter, or any other component forming part of an automated control circuit monitoring for excessive overtravel.

Description

XF9D●●● overtravel limit switches are housed in an aluminium alloy case.

XF9F●●● overtravel limit switches are housed in a sheet steel enclosure.

They are equipped with power contacts from Schneider Electric contactors.

Operation

Mounting and operating precautions

It is recommended that the overtravel limit switch be connected as near as possible to the motor, in order to minimise the risk of shunting.

The switch must be positioned in such a manner so as to avoid any damage in the event of the load exceeding the end of travel limits.

In order to ensure positive operation, the operating lever of the overtravel limit switch must be actuated directly by the moving part being monitored. It is essential that the use of any flexible or deformable intermediate actuators be avoided.

Manual reset switches - resetting after tripping

- Before resetting the overtravel limit switch ensure that the cause of its tripping is located and rectified.
- Rotate and hold lever up against end stop.
- Simultaneously press the reset button (XF9D), using accessory included with switch, or operate the reset lever (XF9F) and turn the control station switch away from the trip position.
- Rotate lever back to its initial position.

Environment								
Overtravel limit switch type			XF9D251	XF9D651	XF9F1151 XF9F1152	XF9F1851 XF9F1852	XF9F2651 XF9F2652	
Conformity to standards			IEC 60158-1, NF C 63-110, VDE 0660, IEC 60947-1, IEC 60947-4					
Product certification	3-phase		CSA					
			20 HP 40 A, 600 V	20 HP 80 A, 600 V	100 HP 175 A, 600 V	150 HP40 A, 200 A, 600 V	200 HP 428 A, 600 V	
	Single-phase, 2-pole		3 HP 40 A, 230 V	10 HP 80 A, 230 V	–	–	–	
Protective treatment	Standard version		"TC"					
	Special version		"TH" on request					
Ambient air temperature	For storage	°C	- 40...+ 70					
	For operation	°C	- 25...+ 70					
Degree of protection	Conforming to IEC/EN 60529		IP 54		IP 43			
Housing			Aluminium alloy case		Sheet steel enclosure			
Cable entry			2 tapped entries for n° 21 cable gland	3 tapped entries for n° 29 cable gland	2 entries incorporating n° 36 plastic cable gland			

Contact block characteristics								
Number of poles			4		3			
Rated operational current (Ie)	For 2-pole scheme	A	50	130	–	–	–	
	For 3-pole scheme on AC-3	A	25	65	115	185	265	
Conventional thermal current (Ithe) at $\theta \leq 40^\circ\text{C}$	For 2-pole scheme	A	80	160	–	–	–	
	For 3-pole scheme	A	40	80	200	275	350	
Rated insulation voltage (Ui)	Conforming to IEC 60158-1, IEC 947-4, VDE 0110 Group C	V	500		660			
	Conforming to CSA 22-2 n° 14	V	600					
Rated breaking capacity (I rms)	Conforming to IEC 60158-1 500 V	A	400	1000	1100	1600	2200	
	For 2-pole scheme 660 V	A	180	630	900	1200	1750	
Connection Min./max. cable c.s.a.	Flexible wiring, without cable end	1 conductor	mm ²	1.5/10	2.5/25	–	–	–
		2 conductors	mm ²	1.5/6	2.5/16	–	–	–
	Flexible wiring, with cable end	1 conductor	mm ²	1/6	2.5/16	–	–	–
		2 conductors	mm ²	1/4	2.5/6	–	–	–
	Solid wiring, without cable end	1 conductor	mm ²	1.5/6	2.5/25	–	–	–
		2 conductors	mm ²	1.5/6	4/16	–	–	–
	Cable	1 conductor	mm ²	–	–	95	150	240
		2 conductors	mm ²	–	–	95	150	240

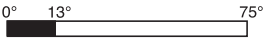
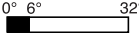

1

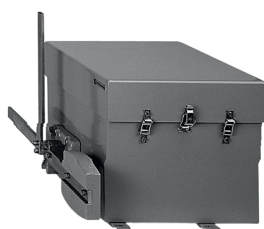


XF9D651

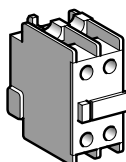
References

Switches without auxiliary contact block

Description	Rated operational current A	Conventional thermal current A	Disconnection	Reference	Weight kg
With manual latching and resetting restricted by a padlockable device Snap action opening mechanism Maximum travel: 75° in each direction	25	40	3-pole or 4-pole	XF9D251	2.200
	50	80	2-pole		
	65	80	3-pole or 4-pole	XF9D651	5.000
	130	160	2-pole		
With manual latching and resetting Horizontal or vertical actuation Snap action opening mechanism	115	200	3-pole	XF9F1151	25.500
	185	275	3-pole	XF9F1851	26.000
	265	350	3-pole		
With counterweights and automatic resetting Horizontal or vertical actuation Slow break opening mechanism Minimum actuation speed: 2.5m/s	115	200	3-pole	XF9F1152	28.500
	185	275	3-pole		
	265	350	3-pole	XF9F2652	32.500



XF9F●●●2



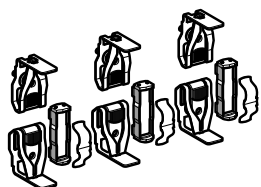
LADN11

Auxiliary contact blocks



Description	For use with switches	Reference	Weight kg
N/C + N/O instantaneous	XF9D●●● and XF9F●●●	LADN11	0.030

Replacement parts

Description	For use with switches	Reference	Weight kg
Contact set comprising per pole: - 2 fixed contacts, - 1 moving contact, - 2 deflectors, - 1 backplate, clamping screw and washers	XF9F115●	LA5FF431	0.270
	XF9F185●	LA5FG431	0.350
	XF9F265●	LA5FH431	0.660
Arc chambers	XF9F115●	LA511550	0.490
	XF9F185●	LA518550	0.670
	XF9F265●	LA526550	0.920

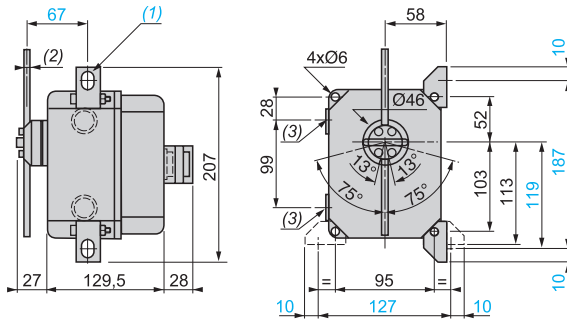


LA5FG431

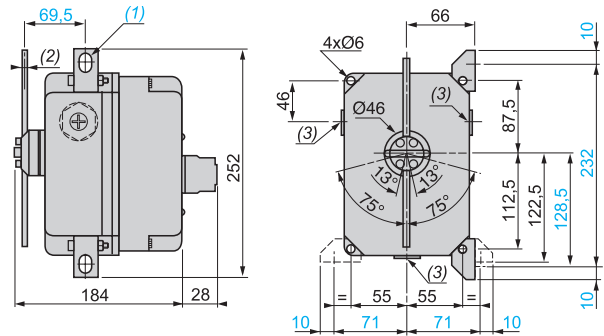
 Contacts closed
 Contacts open

Dimensions

XF9D251



XF9D651

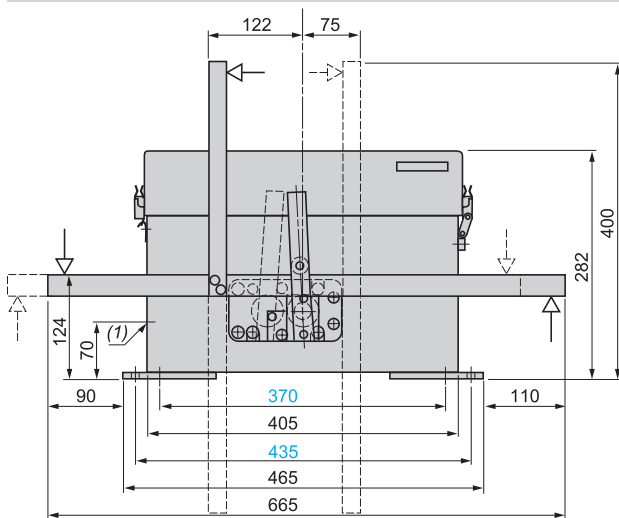


- (1) 2 elongated holes Ø 6 x 8.5 (removable fixing lugs).
 - (2) 6 mm square rod, length 200 (can be mounted at 90°).
 - (3) 2 tapped entries for n° 21 cable gland.
- 13° = contact actuation, 75° = maximum travel.

- (1) 2 elongated holes Ø 6 x 8.5 (removable fixing lugs).
 - (2) 6 mm square rod, length 200 (can be mounted at 90°).
 - (3) 3 plain entries for n° 29 cable gland.
- 13° = contact actuation, 75° = maximum travel.

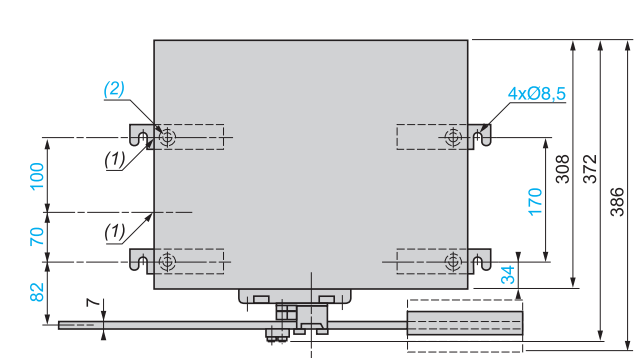
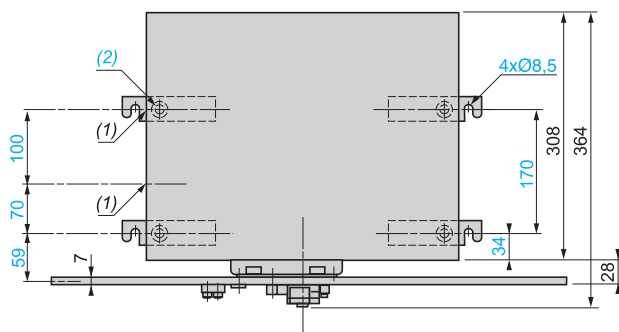
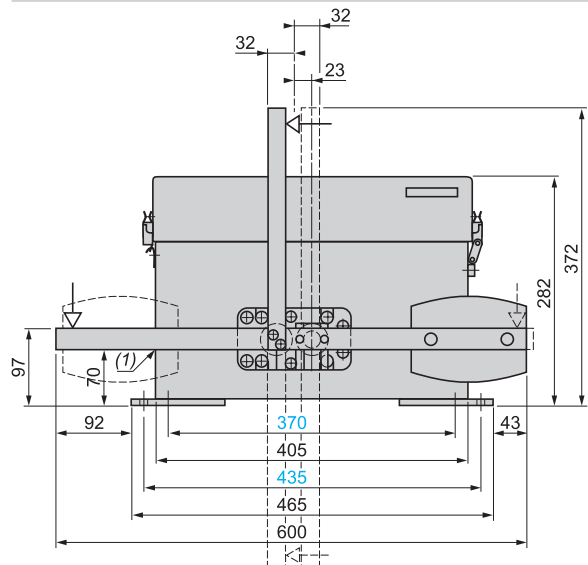
XF9F●●●1

Manual resetting



XF9F●●●2

Automatic resetting



- (1) 2 entries incorporating n° 36 plastic cable gland.
- (2) 4 holes Ø 8.5 to be drilled by user (for attaching fixing lugs to enclosure base).

- (1) 2 entries incorporating n° 36 plastic cable gland.
- (2) 4 holes Ø 8.5 to be drilled by user (for attaching fixing lugs to enclosure base).

2 - Electronic pressure sensors OsiSense XM

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XMLK pressure transmitters

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- References
 - Sizes in bar page 2/13
 - Sizes in psi page 2/14
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XMLG pressure transmitters, pressure and vacuum switches

- Presentation. page 2/16
- References
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XMLP pressure transmitters

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- References
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ZMLP switches with 4-digit display

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XMLR pressure sensors with 4-digit display

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Electromechanical pressure and vacuum switches OsiSense XM

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Electromechanical pressure and vacuum switches for control circuits

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ACW and ADW. For controlling the pressure of air, water, hydraulic oils and corrosive fluids

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 - Sizes 0,07 to 131 bar *page 2/124*
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XXM. For controlling the pressure of air and water

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 - Sizes 6 to 25 bar (87 to 362,5 psi) *page 2/132*
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XM for power circuits

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 - Types FTG *page 2/136*
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XM for XMP power circuits

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- References
 - Type XMP, IP 54 *page 2/144*
 - Size 12 bar (174 psi) *page 2/146*
 - Size 25 bar (362,5 psi) *page 2/148*
 - Type XMP, IP 65 *page 2/150*
 - Accessories and replacement parts *page 2/152*



2

Applications	Type of installation
	Type of sensor and features

Control circuits
Devices without display
Pressure transmitters
Analogue output, 4...20 mA or 0...10 V



Sizes	0...25 bar (0...362 psi)	0... 300 psi (0... 20.7 bar)
Fluids or products controlled	Air, fresh water (0...+ 80°C)	
Fluid connection	G 1/4 A DIN 3852-E male (1)	1/4"-18 NPT male (1)
Rated supply voltage	12/24 V $\overline{---}$ (4...20 mA), 24 V $\overline{---}$ (0...10 V), SELV, PELV (2)	
Voltage limits	8...33 V $\overline{---}$ (4...20 mA), 16.2...33 V $\overline{---}$ (0...10 V)	
Current consumption	< 20 mA (4...20 mA), < 6 mA (0...10 V)	
Electrical connection	M12, EN 175301-803-A (ex-DIN 43650A) or Packard Metri-Pack 150 connector (3)	
Type of output	Analogue, 4...20 mA or 0...10 V	
Materials in contact with fluid	Ceramic Al ₂ O ₃ , stainless steel type AISI 303, nitrile (NBR)	
Output response time	< 2 ms	
Precision including linearity, hysteresis, repeat accuracy	± 1% of the measuring range	
Service life	> 10 million operating cycles	
Dimensions of case (mm)	Width x height x depth Ø 36 x 67.5	
Conforming to standards	CE, ROHS, EN/IEC 61326-2-3	
Product certifications	UL, CSA conforming to UL 508 and CSA-22.2 no. 14, EAC, RCM	
Ambient air temperature for operation	0...+ 80°C	
Degree of protection	IP 65 conforming to EN/IEC 60529, NEMA Type 4 conforming to UL/CSA	
Vibration resistance	20 gn (9...2000 Hz) conforming to EN/IEC 60068-2-6	
Shock resistance	25 gn (half sine wave 11 ms) conforming to EN/IEC 60068-2-27	
Type reference	XMLK●●●B2C●●, XMLK●●●B2C●●TQ (4) XMLK●●●B2D●●, XMLK●●●B2D●●TQ (4) XMLK●●●P2C●●, XMLK●●●P2C●●TQ (4) XMLK●●●P2D●●, XMLK●●●P2D●●TQ (4) XMLK●●●P2P●●, XMLK●●●P2P●●TQ (4)	
Pages	2/13 and 2/14	

Other versions

(1) For other fluid connections, please consult our Customer Care Centre.
 (2) Safety extra-low voltage, Protected extra-low voltage.
 (3) For other electrical connections, please consult our Customer Care Centre.
 (4) Sold in lots of 25, minimum order quantity 50.
 (5) Phoenix Contact "Quickon" integrated connection.

Control circuits

Devices without display

Pressure transmitters
Analogue output, 4...20 mA or 0...10 V.

Pressure and vacuum switches
Factory set switching thresholds
Solid-state NPN or PNP output



- 1...400 bar (- 14.5 psi...5800 psi)	
Fresh water (0...+ 125°C) Air, hydraulic oils, corrosive fluids (- 15...+ 125°C)	
G 1/4 A DIN 3852-E male or 1/4"-18 NPT male (1)	
12/24 V $\overline{\text{---}}$ (4...20 mA) 24 V $\overline{\text{---}}$ (0...10 V)	12/24 V $\overline{\text{---}}$
8...33 V $\overline{\text{---}}$ (4...20 mA) 11.4...33 V $\overline{\text{---}}$ (0...10 V)	8...33 V $\overline{\text{---}}$
< 20 mA	< 4 mA
M12 connector (1) or integrated quick connection (5)	
Analogue, 4...20 mA or 0...10 V	Solid-state, NPN or PNP, NC 150 mA, 12/24 V $\overline{\text{---}}$
Ceramic AL ₂ O ₃ , stainless steel type AISI 303, FPM (Viton) PPS (Leakage protection for P > 40 bar)	
< 2 ms	
± 0.3% of the measuring range	
> 10 million operating cycles	
Ø 22.8 x 58.1 (with M12 connector) Ø 22.8 x 66.1 (with quick connection)	
CE, ROHS, EN/IEC 61326-2-3	
UL, CSA conforming to UL 508 and CSA-22.2 no. 14, EAC	
- 15...+ 85 °C	
IP 66, IP 67 conforming to EN/IEC 60529, NEMA Type 4 conforming to UL/CSA	
20 gn (9...2000 Hz) conforming to EN/IEC 60068-2-6	
25 gn (half sine wave 11 ms) conforming to EN/IEC 60068-2-27	
XMLG●●●D21, XMLG●●●D71 XMLG●●●D21TQ (4) XMLG●●●D71TQ (4) XMLG●●●Q21TQ (4) XMLG●●●Q71TQ (4)	XMLG●●●D31TQ (4) XMLG●●●D41TQ (4) XMLG●●●Q31TQ (4) XMLG●●●Q41TQ (4)

2/17 to 2/21

2

Applications	Type of installation
	Type of sensor and features

Control circuits
Devices without display
Pressure transmitters
Analogue output, 4...20 mA, 0...10 V or ratiometric output, 0.5...4.5 V



Sizes	
Fluids or products controlled	
Fluid connection	
Rated supply voltage	
Voltage limits	
Current consumption	
Electrical connection	
Type of output	
Materials in contact with fluid	
Output response time	
Precision including linearity, hysteresis, repeat accuracy	
Service life	
Dimensions of case (mm)	Width x height x depth
Conforming to standards	
Product certifications	
Ambient air temperature for operation	
Degree of protection	
Vibration resistance	
Shock resistance	
Type reference	
Pages	
Other versions	

-1...0 bar, -1...5 bar (-14.5...72.5 psi), 0...6 bar (0...87 psi) -14.5...0 psi, -14.5...60 psi (-1...4.14 bar), 0...50 psi (0...3.45 bar)	
Fresh water (0... + 125 °C) Air, hydraulic oils (- 15... + 125 °C)	
G 1/4 A DIN 3852-E male, 1/4"-18NPT male, SAE 7/16-20 UNF-2B female	
12/24 V $\overline{\text{---}}$ (4...20 mA), 24 V $\overline{\text{---}}$ (0...10 V), 5 V $\overline{\text{---}}$ (0.5...4.5 V), SELV, PELV (1)	
7...33 V $\overline{\text{---}}$ (4...20 mA), 12...33 V $\overline{\text{---}}$ (0...10 V), 4.5...5.5 V $\overline{\text{---}}$ (0.5...4.5 V)	
< 23 mA (4...20 mA), < 7 mA (0...10 V and 0.5...4.5 V)	
M12 connector, EN 175301-803-A (ex DIN 43650A) connector, Packard Metri-Pack 150 connector or 2 m PVC cable	
Analogue, 4...20 mA, 0...10 V or 0.5...4.5 V	
Ceramic AL ₂ O ₃ , stainless steel type AISI 316L, FPM fluorocarbon	
< 2 ms at 92% of maximum deviation	
± 0.5% of the measuring range (except for size 0.5 bar: ± 1.5% and size 0.25 bar: ± 2%)	
> 10 million operating cycles	
Ø 26 x 32.3 (with M12 connector) Ø 26 x 55 (with EN 175301-803-A connector) Ø 26 x 49.2 (with Packard Metri-Pack 150 connector) Ø 26 x 57 (with cable)	
CE, ROHS, EN/IEC 61326-2-3, NSF ANSI 61	
cULus conforming to UL 61010-1 and CSA-C22.2 n° 61010-1, EAC, RCM	
- 30... + 85 °C	
IP 65 or IP 67 conforming to EN/IEC 60529 IP 69K conforming to DIN 40050 (versions with M12 connector)	
20 gn (10...2000 Hz) conforming to EN/IEC 60068-2-64	
100 gn (half sine wave 11 ms) conforming to EN/IEC 60068-2-27	
XMLP●●●●D●●F XMLP●●●●C●●F XMLP●●●●L●●F XMLP●●●R●●3F	XMLP●●●●D●●FQ (2) XMLP●●●●C●●FQ (2) XMLP●●●●L●●FQ (2) XMLP●●●R●●3FQ (2)
2/24 to 2/37	

(1) Safety extra-low voltage, Protected extra-low voltage.
(2) Sold in lots of 25.
(3) Sold in lots of 40.

Control circuits

Devices without display

Pressure transmitters

Analogue output, 4...20 mA, 0...10 V or ratiometric output, 0.5...4.5 V



- 1...9 bar (- 14.5...130 psi), 0...600 bar (0...8700 psi), 0...6,000 psi (0 bar...414 bar)

Fresh water (0...+ 120°C)

Air, hydraulic oils, refrigeration fluids (- 20...+ 120°C)

G 1/4 A DIN 3852-E male (≤ 40 bar), G 1/4 A DIN 3852-A male (≥ 100 bar) SAE 7/16-20 UNF-2A male, SAE 7/16-20 UNF-2B female or 1/4"-18 NPT male

12/24 V $\overline{\text{---}}$ (4...20 mA), 24 V $\overline{\text{---}}$ (0...10 V), 5 V $\overline{\text{---}}$ (0.5...4.5 V), SELV, PELV (1)

8...30 V $\overline{\text{---}}$ (4...20 mA), 14...30 V $\overline{\text{---}}$ (0...10 V), 4.75...5.25 V $\overline{\text{---}}$ (0.5...4.5 V)

< 20 mA (4...20 mA), < 10 mA (0...10 V), < 5 mA (0.5...4.5 V)

M12, EN 175301-803-A (ex-DIN 43650A) or Packard Metri-Pack 150 connector

Analogue, 4...20 mA, 0...10 V or 0.5...4.5 V

17-4PH stainless steel, stainless steel type AISI 304, FKM fluorocarbon (Viton)

< 5 ms at 90% of maximum deviation

$\pm 0.5\%$ of the measuring range

> 10 million operating cycles

$\varnothing 30 \times 26$ (with M12 connector)

$\varnothing 30 \times 25$ (with EN 175301-803-A connector)

$\varnothing 30 \times 37$ (with Packard Metri-Pack 150 connector)

CE, ROHS, EN/IEC 61326-1

cULus conforming to UL 61010-1 and CSA-C22.2 no. 61010-1, EAC, RCM

- 30...+ 120 °C

IP 65 or IP 67 conforming to EN/IEC 60529

IP 69K conforming to DIN 40050 (versions with M12 connector)

20 gn (10...2000 Hz) conforming to EN/IEC 60068-2-64

25 gn (half sine wave 11 ms) conforming to EN/IEC 60068-2-27

XMLP●●●B●●1V
XMLP●●●B●●●
XMLP●●●P●●3

XMLP●●●B●●1VQ (3)
XMLP●●●B●●●Q (3)
XMLP●●●P●●3Q (3)

2/24 to 2/37

2

Applications	Type of installation
	Type reference and features

Control circuits
Switches with 4-digit display
- With an analogue output, 4...20 mA and a switching output, PNP or NPN type
- With two PNP or NPN switching outputs



Sizes	-	
Fluids or products controlled	-	
Fluid connection	-	
Display	7 segment/4-digit display. Pressure units in bar, psi or pascal. 41 display ranges can be selected, from -14.5 to 6000	
Rated supply voltage	24 V $\overline{\text{---}}$, SELV, PELV (1)	
Voltage limits	17...33 V $\overline{\text{---}}$	
Current consumption	\leq 50 mA	
Electrical connection	M12, 4-pin connector	
Type of output	<ul style="list-style-type: none"> ■ Analogue, 4...20 mA + one switching output, PNP or NPN, 200 mA 	<ul style="list-style-type: none"> ■ 2 switching outputs, PNP or NPN, 200 mA
Materials in contact with fluid	-	
Output response time	\leq 3 ms	
Precision including linearity, hysteresis, repeat accuracy	\pm 1% of the measuring range	
Service life	> 10 million operating cycles	
Dimensions of case (mm)	Width x height x depth 41 x 77 x 42	
Conforming to standards	CE, ROHS, EN/IEC 61000-6-2, EN/IEC 61000-6-4	
Product certifications	cULus conforming to UL 508 and CSA-C22.2 no. 14, EAC, RCM	
Ambient air temperature for operation	-25...+70°C	
Degree of protection	IP 65 or IP 67 conforming to EN/IEC 60529, IP 69K conforming to DIN 40050	
Vibration resistance	5 gn (10...2000 Hz) conforming to EN/IEC 60068-2-6	
Shock resistance	25 gn conforming to EN/IEC 60068-2-27	
Type reference	ZMLPA1●2S●	ZMLPA2●0SH
Pages	2/39	
Other versions		

(1) Safety extra-low voltage, Protected extra-low voltage.
 (2) For other fluid connections, please consult our Customer Care Centre.

Control circuits

Pressure transmitters with 4-digit display

- With one analogue output, 4...20 mA or 0...10 V and one input for diagnosis

Pressure and vacuum switches with 4-digit display

- With one analogue output, 4...20 mA or 0...10 V and one switching output, PNP or NPN type
 - With two switching outputs, PNP or NPN type
 - With one analogue output, 4...20 mA, and two switching outputs, PNP or NPN type



- 1...600 bar (- 14.5 psi...8700 psi)

Fresh water (0...+ 80°C). Air, hydraulic oils, refrigeration fluids (- 20...+ 80°C)

G 1/4 ADIN3852-Y female, 1/4"-18 NPT female or SAE 7/16-20 UNF female (2)

7-segment/4-digit display. Pressure units in bar, psi or pascal. Signalling LED for the pressure unit and output state.

24 V $\overline{\text{---}}$, SELV, PELV (1)

17...33 V $\overline{\text{---}}$

\leq 50 mA

M12, 4-pin connector

■ Analogue, 4...20 mA or 0...10 V

M12, 4 or 5-pin connector

■ Analogue, 4...20 mA or 0...10 V + one switching output, PNP or NPN, 250 mA
 ■ Two switching outputs, PNP or NPN, 250 mA
 ■ Analogue, 4...20 mA + two switching outputs, PNP or NPN, 250 mA

\leq 40 bar: Ceramic Al_2O_3 , stainless steel 316L, FPM fluorocarbon
 \geq 100 bar: Stainless steel 316L, FKM fluorocarbon (Viton)

\leq 10 ms

\leq 10 ms (analogue output)
 \leq 5 ms (switching output)

\pm 1% of the measuring range

> 10 million operating cycles

41 x 93 x 42

CE, ROHS, EN/IEC 61326-2-3, NFS ANSI 61

cULus conforming to UL 61010-1 and CSA-C22.2 no. 61010-1, EAC, RCM

- 20...+ 80°C

IP 66, IP 67 conforming to EN/IEC 60529

20 gn (10...2000 Hz) conforming to EN/IEC 60068-2-6

50 gn conforming to EN/IEC 60068-2-27

XMLR...G0...
 XMLR...M0...

XMLR...G1... , XMLR...G2...
 XMLR...M1... , XMLR...M2...

2/43 to 2/47

Functions

Electronic pressure sensors

The function of electronic pressure sensors is the control and measurement of pressure or vacuum levels in hydraulic or pneumatic systems. Being electronic, the sensors have no mechanical moving parts.

Pressure transmitters

Pressure transmitters convert the pressure into an electrical signal which is proportional to the applied pressure. Their high precision makes them suitable for all industrial applications requiring pressure/vacuum display, control or regulation.

Being very robust, they are equally suitable for applications involving high operating rates.

Pressure and vacuum switches

Electronic pressure switches and vacuum switches convert a change in pressure into a digital electrical signal when the switching points which have been set are reached.

They are distinguished from electromechanical pressure switches and vacuum switches by their very wide switching adjustment ranges.

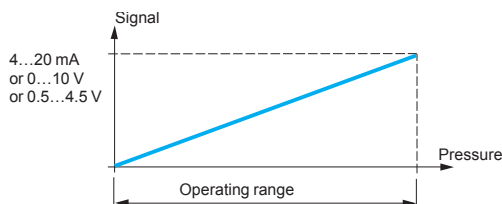
Their robustness, together with their excellent adherence to the set values over a period of time, make them ideal for applications involving high operating rates. In addition, the high repeat accuracy and fast response time of these sensors make them equally suitable for applications requiring accurate pressure regulation and monitoring.

Note: Some sensors in the OsiSense XM ranges have both one analogue output and one or two digital outputs.

Operating principle

Pressure transmitters

These devices provide an analogue output which has a signal proportional to the pressure applied to the sensor. Depending on the model, this signal can be 4...20 mA, 0...10 V or ratiometric (0.5...4.5 V).



Pressure and vacuum switches

These devices have one or two digital outputs depending on the model. The status of these outputs is defined by high (SP) and low (rP) switching points which can usually be independently adjusted.

Pressure switches and vacuum switches can have 2 different switching modes:

- Hysteresis mode, particularly suited to pumping applications (filling/emptying).
- Window mode, more suitable for applications where the pressure is regulated.

The switching outputs can usually be configured as normally open (NO) or normally closed (NC).

In addition, for the OsiSense XMLR range (1), output switching can be delayed for between 1 and 50 seconds, both on the pressure rising edge and falling edge.

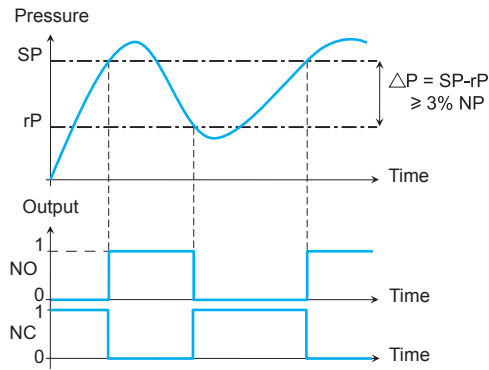
(1) See pages 2/42 to 2/47.

Operating principle (continued)

Pressure and vacuum switches (continued)

Switching output: hysteresis mode

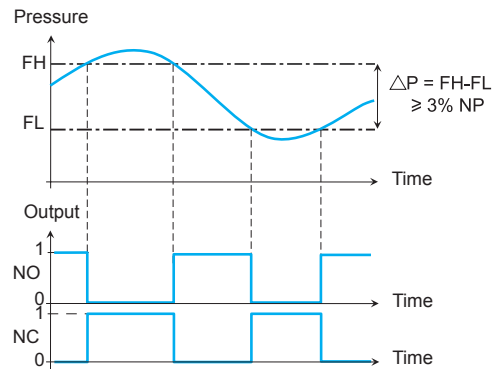
Hysteresis mode is generally used for pumping and/or emptying applications.



SP: High switching point
 rP: Low switching point
 NP: Nominal pressure

Switching output: Window mode

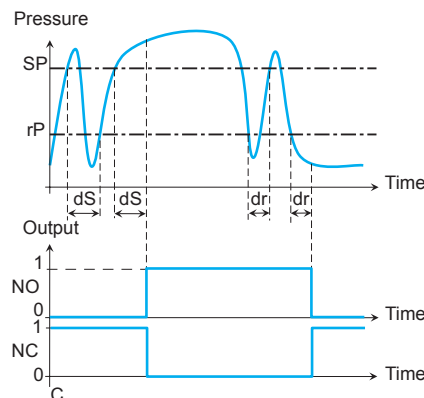
Window mode is generally used for pressure regulation applications.



FH: High switching point
 FL: Low switching point
 NP: Nominal pressure

Switching output: time delay mode

Time delay mode is generally used to filter fast transient pressures. The output only switches after a "dS" and "dr" time period which can be set between 0 and 50 seconds.



FH: High switching point
 FL: Low switching point
 NP: Nominal pressure

Terminology

Nominal pressure NP or size

The nominal pressure is the maximum pressure or vacuum which can be measured by the sensor.

Maximum permissible accidental pressure

This is the maximum pressure, excluding pressure surges, to which the pressure sensor can occasionally be subjected without being damaged.

Destruction pressure

The pressure value which if exceeded is likely to cause serious damage to the sensor i.e. leaking, bursting, component failure, etc.

High switching point (SP)

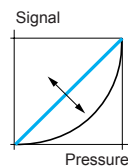
This is the upper pressure setting selected on the pressure or vacuum switch at which the electrical output changes state when this pressure value is reached.

Low switching point (rP)

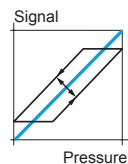
This is the lower pressure setting selected on the pressure or vacuum switch at which the electrical output changes state when this pressure value is reached.

Precision

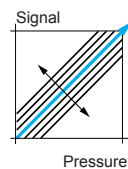
The sensor's overall precision is the result of several error sources linked to linearity, hysteresis, repeat accuracy and setting tolerances. It is expressed as a % of the nominal pressure.



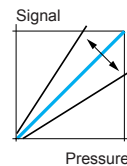
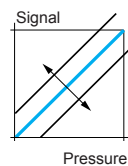
The linearity is the maximum deviation between the actual transmitter curve and the nominal curve.



The hysteresis is the maximum deviation between the rising pressure curve and the falling pressure curve.



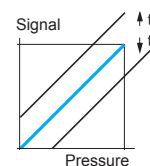
The repeat accuracy is the maximum drift encountered after several successive pressure variation cycles.



The setting tolerances are the calibration tolerances regarding the zero point and sensitivity set during sensor manufacture (gradient of output signal curve from the pressure transmitter).

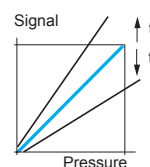
Temperature drift

Although the pressure sensor is compensated electronically, its accuracy is still slightly influenced by the temperature to which it is subjected.



Zero point drift

This is proportional to the temperature and is expressed as % NP/°C.



Sensitivity drift

This is proportional to the temperature and is expressed as % NP/°C.

(NP: Nominal pressure)

Main criteria for selecting an electronic pressure sensor

The fluid or gas to be controlled

Our products, including the materials used, are compatible with the majority of fluids or gases encountered in industrial applications.

However some particularly corrosive fluids (sea water, for example) can affect product operation sooner or later.

The fluid temperature can also be an aggravating factor.

The materials in contact with the fluid are described in the technical data sheets which can be found on our website, www.tesensors.com.

If in doubt about compatibility, contact our Customer Care Centre.

The maximum pressure of the fluid to be controlled

The maximum pressure of the fluid to be controlled will determine the nominal pressure (or size) of the product to be used.

Our product ranges include a number of sizes which cover a pressure range from -1 to 600 bar.

It is advisable to choose a size just above the maximum pressure to be controlled, in order to have the best possible accuracy.

However, sometimes it is necessary to take account of transient pressure surges caused by the system operation (for example: the phenomenon of water hammer) and choose a size well above the maximum pressure to be controlled.

The fluid entry

There are a number of formats for the fluid and pneumatic connections.

Our ranges have the 3 most common types of fluid entry:

- G 1/4
- 1/4" - 18 NPT
- SAE 7/16-20UNF

The type and configuration of the electrical output(s)

Depending on the product range, each sensor reference has one, two or three outputs which may be analogue or digital.

It is important to clearly identify the function(s) the pressure sensor has to fulfil in the control system, in order to select the correct product.

The electrical connection

All products in the OsiSense XM ranges offer connection via an M12 x 1, 4 or 5-pin male cylindrical connector.

Some pressure transmitters also have an EN 175301-803-A or Packard Metri-Pack 150 connector.

We recommend connecting our pressure sensors by means of our OsiSense XZ cabling accessories.

Electronic pressure sensors

OsiSense XM

XMLK pressure transmitters

Plastic body, stainless steel 303 fluid entry.

With analogue output

Presentation

XMLK pressure transmitters are characterised by their ceramic pressure measuring cell.

The deformation caused by the pressure is transmitted to the resistors of a Wheatstone bridge screen-printed on the ceramic.

The change in resistance is then processed by the integrated electronics, giving an analogue output signal.

The stainless steel AISI 303 fluid entry and the ceramic cell combined with a nitrile gasket make these transmitters particularly suitable for fluids such as air and fresh water, for temperatures between 0 and + 80°C.

Depending on the model, these devices are supplied:

- With 12 or 24 V $\overline{\text{---}}$ nominal and operate from 8 to 33 V $\overline{\text{---}}$ for transmitters with 4...20 mA output
- With 24 V $\overline{\text{---}}$ nominal and operate from 11.4 to 33 V $\overline{\text{---}}$ for transmitters with a 0...10 V output

These products have IP 67 and Nema type 4 degree of protection.

In addition to their plastic case and the pressure ratings available, they constitute the optimised solution for water pumping applications.

Description

- 1 Electrical connection: M12 male, EN 175301-803-A or Packard Metri-Pack 150.
- 2 Plastic case.
- 3 Electronics: 4...20 mA or 0...10 V analogue output.
- 4 Ceramic pressure measuring cell.
- 5 Nitrile gasket.
- 6 Fluid entry: G 1/4 male or 1/4" - 18 NPT male.

Functions

Versions with an M12 electrical connector and 4...20 mA analogue output (XMLK●●●●2D2●) can be used with switches with ZMLP 4-digit display (1).

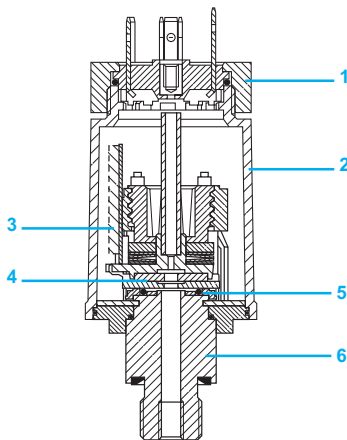
The pressure ranges available are:

- 0...6 bar to 0...25 bar
- 0...100 psi to 0...300 psi

The selling in lots option offers an excellent price/performance ratio (sold individually or in lots of 25).

XMLK electronic pressure sensors are, therefore, mainly intended for machine manufacturers.

(1) See pages 2/48 and 2/39.



Electronic pressure sensors

OsiSense XM

XMLK pressure transmitters

Plastic body, stainless steel 303 fluid entry.

With analogue output. Sizes in bar



XMLK●●●B2D●1



XMLK●●●B2C●1

0 to 6 bar (0 to 87 psi)

Maximum permissible accidental pressure: 12 bar, destruction pressure: 18 bar

Analogue output type	Electrical connection	Reference (1)	Weight kg
G 1/4 A (male) fluid connection			
4...20 mA	M12	XMLK006B2D21	0.110
	EN 175301-803-A	XMLK006B2C21 (2)	0.110
0...10 V	M12	XMLK006B2D71	0.110
	EN 175301-803-A	XMLK006B2C71	0.110

0 to 10 bar (0 to 145 psi)

Maximum permissible accidental pressure: 20 bar, destruction pressure: 30 bar

Analogue output type	Electrical connection	Reference (1)	Weight kg
G 1/4 A (male) fluid connection			
4...20 mA	M12	XMLK010B2D21 (2)	0.110
	EN 175301-803-A	XMLK010B2C21 (2)	0.110
0...10 V	M12	XMLK010B2D71	0.110
	EN 175301-803-A	XMLK010B2C71	0.110

0 to 16 bar (0 to 232 psi)

Maximum permissible accidental pressure: 32 bar, destruction pressure: 48 bar

Analogue output type	Electrical connection	Reference (1)	Weight kg
G 1/4 A (male) fluid connection			
4...20 mA	M12	XMLK016B2D21	0.110
	EN 175301-803-A	XMLK016B2C21 (2)	0.110
0...10 V	M12	XMLK016B2D71	0.110
	EN 175301-803-A	XMLK016B2C71	0.110

0 to 25 bar (0 to 362.5 psi)

Maximum permissible accidental pressure: 50 bar, destruction pressure: 75 bar

Analogue output type	Electrical connection	Reference (1)	Weight kg
G 1/4 A (male) fluid connection			
4...20 mA	M12	XMLK025B2D21 (2)	0.110
	EN 175301-803-A	XMLK025B2C21 (2)	0.110
0...10 V	M12	XMLK025B2D71	0.110

(1) For other electrical or fluid connections, or types of output, please consult our Customer Care Centre.

(2) Sold in lots of 25. Add TQ to the end of the reference selected.

Example: XMLK006B2C21 becomes XMLK006B2C21TQ. Minimum quantity 50.

Electronic pressure sensors

OsiSense XM

XMLK pressure transmitters

Plastic body, stainless steel 303 fluid entry.

With analogue output. Sizes in psi



XMLK●●0P2D●3



XMLK●●0P2C●3



XMLK●●0P2P●3

0 to 100 psi (0 to 6.9 bar)

Maximum permissible accidental pressure: 200 psi, destruction pressure: 300 psi

Analogue output type	Electrical connection	Reference (1)	Weight kg
1/4"- 18 NPT (male) fluid connection			
4...20 mA	M12	XMLK100P2D23 (2)	0.110
	EN 175301-803-A	XMLK100P2C23 (2)	0.110
	Packard Metri-Pack 150	XMLK100P2P23 (2)	0.110
0...10 V	M12	XMLK100P2D73	0.110
	EN 175301-803-A	XMLK100P2C73	0.110

0 to 150 psi (0 to 10.3 bar)

Maximum permissible accidental pressure: 300 psi, destruction pressure: 450 psi

Analogue output type	Electrical connection	Reference (1)	Weight kg
1/4"- 18 NPT (male) fluid connection			
4...20 mA	M12	XMLK150P2D23	0.110
	EN 175301-803-A	XMLK150P2C23	0.110
	Packard Metri-Pack 150	XMLK150P2P23	0.110
0...10 V	M12	XMLK150P2D73	0.110
	EN 175301-803-A	XMLK150P2C73	0.110

0 to 200 psi (0 to 13.8 bar)

Maximum permissible accidental pressure: 400 psi, destruction pressure: 600 psi

Analogue output type	Electrical connection	Reference (1)	Weight kg
1/4"- 18 NPT (male) fluid connection			
4...20 mA	M12	XMLK200P2D23	0.110
	EN 175301-803-A	XMLK200P2C23 (2)	0.110
	Packard Metri-Pack 150	XMLK200P2P23	0.110
0...10 V	M12	XMLK200P2D73	0.110
	EN 175301-803-A	XMLK200P2C73	0.110

0 to 300 psi (0 to 20.7 bar)

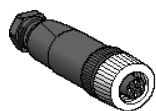
Maximum permissible accidental pressure: 600 psi, destruction pressure: 900 psi

Analogue output type	Electrical connection	Reference (1)	Weight kg
1/4"- 18 NPT (male) fluid connection			
4...20 mA	M12	XMLK300P2D23	0.110
	EN 175301-803-A	XMLK300P2C23 (2)	0.110
	Packard Metri-Pack 150	XMLK300P2P23 (2)	0.110
0...10 V	M12	XMLK300P2D73	0.110
	EN 175301-803-A	XMLK300P2C73	0.110

(1) For other electrical or fluid connections, or types of output, please consult our Customer Care Centre.

(2) Sold in lots of 25. Add TQ to the end of the reference selected.

Example: XMLK200P2D23 becomes XMLK200P2D23TQ. Minimum quantity 50.



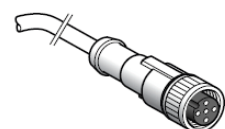
XZCC12FDM40B



XZCC12FCM40B



XZCC43FCP40B



XZCP1141L10



XZCP1241L5

Connection accessories

Description	Type	Reference	Weight kg
M12 female connector metal clamping ring (1)	Straight	XZCC12FDM40B	0.020
	Elbowed	XZCC12FCM40B	0.020
Female connector EN 175301-803-A (1)	–	XZCC43FCP40B	0.035
Description	Length of cable	Reference	Weight kg
Pre-wired M12, straight, female connectors	2 m	XZCP1141L2	0.090
	5 m	XZCP1141L5	0.190
	10 m	XZCP1141L10	0.370
Pre-wired M12, elbowed, female connectors	2 m	XZCP1241L2	0.090
	5 m	XZCP1241L5	0.190
	10 m	XZCP1241L10	0.370

(1) Connector with screw terminal connections.

Electronic pressure sensors

OsiSense XM

XMLG pressure transmitters, pressure and vacuum switches. Metal body, stainless steel 303 fluid entry. With analogue or solid-state output.

2

Presentation

XMLG pressure transmitters and pressure switches are characterised by their ceramic pressure measuring cell. The deformation caused by the pressure is transmitted to the resistors of a Wheatstone bridge screen-printed on the ceramic.

The change in resistance is then processed by the integrated electronics, giving either a digital or analogue output signal.

The stainless steel AISI 303 body and the ceramic cell combined with a viton gasket make these products compatible with industrial fluids such as:

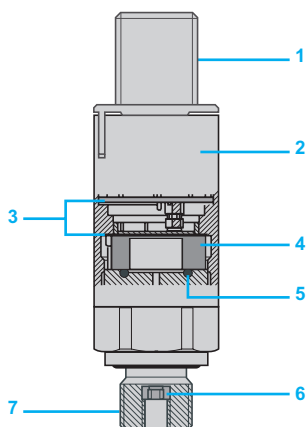
- Air
- Fresh water
- Hydraulic oils

XMLG pressure sensors can control fluids from -15 to + 125°C.

Depending on the model, these sensors are supplied:

- With 12 or 24 V $\overline{\text{---}}$ nominal and operate from 8 to 33 V $\overline{\text{---}}$ for transmitters with 4...20 mA output, pressure and vacuum switches;
- With 24 V $\overline{\text{---}}$ nominal and operate from 11.4 to 33 V $\overline{\text{---}}$ for transmitters with a 0...10 V output.

Offered with IP 67 and Nema type 4 degree of protection, these compact products, which offer excellent EMC characteristics and typical precision better than 0,3 %, are particularly suitable for the most demanding industrial applications.



Description

- 1 Electrical connection: M12 male or quick connection for cable.
- 2 Metal case made of stainless steel 303.
- 3 Electronics with EMC protection.
- 4 Ceramic pressure measuring cell.
- 5 FPM (Viton) gasket.
- 6 Leakage protection (on sizes \geq 40 bar).
- 7 Fluid entry: G 1/4 male or 1/4" - 18 NPT male.

Functions

Pressure transmitters have an 4...20 mA or 0...10 V analogue output, which is proportional to the measuring range.

Versions with an M12 electrical connector and 4...20 mA analogue output (XMLG●●●D2●) can be used with switches with a 4-digit ZMLP display (1).

Pressure and vacuum switches have a solid-state NPN or PNP normally closed (NC) output. The upper and lower switching points can only be adjusted during manufacture. Neither the customer nor the end user can adjust them.

This makes the product extremely reliable during operation and avoids the product losing its settings throughout its operating life.

The pressure ranges offered are:

- - 1...0 bar
- 0...400 bar

An anti-leakage system integrated in products for pressures \geq 40 bar, prevents fluid leakage in the event of the measuring cell destruction pressure being exceeded.

Important ordering requirement

XMLG pressure transmitters are sold individually or in lots of 50. Pressure switches and vacuum switches are only sold in lots of 50.

Since the product is factory-set, please consult our Customer Care Centre before ordering, to specify the desired switching points.

(1) See pages 2/38 and 2/39.

Electronic pressure sensors

OsiSense XM

XMLG pressure transmitters

Metal body, stainless steel 303 fluid entry.

With analogue output. Sizes in bar



XMLG●●●D●●●

-1 to 0 bar (-14.5 to 0 psi)

Maximum permissible accidental pressure: 2.7 bar, destruction pressure: 3 bar

Analogue output type	Electrical connection	Reference (1)	Weight kg
G 1/4 A (male) fluid connection			
4...20 mA	M12	XMLGM01D21 (2)	0.095
0...10 V	M12	XMLGM01D71	0.095
1/4" - 18 NPT (male) fluid connection			
4...20 mA	M12	XMLGM01D23 (2)	0.095
0...10 V	M12	XMLGM01D73TQ (3)	0.095

0 to 1 bar (0 to 14.5 psi)

Maximum permissible accidental pressure: 2.7 bar, destruction pressure: 3 bar

Analogue output type	Electrical connection	Reference (1)	Weight kg
G 1/4 A (male) fluid connection			
4...20 mA	M12	XMLG001D21 (2)	0.095
0...10 V	M12	XMLG001D71 (2)	0.095
Fluid connection 1/4" - 18 NPT (male)			
4...20 mA	M12	XMLG001D23 (2)	0.095
0...10 V	M12	XMLG001D73TQ (3)	0.095

0 to 6 bar (0 to 87 psi)

Maximum permissible accidental pressure: 17.6 bar, destruction pressure: 20 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A (male) fluid connection			
4...20 mA	M12	XMLG006D21	0.095
0...10 V	M12	XMLG006D71	0.095
1/4" - 18 NPT (male) fluid connection			
4...20 mA	M12	XMLG006D23	0.095
0...10 V	M12	XMLG006D73TQ (3)	0.095

(1) For other electrical or fluid connections, or types of output, please contact our Customer Care Centre.

(2) Sold in lots of 25. Minimum quantity 50. Add TQ to the end of the reference selected.
Example: XMLG001D21 becomes XMLG001D21TQ.

(3) Sold only in lots of 25. Minimum quantity 50.

Electronic pressure sensors

OsiSense XM

XMLG pressure transmitters

Metal body, stainless steel 303 fluid entry.

With analogue output. Sizes in bar



XMLG0010D21



XMLG0010Q21TQ

0 to 10 bar (0 to 145 psi)

Maximum permissible accidental pressure: 22 bar, destruction pressure: 25 bar

Analogue output type	Electrical connection	Reference (1)	Weight kg
G 1/4 A (male) fluid connection			
4...20 mA	M12	XMLG010D21 (2)	0.095
	Integrated connection (4)	XMLG010Q21TQ (3)	0.095
0...10 V	M12	XMLG010D71 (2)	0.095
	Integrated connection (4)	XMLG010Q71TQ (3)	0.095

1/4" - 18 NPT (male) fluid connection

4...20 mA	M12	XMLG010D23 (2)	0.095
0...10 V	M12	XMLG010D73	0.095

0 to 16 bar (0 to 232 psi)

Maximum permissible accidental pressure: 35.2 bar, destruction pressure: 40 bar

Analogue output type	Electrical connection	Reference (1)	Weight kg
G 1/4 A (male) fluid connection			
4...20 mA	M12	XMLG016D21 (2)	0.095
0...10 V	M12	XMLG016D71	0.095

1/4" - 18 NPT (male) fluid connection

4...20 mA	M12	XMLG016D23	0.095
0...10 V	M12	XMLG010D73TQ (3)	0.095

0 to 25 bar (0 to 362.5 psi)

Maximum permissible accidental pressure: 56 bar, destruction pressure: 62.5 bar

Analogue output type	Electrical connection	Reference (1)	Weight kg
G 1/4 A (male) fluid connection			
4...20 mA	M12	XMLG025D21 (2)	0.095
	Integrated connection (4)	XMLG025Q21TQ (3)	0.095
0...10 V	M12	XMLG025D71 (2)	0.095
1/4" - 18 NPT (male) fluid connection			
4...20 mA	M12	XMLG025D23 (2)	0.095
0...10 V	M12	XMLG025D73TQ (3)	0.095

(1) For other electrical or fluid connections, or types of output, please consult our Customer Care Centre.

(2) Sold in lots of 25. Minimum quantity 50. Add TQ to the end of the reference selected. Example: XMLG001D21 becomes XMLG001D21TQ.

(3) Sold only in lots of 25. Minimum quantity 50.

(4) Phoenix Contact "Quickon" type integrated quick connection.

Electronic pressure sensors

OsiSense XM

XMLG pressure transmitters

Metal body, stainless steel 303 fluid entry.

With analogue output. Sizes in bar



XMLG000D000



XMLG000Q000

0 to 100 bar (0 to 1450 psi)

Maximum permissible accidental pressure: 225 bar, destruction pressure: 250 bar

Analogue output type (1)	Electrical connection	Reference (1)	Weight kg
G 1/4 A (male) fluid connection			
4...20 mA	M12	XMLG100D21	0.095
	Integrated connection (4)	XMLG100Q21TQ (3)	0.095
0...10 V	M12	XMLG100D71 (2)	0.095
1/4" - 18 NPT (male) fluid connection			
4...20 mA	M12	XMLG100D23 (2)	0.095
0...10 V	M12	XMLG100D73TQ (3)	0.095

0 to 250 bar (0 to 3625 psi)

Maximum permissible accidental pressure: 560 bar, destruction pressure: 625 bar

Analogue output type	Electrical connection	Reference (1)	Weight kg
G 1/4 A (male) fluid connection			
4...20 mA	M12	XMLG250D21 (2)	0.095
0...10 V	M12	XMLG250D71 (2)	0.095
1/4" - 18 NPT (male) fluid connection			
4...20 mA	M12	XMLG250D23	0.095
0...10 V	M12	XMLG250D73TQ (3)	0.095

0 to 400 bar (0 to 5800 psi)

Maximum permissible accidental pressure: 800 bar, destruction pressure: 900 bar

Analogue output type	Electrical connection	Reference (1)	Weight kg
G 1/4 A (male) fluid connection			
4...20 mA	M12	XMLG400D21 (2)	0.095
0...10 V	M12	XMLG400D71 (2)	0.095
1/4" - 18 NPT (male) fluid connection			
4...20 mA	M12	XMLG400D23	0.095
0...10 V	M12	XMLG400D73TQ (3)	0.095

(1) For other electrical or fluid connections, or types of output, please consult our Customer Care Centre.

(2) Sold in lots of 25. Minimum quantity 50. Add TQ to the end of the reference selected.
Example: XMLG001D21 becomes XMLG001D21TQ.

(3) Sold only in lots of 25. Minimum quantity 50.

(4) Phoenix Contact "Quickon" type integrated quick connection.

Electronic pressure sensors

OsiSense XM

XMLG pressure and vacuum switches

Metal body, stainless steel 303 fluid entry.

With solid-state output. Sizes in bar



XMLG●●●D●1TQ

2

-1 to -0.08 bar (-14.5 to -1.16 psi)

Maximum permissible accidental pressure: 2.7 bar, destruction pressure: 3 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A (male) fluid connection			
NPN	M12	XMLGM01D31TQ (1)	0.095
PNP	M12	XMLGM01D41TQ (1)	0.095

0.08 to 1 bar (1.16 to 14.5 psi)

Maximum permissible accidental pressure: 2.7 bar, destruction pressure: 3 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A (male) fluid connection			
NPN	M12	XMLG001D31TQ (1)	0.095
PNP	M12	XMLG001D41TQ (1)	0.095

0.8 to 10 bar (11.6 to 145 psi)

Maximum permissible accidental pressure: 22 bar, destruction pressure: 25 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A (male) fluid connection			
NPN	M12	XMLG010D31TQ (1)	0.095
PNP	M12	XMLG010D41TQ (1)	0.095

2 to 25 bar (29 to 362.5 psi)

Maximum permissible accidental pressure: 56 bar, destruction pressure: 62.5 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A (male) fluid connection			
NPN	M12	XMLG025D31TQ (1)	0.095
PNP	M12	XMLG025D41TQ (1)	0.095

8 to 100 bar (116 to 1450 psi)

Maximum permissible accidental pressure: 225 bar, destruction pressure: 250 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A (male) fluid connection			
NPN	M12	XMLG100D31TQ (1)	0.095
PNP	M12	XMLG100D41TQ (1)	0.095

20 to 250 bar (290 to 3625 psi)

Maximum permissible accidental pressure: 560 bar, destruction pressure: 625 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A (male) fluid connection			
NPN	M12	XMLG250D31TQ (1)	0.095
PNP	M12	XMLG250D41TQ (1)	0.095

32 to 400 bar (464 to 5800 psi)

Maximum permissible accidental pressure: 800 bar, destruction pressure: 900 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A (male) fluid connection			
NPN	M12	XMLG400D31TQ (1)	0.095
PNP	M12	XMLG400D41TQ (1)	0.095

(1) Sold only in lots of 25. Minimum quantity 50.

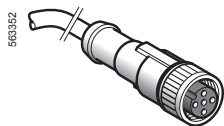
Note: Since the product is factory-set, please consult our Customer Care Centre before ordering, to specify the desired switching points.

Electronic pressure sensors

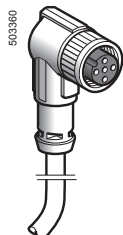
OsiSense XM

XMLG pressure transmitters, pressure and vacuum switches.

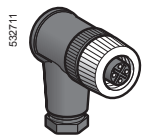
Accessories and replacement parts



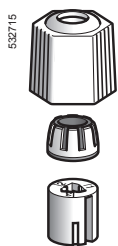
XZCP1141L●



XZCP1241L●



XZCC12FCM40B



XMLGZ001

Connection accessories

Description		Length of cable m	Reference	Weight kg
M12 female connector, metal clamping ring (1)	Straight	–	XZCC12FDM40B	0.020
	Elbowed	–	XZCC12FCM40B	0.020
Pre-wired M12 female connectors	Straight	2	XZCP1141L2	0.090
		5	XZCP1141L5	0.190
		10	XZCP1141L10	0.370
	Elbowed	2	XZCP1241L2	0.090
		5	XZCP1241L5	0.190
		10	XZCP1241L10	0.370

Replacement part

Description	Sold in lots of	Unit reference	Weight kg
Quick connection (2)	10	XMLGZ001	0.025

(1) Connector with screw terminal connections.

(2) Phoenix Contact "Quickon" type connection.

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters

Compact metal body, stainless steel fluid entry

With analogue output

2



"Low pressure" transmitters.
AISI 316L stainless steel casing



"High pressure" transmitters.
AISI 304 stainless steel casing

Presentation

XMLP pressure transmitters rated at less than 9 bar or 100 psi

These transmitters integrate a ceramic pressure measuring cell. Ceramic technology has been used successfully for many years and offers a high level of sensitivity that is particularly suitable for measuring low pressures.

Ceramic also provides good resistance to abrasive fluids. An internal fluorocarbon rubber gasket provides the seal between the ceramic measuring cell and the AISI 316L stainless steel casing.

Pressure transmitters can be used to measure the following types of pressure:

- air
- fresh water
- the majority of hydraulic oils

It is important, however, to ensure that the gasket is compatible with the fluid being controlled.

These transmitters can control fluids ranging in temperature from -15 to 125 °C.

Their power supply (1) depends on the type of analogue output:

- 5 V +/- 10% for the 0.5...4.5 V ratiometric output
- 12 or 24 V (nominal), operating from 7 to 33 V for the 4...20 mA output
- 24 V (nominal), operating from 12 to 33 V for the 0...10 V output

XMLP pressure transmitters rated greater than or equal to 9 bar or 100 psi

These transmitters integrate a "thin film" metal pressure measuring cell. This measuring cell, which is welded directly onto the AISI 304 stainless steel transmitter body, offers the following advantages:

- An all-metal pressure chamber, with no elastomer gasket in contact with the fluid
- Compatibility with a large number of fluids:
 - air
 - fresh water
 - hydraulic oils
 - refrigeration fluids
 - all fluids or gases compatible with AISI 304 stainless steel

XMLP pressure transmitters can control fluids from -30 to 120 °C.

Their power supply (1) depends on the type of analog output:

- 5 V +/- 5% for the 0.5...4.5 V ratiometric output
- 12 or 24 V (nominal), operating from 8 to 30 V for the 4...20 mA output
- 24 V (nominal), operating from 14 to 30 V for the 0...10 V output

General characteristics

Made of stainless steel, XMLP pressure transmitters are compact and rugged.

Their degree of protection varies according to the type of connector:

- IP 65 for EN 175301-803-A connector versions
- IP 65 and IP 67 for Packard Metri-Pack connector versions
- IP 65, IP 67 and IP 69K for M12 connector versions

With typical precision better than 0.5% of the rating, these transmitters are particularly suitable for industrial applications such as:

- machine tools
- moulding presses
- stamping presses
- lifting gear
- HVAC systems (for ratings greater than or equal to 9 bar or 100 psi only)

(1) Use Safety Extra Low Voltage (SELV) or Protected Extra Low Voltage (PELV) power supply.

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters

Compact metal body, stainless steel fluid entry

With analogue output.

Functions

XMLP pressure transmitters have an analogue output which delivers a signal proportional to the measured pressure.

This output can be one of the following types:

- 4...20 mA
- 0...10 V
- 0.5...4.5 V ratiometric

The pressure ranges available are:

- vacuum measuring
 - -1...0 bar
 - -14.5...0 psi
- pressure measuring
 - 0...600 bar
 - 0...6,000 psi
- combined pressure measuring (vacuum and pressure)
 - -1...25 bar
 - -14.5...60 psi

The XMLP offer is available with three types of electrical connection:

- M12, 4-pin connector
- EN 175301-803-A (ex DIN 43650) connector
- Packard Metri-Pack 150 connector
- 2 m PVC cable

Several types of fluid connection are available:

- G1/4 A male
- 1/4"-18NPT male
- SAE 7/16-20UNF-2A male
- SAE 7/16-20UNF-2B female (with or without Schrader pin depending on the model)

Depending on the model, XMLP transmitters are sold:

- individually
- in lots of 25
- in lots of 40

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters

Compact metal body, 316L stainless steel fluid entry

With analogue output. Sizes in bar



XMLP●●●GD●1F



XMLP●●●GC●1F



XMLP●●●GL●1F

-1 to 0 bar (-14.5 to 0 psi)

Maximum permissible accidental pressure: 3 bar, destruction pressure: 5 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4...20 mA	M12	XMLPM00GD21F (1)	0.080
	EN 175301-803-A	XMLPM00GC21F (1)	0.096
	2 m cable	XMLPM00GL21F	0.197
0...10 V	M12	XMLPM00GD71F (1)	0.080
	EN 175301-803-A	XMLPM00GC71F (1)	0.096
	2 m cable	XMLPM00GL71F	0.197
0.5...4.5 V ratiometric	M12	XMLPM00GD11F	0.080
	EN 175301-803-A	XMLPM00GC11F	0.096

SAE 7/16-20UNF-2B (female) fluid connection

4...20 mA	M12	XMLPM00GD2BF	0.080
	EN 175301-803-A	XMLPM00GC2BF	0.096
0...10 V	M12	XMLPM00GD7BF	0.080
	EN 175301-803-A	XMLPM00GC7BF	0.096

-1 to 1 bar (-14.5 to 14.5 psi)

Maximum permissible accidental pressure: 3 bar, destruction pressure: 5 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4...20 mA	M12	XMLPM01GD21F (1)	0.080
	EN 175301-803-A	XMLPM01GC21F (1)	0.096
0...10 V	M12	XMLPM01GD71F	0.080
	EN 175301-803-A	XMLPM01GC71F	0.096

-1 to 5 bar (-14.5 to 72.6 psi)

Maximum permissible accidental pressure: 18 bar, destruction pressure: 24 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4...20 mA	M12	XMLPM05GD21F (1)	0.080
	EN 175301-803-A	XMLPM05GC21F (1)	0.096
0...10 V	M12	XMLPM05GD71F	0.080
	EN 175301-803-A	XMLPM05GC71F	0.096

(1) Sold in lots of 25: add the letter Q to the end of the selected reference.
For example, XMLPM00GD21F becomes XMLPM00GD21FQ.

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters

Compact metal body, 304 stainless steel fluid entry

With analogue output. Sizes in bar



XMLP09BD1V



XMLP09BC1V

-1 to 9 bar (-14.5 to 130 psi)

Maximum permissible accidental pressure: 20 bar, destruction pressure: 100 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4...20 mA	M12	XMLPM09BD21V ⁽¹⁾	0.050
	EN 175301-803-A	XMLPM09BC21V	0.050
0...10 V	M12	XMLPM09BD71V ⁽¹⁾	0.050
	EN 175301-803-A	XMLPM09BC71V	0.050
0.5...4.5 V ratiometric	M12	XMLPM09BD11V	0.050

-1 to 25 bar (-14.5 to 362.5 psi)

Maximum permissible accidental pressure: 50 bar, destruction pressure: 200 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4...20 mA	M12	XMLPM25BD21V	0.050

⁽¹⁾ Sold in lots of 40; add the letter Q to the end of the selected reference.
For example, XMLPM09BD21V becomes XMLPM09BD21VQ.

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters

Compact metal body, 316L stainless steel fluid entry

With analogue output. Sizes in bar



XMLP000D01F



XMLP000C01F



XMLP001GL01F



XMLP001GC0BF



XMLP001GD0BF

0 to 0.25 bar (0 to 3.63 psi)

Maximum permissible accidental pressure: 3 bar, destruction pressure: 5 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4...20 mA	M12	XMLP250MD21F (1)	0.080
	EN 175301-803-A	XMLP250MC21F (1)	0.096
0...10 V	M12	XMLP250MD71F (1)	0.080
	EN 175301-803-A	XMLP250MC71F (1)	0.096
0.5...4.5 V ratiometric	M12	XMLP250MD11F	0.080
	EN 175301-803-A	XMLP250MC11F	0.096

0 to 0.5 bar (0 to 7.26 psi)

Maximum permissible accidental pressure: 3 bar, destruction pressure: 5 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4...20 mA	M12	XMLP500MD21F (1)	0.080
	EN 175301-803-A	XMLP500MC21F (1)	0.096
0...10 V	M12	XMLP500MD71F (1)	0.080
	EN 175301-803-A	XMLP500MC71F (1)	0.096
0.5...4.5 V ratiometric	M12	XMLP500MD11F	0.080
	EN 175301-803-A	XMLP500MC11F	0.096

0 to 1 bar (0 to 14.5 psi)

Maximum permissible accidental pressure: 3 bar, destruction pressure: 5 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4...20 mA	M12	XMLP001GD21F (1)	0.080
	EN 175301-803-A	XMLP001GC21F (1)	0.096
	2 m cable	XMLP001GL21F	0.197
0...10 V	M12	XMLP001GD71F (1)	0.080
	EN 175301-803-A	XMLP001GC71F (1)	0.096
	2 m cable	XMLP001GL71F	0.197
0.5...4.5 V ratiometric	M12	XMLP001GD11F (1)	0.080
	EN 175301-803-A	XMLP001GC11F	0.096

SAE 7/16-20UNF-2B (female) fluid connection

4...20 mA	M12	XMLP001GD2BF	0.080
	EN 175301-803-A	XMLP001GC2BF	0.096
0...10 V	M12	XMLP001GD7BF	0.080
	EN 175301-803-A	XMLP001GC7BF	0.096

(1) Sold in lots of 25; add the letter Q to the end of the selected reference. For example, XMLP250MD21F becomes XMLP250MD21FQ.

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters

Compact metal body, 316L stainless steel fluid entry

With analogue output. Sizes in bar



XMLP000D01F



XMLP000C01F



XMLP000GL01F

0 to 2.5 bar (0 to 36.3 psi)

Maximum permissible accidental pressure: 7.5 bar, destruction pressure: 10 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4...20 mA	M12	XMLP2D5GD21F (1)	0.080
	EN 175301-803-A	XMLP2D5GC21F (1)	0.096
	2 m cable	XMLP2D5GL21F	0.197
0...10 V	M12	XMLP2D5GD71F (1)	0.080
	EN 175301-803-A	XMLP2D5GC71F (1)	0.096
	2 m cable	XMLP2D5GL71F	0.197
0.5...4.5 V ratiometric	M12	XMLP2D5GD11F	0.080
	EN 175301-803-A	XMLP2D5GC11F	0.096

0 to 4 bar (0 to 58 psi)

Maximum permissible accidental pressure: 12 bar, destruction pressure: 16 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4...20 mA	M12	XMLP004GD21F (1)	0.080
	EN 175301-803-A	XMLP004GC21F (1)	0.096
0...10 V	M12	XMLP004GD71F (1)	0.080
	EN 175301-803-A	XMLP004GC71F (1)	0.096
0.5...4.5 V ratiometric	M12	XMLP004GD11F	0.080
	EN 175301-803-A	XMLP004GC11F	0.096

0 to 6 bar (0 to 87 psi)

Maximum permissible accidental pressure: 18 bar, destruction pressure: 24 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4...20 mA	M12	XMLP006GD21F (1)	0.080
	EN 175301-803-A	XMLP006GC21F (1)	0.096
	2 m cable	XMLP006GL21F	0.197
0...10 V	M12	XMLP006GD71F (1)	0.080
	EN 175301-803-A	XMLP006GC71F (1)	0.096
	2 m cable	XMLP006GL71F	0.197
0.5...4.5 V ratiometric	M12	XMLP006GD11F (1)	0.080
	EN 175301-803-A	XMLP006GC11F	0.096

(1) Sold in lots of 25: add the letter Q to the end of the selected reference.
For example, XMLP004GD71F becomes XMLP004GD71FQ.

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters

Compact metal body, 304 stainless steel fluid entry

With analogue output. Sizes in bar



XMLP010BD1V



XMLP010BC1V



XMLP010BD7



XMLP010BC7



XMLP016BD9



XMLP016BC9

0 to 10 bar (0 to 145 psi)

Maximum permissible accidental pressure: 20 bar, destruction pressure: 100 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4...20 mA	M12	XMLP010BD21V (1)	0.050
	EN 175301-803-A	XMLP010BC21V (1)	0.050
0...10 V	M12	XMLP010BD71V (1)	0.050
	EN 175301-803-A	XMLP010BC71V (1)	0.050
0.5...4.5 V ratiometric	M12	XMLP010BD11V	0.050
	EN 175301-803-A	XMLP010BC11V	0.050

SAE 7/16-20UNF-2A (male) fluid connection

4...20 mA	M12	XMLP010BD27	0.050
	EN 175301-803-A	XMLP010BC27	0.050

SAE 7/16-20UNF-2B (female with Schrader pin) fluid connection

4...20 mA	M12	XMLP010BD29 (1)	0.050
	EN 175301-803-A	XMLP010BC29	0.050
0...10 V	M12	XMLP010BD79	0.050
	EN 175301-803-A	XMLP010BC79	0.050
0.5...4.5 V ratiometric	M12	XMLP010BD19	0.050

0 to 16 bar (0 to 232 psi)

Maximum permissible accidental pressure: 32 bar, destruction pressure: 160 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4...20 mA	M12	XMLP016BD21V (1)	0.050
	EN 175301-803-A	XMLP016BC21V (1)	0.050
0...10 V	M12	XMLP016BD71V (1)	0.050
	EN 175301-803-A	XMLP016BC71V (1)	0.050
0.5...4.5 V ratiometric	M12	XMLP016BD11V	0.050
	EN 175301-803-A	XMLP016BC11V	0.050

SAE 7/16-20UNF-2A (male) fluid connection

4...20 mA	M12	XMLP016BD27	0.050
	EN 175301-803-A	XMLP016BC27	0.050

SAE 7/16-20UNF-2B (female with Schrader pin) fluid connection

4...20 mA	M12	XMLP016BD29 (1)	0.050
	EN 175301-803-A	XMLP016BC29	0.050
0...10 V	M12	XMLP016BD79 (1)	0.050
0.5...4.5 V ratiometric	M12	XMLP016BD19	0.050

(1) Sold in lots of 40: add the letter Q to the end of the selected reference.
For example, XMLP016BD21V becomes XMLP016BD21VQ.

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters

Compact metal body, 304 stainless steel fluid entry

With analogue output. Sizes in bar



XMLP●●●BD●1V



XMLP●●●BC●1V



XMLP●●●BD●7



XMLP●●●BC●7



XMLP●●●BD●9



XMLP●●●BC●9

0 to 25 bar (0 to 362.5 psi)

Maximum permissible accidental pressure: 50 bar, destruction pressure: 200 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4...20 mA	M12	XMLP025BD21V	0.050
	EN 175301-803-A	XMLP025BC21V (1)	0.050
0...10 V	M12	XMLP025BD71V (1)	0.050
	EN 175301-803-A	XMLP025BC71V	0.050
0.5...4.5 V ratiometric	M12	XMLP025BD11V	0.050
	EN 175301-803-A	XMLP025BC11V	0.050

SAE 7/16-20UNF-2A (male) fluid connection

4...20 mA	M12	XMLP025BD27	0.050
	EN 175301-803-A	XMLP025BC27	0.050
0...10 V	M12	XMLP025BD77	0.050

SAE 7/16-20UNF-2B (female with Schrader pin) fluid connection

4...20 mA	M12	XMLP025BD29	0.050
	EN 175301-803-A	XMLP025BC29	0.050
0...10 V	M12	XMLP025BD79	0.050

0 to 40 bar (0 to 580 psi)

Maximum permissible accidental pressure: 80 bar, destruction pressure: 320 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4...20 mA	M12	XMLP040BD21V (1)	0.050
	EN 175301-803-A	XMLP040BC21V (1)	0.050
0...10 V	M12	XMLP040BD71V	0.050
	EN 175301-803-A	XMLP040BC71V	0.050
0.5...4.5 V ratiometric	M12	XMLP040BD11V	0.050
	EN 175301-803-A	XMLP040BC11V	0.050

SAE 7/16-20UNF-2A (male) fluid connection

4...20 mA	M12	XMLP040BD27	0.050
	EN 175301-803-A	XMLP040BC27	0.050

SAE 7/16-20UNF-2B (female with Schrader pin) fluid connection

4...20 mA	M12	XMLP040BD29 (1)	0.050
	EN 175301-803-A	XMLP040BC29	0.050
0...10 V	M12	XMLP040BD79	0.050
0.5...4.5 V ratiometric	M12	XMLP040BD19	0.050

(1) Sold in lots of 40: add the letter Q to the end of the selected reference. For example, XMLP040BD21V becomes XMLP040BD21VQ.

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters

Compact metal body, 304 stainless steel fluid entry

With analogue output. Sizes in bar



XMLP060BD●1V
XMLP100BD●2



XMLP060BC●1V
XMLP100BC●2



XMLP060BD●7



XMLP060BC●7



XMLP060BD●9



XMLP060BC●9

0 to 60 bar (0 to 870 psi)

Maximum permissible accidental pressure: 120 bar, destruction pressure: 480 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4...20 mA	M12	XMLP060BD21V (1)	0.050
	EN 175301-803-A	XMLP060BC21V	0.050
0...10 V	M12	XMLP060BD71V	0.050
	EN 175301-803-A	XMLP060BC71V (1)	0.050
0.5...4.5 V ratiometric	M12	XMLP060BD11V	0.050
	EN 175301-803-A	XMLP060BC11V	0.050

SAE 7/16-20UNF-2A (male) fluid connection

4...20 mA	M12	XMLP060BD27	0.050
SAE 7/16-20UNF-2B (female with Schrader pin) fluid connection			
4...20 mA	M12	XMLP060BD29	0.050
	EN 175301-803-A	XMLP060BC29	0.050
0...10 V	M12	XMLP060BD79 (1)	0.050

0 to 100 bar (0 to 1450 psi)

Maximum permissible accidental pressure: 200 bar, destruction pressure: 600 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-A (male) fluid connection			
4...20 mA	M12	XMLP100BD22	0.050
	EN 175301-803-A	XMLP100BC22	0.050
0...10 V	M12	XMLP100BD72 (1)	0.050
	EN 175301-803-A	XMLP100BC72	0.050
0.5...4.5 V ratiometric	M12	XMLP100BD12	0.050
	EN 175301-803-A	XMLP100BC12	0.050

(1) Sold in lots of 40: add the letter Q to the end of the selected reference.
For example, XMLP060BD21V becomes XMLP060BD21VQ.

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters

Compact metal body, 304 stainless steel fluid entry

With analogue output. Sizes in bar



XMLP00BD2



XMLP00BD2

0 to 160 bar (0 to 2320 psi)

Maximum permissible accidental pressure: 320 bar, destruction pressure: 960 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-A (male) fluid connection			
4...20 mA	M12	XMLP160BD22	0.050
	EN 175301-803-A	XMLP160BC22	0.050
0...10 V	M12	XMLP160BD72	0.050
	EN 175301-803-A	XMLP160BC72	0.050
0.5...4.5 V ratiometric	M12	XMLP160BD12	0.050

0 to 250 bar (0 to 3625 psi)

Maximum permissible accidental pressure: 500 bar, destruction pressure: 1000 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-A (male) fluid connection			
4...20 mA	M12	XMLP250BD22 (1)	0.050
	EN 175301-803-A	XMLP250BC22	0.050
0...10 V	M12	XMLP250BD72 (1)	0.050
	EN 175301-803-A	XMLP250BC72 (1)	0.050
0.5...4.5 V ratiometric	M12	XMLP250BD12	0.050
	EN 175301-803-A	XMLP250BC12	0.050

0 to 400 bar (0 to 5800 psi)

Maximum permissible accidental pressure: 800 bar, destruction pressure: 1600 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-A (male) fluid connection			
4...20 mA	M12	XMLP400BD22 (1)	0.050
	EN 175301-803-A	XMLP400BC22 (1)	0.050
0...10 V	M12	XMLP400BD72	0.050
	EN 175301-803-A	XMLP400BC72 (1)	0.050
0.5...4.5 V ratiometric	M12	XMLP400BD12	0.050
	EN 175301-803-A	XMLP400BC12	0.050

0 to 600 bar (0 to 8700 psi)

Maximum permissible accidental pressure: 1200 bar, destruction pressure: 2400 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-A (male) fluid connection			
4...20 mA	M12	XMLP600BD22	0.050
	EN 175301-803-A	XMLP600BC22	0.050
0...10 V	M12	XMLP600BD72	0.050
	EN 175301-803-A	XMLP600BC72 (1)	0.050
0.5...4.5 V ratiometric	M12	XMLP600BD12	0.050

(1) Sold in lots of 40: add the letter Q to the end of the selected reference.
For example, XMLP250BD22 becomes XMLP250BD22Q.

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters

Compact metal body, 316L stainless steel fluid entry

With analogue output. Sizes in psi



XMLP000RD3F



XMLP000RC3F



XMLP000RP3F

-14.5 to 0 psi (-1 to 0 bar)

Maximum permissible accidental pressure: 44 psi, destruction pressure: 73 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4...20 mA	M12	XMLPM00RD23F (1)	0.078
	EN 175301-803-A	XMLPM00RC23F	0.094
	Packard Metri-Pack 150	XMLPM00RP23F	0.080
0...10 V	M12	XMLPM00RD73F (1)	0.078
	EN 175301-803-A	XMLPM00RC73F	0.094
	Packard Metri-Pack 150	XMLPM00RP73F	0.080
0.5...4.5 V ratiometric	M12	XMLPM00RD13F	0.078
	EN 175301-803-A	XMLPM00RC13F	0.094
	Packard Metri-Pack 150	XMLPM00RP13F	0.080

-14.5 to 15 psi (-1 to 1.03 bar)

Maximum permissible accidental pressure: 44 psi, destruction pressure: 73 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4...20 mA	M12	XMLPM15RD23F (1)	0.078
	EN 175301-803-A	XMLPM15RC23F	0.094
	Packard Metri-Pack 150	XMLPM15RP23F (1)	0.080
0...10 V	M12	XMLPM15RD73F (1)	0.078

-14.5 to 60 psi (-1 to 4.14 bar)

Maximum permissible accidental pressure: 260 psi, destruction pressure: 350 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4...20 mA	M12	XMLPM60RD23F (1)	0.078
	EN 175301-803-A	XMLPM60RC23F	0.094
	Packard Metri-Pack 150	XMLPM60RP23F	0.080
0...10 V	M12	XMLPM60RD73F (1)	0.078

(1) Sold in lots of 25; add the letter Q to the end of the selected reference.
For example, XMLPM00RD23F becomes XMLPM00RD23FQ.

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters

Compact metal body, 316L stainless steel fluid entry
With analogue output. Sizes in psi

PF151605



XMLP015RD3F

PF151606



XMLP015RC3F

PF151607



XMLP015RP3F

0 to 15 psi (0 to 1.03 bar)

Maximum permissible accidental pressure: 44 psi, destruction pressure: 73 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4...20 mA	M12	XMLP015RD23F (1)	0.078
	EN 175301-803-A	XMLP015RC23F	0.094
	Packard Metri-Pack 150	XMLP015RP23F	0.080
0...10 V	M12	XMLP015RD73F (1)	0.078
	EN 175301-803-A	XMLP015RC73F	0.094
	Packard Metri-Pack 150	XMLP015RP73F	0.080

0 to 30 psi (0 to 2.07 bar)

Maximum permissible accidental pressure: 109 psi, destruction pressure: 145 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4...20 mA	M12	XMLP030RD23F (1)	0.078
	EN 175301-803-A	XMLP030RC23F	0.094
	Packard Metri-Pack 150	XMLP030RP23F	0.080
0...10 V	M12	XMLP030RD73F (1)	0.078
	EN 175301-803-A	XMLP030RC73F	0.094
	Packard Metri-Pack 150	XMLP030RP73F	0.080

0 to 50 psi (0 to 3.45 bar)

Maximum permissible accidental pressure: 174 psi, destruction pressure: 232 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4...20 mA	M12	XMLP050RD23F (1)	0.078
	EN 175301-803-A	XMLP050RC23F	0.094
	Packard Metri-Pack 150	XMLP050RP23F	0.080
0...10 V	M12	XMLP050RD73F (1)	0.078

0 to 100 psi (0 to 6.9 bar)

Maximum permissible accidental pressure: 260 psi, destruction pressure: 340 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4...20 mA	M12	XMLP100RD23F	0.078
0...10 V	M12	XMLP100RD73F	0.078

(1) Sold in lots of 25; add the letter Q to the end of the selected reference.
For example, XMLP030RD73F becomes XMLP030RD73FQ.

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters

Compact metal body, 304 stainless steel fluid entry

With analogue output. Sizes in psi



XMLP●●●PD●3



XMLP●●●PP●3

0 to 100 psi (0 to 6.9 bar)

Maximum permissible accidental pressure: 200 psi, destruction pressure: 1000 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4...20 mA	M12	XMLP100PD23 (1)	0.050
	Packard Metri-Pack 150	XMLP100PP23 (1)	0.050
0...10 V	M12	XMLP100PD73	0.050
	Packard Metri-Pack 150	XMLP100PP73	0.050
0.5...4.5 V ratiometric	M12	XMLP100PD13	0.050
	Packard Metri-Pack 150	XMLP100PP13	0.050

0 to 150 psi (0 to 10.3 bar)

Maximum permissible accidental pressure: 300 psi, destruction pressure: 1500 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4...20 mA	M12	XMLP150PD23 (1)	0.050
	Packard Metri-Pack 150	XMLP150PP23	0.050
0...10 V	M12	XMLP150PD73	0.050
	Packard Metri-Pack 150	XMLP150PP73	0.050
0.5...4.5 V ratiometric	M12	XMLP150PD13	0.050

0 to 200 psi (0 to 13.8 bar)

Maximum permissible accidental pressure: 400 psi, destruction pressure: 2000 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4...20 mA	M12	XMLP200PD23 (1)	0.050
	Packard Metri-Pack 150	XMLP200PP23	0.050
0...10 V	M12	XMLP200PD73	0.050
	Packard Metri-Pack 150	XMLP200PP73	0.050
0.5...4.5 V ratiometric	M12	XMLP200PD13	0.050

(1) Sold in lots of 40: add the letter Q to the end of the selected reference.
For example, XMLP150PD23 becomes XMLP150PD23Q.

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters

Compact metal body, 304 stainless steel fluid entry

With analogue output. Sizes in psi

PF121705



XMLP...PD3

PF121704



XMLP...PP3

0 to 300 psi (0 to 20.7 bar)

Maximum permissible accidental pressure: 600 psi, destruction pressure: 2400 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4...20 mA	M12	XMLP300PD23 ⁽¹⁾	0.050
	Packard Metri-Pack 150	XMLP300PP23	0.050
0...10 V	M12	XMLP300PD73	0.050
	Packard Metri-Pack 150	XMLP300PP73	0.050
0.5...4.5 V ratiometric	M12	XMLP300PD13	0.050
	Packard Metri-Pack 150	XMLP300PP13	0.050

0 to 600 psi (0 to 41.4 bar)

Maximum permissible accidental pressure: 1200 psi, destruction pressure: 4800 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4...20 mA	M12	XMLP600PD23	0.050
	Packard Metri-Pack 150	XMLP600PP23 ⁽¹⁾	0.050
0.5...4.5 V ratiometric	M12	XMLP600PD13	0.050
	Packard Metri-Pack 150	XMLP600PP13	0.050

0 to 1000 psi (0 to 69 bar)

Maximum permissible accidental pressure: 2000 psi, destruction pressure: 6000 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4...20 mA	M12	XMLP1K0PD23	0.050
	Packard Metri-Pack 150	XMLP1K0PP23	0.050
0...10 V	M12	XMLP1K0PD73	0.050
	Packard Metri-Pack 150	XMLP1K0PP73	0.050
0.5...4.5 V ratiometric	M12	XMLP1K0PD13	0.050

⁽¹⁾ Sold in lots of 40: add the letter Q to the end of the selected reference.
For example, XMLP300PD23 becomes XMLP300PD23Q.

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters

Compact metal body, 304 stainless steel fluid entry

With analogue output. Sizes in psi



XMLP...PD3



XMLP...PP3

0 to 2000 psi (0 to 138 bar)

Maximum permissible accidental pressure: 4000 psi, destruction pressure: 12,000 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4...20 mA	M12	XMLP2K0PD23	0.050
0...10 V	M12	XMLP2K0PD73	0.050
0.5...4.5 V ratiometric	M12	XMLP2K0PD13	0.050

0 to 3000 psi (0 to 207 bar)

Maximum permissible accidental pressure: 6000 psi, destruction pressure: 12,000 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4...20 mA	M12	XMLP3K0PD23	0.050
	Packard Metri-Pack 150	XMLP3K0PP23	0.050
0...10 V	M12	XMLP3K0PD73 (1)	0.050
	Packard Metri-Pack 150	XMLP3K0PP73	0.050
0.5...4.5 V ratiometric	M12	XMLP3K0PD13	0.050

0 to 6000 psi (0 to 414 bar)

Maximum permissible accidental pressure: 11,600 psi, destruction pressure: 24,000 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4...20 mA	M12	XMLP6K0PD23	0.050
	Packard Metri-Pack 150	XMLP6K0PP73	0.050
0...10 V	M12	XMLP6K0PD73	0.050
	Packard Metri-Pack 150	XMLP6K0PP13	0.050
0.5...4.5 V ratiometric	M12	XMLP6K0PD13	0.050
	Packard Metri-Pack 150	XMLP6K0PP13 (1)	0.050

(1) Sold in lots of 40; add the letter Q to the end of the selected reference.
For example, XMLP6K0PP13 becomes XMLP6K0PP13Q.

Electronic pressure sensors

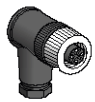
OsiSense XM

XMLP pressure transmitters

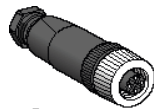
Separate parts



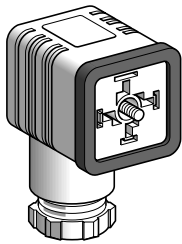
ZMLPA1●2SH



XZCC12FCM40B



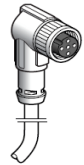
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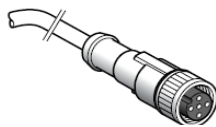
XZCC43FCP40B



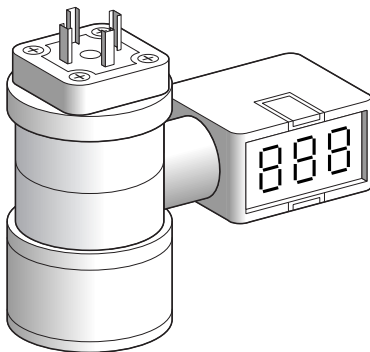
XMLZL016



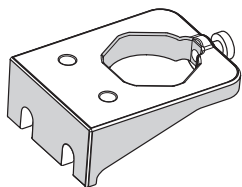
XZCP1241L5



XZCP1141L10



XMLEZ●●●



XMLZL017

Switches with display for XMLP●●●●D2●● pressure transmitters (1)

Analogue output type	Solid-state output type	Switching mode	Reference	Weight kg
4...20 mA	1 x PNP	Hysteresis	ZMLPA1P2SH	0.104
		Window	ZMLPA1P2SW	0.104
-	1 x NPN	Hysteresis	ZMLPA1N2SH	0.104
		Window	ZMLPA1N2SW	0.104
-	2 x PNP	Hysteresis	ZMLPA2P0SH	0.104
-	2 x NPN	Hysteresis	ZMLPA2N0SH	0.104

Accessories

Description	Type	Reference	Weight kg
Sealing gasket (Pack of 10 gaskets)	-	XMLZL016	0.025
M12 female connector metal clamping ring (2)	Straight	XZCC12FDM40B	0.020
	Elbowed	XZCC12FCM40B	0.020
EN 175301-803-A female connector (2)	-	XZCC43FCP40B	0.035

Description	Cable length	Cable material	Reference	Weight kg
Pre-wired M12, straight, female connectors	2 m	PUR	XZCP1141L2	0.090
		PVC	XZCPV1141L2	0.110
	5 m	PUR	XZCP1141L5	0.190
		PVC	XZCPV1141L5	0.210
	10 m	PUR	XZCP1141L10	0.370
		PVC	XZCPV1141L10	0.390
Pre-wired M12, elbowed, female connectors	2 m	PUR	XZCP1241L2	0.090
		PVC	XZCPV1241L2	0.110
	5 m	PUR	XZCP1241L5	0.190
		PVC	XZCPV1241L5	0.210
	10 m	PUR	XZCP1241L10	0.370
		PVC	XZCPV1241L10	0.390

Description	For use with	Size of transmitter bar	Reference	Weight kg
Digital displays for pressure transmitters	XMLPM00GC2●●	-1...0	XMLEZM01	0.100
	XMLP001GC2●●	0...1	XMLEZ001	0.100
	XMLP010BC2●●	0...10	XMLEZ010	0.100
	XMLP025BC2●●	0...25	XMLEZ025	0.100
	XMLP060BC2●●	0...60	XMLEZ060	0.100
	XMLP100BC2●●	0...100	XMLEZ100	0.100
	XMLP250BC2●●	0...250	XMLEZ250	0.100
	XMLP600BC2●●	0...600	XMLEZ600	0.100
Fixing bracket (aluminium)	XMLP●●●M●●● XMLP●●●G●●● XMLP●●●R●●●	-	XMLZL017	0.029

(1) ZMLP switches are compatible with pressure transmitters with 4...20 mA analogue output and M12 connector (see pages 2/38 and 2/39).
(2) Connector with screw terminal connections.

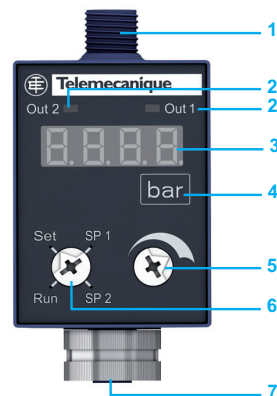
Note: For other connection accessories, visit our website www.tesensors.com.

2



Example of direct mounting on the pressure transmitter.

Example of remote mounting (with jumper cable and fixing bracket).



Presentation

Combined with a pressure transmitter, the ZMLP switch with display converts an analogue signal into one or two switching outputs with adjustable thresholds. It can also be used to display the measured pressure. One of 27 display ranges, from -14.5 to 6000, can be selected for this purpose, meaning the switch can adapt to the majority of pressure transmitters, whether calibrated in bar, psi or pascal.

Depending on the model, ZMLP switches with display are available with different output configurations:

- One 4...20 mA analogue output and one switching output, PNP or NPN type, hysteresis or window switching mode.
- Two switching outputs, PNP or NPN type, hysteresis switching mode (fixed hysteresis).

Compact and robust:

Its compact housing made of Valox™ PBT and polyester front face provide it with IP65, IP67 and IP69K degrees of protection, making it suitable for the harshest environments. These products are for a nominal supply voltage of 24 V $\overline{\text{---}}$ and have a 17 to 33 V $\overline{\text{---}}$ operating range.

Simplicity of setup:

These products must be connected to an electronic pressure transmitter with 4...20 mA analogue output and 4-pin M12 connector.

They can be mounted:

- Directly on the pressure transmitter. The product body can then pivot through 300°, enabling optimum orientation of the display and settings.
- Or mounted remotely, up to 20 metres from the transmitter, using a simple jumper cable. In this case, clever design accessories allow the product to be fixed in place quickly, horizontally, vertically or even directly on the pressure inlet pipe.

Description

- 1 4-pin male M12 output connector, for connection to an automation platform.
- 2 Indicator LEDs displaying the output status (LED lit when the output has been activated).
- 3 7-segment/4-digit display.
- 4 Pressure unit indication, bar by default, psi, kPa or Mpa by the addition of an adhesive label supplied with the product.
- 5 Potentiometer for selecting the display size and adjusting the switching threshold values.
- 6 4-position rotary switch for selecting the parameter to be configured.
- 7 4-pin female M12 connector, for connection to the pressure transmitter.

Functions

Configurable functions

For the display:

- Pressure unit (bar, psi, kPa and MPa)
- 27 display ranges can be selected, from -14.5 to 6000

For the solid-state output(s):

- NO or NC contact

Locking/unlocking:

- In order to avoid losing the product settings accidentally, the product can be locked. The settings cannot then be changed

Fast diagnostic function

- Illumination of all the display segments on each power-up, enabling checking of their operation

Electronic pressure sensors

OsiSense XM

ZMLP switches with 4-digit display



ZMLPA1●2SH



ZMLPA1●2SW



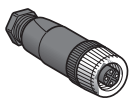
ZMLPA2●0SH



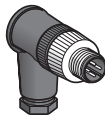
XMLPZLH01



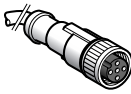
XMLPZLV01



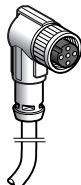
XZCC12FDM40B



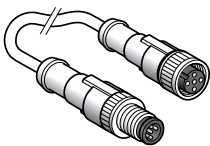
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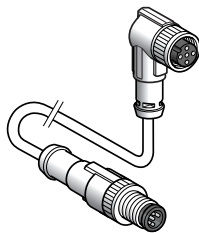
XZCP1141L●



XZCP1241L●



XZCR1511040A●



XZCR1512040A●

Switches with a display for OsiSense XMLP pressure sensors (1)

Analogue output type	Solid-state output type	Switching mode	Reference	Weight kg
4...20 mA	1 x PNP	Hysteresis	ZMLPA1P2SH	0.104
		Window	ZMLPA1P2SW	0.104
	1 x NPN	Hysteresis	ZMLPA1N2SH	0.104
		Window	ZMLPA1N2SW	0.104
–	2 x PNP	Hysteresis	ZMLPA2P0SH	0.104
–	2 x NPN	Hysteresis	ZMLPA2N0SH	0.104

Fixing brackets for ZMLP switches with display

Description	Reference	Weight kg
Metal bracket for fixing horizontally	XMLPZLH01	0.012
Metal bracket for fixing vertically or on an inlet pipe	XMLPZLV01	0.024

Cabling accessories

Type	Length of cable	Reference	Weight kg
	m		
4-pin M12 connectors, for connection on screw terminals (2)			
Straight female connector	–	XZCC12FDM40B	0.020
Elbowed female connector	–	XZCC12FCM40B	0.020
Straight male connector	–	XZCC12MDM40B	0.025
Elbowed male connector	–	XZCC12MCM40B	0.025

Pre-wired M12, 4-pin connectors (PUR cable)

Straight female connector	2	XZCP1141L2	0.090
	5	XZCP1141L5	0.190
	10	XZCP1141L10	0.370
	15	XZCP1141L15	0.500
	20	XZCP1141L20	0.750
Elbowed female connector	2	XZCP1241L2	0.090
	5	XZCP1241L5	0.190
	10	XZCP1241L10	0.370
	15	XZCP1241L15	0.500
	20	XZCP1241L20	0.750

M12-M12, 3-pin jumper cables (PUR cable) (2)

Straight male and female connectors	1	XZCR1511040A1	0.065
	2	XZCR1511040A2	0.095
Straight male connector, elbowed female connector	1	XZCR1512040A1	0.065
	2	XZCR1512040A2	0.095

(1) For XMLP●●●●D2● pressure transmitters (see pages 2/24 to 2/29).

Switches with display are also compatible with XMLK●●●●D2● and XMLG●●●●D2● pressure transmitters (see pages 2/12 to 2/21).

(2) For connecting the pressure transmitter to the switch with display, in the case of remote mounting.

Electronic pressure sensors

OsiSense XM

XMLR pressure sensors with 4-digit display

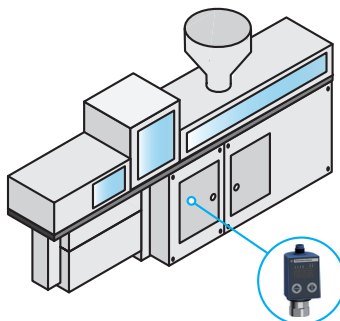
OsiSense XMLR

Electronic pressure sensors are used to control and measure pressure or vacuum levels in hydraulic or pneumatic systems. They convert the pressure into an electrical signal. They then produce an analogue output which is proportional to the measured pressure and/or one or two switching outputs on which the switching point is adjustable.

The high precision and performance of OsiSense XMLR pressure sensors makes them suitable for numerous industrial applications requiring display, control or regulation of pressure/vacuum levels.

Easy to mount

XMLR pressure sensors minimise installation time and effort. Their compact-sized, rotating body and "flip over display" function make mounting easy and flexible.



With its compact size, the OsiSense XMLR pressure sensor is easily integrated into the machine

Compact format

> With a height of just 88 to 100 mm depending on the pressure range and the fluid entry type, OsiSense XMLR is one of the most compact pressure switches on the market.



Rotating body

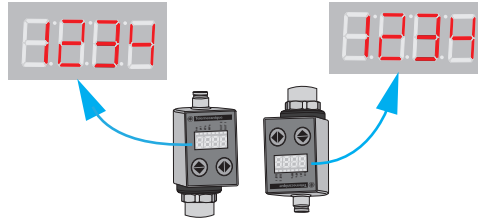
> The body of the OsiSense XMLR pressure sensor can be rotated 300°, thus enabling the user to orientate the front face of the product as required following connection to the pressure inlet pipe.



Easy to mount (continued)

Flip over display function.

> The display can be inverted vertically to adapt to the sensor's installation position.



Easy to set up

Menu naming and structure based on the VDMA* standard

> The ergonomic design of OsiSense XMLR sets a new standard for ease of configuration.

Navigation using just two pushbuttons

> Two simple pushbuttons are all that is needed to navigate through an intuitive menu structured according to the VDMA* 24574-1 standard.



- 1 Pushbutton to display a value or parameter or to save a selected value or parameter and return to the menu.
- 2 Pushbutton to scroll from one menu to another or to increase a value or change a parameter.

Easy to maintain

At each device start up, all segments of the display light up briefly to confirm that it is operating correctly.

The device can be tested using a diagnostic function which checks the whole electronic signal processing chain. This function is accessible via the "Dia" menu and the result of the test is indicated on the display (DONE or ERR).

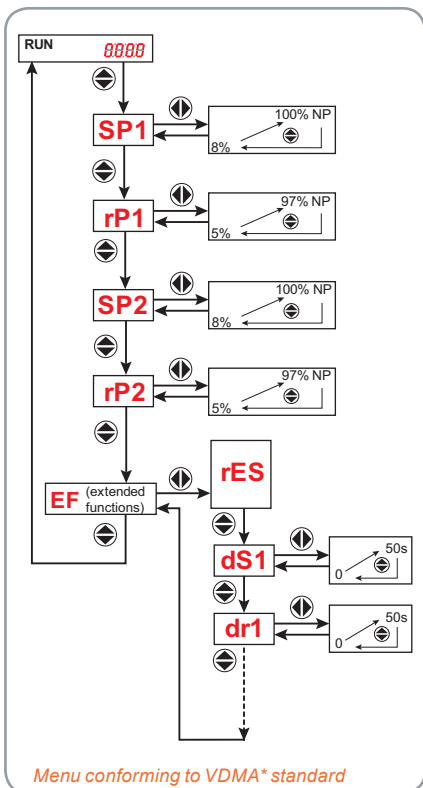
For transmitters, this function can also be remotely activated by connecting the Test input to an automation platform, thus enabling automatic verification without the need for intervention by an operator.

In this instance, the self-test also generates an analogue output signal which is equivalent to 50% of the sensor size (12 mA or 5 V) which, in turn, can be verified by the automation platform.

The pressure sensor can be considered as defective if the difference between the signal transmitted and the standard theoretical value is too great.

OsiSense XMLR pressure sensors also include a recording of the high and low pressure values measured since the last reset.

These values can be displayed via the Hi and Lo menus.



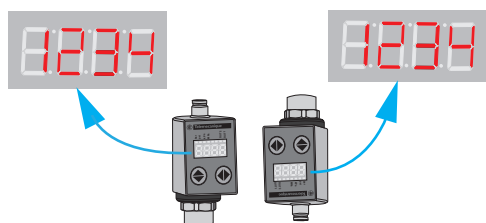
* VDMA: Verband Deutscher Maschinen und Anlagenbau e.V.

Electronic pressure sensors

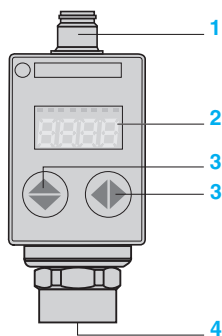
OsiSense XM

XMLR pressure sensors with 4-digit display.
Compact plastic body, stainless steel 316L fluid entry.
With analogue and solid-state outputs.

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"Flip over display" function.



Presentation

XMLR electronic pressure sensors are used for pressure control of hydraulic oils, fresh water, air and refrigeration fluids, between -1 and 600 bar.

Depending on the model, XMLR sensors are available with different output configurations in order to meet the highest number of requirements:

- One analogue output, 4...20 mA or 0...10 V, proportional to the measuring range
- One analogue output and one switching output, PNP or NPN type
- Two switching outputs, PNP or NPN type
- One 4...20 mA analogue output and two switching outputs, PNP or NPN type

Compact and robust:

The stainless steel 316L fluid entry and fibreglass impregnated polyacrylamide body provide the XMLR pressure sensors with excellent mechanical resistance, improved corrosion resistance and an P65/IP67 degree of protection. Compact in size (88 mm to 100 mm overall, depending on model), these products are for a nominal supply voltage of 24 V $\overline{\text{DC}}$ and have a 17 to 33 V $\overline{\text{DC}}$ operating range.

They are particularly suitable for:

- Moulding and thermoforming presses
- Injection machines
- Pneumatic systems and assembly machinery
- Hydraulic systems of lifting and handling equipment
- Pumping and fresh water treatment

Simplicity of setting-up

The body of the OsiSense XMLR pressure sensor can be turned through 300°, thus enabling the front face of the product to be orientated as required following connection to the pressure inlet pipe.

In addition, the "flip over display" function simplifies reading in the event of upside down mounting (fluid entry from above).

Description

- 1 M12 male connector, 4 or 5-pin depending on model.
- 2 4-digit, 7-segment display and LED indicator for pressure and output state (LED lit when the output has been activated).
- 3 Navigation keys for setting and configuring the menus (conforming to VDMA 24574).
- 4 Fluid entry: G 1/4 female, 1/4"-18 NPT female or SAE 7/16-20UNF female, depending on model.

Functions

Configurable functions

For the display:

- Pressure unit of measurement (bar, psi, kPa or MPa)
- Display refresh time: fast (50 ms), normal (200 ms), slow (600 ms)
- 180° flip over display
- Display off, power saving mode

For the analogue output (4...20 mA or 0...10 V):

- Compensation offset in the range of $\pm 5\%$ of the units size
- Adjustment of pressure between 75 and 125% of the nominal pressure

For each solid-state output:

- NO or NC contact
- Switching mode of outputs: Hysteresis (pumping) or Window (control)
- Time delay both on trip and on reset (adjustable from 0 to 50 s, in steps of 1 s)

Locking/unlocking:

- In order to avoid losing the product settings accidentally, the product can be locked. The settings cannot then be changed

Fast diagnostic functions

- Illumination of all the display segments on each power-up, enabling checking of their operation
- Diagnostic function for checking correct operation of the sensor
- Saving of min. and max. pressures measured by the sensor, up to 125% of the nominal pressure, and their subsequent display

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XMLR...G...5



XMLR...G...6

-1 to 0 bar (-14.5 to 0 psi)

Maximum permissible accidental pressure: 3 bar, destruction pressure: 3 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4...20 mA	–	XMLRM01G0T25	0.190
0...10 V	–	XMLRM01G0T75	0.190
4...20 mA	1 x PNP	XMLRM01G1P25	0.190
4...20 mA	1 x NPN	XMLRM01G1N25	0.190
0...10 V	1 x PNP	XMLRM01G1P75	0.190
0...10 V	1 x NPN	XMLRM01G1N75	0.190
–	2 x PNP	XMLRM01G2P05	0.190
–	2 x NPN	XMLRM01G2N05	0.190
4...20 mA	2 x PNP	XMLRM01G2P25	0.190
4...20 mA	2 x NPN	XMLRM01G2N25	0.190
1/4'' - 18 NPT (female) fluid connection			
4...20 mA	–	XMLRM01G0T26	0.212
4...20 mA	1 x PNP	XMLRM01G1P26	0.212
4...20 mA	1 x NPN	XMLRM01G1N26	0.212
–	2 x PNP	XMLRM01G2P06	0.212
–	2 x NPN	XMLRM01G2N06	0.212
4...20 mA	2 x PNP	XMLRM01G2P26	0.212
4...20 mA	2 x NPN	XMLRM01G2N26	0.212

0 to 1 bar (0 to 14.5 psi)

Maximum permissible accidental pressure: 7 bar, destruction pressure: 7 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4...20 mA	–	XMLR001G0T25	0.190
0...10 V	–	XMLR001G0T75	0.190
4...20 mA	1 x PNP	XMLR001G1P25	0.190
4...20 mA	1 x NPN	XMLR001G1N25	0.190
0...10 V	1 x PNP	XMLR001G1P75	0.190
0...10 V	1 x NPN	XMLR001G1N75	0.190
–	2 x PNP	XMLR001G2P05	0.190
–	2 x NPN	XMLR001G2N05	0.190
1/4'' - 18 NPT (female) fluid connection			
4...20 mA	–	XMLR001G0T26	0.212
0...10 V	–	XMLR001G0T76	0.212
4...20 mA	1 x PNP	XMLR001G1P26	0.212
4...20 mA	1 x NPN	XMLR001G1N26	0.212
–	2 x PNP	XMLR001G2P06	0.212
–	2 x NPN	XMLR001G2N06	0.212

0 to 2.5 bar (0 to 36.2 psi)

Maximum permissible accidental pressure: 12 bar, destruction pressure: 12 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4...20 mA	–	XMLR2D5G0T25	0.190
0...10 V	–	XMLR2D5G0T75	0.190
4...20 mA	1 x PNP	XMLR2D5G1P25	0.190
4...20 mA	1 x NPN	XMLR2D5G1N25	0.190
0...10 V	1 x PNP	XMLR2D5G1P75	0.190
0...10 V	1 x NPN	XMLR2D5G1N75	0.190
–	2 x PNP	XMLR2D5G2P05	0.190
–	2 x NPN	XMLR2D5G2N05	0.190
1/4'' - 18 NPT (female) fluid connection			
4...20 mA	1 x PNP	XMLR2D5G1P26	0.212
4...20 mA	1 x NPN	XMLR2D5G1N26	0.212
–	2 x PNP	XMLR2D5G2P06	0.212
–	2 x NPN	XMLR2D5G2N06	0.212

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XMLR...G...5

XMLR...G...6
XMLR...G...9

0 to 10 bar (0 to 145 psi)

Maximum permissible accidental pressure: 40 bar, destruction pressure: 40 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4...20 mA	–	XMLR010G0T25	0.190
0...10 V	–	XMLR010G0T75	0.190
4...20 mA	1 x PNP	XMLR010G1P25	0.190
4...20 mA	1 x NPN	XMLR010G1N25	0.190
0...10 V	1 x PNP	XMLR010G1P75	0.190
0...10 V	1 x NPN	XMLR010G1N75	0.190
–	2 x PNP	XMLR010G2P05	0.190
–	2 x NPN	XMLR010G2N05	0.190
4...20 mA	2 x PNP	XMLR010G2P25	0.190
4...20 mA	2 x NPN	XMLR010G2N25	0.190

1/4"- 18 NPT (female) fluid connection

4...20 mA	–	XMLR010G0T26	0.212
0...10 V	–	XMLR010G0T76	0.212
4...20 mA	1 x PNP	XMLR010G1P26	0.212
4...20 mA	1 x NPN	XMLR010G1N26	0.212
0...10 V	1 x PNP	XMLR010G1P76	0.212
0...10 V	1 x NPN	XMLR010G1N76	0.212
–	2 x PNP	XMLR010G2P06	0.212
–	2 x NPN	XMLR010G2N06	0.212
4...20 mA	2 x PNP	XMLR010G2P26	0.212
4...20 mA	2 x NPN	XMLR010G2N26	0.212

SAE 7/16-20UNF-2B (female) fluid connection

–	2 x PNP	XMLR010G2P09	0.210
–	2 x NPN	XMLR010G2N09	0.210

0 to 16 bar (0 to 232 psi)

Maximum permissible accidental pressure: 62 bar, destruction pressure: 62 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4...20 mA	–	XMLR016G0T25	0.190
0...10 V	–	XMLR016G0T75	0.190
4...20 mA	1 x PNP	XMLR016G1P25	0.190
4...20 mA	1 x NPN	XMLR016G1N25	0.190
0...10 V	1 x PNP	XMLR016G1P75	0.190
–	2 x PNP	XMLR016G2P05	0.190
4...20 mA	2 x PNP	XMLR016G2P25	0.190
1/4"- 18 NPT (female) fluid connection			
4...20 mA	–	XMLR016G0T26	0.212
4...20 mA	1 x PNP	XMLR016G1P26	0.212
4...20 mA	1 x NPN	XMLR016G1N26	0.212
–	2 x PNP	XMLR016G2P06	0.212
–	2 x NPN	XMLR016G2N06	0.212

0 to 25 bar (0 to 362 psi)

Maximum permissible accidental pressure: 100 bar, destruction pressure: 100 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4...20 mA	–	XMLR025G0T25	0.190
0...10 V	–	XMLR025G0T75	0.190
4...20 mA	1 x PNP	XMLR025G1P25	0.190
4...20 mA	1 x NPN	XMLR025G1N25	0.190
0...10 V	1 x PNP	XMLR025G1P75	0.190
0...10 V	1 x NPN	XMLR025G1N75	0.190
–	2 x PNP	XMLR025G2P05	0.190
–	2 x NPN	XMLR025G2N05	0.190
1/4"- 18 NPT (female) fluid connection			
4...20 mA	–	XMLR025G0T26	0.212
4...20 mA	1 x PNP	XMLR025G1P26	0.212
4...20 mA	1 x NPN	XMLR025G1N26	0.212
–	2 x PNP	XMLR025G2P06	0.212
–	2 x NPN	XMLR025G2N06	0.212

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XMLR...G...5



XMLR...G...6

XMLR...M...5
XMLR...M...6

XMLR...M...9

0 to 40 bar (0 to 580 psi)

Maximum permissible accidental pressure: 150 bar, destruction pressure: 150 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4...20 mA	–	XMLR040G0T25	0.190
0...10 V	–	XMLR040G0T75	0.190
4...20 mA	1 x PNP	XMLR040G1P25	0.190
4...20 mA	1 x NPN	XMLR040G1N25	0.190
0...10 V	1 x PNP	XMLR040G1P75	0.190
0...10 V	1 x NPN	XMLR040G1N75	0.190
–	2 x PNP	XMLR040G2P05	0.190
–	2 x NPN	XMLR040G2N05	0.190
4...20 mA	2 x PNP	XMLR040G2P25	0.190
4...20 mA	2 x NPN	XMLR040G2N25	0.190

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4...20 mA	–	XMLR040G0T26	0.212
4...20 mA	1 x PNP	XMLR040G1P26	0.212
4...20 mA	1 x NPN	XMLR040G1N26	0.212
–	2 x PNP	XMLR040G2P06	0.212
–	2 x NPN	XMLR040G2N06	0.212

0 to 100 bar (0 to 1450 psi)

Maximum permissible accidental pressure: 300 bar, destruction pressure: 600 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4...20 mA	–	XMLR100M0T25	0.186
0...10 V	–	XMLR100M0T75	0.186
4...20 mA	1 x PNP	XMLR100M1P25	0.186
4...20 mA	1 x NPN	XMLR100M1N25	0.186
0...10 V	1 x PNP	XMLR100M1P75	0.186
0...10 V	1 x NPN	XMLR100M1N75	0.186
–	2 x PNP	XMLR100M2P05	0.186
–	2 x NPN	XMLR100M2N05	0.186

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4...20 mA	–	XMLR100M0T26	0.186
4...20 mA	1 x PNP	XMLR100M1P26	0.186
4...20 mA	1 x NPN	XMLR100M1N26	0.186
–	2 x PNP	XMLR100M2P06	0.186
–	2 x NPN	XMLR100M2N06	0.186

0 to 160 bar (0 to 2320 psi)

Maximum permissible accidental pressure: 480 bar, destruction pressure: 960 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4...20 mA	–	XMLR160M0T25	0.186
0...10 V	–	XMLR160M0T75	0.186
4...20 mA	1 x PNP	XMLR160M1P25	0.186
4...20 mA	1 x NPN	XMLR160M1N25	0.186
0...10 V	1 x PNP	XMLR160M1P75	0.186
0...10 V	1 x NPN	XMLR160M1N75	0.186
–	2 x PNP	XMLR160M2P05	0.186
–	2 x NPN	XMLR160M2N05	0.186

SAE 7/16-20UNF-2B (female) fluid connection

–	2 x PNP	XMLR160M2P09	0.212
–	2 x NPN	XMLR160M2N09	0.212

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XMLR...M...5
XMLR...M...6



XMLR...M...9

0 to 250 bar (0 to 3625 psi)

Maximum permissible accidental pressure: 750 bar, destruction pressure: 1500 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4...20 mA	–	XMLR250M0T25	0.186
0...10 V	–	XMLR250M0T75	0.186
4...20 mA	1 x PNP	XMLR250M1P25	0.186
4...20 mA	1 x NPN	XMLR250M1N25	0.186
0...10 V	1 x PNP	XMLR250M1P75	0.186
0...10 V	1 x NPN	XMLR250M1N75	0.186
–	2 x PNP	XMLR250M2P05	0.186
–	2 x NPN	XMLR250M2N05	0.186
4...20 mA	2 x PNP	XMLR250M2P25	0.186
4...20 mA	2 x NPN	XMLR250M2N25	0.186

1/4"- 18 NPT (female) fluid connection

4...20 mA	–	XMLR250M0T26	0.186
4...20 mA	1 x PNP	XMLR250M1P26	0.186
4...20 mA	1 x NPN	XMLR250M1N26	0.186
0...10 V	1 x PNP	XMLR250M1P76	0.186
–	2 x PNP	XMLR250M2P06	0.186
–	2 x NPN	XMLR250M2N06	0.186

SAE 7/16-20UNF-2B (female) fluid connection

–	2 x PNP	XMLR250M2P09	0.212
–	2 x NPN	XMLR250M2N09	0.212

0 to 400 bar (0 to 5800 psi)

Maximum permissible accidental pressure: 1200 bar,
destruction pressure: 2400 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4...20 mA	–	XMLR400M0T25	0.186
0...10 V	–	XMLR400M0T75	0.186
4...20 mA	1 x PNP	XMLR400M1P25	0.186
4...20 mA	1 x NPN	XMLR400M1N25	0.186
0...10 V	1 x PNP	XMLR400M1P75	0.186
0...10 V	1 x NPN	XMLR400M1N75	0.186
–	2 x PNP	XMLR400M2P05	0.186
–	2 x NPN	XMLR400M2N05	0.186
4...20 mA	2 x PNP	XMLR400M2P25	0.186
4...20 mA	2 x NPN	XMLR400M2N25	0.186

1/4"- 18 NPT (female) fluid connection

4...20 mA	–	XMLR400M0T26	0.186
4...20 mA	1 x PNP	XMLR400M1P26	0.186
4...20 mA	1 x NPN	XMLR400M1N26	0.186
–	2 x PNP	XMLR400M2P06	0.186
–	2 x NPN	XMLR400M2N06	0.186

0 to 600 bar (0 to 8700 psi)

Maximum permissible accidental pressure: 1500 bar,
minimum destruction pressure: 2500 bar

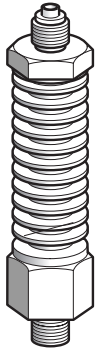
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Fluid connection G 1/4 (female)			
4...20 mA	–	XMLR600M0T25	0.186
0...10 V	–	XMLR600M0T75	0.186
4...20 mA	1 x PNP	XMLR600M1P25	0.186
0...10 V	1 x PNP	XMLR600M1P75	0.186
–	2 x PNP	XMLR600M2P05	0.186

Electronic pressure sensors

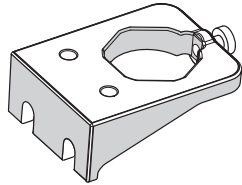
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XMLR pressure sensors with 4-digit display

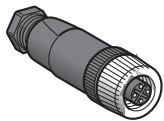
Accessories



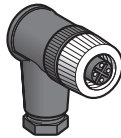
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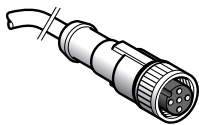
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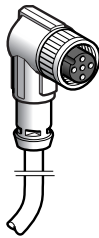
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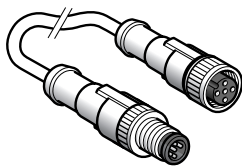
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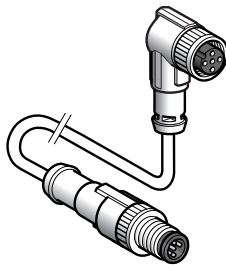
XZCP1141L●



XZCP1241L●



XZCR15110●●●●



XZCR15120●●●●

Accessories

Description	For use with	Reference	Weight kg
Cooler with G 1/4 A (male) connections Usage temperature: 150°C max. for the fluid, 50°C for the ambient air	XMLR●●●●●●●5	XMLZL009	0.370
Fixing bracket aluminium	XMLR●●●	XMLZL017	0.029

Connectors

Description	For use with	Type	Reference	Weight kg
M12 female connector, 4-pin Metal clamping ring	XMLR●●●●0T●● XMLR●●●●1P●● XMLR●●●●1N●● XMLR●●●●2P0● XMLR●●●●2N0●	Straight	XZCC12FDM40B	0.020
		Elbowed	XZCC12FCM40B	0.020
M12 female connector, 5-pin Metal clamping ring	XMLR●●●●2P2● XMLR●●●●2N2●	Straight	XZCC12FDM50B	0.020
		Elbowed	XZCC12FCM50B	0.020

Pre-wired connectors and jumper cables

Description	For use with	Type	Length of cable m	Reference	Weight kg
Pre-wired M12, 4-pin connectors Metal clamping ring PUR cable	XMLR●●●●0T●● XMLR●●●●1●●● XMLR●●●●2P0● XMLR●●●●2N0●	Straight	2	XZCP1141L2	0.090
			5	XZCP1141L5	0.190
			10	XZCP1141L10	0.370
		Elbowed	2	XZCP1241L2	0.090
			5	XZCP1241L5	0.190
			10	XZCP1241L10	0.370
Pre-wired M12, 5-pin connectors PVC cable	XMLR●●●●2P2● XMLR●●●●2N2●	Straight female connector	2	XZCPV11V12L2	0.100
			5	XZCPV11V12L5	0.200
			10	XZCPV11V12L10	0.400
		Elbowed female connector	2	XZCPV12V12L2	0.100
			5	XZCPV12V12L5	0.200
			10	XZCPV12V12L10	0.400
M12-M12 4-pin jumper cables PUR cable	XMLR●●●●0T●● XMLR●●●●1●●● XMLR●●●●2P0● XMLR●●●●2N0●	Straight female connector	1	XZCR1511041C1	0.100
			2	XZCR1511041C2	0.100
		Elbowed female connector	1	XZCR1512041C1	0.100
			2	XZCR1512041C2	0.100
M12-M12 5-pin jumper cables PUR cable	XMLR●●●●2P2● XMLR●●●●2N2●	Straight female connector	1	XZCR1511064D1	0.100
			2	XZCR1511064D2	0.100
		Elbowed female connector	1	XZCR1512064D1	0.100
			2	XZCR1512064D2	0.100

Electromechanical sensors for pressure control

OsiSense XM

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Applications	Type of installation	Control circuits	
	Fluids controlled	Air, water, hydraulic oils, corrosive fluids, viscous products	
	Type of operation	Detection of a single threshold (fixed differential)	Regulation between 2 thresholds (adjustable differential)



Fluid characteristics	Air, fresh water, corrosive fluids, viscous products, up to 160°C Sea water, up to 30 °C, depending on model		
Sizes	- 1 bar...500 bar (- 14.5 psi...7250 psi)		
Dimensions of case (mm) Width x height x depth	35 x 68 x 75	46 x 68 x 85	
Type of contacts	1 CO single-pole, snap action	2 CO single-pole, simultaneous, snap action	
Degree of protection	IP 66: switches with terminal connections IP 65: switches with connector	IP 66: switches with terminal connections	
Electrical connection	Connector : ■ EN 175301-803-A (ex-DIN 43650A), 4-pin male. Screw terminals: ■ 1 tapped entry M20 x 1.5 mm for ISO cable gland or ■ 1 tapped entry 1/2"-14 NPT for cable gland, depending on model.		
Fluid connection	G 1/4 (female) 1/4" - 18 NPTF (female) G 1 1/4" (female) for viscous products		
Type reference	XMLA	XMLB	XMLC
Pages	2/64 to 2/116		
Other versions	Electromechanical pressure and vacuum switches with alternative tapped cable entries and/or fluid entries: NPT etc. Please consult our Customer Care Centre.		

Control circuits	
Air, water, hydraulic oils, corrosive fluids, viscous products	Air, hydraulic oils, corrosive fluids
Dual stage switches Detection at each threshold (fixed differential)	Regulation between 2 thresholds (adjustable differential)



Air, fresh water, corrosive fluids, viscous products, up to 160°C Sea water, up to 30 °C, depending on model	Air, oils and other non corrosive fluids (- 73...+ 125°C)	Oils and other fluids (- 25...+ 120 °C) Only oils, including synthetic oils, (- 30...+ 125 °C), depending on model
- 1 bar...500 bar (- 14.5 psi...7250 psi)	0.7 bar...131 bar (10.15 psi...1900 psi)	69 bar...340 bar (1000 psi...4930 psi)
45 x 68 x 85	88 x 88 x 68	
2 CO single-pole, staggered, snap action	1 CO or 2 CO single-pole, snap action	
IIP 66: switches with terminal connections	IP 65	
Connector : ■ EN 175301-803-A (ex-DIN 43650A), 4-pin male. Screw terminals: ■ 1 tapped entry M20 x 1.5 mm for ISO cable gland or ■ 1 tapped entry 1/2"-14 NPT for cable gland, depending on model.	Screw terminals: ■ 1 tapped entry M20 x 1.5 mm for ISO cable gland or ■ 1 tapped entry for n° 13 cable gland, depending on model	
G 1/4 (female) 1/4" - 18 NPTF (female) G 1 1/4" (female) for viscous products	G 1/4 (femelle)	G 3/8 (female)

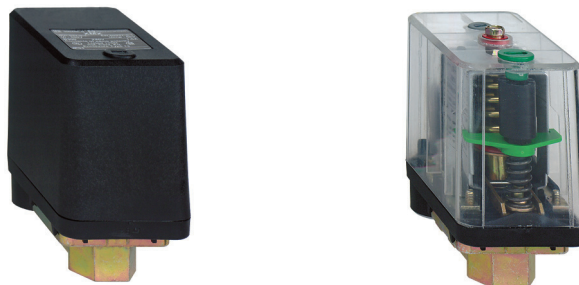
XMLD	ACW	ADW
2/64 to 2/116	2/124 and 2/125	2/126 and 2/127

Electromechanical sensors for pressure control

OsiSense XM

2

Applications	Type of installation	Control circuits
	Fluids controlled	
	Type of operation	
		Air, water
		Regulation between 2 thresholds (adjustable differential)



Fluid characteristics	Air, fresh water, sea water (0...+ 70°C)	
Sizes	6 bar, 12 bar and 25 bar (87 psi, 174 psi and 362.5 psi)	
Dimensions of case (mm) Width x height x depth	57 x 78 x 97.5	
Setting of switching points	Internal screws	External screws
Type of contacts	1 CO single-pole, snap action	
Degree of protection	IP 54	
Electrical connection	Screw terminals: <ul style="list-style-type: none"> ■ 2 entries tapped for n° 13 cable gland, ■ one fitted with n° 13 cable gland, ■ one fitted with blanking plug. 	
Fluid connection	G 1/4 or 4 x G 1/4 (female), depending on model	
Type reference	XMX	XMA
Pages	2/132	2/135

Other versions Electromechanical pressure switches with alternative tapped cable entries and/or fluid entries: ISO, NPT, etc. Please consult our Customer Care Centre.

Power circuits	
Water	Air, water
Detection of a single threshold (fixed differential)	Regulation between 2 thresholds (adjustable differential)



Fresh water, sea water (0...+ 70°C)			Air, fresh water, sea water (0...+ 70°C)	
4.6 bar (66.7 psi)	7 bar (101.5 psi)	10.5 bar (152.3 psi)	6 bar, 12 bar and 25 bar (87 psi, 174 psi and 362.5 psi)	
73 x 73 x 102	72 x 77 x 106	72 x 73 x 102	57 x 78 x 97.5	
Internal screws				
2 NC snap action			2 NC or 3 NC snap action	
IP 20/IP 65			IP 54 or IP 65, depending on model	
Screw terminals: <ul style="list-style-type: none"> ■ 2 cable entries with grommet or ■ 2 cable entries with n° 13 cable gland 			Screw terminals: <ul style="list-style-type: none"> ■ 2 entries incorporating n° 13 cable gland or without cable gland, depending on model 	
G 1/4 or R 1/4 (female or male)			G 1/4, G 3/8 or 4 x G 1/4 (female), depending on model	
FTG●, FTG●NE		FSG●, FSG●NE		FYG22, FYG22NE
FYG32, FYG32NE		XMP		
2/138 to 2/140				2/144 to 2/152



Electromechanical pressure and vacuum switches

OsiSense XM

2

Function

The function of pressure and vacuum switches is the control or regulation of pressure or vacuum levels in hydraulic or pneumatic systems. They transform the pressure change into a digital electrical signal when the preset switching points are reached.

Switches for power circuits

Switches with power electrical contacts, either 2-pole or 3-pole, designed for direct switching of single-phase or 3-phase motors (pumps, compressors, etc.).

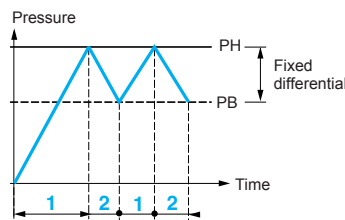
Switches for control circuits

Switches with standard electrical contacts, designed for control of contactors, relays, power valves, PLC inputs, etc.

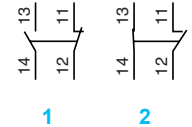
Pressure switch operating principle

Detection of a single threshold

The switches for detection of a single threshold (fixed differential) have a single adjustable setting point (PH). The differential between the high and low points (PH - PB) depends upon the natural characteristics of the switch. It is not adjustable.



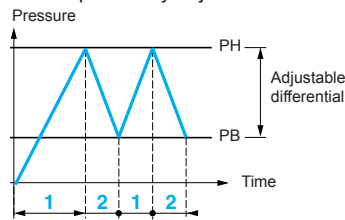
Example: contact schematics of XMLA



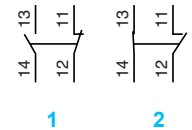
— Adjustable value
 --- Non adjustable value
 PH = High point
 PB = Low point

Regulation between 2 thresholds

The switches for regulation between 2 thresholds (adjustable differential) have both a high point setting (PH) and a low point setting (PB). Both of these points can be independently adjusted.



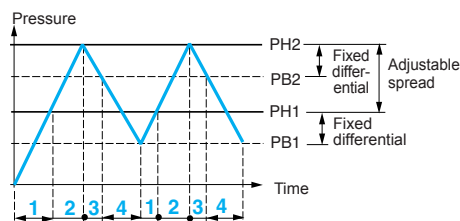
Example: contact schematics of XMLB



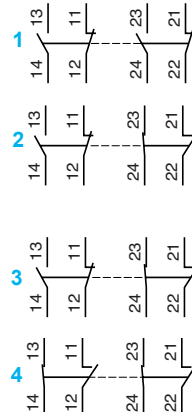
— Adjustable value
 PH = High point
 PB = Low point

Detection of 2 thresholds

The dual stage switches, for detection at each threshold, have an adjustable high point setting for each stage (PH1 and PH2). Both of these points can be independently adjusted. For both stages, the differential between the high point and the low point (PH1 - PB1 and PH2 - PB2) depends upon the natural characteristics of the switch. It is not adjustable.



Example: contact schematics of XMLD



— Adjustable value
 --- Non adjustable value
 PH = High point
 PB = Low point

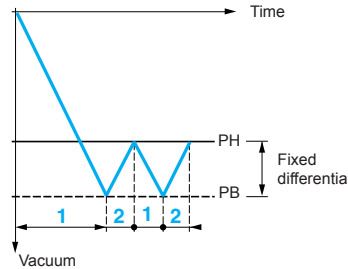
Electromechanical pressure and vacuum switches

OsiSense XM

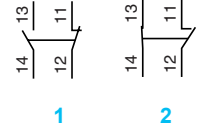
Vacuum switch operating principle

Detection of a single threshold

The switches for detection of a single threshold (fixed differential) have a single adjustable setting point (PH). The differential between the high and low points (PH - PB) depends upon the natural characteristics of the switch. It is not adjustable.



Example: contact schematics of XMLA

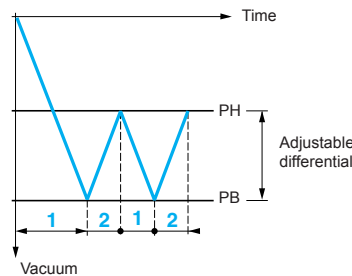


— Adjustable value
 --- Non adjustable value

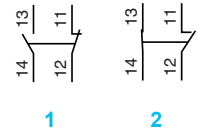
PH = High point
 PB = Low point

Regulation between 2 thresholds

The switches for regulation between 2 thresholds (adjustable differential) have both a high point setting (PH) and a low point setting (PB). Both of these points can be independently adjusted.



Example: contact schematics of XMLB



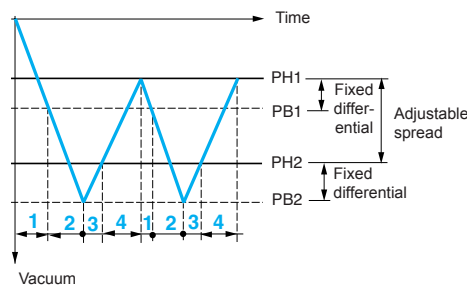
— Adjustable value

PH = High point
 PB = Low point

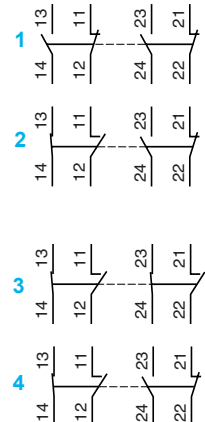
Detection of 2 thresholds

The dual stage switches, for detection at each threshold, have an adjustable high point setting for each stage (PH1 and PH2). Both of these points can be independently adjusted.

For both stages, the differential between the high point and the low point (PH1 - PB1 and PH2 - PB2) depends upon the natural characteristics of the switch. It is not adjustable.



Example: contact schematics of XMLD



— Adjustable value
 --- Non adjustable value

PH = High point
 PB = Low point

Electromechanical pressure and vacuum switches

OsiSense XM

Terminology

Operating range

The difference between the minimum low point (PB) and the maximum high point (PH) setting values.

Size

Pressure switches and vacuum-pressure switches (vacu-pressure switches)

Maximum value of the operating range.

Vacuum switches

Minimum value of the operating range.

Switching point on rising pressure (PH)

Pressure switches

The upper pressure setting at which the pressure switch will actuate the contacts on rising pressure.

Vacuum switches

The lower vacuum setting at which the vacuum switch will reset the contacts on rising pressure.

Switching point on falling pressure (PB)

The pressure at which the switch output changes state on falling pressure.

Switches with fixed differential

The lower point (PB) is not adjustable and is entirely dependent on the high point setting (PH) and the natural differential of the switch.

Switches with adjustable differential

The adjustable differential enables the independent setting of the lower point (PB).

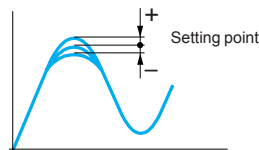
Differential

The difference between the switching point on rising pressure (PH) and the switching point on falling pressure (PB).

Spread

For dual stage switches, the spread indicates the difference between the 2 switching points on rising pressure (PH2 and PH1) and, for vacuum switches, the difference between the 2 switching points on falling pressure (PB2 and PB1).

Accuracy (switches with setting scale)



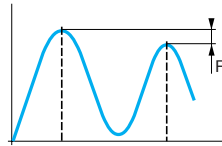
The tolerance between the point at which the switch actuates its contacts and the value indicated on the setting scale. Where very high setting accuracy is required (initial installation of the product), it is recommended to use separate measuring equipment (pressure gauge, etc.).

Electromechanical pressure and vacuum switches

OsiSense XM

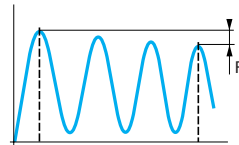
Terminology (continued)

Repeat accuracy (R)



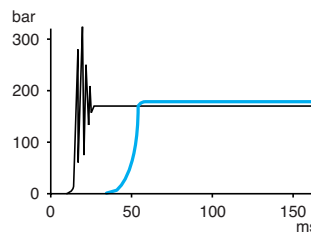
The tolerance between two consecutive switching operations.

Drift (F)



The tolerance of the switching point throughout the entire service life of the switch.

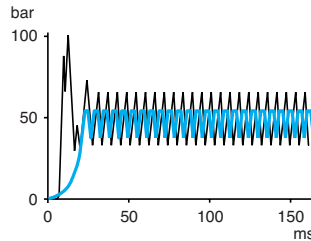
Accidental overpressure



This is an accidental pressure surge of very short duration (a few milliseconds).

If accidental overpressures occur and their duration is less than 50 milliseconds, the pressure damping device incorporated in the XML switches (sizes 10 bar and greater) will diminish the effect.

Example 1: with destructive pressure level.



Example 2: with destructive pressure level and destructive pressure oscillations.

- Without damping device
- With damping device

Maximum permissible pressure per cycle (Ps)

A pressure switch can withstand this pressure, without detrimental effect, on each cycle throughout its service life.

Its minimum value is at least equal to 1.25 times the switch size.

Maximum permissible accidental pressure

The maximum accidental pressure is at least equal to 2.25 times the switch size.

Destruction pressure

The maximum guaranteed pressure that the switch will withstand before its destruction, i.e. bursting, rupturing, component failure, etc.

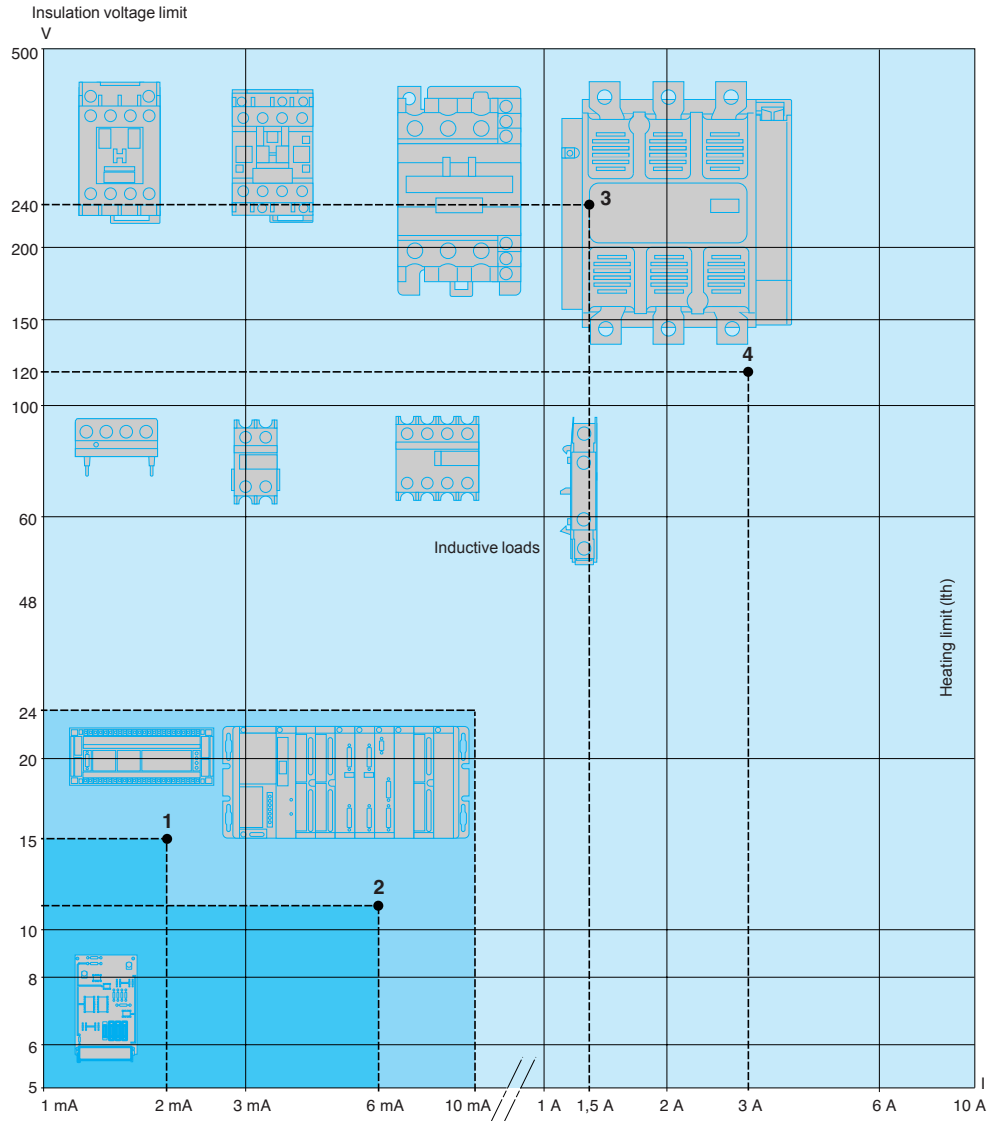
Its value is at least equal to 4.5 times the switch size.

Electromechanical pressure and vacuum switches

OsiSense XM

Application range of pressure and vacuum switches XML, XMA and XMX, for control circuits

On standard loads
Continuous duty, frequent switching.



- 1 Standard PLC input, type 1
- 2 Standard PLC input, type 2
- 3 Switching capacity conforming to IEC 60947-5-1, utilisation category AC-15, DC-13
B300 240 V 1.5 A
R300 250 V 0.1 A
- 4 Switching capacity conforming to IEC 60947-5-1, utilisation category AC-15, DC-13
B300 120 V 3 A
R300 125 V 0.22 A

PLC: Programmable Logic Controller

On small loads

The use of electromechanical pressure and vacuum switches with programmable logic controllers is becoming more predominant.

On small loads, the reliability of the switches maintain a failure rate of less than 1 for 100 million operating cycles.

Pressure switches	Application range	
	XMLA XMLB XMLC XMLD XMV, XMA	
XMLG XMLK		

Electromechanical pressure and vacuum switches

OsiSense XM

Selection of switch size

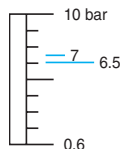
After establishing the type of switch required for the application (single threshold detection or regulation between 2 thresholds), the selection of its size will depend on the following criteria:

- the differential: difference between the high point (PH) and the low point (PB),
- the maximum pressure permissible per cycle,
- repeat accuracy, precision and minimum drift.

Examples of a fixed differential pressure switch selection, for detection of a single threshold

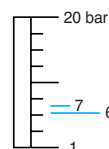
Main criterion: minimum differential

Example: for a selected high point (PH) of 7 bar

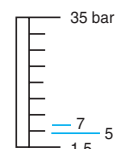


XMLA010●●●●●●
Differential = 0.5 bar

Select an XMLA010●●●●●● (the lowest size)



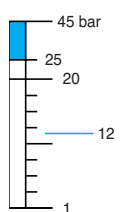
XMLA020●●●●●●
Differential = 1 bar



XMLA035●●●●●●
Differential = 2 bar

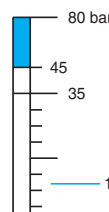
Main criterion: tolerance to overpressures

Example: for a selected high point (PH) of 12 bar



XMLA020●●●●●●
Permissible accidental overpressure = 45 bar

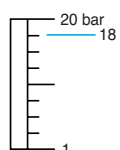
Select an XMLA035●●●●●● (the highest size)



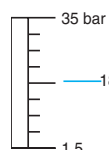
XMLA035●●●●●●
Permissible accidental overpressure = 80 bar

Main criterion: repeat accuracy, precision and minimum drift

Example: for a selected high point (PH) of 18 bar



XMLA020●●●●●●
Adjustable from 1 to 20 bar



XMLA035●●●●●●
Adjustable from 1.5 to 35 bar

Select an XMLA035●●●●●●

As a general rule, working at the upper or lower limits of the operating range should be avoided.

Units of pressure conversion table

	psi	kg/cm ²	bar	atm	mm Hg (Torr)	mm H ₂ O	Pa
1 psi =	1	0.07031	0.06895	0.06805	51.71	703.7	6895
1 kg/cm ² =	14.22	1	0.98066	0.96784	735.55	10 000	98 066
1 bar =	14.50	1.0197	1	0.98695	750.06	10 197	10 ⁵
1 atm =	14.70	1.0333	1.0132	1	760.0	10 333	101 325
1 mm Hg = (Torr)	0.01934	1.360 x 10 ⁻³	1.333 x 10 ⁻³	1.316 x 10 ⁻³	1	13.59	133.3
1 mm H ₂ O =	1.421 x 10 ⁻³	10 ⁻⁴	~ 10 ⁻⁴	~ 10 ⁻⁴	0.07361	1	~ 9.80
1 Pa =	1.45 x 10 ⁻⁴	1.0197 x 10 ⁻⁵	10 ⁻⁵	9.8695 x 10 ⁻⁶	7.5 x 10 ⁻³	0.10197	1

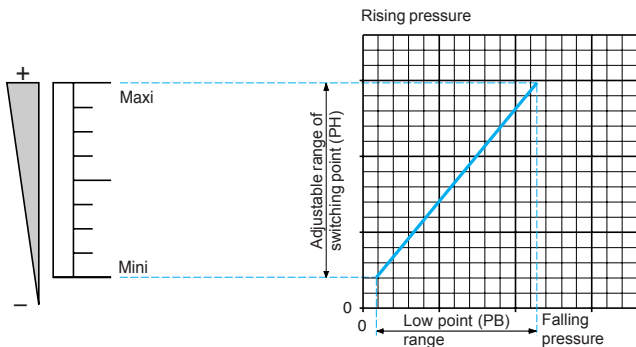
Example: 1 bar = 14.50 psi = 10⁵ Pa

Electromechanical pressure and vacuum switches

Fixed differential switches, for detection of a single threshold

2

Adjustment range of the high point

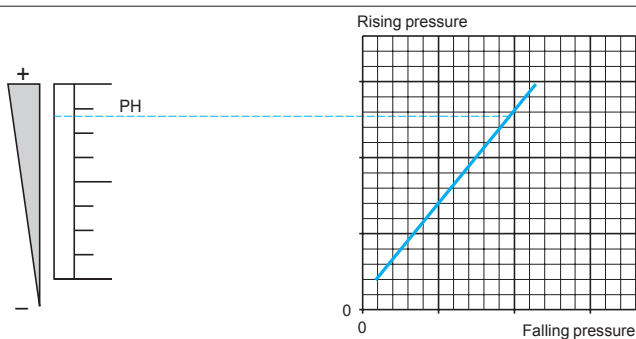


Defined by the difference between the minimum and maximum high point (PH) setting values.

For a high set point (PH), the lower point (PB) is fixed and cannot be adjusted.

For a low set point (PB1 or PB2), the higher point (PH1 or PH2) is fixed and cannot be adjusted.

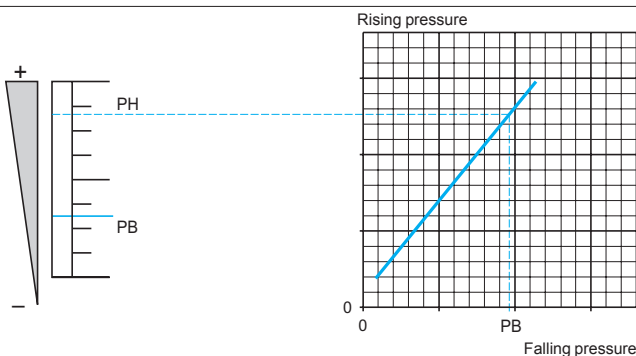
Switching point on rising pressure (PH)



The upper pressure setting at which the pressure or vacuum switch will actuate the contacts on rising pressure.

Adjustable throughout the range on rising pressure.

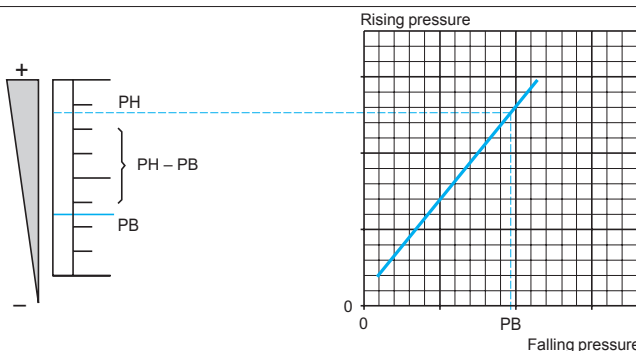
Switching point on falling pressure (PB)



The pressure at which the switch contact changes state on falling pressure.

The lower point (PB) is not adjustable and is entirely dependent on the high point setting (PH) and the natural differential of the switch.

Differential

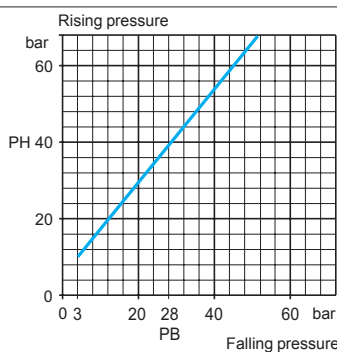


$PH - PB = \text{natural differential}$

The difference between the switching point on rising pressure (PH) and the switching point on falling pressure (PB).

This point is not adjustable and therefore, the value of the differential is fixed. It is the natural differential of the switch (contact differential, friction, etc.).

Example



■ Consider a switching point on rising pressure (PH) of 40 bar (set value at which the contact will change state on rising pressure).

■ It can be seen that the switching point on falling pressure (PB) is 28 bar (fixed value at which the contact will return to its original state).

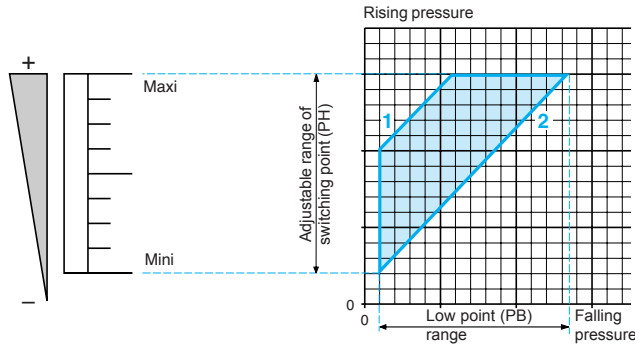
Conclusion:

□ the differential will be $40 - 28 = 12$ bar.

Electromechanical pressure and vacuum switches

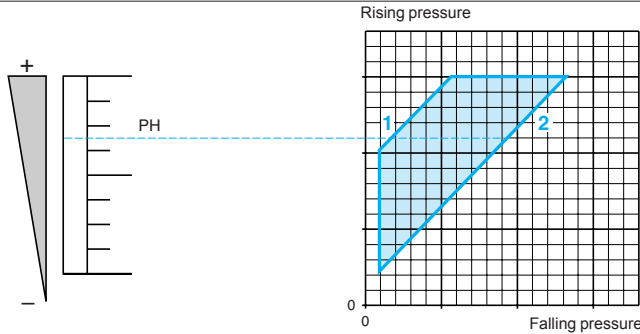
Adjustable differential switches, for regulation between 2 thresholds

Adjustment range of the high point



Defined by the difference between the minimum and maximum high point (PH) setting values.

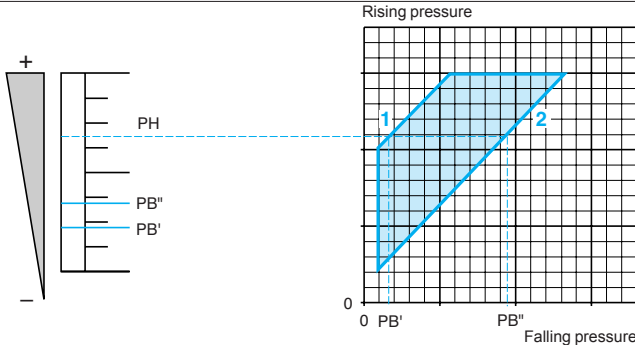
Switching point on rising pressure (PH)



The upper pressure setting at which the pressure or vacuum switch will actuate the contacts on rising pressure.

Adjustable throughout the range on rising pressure.

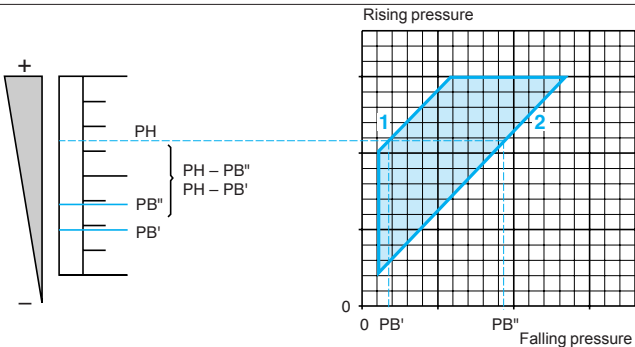
Switching point on falling pressure (PB)



The pressure at which the switch contact changes state on falling pressure.

The adjustable differential enables the independent setting of the lower point (PB).

Differential



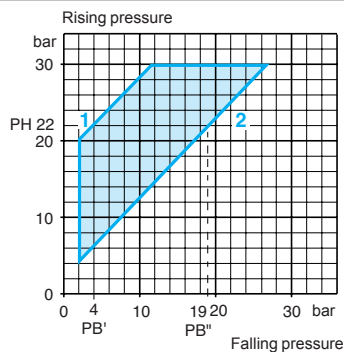
Low point < High point
 $PH - PB'' = \text{natural differential}$
 $PH - PB' = \text{minimum differential}$

The difference between the switching point on rising pressure (PH) and the switching point on falling pressure (PB).

Note: the low point can be set at any value between PB' and PB'' .

Example

- 1 Maximum differential
- 2 Minimum differential



- Consider a switching point on rising pressure (PH) of 22 bar (set value at which the contact will change state on rising pressure).
- It can be seen that the switching point on falling pressure (PB) can be between 4 and 19 bar inclusive (set value at which the contact will return to its original state).

Conclusion:
 □ the maximum differential will be:
 $22 - 4 = 18 \text{ bar}$,
 □ the minimum differential will be:
 $22 - 19 = 3 \text{ bar}$.

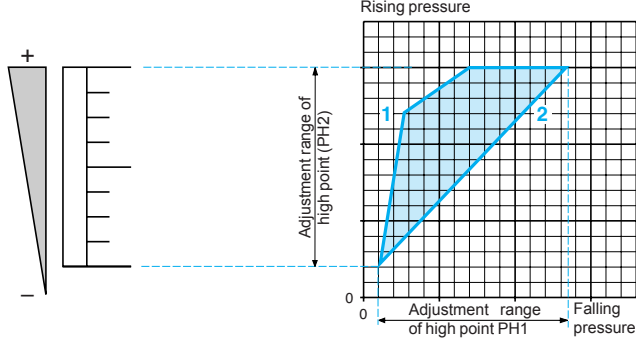
Operating curves (switching points on rising pressure)

Electromechanical pressure and vacuum switches

Dual stage, fixed differential switches, for detection at each threshold

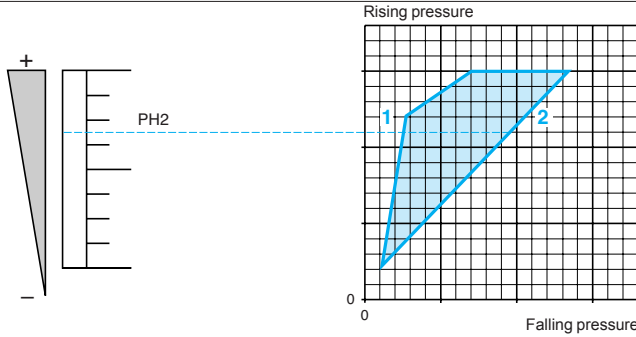
2

Adjustment ranges of the switching points PH1 and PH2 on rising pressure



Defined by the difference between the minimum and maximum high point setting values of each stage (PH1 and PH2).

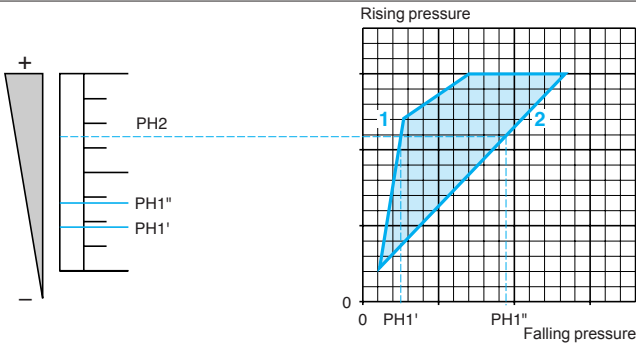
Switching point PH2 on rising pressure



The upper pressure setting at which the pressure or vacuum switch will actuate the contacts on rising pressure.

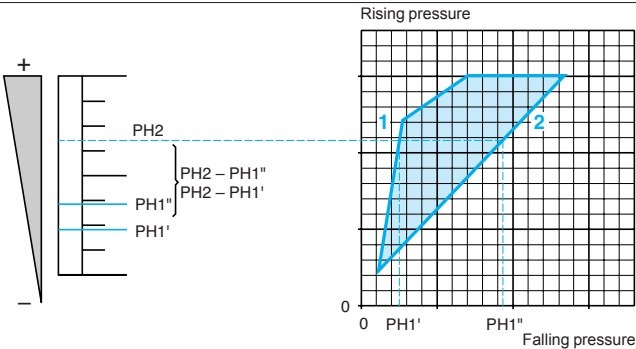
Adjustable throughout the range on rising pressure.

Switching point PH1 on rising pressure



The upper pressure setting at which the pressure or vacuum switch will actuate contact 1 on rising pressure.

Spread

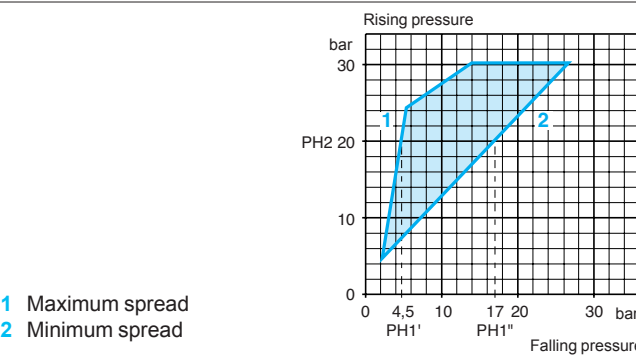


PH1 < PH2
PH2 - PH1' = maximum spread
PH2 - PH1'' = minimum spread

The difference between switching points PH2 and PH1 on rising pressure.

Note: switching point PH1 can be set at any value between PH1' and PH1''.

Example:
Determining switching points on rising pressure for the 2 stages



- 1 Maximum spread
- 2 Minimum spread

- Consider a 2nd stage switching point on rising pressure (PH2) of 20 bar (set value at which contact 2 will change state on rising pressure).
- It can be seen that the 1st stage switching point (PH1) can be set between 4.5 and 17 bar on rising pressure.

Conclusion:

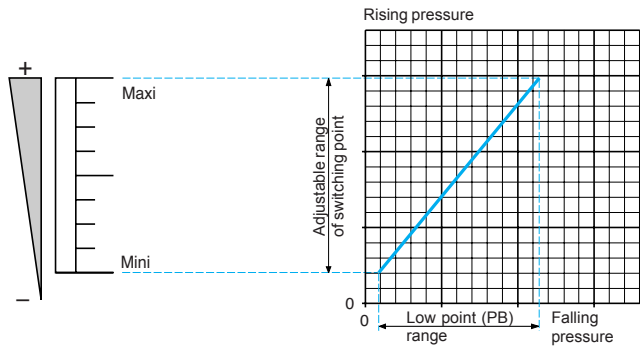
- the maximum spread will be: 20 - 4.5 = 15.5 bar,
- the minimum spread will be: 20 - 17 = 3 bar.

Operating curves (switching points on falling pressure)

Electromechanical pressure and vacuum switches

Dual stage, fixed differential switches, for detection at each threshold

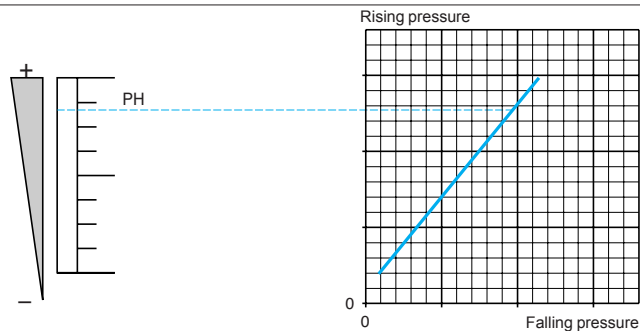
Adjustment range of high point (PH1 or PH2)



Defined by the difference between the minimum and maximum high point (PH1 or PH2) setting values for each stage.

For a high set point (PH), the lower point (PB) is fixed and cannot be adjusted.
For a low set point (PB1 or PB2), the higher point (PH1 or PH2) is fixed and cannot be adjusted.

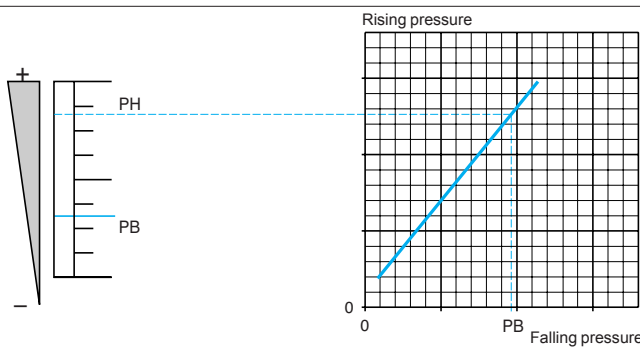
Switching point on rising pressure (PH1 or PH2)



The upper pressure setting at which the pressure or vacuum switch will actuate the contact, for each stage, on rising pressure.

Adjustable throughout the range on rising pressure.

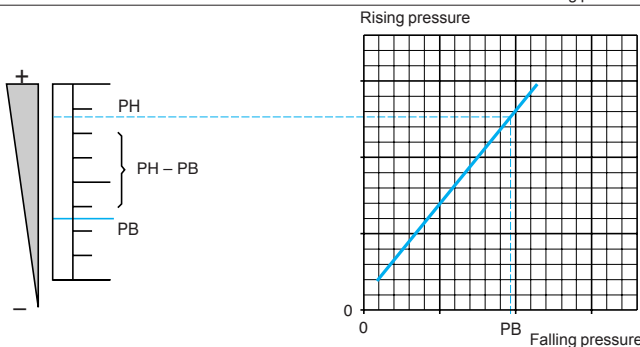
Switching point on falling pressure (PB1 or PB2)



The pressure at which the switch contact changes state, for each stage, on falling pressure.

The lower point (PB) is not adjustable and is entirely dependent on the high point setting (PH) and the natural differential of the switch.

Differential

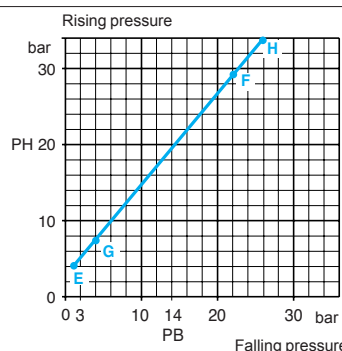


$PH - PB = \text{natural differential}$
The difference between the switching point on rising pressure (PH) and the switching point on falling pressure (PB), for each stage.

This point is not adjustable and therefore, the value of the differential is fixed. It is the natural differential of the switch (contact differential, friction, etc.), for each of its 2 stages.

Example:
stage 1 = segment EF
stage 2 = segment GH

- 1 Maximum spread
- 2 Minimum spread



For stage 2 (segment GH):
 ■ Consider a switching point on rising pressure (PH2) of 20 bar (set value at which contact 2 will change state on rising pressure).
 ■ It can be seen that the switching point on falling pressure (PB2) is 14 bar (fixed value at which contact 2 will return to its original state).
 Conclusion:
 for stage 2, the differential will be:
 $20 - 14 = 6 \text{ bar}$.
 Repeat the same procedure for stage 1 (segment EF).

Electromechanical pressure and vacuum switches

OsiSense XM

OsiSense XML for control circuits

Presentation

OsiSense **XML** pressure and vacuum switches are designed for use in control circuits.

They are used to control the pressure of hydraulic oils, fresh water, sea water, air, steam, corrosive fluids or viscous products, up to 500 bar.

OsiSense **XMLA** pressure and vacuum switches have a fixed differential and are used for detection of a single threshold. They incorporate 1 CO single-pole contact. OsiSense **XMLB** pressure and vacuum switches have an adjustable differential and are used for regulation between 2 thresholds. They incorporate 1 CO single-pole contact.

OsiSense **XMLC** pressure and vacuum switches have an adjustable differential and are used for regulation between 2 thresholds. They incorporate 2 CO single-pole contacts.

OsiSense **XMLD** pressure and vacuum switches are dual stage switches, each stage with a fixed differential, and are used for detection at each threshold. They incorporate 2 CO single-pole contacts (one per stage).

Setting

When setting OsiSense XML pressure and vacuum switches, adjust the switching point on rising pressure (PH) first and then the switching point on falling pressure (PB).

OsiSense XMLA pressure and vacuum switches with fixed differential

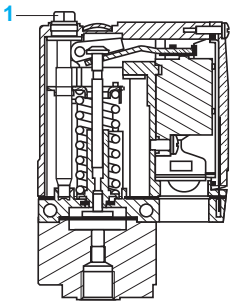
Switching point on rising pressure

The switching point on rising pressure (PH) is set by adjusting the red screw **1**.

Switching point on falling pressure

The switching point on falling pressure (PB) is not adjustable.

The difference between the tripping and resetting points of the contact is the natural differential of the switch (contact differential, friction, etc.).



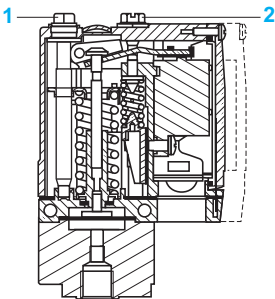
OsiSense XMLB and XMLC pressure and vacuum switches with adjustable differential

Switching point on rising pressure

The switching point on rising pressure (PH) is set by adjusting the red screw **1**.

Switching point on falling pressure

The switching point on falling pressure (PB) is set by adjusting the green screw **2**.



OsiSense XMLD dual stage pressure and vacuum switches with fixed differential for each threshold

Switching point on rising pressure of stage 1 and stage 2

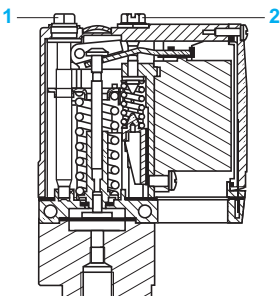
The first stage switching point on rising pressure (PH1) is set by adjusting the red screw **1**.

The second stage switching point on rising pressure (PH2) is set by adjusting the blue screw **2**.

Switching point on falling pressure

The switching points on falling pressure (PB1 and PB2) are not adjustable.

The difference between the tripping and resetting points of each contact is the natural differential of the switch (contact differential, friction, etc.).



Electromechanical pressure and vacuum switches

OsiSense XM

OsiSense XML for control circuits

Environment characteristics

Conformity to standards		CE, IEC/EN 60947-5-1, UL 508, CSA C22-2 no. 14
Product certifications		All products: UL, CSA, EAC XMLA and XMLB: CCC, BV, LROS
Protective treatment		Standard version "TC". Special version "TH"
Ambient air temperature	°C	For operation: -25...+70. For storage: -40...+70
Fluids or products controlled		Hydraulic oils, air, fresh water, sea water Steam, corrosive fluids, viscous products, depending on model
Materials		Case: zinc alloy Component materials in contact with fluid: see pages 2/120 and 2/121
Operating position		All positions
Vibration resistance		4 gn (30...500 Hz) conforming to IEC 60068-2-6 except XMLL35 , XML001 and XMLBM03 : 2 gn
Shock resistance		50 gn conforming to IEC 60068-2-27 except XMLL35 , XML001 and XMLBM03 : 30 gn
Electric shock protection		Class I conforming to IEC 1140, IEC 536 and NF C 20-030
Degree of protection		Screw terminal models: IP 66 conforming to IEC/EN 60529 Connector models: IP 65 conforming to IEC/EN 60529
Operating rate	Op. cycles/min	Piston version switches: ≤ 60 (for temperatures > 0 °C) Diaphragm version switches: ≤ 120 (for temperatures > 0 °C)
Repeat accuracy		< 2%
Fluid connection		G 1/4 (BSP female) conforming to NF E 03-005, ISO 228 or 1/4"-18 NPTF For sizes ≥ 300 bar, use the gasket supplied with the product. This gasket is also available as a separate part, reference XMLZL010 .
Electrical connection		Screw terminal models: ISO M20 x 1.5 or 1/2" NPT tapped entry For an entry tapped for no.13 (DIN Pg 13.5) cable gland, replace the last number of the reference with 1 (for example, XMLA010A2S12 becomes XMLA010A2S11) Connector models: EN 175301-803-A (ex-DIN 43650) connector

Contact block characteristics

Rated operational characteristics		~ AC-15, B300 (Ue = 240 V, Ie = 1.5 A; Ue = 120 V, Ie = 3 A) --- DC-13; R300 (Ue = 250 V, Ie = 0.1 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
Rated insulation voltage		Ui = 500 V conforming to IEC/EN 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 no. 14
Rated impulse withstand voltage		U imp = 6 kV conforming to IEC/EN 60947-1
Type of contacts		Silver tipped contacts XMLA and XMLB : 1 CO single-pole contact (4 terminals), snap action XMLC : 2 CO single-pole contacts (8 terminals), simultaneous, snap action XMLD : 2 CO single-pole contacts (8 terminals), staggered, snap action
Resistance across terminals	mΩ	< 25 conforming to NF C 93-050 method A or IEC 255-7 category 3
Terminal referencing		Conforming to CENELEC EN 50013
Short-circuit protection		10 A cartridge fuse type gG (gl)
Connection		Screw clamp terminals. Minimum clamping capacity: 1 x 0.5 mm ² /AWG 20 Maximum clamping capacity: 2 x 2.5 mm ² /AWG 14

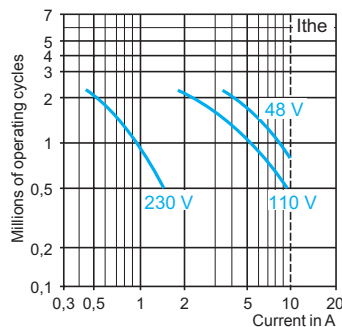
Electrical durability

Conforming to IEC/EN 60947-5-1 Appendix C
Utilisation categories AC-15 and DC-13

Operating rate: 3600 operating cycles/hour
Load factor: 0.5

XMLA and XMLB

AC supply ~ 50/60 Hz
~ Inductive circuit, Ithe = 10 A



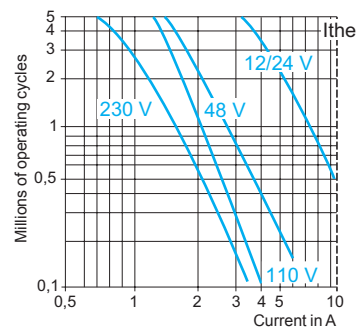
DC supply ---

Power broken in W
for 1 million operating cycles

Voltage V	24	48	120
~ W	31	29	26

XMLC and XMLD

AC supply ~ 50/60 Hz
~ Inductive circuit, Ithe = 10 A



DC supply ---

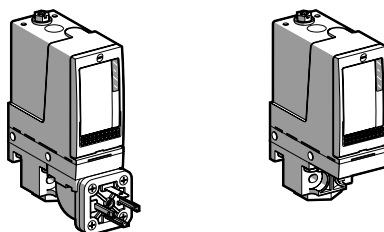
Power broken in W for 5 million operating cycles

Voltage V	24	48	120
~ W	10	7	4

2

OsiSense XMLA vacuum switches

With setting scale



Adjustable range of switching point (PB) (Falling pressure)	- 0.28... - 1 bar (- 4.06... - 14.5 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 70 °C	XMLAM01V2C11	XMLAM01V2S12	XMLAM01V2S13
	Hydraulic oils, fresh water, air, corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	XMLAM01T2C11	XMLAM01T2S12	-
Weight (kg)		0.685	0.715	0.715

Complementary characteristics not shown under general characteristics (page 2/63)

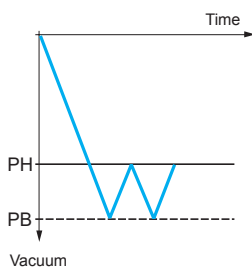
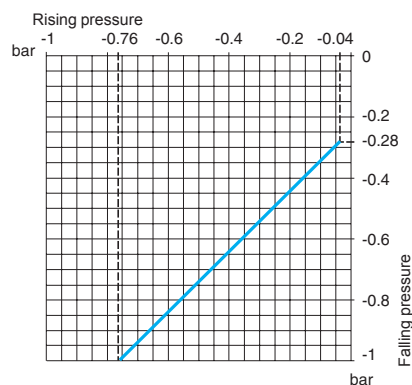
Natural differential (add to PB to give PH)	At low setting (3)	0.24 bar (3.48 psi)		
	At high setting (3)	0.24 bar (3.48 psi)		
Maximum permissible pressure	Per cycle	5 bar (72.5 psi)		
	Accidental	9 bar (130.5 psi)		
Destruction pressure		18 bar (261 psi)		
Mechanical life		3 x 10 ⁶ operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Vacuum switch type		Diaphragm		

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLAM01V2S12 becomes XMLAM01V2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size:
± 0.05 bar (± 0.72 psi).

Operating curves



— Adjustable value
--- Non adjustable value

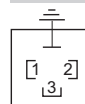
Connection

Terminal model



Connector model

Vacuum switch connector pin view



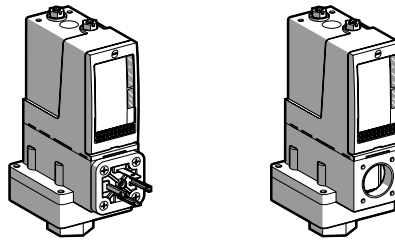
1 → 11 and 13
2 → 12
3 → 14

Other versions

For vacuum switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

OsiSense XMLB vacuum switches

With setting scale



Adjustable range of switching point (PB) (Falling pressure)	- 0.14...- 1 bar (- 2.03...- 14.5 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)				
Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 70 °C	XMLBM02V2C11	XMLBM02V2S12	XMLBM02V2S13
	Hydraulic oils, fresh water, air, corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	XMLBM02T2C11	XMLBM02T2S12	XMLBM02T2S13
Weight (kg)		1.015	1.030	1.030

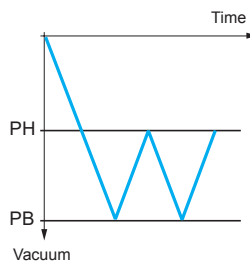
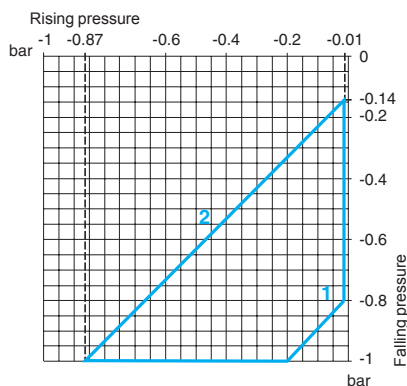
Complementary characteristics not shown under general characteristics (page 2/63)				
Possible differential (add to PB to give PH)	Min. at low setting (3)	0.13 bar (1.88 psi)		
	Min. at high setting (3)	0.13 bar (1.88 psi)		
	Max. at high setting	0.8 bar (11.6 psi)		
Maximum permissible pressure	Per cycle	5 bar (72.5 psi)		
	Accidental	9 bar (130.5 psi)		
Destruction pressure	18 bar (261 psi)			
Mechanical life	3 x 10 ⁸ operating cycles			
Connection	EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/62	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	
Vacuum switch type	Diaphragm			

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLBM02V2S12 becomes XMLBM02V2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.02 bar (± 0.29 psi).

Operating curves



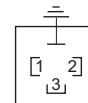
Connection

Terminal model



Connector model

Vacuum switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

- 1 Maximum differential
- 2 Minimum differential

— Adjustable value

Other versions

For vacuum switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical vacuum switches

OsiSense XML

Size - 1 bar (- 14.5 psi)

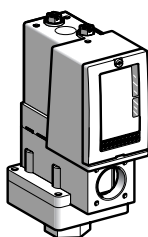
Adjustable differential, for regulation between 2 thresholds

Switches with 2 CO single-pole contacts

2

OsiSense XMLC vacuum switches

With setting scale



Adjustable range of switching point (PB) (Falling pressure)	- 0.14...- 1 bar (- 2.03...- 14.5 psi)
Electrical connection	Terminals
Fluid connection	G 1/4 (female)

References (1)

Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 70 °C	XMLCM02V2S12
	Hydraulic oils, fresh water, air, corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	XMLCM02T2S12
Weight (kg)		1.015

Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (add to PB to give PH)	Min. at low setting (3)	0.13 bar (1.89 psi)
	Min. at high setting (3)	0.14 bar (2.03 psi)
	Max. at high setting	0.8 bar (11.6 psi)
Maximum permissible pressure	Per cycle	5 bar (72.5 psi)
	Accidental	9 bar (130.5 psi)
Destruction pressure		18 bar (261 psi)
Mechanical life		3 x 10 ⁶ operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Vacuum switch type		Diaphragm

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLCM02V2S12 becomes XMLCM02V2S11).

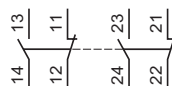
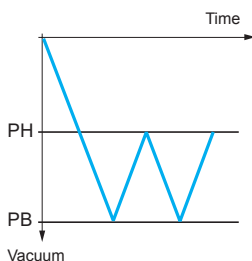
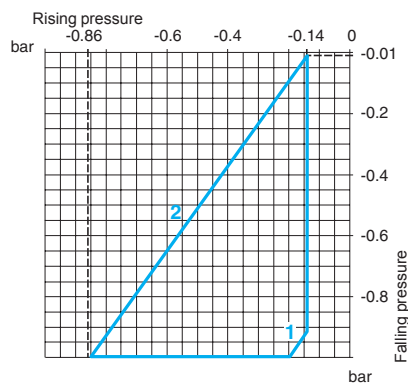
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size:
± 0.02 bar (± 0.29 psi).

Operating curves

Connection

Terminal model



- 1 Maximum differential
- 2 Minimum differential

— Adjustable value

Other versions

For vacuum switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

OsiSense XML

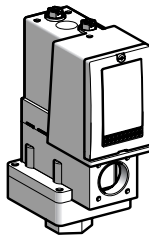
Size - 1 bar (- 14.5 psi)

Dual stage, fixed differential, for detection at each threshold

Switches with 2 CO single-pole contacts

OsiSense XMLD vacuum switches

Without setting scale



Adjustable range of each switching point (Falling pressure)	2nd stage switching point (PB2) 1st stage switching point (PB1)	- 0.12...- 1 bar (- 1.74...- 14.5 psi) - 0.10...- 0.98 bar (- 1.45...- 14.21 psi)
Spread between 2 stages (PB2 - PB1)		0.02...0.88 bar (0.29...12.76 psi)
Electrical connection		Terminals
Fluid connection		G 1/4 (female)

References (1)

Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 70 °C	XMLDM02V1S12
	Hydraulic oils, fresh water, air, corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	XMLDM02T1S12
Weight (kg)		1.015

Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (add to PB1/PB2 to give PH1/PH2)	At low setting (3) At high setting (4)	0.1 bar (1.45 psi) 0.1 bar (1.45 psi)
Maximum permissible pressure	Per cycle Accidental	5 bar (72.5 psi) 9 bar (130.5 psi)
Destruction pressure		18 bar (261 psi)
Mechanical life		3 x 10 ⁸ operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Vacuum switch type		Diaphragm

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLDM02V1S12 becomes XMLDM02V1S11).

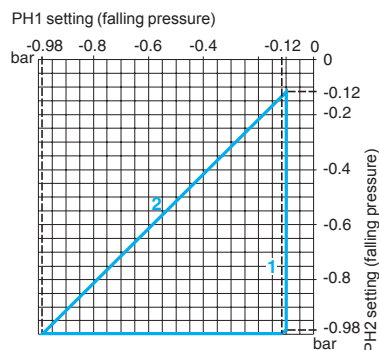
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low setting point for switches of the same size:
± 0.035 bar (± 0.51 psi)

(4) Deviation of the differential at high setting point for switches of the same size:
± 0.02 bar (± 0.29 psi).

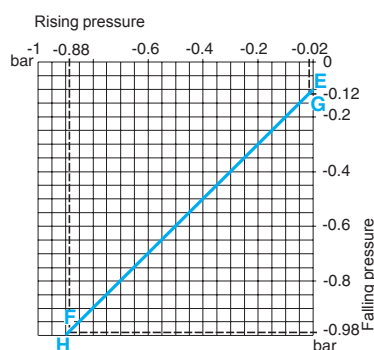
Operating curves

High setting tripping points of contacts 1 and 2

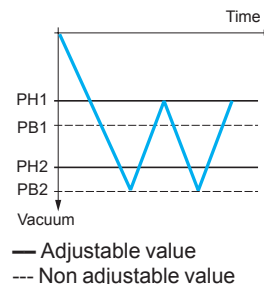


- 1 Maximum differential
- 2 Minimum differential

Natural differential of contacts 1 and 2



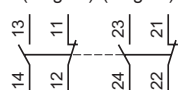
- EF Contact 1 (stage 1)
- GH Contact 2 (stage 2)



Connection

Terminal model

Contact 1 Contact 2
(stage 1) (stage 2)



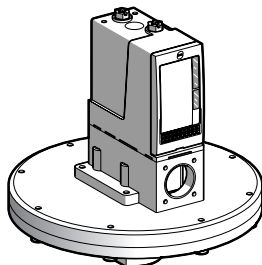
Other versions

For vacuum switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

2

OsiSense XMLB vacuum switches

With setting scale



Adjustable range of switching point (PB) (Falling pressure)	- 20...- 200 mbar (- 0.29...- 2.9 psi)	
Electrical connection	Terminals	
Fluid connection	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, air, up to + 160 °C	XMLBM03R2S12	XMLBM03R2S13
Weight (kg)		3.310	3.310

Complementary characteristics not shown under general characteristics (page 2/63)

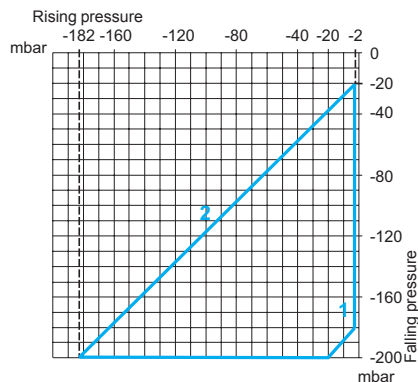
Possible differential (add to PB to give PH)	Min. at low setting (3)	18 mbar (0.26 psi)
	Min. at high setting (3)	18 mbar (0.26 psi)
	Max. at high setting	180 mbar (2.6 psi)
Maximum permissible pressure	Per cycle	1 bar (14.5 psi)
	Accidental	2 bar (29 psi)
Destruction pressure		3.5 bar (50.75 psi)
Mechanical life		3 x 10 ⁶ operating cycles
Cable entry for terminal models	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Vacuum switch type	Diaphragm	

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLBM03R2S12 becomes XMLBM03R2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

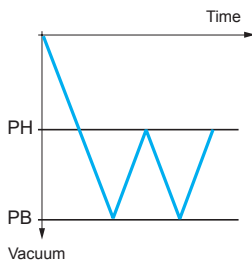
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 2 mbar (± 0.29 psi).

Operating curves



Connection

Terminal model



- 1 Maximum differential
- 2 Minimum differential

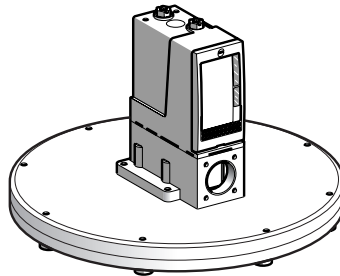
— Adjustable value

Other versions

For vacuum switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

OsiSense XMLB pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	2.6...50 mbar (0.038...0,72 psi)
Electrical connection	Terminals
Fluid connection	G 1/4 (female)

References (1)

Fluids controlled (2)	Hydraulic oils, air, up to + 160 °C	XMLBL05R2S12
	Fresh water, corrosive fluids, up to + 160 °C	XMLBL05S2S12
Weight (kg)		2.420

Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting (3)	1.4 mbar (0.02 psi)
	Min. at high setting (4)	4 mbar (0.06 psi)
	Max. at high setting	40 mbar (0.58 psi)
Maximum permissible pressure	Per cycle	62.5 mbar (0.90 psi)
	Accidental	112.5 mbar (1.63 psi)
Destruction pressure		225 mbar (3.26 psi)
Mechanical life		6 x 10 ⁶ operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLBL05R2S12 becomes XMLBL05R2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

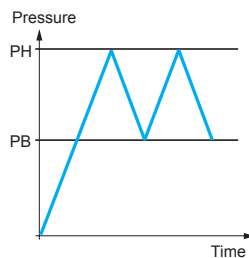
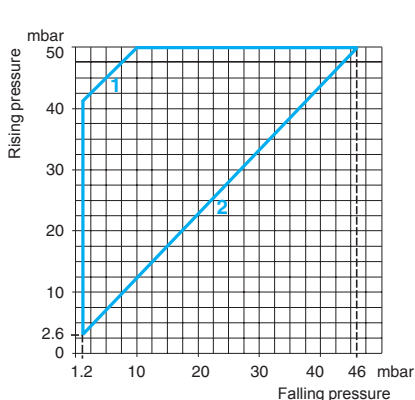
(3) Deviation of the differential at low setting point for switches of the same size:
- 0.8 mbar, + 1.1 mbar (- 0.01 psi, + 0.02 psi).

(4) Deviation of the differential at high setting point for switches of the same size:
± 1.4 mbar, (+ 0.02 psi).

Operating curves

Connection

Terminal model



- 1 Maximum differential
- 2 Minimum differential

— Adjustable value

Other versions

For pressure switches with EN 175301-803-A (ex-DIN 43650A) connector or with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

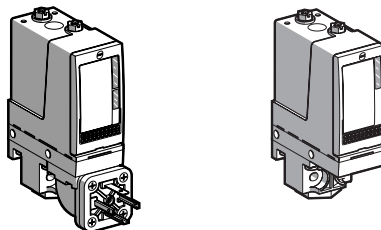
Electromechanical vacu-pressure switches

OsiSense XML. Size 5 bar (72.5 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 1 CO single-pole contact

2

OsiSense XMLB vacu-pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	- 0.5...5 bar (- 7.25...72.5 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 70 °C	XMLBM05A2C11	XMLBM05A2S12	XMLBM05A2S13
	Hydraulic oils, fresh water, air, up to + 160 °C	XMLBM05B2C11	XMLBM05B2S12	—
	Corrosive fluids, up to + 160 °C	XMLBM05C2C11	XMLBM05C2S12	—
	Viscous products, up to + 160 °C (G 1/4" fluid connection)	XMLBM05P2C11	XMLBM05P2S12	—
Weight (kg)		0.715	0.685	0.685

Complementary characteristics not shown under general characteristics (page 2/63)

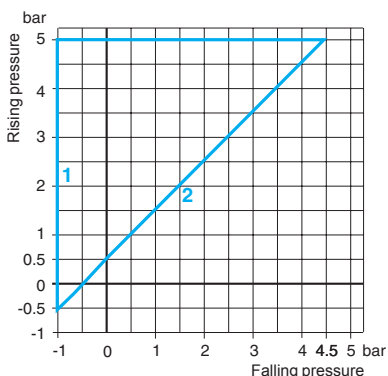
Possible differential (subtract from PH to give PB)	Min. at low setting (3)	0.5 bar (7.25 psi)		
	Min. at high setting (3)	0.5 bar (7.25 psi)		
	Max. at high setting	6 bar (87 psi)		
Maximum permissible pressure	Per cycle	6.25 bar (90.62 psi)		
	Accidental	11.25 bar (163.12 psi)		
Destruction pressure		23 bar (333.5 psi)		
Mechanical life		3 x 10 ⁶ operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
	Vacu-pressure switch type	Diaphragm		

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLBM05A2S12 becomes XMLBM05A2S11).

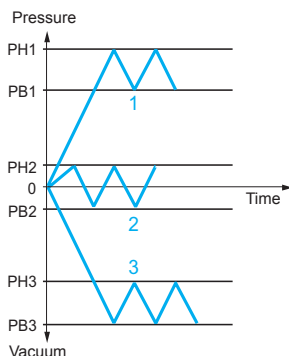
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.05 bar (± 0.72 psi).

Operating curves



- 1 Maximum differential
- 2 Minimum differential



— Adjustable value

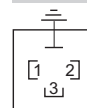
Connection

Terminal model



Connector model

Vacu-pressure switch pin view



- 1 → 11 and 13
- 2 → 12
- 3 → 14

Other versions

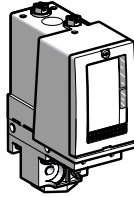
For vacu-pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical vacu-pressure switches

OsiSense XML. Size 5 bar (72.5 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 2 CO single-pole contacts

OsiSense XMLC vacu-pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	- 0.55...5 bar (- 7.97...72.5 psi)
Electrical connection	Terminals
Fluid connection	G 1/4 (female)

References (1)

Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 160 °C	XMLCM05B2S12
	Corrosive fluids, up to + 160 °C	XMLCM05C2S12
Weight (kg)	0.685	

Complementary characteristics not shown under general characteristics (page 2/63)

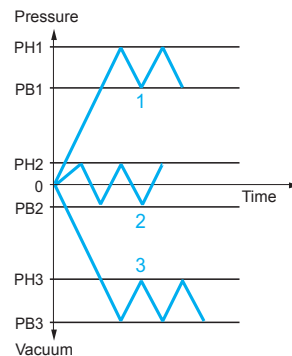
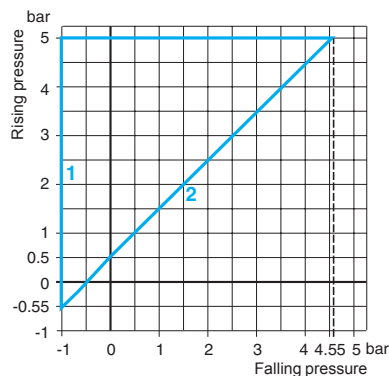
Possible differential (subtract from PH to give PB)	Min. at low setting (3)	0.45 bar (6.52 psi)
	Min. at high setting (3)	0.45 bar (6.52 psi)
	Max. at high setting	6 bar (87 psi)
Maximum permissible pressure	Per cycle	6.25 bar (90.62 psi)
	Accidental	11.25 bar (163.12 psi)
Destruction pressure	23 bar (333.5 psi)	
Mechanical life	3 x 10 ⁹ operating cycles	
Cable entry for terminal models	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	
Vacu-pressure switch type	Diaphragm	

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLCM05B2S12 becomes XMLCM05B2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.1 bar (± 1.45 psi).

Operating curves

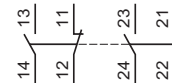


— Adjustable value

- 1 Maximum differential
- 2 Minimum differential

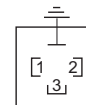
Connection

Terminal model



Connector model

Vacu-pressure switch pin view



- 1 → 11 and 13
- 2 → 12
- 3 → 14

Other versions

For vacu-pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

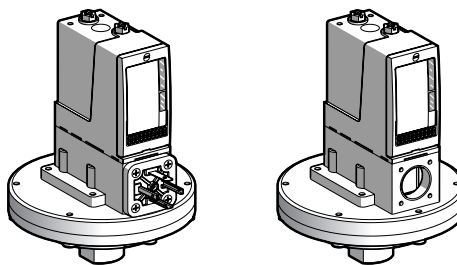
Size 350 mbar (5.07 psi)

Adjustable differential, for regulation between 2 thresholds

Switches with 1 CO single-pole contact

OsiSense XMLB pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	45...350 mbar (0.65...5.07 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

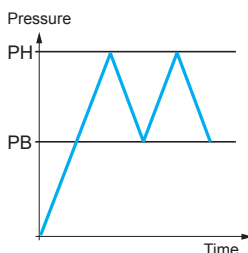
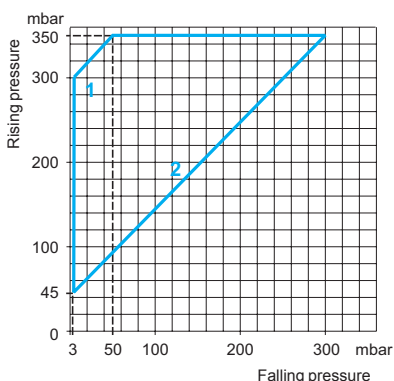
Fluids controlled (2)	Hydraulic oils, air, up to + 160 °C	XMLBL35R2C11	XMLBL35R2S12	XMLBL35R2S13
	Fresh water, corrosive fluids, up to + 160 °C	XMLBL35S2C11	XMLBL35S2S12	-
	Viscous products, up to + 160 °C (G 1 1/4" fluid connection)	XMLBL35P2C11	XMLBL35P2S12	-
Weight (kg)		2.590	2.575	2.575

Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting (3)	42 mbar (0.60 psi)		
	Min. at high setting (4)	50 mbar (0.72 psi)		
	Max. at high setting	300 mbar (4.35 psi)		
Maximum permissible pressure	Per cycle	1.25 bar (18.12 psi)		
	Accidental	2.25 bar (32.62 psi)		
Destruction pressure		4.5 bar (65.25 psi)		
Mechanical life		4 million operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
	Pressure switch type	Diaphragm		

- (1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLBL35R2S12 becomes XMLBL35R2S11).
- (2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
- (3) Deviation of the differential at low setting point for switches of the same size:
- 8 mbar, + 3 mbar (- 0.12 psi, + 0.04 psi).
- (4) Deviation of the differential at high setting point for switches of the same size:
± 8 mbar (± 0.11 psi).

Operating curves



— Adjustable value

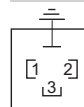
Connection

Terminal model



Connector model

Pressure switch connector pin view



- 1 → 11 and 13
2 → 12
3 → 14

- 1 Maximum differential
2 Minimum differential

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

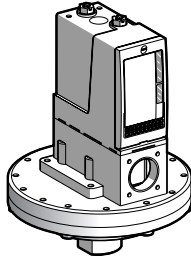
Size 350 mbar (5.07 psi)

Adjustable differential, for regulation between 2 thresholds

Switches with 1 CO single-pole contact

OsiSense XMLB pressure switches

30 bar (435 psi) overpressure
With setting scale



Adjustable range of switching point (PH) (Rising pressure)	42...330 mbar (0.61...4.78 psi)
Electrical connection	Terminals
Fluid connection	G 1/4 (female)

References (1)

Fluids controlled (2)	Hydraulic oils, air, up to + 160 °C	XMLBS35R2S12
Weight (kg)		3.500

Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting (3)	33 mbar (0.48 psi)
	Min. at high setting (4)	58 mbar (0.84 psi)
	Max. at high setting	250 mbar (3.62 psi)
Maximum permissible pressure	Per cycle	30 bar (435 psi)
	Accidental	37.5 bar (543.75 psi)
Destruction pressure		67.5 bar (978.75 psi)
Mechanical life		2 million operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Connector type for connector models		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116
Pressure switch type		Diaphragm

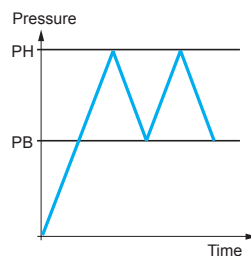
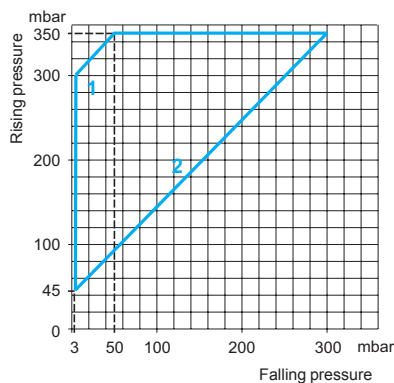
(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLBS35R1S12 becomes XMLBS35R1S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low setting point for switches of the same size:
- 8 mbar, + 3 mbar (- 0.12 psi, + 0.04 psi).

(4) Deviation of the differential at high setting point for switches of the same size:
± 8 mbar (± 0.11 psi).

Operating curves



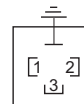
Connection

Terminal model



Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

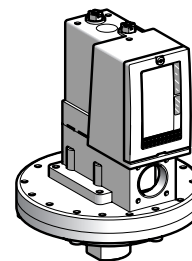
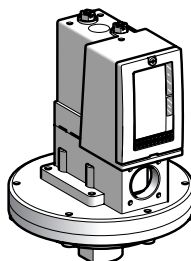
- 1 Maximum differential
2 Minimum differential

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

2

OsiSense XMLC pressure switches	With setting scale	30 bar (435 psi) overpressure With setting scale
---------------------------------	--------------------	-----------------------------------------------------



Adjustable range of switching point (PH) (Rising pressure)	45...350 mbar (0.65...5.07 psi)		42...330 mbar (0.61...4.78 psi)	
Electrical connection	Terminals		Terminals	
Fluid connection	G 1/4 (female)	1/4"-18 NPTF (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, air, up to + 160 °C	XMLCL35R2S12	—	XMLCS35R2S12	XMLCS35R2S13
	Fresh water, corrosive fluids, up to + 160 °C	XMLCL35S2S12	XMLCL35S2S13	—	—
Weight (kg)		2.575	2.575	3.500	3.500

Complementary characteristics not shown under general characteristics (page 2/63)

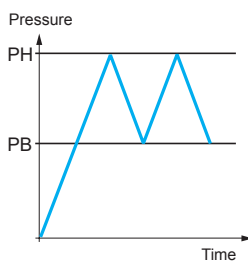
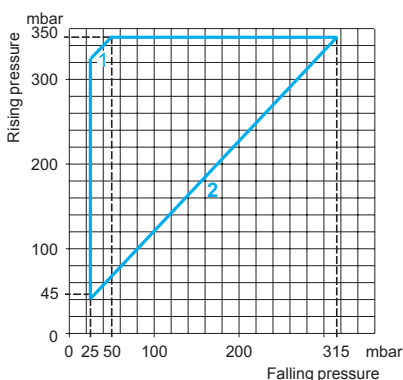
Possible differential (subtract from PH to give PB)	Min. at low setting (3)	20 mbar (0.29 psi)	40 mbar (0.58 psi)	
	Min. at high setting (3)	35 mbar (0.51 psi)	88 mbar (1.27 psi)	
	Max. at high setting	300 mbar (4.35 psi)	230 mbar (3.33 psi)	
Maximum permissible pressure	Per cycle	1.25 bar (18.12 psi)	30 bar (435 psi)	
	Accidental	2.25 bar (32.62 psi)	37.5 bar (543.75 psi)	
Destruction pressure		4.5 bar (65.25 psi)	67.5 bar (978.75 psi)	
Mechanical life		4 million operating cycles	2 million operating cycles	
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLCL35R2S12 becomes XMLCL35R2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

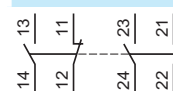
(3) Deviation of the differential at low setting point for switches of the same size:
± 20 mbar (± 0.29 psi).

Operating curves



Connection

Terminal model



- 1 Maximum differential
- 2 Minimum differential

— Adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

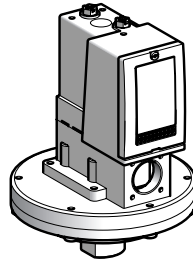
Size 350 mbar (5.07 psi)

Dual stage, fixed differential, for detection at each threshold

Switches with 2 CO single-pole contacts

OsiSense XMLD pressure switches

Without setting scale



Adjustable range of each switching point (Rising pressure)	2nd stage switching point (PH2) 1st stage switching point (PH1)	58...350 mbar (0.84...5.07 psi) 33...325 mbar (0.48...4.71 psi)
Spread between 2 stages (PH2 - PH1)		25...310 mbar (0.36...4.50 psi)
Electrical connection		Terminals
Fluid connection		G 1/4 (female)

References (1)

Fluids controlled (2)	Hydraulic oils, air, up to + 160 °C	XMLDL35R1S12
Weight (kg)		2.575

Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH1/PH2 to give PB1/PB2)	At low setting (3) At high setting (4)	30 mbar (0.44 psi) 30 mbar (0.44 psi)
Maximum permissible pressure	Per cycle Accidental	1.25 bar (18.12 psi) 2.25 bar (32.62 psi)
Destruction pressure		4.5 bar (65.25 psi)
Mechanical life		4 million operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm

(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLDL35R1S12** becomes **XMLDL35R1S11**).

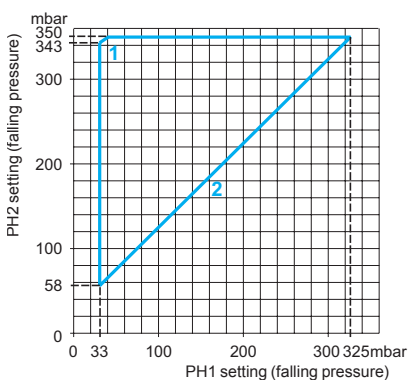
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low setting point for switches of the same size:
± 10 mbar (± 0.15 psi).

(4) Deviation of the differential at high setting point for switches of the same size:
± 8 mbar (± 0.11 psi).

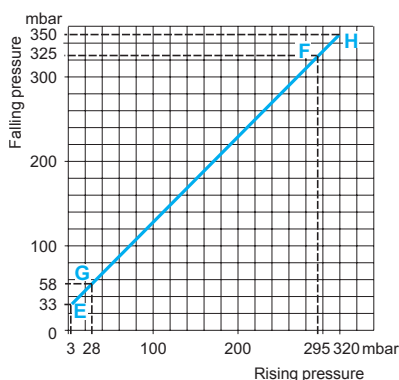
Operating curves

High setting tripping points of contacts 1 and 2

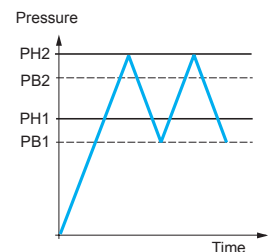


- 1 Maximum differential
- 2 Minimum differential

Natural differential of contacts 1 and 2



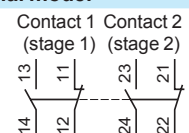
- EF Contact 1 (stage 1)
- GH Contact 2 (stage 2)



— Adjustable value
--- Non adjustable value

Connection

Terminal model



Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

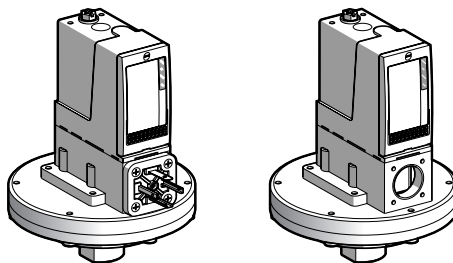
Size 1 bar (14.5 psi)

Fixed differential, for detection of a single threshold

Switches with 1 CO single-pole contact

OsiSense XMLA pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	0.03...1 bar (0.435...14.5 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, air, up to + 160 °C	XMLA001R2C11	XMLA001R2S12	—
	Fresh water, corrosive fluids, up to + 160 °C	XMLA001S2C11	XMLA001S2S12	XMLA001S2S13
Weight (kg)		2.570	2.555	2.555

Complementary characteristics not shown under general characteristics (page 2/63)

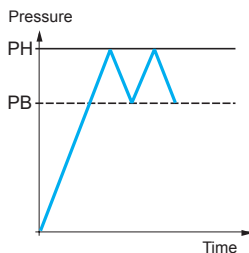
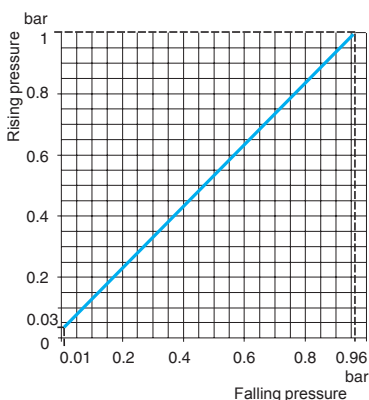
Natural differential (subtract from PH to give PB)	At low setting (3)	0.02 bar (0.29 psi)		
	At high setting (3)	0.04 bar (0.58 psi)		
Maximum permissible pressure	Per cycle	1.25 bar (18.12 psi)		
	Accidental	2.25 bar (32.62 psi)		
Destruction pressure		4.5 bar (65.25 psi)		
Mechanical life		4 x 10 ⁶ operating cycles		
Connection	EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	
	Pressure switch type	Diaphragm		

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLA001R2S12 becomes XMLA001R2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size:
± 0.01 bar (± 0.14 psi)

Operating curves



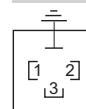
Connection

Terminal model



Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

— Adjustable value
--- Non adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

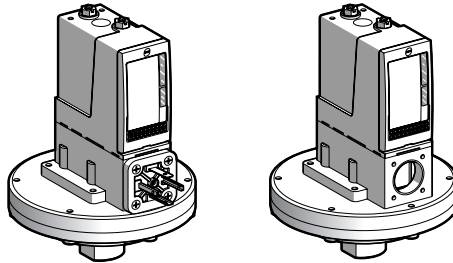
Size 1 bar (14.5 psi)

Adjustable differential, for regulation between 2 thresholds

Switches with 1 CO single-pole contact

OsiSense XMLB pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	0.05...1 bar (0.72...14.5 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, air, up to + 160 °C	XMLB001R2C11	XMLB001R2S12	XMLB001R2S13
	Fresh water, corrosive fluids, up to + 160 °C	XMLB001S2C11	XMLB001S2S12	XMLB001S2S13
	Viscous products, up to + 160 °C (G 1¼" fluid connection)	—	XMLB001P2S12	—
Weight (kg)		2.590	2.575	2.575

Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting (3)	0.04 bar (0.58 psi)		
	Min. at high setting (4)	0.06 bar (0.87 psi)		
	Max. at high setting	0.75 bar (10.87 psi)		
Maximum permissible pressure	Per cycle	1.25 bar (18.12 psi)		
	Accidental	2.25 bar (32.62 psi)		
Destruction pressure		4.5 bar (65.25 psi)		
Mechanical life		4 x 10 ⁸ operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
	Pressure switch type	Diaphragm		

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLB001R2S12 becomes XMLB001R2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

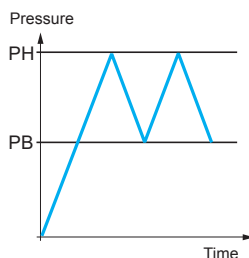
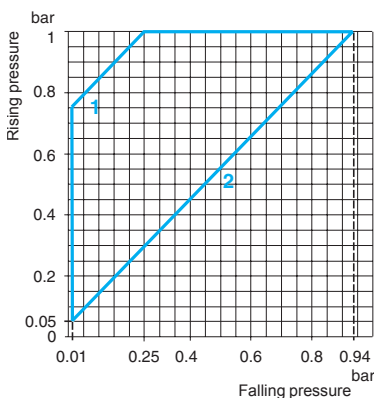
(3) Deviation of the differential at low setting point for switches of the same size:

± 10 mbar (± 0.14 psi).

(4) Deviation of the differential at high setting point for switches of the same size:

± 20 mbar (± 0.29 psi).

Operating curves



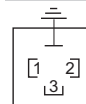
Connection

Terminal model



Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

- 1 Maximum differential
- 2 Minimum differential

— Adjustable value

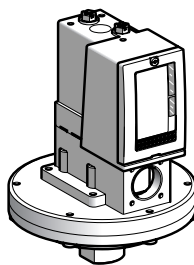
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

2

OsiSense XMLC pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	0.05...1 bar (0.725...14.5 psi)	
Electrical connection	Terminals	
Fluid connection	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, air, up to + 160 °C	XMLC001R2S12	XMLC001R2S13
	Fresh water, corrosive fluids, up to + 160 °C	XMLC001S2S12	XMLC001S2S13
Weight (kg)	2.555		2.555

Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting (3)	0.03 bar (0.43 psi)	
	Min. at high setting (4)	0.04 bar (0.58 psi)	
	Max. at high setting	0.8 bar (11.6 psi)	
Maximum permissible pressure	Per cycle	1.25 bar (18.12 psi)	
	Accidental	2.25 bar (32.62 psi)	
Destruction pressure	4.5 bar (65.25 psi)		
Mechanical life	4 x 10 ⁶ operating cycles		
Cable entry for terminal models	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	
Pressure switch type	Diaphragm		

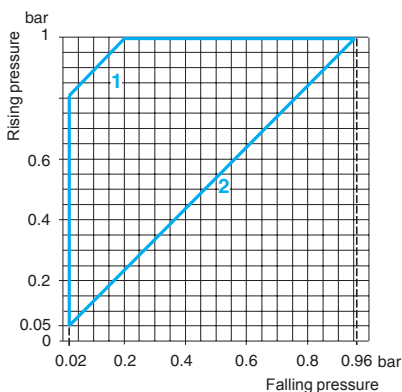
(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLC001R2S12 becomes XMLC001R2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

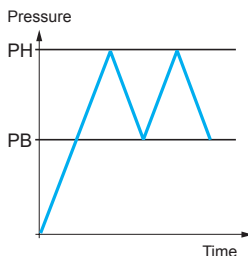
(3) Deviation of the differential at low setting point for switches of the same size:
± 0.01 bar (± 0.14 psi)

(4) Deviation of the differential at high setting point for switches of the same size:
± 0.03 bar (± 0.43 psi)

Operating curves



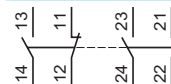
- 1 Maximum differential
- 2 Minimum differential



— Adjustable value

Connection

Terminal model

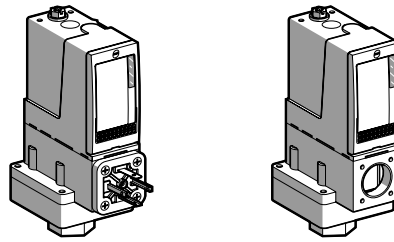


Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

OsiSense XMLA pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	0.15...2.5 bar (2.17...36.25 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)				
Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 70 °C	XMLA002A2C11	XMLA002A2S12	XMLA002A2S13
	Hydraulic oils, fresh water, air, up to + 160 °C	XMLA002B2C11	XMLA002B2S12	—
	Corrosive fluids, up to + 160 °C	XMLA002C2C11	XMLA002C2S12	—
Weight (kg)		1.010	0.995	0.995

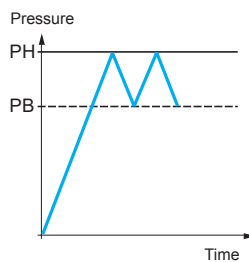
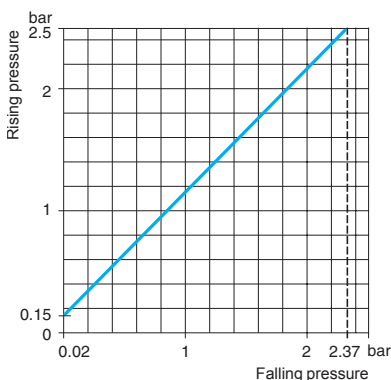
Complementary characteristics not shown under general characteristics (page 2/63)				
Natural differential (subtract from PH to give PB)	At low setting (3)	0.13 bar (1.88 psi)		
	At high setting (3)	0.13 bar (1.88 psi)		
Maximum permissible pressure	Per cycle	5 bar (72.5 psi)		
	Accidental	9 bar (130.5 psi)		
Destruction pressure		18 bar (261 psi)		
Mechanical life		8 x 10 ⁸ operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLA002A2S12 becomes XMLA002A2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.03 bar (± 0.43 psi).

Operating curves



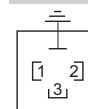
Connection

Terminal model



Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

— Adjustable value
--- Non adjustable value

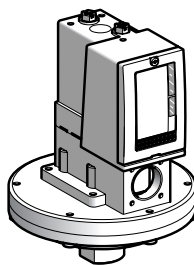
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

2

OsiSense XMLC pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	0.05...1 bar (0.725...14.5 psi)	
Electrical connection	Terminals	
Fluid connection	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, air, up to + 160 °C	XMLC001R2S12	XMLC001R2S13
	Fresh water, corrosive fluids, up to + 160 °C	XMLC001S2S12	XMLC001S2S13
Weight (kg)	2.555		2.555

Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting (3)	0.03 bar (0.43 psi)	
	Min. at high setting (4)	0.04 bar (0.58 psi)	
	Max. at high setting	0.8 bar (11.6 psi)	
Maximum permissible pressure	Per cycle	1.25 bar (18.12 psi)	
	Accidental	2.25 bar (32.62 psi)	
Destruction pressure	4.5 bar (65.25 psi)		
Mechanical life	4 x 10 ⁶ operating cycles		
Cable entry for terminal models	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	
Pressure switch type	Diaphragm		

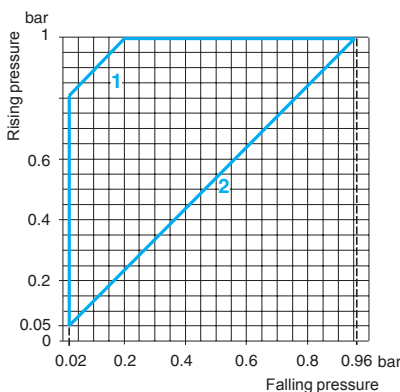
(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLC001R2S12 becomes XMLC001R2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

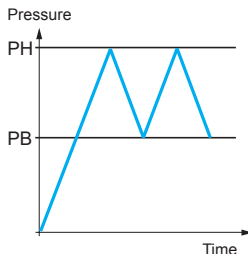
(3) Deviation of the differential at low setting point for switches of the same size:
± 0.01 bar (± 0.14 psi)

(4) Deviation of the differential at high setting point for switches of the same size:
± 0.03 bar (± 0.43 psi)

Operating curves



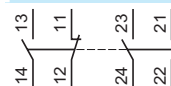
- 1 Maximum differential
- 2 Minimum differential



— Adjustable value

Connection

Terminal model



Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

OsiSense XML

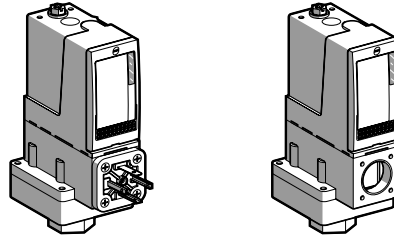
Size 2.5 bar (36.25 psi)

Fixed differential, for detection of a single threshold

Switches with 1 CO single-pole contact

OsiSense XMLA pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	0.15...2.5 bar (2.17...36.25 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 70 °C	XMLA002A2C11	XMLA002A2S12	XMLA002A2S13
	Hydraulic oils, fresh water, air, up to + 160 °C	XMLA002B2C11	XMLA002B2S12	—
	Corrosive fluids, up to + 160 °C	XMLA002C2C11	XMLA002C2S12	—
Weight (kg)		1.010	0.995	0.995

Complementary characteristics not shown under general characteristics (page 2/63)

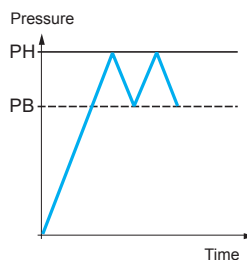
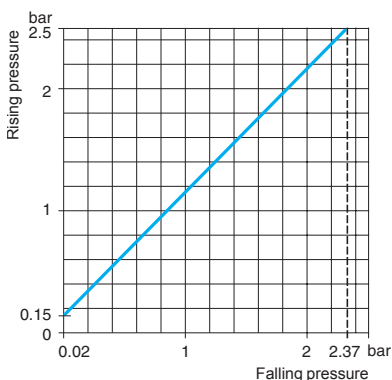
Natural differential (subtract from PH to give PB)	At low setting (3)	0.13 bar (1.88 psi)		
	At high setting (3)	0.13 bar (1.88 psi)		
Maximum permissible pressure	Per cycle	5 bar (72.5 psi)		
	Accidental	9 bar (130.5 psi)		
Destruction pressure		18 bar (261 psi)		
Mechanical life		8 x 10 ⁸ operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLA002A2S12** becomes **XMLA002A2S11**).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size:
± 0.03 bar (± 0.43 psi).

Operating curves



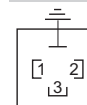
Connection

Terminal model



Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

— Adjustable value
--- Non adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

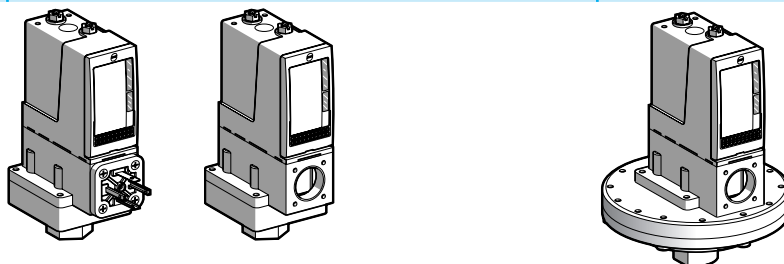
Size 2.5 bar (36.25 psi)

Adjustable differential, for regulation between 2 thresholds

Switches with 1 CO single-pole contact

2

OsiSense XMLB pressure switches	With setting scale	30 bar (435 psi) overpressure With setting scale
---------------------------------	--------------------	-----------------------------------------------------



Adjustable range of switching point (PH) (Rising pressure)	0.3...2.5 bar (4.35...36.25 psi)			
Electrical connection	DIN connector	Terminals		
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)	G 1/4 (female)

References (1)

Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 70 °C	XMLB002A2C11	XMLB002A2S12	XMLB002A2S13	—
	Hydraulic oils, fresh water, air, up to + 160 °C	XMLB002B2C11	XMLB002B2S12	—	XMLBS02B2S12
	Corrosive fluids, up to + 160 °C	XMLB002C2C11	XMLB002C2S12	—	—
Weight (kg)		1.030	1.015	1.015	3.500

Complementary characteristics not shown under general characteristics (page 2/63)

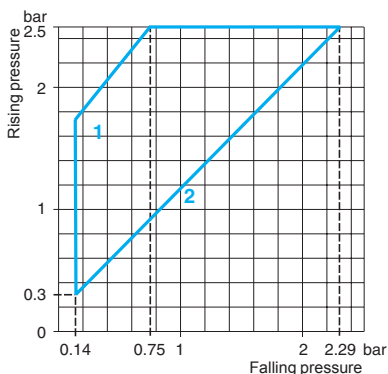
Possible differential (subtract from PH to give PB)	Min. at low setting (3)	0.16 bar (2.32 psi)	0.1 bar (1.45 psi)	
	Min. at high setting (3)	0.21 bar (3.04 psi)	0.22 bar (3.19 psi)	
	Max. at high setting	1.75 bar (25.37 psi) 5 bar (72.5 psi)	1.45 bar (21 psi) 30 bar (435 psi)	
Maximum permissible pressure	Per cycle	9 bar (130.5 psi)	37.5 bar (543.75 psi)	
	Accidental	18 bar (261 psi)	67.5 bar (978.75 psi)	
Destruction pressure		8 x 10 ⁶ operating cycles	2 x 10 ⁶ operating cycles	
Mechanical life		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Connection		Diaphragm	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLB002A2S12 becomes XMLB002A2S11).

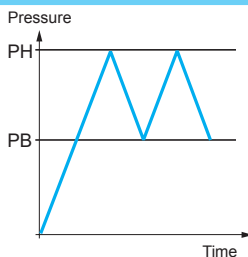
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size:
- 0.03 bar, + 0.05 bar (- 0.43 psi, + 0.72 psi).

Operating curves



- 1 Maximum differential
- 2 Minimum differential



— Adjustable value

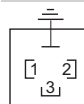
Connection

Terminal model



Connector model

Pressure switch connector pin view



- 1 → 11 and 13
- 2 → 12
- 3 → 14

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

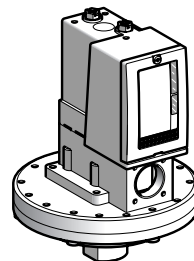
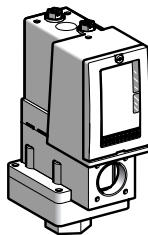
OsiSense XML

Size 2.5 bar (36.25 psi)

Adjustable differential, for regulation between 2 thresholds

Switches with 2 CO single-pole contacts

OsiSense XMLC pressure switches	With setting scale	30 bar (435 psi) overpressure With setting scale	
---------------------------------	--------------------	-----------------------------------------------------	--



Adjustable range of switching point (PH) (Rising pressure)	0.3...2.5 bar (4.35...36.25 psi)			
Electrical connection	Terminals			
Fluid connection	G 1/4 (female)	1/4"-18 NPTF (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)					
Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 160 °C	XMLC002B2S12	XMLC002B2S13	XMLCS02B2S12	XMLCS02B2S13
Weight (kg)		0.995	0.995	3.500	3.500

Complementary characteristics not shown under general characteristics (page 2/63)					
Possible differential (subtract from PH to give PB)	Min. at low setting (3)	0.13 bar (1.89 psi)		0.1 bar (1.45 psi)	
	Min. at high setting (4)	0.17 bar (2.47 psi)		0.18 bar (2.61 psi)	
	Max. at high setting	2 bar (29 psi)		1.25 bar (18.12 psi)	
Maximum permissible pressure	Per cycle	5 bar (72.5 psi)		30 bar (435 psi)	
	Accidental	9 bar (130.5 psi)		37.5 bar (543.75 psi)	
Destruction pressure		18 bar (261 psi)		67.5 bar (978.75 psi)	
Mechanical life		8 x 10 ⁸ operating cycles		2 x 10 ⁶ operating cycles	
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm			

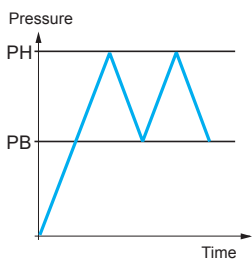
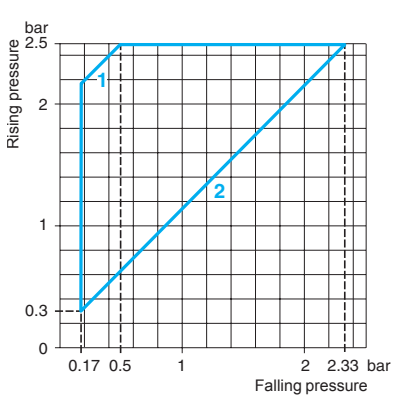
(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLC002B2S12 becomes XMLC002B2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

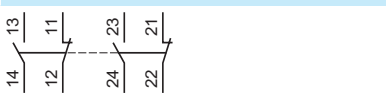
(3) Deviation of the differential at low setting point for switches of the same size:
± 0.02 bar (± 0.29 psi)

(4) Deviation of the differential at high setting point for switches of the same size:
± 0.03 bar (± 0.43 psi)

Operating curves



Connection



- 1 Maximum differential
- 2 Minimum differential

— Adjustable value

Other versions For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

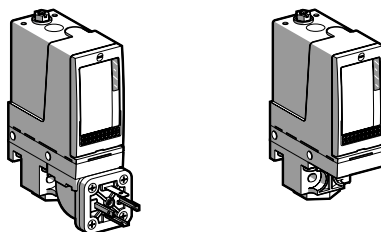
OsiSense XML

Size 4 bar (58 psi)

Fixed differential, for detection of a single threshold
Switches with 1 CO single-pole contact

OsiSense XMLA pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	0.4...4 bar (5.8...58 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 70 °C	XMLA004A2C11	XMLA004A2S12	XMLA004A2S13
	Hydraulic oils, fresh water, air, up to + 160 °C	XMLA004B2C11	XMLA004B2S12	—
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	XMLA004C2C11	XMLA004C2S12	—
	Viscous products, up to + 160 °C (G 1/4" fluid connection)	XMLA004P2C11	XMLA004P2S12	—
Weight (kg)		0.715	0.685	0.685

Complementary characteristics not shown under general characteristics (page 2/63)

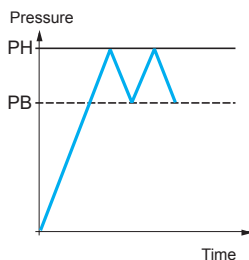
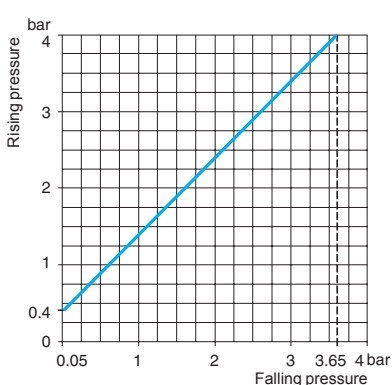
Natural differential (subtract from PH to give PB)	At low setting (3)	0.35 bar (5.07 psi)		
	At high setting (3)	0.35 bar (5.07 psi)		
Maximum permissible pressure	Per cycle	5 bar (72.5 psi)		
	Accidental	9 bar (130.5 psi)		
Destruction pressure		18 bar (261 psi)		
Mechanical life		8 x 10 ⁶ operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLA004A2S12** becomes **XMLA004A2S11**).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size:
± 0.03 bar (± 0.43 psi)

Operating curves



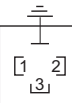
Connection

Terminal model



Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

— Adjustable value
--- Non adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

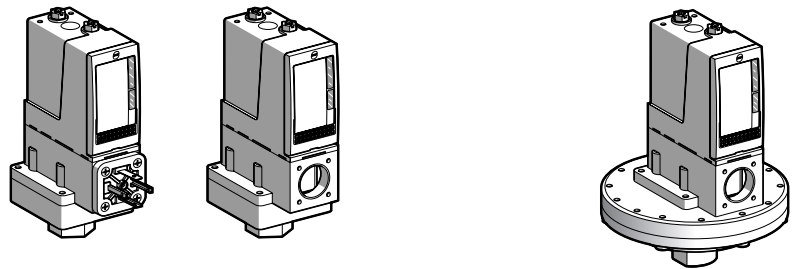
OsiSense XML

Size 4 bar (58 psi)

Adjustable differential, for regulation between 2 thresholds

Switches with 1 CO single-pole contact

OsiSense XMLB pressure switches	With setting scale	30 bar (435 psi) overpressure With setting scale
---------------------------------	--------------------	--------------------------------------------------------



Adjustable range of switching point (PH) (Rising pressure)	0.25...4 bar (3.62...58 psi)			
Electrical connection	DIN connector	Terminals		
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)	G 1/4 (female)

References (1)					
Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 70 °C	XMLB004A2C11	XMLB004A2S12	XMLB004A2S13	—
	Hydraulic oils, fresh water, air, up to + 160 °C	XMLB004B2C11	XMLB004B2S12	—	XMLBS04B2S12
	Corrosive fluids, up to + 160 °C	XMLB004C2C11	XMLB004C2S12	—	—
Weight (kg)		1.030	1.015	1.015	3.500

Complementary characteristics not shown under general characteristics (page 2/63)					
Possible differential (subtract from PH to give PB)	Min. at low setting (3)	0.2 bar (2.9 psi)			0.15 bar (2.18 psi)
	Min. at high setting (4)	0.25 bar (3.62 psi)			0.34 bar (4.93 psi)
	Max. at high setting	2.4 bar (34.8 psi)			2.46 bar (35.67 psi)
Maximum permissible pressure	Per cycle	5 bar (72.5 psi)			30 bar (435 psi)
	Accidental	9 bar (130.5 psi)			37.5 bar (543.75 psi)
Destruction pressure		18 bar (261 psi)			67.5 bar (978.75 psi)
Mechanical life		8 x 10 ⁸ operating cycles			2 x 10 ⁶ operating cycles
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
	Pressure switch type	Diaphragm			

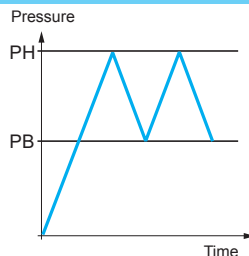
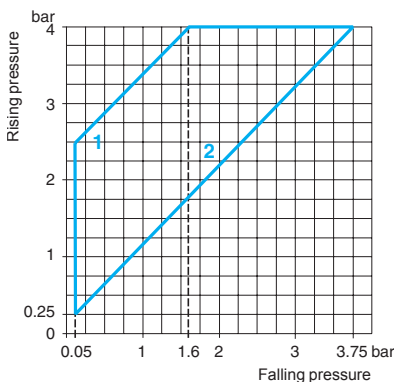
(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLB004A2S12 becomes XMLB004A2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low setting point for switches of the same size:
± 0.01 bar (± 0.14 psi).

(4) Deviation of the differential at high setting point for switches of the same size:
- 0.03 bar, + 0.05 bar (- 0.43 psi, + 0.72 psi).

Operating curves



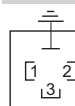
Connection

Terminal model



Connector model

Pressure switch connector pin view



- 1 → 11 and 13
- 2 → 12
- 3 → 14

- 1 Maximum differential
- 2 Minimum differential

— Adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

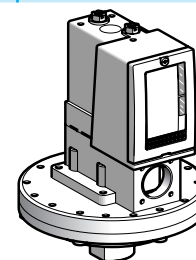
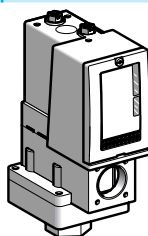
Size 4 bar (58 psi)

Adjustable differential, for regulation between 2 thresholds

Switches with 2 CO single-pole contacts

2

OsiSense XMLC pressure switches	With setting scale	30 bar (435 psi) overpressure With setting scale
---------------------------------	--------------------	-----------------------------------------------------



Adjustable range of switching point (PH) (Rising pressure)	0.3...4 bar (4.35...58 psi)		
Electrical connection	Terminals		
Fluid connection	G 1/4 (female)	1/4"-18 NPTF (female)	G 1/4 (female)

References (1)

Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 160 °C	XMLC004B2S12	XMLC004B2S13	XMLCS04B2S12
	Corrosive fluids, up to + 160 °C	XMLC004C2S12	XMLC004C2S13	-
Weight (kg)		0.685	0.685	3.500

Complementary characteristics not shown under general characteristics (page 2/63)

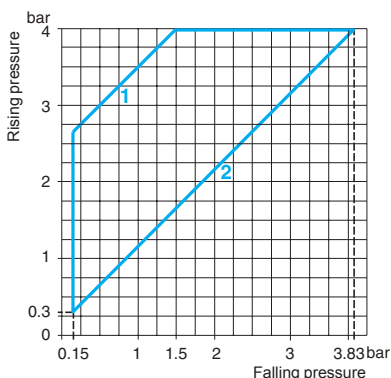
Possible differential (subtract from PH to give PB)	Min. at low setting (3)	0.15 bar (2.18 psi)	0.1 bar (1.45 psi)	
	Min. at high setting (3)	0.17 bar (2.47 psi)	0.25 bar (3.62 psi)	
	Max. at high setting	2.5 bar (36.25 psi)	2.20 bar (31.9 psi)	
Maximum permissible pressure	Per cycle	5 bar (72.5 psi)	30 bar (435 psi)	
	Accidental	9 bar (130.5 psi)	37.5 bar (543.75 psi)	
Destruction pressure		18 bar (261 psi)	67.5 bar (978.75 psi)	
Mechanical life		8 x 10 ⁶ operating cycles	2 x 10 ⁶ operating cycles	
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type	Diaphragm			

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLC004B2S12 becomes XMLC004B2S11).

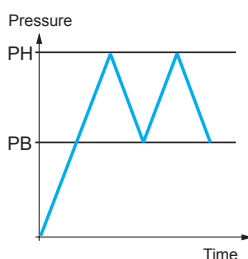
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size:
± 0.02 bar (± 0.29 psi).

Operating curves



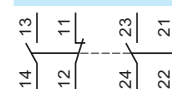
- 1 Maximum differential
- 2 Minimum differential



— Adjustable value

Connection

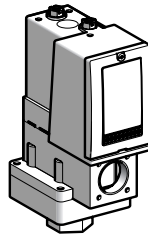
Terminal model



Other versions For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

OsiSense XMLD pressure switches

Without setting scale



Adjustable range of each switching point (Rising pressure)	2nd stage switching point (PH2) 1st stage switching point (PH1)	0.40...4 bar (5.8...58 psi) 0.19...3.79 bar (2.76...54.96 psi)
Spread between 2 stages (PH2 - PH1)		0.21...2.18 bar (3.05...31.61 psi)
Electrical connection		Terminals
Fluid connection		G 1/4 (female)

References (1)

Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 160 °C	XMLD004B1S12
Weight (kg)		1.015

Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH1/PH2 to give PB1/PB2)	At low setting (3) At high setting (3)	0.15 bar (2.18 psi) 0.19 bar (2.76 psi)
Maximum permissible pressure	Per cycle Accidental	5 bar (72.5 psi) 9 bar (130.5 psi)
Destruction pressure		18 bar (261 psi)
Mechanical life		8 x 10 ⁸ operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm

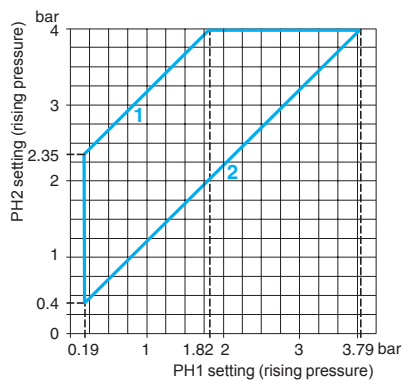
(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLD004B1S12 becomes XMLD004B1S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.03 bar (± 0.43 psi).

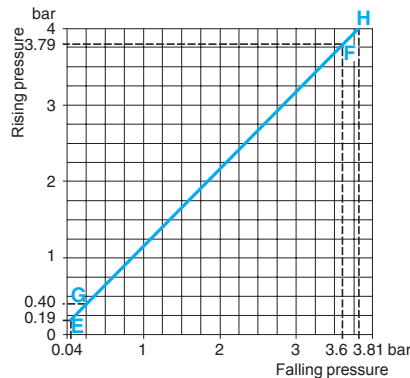
Operating curves

High setting tripping points of contacts 1 and 2

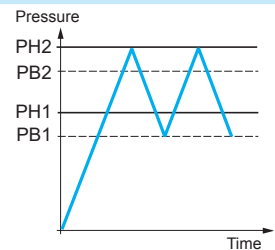


- 1 Maximum differential
- 2 Minimum differential

Natural differential of contacts 1 and 2



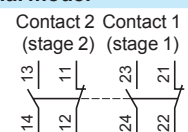
- EF Contact 1 (stage 1)
- GH Contact 2 (stage 2)



— Adjustable value
--- Non adjustable value

Connection

Terminal model



Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

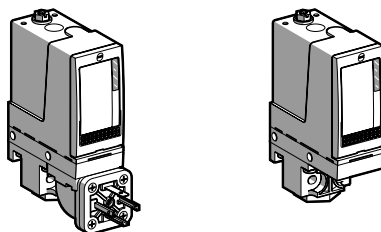
Size 10 bar (145 psi)

Fixed differential, for detection of a single threshold

Switches with 1 CO single-pole contact

2

OsiSense XMLA pressure switches | With setting scale



Adjustable range of switching point (PH) (Rising pressure)	0.6...10 bar (8.7...145 psi)		
Electrical connection	DIN connector	Terminals	Terminals
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 70 °C	XMLA010A2C11	XMLA010A2S12	XMLA010A2S13
	Hydraulic oils, fresh water, air, up to + 160 °C	XMLA010B2C11	XMLA010B2S12	—
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	XMLA010C2C11	XMLA010C2S12	XMLA010C2S13
	Viscous products, up to + 160 °C (G 1 1/4" fluid connection)	XMLA010P2C11	XMLA010P2S12	—

Weight (kg)	0.715	0.685	0.685
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Complementary characteristics not shown under general characteristics (page 2/63)

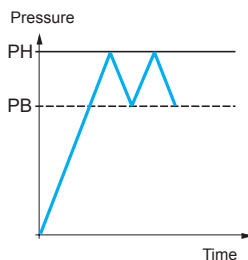
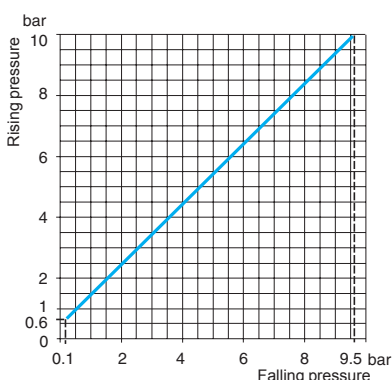
Natural differential (subtract from PH to give PB)	At low setting (3)	0.5 bar (7.25 psi)	
	At high setting (3)	0.5 bar (7.25 psi)	
Maximum permissible pressure	Per cycle	12.5 bar (181.25 psi)	
	Accidental	22.5 bar (326.25 psi)	
Destruction pressure		45 bar (652.5 psi)	
Mechanical life		5 x 10 ⁶ operating cycles	
Connection	EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
		Diaphragm	

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLA010A2S12 becomes XMLA010A2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.05 bar (± 0.72 psi)

Operating curves | Connection

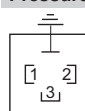


Terminal model



Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

— Adjustable value
--- Non adjustable value

Other versions For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

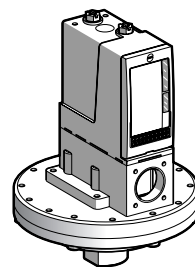
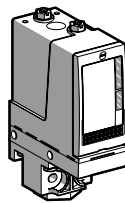
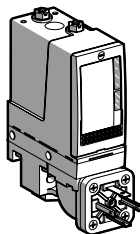
OsiSense XML

Size 10 bar (145 psi)

Adjustable differential, for regulation between 2 thresholds

Switches with 1 CO single-pole contact

OsiSense XMLB pressure switches	With setting scale	30 bar (435 psi) overpressure With setting scale
---------------------------------	--------------------	-----------------------------------------------------



Adjustable range of switching point (PH) (Rising pressure)	0.7...10 bar (10.15...145 psi)			
Electrical connection	DIN connector	Terminals	Terminals	Terminals
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)	G 1/4 (female)

References (1)					
Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 70 °C	XMLB010A2C11	XMLB010A2S12	XMLB010A2S13	XMLBS10A2S12
	Hydraulic oils, fresh water, air, up to + 160 °C	XMLB010B2C11	XMLB010B2S12	XMLB010B2S13	—
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	XMLB010C2C11	XMLB010C2S12	XMLB010C2S13	—
	Viscous products, up to + 160 °C (G 1 1/4" fluid connection)	XMLB010P2C11	XMLB010P2S12	—	—
Weight (kg)	0.735	0.705	0.705	3.500	

Complementary characteristics not shown under general characteristics (page 2/63)				
Possible differential (subtract from PH to give PB)	Min. at low setting (3)	0.57 bar (8.26 psi)		0.45 bar (6.52 psi)
	Min. at high setting (4)	0.85 bar (12.32 psi)		0.85 bar (12.32 psi)
	Max. at high setting	7.5 bar (108.75 psi)		6.25 bar (90.62 psi)
Maximum permissible pressure	Per cycle	12.5 bar (181.25 psi)		30 bar (435 psi)
	Accidental	22.5 bar (326.25 psi)		37.5 bar (543.75 psi)
Destruction pressure		45 bar (652.5 psi)		67.5 bar (978.75 psi)
Mechanical life		5 x 10 ⁶ operating cycles		2 x 10 ⁶ operating cycles
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

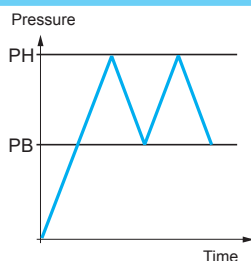
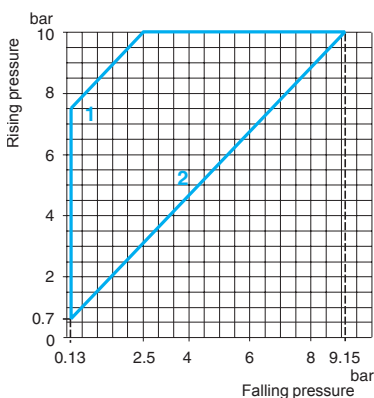
(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLB010A2S12 becomes XMLB010A2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low setting point for switches of the same size:
± 0.05 bar (± 0.72 psi).

(4) Deviation of the differential at high setting point for switches of the same size:
- 0.1 bar, + 0.15 bar (- 1.45 psi, + 2.17 psi).

Operating curves



— Adjustable value

- 1 Maximum differential
- 2 Minimum differential

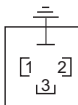
Connection

Terminal model



Connector model

Pressure switch connector pin view



- 1 → 11 and 13
- 2 → 12
- 3 → 14

Electromechanical pressure switches

OsiSense XML

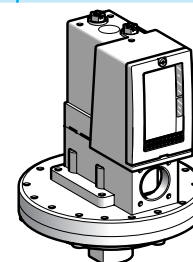
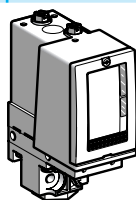
Size 10 bar (145 psi)

Adjustable differential, for regulation between 2 thresholds

Switches with 2 CO single-pole contacts

2

OsiSense XMLC pressure switches	With setting scale	30 bar (435 psi) overpressure With setting scale
---------------------------------	--------------------	-----------------------------------------------------



Adjustable range of switching point (PH) (Rising pressure)	0.7...10 bar (10.15...145 psi)		
Electrical connection	Terminals		
Fluid connection	G 1/4 (female)	1/4"-18 NPTF (female)	G 1/4 (female)

References (1)

Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 70 °C	—	—	XMLCS10A2S12
	Hydraulic oils, fresh water, air, up to + 160 °C	XMLC010B2S12	XMLC010B2S13	—
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	XMLC010C2S12	XMLC010C2S13	—
Weight (kg)	0.685	0.685	3.500	

Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting (3)	0.45 bar (6.53 psi)	0.25 bar (3.62 psi)	
	Min. at high setting (4)	0.70 bar (10.15 psi)	0.65 bar (9.42 psi)	
	Max. at high setting	8 bar (116 psi)	5.6 bar (81.2 psi)	
Maximum permissible pressure	Per cycle	12.5 bar (181.25 psi)	30 bar (435 psi)	
	Accidental	22.5 bar (326.25 psi)	37.5 bar (543.75 psi)	
Destruction pressure		45 bar (652.5 psi)	67.5 bar (978.75 psi)	
Mechanical life		5 x 10 ⁶ operating cycles	2 x 10 ⁶ operating cycles	
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLC010B2S12 becomes XMLC010B2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

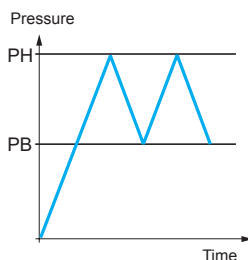
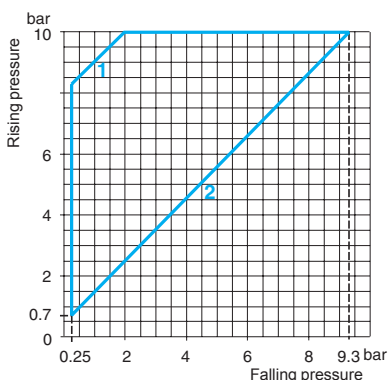
(3) Deviation of the differential at low setting point for switches of the same size:

± 0.05 bar (± 0.72 psi)

(4) Deviation of the differential at high setting point for switches of the same size:

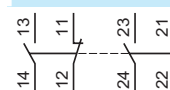
± 0.01 bar (± 1.45 psi)

Operating curves



Connection

Terminal model



- 1 Maximum differential
- 2 Minimum differential

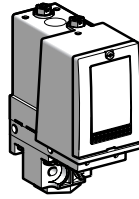
— Adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

OsiSense XMLD pressure switches

Without setting scale



Adjustable range of each switching point (Rising pressure)	2nd stage switching point (PH2) 1st stage switching point (PH1)	1.2...10 bar (17.4...145 psi) 0.52...9.32 bar (7.54...135.14 psi)
Spread between 2 stages (PH2 - PH1)		0.68...5.8 bar (9.86...84.1 psi)
Fluid connection		G 1/4 (female)
Electrical connection		Terminals

References

Fluids controlled (1)	Hydraulic oils, fresh water, air, up to + 160 °C	XMLD010B1S11	XMLD010B1S12
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	XMLD010C1S11	—
Weight (kg)		0.705	0.705

Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH1/PH2 to give PB1/PB2)	At low setting (2)	0.45 bar (6.53 psi)
	At high setting (3)	0.6 bar (8.7 psi)
Maximum permissible pressure	Per cycle	12.5 bar (181.25 psi)
	Accidental	22.5 bar (326.25 psi)
Destruction pressure		45 bar (652.5 psi)
Mechanical life		5 x 10 ⁹ operating cycles
Cable entry for terminal models		1 entry tapped for no. 13 cable gland
		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm

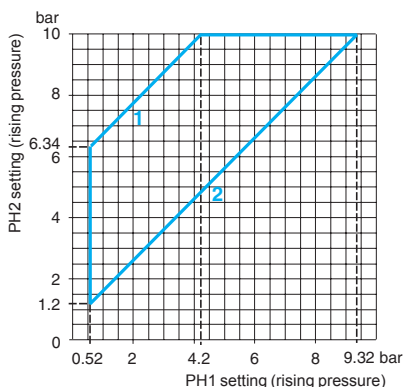
(1) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(2) Deviation of the differential at low setting point for switches of the same size:
± 0.05 bar (± 0.72 psi)

(3) Deviation of the differential at high setting point for switches of the same size:
± 0.1 bar (± 1.45 psi)

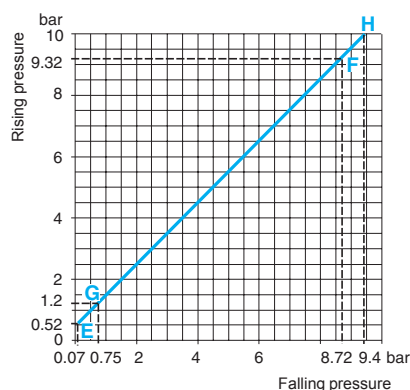
Operating curves

High setting tripping points of contacts 1 and 2

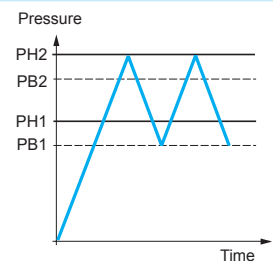


- 1 Maximum differential
- 2 Minimum differential

Natural differential of contacts 1 and 2



- EF Contact 1 (stage 1)
- GH Contact 2 (stage 2)

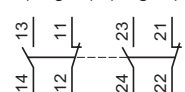


— Adjustable value
--- Non adjustable value

Connection

Terminal model

Contact 2 (stage 2) Contact 1 (stage 1)



Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

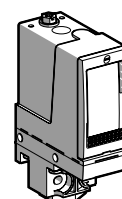
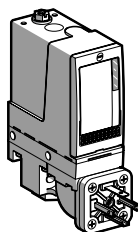
Size 20 bar (290 psi)

Fixed differential, for detection of a single threshold

Switches with 1 CO single-pole contact

OsiSense XMLA pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	1...20 bar (14.5...290 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 70 °C	XMLA020A2C11	XMLA020A2S12	XMLA020A2S13
	Hydraulic oils, fresh water, air, up to + 160 °C	XMLA020B2C11	XMLA020B2S12	—
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	XMLA020C2C11	XMLA020C2S12	—
	Viscous products, up to + 160 °C (G 1/4" fluid connection)	XMLA020P2C11	XMLA020P2S12	—
	Weight (kg)	0.715	0.685	0.685

Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH to give PB)	At low setting (3)	0.4 bar (5.8 psi)		
	At high setting (3)	1 bar (14.5 psi)		
Maximum permissible pressure	Per cycle	25 bar (362.5 psi)		
	Accidental	45 bar (652.5 psi)		
Destruction pressure	90 bar (1305 psi)			
Mechanical life	5 x 10 ⁶ operating cycles			
Connection	EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	
Pressure switch type	Diaphragm			

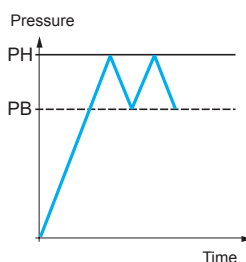
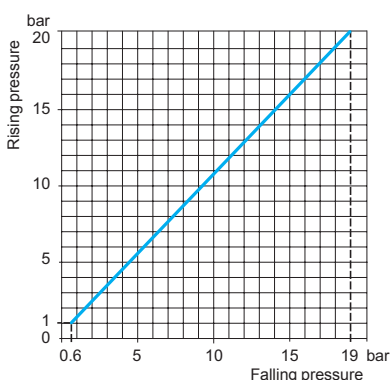
(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLA020A2S12 becomes XMLA020A2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at high setting point for switches of the same size:
± 0.1 bar (± 1.45 psi)

Deviation of the differential at low setting point: ± 0.2 bar (± 2.9 psi)

Operating curves



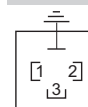
Connection

Terminal model



Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

— Adjustable value
--- Non adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

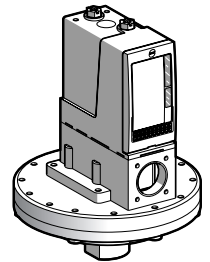
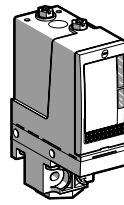
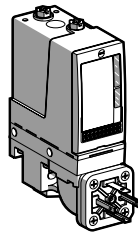
OsiSense XML

Size 20 bar (290 psi)

Adjustable differential, for regulation between 2 thresholds

Switches with 1 CO single-pole contact

OsiSense XMLB pressure switches	With setting scale	30 bar (435 psi) overpressure With setting scale
---------------------------------	--------------------	--------------------------------------------------------



Adjustable range of switching point (PH) (Rising pressure)	1.3...20 bar (18.9...290 psi)			
Electrical connection	DIN connector	Terminals		
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)	G 1/4 (female)

References (1)					
Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 70 °C	XMLB020A2C11	XMLB020A2S12	XMLB020A2S13	XMLBS20A2S12
	Hydraulic oils, fresh water, air, up to + 160 °C	XMLB020B2C11	XMLB020B2S12	XMLB020B2S13	—
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	XMLB020C2C11	XMLB020C2S12	—	—
	Viscous products, up to + 160 °C (G 1¼" fluid connection)	XMLB020P2C11	XMLB020P2S12	—	—
Weight (kg)	0.735	0.705	0.705	3.500	

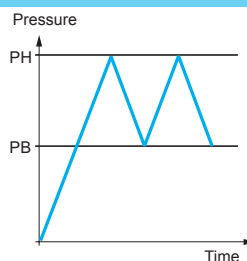
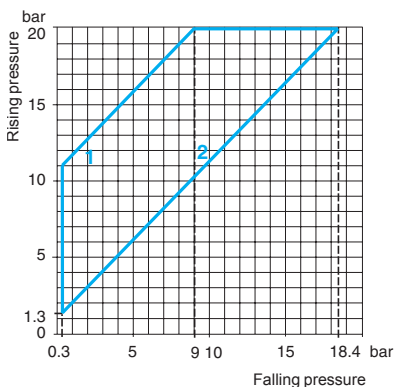
Complementary characteristics not shown under general characteristics (page 2/63)				
Possible differential (subtract from PH to give PB)	Min. at low setting (3)	1 bar (14.5 psi)		0.95 bar (13.78 psi)
	Min. at high setting (3)	1.6 bar (23.20 psi)		1.45 bar (21.03 psi)
	Max. at high setting	11 bar (159.5 psi)		12.6 bar (182.7 psi)
Maximum permissible pressure	Per cycle	25 bar (362.5 psi)		30 bar (435 psi)
	Accidental	45 bar (652.5 psi)		37.5 bar (543.75 psi)
Destruction pressure	90 bar (1305 psi)		67.5 bar (978.75 psi)	
Mechanical life	5 x 10 ⁶ operating cycles			2 x 10 ⁶ operating cycles
Connection	EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
		Diaphragm		

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLB020A2S12 becomes XMLB020A2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size:
± 0.25 bar (± 3.63 psi)

Operating curves



- 1 Maximum differential
- 2 Minimum differential

— Adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

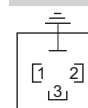
Connection

Terminal model



Connector model

Pressure switch connector pin view



- 1 → 11 and 13
- 2 → 12
- 3 → 14

Electromechanical pressure switches

OsiSense XML

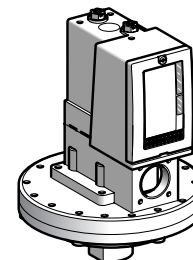
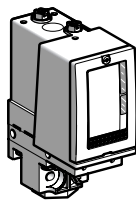
Size 20 bar (290 psi)

Adjustable differential, for regulation between 2 thresholds

Switches with 2 CO single-pole contacts

2

OsiSense XMLC pressure switches	With setting scale	30 bar (435 psi) overpressure With setting scale
---------------------------------	--------------------	--------------------------------------------------------



Adjustable range of switching point (PH) (Rising pressure)	1.3...20 bar (18.85...290 psi)		
Electrical connection	Terminals		
Fluid connection	G 1/4 (female)	1/4"-18 NPTF (female)	G 1/4 (female)

References (1)

Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 70 °C	—	—	XMLCS20A2S12
	Hydraulic oils, fresh water, air, up to + 160 °C	XMLC020B2S12	XMLC020B2S13	—
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	XMLC020C2S12	XMLC020C2S13	—
Weight (kg)	0.685	0.685	3.500	

Complementary characteristics not shown under general characteristics (page 2/63)

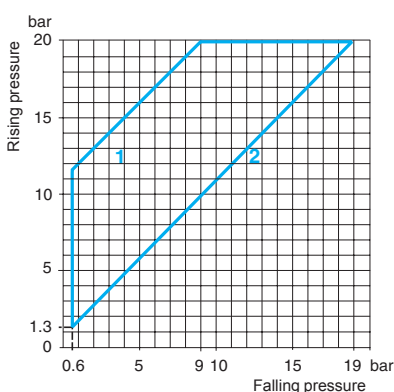
Possible differential (subtract from PH to give PB)	Min. at low setting (3)	0.7 bar (10.15 psi)	0.7 bar (10.15 psi)
	Min. at high setting (3)	1 bar (14.5 psi)	1.15 bar (16.67 psi)
	Max. at high setting	11 bar (159.5 psi)	11.70 bar (169.6 psi)
Maximum permissible pressure	Per cycle	25 bar (362.5 psi)	30 bar (435 psi)
	Accidental	45 bar (652.5 psi)	37.5 bar (543.75 psi)
Destruction pressure		90 bar (1305 psi)	67.5 bar (978.75 psi)
Mechanical life		5 x 10 ⁶ operating cycles	2 x 10 ⁶ operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm	

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLC020B2S12 becomes XMLC020B2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size:
± 0.2 bar (± 2.9 psi)

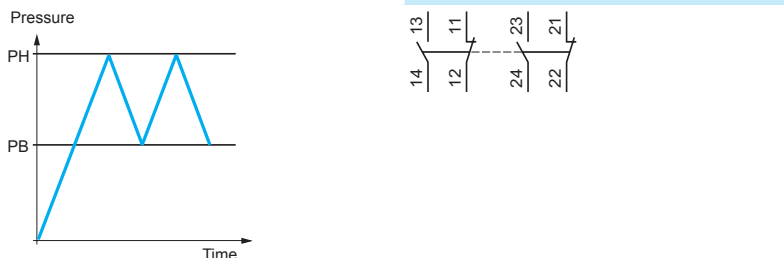
Operating curves



- 1 Maximum differential
- 2 Minimum differential

Other versions

Connection



— Adjustable value

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

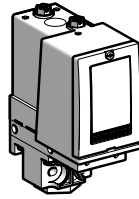
Size 20 bar (290 psi)

Dual stage, fixed differential, for detection at each threshold

Switches with 2 CO single-pole contacts

OsiSense XMLD pressure switches

Without setting scale



Adjustable range of each switching point (Rising pressure)	2nd stage switching point (PH2) 1st stage switching point (PH1)	2.14...20 bar (31.03...290 psi)
Spread between 2 stages (PH2 - PH1)		0.9...18.76 bar (13.05...272.02 psi)
Electrical connection		Terminals
Fluid connection	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 160 °C Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	XMLD020B1S12 XMLD020C1S12	XMLD020B1S13 -
Weight (kg)		0.705	0.705

Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH1/PH2 to give PB1/PB2)	At low setting (3) At high setting (4)	0.7 bar (10.15 psi) 1.3 bar (18.85 psi)
Maximum permissible pressure	Per cycle Accidental	25 bar (362.5 psi) 45 bar (652.5 psi)
Destruction pressure		90 bar (1305 psi)
Mechanical life		5 x 10 ⁶ operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm 1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLD020B1S12 becomes XMLD020B1S11).

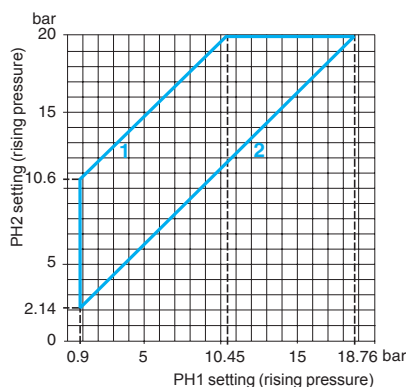
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low setting point for switches of the same size:
± 0.15 bar (± 2.18 psi)

(4) Deviation of the differential at high setting point for switches of the same size:
± 0.3 bar (± 4.35 psi)

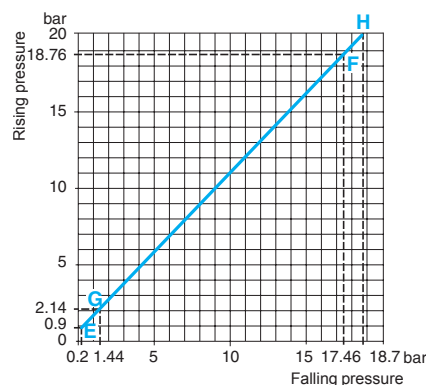
Operating curves

High setting tripping points of contacts 1 and 2

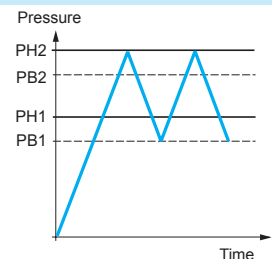


- 1 Maximum differential
- 2 Minimum differential

Natural differential of contacts 1 and 2



- EF Contact 1 (stage 1)
- GH Contact 2 (stage 2)

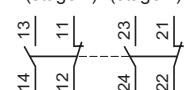


— Adjustable value
--- Non adjustable value

Connection model

Terminal model

Contact 2 (stage 2) Contact 1 (stage 1)



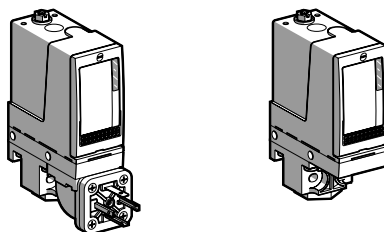
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

2

OsiSense XMLA pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	1.5...35 bar (21.75...507.5 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 70 °C	XMLA035A2C11	XMLA035A2S12	XMLA035A2S13
	Hydraulic oils, fresh water, air, up to + 160 °C	XMLA035B2C11	XMLA035B2S12	-
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	XMLA035C2C11	XMLA035C2S12	-
	Viscous products, up to + 160 °C (G 1/4" fluid connection)	XMLA035P2C11	XMLA035P2S12	-
Weight (kg)		0.725	0.695	0.695

Complementary characteristics not shown under general characteristics (page 2/63)

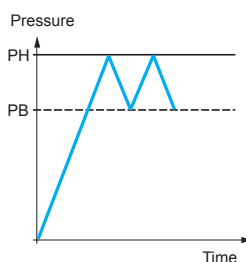
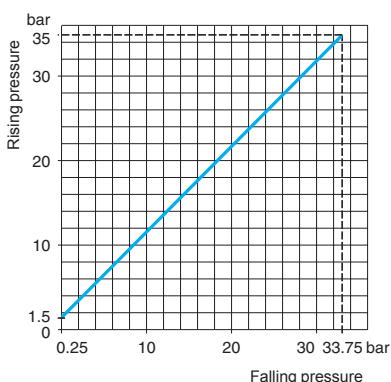
Natural differential (subtract from PH to give PB)	At low setting (3)	1.25 bar (18.12 psi)		
	At high setting (3)	1.25 bar (18.12 psi)		
Maximum permissible pressure	Per cycle	45 bar (652.5 psi)		
	Accidental	80 bar (1160 psi)		
Destruction pressure		160 bar (2320 psi)		
Mechanical life		5 x 10 ⁶ operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLA035A2S12 becomes XMLA035A2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size:
± 0.25 bar (± 3.62 psi)

Operating curves



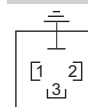
Connection

Terminal model



Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

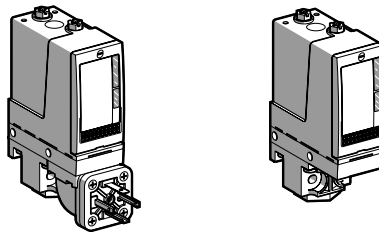
— Adjustable value
--- Non adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

OsiSense XMLB pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	3.5...35 bar (50.75...507.5 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 70 °C	XMLB035A2C11	XMLB035A2S12	XMLB035A2S13
	Hydraulic oils, fresh water, air, up to + 160 °C	XMLB035B2C11	XMLB035B2S12	-
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	XMLB035C2C11	XMLB035C2S12	-
	Viscous products, up to + 160 °C (G 1/4" fluid connection)	-	XMLB035P2S12	-
Weight (kg)		0.745	0.715	0.715

Complementary characteristics not shown under general characteristics (page 2/63)

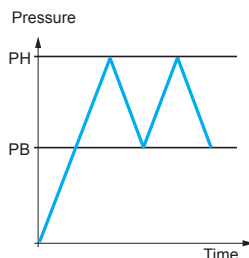
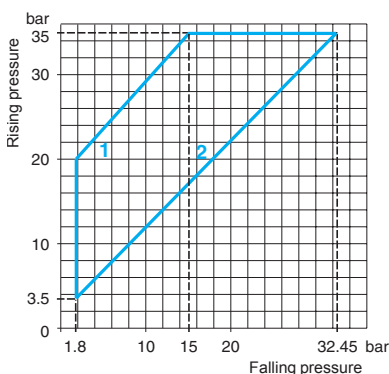
Possible differential (subtract from PH to give PB)	Min. at low setting (3)	1.7 bar (24.65 psi)		
	Min. at high setting (3)	2.55 bar (36.97 psi)		
	Max. at high setting	20 bar (290 psi)		
Maximum permissible pressure	Per cycle	45 bar (652.5 psi)		
	Accidental	80 bar (1160 psi)		
Destruction pressure		160 bar (2320 psi)		
Mechanical life		5 x 10 ⁶ operating cycles		
Connection		EN 175301-803-A connector (ex-DIN 43650A), 4-pin male. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
	Pressure switch type	Diaphragm		

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLB035A2S12 becomes XMLB035A2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size: - 0.5 bar, + 0.7 bar (- 7.25 psi, + 10.15 psi).

Operating curves



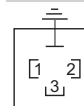
Connection

Terminal model



Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

- 1 Maximum differential
- 2 Minimum differential

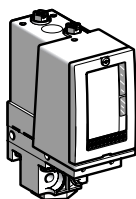
— Adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

OsiSense XMLC pressure switches

With setting scale



2

Adjustable range of switching point (PH) (Rising pressure)	3.5...35 bar (50.75...507.5 psi)	
Electrical connection	Terminals	
Fluid connection	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 160 °C	XMLC035B2S12	XMLC035B2S13
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	XMLC035C2S12	XMLC035C2S13
Weight (kg)	0.695		0.695

Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting (3)	1 bar (14.5 psi)	
	Min. at high setting (4)	1.5 bar (21.75 psi)	
	Max. at high setting	22 bar (319 psi)	
Maximum permissible pressure	Per cycle	45 bar (652.5 psi)	
	Accidental	80 bar (1160 psi)	
Destruction pressure	160 bar (2320 psi)		
Mechanical life	5 x 10 ⁶ operating cycles		
Cable entry for terminal models	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm		1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type	Diaphragm		

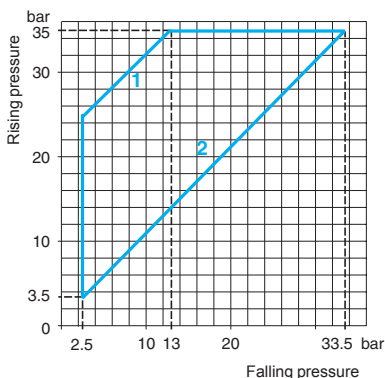
(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLC035B2S12 becomes XMLC035B2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

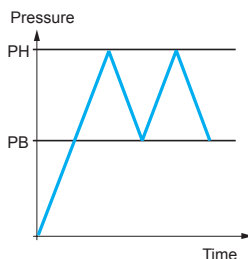
(3) Deviation of the differential at low setting point for switches of the same size:
± 0.2 bar (± 2.9 psi)

(4) Deviation of the differential at high setting point for switches of the same size:
± 0.5 bar (± 7.25 psi)

Operating curves



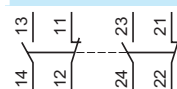
- 1 Maximum differential
- 2 Minimum differential



— Adjustable value

Connection

Terminal model

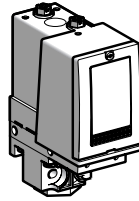


Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

OsiSense XMLD pressure switches

Without setting scale



Adjustable range of each switching point (Rising pressure)	2nd stage switching point (PH2) 1st stage switching point (PH1)	4.4...35 bar (63.8...507.5 psi) 1.9...32.5 bar (27.55...471.25 psi)
Spread between 2 stages (PH2 - PH1)		2.5...20.4 bar (36.25...295.8 psi)
Electrical connection		Terminals
Fluid connection		G 1/4 (female)

References (1)

Fluids controlled (2)	Hydraulic oils, fresh water, air, up to + 160 °C	XMLD035B1S12
Weight (kg)		0.715

Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH1/PH2 to give PB1/PB2)	At low setting (3) At high setting (4)	1.5 bar (21.75 psi) 2.6 bar (37.7 psi)
Maximum permissible pressure	Per cycle Accidental	45 bar (652.5 psi) 80 bar (1160 psi)
Destruction pressure		160 bar (2320 psi)
Mechanical life		5 x 10 ⁶ operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLD035B1S12 becomes XMLD035B1S11).

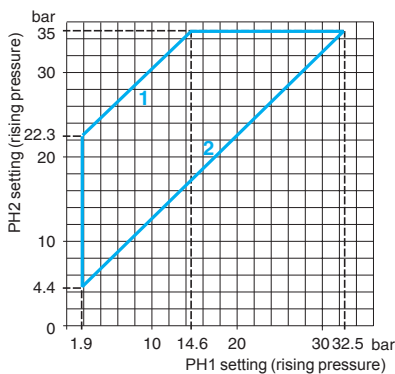
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low setting point for switches of the same size:
± 0.3 bar (± 4.35 psi)

(4) Deviation of the differential at high setting point for switches of the same size:
± 0.7 bar (± 10.15 psi)

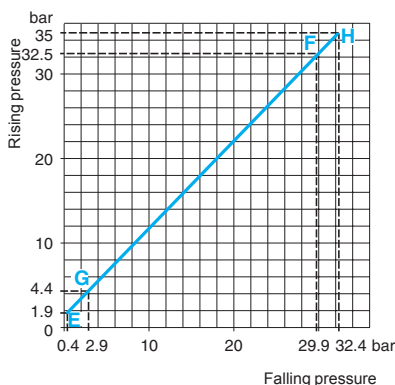
Operating curves

High setting tripping points of contacts 1 and 2

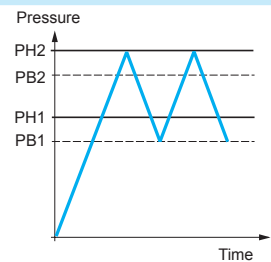


- 1 Maximum differential
- 2 Minimum differential

Natural differential of contacts 1 and 2



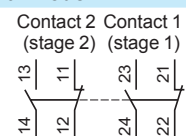
- EF Contact 1 (stage 1)
- GH Contact 2 (stage 2)



— Adjustable value
--- Non adjustable value

Connection

Terminal model



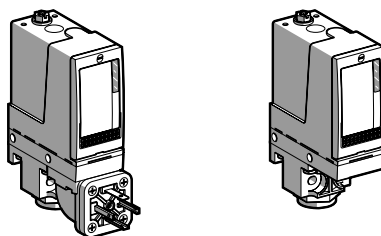
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

2

OsiSense XMLA pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	5...70 bar (72.5...1015 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, up to + 160 °C	XMLA070D2C11	XMLA070D2S12	XMLA070D2S13
	Fresh water, up to + 160 °C	XMLA070E2C11	XMLA070E2S12	XMLA070E2S13
	Corrosive fluids, air, up to + 160 °C	XMLA070N2C11	XMLA070N2S12	—
Weight (kg)		0.725	0.695	0.695

Complementary characteristics not shown under general characteristics (page 2/63)

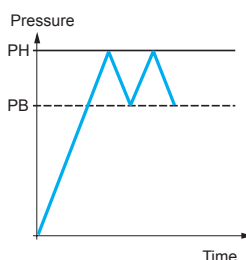
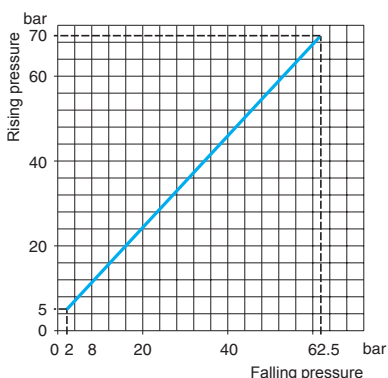
Natural differential (subtract from PH to give PB)	At low setting (3)	3 bar (43.5 psi)		
	At high setting (3)	9.5 bar (137.75 psi)		
Maximum permissible pressure	Per cycle	90 bar (1035 psi)		
	Accidental	160 bar (2320 psi)		
Destruction pressure		320 bar (4640 psi)		
Mechanical life		6 x 10 ⁶ operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston		

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLA070D2S12 becomes XMLA070D2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size: ± 1 bar (± 14.5 psi)

Operating curves



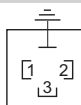
Connection

Terminal model



Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

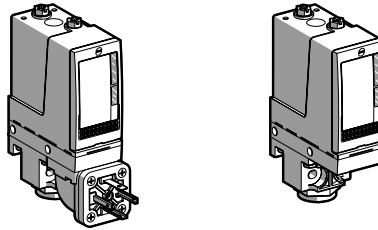
— Adjustable value
--- Non adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

OsiSense XMLB pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	7...70 bar (101.5...1015 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)		XMLB070D2C11	XMLB070D2S12	XMLB070D2S13
Hydraulic oils, up to + 160 °C				
Fresh water, up to + 160 °C		XMLB070E2C11	XMLB070E2S12	—
Corrosive fluids, air, up to + 160 °C		XMLB070N2C11	XMLB070N2S12	—
Weight (kg)		0.745	0.715	0.715

Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting (3)	4.7 bar (68.15 psi)		
	Min. at high setting (4)	9.5 bar (137.75 psi)		
	Max. at high setting	50 bar (725 psi)		
Maximum permissible pressure	Per cycle	90 bar (1035 psi)		
	Accidental	160 bar (2320 psi)		
Destruction pressure		320 bar (4640 psi)		
Mechanical life		6 x 10 ⁸ operating cycles		
Connection		EN 175301-803-A connector (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
	Pressure switch type	Piston		

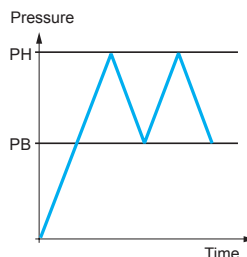
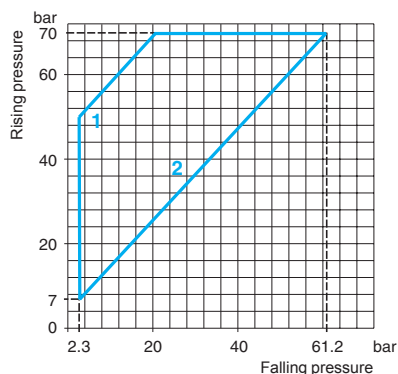
(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLB070D2S12 becomes XMLB070D2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low setting point for switches of the same size:
- 0.4 bar, + 0.7 bar (- 5.8 psi, + 10.15 psi).

(4) Deviation of the differential at high setting point for switches of the same size:
- 0.6 bar, + 0.8 bar (- 8.7 psi, + 11.6 psi).

Operating curves



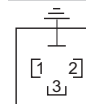
Connection

Terminal model



Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

- 1 Maximum differential
- 2 Minimum differential

— Adjustable value

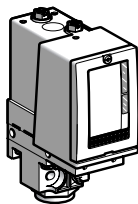
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

2

OsiSense XMLC pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	7...70 bar (101.5...1015 psi)	
Electrical connection	Terminals	
Fluid connection	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, up to + 160 °C	XMLC070D2S12	XMLC070D2S13
	Fresh water, up to + 160 °C	XMLC070E2S12	—
	Corrosive fluids, air, up to + 160 °C	XMLC070N2S12	—
Weight (kg)	0.695		0.695

Complementary characteristics not shown under general characteristics (page 2/63)

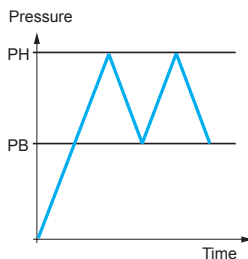
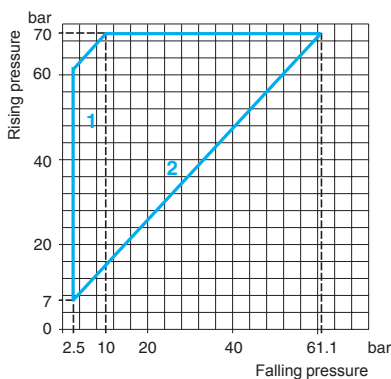
Possible differential (subtract from PH to give PB)	Min. at low setting (3)	4.5 bar (65.25 psi)
	Min. at high setting (3)	9.5 bar (137.75 psi)
	Max. at high setting	60 bar (870 psi)
Maximum permissible pressure	Per cycle	90 bar (1035 psi)
	Accidental	160 bar (2320 psi)
Destruction pressure	320 bar (4640 psi)	
Mechanical life	6 x 10 ⁶ operating cycles	
Cable entry for terminal models	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type	Piston	

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLC070D2S12 becomes XMLC070D2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

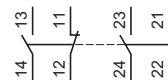
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.8 bar (± 11.6 psi)

Operating curves



Connection

Terminal model



- 1 Maximum differential
- 2 Minimum differential

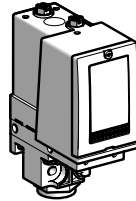
— Adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

OsiSense XMLD pressure switches

Without setting scale



Adjustable range of each switching point (Rising pressure)	2nd stage switching point (PH2)	9.4...70 bar (136.3...1015 psi)
	1st stage switching point (PH1)	6.6...67.2 bar (95.7...974.4 psi)
Spread between 2 stages (PH2 - PH1)		2.8...46 bar (40.6...667 psi)
Electrical connection	Terminals	
Fluid connection	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, up to + 160 °C	XMLD070D1S12	XMLD070D1S13
	Corrosive fluids, air, up to + 160 °C	XMLD070N1S12	-
Weight (kg)		0.715	0.715

Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH1/PH2 to give PB1/PB2)	At low setting (3)	5 bar (72.5 psi)
	At high setting (4)	9.5 bar (137.75 psi)
Maximum permissible pressure	Per cycle	90 bar (1035 psi)
	Accidental	160 bar (2320 psi)
Destruction pressure		320 bar (4640 psi)
Mechanical life		6 x 10 ⁸ operating cycles
Cable entry for terminal models	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type	Piston	

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLD070D1S12 becomes XMLD070D1S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low setting point for switches of the same size:

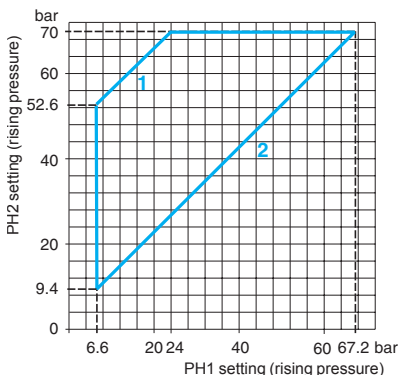
± 1.5 bar (± 21.75 psi)

(4) Deviation of the differential at high setting point for switches of the same size:

± 2 bar (± 29 psi)

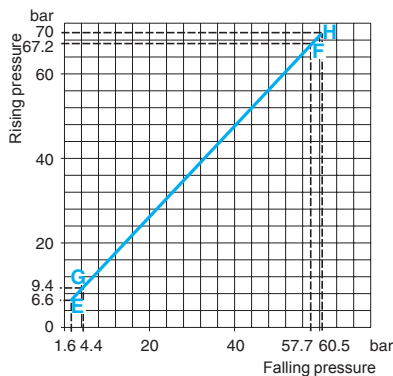
Operating curves

High setting tripping points of contacts 1 and 2

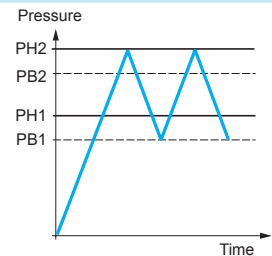


- 1 Maximum differential
- 2 Minimum differential

Natural differential of contacts 1 and 2



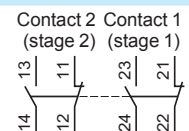
- EF Contact 1 (stage 1)
- GH Contact 2 (stage 2)



— Adjustable value
--- Non adjustable value

Connection

Terminal model



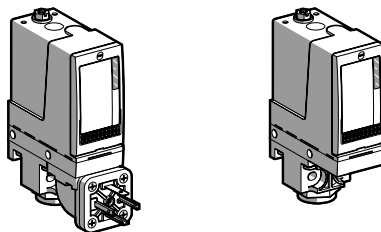
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

2

OsiSense XMLA pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	10...160 bar (145...2320 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, up to + 160 °C	XMLA160D2C11	XMLA160D2S12	XMLA160D2S13
	Fresh water, up to + 160 °C	XMLA160E2C11	XMLA160E2S12	XMLA160E2S13
	Corrosive fluids, air, up to + 160 °C	XMLA160N2C11	XMLA160N2S12	-
Weight (kg)		0.780	0.750	0.750

Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH to give PB)	At low setting (3)	5.5 bar (79.75 psi)		
	At high setting (4)	18 bar (261 psi)		
Maximum permissible pressure	Per cycle	200 bar (2900 psi)		
	Accidental	360 bar (5220 psi)		
Destruction pressure		720 bar (10,440 psi)		
Mechanical life		6 x 10 ⁶ operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston		

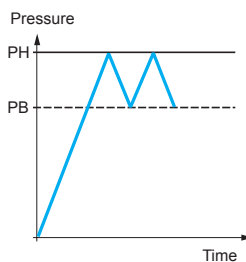
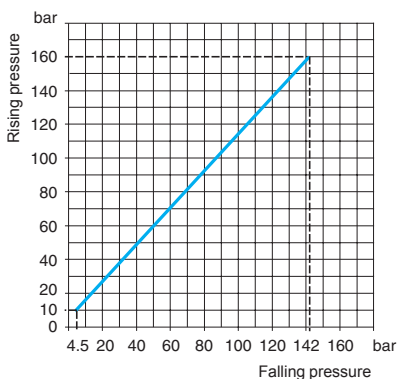
(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLA160D2S12 becomes XMLA160D2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low setting point for switches of the same size:
± 1 bar (± 14.5 psi)

(4) Deviation of the differential at high setting point for switches of the same size:
± 3 bar (± 43.5 psi)

Operating curves



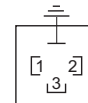
Connection

Terminal model



Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

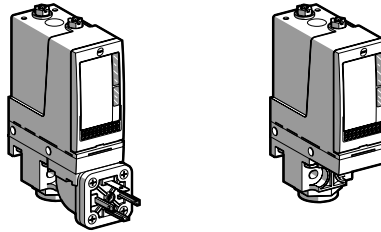
— Adjustable value
--- Non adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

OsiSense XMLB pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	10...160 bar (145...2320 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, up to + 160 °C	XMLB160D2C11	XMLB160D2S12	XMLB160D2S13
	Fresh water, up to + 160 °C	XMLB160E2C11	XMLB160E2S12	—
	Corrosive fluids, air, up to + 160 °C	XMLB160N2C11	XMLB160N2S12	—
Weight (kg)		0.780	0.750	0.750

Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting (3)	9.3 bar (134.85 psi)		
	Min. at high setting (4)	20.8 bar (301.6 psi)		
	Max. at high setting	100 bar (1450 psi)		
Maximum permissible pressure	Per cycle	200 bar (2900 psi)		
	Accidental	360 bar (5220 psi)		
Destruction pressure		720 bar (10,440 psi)		
Mechanical life		6 x 10 ⁸ operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston		

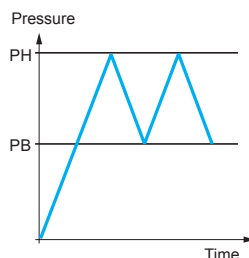
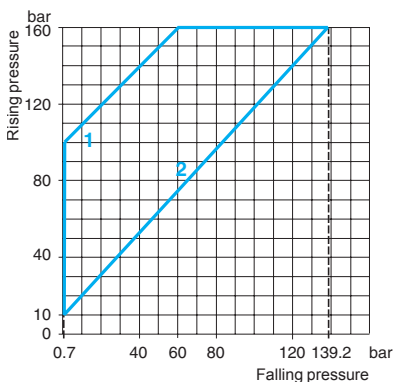
(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLB160D2S12 becomes XMLB160D2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low setting point for switches of the same size:
- 1.8 bar, + 1.5 bar (- 26.1 psi, + 21.75 psi).

(4) Deviation of the differential at high setting point for switches of the same size:
- 1.9 bar, + 1.6 bar (- 27.55 psi, + 23.2 psi).

Operating curves



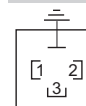
Connection

Terminal model



Connector model

Pressure switch connector pin view



- 1 → 11 and 13
- 2 → 12
- 3 → 14

- 1 Maximum differential
- 2 Minimum differential

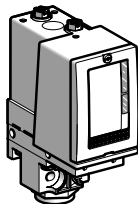
— Adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

2

OsiSense XMLC pressure switches | With setting scale



Adjustable range of switching point (PH) (Rising pressure)	12...160 bar (174...2320 psi)	
Electrical connection	Terminals	
Fluid connection	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

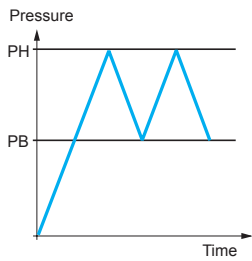
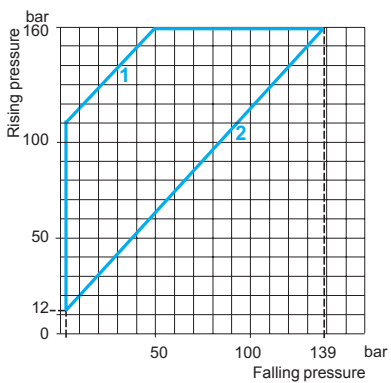
Fluids controlled (2)	Hydraulic oils, up to + 160 °C	XMLC160D2S12	XMLC160D2S13
	Fresh water, up to + 160 °C	XMLC160E2S12	—
	Corrosive fluids, air, up to + 160 °C	XMLC160N2S12	—
Weight (kg)	0.750		0.750

Complementary characteristics not shown under general characteristics (page 2/63)

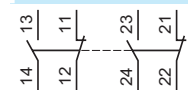
Possible differential (subtract from PH to give PB)	Min. at low setting (3)	9 bar (130.5 psi)
	Min. at high setting (3)	21 bar (304.5 psi)
	Max. at high setting	110 bar (1590 psi)
Maximum permissible pressure	Per cycle	200 bar (2900 psi)
	Accidental	360 bar (5220 psi)
Destruction pressure	720 bar (10 440 psi)	
Mechanical life	6 x 10 ⁶ operating cycles	
Cable entry for terminal models	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type	Piston	

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLC160D2S12 becomes XMLC160D2S11).
 (2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
 (3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.9 bar (± 13.05 psi)

Operating curves



Connection
Terminal model



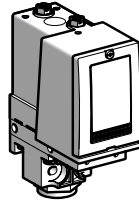
- 1 Maximum differential
- 2 Minimum differential

— Adjustable value

Other versions For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

OsiSense XMLD pressure switches

Without setting scale



Adjustable range of each switching point (Rising pressure)	2nd stage switching point (PH2)	16.5...160 bar (239.25...2320 psi)
	1st stage switching point (PH1)	10.5...154 bar (152.25...2233 psi)
Spread between 2 stages (PH2 - PH1)		6...83 bar (87...1203.5 psi)
Electrical connection		Terminals
Fluid connection	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)	Hydraulic oils, up to + 160 °C	XMLD160D1S12	XMLD160D1S13
	Fresh water, up to + 160 °C	XMLD160E1S12	-
Weight (kg)		0.750	0.750

Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH1/PH2 to give PB1/PB2)	At low setting (3)	8.8 bar (127.6 psi)
	At high setting (4)	20 bar (290 psi)
Maximum permissible pressure	Per cycle	200 bar (2900 psi)
	Accidental	360 bar (5220 psi)
Destruction pressure		720 bar (10,440 psi)
Mechanical life		6 x 10 ⁸ operating cycles
Cable entry for terminal models	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
	Pressure switch type	

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLD160D1S12 becomes XMLD160D1S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low setting point for switches of the same size:

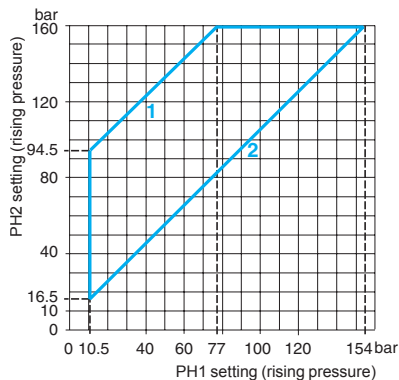
± 1.5 bar (± 21.75 psi)

(4) Deviation of the differential at high setting point for switches of the same size:

± 7 bar (± 101.5 psi)

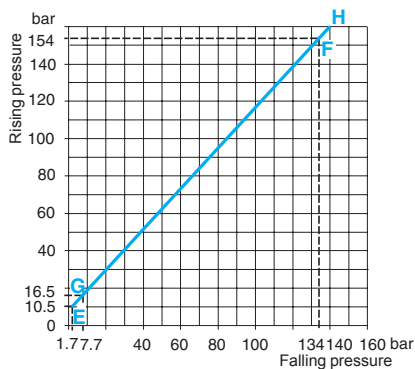
Operating curves

High setting tripping points of contacts 1 and 2

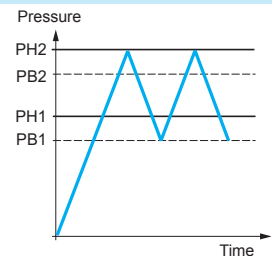


- 1 Maximum differential
- 2 Minimum differential

Natural differential of contacts 1 and 2



- EF Contact 1 (stage 1)
- GH Contact 2 (stage 2)

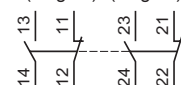


- Adjustable value
- Non adjustable value

Connection

Terminal model

Contact 2 (stage 2) Contact 1 (stage 1)



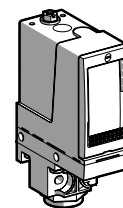
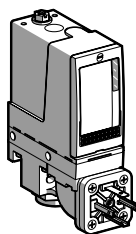
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

2

OsiSense XMLA pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	20...300 bar (290...4350 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2) (5)	Hydraulic oils, up to + 160 °C	XMLA300D2C11	XMLA300D2S12	XMLA300D2S13
	Fresh water, up to + 160 °C	XMLA300E2C11	XMLA300E2S12	XMLA300E2S13
	Corrosive fluids, air, up to + 160 °C	XMLA300N2C11	XMLA300N2S12	-
Weight (kg)		0.780	0.750	0.750

Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH to give PB)	At low setting (3)	16.5 bar (239.25 psi)		
	At high setting (4)	35 bar (507.5 psi)		
Maximum permissible pressure	Per cycle	375 bar (5437.5 psi)		
	Accidental	675 bar (9787.5 psi)		
Destruction pressure		1350 bar (19 575 psi)		
Mechanical life		3 x 10 ⁶ operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
	Pressure switch type	Piston		

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLA300D2S12 becomes XMLA300D2S11).

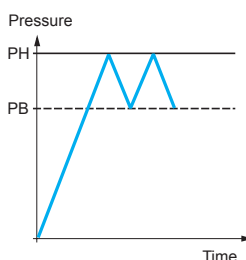
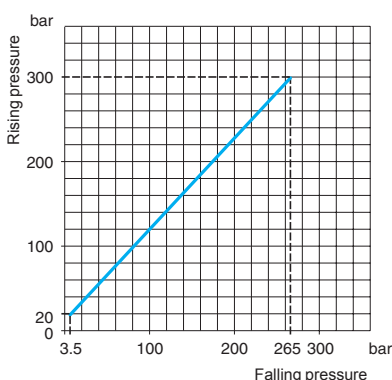
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low setting point for switches of the same size:
± 3 bar (± 43.5 psi)

(4) Deviation of the differential at high setting point for switches of the same size:
± 6 bar (± 87 psi)

(5) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

Operating curves



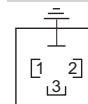
Connection

Terminal model



Connector model

Pressure switch connector pin view



- 1 → 11 and 13
- 2 → 12
- 3 → 14

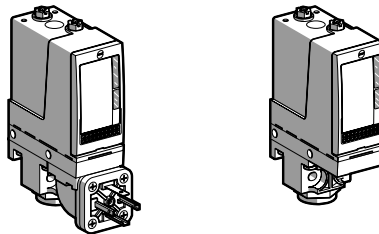
— Adjustable value
--- Non adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

OsiSense XMLB pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	22...300 bar (319...4350 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2)(5)	Hydraulic oils, up to + 160 °C	XMLB300D2C11	XMLB300D2S12	XMLB300D2S13
	Fresh water, up to + 160 °C	XMLB300E2C11	XMLB300E2S12	—
	Corrosive fluids, air, up to + 160 °C	XMLB300N2C11	XMLB300N2S12	—
Weight (kg)		0.780	0.750	0.750

Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting (3)	19.4 bar (281.3 psi)		
	Min. at high setting (4)	37 bar (536.5 psi)		
	Max. at high setting	200 bar (2900 psi)		
Maximum permissible pressure	Per cycle	375 bar (5437.5 psi)		
	Accidental	675 bar (9787.5 psi)		
Destruction pressure		1350 bar (19,575 psi)		
Mechanical life		3 x 10 ⁸ operating cycles		
Connection	EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	
	Pressure switch type	Piston		

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLB300D2S12 becomes XMLB300D2S11).

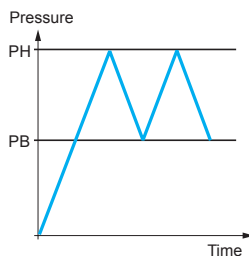
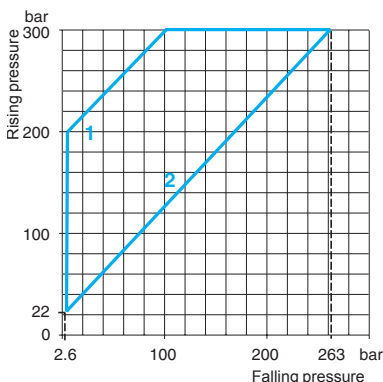
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low setting point for switches of the same size:
- 1.5 bar, + 1.7 bar (- 21.75 psi, + 24.65 psi).

(4) Deviation of the differential at high setting point for switches of the same size:
- 1 bar, + 4 bar (- 14.5 psi, + 58 psi).

(5) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

Operating curves



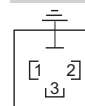
Connection

Terminal model



Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

- 1 Maximum differential
- 2 Minimum differential

— Adjustable value

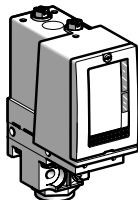
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

2

OsiSense XMLC pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	22...300 bar (319...4350 psi)
Electrical connection	Terminals
Fluid connection	G 1/4 (female)

References (1)

Fluids controlled (2) (4)	Hydraulic oils, up to + 160 °C	XMLC300D2S12
	Fresh water, up to + 160 °C	XMLC300E2S12
	Corrosive fluids, air, up to + 160 °C	XMLC300N2S12
Weight (kg)		0.750

Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting (3)	16 bar (232 psi)
	Min. at high setting (3)	35 bar (507.5 psi)
	Max. at high setting	240 bar (3480 psi)
Maximum permissible pressure	Per cycle	375 bar (5437.5 psi)
	Accidental	675 bar (9787.5 psi)
Destruction pressure		1350 bar (19 575 psi)
Mechanical life		3 x 10 ⁶ operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston

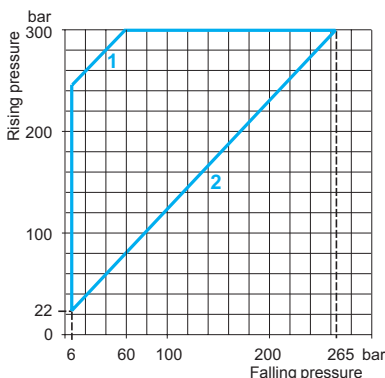
(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLC300D2S12 becomes XMLC300D2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size:
± 0.9 bar (± 13.05 psi)

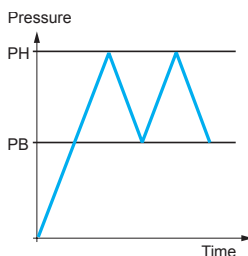
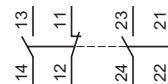
(4) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

Operating curves



- 1 Maximum differential
- 2 Minimum differential

Connection
Terminal model



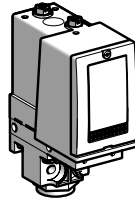
— Adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

OsiSense XMLD pressure switches

Without setting scale



Adjustable range of each switching point (Rising pressure)	2nd stage switching point (PH2)	36...300 bar (522...4350 psi)
	1st stage switching point (PH1)	25...289 bar (362.5...4190.5 psi)
Spread between 2 stages (PH2 - PH1)		11...189 bar (159.5...2740.5 psi)
Electrical connection	Terminals	
Fluid connection	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

Fluids controlled (2) (5)	Hydraulic oils, up to + 160 °C	XMLD300D1S12	XMLD300D1S13
	Fresh water, up to + 160 °C	XMLD300E1S12	—
	Corrosive fluids, air, up to + 160 °C	XMLD300N1S12	—
Weight (kg)		0.750	0.750

Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH1/PH2 to give PB1/PB2)	At low setting (3)	17 bar (246.5 psi)	
	At high setting (4)	42 bar (609 psi)	
Maximum permissible pressure	Per cycle	375 bar (5437.5 psi)	
	Accidental	675 bar (9787.5 psi)	
Destruction pressure		1350 bar (19,575 psi)	
Mechanical life		3 x 10 ⁸ operating cycles	
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston	

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLD300D1S12 becomes XMLD300D1S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

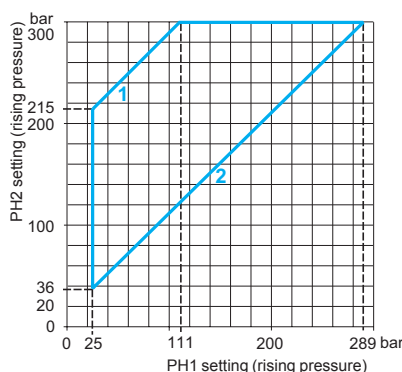
(3) Deviation of the differential at low setting point for switches of the same size:
± 2.5 bar (± 36.25 psi)

(4) Deviation of the differential at high setting point for switches of the same size:
± 9 bar (± 130.5 psi)

(5) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

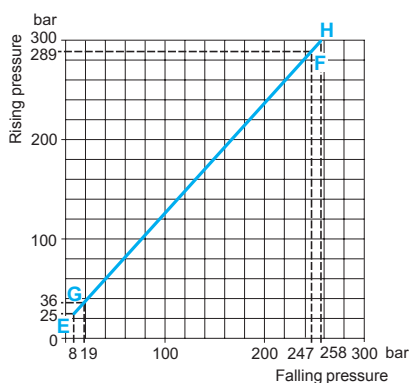
Operating curves

High setting tripping points of contacts 1 and 2

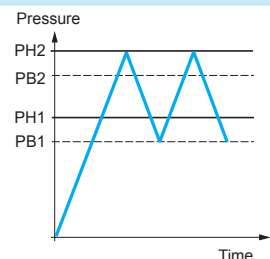


- 1 Maximum differential
- 2 Minimum differential

Natural differential of contacts 1 and 2



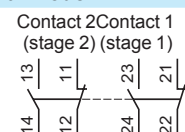
- EF Contact 1 (stage 1)
- GH Contact 2 (stage 2)



- Adjustable value
- Non adjustable value

Connection

Terminal model



Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

Size 500 bar (7250 psi)

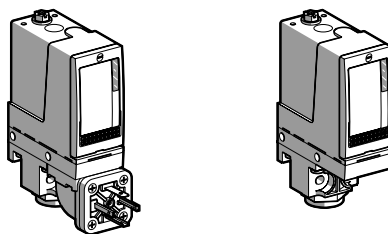
Fixed differential, for detection of a single threshold

Switches with 1 CO single-pole contact

2

OsiSense XMLA pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	30...500 bar (435...7250 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

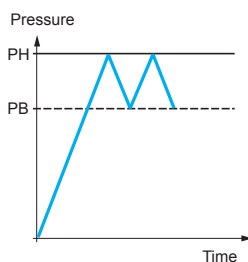
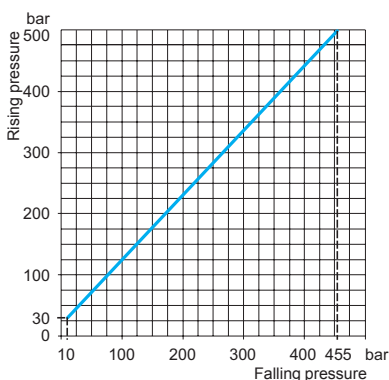
Fluids controlled (2) (5)	Hydraulic oils, up to + 160 °C	XMLA500D2C11	XMLA500D2S12	XMLA500D2S13
	Fresh water, up to + 160 °C	XMLA500E2C11	XMLA500E2S12	XMLA500E2S13
	Corrosive fluids, air, up to + 160 °C	XMLA500N2C11	XMLA500N2S12	—
Weight (kg)		0.780	0.750	0.750

Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH to give PB)	At low setting (3)	20 bar (290 psi)		
	At high setting (4)	45 bar (652.5 psi)		
Maximum permissible pressure	Per cycle	625 bar (9062.5 psi)		
	Accidental	1125 bar (16,312.5 psi)		
Destruction pressure		2250 bar (32,625 psi)		
Mechanical life		3 x 10 ⁶ operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston		

- (1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLA500D2S12 becomes XMLA500D2S11).
- (2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
- (3) Deviation of the differential at low setting point for switches of the same size:
± 6 bar (± 87 psi)
- (4) Deviation of the differential at high setting point for switches of the same size:
± 10 bar (± 145 psi)
- (5) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

Operating curves



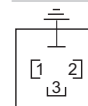
Connection

Terminal model



Connector model

Pressure switch connector pin view



- 1 → 11 and 13
2 → 12
3 → 14

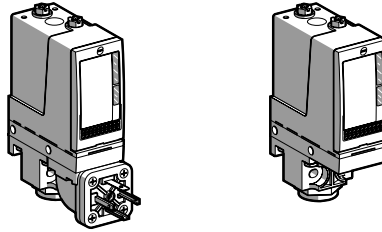
- Adjustable value
--- Non adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

OsiSense XMLB pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	30...500 bar (435...7250 psi)		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References (1)

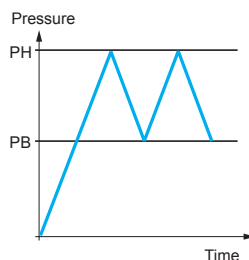
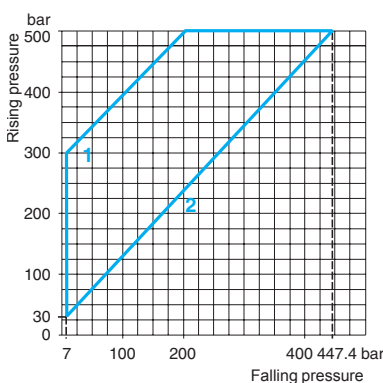
Fluids controlled (2) (5)	Hydraulic oils, up to + 160 °C	XMLB500D2C11	XMLB500D2S12	XMLB500D2S13
	Fresh water, up to + 160 °C	XMLB500E2C11	XMLB500E2S12	—
	Corrosive fluids, air, up to + 160 °C	XMLB500N2C11	XMLB500N2S12	—
Weight (kg)		0.780	0.750	0.750

Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting (3)	23 bar (333.5 psi)		
	Min. at high setting (4)	52.6 bar (762.7 psi)		
	Max. at high setting	300 bar (4350 psi)		
Maximum permissible pressure	Per cycle	625 bar (9062.5 psi)		
	Accidental	1125 bar (16,312.5 psi)		
Destruction pressure		2250 bar (32,625 psi)		
Mechanical life		3 x 10 ⁸ operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
	Pressure switch type	Piston		

- (1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLB500D2S12 becomes XMLB500D2S11).
 (2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
 (3) Deviation of the differential at low setting point for switches of the same size:
 - 2.6 bar, + 3.8 bar (- 37.7 psi, + 55.1 psi).
 (4) Deviation of the differential at high setting point for switches of the same size:
 - 14.8 bar, + 11.2 bar (- 214.6 psi, + 162.4 psi).
 (5) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

Operating curves



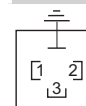
Connection

Terminal model



Connector model

Pressure switch connector pin view



- 1 → 11 and 13
 2 → 12
 3 → 14

- 1 Maximum differential
 2 Minimum differential

— Adjustable value

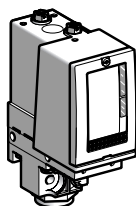
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

2

OsiSense XMLC pressure switches

With setting scale



Adjustable range of switching point (PH) (Rising pressure)	30...500 bar (435...7250 psi)
Electrical connection	Terminals
Fluid connection	G 1/4 (female)

References (1)

Fluids controlled (2) (4)	Hydraulic oils, up to + 160 °C	XMLC500D2S12
	Corrosive fluids, air, up to + 160 °C	XMLC500N2S12

Weight (kg)	0.750
-------------	-------

Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting (3)	19 bar (275.5 psi)
	Min. at high setting (3)	52 bar (754 psi)
	Max. at high setting	340 bar (4930 psi)
Maximum permissible pressure	Per cycle	625 bar (9062.5 psi)
	Accidental	1125 bar (16 312.5 psi)
Destruction pressure		2250 bar (32 625 psi)
Mechanical life		3 x 10 ⁶ operating cycles
Cable entry for terminal models		1 entry tapped. Je préfère acheter des 5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston

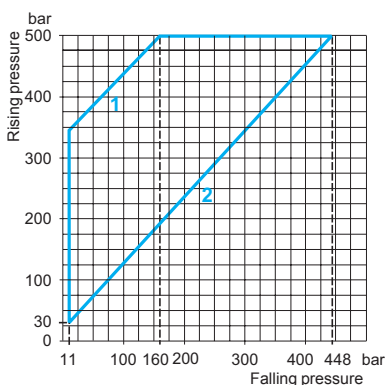
(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLC500D2S12 becomes XMLC500D2S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.9 bar (± 13.05 psi)

(4) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

Operating curves



- 1 Maximum differential
- 2 Minimum differential

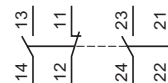
Other versions

— Adjustable value

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

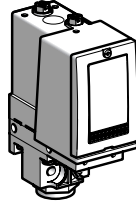
Connection

Terminal model



OsiSense XMLD pressure switches

Without setting scale



Adjustable range of each switching point (Rising pressure)	2nd stage switching point (PH2) 1st stage switching point (PH1)	41...500 bar (594.5...7250 psi) 25...484 bar (362.5...7018 psi)
Spread between 2 stages (PH2 - PH1)		16...244 bar (232...3538 psi)
Electrical connection		Terminals
Fluid connection		G 1/4 (female)

References (1)

Fluids controlled (2) (5)	Hydraulic oils, up to + 160 °C	XMLD500D1S12
Weight (kg)		0.750

Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH1/PH2 to give PB1/PB2)	At low setting (3) At high setting (4)	21 bar (304.5 psi) 65 bar (942.5 psi)
Maximum permissible pressure	Per cycle Accidental	625 bar (9062.5 psi) 1125 bar (16,312.5 psi)
Destruction pressure		2250 bar (32,625 psi)
Mechanical life		3 x 10 ⁶ operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston

(1) For 1 entry tapped for no. 13 cable gland, replace S12 with S11 (for example, XMLD500D1S12 becomes XMLD500D1S11).

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

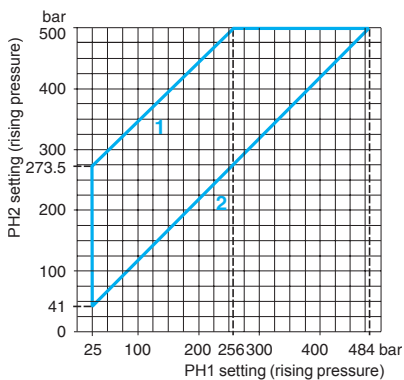
(3) Deviation of the differential at low setting point for switches of the same size:
± 3 bar (± 43.5 psi)

(4) Deviation of the differential at high setting point for switches of the same size:
± 10 bar (± 145 psi)

(5) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

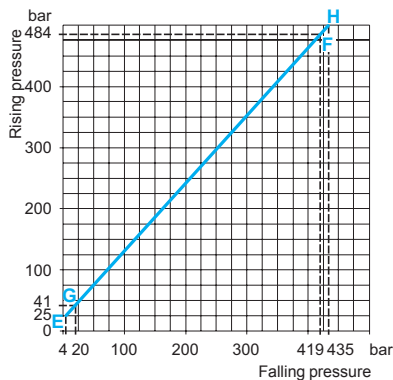
Operating curves

High setting tripping points of contacts 1 and 2

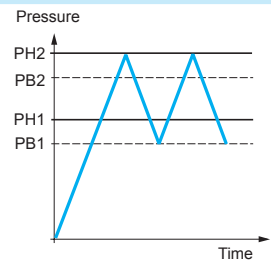


- 1 Maximum differential
- 2 Minimum differential

Natural differential of contacts 1 and 2



- EF Contact 1 (stage 1)
- GH Contact 2 (stage 2)

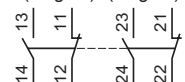


- Adjustable value
- Non adjustable value

Connection

Terminal model

Contact 2 Contact 1
(stage 2) (stage 1)



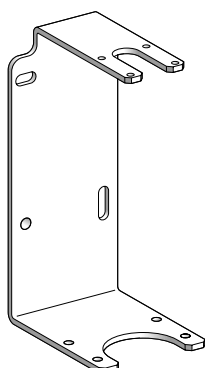
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure and vacuum switches

OsiSense XMLA, XMLB, XMLC and XMLD

Accessories and replacement parts



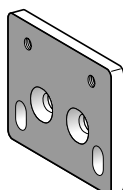
XMLZL006



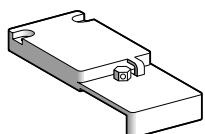
XMLZL002



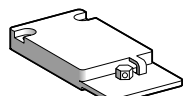
XMLZL003



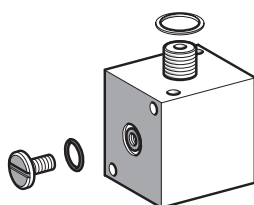
XMLZL004



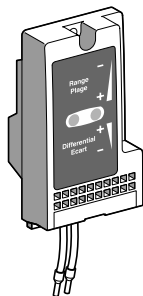
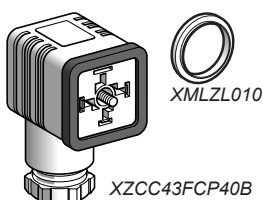
XMLZL001



XMLZL011



XMLZL005

XMLZA●●●,
XMLZB●●●

XMLZL010

XZCC43FCP40B

Accessories for pressure switches and vacuum switches

Description	Specific characteristics	For use with switches	Unit reference	Weight kg	
Rear fixing bracket for vibrations > 2 gn	–	XML●L35 XML●001	XMLZL006	0.230	
Additional top support bracket for vibrations > 4 gn	–	XMLAM01 XML●M05 XMLA004 XML●010... XML●500	XMLZL002	0.020	
Knurled adjustment knob, Ø 36 mm fits over adjustment screws to facilitate setting	–	All models	XMLZL003	0.010	
Fixing plate for replacing an XMJA or XMGB switch with an XML switch	–	XMLAM01 XML●M05 XMLA004 XML●010... XML●500	XMLZL004	0.110	
Lead sealable protective cover to prevent unauthorised access to adjustment screws and fixing screw of switch cover	–	XMLA XMLB	XMLZL001	0.035	
Lead sealable protective cover to prevent unauthorised access to adjustment screws	–	All types	XMLZL011	0.030	
Indicator modules and associated covers, 2 LEDs (orange and green)	Without setting scale	~ or --- 24/48 V	XMLA/B	XMLZZ024	0.090
		~ 110/240 V	XMLA/B	XMLZZ120	0.090
	With setting scale	~ or --- 24/48 V	XMLA	XMLZA024	0.090
			XMLB	XMLZB024	0.090
		~ 110/240 V	XMLA	XMLZA120	0.090
			XMLB	XMLZB120	0.090
Hydraulic block for base mounting directly onto fluid manifold	–	All types	XMLZL005	0.240	
Female EN 175301-803-A connector (ex-DIN 43650A)	–	XML●●●●●●C11	XZCC43FCP40B	0.035	
Adaptor, G 1/4"/G 3/8" male/female	–	All types	XMLZL012	0.130	

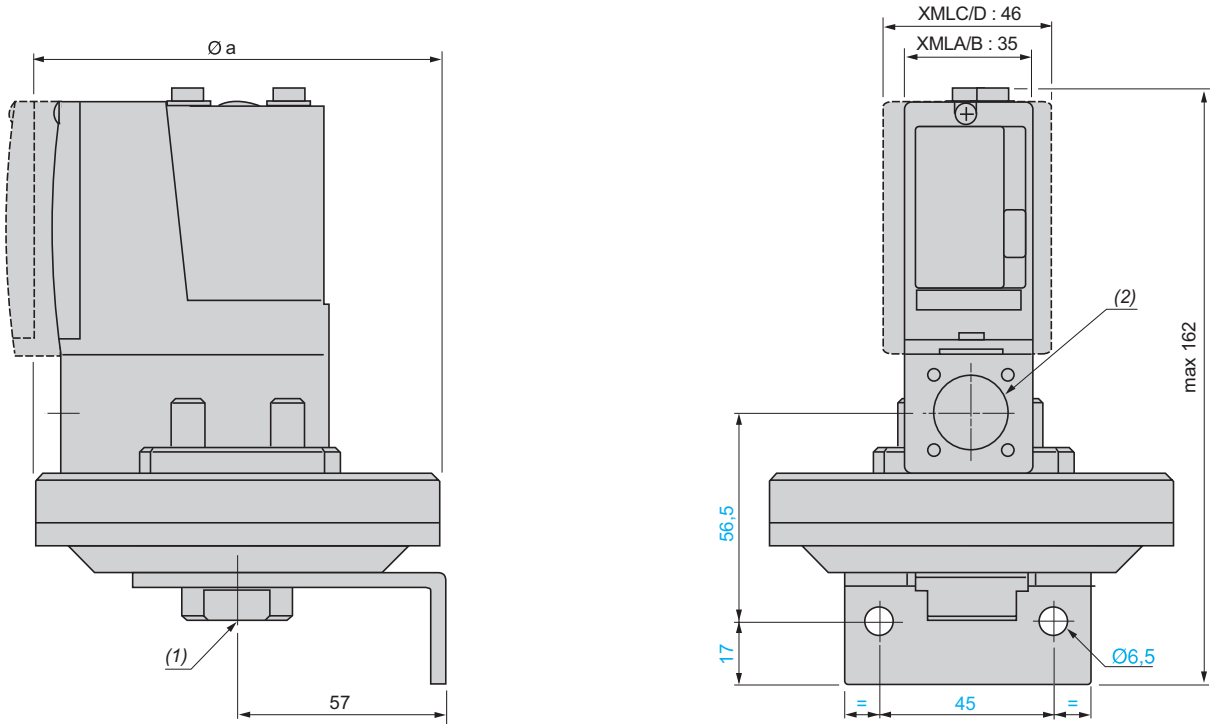
Replacement parts

Sealing gasket (pack of 10 gaskets)	For sizes ≥ 300 bar (XMLA/B/C/D)		XMLZL010	0.015
Diaphragms	–	XML●S35	XMLZL013	0.060
	–	XML●S02	XMLZL014	0.040
	–	XML●S04	XMLZL015	0.030

Electromechanical pressure and vacuum switches

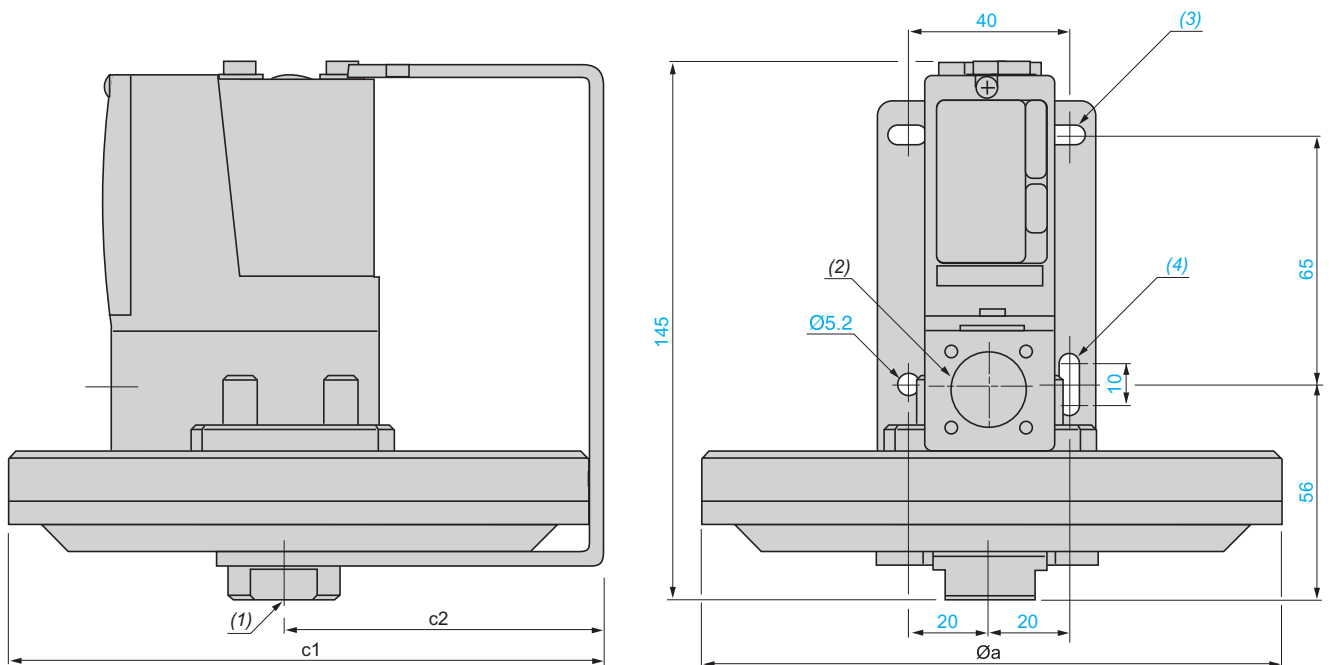
OsiSense XMLA, XMLB, XMLC and XMLD

XML●L35, XML●001, XML●S



- (1) 1 fluid entry, tapped G 1/4 (female) or 1/4"-18 NPTF (female)
- (2) 1 electrical connections entry, tapped M20 x 1.5 mm or Pg 13.5 or 1/2"-14 NPT

XMLBM03, XMLBL05



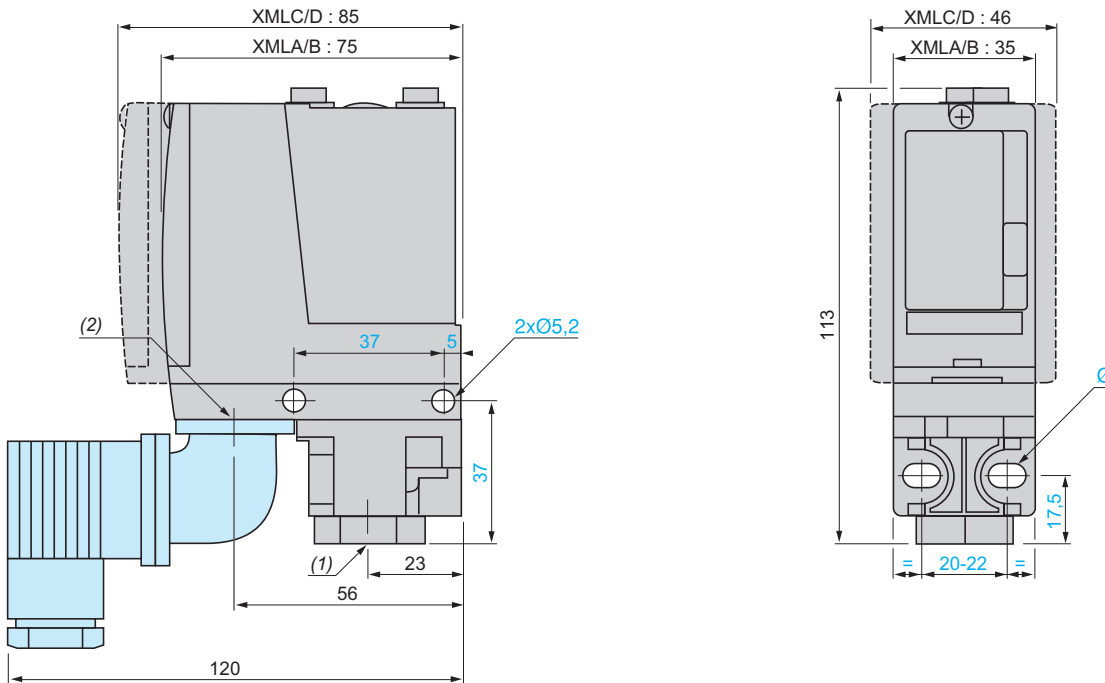
- (1) 1 fluid entry, tapped G 1/4 (female) or 1/4"-18 NPTF (female)
- (2) 1 electrical connections entry, tapped M20 x 1.5 mm or Pg 13.5 or 1/2"-14 NPT
- (3) 2 elongated holes Ø 10.2 x 5.2
- (4) 1 elongated hole Ø 15.2 x 5.2

XML	Øa	c1	c2
BM03	150	155.5	80.5
BL05	200	204	104
●L35, ●001	110	-	-
●S35, ●S02, ●S04	110	-	-
●S10, ●S20	86	-	-

Electromechanical pressure and vacuum switches

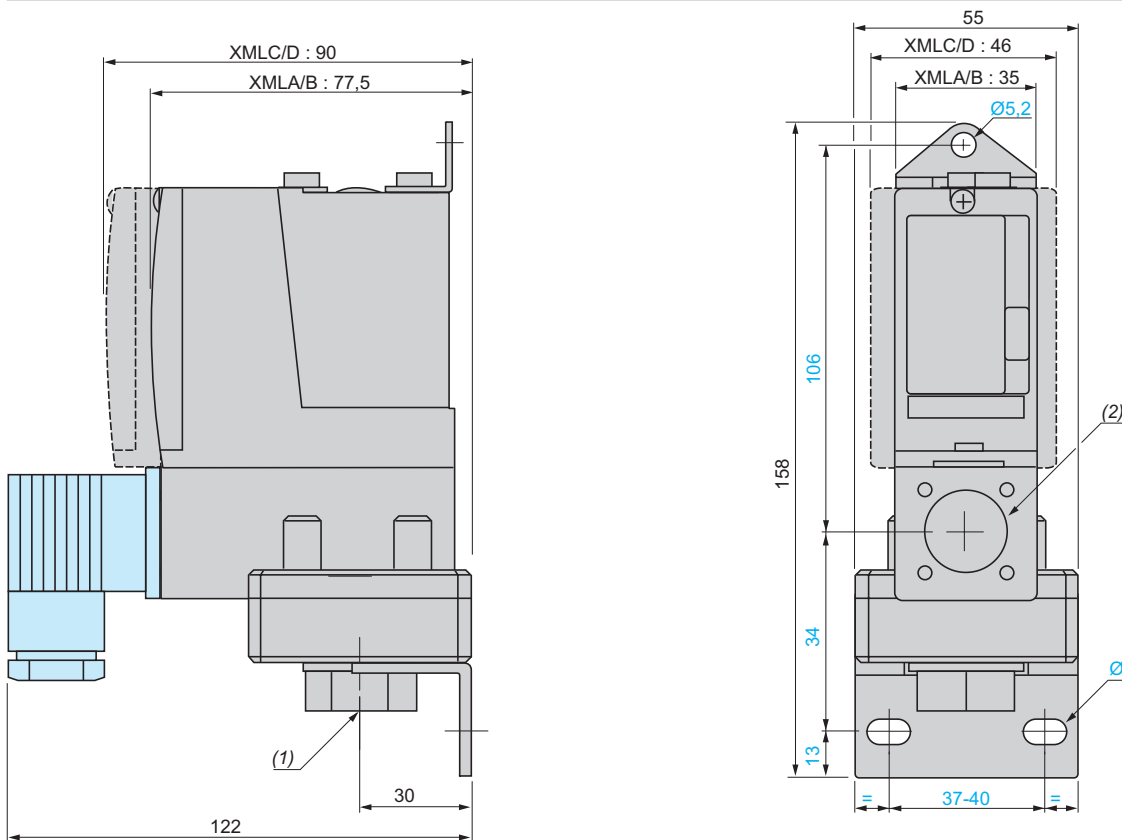
OsiSense XMLA, XMLB, XMLC and XMLD

XMLAM01, XMLBM05, XMLCM05, XMLA004, XML010...500



- (1) 1 fluid entry, tapped G 1/4 (female) or 1/4"-18 NPTF (female)
 - (2) 1 electrical connections entry, tapped M20 x 1.5 mm or Pg 13.5 or 1/2"-14 NPT
- Ø: 2 elongated holes Ø 5.2 x 6.7

XML0M02, XML002, XMLB004, XMLC004, XMLD004

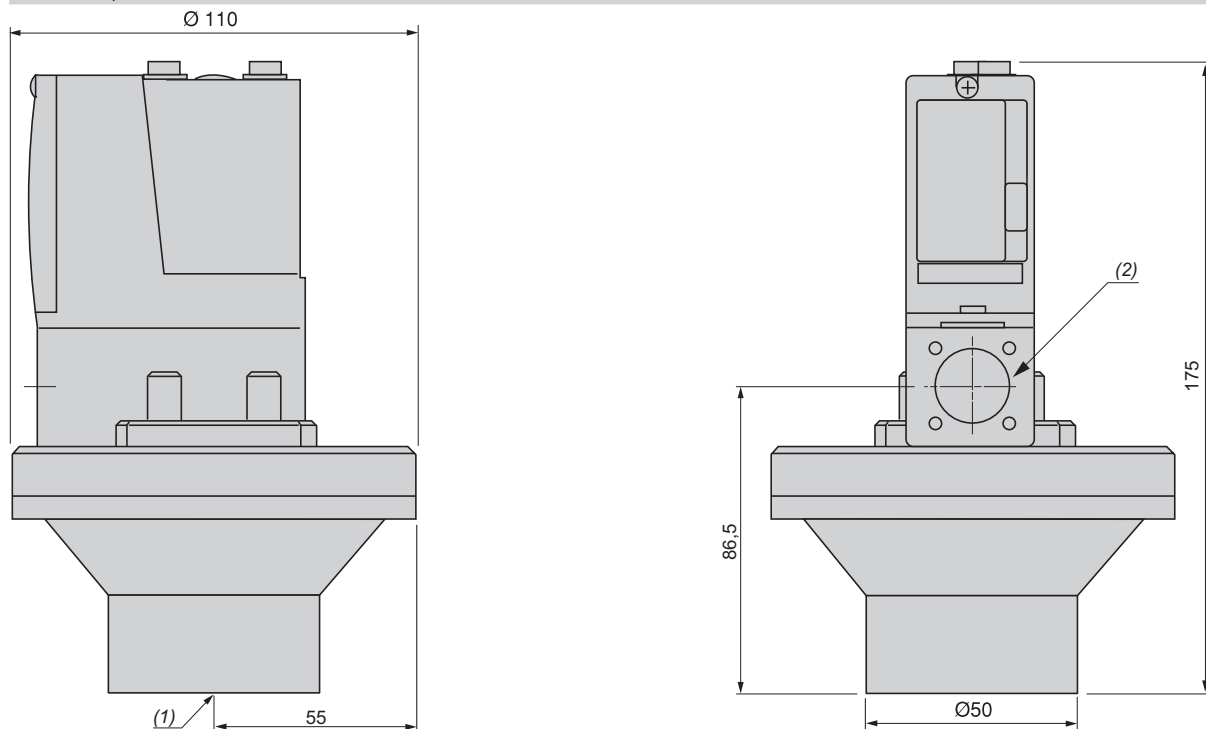


- (1) 1 fluid entry, tapped G 1/4 (female) or 1/4"-18 NPTF (female)
 - (2) 1 electrical connections entry, tapped M20 x 1.5 mm or Pg 13.5 or 1/2"-14 NPT
- Ø: 2 elongated holes Ø 10.2 x 5.2

Electromechanical pressure and vacuum switches

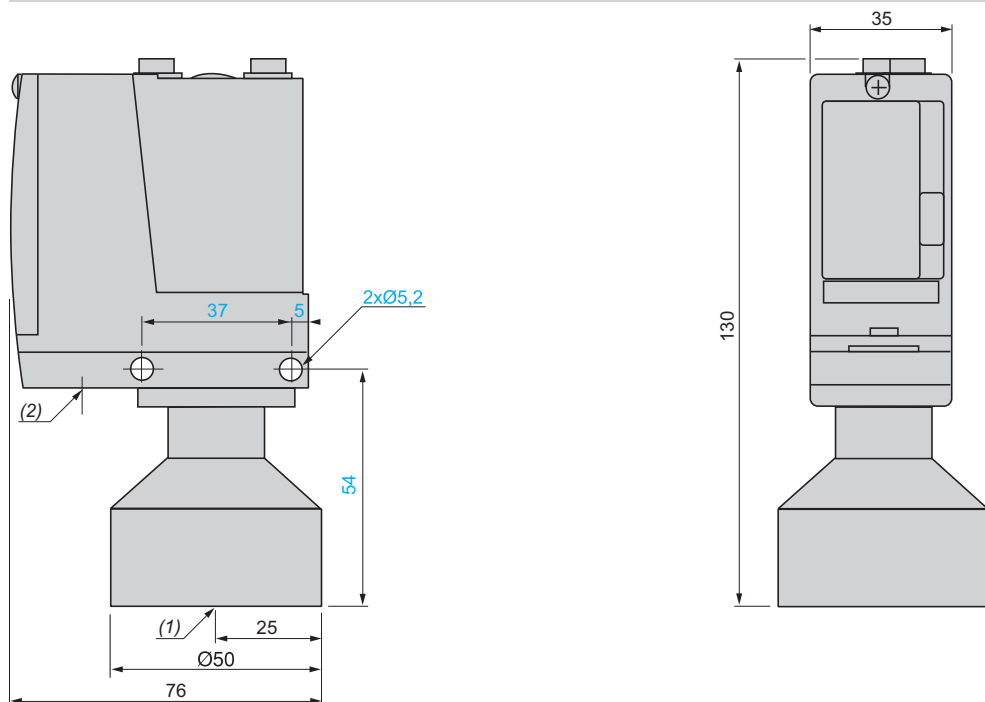
OsiSense XMLA, XMLB, XMLC and XMLD

XMLBL35P, XMLB001P



(1) 1 fluid entry, tapped G 1¼ (female)
 (2) 1 electrical connections entry, tapped M20 x 1.5 mm or Pg 13.5

XMLBM05P, XMLA004P, XML●010P, XML●020P, XML●035P



(1) 1 fluid entry, tapped G 1¼ (female)
 (2) 1 electrical connections entry, tapped M20 x 1.5 mm or Pg 13.5

This information will assist in checking the corrosion resistance of the pressure or vacuum switches in relation to the fluids controlled

2

Pressure or vacuum switch reference	Component materials in contact with fluid							
	Zinc alloy	Stainless steel	Brass	Steel	Nitrile	PTFE	FPM, FKM	Aluminium
XMLAM01V●●●●, XML●M02V●●●●		(1)						
XMLAM01T●●●●, XML●M02T●●●●		(2)						
XMLBM03R●●●●								
XMLBM03S●●●●		(3)						
XML●M05A●●●●		(1)						
XML●M05B●●●●		(1)						
XML●M05C●●●●		(1)						
XMLBM05P●●●●		(1)						
XMLBL05R●●●●								
XMLBL05S●●●●		(3)						
XML●L35R●●●●, XML●S35R●●●●		(1)						
XML●L35S●●●●		(3)						
XMLBL35P●●●●		(1)						
XML●001R●●●●		(1)						
XML●001S●●●●		(3)						
XMLB001P●●●●		(1)						
XML●002A●●●●								
XML●002B●●●●, XML●S02B●●●●								
XML●002C●●●●		(3)						
XMLA004A●●●●								
XMLA004B●●●●								
XMLA004C●●●●		(2)						
XMLA004P●●●●								

 Component materials in contact with fluid

- (1) 1.4307 (AISI 304L)
- (2) 1.4404 (AISI 316L)
- (3) 1.4305 (AISI 303)

This information will assist in checking the corrosion resistance of the pressure or vacuum switches in relation to the fluids controlled

Pressure switch reference	Component materials in contact with fluid							
	Zinc alloy	Stainless steel	Brass	Steel	Nitrile	PTFE	FPM, FKM	Aluminium
XMLB004A●●●●	■				■			
XML●004B●●●●, XML●S04B●●●●				■			■	
XML●004C●●●●		(3)				■		
XML●010A●●●●	■						■	
XML●010B●●●●			■				■	
XML●010C●●●●		(2)				■		
XML●010P●●●●, XML●S10A●●●●				■			■	
XML●020A●●●●, XML●035A●●●●	■		■		■			■
XML●020B●●●●, XML●035B●●●●			■				■	
XML●020C●●●●, XML●035C●●●●		(2)				■		
XML●020P●●●●, XML●035P●●●●, XML●S20A●●●●				■			■	
XML●070D●●●●, XML●160D●●●●			■	■			■	
XML●070E●●●●, XML●160E●●●●		(4)	■	■			■	
XML●070N●●●●, XML●160N●●●●		(5)	■	■			■	
XML●300D●●●●			■	■			■	
XML●300E●●●●		(4)	■	■			■	
XML●300N●●●●		(5)	■	■			■	
XML●500D●●●●			■	■			■	
XML●500E●●●●			■	■			■	
XML●500N●●●●4		(5)	■	■			■	

■ Component materials in contact with fluid

- (2) 1.4404 (AISI 316L)
- (3) 1.4305 (AISI 303)
- (4) 1.4404 (AISI 316L) + 1.4462
- (5) 1.4404 (AISI 316L) + 1.4305 (AISI 303)

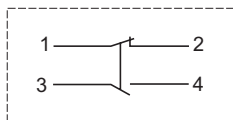
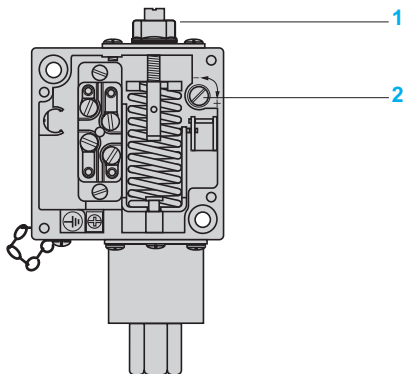
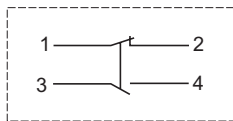
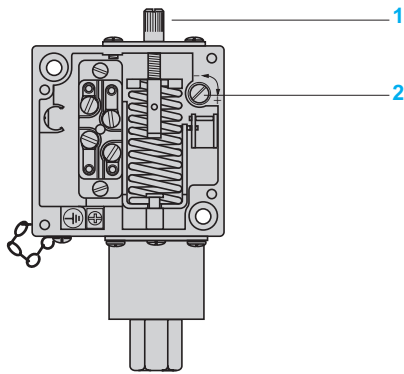


Electromechanical pressure switches

OsiSense XM

For control circuits, OsiSense ACW and ADW

2



Presentation

Pressure switches OsiSense ACW and ADW are switches for control circuits, with an adjustable differential.

Pressure switches OsiSense ACW are used to control the pressure of air, oils and other non corrosive fluids, up to 131 bar.

Pressure switches OsiSense ADW are used to control the pressure of oils (including synthetic), up to 340 bar.

Setting, operating principle

Pressure switches OsiSense ACW

The switching point on falling pressure (low point - PB) is adjusted using screw 1.

The switching point on rising pressure (high point - PH) is made by adjusting screw 2. This sets the differential between the low and high points, giving a switching point on rising pressure of the displayed low point setting plus the differential setting.

The two adjustments are completely independent.

Contact block operation

When the rising pressure reaches the high point setting (low point setting + differential setting), contact B (1-2) opens and contact A (3-4) closes. The contacts remain actuated until the pressure falls back to the low point setting.

Pressure switches OsiSense ADW

The switching point on rising pressure (high point - PH) is adjusted using screw 1.

The switching point on falling pressure (low point - PB) is made by adjusting screw 2. This sets the differential between the high and low points, giving a switching point on falling pressure of the displayed high point setting minus the differential setting.

The two adjustments are completely independent.

Contact block operation

When the rising pressure reaches the high point setting, contact B (1-2) opens and contact A (3-4) closes. The contacts remain actuated until the pressure falls back to the low point setting (high point setting - differential setting).

Environment characteristics			
Pressure switch type		ACW (bellows operated)	ADW (piston operated)
Conformity to standards		CE, IEC/EN 60947-5-1	
Product certifications		CSA, UL (Recognized), EAC	
Protective treatment		"TC"	
Materials		Zinc alloy case Phosphor bronze bellows	Zinc alloy case Pressure switches with drainage hole: Buna N diaphragm, steel piston, cast iron cylinder Pressure switches with Quad-Ring piston seal: Buna N diaphragm, Teflon and Viton seal, stainless steel piston and cylinder
Ambient air temperature (for operation)	°C	- 56...+ 85	- 30...+ 85
Fluids controlled		Air, oils and other non corrosive fluids, from - 73 to + 125°C	Oils and other fluids, from - 25 to + 120°C (for ADW5, ADW6, ADW7S1, ADW25 and ADW26) Oils (including synthetic) only, from - 30 to + 125°C (for ADW3, ADW4, ADW7, ADW23, ADW24 and ADW27)
Degree of protection		IP 65 conforming to IEC/EN 60529	
Fluid connection		G 1/4 (BSP female) conforming to NF E 03-005, ISO 228	G 3/8 (BSP female) conforming to NF E 03-005, ISO 228
Electrical connection	Terminals	1 tapped entry M20 x 1.5 mm for ISO cable gland. (for ACW●M119012, ACW●●M119012, ADW●M119012 and ADW●●M119012). 1 tapped entry for n° 13 (DIN Pg 13.5) cable gland (for ACW●M129012, ACW●●M129012, ADW●M129012 and ADW●●M129012).	

Contact block characteristics					
Rated operational current		1 CO single-pole pressure switches		2 CO single-pole pressure switches	
		Ue	Ie	Ue	Ie
Category AC-15	24 V		5 A		3 A
	110 V		5 A		3 A
	220 V		3 A		1.5 A
	500 V		1.4 A		0.7 A
Category DC-13	24 V		5 A		1.5 A
	110 V		0.5 A		0.25 A
	220 V		0.25 A		–
	500 V		0.10 A		–
	600 V		0.06 A		–
Short-circuit protection		10 A cartridge fuse type gG			
Connection		Screw terminals Minimum clamping capacity: 1 x 1 mm ² Maximum clamping capacity: 2 x 2.5 mm ²			

Electromechanical pressure switches

OsiSense XM

For control circuits, OsiSense ACW

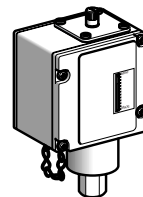
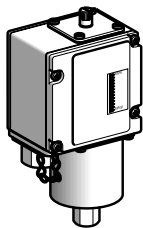
Sizes 0.70 to 131 bar (10.15 to 1900 psi)

Adjustable differential, for regulation between 2 thresholds

Fluid connection G 1/4 (female)

Pressure switches OsiSense ACW

Bellows operated



Adjustable range of switching point (PB)
(Falling pressure)

0.07...0.70 bar
(1.01...10.15 psi)

0.07...1.4 bar
(1.01...20.3 psi)

0.07...5.2 bar
(1.01...75.4 psi)

0.07...7.6 bar
(1.01...110.2 psi)

References

Switches with 1 CO single-pole contact

Electrical connection		ACW3M119012	ACW4M119012	ACW5M119012	ACW1M119012
With one tapped entry M20 x 1.5 mm for ISO cable gland					
With one tapped entry for n° 13 cable gland		ACW3M129012	ACW4M129012	ACW5M129012	ACW1M129012
Weight (kg)		1.750		1.550	

Switches with 2 CO single-pole contacts

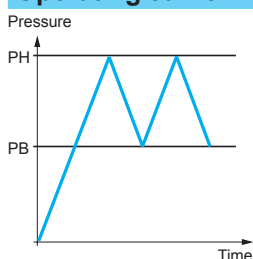
Electrical connection		ACW23M119012	ACW24M119012	ACW25M119012	ACW21M119012
With one tapped entry M20 x 1.5 mm for ISO cable gland					
With one tapped entry for n° 13 cable gland		ACW23M129012	ACW24M129012	ACW25M129012	ACW21M129012
Weight (kg)		1.750		1.550	

Complementary characteristics not shown under general characteristics (page 2/123)

Possible differential (add to PB to give PH)	1 CO switches	Min.	0.04 bar (0.58 psi)	0.10 bar (1.45 psi)	0.30 bar (4.35 psi)	0.50 bar (7.25 psi)
		Max.	0.34 bar (4.93 psi)	0.40 bar (5.8 psi)	1 bar (14.5 psi)	2 bar (29 psi)
	2 CO switches	Min.	0.05 bar (0.73 psi)	0.14 bar (2.03 psi)	0.41 bar (5.95 psi)	0.9 bar (13.05 psi)
		Max.	0.48 bar (6.96 psi)	0.70 bar (10.15 psi)	1.4 bar (20.3 psi)	2.8 bar (40.6 psi)
Maximum permissible pressure		2 bar (29 psi)		7 bar (101.5 psi)	17 bar (246.5 psi)	
Fluids controlled		Air, oils and other non corrosive fluids, from - 73 to + 125°C (1)				
Mechanical life		1 x 10 ⁶ operating cycles (average value, depending on application)				
Cable entry, screw terminals	ACW●M119012, ACW2●M119012	1 tapped entry M20 x 1.5 mm for ISO cable gland. Clamping capacity 7 to 13 mm				
	ACW●M129012, ACW2●M129012	1 tapped entry for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5). Clamping capacity 9 to 13 mm				

(1) See "Component materials of units in contact with the fluid", page 2/123.

Operating curve



— Adjustable value

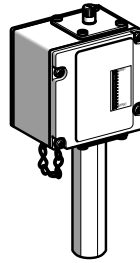
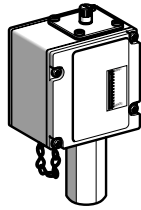
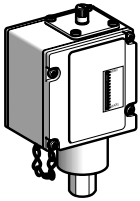
Contact block connections



Other versions

Pressure switches with alternative tapped cable entries: NPT, etc. Please consult our Customer Care Centre.

Bellows operated



1.4...12 bar (20.3...174 psi)	0.7...18 bar (10.15...261 psi)	0.7...21 bar (10.15...304.5 psi)	5.2...34 bar (75.4...493 psi)	10...69 bar (145...1000 psi)	24...131 bar (348...1900 psi)
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References

Switches with 1 CO single-pole contact

ACW8M119012	ACW9M119012	ACW2M119012	ACW6M119012	ACW7M119012	ACW10M119012
ACW8M129012	ACW9M129012	ACW2M129012	ACW6M129012	ACW7M129012	ACW10M129012
1.550		2.100			

Switches with 2 CO single-pole contacts

ACW28M119012	–	ACW22M119012	ACW26M119012	–	ACW20M119012
ACW28M129012	ACW29M129012	ACW22M129012	ACW26M129012	ACW27M129012	ACW20M129012
1.550		2.100			

Complementary characteristics not shown under general characteristics (page 2/123)

0.70 bar (10.15 psi)	1 bar (14.5 psi)	1.7 bar (24.7 psi)	3.4 bar (49.3 psi)	5.9 bar (85.6 psi)	11 bar (159.5 psi)
2 bar (29 psi)	1.7 bar (24.7 psi)	8.6 bar (124.7 psi)	8.3 bar (120.4 psi)	10 bar (145 psi)	21 bar (304.5 psi)
1 bar (14.5 psi)	1.6 bar (23.2 psi)	2.4 bar (34.8 psi)	5.9 bar (85.6 psi)	9.3 bar (134.9 psi)	17 bar (246.5 psi)
2.8 bar (40.6 psi)	2.4 bar (34.8 psi)	10 bar (145 psi)	11 bar (159.5 psi)	14 bar (203 psi)	24 bar (348 psi)
17 bar (246.5 psi)	20 bar (290 psi)	41 bar (549.5 psi)	140 bar (2030 psi)	140 bar (2030 psi)	175 bar (2538 psi)

Air, oils and other non corrosive fluids, from - 73 to + 125°C (1)

1 x 10⁶ operating cycles (average value, depending on application)

1 tapped entry M20 x 1.5 mm for ISO cable gland. Clamping capacity 7 to 13 mm

1 tapped entry for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5). Clamping capacity 9 to 13 mm

Other versions

Pressure switches with alternative tapped cable entries: NPT, etc. Please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XM

For control circuits, OsiSense ADW

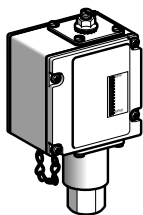
Sizes 69 to 340 bar (1000 to 4930 psi)

Adjustable differential, for regulation between 2 thresholds

Fluid connection G 3/8 (female)

Pressure switches OsiSense ADW

Piston operated, with drainage hole (1)



Adjustable range of switching point (PH) (Rising pressure)	9.3...69 bar (135...1000 psi)	28...210 bar (406...3045 psi)	38...340 bar (551...4930 psi)
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References

Switches with 1 CO single-pole contact

Electrical connection	With one tapped entry M20 x 1.5 mm for ISO cable gland	ADW3M119012	ADW4M119012	ADW7M119012
	With one tapped entry for n° 13 cable gland	ADW3M129012	ADW4M129012	ADW7M129012
Weight (kg)	1.880			

Switches with 2 CO single-pole contacts

Electrical connection	With one tapped entry for n° 13 cable gland	ADW23M129012	ADW24M129012	ADW27M129012
Weight (kg)	1.880			

Complementary characteristics not shown under general characteristics (page 2/123)

Possible differential (subtract from PH to give PB)	1 CO switches	Min.	2.4 bar (34.8 psi)	6.9 bar (100 psi)	8.6 bar (124.7 psi)
		Max.	9.3 bar (135 psi)	28 bar (406 psi)	38 bar (551 psi)
	2 CO switches	Min.	3.1 bar (45 psi)	8.6 bar (124.7 psi)	14 bar (203 psi)
		Max.	14 bar (203 psi)	34 bar (493 psi)	41 bar (594.5 psi)
Maximum permissible pressure	690 bar (10,000 psi)				
Fluids controlled	Oils (including synthetic) only, from - 30°C to + 125°C (2) (3)				
Mechanical life	1 x 10 ⁶ operating cycles (average value, depending on application)				
Cable entry, screw terminals	ADW●M119012	1 tapped entry M20 x 1.5 mm for ISO cable gland. Clamping capacity 7 to 13 mm			
	ADW●M129012, ADW2●●M129012	1 tapped entry for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5). Clamping capacity 9 to 13 mm			

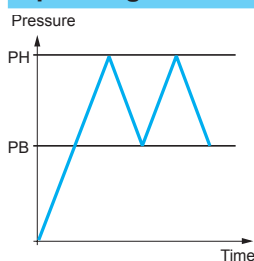
(1) Since it is normal for piston type pressure switches (not incorporating a piston seal) to have a slight oil leakage past the piston, a drain hole through the cylinder wall is incorporated.

To avoid back pressure, this hole should never be plugged. If for any reason this oil leakage is undesirable, use pressure switches incorporating a Quad-Ring piston seal.

(2) See "Component materials of units in contact with the fluid", page 2/123.

(3) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

Operating curve



— Adjustable value

Contact block connections

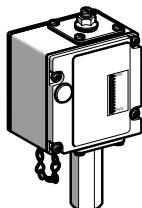


Other versions

Pressure switches with alternative tapped cable entries: NPT, etc. Please consult our Customer Care Centre.

Pressure switches OsiSense ADW

Piston operated, with Quad-Ring piston seal



Adjustable range of switching point (PH) (Falling pressure)	9.3...69 bar (135...1000 psi)	28...210 bar (406...3045 psi)	38...340 bar (551...4930 psi)
-----------------------------------------------------------------------	-----------------------------------------	-----------------------------------------	-----------------------------------------

References

Switches with 1 CO single-pole contact

Electrical connection	With one tapped entry M20 x 1.5 mm for ISO cable gland	ADW5M119012	ADW6M119012	—
	With one tapped entry for n° 13 cable gland	ADW5M129012	ADW6M129012	ADW7S1M129012
Weight (kg)	1.880			

Switches with 2 CO single-pole contacts

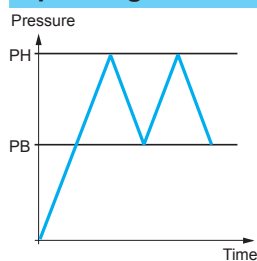
Electrical connection	With one tapped entry for n° 13 cable gland	ADW25M129012	ADW26M129012	—
Weight (kg)	1.880			

Complementary characteristics not shown under general characteristics (page 2/123)

Possible differential (subtract from PH to give PB)	1 CO switches	Min./max. at low setting	4.8/6.9 bar (69.6/100 psi)	14/21 bar (203/304.5 psi)	19/25 bar (275.5/362.5 psi)
		Min./max. at high setting	8.6/10 bar (124.7/145 psi)	28/34 bar (406/493 psi)	38/45 bar (551/652.5 psi)
	2 CO switches	Min./max. at low setting	6.2/7.9 bar (89.9/114.6 psi)	17/24 bar (246.5/348 psi)	22/28 bar (319/406 psi)
		Min./max. at high setting	10/12 bar (145/174 psi)	34/39 bar (493/565.5 psi)	44/50 bar (638/725 psi)
Maximum permissible pressure	690 bar (10,000 psi)				
Fluids controlled	Oils and other fluids, from - 25°C to + 120°C (1) (2)				
Mechanical life	1 x 10 ⁶ operating cycles (average value, depending on application)				
Cable entry, screw terminals	ADW●M119012	1 tapped entry M20 x 1.5 mm for ISO cable gland. Clamping capacity 7 to 13 mm			
	ADW●M129012, ADW2●●M129012	1 tapped entry for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5). Clamping capacity 9 to 13 mm			

(1) See "Component materials of units in contact with the fluid", page 2/123.
(2) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

Operating curve



Contact block connections



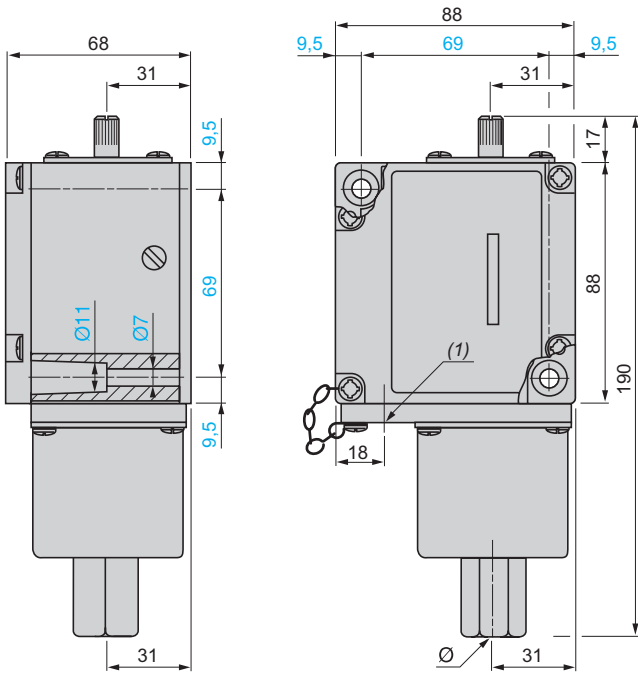
— Adjustable value

Other versions

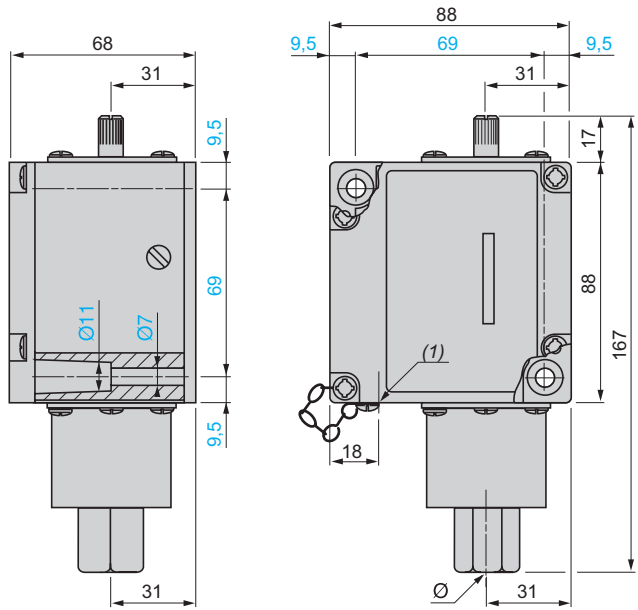
Pressure switches with alternative tapped cable entries: NPT, etc. Please consult our Customer Care Centre.

2

ACW3, ACW4, ACW23 and ACW24



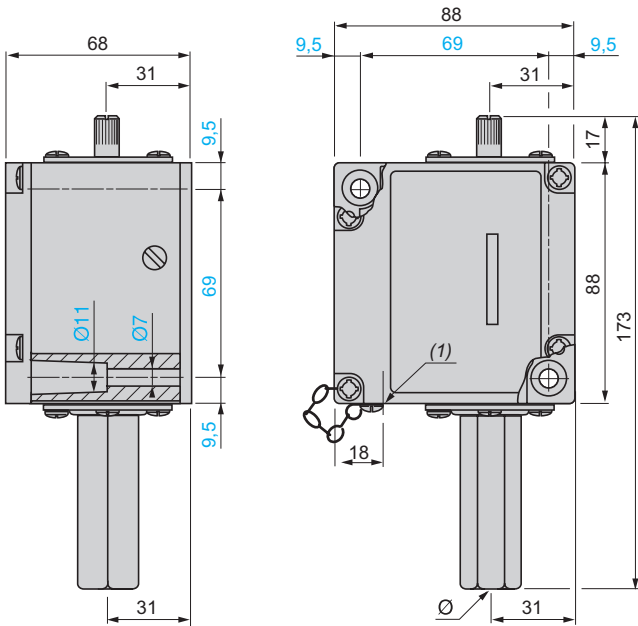
ACW1, ACW5, ACW8, ACW9, ACW21, ACW25, ACW28 and ACW29



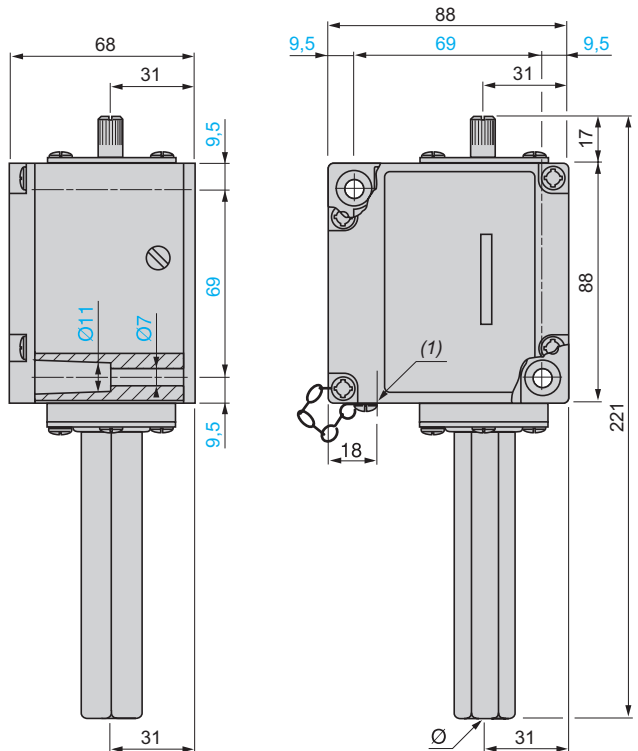
(1) Tapped entry for n° 13 or ISO M20 cable gland, depending on model
Ø: G 1/4 (female)

(1) Tapped entry for n° 13 or ISO M20 cable gland, depending on model
Ø: G 1/4 (female)

ACW2 and ACW22



ACW6, ACW7, ACW10, ACW26, ACW27 and ACW20



(1) Tapped entry for n° 13 or ISO M20 cable gland, depending on model
Ø: G 1/4 (female)

(1) Tapped entry for n° 13 or ISO M20 cable gland, depending on model
Ø: G 1/4 (female)

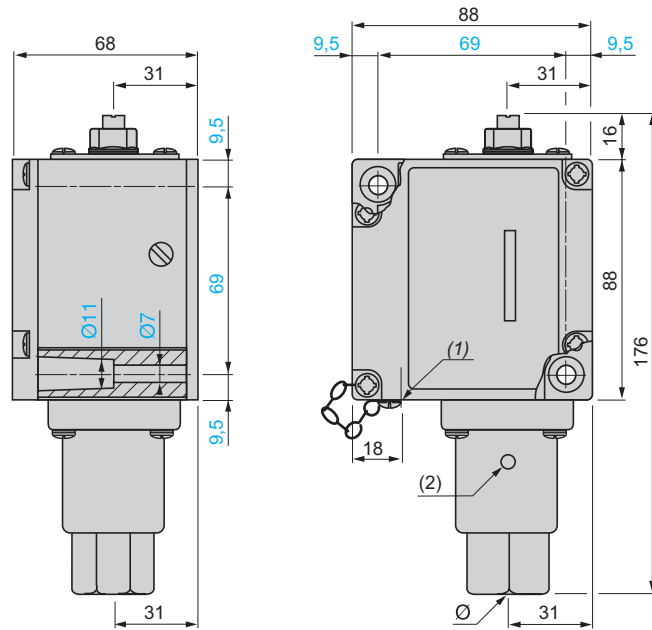
References:
pages 2/124 and 2/125

Electromechanical pressure switches

OsiSense XM

For control circuits, OsiSense ADW

ADW3, ADW4, ADW7, ADW23, ADW24 and ADW27

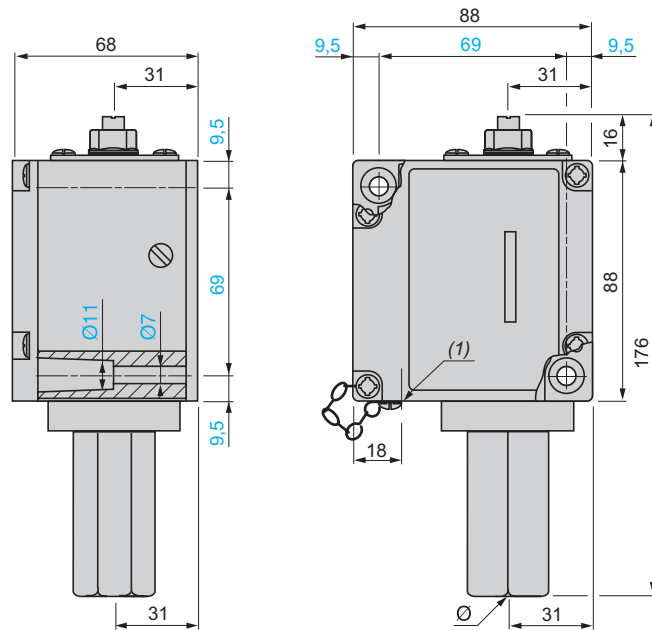


(1) Tapped entry for n° 13 or ISO M20 cable gland, depending on model

(2) Drainage hole, tapped G 1/8 (female)

Ø: G 3/8 (female)

ADW5, ADW6, ADW7S1, ADW25 and ADW26



(1) Tapped entry for n° 13 or ISO M20 cable gland, depending on model

Ø: G 3/8 (female)

Presentation

Pressure switches OsiSense XMX and XMA are switches for control circuits, with an adjustable differential.

They are used to control the pressure of water and air, up to 25 bar.

Equipment fitted to the various models

Location of setting screw

Pressure switches OsiSense XMX have an internal setting screw that is only accessible after removing the cover.

Pressure switches OsiSense XMA have an external setting screw that is accessible without removing the cover.

Case

Pressure switches OsiSense XMX have a black opaque case.

Pressure switches OsiSense XMA can have a transparent case or a black opaque case.

Setting

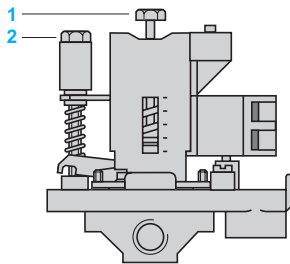
When setting pressure switches XMX or XMA, adjust the switching point on rising pressure (PH) first and then the switching point on falling pressure (PB).

Switching point on rising pressure

The switching point on rising pressure (PH) is set by adjusting screw-nut **1**.

Switching point on falling pressure

The switching point on falling pressure (PB) is set by adjusting screw-nut **2**.



Environment characteristics			
Conformity to standards			CE, IEC/EN 60947-5-1
Product certifications			UL, CSA, CCC, EAC
Protective treatment			"TC"
Ambient air temperature	For operation	°C	- 25...+ 70 for 6 and 25 bar versions - 25...+ 55 for 12 bar version
	For storage		- 40...+ 70
Fluids controlled		°C	Air, fresh water, sea water: 0...+ 70°C for 6 and 25 bar versions 0...+ 55°C for 12 bar version
Materials			Case: polycarbonate impregnated with Lexan 500R fibreglass (black opaque cover) or polycarbonate impregnated with Lexan 123 fibreglass (transparent cover) Component materials in contact with fluid: chromated zinc alloy (fluid entry), canvas covered nitrile (diaphragm)
Operating position			All positions
Electric shock protection			Class I conforming to IEC 536
Degree of protection			IP 54 conforming to IEC/EN 60529
Operating rate		Op. cycles/h	600
Repeat accuracy			< 3.5%
Fluid connection			G 1/4 or 4 x G 1/4 (BSP female) conforming to NF E 03-005, ISO 228
Electrical connection			Terminals 2 tapped entries for n° 13 (DIN Pg 13.5) cable gland

Contact block characteristics			
Rated operational characteristics			~ AC-15, B300 (Ue = 240 V, Ie = 1.5 A; Ue = 120 V, Ie = 3 A) = DC-13, R300 (Ue = 250 V, Ie = 0.1 A)
Rated insulation voltage		V	Ui = 500 conforming to IEC/EN 60947-1
Rated impulse withstand voltage		kV	U imp = 6 conforming to IEC/EN 60947-1
Type of contacts			1 CO single-pole contact, snap action
Terminal referencing			Conforming to CENELEC EN 50013
Short-circuit protection			10 A cartridge fuse type gG (gl)
Connection			Screw clamp terminals Minimum clamping capacity: 1 x 1 mm ² Maximum clamping capacity: 2 x 2.5 mm ²
Electrical durability			AC supply 50/60Hz, Ith = 10 A Inductive circuit, utilisation category AC-15, 3 A/240 V: 1 million operating cycles

Electromechanical pressure switches

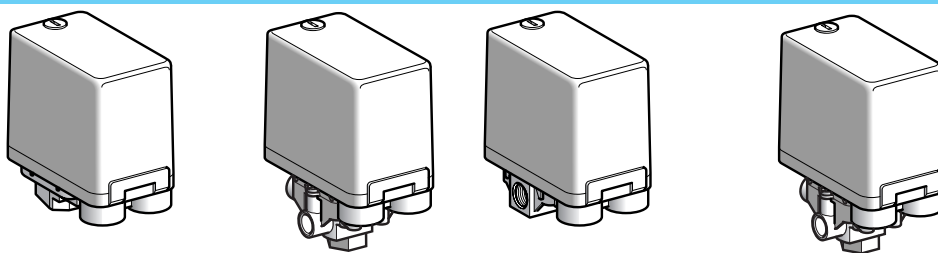
OsiSense XMX for control circuits

Sizes 6 to 25 bar (87 to 362.5 psi)

Adjustable differential, for regulation between 2 thresholds

Switches with 1 CO single-pole contact

Pressure switches OsiSense XMX (internal setting screw)



Adjustable range of switching point (PH) (Rising pressure)	1...6 bar (14.5...87 psi)	1.3...12 bar (18.85...174 psi)	3.5...25 bar (50.75...362.5 psi)	1...6 bar (14.5...87 psi)	1.3...12 bar (18.85...174 psi)	3.5...25 bar (50.75...362.5 psi)
Fluid connection	G 1/4 (female)			4 x G 1/4 (female)		

References

Switches with black opaque cover

Fluids controlled	Air, fresh water, sea water (1)	XMXA06L2135	XMXA12L2135	XMXA25L2135	XMXA06L2435	XMXA12L2435	XMXA25L2435
Weight (kg)		0.430		0.650	0.430		0.650

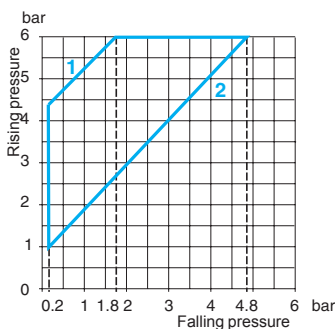
Complementary characteristics not shown under general characteristics (page 2/132)

Possible differential (subtract from PH to give PB)	Min. at low setting	0.8 bar (11.6 psi)	1 bar (14.5 psi)	3.4 bar (49.3 psi)	0.8 bar (11.6 psi)	1 bar (14.5 psi)	3.4 bar (49.3 psi)
	Min. at high setting	1.2 bar (17.4 psi)	1.7 bar (24.6 psi)	4.5 bar (65.2 psi)	1.2 bar (17.4 psi)	1.7 bar (24.6 psi)	4.5 bar (65.2 psi)
	Max. at high setting	4.2 bar (60.9 psi)	8.4 bar (121.8 psi)	20 bar (290 psi)	4.2 bar (60.9 psi)	8.4 bar (121.8 psi)	20 bar (290 psi)
Maximum permissible pressure	Per cycle	7.5 bar (108.7 psi)	15 bar (217.5 psi)	31.25 bar (453.1 psi)	7.5 bar (108.7 psi)	15 bar (217.5 psi)	31.25 bar (453.1 psi)
	Accidental	13.5 bar (195.7 psi)	27 bar (391.5 psi)	56.25 bar (815.6 psi)	13.5 bar (195.7 psi)	27 bar (391.5 psi)	56.25 bar (815.6 psi)
Destruction pressure		30 bar (435 psi)		100 bar (1450 psi)	30 bar (435 psi)		100 bar (1450 psi)
Mechanical life		1 x 10 ⁶ operating cycles					
Cable entry		2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)					
Pressure switch type		Diaphragm					

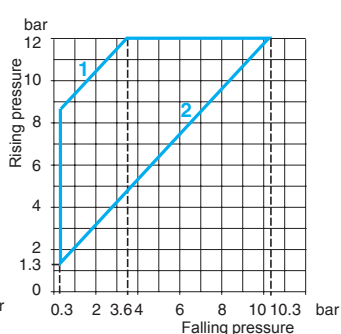
(1) Component materials of units in contact with the fluid, see page 2/132.

Operating curves

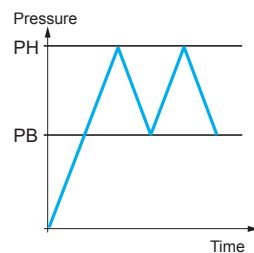
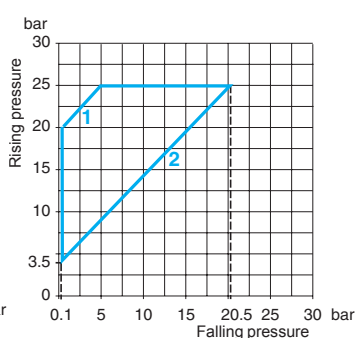
XMXA06●●●●●



XMXA12●●●●●



XMXA25●●●●●



— Adjustable value

- 1 Maximum differential
- 2 Minimum differential

- 1 Maximum differential
- 2 Minimum differential

- 1 Maximum differential
- 2 Minimum differential

Connections



Other versions

Pressure switches with alternative tapped cable entries: ISO, NPT, etc. Please consult our Customer Care Centre.

Electromechanical pressure switches

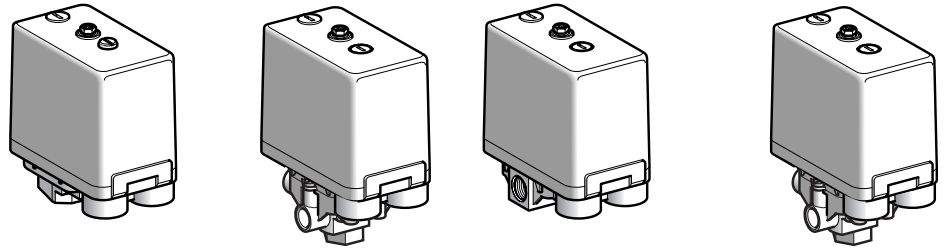
OsiSense XMA for control circuits

Sizes 6 to 25 bar (87 to 362.5 psi)

Adjustable differential, for regulation between 2 thresholds

Switches with 1 CO single-pole contact

Pressure switches OsiSense XMA (external setting screw)



Adjustable range of switching point (PH) (Rising pressure)	1...6 bar (14.5...87 psi)	1.3...12 bar (18.85...174 psi)	3.5...25 bar (50.75...362.5 psi)	1...6 bar (14.5...87 psi)	1.3...12 bar (18.85...174 psi)	3.5...25 bar (50.75...362.5 psi)
Fluid connection	G 1/4 (female)			4 x G 1/4 (female)		

References

Switches with black opaque cover

Fluids controlled	Air, fresh water, sea water (1)	XMAH06L2135	XMAH12L2135	XMAH25L2135	XMAH06L2435	XMAH12L2435	XMAH25L2435
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Switches with transparent cover

Fluids controlled	Air, fresh water, sea water (1)	XMAV06L2135	XMAV12L2135	XMAV25L2135	XMAV06L2435	XMAV12L2435	XMAV25L2435
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Weight (kg)	0.430	0.650	0.430	0.650
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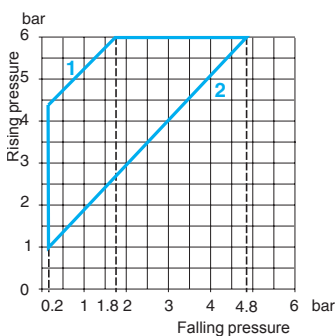
Complementary characteristics not shown under general characteristics (page 2/132)

Possible differential (subtract from PH to give PB)	Min. at low setting	0.8 bar (11.6 psi)	1 bar (14.5 psi)	3.4 bar (49.3 psi)	0.8 bar (11.6 psi)	1 bar (14.5 psi)	3.4 bar (49.3 psi)
	Min. at high setting	1.2 bar (17.4 psi)	1.7 bar (24.6 psi)	4.5 bar (65.2 psi)	1.2 bar (17.4 psi)	1.7 bar (24.6 psi)	4.5 bar (65.2 psi)
	Max. at high setting	4.2 bar (60.9 psi)	8.4 bar (121.8 psi)	20 bar (290 psi)	4.2 bar (60.9 psi)	8.4 bar (121.8 psi)	20 bar (290 psi)
Maximum permissible pressure	Per cycle	7.5 bar (108.7 psi)	15 bar (217.5 psi)	31.25 bar (453.1 psi)	7.5 bar (108.7 psi)	15 bar (217.5 psi)	31.25 bar (453.1 psi)
	Accidental	13.5 bar (195.7 psi)	27 bar (391.5 psi)	56.25 bar (815.6 psi)	13.5 bar (195.7 psi)	27 bar (391.5 psi)	56.25 bar (815.6 psi)
Destruction pressure		30 bar (435 psi)	100 bar (1450 psi)	30 bar (435 psi)	100 bar (1450 psi)	100 bar (1450 psi)	
Mechanical life		1 x 10 ⁶ operating cycles					
Cable entry		2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)					
Pressure switch type		Diaphragm					

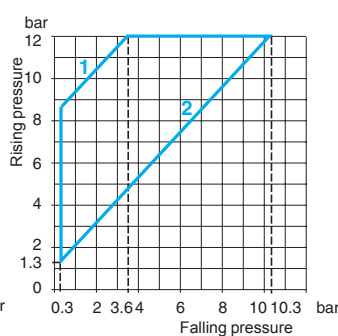
(1) Component materials of units in contact with the fluid, see page 2/132.

Operating curves

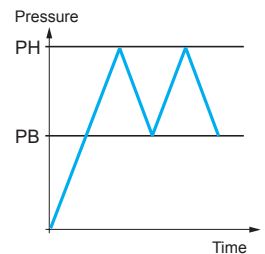
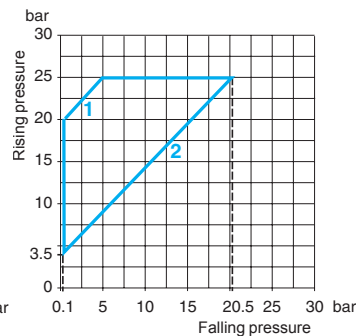
XMA●06●●●●●●



XMA●12●●●●●●



XMA●25●●●●●●



— Adjustable value

- 1 Maximum differential
- 2 Minimum differential

- 1 Maximum differential
- 2 Minimum differential

- 1 Maximum differential
- 2 Minimum differential

Connections



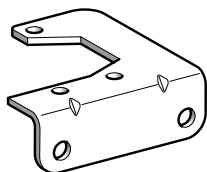
Other versions

Pressure switches with alternative tapped cable entries: ISO, NPT, etc. Please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XMX and XMA for control circuits

Accessories and replacement parts



XMAZL001



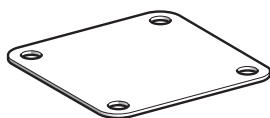
XMLZL003



DE9PM1201



DE9PM1202



XMPZ3●

Description	Reference	Weight kg
Fixing bracket	XMAZL001	0.035

Knurled adjustment knob, Ø 36 mm fits over adjustment screws to facilitate setting	XMLZL003	0.010
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13P cable gland With anti pull-out ring (for cable Ø 6...9 mm)	DE9PM1201	0.005
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Without anti pull-out ring (for cable Ø 6...9 mm)	DE9PM1202	0.005
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With anti pull-out ring (for cable Ø 9...12.5 mm)	DE9PM1203	0.005
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Description	For pressure switch	Reference	Weight kg
Diaphragms	Size 6 bar	XMPZ31	0.005

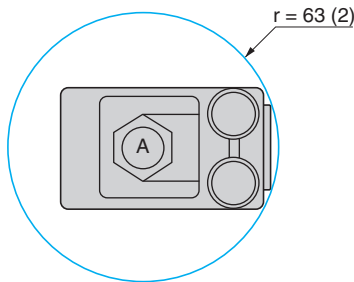
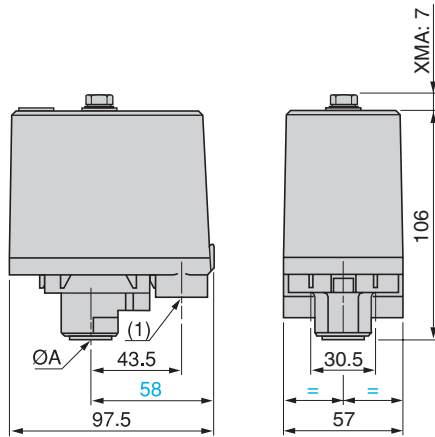
Size 25 bar	XMPZ33	0.005
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Electromechanical pressure switches

OsiSense XM

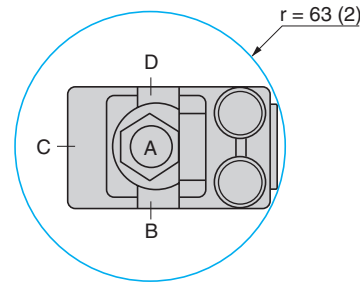
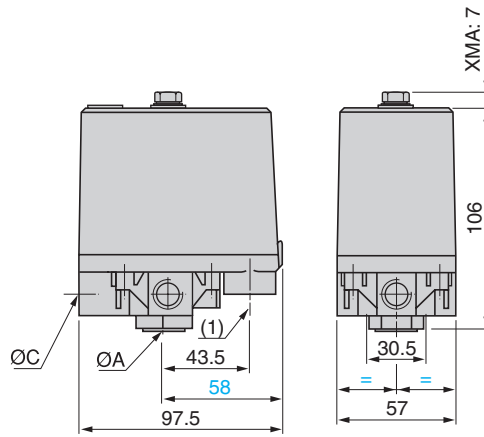
For control circuits, OsiSense XMX and XMA
Accessories and replacement parts

XMxA06L2135, XMxA12L2135
XMA●06L2135, XMA●12L2135



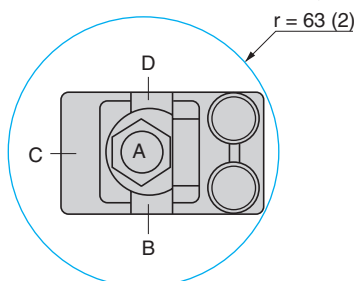
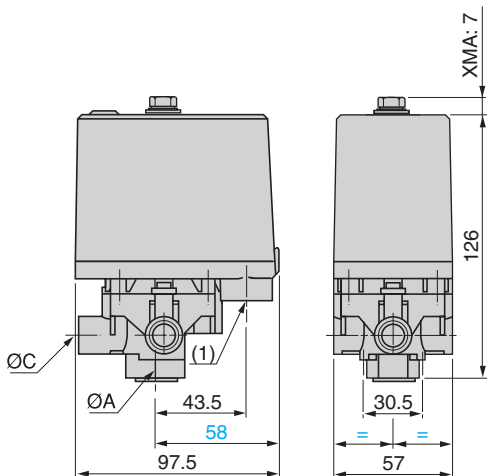
ØA = G 1/4 (female)
(1) 2 tapped entries for n° 13 cable gland
(2) Minimum clearance zone for screwing-on pressure switch at point A

XMxA06L2435, XMxA12L2435
XMA●06L2435, XMA●12L2435



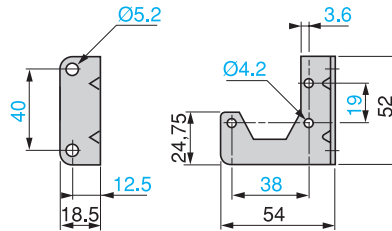
ØA = ØB = ØC = ØD = G 1/4 (female)
(1) 2 tapped entries for n° 13 cable gland
(2) Minimum clearance zone for screwing-on pressure switch at point A

XMxA25L2135, XMxA25L2435
XMA●25L2135, XMA●25L2435



XM●25L2135: ØA only = G 1/4 (female)
XM●25L2435: ØA = ØB = ØC = ØD = G 1/4 (female)

Fixing bracket
XMAZL001



(1) 2 tapped entries for n° 13 cable gland
(2) Minimum clearance zone for screwing-on pressure switch at point A

2

Presentation

Pressure switches OsiSense FTG, FSG and FYG are switches for power circuits. They are used to control the pressure of water, up to 10.5 bar.

2 types of product are available:

- pressure switches OsiSense FTG with fixed differential, for detection of a single threshold,
- pressure switches OsiSense FSG and FYG with an adjustable differential, for regulation between 2 thresholds.

For specific needs, these 2 types of product can be supplied in IP 65 versions, thus ensuring a higher degree of protection. They feature 2 cable entries, fitted with cable gland, and are referenced **F•G•NE**.

Setting

Pressure switches with fixed differential (FTG)

Only the switching point on rising pressure is adjustable.

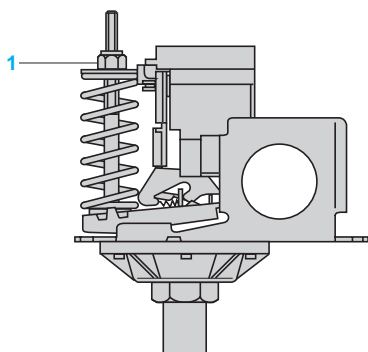
Switching point on rising pressure

The switching point on rising pressure (PH) is set by adjusting screw-nut **1**.

Switching point on falling pressure

The switching point on falling pressure (PB) is not adjustable.

The difference between the tripping and resetting points of the contact is the natural differential of the switch (contact differential, friction, etc.).



Pressure switches with adjustable differential (FSG and FYG)

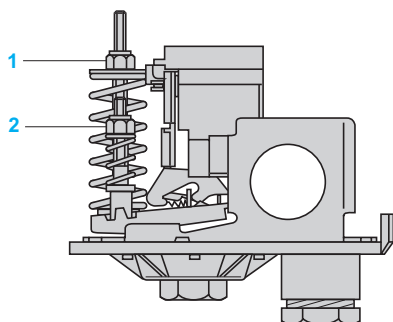
When setting the pressure switch, adjust the switching point on rising pressure (PH) first and then the switching point on falling pressure (PB).

Switching point on rising pressure

The switching point on rising pressure (PH) is set by adjusting screw-nut **1**.

Switching point on falling pressure

The switching point on falling pressure (PB) is set by adjusting screw-nut **2**.



Environment characteristics			
Pressure switch type		FTG● FTG●NE	FSG● and FYG● FSG●NE and FYG●NE
Conformity to standards		CE, IEC/EN 60730	
Protective treatment		Standard version: "TC"	
Ambient air temperature	°C	For operation: 0...+ 45. For storage: - 30...+ 80	
Fluids controlled		Fresh water, sea water (0...+ 70°C)	
Materials		Case: polystyrene, resistant to mechanical impact Component materials in contact with fluid: nylon 6/6, zinc plated steel, nitrile	
Operating position		All positions	
Electric shock protection		Class I conforming to IEC 536	
Degree of protection conforming to IEC/EN 60529	FTG●, FSG● and FYG●	IP 20	
	FTG●NE, FSG●NE and FYG●NE	IP 65	
Operating rate	Op. cycles/h	600	
Repeat accuracy		< 2%	
Fluid connection	F●G 2, FYG●2	G 1/4 (BSP female) conforming to NF E 03-005, ISO 228	
	F●G 9	R 1/4 (BSP male) conforming to NF E 03-004, ISO 7	
Electrical connection	FTG●, FSG● and FYG●	Terminals. 2 cable entries, with grommet	
	FTG●NE, FSG●NE and FYG●NE	Terminals. 2 entries incorporating 13P cable gland (DIN Pg 13.5)	

Contact block characteristics					
Rated operational characteristics		Ie = 10 A, Ue = ~ 250 V conforming to EN 60730-1			
Power ratings of controlled motors	Voltage	~ 2-pole 1-phase	~ 2-pole 3-phase	~ 2-pole 1-phase	~ 2-pole 3-phase
	110 V	0.75 kW (1 HP)	1.1 kW (1.5 HP)	0.75 kW (1 HP)	1.1 kW (1.5 HP)
	230 V	1.1 kW (1.5 HP)	1.5 kW (2 HP)	1.5 kW (2 HP)	2.2 kW (3 HP)
	400 V	1.5 kW (2 HP)	1.5 kW (2 HP)	1.5 kW (2 HP)	2.2 kW (3 HP)
Rated insulation voltage conforming to IEC/EN 60947-1	V	Ui = 500			
Rated impulse withstand voltage conforming to IEC/EN 60947-1	kV	U imp = 6			
Type of contacts		1 2-pole 2 NC (4 terminal) contact, snap action			
Short-circuit protection		20 A cartridge fuse type gG			
Connection		Screw clamp terminals. Minimum clamping capacity: 1 x 1 mm ² , max: 2 x 2 mm ²			
Electrical durability at an operating rate of 600 operating cycles/hour	Op. cycles	40 000		100 000	

Electromechanical pressure switches

OsiSense XM

For power circuits, OsiSense FTG

Size 4.6 bar (66.7 psi), fixed differential, for detection of a single threshold. Switches with 2-pole 2 NC contact.

Degree of protection IP 20 or IP 65

Fluid connection	G 1/4 (female)	R 1/4 (male)	G 1/4 (female)	R 1/4 (male)

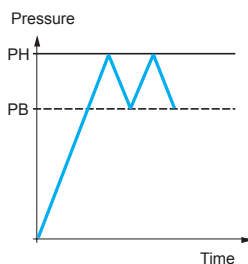
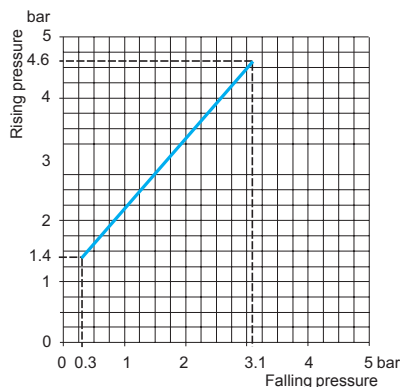
Adjustable range of switching point (PH) (Rising pressure)	1.4...4.6 bar (20.3...66.7 psi)			
Degree of protection conforming to IEC/EN 60529	IP 20		IP 65	

References					
Fluids controlled	Fresh water, sea water, from 0°C to +70°C (1)	FTG2	FTG9	FTG2NE	FTG9NE
Weight (kg)	0.340				

Complementary characteristics not shown under general characteristics (page 2/137)		
Natural differential (subtract from PH to give PB)	At low setting	1.1 bar (15.95 psi)
	At middle setting	1.3 bar (18.85 psi)
	At high setting	1.5 bar (21.75 psi)
Maximum permissible pressure	Per cycle	5.75 bar (83.38 psi)
	Accidental	8 bar (116 psi)
Destruction pressure	20 bar (290 psi)	
Mechanical life	4 x 10 ⁵ operating cycles	
Cable entry	2 cable entries, with grommet	2 entries with 13P cable gland (DIN Pg 13.5)
Clamping capacity	9 to 13 mm	
Pressure switch type	Diaphragm	

(1) Component materials of units in contact with the fluid, see page 2/137.

Operating curves Connections



— Adjustable value
--- Non adjustable value

Electromechanical pressure switches

OsiSense XM

For power circuits, OsiSense FSG

Size 4.6 bar (66.7 psi), adjustable differential, for regulation between 2 thresholds. Switches with 2-pole 2 NC contact.

Degree protection IP 20 or IP 65

Fluid connection	G 1/4 (female)	R 1/4 (male)	G 1/4 (female)	R 1/4 (male)

Adjustable range of switching point (PH) (Rising pressure)	1.4...4.6 bar (20.3...66.7 psi)			
Degree of protection conforming to IEC/EN 60529	IP 20		IP 65	

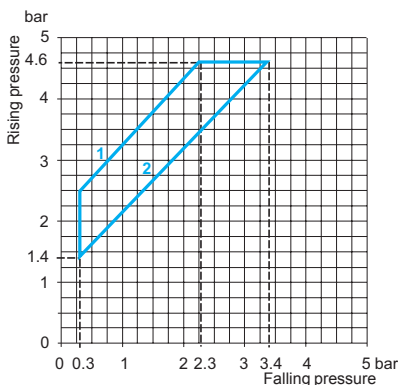
References					
Fluids controlled	Fresh water, sea water, from 0°C to +70°C (1)	FSG2	FSG9	FSG2NE (2)	FSG9NE
Weight (kg)	0.340				

Complementary characteristics not shown under general characteristics (page 2/137)				
Possible differential (subtract from PH to give PB)	Max. at low setting	2.1 bar (30.45 psi)		
	Max. at middle setting	2.2 bar (31.9 psi)		
	Max. at high setting	2.3 bar (33.35 psi)		
	Min. at low setting	1 bar (14.5 psi)		
	Min. at middle setting	1.1 bar (15.95 psi)		
	Min. at high setting	1.2 bar (17.4 psi)		
Maximum permissible pressure	Per cycle	5.75 bar (83.38 psi)		
	Accidental	8 bar (116 psi)		
Destruction pressure	20 bar (290 psi)			
Mechanical life	1 x 10 ⁶ operating cycles			
Cable entry	2 cable entries, with grommet		2 entries with 13P cable gland (DIN Pg 13.5)	
Clamping capacity	-		9 to 13 mm	
Pressure switch type	Diaphragm			

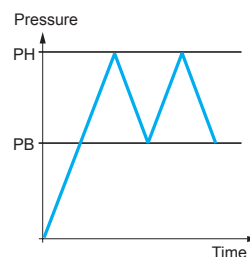
(1) Component materials of units in contact with the fluid, see page 2/137.

(2) Variant: for a G 3/8 female fluid entry that pivots throughout 360°, select the FSG2NEG.

Operating curves Connections



- 1 Maximum differential
- 2 Minimum differential



— Adjustable value



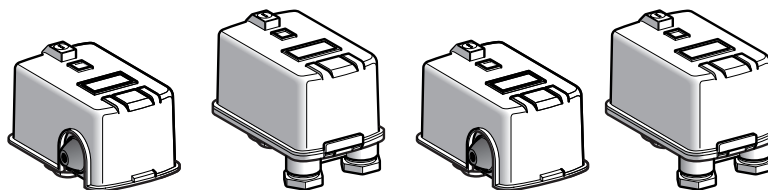
Electromechanical pressure switches

OsiSense XM

For power circuits, OsiSense FYG

Sizes 7 and 10.5 bar (101.5 and 152.3 psi), adjustable differential, for regulation between 2 thresholds. Switches with 2-pole 2 NC contact. Degree of protection IP 20 or IP 65

Fluid connection	G 1/4 (female)
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Adjustable range of switching point (PH) (Rising pressure)	2.8...7 bar (40.6...101.5 psi)	5.6...10.5 bar (81.2...152.3 psi)
Degree of protection conforming to EN/IEC 60529	IP 20	IP 65

References

Fluids controlled	Fresh water, sea water, from 0°C to + 70°C (1)	FYG22 (2)	FYG22NE	FYG32 (3)	FYG32NE
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Weight (kg)	0.340
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Complementary characteristics not shown under general characteristics (page 2/137)

Possible differential (subtract from PH to give PB)	Max. at low setting	2.3 bar (33.35 psi)	3 bar (43.5 psi)
	Max. at middle setting	2.5 bar (36.25 psi)	3.2 bar (46.4 psi)
	Max. at high setting	2.7 bar (39.15 psi)	3.4 bar (49.3 psi)
	Min. at low setting	1.2 bar (17.4 psi)	1.9 bar (27.55 psi)
	Min. at middle setting	1.4 bar (20.3 psi)	2.1 bar (30.45 psi)
	Min. at high setting	1.6 bar (23.2 psi)	2.3 bar (33.35 psi)
Maximum permissible pressure	Per cycle	8.75 bar (126.9 psi)	13 bar (188.5 psi)
	Accidental	15 bar (217.5 psi)	15 bar (217.5 psi)
Destruction pressure		20 bar (290 psi)	20 bar (290 psi)
Mechanical life		1 x 10 ⁶ operating cycles	
Cable entry		2 cable entries, with grommet	
Pressure switch type		Diaphragm	

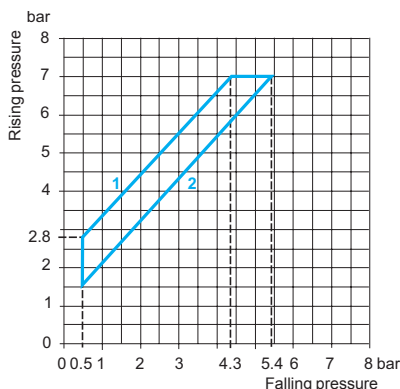
(1) Component materials of units in contact with the fluid, see page 2/137.

(2) Variant: for a 2.8 to 7 bar, IP 20, pressure switch with R 1/4 (male) fluid entry, select the **FYG29**.

(3) Variant: for a 5.6 to 10.5 bar, IP 20, pressure switch with R 1/4 (male) fluid entry, select the **FYG39**.

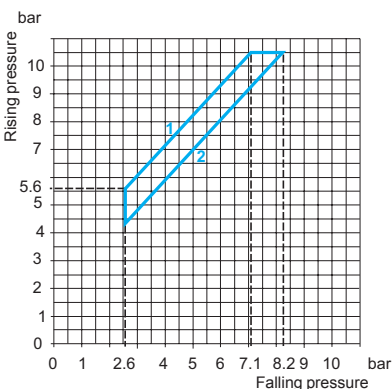
Operating curves

FYG22



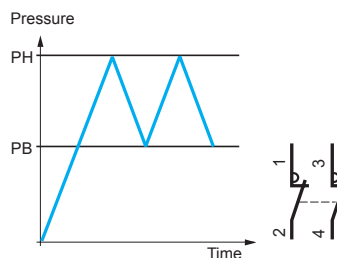
- 1 Maximum differential
- 2 Minimum differential

FYG32



- 1 Maximum differential
- 2 Minimum differential

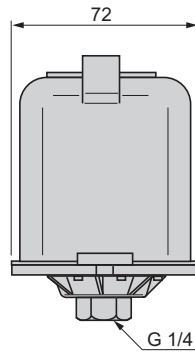
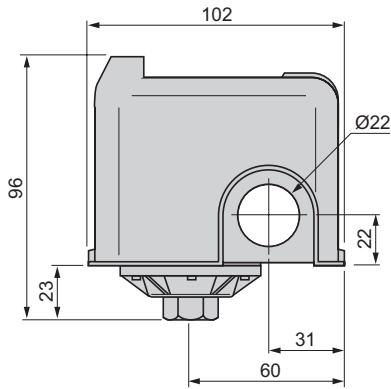
Connections



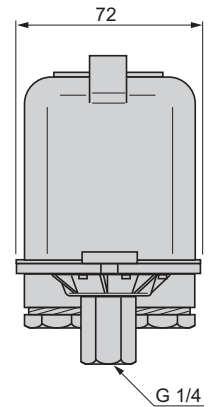
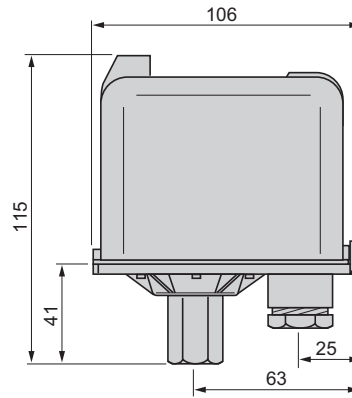
— Adjustable value

Dimensions

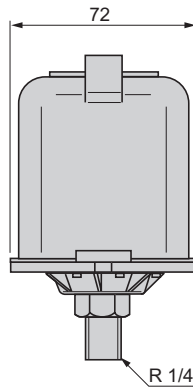
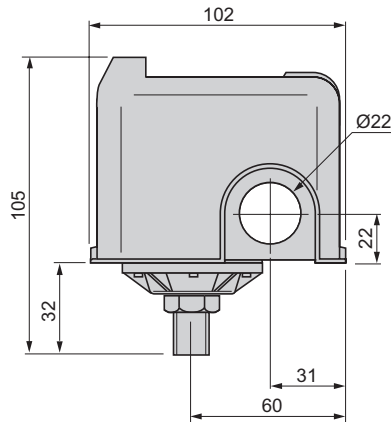
FTG2, FSG2



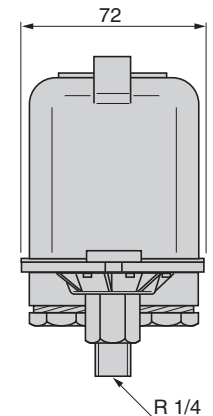
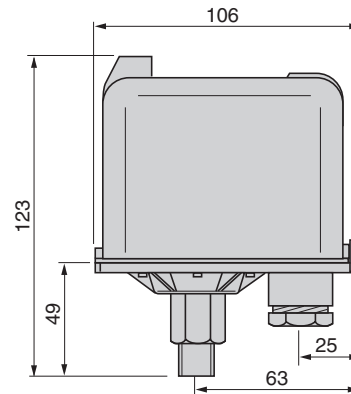
FTG2NE, FSG2NE



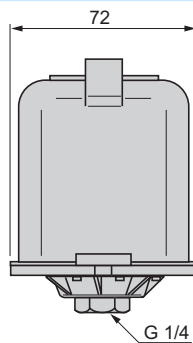
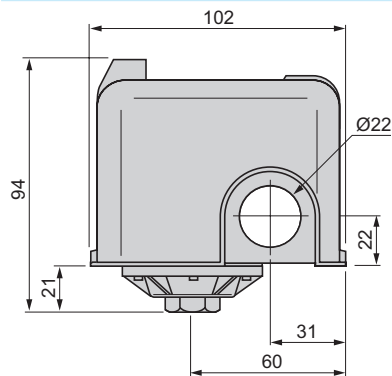
FTG9, FSG9



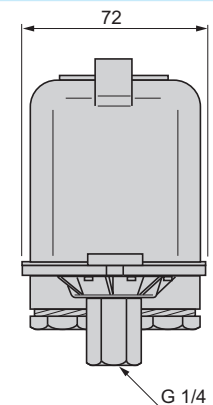
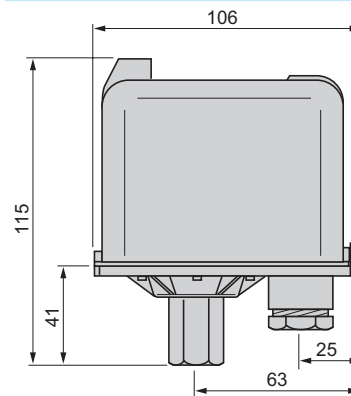
FTG9NE, FSG9NE



FYG22, FYG32



FYG22NE, FYG32NE



Presentation

Pressure switches OsiSense XMP are switches for power circuits (direct switching), with an adjustable differential.

They are used to control the pressure of water and air, up to 25 bar.

Equipment fitted to the various models

Case

Pressure switches OsiSense XMP, depending on the model, include:

- 3 types of case:
 - bare case,
 - case with On/Off knob (black): used as a switch for starting and stopping the installation,
 - case with reset knob (yellow): necessary when the safety requirements of the system include tripping in the event of overpressure. Resetting is not automatic on return to normal pressure, and it can only be achieved by manually turning the "Reset" knob.
- 2 degrees of protection:
 - IP 54,
 - IP 65.

Decompression valve

Depending on the model, 2 types of decompression valve can be fitted to pressure switches OsiSense XMP:

- Straight, instant connection, decompression valve (connection by \varnothing 6 mm plastic tube).
- Straight, olive connection, decompression valve (connection by \varnothing 6 mm plastic or metal tube).

Setting

When setting XMP pressure switches, adjust the switching point on rising pressure (PH) first and then the switching point on falling pressure (PB).

Switching point on rising pressure

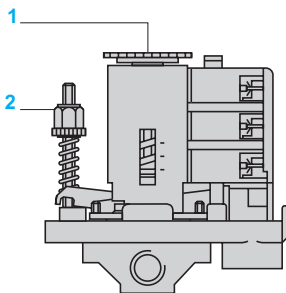
The switching point on rising pressure (PH) is set by adjusting the screw-nut or knurled knob **1**.

Tighten either the nut or knurled knob **1** to increase the high point switching value.

Switching point on falling pressure

The switching point on falling pressure is set by adjusting screw-nut **2**.

Tighten nut **2** to reduce the low point switching value (increase in differential).



Environment characteristics		
Conformity to standards		CE, IEC/EN 60947-4-1
Product certifications		EAC
Ambient air temperature	°C	For operation: - 25...+ 70 For storage: - 40...+ 70
Fluids controlled		Air, fresh water, sea water (0...+ 70°C)
Materials		Case: polyamide impregnated with fibreglass Component materials in contact with fluid: chromated zinc alloy (fluid entry), canvas covered nitrile (diaphragm)
Operating position		All positions
Vibration resistance		3 gn (10...500 Hz) conforming to IEC 60068-2-6
Shock resistance		50 gn, conforming to IEC 60068-2-27
Electric shock protection		Class I conforming to IEC 60536
Degree of protection		IP 54 conforming to IEC/EN 60529 or IP 65 for universal model
Operating rate	Op. cycles/h	≤ 600
Repeat accuracy		< 3.5%
Fluid connection		G 1/4, 4 x G 1/4 or G 3/8 (BSP female) conforming to NF E 03-005, ISO 228
Electrical connection		2 tapped entries for n° 13 (DIN Pg 13.5) cable gland

Contact block characteristics			
Rated insulation voltage	V	Ui = 500 conforming to IEC/EN 60947-1	
Rated impulse withstand voltage	V	U imp = 6 kV conforming to IEC/EN 60947-1	
Type of contacts		One 2-pole 2 NC or 3-pole 3 NC contact, snap action	
Resistance across terminals	mΩ	≤ 25 conforming to NF C 93-050 method A or IEC 255-7 category 3	
Terminal referencing		Conforming to CENELEC EN 50013	
Short-circuit protection		Cartridge fuse type Am	
Connection		Screw clamp terminals. Minimum clamping capacity: 2 x 4 mm ²	
Electrical durability Operating rate: 600 operating cycles/hour Load factor: 0.4		Power	Number of operating cycles
		kW	~ 400 V, 3-phase
		1.5	1 000 000
		2.2	700 000
		3	500 000
			~ 230 V, 3-phase
			600 000
			–
			–

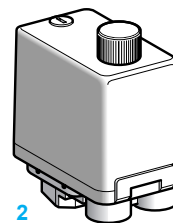
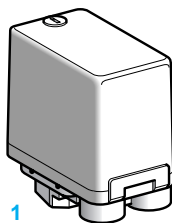
Electromechanical pressure switches

OsiSense XMP, IP 54

Size 6 bar (87 psi)

Adjustable differential, for regulation between 2 thresholds
Switches with 2-pole 2 NC or 3-pole 3 NC contact

Fluid connection **G 1/4 (female)**



Adjustable range of switching point (PH) (Rising pressure)	1...6 bar (14.5...87 psi)	
Type of contact	2-pole 2 NC	3-pole 3 NC

References (1)

Switches without decompression valve

Bare case 1	XMPA06B2131	XMPA06C2131
Case with reset knob 2	XMPB06B2131	—
Case with On/Off knob 2	XMPC06B2131	XMPC06C2131
Weight (kg)	0.430	

Switches with straight decompression valve, instant connection

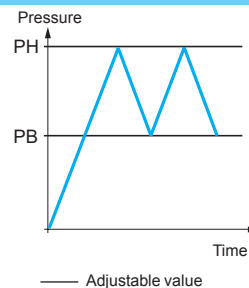
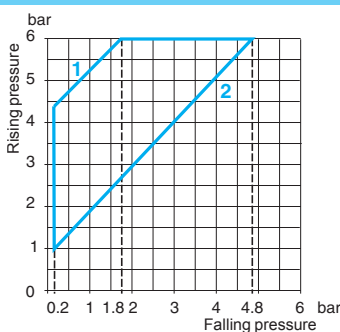
Bare case 1	XMPD06B2131	XMPD06C2131
Case with On/Off knob 2	XMPE06B2131	XMPE06C2131
Weight (kg)	0.450	

Complementary characteristics not shown under general characteristics (page 2/144)

Possible differential (subtract from PH to give PB)	Min. at low setting	0.8 bar (11.6 psi)
	Min. at high setting	1.2 bar (17.4 psi)
	Max. at high setting	4.2 bar (60.9 psi)
Destruction pressure	30 bar (435 psi)	
Mechanical life	1 million operating cycles	
Cable entry	2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)	
Pressure switch type	Diaphragm	

(1) References for individually packaged switches. Also available packaged in lots of 10.
To order, add the letter **C** to the reference selected from above. Example: reference for lot of 10 pressure switches **XMPA06B2131** in one package becomes **XMPA06B2131C**.

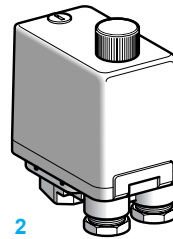
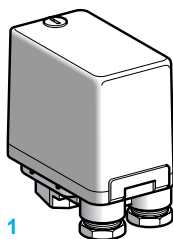
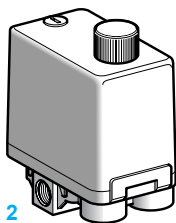
Operating curves



- 1 Maximum differential
- 2 Minimum differential

4 x G 1/4 (female)

G 3/8 (female)



1...6 bar (14.5...87 psi)

3-pole 3 NC

2-pole 2 NC

3-pole 3 NC

References

Switches without decompression valve

-	XMPA06B2242	XMPA06C2242
-	XMPB06B2242	-
-	XMPC06B2242	XMPC06C2242
-	0.430	

Switches with straight decompression valve, instant connection

-	XMPD06B2242	XMPD06C2242
XMPE06C2431	-	XMPE06C2242
0.450		

Complementary characteristics not shown under general characteristics (page 2/144)

0.8 bar (11.6 psi)

1.2 bar (17.4 psi)

4.2 bar (60.9 psi)

30 bar (435 psi)

1 million operating cycles

2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)

2 entries incorporating n° 13 plastic cable gland (DIN Pg 13.5)
Clamping capacity 9 to 13 mm

Diaphragm

Other versions

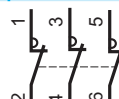
Pressure switches not listed above, comprising the equipment proposed for the choice of reference. Please consult our Customer Care Centre.

Terminal connections

XMP●●●B●●●●



XMP●●●C●●●●



Electromechanical pressure switches

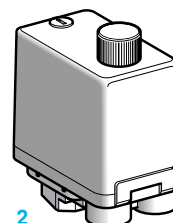
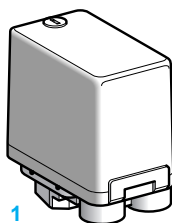
OsiSense XMP, IP 54

Size 12 bar (174 psi)

Adjustable differential, for regulation between 2 thresholds

Switches with 2-pole 2 NC or 3-pole 3 NC contact

Fluid connection G 1/4 (female)



Adjustable range of switching point (PH) (Rising pressure)	1.3...12 bar (18.85...174 psi)	
Type of contact	2-pole 2 NC	3-pole 3 NC

References (1)

Switches without decompression valve

Bare case 1	XMPA12B2131	XMPA12C2131
Case with reset knob 2	XMPB12B2131	-
Case with On/Off knob 2	XMPC12B2131	XMPC12C2131
Weight (kg)	0.430	

Switches with straight decompression valve, instant connection

Bare case 1	XMPD12B2131	XMPD12C2131
Case with On/Off knob 2	XMPE12B2131	XMPE12C2131
Weight (kg)	0.450	

Switches with straight decompression valve, olive connection

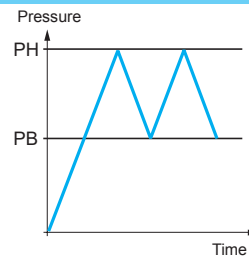
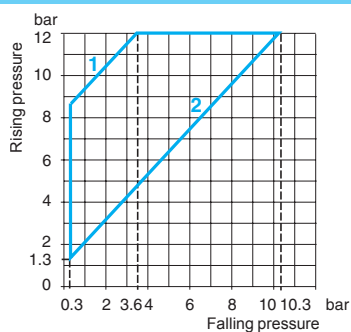
Case with On/Off knob 2	XMPR12B2131	XMPR12C2131
Weight (kg)	0.450	

Complementary characteristics not shown under general characteristics (page 2/144)

Possible differential (subtract from PH to give PB)	Min. at low setting	1 bar (14.5 psi)
	Min. at high setting	1.7 bar (24.6 psi)
	Max. at high setting	8.4 bar (121.8 psi)
Destruction pressure	30 bar (435 psi)	
Mechanical life	1 million operating cycles	
Cable entry	2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)	
Pressure switch type	Diaphragm	

(1) References for individually packaged switches. Also available packaged in lots of 10. To order, add the letter C to the reference selected from above. Example: reference for lot of 10 pressure switches XMPA12B2131 in one package becomes XMPA12B2131C.

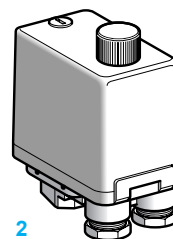
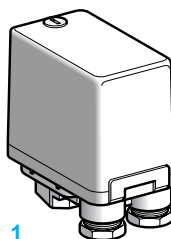
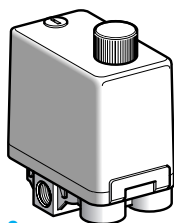
Operating curves



- 1 Maximum differential
- 2 Minimum differential

4 x G 1/4 (female)

G 3/8 (female)



1.3...12 bar (18.85...174 psi)

2-pole 2 NC

3-pole 3 NC

2-pole 2 NC

3-pole 3 NC

References

Switches without decompression valve

-		XMPA12B2242	XMPA12C2242
-		XMPB12B2242	-
XMPC12B2431	-	XMPC12B2242	XMPC12C2242

0.430

Switches with straight decompression valve, instant connection

-	XMPD12C2431	XMPD12B2242	XMPD12C2242
XMPE12B2431	XMPE12C2431	XMPE12B2242	XMPE12C2242

0.450

Switches with straight decompression valve, olive connection

-			
-			

Complementary characteristics not shown under general characteristics (page 2/144)

1 bar (14.5 psi)

1.7 bar (24.6 psi)

8.4 bar (121.8 psi)

30 bar (435 psi)

1 million operating cycles

2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)

2 entries incorporating n° 13 plastic cable gland (DIN Pg 13.5)
Clamping capacity 9 to 13 mm

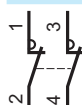
Diaphragm

Other versions

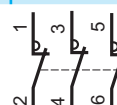
Pressure switches not listed above, comprising the equipment proposed for the choice of reference. Please consult our Customer Care Centre.

Terminal connections

XMP●●●B●●●●



XMP●●●C●●●●



Electromechanical pressure switches

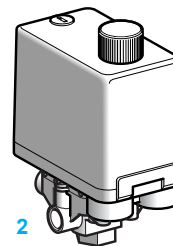
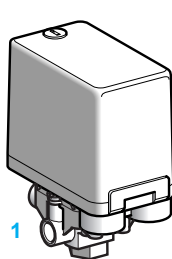
OsiSense XMP, IP 54

Size 25 bar (362.5 psi)

Adjustable differential, for regulation between 2 thresholds

Switches with 2-pole 2 NC or 3-pole 3 NC contact

Fluid connection	G 1/4 (female)
------------------	----------------



Adjustable range of switching point (PH) (Rising pressure)	3.5...25 bar (50.75...362.5 psi)
Type of contact	2-pole 2 NC

References

Switches without decompression valve

Bare case 1	XMPA25B2131
Case with reset knob 2	XMPB25B2131
Case with On/Off knob 2	XMPC25B2131

Weight (kg)	0.650
-------------	-------

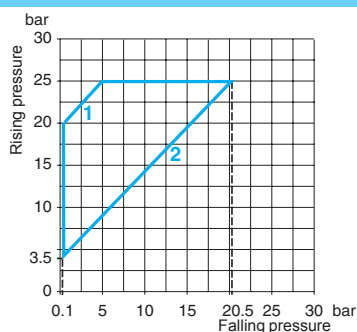
Switches with straight decompression valve, olive connection

Case with On/Off knob 2	XMPR25B2131
Weight (kg)	0.670

Complementary characteristics not shown under general characteristics (page 2/144)

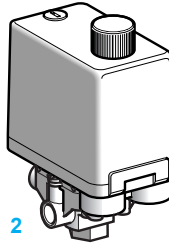
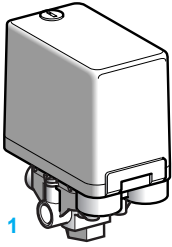
Possible differential (subtract from PH to give PB)	Min. at low setting	3.4 bar (49.3 psi)
	Min. at high setting	4.5 bar (65.2 psi)
	Max. at high setting	20 bar (290 psi)
Destruction pressure	100 bar (1450 psi)	
Mechanical life	1 million operating cycles	
Cable entry	2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)	
Pressure switch type	Diaphragm	

Operating curves



- 1 Maximum differential
- 2 Minimum differential

G 1/4 (female)



3.5...25 bar (50.75...362.5 psi)

3-pole 3 NC

References

Switches without decompression valve

XMPA25C2131

-

XMPC25C2131

0.650

Switches with straight decompression valve, olive connection

XMPR25C2131

0.670

Complementary characteristics not shown under general characteristics (page 2/144)

3.4 bar (49.3 psi)

4.5 bar (65.2 psi)

20 bar (290 psi)

100 bar (1450 psi)

1 million operating cycles

2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)

Diaphragm

Other versions

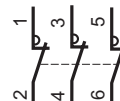
Pressure switches not listed above, comprising the equipment proposed for the choice of reference. Please consult our Customer Care Centre.

Terminal connections

XMP●●●B●●●●



XMP●●●C●●●●



Electromechanical pressure switches

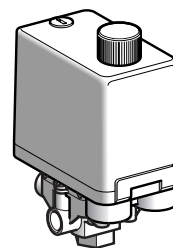
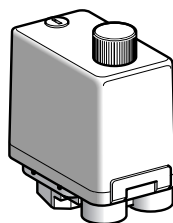
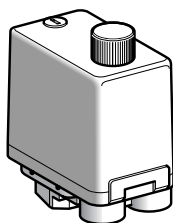
OsiSense XMP, IP 65

Sizes 6 to 25 bar (87 to 362.5 psi)

Adjustable differential, for regulation between 2 thresholds

Switches with 2-pole 2 NC or 3-pole 3 NC contact

Fluid connection **G 1/4 (female)**



Adjustable range of switching point (PH) (Rising pressure)	1...6 bar (14.5...87 psi)		1.3...12 bar (18.85...174 psi)		3.5...25 bar (50.75...362.5 psi)	
Type of contact	2-pole 2 NC	3-pole 3 NC	2-pole 2 NC	3-pole 3 NC	2-pole 2 NC	3-pole 3 NC

References

Switches with straight decompression valve, olive connection

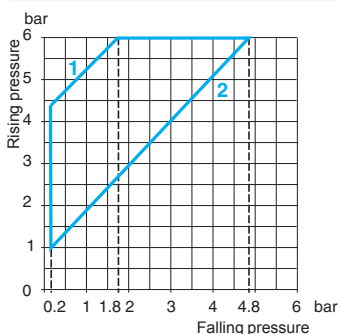
Case with On/Off knob	XMPR06B2133	XMPR06C2133	XMPR12B2133	XMPR12C2133	XMPR25B2133	XMPR25C2133
Weight (kg)	0.450				0.670	

Complementary characteristics not shown under general characteristics (page 2/144)

Possible differential (subtract from PH to give PB)	Min. at low setting	0.8 bar (11.6 psi)	1 bar (14.5 psi)	3.4 bar (49.3 psi)
	Min. at high setting	1.2 bar (17.4 psi)	1.7 bar (24.6 psi)	4.5 bar (65.2 psi)
	Max. at high setting	4.2 bar (60.9 psi)	8.4 bar (121.8 psi)	20 bar (290 psi)
Destruction pressure	30 bar (435 psi)		100 bar (1450 psi)	
Mechanical life	1 million operating cycles			
Cable entry	2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)			
Adjustment of high setting point (PH)	By screw-nut			
Pressure switch type	Diaphragm			

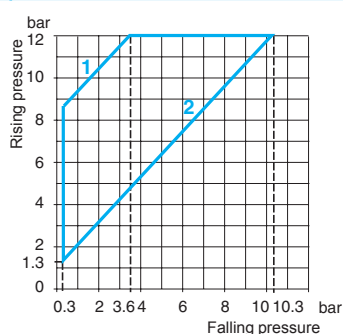
Operating curves

XMPR06.....



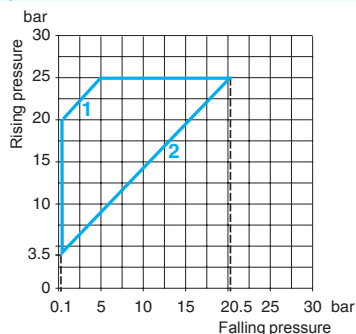
- 1 Maximum differential
- 2 Minimum differential

XMPR12.....

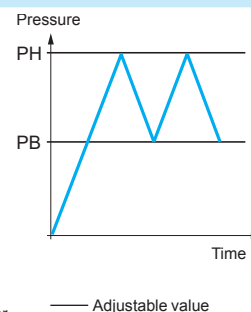


- 1 Maximum differential
- 2 Minimum differential

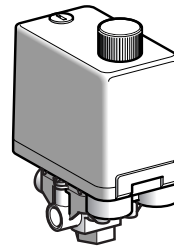
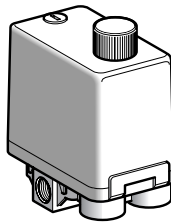
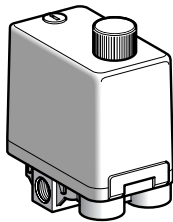
XMPR25.....



- 1 Maximum differential
- 2 Minimum differential



4 x G 1/4 (female)



1...6 bar (14.5...87 psi)		1.3...12 bar (18.85...174 psi)		3.5...25 bar (50.75...362.5 psi)	
2-pole 2 NC	3-pole 3 NC	2-pole 2 NC	3-pole 3 NC	2-pole 2 NC	3-pole 3 NC

References

Switches with straight decompression valve, olive connection

XMPR06B2433	XMPR06C2433	XMPR12B2433	XMPR12C2433	XMPR25B2433	XMPR25C2433
0.450				0.670	

Complementary characteristics not shown under general characteristics (page 2/144)

0.8 bar (11.6 psi)	1 bar (14.5 psi)	3.4 bar (49.3 psi)
1.2 bar (17.4 psi)	1.7 bar (24.6 psi)	4.5 bar (65.2 psi)
4.2 bar (60.9 psi)	8.4 bar (121.8 psi)	20 bar (290 psi)
30 bar (435 psi)	100 bar (1450 psi)	
1 million operating cycles		
2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)		
By screw-nut		
Diaphragm		

Other versions

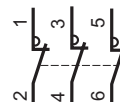
Pressure switches not listed above, comprising the equipment proposed for the choice of reference. Please consult our Customer Care Centre.

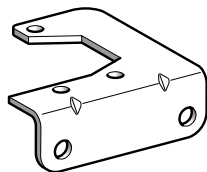
Terminal connections

XMP●●●B●●●●



XMP●●●C●●●●





XMAZL001



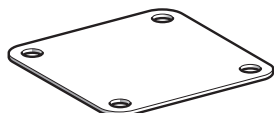
XMPMDR01



DE9PM1201



DE9PM1202



XMPZ3

References

Description	Reference	Weight kg
Fixing bracket	XMAZL001	0.035

Knurled adjustment knob, Ø 36 mm fits over adjustment screws to facilitate setting	XMPMDR01	0.010
----------------------------------------------------------------------------------------------	----------	-------

13P cable gland	With anti pull-out ring (for cable Ø 6...9 mm)	DE9PM1201	0.005
------------------------	---------------------------------------------------	-----------	-------

	Without anti pull-out ring (for cable Ø 6...9 mm)	DE9PM1202	0.005
--	------------------------------------------------------	-----------	-------

	With anti pull-out ring (for cable Ø 9...12.5 mm)	DE9PM1203	0.005
--	------------------------------------------------------	-----------	-------

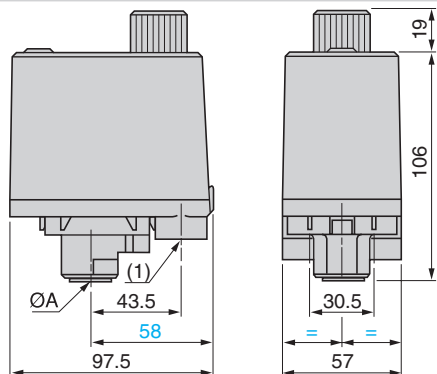
Description	For pressure switch	Sold in lots of	Unit reference	Weight kg
Diaphragms	Size 6 bar	50	XMPZ31	0.005

	Size 25 bar	50	XMPZ33	0.005
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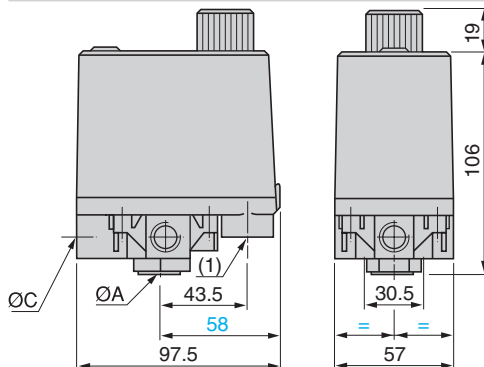
Dimensions

XMP●06●●●●● and XMP●12●●●●●

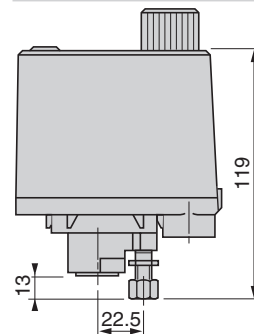
Fluid connection G 1/4 or G 3/8 (female)
Without decompression valve



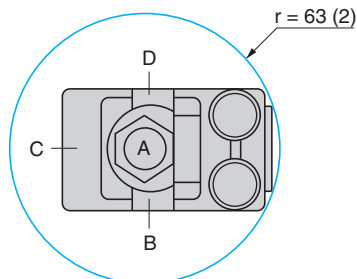
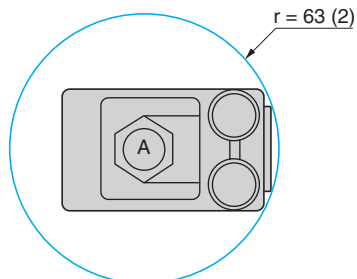
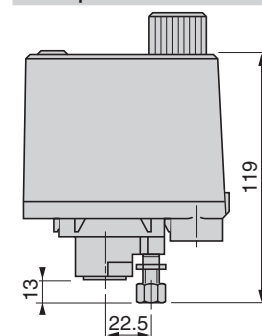
Fluid connection 4 x G 1/4 (female)
Without decompression valve



With straight, instant connection, decompression valve



With straight, olive connection, decompression valve



ØA = G 1/4 or G 3/8 (female)

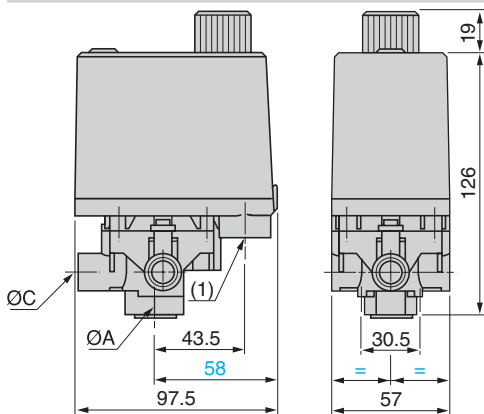
(1) 2 tapped entries for n° 13 cable gland

(2) Minimum clearance zone for screwing-on pressure switch at point A

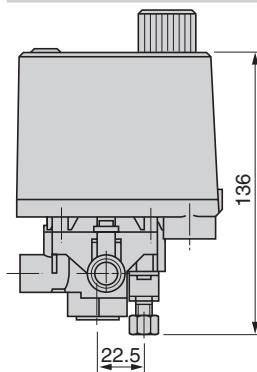
ØA = ØB = ØC = ØD = G 1/4 (female)

XMP●25●●●●●

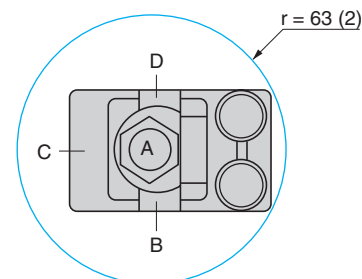
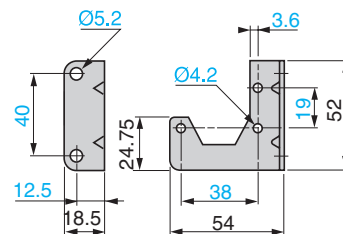
Fluid connection G 1/4 or 4 x G 1/4 (female)
Without decompression valve



With straight, olive connection, decompression valve



Fixing bracket XMAZL001



XMP●25●21●●: ØA only = G 1/4 (female)

XMP●25●24●●: ØA = ØB = ØC = ØD = G 1/4 (female)

(1) 2 tapped entries for n° 13 cable gland

(2) Minimum clearance zone for screwing-on pressure switch at point A

Selection guide page 3/2

- General page 3/12
- Flush mountability using teach mode:
 - Simplicity through innovation page 3/22

OsiSense XS, general purpose

- Cylindrical type
 - Standard range, flush mountable page 3/24
 - Increased range, flush mountable page 3/34
 - Increased range, non flush mountable page 3/42
- Flat formatpages 3/44 to 3/72
- Cubic type page 3/48
- Plastic type.....pages 3/50 to 3/60
- Multivoltage sensor, cylindrical with short-circuit protection page 3/52
 - Solid-state PNP or NPN, NO + NC outputs page 3/56
 - Solid-state PNP + NPN, NO or NC programmable outputs..... page 3/58
- Basic sensors, flush and non flush mountable page 3/62
- Quasi flush mountable sensors, increased range page 3/66
- Miniature sensors. page 3/68

OsiSense XS Application

- Adjustable range sensors..... page 3/70
- Sensors for rotation monitoring page 3/76
- Sensors with analogue output page 3/78
- Sensors for food/beverage and pharmaceutical applications
 - Cylindrical, stainless steel page 3/88
 - Cylindrical, plastic page 3/92
 - Cylindrical, stainless steel, for harsh industrial environments..... page 3/96
- Sensors for assembly, packaging and light material handling applications
 - 12 x 26 x 40 mm format. page 3/98
 - 80 x 80 x 40 mm format. page 3/104
- Sensors for welding machine applications page 3/106
- Selective detection of ferrous and non ferrous materials page 3/108

OsiSense XS

- Accessoriespage 3/112
- Detection curves page 3/120
- Substitution table page 3/120



Cylindrical type

Standard range

Flush mountable



Sensing distance Sn (mm)	
Diameter	
Short case	Supply
	3-wire $\overline{---}$ (PNP/NPN)
	2-wire $\overline{---}$
Long case	Supply
	3-wire $\overline{---}$ (PNP/NPN)
	2-wire $\overline{---}$
	2-wire \sim
Function	NO NC
Connection	Pre-cabled (L = 2 m) (1)
	M8 connector, 3-pin (3-wire $\overline{---}$)
	M12 connector
	1/2"-20UNF connector Remote connector
Degree of protection	
Special temperatures	- 40 °C, + 70 °C
	- 25 °C, + 85 °C
Type reference	
Pages	

	1.5	2	5	10
Diameter	Ø 6.5 plain and M8	M12	M18	M30
Page 3/24				
Page 3/28				
Page 3/25				
Page 3/29				
-		Page 3/32		
•	•	•	•	
•	•	•	•	
•	•	•	•	
•	-	-	-	
•	•	•	•	
-	•	•	•	
Remote connectors available: M8, M12, M18, screw terminal, 7/8", DIN: please consult our Customer Care Centre				
IP 65 and IP 67, IP 68 for pre-cabled version, IP 69K for diameters 12 to 30				
Add the suffix TF to the end of the reference (2)				
Add the suffix TT to the end of the reference (2)				
XS506	XS508	XS512	XS518	XS530
3/24 to 3/33				

(1) Also available in lengths of 5 and 10 m, depending on model

(2) Product availability depending on model: please consult our Customer Care Centre.

3

Increased range

Flush mountable

Non flush mountable



2.5	4	8	15	7	8	12	16	22	30
Ø 6.5 plain and M8	M12	M18	M30	M12		M18		M30	
Pages 3/34 and 3/35				-	Page 3/34	-	Page 3/34	-	-
Page 3/38				-	-	-	-	-	-
Page 3/36				Page 3/40	-	Page 3/40	-	-	Page 3/40
Page 3/38				-	-	-	-	-	-
-	Page 3/40			-	-	Page 3/42	-	Page 3/42	-
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•
•	-	-	-	-	-	-	-	-	-
•	•	•	•	•	•	•	•	•	•
-	•	•	•	-	-	•	-	•	-
Remote connectors available: M8, M12, M18, screw terminal, 7/8", DIN: please consult our Customer Care Centre									
IP 65 and IP 67, IP 68 for pre-cabled version, IP 69K for diameters 12 to 30					IP 65 and IP 67, IP 68 for pre-cabled version, IP 69K				
Add the suffix TF to the end of the reference (2)									
Add the suffix TT to the end of the reference (2)									
XS106	XS108	XS112, XS612	XS118, XS618	XS130, XS630	XS612	XS212	XS618	XS218	XS630
XS606	XS608								
3/34 to 3/41					3/40 to 3/43				

Inductive proximity sensors

OsiSense XS
General purpose

Block type

Standard range

Flush mountable



3

Sensing distance Sn (mm)	
Dimensions (W x H x D)	
Supply	3-wire --- (PNP/NPN) 2-wire --- \sim
Function	NO NC NO + NC NO/NC
Connection	Pre-cabled (L = 2 m) (1) M8 connector, 3-pin (3-wire ---) M12 connector 1/2"-20UNF connector Screw terminals Remote connector M8 M12 1/2"-20 UNF Other remote connectors available
Degree of protection	
Special temperatures	- 40 °C, + 70 °C - 25 °C, + 85 °C
Type reference	
Pages	

	2.5	5	10	15	40
Dimensions (W x H x D)	8 x 22 x 8	15 x 32 x 8	26 x 26 x 13	40 x 40 x 15	80 x 80 x 26
Supply	3/44	3/44	3/46	3/46	3/46
	3/44	3/44	3/46	3/46	3/46
	-	-	-	-	-
Function	•	•	•	•	•
	•	•	•	•	•
	-	-	-	-	-
	-	-	-	-	-
Connection	•	•	•	•	•
	-	-	•	•	-
	-	-	-	-	•
	-	-	-	-	-
	-	-	-	-	-
	•	•	-	-	-
	-	-	•	•	-
	-	-	-	-	-
M18, screw terminal, 7/8", DIN: please consult our Customer Care Centre					
Degree of protection	IP 67	IP 67, double insulation \square or IP 68, double insulation \square , depending on model			
Add the suffix TF to the end of the reference (2)					
Add the suffix TT to the end of the reference (2)					
Type reference	XS7J	XS7F	XS7E	XS7C	XS7D
Pages	3/44		3/46		

(1) Also available in lengths of 5 and 10 m, depending on model.

(2) Product availability depending on model: please consult our Customer Care Centre.

Standard and increased ranges

Flush mountable

Non flush mountable



15 20 40

40 x 40 x 70 and 40 x 40 x 117

Pages 3/48 and 3/50

Pages 3/48 and 3/50

Pages 3/48 and 3/50

•	•	•
•	•	•
–	•	•
•	•	•
–	–	–
–	–	–
•	•	•
•	•	•
•	•	•
–	–	–
–	–	–
–	–	–
–	–	–

IP 65, IP 67 and IP 69K

Add the suffix TF to the end of the reference (2)

Add the suffix TT to the end of the reference (2)

XS7C2, XS7C4, XS8C2 and XS8C4

3/48 and 3/50

Inductive proximity sensors

OsiSense XS
General purpose

3

Sensor type: flush and non flush mountable

Multivoltage sensors	Sensors with 2 complementary outputs	
With short-circuit protection	Solid-state PNP or NPN NO + NC outputs	Solid-state PNP + NPN, NO or NC programmable outputs



Sensing distance Sn (mm)	Flush mountable Non flush mountable
Diameter	
Case material	
Supply	<ul style="list-style-type: none"> 11 2 12
Function	<ul style="list-style-type: none"> NO NC NO + NC NO/NC
Connection	<ul style="list-style-type: none"> Pre-cabled (L = 2 m) (1) M8 connector, 3-pin (3-wire ---) M12 connector 1/2"-20UNF connector Remote connector
Degree of protection	
Special temperatures	<ul style="list-style-type: none"> - 40 °C, + 70 °C - 25 °C, + 85 °C
Type reference	
Pages	

2 ... 10	1.5 ... 15	2 ... 10
4 ... 15	2.5 ... 15	4 ... 15
Threaded: M12, M18, M30	Plain: Ø 6.5 Threaded: M8, M12, M18, M30	Threaded: M12, M18, M30
Nickel plated brass	Nickel plated brass or stainless steel or plastic	Nickel plated brass or plastic
–	•	•
–	–	–
•	–	–
•	–	–
•	–	–
–	•	–
–	–	• programmable
•	•	•
–	–	–
–	•	•
•	–	–
Remote connectors available: M8, M12, M18, screw terminal, 7/8", DIN: please consult our Customer Care Centre		
IP 67, IP 68 or IP 69K depending on model		
Add the suffix TF to the end of the reference (2)		
Add the suffix TT to the end of the reference (2)		
XS1M XS2M	XS1●●●●C410 XS4P●●●●C410 XS1●●B3PC●	XS1M●●KP340 XS2M●●KP340 XS4P●●KP340
2/52	3/54	3/58

(1) Also available in lengths of 5 and 10 m, depending on model.
 (2) Product availability depending on model: please consult our Customer Care Centre.
 (3) Packed and sold in lots of 20

Plastic case sensors	Basic sensors	Almost flush mountable sensors	Miniature sensors
For chemical processing, marine applications	For repetitive machines		For robotic, transfer machine, assembly line applications



–	1.5 ... 10	2.5 ... 15	–	1
2.5 ... 15	2.5 ... 15	–	2.5 ... 20	–
Threaded: M8, M12, M18, M30	Threaded: M8, M12, M18, M30	Plain: Ø 6.5 Threaded: M8, M12, M18, M30		Plain: Ø 4 Threaded: M5
Plastic	Nickel plated brass or plastic	Nickel plated brass		Nickel plated brass or stainless steel
•	•	•	•	•
–	–	–	–	–
•	–	–	–	–
–	•	•	•	•
•	•	•	•	•
–	–	–	–	–
–	–	–	–	–
•	•	•	•	•
–	•	•	•	•
–	•	•	•	•
•	–	–	–	–
Remote connectors available: M8, M12, M18, screw terminal, 7/8", DIN: please consult our Customer Care Centre				
IP 67 or IP 68 depending on model	IP 67		IP 67 or IP 68	IP 67
Add the suffix TF to the end of the reference (2)				
Add the suffix TT to the end of the reference (2)				
XS4P	XS1●●BL● XS2●●BL●	XS1●●B3●●●TQ (3)	XS1N●●349	XS1L XS2L XS1N
3/60	3/62 and 3/63	3/34 and 3/35	3/66	3/68

Conveying

Sensor type: flush and non flush mountable

Adjustable range sensors

Developed in accordance with the needs expressed by our customers, these sensors provide a complete solution for specific application functions: rotation monitoring, selective detection, analogue control, etc.

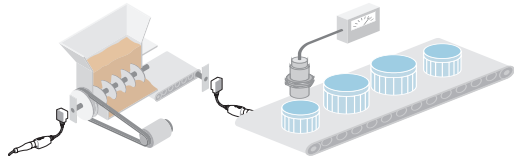


		3...11 (1)	15	25	60
Sensing dist.	Flush mountable				
Sn (mm)	Non flush mountable				
Form	Cylindrical				
	Block (W x H x D) dimensions in mm				
		M12 x 54 M18 x 67 M30 x 71	26 x 26 x 13	40 x 40 x 15	80 x 80 x 26
Case material		Nickel plated brass	PBT	PBT	PBT
Supply	☰	●	●	●	●
	~	-	-	-	-
	~	-	●	●	●
Function	NO	●	●	●	●
	NC	●	●	●	●
	NO + NC	-	-	-	-
	NO/NC	-	-	-	-
Connection	Pre-cabled (L = 2 m) (2)	-	●	●	●
	M8 connector, 3-pin (☰ 3-wire)	-	●	●	-
	M12 connector	-	-	-	●
	1/2"-20UNF connector	-	-	-	●
	Remote connector	●	●	●	●
	Screw terminals	-	-	-	-
Degree of protection		IP 67, double insulation ☐	IP 67, double insulation ☐ or IP 68, double insulation ☐, depending on model.		
Special temperatures	-40 °C, +70 °C	Add the suffix TF to the end of the reference (3)			
	-25 °C, +85 °C	Add the suffix TT to the end of the reference (3)			
Type reference		XS612B2 XS618 B2 XS630 B2	XS8E	XS8C	XS8D
Pages		3/70	3/72		

(1) Depending on model.

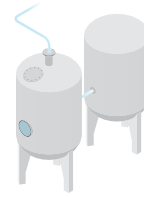
(2) Also available in lengths of 5 and 10 m, depending on model.

(3) Product availability depending on model: please consult our Customer Care Centre.



Detection of underspeed, shaft overload

Position, displacement and deformation control/monitoring



Machine with stainless steel housing

Sensors for rotation monitoring

**Sensors with analogue output
0 ... 10 V or 4 ... 20 mA**

Sensors for food/beverage and pharmaceutical applications

Cylindrical, stainless steel 316 L

Cylindrical, plastic



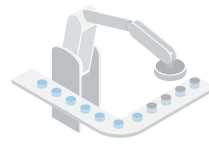
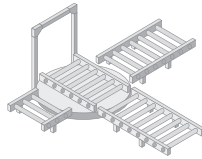
10	10...15 (1)	0.2...10 (1)	5...40 (1)	–	–	6, 10 or 20 (1)	–	–
10	10...15 (1)	0.4...15 (1)	5...40 (1)	2...25	2...25	10, 20 or 40 (1)	7...22 (1)	7...22 (1)
M30 x 81	–	Threaded: M12, M18, M30	–	–	–	Threaded: M12, M18, M30	Plain: Ø 18 Threaded: M12, M18, M30	Threaded: M12, M18, M30
–	26 x 26 x 13 40 x 40 x 15	–	32 x 15 x 8 26 x 26 x 13 40 x 40 x 15 80 x 80 x 26	40 x 40 x 70	40 x 40 x 117	–	–	–
Metal	PBT	Metal or plastic	PBT	PBT	PBT	Stainless steel, 316 L	Stainless steel, 316 L	Plastic, PPS
•	•	•	•	•	•	•	•	•
–	–	–	–	–	–	–	–	–
•	•	–	–	–	–	–	•	•
–	–	–	–	–	–	•	•	•
•	•	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
•	–	•	•	–	–	–	•	•
–	–	–	–	–	–	–	–	–
–	–	–	•	•	–	•	•	•
–	–	–	–	–	–	–	•	•
–	•	–	•	–	–	–	–	–
–	–	–	–	–	•	–	–	–
IP 67	IP 67, double insulation ☐	IP 67	IP 67 or IP 68 (pre-cabled version)	IP 65, IP 67 IP 69K	IP 65, IP 67 IP 69K	IP 68, IP 69K	IP 68 (pre-cabled version), double insulation ☐ IP 69K conforming to DIN 40050	

Add the suffix TF to the end of the reference (3)

Add the suffix TT to the end of the reference (3)

XSAV	XS9●11R	XS1M●●●AB1 XS4P●●●AB1	XS9●●●●A	XS9C2	XS9C4	XS9●●S●	XS2●●SA	XS2●●AA
3/75	3/77	3/79	3/83 and 3/85	3/86	3/86	3/88	3/90 and 3/92	3/94 and 3/96

Applications



Conveying

Sensor type: flush and non flush mountable

Sensors for conveying and material handling applications

Cylindrical,
stainless steel 303

12 x 40 x 26
format

80 x 80 x 40
format,
increased range



Developed in accordance with the needs expressed by our customers, these sensors provide a complete solution for specific application functions: rotation monitoring, selective detection, analogue control, etc.

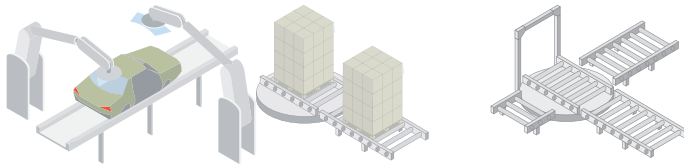
Sensing dist.	Flush mountable
Sn (mm)	Non flush mountable
Form	Cylindrical
	Block (W x H x D) dimensions in mm
Case material	
Supply	<ul style="list-style-type: none"> ⋮ ~ ~
Function	<ul style="list-style-type: none"> NO NC NO + NC NO/NC
Connection	<ul style="list-style-type: none"> Pre-cabled (L = 2 m) (2) M8 connector, 3-pin (--- 3-wire) M12 connector 1/2"-20UNF connector Remote connector Screw terminals
Degree of protection	
Special temperatures	<ul style="list-style-type: none"> - 40 °C, + 70 °C - 25 °C, + 85 °C
Type reference	
Pages	

3, 6, 10 or 20 (1)	2	50
6, 10, 20 or 40 (1)	4	42
Threaded: M8, M12, M18, M30	–	–
–	12 x 40 x 26	80 x 80 x 40
Stainless steel 303	Plastic	Plastic
•	•	•
–	–	–
–	•	–
•	•	•
–	•	–
–	•	–
–	–	–
–	–	–
–	•	–
–	•	–
•	–	•
–	–	–
–	–	–
–	–	–
IP 67 and IP 69K	IP 67	IP 67, double insulation ☐
Add the suffix TF to the end of the reference (3)		
Add the suffix TT to the end of the reference (3)		
XS9●●R●	XS7G XS8G	XS7D
3/98	3/100	3/104

(1) Depending on model.

(2) Also available in lengths of 5 and 10 m, depending on model.

(3) Product availability depending on model: please consult our Customer Care Centre.



Robotics

Assembly machines, conveyor systems, material handling

Sensors for welding machine applications	Factor 1 (Fe/Nfe) sensors for ferrous and non ferrous materials			Selective detection sensors for ferrous materials only or non ferrous materials only
Cylindrical, stainless steel 303	Cylindrical	Cubic	Rectangular	Cylindrical



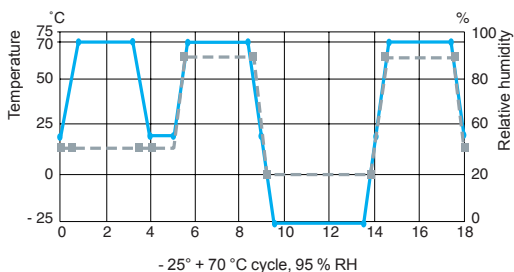
6 or 10 (1)	5, 10 or 15 (1)	20	20	5
–	–	–	–	–
Threaded: M12, M18	Threaded: M18, M30	–	–	Threaded: M18
–	–	40 x 40 x 70	40 x 40 x 117	–
Stainless steel 303	Metal	PBT	PBT	Metal
•	•	•	•	•
–	–	–	–	–
–	–	–	–	–
•	–	–	–	•
–	–	–	–	–
–	–	•	•	–
–	•	–	–	–
–	•	–	–	•
–	–	–	–	–
•	•	•	–	–
–	–	–	–	–
–	•	–	–	–
–	–	–	•	–
IP 68 and IP 69K	IP 68	IP 65, IP 67 and IP 69K		IP 68
Add the suffix TF to the end of the reference (3)				
Add the suffix TT to the end of the reference (3)				
XS9●●RW XSLC	XS1M●●●KP	XS9C2	XS9C4	XS1M18PA
3/106 and 3/108	3/110	3/112	3/112	3/114



3

Standards and certifications

Parameters related to the environment



— Temperature °C
 - - - Humidity as %

Recommendations

The sensors detailed in this catalogue are designed for use in standard industrial applications relating to presence detection. These sensors do not incorporate the required redundant electrical circuit enabling their usage in safety applications. For safety applications, please refer to our "Safety solutions using Preventa" catalogue.

Quality control

Our inductive proximity sensors are subject to special precautions in order to guarantee their reliability in the most arduous industrial environments.

- **Qualification**
 - The product characteristics stated in this catalogue are subject to a qualification procedure carried out in our laboratories.
 - In particular, the products are subjected to climatic cycle tests for 3000 hours whilst powered-up to verify their ability to maintain their characteristics over time.
- **Production**
 - The electrical characteristics and sensing distances at both ambient temperature and extreme temperatures are 100% checked.
 - Products are randomly selected during the course of production and subjected to monitoring tests relating to all their qualified characteristics.
- **Customer returns**

If, in spite of all these precautions, defective products are returned to us, they are subject to **systematic analysis** and **corrective actions** are implemented to eliminate the risks of the fault recurring.

Conformity to standards

All Telemecanique Sensors brand inductive proximity sensors conform to and are tested in accordance with the recommendations of standard IEC 60947-5-2.

Mechanical shock resistance

The sensors are tested in accordance with standard IEC 60068-2-27, 50 gn, duration 11 ms.

Vibration resistance

The sensors are tested in accordance with standard IEC 60068-2-6, amplitude ± 2 mm, $f = 10 \dots 55$ Hz, 25 gn at 55 Hz.

Resistance to the environment

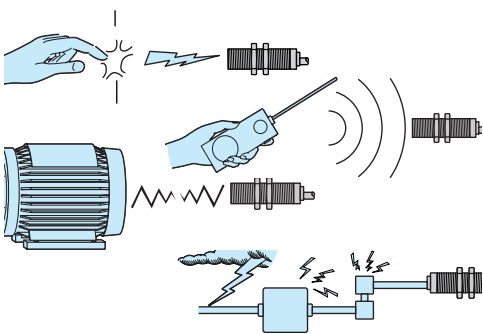
- Please refer to the characteristics pages for the various sensors.
- IP 67: protection against the effects of immersion.
 - Test conforming to IEC 60529: sensor immersed for 30 minutes in 1 m of water. No deterioration in either operating or insulation characteristics is permitted.
- IP 68: protection against prolonged immersion.
 - Sensor immersed for 336 hours in 40 metres of water at 50 °C. No deterioration in either operating or insulation characteristics is permitted. Telemecanique Sensors with an IP 68 degree of protection are ideal for use in the most arduous conditions, such as machine tools, automatic car washers.
- IP 69K: protection against the effects of high pressure cleaning. Adherence to standard DIN 40050 which stipulates that the product must withstand a water jet at a pressure of 90 bar and temperature of +80 °C for 3 minutes. No deterioration in either operating or insulation characteristics is permitted.

Resistance to electromagnetic interference

- Electrostatic discharges
 - ~ and ~ versions: level 4 immunity (15 kV). **IEC 61000-4-2**
- Radiated electromagnetic fields (electromagnetic waves)
 - ~, ~ and ~ versions: level 2 (3 V/m) or level 3 (10 V/m) immunity. **IEC 61000-4-3**
- Fast transients (motor start/stop interference)
 - ~ version: level 3 immunity (1 kV).
 - ~ and ~ versions: level 4 immunity (2 kV) except Ø 8 mm model (level 2). **IEC 61000-4-4**
- Impulse voltage
 - ~, ~ and ~ versions: level 3 immunity (2.5 kV) except Ø 8 mm and smaller models (level 1 kV). **IEC 60947-5-2**

Resistance to chemicals in the environment

- Owing to the very wide range of chemicals encountered in industry, it is very difficult to give general guidelines common to all sensors.
 - To ensure lasting efficient operation, it is essential that any chemicals coming into contact with the sensors will not affect their casing and, in doing so, prevent their reliable operation.
 - Cylindrical and flat plastic case sensors offer excellent overall resistance to:
 - chemical products such as salts, aliphatic and aromatic oils, petroleum, acids and diluted bases. For alcohols, ketones and phenols, preliminary tests should be made relating to the nature and concentration of the liquid.
 - food and beverage industry products such as animal or vegetable based products (vegetable oils, animal fat, fruit juice, dairy proteins, etc.).
- In all cases, the materials selected (see product characteristics) provide satisfactory compatibility in most industrial environments (for further information, please consult our Customer Information Centre).

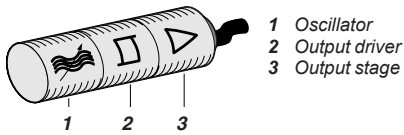


Insulation

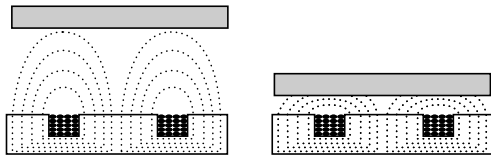
Class 2 devices

Electrical insulation conforming to standards IEC 61140 and NF C 20-030 relating to means of protection against electric shock.

Principle of inductive detection



Composition of an inductive proximity sensor



Detection of a metal object

Operating principle

■ An inductive proximity sensor is solely for the detection of metal objects. It basically comprises an oscillator whose windings constitute the sensing face. An alternating magnetic field is generated in front of these windings.

■ When a metal object is placed within the magnetic field generated by the sensor, the resulting currents induced form an additional load and the oscillations cease. This causes the output driver to operate and, depending on the sensor type, a normally open (NO) or normally closed (NC) output signal is produced.

Inductive proximity detection

- Inductive proximity sensors enable the detection, without physical contact, of metal objects.
- Their range of applications is very extensive and includes:
 - monitoring the position of machine parts (cams, end stops, etc.),
 - counting the presence of metal objects, etc.

Advantages of inductive detection

- No physical contact with the object to be detected, thus avoiding wear and enabling detection of fragile objects, freshly painted objects, etc.
- High operating rates. Fast response.
- Excellent resistance to industrial environments (robust products, fully encapsulated in resin).
- Solid-state technology: no moving parts, therefore service life of sensor not related to number of operating cycles.

Flush mountable using teach mode sensors

- The flush mountable sensors using teach mode are suitable for all metal environments (flush mountable or non flush mountable) since they ensure a maximum sensing distance, even if there is a metal background. Precise detection of the position of the object can be obtained using the teach mode. For further information, see page 3/22.

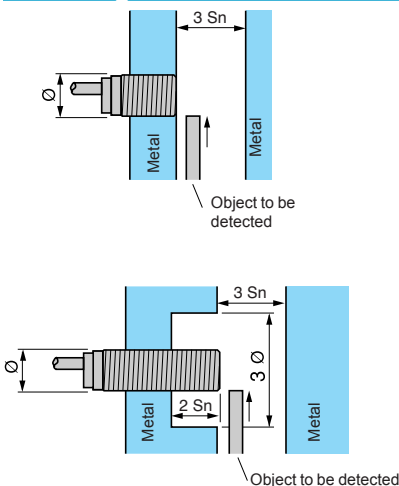
LED indicator

	Sortie NO	Sortie NC
No object present	LED	
Object present	LED	

Output LED

All Telemecanique Sensors inductive proximity sensors incorporate an output state LED indicator. The flush mountable sensors using teach mode are fitted with a green LED that indicates "Power on" and also assists the user during setting-up (teach mode).

Mounting sensors on a metal support



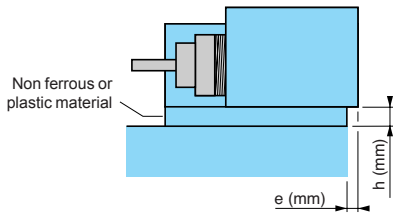
Flush mountable in metal

- No side clearance required.
- All flush mountable sensors using teach mode also enable detection of an object against a metal background. For further information, see pages 3/22 and 3/23.

Sensors not suitable for flush mounting in metal

- Side clearance required. Sensing distance greater than that for a standard flush mountable model.
- Flush mountable sensors using teach mode eliminate the need for side clearance. For further information, see pages 3/22 and 3/23.

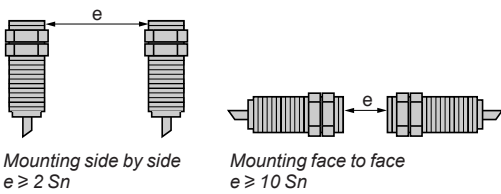
Mounting sensors on a metal support



Mounting using fixing clamp

- Standard flush mountable models: $e = 0, h = 0$
- Standard non flush mountable models
 - $\varnothing 6.5 / 8 / 12$ mm: $e = 0, h = 0$
 - $\varnothing 18$ mm: if $h = 0, e \geq 5; e = 0, h \geq 3$.
 - $\varnothing 30$ mm: if $h = 0, e \geq 8; e = 0, h \geq 4$.
- Flush mountable sensors using teach mode: $e = 0, h = 0$

Mounting distance between sensors



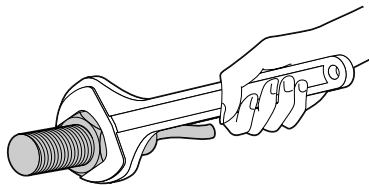
Standard sensors

If 2 standard sensors are mounted too close to each other they are likely to lock in the "detection state" due to interference between their respective oscillating frequencies. To avoid this condition, the minimum mounting distances stated for the sensors should be adhered to or, alternatively, sensors with staggered oscillating frequencies should be used.

Staggered frequency sensors

For applications where the minimum recommended mounting distances for standard sensors cannot be achieved, it is possible to overcome this restraint by using staggered frequency sensors. Please consult our Customer Care Centre. In this case, a staggered frequency sensor is mounted adjacent to or opposite each standard sensor.

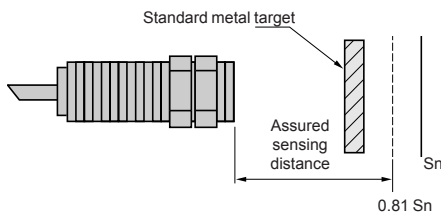
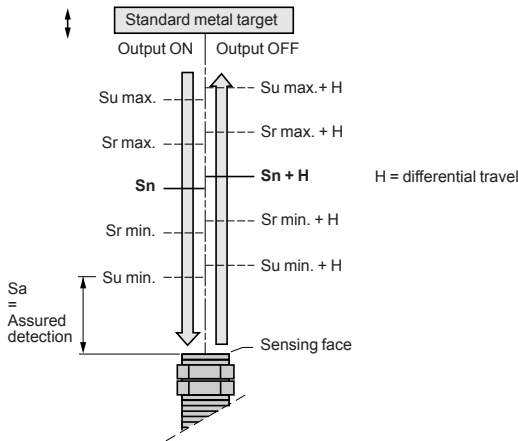
Tightening torque for cylindrical type sensors



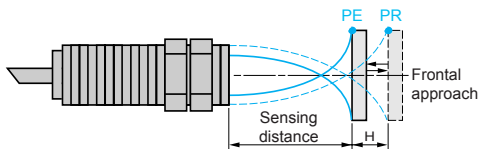
Diameter of sensor (mm)	Maximum tightening torque for the various sensor case materials			
	Brass	Brass	Stainless steel	Plastic
	Short case model	Long case model form A	Long case model form A	All models
	XS5●●B1 XS6●●B3	XS6●●B1 XS6●●B2 XS6●●B4 XSAV●	XS1●● XS2●●	XS4P●●
$\varnothing 5$	1.6 N.m	1.6 N.m	2 N.m	–
$\varnothing 8$	5 N.m	5 N.m	9 N.m	1 N.m
$\varnothing 12$	6 N.m	6 N.m	30 N.m	2 N.m
$\varnothing 18$	15 N.m	15 N.m	50 N.m	5 N.m
$\varnothing 30$	40 N.m	40 N.m	100 N.m	20 N.m

3

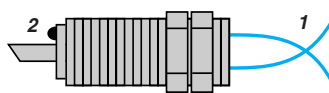
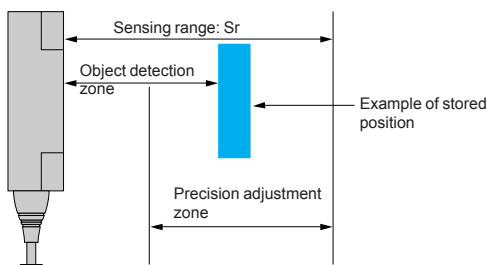
Sensing distance



Terminology



PE = pick-up point, the object is detected
 PR = drop-out point, the object is no longer detected



1 Detection threshold curves
 2 "Object detected" LED

Definitions

In order to ensure that customers can make reliable product comparisons and selection, the standard IEC 60947-5-2 defines various sensing distances, such as:

- **Nominal sensing distance (Sn)**
 The rated operating distance for which the sensor is designed. It does not take into account any variations (manufacturing tolerances, temperature, voltage).
- **Effective sensing distance (Sr)**
 The effective sensing distance is measured at the rated voltage (U_n) and the rated ambient temperature (T_n). It must be between 90% and 110% of the nominal sensing distance (S_n): $0.9 S_n \leq S_r \leq 1.1 S_n$.
- **Usable sensing distance (Su)**
 The usable sensing distance is measured at the limits of the permissible variations in the ambient temperature (T_a) and the supply voltage (U_b). It must be between 90% and 110% of the effective sensing distance: $0.9 S_r \leq S_u \leq 1.1 S_r$.
- **Assured operating distance (Sa)**
 This is the operating zone of the sensor. The assured sensing distance is between 0 and 81% of the nominal sensing distance (S_n): $0 \leq S_a \leq 0.9 \times 0.9 \times S_n$.

Standard metal target

The standard IEC 60947-5-2 defines the standard metal target as a square mild steel (Fe 360) plate, 1 mm thick. The side dimension of the plate is either equal to the diameter of the circle engraved on the sensing face of the sensor or 3 times the nominal sensing distance (S_n).

Differential travel

The differential travel (H), or hysteresis, is the distance between the operating point, as the standard metal target moves towards the sensor, and the release point, as it moves away. This hysteresis is essential for the stable operation of the sensor.

Repeat accuracy

The repeat accuracy (R) is the repeatability of the sensing distance between successive operations. Readings are taken over a period of time whilst the sensor is subjected to voltage and temperature variations: 8 hours, 10 to 30 °C, $U_n \pm 5\%$. It is expressed as a percentage of the effective sensing distance Sr. For all OsiSense XS sensors, the repeat accuracy is 3%.

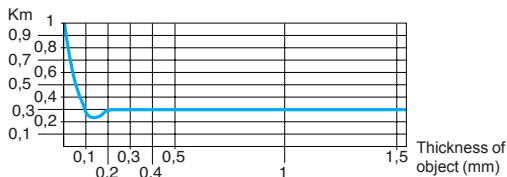
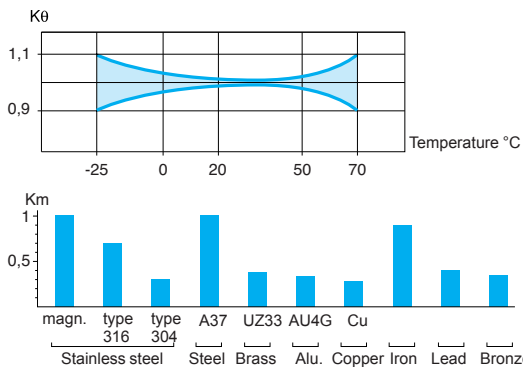
Detection zone and precision adjustment zone

- Flush mountable sensors using teach mode, due to adjustment of sensitivity whilst teaching, enable the position of an object to be detected as it approaches from the front or side. The teach mode can be used when the object is located in the zone known as the "precision adjustment zone". When the object approaches from the front, the detection zone of the object ranges from the stored position down to zero.

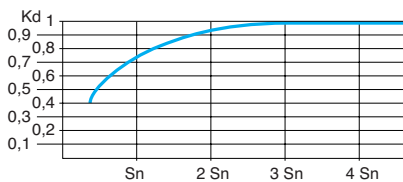
Operating zone

- The operating zone relates to the area in front of the sensing face in which the detection of a metal object is certain. The values stated in the characteristics relating to the various types of sensor are for steel objects of a size equal to the sensing face of the sensor. For objects of a different nature (smaller than the sensing face of the sensor, other metals, etc.), it is necessary to apply a correction coefficient.

Correction coefficients to apply to the assured operating distance



Typical curve for a copper object used with a \varnothing 18 mm cylindrical sensor



Typical curve for a steel object used with a cylindrical sensor

Calculation examples

Assured operating distance of a sensor

In practice, most objects to be detected are generally made of steel and are of a size equal to, or greater, than the sensing face of the sensor.

For the calculation of the assured operating distance for different operating conditions, one must take into account the correction coefficients that influence it.

The curves indicated are purely representative of typical curves. They are only given as a guide to the approximate usable sensing distance of a proximity sensor for a given application.

Influence of ambient temperature

Apply a correction coefficient K_θ , determined from the curve shown opposite.

Material of object to be detected

Apply a correction coefficient K_m , determined from the diagram shown opposite.

The fixed sensing distance models for ferrous/non ferrous (Fe/NFe) materials enable the detection of different objects at a fixed distance, irrespective of the type of material.

Special case of a very thin object made of a non ferrous material.

Size of object to be detected

Apply a correction coefficient K_d , determined from the curve shown opposite.

When calculating the sensing distance for the selection of a sensor, make the assumption that $K_d = 1$.

Variation of supply voltage

In all cases, apply the correction coefficient $K_t = 0.9$.

Correction of the sensing distance of a sensor

Sensor with nominal sensing distance $S_n = 15$ mm.

Ambient temperature variation 0 to +20 °C.

Object material and size: steel, 30 x 30 x 1 mm thick.

The assured sensing distance S_a is determined using the formula:

$$S_a = S_n \times K_\theta \times K_q \times K_m \times K_d \times K_t = 15 \times 0.98 \times 1 \times 0.95 \times 0.9$$

i.e. $S_a = 12.5$ mm.

Selecting a sensor for a given application

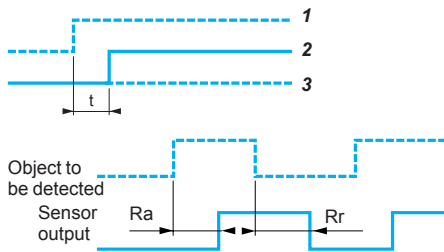
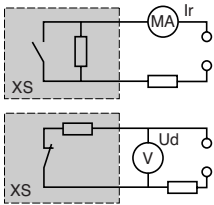
Application characteristics:

- object material and size: iron ($K_m = 0.9$), 30 x 30 mm,
- temperature: 0 to 20 °C ($K_\theta = 0.98$),
- object detection distance: 3 mm \pm 1.5 mm, i.e. $S_a \text{ max.} = 4.5$ mm,
- assume $K_d = 1$.

$$\text{A sensor must be selected for which } S_n \geq \frac{S_a}{K_\theta \times K_q \times K_m \times K_d \times K_t} = \frac{4.5}{0.98 \times 0.9 \times 1 \times 0.9}$$

i.e. $S_n \geq 5.7$ mm

Specific aspects of electronic sensors



Supply

Terminology

- Residual current (I_r)
 - The residual current (I_r) corresponds to the current flowing through the sensor when in the "open" state.
 - Characteristic of 2-wire type proximity sensors.
- Voltage drop (U_d)
 - The voltage drop (U_d) corresponds to the voltage drop at the sensor's terminals when in the "closed" state (value measured at nominal current rating of sensor).
- First-up delay
 - The first-up delay corresponds to the time (t) between the connection of the power supply to the sensor and its fully operational state.
- 1 Supply voltage U on
- 2 Sensor operational at state 1
- 3 Sensor at state 0
- Response time
 - Response time (R_a): the time delay between the object to be detected entering the sensor's operating zone and the subsequent change of output state. This parameter limits the speed and size of the object.
 - Recovery time (R_r): the time delay between an object to be detected leaving the sensor's operating zone and the subsequent change of output state. This parameter limits the interval between successive objects.

Sensors for AC circuits (\sim and \sphericalangle models)

Check that the voltage limits of the sensor are compatible with the nominal voltage of the AC supply used.

Sensors for DC circuits

- DC source: check that the voltage limits of the sensor and the acceptable level of ripple are compatible with the supply used.
- AC source (comprising transformer, rectifier, smoothing capacitor): the supply voltage must be within the operating limits specified for the sensor.

Where the voltage is derived from a single-phase AC supply, the voltage must be rectified and smoothed to ensure that:

- the peak voltage of the DC supply is lower than the maximum voltage rating of the sensor.
- the minimum voltage of the supply is greater than the minimum voltage rating of the sensor,

given that :

$$\Delta V = (I \times t) / C$$

$$\Delta V = \text{max. ripple: } 10\% (V),$$

$$I = \text{anticipated load current (mA),}$$

$$t = \text{period of 1 cycle (10 ms full-wave rectified for a 50 Hz supply frequency),}$$

$$C = \text{capacitance } (\mu\text{F}).$$

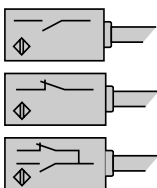
As a general rule, use a transformer with a lower secondary voltage (U_e) than the required DC voltage (U).

Example:

$\sim 18\text{ V}$ to obtain $\text{---} 24\text{ V}$,

$\sim 36\text{ V}$ to obtain $\text{---} 48\text{ V}$.

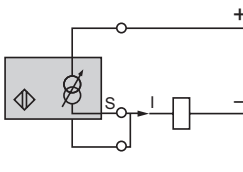
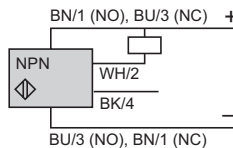
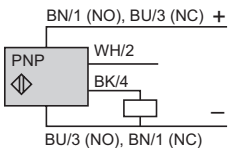
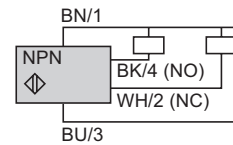
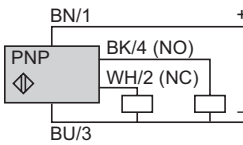
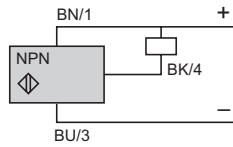
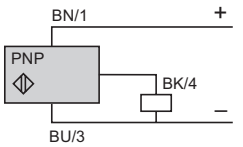
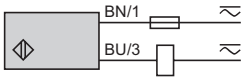
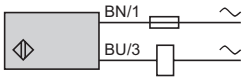
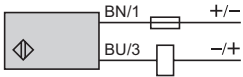
Outputs



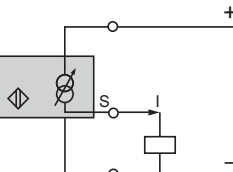
Output signal (contact logic)

- Normally open (NO)
 - Corresponds to a sensor whose output changes to the closed state when an object is present in the operating zone.
- Normally closed (NC)
 - Corresponds to a sensor whose output changes to the open state when an object is present in the operating zone.
- Complementary outputs (NO + NC)
 - Corresponds to a sensor with a normally closed output and a normally open output.

Outputs (continued)



2-wire connection



3-wire connection

2-wire type, non polarised NO or NC output

■ Specific aspects

These sensors are wired in series with the load to be switched.

As a consequence, they are subject to:

- a residual current in the open state (current flowing through the sensor in the “open” state),
- A voltage drop in the closed state (voltage drop across the sensor’s terminals in the “closed” state).

■ Advantages

- Only 2 leads to be wired: these sensors can be wired in series in the same way as mechanical limit switches,
- They can be connected to either positive (PNP) or negative (NPN) logic PLC inputs,
- No risk of incorrect connections.

■ Operating precautions

- Check the possible effects of residual current and voltage drop on the actuator or input connected,
- For sensors that do not have overload and short-circuit protection (AC or AC/DC symbol), it is essential to connect a 0.4 A “quick-blow” fuse in series with the load.

3-wire type, NO or NC output, PNP or NPN

■ Specific aspects

- These sensors comprise 2 wires for the DC supply and a 3rd wire for the output signal,
- PNP type: switching the positive side to the load,
- NPN type: switching the negative side to the load.

■ Advantages

- Protection against supply reverse polarity,
- Protection against overload and short-circuit,
- No residual current, low voltage drop.

4-wire type, complementary NO and NC outputs, PNP or NPN

■ Advantages

- Protection against supply reverse polarity (+/-).
- Protection against overload and short-circuit.

4-wire type, multifunction, programmable NO or NC output, PNP or NPN

■ Advantages

- Protection against supply reverse polarity (+/-).
- Protection against overload and short-circuit.

Specific output signals, analogue type

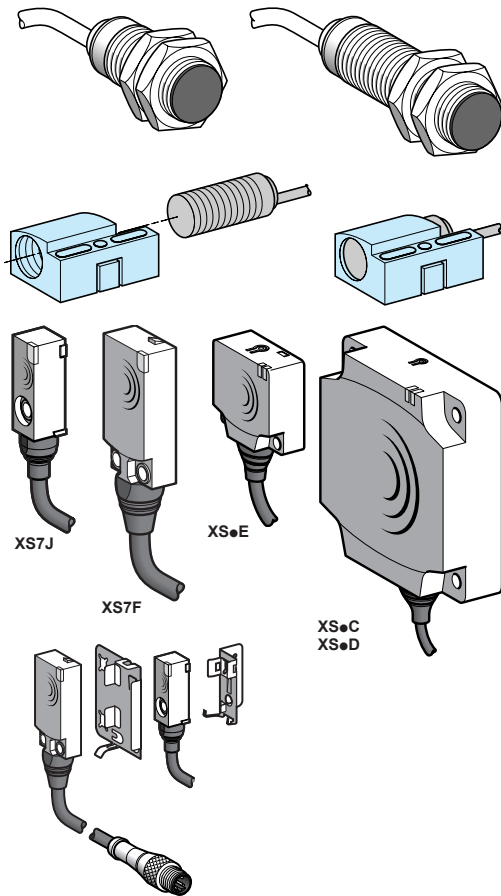
■ These sensors convert the approach of a metal object towards the sensing face into an output current variation which is proportional to the distance between the object and the sensing face.

■ Two models available:

- 0...10 V (0...10 mA) output for 3-wire connection,
- 4-20 mA output for 2-wire connection.

3

Features of the various models

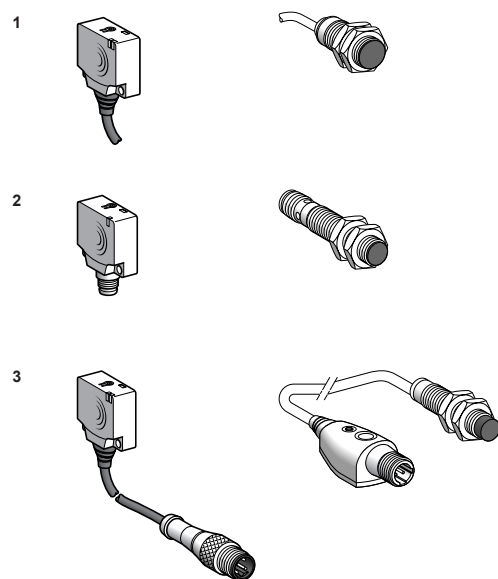


Types of case

- Cylindrical case
 - Fast installation and setting-up.
 - Short case and long case, 2-wire c and 3-wire c versions available.
 - Pre-cabled (moulded cable) and various integral connector (M8, M12, 7/8", M18) and remote connector (on flying lead) versions available.
 - Small size facilitates mounting in locations with restricted access.
 - Interchangeability, provided by indexed fixing clamp: when assembled, becomes similar to a block type sensor.

- Flat case
 - Reduced size (sensor volume divided by 8).
 - Fast installation by mounting on clip-on brackets.
 - Precision detection with the flush mountable sensors using teach mode (see page 3/22).

Electrical connection



Connection methods

- 1 Pre-cabled:** factory fitted moulded cable, good protection against splashing liquids (IP 68). Example: machine tool.
- 2 Connector:** easy installation and maintenance (IP 67).
- 3 Remote connector:** easy installation and maintenance (IP 68 at sensor level and IP 67 at remote connector level).

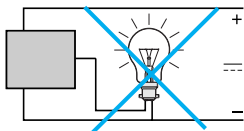
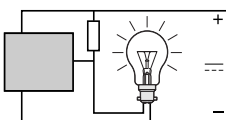
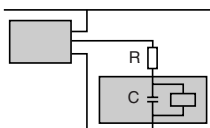
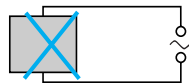
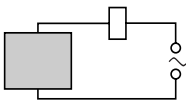
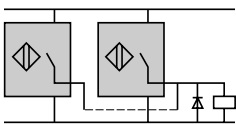
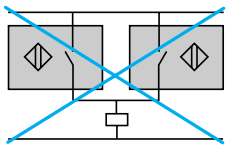
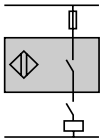
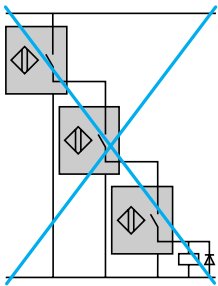
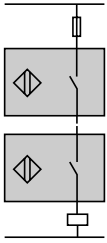
Wiring advice

- Length of cable
 - No limitation up to 200 m or up to a line capacitance of < 100 nF (characteristics of sensor remain unaffected).
 - In this case, it is important to take into account the voltage drop on the line.

- Separation of control and power circuit wiring
 - The sensors are immune to electrical interference encountered in normal industrial conditions.
 - Where extreme conditions of electrical "noise" could occur (large motors, spot welders, etc.), it is advisable to protect against transients in the normal way:
 - suppress interference at source,
 - separate power and control wiring from each other,
 - smooth the supply,
 - limit the length of cable.

- Connect the sensor with supply switched off.

Setting-up precautions



Connection in series

2-wire type sensors

- The following points should be taken into account:
 - Series wiring is only possible using sensors with wide voltage limits. Based on the assumption that each sensor has the same residual current value, each sensor, in the open state, will share the supply voltage, i.e.
- $$U_{\text{sensor}} = \frac{U_{\text{supply}}}{n \text{ sensors}}$$

- U sensor and U supply must remain within the sensor's voltage limits.
- If only one sensor in the circuit is in the open state, it will be supplied at a voltage almost equal to the supply voltage.
- When in the closed state, a small voltage drop is present across each sensor. The resultant loss of voltage at the load will be the sum of the individual voltage drops and therefore, the load voltage should be selected accordingly.

3-wire type sensors

- This connection method is not recommended.
- Correct operation of the sensors cannot be assured and, if this method is used, tests should be made before installation. The following points should be taken into account:
 - Sensor 1 carries the load current in addition to the no-load current consumption values of the other sensors connected in series. For certain models, this connection method is not possible unless a current limiting resistor is used.
 - When in the closed state, a small voltage drop is present across each sensor. The load should therefore be selected accordingly.
 - As sensor 1 closes, sensor 2 does not operate until a certain time (t) has elapsed (corresponding to the first-up delay) and likewise for the following sensors in the sequence.
 - The use of "flywheel" diodes is recommended when an inductive load is being switched.

Sensors and devices in series with an external mechanical contact

2 and 3-wire type sensors

- The following points should be taken into account:
 - When the mechanical contact is open, the sensor is not supplied.
 - When the contact closes, the sensor does not operate until a certain time (t) has elapsed (corresponding to the first-up delay).

Connection in parallel

2-wire type sensors

- This connection method is not recommended.**
- Should one of the sensors be in the closed state, the sensor in parallel will be "shorted-out" and no longer supplied. As the first sensor passes into the open state, the second sensor will become energised and will be subject to its first-up delay.
 - This configuration is only permissible where the sensors will be working alternately.
 - This method of connection can lead to irreversible damage of the units.

3-wire type sensors

- No specific restrictions. The use of "flywheel" diodes is recommended when an inductive load (relay) is being switched.

AC supply

- 2-wire type sensors cannot be connected directly to an AC supply.
- This would result in immediate destruction of the sensor and considerable danger to the user.
- An appropriate load (refer to the instruction sheet supplied with the sensor) must always be connected in series with the sensor.

Capacitive load (C > 0.1 µF)

- On power-up, it is necessary to limit (by resistor) the charging current of the capacitive load C.
- The voltage drop in the sensor can also be taken into account by subtracting it from the supply voltage for the calculation of R.

$$R = \frac{U_{\text{supply}}}{I_{\text{max. (sensor)}}$$

Load comprising an incandescent lamp

- If the load comprises an incandescent lamp, the cold state resistance can be 10 times lower than the hot state resistance. This can cause very high current levels on switching. Fit a pre-heat resistor in parallel with the sensor.

$$R = \frac{U^2}{P} \times 10, \quad U = \text{supply voltage and } P = \text{lamp power}$$

3

Fast trouble shooting guide

Problem	Possible causes	Remedy
The sensor's output will not change state when a metal object enters the detection zone	On a flush mountable sensor using teach mode: setting-up or programming error.	<ul style="list-style-type: none"> ■ After a RESET, follow the environment teach mode procedure. Refer to instruction sheet supplied with sensor.
	Output stage faulty or complete failure of the sensor or the short-circuit protection has tripped.	<ul style="list-style-type: none"> ■ Check that the sensor is compatible with the supply being used. ■ Check the load current characteristics: <ul style="list-style-type: none"> □ if load current I_u maximum switching capacity, an auxiliary relay, of the CAD N type for example, should be interposed between the sensor and the load, □ if I_y maximum switching capacity, check for wiring faults (short-circuit). ■ In all cases, a 0.4 A "quick-blow" fuse should be fitted in series with the sensor.
	Wiring error	<ul style="list-style-type: none"> ■ Check that the wiring conforms to the wiring shown on the sensor label or instruction sheet.
	Supply fault	<ul style="list-style-type: none"> ■ Check that the sensor is compatible with the supply (~ or ---). ■ Check that the supply voltage is within the voltage limits of the sensor. Remember that with a rectified, smoothed supply, U_{peak} = U_{nominal} x √2 with a ripple voltage γ 10 %.
False or erratic operation, with or without the presence of a metal object in the detection zone	On flush mountable sensor using teach mode: setting-up or programming error.	<ul style="list-style-type: none"> ■ After a RESET, follow the environment teach mode procedure. Refer to instruction sheet supplied with sensor.
	Influence of background or metal environment	<ul style="list-style-type: none"> ■ Refer to the instruction sheet supplied with the sensor. For sensors with adjustable sensitivity, reduce the sensing distance.
	Sensing distance poorly defined for the object to be detected	<ul style="list-style-type: none"> ■ Apply the correction coefficients. ■ Realign the system or run the teach mode again.
	Influence of transient interference on the supply lines	<ul style="list-style-type: none"> ■ Ensure that any DC supplies, when derived from rectified AC, are correctly smoothed (C > 400 μF). ■ Separate AC power cables from low-level DC cables (24 V low level). ■ Where very long distances are involved, use suitable cable: screened and twisted pairs of the correct cross-sectional area.
	Equipment prone to emitting electromagnetic interference	<ul style="list-style-type: none"> ■ Position the sensors as far away as possible from any sources of interference.
	Response time of the sensor too slow for the particular object being detected	<ul style="list-style-type: none"> ■ Check the suitability of the sensor for the position or size of the object to be detected. ■ If necessary, select a sensor with a higher switching frequency.
	Influence of high temperature	<ul style="list-style-type: none"> ■ Eliminate sources of radiated heat or protect the sensor casing with a heat shield. ■ Realign, having adjusted the temperature around the fixing support.
	No detection following a period of service	Vibration, shock



Inductive proximity sensors

OsiSense XS

Flush mountability using teach mode: simplicity through innovation

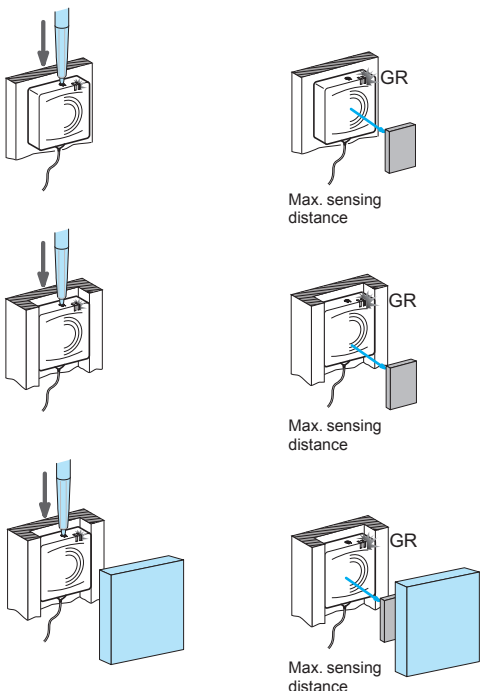
Operating principle

In proposing flush mountable sensors using teach mode, Telemecanique Sensors offers simplicity through innovation.

- A single product enables flush mounting using teach mode and meets all the requirements for inductive detection of metal objects. By simply pressing the "Teach mode" button, the sensor automatically acquires optimum configuration for all detection, flush mountability and environment requirements.

- Other advantages of flush mountable sensors using teach mode

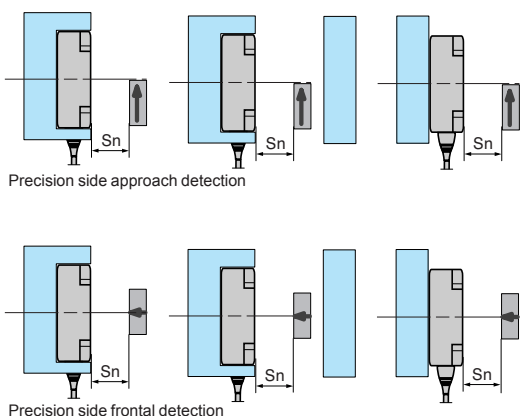
- Increased performance:
 - sensing distance guaranteed and optimised irrespective of the mounting method, object, environment or background,
 - suitable for all metal environments.
- Simplified use provided by:
 - the flush mountability using teach mode technology, associated with the availability of the flattest and most compact sensors on the market, ensures full integration in the machine and limits the risks of mechanical damage,
 - mechanical adjustments no longer necessary due to teach mode.
- Lower costs due to:
 - the elimination of adjustment times and complex supports
 - the elimination of flush mountable and non flush mountable versions, which halves the number of references,
 - much easier and much quicker product selection.



Precision position detection

All flush mountable inductive proximity sensors using teach mode benefit from ultra precise adjustment, which is very quick irrespective of the metal environment.

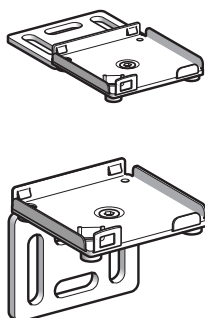
- Precision side approach detection makes it possible to accurately define the distance at which the object will be detected as it passes the sensor. On the flush mountable sensors using teach mode, the desired detection position can be stored in memory by simply pressing the teach button.
- Precision frontal approach detection makes it possible to accurately define the distance at which the object will be detected as it approaches the sensor. On the flush mountable sensors using teach mode, the desired detection position can be stored in memory by simply pressing the teach button.



Mounting accessories

Telemecanique Sensors offers a complete, inexpensive range of mounting accessories (clamps, plates, brackets, etc.) that provide solutions for all installation problems.

- Fixing kits for quick installation or replacement of sensors
- No adjustment required. Simple clipping-in enables the sensor to be fixed in position and ready for operation.



Inductive proximity sensors

OsiSense XS

Flush mountability using teach mode:
simplicity through innovation



Block type				
Dimensions (mm)		26 x 26 x 13	40 x 40 x 15	80 x 80 x 26
Sensing distance (mm)	Flush mounted use	0...10	0...15	0...40
	Non flush mounted use	0...15	0...25	0...60
Sensor type		XS8E1A1	XS8C1A1	XS8D1A1
Page		3/72		



Cylindrical type				
Dimensions (mm)		12	18	30
Sensing distance (mm)	Flush mounted use	0...3.4	0...6	0...11
	Non flush mounted use	0...5	0...9	0...18
Sensor type		XS612B2	XS618B2	XS630B2
Page		3/70		

3

Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, standard range, flush mountable

Three-wire DC, solid-state output

Sensors, 3-wire 12-24 V, short case model

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Ø 6.5, plain					
1.5	NO	PNP	Pre-cabled (L = 2 m) (1)	XS506B1PAL2	0.035
			M8 connector	XS506B1PAM8	0.025
			M12 connector	XS506B1PAM12	0.025
	NPN	PNP	Pre-cabled (L = 2 m) (1)	XS506B1NAL2	0.035
			M8 connector	XS506B1NAM8	0.025
			M12 connector	XS506B1NAM12	0.025
NC	PNP	Pre-cabled (L = 2 m) (1)	XS506B1PBL2	0.035	
		M8 connector	XS506B1PBM8	0.025	
		M12 connector	XS506B1PBM12	0.025	

Ø 8, threaded M8 x 1

1.5	NO	PNP	Pre-cabled (L = 2 m) (1)	XS508B1PAL2	0.035		
			M8 connector	XS508B1PAM8	0.025		
			M12 connector	XS508B1PAM12	0.025		
			NPN	PNP	Pre-cabled (L = 2 m) (1)	XS508B1NAL2	0.035
					M8 connector	XS508B1NAM8	0.025
					M12 connector	XS508B1NAM12	0.025
	NC	PNP	Pre-cabled (L = 2 m) (1)	XS508B1PBL2	0.035		
			M8 connector	XS508B1PBM8	0.025		
			M12 connector	XS508B1PBM12	0.025		
			NPN	PNP	Pre-cabled (L = 2 m) (1)	XS508B1NBL2	0.035
					M8 connector	XS508B1NBM8	0.025
					M12 connector	XS508B1NBM12	0.025

Ø 12, threaded M12 x 1

2	NO	PNP	Pre-cabled (L = 2 m) (1)	XS512B1PAL2	0.075		
			M12 connector	XS512B1PAM12	0.035		
			NPN	PNP	Pre-cabled (L = 2 m) (1)	XS512B1NAL2	0.075
					M12 connector	XS512B1NAM12	0.035
					NC	PNP	Pre-cabled (L = 2 m) (1)
			M12 connector	XS512B1PBM12			0.035
	NPN	PNP	Pre-cabled (L = 2 m) (1)	XS512B1NBL2			0.075
			M12 connector	XS512B1NBM12			0.035

Ø 18, threaded M18 x 1

5	NO	PNP	Pre-cabled (L = 2 m) (1)	XS518B1PAL2	0.120		
			M12 connector	XS518B1PAM12	0.060		
			NPN	PNP	Pre-cabled (L = 2 m) (1)	XS518B1NAL2	0.120
					M12 connector	XS518B1NAM12	0.060
					NC	PNP	Pre-cabled (L = 2 m) (1)
			M12 connector	XS518B1PBM12			0.060
	NPN	PNP	Pre-cabled (L = 2 m) (1)	XS518B1NBL2			0.120
			M12 connector	XS518B1NBM12			0.060

Ø 30, threaded M30 x 1.5

10	NO	PNP	Pre-cabled (L = 2 m) (1)	XS530B1PAL2	0.205		
			M12 connector	XS530B1PAM12	0.145		
			NPN	PNP	Pre-cabled (L = 2 m) (1)	XS530B1NAL2	0.205
					M12 connector	XS530B1NAM12	0.145
					NC	PNP	Pre-cabled (L = 2 m) (1)
			M12 connector	XS530B1PBM12			0.145
	NPN	PNP	Pre-cabled (L = 2 m) (1)	XS530B1NBL2			0.205
			M12 connector	XS530B1NBM12			0.145

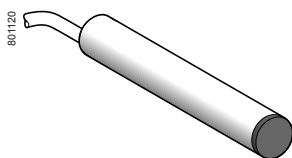
Accessories (2)

Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 6.5 (plain)	XSZB165	0.005
	Ø 8	XSZB108	0.006
	Ø 12	XSZB112	0.006
	Ø 18	XSZB118	0.010
	Ø 30	XSZB130	0.020

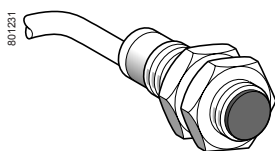
(1) For a 5 m cable replace L2 by L5; for a 10 m cable replace L2 by L10.

Example: **XS508B1PAL2** becomes **XS508B1PAL5** with a 5 m cable.

(2) For more information, see page 3/116.



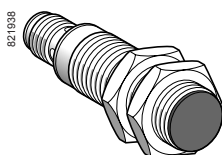
XS506B1●●L2



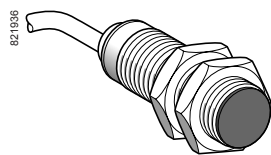
XS508B1●●L2



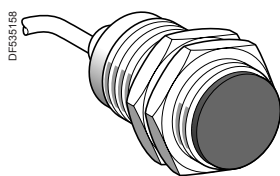
XS512B1●●M12



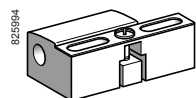
XS518B1●●M12



XS518B1●●L2



XS530B1●●L2



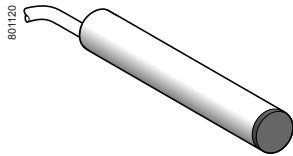
XSZB1●●

Inductive proximity sensors

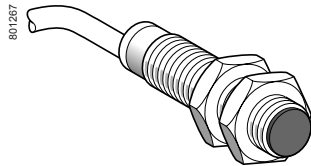
OsiSense XS, general purpose

Cylindrical, standard range, flush mountable

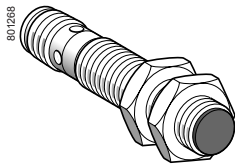
Three-wire DC, solid-state output



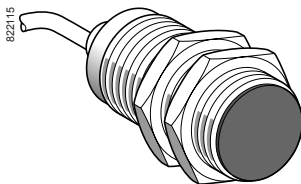
XS506BL●●L2



XS5●●BL●●L2



XS5●●BL●●M12



XS530BL●●L2

Sensors, 3-wire 12-48 V, long case model

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Ø 6.5, plain					
1.5	NO	PNP	Pre-cabled (L = 2 m) (1)	XS506BLPAL2	0.035
		NPN	Pre-cabled (L = 2 m) (1)	XS506BLNAL2	0.035

Ø 8, threaded M8 x 1

1.5	NO	PNP	Pre-cabled (L = 2 m) (1)	XS508BLPAL2	0.035
			M12 connector	XS508BLPAM12	0.025
	NPN	Pre-cabled (L = 2 m) (1)	XS508BLNAL2	0.035	
		M12 connector	XS508BLNAM12	0.025	
	NC	PNP	Pre-cabled (L = 2 m) (1)	XS508BLPBL2	0.035
			M12 connector	XS508BLPBM12	0.025
NPN	Pre-cabled (L = 2 m) (1)	XS508BLNBL2	0.035		
	M12 connector	XS508BLNBM12	0.025		

Ø 12, threaded M12 x 1

2	NO	PNP	Pre-cabled (L = 2 m) (1)	XS512BLPAL2	0.075
			M12 connector	XS512BLPAM12	0.035
	NPN	Pre-cabled (L = 2 m) (1)	XS512BLNAL2	0.075	
		M12 connector	XS512BLNAM12	0.035	
	NC	PNP	Pre-cabled (L = 2 m) (1)	XS512BLPBL2	0.075
			M12 connector	XS512BLPBM12	0.035
NPN	Pre-cabled (L = 2 m) (1)	XS512BLNBL2	0.075		
	M12 connector	XS512BLNBM12	0.035		

Ø 18, threaded M18 x 1

5	NO	PNP	Pre-cabled (L = 2 m) (1)	XS518BLPAL2	0.120
			M12 connector	XS518BLPAM12	0.060
	NPN	Pre-cabled (L = 2 m) (1)	XS518BLNAL2	0.120	
		M12 connector	XS518BLNAM12	0.060	
	NC	PNP	Pre-cabled (L = 2 m) (1)	XS518BLPBL2	0.120
			M12 connector	XS518BLPBM12	0.060
NPN	Pre-cabled (L = 2 m) (1)	XS518BLNBL2	0.120		
	M12 connector	XS518BLNBM12	0.060		

Ø 30, threaded M30 x 1.5

10	NO	PNP	Pre-cabled (L = 2 m) (1)	XS530BLPAL2	0.205
			M12 connector	XS530BLPAM12	0.145
	NPN	Pre-cabled (L = 2 m) (1)	XS530BLNAL2	0.205	
		M12 connector	XS530BLNAM12	0.145	
	NC	PNP	Pre-cabled (L = 2 m) (1)	XS530BLPBL2	0.205
			M12 connector	XS530BLPBM12	0.145
NPN	Pre-cabled (L = 2 m) (1)	XS530BLNBL2	0.205		
	M12 connector	XS530BLNBM12	0.145		

Accessories (2)

Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 6.5 (plain)	XSZB165	0.005
	Ø 8	XSZB108	0.006
	Ø 12	XSZB112	0.006
	Ø 18	XSZB118	0.010
	Ø 30	XSZB130	0.020

(1) For a 5 m cable replace L2 by L5; for a 10 m cable replace L2 by L10.

Example: **XS508BLPAL2** becomes **XS508BLPAL5** with a 5 m cable.

(2) For more information, see page 3/116.

Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, standard range, flush mountable

Three-wire DC, solid-state output

3

Characteristics			
Sensor type		XS5●●B1●●M8, XS5●●B1●●M12 XS5●●BL●●M8, XS5●●BL●●M12	XS5●●B1●●L2 XS5●●BL●●L2
Product certifications		UL, CSA, CE, E2	
Connection	Connector	M8 on Ø 6.5 and Ø 8, M12 on Ø 8, Ø 12, Ø 18 and Ø 30	–
	Pre-cabled	–	Length: 2 m
Operating zone	Ø 6.5 and Ø 8	mm	0...1.2
	Ø 12	mm	0...1.6
	Ø 18	mm	0...4
	Ø 30	mm	0...8
Differential travel		%	1...15 of effective sensing distance (Sr)
Degree of protection	Conforming to IEC 60529	IP 65 and IP 67	IP 65 and IP 68, double insulation ☐ (except Ø 6.5 and Ø 8: IP 67)
	Conforming to DIN 40050	IP 69K for Ø 12 to Ø 30	
Storage temperature		°C	-40...+85
Operating temperature		°C	-25...+70
Materials	Case	Nickel plated brass (except XS506 and XS508BL: stainless steel, grade 303)	
	Sensing face	PPS	
	Cable	–	PvR 3 x 0.34 mm ² except XS506 and XS508: 3 x 0.11 mm ²
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 to 50 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	50 gn, duration 11 ms	
Output state indication		Yellow LED: 4 viewing ports at 90°	Yellow LED: annular
Rated supply voltage		V	--- 12...48 for XS5●●BL --- 12...24 for XS5●●B1 with protection against reverse polarity
Voltage limits (including ripple)		V	--- 10...58 for XS5●●BL --- 10...36 for XS5●●B1
Switching capacity		mA	≤ 200 with overload and short-circuit protection
Voltage drop, closed state		V	≤ 2
Current consumption, no-load		mA	≤ 10
Maximum switching frequency	XS506, XS508, XS512	Hz	5000
	XS518	Hz	2000
	XS530	Hz	1000
Delays	First-up	ms	≤ 10
	Response	ms	≤ 0.1: XS506, XS508 and XS512 ≤ 0.15: XS518 ≤ 0.3: XS530
	Recovery	ms	≤ 0.1: XS506, XS508 and XS512 ≤ 0.35: XS518 ≤ 0.7: XS530

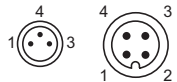
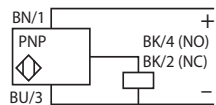
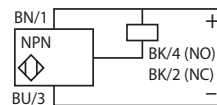
Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, standard range, flush mountable

Three-wire DC, solid-state output

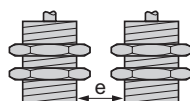
Wiring schemes

Connector	Pre-cabled	PNP	NPN
M8 M12 	BU: Blue BN: Brown BK: Black		

For M8 connector, NO and NC outputs on terminal 4

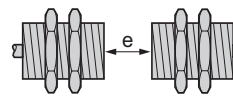
Setting-up

Minimum mounting distances (mm)



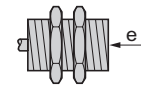
Side by side

$e \geq 3$
 $e \geq 3$
 $e \geq 4$
 $e \geq 10$
 $e \geq 20$



Face to face

$e \geq 18$
 $e \geq 18$
 $e \geq 24$
 $e \geq 60$
 $e \geq 120$



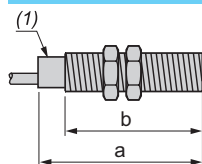
Facing a metal object

$e \geq 4.5$
 $e \geq 4.5$
 $e \geq 6$
 $e \geq 15$
 $e \geq 30$

Flush mountable sensors

$\varnothing 6.5$
 $\varnothing 8$
 $\varnothing 12$
 $\varnothing 18$
 $\varnothing 30$

Dimensions



(1) LED

Sensors	Short case model	Pre-cabled (mm)		M8 connector (mm)		M12 connector (mm)	
		a	b	a	b	a	b
$\varnothing 6.5$	XS506B1	33	–	42	–	45	–
$\varnothing 8$	XS508B1	33	25	42	26	45	24
$\varnothing 12$	XS512B1	35	25	–	–	50	30
$\varnothing 18$	XS518B1	39	28	–	–	50	28
$\varnothing 30$	XS530B1	43	32	–	–	55	32

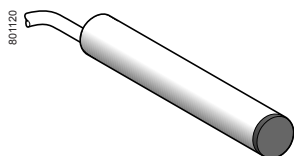
Sensors	Long case model	Pre-cabled (mm)		M12 connector (mm)	
		a	b	a	b
$\varnothing 6.5$	XS506BL	51	–	–	–
$\varnothing 8$	XS508BL	51	42	62	40
$\varnothing 12$	XS512BL	53	42	62	42
$\varnothing 18$	XS518BL	62	52	74	52
$\varnothing 30$	XS530BL	62	52	74	52

Inductive proximity sensors

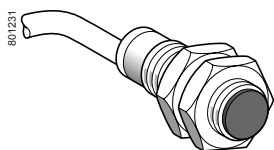
OsiSense XS, general purpose

Cylindrical, standard range, flush mountable

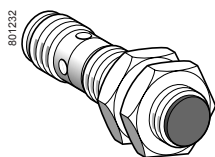
Two-wire DC



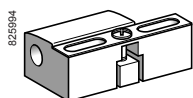
XS506BS●●L2



XS512BS●●L2



XS5●●BS●●M12



XSZB1●●

Sensors, 2-wire 12-24 V, short case model

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
Ø 6.5, plain				
1.5	NO terminals 1 & 4 (2)	Pre-cabled (L = 2 m) (1)	XS506BSCAL2	0.035
		Remote M12 connector	XS506BSCAL01M12	0.050
	NC	Pre-cabled (L = 2 m) (1)	XS506BSCBL2	0.035
Ø 8, threaded M8 x 1				
1.5	NO terminals 1 & 4 (2)	Pre-cabled (L = 2 m) (1)	XS508BSCAL2	0.035
		Remote M12 connector	XS508BSCAL01M12	0.050
	NC	Pre-cabled (L = 2 m) (1)	XS508BSCBL2	0.035
		Remote M12 connector	XS508BSCBL01M12	0.050
Ø 12, threaded M12 x 1				
2	NO	Pre-cabled (L = 2 m) (1)	XS512BSDAL2	0.075
		M12 connector	XS512BSDAM12	0.035
	NO terminals 1 & 4 (2)	M12 connector	XS512BSCAM12	0.035
		Remote M12 connector	XS512BSCAL08M12	0.060
	NC	Pre-cabled (L = 2 m) (1)	XS512BSDBL2	0.075
		M12 connector	XS512BSDBM12	0.035
Ø 18, threaded M18 x 1				
5	NO	Pre-cabled (L = 2 m) (1)	XS518BSDAL2	0.120
		M12 connector	XS518BSDAM12	0.060
	NO terminals 1 & 4 (2)	M12 connector	XS518BSCAM12	0.060
		Remote M12 connector	XS518BSCAL08M12	0.085
	NC	Pre-cabled (L = 2 m) (1)	XS518BSDBL2	0.120
		M12 connector	XS518BSDBM12	0.060
Ø 30, threaded M30 x 1.5				
10	NO	Pre-cabled (L = 2 m) (1)	XS530BSDAL2	0.205
		M12 connector	XS530BSDAM12	0.145
	NO terminals 1 & 4 (2)	M12 connector	XS530BSCAM12	0.145
		Remote M12 connector	XS530BSCAL08M12	0.170
	NC	Pre-cabled (L = 2 m) (1)	XS530BSDBL2	0.205
		M12 connector	XS530BSDBM12	0.145

Accessories (3)

Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 6.5 (plain)	XSZB165	0.005
	Ø 8	XSZB108	0.006
	Ø 12	XSZB112	0.006
	Ø 18	XSZB118	0.010
	Ø 30	XSZB130	0.020

(1) For a 5 m cable replace L2 by L5; for a 10 m cable replace L2 by L10.

Example: XS508BSCAL2 becomes **XS508BSCAL5** with a 5 m cable.

(2) The NO output is connected to terminals 1 and 4 of the M12 connector.

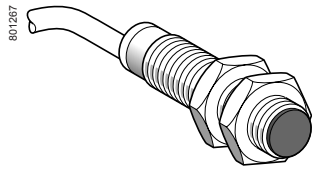
(3) For more information, see page 3/116.

Inductive proximity sensors

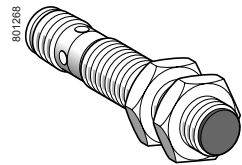
OsiSense XS, general purpose

Cylindrical, standard range, flush mountable

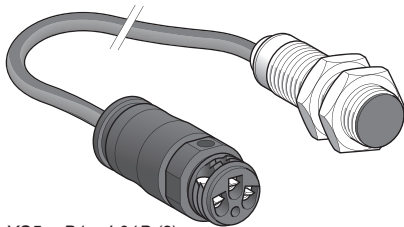
Two-wire DC



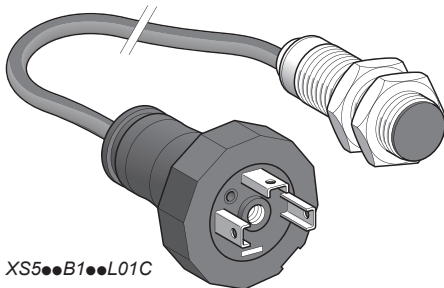
XS500B100L2



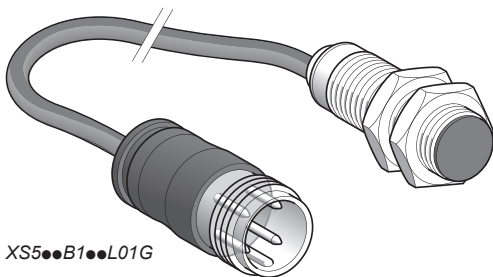
XS500B100M12



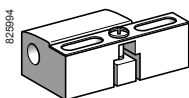
XS500B100L01B (2)



XS500B100L01C



XS500B100L01G



XSZB100

Sensors, 2-wire $\overline{\text{DC}}$ 12-48 V, long case model

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
Ø 8, threaded M8 x 1				
1.5	NO	Pre-cabled (L = 2 m) (1)	XS508B1DAL2	0.035
		Remote M12 connector	XS508B1DAL08M12	0.050
		M12 connector	XS508B1DAM12	0.025
	NO terminals 1 & 4 (3)	M12 connector	XS508B1CAM12	0.025
		Remote M12 connector	XS508B1CAL08M12	0.050
	NC	Pre-cabled (L = 2 m) (1)	XS508B1DBL2	0.035
M12 connector		XS508B1DBM12	0.025	
Ø 12, threaded M12 x 1				
2	NO	Pre-cabled (L = 2 m) (1)	XS512B1DAL2	0.075
		Remote 7/8" connector	XS512B1DAL08U78	0.050
		M12 connector	XS512B1DAM12	0.035
	NO terminals 1 & 4 (3)	M12 connector	XS512B1CAM12	0.035
		Remote M12 connector	XS512B1CAL08M12	0.060
	NC	Pre-cabled (L = 2 m) (1)	XS512B1DBL2	0.075
M12 connector		XS512B1DBM12	0.035	
5	NO	Pre-cabled (L = 2 m) (1)	XS518B1DAL2	0.120
		Low temperature version (-40 °C)	XS518B1DAL2TF (5)	0.120
		Remote screw terminal connector (2)	XS518B1DAL01B	0.085
		Remote EN 175301-803-A connector	XS518B1DAL01C	0.085
		Remote M18 connector	XS518B1DAL01G	0.085
		M12 connector	XS518B1DAM12	0.060
NO terminals 1 & 4 (3)	M12 connector	XS518B1CAM12	0.060	
	Remote M12 connector	XS518B1CAL08M12	0.085	
NC	Pre-cabled (L = 2 m) (1)	XS518B1DBL2	0.120	
	M12 connector	XS518B1DBM12	0.060	
	Remote M12 connector	XS518B1DBL08M12	0.085	
	Remote screw terminal connector (2)	XS518B1DBL01B	0.120	
Ø 30, threaded M30 x 1.5				
10	NO	Pre-cabled (L = 2 m) (1)	XS530B1DAL2	0.205
		Low temperature version (-40 °C)	XS530B1DAL2TF (5)	0.205
		M12 connector	XS530B1DAM12	0.145
		Remote screw terminal connector (2)	XS530B1DAL01B	0.205
		Remote EN 175301-803-A connector	XS530B1DAL01C	0.205
		Remote M18 connector	XS530B1DAL01G	0.205
	NO terminals 1 & 4 (3)	M12 connector	XS530B1CAM12	0.145
		Remote M12 connector	XS530B1CAL08M12	0.170
	NC	Pre-cabled (L = 2 m) (1)	XS530B1DBL2	0.205
		M12 connector	XS530B1DBM12	0.145
		Remote screw terminal connector (2)	XS530B1DBL01B	0.205

Accessories (4)

Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 8	XSZB108	0.006
	Ø 12	XSZB112	0.006
	Ø 18	XSZB118	0.010
	Ø 30	XSZB130	0.020

(1) For a 5 m cable replace L2 by L5; for a 10 m cable replace L2 by L10.

Example: XS508B1DAL2 becomes **XS508B1DAL5** with a 5 m cable.

(2) Protective cable gland included with sensor.

(3) The NO output is connected to terminals 1 and 4 of the M12 connector.

(4) For more information, see page 3/116.

(5) For a 5 m cable replace L2 by L5.

Example: XS518B1DAL2TF becomes **XS518B1DAL5TF** with a 5 m cable.

For a PUR cable, replace the letter L by P in the reference.

Example: XS518B1DAL2TF becomes **XS518B1DAP2TF**.

For a 5 m PUR cable, replace P2 by P5.

Example: XS518B1DAP2TF becomes **XS518B1DAP5TF** with a 5 m PUR cable.

Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, standard range, flush mountable

Two-wire DC

3

Characteristics			
Sensor type		XS5●●B1●●M12, XS5●●BS●●M12	XS5●●B1D●L2, XS5●●BS●●L2
Product certifications		UL, CSA, CE	
Connection	Connector	M12	–
	Pre-cabled	–	Length: 2 m
	Remote connector	M12 (L01M12), screw terminal (L01B), EN 175301-803-A (L01C) and M18 (L01G) remote connectors on 0.15 m flying lead M12 (L08M12) and 7/8" (L08U78) remote connectors on 0.80 m flying lead	
Operating zone	Ø 6.5	mm	0...1.2
	Ø 8	mm	0...1.2
	Ø 12	mm	0...1.6
	Ø 18	mm	0...4
	Ø 30	mm	0...8
Differential travel		%	1...15 of effective sensing distance (Sr)
Degree of protection	Conforming to IEC 60529	IP 65 and IP 67	IP 65 and IP 68, double insulation □ (except Ø 6.5 and Ø 8: IP 67)
Storage temperature		°C	-40...+85
Operating temperature		°C	-25...+70; TF products: -40...+70
Materials	Case	Nickel plated brass (except XS506 and XS508B1: stainless steel, grade 303)	
	Sensing face	PPS	
	Cable	–	PvR 2 x 0.34 mm ² (except XS506 and XS508: 2 x 0.11 mm ²) PUR available (1)
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	50 gn, duration 11 ms	
Output state indication		Yellow LED: 4 viewing ports at 90°	Yellow LED: annular
Rated supply voltage		V	--- 12...48 non polarised for XS5●●B1● --- 12...24 non polarised for XS5●●BS (except Ø 6.5 short and Ø 8 short: polarised) with protection against reverse polarity
Voltage limits (including ripple)		V	--- 10...58 for XS5●●B1● --- 10...36 for XS5●●BS
Switching capacity		mA	1.5...100 with overload and short-circuit protection
Voltage drop, closed state		V	≤ 4.2
Residual current, open state		mA	≤ 0.5
Maximum switching frequency	XS506, XS508	Hz	1000 for XS5●●BS, 1400 for XS5●●B1●
	XS512	Hz	1000
	XS518	Hz	1200
	XS530	Hz	1300
Delays	First-up	ms	≤ 10
	Response	ms	≤ 0.5: XS506, XS508 and XS512 ≤ 0.6: XS518 ≤ 0.6: XS530
	Recovery	ms	≤ 0.2 (except XS530 ≤ 0.4)

(1) For PUR cable, replace the letter L in the reference by P. Example: XS506BSCAL2 becomes XS506BSCAP2 with a PUR cable.


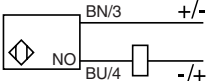
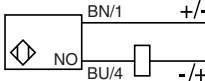
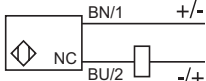
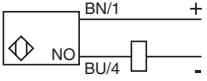
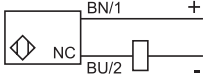
Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, standard range, flush mountable

Two-wire DC

Wiring schemes

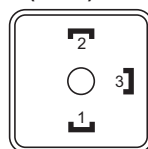
Connector	Pre-cabled	2-wire $\overline{\text{---}}$ non polarised		
M12 	BU: Blue BN: Brown	NO output		NC output
		XS5●●B●DA●●●	XS5●●B1CA●●●	XS5●●B●DB●●●
				
		2-wire $\overline{\text{---}}$ polarised		
		NO output		NC output
		XS5●●BSCA●●●	XS5●●BSCB●●●	
				

Remote connectors L01B, L01C, L01G

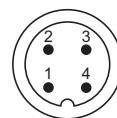
Screw terminal (L01B)

The terminal numbering differs according to the version (2-wire $\overline{\text{---}}$, 3-wire $\overline{\text{---}}$, 2-wire $\overline{\text{---}}$).

EN 175301-803-A (L01C)



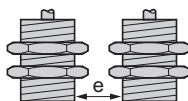
M18 (L01G)



The NO or NC outputs are connected to terminal 2.

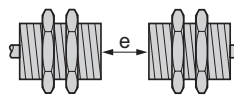
Setting-up

Minimum mounting distances (mm)



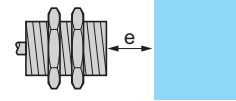
Side by side

Ø 6.5	$e \geq 3$
Ø 8	$e \geq 3$
Ø 12	$e \geq 4$
Ø 18	$e \geq 10$
Ø 30	$e \geq 20$



Face to face

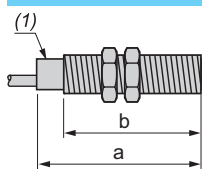
$e \geq 18$
$e \geq 18$
$e \geq 24$
$e \geq 60$
$e \geq 120$



Facing a metal object

$e \geq 4.5$
$e \geq 4.5$
$e \geq 6$
$e \geq 15$
$e \geq 30$

Dimensions



(1) LED

Sensors		Pre-cabled (mm)		M8 connector (mm)		M12 connector (mm)	
Short case model		a	b	a	b	a	b
Ø 6.5	XS506BS	33	–	42	–	45	–
Ø 8	XS508BS	33	25	42	26	45	24
Ø 12	XS512BS	35	25	–	–	50	30
Ø 18	XS518BS	39	28	–	–	50	28
Ø 30	XS530BS	43	32	–	–	55	32
Sensors		Pre-cabled (mm)		M12 connector (mm)			
Long case model		a	b	a	b		
Ø 8	XS508B1	51	42	62	40		
Ø 12	XS512B1	54	42	61	42		
Ø 18	XS518B1	56	44	64	44		
Ø 30	XS530B1	54	41	72	41		

Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, standard range, flush mountable

Two-wire AC or DC ⁽¹⁾

Sensors, 2-wire \sim 24-240 V, long case model

Ø 12, threaded M12 x 1

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
2	NO	Pre-cabled (L = 2 m) (2)	XS512B1MAL2	0.075
		1/2"-20 UNF connector	XS512B1MAU20	0.025
	NC	Pre-cabled (L = 2 m) (2)	XS512B1MBL2	0.075
		1/2"-20 UNF connector	XS512B1MBU20	0.025

Ø 18, threaded M18 x 1

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
5	NO	Pre-cabled (L = 2 m) (2)	XS518B1MAL2	0.100
		1/2"-20 UNF connector	XS518B1MAU20	0.060
	NC	Pre-cabled (L = 2 m) (2)	XS518B1MBL2	0.100
		1/2"-20 UNF connector	XS518B1MBU20	0.060

Ø 30, threaded M30 x 1.5

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
10	NO	Pre-cabled (L = 2 m) (2)	XS530B1MAL2	0.205
		1/2"-20 UNF connector	XS530B1MAU20	0.145
	NC	Pre-cabled (L = 2 m) (2)	XS530B1MBL2	0.205
		1/2"-20 UNF connector	XS530B1MBU20	0.145

Accessories (3)

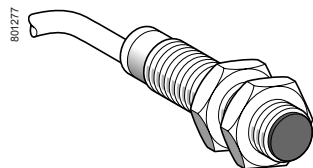
Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 12	XSZB112	0.006
	Ø 18	XSZB118	0.010
	Ø 30	XSZB130	0.020

(1) Ø 8 plastic, double insulation version available (see page 3/60).

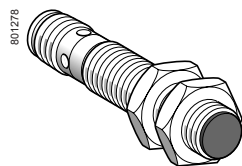
(2) For a 5 m cable replace L2 by L5; for a 10 m cable replace L2 by L10.

Example: **XS512B1MAL2** becomes **XS512B1MAL5** with a 5 m cable.

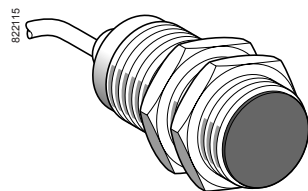
(3) For more information, see page 3/116.



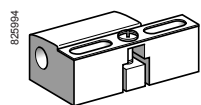
XS512B1M-L2



XS518B1M-U20



XS530B1-L2



XSZB1-L2

Inductive proximity sensors

OsiSense XS, general purpose

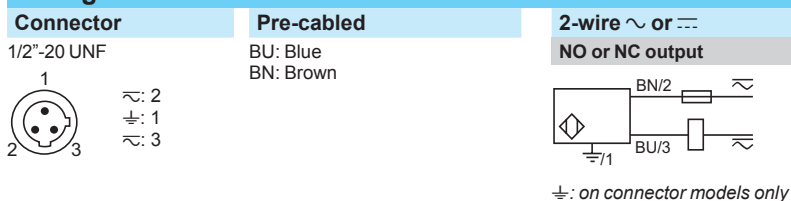
Cylindrical, standard range, flush mountable

Two-wire AC or DC

Characteristics			XS5●●B1M●U20	XS5●●B1M●L2
Sensor type				
Product certifications			UL, CSA, CE	
Connection	Connector		1/2"-20 UNF	-
	Pre-cabled		-	Length: 2 m
Operating zone	Ø 12	mm	0...1.6	
	Ø 18	mm	0...4	
	Ø 30	mm	0...8	
Differential travel		%	1...15 of effective sensing distance (Sr)	
Degree of protection	Conforming to IEC 60529		IP 65 and IP 67	IP 65 and IP 68, double insulation \square
	Conforming to DIN 40050		IP 69K	
Storage temperature		°C	-40...+85	
Operating temperature		°C	-25...+70	
Materials	Case		Nickel plated brass	
	Sensing face		PPS	
	Cable		-	PvR 2 x 0.34 mm ²
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms	
Output state indication			Yellow LED: 4 viewing ports at 90°	Yellow LED: annular
Rated supply voltage		V	~ or - 24...240 (~ 50/60 Hz)	
Voltage limits (including ripple)		V	~ or - 20...264	
Switching capacity	XS512B1M●●●	mA	5...200 (1)	
	XS518B1M●●●, XS530B1M●●●	mA	~ 5...300 or - 5...200 (1)	
Voltage drop, closed state		V	≤ 5.5	
Residual current, open state		mA	≤ 0.8	
Maximum switching frequency	XS512B1●●●, XS518B1M●●●	Hz	~ 25 or - 1000	
	XS530B1M●●●	Hz	~ 25 or - 500	
Delays	First-up	ms	≤ 20 XS512B1M●●● ≤ 25 XS518B1M●●● and XS530B1M●●●	
	Response	ms	≤ 0.5	
	Recovery	ms	≤ 0.2 XS512B1M●●● ≤ 0.5 XS518B1M●●● ≤ 2 XS518B1M●●●	

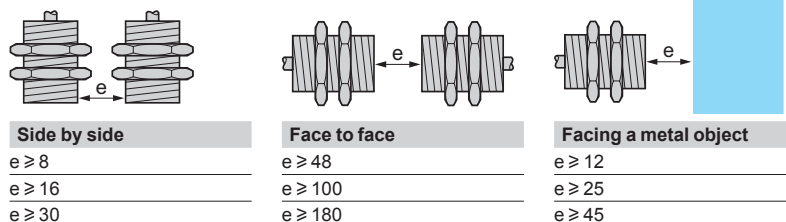
(1) It is essential to connect a 0.4 A "quick-blow" fuse in series with the load.

Wiring schemes



Setting-up

Minimum mounting distances (mm)



Dimensions

Sensor	XS6		Connector (mm)	
	Pre-cabled (mm)		a	b
XS512B1M	53	42	62	42
XS518B1M	62	52	73	52
XS530B1M	62	52	73	52

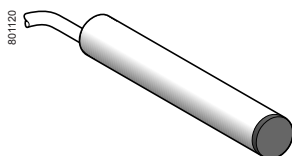
(1) LED

Inductive proximity sensors

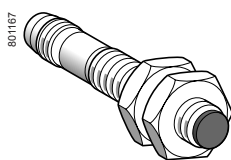
OsiSense XS, general purpose

Cylindrical, increased range, flush mountable

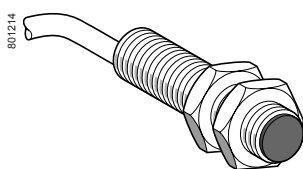
Three-wire DC, solid-state output



XS106B3●●L2



XS108B3●●M8



XS112B3●●L2

Sensors, 3-wire --- 12-24 V, short case model

Sensing distance (Sn) mm	Function	Output	Connection	Sold in lots of	Unit reference	Weight kg	
Ø 6.5, plain							
2.5	NO	PNP	Pre-cabled (L = 2 m) (1)	1	XS106B3PAL2	0.060	
			M8 connector	1	XS106B3PAM8	0.030	
			M12 connector	1	XS106B3PAM12	0.050	
			Pre-cabled (L = 2 m)	20	XS106B3PAL2TQ	0.980	
			M8 connector	20	XS106B3PAM8TQ	0.320	
			M12 connector	20	XS106B3PAM12TQ	0.470	
	NPN	Pre-cabled (L = 2 m)	1	XS106B3NAL2	0.060		
		M8 connector	1	XS106B3NAM8	0.030		
	NC	PNP	Pre-cabled (L = 2 m) (1)	1	XS106B3PBL2	0.060	
			M8 connector	1	XS106B3PBM8	0.030	
		NPN	Pre-cabled (L = 2 m) (1)	1	XS106B3NBL2	0.060	
			M8 connector	1	XS106B3NBM8	0.030	
Ø 8, threaded M8 x 1							
2.5	NO	PNP	Pre-cabled (L = 2 m) (1)	1	XS108B3PAL2	0.070	
			M8 connector	1	XS108B3PAM8	0.030	
			M12 connector	1	XS108B3PAM12	0.060	
			Pre-cabled (L = 2 m)	20	XS108B3PAL2TQ	1.120	
			M8 connector	20	XS108B3PAM8TQ	0.460	
			M12 connector	20	XS108B3PAM12TQ	0.940	
	NPN	Pre-cabled (L = 2 m) (1)	1	XS108B3NAL2	0.070		
		M8 connector	1	XS108B3NAM8	0.030		
		M12 connector	1	XS108B3NAM12	0.060		
	NC	PNP	Pre-cabled (L = 2 m)	20	XS108B3NAL2TQ	1.120	
			M8 connector	20	XS108B3NAM8TQ	0.460	
			M12 connector	20	XS108B3NAM12TQ	0.940	
		NPN	Pre-cabled (L = 2 m) (1)	1	XS108B3PBL2	0.070	
			M8 connector	1	XS108B3PBM8	0.030	
			M12 connector	1	XS108B3PBM12	0.060	
	NPN	Pre-cabled (L = 2 m) (1)	1	XS108B3NBL2	0.070		
		M8 connector	1	XS108B3NBM8	0.030		
		M12 connector	1	XS108B3NBM12	0.060		
Ø 12, threaded M12 x 1							
4		NO	PNP	Pre-cabled (L = 2 m) (1)	1	XS112B3PAL2	0.090
				M12 connector	1	XS112B3PAM12	0.030
	Pre-cabled (L = 2 m)			20	XS112B3PAL2TQ	1.600	
	M12 connector			20	XS112B3PAM12TQ	0.470	
	NPN			Pre-cabled (L = 2 m) (1)	1	XS112B3NAL2	0.090
				M12 connector	1	XS112B3NAM12	0.030
		Pre-cabled (L = 2 m)	20	XS112B3NAL2TQ	1.600		
	NC	PNP	M12 connector	20	XS112B3NAM12TQ	0.470	
			Pre-cabled (L = 2 m) (1)	1	XS112B3PBL2	0.090	
			M12 connector	1	XS112B3PBM12	0.030	
		NPN	M12 connector	20	XS112B3PBM12TQ	0.470	
			Pre-cabled (L = 2 m) (1)	1	XS112B3NBL2	0.090	
			M12 connector	1	XS112B3NBM12	0.030	

(1) For a 5 m long cable replace L2 by L5.

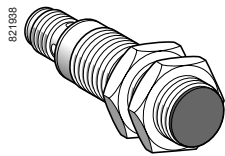
Example: XS106B3PAL2 becomes XS106B3PAL5 with a 5 m cable.

Inductive proximity sensors

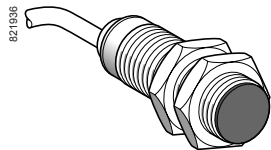
OsiSense XS, general purpose

Cylindrical, increased range, flush mountable

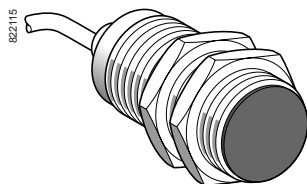
Three-wire DC, solid-state output



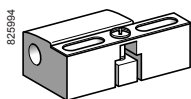
XS118B3●●M12



XS118B3●●L2



XS130B3●●L2



XSZB1●●

Sensors, 3-wire 12-24 V, short case model (continued)

Sensing distance (Sn) mm	Function	Output	Connection	Sold in lots of	Unit reference	Weight kg		
Ø 18, threaded M18 x 1								
8	NO	PNP	Pre-cabled (L = 2 m) (1)	1	XS118B3PAL2	0.110		
			M12 connector	1	XS118B3PAM12	0.060		
			Pre-cabled (L = 2 m)	20	XS118B3PAL2TQ	2.000		
	NPN	PNP	M12 connector	20	XS118B3PAM12TQ	1.140		
			Pre-cabled (L = 2 m) (1)	1	XS118B3NAL2	0.110		
			M12 connector	1	XS118B3NAM12	0.060		
NC	PNP	PNP	Pre-cabled (L = 2 m)	20	XS118B3NAL2TQ	2.000		
			M12 connector	20	XS118B3NAM12TQ	1.140		
			Pre-cabled (L = 2 m) (1)	1	XS118B3PBL2	0.110		
	NPN	PNP	M12 connector	1	XS118B3PBM12	0.060		
			Pre-cabled (L = 2 m) (1)	1	XS118B3NBL2	0.110		
			M12 connector	1	XS118B3NBM12	0.060		
Ø 30, threaded M30 x 1.5								
15	NO	PNP	Pre-cabled (L = 2 m) (1)	1	XS130B3PAL2	0.180		
			M12 connector	1	XS130B3PAM12	0.130		
			Pre-cabled (L = 2 m)	20	XS130B3PAL2TQ	3.360		
			M12 connector	20	XS130B3PAM12TQ	2.000		
			NPN	PNP	Pre-cabled (L = 2 m) (1)	1	XS130B3NAL2	0.180
					M12 connector	1	XS130B3NAM12	0.130
	M12 connector	20			XS130B3NAM12TQ	2.000		
	NC	PNP	PNP	Pre-cabled (L = 2 m) (1)	1	XS130B3PBL2	0.180	
				M12 connector	1	XS130B3PBM12	0.130	
				Pre-cabled (L = 2 m) (1)	1	XS130B3NBL2	0.180	
		NPN	PNP	M12 connector	1	XS130B3NBM12	0.130	

Accessories (2)

Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 6.5 (plain)	XSZB165	0.005
	Ø 8 (M8 x1)	XSZB108	0.006
	Ø 12 (M12 x1)	XSZB112	0.006
	Ø 18 (M18 x1)	XSZB118	0.010
	Ø 30 (M30 x 1.5)	XSZB130	0.020

(1) For a 5 m cable, replace L2 by L5.

Example: XS118B3PAL2 becomes XS118B3PAL5 with a 5 m cable.

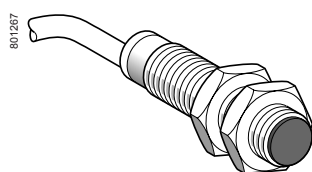
(2) For more information, see page 3/116.

Inductive proximity sensors

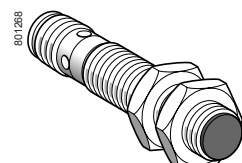
OsiSense XS, general purpose

Cylindrical, increased range, flush mountable

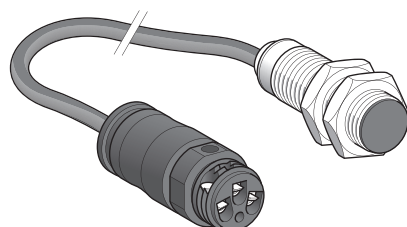
Three-wire DC, solid-state output



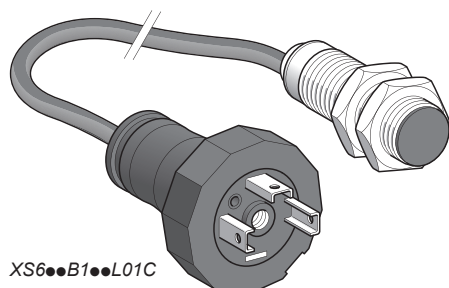
XS600B100L2



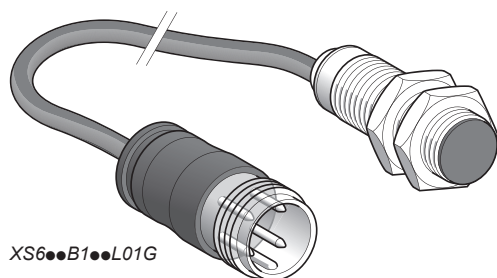
XS600B100M12



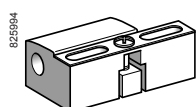
XS600B100L01B (2)



XS600B100L01C



XS600B100L01G



XSZB000

Sensors, 3-wire $\bar{\bar{}}$ 12-48 V, long case model

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Ø 8, threaded M8 x 1					
2.5	NO	PNP	Pre-cabled (L = 2 m) (1)	XS608B1PAL2	0.035
			M12 connector	XS608B1PAM12	0.015
	NPN	PNP	Pre-cabled (L = 2 m) (1)	XS608B1NAL2	0.035
			M12 connector	XS608B1NAM12	0.015
	NC	PNP	Pre-cabled (L = 2 m) (1)	XS608B1PBL2	0.035
			M12 connector	XS608B1PBM12	0.015
NPN	PNP	Pre-cabled (L = 2 m) (1)	XS608B1NBL2	0.035	
		M12 connector	XS608B1NBM12	0.015	
Ø 12, threaded M12 x 1					
4	NO	PNP	Pre-cabled (L = 2 m) (1)	XS612B1PAL2	0.075
			M12 connector	XS612B1PAM12	0.020
	NPN	PNP	Pre-cabled (L = 2 m) (1)	XS612B1NAL2	0.075
			M12 connector	XS612B1NAM12	0.020
	NC	PNP	Pre-cabled (L = 2 m) (1)	XS612B1PBL2	0.075
			M12 connector	XS612B1PBM12	0.020
NPN	PNP	Pre-cabled (L = 2 m) (1)	XS612B1NBL2	0.075	
		M12 connector	XS612B1NBM12	0.020	
Ø 18, threaded M18 x 1					
8	NO	PNP	Pre-cabled (L = 2 m) (1)	XS618B1PAL2	0.100
			M12 connector	XS618B1PAM12	0.040
			Remote screw terminal connector	XS618B1PAL01B (2)	0.100
			Remote EN 175301-803-A connector	XS618B1PAL01C	0.100
			Remote M18 connector	XS618B1PAL01G	0.100
			NPN	PNP	Pre-cabled (L = 2 m) (1)
	M12 connector	XS618B1NAM12	0.040		
	Remote screw terminal connector	XS618B1NAL01B (2)	0.100		
	Remote EN 175301-803-A connector	XS618B1NAL01C	0.100		
	Remote M18 connector	XS618B1NAL01G	0.100		
	NC	PNP	Pre-cabled (L = 2 m) (1)		XS618B1PBL2
			M12 connector	XS618B1PBM12	0.040
			Remote screw terminal connector	XS618B1PBL01B (2)	0.100
			Remote EN 175301-803-A connector	XS618B1PBL01C	0.100
			Remote M18 connector	XS618B1PBL01G	0.100
			NPN	PNP	Pre-cabled (L = 2 m) (1)
	M12 connector	XS618B1NBM12			0.040
	Remote screw terminal connector	XS618B1NBL01B (2)			0.100
Remote EN 175301-803-A connector	XS618B1NBL01C	0.100			
Remote M18 connector	XS618B1NBL01G	0.100			
Ø 30, threaded M30 x 1.5					
15	NO	PNP	Pre-cabled (L = 2 m) (1)	XS630B1PAL2	0.205
			M12 connector	XS630B1PAM12	0.145
			Remote screw terminal connector	XS630B1PAL01B (2)	0.205
			Remote EN 175301-803-A connector	XS630B1PAL01C	0.205
			Remote M18 connector	XS630B1PAL01G	0.205
			NPN	PNP	Pre-cabled (L = 2 m) (1)
	M12 connector	XS630B1NAM12	0.145		
	Remote screw terminal connector	XS630B1NAL01B (2)	0.205		
	Remote EN 175301-803-A connector	XS630B1NAL01C	0.205		
	Remote M18 connector	XS630B1NAL01G	0.205		
	NC	PNP	Pre-cabled (L = 2 m) (1)		XS630B1PBL2
			M12 connector	XS630B1PBM12	0.145
			Remote screw terminal connector	XS630B1PBL01B (2)	0.205
			Remote EN 175301-803-A connector	XS630B1PBL01C	0.205
			Remote M18 connector	XS630B1PBL01G	0.205
			NPN	PNP	Pre-cabled (L = 2 m) (1)
	M12 connector	XS630B1NBM12			0.145
	Remote screw terminal connector	XS630B1NBL01B (2)			0.205
Remote EN 175301-803-A connector	XS630B1NBL01C	0.205			
Remote M18 connector	XS630B1NBL01G	0.205			

Accessories (3)

Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 8	XSZB108	0.006
	Ø 12	XSZB112	0.006
	Ø 18	XSZB118	0.010
	Ø 30	XSZB130	0.020

(1) For a 5 m long cable replace L2 by L5; for a 10 m long cable replace L2 by L10.
Example: XS608B1PAL2 becomes XS608B1PAL5 with a 5 m cable.

(2) Protective cable gland included with sensor.


(3) For more information, see page 3/116.

Inductive proximity sensors

OsiSense XS, general purpose

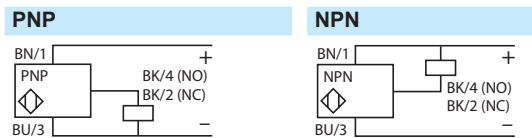
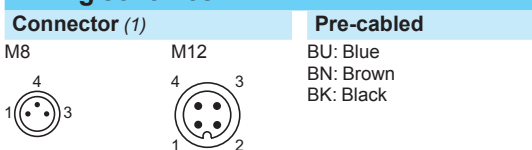
Cylindrical, increased range, flush mountable

Three-wire DC, solid-state output

Characteristics		XS1/XS6●●B●●M8	XS1/XS6●●B●●M12	XS1/XS6●●B●●L2
Sensor type		UL, CSA, CE, E2		
Product certifications		UL, CSA, CE, E2		
Connection	Connector	M8	M12	–
	Pre-cabled	–	–	Length 2 m
	Remote connector	Screw terminal (L01B), EN 175301-803-A (L01C) and M18 (L01G) remote connectors on 0.15 m flying lead		
Operating zone (1)	Ø 6.5 and Ø 8	mm	0...2	
	Ø 12	mm	0...3.2	
	Ø 18	mm	0...6.4	
	Ø 30	mm	0...12	
Differential travel		%		
Degree of protection		Conforming to IEC 60529		IP 65 and IP 67
		Conforming to DIN 40050		IP 65 and IP 68, double insulation  except Ø 6.5 and Ø 8: IP 67
Storage temperature		°C	-40...+85	
Operating temperature		°C	-25...+70	
Materials	Case	Nickel plated brass (except XS608: stainless steel, grade 303)		
	Sensing face	PPS		
	Cable	–		PvR 3 x 0.34 mm ² except Ø 6.5 and 8: 3 x 0.11 mm ²
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27	50 gn, duration 11 ms		
Output state indication		Yellow LED, 4 viewing ports at 90°		Yellow LED, annular
Rated supply voltage		V		
		XS1: ≍ 12...24 with protection against reverse polarity XS6: ≍ 12...48 with protection against reverse polarity		
Voltage limits (including ripple)		V		
		XS1: ≍ 10...36; XS6: ≍ 10...58		
Switching capacity		mA		
		≤ 200 with overload and short-circuit protection		
Voltage drop, closed state		V		
		≤ 2		
Current consumption, no-load		mA		
		≤ 10		
Maximum switching frequency	Ø 6.5, Ø 8 and Ø 12	Hz	2500	
	Ø 18	Hz	1000	
	Ø 30	Hz	500	
Delays	First-up	ms	≤ 10	
	Response	ms	≤ 0.2 for Ø 6.5, Ø 8 and Ø 12, ≤ 0.3 for Ø 18, ≤ 0.6 for Ø 30	
	Recovery	ms	≤ 0.2 for Ø 6.5, Ø 8 and Ø 12, ≤ 0.7 for Ø 18, ≤ 1.4 for Ø 30	

(1) Detection curves, see page 3/120.

Wiring schemes

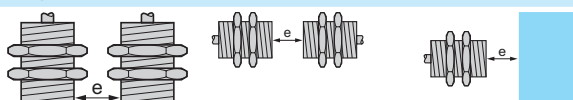


For M8 connector, NO and NC outputs on terminal 4

(1) For pin arrangement of remote connectors L01B, L01C and L01G, see page 3/31.

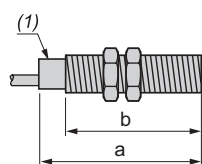
Setting-up

Minimum mounting distances (mm)



Sensors	Side by side	Face to face	Facing a metal object
Ø 6.5	e ≥ 5	e ≥ 30	e ≥ 8
Ø 8	e ≥ 5	e ≥ 30	e ≥ 8
Ø 12	e ≥ 8	e ≥ 50	e ≥ 12
Ø 18	e ≥ 16	e ≥ 100	e ≥ 25
Ø 30	e ≥ 30	e ≥ 180	e ≥ 45

Dimensions



(1) LED

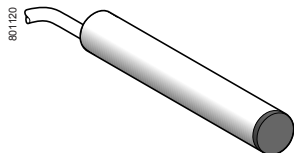
Sensors		Pre-cabled (mm)		M8 connector (mm)		M12 connector (mm)	
Short case model		a	b	a	b	a	b
Ø 6.5	XS106B3	33	–	42	–	45	–
Ø 8	XS108B3	33	25	42	26	45	24
Ø 12	XS112B3	35	25	–	–	50	30
Ø 18	XS118B3	39	28	–	–	50	28
Ø 30	XS130B3	43	32	–	–	55	32

Sensors		Pre-cabled (mm)		M12 connector (mm)	
Long case model		a	b	a	b
Ø 8	XS608B1	51	42	62	40
Ø 12	XS612B1	53	42	62	42
Ø 18	XS618B1	62	52	74	52
Ø 30	XS630B1	62	52	74	52

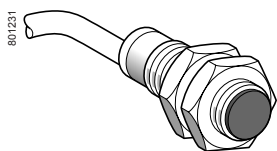
Inductive proximity sensors

OsiSense XS, general purpose

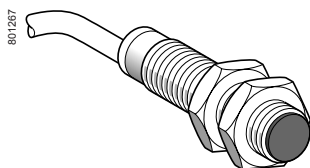
Cylindrical, increased range, flush mountable
Two-wire DC, solid-state output



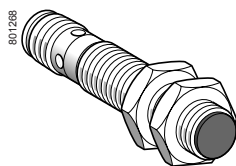
XS606B3●●L2



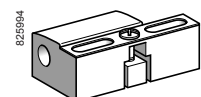
XS612B3●●L2



XS6●●B1●●L2



XS6●●B1●●M12



XSZB1●●

Sensors, 2-wire 12-24 V, short case model

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
Ø 6.5, plain				
2.5	NO	Pre-cabled (L = 2 m) (1)	XS606B3CAL2	0.060
		Remote M12 connector	XS606B3CAL01M12	0.070
	NC	Pre-cabled (L = 2 m) (1)	XS606B3CBL2	0.060
Ø 8, threaded M8 x 1				
2.5	NO	Pre-cabled (L = 2 m) (1)	XS608B3CAL2	0.070
		Remote M12 connector	XS608B3CAL01M12	0.070
	NC	Pre-cabled (L = 2 m) (1)	XS608B3CBL2	0.070
		Remote M12 connector	XS608B3CBL01M12	0.070
Ø 12, threaded M12 x 1				
4	NO	Pre-cabled (L = 2 m) (1)	XS612B3DAL2	0.090
		M12 connector	XS612B3DAM12	0.030
	NC	Pre-cabled (L = 2 m) (1)	XS612B3DBL2	0.090
		M12 connector	XS612B3DBM12	0.030
Ø 18, threaded M18 x 1				
8	NO	Pre-cabled (L = 2 m) (1)	XS618B3DAL2	0.110
		M12 connector	XS618B3DAM12	0.060
	NC	Pre-cabled (L = 2 m) (1)	XS618B3DBL2	0.110
		M12 connector	XS618B3DBM12	0.060
Ø 30, threaded M30 x 1.5				
15	NO	Pre-cabled (L = 2 m) (1)	XS630B3DAL2	0.180
		M12 connector	XS630B3DAM12	0.130
	NC	Pre-cabled (L = 2 m) (1)	XS630B3DBL2	0.180
		M12 connector	XS630B3DBM12	0.180

Sensors, 2-wire 12-48 V, long case model

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
Ø 6.5, plain				
2.5	NO	Pre-cabled (L = 2 m) (1)	XS606B1DAL2	0.060
		Pre-cabled (L = 2 m) (1)	XS606B1DBL2	0.060
Ø 8, threaded M8 x 1				
2.5	NO	Pre-cabled (L = 2 m) (1)	XS608B1DAL2	0.035
		M12 connector	XS608B1DAM12	0.015
	NC	Pre-cabled (L = 2 m) (1)	XS608B1DBL2	0.035
		M12 connector	XS608B1DBM12	0.015
Ø 12, threaded M12 x 1				
4	NO	Pre-cabled (L = 2 m) (1)	XS612B1DAL2	0.180
		M12 connector	XS612B1DAM12	0.020
	NC	Pre-cabled (L = 2 m) (1)	XS612B1DBL2	0.075
		M12 connector	XS612B1DBM12	0.020
Ø 18, threaded M18 x 1				
8	NO	Pre-cabled (L = 2 m) (1)	XS618B1DAL2	0.100
		M12 connector	XS618B1DAM12	0.040
	NC	Pre-cabled (L = 2 m) (1)	XS618B1DBL2	0.100
		M12 connector	XS618B1DBM12	0.040
Ø 30, threaded M30 x 1.5				
15	NO	Pre-cabled (L = 2 m) (1)	XS630B1DAL2	0.205
		M12 connector	XS630B1DAM12	0.145
	NC	Pre-cabled (L = 2 m) (1)	XS630B1DBL2	0.205
		M12 connector	XS630B1DBM12	0.145

Accessories (2)

Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 6.5 (plain)	XSZB165	0.005
	Ø 8 (M8 x1)	XSZB108	0.006
	Ø 12 (M12 x1)	XSZB112	0.006
	Ø 18 (M18 x1)	XSZB118	0.010
	Ø 30 (M30 x 1.5)	XSZB130	0.020

(1) For a 5 m cable, replace L2 by L5.

Example: XS606B3CAL2 becomes **XS606B3CAL5** with a 5 m cable.


(2) For more information, see page 3/116.

Characteristics

Sensor type		XS6●●B3●●M12 XS6●●B1D●M12	XS6●●B3●●L2 XS6●●B1D●L2
Product certifications		UL, CSA, CE	
Connection	Connector	M12 or remote M12 connector (L01M12) on 0.15 m flying lead	
	Pre-cabled	Length 2 m	
Operating zone (1)	Ø 6.5 and Ø 8	mm	0... 2
	Ø 12	mm	0... 3.2
	Ø 18	mm	0... 6.4
	Ø 30	mm	0... 12
Differential travel		%	
Degree of protection	Conforming to IEC 60529	IP 65 and IP 67	
	Conforming to DIN 40050	IP 69K	
Storage temperature		°C -40...+85	
Operating temperature		°C -25...+70	
Materials	Case	Nickel plated brass (except XS606B1D or XS608B1D: stainless steel, grade 303)	
	Sensing face	PPS	
	Cable	PvR 2 x 0.34 mm ² except Ø 6.5 and Ø 8: 2 x 0.11 mm ²	
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	50 gn, duration 11 ms	
Output state indication		Yellow LED, 4 viewing ports at 90°	
Rated supply voltage		V --- 12...48 non polarised for XS6●●B1D --- 12...24 non polarised for XS6●●B3● (except Ø 6.5 short and Ø 8 short: polarised), with protection against reverse polarity	
Voltage limits (including ripple)		V --- 10...58 for XS6●●B1D --- 10...36 for XS6●●B3●	
Switching capacity		mA ≤ 100 with overload and short-circuit protection	
Voltage drop, closed state		V ≤ 4.2	
Residual current, open state		mA ≤ 0.5 mA	
Maximum switching frequency	Ø 6.5, Ø 8	Hz 1400 for XS6●●B1D, 1100 for XS6●●B3●	
	Ø 12	Hz 1300	
	Ø 18	Hz 1500	
	Ø 30	Hz 800	
Delays	First-up	ms ≤ 10	
	Response	ms ≤ 0.5	
	Recovery	ms ≤ 0.2 for Ø 6.5, Ø 8 and Ø 12; 0.3 for Ø 18; 0.6 for Ø 30	

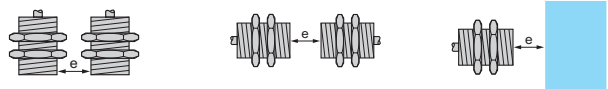
(1) Detection curves, see page 3/120.

Wiring schemes

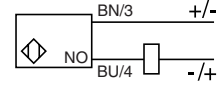
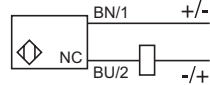
M12 connector	Pre-cabled
	BU: Blue BN: Brown

Setting-up

Minimum mounting distances (mm)

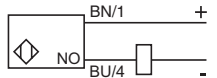
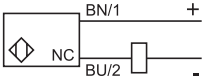


2-wire --- non polarised

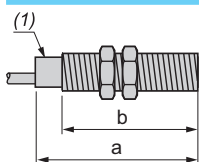
NO output	NC output
	

Sensors	Side by side	Face to face	Facing a metal object
Ø 6.5	e ≥ 5	e ≥ 30	e ≥ 8
Ø 8	e ≥ 5	e ≥ 30	e ≥ 8
Ø 12	e ≥ 8	e ≥ 50	e ≥ 12
Ø 18	e ≥ 16	e ≥ 100	e ≥ 25
Ø 30	e ≥ 30	e ≥ 180	e ≥ 45

2-wire --- polarised

XS6●●B3CA	XS6●●B3CB
	

Dimensions



(1) LED

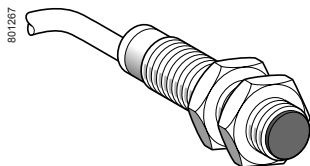
Sensors	Short case model	Pre-cabled (mm)		M12 connector (mm)	
		a	b	a	b
Ø 6.5	XS606B3C	33	–	–	–
Ø 8	XS608B3C	33	25	–	24
Ø 12	XS612B3D	35	25	50	30
Ø 18	XS618B3D	40	28	50	28
Ø 30	XS630B3D	44	32	55	32
Long case model		a	b	a	b
Ø 6.5	XS606B1D	51	–	–	–
Ø 8	XS608B1D	51	42	62	40
Ø 12	XS612B1D	53	42	61	42
Ø 18	XS618B1D	62	52	74	52
Ø 30	XS630B1D	62	52	74	52

Inductive proximity sensors

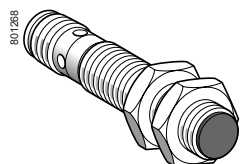
OsiSense XS, general purpose

Cylindrical, increased range, flush mountable

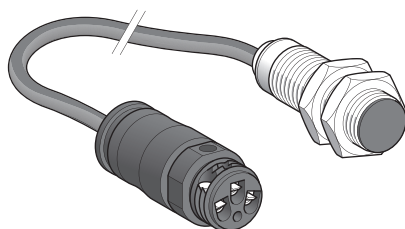
Two-wire AC or DC ⁽¹⁾



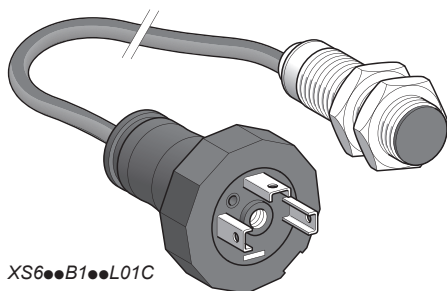
XS612B1MAL2



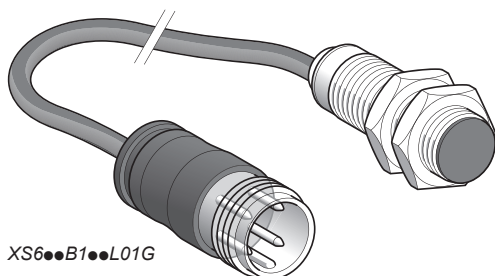
XS618B1MAL2



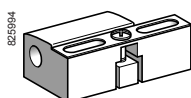
XS630B1MAL2



XS612B1MAL01B



XS618B1MAL01B



XS630B1MAL01B

Sensors, 2-wire \sim 24-240 V, long case model

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
Ø 12, threaded M12 x 1				
4	NO	Pre-cabled (L = 2 m) (2)	XS612B1MAL2	0.075
		1/2"-20 UNF connector	XS612B1MAU20	0.025
	NC	Pre-cabled (L = 2 m) (2)	XS612B1MBL2	0.075
		1/2"-20 UNF connector	XS612B1MBU20	0.025

Ø 18, threaded M18 x 1				
8	NO	Pre-cabled (L = 2 m) (2)	XS618B1MAL2	0.100
		1/2"-20 UNF connector	XS618B1MAU20	0.060
		Remote screw terminal connector	XS618B1MAL01B (3)	0.100
		Remote EN 175301-803-A connector	XS618B1MAL01C	0.100
	NC	Pre-cabled (L = 2 m) (2)	XS618B1MBL2	0.100
		1/2"-20 UNF connector	XS618B1MBU20	0.060
		Remote screw terminal connector	XS618B1MBL01B (3)	0.100
		Remote EN 175301-803-A connector	XS618B1MBL01C	0.100
Ø 30, threaded M30 x 1.5				
15	NO	Pre-cabled (L = 2 m) (2)	XS630B1MAL2	0.205
		1/2"-20 UNF connector	XS630B1MAU20	0.145
		Remote screw terminal connector	XS630B1MAL01B (3)	0.205
		Remote EN 175301-803-A connector	XS630B1MAL01C	0.205
	NC	Pre-cabled (L = 2 m) (2)	XS630B1MBL2	0.205
		1/2"-20 UNF connector	XS630B1MBU20	0.145
		Remote screw terminal connector	XS630B1MBL01B (3)	0.205
		Remote EN 175301-803-A connector	XS630B1MBL01C	0.205
Accessories (4)				
Description	For use with sensors	Reference	Weight kg	
Fixing clamps	Ø 12	XSZB112	0.006	
	Ø 18	XSZB118	0.010	
	Ø 30	XSZB130	0.020	

(1) Ø8 plastic, double insulation version available (see page 3/60).

(2) For a 5 m cable replace L2 by L5; for a 10 m cable replace L2 by L10.

Example: XS612B1MAL2 becomes XS612B1MAL5 with a 5 m cable.

(3) Protective cable gland included with sensor.

(4) For more information, see page 3/116.

Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, increased range, flush mountable

Two-wire AC or DC

Characteristics		XS6●●B1M●U20	XS6●●B1M●L●
Sensor type		UL, CSA, CE	
Product certifications		UL, CSA, CE	
Connection	Connector	1/2" - 20 UNF	–
	Pre-cabled	–	Length 2 m
	Remote connector	Screw terminal (L01B), EN 175301-803-A (L01C) and M18 (L01G) remote connectors on 0.15 m flying lead	
Operating zone (1)	Ø 12	mm	0... 3.2
	Ø 18	mm	0... 6.4
	Ø 30	mm	0... 12
Differential travel		%	
Degree of protection		1...15 of effective sensing distance (Sr)	
Storage temperature	Conforming to IEC 60529	IP 65, IP 67	
	Conforming to DIN 40050	IP 69K	
Operating temperature		°C	
Materials		°C	
Materials	Case	Nickel plated brass	
	Sensing face	PPS	
	Cable	PvR 2 x 0.34 mm ²	
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	50 gn, duration 11 ms	
Output state indication		Yellow LED: annular on pre-cabled version Yellow LED with 4 viewing ports at 90° on connector version	
Rated supply voltage		V	
Voltage limits (including ripple)		V	
Switching capacity	XS612B1M●●●	mA	
	XS618B1M●●●	mA	
	XS630B1M●●●	mA	
Voltage drop, closed state		V	
Residual current, open state		mA	
Maximum switching frequency (DC/AC)	Ø 12	Hz	
	Ø 18	Hz	
	Ø 30	Hz	
Delays	First-up	ms	
	Response	ms	
	Recovery	ms	

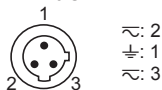
(1) Detection curves, see page 3/120.

(2) It is essential to connect a 0.4 A "quick-blow" fuse in series with the load.

Wiring schemes

Connector (1)

1/2"-20 UNF

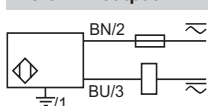


Pre-cabled

BU: Blue
BN: Brown

2-wire ~ or ---

NO or NC output

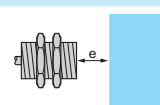
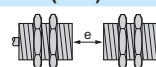
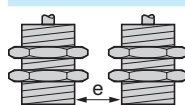


±: on connector models only

(1) For pin arrangement of remote connectors L01B, L01C and L01G, see page 3/31.

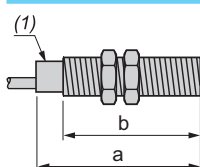
Setting-up

Minimum mounting distances (mm)



Sensors	Side by side	Face to face	Facing a metal object
Ø 12	e ≥ 8	e ≥ 50	e ≥ 12
Ø 18	e ≥ 16	e ≥ 100	e ≥ 25
Ø 30	e ≥ 30	e ≥ 180	e ≥ 45

Dimensions



Sensors	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
Ø 12 XS612B1M●	53	42	62	42
Ø 18 XS618B1M●	62	52	73	52
Ø 30 XS630B1M●	62	52	73	52

(1) LED

Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, increased range, non flush mountable

Three-wire DC, solid-state output

Sensors, 3-wire $\overline{\text{DC}}$ 12...48 V, long case model

Ø 12, threaded M12 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
7	NO	PNP	Pre-cabled (L = 2 m) (1)	XS612B4PAL2	0.075
			M12 connector	XS612B4PAM12	0.020
	NPN	PNP	Pre-cabled (L = 2 m) (1)	XS612B4NAL2	0.075
			M12 connector	XS612B4NAM12	0.020
	NC	PNP	Pre-cabled (L = 2 m) (1)	XS612B4PBL2	0.075
			M12 connector	XS612B4PBM12	0.020
NPN	PNP	Pre-cabled (L = 2 m) (1)	XS612B4NBL2	0.075	
		M12 connector	XS612B4NBM12	0.020	

Ø 18, threaded M18 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
12	NO	PNP	Pre-cabled (L = 2 m) (1)	XS618B4PAL2	0.100
			M12 connector	XS618B4PAM12	0.040
	NPN	PNP	Pre-cabled (L = 2 m) (1)	XS618B4NAL2	0.100
			M12 connector	XS618B4NAM12	0.040
	NC	PNP	Pre-cabled (L = 2 m) (1)	XS618B4PBL2	0.100
			M12 connector	XS618B4PBM12	0.040
NPN	PNP	Pre-cabled (L = 2 m) (1)	XS618B4NBL2	0.100	
		M12 connector	XS618B4NBM12	0.040	

Ø 30, threaded M30 x 1.5

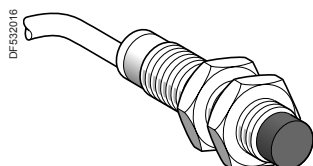
Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
30	NO	PNP	Pre-cabled (L = 2 m) (1)	XS630B5PAL2	0.205
			M12 connector	XS630B5PAM12	0.145
	NPN	PNP	Pre-cabled (L = 2 m) (1)	XS630B5NAL2	0.205
			M12 connector	XS630B5NAM12	0.145
	NC	PNP	Pre-cabled (L = 2 m) (1)	XS630B5PBL2	0.205
			M12 connector	XS630B5PBM12	0.145
NPN	PNP	Pre-cabled (L = 2 m) (1)	XS630B5NBL2	0.205	

Accessories (2)

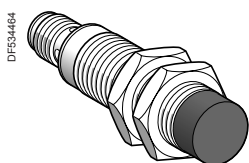
Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 12	XSZB112	0.006
	Ø 18	XSZB118	0.010
	Ø 30	XSZB130	0.020

(1) For a 5 m long cable replace L2 by L5; for a 10 m long cable replace L2 by L10.
Example: XS612B4PAL2 becomes **XS612B4PAL5** with a 5 m cable.

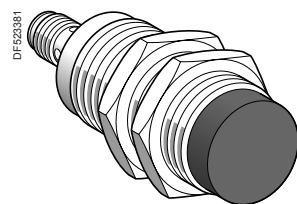
(2) For more information, see page 3/116.



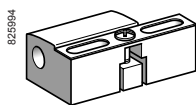
XS612B4●●L2



XS618B4●●M12



XS630B5●●M12



XSZB●●●

Inductive proximity sensors


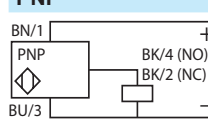
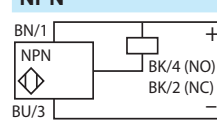
OsiSense XS, general purpose

Cylindrical, increased range, non flush mountable

Three-wire DC, solid-state output

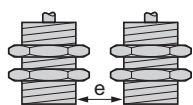
Characteristics		XS6...B...M12	XS6...B...L2
Sensor type		UL, CSA, CE, E2	
Product certifications		UL, CSA, CE, E2	
Connection	Connector	M12	–
	Pre-cabled	–	Length: 2 m
Operating zone	∅ 12	mm	0...5.6
	∅ 18	mm	0...9.6
	∅ 30	mm	0...24
Differential travel		%	1...15 of effective sensing distance (Sr)
Degree of protection	Conforming to IEC 60529	IP 65 and IP 67	IP 65 and IP 68, double insulation □
	Conforming to DIN 40050	IP 69K	–
Storage temperature		°C	-40...+85
Operating temperature		°C	-25...+70
Materials	Case	Nickel plated brass	
	Sensing face	PPS	
	Cable	–	PvR 3 x 0.34 mm ²
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	50 gn, duration 11 ms	
Output state indication		Yellow LED: 4 viewing ports at 90°	Yellow LED: annular
Rated supply voltage		V	12...48 with protection against reverse polarity
Voltage limits (including ripple)		V	10...58
Switching capacity		mA	≤ 200 with overload and short-circuit protection
Voltage drop, closed state		V	≤ 2
Current consumption, no-load		mA	≤ 10
Maximum switching frequency	XS612B4...●●●●	Hz	2500
	XS618B4...●●●●	Hz	1000
	XS630B5...●●●●	Hz	500
Delays	First-up	ms	≤ 10 for ∅ 12 and ∅ 18; ≤ 15 for ∅ 30
	Response	ms	≤ 0.2 for ∅ 12; ≤ 0.3 for ∅ 18; ≤ 0.6 for ∅ 30
	Recovery	ms	≤ 0.2 for ∅ 12; ≤ 0.7 for ∅ 18; ≤ 1.4 for ∅ 30

Wiring schemes

Connector	Pre-cabled	PNP	NPN
M12 	BU: Blue BN: Brown BK: Black		

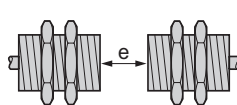
Setting-up

Minimum mounting distances (mm)



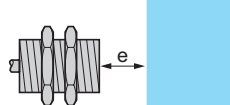
Side by side

∅ 12	e ≥ 48
∅ 18	e ≥ 72
∅ 30	e ≥ 300



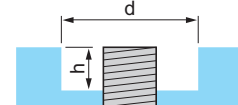
Face to face

e ≥ 84
e ≥ 144
e ≥ 300



Facing a metal object

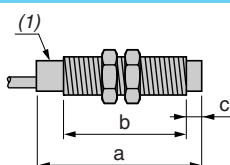
e ≥ 21
e ≥ 36
e ≥ 90



Mounted in a metal support

d ≥ 36, h ≥ 12
d ≥ 54, h ≥ 18
d ≥ 90, h ≥ 35

Dimensions



XS6	Pre-cabled (mm)			Connector (mm)		
	a	b	c	a	b	c
∅ 12	54	42	5	66	42	5
∅ 18	60	44	8	72	44	8
∅ 30	64	39	13	74	39	13

(1) LED

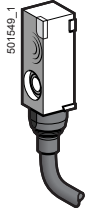
Inductive proximity sensors

OsiSense XS, general purpose, standard range

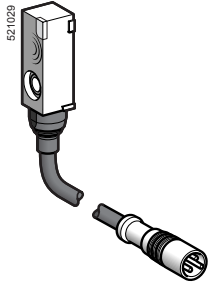
Flat format, flush mountable

Two-wire DC

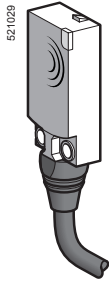
Three-wire DC, solid-state output



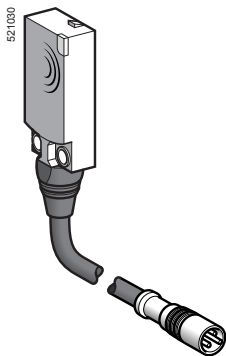
XS7J1A1●●L2



XS7J1A1●●L01M8



XS7F1A1●●L2



XS7F1A1●●L01M8

Flat, 8 x 22 x 8 mm format ^{(1) (2)}

Three-wire ---

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
2.5	NO	PNP	Pre-cabled (L = 2 m) (3)	XS7J1A1PAL2	0.060
			Remote M8 connector on 0.15 m flying lead	XS7J1A1PAL01M8	0.040
	NPN	PNP	Pre-cabled (L = 2 m) (3)	XS7J1A1NAL2	0.060
			Remote M8 connector on 0.15 m flying lead	XS7J1A1NAL01M8	0.040
	NC	PNP	Pre-cabled (L = 2 m) (3)	XS7J1A1PBL2	0.060
			Remote M8 connector on 0.15 m flying lead	XS7J1A1PBL01M8	0.040
NPN	PNP	Pre-cabled (L = 2 m) (3)	XS7J1A1NBL2	0.060	
		Remote M8 connector on 0.15 m flying lead	XS7J1A1NBL01M8	0.040	

Two-wire ---

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
2.5	NO		Pre-cabled (L = 2 m) (3)	XS7J1A1DAL2	0.050
			Remote M8 connector on 0.15 m flying lead	XS7J1A1DAL01M8	0.035
	NC		Pre-cabled (L = 2 m) (3)	XS7J1A1DBL2	0.050
			Remote M8 connector on 0.15 m flying lead	XS7J1A1DBL01M8	0.035

Flat, 15 x 32 x 8 mm format ⁽¹⁾

Three-wire ---

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
5	NO	PNP	Pre-cabled (L = 2 m) (3)	XS7F1A1PAL2	0.065
			Remote M8 connector on 0.15 m flying lead	XS7F1A1PAL01M8	0.045
	NPN	PNP	Pre-cabled (L = 2 m) (3)	XS7F1A1NAL2	0.065
			Remote M8 connector on 0.15 m flying lead	XS7F1A1NAL01M8	0.045
	NC	PNP	Pre-cabled (L = 2 m) (3)	XS7F1A1PBL2	0.065
			Remote M8 connector on 0.15 m flying lead	XS7F1A1PBL01M8	0.045
NPN	PNP	Pre-cabled (L = 2 m) (3)	XS7F1A1NBL2	0.065	
		Remote M8 connector on 0.15 m flying lead	XS7F1A1NBL01M8	0.045	

Two-wire ---

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
5	NO		Pre-cabled (L = 2 m) (3)	XS7F1A1DAL2	0.055
			Remote M8 connector on 0.15 m flying lead	XS7F1A1DAL01M8	0.045
	NC		Pre-cabled (L = 2 m) (3)	XS7F1A1DBL2	0.055
			Remote M8 connector on 0.15 m flying lead	XS7F1A1DBL01M8	0.045

(1) For accessories, see page 3/116.

(2) Sensors **XS7J** include a fixing clamp with screw.

(3) For a 5 m long cable replace L2 by L5; for a 10 m long cable replace L2 by L10.
Example: **XS7J1A1PAL2** becomes **XS7J1A1PAL5** with a 5 m long cable.

Inductive proximity sensors

OsiSense XS, general purpose, standard range

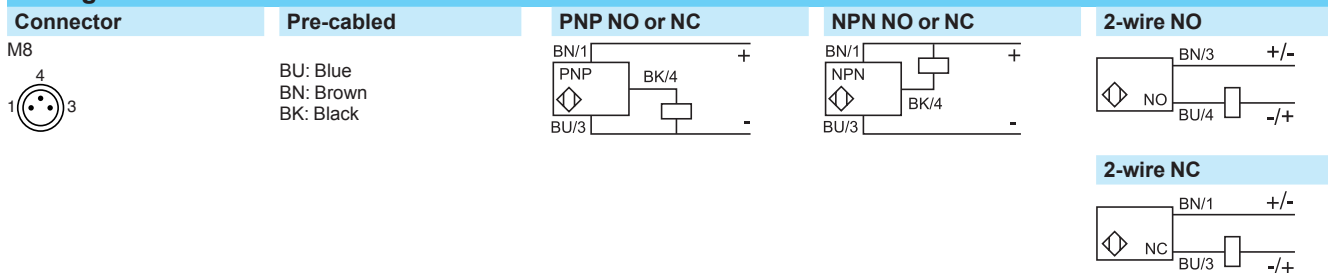
Flat format, flush mountable

Two-wire DC

Three-wire DC, solid-state output

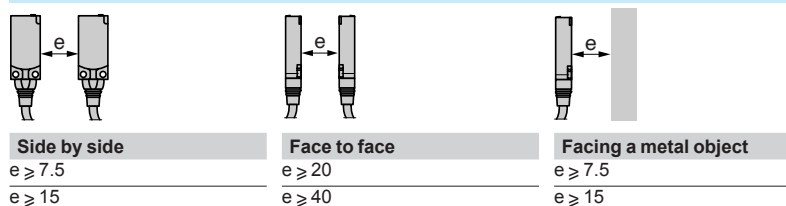
Characteristics		XS7J●●●●●L01M8	XS7F●●●●●L01M8	XS7J●●●●●L2, XS7F●●●●●L2
Sensor type		XS7J●●●●●L01M8	XS7F●●●●●L01M8	XS7J●●●●●L2, XS7F●●●●●L2
Product certifications		CE	UL, CSA, CE	
Connection	Connector	Remote M8 connector on 0.15 m flying lead	–	–
	Pre-cabled	–	–	Length: 2 m
Operating zone	XS7J	mm	0...2	
	XS7F	mm	0...4	
Differential travel		%	1...15 of effective sensing distance (Sr)	
Degree of protection	Conforming to IEC 60529		IP 67 (XS7J), IP 68 (XS7F)	
Storage temperature		°C	-40...+85	
Operating temperature		°C	-25...+70	
Materials	Case		PBT	
	Cable		PvR 3 x 0.11 mm ² or 2 x 0.11 mm ² (XS7F: 2 or 3 x 0.34 mm ²)	
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms	
Output state indication			Yellow LED	
Rated supply voltage		V	12...24 with protection against reverse polarity	
Voltage limits (including ripple)		V	10...36	
Current consumption, no-load	3-wire	mA	≤ 10	
Residual current, open state	2-wire	mA	≤ 0.5	
Switching capacity	3-wire	mA	100 with overload and short-circuit protection	
	2-wire	mA	1.5...100 with overload and short-circuit protection	
Voltage drop, closed state	3-wire	V	≤ 2	
	2-wire	V	≤ 4	
Maximum switching frequency	3-wire	kHz	2	
	2-wire	kHz	4 for XS7J, 5 for XS7F	
Delays	First-up	ms	Three-wire: 5	
		ms	Two-wire: 10 XS7J, 5 XS7F	
	Response	ms	Three-wire: 0,1	
		ms	Two-wire: 0,5 XS7J, 5 XS7F	
		ms	Three-wire: 0,1	
Recovery	ms	Three-wire: 0,1		
	ms	Two-wire: 1 XS7J, 5 XS7F		

Wiring schemes



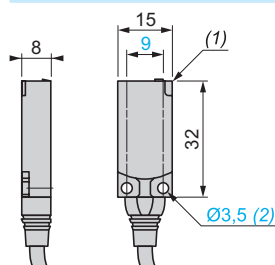
Setting-up

Minimum mounting distances (mm)

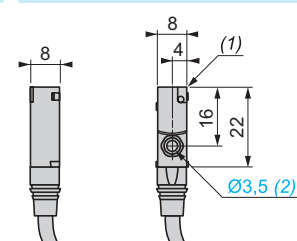


Dimensions

XS7F



XS7J



(1) LED
(2) For CHC type screws

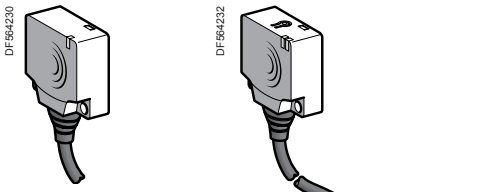
Inductive proximity sensors

OsiSense XS, general purpose, standard range

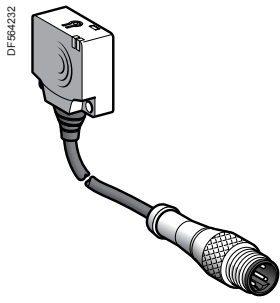
Flat format, flush mountable

Two-wire DC

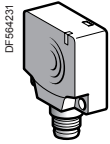
Three-wire DC, solid-state output



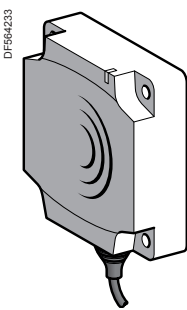
XS7E1A1●●L2



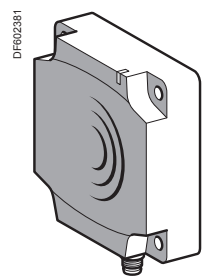
XS7E1A1●L0●M12



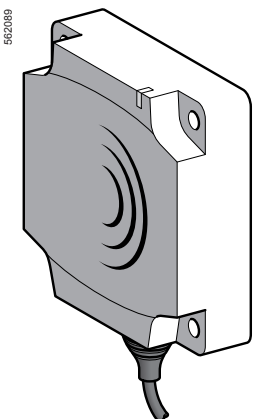
XS7E1A1●●M8



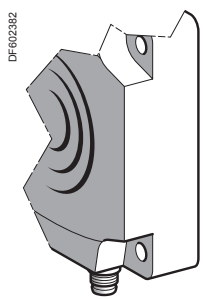
XS7C1A1●●L2



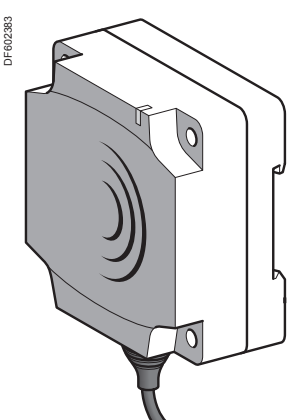
XS7C1A1●●M8



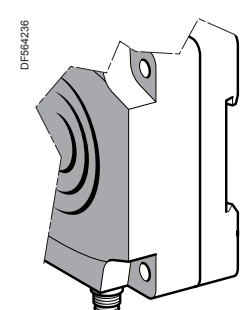
XS7D1A1●●L2



XS7D1A1●●M12



XS7D1A1●●L2DIN



XS7D1A1●●M12DIN

Sens. dist. (Sn) mm	Func-tion	Output	Connection	Reference	Weight kg	
Flat, 26 x 26 x 13 mm format (1)						
Three-wire ---						
10	NO	PNP	Pre-cabled (L = 2 m) (4)	XS7E1A1PAL2	0.075	
			M8 connector	XS7E1A1PAM8	0.040	
			Remote M12 connector	XS7E1A1PAL01M12	0.040	
		NPN	Pre-cabled (L = 2 m) (4)	XS7E1A1NAL2	0.075	
			M8 connector	XS7E1A1NAM8	0.075	
			Remote M12 connector	XS7E1A1NAL01M12	0.040	
	NC	PNP	Pre-cabled (L = 2 m) (4)	XS7E1A1PBL2	0.075	
			M8 connector	XS7E1A1PBM8	0.040	
			Remote M12 connector	XS7E1A1PBL01M12	0.040	
		NPN	Pre-cabled (L = 2 m) (4)	XS7E1A1NBL2	0.075	
			M8 connector	XS7E1A1NBM8	0.040	
			Remote M12 connector	XS7E1A1NBL01M12	0.040	
Two-wire ---						
10	NO	NO	Pre-cabled (L = 2 m) (4)	XS7E1A1DAL2	0.070	
			M8 connector	XS7E1A1DAM8	0.040	
			Remote M12 connector	XS7E1A1DAL01M12	0.040	
		NO terminals 1 and 4 (2)	Remote M12 connector	XS7E1A1CAL01M12	0.040	
			Remote M12 connector (3)	XS7E1A1CAL08M12	0.065	
			NC	Pre-cabled (L = 2 m) (4)	XS7E1A1DBL2	0.070
	M8 connector	XS7E1A1DBM8		0.040		
	Remote M12 connector	XS7E1A1DBL01M12		0.040		
	Flat, 40 x 40 x 15 mm format (1)					
	Three-wire ---					
	15	NO	PNP	Pre-cabled (L = 2 m) (4)	XS7C1A1PAL2	0.095
				M8 connector	XS7C1A1PAM8	0.060
Remote M12 connector				XS7C1A1PAL01M12	0.060	
NPN			Pre-cabled (L = 2 m) (4)	XS7C1A1NAL2	0.095	
			M8 connector	XS7C1A1NAM8	0.060	
			Remote M12 connector	XS7C1A1NAL01M12	0.060	
NC			PNP	Pre-cabled (L = 2 m) (4)	XS7C1A1PBL2	0.095
				M8 connector	XS7C1A1PBM8	0.060
				Remote M12 connector	XS7C1A1PBL01M12	0.060
		NPN	Pre-cabled (L = 2 m) (4)	XS7C1A1NBL2	0.095	
			M8 connector	XS7C1A1NBM8	0.060	
			Remote M12 connector	XS7C1A1NBL01M12	0.060	
Two-wire ---						
15		NO	NO	Pre-cabled (L = 2 m) (4)	XS7C1A1DAL2	0.090
				M8 connector	XS7C1A1DAM8	0.060
				Remote M12 connector	XS7C1A1DAL01M12	0.060
			NO terminals 1 and 4 (2)	Remote M12 connector	XS7C1A1CAL01M12	0.060
				Remote M12 connector (3)	XS7C1A1CAL08M12	0.090
	NC			Pre-cabled (L = 2 m) (4)	XS7C1A1DBL2	0.090
		M8 connector	XS7C1A1DBM8	0.060		
		Remote M12 connector	XS7C1A1DBL01M12	0.060		
	Flat, 80 x 80 x 26 mm format (1)					
	Three-wire ---					
	40	NO	PNP	Pre-cabled (L = 2 m) (4)	XS7D1A1PAL2 (5)	0.340
				M12 connector	XS7D1A1PAM12 (5)	0.290
M12 connector				XS7D1A1NAM12 (5)	0.290	
NPN			Pre-cabled (L = 2 m) (4)	XS7D1A1NAL2 (5)	0.340	
			M12 connector	XS7D1A1NAM12 (5)	0.290	
			M12 connector	XS7D1A1NAM12 (5)	0.290	
NC		PNP	Pre-cabled (L = 2 m) (4)	XS7D1A1PBL2 (5)	0.340	
			M12 connector	XS7D1A1PBM12 (5)	0.290	
			M12 connector	XS7D1A1PBM12 (5)	0.290	
		NPN	Pre-cabled (L = 2 m) (4)	XS7D1A1NBL2 (5)	0.340	
			M12 connector	XS7D1A1NBM12 (5)	0.290	
			M12 connector	XS7D1A1NBM12 (5)	0.290	
Two-wire ---						
40	NO	NO	Pre-cabled (L = 2 m) (4)	XS7D1A1DAL2 (5)	0.340	
			M12 connector	XS7D1A1DAM12 (5)	0.290	
			M12 connector	XS7D1A1CAM12 (5)	0.290	
	NC	NC	Pre-cabled (L = 2 m) (4)	XS7D1A1DBL2 (5)	0.340	
			M12 connector	XS7D1A1DBM12 (5)	0.290	
			M12 connector	XS7D1A1DBM12 (5)	0.290	

(1) For accessories, see page 3/116.

(2) The NO output is connected to terminals 1 and 4 of the M12 connector.

(3) Remote connector on 0.8 m flying lead.

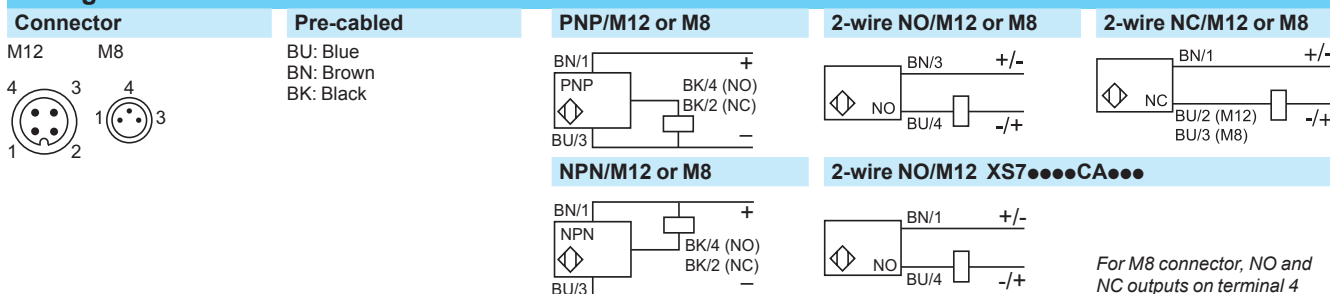
(4) For a 5 m long cable replace L2 by L5; for a 10 m long cable replace L2 by L10.

Example: **S7 J1A1PAL2** becomes **XS7J1A1PAL5** with a 5 m long cable.

(5) For clipping onto 35 mm omega rail or 80 x 80 x 40 mm format, add DIN to the end of the reference. Example: **XS7D1A1PAL2** becomes **XS7D1A1PAL2DIN**.

Characteristics				
Sensor type		XS7E●●●●M8, XS7C●●●●M8, XS7D●●●●M12	XS7E●●●●L01M12, XS7C●●●●L01M12	
			XS7E●●●●L2, XS7C●●●●L2, XS7D●●●●L2	
Product certifications		UL, CSA, CE, ECOLAB		
Connection	Connector	M8 except M12 on XS7D●●●●M12	M12 on 0.15 m flying lead for XS7●●●●L01M12	
	Pre-cabled	–	–	
Operating zone	XS7E	mm	0...8	
	XS7C	mm	0...12	
	XS7D	mm	0...32	
Differential travel		%	1...15 of effective sensing distance (Sr)	
Degree of protection	Conforming to IEC 60529		IP 67, double insulation □ (except for M8 connector: IP 67) IP 68, □	
Storage temperature		°C	-40...+85	
Operating temperature		°C	-25...+70	
Materials	Case		PBT	
	Cable		– PvR 3 x 0.34 mm ² or 2 x 0.34 mm ²	
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms	
Output state indication			Yellow LED	
Rated supply voltage		V	12...24 with protection against reverse polarity	
Voltage limits (including ripple)		V	10...36	
Current consumption, no-load	3-wire	mA	≤ 10	
Residual current, open state	2-wire	mA	≤ 0.5	
Switching capacity	3-wire	mA	≤ 100 with overload and short-circuit protection	
	2-wire	mA	1.5...100 with overload and short-circuit protection	
Voltage drop, closed state	3-wire	V	≤ 2	
	2-wire	V	≤ 4	
Maximum switching frequency	XS7E, XS7C	kHz	1	
	XS7D	Hz	100	
Delays	First-up	3-wire	ms	10 XS7E and XS7C, 30 XS7D
		2-wire	ms	5 XS7E and XS7D, 10 XS7D
	Response	3-wire	ms	2 XS7E and XS7C, 5 XS7D
		2-wire	ms	0,3 XS7E and XS7D, 10 XS7D
	Recovery	3-wire	ms	6 XS7E, 5 XS7C, 35 XS7D
		2-wire	ms	0,7 XS7E and XS7D, 10 XS7D

Wiring schemes



Setting-up

Minimum mounting distances (mm)				
Side by side	e ≥	XS7E	XS7C	XS7D
		30	45	120
Face to face	e ≥	XS7E	XS7C	XS7D
		72	110	300
Facing a metal object	e ≥	XS7E	XS7C	XS7D
		30	45	120

Dimensions

	XS7C/D/E	XS7C/D	XS7E				
Sensor	A (cable)	A (connector)	B	C	D	E	F
XS7E	14	11	26	13	8.8	20	3.5
XS7C	14	11	40	15	9.8	33	4.5
XS7D	23	18	80	26	16	65	5.5
XS7D●●DIN	23	18	80	40	30	65	5.1

(1) LED
(2) For CHC type screws

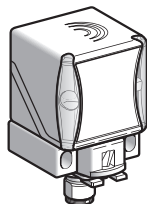
Inductive proximity sensors

OsiSense XS, general purpose

Cubic case, 40 x 40 x 70 mm, M12 or 1/2"-20UNF connector

5 position turret head

Sensor	Flush mountable in metal	Non flush mountable in metal
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Nominal sensing distance (Sn)	15 mm	20 mm	40 mm
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References

4-wire ---	PNP NO+NC	–	XS8C2A1PCM12	XS8C2A4PCM12
	NPN NO+NC	–	XS8C2A1NCM12	XS8C2A4NCM12
3-wire ---	PNP NO	XS7C2A1PAM12	–	–
	NPN NO	XS7C2A1NAM12	–	–
	PNP NC	XS7C2A1PBM12	–	–
	NPN NC	XS7C2A1NBM12	–	–
2-wire ---	NO	XS7C2A1DAM12	XS8C2A1DAM12	XS8C2A4DAM12
	NC	XS7C2A1DBM12	XS8C2A1DBM12	XS8C2A4DBM12
2-wire (~/-) unprotected (1)	NO	XS7C2A1MAU20	XS8C2A1MAU20	XS8C2A4MAU20
	NC	XS7C2A1MBU20	XS8C2A1MBU20	XS8C2A4MBU20
Weight (kg)		0.149	0.149	0.149

Characteristics

Operating zone		0...12 mm	0...16 mm	0...32 mm
Product certifications		UL, CSA, CE, TÜV (4-wire), E2 (3-wire and 4-wire)		
Conformity to standards		IEC 60947-5-2		
Conformity to safety standards (2)	For XS8C2A●PCM12	EN 62061 (2005): SILcl2 EN 61508 (2010): SIL 2, EN ISO 13849 (2008): PL d		
Reliability data (2)	For XS8C2A●PCM12	MTTFd = 1546 years PFHd = 7.4 10 ⁻⁸ 1/h		
Connection		M12 connector for --- versions 1/2"-20UNF connector for ~/- versions		
Differential travel		3...15% of Sr		
Degree of protection	Conforming to IEC 60529 and DIN 40050	IP 65, IP 67 and IP 69K		
Temperature	Storage	- 40...+ 85°C		
	Operation (3)	- 25...+ 70°C		
Material		Case: PBT		
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10...55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27	50 gn for 11 ms		
Indicators	Output state	Yellow LED		
	Power on	Green LED, for 4-wire ---, 3-wire --- and 2-wire ~/- versions		
Rated supply voltage	4-wire ---	12...48 V with protection against reverse polarity		
	3-wire ---	12...24 V with protection against reverse polarity		
	2-wire ---	12...48 V with protection against reverse polarity		
	2-wire ~/-	24...240 V (~ 50/60 Hz)		
Voltage limits (including ripple)	4-wire ---	10...58 V		
	3-wire ---	10...36 V		
	2-wire ---	10...58 V		
	2-wire ~/-	20...264 V		
Current consumption, no-load	3-wire and 4-wire ---	< 15 mA		
Residual current, open state	2-wire ---	< 0.6 mA		
	2-wire ~/-	1.5 mA		
Switching capacity	3-wire and 4-wire ---	< 200 mA with overload and short-circuit protection		
	2-wire ---	< 100 mA with overload and short-circuit protection		
	2-wire ~/-	~: 5...300 mA (1) ---: 5...200 mA (1)		
Voltage drop, closed state	3-wire and 4-wire ---	< 2 V		
	2-wire ---	< 4.2 V		
	2-wire ---/~	< 5.5 V		
Maximum switching frequency		Flush mountable: --- 300 Hz, ~ 25 Hz Non flush mountable: --- 150 Hz, ~ 25 Hz		
Delays	First-up	7 ms (3-wire and 4-wire ---), 20 ms (2-wire --- and 2-wire ---/~)		
	Response	Flush mountable: ≤ 1.2 ms. Non flush mountable: ≤ 1.4 ms		
	Recovery	Flush mountable: ≤ 1.8 ms. Non flush mountable: ≤ 3.5 ms		

(1) Sensor must be protected by a 0.4 A quick-blow fuse (reference **XUZE04**) connected in series with the load.

(2) SIL 2 protection can only be obtained by connecting both outputs to a safety PLC. Please refer to the "Safety solutions using Preventa" catalogue.

(3) Sensors are available for very low temperatures (suffix **TF**: - 40°C, + 70°C) or very high temperatures (suffix **TT**: - 25°C, + 85°C). Please consult our Customer Care Centre.

Inductive proximity sensors

OsiSense XS, general purpose
Cubic case, 40 x 40 x 70 mm, M12 or 1/2"-20UNF
connector
5 position turret head

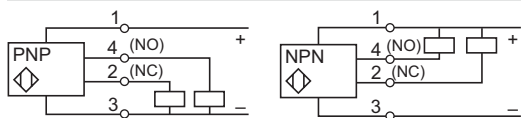
Setting-up precautions

Minimum mounting distances (mm)

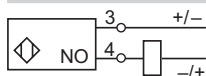
		Side by side	Face to face	Facing a metal object
Sensors flush mountable in metal	XS7C2A1●●	$e \geq 60$	$e \geq 120$	$e \geq 45$
	XS8C2A1●●	$e \geq 80$	$e \geq 160$	$e \geq 60$
Sensors non flush mountable in metal	XS8C2A4●●	$e \geq 160$	$e \geq 320$	$e \geq 120$

Wiring schemes

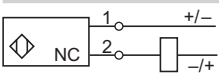
4-wire $\overline{\text{NPN}}$, NO + NC outputs



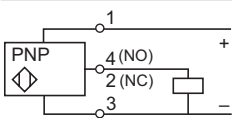
2-wire $\overline{\text{NPN}}$, NO output (M12 connector)



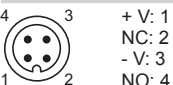
2-wire $\overline{\text{NPN}}$, NC output (M12 connector)



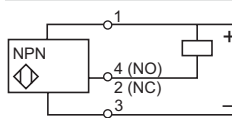
3-wire, PNP



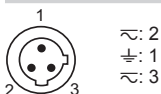
M12 connector



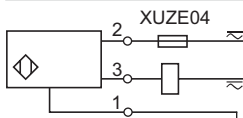
3-wire, NPN



1/2"-20UNF connector



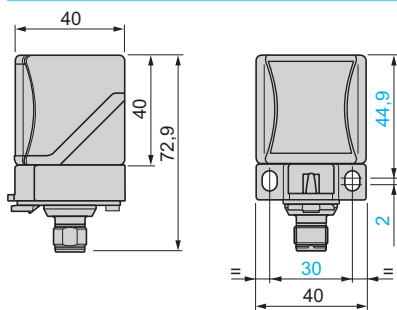
2-wire, 1/2"-20UNF



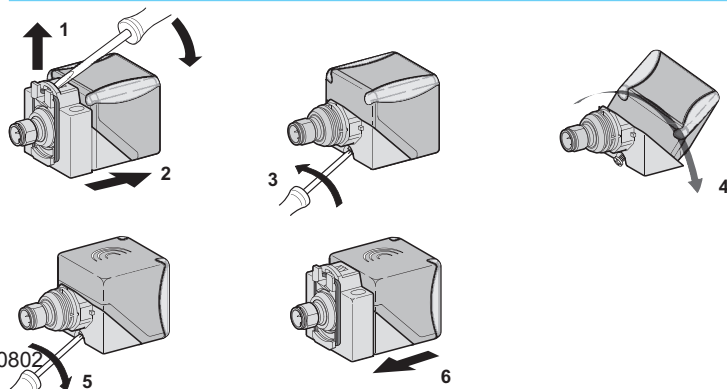
Accessory references

Description	Type	Length m	Reference	Weight kg
Pre-wired M12 connectors Female, 4-pin, zinc die-cast, nickel plated clamping ring	Straight	2	XZCP1141L2	0.090
		5	XZCP1141L5	0.190
		10	XZCP1141L10	0.370
	Elbowed	2	XZCP1241L2	0.090
		5	XZCP1241L5	0.190
		10	XZCP1241L10	0.370
Pre-wired 1/2"-20UNF connectors Female, 3-pin, zinc die-cast, nickel plated clamping ring	Straight	5	XZCP1865L5	0.180
		10	XZCP1865L10	0.350
		10	XZCP1865L10	0.350
	Elbowed	5	XZCP1965L5	0.180
		10	XZCP1965L10	0.350
		10	XZCP1965L10	0.350

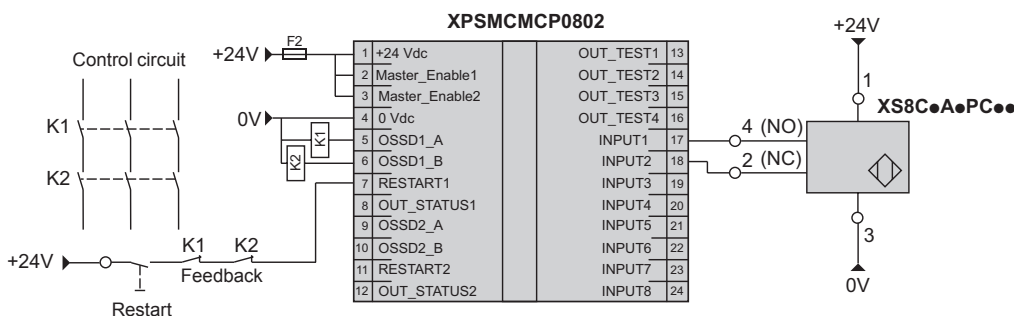
Dimensions



Head positions



Example SIL 2 wiring scheme (with Preventa XPSMCMCP0802 safety PLC)

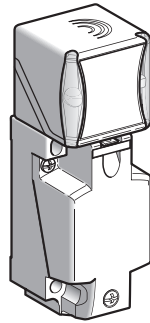


SFF (Safe Failure Fraction): 92,68 %
DC (Diagnosis Coverage): 75,8 %

Inductive proximity sensors

OsiSense XS, general purpose
Plastic case, 40 x 40 x 117 mm, plug-in
5 position turret head

Sensor	Flush mountable in metal	Non flush mountable in metal
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Nominal sensing distance (Sn)	15 mm	20 mm	40 mm
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References

4-wire ---	PNP NO+NC	–	XS8C4A1PCP20	XS8C4A4PCP20
	NPN NO+NC	–	XS8C4A1NCP20	XS8C4A4NCP20
2-wire ---	NO or NC programmable	XS7C4A1DPP20	XS8C4A1DPP20	XS8C4A4DPP20
2-wire $(\sim/\text{---})$ unprotected (1)	NO or NC programmable	XS7C4A1MPP20	XS8C4A1MPP20	XS8C4A4MPP20
Weight (kg)		0.244	0.244	0.244

Note: These sensors have an M20 cable entry. They can also be supplied with a PG 13.5 cable entry (e.g. XS8C4A4PCG13) or a 1/2" NPT cable entry (e.g. XS8C4A1MPN12). Please consult our Customer Care Centre.

Characteristics

Operating zone		0...12 mm	0...16 mm	0...32 mm
Product certifications		UL, CSA, CE, TÜV (4-wire), E2 (4-wire)		
Conformity to standards		IEC 60947-5-2		
Conformity to safety standards (2)	For XS8C4A●PCP20	EN 62061 (2005): SILcl2, EN 61508 (2010): SIL 2, EN ISO 13849 (2008): PL d		
Reliability data (2)	For XS8C4A●PCP20	MTTFd = 1546 years PFHd = 7.4 10 ⁻⁸ 1/h		
Connection		Screw terminals, clamping capacity: 2 or 4 x 1.5 mm ² / 2 or 4 x 16 AWG (3)		
Differential travel		3...15% of Sr		
Degree of protection	Conforming to IEC 60529 and DIN 40050	IP 65, IP 67 and IP 69K		
Temperature	Storage	- 40...+ 85°C		
	Operation (4)	- 25...+ 70°C		
Material		Case: PBT		
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10...55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27	50 gn for 11 ms		
Indicators	Output state	Yellow LED		
	Power on	Green LED, for 4-wire --- and 2-wire $(\sim/\text{---})$ versions		
Rated supply voltage	4-wire ---	12...48 V with protection against reverse polarity		
	2-wire ---	12...48 V with protection against reverse polarity		
	2-wire $(\sim/\text{---})$	24...240 V (\sim 50/60 Hz)		
Voltage limits (including ripple)	4-wire ---	10...58 V		
	2-wire ---	10...58 V		
	2-wire $(\sim/\text{---})$	20...264 V		
Current consumption, no-load	4-wire ---	< 15 mA		
Residual current, open state	2-wire ---	< 0.6 mA		
	2-wire $(\sim/\text{---})$	1.5 mA		
Switching capacity	4-wire ---	< 200 mA with overload and short-circuit protection		
	2-wire ---	< 100 mA with overload and short-circuit protection		
	2-wire $(\sim/\text{---})$	\sim : 5...300 mA (1) --- : 5...200 mA (1)		
Voltage drop, closed state	4-wire ---	< 2 V		
	2-wire ---	< 4.2 V		
	2-wire $(\sim/\text{---})$	< 5.5 V		
Maximum switching frequency		Flush mountable: --- 300 Hz, \sim 25 Hz Non flush mountable: --- 150 Hz, \sim 25 Hz		
Delays	First-up	7 ms (3-wire and 4-wire ---), 20 ms (2-wire --- and 2-wire $(\sim/\text{---})$)		
	Response	Flush mountable: ≤ 1.2 ms. Non flush mountable: ≤ 1.4 ms		
	Recovery	Flush mountable: ≤ 1.8 ms. Non flush mountable: ≤ 3.5 ms		

(1) Sensor must be protected by a 0.4 A quick-blow fuse (reference XUZE04) connected in series with the load.

(2) SIL 2 protection can only be obtained by connecting both outputs to a safety PLC. Please refer to the "Safety solutions using Preventa" catalogue.

(3) These sensors are supplied without a cable gland. An adaptable PG 13.5 cable gland is available (reference XSZPE13). Accessories are available for connection to an M12 or 7/8"-16UN connector which can be added to the PG 13.5 sensor. Please consult our Customer Care Centre.

(4) Sensors are available for very low temperatures (suffix TF: - 40°C, + 70°C) or very high temperatures (suffix TT: - 25°C, + 85°C). Please consult our Customer Care Centre.

Inductive proximity sensors

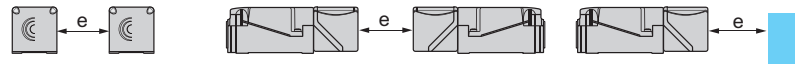
OsiSense XS, general purpose

Plastic case, 40 x 40 x 117 mm, plug-in

5 position turret head

Setting-up precautions

Minimum mounting distances (mm)

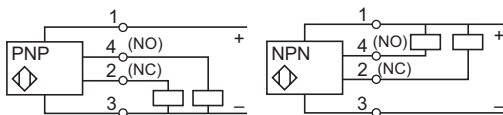


		Side by side	Face to face	Facing a metal object
Sensors flush mountable in metal	XS7C4A1●●	$e \geq 60$	$e \geq 120$	$e \geq 45$
	XS8C4A1●●	$e \geq 80$	$e \geq 160$	$e \geq 60$
Sensors non flush mountable in metal	XS8C4A4●●	$e \geq 160$	$e \geq 320$	$e \geq 120$

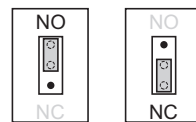
Wiring schemes

NO + NC outputs

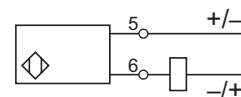
4-wire ☰



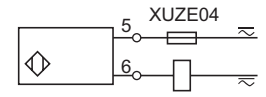
NO or NC outputs, depending on position of link



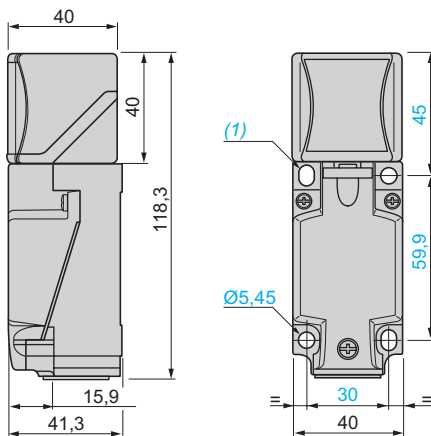
2-wire ☰ (non polarised)



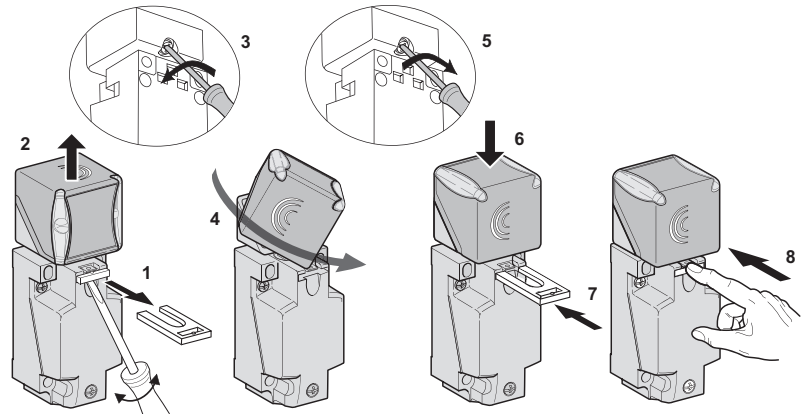
2-wire ~ or ☰ (programmable)



Dimensions



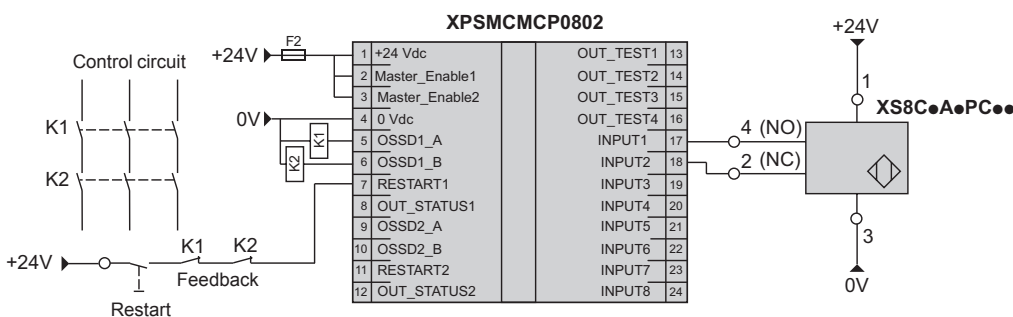
Head positions



(1) 2 elongated holes Ø 5.3 x 7 cm.

Tightening torque of cover fixing screws and clamp screws: < 1.2 N.m / < 10.62 lb-in

Example SIL 2 wiring scheme (with Preventa XPSMCMCP0802 safety PLC)



SFF (Safe Failure Fraction): 92,68 %

DC (Diagnosis Coverage): 75,8 %

Inductive proximity sensors

OsiSense XS, general purpose

Multivoltage sensor, cylindrical, flush mountable and non flush mountable

Two-wire AC or DC, short-circuit protection

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
--------------------------	----------	------------	-----------	-----------

Ø 12, threaded M12 x 1

Flush mountable

2	NO	Pre-cabled (L = 2 m) (1) 1/2"-20UNF connector	XS1M12MA250 XS1M12MA250K	0.075 0.025
	NC	Pre-cabled (L = 2 m) (1) 1/2"-20UNF connector	XS1M12MB250 XS1M12MB250K	0.075 0.025

Non flush mountable

4	NO	Pre-cabled (L = 2 m) (1) 1/2"-20UNF connector	XS2M12MA250 XS2M12MA250K	0.075 0.025
	NC	Pre-cabled (L = 2 m) (1)	XS2M12MB250	0.075

Ø 18, threaded M18 x 1

Flush mountable

5	NO	Pre-cabled (L = 2 m) (1) 1/2"-20UNF connector	XS1M18MA250 XS1M18MA250K	0.120 0.060
	NC	Pre-cabled (L = 2 m) (1) 1/2"-20UNF connector	XS1M18MB250 XS1M18MB250K	0.120 0.060

Non flush mountable

8	NO	Pre-cabled (L = 2 m) (1) 1/2"-20UNF connector	XS2M18MA250 XS2M18MA250K	0.120 0.060
	NC	Pre-cabled (L = 2 m) (1) 1/2"-20UNF connector	XS2M18MB250 XS2M18MB250K	0.120 0.060

Ø 30, threaded M30 x 1.5

Flush mountable

10	NO	Pre-cabled (L = 2 m) (1) 1/2"-20UNF connector	XS1M30MA250 XS1M30MA250K	0.205 0.145
	NC	Pre-cabled (L = 2 m) (1) 1/2"-20UNF connector	XS1M30MB250 XS1M30MB250K	0.205 0.145

Non flush mountable

15	NO	Pre-cabled (L = 2 m) (1) 1/2"-20UNF connector	XS2M30MA250 XS2M30MA250K	0.205 0.145
	NC	Pre-cabled (L = 2 m) (1) 1/2"-20UNF connector	XS2M30MB250 XS2M30MB250K	0.205 0.145

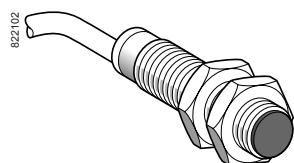
Accessories (2)

Description mm		Reference	Weight kg
Fixing clamps	Ø 12	XSZB112	0.006
	Ø 18	XSZB118	0.010
	Ø 30	XSZB130	0.020

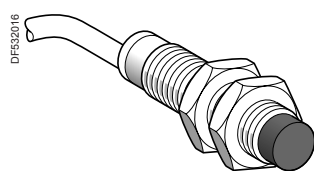
(1) For a 5 m long cable add L1 to the reference; for a 10 m long cable add L2 to the reference.

Example: **XS1M18MA250** becomes **XS1M18MA250L1** with a 5 m long cable.

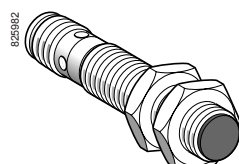
(2) For further information, see page 3/116.



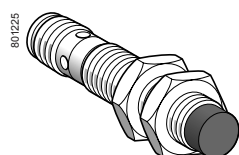
XS1M12MA250



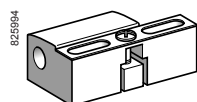
XS2M12MA250



XS1M18MA250K



XS2M18MA250K



XSZB112

Inductive proximity sensors

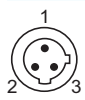
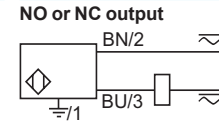
OsiSense XS, general purpose

Multivoltage sensor, cylindrical, flush mountable and non flush mountable

Two-wire AC or DC, short-circuit protection

Characteristics			XS●M●●M●250K	XS●M●●M●250
Sensor type				
Product certifications			UL, CSA, CE	
Connection			1/2"-20UNF connector	Pre-cabled, length: 2 m
Operating zone	Ø 12 flush mountable	mm	0...1.6	
	Ø 12 non flush mountable	mm	0...3.2	
	Ø 18 flush mountable	mm	0...4	
	Ø 18 non flush mountable	mm	0...6.4	
	Ø 30 flush mountable	mm	0...8	
	Ø 30 non flush mountable	mm	0...12	
Differential travel		%	1...15 of effective sensing distance (Sr)	
Degree of protection		Conforming to IEC 60529	IP 67	IP 68, double insulation
Storage temperature			°C -40...+85	
Operating temperature			°C -25...+70	
Materials	Case		Nickel plated brass	
	Cable		-	PvR 2 x 0.34 mm ²
Vibration resistance		Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance		Conforming to IEC 60068-2-27	50 gn, duration 11 ms	
Indicators	Output state		Yellow LED, 4 viewing ports at 90°	Yellow LED
	Supply on		-	Green LED (only on Ø 18 and Ø 30)
Rated supply voltage		V	~ 24...240 (50/60 Hz) or --- 24...210	
Voltage limits (including ripple)		V	~ or --- 20...264	
Switching capacity		mA	~ 5...300 or --- 5...200 (except Ø 12: ~ or --- 5...200) with overload and short-circuit protection	
Voltage drop, closed state		V	≤ 5.5	
Current consumption, no-load		mA	-	
Residual current, open state		mA	≤ 1.5	
Maximum switching frequency	Ø 12	Hz	~ 25 or --- 4000	
	Ø 18	Hz	~ 25 or --- 2000	
	Ø 30 flush mountable	Hz	~ 25 or --- 2000	
	Ø 30 non flush mountable	Hz	~ 25 or --- 1000	
Delays	First-up	ms	≤ 70	
	Response	ms	≤ 0.2 for Ø 12, ≤ 2 for Ø 18 and Ø 30	
	Recovery	ms	≤ 0.2 for Ø 12, ≤ 4 for Ø 18, ≤ 5 for Ø 30 flush mountable, ≤ 10 for Ø 30 non flush mountable	

Wiring schemes

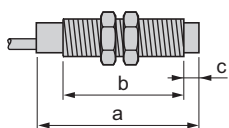
1/2"-20UNF connector	Pre-cabled	2-wire ~ or --- NO or NC output
 <p>+/- : 2 ± : 1 +/- : 3</p>	<p>BU: Blue BN: Brown</p>	 <p>± : on connector models only.</p>

Setting-up

Sensor	Minimum mounting distances (mm)			
	Side by side	Face to face	Facing a metal object	Mounted in a metal support
Ø 12 flush mountable	e ≥ 4	e ≥ 24	e ≥ 6	d ≥ 12 h ≥ 0
Ø 12 non flush mountable	e ≥ 16	e ≥ 48	e ≥ 12	d ≥ 36 h ≥ 8
Ø 18 flush mountable	e ≥ 10	e ≥ 60	e ≥ 15	d ≥ 18 h ≥ 0
Ø 18 non flush mountable	e ≥ 16	e ≥ 96	e ≥ 24	d ≥ 54 h ≥ 16
Ø 30 flush mountable	e ≥ 20	e ≥ 120	e ≥ 30	d ≥ 30 h ≥ 0
Ø 30 non flush mountable	e ≥ 60	e ≥ 180	e ≥ 45	d ≥ 90 h ≥ 30

Dimensions

Sensor	Flush mountable in metal					Non flush mountable in metal				
	Pre-cabled		Connector			Pre-cabled		Connector		
	a	b	a	b	c	a	b	a	b	c
Ø 12	57	42	66	48	5	57	42	66	42	5
Ø 18	60	51	72	51	8	60	44	72	44	8
Ø 30	60	51	72	51	13	63	41	75	41	13



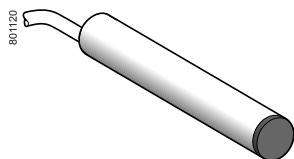
Inductive proximity sensors

OsiSense XS, general purpose

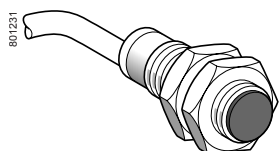
Cylindrical, metal and plastic, flush mountable

and non flush mountable

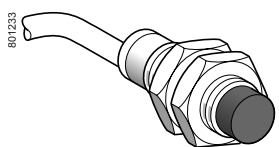
Four-wire DC, solid-state NO + NC output



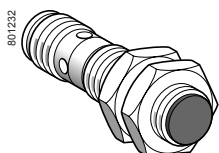
XS1L06●C410



XS1●●●●C410



XS2●●●●C410



XS1N●●●C410D

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Ø 6.5 plain					
Stainless steel case, flush mountable					
1.5	NO + NC	PNP	Pre-cabled (L = 2 m)	XS1L06PC410	0.025
		NPN	Pre-cabled (L = 2 m)	XS1L06NC410	0.025
Ø 8, threaded M8 x 1					
Stainless steel case, flush mountable					
1.5	NO + NC	PNP	Pre-cabled (L = 2 m)	XS1M08PC410	0.035
			M12 connector	XS1M08PC410D	0.025
		NPN	Pre-cabled (L = 2 m)	XS1M08NC410	0.035
			M12 connector	XS1M08NC410D	0.025
Stainless steel case, non flush mountable					
2.5	NO + NC	PNP	Pre-cabled (L = 2 m) (1)	XS2M08PC410	0.035
			M12 connector	XS2M08PC410D	0.025
		NPN	Pre-cabled (L = 2 m)	XS2M08NC410	0.035
			M12 connector	XS2M08NC410D	0.025
Plastic case, non flush mountable					
2.5	NO + NC	PNP (3)	Pre-cabled (L = 2 m) (1)	XS4P08PC410	0.035
Ø 12, threaded M12 x 1					
Brass case, flush mountable					
2	NO + NC	PNP	Pre-cabled (L = 2 m) (1) (2)	XS1N12PC410	0.070
			M12 connector	XS1N12PC410D	0.020
		NPN	Pre-cabled (L = 2 m) (1)	XS1N12NC410	0.070
			M12 connector	XS1N12NC410D	0.020
Plastic case, non flush mountable					
4	NO + NC	PNP (3)	Pre-cabled (L = 2 m) (1)	XS4P12PC410	0.070
			M12 connector	XS4P12PC410D	0.020

(1) For a 5 m long cable add **L1** to the reference. Example: **XS1N12PC410** becomes **XS1N12PC410L1** with a 5 m long cable.

(2) For a 10 m long cable add **L2** to the reference. Example: **XS1N12PC410** becomes **XS1N12PC410L2** with a 10 m long cable.

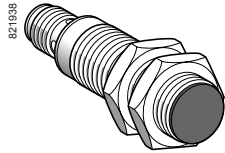
(3) These sensors can be supplied in NPN versions. Please contact our Customer Care Centre.

Inductive proximity sensors

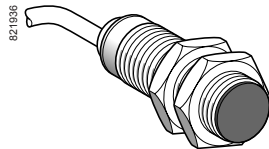
OsiSense XS, general purpose

Cylindrical, metal and plastic, flush mountable and non flush mountable

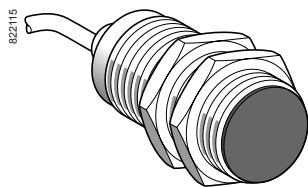
Four-wire DC, solid-state NO + NC output



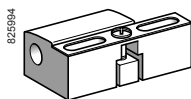
XS●●18●C410



XS●●18●C410D



XS●●30●C410



XSZB1●●

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Ø 18, threaded M18 x 1					
Brass case, flush mountable					
5	NO + NC	PNP	Pre-cabled (L = 2 m) (1) (2)	XS1N18PC410	0.100
			M12 connector	XS1N18PC410D	0.040
		NPN	Pre-cabled (L = 2 m)	XS1N18NC410	0.100
			M12 connector	XS1N18NC410D	0.040
Plastic case, non flush mountable					
8	NO + NC	PNP (3)	Pre-cabled (L = 2 m)	XS4P18PC410	0.100
			M12 connector	XS4P18PC410D	0.040
Ø 30, threaded M30 x 1.5					
Brass case, flush mountable					
10	NO + NC	PNP	Pre-cabled (L = 2 m) (1) (2)	XS1N30PC410	0.160
			M12 connector	XS1N30PC410D	0.100
		NPN	Pre-cabled (L = 2 m)	XS1N30NC410	0.160
			M12 connector	XS1N30NC410D	0.100
Plastic case, non flush mountable					
15	NO + NC	PNP (3)	Pre-cabled (L = 2 m)	XS4P30PC410	0.160
			M12 connector	XS4P30PC410D	0.100
Accessories (4)					
Description				Reference	Weight kg
Fixing clamps	Ø 8			XSZB108	0.006
	Ø 12			XSZB112	0.006
	Ø 18			XSZB118	0.010
	Ø 30			XSZB130	0.020

(1) For a 5 m long cable add **L1** to the reference. Example: **XS1N18PC410** becomes **XS1N18PC410L1** with a 5 m long cable.

(2) For a 10 m long cable add **L2** to the reference. Example: **XS1N18PC410** becomes **XS1N18PC410L2** with a 10 m long cable.

(3) These sensors can be supplied in NPN versions. Please contact our Customer Care Centre.

(4) For further information, see page 3/116.

Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, metal and plastic, flush mountable and non flush mountable

Four-wire DC, solid-state NO + NC output

Characteristics					
Sensor type		XS●●●●PC410D	XS●●●●NC410D	XS●●●●PC410	XS●●●●NC410
Product certifications	Ø 6.5 and Ø 8	UL, CSA, CÉ			
	Ø 12, Ø 18 and Ø 30	UL, CSA, CÉ, E2 (1)	UL, CSA, CÉ	UL, CSA, CÉ, E2 (2)	UL, CSA, CÉ
Conformity to safety standards	Ø 6.5 and Ø 8	–			
	Ø 12, Ø 18 and Ø 30	EN/IEC 61508: SIL 2 EN/ISO 13849-1: PL = d IEC 62061: SILcl2 (3)	–	EN/IEC 61508: SIL 2 EN/ISO 13849-1: PL = d IEC 62061: SILcl2 (4)	–
Reliability data	Ø 12, Ø 18 and Ø 30	MTTFd = 1810 years, PFHd = 69.9 10 ⁻⁹ 1/h, SFF > 92 %, DC > 75 % (with a safety controller) (3)	–	MTTFd = 1810 years, PFHd = 69.9 10 ⁻⁹ 1/h, SFF > 92 %, DC > 75 % (with a safety controller) (4)	–
Connection		M12 connector		Pre-cabled, length: 2 m	
Operating zone	Ø 6.5 and Ø 8 flush mountable	mm	0...1.2		
	Ø 8 non flush mountable	mm	0...2		
	Ø 12 flush mountable	mm	0...1.6		
	Ø 12 non flush mountable	mm	0...3.2		
	Ø 18 flush mountable	mm	0...4		
	Ø 18 non flush mountable	mm	0...6.4		
	Ø 30 flush mountable	mm	0...8		
	Ø 30 non flush mountable	mm	0...12		
Differential travel		%	1...15 of effective sensing distance (Sr)		
Degree of protection	Conforming to IEC 60529		IP 65 and IP 67	IP 67	IP 67, double insulation (Ø 6.5 and Ø 8) IP 68, double insulation (Ø 12, Ø 18 and Ø 30)
	Conforming to DIN 40050		IP 69K (Ø 12, Ø 18 and Ø 30)	–	–
Storage temperature		°C	- 40...+ 85		
Operating temperature		°C	- 25...+ 70 (5)		
Materials	Case		Nickel plated brass for XS1N●●●. Stainless steel 303 for XS1M08●●● and XS2M08●●●. Plastic, PPS, for XS4P●●●.		
	Cable		–	PvR 4 x 0.08 mm ² (Ø 6.5 and Ø 8) PvR 4 x 0.22 mm ² (Ø 12, Ø 18 and Ø 30)	
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms		
Output state indication			Yellow LED, 4 viewing ports at 90°		Yellow LED, annular
Rated supply voltage		V	--- 12...24 with protection against reverse polarity		
Voltage limits (including ripple)		V	--- 9...36 (--- 10...36 for XS4P●●●)	--- 10...36	--- 9...36 (--- 10...36 for XS4P18●●●)
Switching capacity		mA	≤ 200 with overload and short-circuit protection		
Voltage drop, closed state		V	≤ 2		
Current consumption, no-load		mA	≤ 10		
Maximum switching frequency	Ø 6.5, Ø 8 and Ø 12	Hz	5000		
	Ø 18	Hz	2000		
	Ø 30	Hz	1000		
Delays	First-up	ms	≤ 5		
	Response	ms	≤ 0.1 for Ø 8 and Ø 12, ≤ 0.15 for Ø 18, ≤ 0.3 for Ø 30		
	Recovery	ms	≤ 0.1 for Ø 8 and Ø 12, ≤ 0.35 for Ø 18, ≤ 0.7 for Ø 30		

(1) Except XS4P●●●: UL, CSA and CÉ.

(2) Except XS4P18●●●: UL, CSA and CÉ.

(3) Except XS4P●●●.


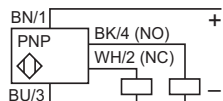
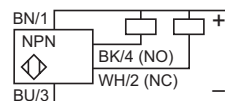
(4) Except XS4P18●●●.

(5) Sensors are available for very low temperatures (suffix TF: -40°C, + 70°C) or very high temperatures (suffix TT: - 25°C, + 85°C). Please consult our Customer Care Centre.

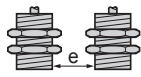
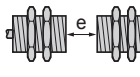

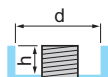
Inductive proximity sensors

OsiSense XS, general purpose
Cylindrical, metal and plastic, flush mountable
and non flush mountable
Four-wire DC, solid-state NO + NC output

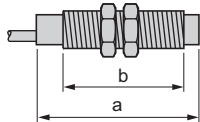
Wiring schemes

M12 connector	Pre-cabled	PNP 4-wire	NPN 4-wire
	BU: Blue BN: Brown BK: Black WH: White		

Setting-up

Sensor	Minimum mounting distances (mm)			
	Side by side	Face to face	Facing a metal object	Mounted in a metal support
Ø 6.5 flush mountable XS1L06	 e ≥ 3	 e ≥ 18	 e ≥ 4.5	 d ≥ 6.5 h ≥ 0
Ø 8 flush mountable XS1M08	e ≥ 3	e ≥ 18	e ≥ 4.5	d ≥ 8 h ≥ 0
Ø 8 non flush mountable XS4P08	e ≥ 10	e ≥ 30	e ≥ 7.5	d ≥ 24 h ≥ 5
Ø 12 flush mountable XS1N12	e ≥ 4	e ≥ 24	e ≥ 6	d ≥ 12 h ≥ 0
Ø 12 non flush mountable XS4P12	e ≥ 16	e ≥ 48	e ≥ 12	d ≥ 36 h ≥ 8
Ø 18 flush mountable XS1N18	e ≥ 10	e ≥ 60	e ≥ 15	d ≥ 18 h ≥ 0
Ø 18 non flush mountable XS4P18	e ≥ 16	e ≥ 96	e ≥ 24	d ≥ 54 h ≥ 16
Ø 30 flush mountable XS1N30	e ≥ 20	e ≥ 120	e ≥ 30	d ≥ 30 h ≥ 0
Ø 30 non flush mountable XS4P30	e ≥ 60	e ≥ 180	e ≥ 45	d ≥ 90 h ≥ 30

Dimensions

Sensor		Pre-cabled (mm)		M12 connector (mm)	
		a	b	a	b
		Flush mountable in metal			
Ø 6.5	XS1L06	50	-	-	-
stainless steel					
Ø 8	XS1M08	51	42	62	40
stainless steel					
Ø 12	XS1N12	37	25	50	31
brass					
Ø 18	XS1N18	41	29	51	28
brass					
Ø 30	XS1N30	45	33	54	33
brass					
		Non flush mountable in metal			
Sensor		Pre-cabled (mm)		M12 connector (mm)	
		a	b	a	b
Ø 8	XS2M08	54	42	65	40
stainless steel					
Ø 8	XS4P08	34	25	-	-
plastic					
Ø 12	XS4P12	37	25	50	31
plastic					
Ø 18	XS4P18	41	29	51	28
plastic					
Ø 30	XS4P30	45	33	54	33
plastic					

Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, metal and plastic, flush and non flush mountable

Four-wire DC, solid-state PNP + NPN NO/NC

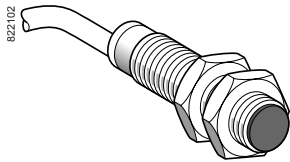
programmable output

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Ø 12, threaded M12 x 1					
Metal case, flush mountable					
2	NO/NC programmable	PNP + NPN	Pre-cabled (L = 2 m) (1)	XS1M12KP340	0.075
			M12 connector	XS1M12KP340D	0.025
Metal case, non flush mountable					
4	NO/NC programmable	PNP + NPN	Pre-cabled (L = 2 m) (1)	XS2M12KP340	0.075
			M12 connector	XS2M12KP340D	0.025
Plastic case, non flush mountable					
4	NO/NC programmable	PNP + NPN	Pre-cabled (L = 2 m) (1)	XS4P12KP340	0.075
			M12 connector	XS4P12KP340D	0.025
Ø 18, threaded M18 x 1					
Metal case, flush mountable					
5	NO/NC programmable	PNP + NPN	Pre-cabled (L = 2 m) (1)	XS1M18KP340	0.120
			M12 connector	XS1M18KP340D	0.060
Metal case, non flush mountable					
8	NO/NC programmable	PNP + NPN	Pre-cabled (L = 2 m) (1)	XS2M18KP340	0.120
			M12 connector	XS2M18KP340D	0.060
Plastic case, non flush mountable					
8	NO/NC programmable	PNP + NPN	Pre-cabled (L = 2 m) (1)	XS4P18KP340	0.120
			M12 connector	XS4P18KP340D	0.060
Ø 30, threaded M30 x 1.5					
Metal case, flush mountable					
10	NO/NC programmable	PNP + NPN	Pre-cabled (L = 2 m) (1)	XS1M30KP340	0.205
			M12 connector	XS1M30KP340D	0.145
Metal case, non flush mountable					
15	NO/NC programmable	PNP + NPN	Pre-cabled (L = 2 m) (1)	XS2M30KP340	0.205
			M12 connector	XS2M30KP340D	0.145
Plastic case, non flush mountable					
15	NO/NC programmable	PNP + NPN	Pre-cabled (L = 2 m) (1)	XS4P30KP340	0.205
			M12 connector	XS4P30KP340D	0.145
Accessories (2)					
Description mm			Reference	Weight kg	
Fixing clamps	Ø 12		XSZB112	0.006	
	Ø 18		XSZB118	0.010	
	Ø 30		XSZB130	0.020	

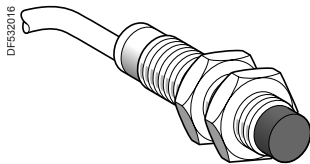
(1) For a 5 m long cable add L1 to the reference; for a 10 m long cable add L2 to the reference.

Example: **XS1M12KP340** becomes **XS1M12KP340L1** with a 5 m long cable.

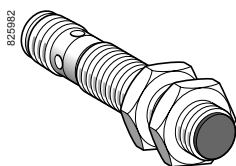
(2) For further information, see page 3/116.



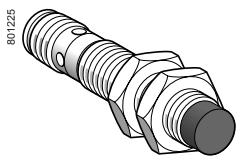
XS1M●●KP340
XS4P●●KP340



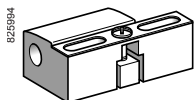
XS2M●●KP340



XS1M●●KP340D
XS4P●●KP340D



XS2M●●KP340D



XSZB1●●

Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, metal and plastic, flush and non flush mountable

Four-wire DC, solid-state PNP + NPN NO/NC programmable output

Characteristics

Sensor type		XS●M●●KP340D	XS●M●●KP340
Product certifications		UL, CSA, CE	
Connection		M12 connector	Pre-cabled, length: 2 m
Operating zone	Ø 12 flush mountable	mm	0...1.6
	Ø 12 non flush mountable	mm	0...3.2
	Ø 18 flush mountable	mm	0...4
	Ø 18 non flush mountable	mm	0...6.4
	Ø 30 flush mountable	mm	0...8
	Ø 30 non flush mountable	mm	0...12
Differential travel		%	1...15 of effective sensing distance (Sr)
Degree of protection		Conforming to IEC 60529	IP 67 IP 68, double insulation
Storage temperature		°C	-40...+85
Operating temperature		°C	-25...+70
Materials	Case	Nickel plated brass for XS1M and XS2M, PPS for XS4P	
	Cable	-	PvR 4 x 0.34 mm ²
Vibration resistance		Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)
Shock resistance		Conforming to IEC 60068-2-27	50 gn, duration 11 ms
Output state indication		Yellow LED, 4 viewing ports at 90° Yellow LED, annular	
Rated supply voltage		V	--- 12...24 with protection against reverse polarity
Voltage limits (including ripple)		V	--- 10...36
Switching capacity		mA	≤ 200 with overload and short-circuit protection
Voltage drop, closed state		V	≤ 2.6
Current consumption, no-load		mA	≤ 10
Maximum switching frequency	Ø 12	Hz	5000
	Ø 18	Hz	2000
	Ø 30 flush mountable	Hz	1000
	Ø 30 non flush mountable	Hz	1000
	Delays	First-up	ms
	Response	ms	≤ 0.1 for Ø 12, ≤ 0.15 for Ø 18, ≤ 0.3 for Ø 30
	Recovery	ms	≤ 0.1 for Ø 12, ≤ 0.35 for Ø 18, ≤ 0.7 for Ø 30

Wiring schemes

M12 connector	Pre-cabled	PNP + NPN
	BU: Blue BN: Brown BK: Black WH: White	4-wire programmable, NO or NC output
		PNP
		NPN

Setting-up

Sensor	Minimum mounting distances (mm)			
	Side by side	Face to face	Facing a metal object	Mounted in a metal support
Ø 12 flush mountable XS1M12	e ≥ 4	e ≥ 24	e ≥ 6	d ≥ 12 h ≥ 0
Ø 12 non flush mountable XS2M12 and XS4P12	e ≥ 16	e ≥ 48	e ≥ 12	d ≥ 36 h ≥ 8
Ø 18 flush mountable XS1M18	e ≥ 10	e ≥ 60	e ≥ 15	d ≥ 18 h ≥ 0
Ø 18 non flush mountable XS2M18 and XS4P18	e ≥ 16	e ≥ 96	e ≥ 24	d ≥ 54 h ≥ 16
Ø 30 flush mountable XS1M30	e ≥ 20	e ≥ 120	e ≥ 30	d ≥ 30 h ≥ 0
Ø 30 non flush mountable XS2M30 and XS4P30	e ≥ 60	e ≥ 180	e ≥ 45	d ≥ 90 h ≥ 30

Dimensions

Sensor	Flush mountable in metal				Non flush mountable in metal				
	Pre-cabled		Connector		Pre-cabled		Connector		c
	a	b	a	b	a	b	a	b	
Ø 12 metal	54	42	61	42	55	42	66	42	5
Ø 12 plastic	-	-	-	-	54	42	61	43	0
Ø 18 metal	60	51	72	51	60	44	72	44	8
Ø 18 plastic	-	-	-	-	60	51	70	51	0
Ø 30 metal	60	51	72	51	63	41	75	41	13
Ø 30 plastic	-	-	-	-	60	51	70	51	0

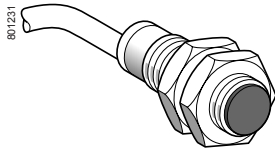
Inductive proximity sensors

OsiSense XS, general purpose

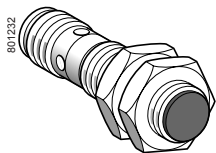
Plastic, cylindrical, non flush mountable

Two-wire AC or DC

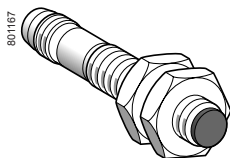
Three-wire DC, solid-state output



XS4P●●●●340
XS4P●●●●370
XS4P●●●●230



XS4P●●●●340D
XS4P●●●●370D
XS4P●●●●230K



XS4P08●●●340S

Sensing dist. (Sn) mm	Function	Output	Connection	Reference	Weight kg
Ø 8, threaded M8 x 1					
Three-wire ∴ 12-24 V					
2.5	NO	PNP	Pre-cabled (L = 2 m) (1) (2)	XS4P08PA340	0.025
		NPN	Pre-cabled (L = 2 m) (1) (2)	XS4P08NA340	0.025
	NC	PNP	Pre-cabled (L = 2 m) (1) (2)	XS4P08PB340	0.025
		NPN	Pre-cabled (L = 2 m) (1) (2)	XS4P08NB340	0.025
Three-wire ∴ 12-48 V					
2.5	NO	PNP	Pre-cabled (L = 2 m) (1)	XS4P08PA370	0.030
		NPN	Pre-cabled (L = 2 m)	XS4P08NA370	0.030
	NC	PNP	Pre-cabled (L = 2 m)	XS4P08PB370	0.030
		NPN	Pre-cabled (L = 2 m)	XS4P08NB370	0.030
Two-wire ~ or ∴ 24-240 V					
2.5	NO		Pre-cabled (L = 2 m) (1)	XS4P08MA230	0.030
			1/2"-20UNF connector	XS4P08MA230K	0.020
	NC		Pre-cabled (L = 2 m) (1)	XS4P08MB230	0.030
			1/2"-20UNF connector	XS4P08MB230K	0.020
Ø 12, threaded M12 x 1					
Three-wire ∴ 12-24 V					
4	NO	PNP	Pre-cabled (L = 2 m) (1) (3)	XS4P12PA340	0.060
		NPN	Pre-cabled (L = 2 m) (1) (3)	XS4P12NA340	0.060
	NC	PNP	Pre-cabled (L = 2 m) (1) (3)	XS4P12PB340	0.060
		NPN	Pre-cabled (L = 2 m) (1) (3)	XS4P12NB340	0.060
Three-wire ∴ 12-48 V					
4	NO	PNP	Pre-cabled (L = 2 m) (1) (3)	XS4P12PA370	0.065
		NPN	Pre-cabled (L = 2 m) (1) (3)	XS4P12NA370	0.065
	NC	PNP	Pre-cabled (L = 2 m) (1) (3)	XS4P12PB370	0.065
		NPN	Pre-cabled (L = 2 m) (3)	XS4P12NB370	0.065
Two-wire ~ or ∴ 24-240 V					
4	NO		Pre-cabled (L = 2 m) (1)	XS4P12MA230	0.065
			1/2"-20UNF connector	XS4P12MA230K	0.030
	NC		Pre-cabled (L = 2 m) (1)	XS4P12MB230	0.065
			1/2"-20UNF connector	XS4P12MB230K	0.030
Ø 18, threaded M18 x 1					
Three-wire ∴ 12-24 V					
8	NO	PNP	Pre-cabled (L = 2 m) (1) (3)	XS4P18PA340	0.090
		NPN	Pre-cabled (L = 2 m) (1) (3)	XS4P18NA340	0.090
	NC	PNP	Pre-cabled (L = 2 m) (1) (3)	XS4P18PB340	0.090
		NPN	Pre-cabled (L = 2 m) (1) (3)	XS4P18NB340	0.090
Three-wire ∴ 12-48 V					
8	NO	PNP	Pre-cabled (L = 2 m) (1) (3)	XS4P18PA370	0.100
		NPN	Pre-cabled (L = 2 m) (1) (3)	XS4P18NA370	0.100
	NC	PNP	Pre-cabled (L = 2 m) (1) (3)	XS4P18PB370	0.100
		NPN	Pre-cabled (L = 2 m) (3)	XS4P18NB370	0.100
Two-wire ~ or ∴ 24-240 V					
8	NO		Pre-cabled (L = 2 m) (1)	XS4P18MA230	0.100
			1/2"-20UNF connector	XS4P18MA230K	0.040
	NC		Pre-cabled (L = 2 m) (1)	XS4P18MB230	0.100
			1/2"-20UNF connector	XS4P18MB230K	0.040
Ø 30, threaded M30 x 1.5					
Three-wire ∴ 12-24 V					
15	NO	PNP	Pre-cabled (L = 2 m) (1) (3)	XS4P30PA340	0.120
		NPN	Pre-cabled (L = 2 m) (1) (3)	XS4P30NA340	0.120
	NC	PNP	Pre-cabled (L = 2 m) (1) (3)	XS4P30PB340	0.120
		NPN	Pre-cabled (L = 2 m) (1) (3)	XS4P30NB340	0.120
Three-wire ∴ 12-48 V					
15	NO	PNP	Pre-cabled (L = 2 m) (1) (3)	XS4P30PA370	0.140
		NPN	Pre-cabled (L = 2 m) (1) (3)	XS4P30NA370	0.140
	NC	PNP	Pre-cabled (L = 2 m) (3)	XS4P30PB370	0.140
		NPN	Pre-cabled (L = 2 m) (3)	XS4P30NB370	0.140
Two-wire ~ or ∴					
15	NO		Pre-cabled (L = 2 m) (1)	XS4P30MA230	0.140
			1/2"-20UNF connector	XS4P30MA230K	0.080
	NC		Pre-cabled (L = 2 m) (1)	XS4P30MB230	0.140
			1/2"-20UNF connector	XS4P30MB230K	0.080

(1) For a 5 m long cable add L1 to the reference; for a 10 m long cable add L2 to the reference. Example: **XS4P08PA340** becomes **XS4P08PA340L1** with a 5 m long cable.

(2) For an M8 connector, add S to the reference. Example: **XS4P08PA340** becomes **XS4P08PA340S** with an M8 connector.

(3) For an M12 connector, add D to the reference. Example: **XS4P12PA370** becomes **XS4P12PA370D** with an M12 connector.

Inductive proximity sensors

OsiSense XS, general purpose

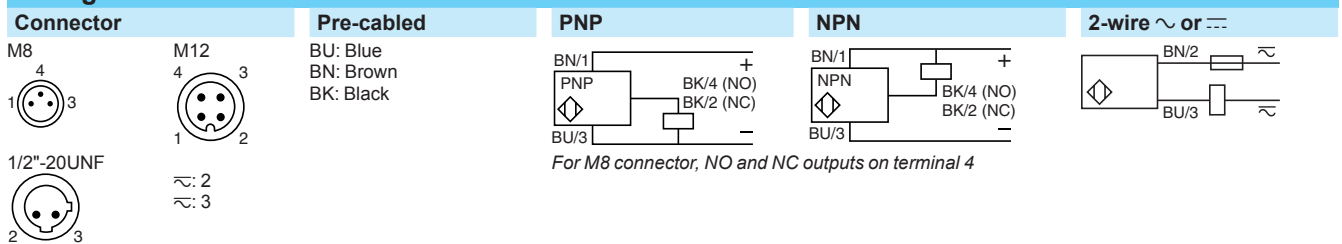
Plastic, cylindrical, non flush mountable

Two-wire AC or DC

Three-wire DC, solid-state output

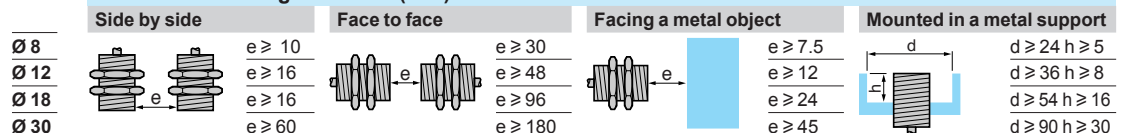
Characteristics		XS4P●●●●340●	XS4P●●●●370●	XS4P●●M●230●
Sensor type		UL, CSA, CE, ECOLAB		
Product certifications		UL, CSA, CE, ECOLAB		
Connection	Pre-cabled	Length: 2 m		
	Connector	M8 on Ø 8 M12 on Ø 12, Ø 18 and Ø 30	1/2"-20UNF	
Operating zone	Ø 6.5 and Ø 8	mm	0...2	
	Ø 12	mm	0...3.2	
	Ø 18	mm	0...6.4	
	Ø 30	mm	0...12	
Differential travel		%		
Degree of protection		Conforming to IEC 60529		
Storage temperature		°C		
Operating temperature		°C		
Materials	Case	PPS		
	Cable	PvR 3 x 0.34 mm ² except Ø 6.5 and 8: 3 x 0.11 mm ²		PvR 2 x 0.34 mm ² except Ø 8: 2 x 0.11 mm ²
Vibration resistance		Conforming to IEC 60068-2-6		
Shock resistance		Conforming to IEC 60068-2-27		
Output state indication		Yellow LED: annular on pre-cabled version Yellow LED: 4 viewing ports at 90° on connector version		
Rated supply voltage		V	~ 12...24 with protection against reverse polarity	~ 12...48 with protection against reverse polarity ~ or ~ 24...240 (50/60 Hz)
Voltage limits (including ripple)		V	~ 10...36	~ 10...58 ~ or ~ 20...264
Switching capacity		mA	≤ 200 with overload and short-circuit protection	
Voltage drop, closed state		V	≤ 2	
Residual current, open state		mA	-	
Current consumption, no-load		mA	≤ 10	
Maximum switching frequency	Ø 6.5, Ø 8 and Ø 12	Hz	5000	
	Ø 18	Hz	2000	
	Ø 30	Hz	1000	
Delays	First-up	ms	≤ 10	
	Response	ms	≤ 0.1 for Ø 8 and Ø 12, ≤ 0.15 for Ø 18, ≤ 0.3 for Ø 30	
	Recovery	ms	≤ 0.1 for Ø 8 and Ø 12, ≤ 0.35 for Ø 18, ≤ 0.7 for Ø 30	

Wiring schemes



Setting-up

Minimum mounting distances (mm)



Dimensions

XS4P	3-wire ~ 12-24 V				3-wire ~ 12-48 V or 2-wire ~ 24-240 V			
	Pre-cabled (mm)		Connector (mm)		Pre-cabled (mm)		Connector (mm)	
	a	b	a	b	a	b	a	b
Ø 8	33	26	42	26	50	42	61	40
Ø 12	35	25	48	27	54	42	61	42
Ø 18	36	25	48	29	62	52	70	52
Ø 30	43	32	50	34	62	52	70	52

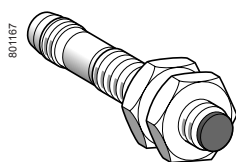
Inductive proximity sensors

OsiSense XS, general purpose

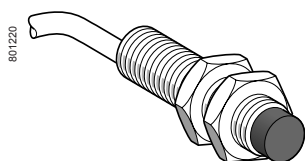
Basic, cylindrical, metal, flush and non flush mountable

Three-wire DC, solid-state output

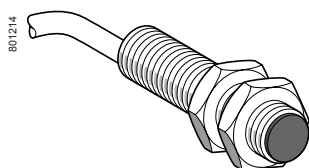
Sensing distance (Sn)	Function	Output	Connection	Reference	Weight
					kg
mm					
Ø 8, threaded M8 x 1					
Three-wire 12-24 V, flush mountable					
1.5	NO	PNP	Pre-cabled (L = 2 m)	XS108BLPAL2	0.035
			Pre-cabled (L = 5 m)	XS108BLPAL5	0.105
			M8 connector	XS108BLPAM8	0.008
	NPN	PNP	M12 connector	XS108BLPAM12	0.015
			Pre-cabled (L = 2 m)	XS108BLNAL2	0.035
			M12 connector	XS108BLNAM12	0.015
Three-wire 12-24 V, non flush mountable					
2.5	NO	PNP	Pre-cabled (L = 2 m)	XS208BLPAL2	0.035
			Pre-cabled (L = 5 m)	XS208BLPAL5	0.105
			M8 connector	XS208BLPAM8	0.008
	NPN	PNP	M12 connector	XS208BLPAM12	0.015
			Pre-cabled (L = 2 m)	XS208BLNAL2	0.035
			M12 connector	XS208BLNAM12	0.015
Ø 12, threaded M12 x 1					
Three-wire 12-24 V, flush mountable					
2	NO	PNP	Pre-cabled (L = 2 m)	XS112BLPAL2	0.070
			Pre-cabled (L = 3 m)	XS112BLPAL3	0.095
			Pre-cabled (L = 5 m)	XS112BLPAL5	0.140
	NPN	PNP	M12 connector	XS112BLPAM12	0.015
			Pre-cabled (L = 2 m)	XS112BLNAL2	0.070
			M12 connector	XS112BLNAM12	0.015
NC	PNP	Pre-cabled (L = 2 m)	XS112BLPBL2	0.070	
		M12 connector	XS112BLPBM12	0.015	
Three-wire 12-24 V, non flush mountable					
4	NO	PNP	Pre-cabled (L = 2 m)	XS212BLPAL2	0.070
			Pre-cabled (L = 5 m)	XS212BLPAL5	0.140
			M12 connector	XS212BLPAM12	0.015
	NPN	PNP	Pre-cabled (L = 2 m)	XS212BLNAL2	0.070
			Pre-cabled (L = 7 m)	XS212BLNAL7	0.185
			M12 connector	XS212BLNAM12	0.015
NC	PNP	Pre-cabled (L = 2 m)	XS212BLPBL2	0.070	
		Pre-cabled (L = 5 m)	XS212BLPBL5	0.140	
		Pre-cabled (L = 2 m)	XS212BLNBL2	0.070	



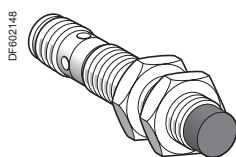
XS108BLPAM8



XS208BLAL



XS112BL



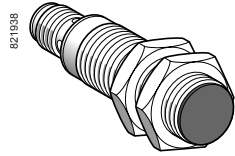
XS212BLAM12

Inductive proximity sensors

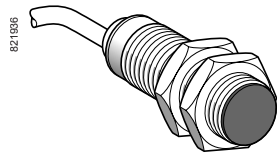
OsiSense XS, general purpose

Basic, cylindrical, metal, flush and non flush mountable

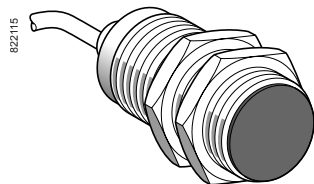
Three-wire DC, solid-state output



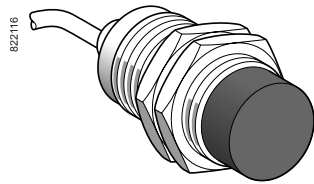
XS118BL●●M12



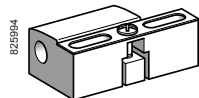
XS118BL●●L2●



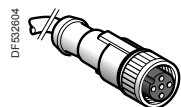
XS130BL●●L●



XS230BL●●L●



XSZB1●●



XZCPV1141L●●

Sensing distance (Sn)	Function	Output	Connection	Reference	Weight
mm					kg
Ø 18, threaded M18 x 1					
Three-wire --- 12-24 V, flush mountable					
5	NO	PNP	Pre-cabled (L = 2 m)	XS118BLPAL2	0.105
			Pre-cabled (L = 5 m)	XS118BLPAL5	0.175
			M12 connector	XS118BLPAM12	0.035
	NPN	Pre-cabled (L = 2 m)	XS118BLNAL2	0.105	
		Pre-cabled (L = 5 m)	XS118BLNAL5	0.175	
		M12 connector	XS118BLNAM12	0.035	
NC	PNP	Pre-cabled (L = 2 m)	XS118BLPBL2	0.105	
		M12 connector	XS118BLPBM12	0.035	

Three-wire --- 12-24 V, non flush mountable						
8	NO	PNP	Pre-cabled (L = 2 m)	XS218BLPAL2	0.105	
			Pre-cabled (L = 5 m)	XS218BLPAL5	0.175	
			M12 connector	XS218BLPAM12	0.035	
	NPN	Pre-cabled (L = 2 m)	XS218BLNAL2	0.105		
		Pre-cabled (L = 5 m)	XS218BLNAL5	0.175		
		Pre-cabled (L = 7 m)	XS218BLNAL7	0.220		
	NC	PNP	M12 connector	XS218BLNAM12	0.035	
			Pre-cabled (L = 2 m)	XS218BLPBL2	0.105	
			NPN	Pre-cabled (L = 2 m)	XS218BLNBL2	0.105

Ø 30, threaded M30 x 1.5					
Three-wire --- 12-24 V, flush mountable					
10	NO	PNP	Pre-cabled (L = 2 m)	XS130BLPAL2	0.165
			M12 connector	XS130BLPAM12	0.075
			NPN	Pre-cabled (L = 2 m)	XS130BLNAL2
	NC	PNP	Pre-cabled (L = 3 m)	XS130BLNAL3	0.190
			M12 connector	XS130BLNAM12	0.075
			Pre-cabled (L = 2 m)	XS130BLPBL2	0.165
			M12 connector	XS130BLPBM12	0.075

Three-wire --- 12-24 V, non flush mountable					
15	NO	PNP	Pre-cabled (L = 2 m)	XS230BLPAL2	0.155
			Pre-cabled (L = 5 m)	XS230BLPAL5	0.225
			M12 connector	XS230BLPAM12	0.085
	NPN	Pre-cabled (L = 2 m)	XS230BLNAL2	0.155	
		Pre-cabled (L = 7 m)	XS230BLNAL7	0.225	
		M12 connector	XS230BLNAM12	0.085	
NC	PNP	Pre-cabled (L = 2 m)	XS230BLPBL2	0.155	

Fixing accessories (1)			
Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 8	XSZB108	0.006
	Ø 12	XSZB112	0.006
	Ø 18	XSZB118	0.010
	Ø 30	XSZB130	0.020

Cabling accessories			
Description	Length of cable m	Reference	Weight kg
Pre-wired connectors female straight	5	XZCPV1141L5	0.210
M12 connector, 4 pins PVC cable	10	XZCPV1141L10	0.390

(1) For further information, see page 3/116.

Inductive proximity sensors

OsiSense XS, general purpose

Basic, cylindrical, metal, flush and non flush mountable

Three-wire DC, solid-state output

3

Characteristics			XS1●●BLP●L● XS1●●BLN●L●	XS1●●BLP●M● XS1●●BLN●M●	XS2●●BLP●L XS2●●BLN●L	XS2●●BLP●M● XS2●●BLN●M●	
Sensor type			UL, CSA, CE				
Product certifications	Connection	Pre-cabled	Length 2, 3 or 5 m, depending on model		Length 2, 5 or 7 m, depending on model	–	
	Connector		–	M8 on Ø 8 M12 on Ø 8, Ø 12, Ø 18 and Ø 30	–	M8 on Ø 8 M12 on Ø 8, Ø 12, Ø 18 and Ø 30	
Operating zone (1)	Ø 8	mm	0...1.2		0...2		
	Ø 12	mm	0...1.6		0...3.2		
	Ø 18	mm	0...4		0...6.4		
	Ø 30	mm	0...8		0...12		
Differential travel		%	1...15 of effective sensing distance (Sr)				
Degree of protection		Conforming to IEC 60529	IP 65 and IP 67				
Storage temperature		°C	- 40...+ 85				
Operating temperature		°C	- 25...+ 70				
Materials	Case		Nickel plated brass				
	Cable		PVC 3 x 0.14 mm ² except Ø 8 : 3 x 0.11 mm ²	–	PVC 3 x 0.14 mm ² except Ø 8 : 3 x 0.11 mm ²	–	
Vibration resistance		Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)				
Shock resistance		Conforming to IEC 60068-2-27	50 gn, duration 11 ms				
Output state indication			Yellow LED, on rear	Yellow LED: 2 viewing ports at 180°	Yellow LED, on rear	Yellow LED: 2 viewing ports at 180°	
Rated supply voltage		V	12...24 with protection against reverse polarity				
Voltage limits (including ripple)		V	10...36				
Switching capacity		mA	≤ 200 (except Ø 8: ≤ 50) with overload and short-circuit protection (2)				
Voltage drop, closed state		V	≤ 2				
Current consumption, no-load		mA	≤ 10				
Residual current, open state		mA	–				
Maximum switching frequency	Ø 8	Hz	1000		1000		
	Ø 12	Hz	2500		1200		
	Ø 18	Hz	1200		500		
	Ø 30	Hz	500		300		
Delays	First-up		ms		≤ 15		
		Response	Ø 8	ms	≤ 5		
	Recovery	Ø 12	ms	≤ 0.1		≤ 0.1	
		Ø 18	ms	≤ 0.1		≤ 0.1	
		Ø 30	ms	≤ 0.1		≤ 0.2	
		Ø 8	ms	≤ 0.3		≤ 0.3	
		Ø 12	ms	≤ 0.15		≤ 0.4	
		Ø 18	ms	≤ 0.3		≤ 1	
Ø 30	ms	≤ 1		≤ 1.4			

Wiring schemes

Connector	Pre-cabled	PNP	NPN
M8	BU: Blue BN: Brown BK: Black		
M12			

(1) Detection curves, see page 3/120.

(2) These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a 0.4 A "quick-blow" fuse in series with the load, see page 3/116.

Inductive proximity sensors

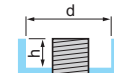
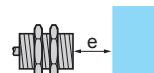
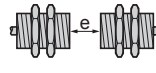
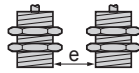
OsiSense XS, general purpose

Basic, cylindrical, metal, flush and non flush mountable

Three-wire DC, solid-state output

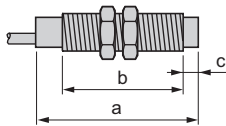
Setting-up

Minimum mounting distances (mm)



Sensors		Side by side	Face to face	Facing a metal object	Mounted in a metal support
Ø 8 flush mountable	XS108	$e \geq 3$	$e \geq 18$	$e \geq 4.5$	$d \geq 8$ $h \geq 0$
Ø 8 non flush mountable	XS208	$e \geq 10$	$e \geq 30$	$e \geq 7.5$	$d \geq 24$ $h \geq 5$
Ø 12 flush mountable	XS112	$e \geq 4$	$e \geq 24$	$e \geq 6$	$d \geq 12$ $h \geq 0$
Ø 12 non flush mountable	XS212	$e \geq 16$	$e \geq 48$	$e \geq 12$	$d \geq 36$ $h \geq 8$
Ø 18 flush mountable	XS118	$e \geq 10$	$e \geq 60$	$e \geq 15$	$d \geq 18$ $h \geq 0$
Ø 18 non flush mountable	XS218	$e \geq 16$	$e \geq 96$	$e \geq 24$	$d \geq 54$ $h \geq 16$
Ø 30 flush mountable	XS130	$e \geq 20$	$e \geq 120$	$e \geq 30$	$d \geq 30$ $h \geq 0$
Ø 30 non flush mountable	XS230	$e \geq 60$	$e \geq 180$	$e \geq 45$	$d \geq 90$ $h \geq 30$

Dimensions



Sensors		Flush mountable in metal					
		Pre-cabled (mm)		M8 connector (mm)		M12 connector (mm)	
		a	b	a	b	a	b
Ø 8	XS108	42	40	53	42	62	39
Ø 12	XS112	44	31	-	-	55	34
Ø 18	XS118	53	41	-	-	64	43
Ø 30	XS130	57	44	-	-	68	47

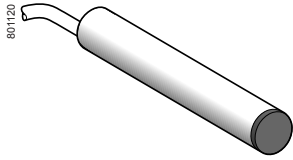
Sensors		Non flush mountable in metal								
		Pre-cabled (mm)			M8 connector (mm)			M12 connector (mm)		
		a	b	c	a	b	c	a	b	c
Ø 8	XS208	42	36	4	53	38	4	62	36	4
Ø 12	XS212	44	26	5	-	-	-	55	29	5
Ø 18	XS218	53	33	8	-	-	-	64	35	8
Ø 30	XS230	57	32	13	-	-	-	68	34	13

Inductive proximity sensors

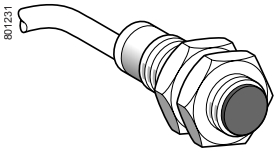
OsiSense XS, general purpose

Cylindrical, almost flush mountable, increased range

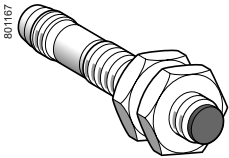
Three-wire DC, solid-state output



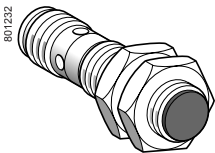
XS1L06●A349



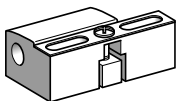
XS1N●●●●349



XS1N08●●349S



XS1N●●●●349D



XSZB1●●

Sensing distance (Sn) (mm)	Function	Output	Connection	Reference	Weight kg
Ø 6.5, plain					
2.5	NO	PNP	Pre-cabled (L = 2 m)	XS1L06PA349	0.025
			M8 connector	XS1L06PA349S	0.010
			M12 connector	XS1L06PA349D	0.015
	NPN	PNP	Pre-cabled (L = 2 m)	XS1L06NA349	0.025
			M8 connector	XS1L06NA349S	0.010
			M12 connector	XS1L06NA349D	0.015
NC	PNP	Pre-cabled (L = 2 m)	XS1L06PB349	0.025	
		M8 connector	XS1L06PB349S	0.010	
		M12 connector	XS1L06PB349D	0.015	
	NPN	PNP	Pre-cabled (L = 2 m)	XS1L06NB349	0.025
			M8 connector	XS1L06NB349S	0.010
			M12 connector	XS1L06NB349D	0.015

Ø 8, threaded M8 x 1

2.5	NO	PNP	Pre-cabled (L = 2 m)	XS1N08PA349	0.035		
			M8 connector	XS1N08PA349S	0.015		
			M12 connector	XS1N08PA349D	0.020		
			NPN	PNP	Pre-cabled (L = 2 m)	XS1N08NA349	0.035
					M8 connector	XS1N08NA349S	0.015
					M12 connector	XS1N08NA349D	0.020
	NC	PNP	Pre-cabled (L = 2 m)	XS1N08PB349	0.035		
			M8 connector	XS1N08PB349S	0.015		
			M12 connector	XS1N08PB349D	0.020		
			NPN	PNP	Pre-cabled (L = 2 m)	XS1N08NB349	0.035
					M8 connector	XS1N08NB349S	0.015
					M12 connector	XS1N08NB349D	0.020

Ø 12, threaded M12 x 1

4	NO	PNP	Pre-cabled (L = 2 m)	XS1N12PA349	0.070		
			M12 connector	XS1N12PA349D	0.020		
			NPN	PNP	Pre-cabled (L = 2 m)	XS1N12NA349	0.070
					M12 connector	XS1N12NA349D	0.020
					NC	PNP	Pre-cabled (L = 2 m)
			M12 connector	XS1N12PB349D			0.020
	NPN	PNP	Pre-cabled (L = 2 m)	XS1N12NB349			0.070
			M12 connector	XS1N12NB349D			0.020

Ø 18, threaded M18 x 1

10	NO	PNP	Pre-cabled (L = 2 m)	XS1N18PA349	0.100		
			M12 connector	XS1N18PA349D	0.040		
			NPN	PNP	Pre-cabled (L = 2 m)	XS1N18NA349	0.100
					M12 connector	XS1N18NA349D	0.040
					NC	PNP	Pre-cabled (L = 2 m)
			M12 connector	XS1N18PB349D			0.040
	NPN	PNP	Pre-cabled (L = 2 m)	XS1N18NB349			0.100
			M12 connector	XS1N18NB349D			0.040

Ø 30, threaded M30 x 1.5

20	NO	PNP	Pre-cabled (L = 2 m)	XS1N30PA349	0.160		
			M12 connector	XS1N30PA349D	0.100		
			NPN	PNP	Pre-cabled (L = 2 m)	XS1N30NA349	0.160
					M12 connector	XS1N30NA349D	0.100
					NC	PNP	Pre-cabled (L = 2 m)
			M12 connector	XS1N30PB349D			0.100
	NPN	PNP	Pre-cabled (L = 2 m)	XS1N30NB349			0.160
			M12 connector	XS1N30NB349D			0.100

Accessories (1)

Description mm	Reference	Weight kg	
Fixing clamps	Ø 6.5 (plain)	XSZB165	0.005
	Ø 8	XSZB108	0.006
	Ø 12	XSZB112	0.006
	Ø 18	XSZB118	0.010
	Ø 30	XSZB130	0.020

(1) For further information, see page 3/116.

Characteristics		XS1.....349D	XS1.....349S	XS1.....349
Sensor type				
Product certifications		UL, CSA, CE		
Connection		M12 connector	M8 connector	Pre-cabled, length: 2 m
Operating zone	Ø 6.5 and Ø 8	mm	0...2	
	Ø 12	mm	0...3.2	
	Ø 18	mm	0...8	
	Ø 30	mm	0...16	
Differential travel		%	1...15 of effective sensing distance (Sr)	
Degree of protection	Conforming to IEC 60529		IP 67	IP 68, double insulation (except Ø 6.5 and Ø 8: IP 67)
	Conforming to DIN 40050		IP 69K for Ø 12 to Ø 30	
Storage temperature		°C	-40...+85	
Operating temperature		°C	-25...+70	
Materials	Case		Nickel plated brass	
	Cable		-	PvR 3 x 0.34 mm ² except Ø 6.5 and 8: 3 x 0.11 mm ²
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms	
Output state indication			Yellow LED, 4 viewing ports at 90°	Yellow LED, annular
Rated supply voltage		V	12...24 with protection against reverse polarity	
Voltage limits (including ripple)		V	10...36	
Switching capacity		mA	≤ 200 with overload and short-circuit protection	
Voltage drop, closed state		V	≤ 2	
Current consumption, no-load		mA	≤ 10	
Maximum switching frequency	Ø 6.5, Ø 8 and Ø 12	Hz	2500	
	Ø 18	Hz	1000	
	Ø 30	Hz	500	
Delays	First-up	ms	≤ 5	
	Response	ms	≤ 0.2 for Ø 8 and Ø 12, ≤ 0.3 for Ø 18, ≤ 0.6 for Ø 30	
	Recovery	ms	≤ 0.2 for Ø 8 and Ø 12, ≤ 0.7 for Ø 18, ≤ 1.4 for Ø 30	

Wiring schemes

Connector	Pre-cabled	PNP 3-wire	NPN 3-wire
M8			
M12			
	BU: Blue BN: Brown BK: Black		

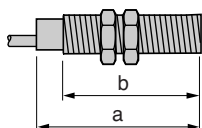
For M8 connector, NO and NC outputs on terminal 4

Setting-up precautions

Sensor	Minimum mounting distances (mm)			
	Side by side	Face to face	Facing a metal object	Mounted in a metal support
Ø 6.5	e ≥ 5	e ≥ 30	e ≥ 7.5	d ≥ 10 h ≥ 1.6
Ø 8	e ≥ 5	e ≥ 30	e ≥ 7.5	d ≥ 10 h ≥ 1.6
Ø 12	e ≥ 8	e ≥ 48	e ≥ 12	d ≥ 14 h ≥ 2.4
Ø 18	e ≥ 20	e ≥ 96	e ≥ 30	d ≥ 28 h ≥ 3.6
Ø 30	e ≥ 40	e ≥ 240	e ≥ 60	d ≥ 50 h ≥ 6

Dimensions

Sensor	Flush mountable in metal					
	Pre-cabled		M8 connector		M12 connector	
	a	b	a	b	a	b
Ø 6.5	33	-	42	-	45	-
Ø 8	33	25	42	26	45	23
Ø 12	35	25	-	-	50	30
Ø 18	39	28	-	-	50	28
Ø 30	43	32	-	-	55	32

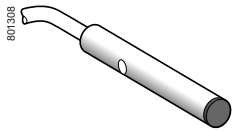


Inductive proximity sensors

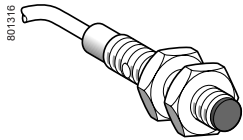
OsiSense XS, general purpose

Miniature, cylindrical, flush and non flush mountable

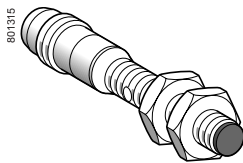
Three-wire DC, solid-state output



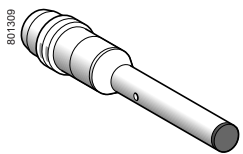
XS1L04●●310



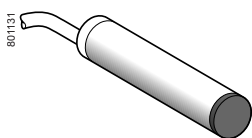
XS1N05●●310



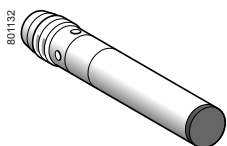
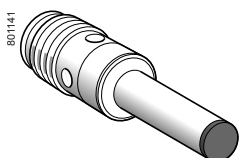
XS1N05●●311S



XS1L04●●310S



XS●L06●●340

XS●L06●●340S
XS●L06●●349S

XS●L06●●340D

Ø 4 plain ⁽¹⁾

Sensing distance (Sn) mm	Function	Output	Connection ⁽²⁾	Reference	Weight kg
Brass case, flush mountable					
1	NO	PNP	Pre-cabled (L = 2 m)	XS1L04PA310	0,025
			M8 connector	XS1L04PA310S	0,010
	NPN	PNP	Pre-cabled (L = 2 m)	XS1L04NA310	0,025
			M8 connector	XS1L04NA310S	0,010
	NC	PNP	Pre-cabled (L = 2 m)	XS1L04PB310	0,025
			M8 connector	XS1L04PB310S	0,010
NPN	PNP	Pre-cabled (L = 2 m)	XS1L04NB310	0,025	
		M8 connector	XS1L04NB310S	0,010	

Stainless steel case, flush mountable

0,8	NO	PNP	Pre-cabled (L = 2 m)	XS1L04PA311	0,025
			M8 connector	XS1L04PA311S	0,010
	NPN	PNP	Pre-cabled (L = 2 m)	XS1L04NA311	0,025
			M8 connector	XS1L04NA311S	0,010
	NC	PNP	Pre-cabled (L = 2 m)	XS1L04PB311	0,025
			M8 connector	XS1L04PB311S	0,010
NPN	PNP	Pre-cabled (L = 2 m)	XS1L04NB311	0,025	
		M8 connector	XS1L04NB311S	0,010	

Ø 5, threaded M5 x 0.5 ⁽¹⁾

Sensing distance (Sn) mm	Function	Output	Connection ⁽²⁾	Reference	Weight kg
Brass case, flush mountable					
1	NO	PNP	Pre-cabled (L = 2 m)	XS1N05PA310	0,030
			NPN	Pre-cabled (L = 2 m)	XS1N05NA310
	NC	PNP	Pre-cabled (L = 2 m)	XS1N05PB310	0,030
			NPN	Pre-cabled (L = 2 m)	XS1N05NB310

Stainless steel case, flush mountable

0,8	NO	PNP	Pre-cabled (L = 2 m)	XS1N05PA311	0,030
			M8 connector	XS1N05PA311S	0,015
	NPN	PNP	Pre-cabled (L = 2 m)	XS1N05NA311	0,030
			M8 connector	XS1N05NA311S	0,015
	NC	PNP	Pre-cabled (L = 2 m)	XS1N05PB311	0,030
			M8 connector	XS1N05PB311S	0,015
NPN	PNP	Pre-cabled (L = 2 m)	XS1N05NB311	0,030	
		M8 connector	XS1N05NB311S	0,015	

Ø 6.5 plain ⁽¹⁾

Sensing distance (Sn) mm	Function	Output	Connection ⁽²⁾	Reference	Weight kg	
Stainless steel case, non flush mountable						
2,5	NO	PNP	Pre-cabled (L = 2 m)	XS2L06PA340	0,025	
			M8 connector	XS2L06PA340S	0,010	
			M12 connector	XS2L06PA340D	0,015	
			NPN	Pre-cabled (L = 2 m)	XS2L06NA340	0,025
				M8 connector	XS2L06NA340S	0,010
				M12 connector	XS2L06NA340D	0,015
	NC	PNP	Pre-cabled (L = 2 m)	XS2L06PB340	0,025	
			M8 connector	XS2L06PB340S	0,010	
			M12 connector	XS2L06PB340D	0,015	
			NPN	Pre-cabled (L = 2 m)	XS2L06NB340	0,025
				M8 connector	XS2L06NB340S	0,010
				M12 connector	XS2L06NB340D	0,015

(1) For accessories, see page 3/116.

(2) For a 5 m long cable add **L1** to the reference; for a 10 m long cable add **L2** to the reference.
Example: **XS1L04PA310** becomes **XS1L04PA310L1** with a 5 m long cable.

Inductive proximity sensors

OsiSense XS, general purpose

Miniature, cylindrical, flush and non flush mountable

Three-wire DC, solid-state output

Characteristics		XS1●●●●●●S, XS1●●●●●●D, XS2L06●A340●		XS1●●●●●●, XS2L06●A340	
Sensor type					
Product certifications		UL, CSA, CE			
Connection (1)	Connector	M8 on XS1●●●●●●S and M12 on XS1●●●●●●D		-	
	Pre-cabled	-		Length: 2 m	
Operating zone	∅ 4	mm	0...0.8 (brass), 0...0.6 (stainless steel)		
	∅ 5	mm	0...0.8 (brass), 0...0.6 (stainless steel)		
	∅ 6.5 non flush mountable	mm	0...2 (stainless steel)		
Degree of protection	Conforming to IEC 60529	IP 67			
Storage temperature		°C	- 40...+ 85		
Operating temperature		°C	- 25...+ 70		
Materials	Case	Nickel plated brass or stainless steel 303			
	Cable	PvR 3 x 0.11 mm ² or 4 x 0.08 mm ²			
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)			
Shock resistance	Conforming to IEC 60068-2-27	50 gn, duration 11 ms			
Output state indication		Yellow LED, 4 viewing ports at 90°		Yellow LED, annular	
Rated supply voltage		V	--- 5...24 for XS1L04●●●●●● and XS1N05●●●●●● --- 12...24 for XS2L06●●●●●●		
Voltage limits (including ripple)		V	--- 5...30 for XS1L04●●●●●● and XS1N05●●●●●● --- 10...38 for XS2L06●●●●●●		
Current consumption, no-load		mA	≤ 10		
Switching capacity	3-wire PNP/NPN	mA	≤ 100 with overload and short-circuit protection ≤ 200 for XS2L06 with overload and short-circuit protection		
Voltage drop, closed state		V	≤ 2		
Maximum switching frequency		kHz	5		
Delays	First-up	ms	≤ 5		
	Response	ms	≤ 0.1		
	Recovery	ms	≤ 0.1		

(1) Detection curves, see page 3/120

Wiring schemes

Connector	Pre-cabled	PNP 3-wire	NPN 3-wire
	BU: Blue BN: Brown BK: Black WH: White		

For M8 connector, NO and NC outputs on terminal 4.

Setting-up

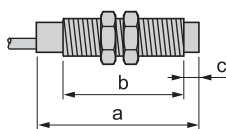
Sensor	Side by side	Face to face	Facing a metal object
∅ 4	e ≥ 2	e ≥ 12	e ≥ 3
∅ 5	e ≥ 2	e ≥ 12	e ≥ 3
∅ 6.5	e ≥ 5	e ≥ 30	e ≥ 7.5

Tightening torque

Stainless steel: 2.2 N.m. Brass: 1.6 N.m (values obtained with washers mounted)

Dimensions

Sensor	Pre-cabled			M8 connector			M12 connector		
	a	b	c	a	b	c	a	b	c
∅ 4	28	-	-	42	-	-	-	-	-
∅ 5	28	24	-	42	24	-	-	-	-
∅ 6.5	33	-	4	46	-	4	49	-	4



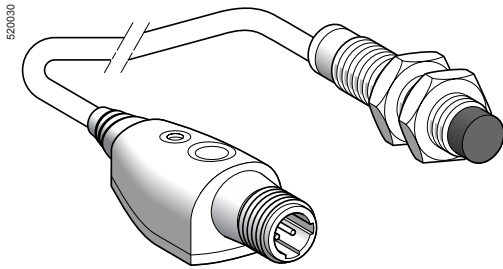
Inductive proximity sensors

OsiSense XS Application

Adjustable range sensors

Cylindrical, flush mountable and non flush mountable

Three-wire DC, solid-state output



XS6...B2...L01M12

Ø 12, threaded M12 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
5	NO	PNP	Remote M12 connector on 0.15 m flying lead	XS612B2PAL01M12	0.100
		NPN	Remote M12 connector on 0.15 m flying lead	XS612B2NAL01M12	0.100
	NC	PNP	Remote M12 connector on 0.15 m flying lead	XS612B2PBL01M12	0.100
		NPN	Remote M12 connector on 0.15 m flying lead	XS612B2NBL01M12	0.100

Ø 18, threaded M18 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
9	NO	PNP	Remote M12 connector on 0.15 m flying lead	XS618B2PAL01M12	0.140
		NPN	Remote M12 connector on 0.15 m flying lead	XS618B2NAL01M12	0.140
	NC	PNP	Remote M12 connector on 0.15 m flying lead	XS618B2PBL01M12	0.140
		NPN	Remote M12 connector on 0.15 m flying lead	XS618B2NBL01M12	0.140

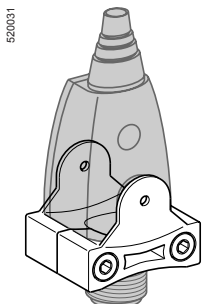
Ø 30, threaded M30 x 1.5

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
18	NO	PNP	Remote M12 connector on 0.15 m flying lead	XS630B2PAL01M12	0.220
		NPN	Remote M12 connector on 0.15 m flying lead	XS630B2NAL01M12	0.220
	NC	PNP	Remote M12 connector on 0.15 m flying lead	XS630B2PBL01M12	0.220
		NPN	Remote M12 connector on 0.15 m flying lead	XS630B2NBL01M12	0.220

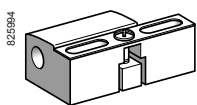
Accessories (1)

Description	Reference	Weight kg	
Remote control fixing clamp	XSZBPM12	0.015	
Sensor fixing clamps	Ø 12	XSZB112	0.006
	Ø 18	XSZB118	0.010
	Ø 30	XSZB130	0.020

(1) For further information, see page 3/116.



XSZBPM12



XSZB...

Inductive proximity sensors

OsiSense XS Application

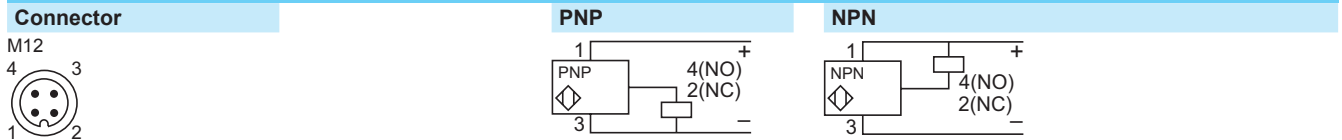
Adjustable range sensors

Cylindrical, flush mountable and non flush mountable

Three-wire DC, solid-state output

Characteristics		XS6●●B2●●L01M12	
Sensor type		XS6●●B2●●L01M12	
Product certifications		UL, CSA, CE	
Connection	Connector	Remote M12 connector on 0.15 m flying lead	
Sensing distance and adjustment zone	Ø 12	Nominal sensing distance (Sn)	mm 0...5 non flush mounted / 0...3.4 flush mounted
		Precision adjustment zone	mm 1.7...5 non flush mounted / 1.7...3.4 flush mounted
	Ø 18	Nominal sensing distance (Sn)	mm 0...9 non flush mounted / 0...6 flush mounted
		Precision adjustment zone	mm 3...9 non flush mounted / 3...6 flush mounted
Ø 30	Nominal sensing distance (Sn)	mm 0...18 non flush mounted / 0...11 flush mounted	
	Precision adjustment zone	mm 6...18 non flush mounted / 6...11 flush mounted	
Differential travel		%	1...15 of effective sensing distance (Sr)
Degree of protection	Conforming to IEC 60529	IP 67,	
Storage temperature		°C	- 40...+ 85
Operating temperature		°C	- 25...+ 70
Materials	Case	Nickel plated brass	
	Remote control	PBT	
	Cable	PvR - Ø 4.2 mm	
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	50 gn, duration 11 ms	
Indicators	Output state	Yellow LED	
	Supply on and teach mode	Green LED	
Rated supply voltage		V	12...24 with protection against reverse polarity
Voltage limits (including ripple)		V	10...36
Switching capacity		mA	≤ 100 with overload and short-circuit protection
Voltage drop, closed state		V	≤ 2
Current consumption, no-load		mA	≤ 10
Maximum switching frequency		Hz	1000
Delays	First-up	ms	≤ 10
	Response	ms	≤ 0.3
	Recovery	ms	≤ 0.7

Wiring schemes



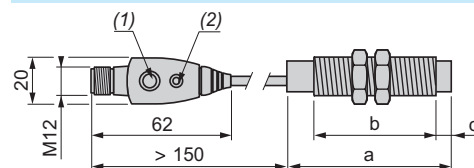
Setting-up

Minimum mounting distances (mm)

	Side by side		Face to face		Facing a metal object
	flush mounted	not flush mounted	flush mounted	not flush mounted	
Ø 12	e ≥ 14	50	e ≥ 50	100	e ≥ 3.4
Ø 18	e ≥ 28	100	e ≥ 100	200	e ≥ 6
Ø 30	e ≥ 48	180	e ≥ 180	360	e ≥ 11

Dimensions

XS6



(1) Teach mode button
(2) LED

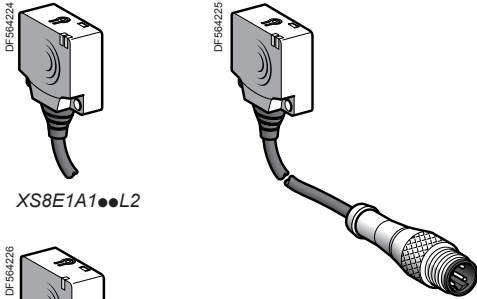
Connector (mm)

	a	b	c
Ø 12	59	42	5
Ø 18	64	44	8
Ø 30	62.6	41	13



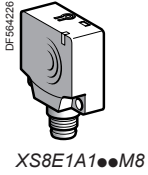
Inductive proximity sensors

OsiSense XS, general purpose with increased range
 Flat, flush mountable/non flush mountable + teach mode (1)
 Two-wire AC or DC
 Three-wire DC, solid-state output

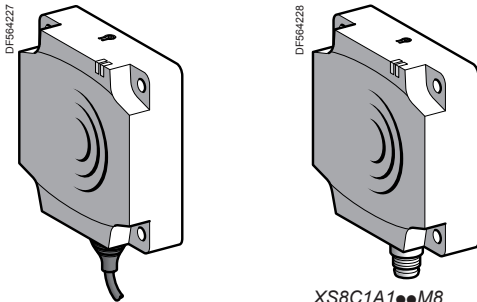


XS8E1A1●●L2

XS8●1A1●●L01M12
 XS8●1A1●●L01U20

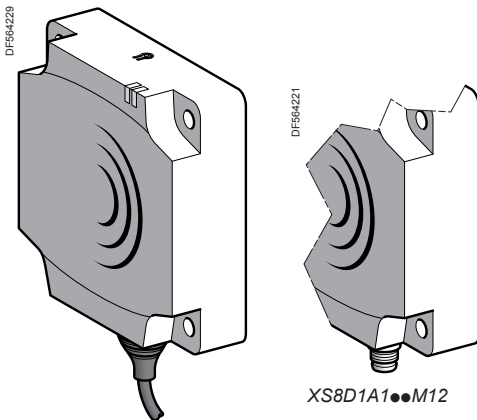


XS8E1A1●●M8



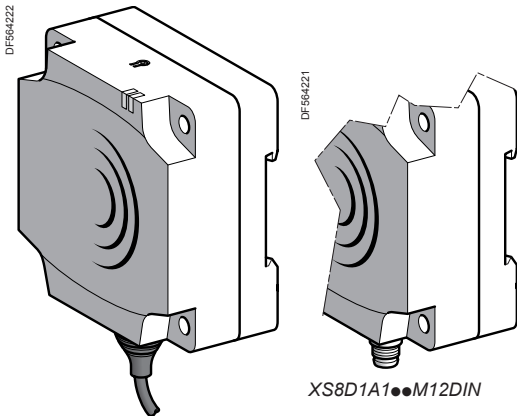
XS8C1A1●●L2

XS8C1A1●●M8



XS8D1A1●●L2

XS8D1A1●●M12



XS8D1A1●●L2DIN

XS8D1A1●●M12DIN

Flat, 26 x 26 x 13 mm format (2)

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
15	NO	PNP	Pre-cabled (L = 2 m) (3)	XS8E1A1PAL2	0.075
			M8 connector	XS8E1A1PAM8	0.040
			Remote M12 connector	XS8E1A1PAL01M12	0.040
		NPN	Pre-cabled (L = 2 m) (3)	XS8E1A1NAL2	0.075
			M8 connector	XS8E1A1NAM8	0.040
			Remote M12 connector	XS8E1A1NAL01M12	0.040
	NC	PNP	Pre-cabled (L = 2 m) (3)	XS8E1A1PBL2	0.075
			M8 connector	XS8E1A1PBM8	0.040
			Remote M12 connector	XS8E1A1PBL01M12	0.040
		NPN	Pre-cabled (L = 2 m) (3)	XS8E1A1NBL2	0.075
			M8 connector	XS8E1A1NBM8	0.040
			Remote M12 connector	XS8E1A1NBL01M12	0.040

Two-wire ~ or --- unprotected (4)

15	NO	-	Pre-cabled (L = 2 m) (3)	XS8E1A1MAL2	0.070
			Remote 1/2"-20UNF connector	XS8E1A1MAL01U20	0.040
	NC	-	Pre-cabled (L = 2 m) (3)	XS8E1A1MBL2	0.070
			Remote 1/2"-20UNF connector	XS8E1A1MBL01U20	0.040

Flat, 40 x 40 x 15 mm format (2)

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
25	NO	PNP	Pre-cabled (L = 2 m) (3)	XS8C1A1PAL2	0.095
			M8 connector	XS8C1A1PAM8	0.060
			Remote M12 connector	XS8C1A1PAL01M12	0.060
		NPN	Pre-cabled (L = 2 m) (3)	XS8C1A1NAL2	0.095
			M8 connector	XS8C1A1NAM8	0.060
			Remote M12 connector	XS8C1A1NAL01M12	0.060
	NC	PNP	Pre-cabled (L = 2 m) (3)	XS8C1A1PBL2	0.095
			M8 connector	XS8C1A1PBM8	0.060
			Remote M12 connector	XS8C1A1PBL01M12	0.060
		NPN	Pre-cabled (L = 2 m) (3)	XS8C1A1NBL2	0.095
			M8 connector	XS8C1A1NBM8	0.060
			Remote M12 connector	XS8C1A1NBL01M12	0.060

Two-wire ~ or --- unprotected (4)

25	NO	-	Pre-cabled (L = 2 m) (3)	XS8C1A1MAL2	0.090
			Remote 1/2"-20UNF connector	XS8C1A1MAL01U20	0.060
	NC	-	Pre-cabled (L = 2 m) (3)	XS8C1A1MBL2	0.090
			Remote 1/2"-20UNF connector	XS8C1A1MBL01U20	0.060

Flat, 80 x 80 x 26 mm format (2)

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
60	NO	PNP	Pre-cabled (L = 2 m) (3)	XS8D1A1PAL2 (5)	0.390
			M12 connector	XS8D1A1PAM12 (5)	0.340
			M12 connector	XS8D1A1NAM12 (5)	0.340
		NPN	Pre-cabled (L = 2 m) (3)	XS8D1A1NAL2 (5)	0.390
			M12 connector	XS8D1A1NAM12 (5)	0.340
			M12 connector	XS8D1A1NAM12 (5)	0.340
	NC	PNP	Pre-cabled (L = 2 m) (3)	XS8D1A1PBL2 (5)	0.390
			M12 connector	XS8D1A1PBM12 (5)	0.340
			M12 connector	XS8D1A1PBM12 (5)	0.340
		NPN	Pre-cabled (L = 2 m) (3)	XS8D1A1NBL2 (5)	0.390
			M12 connector	XS8D1A1NBM12 (5)	0.340
			M12 connector	XS8D1A1NBM12 (5)	0.340

Two-wire ~ or --- unprotected (4)

60	NO	-	Pre-cabled (L = 2 m) (3)	XS8D1A1MAL2 (5)	0.390
			1/2"-20UNF connector	XS8D1A1MAU20 (5)	0.340
	NC	-	Pre-cabled (L = 2 m) (3)	XS8D1A1MBL2 (5)	0.390
			1/2"-20UNF connector	XS8D1A1MBU20 (5)	0.340

(1) For further information on flush or non flush mountable sensors using teach mode, see page 3/22.

(2) For accessories, see page 3/116.

(3) For a 5 m long cable replace L2 by L5; for a 10 m long cable replace L2 by L10.

(4) It is essential to connect a 0.4 A "quick-blow" fuse in series with the load.

(5) For clipping onto 35 mm omega rail or 80 x 80 x 40 mm format, add DIN to the end of the reference. Example: XS8D1A1PAL2 DIN.

Characteristics

Sensor type		XS8E●●●●●M8, XS8C●●●●●M8, XS8D●●●●●M12, XS8D●●●●●U20	XS8E●●●●●L01M12, XS8E●●●●●L01U20, XS8C●●●●●L01M12, XS8C●●●●●L01U20	XS8E●●●●●L2, XS8C●●●●●L2, XS8D●●●●●L2
Product certifications		UL, CSA, CE, ECOLAB		
Connection	Connector	M8 except XS8●●●●●M12: M12 XS8●●●●●U20: 1/2"-20UNF	Remote on 0.15 m flying lead XS8●●●●●L01M12: M12 XS8●●●●●L01U20: 1/2"-20UNF	–
	Pre-cabled	–	–	Length: 2 m
Sensing distance and adjustment zone	XS8E	Nominal sensing dist. Sn	mm 0...15 not flush mounted / 0...10 flush mounted	
		Fine adjustment zone	mm 5...15 not flush mounted / 5...10 flush mounted	
	XS8C	Nominal sensing dist. Sn	mm 0...25 not flush mounted / 0...15 flush mounted	
		Fine adjustment zone	mm 8...25 not flush mounted / 8...15 flush mounted	
XS8D	Nominal sensing dist. Sn	mm 0...60 not flush mounted / 0...40 flush mounted		
	Fine adjustment zone	mm 20...60 not flush mounted / 20...40 flush mounted		
Differential travel		% 1...15 of effective sensing distance (Sr)		
Degree of protection	Conforming to IEC 60529	IP 67, double insulation (except M8 connector: IP 67)		IP 68, (except M8 connector)
Storage temperature		°C -40...+85		
Operating temperature		°C -25...+70		
Materials	Case	PBT		
	Cable	–	PvR 3 x 0.34 mm ² ~ and PvR 2 x 0.34 mm ² ~	
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27	50 gn, duration 11 ms		
Indicators	Output state	Yellow LED		
	Supply on and teach mode	Green LED		
Rated supply voltage	3-wire	V 12...24 with protection against reverse polarity		
	2-wire	V ~ or ~ 24...240 (~ 50/60 Hz)		
Voltage limits (including ripple)	3-wire	V 10...36		
	2-wire	V ~ or ~ 20...264		
Current consumption, no-load	3-wire	mA ≤ 10		
Residual current, open state	2-wire	mA ≤ 1.5		
Switching capacity	3-wire	mA ≤ 100 XS8E, ≤ 200 XS8C and XS8D, with overload and short-circuit protection		
	2-wire	mA 5...200 ~ XS8E, 5...300 ~ XS8C and XS8D, 5...200 ~ XS8C and XS8D		
Voltage drop, closed state	3-wire	V ≤ 2		
	2-wire	V ≤ 5.5		
Maximum switching frequency		Hz 2000 XS8E, 1000 XS8C, 150 XS8D		
Delays	First-up	ms ≤ 10 XS8E, XS8C and XS8D (3-wire), ≤ 10 XS8E and XS8C, ≤ 15 XS8D (2-wire)		
	Response	ms ≤ 0.3		
	Recovery	ms ≤ 0.8 XS8E and XS8C, ≤ 6 XS8D		

Wiring schemes

Connector	Pre-cabled	PNP/M12 or M8	NPN/M12 or M8	2-wire 1/2"-20UNF
	BU: Blue BN: Brown BK: Black			
For M8 connector, NO and NC outputs on terminal 4				

Setting-up

Minimum mounting distances (mm)

Side by side	e ≥	XS8E	XS8C	XS8D
Flush mounted		40	60	200
Not flush mounted		150	125	600

Face to face	e ≥	XS8E	XS8C	XS8D
Flush mounted		80	120	400
Not flush mounted		300	250	not recommended

Facing a metal object	e ≥	XS8E	XS8C	XS8D
		10	15	40

Dimensions

	XS8C/D/E	XS8C/D	XS8E
(1) LED			
(2) Teach mode button			
(3) For CHC type screws			

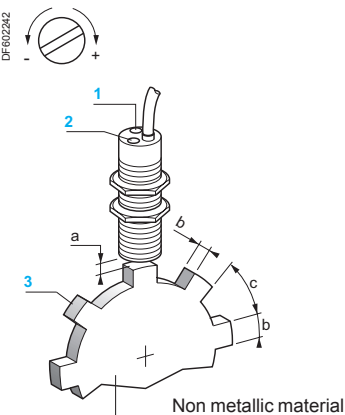
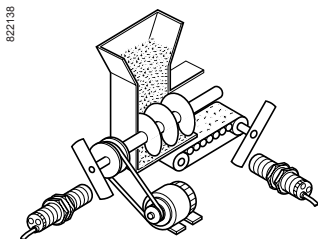
Sensor	A (cable)	A (connector)	B	C	D	E	F	G	H
XS8E	14	11	26	13	8.8	20	3.5	6.8	6.6
XS8C	14	11	40	15	9.8	33	4.5	8.3	13.6
XS8D	23	18	80	26	16	65	5.5	8.5	37.8
XS8D●●DIN	23	18	80	40	30	65	5.1	22.5	37.8

Inductive proximity sensors

OsiSense XS Application

Sensors for rotation monitoring, slip detection, shaft overload detection
Cylindrical form

Example:
Coupling breakage monitoring



Functions

These self-contained rotation speed monitoring sensors have the special feature of incorporating, in the same case, the pulse sensing and processing electronics as well as the output switching amplifier that are required to establish an integrated rotation monitoring device.

The unit provides an economical solution for detecting slip, belt breakage, drive shaft shear and overloading, etc., in the following applications: conveyor belts, bucket elevators, Archimedian screws, grinders, crushers, pumps, centrifugal driers, mixers, etc.

Operating principle

The output signal of this type of sensor is processed by an impulse comparator incorporated in the sensor. The impulse frequency F_c generated by the moving part to be monitored is compared to the frequency F_r preset on the sensor. The output switching circuit of the sensor is in the closed state for $F_c > F_r$ and the open state for $F_c < F_r$.

Sensors XSAV are particularly suitable for the detection of underspeed: when the speed of the moving part F_c falls below a preset threshold F_r , this causes the output circuit of the sensor to switch off.

Note: Following power-up, the operational status of the sensor is subject to a delay of 9 seconds in order for the moving part being monitored to run-up to its nominal speed. During this time, the output of the sensor remains in the closed state.

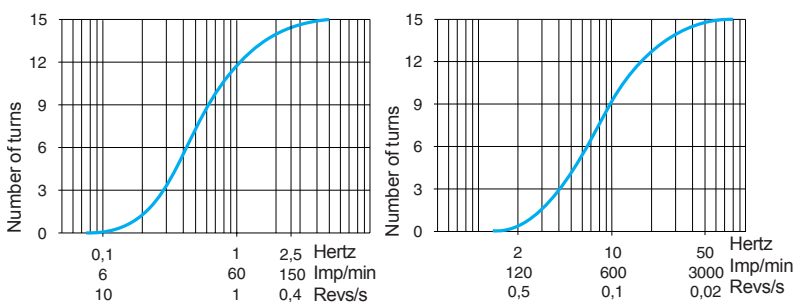
Adjustment of frequency threshold

- Adjustment of sensor's frequency threshold: using potentiometer, 15 turns approximately.
- To increase the frequency threshold: turn the adjustment screw clockwise (+).
- To decrease the frequency threshold: turn the adjustment screw anti-clockwise (-).

1: Potentiometer	Diameter of sensor		
2: LED	a	b	c
3: Metal target	M30	4...6 mm	30 mm
		60 mm	

Potentiometer adjustment curves (for XSAV1●801, 2-wire ~ or --- sensors)

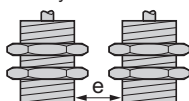
Low speed version (6...150 impulses/minute) High speed version (120...3000 impulses/minute)



Setting-up

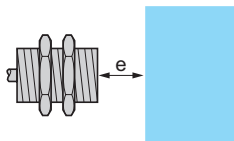
Minimum distances (mm)

Side by side



$e \geq 20$

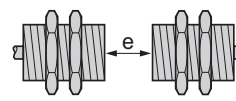
Facing a metal object



$e \geq 30$

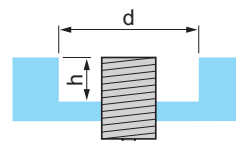
Fixing nut tightening torque: < 50 N.m

Face to face



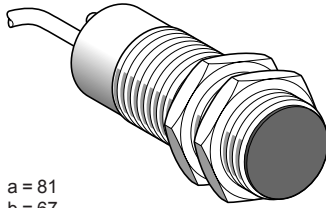
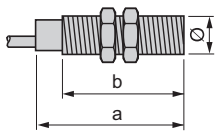
$e \geq 120$

Mounted in a metal support



$d \geq 30, h \geq 0$

Flush mountable in metal



Lengths (mm):

a = Overall

b = Threaded section

a = 81

b = 67

Ø = M30

	DC	DC	AC/DC	AC/DC
Nominal sensing distance (Sn)	10 mm	10 mm	10 mm	10 mm
Adjustable frequency range	6...150 impulses/min	120...3000 impulses/min	6...150 impulses/min	120...3000 impulses/min

References

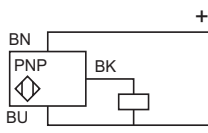
3-wire ---	PNP / NC	XSAV11373	XSAV12373	–	–
2-wire --- or \sim / NC	–	–	–	XSAV11801	XSAV12801
Weight (kg)	0.300				

Characteristics

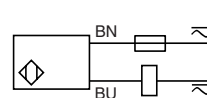
Connection	Pre-cabled, 3 x 0.34 mm ² , length 2 m (1)	Pre-cabled, 2 x 0.34 mm ² , length 2 m (1)
Degree of protection conforming to IEC 60529	IP 67	
Operating zone	0...8 mm	
Repeat accuracy	3 % of Sr	
Differential travel	3...15 % of Fr	
Operating temperature	-25...+70 °C	
Output state indication	Red LED	
Rated supply voltage	--- 12...48 V with protection against reverse polarity	\sim 24...240 V (50/60 Hz) or --- 24...210 V
Voltage limits (including ripple)	--- 10...58 V	\sim or --- 20...264 V
Switching capacity	≤ 200 mA with overload and short-circuit protection	\sim 5...350 mA or --- 5...200 mA (2)
Voltage drop, closed state	≤ 1.8 V	≤ 5.7 V
Residual current, open state	–	≤ 1.5 mA
Current consumption, no-load	≤ 15 mA	–
Maximum switching frequency	6000 impulses/min (for XSAV11●●●); 48,000 impulses/min (for XSAV12●●●)	
“Run-up” delay following power-up	9 seconds ± 20 % + 1/Fr (3)	

Wiring schemes

3-wire ---
XSAV1●373



2-wire \sim or ---
XSAV1●801



(1) For a 5 m long cable add L05 to the reference, for a 10 m long cable add L10 to the reference.

Example: XSAV11373 becomes XSAV11373L05 with a 5 m long cable.

(2) These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a 0.4 A “quick-blow” fuse in series with the load, see page 3/116.

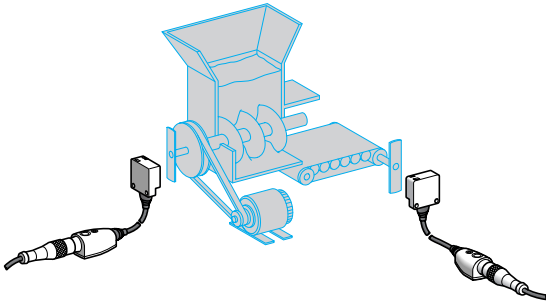
(3) For a sensor without a “run-up” delay following power-up, replace XSAV1 in the reference by XSAV0. Example: XSAV11801 becomes XSAV01801 without a “run-up” delay. For a reduced “run-up” delay of 3 s, replace XSAV1 in the reference by XSAV3.

Inductive proximity sensors

OsiSense XS Application

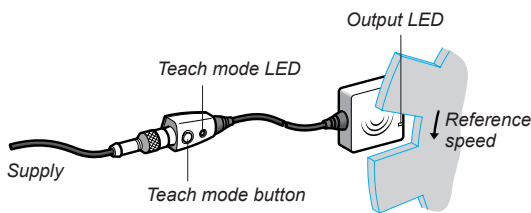
Sensors for rotation monitoring, slip detection and shaft overload detection, with teach mode

Operating principle and applications



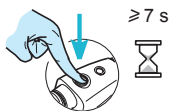
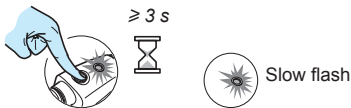
- These inductive proximity sensors are designed for monitoring rotational speed or the speed of the flow of objects to be protected or monitored. They operate on the principle of comparing a speed threshold preset by the operator against the instantaneous measurement of the speed of the moving object to be protected.
- They provide a simple, economical solution for detecting slip, belt breakage, coupling breakage and overload, etc.
- They are widely used in grinder/crusher, mixer, pump, centrifugal driver, conveyor belt, bucket elevator, Archimedean screw, etc. type applications.

Installation and setting-up



Setting-up and positioning the sensor

- In the positioning phase, the XS9 sensor can operate as a standard inductive sensor (Schneider Electric patent). Operation in inductive mode enables validation of reliable detection of all the moving objects to be monitored.
- Using this system, the positioning is therefore made 100 % reliable and can be checked at any time without altering the settings of the sensor.

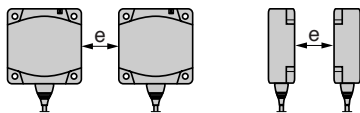


Speed adjustment in teach mode

- The normal or reference speed of the moving object (1) to be monitored is adjusted by simply pressing the teach mode button (2) and is then validated by the display LED.
- If in doubt, the sensor can be reset at any time to the factory settings.
- (1) To allow the moving object to reach its normal speed (machine inertia), the sensor holds its output closed for 9 seconds.
- (2) The sensor's default drop-out underspeed corresponds to the preset speed - 30%.
Example: If the preset speed is 1000 rpm, the sensor drops out on underspeed when the speed of the moving object drops below $1000 - (1000 \times 0.3) = 700$ rpm.
- 20 %, - 11 % and - 6 % thresholds can be obtained by pressing the teach mode button.

Setting-up

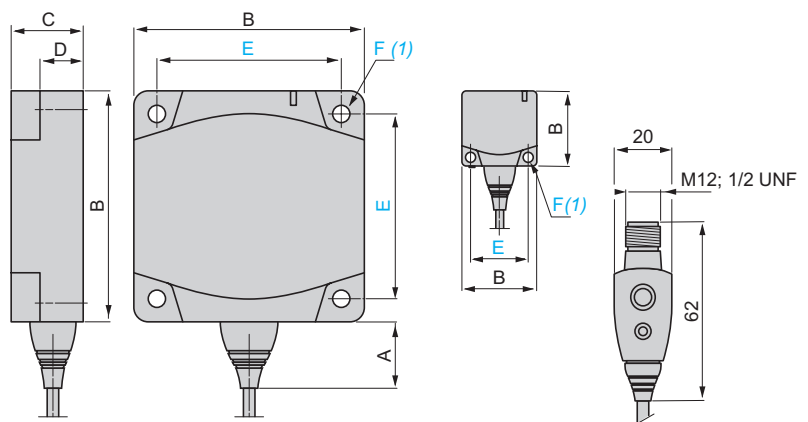
Minimum mounting distances (mm)



Type	Side by side	Face to face
XS9E	e ≥ 40	e ≥ 80
XS9C	e ≥ 60	e ≥ 120

Dimensions

XS9E, XS9C



(1) For CHC type screws

Type	A	B	C	D	E	F
XS9E	14	26	13	8.8	20	3.5
XS9C	14	40	15	9.8	33	4.5

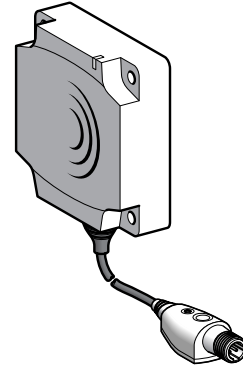
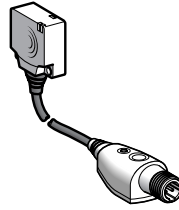
Inductive proximity sensors

OsiSense XS Application

Sensors for rotation monitoring, slip detection and shaft overload detection, with teach mode

Flush mountable in metal

PBT case



Nominal sensing distance (Sn)	10 mm	15 mm	10 mm	15 mm
Adjustable frequency range	6...6000 impulses/min			

References

3-wire	PNP / NC	XS9E11RPBL01M12	XS9C11RPBL01M12	–	–
2-wire	⎓ or ~ / NC	–	–	XS9E11RMBL01U20	XS9C11RMBL01U20
Weight (kg)		0.040	0.060	0.040	0.060

Characteristics

Product certifications	UL, CSA, CE				
Connection	Remote M12 connector on 0.15 m flying lead		Remote 1/2"-20UNF connector on 0.15 m flying lead		
Operating zone	0...8 mm	0...12 mm	0...8 mm	0...12 mm	
Degree of protection	Conforming to IEC 60529 IP 67, double insulation				
Storage temperature	- 40...+ 85 °C				
Operating temperature	- 25...+ 70 °C				
Vibration resistance	Conforming to IEC 60068-2-6 25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)				
Shock resistance	Conforming to IEC 60068-2-27 50 gn, duration 11 ms				
Indicators	Output state		Yellow LED		
	Supply on		Green LED		
Rated supply voltage	⎓ 12...24 V		~ or ⎓ 24...240 V (50/60 Hz)		
Voltage limits (including ripple)	⎓ 10...36 V		~ or ⎓ 20...264 V		
Switching capacity	≤ 100 mA (1)	≤ 200 mA (1)	~ or ⎓ 5...100 mA (2)	⎓ 5...200 mA, ~ 5...300 mA(2)	
Voltage drop, closed state	≤ 2 V		≤ 5.5 V		
Residual current, open state	≤ 100 mA		≤ 1.5 mA		
Current consumption, no-load	≤ 10 mA		–		
Maximum switching frequency	48,000 impulses/min				
"Run-up" delay following power-up	9 seconds + 1/Fr				

(1) With overload and short-circuit protection.

(2) It is essential to connect a 0.4 A "quick-blow" fuse in series with the load.

Wiring schemes

Connector

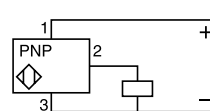
M12

1/2"-20UNF



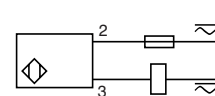
3-wire ⎓

XS9E11RPBL01M12

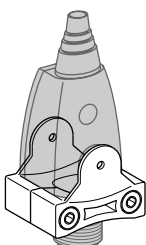


2-wire ~ or ⎓

XS9E11RMBL01U20



Accessory (1)



XSZBPM12

(1) For accessories, see page 3/116.

Description	Reference	Weight kg
Remote control fixing clamp	XSZBPM12	0.015

Inductive proximity sensors

OsiSense XS Application

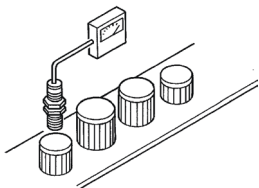
Sensors with analogue output signal 0...10 V ⁽¹⁾

or 4...20 mA

For position, displacement and deformation control/monitoring

Functions

Example:
Sorting parts



These analogue output proximity sensors are solid-state sensors designed for monitoring displacement. They are not measuring sensors. They are suitable for use in many sectors, particularly for applications involving:

- deformation and displacement monitoring,
- vibration amplitude and frequency monitoring,
- control of dimensional tolerances,
- position control,
- concentricity or eccentricity monitoring.

Operating principle

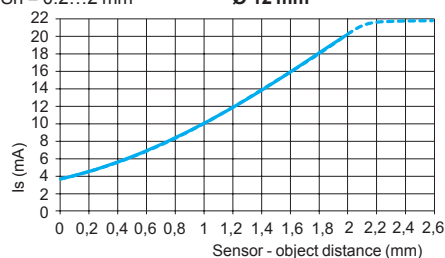
The operating principle of the sensor is that of a damped oscillator. The degree of damping will depend on the distance of an object from the sensing face. The sensor will sense the distance and produce an output current with a value directly proportional to this distance.

Output curves 4..0.20 mA, 2-wire connection

XS1M12AB120

Sn = 0.2...2 mm

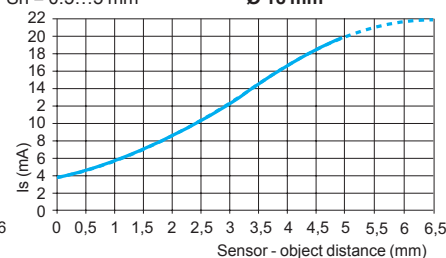
Ø 12 mm



XS1M18AB120

Sn = 0.5...5 mm

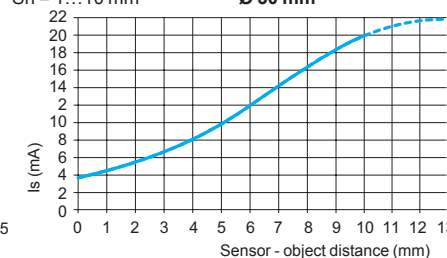
Ø 18 mm



XS1M30AB120

Sn = 1...10 mm

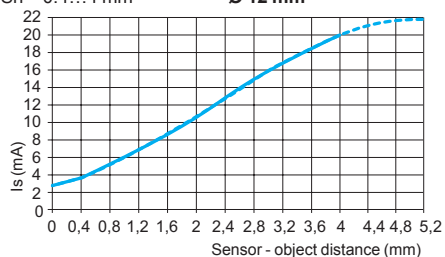
Ø 30 mm



XS4P12AB120

Sn = 0.4...4 mm

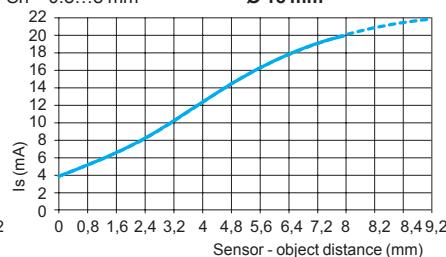
Ø 12 mm



XS4P18AB120

Sn = 0.8...8 mm

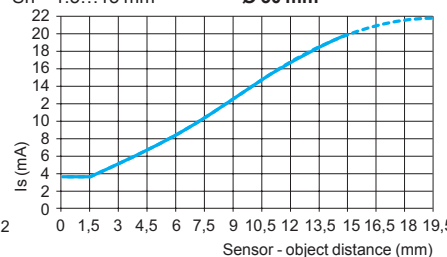
Ø 18 mm



XS4P30AB120

Sn = 1.5...15 mm

Ø 30 mm

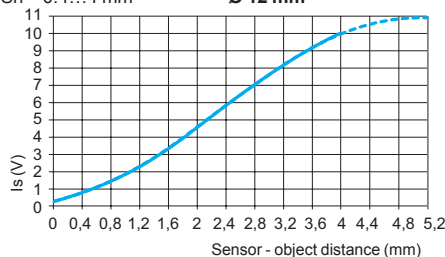


Output curves 0...10 V, 3-wire connection

XS4P12AB110

Sn = 0.4...4 mm

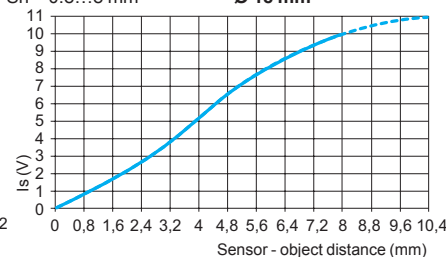
Ø 12 mm



XS4P18AB110

Sn = 0.8...8 mm

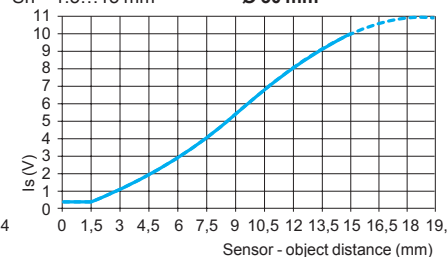
Ø 18 mm



XS4P30AB110

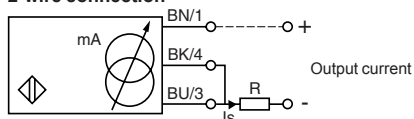
Sn = 1.5...15 mm

Ø 30 mm



Wiring schemes

2-wire connection



Output current

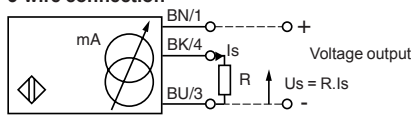
Load impedance value

12 V	4...20 mA	$R \leq 8.2 \Omega$
24 V	4...20 mA	$R \leq 470 \Omega$

Ensure a minimum of 10 V between the + and the - (terminal 3) of the sensor.

⁽¹⁾ Voltage range only obtained with a load impedance of 1000 Ω .

3-wire connection



Output current

Output voltage

24 V	0...10 mA	$R \leq 1500 \Omega$	0...10 V	$R = 1000 \Omega$
48 V	0...10 mA	$R \leq 3300 \Omega$	0...10 V	$R = 1000 \Omega$

Ensure a minimum of 5 V between the + and the sensor output (terminal 4).

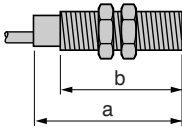
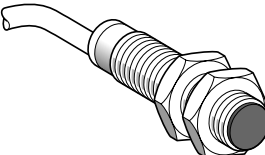
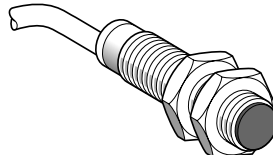
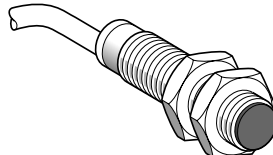
Inductive proximity sensors

OsiSense XS Application

Sensors with analogue output signal 0...10 V ⁽¹⁾

or 4...20 mA

For position, displacement and deformation control/monitoring

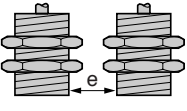
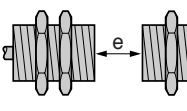
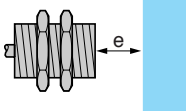
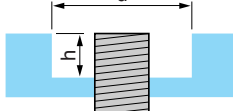
Sensor	Flush mountable in metal	Non flush mountable in metal	
			
Lengths (mm): a = Overall b = Threaded section	a = 50 b = 42	a = 50 b = 42	a = 54 b = 42
Nominal sensing distance (S _n)	Metal case 2 mm	Plastic case 4 mm	Plastic case 4 mm

References			
3-wire --- Output 0...10 V ⁽²⁾	–	–	XS4P12AB110
2-wire --- Output 4...20 mA ⁽²⁾	XS1M12AB120	XS4P12AB120	–
Weight (kg)	0.075	0.065	0.065

Characteristics			
Product certifications	CE, UL, CSA		
Connection	Pre-cabled, PvR 3 x 0.34 mm ² , length 2 m		
Degree of protection Conforming to IEC 60529	IP 67		
Operating zone	0.2...2 mm	0.4...4 mm	0.4...4 mm
Repeat accuracy	± 3 %		
Linearity error	± 2 mA	± 1 V	
Ambient air temperature	For operation: - 25...+ 70 °C		
Rated supply voltage	--- 12...24 V	--- 12...24 V	--- 24...48 V
Voltage limits (including ripple)	--- 10...36 V	--- 10...36 V	--- 15...58 V
Output current drift Ambient temperature: - 25...+ 70 °C	≤ 10 %		
Current consumption, no-load	4 mA		
Maximum operating rate	1500 Hz		

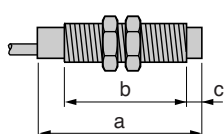
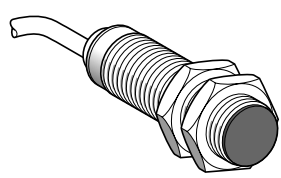
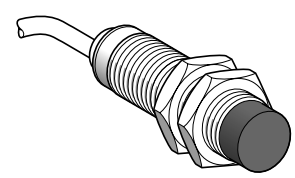
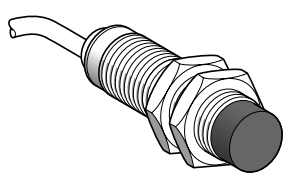
⁽¹⁾ Voltage range only obtained with a load impedance of 1000 Ω.



⁽²⁾ Output current range I_s, see page 3/78.







Setting-up				
Minimum mounting distances (mm)	Side by side	Face to face	Facing a metal object	Mounted in a metal support
				
XS1M12AB120 flush mountable	e ≥ 4	e ≥ 24	e ≥ 6	d ≥ 12, h ≥ 0
XS4P12AB110 non flush mountable	e ≥ 16	e ≥ 48	e ≥ 12	d ≥ 36, h ≥ 8
XS4P12AB120 non flush mountable	e ≥ 16	e ≥ 48	e ≥ 12	d ≥ 36, h ≥ 8

Fixing nut tightening torque < 6 N.m (metal case), < 2 N.m (plastic case)

Other versions Please consult our Customer Care Centre.

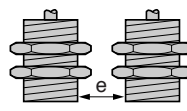
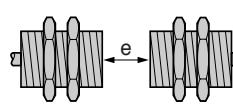
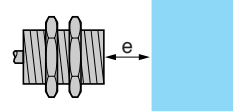
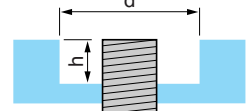
Sensor	Flush mountable in metal	Non flush mountable in metal	
			
Lengths (mm): a = Overall b = Threaded section c = For non flush mountable sensors	a = 53 b = 44 c = 0	a = 41 b = 26 c = 8	a = 41 b = 26 c = 8
Nominal sensing distance (S _n)	Metal case 5 mm	Plastic case 8 mm	Plastic case 8 mm

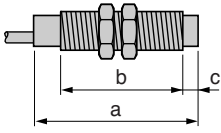
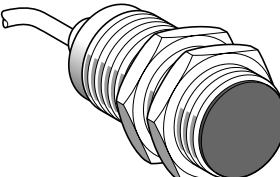
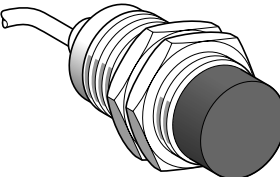
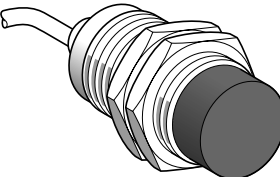
References			
3-wire 	Output 0...10 V (2)	–	XS4P18AB110
2-wire 	Output 4...20 mA (2)	XS1M18AB120	XS4P18AB120
Weight (kg)	0.120	0.080	0.080

Characteristics			
Product certifications	CE, UL, CSA		
Connection	Pre-cabled, PvR 3 x 0.34 mm ² , length 2 m		
Degree of protection Conforming to IEC 60529	IP 67		
Operating zone	0.5...5 mm	0.8...8 mm	0.8...8 mm
Repeat accuracy	± 3 %		
Linearity error	± 2 mA		± 1 V
Ambient air temperature	For operation: - 25...+ 70 °C		
Rated supply voltage	 12...24 V	 12...24 V	 24...48 V
Voltage limits (including ripple)	 10...36 V	 10...36 V	 15...58 V
Output current drift Ambient temperature: - 25...+ 70 °C	≤ 10 %		
Current consumption, no-load	4 mA		
Maximum operating rate	500 Hz		

(1) Voltage range only obtained with a load impedance of 1000 Ω.

(2) Output current range I_s, see page 3/78.

Setting-up				
Minimum mounting distances (mm)	Side by side	Face to face	Facing a metal object	Mounted in a metal support
				
XS1M18AB120 flush mountable	e ≥ 10	e ≥ 60	e ≥ 15	d ≥ 18, h ≥ 0
XS4P18AB110 non flush mountable	e ≥ 32	e ≥ 96	e ≥ 24	d ≥ 54, h ≥ 16
XS4P18AB120 non flush mountable	e ≥ 32	e ≥ 96	e ≥ 24	d ≥ 54, h ≥ 16
Fixing nut tightening torque	< 15 N.m (metal case), < 5 N.m (plastic case)			
Other versions	Please consult our Customer Care Centre.			

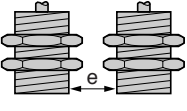
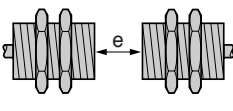
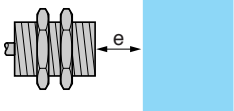
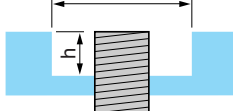
Sensor	Flush mountable in metal	Non flush mountable in metal	
			
Lengths (mm): a = Overall b = Threaded section c = For non flush mountable sensors	a = 50 b = 42 c = 0	a = 53 b = 32 c = 13	a = 53 b = 32 c = 13
Nominal sensing distance (S _n)	Metal case 10 mm	Plastic case 15 mm	Plastic case 15 mm

References			
3-wire $\overline{\text{---}}$ Output 0...10 V ⁽²⁾	–	–	XS4P30AB110
2-wire $\overline{\text{---}}$ Output 4...20 mA ⁽²⁾	XS1M30AB120	XS4P30AB120	–
Weight (kg)	0.200	0.100	0.100

Characteristics			
Product certifications	CE, UL, CSA		
Connection	Pre-cabled, PvR 3 x 0.34 mm ² , length 2 m		
Degree of protection Conforming to IEC 60529	IP 67		
Operating zone	1...10 mm	1.5...15 mm	1.5...15 mm
Repeat accuracy	± 3 %		
Linearity error	± 2 mA	± 1 V	
Ambient air temperature	For operation: - 25...+ 70 °C		
Rated supply voltage	$\overline{\text{---}}$ 12...24 V	$\overline{\text{---}}$ 12...24 V	$\overline{\text{---}}$ 24...48 V
Voltage limits (including ripple)	$\overline{\text{---}}$ 10...36 V	$\overline{\text{---}}$ 10...36 V	$\overline{\text{---}}$ 15...58 V
Output current drift Ambient temperature: - 25...+ 70 °C	≤ 10 %		
Current consumption, no-load	4 mA		
Maximum operating rate	300 Hz		

⁽¹⁾ Voltage range only obtained with a load impedance of 1000 Ω.

⁽²⁾ Output current range I_s, see page 3/78.

Setting-up				
Minimum mounting distances (mm)	Side by side	Face to face	Facing a metal object	Mounted in a metal support
				
XS1M30AB120 flush mountable	e ≥ 20	e ≥ 120	e ≥ 30	d ≥ 30, h ≥ 0
XS4P30AB110 non flush mountable	e ≥ 60	e ≥ 180	e ≥ 45	d ≥ 90, h ≥ 30
XS4P30AB120 non flush mountable	e ≥ 60	e ≥ 180	e ≥ 45	d ≥ 90, h ≥ 30

Fixing nut tightening torque < 40 N.m (metal case), < 20 N.m (plastic case)

Other versions Please consult our Customer Care Centre.

Inductive proximity sensors

OsiSense XS Application

Sensors with analogue output signal 0...10 V (1)

For position, displacement and deformation control/monitoring

Functions

These analogue output proximity sensors are solid-state sensors designed for monitoring displacement. They are not measuring sensors.

They are suitable for use in many sectors, particularly for applications involving:

- deformation and displacement monitoring,
- vibration amplitude and frequency monitoring,
- control of dimensional tolerances,
- position control,
- concentricity or eccentricity monitoring.

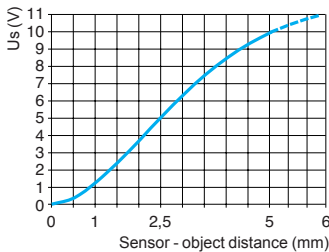
Operating principle

The operating principle of the sensor is that of a damped oscillator. The degree of damping will depend on the distance of an object from the sensing face. The sensor will sense the distance and produce an output current with a value directly proportional to this distance.

Output curves 0...10 V, 3-wire connection

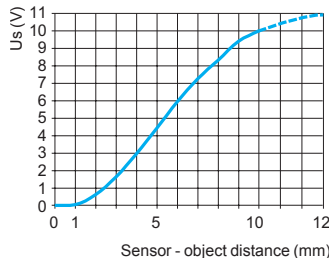
XS9F

$S_n = 1...5$ mm



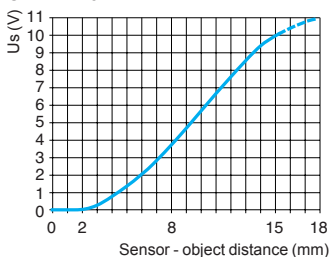
XS9E

$S_n = 1...10$ mm



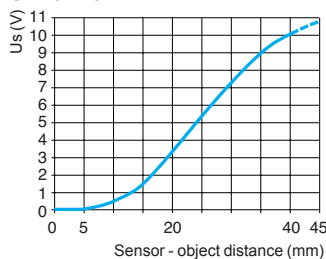
XS9C

$S_n = 2...15$ mm



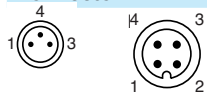
XS9D

$S_n = 5...40$ mm



Wiring schemes

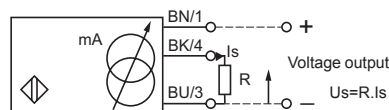
Connector



Pre-cabled

BN: Brown
BU: Blue
BK: Black

3-wire connection



Output current	Load impedance value	Output voltage	Load impedance value
24 V	0...10 mA	$R \leq 1400 \Omega$	0...10 V
			$R = 1000 \Omega$

Note: Ensure a minimum of 5 V between the + (terminal 1) and the sensor output (terminal 4).

(1) Voltage range only obtained with a load impedance of 1000 Ω .

Inductive proximity sensors

OsiSense XS Application

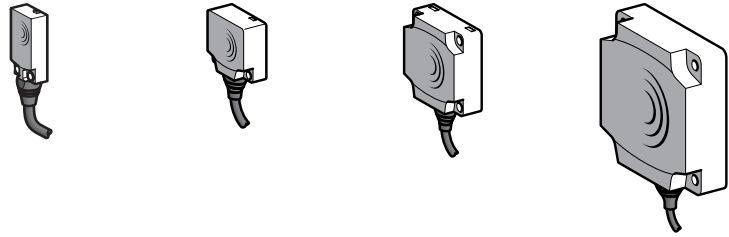
Sensors with analogue output signal 0...10 V (1)

For position, displacement and deformation control/monitoring

Flush mountable in metal



PBT case



Nominal sensing distance (Sn)	5 mm	10 mm	15 mm	40 mm
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References

3-wire --- 0...10 V	Pre-cabled (L = 2 m) (2)	XS9F111A1L2	XS9E111A1L2	XS9C111A1L2	XS9D111A1L2
	Connector	XS9F111A1L01M8	XS9E111A1L01M12	XS9C111A1L01M12	XS9D111A1M12
Weight (kg)	Pre-cabled (L = 2 m) (2)	0.060	0.075	0.095	0.340
	Connector	0.040	0.055	0.075	0.320

Characteristics

Product certifications		UL, CSA, CE	UL, CSA, CE, ECOLAB		
Connection	Pre-cabled	PvR 3 x 0.34 mm ² , length 2 m for XS9●111A●L2			
	Connector	0.15 m flying lead with M8 connector	0.15 m flying lead with M12 connector	M12	
Operating zone		1...5 mm	1...10 mm	2...15 mm	5...40 mm
Degree of protection	Pre-cabled	IP 68	IP 68, double insulation □		
	Connector	IP 67	IP 67, double insulation □		
Storage temperature		- 40...+ 85 °C			
Operating temperature		- 25...+ 70 °C			
Materials		PBT case			
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)			
Shock resistance	Conforming to IEC 60068-2-27	50 gn, duration 11 ms			
Output state indication		No			
Rated supply voltage		--- 24 V			
Voltage limits (including ripple)		--- 15...36 V			
Repeat accuracy		± 3 %			
Linearity error		± 1 V			
Current consumption, no-load		≤ 4 mA with overload and short-circuit protection			
Maximum operating frequency		2000 Hz	1000 Hz	100 Hz	
Output current drift		≤ 10 % (throughout the operating temperature range)			

Dimensions

XS9F	XS9E/C/D		XS9C/D				XS9E	
	Type	A (L2)	A (M12)	B	C	D	E	F
	XS9E	14	—	26	13	8.8	20	3.5
	XS9C	14	—	40	15	9.8	33	4.5
	XS9D	23	14	80	26	16	65	5.5

(3) For CHC type screws

Setting-up (Minimum mounting distances (mm))

Type	Side by side	Face to face	Facing a metal object
XS9F			
XS9E	$e \geq 15$	$e \geq 30$	$e \geq 36$
XS9C	$e \geq 30$	$e \geq 45$	$e \geq 72$
XS9D	$e \geq 45$	$e \geq 120$	$e \geq 110$
			$e \geq 300$

(1) Voltage range only obtained with a load impedance of 1000 Ω.

(2) For a 5 m long cable replace L2 by L5, for a 10 m long cable replace L2 by L10.

Example: XS9C111A1L2 becomes XS9C111A1L5 with a 5 m long cable.

Inductive proximity sensors

OsiSense XS Application

Sensors with analogue output signal 4...20 mA

For position, displacement and deformation control/monitoring

Functions

These analogue output proximity sensors are solid-state sensors designed for monitoring displacement. They are not measuring sensors.

They are suitable for use in many sectors, particularly for applications involving:

- deformation and displacement monitoring,
- vibration amplitude and frequency monitoring,
- control of dimensional tolerances,
- position control,
- concentricity or eccentricity monitoring.

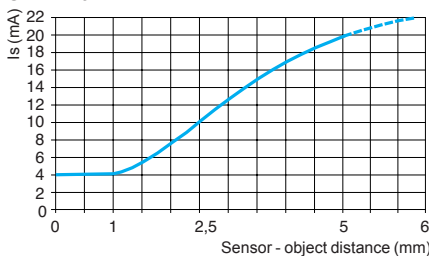
Operating principle

The operating principle of the sensor is that of a damped oscillator. The degree of damping will depend on the distance of an object from the sensing face. The sensor will sense the distance and produce an output current with a value directly proportional to this distance.

Output curves 4...20 mA, 2-wire connection

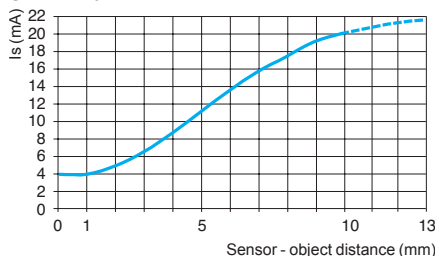
XS9F

Sn = 1...5 mm



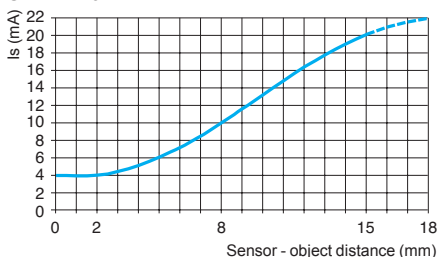
XS9E

Sn = 1...10 mm



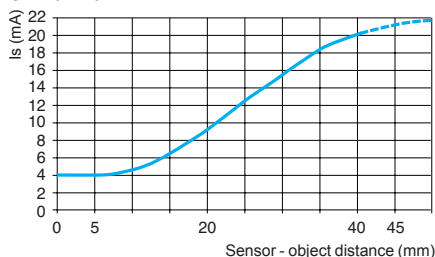
XS9C

Sn = 2...15 mm



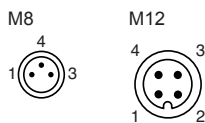
XS9D

Sn = 5...40 mm



Wiring schemes

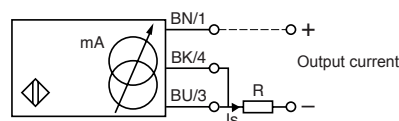
Connector



Pre-cabled

BN: Brown
BU: Blue
BK: Black

2-wire connection



	Output current	Load impedance value
12 V	4...20 mA	$R \leq 8.2 \Omega$
24 V	4...20 mA	$R \leq 470 \Omega$

Note: Ensure a minimum of 10 V between the + (terminal 1) and - (terminal 3) of the sensor.

Inductive proximity sensors

OsiSense XS Application

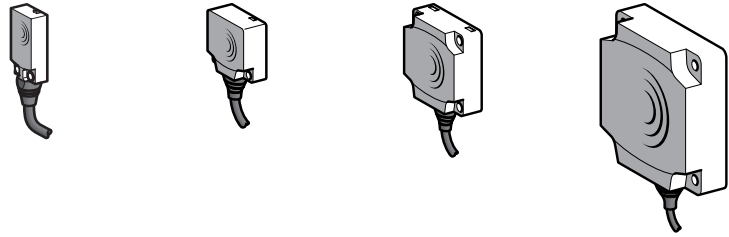
Sensors with analogue output signal 4...20 mA

For position, displacement and deformation control/monitoring

Flush mountable in metal



PBT case



Nominal sensing distance (Sn)	5 mm	10 mm	15 mm	40 mm
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References

2-wire --- 4...20 mA	Pre-cabled (L = 2 m) (1)	XS9F111A2L2	XS9E111A2L2	XS9C111A2L2	XS9D111A2L2
	Connector	XS9F111A2L01M8	XS9E111A2L01M12	XS9C111A2L01M12	XS9D111A2M12
Weight (kg)	Pre-cabled (L = 2 m)	0.060	0.075	0.095	0.340
	Connector	0.040	0.055	0.075	0.320

Characteristics

Product certifications	UL, CSA, CE	UL, CSA, CE, ECOLAB			
Connection	Pre-cabled	PvR 3 x 0.34 mm ² , length 2 m for XS9●111A●L2			
	Connector	0.15 m flying lead with M8 connector	0.15 m flying lead with M12 connector	M12	
Operating zone		1...5 mm	1...10 mm	2...15 mm	5...40 mm
Degree of protection	Pre-cabled	IP 68	IP 68, double insulation ☐		
	Connector	IP 67	IP 67, double insulation ☐		
Storage temperature		- 40...+ 85 °C			
Operating temperature		- 25...+ 60 °C		- 25...+ 70 °C	
Materials		PBT case			
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)			
Shock resistance	Conforming to IEC 60068-2-27	50 gn, duration 11 ms			
Output state indication		No			
Rated supply voltage		--- 12...24 V			
Voltage limits (including ripple)		--- 10...36 V			
Repeat accuracy		± 3 %			
Linearity error		± 2 mA			
Current consumption, no-load		≤ 4 mA with overload and short-circuit protection			
Maximum operating frequency		2000 Hz	1000 Hz	100 Hz	
Output current drift		≤ 10 % (throughout the operating temperature range)			

Dimensions

XS9F	XS9E/C/D	XS9C/D	XS9E				
	(2) For CHC type screws						
Type	A (L2)	A (M12)	B	C	D	E	F
XS9E	14	–	26	13	8.8	20	3.5
XS9C	14	–	40	15	9.8	33	4.5
XS9D	23	14	80	26	16	65	5.5

Setting-up (Minimum mounting distances (mm))

Type	Side by side	Face to face	Facing a metal object
XS9F			
XS9E	e ≥ 15	e ≥ 36	e ≥ 15
XS9C	e ≥ 30	e ≥ 72	e ≥ 30
XS9D	e ≥ 45	e ≥ 110	e ≥ 45
XS9D	e ≥ 120	e ≥ 300	e ≥ 120

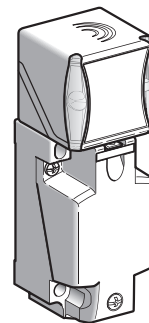
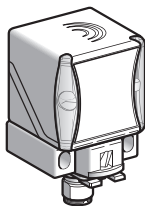
(1) For a 5 m long cable replace L2 by L5; for a 10 m long cable replace L2 by L10.
Example: XS9F111A2L2 becomes **XS9F111A2L5** with a 5 m long cable.

Inductive proximity sensors

OsiSense XS Application

Sensors with analogue output signal 0...10 V ⁽¹⁾
or 4...20 mA. Plastic case, 40 x 40 mm front face
5 position turret head

Sensor	Non flush mountable in metal	
Dimensions	40 x 40 x 70 mm	40 x 40 x 117 mm



Nominal sensing distance (Sn)	25 mm
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References

3-wire ---	0...10 V output ⁽¹⁾	XS9C2A2A1M12	XS9C4A2A1P20 ⁽²⁾
2-wire ---	4...20 mA output	XS9C2A2A2M12	XS9C4A2A2P20 ⁽²⁾

XS9C4 $\bullet\bullet\bullet$ **P20** sensors are available with an ISO M20 cable entry and can be supplied with a PG 13.5 (e.g. **XS9C4A2A1G13**) or a 1/2" NPT (e.g. **XS9C4A2A2N12**) cable entry: please consult our Customer Care Centre for more information.

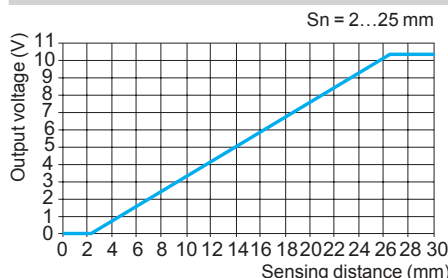
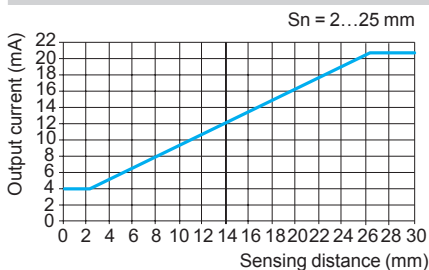
Weight (kg)	0.149	0.244
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Characteristics

Product certifications	UL, CSA, CE	
Conformity to standards	IEC 60947-5-2 and IEC 60947-5-7	
Connection	M12 connector (4-pin)	Screw terminals, clamping capacity 3 x 1.5 mm ² / 3 x 16 AWG
Operating zone	2...27 mm	
Linearity error	< 3%	
Repeat accuracy	< 3%	
Output current drift	< 5%	
Degree of protection	Conforming to IEC 60529 and DIN 40050	IP 65, IP 67 and IP 69K
Temperature	Storage	- 40...+ 85°C
	Operation ⁽³⁾	- 25...+ 70°C
Material	Case: PBT	
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude \pm 2 mm (f = 10...55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	50 gn for 11 ms
Indicators	Output state (alignment aid)	Yellow LED
Rated supply voltage	4...20 mA	--- 12...24 V with protection against reverse polarity
	0...10 V	--- 24 V with protection against reverse polarity
Voltage limits (including ripple)	4...20 mA	--- 12...36 V
	0...10 V	--- 15...36 V
Current consumption, no-load	3-wire ---	< 4 mA
Delays	First-up	< 7 ms
	Response	< 6 ms
	Recovery	< 6 ms

Analogue outputs 4-20 mA and 0-10 V

XS9C2A2A2M12 and XS9C4A2A2P20	XS9C2A2A1M12 and XS9C4A2A1P20
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⁽¹⁾ Voltage range only obtained with a load impedance of 1000 Ω .

⁽²⁾ These sensors are supplied without a cable gland. An adaptable PG 13.5 cable gland is available (reference **XSZPE13**).

⁽³⁾ Sensors are available for very low temperatures (suffix **TF**: - 40°C, + 70°C) or very high temperatures (suffix **TT**: - 25°C, + 85°C); please consult our Customer Care Centre.

Inductive proximity sensors

OsiSense XS Application

Sensors with analogue output signal 0...10 V ⁽¹⁾ or 4...20 mA. Plastic case, 40 x 40 mm front face
5 position turret head

Setting-up precautions

Minimum mounting distances (mm)



Side by side

Face to face

Facing a metal object

Sensors non flush mountable in metal

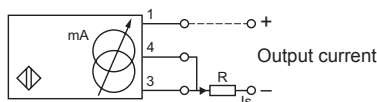
$e \geq 120$

$e \geq 240$

$e \geq 90$

Wiring schemes

2-wire

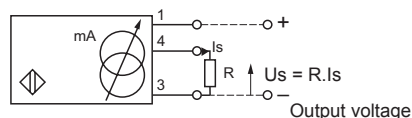


Output current Load impedance value

12 V	4...20 mA	$R \leq 82 \Omega$
24 V	4...20 mA	$R \leq 560 \Omega$

Ensure a minimum of 10 V between the + and the - (terminal 3) of the sensor.

3-wire



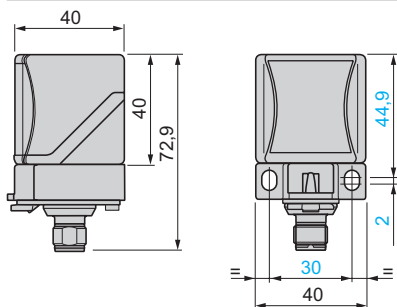
Output current Load impedance value Output voltage Load impedance value

12 V	0...10 mA	$R \leq 630 \Omega$	-	-
24 V	0...10 mA	$R \leq 1500 \Omega$	0...10 V	$R = 1000 \Omega$

Ensure a minimum of 5 V between the + and the sensor output (terminal 4).

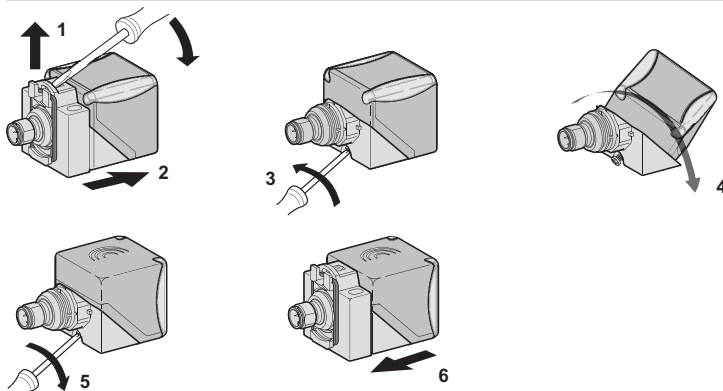
Dimensions

XS9C2A2A1M12 and XS9C2A2A2M12

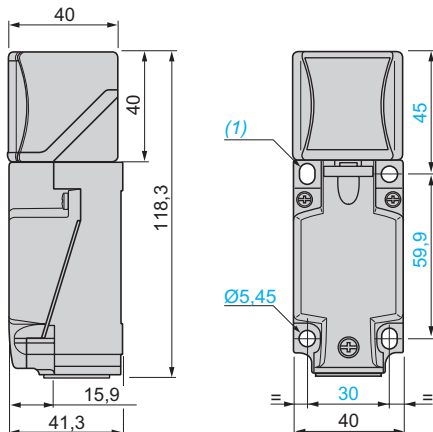


Head positions

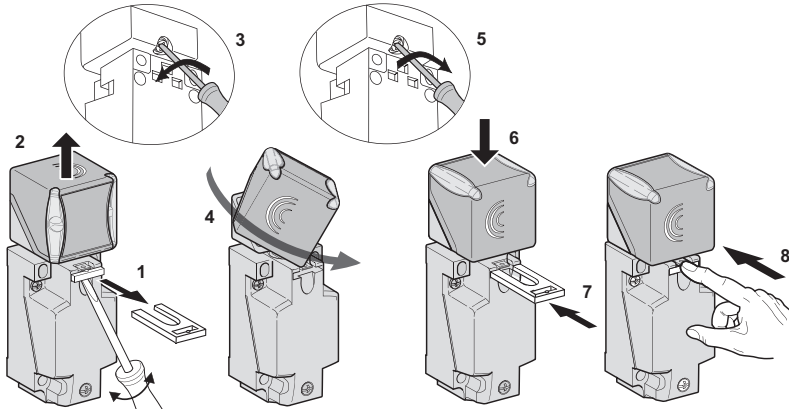
XS9C2A2A1M12 and XS9C2A2A2M12



XS9C4A2A1P20 and XS9C4A2A2P20



XS9C4A2A1P20 and XS9C4A2A2P20



(1) 2 elongated holes $\varnothing 5.3 \times 7$ mm.

Tightening torque of cover fixing screws and clamp screws: $< 1.2 \text{ N.m} / < 10.62 \text{ lb-in}$

(1) Voltage range only obtained with a load impedance of 1000 Ω .

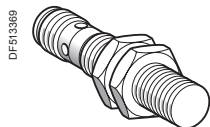
Inductive proximity sensors

OsiSense XS Application

Cylindrical, stainless steel 316L front face
for food and beverage applications and harsh industrial
environments. Three-wire DC, solid-state output

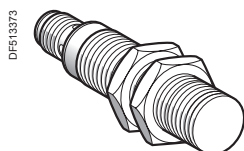
ECOLAB[®]

certified



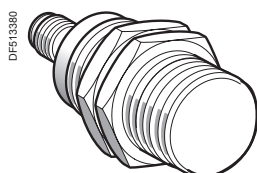
DF513389

XS912●1PAM12



DF513373

XS918●1PAM12



DF513380

XS930●1PAM12



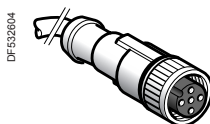
805817

XUZA118



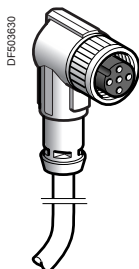
DF52384

XSZBS30



DF532604

XZCP1141L●



DF503830

XZCP1241L●

Ø 12 mm, threaded M12 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire 12-24V \overline{DC}, flush mountable					
6	NO	PNP	M12	XS912S1PAM12	0.024

Three-wire 12-24V \overline{DC} , non flush mountable

10	NO	PNP	M12	XS912S4PAM12	0.023
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Ø 18 mm, threaded M18 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire 12-24V \overline{DC}, flush mountable					
10	NO	PNP	M12	XS918S1PAM12	0.051

Three-wire 12-24V \overline{DC} , non flush mountable

20	NO	PNP	M12	XS918S4PAM12	0.051
----	----	-----	-----	---------------------	-------

Ø 30 mm, threaded M30 x 1.5

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire 12-24V \overline{DC}, flush mountable					
20	NO	PNP	M12	XS930S1PAM12	0.140

Three-wire 12-24V \overline{DC} , non flush mountable

40	NO	PNP	M12	XS930S4PAM12	0.145
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Accessories

Description	For use with sensor	Reference	Weight kg
Stainless steel mounting bracket	Ø 12	XSZBS12	0.090
	Ø 18	XUZA118	0.190
	Ø 30	XSZBS30	0.370

Connecting cables (PVC) ⁽¹⁾

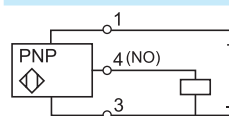
Description	Type	Length m	Reference	Weight kg
Pre-wired M12 connectors Female, 4-pin Stainless steel clamping ring	Straight	2	XZCPA1141L2	0.090
		5	XZCPA1141L5	0.190
		10	XZCPA1141L10	0.370
	Elbowed	2	XZCPA1241L2	0.090
		5	XZCPA1241L5	0.190
		10	XZCPA1241L10	0.370

Wiring schemes

M12 connector



PNP



(1) For further information, please consult the catalogue "Cabling accessories OsiSense XZ" on our site www.tesensors.com.

Inductive proximity sensors

OsiSense XS Application

Cylindrical, stainless steel 316L front face
for food and beverage applications and harsh industrial
environments. Three-wire DC, solid-state output

Characteristics

Sensor type	Flush	XS912S1PAM12	XS918S1PAM12	XS930S1PAM12
	Non flush	XS912S4PAM12	XS918S4PAM12	XS930S4PAM12
Product certifications	CE, cULus, ECOLAB			
Connection	Connector	M12		
Operating zone	Flush	mm 0...4.8	0...8	0...16
	Non flush	mm 0...8	0...16	0...32
Differential travel	%			
Degree of protection	1...15 (real sensing distance Sr)			
Storage temperature	°C -25...+85 (-13...185°F)			
	°C -25...+85 (-13...185°F)			
Operating temperature	°C			
Materials	Case	Stainless steel 316L		
Front face thickness	mm	0.4	0.6	1.0
Mechanical shock resistance	Conforming to EN 50102	IK10		
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 1 mm (f = 10 to 55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms		
Output state indication	Yellow LED, 4 viewing points at 90° (blinking from 0.8 Sr and Sr)			
Rated supply voltage	V	12...24 with protection against reverse polarity		
Voltage limits (including ripple)	V	10...30		
Switching capacity	mA	≤ 200 with overload and short-circuit protection		
Voltage drop, closed state	V	≤ 2		
Current consumption, no-load	mA	≤ 10		
Maximum switching frequency	Flush	Hz 600	300	100
	Non flush	Hz 400	200	90
Delays	First set-up	ms 40		
	Response	µs 0.06		
	Recovery	µs 15		

Setting-up

Minimum mounting distances in mm, flush version

Side by side		Face to face	Facing a metal object	Mounted in a metal support
$\frac{\varnothing 12}{\varnothing 18}$	$e \geq 38$	$e \geq 30$	$e \geq 20$	$d \geq 24$
$\frac{\varnothing 18}{\varnothing 30}$	$e \geq 42$	$e \geq 40$	$e \geq 30$	$d \geq 50$
	$e \geq 80$	$e \geq 70$	$e \geq 60$	$d \geq 90$

Minimum mounting distances in mm, non flush version

Side by side		Face to face	Facing a metal object	Mounted in a metal support
$\frac{\varnothing 12}{\varnothing 18}$	$e \geq 108$	$e \geq 40$	$e \geq 30$	$d \geq 30$ $h \geq 22$
$\frac{\varnothing 18}{\varnothing 30}$	$e \geq 182$	$e \geq 70$	$e \geq 60$	$d \geq 60$ $h \geq 34$
	$e \geq 270$	$e \geq 130$	$e \geq 120$	$d \geq 120$ $h \geq 34$

Dimensions

Lengths (mm): a = overall b = threaded c = for non flush mountable sensors	Flush sensor			Non flush sensor		
	M12	M18	M30	M12	M18	M30
	a (mm)	60	63.5	63.5	60	63.5
b (mm)	41	42	42	36	35	32
c (mm)	0	0	0	5	7	10

Reduction coefficient

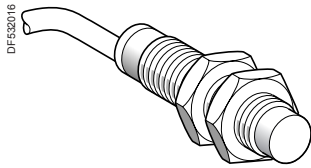
Flush-non mounted		Flush sensor			Non flush sensor		
		M12	M18	M30	M12	M18	M30
Steel		1	1	1	1	1	1
Aluminum		1	1	1	1	1	1
Brass		1.3	1.2	1.3	1.4	1.35	1.2
Copper		0.85	0.8	0.9	0.8	0.9	0.9
Stainless steel	Thickness 1 mm	0.5	0.5	0.35	(1)	0.3	(1)
	Thickness 2 mm	0.9	0.9	0.7	0.66	0.6	0.25
Flush mounted		M12	M18	M30	(1) No detection.		
Steel		0.7	0.75	0.9			
Aluminum		1.15	0.9	0.7			
Brass		1.05	0.75	0.6			
Stainless steel		0.8	0.8	1.3			

Inductive proximity sensors

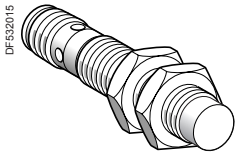
OsiSense XS Application, food and beverage processing series

Cylindrical, stainless steel, non flush mountable

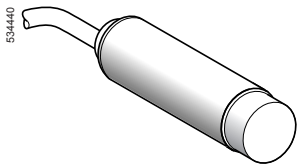
Three-wire DC, solid-state output



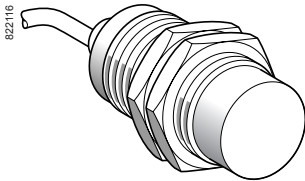
XS212SA●●L2



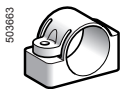
XS218SA●●M12



XS2L2SA●●L2



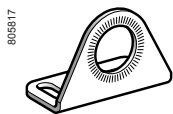
XS230SA●●L2



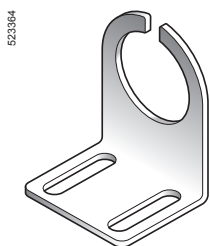
XUZB2005



XSZBS12



XUZA118



XSZBS30

Ø 12, threaded M12 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
7	NO	PNP	Pre-cabled (L = 2 m)	XS212SAPAL2	0.075
			M12 connector	XS212SAPAM12	0.035
		NPN	Pre-cabled (L = 2 m)	XS212SANAL2	0.075
			M12 connector	XS212SANAM12	0.035

Ø 18, threaded M18 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
12	NO	PNP	Pre-cabled (L = 2 m)	XS218SAPAL2	0.120
			M12 connector	XS218SAPAM12	0.060
		NPN	Pre-cabled (L = 2 m)	XS218SANAL2	0.120
			M12 connector	XS218SANAM12	0.060

Ø 18, plain

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
12	NO	PNP	Pre-cabled (L = 2 m)	XS2L2SAPAL2	0.120
			M12 connector	XS2L2SAPAM12	0.060
		NPN	Pre-cabled (L = 2 m)	XS2L2SANAL2	0.120
			M12 connector	XS2L2SANAM12	0.060

Ø 30, threaded M30 x 1.5

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
22	NO	PNP	Pre-cabled (L = 2 m)	XS230SAPAL2	0.205
			M12 connector	XS230SAPAM12	0.145
		NPN	Pre-cabled (L = 2 m)	XS230SANAL2	0.205
			M12 connector	XS230SANAM12	0.145

Accessories (2)

Description	For use with	Reference	Weight kg
Plastic fixing clamp , 24.1 mm centres, with locking screw	Ø 18 sensor, plain case	XUZB2005	0.007
Stainless steel fixing bracket	Ø 12 sensor	XSZBS12	0.060
	Ø 18 sensor	XUZA118	0.045
	Ø 30 sensor	XSZBS30	0.080

Connecting cables

Description	Type	Length m	Reference	Weight kg
Pre-wired M12 connectors Female, 4-pin, stainless steel clamping ring	Straight	2	XZCPA1141L2	0.090
		5	XZCPA1141L5	0.210
		10	XZCPA1141L10	0.410
	Elbowed	2	XZCPA1241L2	0.090
		5	XZCPA1241L5	0.210
		10	XZCPA1241L10	0.410
M12 jumper cable Male, 3-pin, stainless steel clamping ring	Straight	2	XZCRA151140A2	0.095
		5	XZCRA151140A5	0.200

(1) For a 5 m long cable replace L2 by L5; for a 10 m long cable replace L2 by L10.

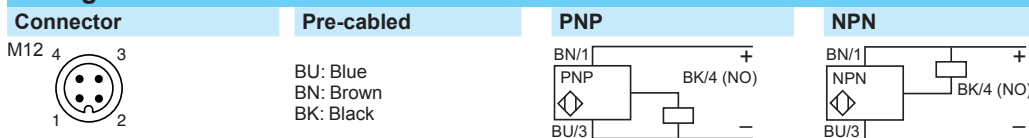
Example: **XS212SAPAL2** becomes **XS212SAPAL5** with a 5 m long cable.

(2) For further information, see page 3/116.

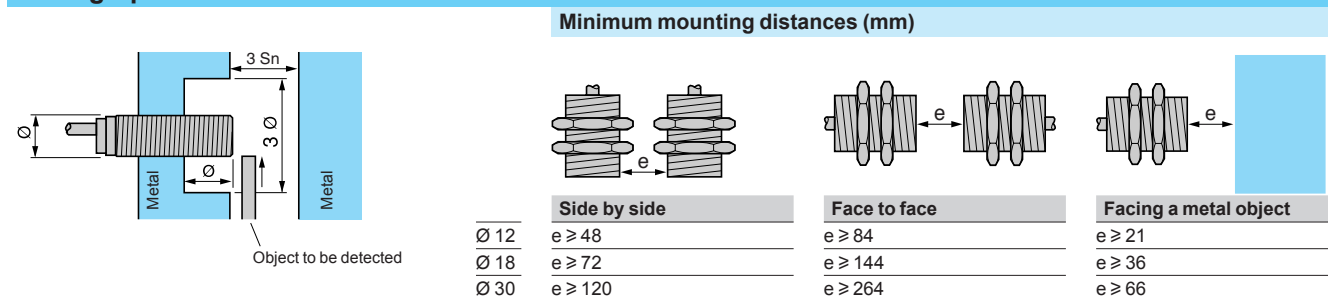
Characteristics		XS2●●SA●●M12	XS2●●SA●●L2
Sensor type		XS2●●SA●●M12	
Product certifications/approvals		UL, CSA, CE	
Connection	Connector	M12	–
	Pre-cabled	–	Length: 2 m
Operating zone	∅ 12	mm	0...5.6
	∅ 18	mm	0...9.6
	∅ 30	mm	0...17.6
Differential travel		%	
Degree of protection		1...15 of effective sensing distance (Sr)	
Storage temperature	Conforming to IEC 60529	IP 67	IP 68, double insulation □
	DIN 40050	IP 69K	
Operating temperature		°C	
Materials		°C	
Case		Stainless steel 316 L	
Cable		–	Non-poisonous PVC, 3 x 0.34 mm ²
Vibration resistance		Conforming to IEC 60068-2-6	
Shock resistance		Conforming to IEC 60068-2-27	
Output state indication		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Rated supply voltage		50 gn, duration 11 ms	
Voltage limits (including ripple)		Yellow LED: 4 viewing ports at 90°	
Switching capacity		Yellow LED: annular	
Voltage drop, closed state		V	
Current consumption, no-load		V	
Maximum switching frequency		mA	
Delays		ms	
First-up		ms	
Response		ms	
Recovery		ms	

(1) + 100 °C for cleaning and sterilization phases whilst not in service.

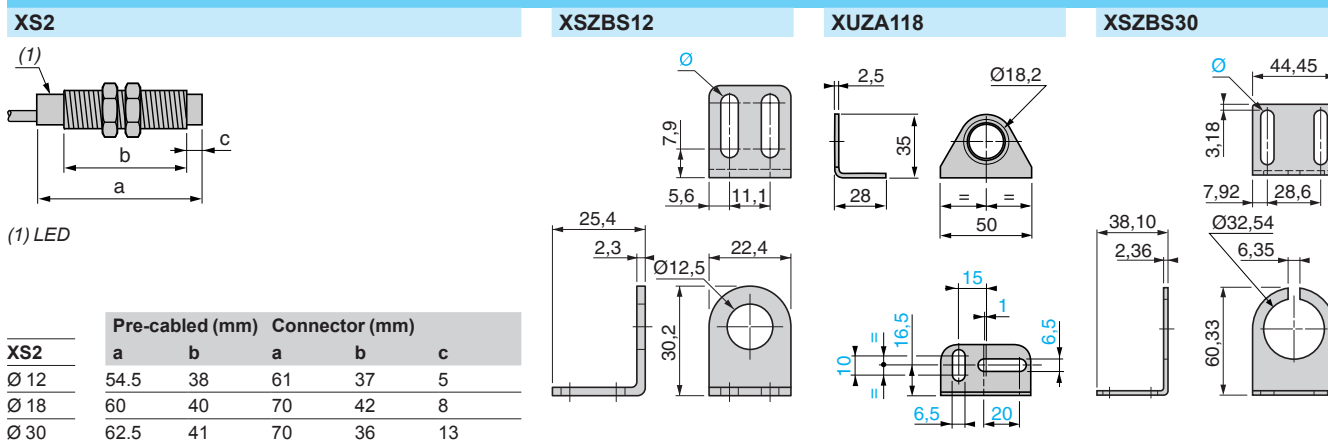
Wiring schemes



Setting-up



Dimensions

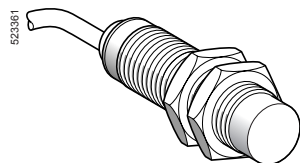


∅: 2 elongated holes ∅ 4.8 x 12.7

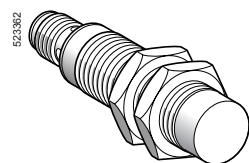
Inductive proximity sensors

OsiSense Application, food and beverage processing series

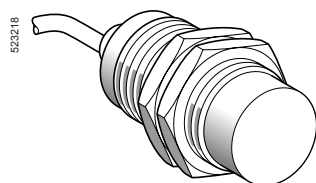
Cylindrical, stainless steel, non flush mountable
Two-wire AC or DC



XS218SAM L2



XS218SAM U20



XS230SAM L2



XUZA118



XSZBS30

Ø 18, threaded M18 x 1

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
12	NO	Pre-cabled (L = 2 m) (1)	XS218SAMAL2	0.120
		1/2"-20UNF connector	XS218SAMAU20	0.060

Ø 30, threaded M30 x 1.5

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
22	NO	Pre-cabled (L = 2 m) (1)	XS230SAMAL2	0.205
		1/2"-20UNF connector	XS230SAMAU20	0.145

Connecting cables

Description	Type	Length m	Reference	Weight kg
Pre-wired connectors 1/2"-20UNF 3-pin female, stainless steel clamping ring	Straight	5	XZCPA1865L5	0.210
		10	XZCPA1865L10	0.410
	Elbowed	5	XZCPA1965L5	0.250
		10	XZCPA1965L10	0.485

Accessories

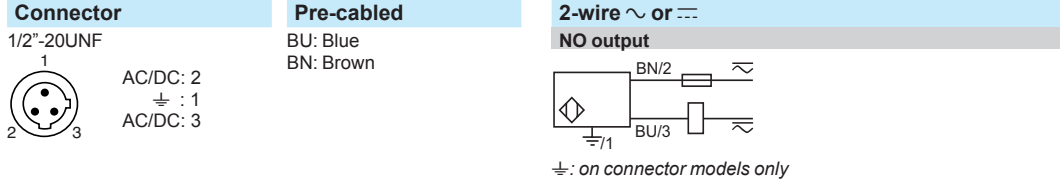
Description	For use with	Reference	Weight kg
Stainless steel fixing brackets	Ø 18 sensor	XUZA118	0.045
	Ø 30 sensor	XSZBS30	0.080

(1) For a 5 m long cable replace L2 by L5; for a 10 m long cable replace L2 by L10.
Example: XS218SAMAL2 becomes XS218SAMAL5 with a 5 m long cable.

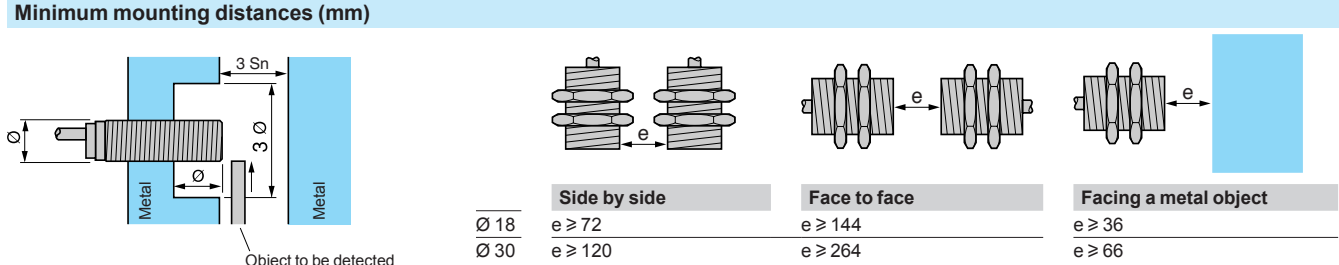
Characteristics		XS2●●SAM●U20	XS2●●SAM●L2
Sensor type			
Product certifications/approvals		UL, CSA, CE	
Connection	Connector	1/2"-20UNF	—
	Pre-cabled	—	Length: 2 m
Operating zone	∅ 18	mm 0...9.6	
	∅ 30	mm 0...17.6	
Differential travel		%	1...15 of effective sensing distance (Sr)
Degree of protection	Conforming to IEC 60529	IP 67	IP 68, double insulation □
	DIN 40050	IP 69K	
Storage temperature		°C	-40...+85 (1)
Operating temperature		°C	-25...+85
Materials	Case	Stainless steel 316 L	
	Cable	—	Non-poisonous PVC, 2 x 0.34 mm ²
Vibration resistance		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance		50 gn, duration 11 ms	
Output state indication		Yellow LED: 4 viewing ports at 90°	
Rated supply voltage		V	~ or --- 24...240 (~ 50/60 Hz)
Voltage limits (including ripple)		V	~ or --- 20...264
Switching capacity		mA	~ 5...300 or --- 5...200 (2)
Voltage drop, closed state		V	≤ 5.5
Residual current, open state		mA	≤ 0.8
Maximum switching frequency	XS218SAM●●●	Hz	~ 25 or --- 1000
	XS230SAM●●●	Hz	~ 25 or --- 300
Delays	First-up	ms	≤ 30
	Response	ms	≤ 0.5
	Recovery	ms	≤ 0.5 XS218SAM●●●, ≤ 2 XS230SAM●●●

(1) + 100 °C for cleaning and sterilization phases whilst not in service.
(2) It is essential to connect a 0.4 A "quick-blow" fuse in series with the load.

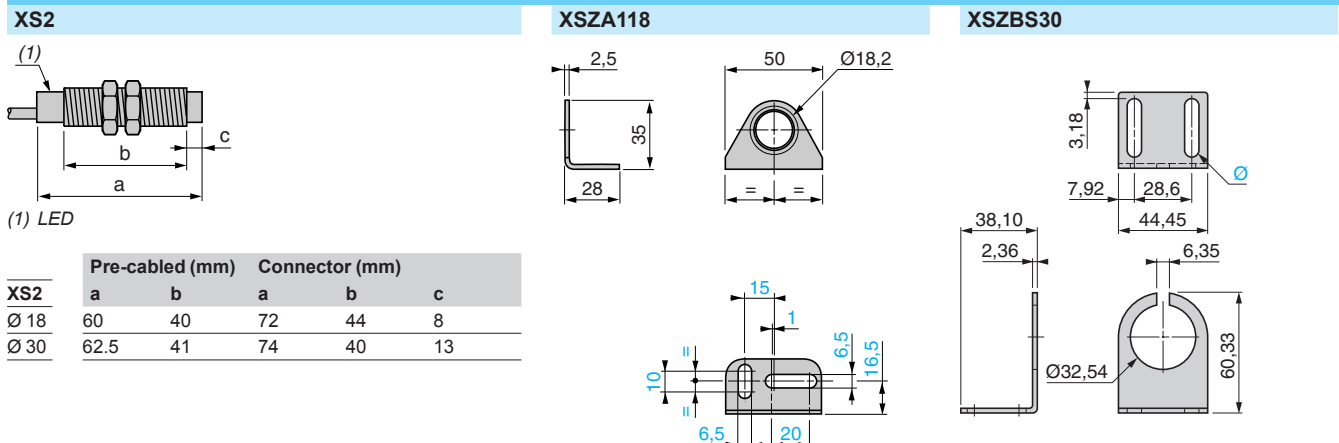
Wiring schemes



Setting-up



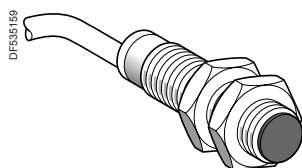
Dimensions



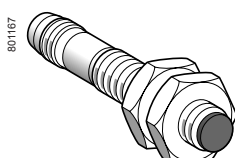
∅: 2 elongated holes ∅ 7.14 x 29.36

Inductive proximity sensors

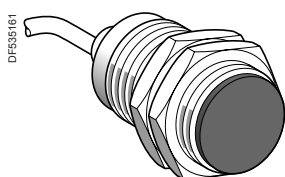
OsiSense Application, food and beverage processing series
Cylindrical, plastic, non flush mountable
Three-wire DC, solid-state output



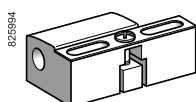
XS212AA●●L2



XS218AA●●M12



XS230AA●●L2



XSZB●●●

Ø 12, threaded M12 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
7	NO	PNP	Pre-cabled (L = 2 m) (1)	XS212AAPAL2	0.065
			M12 connector	XS212AAPAM12	0.030
		NPN	Pre-cabled (L = 2 m) (1)	XS212AANAL2	0.065
			M12 connector	XS212AANAM12	0.030

Ø 18, threaded M18 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
12	NO	PNP	Pre-cabled (L = 2 m) (1)	XS218AAPAL2	0.100
			M12 connector	XS218AAPAM12	0.040
		NPN	Pre-cabled (L = 2 m) (1)	XS218AANAL2	0.100
			M12 connector	XS218AANAM12	0.040

Ø 30, threaded M30 x 1.5

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
22	NO	PNP	Pre-cabled (L = 2 m) (1)	XS230AAPAL2	0.140
			M12 connector	XS230AAPAM12	0.080
		NPN	Pre-cabled (L = 2 m) (1)	XS230AANAL2	0.140
			M12 connector	XS230AANAM12	0.080

Accessories (2)

Description		Reference	Weight kg
Fixing clamps	Ø 12	XSZB112	0.006
	Ø 18	XSZB118	0.010
	Ø 30	XSZB130	0.020

Connecting cables

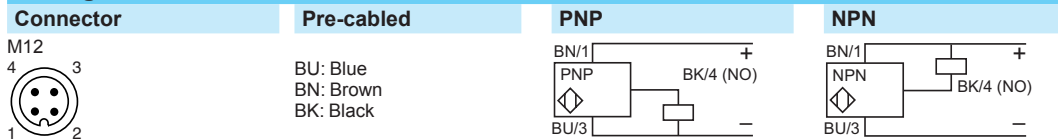
Description	Type	Length m	Reference	Weight kg
Pre-wired M12 connectors Female, 4-pin, stainless steel clamping ring	Straight	2	XZCPA1141L2	0.090
		5	XZCPA1141L5	0.190
		10	XZCPA1141L10	0.370
	Elbowed	2	XZCPA1241L2	0.090
		5	XZCPA1241L5	0.190
		10	XZCPA1241L10	0.370
M12 jumper cable Male, 3-pin, stainless steel clamping ring	Straight	2	XZCRA151140A2	0.090
		5	XZCRA151140A5	0.190

(1) For a 5 m long cable replace L2 by L5; for a 10 m long cable replace L2 by L10.
Example: XS212AAPAL2 becomes XS212AAPAL5 with a 5 m long cable.

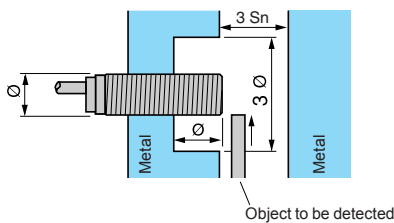
(2) For further information, see page 3/116.

Characteristics		XS2●●AA●●M12	XS2●●AA●●L2
Sensor type		UL, CSA, CE	
Product certifications/approvals		UL, CSA, CE	
Connection	Connector	M12	–
	Pre-cabled	–	Length: 2 m
Operating zone	∅ 12	mm	0...5.6
	∅ 18	mm	0...9.6
	∅ 30	mm	0...17.6
Differential travel		%	1...15 of effective sensing distance (Sr)
Degree of protection	Conforming to IEC 60529	IP 67	IP 68, double insulation □
	DIN 40050	IP 69K	
Storage temperature		°C	-40...+85
Operating temperature		°C	-25...+85
Materials	Case	PPS	
	Cable	–	PvR and 3 x 0.34 mm ²
Vibration resistance		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance		50 gn, duration 11 ms	
Output state indication		Yellow LED: annular	
Rated supply voltage		V	12...48 for T -25...+85 °C
Voltage limits (including ripple)		V	10...58 for T -25...+85 °C
Switching capacity		mA	≤ 200 with overload and short-circuit protection
Voltage drop, closed state		V	≤ 2
Current consumption, no-load		mA	≤ 10
Maximum switching frequency	XS212AA●●●●	Hz	2500
	XS218AA●●●●	Hz	1000
	XS230AA●●●●	Hz	500
Delays	First-up	ms	≤ 10
	Response	ms	≤ 0.2 ∅ 12, ≤ 0.3 ∅ 18, ≤ 0.6 ∅ 30
	Recovery	ms	≤ 0.2 ∅ 12, ≤ 0.7 ∅ 18, ≤ 1.4 ∅ 30

Wiring schemes



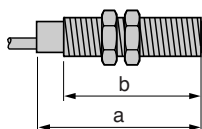
Setting-up



Minimum mounting distances (mm)

	Side by side	Face to face	Facing a metal object
∅ 12	e ≥ 48	e ≥ 84	e ≥ 21
∅ 18	e ≥ 72	e ≥ 144	e ≥ 36
∅ 30	e ≥ 120	e ≥ 264	e ≥ 66

Dimensions



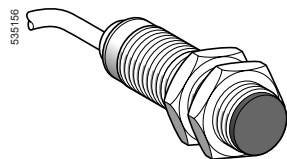
XS2	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
∅ 12	50	42	61	43
∅ 18	60	51	70	52
∅ 30	60	51	70	52

Inductive proximity sensors

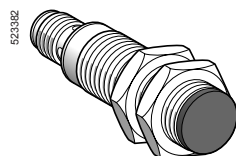
OsiSense XS Application, food and beverage processing series

Cylindrical, plastic, non flush mountable

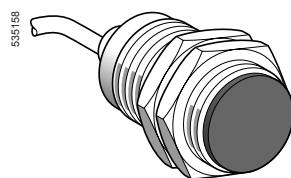
Two-wire AC or DC



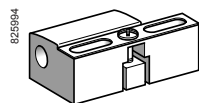
XS218AAM L2



XS230AAM U20



XS230AAM L2



XSZB1

Ø 18, threaded M18 x 1

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
12	NO	Pre-cabled (L = 2 m) (1)	XS218AAMAL2	0.100
		1/2"-20UNF connector	XS218AAMAU20	0.040

Ø 30, threaded M30 x 1.5

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
22	NO	Pre-cabled (L = 2 m) (1)	XS230AAMAL2	0.140
		1/2"-20UNF connector	XS230AAMAU20	0.080

Accessories (2)

Description		Reference	Weight kg
Fixing clamps	Ø 18	XSZB118	0.010
	Ø 30	XSZB130	0.020

Connecting cables

Description	Type	Length m	Reference	Weight kg
Pre-wired connectors 1/2"-20UNF 3-pin female, stainless steel 316 L clamping ring	Straight	5	XZCPA1865L5	0.180
		10	XZCPA1865L10	0.350
	Elbowed	5	XZCPA1965L5	0.180
		10	XZCPA1965L10	0.350

(1) For a 5 m long cable replace L2 by L5; for a 10 m long cable replace L2 by L10.
Example: **XS218AAMAL2** becomes **XS218AAMAL5** with a 5 m long cable.

(2) For further information, see page 3/116.

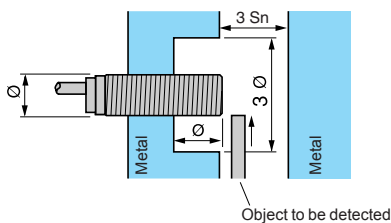
Characteristics		XS2●●AAM●U20	XS2●●AAM●L2
Sensor type		XS2●●AAM●U20	
Product certifications/approvals		UL, CSA, CE	
Connection	Connector	1/2"-20UNF	—
	Pre-cabled	—	Length: 2 m
Operating zone	∅ 18	mm 0...9.6	
	∅ 30	mm 0...17.6	
Differential travel		%	
Degree of protection		1...15 of effective sensing distance (Sr)	
Storage temperature	Conforming to IEC 60529	IP 67	IP 68, double insulation □
	DIN 40050	IP 69K	
Operating temperature		°C	
Materials		°C	
Vibration resistance	Case	PPS	
	Cable	—	PvR and 2 x 0.34 mm ²
Shock resistance		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Output state indication		50 gn, duration 11 ms	
Rated supply voltage		Yellow LED: annular	
Voltage limits (including ripple)		V	
Switching capacity		V	
Voltage drop, closed state		mA	
Residual current, open state		V	
Maximum switching frequency	XS218AAM●●●	~ or --- 24...240 (~ 50/60 Hz)	
	XS230AAM●●●	~ or --- 20...264	
Delays	First-up	mA	
	Response	ms	
	Recovery	ms	

(1) It is essential to connect a 0.4 A "quick-blow" fuse in series with the load.

Wiring schemes

Connector	Pre-cabled	2-wire ~ or ---
1/2"-20UNF	BU: Blue BN: Brown	NO output

Setting-up

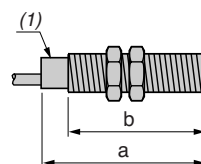


Minimum mounting distances (mm)

	Side by side	Face to face	Facing a metal object
∅ 18	e ≥ 72	e ≥ 144	e ≥ 36
∅ 30	e ≥ 120	e ≥ 264	e ≥ 66

Dimensions

XS2

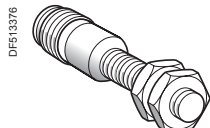


(1) LED

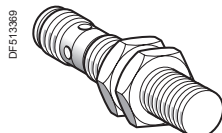
XS2	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
∅ 18	60	51	70	52
∅ 30	60	51	70	52

Inductive proximity sensors

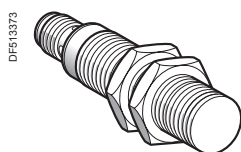
OsiSense XS Application
Cylindrical, stainless steel 303 front face
for harsh industrial environments
Three-wire DC, solid-state output



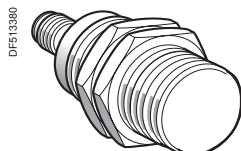
XS908●1PAM12



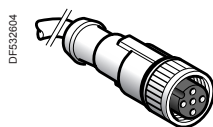
XS912●1PAM12



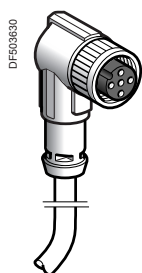
XS918●1PAM12



XS930●1PAM12



XZCP1141L●



XZCP1241L●

Ø 8 mm, threaded M8 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire 12-24V $\overline{\text{DC}}$, flush mountable					
3	NO	PNP	M12	XS908R1PAM12	0.018

Three-wire 12-24V $\overline{\text{DC}}$, non flush mountable

6	NO	PNP	M12	XS908R4PAM12	0.018
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Ø 12 mm, threaded M12 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire 12-24V $\overline{\text{DC}}$, flush mountable					
6	NO	PNP	M12	XS912R1PAM12	0.024

Three-wire 12-24V $\overline{\text{DC}}$, non flush mountable

10	NO	PNP	M12	XS912R4PAM12	0.023
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Ø 18 mm, threaded M18 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire 12-24V $\overline{\text{DC}}$, flush mountable					
10	NO	PNP	M12	XS918R1PAM12	0.044

Three-wire 12-24V $\overline{\text{DC}}$, non flush mountable

20	NO	PNP	M12	XS918R4PAM12	0.051
----	----	-----	-----	--------------	-------

Ø 30 mm, threaded M30 x 1.5

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire 12-24V $\overline{\text{DC}}$, flush mountable					
20	NO	PNP	M12	XS930R1PAM12	0.140

Three-wire 12-24V $\overline{\text{DC}}$, non flush mountable

40	NO	PNP	M12	XS930R4PAM12	0.144
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Connecting cables (PUR) ⁽¹⁾

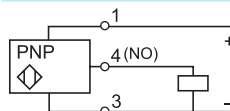
Description	Type	Length m	Reference	Weight kg
Pre-wired M12 connectors Female, 4-pin Metal clamping	Straight	2	XZCP1141L2	0.090
		5	XZCP1141L5	0.190
		10	XZCP1141L10	0.370
	Elbowed	2	XZCP1241L2	0.090
		5	XZCP1241L5	0.190
		10	XZCP1241L10	0.370

Wiring schemes

M12 connector



PNP



(1) For further information, please consult the catalogue "Cabling accessories OsiSense XZ", on our site www.tesensors.com.

Inductive proximity sensors

OsiSense XS Application
Cylindrical, stainless steel 303 front face
for harsh industrial environments
Three-wire DC, solid-state output

Characteristics					
Sensor type	Flush	XS908R1PAM12	XS912R1PAM12	XS918R1PAM12	XS930R1PAM12
	Non flush	XS908R4PAM12	XS912R4PAM12	XS918R4PAM12	XS930R4PAM12
Product certifications	CE, cULus				
Connection	Connector	M12			
Operating zone	Flush	mm 0...2.4	0...4.8	0...8	0...16
	Non flush	mm 0...4.8	0...8	0...16	0...32
Differential travel	%				
Degree of protection	Conforming to IEC 60529	IP 67		IP 68 (5 meters underwater for 1 month)	
	Conforming to DIN 40050	IP 69K			
Storage temperature	°C -25...+70 (-13...158°F)				
Operating temperature	°C -25...+70 (-13...158°F)				
Materials	Case	Stainless steel, 303 grade			
Front face thickness	mm	0.25	0.4	0.6	1.0
Mechanical shock resistance	Conforming to EN 50102	IK10			
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 1 mm (f = 10 to 55 Hz)			
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms			
Output state indication	Yellow LED, 4 viewing points at 90° (blinking from 0.8 Sr and Sr)				
Rated supply voltage	V $\bar{\bar{}}$ 12...24 with protection against reverse polarity				
Voltage limits (including ripple)	V $\bar{\bar{}}$ 10...30				
Switching capacity	mA ≤ 200 with overload and short-circuit protection				
Voltage drop, closed state	V ≤ 2				
Current consumption, no-load	mA ≤ 10				
Maximum switching frequency	Flush	Hz 1000	600	300	100
	Non flush	Hz 700	400	200	90
Delays	First set-up	ms 40			
	Response	μs 0.05		0.06	
	Recovery	μs 23		15	

Setting-up

Minimum mounting distances in mm, flush version

Side by side		Face to face	Facing a metal object	Mounted in a metal support
∅ 8	e ≥ 14	e ≥ 15	e ≥ 10	d ≥ 12
∅ 12	e ≥ 38	e ≥ 30	e ≥ 20	d ≥ 24
∅ 18	e ≥ 42	e ≥ 40	e ≥ 30	d ≥ 50
∅ 30	e ≥ 80	e ≥ 70	e ≥ 60	d ≥ 90

Minimum mounting distances in mm, non flush version

Side by side		Face to face	Facing a metal object	Mounted in a metal support
∅ 8	e ≥ 52	e ≥ 25	e ≥ 20	d ≥ 20 h ≥ 15
∅ 12	e ≥ 108	e ≥ 40	e ≥ 30	d ≥ 30 h ≥ 22
∅ 18	e ≥ 182	e ≥ 70	e ≥ 60	d ≥ 60 h ≥ 34
∅ 30	e ≥ 270	e ≥ 130	e ≥ 120	d ≥ 120 h ≥ 34

Dimensions

Lengths (mm): a = overall b = threaded c = for non flush mountable sensors	Flush sensor				Non flush sensor			
	M8	M12	M18	M30	M8	M12	M18	M30
	a (mm)	66	60	63.5	63.5	66	60	63.5
b (mm)	46	41	42	42	42	36	35	32
c (mm)	0	0	0	0	4	5	7	10

Reduction coefficient

Non flush mounted	Flush sensor				Non flush sensor			
	M8	M12	M18	M30	M8	M12	M18	M30
Steel	1	1	1	1	1	1	1	1
Aluminum	1	1	1	1	1	1	1	1
Brass	1.35	1.3	1.2	1.3	1.4	1.4	1.35	1.2
Copper	0.9	0.85	0.8	0.9	0.85	0.8	0.9	0.9
Stainless steel	Thickness 1 mm	0.3	0.5	0.5	0.35	0.3	(1)	(1)
	Thickness 2 mm	0.6	0.9	0.9	0.7	0.9	0.66	0.6

Flush mounted

	M8	M12	M18	M30
Steel	1	0.7	0.75	0.9
Aluminum	0.9	1.15	0.9	0.7
Brass	0.9	1.05	0.75	0.6
Stainless steel	1	0.8	0.8	1.3

(1) No detection.

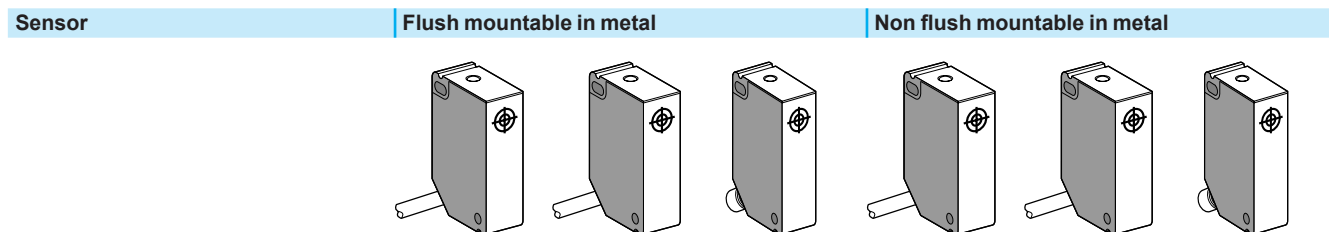
Inductive proximity sensors

OsiSense XS Application

For assembly, packaging and light material handling

Plastic case, 12 x 26 x 40 mm

DC supply, solid-state output



Nominal sensing distance (Sn)	2 mm	4 mm
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References							
3-wire $\overline{\text{---}}$	PNP NO	XS7G12PA140	–	XS7G12PA140S	XS8G12PA140	–	XS8G12PA140S
	NPN NO	XS7G12NA140	–	XS7G12NA140S	XS8G12NA140	–	XS8G12NA140S
4-wire $\overline{\text{---}}$ (complementary outputs)	PNP NO + NC	–	XS7G12PC440	–	–	XS8G12PC440	–
	NPN NO + NC	–	XS7G12NC440	–	–	XS8G12NC440	–
Weight (kg)		0.100	0.100	0.030	0.100	0.100	0.030

Characteristics								
Product certifications	CSA, UL, CE							
Connection	Pre-cabled	3 x 0.34 mm ² , length 2 m (1)	4 x 0.34 mm ² , length 2 m (1)	–	3 x 0.34 mm ² , length 2 m (1)	4 x 0.34 mm ² , length 2 m (1)	–	
	Connector	–	–	M8	–	–	M8	
Operating zone	0...1.6 mm				0...3.2 mm			
Repeat accuracy	≤ 10 % of Sr							
Differential travel	3...20 % of Sr							
Degree of protection	IP 67							
Storage temperature	-40...+85 °C							
Operating temperature	-25...+70 °C							
Materials	Case: PBT, cable: PVC							
Vibration resistance Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)							
Shock resistance Conforming to IEC 60068-2-27	50 gn, duration 11 ms							
Output state indication	Yellow LED (on top of case)							
Rated supply voltage	$\overline{\text{---}}$ 12...24 V	$\overline{\text{---}}$ 12...48 V	$\overline{\text{---}}$ 12...24 V	$\overline{\text{---}}$ 12...24 V	$\overline{\text{---}}$ 12...48 V	$\overline{\text{---}}$ 12...24 V	$\overline{\text{---}}$ 12...24 V	
Voltage limits (including ripple)	$\overline{\text{---}}$ 10...30 V	$\overline{\text{---}}$ 10...58 V	$\overline{\text{---}}$ 10...30 V	$\overline{\text{---}}$ 10...30 V	$\overline{\text{---}}$ 10...58 V	$\overline{\text{---}}$ 10...30 V	$\overline{\text{---}}$ 10...30 V	
Current consumption, no-load	≤ 10 mA							
Switching capacity	0...100 mA (2)	0...200 mA (2)	0...100 mA (2)	0...100 mA (2)	0...200 mA (2)	0...100 mA (2)	0...100 mA (2)	
Voltage drop, closed state	≤ 1.8 V	≤ 2.6 V	≤ 1.8 V	≤ 1.8 V	≤ 2.6 V	≤ 1.8 V	≤ 1.8 mA	
Maximum switching frequency	≤ 2 kHz				≤ 1 kHz			
Delays	First-up	≤ 4 ms						
	Response	≤ 0.5 ms						
	Recovery	≤ 1 ms						

(1) Sensors available with other cable lengths:

Length of cable	Suffix to be added to references stated above for 2 m pre-cabled sensors	Weight increase
5 m	L1	0.120 kg
10 m	L2	0.320 kg

Example: sensor **XS7G12PA140** with 5 m long cable becomes **XS7G12PA140L1**.

(2) With overload and short-circuit protection

Inductive proximity sensors

OsiSense XS Application

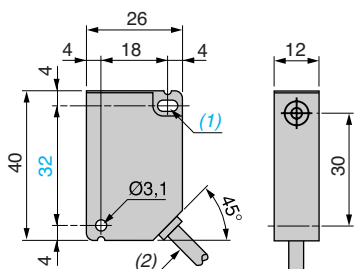
For assembly, packaging and light material handling

Plastic case, 12 x 26 x 40 mm

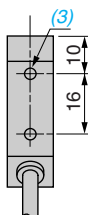
DC supply, solid-state output

Dimensions

XS● G12●A140, XS● G12●C440



Rear view

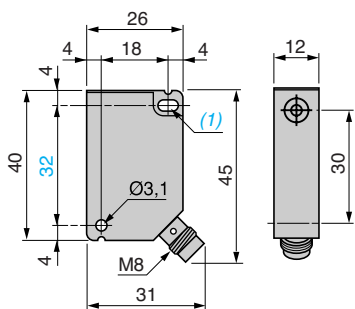


(1) 1 elongated hole $\varnothing 3.1 \times 5.1$.

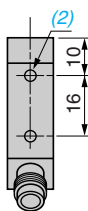
(2) Cable L = 2 m.

(3) 2 holes M3 x 5.

XS● G12●A140S



Rear view

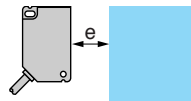
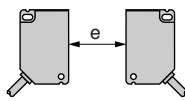
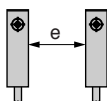


(1) 1 elongated hole $\varnothing 3.1 \times 5.1$.

(2) 2 holes M3 x 5.

Setting-up

Minimum mounting distances (mm)



Side by side

Face to face

Facing a metal object and mounting in a metal support

XS7G flush mountable

$e \geq 0$

$e \geq 15$

$e \geq 6$

XS8G non flush mountable

$e \geq 10$

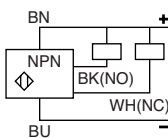
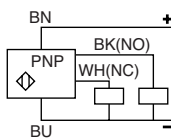
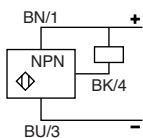
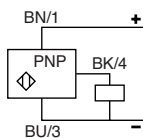
$e \geq 60$

$e \geq 12$

Wiring schemes

3-wire $\overline{\text{NO}}$, NO output

4-wire $\overline{\text{NO}}$, NO + NC output



Connector

M8



Détecteurs de proximité inductifs

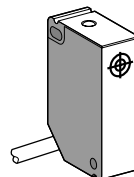
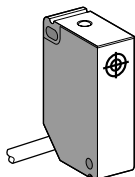
OsiSense XS Application

Pour assemblage, emballage et petite manutention

Boîtier en plastique 12 x 26 x 40 mm

Alimentation en courant alternatif ou continu

Appareils	Noyables dans le métal	Non noyables dans le métal
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Portée nominale (Sn)	2 mm	4 mm
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Références

2 fils \sim ou \sim	NO	XS7G12MA230	XS8G12MA230
	NC	XS7G12MB230	XS8G12MB230
Masse (kg)	0,100	0,100	0,100

Caractéristiques

Certifications de produits	CSA, UL, CE	
Mode de raccordement	Par câble 2 x 0,34 mm ² , longueur 2 m (1)	
Domaine de fonctionnement	0...1,6 mm	0...3,2 mm
Reproductibilité	≤ 10 % de Sr	
Hystérésis	3...20 % de Sr	
Degré de protection	IP 67	
Température de stockage	- 40...+ 85 °C	
Température de fonctionnement	- 25...+ 70 °C	
Matériaux	Boîtier : PBT, câble : PVC	
Tenue aux vibrations Selon IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 à 55 Hz)	
Tenue aux chocs Selon IEC 60068-2-27	50 gn, durée 11 ms	
Signalisation d'état de sortie	DEL jaune (sur partie supérieure)	
Tension assignée d'alimentation	\sim 24...240 V (50/60 Hz) ou \sim 24...210 V	
Limites de tension (ondulation comprise)	\sim ou \sim 20...264 V	
Courant commuté	5...200 mA (2)	
Tension de déchet, état fermé	≤ 5,5 V	
Courant résiduel, état ouvert	≤ 0,8 mA / 24 V, 1,5 mA / 120 V	
Fréquence maximale de commutation	\sim 25 Hz ou \sim 250 Hz	
Retards	A la disponibilité	≤ 40 ms
	A l'action	≤ 1 ms
	Au relâchement	≤ 2 ms

(1) Détecteurs avec autres longueurs de câble :

Longueur de câble	Repère à ajouter en fin de référence du détecteur choisi avec câble de 2 m	Masse augmentée de
5 m	L1	0,120 kg
10 m	L2	0,320 kg

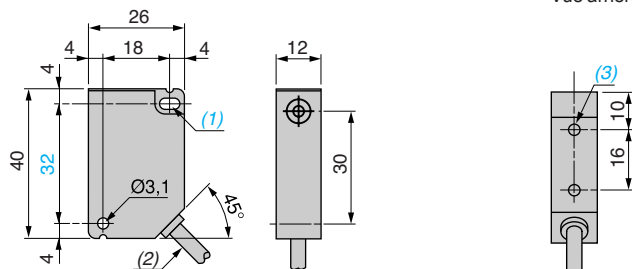
Exemple : détecteur **XS7G12MA230** avec câble de 5 m devient **XS7G12MA230L1**.

(2) Ces détecteurs n'étant pas protégés contre les surcharges et les courts-circuits, il est impératif de mettre, en série avec la charge, un fusible à action rapide de 0,4 A.

Encombremments

XS•G12M•230

Vue arrière



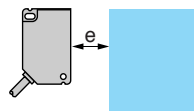
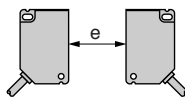
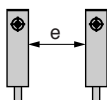
(1) 1 trou oblong 3,1 x 5,1.

(2) Câble L = 2 m.

(3) 2 trous M3 x 5.

Précautions de mise en œuvre

Distances à respecter au montage (mm)



Côte à côte

Face à face

Face à masse métallique et montage dans support métallique

XS7G noyable

$e \geq 0$

$e \geq 15$

$e \geq 6$

XS8G non noyable

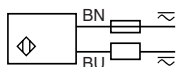
$e \geq 10$

$e \geq 60$

$e \geq 12$

Raccordements

Type 2 fils ~ ou ☐, sortie NO ou NC



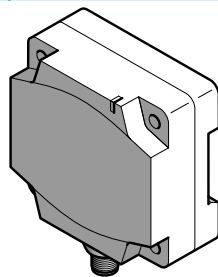
Inductive proximity sensors

OsiSense XS Application

Flat sensor, flush mountable, increased range, switching capacity 300 mA

80 x 80 x 40 format, DIN rail mounting, solid-state output

Sensor Flush mountable in metal



Dimensions (mm)	80 x 80 x 40
Nominal sensing distance (S _n)	50 mm (not flush mounted: 42 mm)

Reference

2-wire $\overline{\text{---}}$ (non polarised)	NO	XS7D1A3CAM12DIN
Weight (kg)	0.374	

Characteristics

Product certifications	CE	
Degree of protection	Conforming to IEC 60529	IP 67, double insulation \square
Temperature	Operating	- 25...+ 70 °C
	Storage	- 40...+ 85 °C
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude \pm 2 mm (f = 10 to 55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	50 gn, duration 11 ms
Connection	M12 connector	
Operating zone	0...40 mm (not flush mounted: 0...35 mm)	
Repeat accuracy	3 % of S _r	
Differential travel	1...15 % of S _r	
Output state indication	Yellow LED	
Rated supply voltage	$\overline{\text{---}}$ 12...48 V with protection against reverse polarity	
Voltage limits (including ripple)	$\overline{\text{---}}$ 10...58 V	
Residual current, open state	\leq 0.5 mA	
Switching capacity	1.5...300 mA with overload and short-circuit protection	
Voltage drop, closed state	\leq 4.5 V	
Maximum switching frequency	100 Hz	
Delays	First-up	\leq 10 ms
	Response	\leq 2 ms
	Recovery	\leq 5 ms

Inductive proximity sensors

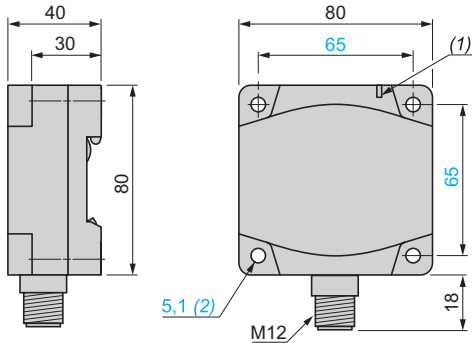
OsiSense XS Application

Flat sensor, flush mountable, increased range, switching capacity 300 mA

80 x 80 x 40 format, DIN rail mounting, solid-state output

Dimensions

XS7D1A3CAM12DIN

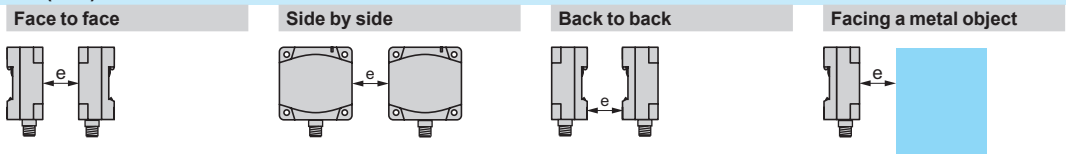


(1) Output LED

(2) For CHC type screws

Setting-up

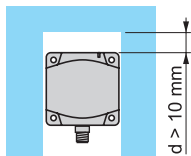
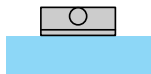
Minimum mounting distances (mm)



	Face to face	Side by side	Back to back	Facing a metal object
Flush mounted	450	140	90	150
Not flush mounted	450	180	180	150

Flush/non flush conditions

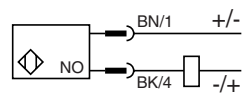
In A37 steel



Sn	Su	Sn	Su
42 mm	35 mm	50 mm	40 mm

Wiring schemes

2-wire NO/M12 XS7D1A3CAM12DIN



Inductive proximity sensors

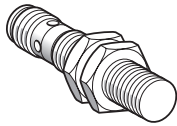
OsiSense XS Application

Cylindrical, stainless steel 303 front face

for welding environments

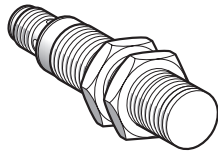
Three-wire DC, solid-state output

DF513689



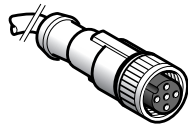
XS912RWPAM12

DF513373



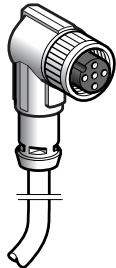
XS918RWPAM12

DF532604



XZCP1141L●

DF532630



XZCP1241L●

Ø 12 mm, threaded M12 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire 12-24V $\overline{\text{DC}}$, flush mountable					
6	NO	PNP	M12	XS912RWPAM12	0.024

Ø 18 mm, threaded M18 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire 12-24V $\overline{\text{DC}}$, flush mountable					
10	NO	PNP	M12	XS918RWPAM12	0.051

Connecting cables (PUR) ⁽¹⁾

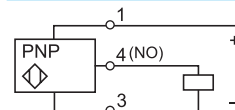
Description	Type	Length m	Reference	Weight kg
Pre-wired M12 connectors Female, 4-pin Metal clamping ring	Straight	2	XZCP1141L2	0.090
		5	XZCP1141L5	0.190
		10	XZCP1141L10	0.370
	Elbowed	2	XZCP1241L2	0.090
		5	XZCP1241L5	0.190
		10	XZCP1241L10	0.370

Wiring schemes

M12 connector



PNP



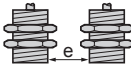
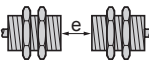
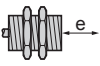
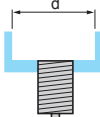
(1) For further information, please consult the catalogue "Cabling accessories OsiSense XZ" on our site www.tesensors.com.

Inductive proximity sensors

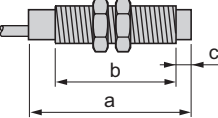
OsiSense XS Application
Cylindrical, stainless steel 303 front face
for welding environments
Three-wire DC, solid-state output

Characteristics			
Sensor type	Flush	XS912RWPAM12	XS918RWPAM12
Product certifications		CE, cULus	
Connection	Connector	M12	
Operating zone		mm	0...4.8
Differential travel		%	1...15 (real sensing distance Sr)
Degree of protection	Conforming to IEC 60529	IP 68 (5 meters underwater for 1 month)	
	Conforming to DIN 40050	IP 69K	
Storage temperature		°C	-25...+70 (-13...158°F)
Operating temperature		°C	-25...+70 (-13...158°F)
Materials	Case	Stainless steel, 303 grade	
Front face thickness		mm	0.4
			0.6
Mechanical shock resistance	Conforming to EN 50102	IK10	
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 1 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Output state indication		Yellow LED, 4 viewing points at 90° (blinking from 0.8 Sr and Sr)	
Rated supply voltage		V	--- 12...24 with protection against reverse polarity
Voltage limits (including ripple)		V	--- 10...30
Switching capacity		mA	≤ 200 with overload and short-circuit protection
Voltage drop, closed state		V	≤ 2
Current consumption, no-load		mA	≤ 10
Maximum switching frequency		Hz	15
Delays	First set-up	ms	80
	Response	µs	100
	Recovery	µs	15

Setting-up

Minimum mounting distances in mm, flush version			
Side by side	Face to face	Facing a metal object	Mounted in a metal support
$\frac{\varnothing 12}{\varnothing 18}$ $e \geq 38$ $e \geq 42$ 	$e \geq 30$ $e \geq 40$ 	$e \geq 20$ $e \geq 30$ 	$d \geq 24$ $d \geq 50$ 

Dimensions

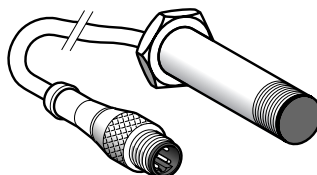
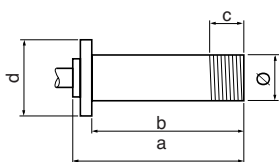
 <p>Lengths (mm): a = overall b = threaded c = for non flush mountable sensors</p>	Flush sensor	
	M12	M18
a (mm)	60	63.5
b (mm)	41	42
c (mm)	0	0

Reduction coefficient

Non flush mounted		Flush sensor	
		M12	M18
Steel		1	1
Aluminum		1	1
Brass		1.3	1.2
Copper		0.85	0.8
Stainless steel	Thickness 1 mm	0.5	0.5
	Thickness 2 mm	0.9	0.9

Flush mounted		M12		M18	
Steel		0.7		0.75	
Aluminum		1.15		0.9	
Brass		1.05		0.75	
Stainless steel		0.8		0.8	

Flush mountable in metal



Lengths (mm):
a = Overall
b = To shoulder
c = Removal
d = Shoulder

Ø = 12
a = 55
b = 50
c = 9 (threaded end)
d = 15 hexagonal

Nominal sensing distance (Sn)	3 mm	3 mm	3 mm
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References

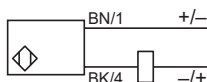
2-wire $\overline{\overline{\text{---}}}$ (non polarised) Terminal connections	1-4	NO	XSLC1401393L1	XSLC1401393L3	XSLC1401393L4
Weight (kg)			0.050	0.065	0.050

Characteristics

Connection	Remote M12 connector on 1.2 m flying lead	Remote M12 connector on 0.8 m flying lead	Remote M12 connector on 0.15 m flying lead
Degree of protection conforming to IEC 60529	IP 67		
Operating zone	0...2.4 mm		
Repeat accuracy	≤ 3 % of Sr		
Differential travel	1...15 % of Sr		
Operating temperature	- 25...+ 80 °C		
Output state indication	Yellow LED, annular		
Rated supply voltage	$\overline{\overline{\text{---}}}$ 12...48 V		
Voltage limits (including ripple)	$\overline{\overline{\text{---}}}$ 10...58 V		
Switching capacity	1.5...100 mA with overload and short-circuit protection		
Voltage drop, closed state	≤ 4 V		
Residual current, open state	≤ 0.5 mA		
Current consumption, no-load	-		
Maximum switching frequency	800 Hz		
Delays	First-up: ≤ 5 ms; response: ≤ 05 ms; recovery: ≤ 0.5 ms		

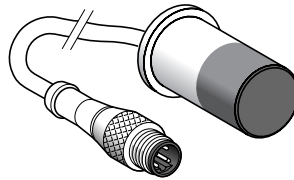
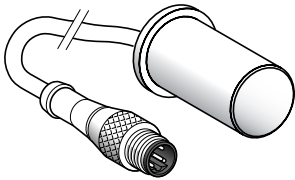
Wiring schemes

2-wire $\overline{\overline{\text{---}}}$, non polarised, NO output



Flush mountable in metal

Non flush mountable in metal



Ø = 18
a = 40
b = 35
c = 0 (PPS front face)
d = Ø 22

Ø = 18
a = 45
b = 35
c = 20 (Teflon front face and case)
d = Ø 22

6.3 mm	10 mm	10 mm
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XSLC1401392L1	XSLC1401405L3	XSLC1401405L4
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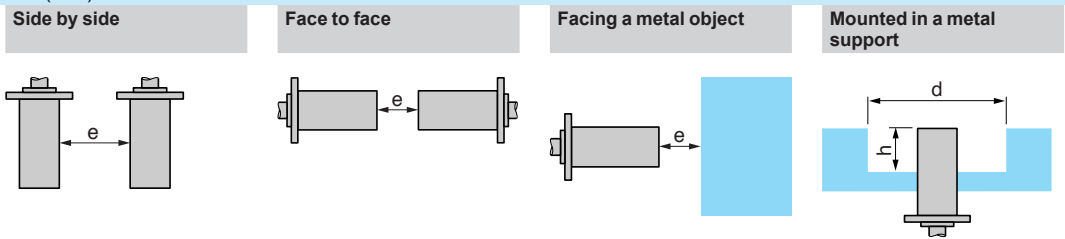
0.100	0.065	0.050
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Remote M12 connector on 1.2 m flying lead	Remote M12 connector on 0.8 m flying lead	Remote M12 connector on 0.15 m flying lead
-------------------------------------------	-------------------------------------------	--------------------------------------------

IP 67	0...8 mm	
0...5 mm		
3 % of Sr		
1...15 % of Sr		
- 25...+ 70 °C		
Yellow LED, annular		
--- 12...48 V		
--- 10...58 V		
1.5...100 mA with overload and short-circuit protection		
≤ 4 V		
≤ 0.5 mA		
-		
100 Hz		
First-up: ≤ 10 ms; response: ≤ 10 ms; recovery: ≤ 2 ms		

Setting-up

Minimum mounting distances (mm)



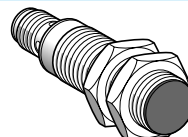
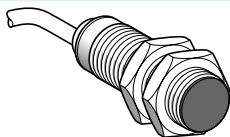
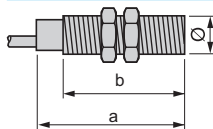
XSLC	Ø 12 (flush mountable)	e ≥ 10	e ≥ 60	e ≥ 15	d = 12, h = 0
	Ø 18 (non flush mountable)	e ≥ 16	e ≥ 96	e ≥ 24	d = 54, h = 16

Inductive proximity sensors

OsiSense XS

Detection at fixed sensing distance. Factor 1 (Fe/Nfe) sensors (1) for ferrous and non ferrous materials
Solid-state output

Flush mountable in metal



Lengths (mm):
a = Overall
b = Threaded section

a = 60
b = 51.5
Ø = M18 x 1

a = 70
b = 51.5
Ø = M18 x 1

	Brass case	Brass case
Nominal sensing distance (Sn)	5 mm	5 mm

References

4-wire ---	PNP/PNP programmable NO/NC	XS1M18KPM40	XS1M18KPM40D
Weight (kg)		0.120	0.060

Characteristics

Product certifications	CE, UL, CSA		
Connection	Pre-cabled, PvR 4 x 0.34 mm ² , length 2 m (2)		M12 connector
Degree of protection	Conforming to IEC 60529	IP 68	IP 67
Operating zone	0...4 mm		
Repeat accuracy	3 % of Sr		
Differential travel	1...15 % of Sr		
Operating temperature	0...+ 50 °C		
Output state indication	Yellow LED, annular		Yellow LED, 4 viewing ports at 90°
Rated supply voltage	--- 12...24 V with protection against reverse polarity		
Voltage limits (including ripple)	--- 10...38 V		
Switching capacity	0...200 mA with overload and short-circuit protection		
Voltage drop, closed state	≤ 2.6 V		
Current consumption, no-load	≤ 15 mA		
Maximum switching frequency	1000 Hz		
Delays	First-up	≤ 10 ms	
	Response	≤ 0.3 ms	
	Recovery	≤ 0.7 ms	

Wiring schemes

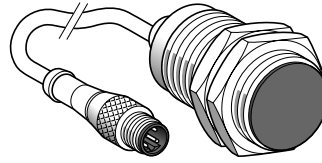
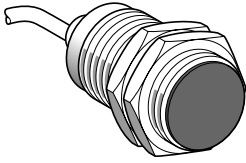
M12 connector	Pre-cabled	4-wire ---, PNP/NPN, NO or NC output	
	BN: brown BU: blue BK: black WH: white	PNP 	NPN

(1) The variation in sensing distance between ferrous and non ferrous materials is typically less than 5 %.
 (2) Sensors available with other cable lengths: please consult our Customer Care Centre.

Inductive proximity sensors

OsiSense XS

Detection at fixed sensing distance. Factor 1 (Fe/Nfe) sensors (1) for ferrous and non ferrous materials
Solid-state output



a = 60
b = 51.5
Ø = M30 x 1.5

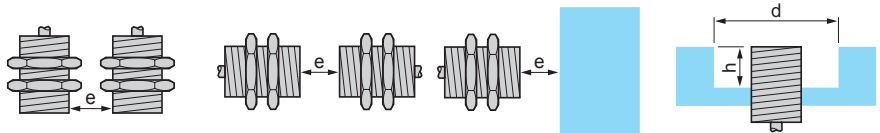
a = 60
b = 51.5
Ø = M30 x 1.5

Stainless steel case 10 mm	Stainless steel case 10 mm
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References	
XS1M30KPM40	XS1M30KPM40LD
0.205	0.145

Characteristics	
CE, UL, CSA	
Pre-cabled, PvR 4 x 0.34 mm ² , length 2 m (2)	M12 connector on 0.8 m flying lead
IP 68	IP 67
0...8 mm	
3 % of Sr	
1...15 % of Sr	
0...+ 50 °C	
Yellow LED, annular	
--- 12...24 V with protection against reverse polarity	
--- 10...38 V	
0...200 mA with overload and short-circuit protection	
≤ 2.6 V	
≤ 15 mA	
1000 Hz	
≤ 5 ms	
≤ 0.3 ms	
≤ 0.7 ms	

Setting-up	Side by side	Face to face	Facing a metal object	Mounted in a metal support
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XS1M18 flush mountable	$e \geq 10$	$e \geq 60$	$e \geq 15$	$d \geq 18, h \geq 0$
XS1M30 flush mountable	$e \geq 20$	$e \geq 120$	$e \geq 30$	$d \geq 30, h \geq 0$

Fixing nut tightening torque: XS1M18: < 35 N.m, XS1M30: < 100 N.m

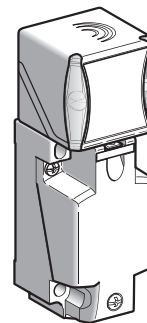
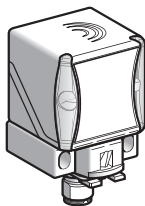
(1) The variation in sensing distance between ferrous and non ferrous materials is typically less than 5 %.
(2) Sensors available with other cable lengths: please consult our Customer Care Centre.

Inductive proximity sensors

OsiSense XS Application

Factor 1 sensors for ferrous or non ferrous material detection and welding applications. Plastic case, 40 x 40 mm front face. 5 position turret head

Sensor	Flush mountable in metal	
Dimensions	40 x 40 x 70 mm	40 x 40 x 117 mm



Nominal sensing distance (Sn)	20 mm
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References

4-wire ---	PNP NO+NC	XS9C2A1PCM12	XS9C4A1PCP20 (1)
	NPN NO+NC	XS9C2A1NCM12	XS9C4A1NCP20 (1)

XS9C4●●●P20 sensors are available with an ISO M20 cable entry and can be supplied with a Pg 13.5 (e.g. **XS9C4A1PCG13**) or a 1/2" NPT (e.g. **XS9C4A1PCN12**) cable entry: please consult our Customer Care Centre for more information.

Weight (kg)	0.110	0.220
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Characteristics

Product certifications	UL, CSA, CE	
Conformity to standards	IEC 60947-5-2	
Connection	M12 connector (4-pin)	Screw terminals, clamping capacity 4 x 1.5 mm ² / 4 x 16 AWG
Operating zone	0...16 mm	
Differential travel	3...15% of Sr	
Repeat accuracy	< 3%	
Immunity to magnetic fields	< 250 mTesla	
Degree of protection	Conforming to IEC 60529 and DIN 40050	IP 65, IP 67 and IP 69K
Temperature	Storage	- 40...+ 85°C
	Operation (2)	- 25...+ 70°C
Material	Case: PBT	
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10...55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	50 gn for 11 ms
Indicators	Output state: yellow LED. Supply on: green LED	
Rated supply voltage	4-wire ---	--- 12...24 V with protection against reverse polarity
Voltage limits (including ripple)	4-wire ---	--- 10...36 V
Current consumption, no-load	4-wire ---	< 30 mA
Switching capacity	4-wire ---	< 200 mA with protection against overload and short-circuit
Voltage drop, closed state	4-wire ---	< 2 V
Maximum switching frequency	4-wire ---	250 Hz
Delays	First-up	< 15 ms
	Response	< 2.5 ms
	Recovery	< 2.5 ms

Setting-up

<p>Sensing distance correction factor</p> <p>SS: stainless steel, Fe: steel, Al: aluminium, Cu: copper.</p>	<p>Operating distance (according to the sensor's level of flush mounting)</p> <p>--- : Flush mounted in Fe360 — : Flush mounted in aluminium</p>
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(1) These sensors are supplied without a cable gland. A suitable Pg 13.5 cable gland is available (reference **XSZPE13**).
 (2) Sensors are available for very low temperatures (suffix **TF**: - 40°C, + 70°C) or very high temperatures (suffix **TT**: - 25°C, + 85°C); please consult our Customer Care Centre.

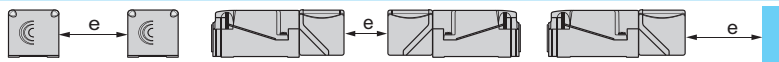
Inductive proximity sensors

OsiSense XS Application

Factor 1 sensors for ferrous or non ferrous material detection and welding applications. Plastic case, 40 x 40 mm front face. 5 position turret head

Setting-up (continued)

Minimum mounting distances (mm)



Side by side

Face to face

Facing a metal object

Sensors flush mountable in metal

$e \geq 80$

$e \geq 200$

$e \geq 60$

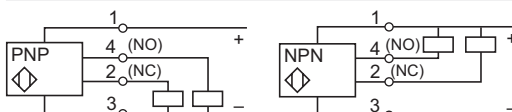
Wiring schemes

M12 connector

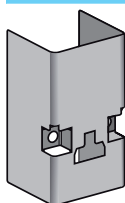


1: +V
2: NC Output
3: 0 V
4: NO Output

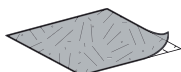
4-wire \rightarrow , NO + NC outputs



Accessories



XSZPSC2



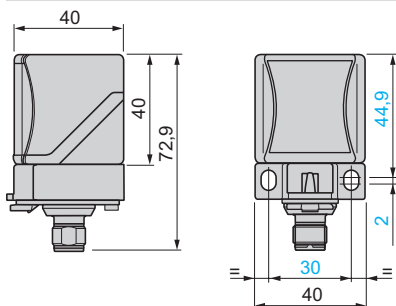
XSZPKC2

Description	Use for	Reference	Weight kg
Stainless steel rigid protective cover (only suitable for use when detecting from the top)	Welding	XSZPSC2	0.010
Protective sheet (for sensing face of sensor)	Welding	XSZPKC2	0.010

Sold in lots of 5

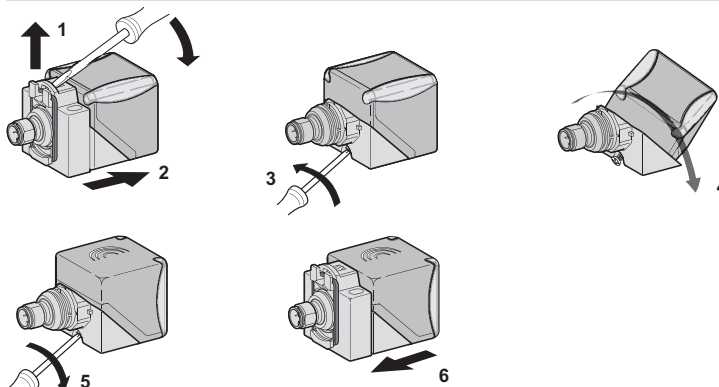
Dimensions

XS9C2A1PCM12 and XS9C2A1NCM12

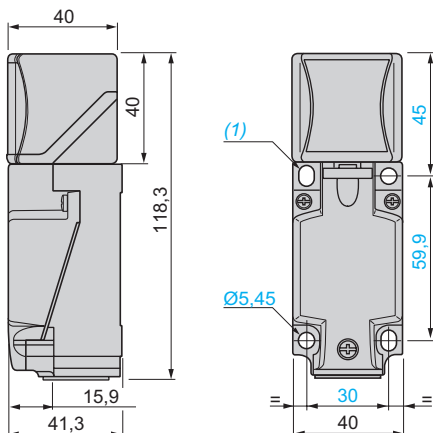


Head positions

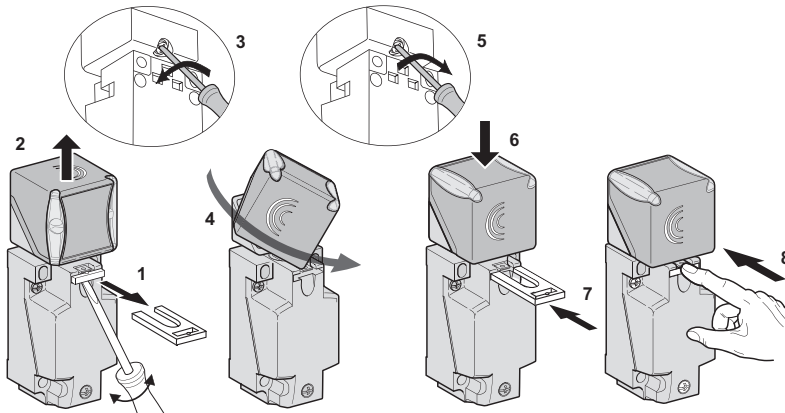
XS9C2A1PCM12 and XS9C2A1NCM12



XS9C4A1PCP20 and XS9C4A1NCP20



XS9C4A1PCP20 and XS9C4A1NCP20



(1) 2 elongated holes $\varnothing 5.3 \times 7$ mm.

Tightening torque of cover fixing screws and clamp screws: < 1.2 N.m / < 10.62 lb-in.

Inductive proximity sensors

OsiSense XS Application

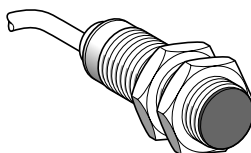
Selective detection of ferrous materials

Selective detection of non ferrous materials

Cylindrical type, solid-state output

Flush mountable

Stainless steel case



Nominal sensing distance (Sn) 5 mm

References

3-wire, ferrous version Insensitive to non ferrous materials	PNP NO	XS1M18PAS40
3-wire, non ferrous version Insensitive to ferrous materials	PNP NO	XS1M18PAS20
Weight (kg)		0.120

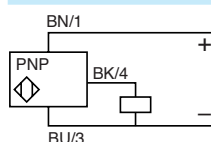
Characteristics

Product certifications	UL, CSA, CE
Connection	Pre-cabled, PvR, 3 x 0.34 mm ² , length 2 m (1)
Operating zone	0...4 mm
Degree of protection conforming to IEC 60529	IP 68
Operating temperature	-25...+70 °C
Output state indication	Yellow LED, annular
Rated supply voltage	DC 12...24 V with protection against reverse polarity
Voltage limits (including ripple)	DC 10...38 V
Switching capacity	0...200 mA with overload and short-circuit protection
Voltage drop, closed state	≤ 2.6 V
Residual current, open state	-
Current consumption, no-load	≤ 15 mA
Maximum switching frequency	1000 Hz
Delays	First-up ≤ 10 ms Response ≤ 0.3 ms Recovery ≤ 0.7 ms

(1) Sensors available with other cable lengths: please consult our Customer Care Centre.

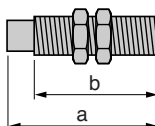
Wiring schemes

3-wire PNP



Dimensions

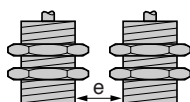
XS1M



a (mm)	b (mm)
60	51.5

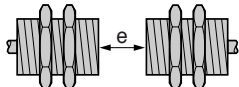
Setting-up

Minimum mounting distances (mm)



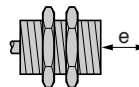
Side by side

$e \geq 10$



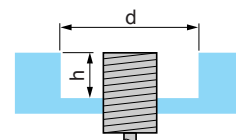
Face to face

$e \geq 60$



Facing a metal object

$e \geq 15$



Mounted in a metal support

$d \geq 18$, $h \geq 0$ (ferrous metal)
 $d \geq 18$, $h \geq 5$ (non ferrous metal)

XS1M18

Inductive proximity sensors

OsiSense XS Application

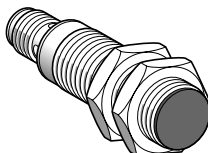
Selective detection of ferrous materials

Selective detection of non ferrous materials

Cylindrical type, solid-state output

Flush mountable

Stainless steel case



Nominal sensing distance (Sn) 5 mm

References

3-wire, ferrous version Insensitive to non ferrous materials	PNP NO	XS1M18PAS40D
3-wire, non ferrous version Insensitive to ferrous materials	PNP NO	XS1M18PAS20D
Weight (kg)		0.060

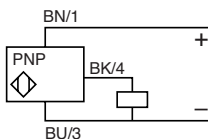
Characteristics

Product certifications	UL, CSA, CE	
Connection	M12 connector	
Degree of protection conforming to IEC 60529	IP 67	
Operating zone	0...4 mm	
Operating temperature	-25...+70 °C	
Output state indication	Yellow LED, 4 viewing ports at 90°	
Rated supply voltage	12...24 V with protection against reverse polarity	
Voltage limits (including ripple)	10...38 V	
Switching capacity	0...200 mA with overload and short-circuit protection	
Voltage drop, closed state	≤ 2.6 V	
Residual current, open state	–	
Current consumption, no-load	≤ 15 mA	
Maximum switching frequency	1000 Hz	
Delays	First-up	≤ 10 ms
	Response	≤ 0.3 ms
	Recovery	≤ 0.7 ms

Wiring schemes

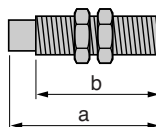
M12 connector

3-wire PNP



Dimensions

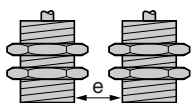
XS1M



a (mm)	b (mm)
70	51.5

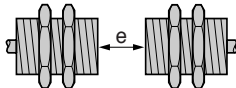
Setting-up

Minimum mounting distances (mm)



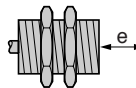
Side by side

$e \geq 10$



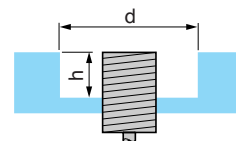
Face to face

$e \geq 60$



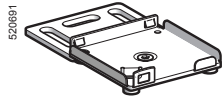
Facing a metal object

$e \geq 15$

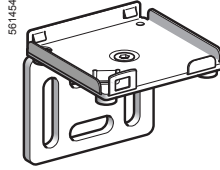


Mounted in a metal support

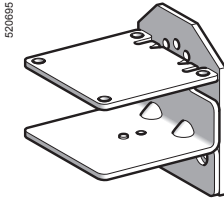
$d \geq 18, h \geq 0$ (ferrous metal)
 $d \geq 18, h \geq 5$ (non ferrous metal)



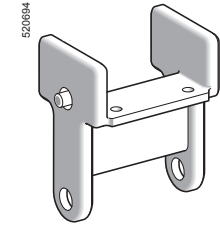
XSZB00



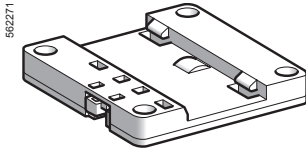
XSZB90



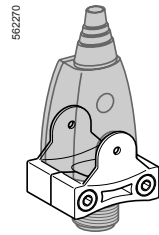
XSZBC10



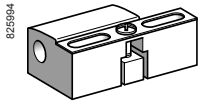
XSZBE10



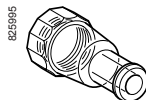
XSZBD10



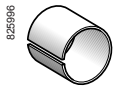
XSZBPM12



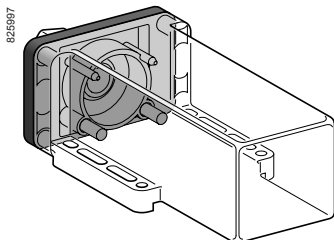
XSZB100



XSZP100



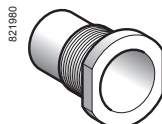
XSZA000



XSCZ01



XSZF10



XTAZ30

Mounting and fixing accessories

Description	For use with sensor		Unit reference	Weight kg	
	Type	Diameter (mm)			
"Clip" mounting plate Can be mounted without "clip" on threaded holes	XS●J	–	XSZBJ00	0.003	
	XS●F	–	XSZBF00	0.005	
	XS●E	–	XSZBE00	0.025	
	XS●C	–	XSZBC00	0.060	
"Clip" 90° mounting bracket Can be mounted without "clip" on threaded holes	XS●J	–	XSZBJ90	0.003	
	XS●F	–	XSZBF90	0.005	
	XS●E	–	XSZBE90	0.025	
	XS●C	–	XSZBC90	0.060	
Replacement bracket Replaces: XS7T2, XS8T2, XSE	XS●E	–	XSZBE10	0.060	
	XS●C	–	XSZBC10	0.110	
	XS●D (for XSD) (1)	–	XSZBD10	0.065	
	XS9, XS6●●●B2	–	XSZBPM12	0.015	
Fixing clamp for remote control	XS1	4 (plain)	XSZB104	0.005	
		5 (M5 x 0.5)	XSZB105	0.005	
	XS1, XS2	6.5 (plain)	XSZB165	0.005	
		8 (M8 x 1)	XSZB108	0.006	
	XS1, XS2, XS4, XS5, XS6, XT1	12 (M12 x 1)	XSZB112	0.006	
		18 (M18 x 1)	XSZB118	0.010	
		30 (M30 x 1.5)	XSZB130	0.020	
	Set of 2 metal fixing nuts, nickel plated	XT1	32 (plain)	XUZB32	0.050
XS1		5 (M5 x 0.5)	XSZE105	0.010	
XS1, XS2, XS5, XS6		8 (M8 x 1)	XSZE108	0.015	
XS1, XS2, XT1, XS5, XS6		12 (M12 x 1)	XSZE112	0.015	
Set of 2 stainless steel fixing nuts		18 (M18 x 1)	XSZE118	0.020	
		30 (M30 x 1.5)	XSZE130	0.050	
	XS1, XS2, XS5, XS6	8 (M8 x 1)	XSZE308	0.015	
	XS1, XS2, XT1, XS5, XS6	12 (M12 x 1)	XSZE312	0.015	
		18 (M18 x 1)	XSZE318	0.020	
		30 (M30 x 1.5)	XSZE330	0.050	
Set of 2 plastic fixing nuts	XS4	8 (M8 x 1)	XSZE208	0.002	
		12 (M12 x 1)	XSZE212	0.003	
	XS4	18 (M18 x 1)	XSZE218	0.004	
		30 (M30 x 1.5)	XSZE230	0.005	
Adaptor collar	Ø 20	XS●, XT●	18 (M18 x 1)	XSZA020	0.005
	Ø 34	XS●, XT●	30 (M30 x 1.5)	XSZA034	0.005

Protection accessories

Cable sleeve adaptor (CNOMO type)	XS●, XT●	12 (M12 x 1)	XSZP112	0.005
		18 (M18 x 1)	XSZP118	0.005
		30 (M30 x 1.5)	XSZP130	0.010
Outer cover (IP 68)	XT7, XS7, XS8 and XS9 – (C format)	–	XSCZ01	0.100
Thread adaptor	XS●, XT●	30 (M30 x 1.5)	XTAZ30	0.035
13P cable gland	Clamping capacity Ø 9 to 12 mm	–	XSZPE13	0.010
Protective cover Sold in lots of 50	M12 universal connectors	–	XSZF10	0.020

Fixings

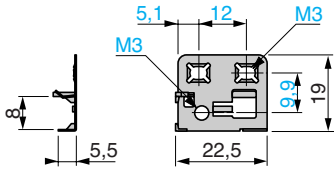
Threaded inserts for rear fixing	XS●E	M3	XSZVF03	0.002
	XS●C	M4	XSZVF04	0.005
	XS●D	M5	XSZVF05	0.006

Fuses (for unprotected 2-wire ~ sensors)

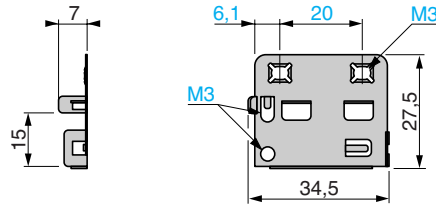
Description	Type	Sold in lots of	Unit reference	Weight kg
Cartridge fuses 5 x 20	0.4 A "quick-blow"	10	XUZE04	0.001
	0.63 A "quick-blow"	10	XUZE06	0.001
	0.8 A "quick-blow"	10	XUZE08	0.001
Fuse terminal block for XUZE0●	–	50	AB1FU10135U	0.040

(1) Depth adjustment shim for converting 80 x 80 x 26 mm format to 80 x 80 x 40 mm format. Also enables clipping onto 35 mm omega rail.

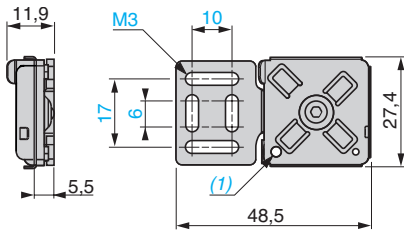
XSZBJ00



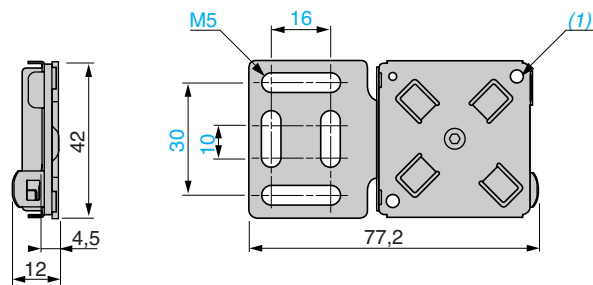
XSZBF00



XSZBE00



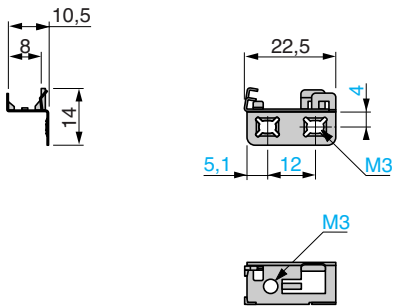
XSZBC00



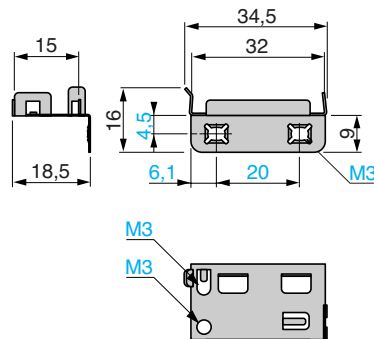
(1) 2 screws M3 x 12 (included).

(1) 4 screws M4 x 14 (included).

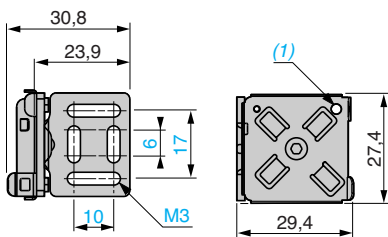
XSZBJ90



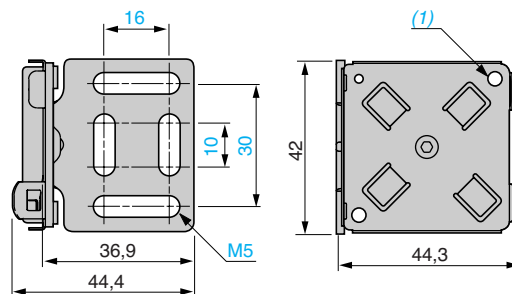
XSZBF90



XSZBE90



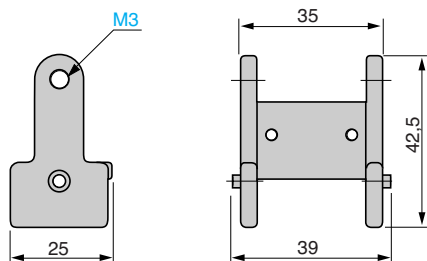
XSZBC90



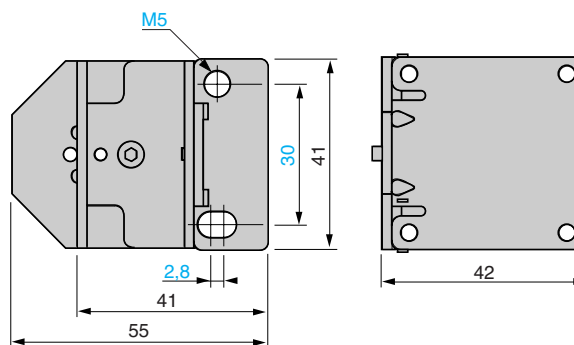
(1) 2 screws M3 x 12 (included).

(1) 4 screws M4 x 14 (included).

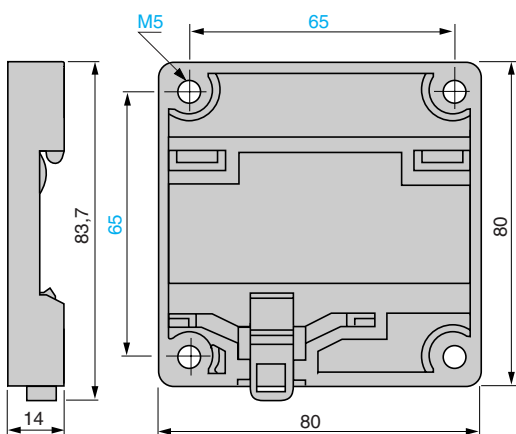
XSZBE10



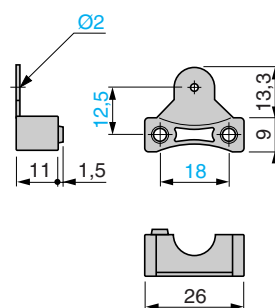
XSZBC10



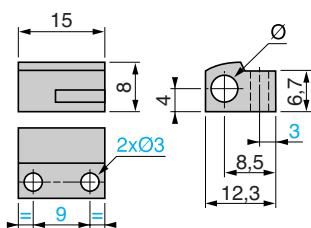
XSZBD10 (for mounting on XS•D•••••)



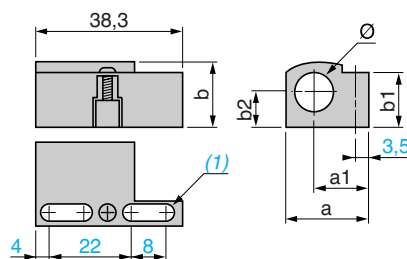
XSZBPM12



XSZB104, B105



XSZB108, B112, B118, B130, B165



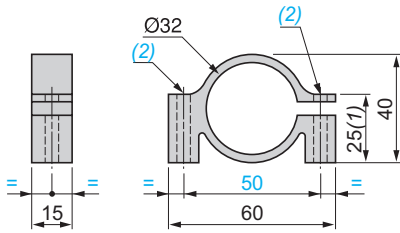
XSZ	a	a1	b	b1	b2	Ø
B108	19.9	14.5	14	12.5	7.5	8
B112	21.9	14.5	16	15.5	8.5	12
B118	26	15.7	22.3	20.1	11.5	18
B130	39	21.7	35.5	31	18.5	30
B165	19.9	14.5	14	12.5	7.5	6.5

(1) 2 elongated holes 4 x 8 mm.

XSZ	Ø
B104	4
B105	5

Note: for fixing clamps XSZB118 and XSZB130, see mounting precautions, page 3/19.

XUZB32

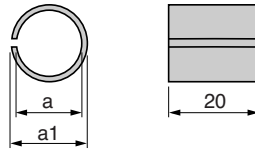


(1) Maximum value

(2) 2 holes Ø 5.5

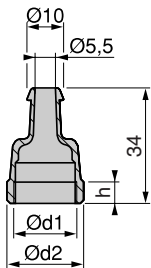
2 x M5 screws, HM head, included with fixing clamp

XSZA0●●



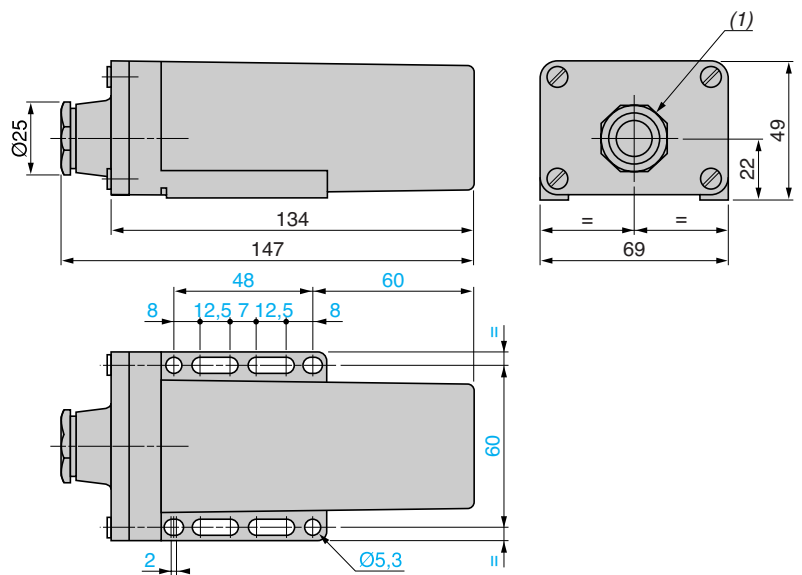
XSZ	a	a1
A020	Ø18	Ø20
A034	Ø30	Ø34

XSZP112, P118, P130

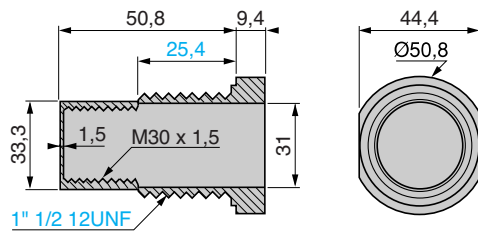


XSZ	h	Ø d1	Ø d2
P112	7	12	16,8
P118	6,2	18	23
P130	6,2	30	34,4

XSCZ01



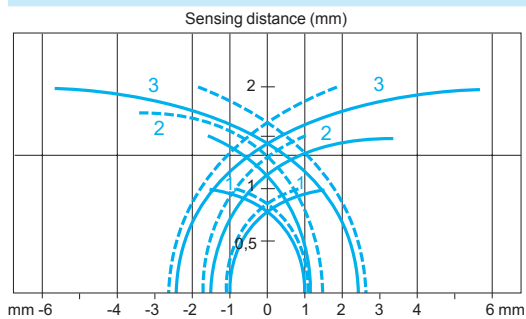
XTAZ30



(1) 13P cable gland

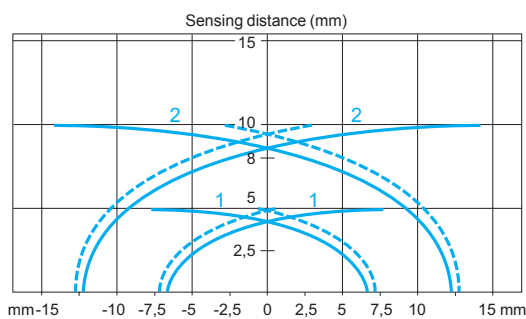
Cylindrical type sensors

Flush mountable in metal



Sensor (mm)	Standard steel target (mm)	Operating zone (mm)
Ø 4	5 x 5 x 1	0...0.8
Ø 5	5 x 5 x 1	0...0.8
Ø 6.5	8 x 8 x 1	0...1.2
Ø 8	8 x 8 x 1	0...1.2
Ø 12	12 x 12 x 1	0...1.6

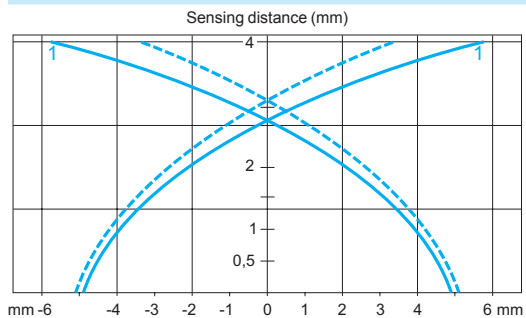
- pick-up points
- - - drop-out points (object approaching from the side)
- 1 Ø 4 (plain) XS1 and Ø 5 (M5 x 0.5) XS1
- 2 Ø 6.5 (plain) XS1 and Ø 8 (M8 x 1) XS5
- 3 Ø 12 (M12 x 1) XS5



Sensor (mm)	Standard steel target (mm)	Operating zone (mm)
Ø 18	18 x 18 x 1	0...4
Ø 30	30 x 30 x 1	0...8

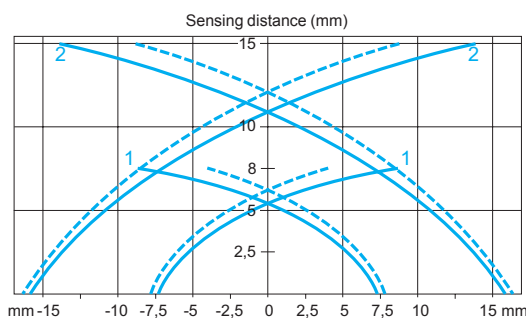
- pick-up points
- - - drop-out points (object approaching from the side)
- 1 Ø 18 (M18 x 1) XS5
- 2 Ø 30 (M30 x 1.5) XS5

Non flush mountable in metal



Sensor (mm)	Standard steel target (mm)	Operating zone (mm)
Ø 12	12 x 12 x 1	0...3.2

- pick-up points
- - - drop-out points (object approaching from the side)
- 1 Ø 12 (M12 x 1) XS4



Sensor (mm)	Standard steel target (mm)	Operating zone (mm)
Ø 18	24 x 24 x 1	0...6.4
Ø 30	45 x 45 x 1	0...12

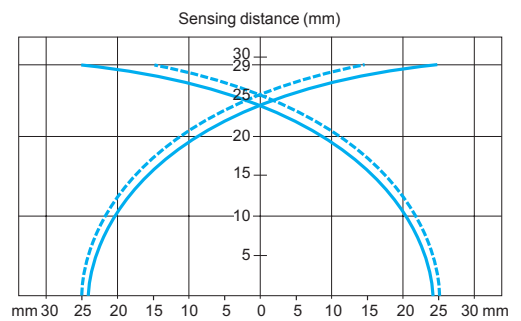
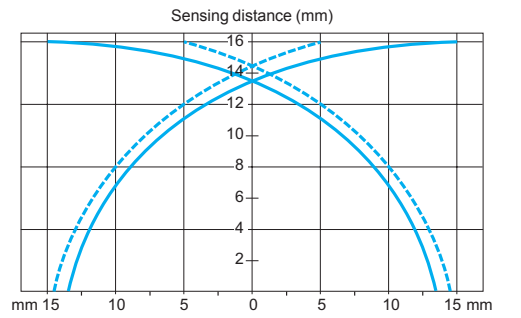
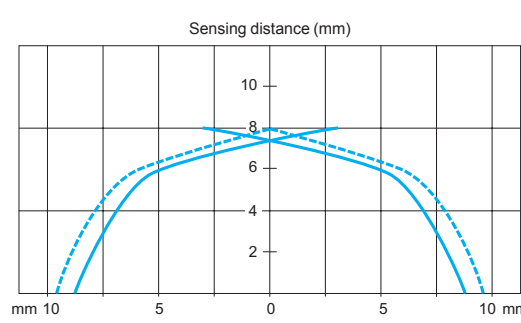
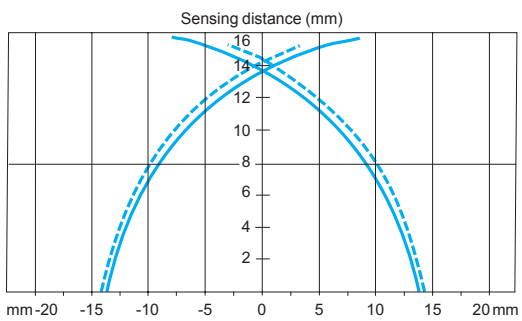
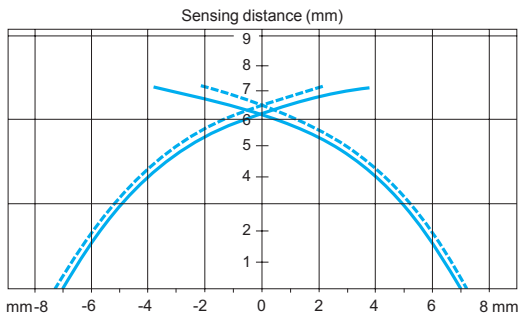
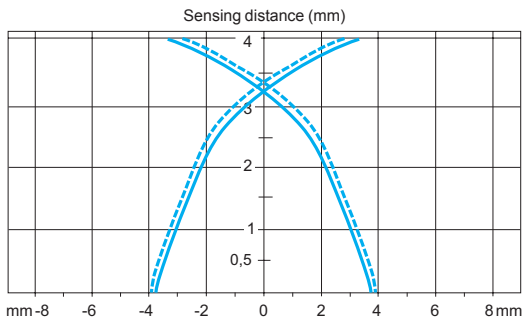
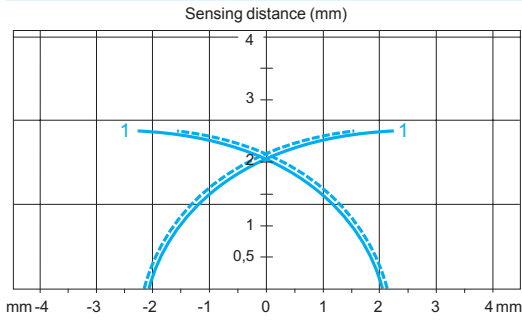
- pick-up points
- - - drop-out points (object approaching from the side)
- 1 Ø 18 (M18 x 1) XS4
- 2 Ø 30 (M30 x 1.5) XS4

3

Cylindrical type sensors, increased range

Flush mountable in metal

Non flush mountable in metal



— pick-up points
 - - - drop-out points (object approaching from the side)

Sensor (mm)
 Ø 6,5 and Ø 8
Standard steel target (mm)
 8 x 8 x 1
Operating zone (mm)
 0...2 (flush mounted)
 1 Ø 6.5 (plain) XS106B3●● and Ø 8 (M8 x 1) XS108B3 and XS608●●

Sensor (mm)
 Ø 12
Standard steel target (mm)
 12 x 12 x 1
Operating zone (mm)
 0...3.2 (flush mounted)
 0...6.4 (not flush mounted)

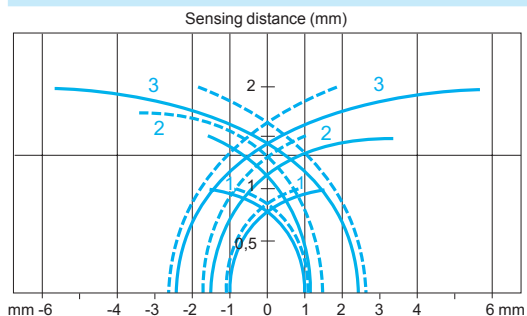
Sensor (mm)
 Ø 18
Standard steel target (mm)
 24 x 24 x 1
Operating zone (mm)
 0...6.4 (flush mounted)
 0...12.8 (not flush mounted)

Sensor (mm)
 Ø 30
Standard steel target (mm)
 45 x 45 x 1
Operating zone (mm)
 0...12 (flush mounted)
 0...24 (not flush mounted)



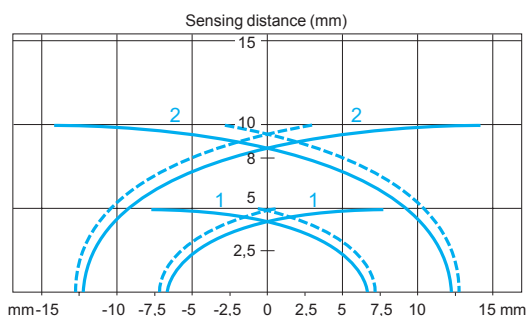
Cylindrical type sensors

Flush mountable in metal



Sensor (mm)	Standard steel target (mm)	Operating zone (mm)
Ø 4	5 x 5 x 1	0...0.8
Ø 5	5 x 5 x 1	0...0.8
Ø 6.5	8 x 8 x 1	0...1.2
Ø 8	8 x 8 x 1	0...1.2
Ø 12	12 x 12 x 1	0...1.6

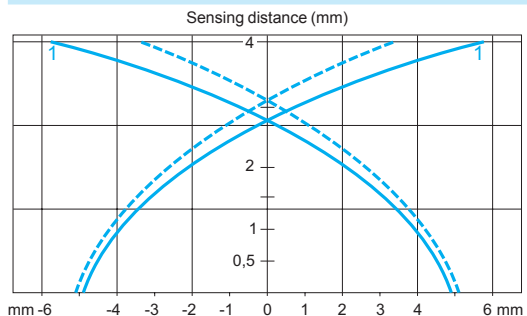
- pick-up points
- - - drop-out points (object approaching from the side)
- 1 Ø 4 (plain) XS1 and Ø 5 (M5 x 0.5) XS1
- 2 Ø 6.5 (plain) XS1 and Ø 8 (M8 x 1) XS5
- 3 Ø 12 (M12 x 1) XS5



Sensor (mm)	Standard steel target (mm)	Operating zone (mm)
Ø 18	18 x 18 x 1	0...4
Ø 30	30 x 30 x 1	0...8

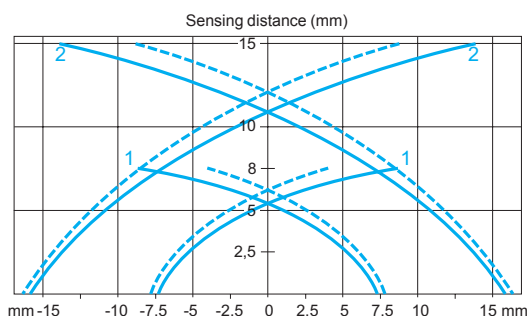
- pick-up points
- - - drop-out points (object approaching from the side)
- 1 Ø 18 (M18 x 1) XS5
- 2 Ø 30 (M30 x 1.5) XS5

Non flush mountable in metal



Sensor (mm)	Standard steel target (mm)	Operating zone (mm)
Ø 12	12 x 12 x 1	0...3.2

- pick-up points
- - - drop-out points (object approaching from the side)
- 1 Ø 12 (M12 x 1) XS4



Sensor (mm)	Standard steel target (mm)	Operating zone (mm)
Ø 18	24 x 24 x 1	0...6.4
Ø 30	45 x 45 x 1	0...12

- pick-up points
- - - drop-out points (object approaching from the side)
- 1 Ø 18 (M18 x 1) XS4
- 2 Ø 30 (M30 x 1.5) XS4

3

Cylindrical type sensors, increased range

Flush mountable in metal

Non flush mountable in metal

Sensor (mm)

Ø 6,5 and Ø 8

Standard steel target (mm)

8 x 8 x 1

Operating zone (mm)

0...2 (flush mounted)

1 Ø 6.5 (plain) XS106B3●● and Ø 8 (M8 x 1) XS108B3 and XS608●●

Sensor (mm)

Ø 12

Standard steel target (mm)

12 x 12 x 1

Operating zone (mm)

0...3.2 (flush mounted)

0...6.4 (not flush mounted)

Sensor (mm)

Ø 18

Standard steel target (mm)

24 x 24 x 1

Operating zone (mm)

0...6.4 (flush mounted)

0...12.8 (not flush mounted)

Sensor (mm)

Ø 30

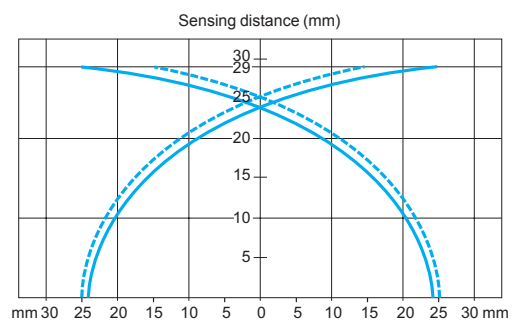
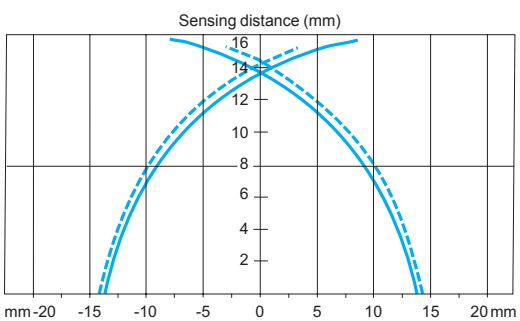
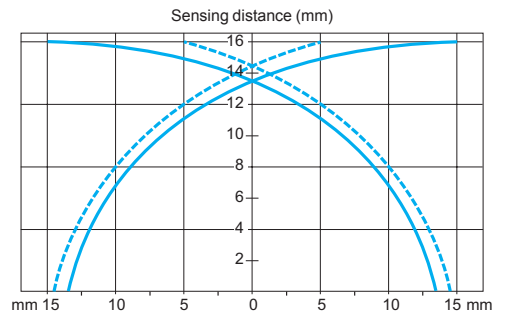
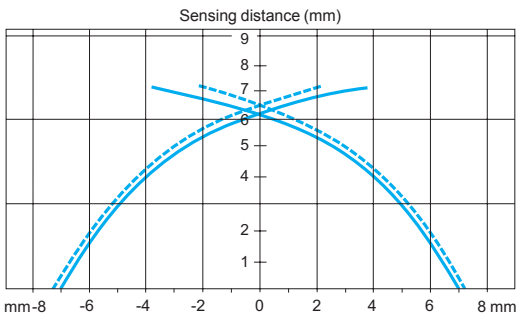
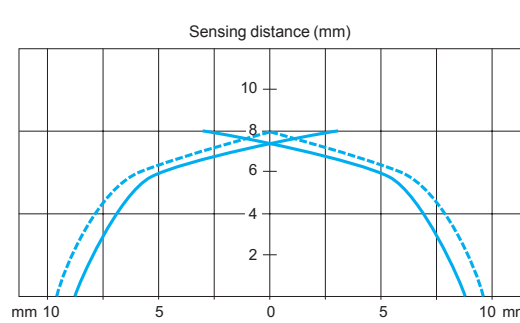
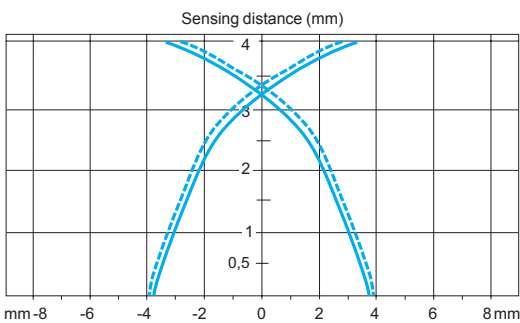
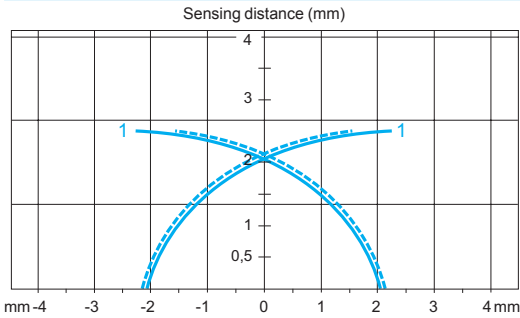
Standard steel target (mm)

45 x 45 x 1

Operating zone (mm)

0...12 (flush mounted)

0...24 (not flush mounted)



— pick-up points
 - - - drop-out points (object approaching from the side)

Old sensor	New OsiSense XS sensor	Old sensor	New OsiSense XS sensor	Old sensor	New OsiSense XS sensor
Cylindrical type, DC					
Diameter 6.5 mm					
XS1					
XS1L06NA340	XS506B1NAL2	XS1M08NA370	XS508BLNAL2	XS1N08PB349L1	XS108B3PBL5
XS1L06NA340S	XS506B1NAM8	XS1M08NA370D	XS508BLNAM12	XS1N08PB349D	XS108B3PBM12
XS1L06NB340	XS506B1NBL2	XS1M08NA370L1	XS508BLNAL5	XS1N08PB349S	XS108B3PBM8
XS1L06NB340S	XS506B1NBM8	XS1M08NB370	XS508BLNBL2		
XS1L06PA340	XS506B1PAL2	XS1M08NB370D	XS508BLNBM12		
XS1L06PA340L1	XS506B1PAL5	XS1M08PA370	XS508BLPAL2	XS2	
XS1L06PA340D	XS506B1PAM12	XS1M08PA370D	XS508BLPAM12	XS2M08NA340	XS608B1NAL2
XS1L06PA340S	XS506B1PAM8	XS1M08PA370L1	XS508BLPAL5	XS2N08NA340	XS108B3NAL2
XS1L06PB340	XS506B1PBL2	XS1M08PA370L2	XS508BLPAL10	XS2N08NA340D	XS108B3NAM12
XS1L06PB340L1	XS506B1PBL5	XS1M08PA370LD	XS508BLPAM12 (1)	XS2N08NA340L1	XS108B3NAL5
XS1L06PB340S	XS506B1PBM8	XS1M08PB370S	XS508BLPAM12 (2)	XS2N08NA340L2	XS108B3NAM10
		XS1M08PB370	XS508BLPBL2	XS2N08NA340S	XS108B3NAM8
		XS1M08PB370D	XS508BLPBM12	XS2N08NB340	XS108B3NBL2
		XS1M08PB370L1	XS508BLPBL5	XS2N08NB340D	XS108B3NBM12
		XS1M08PB370L2	XS508BLPBL10	XS2N08NB340S	XS108B3NBM8
				XS2N08PA340	XS108B3PAL2
XS1L06NA349	XS106B3NAL2			XS2N08PA340D	XS108B3PAM12
XS1L06NA349S	XS106B3NAM8	XS1N08NA340	XS508B1NAL2	XS2N08PA340L1	XS108B3PAL5
XS1L06NB349	XS106B3NBL2	XS1N08NA340D	XS508B1NAM12	XS2N08PA340L2	XS108B3PAL10
XS1L06NB349S	XS106B3NBM8	XS1N08NA340L1	XS508B1NAL5	XS2N08PA340S	XS108B3PAM8
XS1L06PA349	XS106B3PAL2	XS1N08NA340L2	XS508B1NAL10	XS2N08PB340	XS108B3PBL2
XS1L06PA349L1	XS106B3PAL5	XS1N08NA340S	XS508B1NAM8	XS2N08PB340D	XS108B3PBM12
XS1L06PA349D	XS106B3PAM12	XS1N08NB340	XS508B1NBL2	XS2N08PB340S	XS108B3PBM8
XS1L06PA349S	XS106B3PAM8	XS1N08NB340D	XS508B1NBM12		
XS1L06PB349	XS106B3PBL2	XS1N08NB340S	XS508B1NBM8		
XS1L06PB349L1	XS106B3PBL5	XS1N08PA340	XS508B1PAL2	XS3	
XS1L06PB349S	XS106B3PBM8	XS1N08PA340D	XS508B1PAM12	XS3P08NA340	XS508B1NAL2 (3)
		XS1N08PA340L1	XS508B1PAL5	XS3P08NA340D	XS508B1NAM12 (3)
		XS1N08PA340L2	XS508B1PAL10	XS3P08NA340L1	XS508B1NAL5 (3)
Diameter 8 mm		XS1N08PA340LD	XS508B1PAM12	XS3P08PA340	XS508B1PAL2 (3)
XS1		XS1N08PA340S	XS508B1PAM8	XS3P08PA340D	XS508B1PAM12 (3)
XS1D08NA140	XS108BLNAL2	XS1N08PB340	XS508B1PBL2	XS3P08PA340L1	XS508B1PAL5 (3)
XS1D08NA140D	XS108BLNAM12	XS1N08PB340D	XS508B1PBM12		
XS1D08PA140	XS108BLPAL2	XS1N08PB340L1	XS508B1PBL5	XS3P08NA370	XS508BLNAL2 (3)
XS1D08PA140D	XS108BLPAM12	XS1N08PB340L2	XS508B1PBL10	XS3P08NA370L1	XS508BLNAL5 (3)
XS1D08PA140L1	XS108BLPAL5	XS1N08PB340S	XS508B1PBM8	XS3P08PA370	XS508BLPAL2 (3)
				XS3P08PA370L1	XS508BLPAL5 (3)
XS1M08DA210	XS508B1DAL2	XS1N08NA349	XS108B3NAL2		
XS1M08DA210D	XS508B1DAM12	XS1N08NA349L1	XS108B3NAL5		
XS1M08DA210L1	XS508B1DAL5	XS1N08NA349D	XS108B3NAM12		
XS1M08DA210L2	XS508B1DAL10	XS1N08NA349S	XS108B3NAM8		
XS1M08DA210LD	XS508B1DAL08M12	XS1N08NB349	XS108B3NBL2		
XS1M08DB210	XS508B1DBL2	XS1N08NB349L1	XS108B3NBL5		
XS1M08DB210D	XS508B1DBM12	XS1N08NB349D	XS108B3NBM12		
XS1M08DB210L1	XS508B1DBL5	XS1N08NB349S	XS108B3NBM8		
XS1M08DB210LD	XS508B1DBM12 (1)	XS1N08PA349	XS108B3PAL2		
		XS1N08PA349L1	XS108B3PAL5		
		XS1N08PA349D	XS108B3PAM12		
XS1M08DA214D	XS508B1CAM12	XS1N08PA349S	XS108B3PAM8		
XS1M08DA214LD	XS508B1CAL08M12	XS1N08PB349	XS108B3PBL2		

(1) For the new sensor an integral M12 connector replaces the remote M12 connector on a 0.80 m flying lead.

(2) For the new sensor an M12 connector replaces the M8 connector.

(3) For the new OsiSense XS sensor, the metal case replaces the plastic case.

Old sensor	New OsiSense XS sensor	Old sensor	New OsiSense XS sensor	Old sensor	New OsiSense XS sensor
Cylindrical type, DC (continued)					
Diameter 12 mm					
XS1					
XS1M12DA210	XS512B1DAL2	XS1N12PA340S	XS512B1PAM12 (2)	XS2N12PC410D	XS112B3PCM12
XS1M12DA210D	XS512B1DAM12	XS1N12PB340	XS512B1PBL2	XS2N12PC410L1	XS112B3PCM12 + XZCPV1141L5
XS1M12DA210L1	XS512B1DAL5	XS1N12PB340D	XS512B1PBM12	XS2N12PC410L2	XS112B3PCM12 + XZCPV1141L10
XS1M12DA210L2	XS512B1DAL10	XS1N12PB340L1	XS512B1PBL5	XS2N12PB340	XS112B3PBL2
XS1M12DA210LA	XS512B1DAL08U78	XS1M12PA349D	XS612B1PAM12	XS2N12PB340D	XS112B3PBM12
XS1M12DA210LD	XS512B1DAL08M12	XS1N12NA349	XS112B3NAL2	XS2N12PB340L1	XS112B3PBL5
XS1M12DB210	XS512B1DBL2	XS1N12NA349L1	XS112B3NAL5	XS3	
XS1M12DB210D	XS512B1DBM12	XS1N12NA349D	XS112B3NAM12	XS3P12NA340	XS512B1NAL2 (3)
XS1M12DB210L1	XS512B1DBL5	XS1N12NB349	XS112B3NBL2	XS3P12NA340D	XS512B1NAM12 (3)
XS1M12DB210L2	XS512B1DBL10	XS1N12NB349L1	XS112B3NBL5	XS3P12NA340L1	XS512B1NAL5 (3)
XS1M12DB210LD	XS512B1DBL08M12	XS1N12NB349D	XS112B3NBM12	XS3P12PA340	XS512B1PAL2 (3)
XS1M12DA214D	XS512B1CAM12	XS1N12PA349L1	XS112B3PAL2	XS3P12PA340D	XS512B1PAM12 (3)
XS1M12DA214LD	XS512B1CAL08M12	XS1N12PA349D	XS112B3PAL5	XS3P12PA340L1	XS512B1PAL5 (3)
XS1M12NA370	XS512BLNAL2	XS1N12PB349	XS112B3PAM12	XS3P12NA370	XS512BLNAL2 (3)
XS1M12NA370D	XS512BLNAM12	XS1N12PB349L1	XS112B3PBL2	XS3P12NA370L1	XS512BLNAL5 (3)
XS1M12NA370L1	XS512BLNAL5	XS1N12PB349D	XS112B3PBL5	XS3P12PA370	XS512BLPAL2 (3)
XS1M12NA370L2	XS512BLNAL10	XS1N12PB349D	XS112B3PBL5	XS3P12PA370L1	XS512BLPAL5 (3)
XS1M12NA370S	XS612B1NAM12 (2)	XS1N12PB349D	XS112B3PBL5	XS4	
XS1M12NB370	XS512BLNBL2	XS1N12PB349D	XS112B3PBL5	XS4P12PC410L2	XS4P12PC410D + XZCPV1141L10
XS1M12NB370D	XS512BLNBM12	XS1N12PB349D	XS112B3PBL5		
XS1M12PA370	XS512BLPAL2	XS1N12PB349D	XS112B3PBL5		
XS1M12PA370D	XS512BLPAM12	XS1N12PB349D	XS112B3PBL5		
XS1M12PA370L1	XS512BLPAL5	XS1N12PB349D	XS112B3PBL5		
XS1M12PA370L2	XS512BLPAL10	XS1N12PB349D	XS112B3PBL5		
XS1M12PA370LA	XS612B1PAL08U78	XS1N12PB349D	XS112B3PBL5		
XS1M12PA370LD	XS612B1PAL08M12	XS1N12PB349D	XS112B3PBL5		
XS1M12PB370	XS512BLPBL2	XS1N12PB349D	XS112B3PBL5		
XS1M12PB370D	XS512BLPBM12	XS1N12PB349D	XS112B3PBL5		
XS1M12PB370L1	XS512BLPBL5	XS1N12PB349D	XS112B3PBL5		
XS1M12PB370L2	XS512BLPBL10	XS1N12PB349D	XS112B3PBL5		
XS1M12PB370LD	XS612B1PAM12 (1)	XS1N12PB349D	XS112B3PBL5		
XS1N12NA340	XS512B1NAL2	XS1N12PB349D	XS112B3PBL5		
XS1N12NA340D	XS512B1NAM12	XS1N12PB349D	XS112B3PBL5		
XS1N12NA340L1	XS512B1NAL5	XS1N12PB349D	XS112B3PBL5		
XS1N12NA340L2	XS512B1NAL10	XS1N12PB349D	XS112B3PBL5		
XS1N12NB340	XS512B1NBL2	XS1N12PB349D	XS112B3PBL5		
XS1N12NB340D	XS512B1NBM12	XS1N12PB349D	XS112B3PBL5		
XS1N12NC410L2	XS1N12NC410D + XZCPV1141L10	XS1N12PB349D	XS112B3PBL5		
XS1N12PA340	XS512B1PAL2	XS1N12PB349D	XS112B3PBL5		
XS1N12PA340D	XS512B1PAM12	XS1N12PB349D	XS112B3PBL5		
XS1N12PA340L1	XS512B1PAL5	XS1N12PB349D	XS112B3PBL5		
XS1N12PA340L2	XS512B1PAL10	XS1N12PB349D	XS112B3PBL5		
XS1N12PA340LD	XS512B1PAM12 (1)	XS1N12PB349D	XS112B3PBL5		
		XS2N12NA340	XS112B3NAL2		
		XS2N12NA340D	XS112B3NAM12		
		XS2N12NA340L1	XS112B3NAL5		
		XS2N12NA340L2	XS112B3NAL10		
		XS2N12NB340	XS112B3NBL2		
		XS2N12NB340D	XS112B3NBL2		
		XS2N12NB340L1	XS112B3NBM12		
		XS2N12NC410L1	XS2N12NC410D + XZCPV1141L5		
		XS2N12PA340	XS112B3PAL2		
		XS2N12PA340D	XS112B3PAM12		
		XS2N12PA340L1	XS112B3PAL5		
		XS2N12PA340L2	XS112B3PAL10		
		XS2N12PC410	XS112B3PCL2		

(1) For the new sensor an integral M12 connector replaces the remote M12 connector on a 0.80 m flying lead.

(2) For the new sensor an M12 connector replaces the M8 connector.

(3) For the new OsiSense XS sensor, the metal case replaces the plastic case.

Old sensor	New OsiSense XS sensor	Old sensor	New OsiSense XS sensor	Old sensor	New OsiSense XS sensor
Cylindrical type, DC (continued)		XS1		XS2	
Diameter 18 mm					
XS1					
XS1M18DA210	XS518B1DAL2	XS1M18PB370D	XS518BLPBM12	XS2M18NB370B	XS618B1NBL01B (4)
XS1M18DA210B	XS518B1DAL01B (4)	XS1M18PB370L1	XS518BLPBL5	XS2M18NB370C	XS618B1NBL01C (4)
XS1M18DA210C	XS518B1DAL01C (4)	XS1M18PB370L2	XS518BLPBL10	XS2M18NB370D	XS618B1NBM12
XS1M18DA210D	XS518B1DAM12	XS1M18PB370C	XS618B1PBL01C (4)	XS2M18NB370L1	XS618B1NBL5
XS1M18DA210G	XS518B1DAL01G (4)			XS2M18NB370L2	XS618B1NBL10
XS1M18DA210L1	XS518B1DAL5	XS1N18NA340	XS518B1NAL2	XS2M18PA370	XS618B1PAL2
XS1M18DA210L2	XS518B1DAL10	XS1N18NA340D	XS518B1NAM12	XS2M18PA370A	XS618B1PAL01U78 (4)
XS1M18DA210LD	XS518B1DAL08M12	XS1N18NA340L1	XS518B1NAM12	XS2M18PA370B	XS618B1PAL01B (4)
XS1M18DB210	XS518B1DBL2	XS1N18NA340L2	XS518B1NAL5	XS2M18PA370C	XS618B1PAL01C (4)
XS1M18DB210B	XS518B1DBL01B (4)	XS1N18NB340	XS518B1NAL10	XS2M18PA370D	XS618B1PAM12
XS1M18DB210D	XS518B1DBM12	XS1N18NB340D	XS518B1NBL2	XS2M18PA370G	XS618B1PAL01G (4)
XS1M18DB210LD	XS518B1DBL08M12	XS1N18NB340L2	XS518B1NBL10	XS2M18PA370LA	XS618B1PAL08U78 (4)
		XS1N18NC410L1	XS1N18NC410D + XZCPV1141L5	XS2M18PA370L1	XS618B1PAL5
				XS2M18PA370L2	XS618B1PAL10
		XS1N18PA340	XS518B1PAL2	XS2M18PB370	XS618B1PBL2
XS1M18DA214D	XS518B1CAM12	XS1N18PA340D	XS518B1PAM12	XS2M18PB370A	XS618B1PBL01U78 (4)
XS1M18DA214LD	XS518B1CAL08M12	XS1N18PA340L1	XS518B1PAL5	XS2M18PB370B	XS618B1PBL01B (4)
		XS1N18PA340L2	XS518B1PAL10	XS2M18PB370C	XS618B1PBL01C (4)
		XS1N18PB340	XS518B1PBL2	XS2M18PB370D	XS618B1PBM12
		XS1N18PB340D	XS518B1PBM12	XS2M18PB370L1	XS618B1PBL5
		XS1N18PB340L2	XS518B1PBL10	XS2M18PB370L2	XS618B1PBL10
XS1M18NA370	XS518BLNAL2				
XS1M18NA370A	XS618B1NAL01U78 (4)				
XS1M18NA370B	XS618B1NAL01B (4)				
XS1M18NA370C	XS618B1NAL01C (4)				
XS1M18NA370D	XS518BLNAM12				
XS1M18NA370L1	XS518BLNAL5				
XS1M18NA370L2	XS518BLNAL10				
XS1M18NB370	XS518BLNBL2				
XS1M18NB370B	XS618B1NBL01B (4)				
XS1M18NB370C	XS618B1NBL01C (4)				
XS1M18NB370D	XS518BLNBM12				
XS1M18NB370L1	XS518BLNBL5				
XS1M18NB370L2	XS518BLNBL10				
XS1M18PA370	XS518BLPAL2				
XS1M18PA370A	XS618B1PAL01U78 (4)				
XS1M18PA370B	XS618B1PAL01B (4)				
XS1M18PA370C	XS618B1PAL01C (4)				
XS1M18PA370D	XS518BLPAM12				
XS1M18PA370G	XS618B1PAL01G (4)				
XS1M18PA370DTQ	XS518BLPAM12TQ				
XS1M18PA370G	XS618B1PAL01G (4)				
XS1M18PA370L1	XS518BLPAL5				
XS1M18PA370L2	XS518BLPAL10				
XS1M18PA370LA	XS618B1PAL08U78				
XS1M18PA370LD	XS518BLPAM12 (1)				
XS1M18PA370DTQ	XS518BLPAM12TQ				
XS1M18PA370TF	XS518BLPAL2TF				
XS1M18PB370	XS518BLPBL2				
XS1M18PB370A	XS618B1PBL01U78 (4)				
XS1M18PB370B	XS618B1PBL01B (4)				

(1) For the new sensor an integral M12 connector replaces the remote M12 connector on a 0.80 m flying lead.

(3) For the new OsiSense XS sensor, the metal case replaces the plastic case.

(4) For the new sensor, connectors A, B, C and G on 0.1 m flying lead replace integral connectors A, B, C and G.

Old sensor	New OsiSense XS sensor	Old sensor	New OsiSense XS sensor	Old sensor	New OsiSense XS sensor
Cylindrical type, DC (continued)					
Diameter 30 mm					
XS1					
XS1M30DA210	XS530B1DAL2	XS1N30NA340	XS530B1NAL2	XS2M30PA370G	XS630B1PAL01G (4)
XS1M30DA210B	XS530B1DAL01B (4)	XS1N30NA340D	XS530B1NAM12	XS2M30PA370L1	XS630B1PAL5
XS1M30DA210C	XS530B1DAL01C (4)	XS1N30NA340L1	XS530B1NAL5	XS2M30PA370L2	XS630B1PAL10
XS1M30DA210D	XS530B1DAM12	XS1N30NA340L2	XS530B1NAL10	XS2M30PB370	XS630B1PBL2
XS1M30DA210G	XS530B1DAL01G (4)	XS1N30NB340	XS530B1NBL2	XS2M30PB370B	XS630B1PBL01B (4)
XS1M30DA210L1	XS530B1DAL5	XS1N30NB340D	XS530B1NBM12	XS2M30PB370C	XS630B1PBL01C (4)
XS1M30DA210L2	XS530B1DAL10	XS1N30PA340	XS530B1PAL2	XS2M30PB370D	XS630B1PBM12
XS1M30DA210LD	XS530B1DAL08M12	XS1N30PA340D	XS530B1PAM12	XS2M30PB370G	XS630B1PBL01G (4)
XS1M30DB210	XS530B1DBL2	XS1N30PA340L1	XS530B1PAL5	XS2M30PB370L1	XS630B1PBL5
XS1M30DB210B	XS530B1DBL01B (4)	XS1N30PA340L2	XS530B1PAL10	XS2M30PB370L2	XS630B1PBL10
XS1M30DB210D	XS530B1DBM12	XS1N30PB340	XS530B1PBL2	XS3	
XS1M30DB210LD	XS530B1DBM12 (1)	XS1N30PB340D	XS530B1PBM12	XS3P30NA340	XS530B1NAL2 (3)
XS2					
XS1M30DA214D	XS530B1CAM12	XS2N30NA340	XS130B3NAL2	XS3P30NA340D	XS530B1NAM12 (3)
XS1M30DA214LD	XS530B1CAL08M12	XS2N30NA340D	XS130B3NAM12	XS3P30NA340L1	XS530B1NAL5 (3)
XS3					
XS1M30PA349D	XS630B1PAM12 (5)	XS2N30NA340L1	XS130B3NAL5	XS3P30PA340	XS530B1PAL2 (3)
XS4					
XS1M30NA370	XS530BLNAL2	XS2N30NA340L2	XS130B3NAL10	XS3P30PA340D	XS530B1PAM12 (3)
XS1M30NA370B	XS630B1NAL01B (4)	XS2N30NB340	XS130B3NBL2	XS3P30PA340L1	XS530B1PAL5 (3)
XS1M30NA370C	XS630B1NAL01C (4)	XS2N30NC410L1	XS2N30NC410D + XZCPV1141L5	XS3P30PA340L2	XS530B1PAL10 (3)
XS1M30NA370D	XS530BLNAM12	XS2N30PC410	XS130B3PCL2	XS3P30PA370	XS530BLPAL2 (3)
XS1M30NA370L1	XS530BLNAL5	XS2N30PC410D	XS130B3PCM12	XS3P30PA370L1	XS530BLPAL5 (3)
XS1M30NA370L2	XS530BLNAL10	XS2N30PC410L1	XS130B3PCM12 + XZCPV1141L5	XS3P30PA370L2	XS530BLPAL10 (3)
XS1M30NB370	XS530BLNBL2	XS2N30NB340D	XS130B3PAL2	XS3P30NA370	XS530BLNAL2 (3)
XS1M30NB370B	XS630B1NBL01B (4)	XS2N30PA340	XS130B3PAL5	XS3P30NA370L1	XS530BLNAL5 (3)
XS1M30NB370C	XS630B1NBL01C (4)	XS2N30PA340D	XS130B3PAM12	XS4	
XS1M30NB370D	XS530BLNBM12	XS2N30PA340L1	XS130B3PAL5	XS4P30NA370B	XS4P30NA370L01B (4)
XS1M30NB370L1	XS530BLNBL5	XS2N30PA340L2	XS130B3PAL10	XS4P30NB370B	XS4P30NB370L01B (4)
XS1M30NB370L2	XS530BLNBL10	XS2N30PB340	XS130B3PBL2	XS4P30NC410L2	XS4P30NC410D + XZCPV1141L10
XS1M30PA370	XS530BLPAL2	XS2N30PB340D	XS130B3PBM12	XS4P30PA370B	XS4P30PA370L01B (4)
XS1M30PA370A	XS630B1PAL01U78 (4)	XS2M30NA370	XS630B1NAL2	XS4P30PB370B	XS4P30PB370L01B (4)
XS1M30PA370B	XS630B1PAL01B (4)	XS2M30NA370C	XS630B1NAL01B (4)	XS4P30PC410L1	XS4P30PC410D + XZCPV1141L5
XS1M30PA370C	XS630B1PAL01C (4)	XS2M30NA370D	XS630B1NAL01C (4)	XS4P30PC410L2	XS4P30PC410D + XZCPV1141L10
XS1M30PA370D	XS530BLPAM12	XS2M30NA370L1	XS630B1NAM12	XS4	
XS1M30PA370G	XS630B1PAL01G (4)	XS2M30NA370L2	XS630B1NAL5	XS4P30NA370B	XS4P30NA370L01B (4)
XS1M30PA370L1	XS530BLPAL5	XS2M30NB370	XS630B1NAL10	XS4P30NB370B	XS4P30NB370L01B (4)
XS1M30PA370L2	XS530BLPAL10	XS2M30NB370B	XS630B1NBL2	XS4P30NC410L2	XS4P30NC410D + XZCPV1141L10
XS1M30PB370	XS530BLPBL2	XS2M30NB370C	XS630B1NBL01B (4)	XS4P30PA370B	XS4P30PA370L01B (4)
XS1M30PB370B	XS630B1PBL01B (4)	XS2M30NB370D	XS630B1NBL01C (4)	XS4P30PB370B	XS4P30PB370L01B (4)
XS1M30PB370C	XS630B1PBL01C (4)	XS2M30NB370D	XS630B1NBM12	XS4P30PC410L1	XS4P30PC410D + XZCPV1141L5
XS1M30PB370D	XS530BLPBM12	XS2M30NB370L1	XS630B1NBL5	XS4P30PC410L2	XS4P30PC410D + XZCPV1141L10
XS1M30PB370G	XS630B1PBL01G (4)	XS2M30NB370L2	XS630B1NBL10	XS4	
XS1M30PB370L1	XS630B1PBL01B (4)	XS2M30PA370	XS630B1PAL2	XS4P30NA370B	XS4P30NA370L01B (4)
XS1M30PB370L2	XS530BLPBL10	XS2M30PA370A	XS630B1PAL01U78 (4)	XS4P30NB370B	XS4P30NB370L01B (4)
XS2					
XS1M30PA370	XS530BLPBL5	XS2M30PA370B	XS630B1PAL01B (4)	XS4P30NC410L2	XS4P30NC410D + XZCPV1141L10
XS1M30PA370A	XS630B1PAL01U78 (4)	XS2M30PA370C	XS630B1PAL01C (4)	XS4	
XS1M30PA370B	XS630B1PAL01B (4)	XS2M30PA370D	XS630B1PAL01G (4)	XS4P30PB370B	XS4P30PB370L01B (4)
XS1M30PA370C	XS630B1PAL01C (4)	XS2M30PB370	XS630B1PAM12	XS4P30PC410L1	XS4P30PC410D + XZCPV1141L5
XS1M30PA370D	XS530BLPAM12	XS2M30PB370B	XS630B1PBL2	XS4P30PC410L2	XS4P30PC410D + XZCPV1141L10
XS1M30PB370	XS530BLPBL2	XS2M30PB370C	XS630B1PBL01B (4)	XS4	
XS1M30PB370B	XS630B1PBL01B (4)	XS2M30PB370D	XS630B1PBL01C (4)	XS4P30PA370B	XS4P30PA370L01B (4)
XS1M30PB370C	XS630B1PBL01C (4)	XS2M30PB370L1	XS630B1PBL5	XS4P30PB370B	XS4P30PB370L01B (4)
XS1M30PB370D	XS530BLPBM12	XS2M30PB370L2	XS630B1PBL10	XS4P30PC410L1	XS4P30PC410D + XZCPV1141L5
XS1M30PB370G	XS630B1PBL01G (4)	XS2M30PA370	XS630B1PAL2	XS4P30PC410L2	XS4P30PC410D + XZCPV1141L10
XS1M30PB370L1	XS630B1PBL01B (4)	XS2M30PA370A	XS630B1PAL01U78 (4)	XS4	
XS1M30PB370L2	XS530BLPBL5	XS2M30PA370B	XS630B1PAL01B (4)	XS4P30PB370B	XS4P30PB370L01B (4)
XS2					
XS1M30PB370	XS530BLPBL2	XS2M30PA370C	XS630B1PAL01C (4)	XS4P30PC410L1	XS4P30PC410D + XZCPV1141L5
XS1M30PB370B	XS630B1PBL01B (4)	XS2M30PA370D	XS630B1PAL01G (4)	XS4P30PC410L2	XS4P30PC410D + XZCPV1141L10
XS1M30PB370C	XS630B1PBL01C (4)	XS2M30PB370	XS630B1PAM12	XS4	
XS1M30PB370D	XS530BLPBM12	XS2M30PB370B	XS630B1PBL2	XS4P30PA370B	XS4P30PA370L01B (4)
XS1M30PB370G	XS630B1PBL01G (4)	XS2M30PB370C	XS630B1PBL01B (4)	XS4P30PB370B	XS4P30PB370L01B (4)
XS1M30PB370L1	XS630B1PBL01B (4)	XS2M30PB370D	XS630B1PBL01C (4)	XS4P30PC410L1	XS4P30PC410D + XZCPV1141L5
XS1M30PB370L2	XS530BLPBL10	XS2M30PB370L1	XS630B1PBL5	XS4P30PC410L2	XS4P30PC410D + XZCPV1141L10
XS2					
XS1M30PB370	XS530BLPBL2	XS2M30PB370L2	XS630B1PBL10	XS4	
XS1M30PB370B	XS630B1PBL01B (4)	XS2M30PA370	XS630B1PAL2	XS4P30NA370B	XS4P30NA370L01B (4)
XS1M30PB370C	XS630B1PBL01C (4)	XS2M30PA370A	XS630B1PAL01U78 (4)	XS4P30NB370B	XS4P30NB370L01B (4)
XS1M30PB370D	XS530BLPBM12	XS2M30PA370B	XS630B1PAL01B (4)	XS4P30NC410L2	XS4P30NC410D + XZCPV1141L10
XS1M30PB370G	XS630B1PBL01G (4)	XS2M30PA370C	XS630B1PAL01C (4)	XS4	
XS1M30PB370L1	XS630B1PBL01B (4)	XS2M30PB370	XS630B1PAM12	XS4P30PA370B	XS4P30PA370L01B (4)
XS1M30PB370L2	XS530BLPBL10	XS2M30PB370B	XS630B1PBL2	XS4P30PB370B	XS4P30PB370L01B (4)

(1) For the new sensor an integral M12 connector replaces the remote M12 connector on a 0.80 m flying lead.
 (3) For the new OsiSense XS sensor, the metal case replaces the plastic case.
 (4) For the new sensor, connectors A, B, C and G on 0.1 m flying lead replace integral connectors A, B, C and G.
 (5) For the new sensor, Sn = 15 mm instead of 20 mm.

Old sensor	New OsiSense XS sensor	Old sensor	New OsiSense XS sensor	Old sensor	New OsiSense XS sensor
Cylindrical type, AC or DC		Diameter 18 mm (continued)		Diameter 30 mm (continued)	
Diameter 12 mm		XS1		XS1M30MB230C XS630B1MBL01C (4)	
XS1		XS1M18MA239A XS1M18MA239L01A (4)		XS1M30MB230G XS630B1MBL01G (4)	
XS1M12MA230 XS512B1MAL2		XS1M18MA239K XS618B1MAU20 (5)		XS1M30MB230K XS530B1MBU20	
XS1M12MA230K XS512B1MAU20				XS1M30MB230L1 XS530B1MBL5	
XS1M12MA230L1 XS512B1MAL5				XS1M30MB230L2 XS530B1MBL10	
XS1M12MA230L2 XS512B1MAL10					
XS1M12MB230 XS512B1MBL2		XS2			
XS1M12MB230K XS512B1MBU20		XS2M18MA230 XS618B1MAL2		XS1M30MA239 XS630B1MAL2 (5)	
XS1M12MB230L1 XS512B1MBL5		XS2M18MA230A XS618B1MAL01U78 (4)		XS1M30MA239A XS1M30MA239L01A (4)	
XS1M12MB230L2 XS512B1MBL10		XS2M18MA230B XS618B1MAL01B (4)			
		XS2M18MA230C XS618B1MAL01C (4)			
		XS2M18MA230G XS618B1MAL01G (4)			
		XS2M18MA230K XS618B1MAU20		XS2	
XS1M12MA239 XS612B1MAL2		XS2M18MA230L1 XS618B1MAL5		XS2M30MA230 XS630B1MAL2	
XS1M12MA239K XS612B1MAU20		XS2M18MA230L2 XS618B1MAL10		XS2M30MA230A XS630B1MAL01U78 (4)	
		XS2M18MB230 XS618B1MBL2		XS2M30MA230B XS630B1MAL01B (4)	
XS2		XS2M18MB230A XS618B1MBL01U78 (4)		XS2M30MA230C XS630B1MAL01C (4)	
XS2M12MA230 XS612B1MAL2		XS2M18MB230B XS618B1MBL01B (4)		XS2M30MA230G XS630B1MAL01G (4)	
XS2M12MA230K XS612B1MAU20		XS2M18MB230C XS618B1MBL01C (4)		XS2M30MA230K XS630B1MAU20	
XS2M12MA230L1 XS612B1MAL5		XS2M18MB230G XS618B1MBL01G (4)		XS2M30MA230L1 XS630B1MAL5	
XS2M12MA230L2 XS612B1MAL10		XS2M18MB230K XS618B1MBU20		XS2M30MA230L2 XS630B1MAL10	
XS2M12MB230 XS612B1MBL2		XS2M18MB230L1 XS618B1MBL5		XS2M30MB230 XS630B1MBL2	
XS2M12MB230K XS612B1MBU20		XS2M18MB230L2 XS618B1MBL10		XS2M30MB230A XS630B1MBL01U78 (4)	
XS2M12MB230L1 XS612B1MBL5				XS2M30MB230B XS630B1MBL01B (4)	
XS2M12MB230L2 XS612B1MBL10		XS3		XS2M30MB230C XS630B1MBL01C (4)	
		XS3P18MA230 XS618B1MAL2 (3)		XS2M30MB230G XS630B1MBL01G (4)	
XS3		XS3P18MA230K XS618B1MAU20 (3)		XS2M30MB230K XS630B1MBU20	
XS3P12MA230 XS612B1MAL2 (3)		XS3P18MA230L1 XS618B1MAL5 (3)		XS2M30MB230L1 XS630B1MBL5	
XS3P12MA230K XS612B1MAU20 (3)		XS3P18MA230L2 XS618B1MAL10 (3)		XS2M30MB230L2 XS630B1MBL10	
XS3P12MA230L1 XS612B1MAL5 (3)		XS3P18MB230 XS618B1MBL2 (3)			
XS3P12MA230L2 XS612B1MAL10 (3)		XS3P18MB230A XS618B1MBU20 (3)		XS3	
XS3P12MB230 XS612B1MBL2 (3)		XS3P18MB230K XS618B1MBU20 (3)		XS3P30MA230 XS630B1MAL2 (3)	
XS3P12MB230K XS612B1MBU20 (3)		XS3P18MB230L1 XS618B1MBL5 (3)		XS3P30MA230K XS630B1MAU20 (3)	
XS3P12MB230L1 XS612B1MBL5 (3)				XS3P30MA230L1 XS630B1MAL5 (3)	
		XS4		XS3P30MA230L2 XS630B1MAL10 (3)	
Diameter 18 mm		XS4P18MA230B XS4P18MA230L01B (4)		XS3P30MB230 XS630B1MBL2 (3)	
XS1		XS4P18MA230C XS4P18MA230L01C (4)		XS3P30MB230K XS630B1MBU20 (3)	
XS1M18MA230 XS518B1MAL2		XS4P18MA230G XS4P18MA230L01G (4)		XS3P30MB230L1 XS630B1MBL5 (3)	
XS1M18MA230A XS618B1MAL01U78 (4)					
XS1M18MA230B XS618B1MAL01B (4)		Diameter 30 mm			
XS1M18MA230C XS618B1MAL01C (4)		XS1			
XS1M18MA230G XS618B1MAL01G (4)		XS1M30MA230 XS530B1MAL2		XS4	
XS1M18MA230K XS518B1MAU20		XS1M30MA230A XS630B1MAL01U78 (4)		XS4P30MA230B XS4P30MA230L01B (4)	
XS1M18MA230L1 XS518B1MAL5		XS1M30MA230B XS630B1MAL01B (4)		XS4P30MA230C XS4P30MA230L01C (4)	
XS1M18MA230L2 XS518B1MAL10		XS1M30MA230C XS630B1MAL01C (4)		XS4P30MA230G XS4P30MA230L01G (4)	
XS1M18MB230 XS518B1MBL2		XS1M30MA230G XS630B1MAL01G (4)		XS4P30MB230B XS4P30MB230L01B (4)	
XS1M18MB230A XS618B1MBL01U78 (4)		XS1M30MA230K XS530B1MAU20		XS4P30MB230C XS4P30MB230L01C (4)	
XS1M18MB230B XS618B1MBL01B (4)		XS1M30MA230L1 XS530B1MAL5			
XS1M18MB230C XS618B1MBL01C (4)		XS1M30MA230L2 XS530B1MAL10			
XS1M18MB230G XS618B1MBL01G (4)		XS1M30MB230 XS530B1MBL2			
XS1M18MB230K XS518B1MBU20		XS1M30MB230A XS630B1MBL01U78 (4)			
XS1M18MB230L1 XS518B1MBL5		XS1M30MB230B XS630B1MBL01B (4)			
XS1M18MB230L2 XS518B1MBL10					
XS1M18MA239 XS618B1MAL2 (5)					

(3) For the new OsiSense XS sensor, the metal case replaces the plastic case.
 (4) For the new sensor, connectors A, B, C and G on 0.1 m flying lead replace integral connectors A, B, C and G.
 (5) For the new sensor, Sn = 8 mm instead of 10 mm.

Old sensor	New OsiSense XS sensor	Old sensor	New OsiSense XS sensor
Block type		40 x 40 x 70 mm and 40 x 40 x 117 mm (continued)	
40 x 40 x 70 mm and 40 x 40 x 117 mm		XS8	
XS7		XS8C40DA210	XS8C4A1DPG13
XS7C40DA210	XS7C4A1DPG13	XS8C40DA210H29	XS8C4A1DPP20
XS7C40DA210A	XS7C4A1DPU78	XS8C40DA214D	XS8C4A1DPM12
XS7C40DA210D	XS7C4A1DPM12	XS8C40DP210	XS8C4A1DPG13
XS7C40DA210H29	XS7C4A1DPP20	XS8C40DP210H29	XS8C4A1DPP20
XS7C40DA210H7	XS7C4A1DPN12	XS8C40DP210H7	XS8C4A1DPN12
XS7C40DA214D	XS7C4A1DPM12	XS8C40FP260	XS8C4A1MPG13
XS7C40DP210	XS7C4A1DPG13	XS8C40FP260H29	XS8C4A1MPP20
XS7C40DP210H29	XS7C4A1DPP20	XS8C40FP260H7	XS8C4A1MPN12
XS7C40DP210H7	XS7C4A1DPN12	XS8C40MP230	XS8C4A1MPG13
XS7C40FP260	XS7C4A1MPG13	XS8C40MP230H29	XS8C4A1MPP20
XS7C40FP260A	XS7C4A1MPU78	XS8C40MP230H7	XS8C4A1MPN12
XS7C40FP260H29	XS7C4A1MPP20	XS8C40NC440	XS8C4A1NCG13
XS7C40FP260H7	XS7C4A1MPN12	XS8C40NC440H29	XS8C4A1NCP20
XS7C40KPM40	XS9C4A1PCG13	XS8C40NC449	XS8C4A4NCG13
XS7C40KPM40H29	XS9C4A1PCP20	XS8C40NC449H29	XS8C4A4NCP20
XS7C40KPM40H7	XS9C4A1PCN12	XS8C40NC449H7	XS8C4A4NCN12
XS7C40MP230	XS7C4A1MPG13	XS8C40PC440	XS8C4A1PCG13
XS7C40MP230A	XS7C4A1MPU78	XS8C40PC440D	XS8C4A1PCM12
XS7C40MP230H29	XS7C4A1MPP20	XS8C40PC440H29	XS8C4A1PCP20
XS7C40MP230H7	XS7C4A1MPN12	XS8C40PC440H7	XS8C4A1PCN12
XS7C40NC440	XS8C4A1NCG13	XS8C40PC449	XS8C4A4PCG13
XS7C40NC440D	XS8C4A1NCM12	XS8C40PC449D	XS8C4A4PCM12
XS7C40NC440H29	XS8C4A1NCP20	XS8C40PC449H29	XS8C4A4PCP20
XS7C40NC440H7	XS8C4A1NCN12	XS8C40PC449H7	XS8C4A4PCN12
XS7C40NC449	XS8C4A1NCG13	XS8T4NC440	XS8C2A1NCM12 + XZCP1141L2
XS7C40NC449H29	XS8C4A1NCP20	XS8T4NC440LD01	XS8C2A1NCM12
XS7C40NC449H7	XS8C4A1NCN12	XS8T4PC440	XS8C2A1PCM12 + XZCP1141L2
XS7C40PC440	XS8C4A1PCG13	XS8T4PC440L1	XS8C2A1PCM12 + XZCP1141L5
XS7C40PC440D	XS8C4A1PCM12	XS8T4PC440L2	XS8C2A1PCM12 + XZCP1141L10
XS7C40PC440H29	XS8C4A1PCP20	XS8T4PC440LD	XS8C2A1PCM12
XS7C40PC440H7	XS8C4A1PCN12	XS8T4PC440LD01	XS8C2A1PCM12
XS7C40PC449	XS8C4A1PCG13		
XS7C40PC449D	XS8C4A1PCM12		
XS7C40PC449H29	XS8C4A1PCP20		
XS7C40PC449H7	XS8C4A1PCN12		
XS7T4DA210	XS7C2A1DAM12 + XZCP1141L2		
XS7T4DA214LD	XS8C2A1CAM12		
XS7T4DA214LD01	XS8C2A1CAM12		
XS7T4DA214LD01W	XS8C2A1CAM12 + XSZPKC2		
XS7T4DA214LDW	XS8C2A1CAM12 + XSZPKC2		
XS7T4NC440	XS8C2A1NCM12 + XZCP1141L2		
XS7T4NC440LD	XS8C2A1NCM12		
XS7T4NC440LD01	XS8C2A1NCM12		
XS7T4PC440	XS8C2A1PCM12 + XZCP1141L2		
XS7T4PC440LD	XS8C2A1PCM12		
		40 x 40 x 117 mm	
		XSCH	
		XSCH203629	XS9C4A2A2G13
		XSCH203629H7	XS9C4A2A2N12
		XSCH207629	XS9C4A2A1G13
		XSCH207629H7	XS9C4A2A1N12

Selection guide *page 4/2*

■ General *page 4/4*

OsiSense XT

■ Cylindrical, flush mountable. Metal case *page 4/8*

■ Cylindrical, non flush mountable. Plastic case *page 4/12*

■ 40 x 40 x 117 format. Plastic case, plug in. Turret head *page 4/16*

Capacitive proximity sensors

OsiSense XT

Detection of insulated or conductive materials

Applications: detection of any object irrespective of material or conductivity, for example: metals, minerals, wood, plastic, glass, cardboard, fluids, etc.

Cylindrical sensors, flush mountable, metal case

Detection of insulated or conductive materials: presence, passage of paper, cardboard, glass, etc.



4

Form	Cylindrical
	Block, dimensions (w x h x d) in mm
Case	
Sensing distance (Sn) in mm	Flush mountable in metal sensors
	Non flush mountable in metal sensors
Degree of protection	
Supply	---
	~
Connection	Pre-cabled
	Connector
	Screw terminals
Type reference	
Pages	

Threaded: M12 x 1	Threaded: M18 x 1	Threaded: M30 x 1.5	Plain: Ø 32
-			
Stainless steel	Nickel plated brass	Nickel plated brass	Nickel plated brass
2	5	10	15
-			
IP 67 IP 65 for sensors with connector			
•	•	•	-
-	•	•	•
•			
•	•	•	-
-			
XT112S1•	XT118B1•	XT130B1•	XT132B1•
4/8			

Cylindrical sensors, non flush mountable, plastic case

Block type sensors, flush mountable in support, plastic case

Detection of insulated or conductive materials
Liquid level control

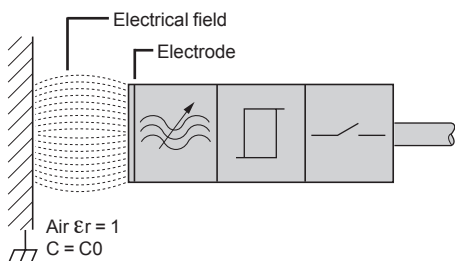
Application series:
Automatic feed system
for livestock

Detection of insulated materials:
presence, passage of paper, cardboard, glass,
etc.



Threaded: M18 x 1	Threaded: M30 x 1.5	Plain: Ø 32	Threaded: M30 x 1.5	–
–	–	–	–	40 x 40 x 117 format
Plastic	–	–	–	Plastic, turret head
–	–	–	–	15
8	15	20	15	–
IP 67, double insulation <input type="checkbox"/>			IP 65, double insulation <input type="checkbox"/>	IP 67
•	•	–	•	•
•	–	–	•	•
•	–	–	–	–
•	•	–	–	–
–	–	–	•	•
XT218A1●	XT230A1●	XT232A1●	XT230A2MDB	XT7C40●
4/12	–	–	–	4/16

Presentation



Advantages

- No physical contact with the object to be detected.
- High operating rates.
- Solid-state product, no moving parts (service life not related to number of operating cycles).
- Detection of any object irrespective of material or conductivity, for example: metals, minerals, wood, plastic, glass, cardboard, leather, ceramic, fluids, etc.

Operating principle

An electrical field is created between 2 electrodes on the front face of the sensor. These electrodes constitute a capacitor with a capacitance of:

$$C = \epsilon_0 * \epsilon_r * A/d \text{ where:}$$

$\epsilon_0 = 8.854\ 187\ \text{pF/m}$ (permittivity in free space)

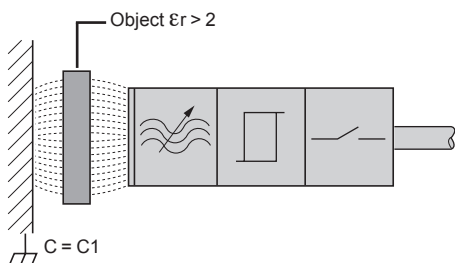
ϵ_r : relative permittivity of the material present between the 2 electrodes

A: dimensions of electrodes

d: distance between electrodes

All materials where $\epsilon_r > 2$ will be detected.

4

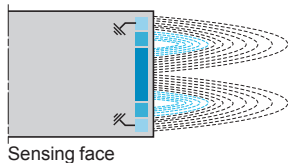


When an object of any material ($\epsilon_r > 2$) passes the sensing face of the sensor, it modifies the coupling capacitance (C_1). This variation in capacitance ($C_1 > C_0$) instigates the starting of the oscillator which, in turn, causes the output driver to operate and provides an output signal.

Types of sensor

Sensors flush mountable in support

The special feature of these versions is the shape of the electrical field which is rectilinear and confined within the dimensions of the product. Cylindrical and block type models used for the detection of insulated materials (wood, plastic, cardboard, glass...), conductive materials (metal...) or liquid through an insulated partition (glass, plastic...) with a maximum thickness of 4 mm.



These products are recommended for:

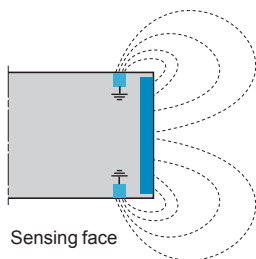
- comparatively short detection distances,
- applications requiring flush mounting of the sensor,
- detection through a partition (example: detection of glass through cardboard),
- side by side mounting.

Sensors non flush mountable in support

Cylindrical models (plastic case).

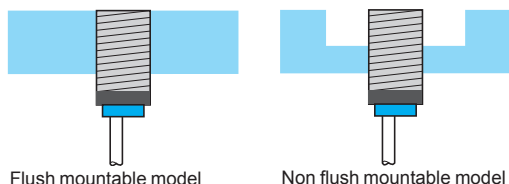
The spherical shape of the electrical field enables detection of any type of material whether it be solid, liquid, granular... (metal, water, oil, plastic pellets, powder, flour...). Detection can be achieved through a partition or by direct contact (immersion) of the active surface with the object to be detected.

Distances to be adhered to around the sensing face. (See characteristics page 4/15).

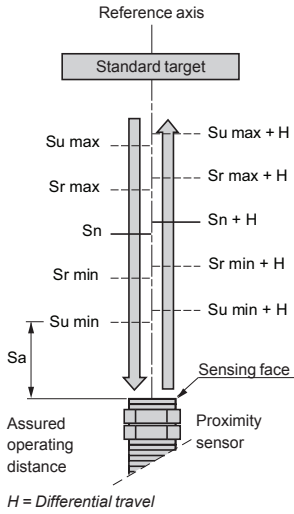


Mounting precautions

Non flush mountable models cannot be flush mounted in their support. The non flush mountable models require a free zone around the active head. (See page 4/15).



Terminology



Definitions

In order to ensure that customers can make reliable product comparisons and selection, the standard IEC 60947-5-2 defines various sensing distances, such as:

Nominal sensing distance (Sn)

The rated operating distance for which the sensor is designed. It does not take into account any variations (manufacturing tolerances, temperature, voltage).

Effective sensing distance (Sr)

The effective sensing distance is measured at the rated voltage (U_n) and the rated ambient temperature ($23\text{ °C} \pm 5\text{ °C}$). It must be between 90% and 110% of S_n .

Usable sensing distance (Su)

The usable sensing distance is measured at the limits of the permissible variations in the ambient temperature and at a supply voltage equal to 85% and 110% of the rated voltage.

It must be between 80% and 120% of S_r .

Assured operating distance (Sa)

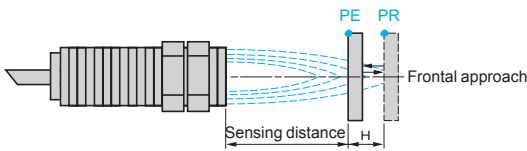
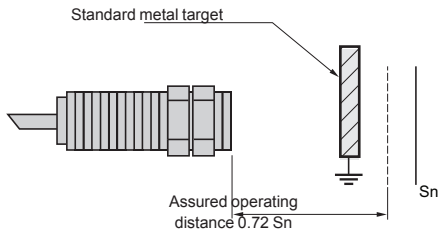
This is the operating zone of the sensor.

The assured operating distance is between 0 and 72% of S_n .

Standard metal target

The standard IEC 60947-5-2 defines the standard metal target as a square mild steel (Fe 360) plate, 1 mm thick.

The side dimension of the plate is either equal to the diameter of the circle engraved on the sensing face of the sensor or 3 times the nominal sensing distance (S_n).



PE = pick-up point, the target is detected

PR = drop-out point, the target is no longer detected

Repeat accuracy

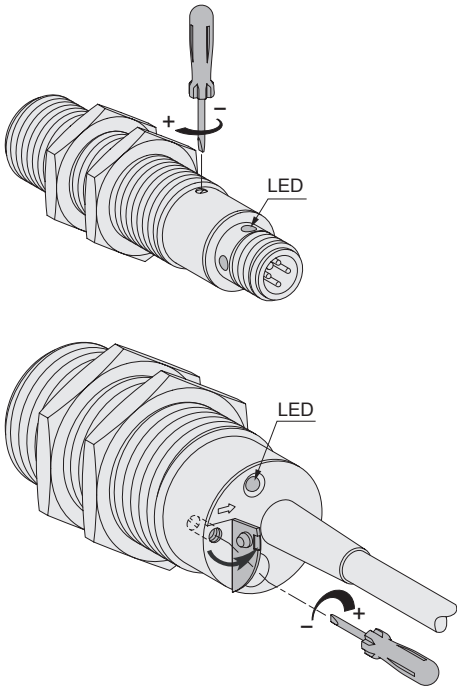
The repeat accuracy (R) is the repeatability of the sensing distance between successive operations. Readings are taken over a period of time whilst the sensor is subjected to voltage and temperature variations: 8 hours, 10 to 30 °C, $U_n \pm 5\%$. It is expressed as a percentage of the effective sensing distance S_r .

Differential travel

The differential travel (H) or hysteresis, is the distance between the operating point, as the standard metal target moves towards the sensor, and the release point, as it moves away.

This hysteresis is essential for the stable operation of the sensor.

Terminology (continued)



Sensitivity of the sensor

All our sensors incorporate a sensitivity adjustment potentiometer. This enables the sensitivity of the sensor to be adjusted to suit the type of object to be detected.

Depending on the sensor version, the sensitivity adjustment potentiometer is either mounted on the side or the rear.

The sensors are factory preset for nominal sensitivity.

Depending on the application, adjustment of the sensitivity could be necessary as follows:

- increasing the sensitivity for objects which have a weak influence (weak ϵ_r): paper, cardboard, glass, plastic,
- decreasing the sensitivity for objects which have a strong influence (strong ϵ_r): metals, liquids.

However, in the event of severe variations in the ambient conditions, do not increase the sensitivity of the sensor such that it is set to its maximum operating limits.

An increase in sensitivity causes an increase in the switching hysteresis.

Operating distances

The operating distance of the sensor is related to the dielectric constant (ϵ_r) of the object material to be detected.

The higher the value of ϵ_r , the easier the detection of the object will be.

The assured operating distance depends on the object material: $S_a = S_n \times F_c$

S_a = assured operating distance,

S_n = nominal sensing distance of the sensor,

F_c = correction factor related to the object material.

Example: sensor XT130B1PAL2 used to detect a rubber object.

$S_n = 10 \text{ mm}$, $F_c = 0.3$.

Assured operating distance $S_a = 10 \times 0.3 \text{ mm}$.

The list below indicates the dielectric constant values of the most common object materials, together with their correction factors (F_c) for the nominal sensing distance of the sensor.

Material	ϵ_r	F_c	Material	ϵ_r	F_c
Air	1	0	Petrol	2.2	0.2
Acetone	20	0.8	Plexiglass	3.2	0.3
Alcohol	24	0.85	Polyester resin	2.8...8	0.2...0.6
Ammonia	15...25	0.75...0.85	Polystyrene	3	0.3
Cement (powder)	4	0.35	Porcelain	5...7	0.4...0.5
Cereals	3...5	0.3...0.4	Powdered milk	3.5...4	0.3...0.4
Epoxy resin	4	0.36	Rubber	2.5...3	0.3
Ethylene glycol	38	0.95	Sand	3...5	0.3...0.4
Flour	2.5...3	0.2...0.3	Salt	6	0.5
Glass	3...10	0.3...0.7	Sugar	3	0.3
Marble	6...7	0.5...0.6	Teflon	2	0.2
Mica	6...7	0.5...0.6	Vaseline	2...3	0.2...0.3
Nylon	4...5	0.3...0.4	Water	80	1
Oil	2.2	0.2	Wood (damp)	10...30	0.7...0.9
Paper	2...4	0.2...0.3	Wood (dry)	2...7	0.2...0.6
Paraffin	2...2.5	0.2			

Environment

■ **Electromagnetic interference**

The sensors undergo electromagnetic interference testing in accordance with the recommendations of standard IEC 60947-5-2 (electrostatic discharges, radiated electromagnetic fields, fast transients, impulse voltages).

■ **Thermal influences**

It is advisable to remain within the values stated on the characteristic pages so as to avoid sensing distance drift and possible incorrect operation of the sensor.

■ **Chemical agents**

To ensure a long service life, it is essential that any chemicals coming into contact with the case of the sensor are non corrosive.

■ **Earthing**

Earthing of an object that has high conductivity increases the sensing distance.

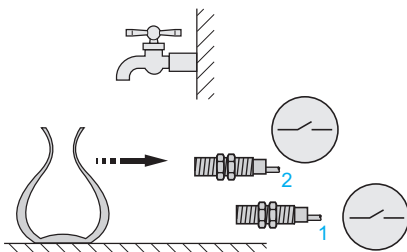
Additional information relating to outputs

Refer to corresponding pages relating to inductive proximity sensors for:

- Terminology.
- Details and specific aspects of 2-wire and 3-wire type connection.
- Connecting several sensors in series or parallel.

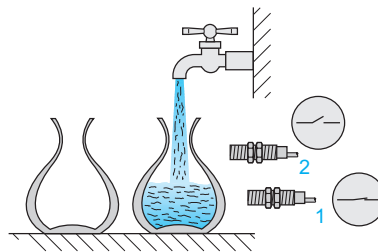
Application examples:

Bottle filling



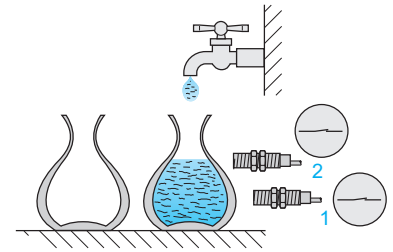
■ **Bottle arrival**

- Bottles are fed on a conveyor for filling.
- Sensors 1 and 2 are in an unoperated state.
- Adjustment:
 - sensor 1 is adjusted to detect the bottle,
 - sensor 2 is adjusted to detect the water in the bottle.



■ **Bottle filling**

As soon as the bottle enters the detection zone of sensor 1, the filling operation commences. Sensor 2 remains in the unoperated state.

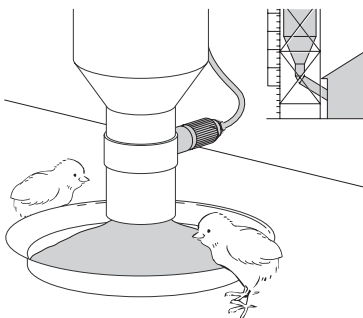


■ **Filling complete**

Sensor 2 detects that the required level has been reached and stops further filling.

Reminder: the wall of the container must be non metallic and its thickness ≤ 4 mm

Livestock feeder filling



Capacitive technology is particularly suited for the detection of feed levels in automatic dispensers for livestock. Any type of feed can be detected (pellets, powders, broths, grains, pastas, etc.).

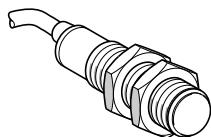
The materials used, as well as the degree of protection of the sensor, have been specially selected to tolerate the acidic and dusty environments associated with this application.

Capacitive proximity sensors

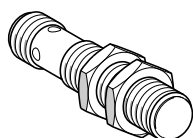
OsiSense XT

Cylindrical, flush mountable. Metal case

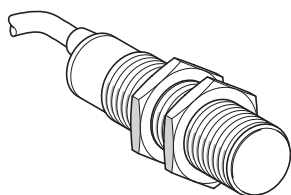
AC or DC supply



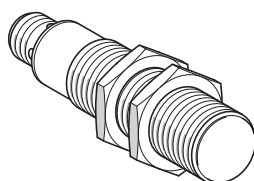
XT112S1●●L2



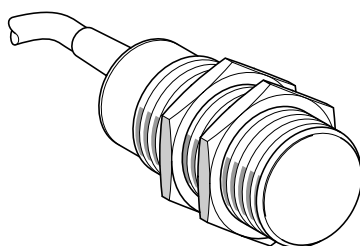
XT112S1PCM12



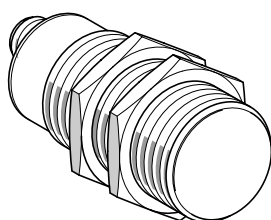
XT118B1●●L2



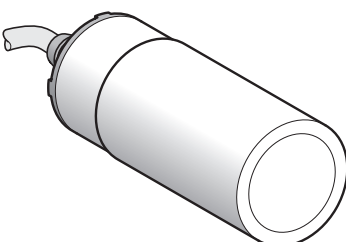
XT118B1PCM12



XT130B1●●L2



XT130B1PCM12



XT132B1●●L2

Ø 12, threaded M12 x 1, stainless steel

Sensing distance (Sn) (mm)	Function	Output	Connection	Reference	Weight (kg)
4-wire ~ 24 V					
2	NO/NC	PNP	Pre-cabled (L = 2 m)	XT112S1PCL2	0.070
			M12 connector	XT112S1PCM12	0.040

3-wire ~ 24 V

2	NO	PNP	Pre-cabled (L = 2 m)	XT112S1PAL2	0.070
		NPN	Pre-cabled (L = 2 m)	XT112S1NAL2	0.070

Ø 18, threaded M18 x 1, nickel plated brass

Sensing distance (Sn) (mm)	Function	Output	Connection	Reference	Weight (kg)
4-wire ~ 24 V					
5	NO/NC	PNP	Pre-cabled (L = 2 m)	XT118B1PCL2	0.150
			M12 connector	XT118B1PCM12	0.075

3-wire ~ 24 V

5	NO	PNP	Pre-cabled (L = 2 m)	XT118B1PAL2	0.150
		NPN	Pre-cabled (L = 2 m)	XT118B1NAL2	0.150

2-wire ~ 24-240 V

5	NO	–	Pre-cabled (L = 2 m)	XT118B1FAL2	0.150
	NC	–	Pre-cabled (L = 2 m)	XT118B1FBL2	0.150

Ø 30, threaded M30 x 1.5, nickel plated brass

Sensing distance (Sn) (mm)	Function	Output	Connection	Reference	Weight (kg)
4-wire ~ 24 V					
10	NO/NC	PNP	Pre-cabled (L = 2 m)	XT130B1PCL2	0.270
			M12 connector	XT130B1PCM12	0.150

3-wire ~ 24 V

10	NO	PNP	Pre-cabled (L = 2 m)	XT130B1PAL2	0.270
		NPN	Pre-cabled (L = 2 m)	XT130B1NAL2	0.270

2-wire ~ 24-240 V

10	NO	–	Pre-cabled (L = 2 m)	XT130B1FAL2	0.270
	NC	–	Pre-cabled (L = 2 m)	XT130B1FBL2	0.270

Ø 32, plain, nickel plated brass (1)

Sensing distance (Sn) (mm)	Function	Output	Connection	Reference	Weight (kg)
2-wire ~ 24-240 V					
15	NO	–	Pre-cabled (L = 2 m)	XT132B1FAL2	0.400
	NC	–	Pre-cabled (L = 2 m)	XT132B1FBL2	0.400

(1) Mounting accessory included with sensor.

Accessories

Fixing and protection accessories, fuses and fuse terminal block: see page 4/12.

Capacitive proximity sensors

OsiSense XT

Cylindrical, flush mountable. Metal case

AC or DC supply

Characteristics								
Sensor type		M12	M18	M30		Ø 32		
		XT112●	XT118●	XT130●	XT132p			
		3-wire ⋯ 4-wire ⋯	3-wire ⋯ 4-wire ⋯	2-wire ~	3-wire ⋯ 4-wire ⋯	2-wire ~	2-wire ~	
Product certifications		CE, cETLus					CE, cULus	
Conformity to standards		IEC 60947-5-2, UL 61010-1						
Connection	Pre-cabled, length 2 m	●	●	●	●	●	●	
	Connector, M12	●	●	–	●	–	–	
Main characteristics								
Nominal sensing distance (Sn)	Conforming to IEC 60947-5-2	mm	2	5	10		15	
Assured operating distance Sa	Conforming to IEC 60947-5-2	mm	0...1.44	0...3.60	0...3.60	0...7.2	0...7.2	0...11
Adjustment zone		mm	0.5...5	1...8	1...5	2...20	2...15	0...20
Repeat accuracy			< 0.1 Sr				< 0.15 Sr	
Differential travel			< 0.2 Sr				< 0.2 Sr	
Output characteristics								
Output state indication			Yellow LED					
Switching capacity		mA	200	200	330	200	330	300
Maximum switching frequency		Hz	300	200	25	150	25	15
Protection against short-circuits			●	●	– (1)	●	– (1)	– (1)
Voltage drop		V	≤ 2	≤ 2	≤ 6	≤ 2	≤ 6	≤ 10
Residual current, open state		mA	< 0.1	< 0.1	< 5	< 0.1	< 5	< 5
Delays	First-up	ms	≤ 30	≤ 30	≤ 100	≤ 30	≤ 100	≤ 200
	Response	ms	≤ 5	≤ 5	≤ 20	≤ 5	≤ 20	≤ 30
	Recovery	ms	≤ 5	≤ 5	≤ 20	≤ 5	≤ 20	≤ 30
Supply								
Rated supply voltage		V	⋯ 24	⋯ 24	~ 24 - 240 50/60 Hz	⋯ 24	~ 24 - 240 50/60 Hz	~ 24 - 240 50/60 Hz
Voltage limits (including ripple)		V	⋯ 12 - 30	⋯ 12 - 30	~ 20 - 264 50/60 Hz	⋯ 12 - 30	~ 20 - 264 50/60 Hz	~ 20 - 264 50/60 Hz
Current consumption, no-load		mA	< 15	< 15	< 3	< 15	< 3	< 4
Protection against reverse polarity			Yes	Yes	–	Yes	–	–
Environment								
Materials	Case		Stainless steel 303	Nickel plated brass				
	Cable		PVC					
	Number and c.s.a. of wires		3 x 0.14 mm ² or 4 x 0.14 mm ²	3 x 0.34 mm ² or 4 x 0.34 mm ²	3 x 0.34 mm ²	3 x 0.75 mm ² or 4 x 0.5 mm ²	3 x 0.75 mm ²	3 x 0.34 mm ²
Degree of protection	Conforming to IEC 60529 and IEC 60947-5-2		IP 67 (2) IP 65 for sensors XT112S1PCM12 and XT118B1PCM12				IP 67	
Storage and operating temperature		°C	- 25...+ 70					
Vibration resistance	Conforming to IEC 60068-2-6		10 gn, ± 1 mm (f = 10...55 Hz)					
Shock resistance	Conforming to IEC 60068-2-27		30 gn, 11 ms				30 gn, 6 ms	
Resistance to electromagnetic interference								
Electrostatic discharges	Conforming to IEC 61000-4-2	kV	8 (air) / 4 (contact)					
Radiated electromagnetic fields	Conforming to IEC 61000-4-3	V/m	3					
Fast transients	Conforming to IEC 61000-4-4	kV	2					

(1) These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a "quick-blow" fuse in series with the load (see page 4/12).

(2) With adjustment potentiometer sealing screw.

Capacitive proximity sensors

OsiSense XT

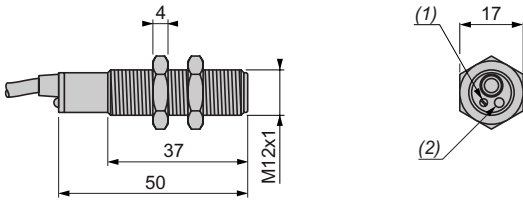
Cylindrical, flush mountable. Metal case

AC or DC supply

Dimensions

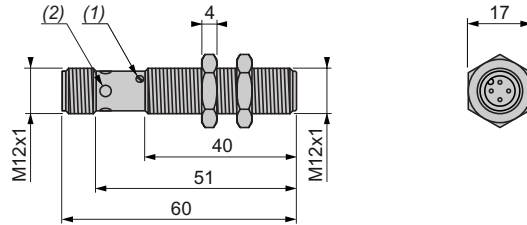
M12, pre-cabled

XT112S1●●L2



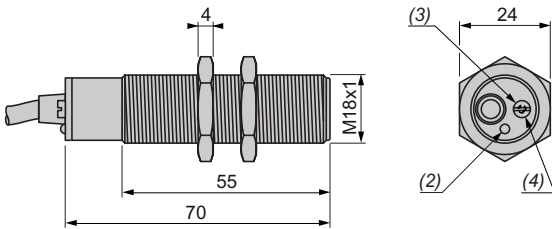
M12, M12 connector

XT112S1PCM12



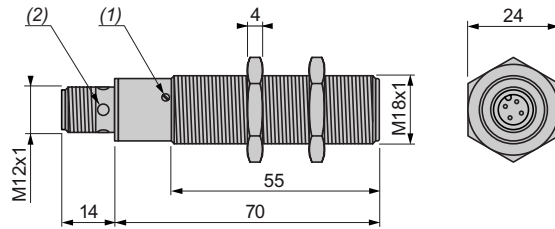
M18, pre-cabled

XT118B1●●L2



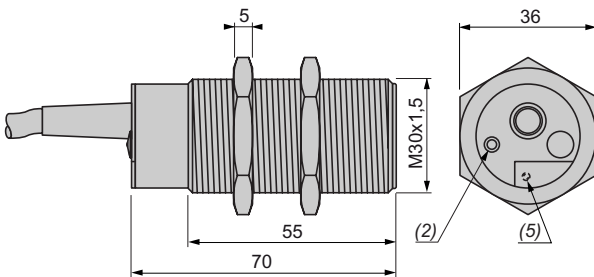
M18, M12 connector

XT118B1PCM12



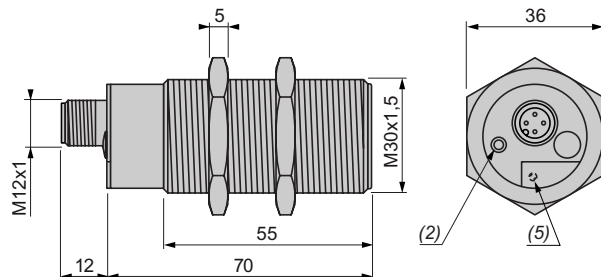
M30, pre-cabled

XT130B1●●L2



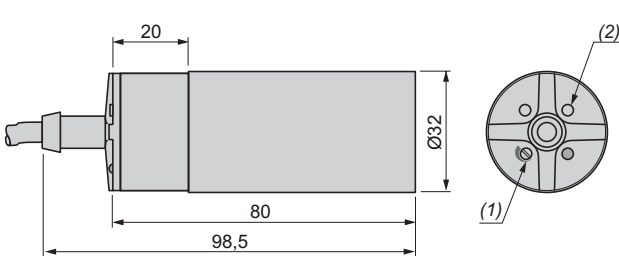
M30, M12 connector

XT130B1PCM12

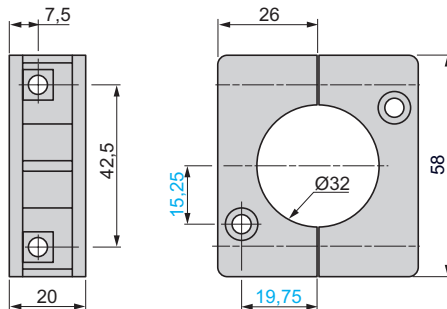


Ø 32, plain, pre-cabled

XT132B1F●L2



Mounting accessory (included with sensor XT132B1F●L2)



- (1) Adjustment potentiometer
- (2) LED
- (3) Sealing screw
- (4) Potentiometer beneath sealing screw
- (5) Potentiometer beneath protective flap

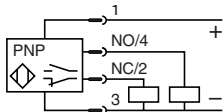
Wiring schemes

Connector version

M12 connector

4-wire ~, PNP
NO + NC output, M12

XT112/18/30●●●●M12

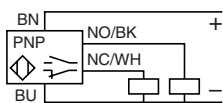


Pre-cabled version

Cable

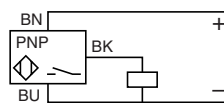
4-wire ~, PNP
NO + NC output,
pre-cabled

XT112/18/30PC●●L2



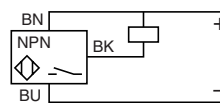
3-wire ~, PNP
NO output, pre-cabled

XT112/18/30PA●●L2



3-wire ~, NPN
NO output, pre-cabled

XT112/18/30NA●●L2



BU: Blue

BN: Brown

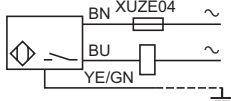
BK: Black

WH: White

YE/GN: Yellow/
green

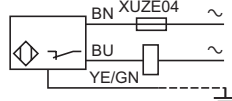
2-wire ~
NO output

XT118/30/32B1FAL2



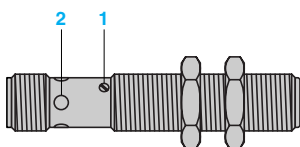
2-wire ~
NC output

XT118/30/32B1FBL2



Adjustment

Sensitivity adjustment



Adjustment from the side for

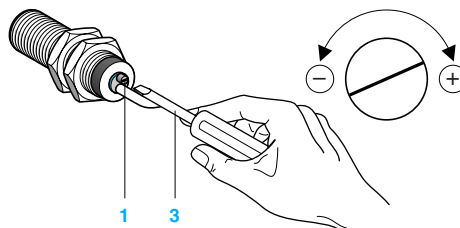
XT112●●●●M12

XT118●●●●M12

Adjustment from the rear for

XT1●●●●L2

XT130●●●●M12



- 1 Adjustment potentiometer LED
- 2 Adjustment using suitable screwdriver (included with sensor)
- 3

Setting-up

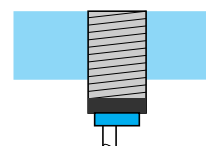
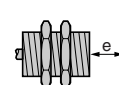
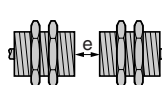
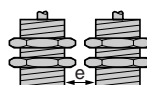
Minimum mounting distances (mm)

Side by side

Face to face

Facing a metal object

Mounted in support



XT1M12 flush mountable

$e \geq 0$

$e \geq 2.2 \times S_n$

$e \geq 2 \times S_n$

-

XT1M18 flush mountable

$e \geq 0$

$e \geq 2.2 \times S_n$

$e \geq 2 \times S_n$

-

XT1M30 flush mountable

$e \geq 0$

$e \geq 2.2 \times S_n$

$e \geq 2 \times S_n$

-

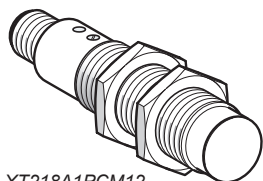
Fixing nut tightening torque: XT112: 10 N.m, XT118: 28 N.m, XT130: 40 N.m

Capacitive proximity sensors

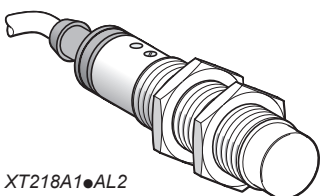
OsiSense XT

Cylindrical, non flush mountable. Plastic case

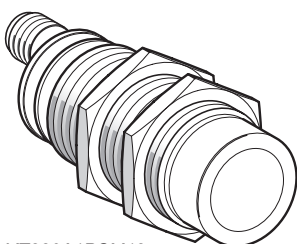
AC or DC supply



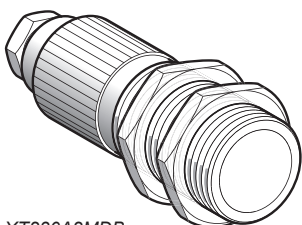
XT218A1PCM12



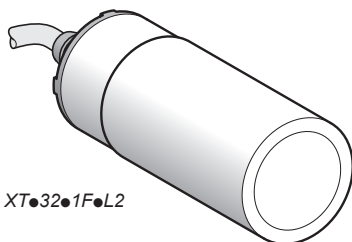
XT218A1AL2



XT230A1PCM12



XT230A2MDB



XT321FAL2



XUZA118

Ø 18, threaded M18 x 1

Sensing distance (Sn) (mm)	Function	Output	Connection	Reference	Weight kg
4-wire ~ 12...24 V					
8	NO/NC	PNP	M12 connector	XT218A1PCM12	0.060
3-wire ~ 12...24 V					
8	NO	PNP	Pre-cabled (L = 2 m)	XT218A1PAL2	0.140
		NPN	Pre-cabled (L = 2 m)	XT218A1NAL2	0.140
2-wire ~ 24-240 V					
8	NO	-	Pre-cabled (L = 2 m)	XT218A1FAL2	0.140

Ø 30, threaded M30 x 1.5

Sensing distance (Sn) (mm)	Function	Output	Connection	Reference	Weight kg
4-wire ~ 12...24 V					
15	NO/NC	PNP	M12 connector	XT230A1PCM12	0.100
3-wire ~ 12...24 V					
15	NO	PNP	Pre-cabled (L = 2 m)	XT230A1PAL2	0.200
		NPN	Pre-cabled (L = 2 m)	XT230A1NAL2	0.200
2-wire ~ 24-240 V					
15	NO	-	Pre-cabled (L = 2 m)	XT230A1FAL2	0.200
	NC	-	Pre-cabled (L = 2 m)	XT230A1FBL2	0.200

Ø 30, threaded M30 x 1.5, Application series

Sensing distance (Sn) (mm)	Function	Connection	Reference	Weight kg
2-wire ~ 24-240 V / ~ 24 V				
0...15, adjustable	NO or NC, selectable	Screw terminals	XT230A2MDB	0.100

Applications: sensor **XT230A2MDB** is particularly suited to automatic feed systems for livestock. It enables detection of the level of all types of feed: pellets, grains, pastas, broths and powders.

Ø 32, plain (1)

Sensing distance (Sn) (mm)	Function	Connection	Reference	Weight kg
2-wire ~ 24-240 V				
20	NO	Pre-cabled (L = 2 m)	XT232A1FAL2	0.350
	NC	Pre-cabled (L = 2 m)	XT232A1FBL2	0.350

(1) Mounting accessory included with sensor.

Accessories for capacitive sensors XT1● and XT2●

Fixing accessories

Description	For use with sensor	Reference	Weight kg
90° fixing bracket	Ø 12	XXZ12	0.025
	Ø 18	XUZA118	0.045
	Ø 30	XXZ30	0.115

Protection accessories

Description	For use with sensor	Reference	Weight kg
Threaded sleeve	Ø 30, threaded M30 x 1.5	XTAZ30	0.035

Fuses (for unprotected 2-wire ~ sensors)

Description	Type	Sold in lots of	Unit reference	Weight kg
Cartridge fuses 5 x 20	0.4 A "quick-blow"	10	XUZE04	0.001
	0.63 A "quick-blow"	10	XUZE06	0.001
	0.8 A "quick-blow"	10	XUZE08	0.001

Fuse terminal block

Description	Sold in lots of	Unit reference	Weight kg
Fuse terminal block for 5 x 20 fuses, grey	50	AB1FUSE435U5X	0.016

Capacitive proximity sensors

OsiSense XT

Cylindrical, non flush mountable. Plastic case

AC or DC supply

Characteristics

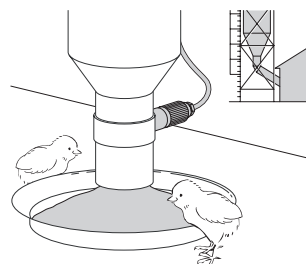
Sensor type		M18			M30			Ø 32				
		XT218A1			XT230A1			XT230A2	XT232A			
		4-wire ---	3-wire ---	2-wire ~	4-wire ---	3-wire ---	2-wire ~	2-wire ~	2-wire ~			
Product certifications		CE, cULus										
Conformity to standards		IEC 60947-5-2, UL 61010-1										
Connection		Pre-cabled, length 2 m		-	•	•	-	•	•	-	•	
		Connector, M12		•	-	-	•	-	-	-	-	-
		Screw terminals, 2 x M3		-	-	-	-	-	-	•	-	-
Main characteristics												
Nominal sensing distance (Sn)	IEC 60947-5-2	mm	8			15			15	20		
Assured operating distance (Sa)	IEC 60947-5-2	mm	0...5.8			0...11			0...11	0...15		
Adjustment zone		mm	0...12			0...17			0...17	0...22		
Repeat accuracy		Sr	< 5%									
Differential travel		Sr	< 1...20%						< 1...15%	< 1...20%		
Output characteristics												
Output state indication		Yellow LED										
Switching capacity		mA	2 x 200	200	300	2 x 200	200	300	300	300		
Maximum switching frequency		Hz	30	30	15	50	50	15	40	15		
Protection against short-circuits			•	•	-(1)	•	•	-(1)	-(1)	-(1)		
Voltage drop		V	< 2.5	< 2.5	< 10	< 2.5	< 2.5	< 10	< 2	< 10		
Residual current, open state		µA	≤ 100	≤ 100	-	≤ 100	≤ 100	-	< 120	-		
Delays	First-up	ms	< 100	< 100	< 200	< 100	< 100	< 200	< 100	< 200		
	Response	ms	< 15	< 15	< 30	< 15	< 10	< 30	< 10	< 30		
	Recovery	ms	< 15	< 15	< 30	< 15	< 10	< 30	< 10	< 30		
Supply												
Rated supply voltage		V	--- 12...24		~ 24...240 50/60 Hz	--- 12...24		~ 24...240 50/60 Hz	~ 24...240 50/60 Hz --- 24	~ 24...240 50/60 Hz		
Voltage limits (including ripple)		V	--- 10...30		~ 20...265	--- 10...30		~ 20...265	~ 20...265	~ 20...265		
Current consumption, no-load	24 V	mA	< 25	< 15	-	< 25	< 15	-	-	-		
	240 V	mA	-	-	< 4	-	-	< 4	< 3	< 4		
Protection against reverse polarity			Yes	Yes	-	Yes	Yes	-	-	-		
Environment												
Materials	Case		Plastic									
	Cable		PVC						-	PVC		
	Number and c.s.a. of wires (mm ²)		-	3 x 0.34	2 x 0.5	-	3 x 0.34	2 x 0.5	2 x 1 (min.) (2) 2 x 2.5 (max.)	2 x 0.5		
Degree of protection	Conforming to IEC 60529		IP 67, double insulation ☐					IP 65, double insulation ☐	IP 67, double insulation ☐			
Storage temperature		°C	- 10...+ 60						- 40...+ 85	- 10...+ 60		
Operating temperature		°C	- 10...+ 60						- 20...+ 70	- 10...+ 60		
Vibration resistance	IEC 60068-2-6		10 gn, ± 1 mm (f = 10...55 Hz)									
Shock resistance	IEC 60068-2-27		30 gn, 11 ms									
Resistance to electromagnetic interference												
Electrostatic discharges	IEC 61000-4-2	kV	8 (air) / 4 (contact)									
Radiated electromagnetic fields	IEC 61000-4-3	V/m	3									
Fast transients	IEC 61000-4-4	kV	2									

(1) These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a "quick-blow" fuse in series with the load (see page 4/12).

(2) The supply cable can have a 14 mm maximum diameter sheath.

Application example (XT230A2MDB)

Automatic feed system for livestock



Capacitive proximity sensors

OsiSense XT

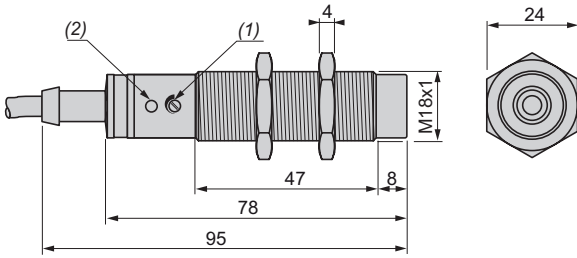
Cylindrical, non flush mountable. Plastic case

AC or DC supply

Dimensions

M18, pre-cabled

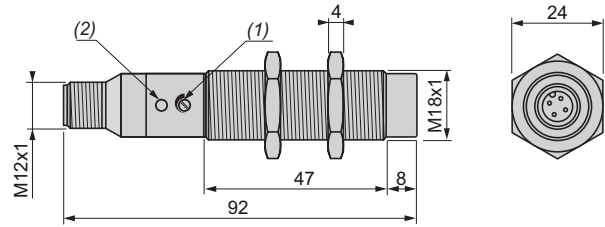
XT218A1●●L2



(1) Adjustment potentiometer.
(2) LED.

M18, M12 connector

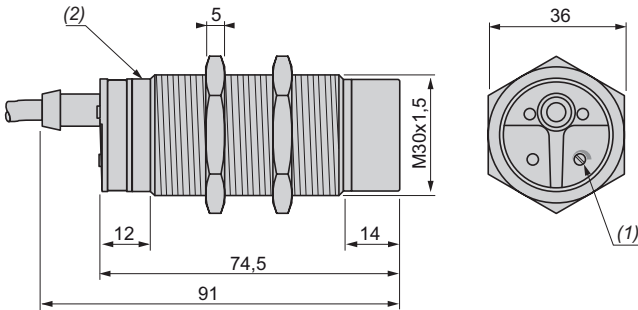
XT218A1PCM12



(1) Adjustment potentiometer.
(2) LED.

M30, pre-cabled

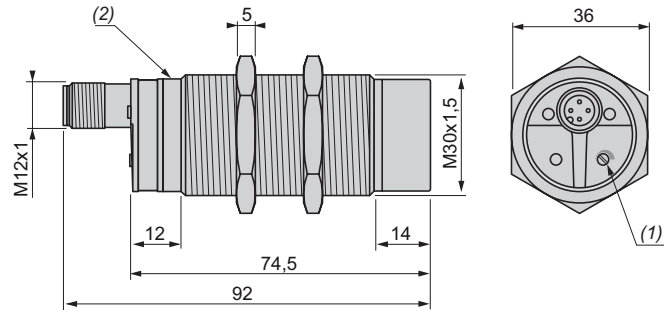
XT230A1●●L2



(1) Adjustment potentiometer.
(2) LED.

M30, M12 connector

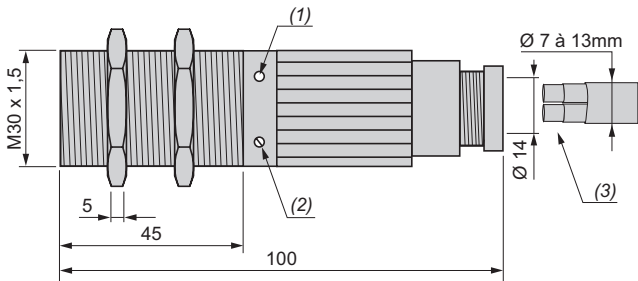
XT230A1PCM12



(1) Adjustment potentiometer.
(2) LED.

M30, screw terminals

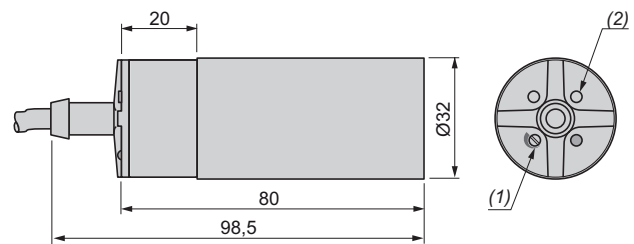
XT230A2MDB



(1) LED.
(2) Potentiometer.
(3) 2 x 1 mm² to 2.5 mm² wires max.

Ø 32, plain, pre-cabled

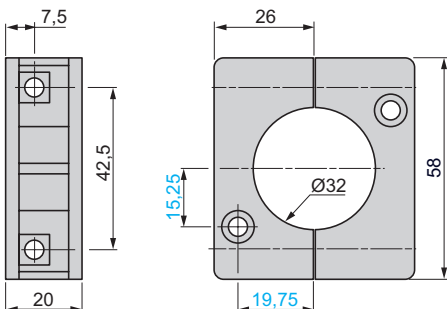
XT232A1F●L2



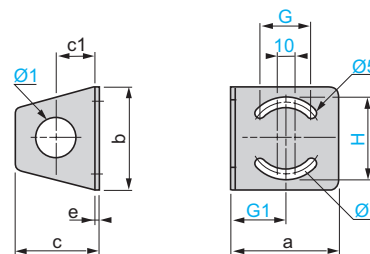
(1) Adjustment potentiometer.
(2) LED.

Accessories

Mounting accessory (included with sensor XT232A1F●L2)



XXZ12, XXZ30



XXZ	a	b	c	c1	e	H	G	G1	Ø	Ø1
12	35	40	33	18	2	31	18	18	25	13
30	67	65	52	25	3	51	35	33	50	31

Capacitive proximity sensors

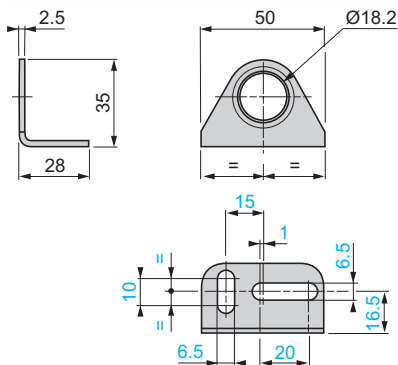
OsiSense XT

Cylindrical, non flush mountable. Plastic case

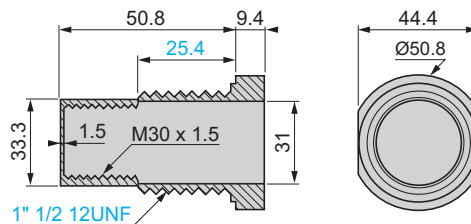
AC or DC supply

Dimensions (continued)

XUZA118



XTAZ30



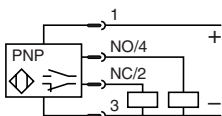
Wiring schemes

Connector version

M12 connector

4-wire ~, PNP
NO + NC output, M12

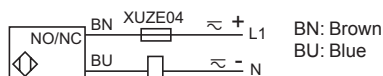
XT218/30●●●M12



Screw terminal version

2-wire ~
NO or NC output, selectable

XT230A2MDB



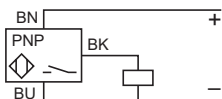
Pre-cabled version

Cable

3-wire ~, PNP
NO output

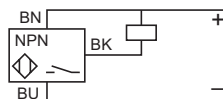
XT218/30A1PAL2

BU: Blue
BN: Brown
BK: Black
WH: White



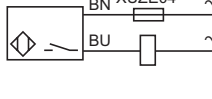
3-wire ~, NPN
NO output

XT218/30A1NAL2



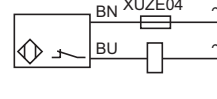
2-wire ~
NO output

XT218/30/32A1FAL2



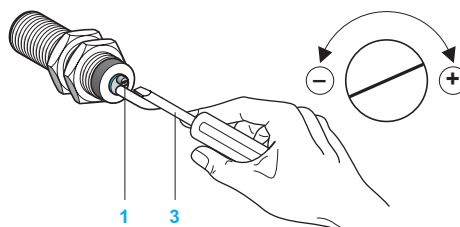
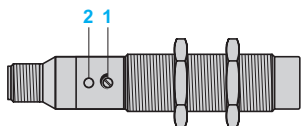
2-wire ~
NC output

XT230/32A1FBL2



Adjustment

Sensitivity adjustment



- 1 Adjustment potentiometer LED
- 2 Adjustment using suitable screwdriver (included with sensor)
- 3

Adjustment from the side for XT218A1, XT230A2

Adjustment from the rear for XT230A1
XT232A1

Setting-up

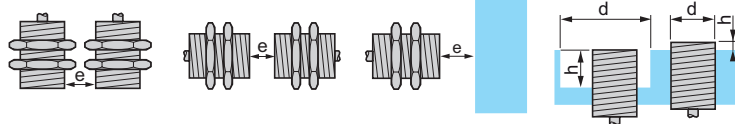
Minimum mounting distances (mm)

Side by side

Face to face

Facing a metal object

Mounted in support



	Side by side	Face to face	Facing a metal object	Mounted in support
XT218A1, M18 x 1 non flush mountable	$e \geq 40$	$e \geq 6$ Sn	$e \geq 3$ Sn	$d \geq 60$ $h \geq 20$
XT230A1, M30 x 1.5 non flush mountable	$e \geq 60$	$e \geq 6$ Sn	$e \geq 3$ Sn	$d \geq 90$ $h \geq 30$
XT230A2, M30 x 1.5 non flush mountable	$e \geq 16$	$e \geq 90$ Sn	$e \geq 45$ Sn	$d \geq 90$ $h \geq 30$
XT232A1, Ø 32 plain, non flush mountable	$e \geq 65$	$e \geq 6$ Sn	$e \geq 3$ Sn	$d \geq 100$ $h \geq 30$

Fixing nut tightening torque: XT218A: 3 N.m, XT230A: 8 N.m
Cable gland tightening torque: XT230A2: 4 N.m

Capacitive proximity sensors

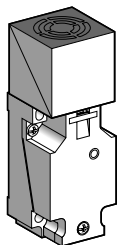
OsiSense XT

For detection of insulated materials

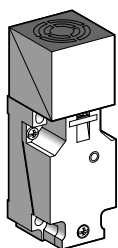
40 x 40 x 117 format.

Plastic case, plug-in. Turret head

AC or DC supply



XT7C40●C440



XT7C40●●262

Sensors flush mountable in support

3-wire \sim 12...48 V flush mountable

Sensing distance (Sn) mm	Function	Output	Reference	Weight kg
15	NO + NC	PNP	XT7C40PC440	0.220
		NPN	XT7C40NC440	0.220

2-wire \sim 24...240 V (50/60 Hz) flush mountable

Sensing distance (Sn) mm	Function	Reference	Weight kg
15	NO or NC via programming	XT7C40FP262	0.220

Accessories

Fuses (for unprotected 2-wire \sim sensors)

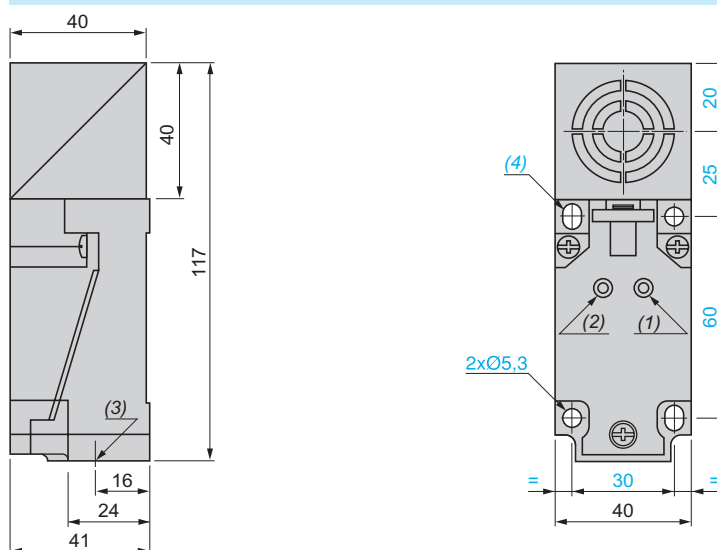
Description	Type	Sold in lots of	Unit reference	Weight kg
Cartridge fuses 5 x 20	0.4 A "quick-blow"	10	XUZE04	0.001
	0.63 A "quick-blow"	10	XUZE06	0.001
	0.8 A "quick-blow"	10	XUZE08	0.001

Fuse terminal block

Description	Sold in lots of	Unit reference	Weight kg
Fuse terminal block for 5 x 20 fuses, grey	50	AB1FUSE435U5X	0.016

Dimensions

XT7C40●●●●●



- (1) Output LED
- (2) Supply LED (depending on model)
- (3) 1 tapped entry for 13P cable gland
- (4) 2 elongated holes \varnothing 5.3 x 7

Capacitive proximity sensors

OsiSense XT
For detection of insulated materials
40 x 40 x 117 format.
Plastic case, plug-in. Turret head
AC or DC supply

Characteristics		XT7C40●C440	XT7C40FP262
Sensor type		XT7C40●C440	XT7C40FP262
Connection		Screw terminals, clamping capacity 4 x 1.5 mm ² (1)	Screw terminals, clamping capacity 3 x 1.5 mm ² (1)
Degree of protection	Conforming to IEC 60529	IP 67	
Operating zone	mm	0...10.8	
Repeat accuracy		≤ 0.1 Sr	
Product certifications		UL, CSA, CE	
Differential travel		≤ 0.2 Sr	
Operating temperature	°C	- 25...+ 70	
Output state indication		Yellow LED: output Green LED: supply	Yellow LED: output
Rated supply voltage	V	~ 12...48	~ 24...240 (50/60 Hz)
Voltage limits (including ripple)	V	~ 10...58	~ 20...264
Switching capacity	mA	0...200 with overload and short-circuit protection	5...350 (2 A inrush) (2)
Voltage drop, closed state	V	≤ 2	≤ 5.5
Residual current, open state	mA	–	≤ 1.5
Current consumption, no-load	mA	≤ 10	–
Maximum switching frequency	Hz	100	25
Delays	First-up	ms	≤ 30
	Response	ms	≤ 5
	Recovery	ms	≤ 5

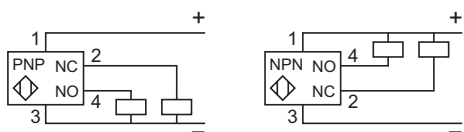
(1) Cable gland not included with sensor. Suitable 13P cable gland: XSZPE13.

(2) These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a "quick-blow" fuse in series with the load (see page 4/12).

Wiring schemes

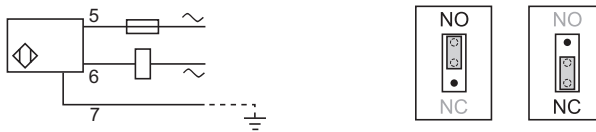
3-wire ~

NO + NC output



2-wire ~ programmable

NO or NC output, depending on position of link

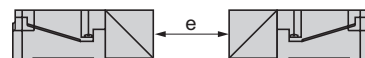
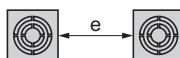


Setting-up

Minimum mounting distances (mm)

Side by side

Face to face

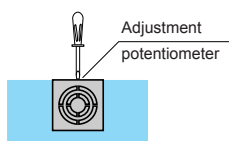


XT7 flush mountable

$e \geq 40$

$e \geq 120$

Flush mounting



To avoid interference by the immediate surroundings, it may be necessary to reduce the sensitivity when flush mounting the sensor.

Selection guide page 5/2

- General page 5/14

OsiSense XU, general purpose

- Design 18
 - Single mode function, plastic page 5/28
 - Single mode function, metal page 5/30
 - Multimode function, metal or plastic page 5/32
- Miniature design
 - Single mode function, plastic page 5/34
 - Multimode function, plastic page 5/38
 - Diffuse mode with adjustable background and foreground page 5/40
- Compact design, 50 x 50
 - Fonction monomode, plastique page 5/42
 - Fonction multimode, plastique page 5/44
 - Réflexion directe, avec suppression de l'arrière-plan réglable page 5/46
- Design compact
 - Single mode function, plastic page 5/50
 - Multimode function, plastic page 5/52
 - Diffuse with adjustable background suppression page 5/54

OsiSense XU Application, fork and frame form

- Fork design
 - Optical fork without adjustment page 5/56
 - Optical fork with teach mode page 5/58
 - Optical fork with laser transmission and with teach mode page 5/60
 - Ultrasonic fork, packaging series page 5/62
 - Optical fork for detection of opaque labels page 5/64
 - Optical fork with teach mode, packaging series page 5/68
 - Optical fork with integral amplifier, mechanical handling series page 5/70
- Frame design
 - Dynamic detection of passage of objects, conveying series page 5/72

OsiSense XU Application, packaging series

- Detection of contrast
 - Compact design 50 X 50 page 5/74
 - Fibre design, with teach mode page 5/76
 - Compact design 81 X 58 page 5/78
- Luminescence sensor page 5/80
- Illumination sensor page 5/82
- For detection of transparent materials page 5/84
- For detection of transparent materials, with teach mode page 5/86
- For colour detection, sorting page 5/90

OsiSense XU Application, food and beverage series

- Design 18, stainless steel, multimode function page 5/92
- Design 18, stainless steel, single mode page 5/94

OsiSense XU Application, assembly and conveying series

- Metal case, cylindrical, threaded M8 x 1 for assembly series page 5/98
- Miniature design for conveyor system and access control series page 5/100
- Miniature design with laser transmission for assembly series and conveyor system page 5/102
- Compact design with laser transmission for assembly series page 5/104
- Cylindrical design for detecting packages on a roller conveyor page 5/108



OsiSense XU Application, materials handling series

- Design 18, laser transmission page 5/112
- With analogue output signal 4...20 mA et 0...10 V page 5/114
- With analogue output signal 4...20 mA page 5/116
- Laser transmission
with solid-state and analogue output signal 4...20 mA page 5/118
- Thru-beam system with high “excess gain” page 5/120
- Laser transmission
with analogue output signal 4...20 mA et 0...10 V page 5/122
- Laser transmission with background suppression page 5/124
- Diffuse with 2 channels using triangulation. page 5/126

OsiSense XU Application, amplifier and fibre optics

- Amplifiers with teach mode page 5/128
- “Plastic” fibre optics for amplifiers. page 5/130
- “Glass” fibre optics for amplifier page 5/134
- Amplifiers for plastic or glass fibre optics page 5/142

OsiSense XU Application, other formats

- Compact design, conveying serie page 5/148
- Compact design for conveyor system and access control system page 5/150
- Design 18, a.c. or d.c.supply, solid-state output
with adjustable sensitivity. page 5/152

OsiSense XU Application, tertiary sector series

- For access detection page 5/154
- With integral buzzer page 5/156

OsiSense XU

- Accessories page 5/158
- Curves page 5/170

OsiSense XUK8T, XUK9T

- *Selection guide* page 5/176
- Presentation. page 5/178

OsiSense XUW

- *Selection guide* page 5/182

Photo-electric sensors

OsiSense XU General purpose

Single mode or multimode function

Format

Design 18

Metal

Plastic



Single mode function	
Sensing distance (m) related to system	Diffuse with adjustable sensitivity
	Diffuse
	Polarised reflex
	Reflex
	Thru-beam
Type reference	
Pages	

Type	Sensing distance (m)
XUB5B	0.6
XUB4B	0.1
XUB9B	2
XUB1B	4
XUB2B	15
XUB●B (1)	
5/30	

Type	Sensing distance (m)
XUB5A	0.6
XUB4A	0.1
XUB9A	2
XUB1A	4
XUB2A	15
XUB●A (1)	
5/28	

Multimode function	
Sensing distance (m) related to system	Diffuse with background suppression
	Diffuse
	Polarised reflex
	Reflex
	Thru-beam
Type reference	
Pages	

Type	Sensing distance (m)
XUB0B	0.12
	0.30
	3
	15
XUB0B (1)	
5/32	

Type	Sensing distance (m)
XUB0A	0.12
	0.30
	3
	15
XUB0A (1)	
5/32	

High performance diffuse with adjustable background suppression	
Type reference	
Pages	

Type	Sensing distance (m)
–	–
–	
–	–

Type	Sensing distance (m)
–	–
–	
–	–

Characteristics		
Dimensions (w x h x d) in mm		
Case	Materials	Plastic, PBT Nickel plated brass Stainless steel
	Degree of protection	
	Supply	c 3-wire (PNP/NPN) z 5-wire, relay output
Function	NO	
	NC	
	NO/NC	
	NO + NC	
Connection	Pre-cabled (L = 2 m) (2)	
	Connector	M8 (4-pin) 3-wire M12
	Screw terminals	
	Remote connector	

Ø 18, threaded M18 x 1 XUB●A/XUB●B: length 46 (62 for XUB5 and connector version) XUB0A/XUB0B: length 62 (pre-cabled version) or length 78 (connector version)	
–	•
•	–
• (XUB0S: see page 5/92)	–
IP 65, IP 67 IP 69K (XUB0S, stainless steel case, see page 5/92)	IP 65, IP 67
•	•
(2-wire XU●M18, see page 5/152)	–
•	•
•	•
–	–
–	–
•	•
–	–
•	•
–	–
–	–
M8 and M12 remote connectors available: please contact our Customer Care Centre.	

(1) Sensors also available with line of sight 90° to case axis.
 (2) Cable lengths of 5 and 10 m also available, depending on model.
 (3) With adjustable sensitivity.

5

Miniature design
Plastic



Compact design, 50 x 50
Plastic



Compact design, 92 x 71
Plastic



Type	Sensing distance (m)
XUM5A	1 (3)
–	–
XUM9A	5 (3)
–	–
XUM2A	15 (3)
XUM●A	
5/34	

Type	Sensing distance (m)
XUK5A	1 (3)
–	–
XUK9A	6
XUK1A	7
XUK2A	30
XUK●A	
5/42	

Type	Sensing distance (m)
XUX5A	2 (3)
–	–
XUX9A	11 (3)
XUX1A	14 (3)
XUX2A	40 (3)
XUX●A	
5/50	

Type	Sensing distance (m)
XUM0A	0.10
	0.4
	3
	10
XUM0A	
5/38	

Type	Sensing distance (m)
XUK0A	0.28
	0.8
	4
	30
	–
XUK0A	
5/44	

Type	Sensing distance (m)
XUX0A	1.3
	2
	15
	40
XUX0A	
5/52	

Type	Sensing distance (m)
XUM8	0.3
XUM8	
5/40	

Type	Sensing distance (m)
XUK8AKSN, XUK8ARCT	1
	0.75
XUK8AKSN, XUK8ARCT	
5/46 and 5/48	

Type	Sensing distance (m)
XUX8	2
XUX8	
5/54	

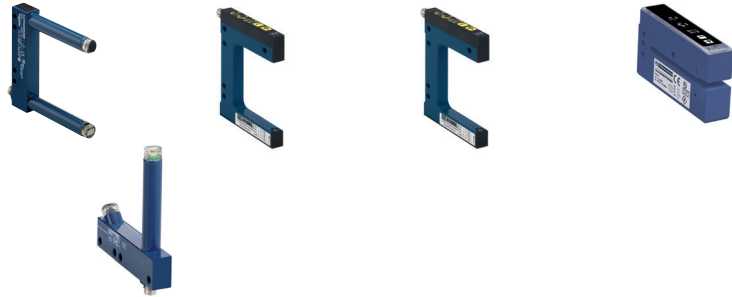
XUM●A: 11 x 34 x 20 (pre-cabled) or 11 x 43 x 20 (M8)
XUM0A: 12 x 34 x 20 (pre-cabled) or 12 x 45 x 20 (M8)
●
–
–
IP 65, IP 67
●
–
–
–
● configurable using switch and by programming (XUM0A)
–
●
●
–
–

18 x 50 x 50
●
–
–
IP 65
●
●
●
●
● by programming (XUK0A and XUK8)
● relay output
●
–
●
–

31 x 92 x 77
●
–
–
IP 65, IP 67
●
●
●
●
● by programming (XUX0A and XUX8)
● relay output
–
–
●
●

M8 and M12 remote connectors available: please contact our Customer Care Centre.

Recommended applications	Detection of objects on small conveyors	Detection of labels on strip. Detection of sheet feed on printing machine	Detection on vibrating rail. Detection of transparent objects	Detection of transparent labels
--------------------------	-----------------------------------------	---------------------------------------------------------------------------	---------------------------------------------------------------	---------------------------------



Format	Optical fork	Optical fork	Laser optical fork	Ultrasonic fork
Dimensions (w x h x d) in mm	Passageway: 30 to 180 Depth: 30, 60, 95	Passageway: 2 to 120 Depth: 42, 59, 95		18 x 47.3 x 92.5
Case	Metal	Metal	Metal	Metal
Sensing distance (mm) related to system	Diffuse with background suppression Diffuse Polarised reflex Reflex Thru-beam			
Degree of protection	IP65, IP 67	IP 65	IP 65	IP 65
Supply	• - -	• - -	• - -	• - -
Output	PNP/NPN NO/NC	PNP/NPN (3) NO/NC (4)	PNP/NPN (3) NO/NC (4)	PNP and NPN NO/NC (4)
Connection	Pre-cabled Connector Screw terminals			
Type reference	XUVR• XUVA•	XUYFNEP• XUYFANEP•	XUYFLNEP• XUYFALNEP•	XUVU06
Pages	5/56	5/58	5/60	5/62

(1) With or without teach mode, depending on model.
 (2) Depending on model.
 (3) Depending on wiring.
 (4) By programming.

5

Detection of opaque labels, of different colours

Detection of opaque labels

Detection of flags in lifts and transtockers.
Integrated amplifier

Material handling: detection and counting of objects being fed to or exiting a machine



Optical fork	Optical fork	Optical fork	Optical fork	Frame design
10 x 25 x 64	20 x 26 x 90	12 x 37.5 x 80	14 x 58 x 68	15 x 50 x 108 15 x 86 x 131 25 x 230 x 205/265/335
Plastic	Metal	Metal	Plastic	Metal
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–
3	2	3 or 5 (2)	3	3, 6, 12, 18, 25 (2)
IP 65	IP 65	IP 65	IP 54	IP 65
•	•	•	•	•
–	–	–	–	–
–	–	–	–	–
PNP and NPN NO/NC (4)	PNP and NPN NO/NC (4)	PNP and NPN NO/NC (4)	Solid-state PNP or NPN NO	PNP and NPN NO/NC (3)
–	–	–	•	–
•	•	•	–	•
–	–	–	–	–
XUVE	XUVK	XUYFA98 ●	XUVH XUVJ	XUVF
5/64	5/66	5/68	5/70	5/72

5

Recommended applications

Packaging			
Colour mark readers			Luminescence sensors
Detection of reference marks, contrasting colours and markings on packaging, printing, labelling machines, etc.	Detection of reference marks on packaging paper, tubes	Detection of reference marks, contrasting colours and markings on packaging, printing, labelling machines, etc.	Detection of invisible reference marks, markings, adhesives, varnishes, etc. Sensitive to the bluing agents generally present in inks, adhesives, varnishes, etc.



Format	
Dimensions (w x h x d) in mm	
Case	
Sensing distance (m) related to system	Diffuse with background suppression
	Diffuse
	Polarised reflex
	Reflex
	Thru-beam
Degree of protection	
Supply	—
	~
	~
Output	
Connection	Pre-cabled
	Connector
	Screw terminals
Type reference	
Pages	

Compact design	Fibre design	Compact design	Design 18
50 x 50 x 15	13 x 72 x 30	31 x 81 x 58	Ø 18, threaded M18 x 1 L: 82
Plastic	Plastic	Metal	
—	—	—	—
0.019	(1)	0.009	0.02
—	—	—	—
—	—	—	—
—	—	—	—
IP 65	IP 65	IP 67	IP 67
•	•	•	•
—	—	—	—
—	—	—	—
Solid-state (PNP or NPN)			Solid-state (PNP)
—	—	—	—
•	•	•	•
—	—	—	—
XUKR	XUYDCF ●●966S	XURK	XU5M
5/74	5/76	5/78	5/80

(1) Depending on fibres used.
(2) Depending on model.

5

Packaging

Illumination sensors

Verifying operation of indicator lights

Detection of any transparent object

Bottles, flasks, containers, films, etc.

For detection of colours, sorting

Recognises colours for sorting or checking parts



Fibre design	Design 18	Miniature design	Compact design, 50 x 50	Compact design
13 x 76.7 x 30	Ø 18, threaded M18 x 1 L: 64, 78 or 92	11 x 43 x 20	18 x 50 x 50	50 x 50 x 25
Plastic	Plastic or stainless steel (2)	Plastic	Plastic	Plastic
Sensing distance depending on fibre used	–	–	–	–
	–	–	–	0.020
	0...1.4	–	–	–
	–	0.1...2 (depending on reflector)	1.5	–
	–	–	–	–
IP 65	IP 65 IP 67	IP 67	IP 65	IP 65
•	•	•	•	•
–	–	–	–	–
–	–	–	–	–
PNP/NPN NO/NC (programmable)	Solid-state (PNP or NPN)	PNP/NPN NO/NC (programmable)	Solid-state (PNP or NPN)	
–	•	•	•	–
•	•	•	•	•
–	–	–	–	–
XUYAFL ●●966S	XUBT	XUMT	XUKT	XUKC
5/82	5/84	5/86	5/88	5/90

5

Recommended applications

Food processing
Stainless steel cylindrical sensor (grade 304 CU)
 For use in vicinity of food processing machinery

Assembly
Diameter 8 metal range



5

Format	Design 18	Design 18	Design 8
Dimensions (w x h x d) in mm	Ø 18, threaded M18 x 1 L: 64...92	Ø 18, threaded M18 x 1 L: 62...88	Ø 8, threaded M8 x 1 L: 40
Case	Stainless steel	Stainless steel	Metal
Sensing distance related to system	Diffuse with background suppression	0.12 m	–
	Diffuse	0.3 m	0.10 m
	Polarised reflex	2 m	2 m
	Reflex	–	4 m
	Thru-beam	15 m	15 m
Degree of protection	IP 67, IP 69K	IP 67	IP 65 (1) IP 67 (1)
Supply	•	•	•
	–	–	–
	–	–	–
Output	Solid-state (PNP and NPN)	Solid-state (PNP and NPN)	Solid-state (PNP or NPN)
Connection	•	•	•
	•	•	•
	–	–	–
Type reference	XUB0S●	XU●N18	XUA
Pages	5/92	5/94	5/98

(1) Depending on model.

Assembly	Conveying and assembly		
Detection of objects on conveyor and access control	Miniature, laser with teach mode	Long range laser	Detection of objects on conveyor



Miniature design	Miniature design	Compact design	Cylindrical design
20 x 32 x 13 10 x 40 x 13.5	12 x 32 x 20	23 x 50 x 50	250...900
Plastic	Plastic	PC Shock-resistant ABS	Aluminium and PA
0.015...0.08 m	20...60 mm 30...110 mm	5...800 mm	–
0.03...0.25 m	–	5...1200 mm	0...0.1 m
1 m	100...1000 mm	0.3...12 m	–
–	–	–	–
4 m	15 m	0...25 m	–
IP 65 IP 67	IP 67	IP 67 IP 69K	IP 50 (IP 65 on request)
•	•	•	•
–	–	–	–
–	–	–	–
PNP or NPN NO/NC (1)	PNP	PNP	Solid-state (PNP or NPN)
•	•	–	•
•	•	•	M8 and M12 remote connector (other connectors available on request)
–	–	–	–
XUY●●989	XUY●●●929	XUK●LA●●	XUY●●●N●●●
5/100	5/102	5/104	5/108

Recommended applications	Material handling		
	Laser	Diffuse with analogue output	Laser
		Measurement, servo control, position control, eccentricity monitoring, concentricity monitoring, etc.	Time of flight measurement



Format	Design 18	Compact design	Design 18	Design 90 x 90
Dimensions (w x h x d) in mm	Ø 18, threaded M18 x 1	27 x 85 x 61	Ø 18, threaded M18 x 1 L: 82	42 x 93 x 95
Case	Plastic or brass (1)	Plastic	Metal	ABS
Sensing distance (m) related to system	Diffuse with background suppression	–	–	–
	Diffuse	–	0.20...0.80	0.2...6
	Polarised reflex	–	–	0.2...30
	Reflex	–	–	–
	Thru-beam	0...100 with teach mode	–	–
Degree of protection	IP 67	IP 67	IP 67	IP 67
Supply	•	•	•	•
	–	–	–	–
	–	–	–	–
Output	PNP, NPN NO/NC by programming	Analogue (PNP)		Solid-state PNP (2 outputs) + analogue
	•	–	–	–
Connection	•	–	•	•
	–	•	–	–
	–	–	–	–
Type reference	XUBL	XUJ	XU5M	XUE●AA2
Pages	5/112	5/114	5/116	5/118

(1) Depending on model.

5

Material handling				Conveying
Thru-beam with high excess gain	Laser transmission	Diffuse with background suppression, laser transmission	Diffuse with 2 channels using triangulation, with background suppression	
Detection of objects in harsh environments (smoke, dust, mist, etc.). Measuring opacity	Monitoring dimensions in series, monitoring roundness of a wheel	High precision, detection of any dark or shiny object, including small sized		



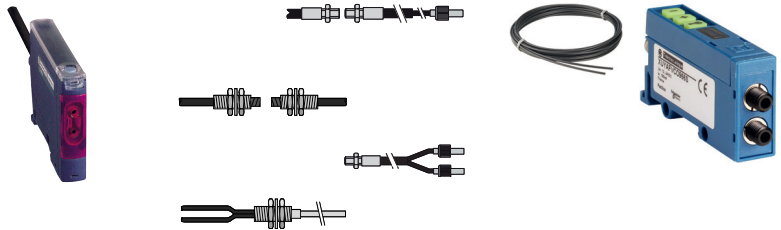
Design 18	Compact design, 50 x 50	Compact design	Compact design	–
Ø 18, threaded M18 x 1 L: 82	17 x 50 x 50	18 x 60 x 60	18 x 60 x 60	29 x 95 x 60
Metal	Plastic	Plastic	Plastic	Plastic
–	–	Adjustable from 50 to 300 mm	Adjustable from 50 to 600 mm	–
–	0.04...0.06 0.045...0.085 0.08...0.3	–	–	1.5 or 4 (1)
–	–	–	–	6 or 10 (1)
–	–	–	–	–
50	–	–	–	•
IP 67	IP 67	IP 65	IP 65	IP 65 and IP 67
•	•	•	•	•
–	–	–	–	•
–	–	–	–	–
Solid-state (PNP) + analogue	Solid-state (PNP) + analogue	PNP and NPN NO/NC depending on wiring	PNP and NPN NO/NC programmable	PNP/NPN Relay NO/NC programmable
–	–	–	•	–
•	•	•	•	–
–	–	–	–	•
XU2M	XUY●●925	XUYPS1●	XUYPS2●	XUY● 952/954
5/120	5/122	5/124	5/126	5/150



Recommended applications

Amplifier and fibre optics

Amplifier, teach mode	Plastic fibres with end fittings	Glass fibres with end fittings	Ecofibre concept Bare fibres and end fittings supplied separately for customer assembly	Amplifier, teach mode or potentiometer
-----------------------	----------------------------------	--------------------------------	--------------------------------------------------------------------------------------------	----------------------------------------



Format	
Dimensions (w x h x d) in mm	
Case	
Sensing distance (m) related to system	Diffuse with background suppression
	Diffuse
	Polarised reflex
	Reflex
Thru-beam	
Degree of protection	
Supply	⋮
	~
	~
Output	
Connection	Pre-cabled
	Connector
	Screw terminals
Type reference	
Pages	

Fibre design	–	–	–	Fibre design
10 x 40 x 65 (amplifier)	Length (1): 1 m, 2 m or 10 m	Length (1): 0.60 m, 1 m, 1.5 m or 2 m	Length (1): 1 m, 10 m or 50 m	13 x 72.2 x 30 13 x 76.7 x 30
Plastic	Plastic	Glass	Plastic	Plastic
–	–	–	Sensing distance: 70 mm to 4000 mm (1)	Sensing distance depends on fibre used
0.006 to 0.095 (2)	6 to 95 (1)	80	–	–
–	–	–	–	–
–	–	–	–	–
0.050 to 2 (2)	30 to 2500 (1)	80 or 200 (1)	–	–
IP 65 (amplifier) IP 64 (fibres)	IP 64, IP641 (1) IP 65, IP651 (1)	–	–	IP 65
•	–	–	–	•
–	–	–	–	–
–	–	–	–	–
Solid-state (PNP or NPN) (3) NO or NC (programmable)	–	–	–	PNP/NPN NO/NC depending on wiring or programmable depending on model
•	–	–	–	•
•	–	–	–	•
–	–	–	–	–
XUDA	XUF	XUYFV●	XUYA● XUYFP●	XUY AF●966 AF●946
5/128	5/130	5/138	5/144	5/146

(1) Depending on model.
 (2) Depending on fibre.
 (3) Depending on wiring.
 (4) With audible signalling (buzzer): reference **XUJB** (see page 5/156).

5

Building, tertiary sectors

2-wire AC or DC supply

Motion detection, relay output. With audible signalling (buzzer) (4)

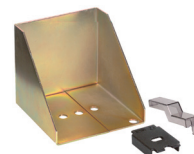
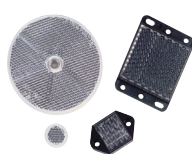


Accessories

Reflectors

Fixing brackets, clamps and kits

Protective covers



Design 18
Ø 18, threaded, M18 x 1 L: 82...110
Metal
0.12
0.4
2
–
15
IP 67
–
–
•
Solid-state
•
•
–
XU●M18
5/152

Compact design
18 x 50 x 50 (XUK1AR) 27 x 85 x 61 (XUJB)
Plastic
–
–
–
7 with 50 x 50 reflector (XUK1AR) 6 (XUJB)
–
IP 65 (XUK1AR) IP 40 (XUJB)
–
–
•
1 NO/NC programmable relay (XUK1AR) 1 NO relay (XUJB)
• (XUK1AR)
–
• (XUJB)
XUK1AR, XUJB (4)
5/154, 5/156

XUZC●, XUZB●
5/158

XUZA●, XUZB●, XUZE●, XUZX●, XUZL●, XUZM●
5/160

XUZD●●, XUJZ01
5/160

Photo-electric sensors

OsiSense XU

Multimode: Simplicity through innovation

Principle

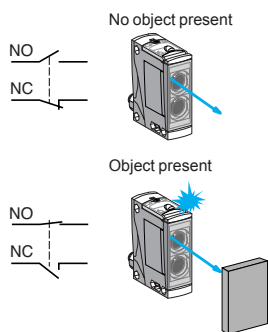
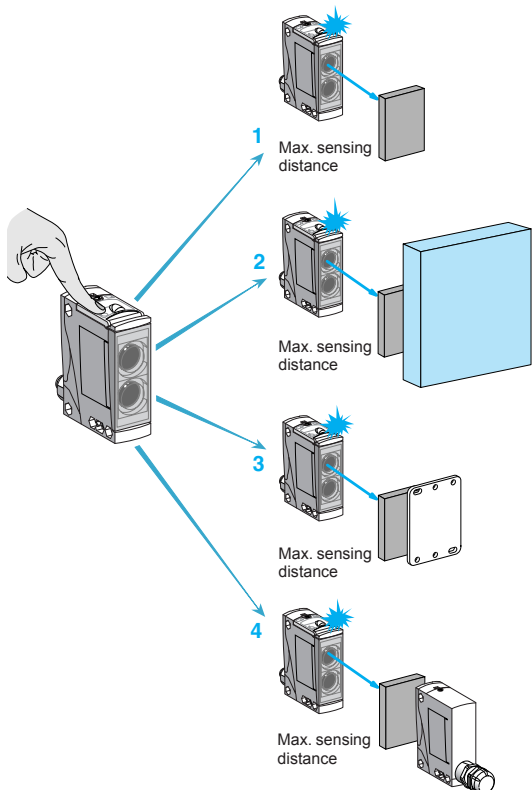
In proposing multimode products, Telemecanique Sensors offers simplicity through innovation.

■ With the multimode function, a single product meets all the requirements for optical detection. Effectively, by simply pressing the “Teach mode” button, the sensor automatically acquires optimum configuration for the application requirements

- 1 Diffuse system detection of object.
- 2 Diffuse system, with background suppression, detection of object.
- 3 Reflex system (reflector accessory) detection of object.
- 4 Thru-beam system, on optical receiver (transmitter accessory for thru-beam use), detection of object.

■ In addition to this, a multimode sensors also means:

- improved performance: maximum sensing distance guaranteed and optimised for each application,
- simplified use: intuitive setting-up plus less and easier maintenance,
- lower costs: the number of references is divided by 10 and, consequently, selection and supply is simplified and storage costs significantly reduced,
- guaranteed maximum productivity.



Straightforward NO or NC output

■ Irrespective of the detection mode used (diffuse, reflex, thru-beam, etc.), the outputs become either NO or NC (1).

■ A multimode sensor means immediate and intuitive setting-up that is accessible to all.

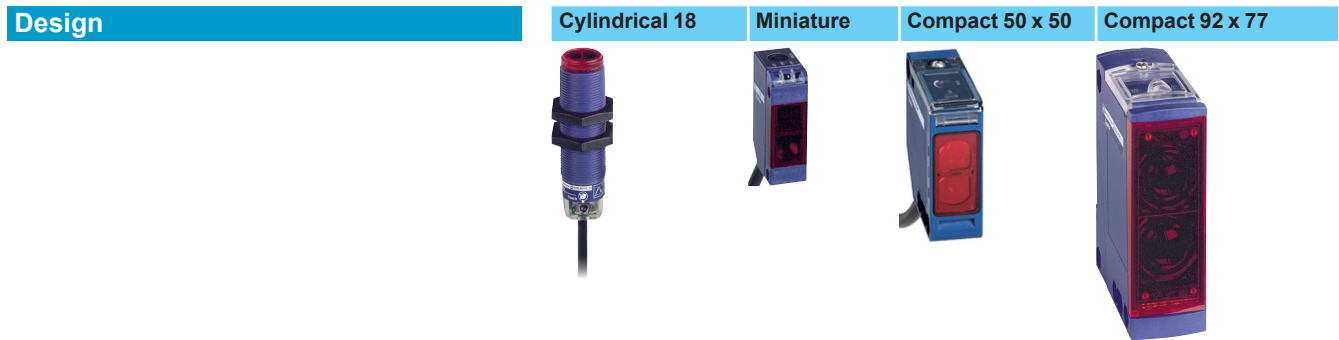
(1) The sensor is supplied in NO configuration. NO or NC selection is performed by simply pressing the Teach mode button.

Fixing accessories

A complete range of inexpensive mounting accessories (clamps, traditional or 3D brackets, etc.) is available that provides solutions for all installation and adjustment problems

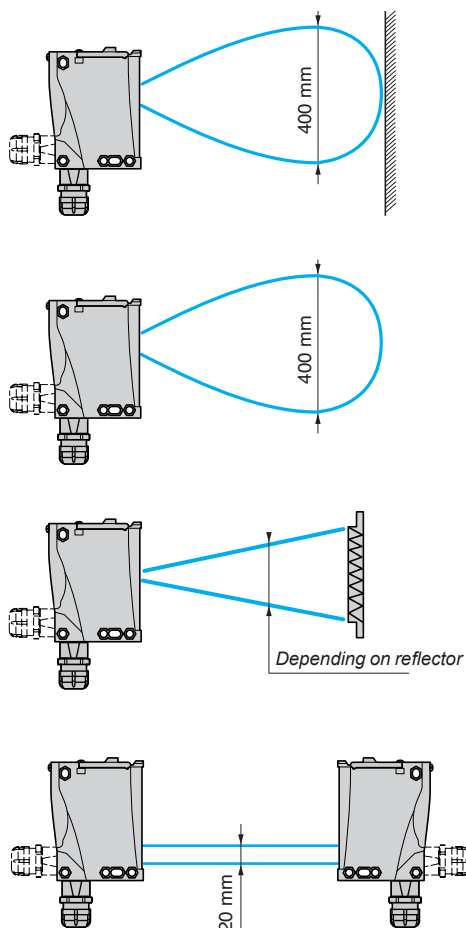


5



Dimensions (w x h x d) in mm		M18 x 64	12 x 34 x 20	18 x 50 x 50	30 x 92 x 77
Maximum sensing distance in m	Without accessory with background suppression	0.12	0.10	0.28	1.3
	Without accessory	0.4	0.55	1.2	3
	With polarised reflector	3	4	5.7	15
	With thru-beam accessory	20	14	35	60
Supply	Solid-state output	■	■	■	■
	Relay output	—	—	■	■
Connection	Pre-cabled	■	■	■	—
	Connector	■	■	■	■
	Screw terminals	—	—	—	■
Sensor type		XUB0	XUM0	XUK0	XUX0
Pages		5/32	5/38	5/44	5/52

Sensing distances (see table above)



Sensing distance without accessory with background suppression

- Without accessory, the multimode sensor detects objects irrespective of their colour or background.
- A clean environment is recommended

Sensing distance without accessory

- Beyond the sensing distance with background suppression, the same multimode sensor without accessory detects objects but may be influenced by the backgrounds and colour of the objects to be detected.

Sensing distance with polarised reflector

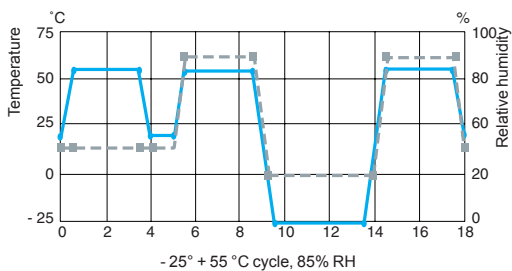
- By installing a reflector opposite, the same multimode sensor detects objects irrespective of their shininess and colour.
- The size of the reflector must be smaller than that of the object to be detected.
- The larger the area of the reflector the longer the sensing distance.

Sensing distance with thru-beam transmitter accessory

- After setting-up and connecting a thru-beam transmitter accessory opposite, the same multimode sensor detects objects irrespective of their shininess, colour or background.
- The detection distance is a maximum.
- The sensor and the thru-beam transmitter must be carefully aligned.
- Good resistance to accumulation of dirt and dust.

Standards and certifications

Parameters related to the environment



- 25° + 55 °C cycle, 85% RH

— Temperature °C
 - - - Relative humidity %

Recommendation

The sensors detailed in this catalogue are designed for use in standard industrial applications relating to presence detection. These sensors do not incorporate the required redundant electrical circuit enabling their usage in safety applications. For safety applications, please refer to our "Safety solutions using Preventa" catalogue.

Quality control

Our photo-electric sensors are subject to special precautions in order to guarantee their reliability in the most arduous industrial environments.

- **Qualification**
 - The product characteristics stated in this catalogue are subject to a **qualification procedure** carried out in our laboratories.
 - In particular, the products are subjected to **climatic cycle** tests for 3000 hours whilst powered-up to verify their ability to maintain their characteristics over time.
- **Production**
 - The electrical characteristics and sensing distances at both ambient temperature and extreme temperatures are 100% checked.
 - Products are randomly selected during the course of production and subjected to **monitoring tests** relating to all their characteristics.
- **Customer returns**
 - If, in spite of all these precautions, defective products are returned to us, they are subject to **systematic analysis** and **corrective actions** are implemented to eliminate the risks of the fault recurring.

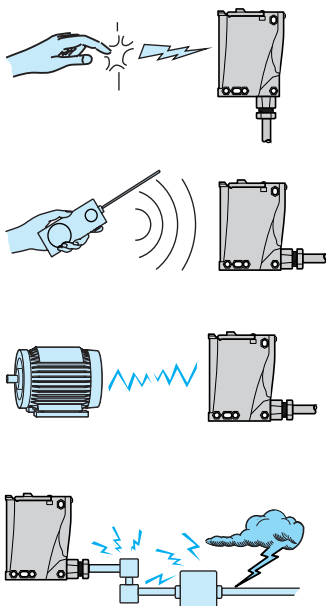
Immunity to ambient light

- OsiSense XU photo-electric sensors use the pulsed light principle. This provides a high degree of immunity to spurious light that conforms to standard **IEC 60947-5-2**.

Resistance to electromagnetic interference

The photo-electric sensors are tested in accordance with the recommendations of the standard **IEC 60947-5-2**

- Electrostatic discharges **IEC/EN 61000-4-2**
 - ≈ 15 kV version, level 4
 - 8 kV version, level 3
- Radiated electromagnetic fields (electromagnetic waves) **IEC/EN 61000-4-3**
 - 10 V/metre, level 3
- Fast transients in salvos (motor start/stop interference) **IEC/EN 61000-4-4**
 - 2 kV, level 4
- Impulse voltages, lightning **IEC 60947-5-2**
 - ≈ 2.5 kV version
 - 1 kV version



Mechanical shock resistance

The sensors are tested in accordance with standard IEC 60068-2-27, 30 gn, duration 11 ms.

Vibration resistance

The sensors are tested in accordance with standard IEC 60068-2-6, 7 gn, amplitude ± 1.5 mm, f = 10...55 Hz.

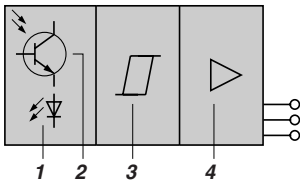
Resistance to chemicals in the environment

- Owing to the very wide range of chemicals encountered in industry, it is very difficult to give general guidelines common to all sensors.
- To ensure lasting efficient operation, it is essential that any chemicals coming into contact with the sensors will not affect their casing and, in doing so, prevent their reliable operation (please refer to the characteristics pages for the various sensors).

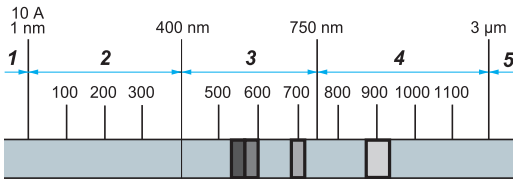
In all cases, the materials selected (see product characteristics) provide satisfactory compatibility in most industrial environments (for further information, please consult our Customer Care Centre).

5

Principle of optical detection

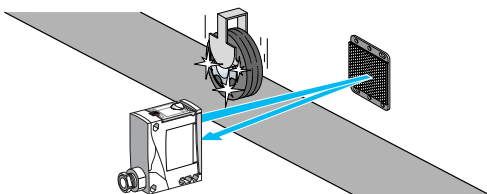
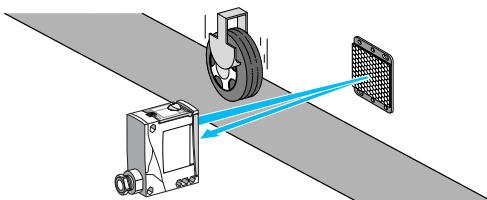
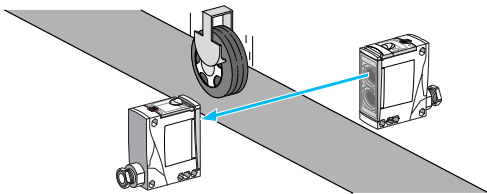


- 1 Light beam transmitter
- 2 Light beam receiver
- 3 Signal processing stage
- 4 Output stage



- 1 X rays, 2 Ultraviolet, 3 Visible light,
4 Near infrared, 5 Far infrared

Detection systems



Composition of a photo-electric sensor

A photo-electric sensor basically comprises a light beam transmitter (light-emitting diode) and a light-sensitive receiver (photo-transistor).
A light-emitting diode is an electronic semi-conductor component that emits light when an electric current flows through it. This light can be visible or invisible, depending on the transmission wavelength.

Detection occurs when an object enters the transmitted light beam and, in so doing, affects the intensity of the light at the receiver. As the light intensity at the receiver decreases a point is reached whereby the output of the sensor changes state.

Light spectrum

Depending on the model and application requirements, the transmission beam is either non visible infrared (most common case) or ultraviolet (detection of luminescent materials). It may also be visible red or green (colour mark reading etc.) and laser red (long sensing distance and short focal length).

Modulation

The advantage of LEDs is their very fast response. To render the system insensitive to ambient light, the current flowing through the LED is modulated so as to produce a pulsed light transmission.

Only the pulsed signal will be used by the photo-transistor and processed to control the load.

Thru-beam system or multimode with thru-beam accessory

Advantages

- Long sensing distance (up to 60 m).
- Very precise detection, high repeat accuracy.
- Detection not affected by colour of object.
- Good resistance to difficult environments (dust, grime, etc.).

Drawbacks

- 2 units to be wired.
- The object to be detected must be opaque.
- Precise alignment required, which can be difficult since the sensor transmits in the infrared range (invisible).

Operating precautions

- When several sensors are used, care must be taken to ensure that no sensor is disrupted by another sensor (e.g. alternate mounting of transmitter/receiver etc.).

Advantages of multimode sensor with thru-beam accessory

- Easy alignment
- The sensor transmits in the visible red range during the alignment phase.
- 3 LEDs providing setting-up assistance.

Polarised reflex system or multimode with reflector accessory

Advantages

- Medium sensing distance (up to 15 m).
- Precise detection.
- Only one unit to be wired.
- Detection not affected by colour of object.
- Visible red beam transmission.

Drawbacks

- Precise alignment required.
- The object to be detected must be opaque and larger than the reflector.

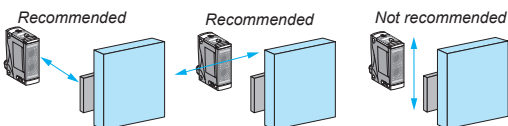
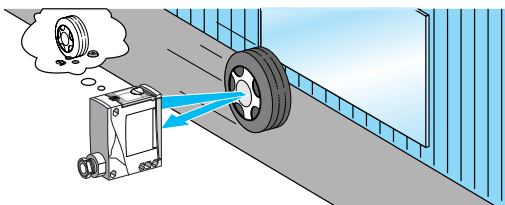
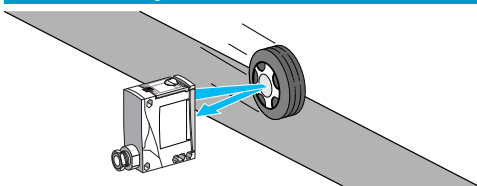
Operating precautions

- When several sensors are used, they must be aligned in such a manner that no sensor is disrupted by another sensor.
- For short distance detection use a reflector with large trihedrons, type XUZC24.
- For long distance detection use a reflector XUZC50 or XUZC80.
- To increase the sensing distance use reflector XUZC100.
- If reflective tape is used, use rolls of tape XUZB1 or XUZB15 which are specially adapted for polarised reflex systems.

Advantages of multimode sensor with reflector accessory

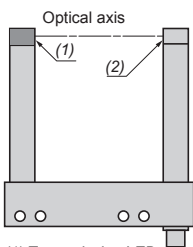
- Easy alignment
- 3 LEDs providing setting-up assistance.
- The anti-interference function enables 2 sensors to be used without specific alignment precautions.
- Semi-transparent objects can be detected by using the teach mode function.

Detection systems (continued)

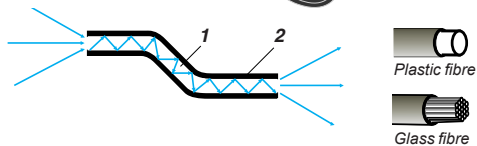
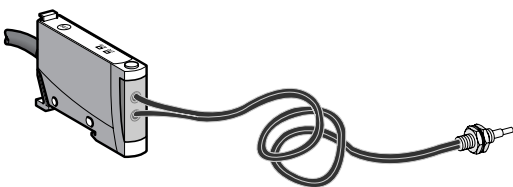


Positioning recommendations for sensor with background suppression

Specific systems



(1) Transmission LED
(2) Output LED



1 Core
2 Sheath

Diffuse system or multimode

- **Advantage**
 - Only one unit to be wired.
- **Drawbacks**
 - Short sensing distance.
 - Sensitivity to object or background colour differences.
 - Object sighting line difficult since the sensor transmits in the infrared range (invisible).
- **Operating precautions**
 - When several sensors are used, they must be aligned in such a manner that no sensor is disrupted by another sensor.
- **Advantages of a multimode sensor**
 - Easy alignment:
 - the sensor transmits in the visible red range during the alignment phase,
 - 3 LEDs providing setting-up assistance,
 - the anti-interference function enables 2 sensors to be used without specific alignment precautions.
 - Refined detection: the position of the object can be detected using the teach mode.

Diffuse, with or without background suppression, system or multimode

- **Advantages**
 - Only one unit to be wired.
 - Detection not affected by colour of object or background.
- **Drawbacks**
 - Short sensing distance.
 - Object sighting line difficult since the sensor transmits in the infrared range (invisible).
- **Operating precautions**
 - Detection can be affected by the object's direction of movement. To overcome this phenomenon (the hat effect), it is recommended that the sensor is mounted so that the object simultaneously breaks the beam of both lenses.
 - When several sensors are used, they must be aligned in such a manner that no sensor is disrupted by another sensor.
- **Advantages of a multimode sensor**
 - Easy alignment:
 - the sensor transmits in the visible red range during the alignment phase,
 - 3 LEDs providing setting-up assistance,
 - the anti-interference function enables 2 sensors to be used without specific alignment precautions,
 - the hat effect is minimised using the background teach mode.
 - Refined detection: the position of the object can be detected using the teach mode.

Optical forks

- Constructed from metal, the optical fork is a robust sensor that is particularly suited to conveying and packaging applications and detection of labels.
- Rugged optical detection device **not requiring alignment** in thru-beam mode.
- The beam from the transmitter limb is transmitted to the receiver limb. Due to its construction, **only one connection** is required as opposed to two for a traditional thru-beam function.
- The transmission sources are LEDs of various technologies:
 - Red for much improved efficiency during adjustment and maintenance
 - Red laser for detection of transparent materials or very small parts
 - Infrared, particularly for optical frames
 - Ultrasonic for detection of transparent labels (clear on clear)
- The beam is adjustable or fixed depending on the version. Adjustment enables the sensitivity to be altered and, therefore, detection of small parts down to dimensions of less than tenths of millimetres (minimum size of detectable object: 0.05 mm).
- The high switching frequency (from 4 kHz up to 25 kHz) is very useful in industrial applications involving high operating rates.

Fibre optics

- The fibre acts as a light conductor. Light rays entering the fibre at a certain angle are conveyed to the required location, with minimum loss.
- Separate amplifier.
 - Size kept to minimum.
 - This system enables detection of very small objects (approximately 1 mm).
 - And, detection is very precise.

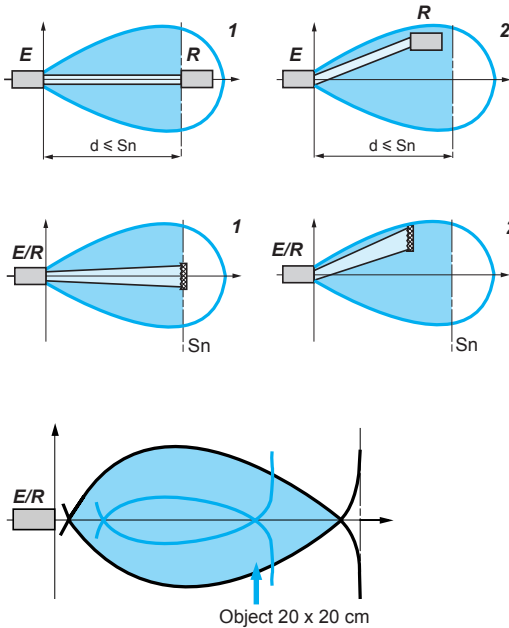
Plastic fibres

- The core of the fibre is flexible plastic (PMMA). In general, there is only a single fibre of diameter 0.25 to 1 mm, depending on the model.
- Fibres are used with amplifiers transmitting red light.
 - Minimum bend radius:
 - 10 mm for fibres with 0.25 mm diameter core,
 - 25 mm for fibres with 1 mm diameter core.
 - Advantages: fibres can be cut to the required length.

Glass fibres

- The core of the fibre is silica. For maximum flexibility, each fibre comprises numerous strands that are approximately 50 µm in diameter.
- Fibres are used with amplifiers transmitting infrared or red light.
- Minimum bend radius:
 - 10 mm with plastic sheath,
 - 90 mm with stainless steel sheath.
- **Advantages**
 - Fibres suitable for use at high temperatures (250 °C).
 - Fibres with stainless steel sheath provide protection against mechanical impact and crushing.

Detection curves



Thru-beam system

- The zone indicates the positioning tolerance of the receiver.
 - The zone represents the usable sensing zone of the system. Any opaque object entering this zone breaks the beam and causes the sensor's output to change state.
- Ideal detection
 - Acceptable detection
- T = transmitter
R = receiver

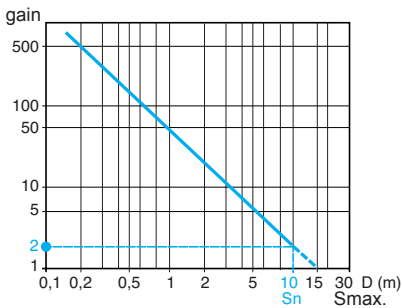
Polarised reflex system

- The zone indicates the positioning tolerance of the reflector.
 - The zone represents the usable sensing zone of the system. Any opaque object entering this zone breaks the beam and causes the sensor's output to change state.
- Ideal detection
 - Acceptable detection
- T = transmitter
R = receiver

Diffuse, with or without background suppression, system

- The zone represents the sensor's sensitivity zone.
 - All of this zone is usable: any object that is adequately reflective entering this zone, in the direction of the arrow, will cause the sensor's output to change state. The black line corresponds to a light colour surface and the blue line to a darker colour surface.
 - A test using the object to be detected will determine the zone of sensitivity in relation to its reflection coefficient.
- White 90% object
— Grey 18% object
- For specific aspects of diffuse systems see page 5/18.
T = transmitter
R = receiver

Excess gain



Operating margin

To ensure correct operation of a sensor in spite of environmental constraints, the sensors feature an operating margin. This margin can be expressed in terms of excess gain, which is the ratio: Excess gain = Signal level received / Signal required for switching.

For all OsiSense XU sensors

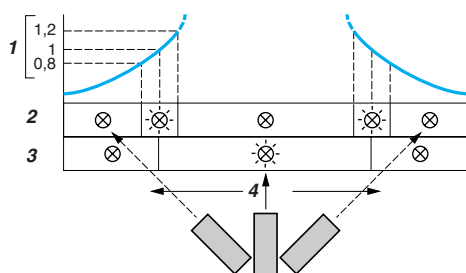
- The **nominal sensing distance Sn** is defined as the sensing distance with an **excess gain of 2**, i.e. the sensing distance for which the sensor receives twice as much light energy as it strictly needs to switch it.
- The **maximum sensing distance** is defined as the sensing distance with an **excess gain of 1**. It corresponds to the maximum detection value.

The use of the sensor at the nominal sensing distance ensures the sensor's correct operation in normal operating conditions.

In extreme conditions, refer to the following setting-up recommendations:

- clean environment: work at nominal sensing distance Sn,
- slightly polluted environment: work at sensing distance Sn/2,
- moderately polluted environment: work at sensing distance Sn/4,
- heavily polluted environment: preferably use multimode sensors with thru-beam accessory (or the thru-beam system) with a sensing distance Sn/10.

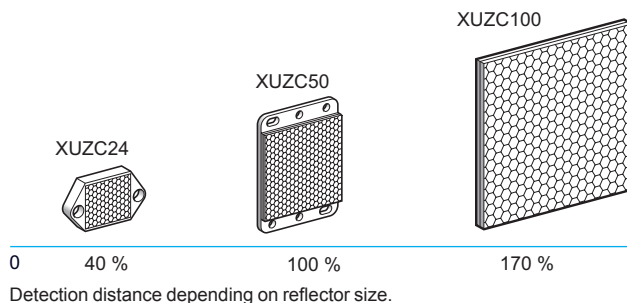
Optical alignment aid



A red LED assists setting-up by illuminating when optimum alignment of the sensor is achieved.

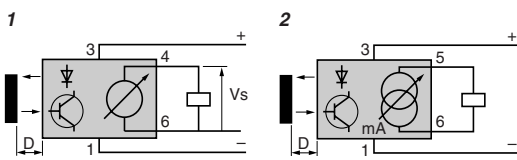
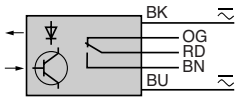
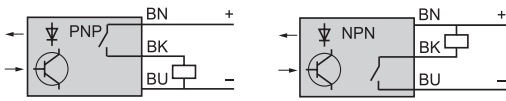
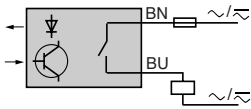
- Signal level
- Red LED, on , off
- Green LED, on , off
- Optimum alignment

Detection distance using reflector



Detection distance depending on reflector size.

Outputs



2-wire technique ~ or ~

Specific aspects

These sensors are wired in series with the load to be switched.

As a consequence, they are subject to:

- A residual current in the open state (current flowing through the sensor in the “open” state),
- A voltage drop in the closed state (voltage drop across the sensor’s terminals in the “closed” state).

Advantages

- Only 2 wires to be connected. They can be wired in series in the same way as mechanical limit switches.
- For use on 2-wire \sim , they can be connected to either positive (PNP) or negative (NPN) logic PLC inputs.
- No risk of incorrect connections.

Operating precautions

- Check the possible effects of residual current and voltage drop on the actuator or input connected.
- These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a 0.4 A “quick-blow” fuse in series with the load.

3-wire technique \sim

Specific aspects

- These sensors comprise 2 wires for the DC supply and a 3rd wire for the output signal.
- PNP type: switching the positive side to the load.
- NPN type: switching the negative side to the load.

Advantages

- No residual current, low voltage drop.

5-wire technique ~ or ~, relay output

Specific aspects

- Sensors incorporating output relay. The supply and output circuits are electrically separate.

Advantages

- \sim or \sim supply with a wide voltage range.
- High breaking capacity (approximately 3 A).
- Direct control of a simple automation system.
- Availability of a NC (normally closed) contact and a NO (normally open) contact.
- The sensor/relay contact galvanic isolation is 1500 to 2500 V, depending on the model.

Operating precautions

- Low switching frequency. Check that it is suitable for the application.
- Limited service life of relay. Check that it is suitable for the application.

Analogue technique

Specific aspects

There are two output configurations:

- Voltage output: the output voltage varies in proportion to the distance between the sensor and the object to be detected.
- Current output: the output current varies in proportion to the distance between the sensor and the object to be detected.

Advantage

- Availability of a physical item of data proportional to the distance between the sensor and the object to be detected.

Operating precautions

- Refer to the detailed descriptions of the sensor to assess the relative influence of the colour of the object to be detected.

- 1 Voltage output
- 2 Current output

5

Outputs (continued)

Output functions

In the past, the output functions of photo-electric sensors were always governed by the “light/dark” principle, i.e. the output would be activated on light being received for “light” switching and the output would be activated on light not being received for “dark” switching. This called for fastidious programming specific to each detection mode.


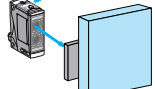
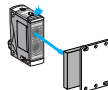
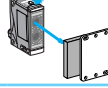
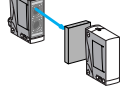


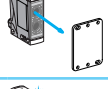
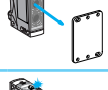
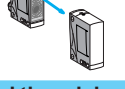
Now, the output functions of the OsiSense XU range of photo-electric sensors are in phase with the language of the automation system engineer, i.e. NO (normally open) or NC (normally closed).

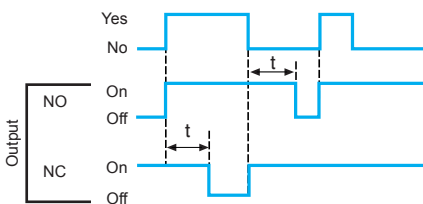
Advantages

- NO output (or NO programming for multimode sensors): irrespective of the detection mode, the output of the sensor is activated when the object to be detected is present.
- NC output (or NC programming for multimode sensors): irrespective of the detection mode, the output of the sensor is activated when the object to be detected is not present.

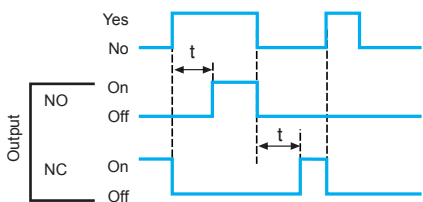
Advantages of multimode sensors

- By default, the output is NO programmed, i.e. the output of the sensor is activated when the object to be detected is present.
- By pressing the teach button, the output can be programmed to NC, i.e. the output of the sensor is activated when the object to be detected is not present.

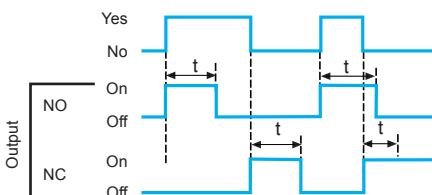
System		NO output or NO programming	Yellow LED	NC output or NC programming	Yellow LED
Object present					
Diffuse		Activated	On ☀	Not activated	Off ☒
Diffuse with background suppression		Activated	On ☀	Not activated	Off ☒
Reflex		Activated	On ☀	Not activated	Off ☒
Polarised reflex		Activated	On ☀	Not activated	Off ☒
Thru-beam		Activated	On ☀	Not activated	Off ☒
No object present					
Diffuse		Not activated	Off ☒	Activated	On ☀
Diffuse with background suppression		Not activated	Off ☒	Activated	On ☀
Reflex		Not activated	Off ☒	Activated	On ☀
Polarised reflex		Not activated	Off ☒	Activated	On ☀
Thru-beam		Not activated	Off ☒	Activated	On ☀



Time delay on beam break



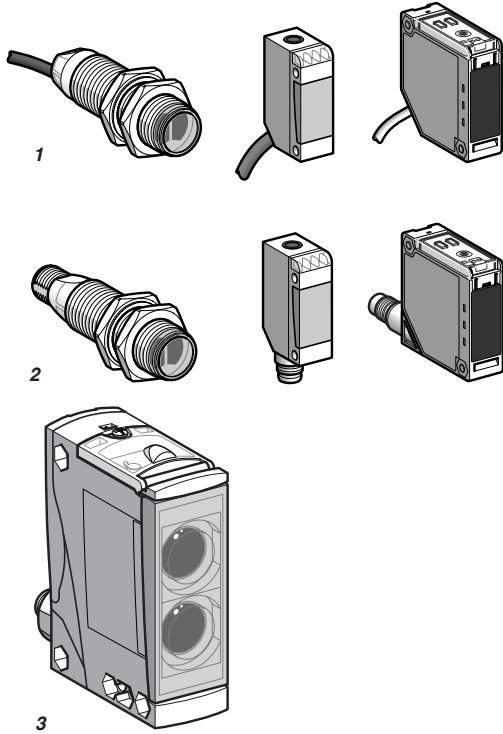
Monostable



Output signal time delay

- Certain sensor models (XUK, XUX and XUD) incorporate a time delay output.
- These time delays enable simple automation systems to be established.
- There are three types of time delay:
 - Time delay on beam make (ON delay).
 - Time delay on beam break (OFF delay).
 - Monostable (one shot).

Connections



All our sensors are available either in pre-cabled version (except XUX; screw terminal with cable gland version) or connector version. The connectors used are:

M12 (4-pin)



M8 (4-pin)



1/2" 20UNF (3-pin)



Types of connection

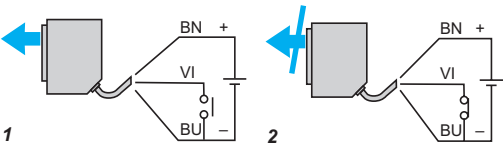
- 1 Factory fitted moulded cable: good protection against splashing liquids.
- 2 Connector: easy installation and maintenance.
- 3 Screw terminals: flexibility, cable runs to required length.

Wiring advice

- Length of cable: no limitation up to 200 m or up to a line capacitance of $< 0.1 \mu\text{F}$ (characteristics of sensors remain unaffected). In this case, it is important to take into account the voltage drop on the line.
- Separation of control and power circuit wiring: the sensors are immune to electrical interference encountered in normal industrial conditions. Where extreme conditions of electrical "noise" could occur (motors etc.), it is advisable to protect against transients in the normal way:
 - suppress interference at source and filter the power supply,
 - separate power and control wiring from each other,
 - ensure the HF equipotentiality of the site,
 - limit the length of cable,
 - connect the sensor with supply switched off.
- Dust and damp protection of connections: the level of dust and damp protection depends on how carefully the cable glands or connectors are tightened. To efficiently protect the sensors from dust and damp, select the correct diameter cable for the cable gland used.

Cable gland	Diameter of cable	
	Minimum	Maximum
9P	6	8
11P	8	10
13P	10	12
ISO 16	7	10
ISO 20	10	12

Complementary functions



Diagnostics, beam break test

A test input enables the transmitted beam to be broken in order to verify that the output of the sensor changes state. Fault diagnostics regarding correct operation of the sensor can therefore be carried out.

- 1 Beam made
 - 2 Beam broken
- VI: test input for breaking transmitted beam.

Verification of correct operation

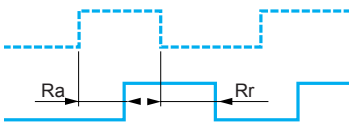
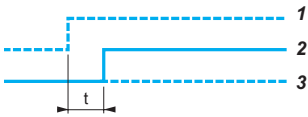
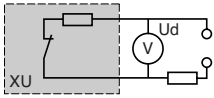
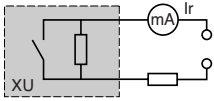
In the event of dirty lenses (reflectors), an excessively polluted atmosphere or a slight disturbance of optical alignment (mechanical impact on support), the level of light energy received by the sensor will decrease until it ceases to operate.

To overcome this problem, all our products incorporate:

- a red alarm LED,
- an alarm output, for connection in the automation system, to warn the operator that the operation of the sensor is stable but close to its limits (applies to sensors XUK, XUX, XUD).

5

Specific aspects of electronic sensors



Terminology

Residual current (Ir)

- The residual current (Ir) corresponds to the current flowing through the sensor when in the "open" state.
- Characteristic of 2-wire type sensors.

Voltage drop (Ud)

- The voltage drop (Ud) corresponds to the voltage drop at the sensor's terminals when in the "closed" state (value measured at nominal current rating of sensor).
- Characteristic of 2-wire type proximity sensors.

First-up delay

The first-up delay corresponds to the time (t) between the connection of the power supply to the sensor and its fully operational state.

- 1 Supply voltage U on
- 2 Sensor operational at state 1
- 3 Sensor at state 0

Response time

- Response time (Ra): the time delay between the object to be detected entering the sensor's operating zone and the subsequent change of output state. This parameter limits the speed and size of the object.
- Recovery time (Rr): the time delay between an object to be detected leaving the sensor's operating zone and the subsequent change of output state. This parameter limits the interval between successive objects.

Power supplies

Sensors for AC circuits (~ and ~ models)

Check that the voltage limits of the sensor are compatible with the nominal voltage of the AC supply used.

Sensors for DC circuits (— models)

- DC source: check that the voltage limits of the sensor and the acceptable level of ripple are compatible with the supply used.
- AC source (comprising transformer, rectifier, smoothing capacitor): the supply voltage must be within the operating limits specified for the sensor.
- Where the voltage is derived from a single-phase AC supply, the voltage must be rectified and smoothed to ensure that:
 - the peak voltage of the DC supply is lower than the maximum voltage rating of the sensor. Peak voltage = nominal voltage x $\sqrt{2}$
 - the minimum voltage of the supply is greater than the minimum voltage rating of the sensor, given that:

$$\Delta V = (I \times t) / C$$

$$\Delta V = \text{max. ripple: } 10\% (V),$$

$$I = \text{anticipated load current (mA),}$$

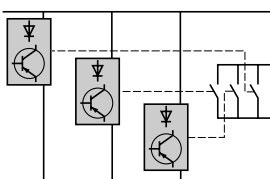
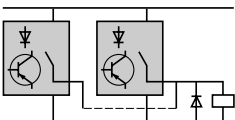
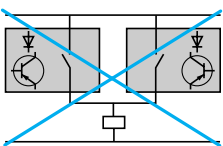
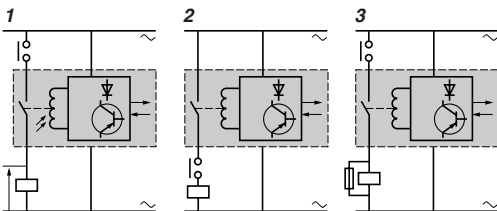
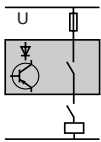
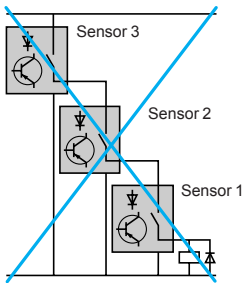
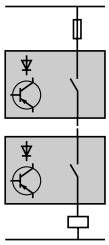
$$t = \text{period of 1 cycle (10 ms full-wave rectified for a 50 Hz supply frequency),}$$

$$C = \text{capacitance (}\mu\text{F).}$$
- As a general rule, use a transformer with a lower secondary voltage (Ue) than the required DC voltage (U).

Example: ~ 18 V to obtain — 24 V, ~ 36 V to obtain — 48 V. Fit a smoothing capacitor of 400 μF minimum per sensor, or 2000 μF minimum per Ampere required.



Setting-up



Connection in series

2-wire type sensors

- The following points should be taken into account:
 - Series wiring is only possible using sensors with wide voltage limits. Based on the assumption that each sensor has the same residual current value, each sensor, in the open state, will share the supply voltage, i.e.

$$U_{\text{sensor}} = \frac{U_{\text{supply}}}{n \text{ sensors}}$$

U sensor and U supply must remain within the sensor's voltage limits.

- If only one sensor in the circuit is in the open state, it will be supplied at a voltage almost equal to the supply voltage.
- When in the closed state, a small voltage drop is present across each sensor. The resultant loss of voltage at the load will be the sum of the individual voltage drops and therefore, the load voltage should be selected accordingly.

3-wire type sensors

This connection method is not recommended.

- Correct operation of the sensors cannot be assured and, if this method is used, tests should be made before installation.
- The following points should be taken into account:
 - The first sensor carries the load current in addition to the no-load current consumption values of the other sensors connected in series. For certain models, this connection method is not possible unless a current limiting resistor is used.
 - When in the closed state, a small voltage drop is present across each sensor. The load should therefore be selected accordingly.
 - As sensor 1 closes, sensor 2 does not operate until a certain time (t) has elapsed (corresponding to the first-up delay) and likewise for the following sensors in the sequence.
 - The use of "flywheel" diodes is recommended when an inductive load is being switched.

Wiring sensors to devices with mechanical contact

2 and 3-wire type sensors

- The following points should be taken into account:
 - When the mechanical contact is open, the sensor is not supplied.
 - When the contact closes, the sensor does not operate until a certain time (t) has elapsed (corresponding to the first-up delay).
- In scheme 1, as the external contact opens, the voltage transient caused by the breaking of the inductive load will appear inside the sensor and, if greater than the recommended max. insulation voltage, may cause a "flashover" within the sensor.
- The return path of this voltage will be back to one line of the supply, through the sensor, and should "flashover" occur anywhere on the printed circuit board, severe damage could occur.
- It is therefore recommended to use schemes 2 or 3.

Connection in parallel

2-wire type sensors

This connection method is not recommended.

- Should one of the sensors be in the closed state, the sensor in parallel will be "shorted-out" and no longer supplied. As the first sensor passes into the open state, the second sensor will become energised and will be subject to its first-up delay.
- This configuration is only permissible where the sensors will be working alternately.
- This method of connection can lead to irreversible damage of the units.

3-wire type sensors

- No specific restrictions. The use of "flywheel" diodes is recommended when an inductive load (relay) is being switched.

Wiring sensors to devices with mechanical contact

2 and 3-wire type sensors

- No specific restrictions.
 - For these sensors, the supply and output circuits are electrically separate.
 - The sensor/relay contact galvanic isolation is 1500 to 2500 V, depending on the model.
 - The maximum voltage, depending on the model, across each contact is ~ 250 V.

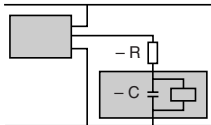
5

Setting-up precautions (continued)



AC supply

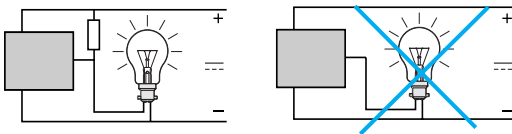
- **2-wire type sensors cannot be connected directly to an AC supply.**
- This would result in immediate destruction of the sensor and considerable danger to the user.
- An appropriate load (refer to the instruction sheet supplied with the sensor) must always be connected in series with the sensor.



Capacitive load ($C > 0.1 \mu\text{F}$)

- On power-up, it is necessary to limit (by resistor) the charging current of the capacitive load C.
- The voltage drop in the sensor can also be taken into account by subtracting it from the supply voltage for the calculation of R.

$$R = \frac{U \text{ (supply)}}{I_{\text{max. (sensor)}}$$



Load comprising an incandescent lamp

- If the load comprises an incandescent lamp, the cold state resistance can be 10 times lower than the hot state resistance. This can cause very high current levels on switching. Fit a pre-heat resistor in parallel with the sensor.

$$R = \frac{U^2}{P} \times 10, \text{ U = supply voltage and P = lamp power}$$

Fast trouble shooting guide

Problem	Possible causes	Remedy
The sensor's output will not change state when an object enters the operating zone	On multimode sensor: setting-up error (detection mode programming)	<ul style="list-style-type: none"> ■ Use the detection mode display option. After a RESET, follow the environment teach mode procedure.
	Output stage faulty or complete failure of the sensor (in either case, the sensor must be replaced), or the short-circuit protection has tripped.	<ul style="list-style-type: none"> ■ Check that the sensor is compatible with the supply being used. ■ Check the load current characteristics: <ul style="list-style-type: none"> □ if load current $I \geq$ maximum switching capacity, an auxiliary relay, of the CAD N type for example, should be interposed between the sensor and the load. □ if $I \leq$ maximum switching capacity, check or wiring faults (short-circuit). ■ In all cases, a 0.4 A "quick-blow" fuse should be fitted in series with the sensor.
	Wiring error	<ul style="list-style-type: none"> ■ Check that the wiring conforms to the wiring shown on the sensor label or instruction sheet.
	Supply fault	<ul style="list-style-type: none"> ■ Check that the sensor is compatible with the supply (\sim or $---$). ■ Check that the supply voltage is within the voltage limits of the sensor. Remember that with a rectified, smoothed supply, ■ $(U_{peak} = U_{nominal} \times \sqrt{2}$ with a ripple voltage of $\leq 10\%$).
	With a reflex system: incorrect use or poor state of reflector	<ul style="list-style-type: none"> ■ The reflex system must operate in conjunction with a reflector. Adhere to the operating distances and check the alignment between the sensor and the reflector. ■ Replace the reflector if it has been damaged. ■ Clean the reflector and sensor lenses.
	Influence of ambient light	<ul style="list-style-type: none"> ■ Make sure that the sensor is not dazzled by stray light (neon, sun, oven, etc.). ■ Fit a lens hood or turn the sensor.
False or erratic operation, with or without the presence of an object in the operating zone	On multimode sensor: setting-up error (detection mode programming)	<ul style="list-style-type: none"> ■ Use the detection mode display option. After a RESET, follow the environment teach mode procedure.
	Influence of background or surface condition of the object to be detected (stray reflections)	<ul style="list-style-type: none"> ■ Refer to the instruction sheet supplied with the sensor. For sensors with adjustable sensitivity, reduce or increase the sensing distance.
	Operating distance poorly defined for the reflector or object to be detected	<ul style="list-style-type: none"> ■ Apply the correction coefficients. ■ Realign the system. ■ Clean the sensor lenses and reflector, or, if damaged, replace it.
	Influence of immediate environment	<ul style="list-style-type: none"> ■ Check the cleanliness of the lenses and reflector. ■ Fit a lens hood, where required.
	Influence of transient interference on the supply lines	<ul style="list-style-type: none"> ■ Ensure that any DC supplies, when derived from rectified AC, are correctly smoothed ($C > 400 \mu F$). ■ Separate AC power cables from low-level DC cables ($---$ 24 V low level). ■ Where very long distances are involved, use suitable cable: screened and twisted pairs of the correct cross-sectional area.
	Equipment prone to emitting electromagnetic interference	<ul style="list-style-type: none"> ■ Position the sensors as far away as possible from any sources of interference.
	Response time of the sensor too slow for the particular object being detected	<ul style="list-style-type: none"> ■ Check the suitability of the sensor for the position or shape of the object to be detected. ■ If necessary, select a sensor with a higher switching frequency.
	Influence of high temperature	<ul style="list-style-type: none"> ■ Eliminate sources of radiated heat or protect the sensor casing with a heat shield. ■ Realign, having adjusted the temperature around the fixing support.
	Influence of ambient light	<ul style="list-style-type: none"> ■ Make sure that the sensor is not disrupted by a intermittent source of light (flashing light, rotating mirror beacon, hinged mirror, reflective door, etc.). ■ Fit a lens hood or turn the sensor.

5

Fast troubleshooting guide (continued)

Problem	Possible causes	Remedy
No detection following a period of service	Vibration, shock	<ul style="list-style-type: none"> ■ Realign the system ■ Replace the support or protect the sensor.
	Deterioration of relay contact	<ul style="list-style-type: none"> ■ On an inductive load, use an RC suppressor connected in parallel with the load. ■ To eliminate contact contamination, the minimum current recommended is 15 mA. ■ Relay output models are not recommended for fast counting of objects since their service life is too short. Use models with a solid-state output.
	Dusty atmosphere	<ul style="list-style-type: none"> ■ Clean the lenses and reflector with a soft cloth.

Notes:

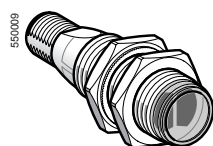
- **Sensors with a test input** enable automatic verification of their correct operation.
- **Sensors with an alarm output** enable the operator to be informed, for preventive maintenance purposes, that the operating limits of sensors have been reached (dirty etc.).

Photo-electric sensors

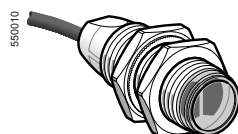
OsiSense XU, single mode function

Design 18, plastic

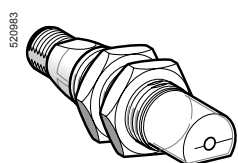
Three-wire DC, solid-state output



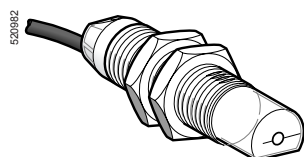
XUB●A●●NM12



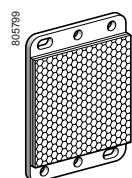
XUB●A●●NL2



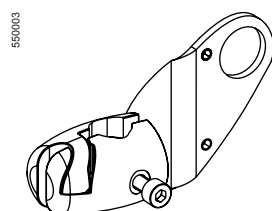
XUB●A●●WM12



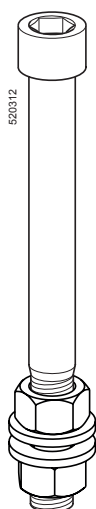
XUB●A●●WL2



XUZC50



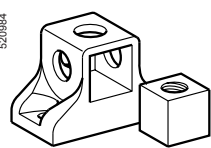
XUZB2003



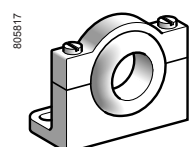
XUZ2001



XUZA118



XUZ2003



XUZA218

Connector

Sensing distance (Sn) m	Function	Output	Line of sight	Reference	Weight kg
Diffuse system					
0.1	NO	PNP	Along case axis	XUB4APANM12	0.040
			90° to case axis	XUB4APAWM12	0.040
	NPN	PNP	Along case axis	XUB4ANANM12	0.040
			90° to case axis	XUB4ANAWM12	0.040
	NC	PNP	Along case axis	XUB4APBNM12	0.040
			90° to case axis	XUB4APBWM12	0.040
NPN	PNP	Along case axis	XUB4ANBNM12	0.040	
		90° to case axis	XUB4ANBWM12	0.040	

Diffuse system with adjustable sensitivity

0.6	NO	PNP	Along case axis	XUB5APANM12	0.045
			90° to case axis	XUB5APAWM12	0.050
	NPN	PNP	Along case axis	XUB5ANANM12	0.045
			90° to case axis	XUB5ANAWM12	0.050
	NC	PNP	Along case axis	XUB5APBNM12	0.045
			90° to case axis	XUB5APBWM12	0.050
NPN	PNP	Along case axis	XUB5ANBNM12	0.045	
		90° to case axis	XUB5ANBWM12	0.050	

Polarised reflex system

2	NO	PNP	Along case axis	XUB9APANM12	0.040
			90° to case axis	XUB9APAWM12	0.040
	NPN	PNP	Along case axis	XUB9ANANM12	0.040
			90° to case axis	XUB9ANAWM12	0.040
	NC	PNP	Along case axis	XUB9APBNM12	0.040
			90° to case axis	XUB9APBWM12	0.040
NPN	PNP	Along case axis	XUB9ANBNM12	0.040	
		90° to case axis	XUB9ANBWM12	0.040	

Reflector	–	–	–	XUZC50	0.020
50 x 50 mm					

Reflex system

4	NO	PNP	Along case axis	XUB1APANM12	0.040
			90° to case axis	XUB1APAWM12	0.040
	NPN	PNP	Along case axis	XUB1ANANM12	0.040
			90° to case axis	XUB1ANAWM12	0.040
	NC	PNP	Along case axis	XUB1APBNM12	0.040
			90° to case axis	XUB1APBWM12	0.040
NPN	PNP	Along case axis	XUB1ANBNM12	0.040	
		90° to case axis	XUB1ANBWM12	0.040	

Reflector	–	–	–	XUZC50	0.020
50 x 50 mm					

Thru-beam system

Transmitter	–	–	Along case axis	XUB2AKSNM12T	0.040
15			90° to case axis	XUB2AKSWM12T	0.040
Receiver	NO	PNP	Along case axis	XUB2APANM12R	0.040
			90° to case axis	XUB2APAWM12R	0.040
	NPN	PNP	Along case axis	XUB2ANANM12R	0.040
			90° to case axis	XUB2ANAWM12R	0.040
NC	PNP	Along case axis	XUB2APBNM12R	0.040	
		90° to case axis	XUB2APBWM12R	0.040	
NPN	PNP	Along case axis	XUB2ANBNM12R	0.040	
		90° to case axis	XUB2ANBWM12R	0.040	

Fixing accessories (1)

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XUB or XUZC50	XUZB2003	0.170
M12 rod	XUZ2001	0.050
Support for M12 rod	XUZ2003	0.150
Stainless steel fixing bracket	XUZA118	0.045
Plastic fixing bracket with adjustable ball-joint	XUZA218	0.035

Pre-cabled

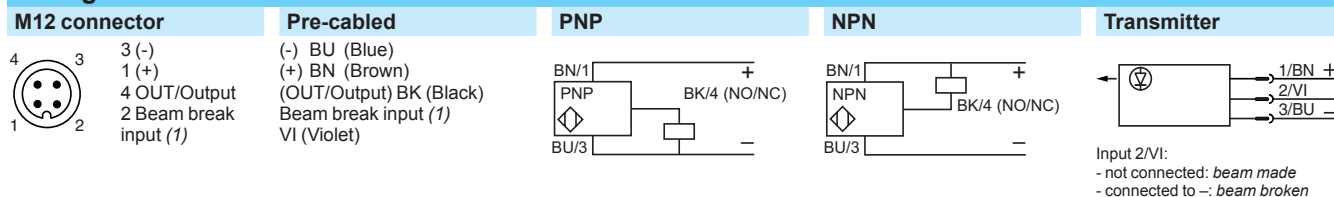
For a pre-cabled sensor, replace M12 by L2 for a 2 m long cable, or by L5 for a 5 m long cable. Example: XUB1APANM12 becomes XUB1APANL2 for a 2 m long cable and XUB1APANL5 for a 5 m long cable.

For availability, please consult our Customer Care Centre.

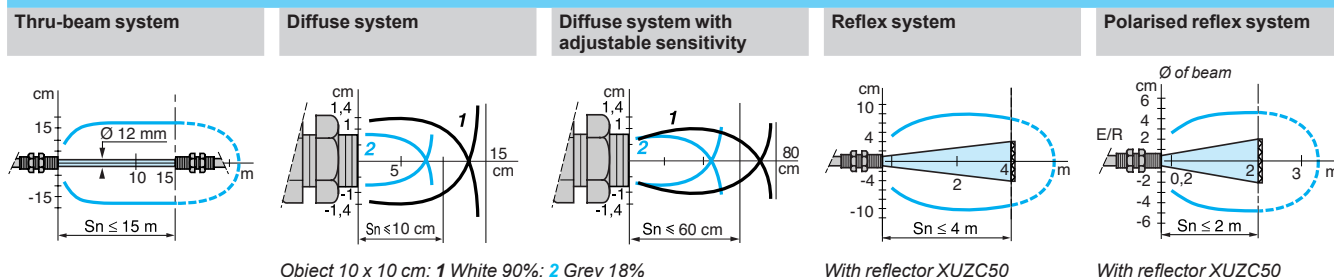
(1) For further information, see page 5/158.

Characteristics		XUB1, XUB2, XUB4, XUB5, XUB9	XUB1, XUB2, XUB4, XUB5, XUB9
Sensor type		UL, CSA, CE	
Product certifications		UL, CSA, CE	
Connection	Connector	M12	—
	Pre-cabled	—	Length: 2 m
Sensing distance nominal Sn / maximum (excess gain = 1) (excess gain = 2)		0.1 / 0.15 diffuse	
		0.6 / 0.8 diffuse with adjustable sensitivity	
		2 / 3 polarised reflex	
		4 / 5.5 reflex	
		15 / 20 thru-beam	
Type of transmission		Infrared, except polarised reflex (red)	
Degree of protection	Conforming to IEC 60529	IP 65, IP 67, double insulation ☐	
	Conforming to DIN 40050	IP 69K for connector versions	
Storage temperature		°C -40...+70	
Operating temperature		°C -25...+55	
Materials	Case	PBT	
	Lens	PMMA	
	Cable	—	PvR
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Indicator lights	Output state	Yellow LED (except for XUB2●●●●●T)	
	Supply on	Green LED (only for XUB2●●●●●T)	
Rated supply voltage		V --- 12...24 with protection against reverse polarity	
Voltage limits (including ripple)		V --- 10...36	
Current consumption, no-load		mA 35	
Switching capacity		mA ≤ 100 with overload and short-circuit protection	
Voltage drop, closed state		V 1.5	
Maximum switching frequency		Hz 500	
Delays	First-up	ms < 15	
	Response	ms < 1	
	Recovery	ms < 1	

Wiring schemes



Detection curves



Dimensions

XUB	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
∅ 18, line of sight along case axis	46 (2)	28	60 (1)	28
∅ 18, line of sight 90° to case axis	62	28	76	28
∅ 18, line of sight along case axis XUB5	62	44	76	44
∅ 18, line of sight 90° to case axis XUB5	78	44	92	44

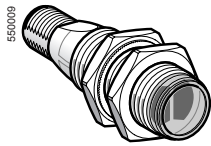
(1) Beam break input on thru-beam transmitter only.
(2) For XUB9●●●●● (polarised reflex) 46 becomes 48 mm and 60 becomes 62 mm.

Photo-electric sensors

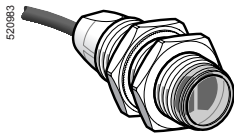
OsiSense XU, single mode function

Design 18, metal

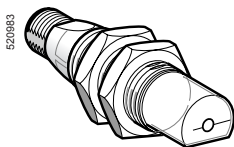
Three-wire DC, solid-state output



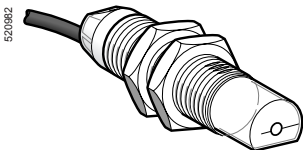
XUB•B••NM12



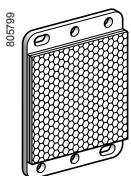
XUB•B••NL2



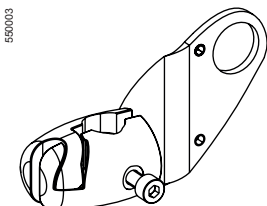
XUB•B••WM12



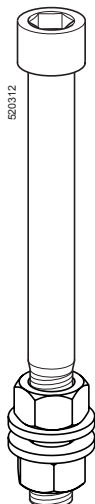
XUB•B••WL2



XUZC50



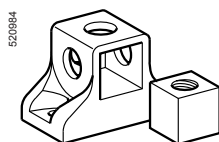
XUZB2003



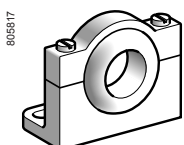
XUZ2001



XUZA118



XUZ2003



XUZA218

Connector

Sensing distance (Sn) m	Function	Output	Line of sight	Reference	Weight kg
Diffuse system					
0.1	NO	PNP	Along case axis	XUB4BPANM12	0.050
			90° to case axis	XUB4BPAWM12	0.050
	NPN	PNP	Along case axis	XUB4BNANM12	0.050
			90° to case axis	XUB4BNAWM12	0.050
	NC	PNP	Along case axis	XUB4BPBNM12	0.050
			90° to case axis	XUB4BPBWM12	0.050
NPN	PNP	Along case axis	XUB4BNBNM12	0.050	
		90° to case axis	XUB4BNBWM12	0.050	

Diffuse system with adjustable sensitivity

0.6	NO	PNP	Along case axis	XUB5BPANM12	0.055
			90° to case axis	XUB5BPAWM12	0.060
	NPN	PNP	Along case axis	XUB5BNANM12	0.055
			90° to case axis	XUB5BNAWM12	0.060
	NC	PNP	Along case axis	XUB5BPBNM12	0.055
			90° to case axis	XUB5BPBWM12	0.060
NPN	PNP	Along case axis	XUB5BNBNM12	0.055	
		90° to case axis	XUB5BNBWM12	0.060	

Polarised reflex system

2	NO	PNP	Along case axis	XUB9BPANM12	0.050
			90° to case axis	XUB9BPAWM12	0.050
	NPN	PNP	Along case axis	XUB9BNANM12	0.050
			90° to case axis	XUB9BNAWM12	0.050
	NC	PNP	Along case axis	XUB9BPBNM12	0.050
			90° to case axis	XUB9BPBWM12	0.050
NPN	PNP	Along case axis	XUB9BNBNM12	0.050	
		90° to case axis	XUB9BNBWM12	0.050	

Reflector
50 x 50 mm

Reflex system

4	NO	PNP	Along case axis	XUB1BPANM12	0.050
			90° to case axis	XUB1BPAWM12	0.050
	NPN	PNP	Along case axis	XUB1BNANM12	0.050
			90° to case axis	XUB1BNAWM12	0.050
	NC	PNP	Along case axis	XUB1BPBNM12	0.050
			90° to case axis	XUB1BPBWM12	0.050
NPN	PNP	Along case axis	XUB1BNBNM12	0.050	
		90° to case axis	XUB1BNBWM12	0.050	

Reflector
50 x 50 mm

Thru-beam system

Transmitter					
15	–	–	Along case axis	XUB2BKSNM12T	0.050
			90° to case axis	XUB2BKSWM12T	0.050
Receiver					
15	NO	PNP	Along case axis	XUB2BPANM12R	0.050
			90° to case axis	XUB2BPAWM12R	0.050
	NPN	PNP	Along case axis	XUB2BNANM12R	0.050
			90° to case axis	XUB2BNAWM12R	0.050
	NC	PNP	Along case axis	XUB2BPBNM12R	0.050
			90° to case axis	XUB2BPBWM12R	0.050
NPN	PNP	Along case axis	XUB2BNBNM12R	0.050	
		90° to case axis	XUB2BNBWM12R	0.050	

Fixing accessories (1)

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XUB or XUZC50	XUZB2003	0.170
M12 rod	XUZ2001	0.050
Support for M12 rod	XUZ2003	0.150
Stainless steel fixing bracket	XUZA118	0.045
Plastic fixing bracket with adjustable ball-joint	XUZA218	0.035


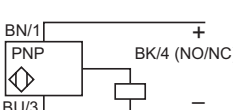
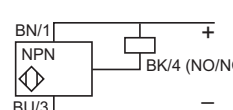
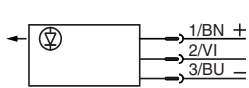
Pre-cabled

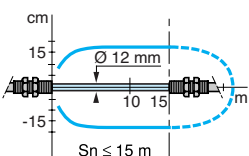
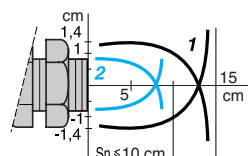
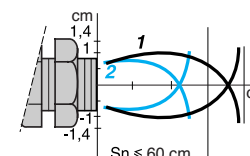
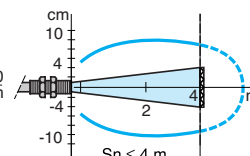
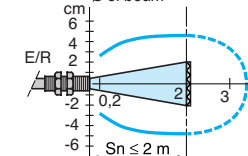
For a pre-cabled sensor, replace **M12** by **L2** for a 2 m long cable, or by **L5** for a 5 m long cable. Example: **XUB1BPANM12** becomes **XUB1BPANL2** for a 2 m long cable and **XUB1BPANL5** for a 5 m long cable.

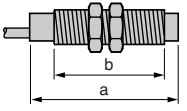
For availability, please consult our Customer Care Centre.

(1) For further information, see page 5/158.

Characteristics		XUB1, XUB2, XUB4, XUB5, XUB9	XUB1, XUB2, XUB4, XUB5, XUB9
Sensor type		XUB1, XUB2, XUB4, XUB5, XUB9	
Product certifications		UL, CSA, CE	
Connection	Connector	M12	–
	Pre-cabled	–	Length: 2 m
Sensing distance nominal Sn / maximum (excess gain = 2) (excess gain = 1)		0.1 / 0.15 diffuse	
		0.6 / 0.8 diffuse with adjustable sensitivity	
		2 / 3 polarised reflex	
		4 / 5.5 reflex	
		15 / 20 thru-beam	
Type of transmission		Infrared, except polarised reflex (red)	
Degree of protection	Conforming to IEC 60529	IP 65, IP 67, double insulation ☐	
	Conforming to DIN 40050	IP 69K for connector versions	
Storage temperature		°C -40...+70	
Operating temperature		°C -25...+55	
Materials	Case	Nickel plated brass	
	Lens	PMMA	
	Cable	–	PvR
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Indicator lights	Output state	Yellow LED (except for XUB2●●●●●T)	
	Supply on	Green LED (only for XUB2●●●●●T)	
Rated supply voltage		V --- 12...24 with protection against reverse polarity	
Voltage limits (including ripple)		V --- 10...36	
Current consumption, no-load		mA 35	
Switching capacity		mA ≤ 100 with overload and short-circuit protection	
Voltage drop, closed state		V 1.5	
Maximum switching frequency		Hz 500	
Delays	First-up	ms < 15	
	Response	ms < 1	
	Recovery	ms < 1	

Wiring schemes				
M12 connector	Pre-cabled	PNP	NPN	Transmitter
 <p>3 (-) 1 (+) 4 OUT/Output 2 Beam break input (1)</p>	<p>(-) BU (Blue) (+) BN (Brown) (OUT/Output) BK (Black) Beam break input (1) VI (Violet)</p>	 <p>BN/1 + BK/4 (NO/NC) BU/3 -</p>	 <p>BN/1 + BK/4 (NO/NC) BU/3 -</p>	 <p>1/BN + 2/VI + 3/BU -</p> <p>Input 2/VI: - not connected: beam made - connected to -: beam broken</p>

Detection curves				
Thru-beam system	Diffuse system	Diffuse system with adjustable sensitivity	Reflex system	Polarised reflex system
 <p>Sn ≤ 15 m</p>	 <p>Sn ≤ 10 cm</p> <p>Object 10 x 10 cm; 1 White 90%; 2 Grey 18%</p>	 <p>Sn ≤ 60 cm</p>	 <p>Sn ≤ 4 m</p> <p>With reflector XUZC50</p>	 <p>Sn ≤ 2 m</p> <p>With reflector XUZC50</p>

Dimensions					
XUB					
	Pre-cabled (mm)		Connector (mm)		
	a	b	a	b	
	Ø 18, line of sight along case axis	46 (2)	28	60 (1)	28
	Ø 18, line of sight 90° to case axis	62	28	76	28
	Ø 18, line of sight along case axis XUB5	62	44	76	44
Ø 18, line of sight 90° to case axis XUB5	78	44	92	44	

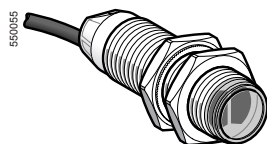
(1) Beam break input on thru-beam transmitter only.
(2) For XUB9●●●●● (polarised reflex) 46 becomes 48 mm and 60 becomes 62 mm.

Photo-electric sensors

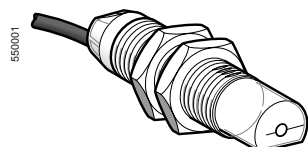
OsiSense XU multimode

Design 18, metal or plastic

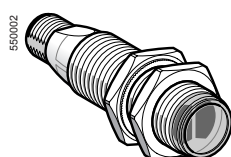
Three-wire DC, solid-state output



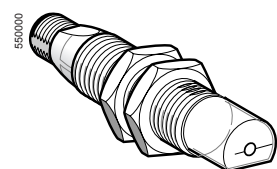
XUB0...NL2



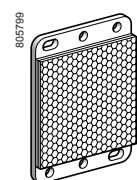
XUB0...WL2



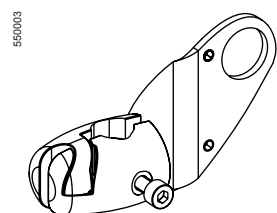
XUB0...NM12



XUB0...WM12



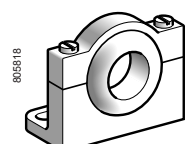
XUZC50



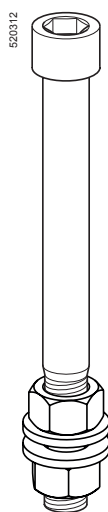
XUZB2003



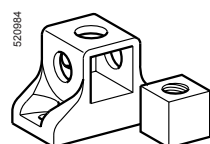
XUZA118



XUZA218



XUZ2001



XUZ2003

Ø 18 metal

Pre-cabled (1)

Sensing distance (Sn) (2) m	Function	Output	Line of sight	Reference	Weight kg
0...20 depending on whether accessories are used	NO or NC, by PNP programming	PNP	Along case axis	XUB0BPSNL2	0.105
			90° to case axis	XUB0BPSWL2 (3)	0.110
		NPN	Along case axis	XUB0BNSNL2	0.105
			90° to case axis	XUB0BNSWL2 (3)	0.110

M12 connector

0...20 depending on whether accessories are used	NO or NC, by PNP programming	PNP	Along case axis	XUB0BPSNM12	0.055
			90° to case axis	XUB0BPSWM12 (3)	0.060
		NPN	Along case axis	XUB0BNSNM12	0.055
			90° to case axis	XUB0BNSWM12 (3)	0.060

Accessories

Description	Connecti- on	Line of sight	Reference	Weight kg
Thru-beam transmitter	Pre-cabled (1)	Along case axis	XUB0BKSNL2T	0.105
		90° to case axis	XUB0BKSWL2T (3)	0.110
	M12 connector	Along case axis	XUB0BKSNM12T	0.055
		90° to case axis	XUB0BKSWM12T (3)	0.060
Reflector 50 x 50 mm	–	–	XUZC50	0.020

Ø 18 plastic

Pre-cabled (1)

Sensing distance (Sn) (3) m	Function	Output	Line of sight	Reference	Weight kg
0...20 depending on whether accessories are used	NO or NC, by PNP programming	PNP	Along case axis	XUB0APSNL2	0.095
			90° to case axis	XUB0APSWL2 (3)	0.100
		NPN	Along case axis	XUB0ANSNL2	0.095
			90° to case axis	XUB0ANSWL2 (3)	0.100

M12 connector

0...20 depending on whether accessories are used	NO or NC, by PNP programming	PNP	Along case axis	XUB0APSNM12	0.045
			90° to case axis	XUB0APSWM12 (3)	0.050
		NPN	Along case axis	XUB0ANSNM12	0.045
			90° to case axis	XUB0ANSWM12 (3)	0.050

Accessories

Description	Connecti- on	Line of sight	Reference	Weight kg
Thru-beam transmitter	Pre-cabled (1)	Along case axis	XUB0AKSNL2T	0.095
		90° to case axis	XUB0AKSWL2T (3)	0.100
	M12 connector	Along case axis	XUB0AKSNM12T	0.045
		90° to case axis	XUB0AKSWM12T (3)	0.050
Reflector 50 x 50 mm	–	–	XUZC50	0.020

Fixing accessories (4)

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XUB or XUZC50	XUZB2003	0.170
M12 rod	XUZ2001	0.050
Support for M12 rod	XUZ2003	0.150
Stainless steel fixing bracket	XUZA118	0.045
Plastic fixing bracket with adjustable ball-joint	XUZA218	0.035

(1) For a 5 m long cable, replace L2 by L5.

Example: XUB0BPSNL2 becomes XUB0BPSNL5.

For availability, please consult our Customer Care Centre.


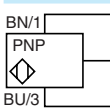
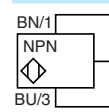
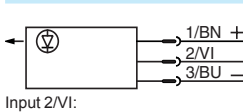
(2) For further information, see page 5/33.

(3) For line of sight 90° to case axis versions, see sensing distances on page 5/33.

(4) For further information, see page 5/158.

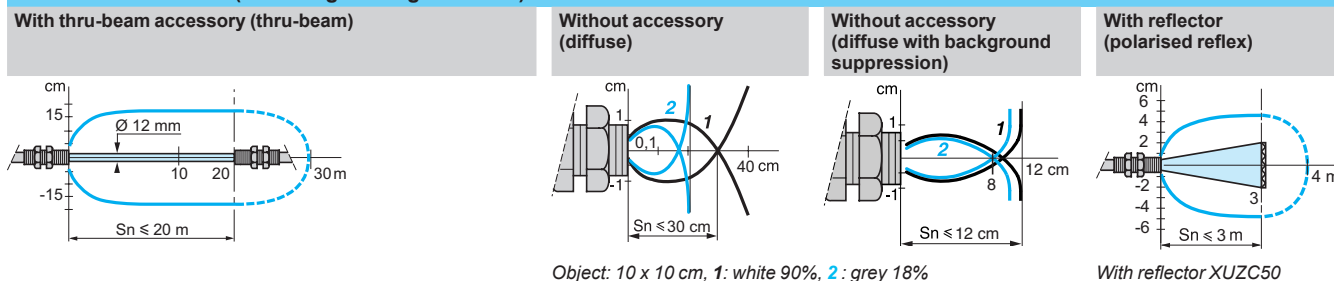
Characteristics		XUB0●●●●M12, XUB0●●●●M12T	XUB0●●●●L2, XUB0●●●●L2T	
Sensor type				
Product certifications		UL, CSA, CE		
Connection	Connector	M12	–	
	Pre-cabled	–	Length: 2 m	
Sensing distance maximum (excess gain = 1) nominal Sn / (excess gain = 2)	Line of sight along case axis	Line of sight 90° to case axis	Accessory	
		Without (diffuse with background suppression)		
	m	0.12 / 0.12	0.11 / 0.11	Without (diffuse)
		0.3 / 0.4	0.2 / 0.3	With reflector (polarised reflex)
m	3 / 4	1.5 / 2	With thru-beam transmitter (thru-beam)	
	20 / 30	7 / 10		
Type of transmission		Infrared, except for polarised reflex (red)		
Degree of protection	Conforming to IEC 60529	IP 65, IP 67, double insulation □		
	Conforming to DIN 40050	IP 69K for XUB0●●●●M12 and XUB0●●●●M12T		
Storage temperature		°C - 40...+ 70		
Operating temperature		°C - 25...+ 55		
Materials		Case: nickel plated brass for XUB0B or PBT for XUB0A; Lens: PMMA; Cable: PvR		
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms		
Indicator lights	Output state	Yellow LED (transmission present for XUB0●●●●●T)		
	Supply on	Green LED		
	Optical alignment aid/dirty	Red LED (except for XUB0●●●●●T)		
Rated supply voltage		V --- 12...24 with protection against reverse polarity		
Voltage limits (including ripple)		V --- 10...36		
Current consumption, no-load		mA 35 (20 for XUB0●●●●●T)		
Switching capacity		mA ≤ 100 with overload and short-circuit protection		
Voltage drop, closed state		V < 1.5		
Maximum switching frequency		Hz 250 (200 for diffuse with background suppression)		
Delays	First-up	ms < 200		
	Response	ms < 2 (< 2.5 for diffuse with background suppression)		
	Recovery	ms < 2 (< 2.5 for diffuse with background suppression)		

Wiring schemes

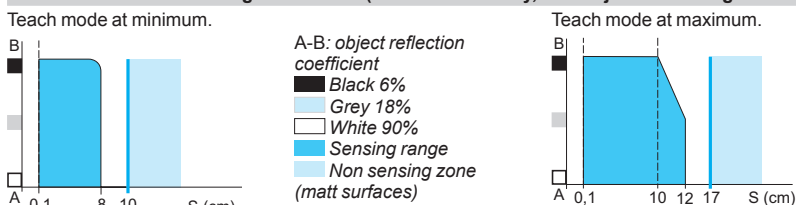
M12 connector	Pre-cabled	Receiver, PNP output	Receiver, NPN output	Thru-beam transmitter
 <p>3 (-) 1 (+) 4 OUT/Output 2 Beam break input (1)</p>	<p>(-) BU (Blue) (+) BN (Brown) OUT/Output BK (Black) Beam break input (1) VI (Violet)</p>	 <p>BN/1 + BK/4 BU/3 -</p>	 <p>BN/1 + BK/4 BU/3 -</p>	 <p>1/BN + 2/VI + 3/BU -</p> <p>Input 2/VI: - not connected: beam made - connected to -: beam broken</p>

See connection on page 30210/2.

Detection curves (line of sight along case axis)



Variation of usable sensing distance Su (without accessory, with adjustable background suppression)



Dimensions

XUB	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
∅ 18, line of sight along case axis	64 (2)	44	78 (2)	44
∅ 18, line of sight 90° to case axis	78	44	92	44

(1) Beam break input on thru-beam transmitter only.

(2) For XUB0●●●●●T, 64 becomes 62 mm and 78 becomes 76 mm.

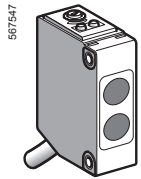
Photo-electric sensors

OsiSense XU, general purpose, single mode function

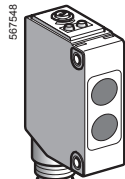
Miniature design, plastic

Three-wire DC, solid-state output

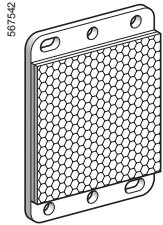
NO/NC configuration switch



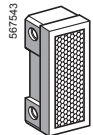
XUM5A●CNL2



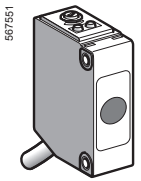
XUM5A●CNM8



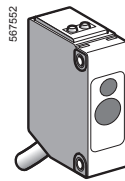
XUZC50



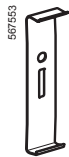
XUZC08



XUM2AKCNL2T



XUM2A●CNL2R



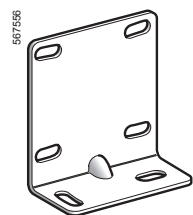
XUZMSV●●



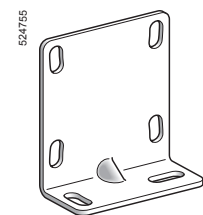
XUZMSH●●



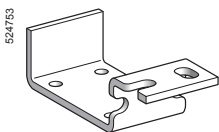
XUZMU01



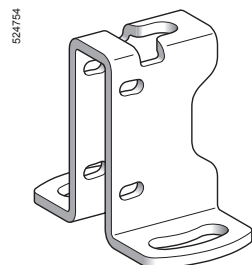
XUZAM01



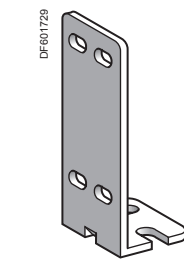
XUZAM04



XUZAM03



XUZAM02



XUZA50

Sensing distance (Sn)	Function	Output	Connection	Reference	Weight kg
Diffuse system with adjustable sensitivity					
1 m	NO/NC, configuration by switch	PNP	Pre-cabled (L = 2 m)	XUM5APCNL2	0.063
			M8 connector	XUM5APCNM8	0.010
	NPN	Pre-cabled (L = 2 m)	XUM5ANCNL2	0.063	
		M8 connector	XUM5ANCNM8	0.010	

Polarised reflex system with adjustable sensitivity

5 m with reflector XUZC50	NO/NC, configuration by switch	PNP	Pre-cabled (L = 2 m)	XUM9APCNL2	0.063
			M8 connector	XUM9APCNM8	0.010
2 m with reflector XUZC08	NO/NC, configuration by switch	NPN	Pre-cabled (L = 2 m)	XUM9ANCNL2	0.063
			M8 connector	XUM9ANCNM8	0.010

Reflectors

Universal reflector 50 x 50 mm	–	–	XUZC50	0.020
Lateral reflector 8.6 x 29.5 mm	–	–	XUZC08	0.006

Thru-beam system (transmitter + receiver) with adjustable sensitivity

15 m	NO/NC, configuration by switch	PNP	Pre-cabled (L = 2 m)	XUM2APCNL2	0.119
			M8 connector	XUM2APCNM8	0.019
	NPN	Pre-cabled (L = 2 m)	XUM2ANCNL2	0.119	
		M8 connector	XUM2ANCNM8	0.019	

Transmitter only

15 m	Pre-cabled (L = 2 m)	XUM2AKCNL2T	0.063
	M8 connector	XUM2AKCNM8T	0.010

Receiver only

15 m	NO/NC, configuration by switch	PNP	Pre-cabled (L = 2 m)	XUM2APCNL2R	0.063
			M8 connector	XUM2APCNM8R	0.010
	NPN	Pre-cabled (L = 2 m)	XUM2ANCNL2R	0.063	
		M8 connector	XUM2ANCNM8R	0.010	

Accessories for thru-beam system

Description	Dimensions mm	Sensing distance m	Reference	Weight kg
Vertical diaphragm <i>Sold in lots of 2</i>	0.5 x 6.4	1.2	XUZMSV05	0.002
	1 x 6.4	3	XUZMSV10	0.002
	1.5 x 6.4	4	XUZMSV15	0.002
	2 x 6.4	5	XUZMSV20	0.002
Horizontal diaphragm <i>Sold in lots of 2</i>	0.5 x 6.4	1.2	XUZMSH05	0.002
	1 x 6.4	3	XUZMSH10	0.002
	1.5 x 6.4	4	XUZMSH15	0.002
	2 x 6.4	5	XUZMSH20	0.002
Anti-interference filter <i>Sold in lots of 4</i>	–	7	XUZMU01	0.006

Fixing accessories

Description	Reference	Weight kg
Base mounting fixing bracket	XUZAM01	0.017
Side mounting fixing bracket	XUZAM04	0.026
Vertical fixing bracket with protective cover (1)	XUZAM02	0.062
Horizontal fixing bracket with protective cover (1)	XUZAM03	0.026
Metal fixing bracket	XUZA50	0.025

(1) For pre-cabled version

Photo-electric sensors

OsiSense XU, general purpose, single mode function

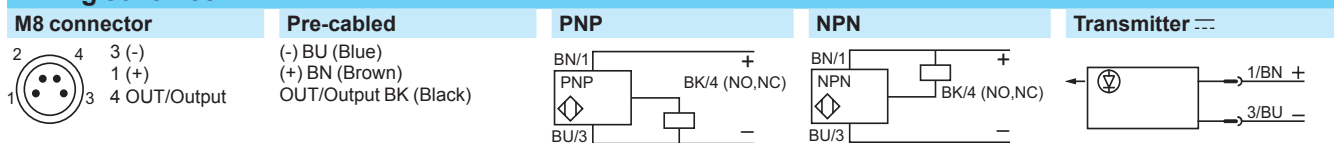
Miniature design, plastic

Three-wire DC, solid-state output

NO/NC configuration switch

Characteristics		XUM●A●●●M8	XUM●A●●●L2
Sensor type		XUM●A●●●M8	
Product certifications		CE, cULus, CTick	
Connection	Connector	M8	–
	Pre-cabled	–	Length: 2 m
Nominal sensing distance Sn (excess gain = 2)	m	1 diffuse with adjustable sensitivity	
	m	5 polarised reflex with adjustable sensitivity	
	m	15 thru-beam with adjustable sensitivity	
Type of transmission		Red, except diffuse system (Infrared)	
Degree of protection	Conforming to IEC 60529	IP 65, IP 67	
Storage temperature		°C -40...+70	
Operating temperature		°C -30...+60	
Materials	Case	PBT	
	Lens	PMMA	
	Cable	–	PVC (black for transmitter, grey for other versions)
Vibration resistance	Conforming to IEC 60068-2-6	10 to 55 Hz, amplitude ± 1.5 mm, 2 hours in each direction X, Y and Z	
Shock resistance	Conforming to IEC 60068-2-27	500 m/s² 10 x in each direction X, Y and Z	
Indicator lights	Output state	Orange LED (excluding transmitter)	
	Stability	Green LED	
	Transmitter	Orange LED: supply on	
	Receiver	Red LED: light received; green LED: supply on	
Rated supply voltage		V $\bar{\bar{}}$ 12...24 with protection against reverse polarity	
Voltage limits (including ripple)		V $\bar{\bar{}}$ 10...30	
Current consumption, no-load		mA 16 for XUM5; 13 for XUM9; 11 for transmitter XUM2; 13 for receiver XUM2	
Switching capacity		mA \leq 100 with overload and short-circuit protection	
Voltage drop, closed state		V \leq $\sqrt{3}$	
Maximum switching frequency		Hz 1000	
Delays	First-up	ms < 100	
	Response	ms 0.5	
	Recovery	ms 0.5	

Wiring schemes



Curves

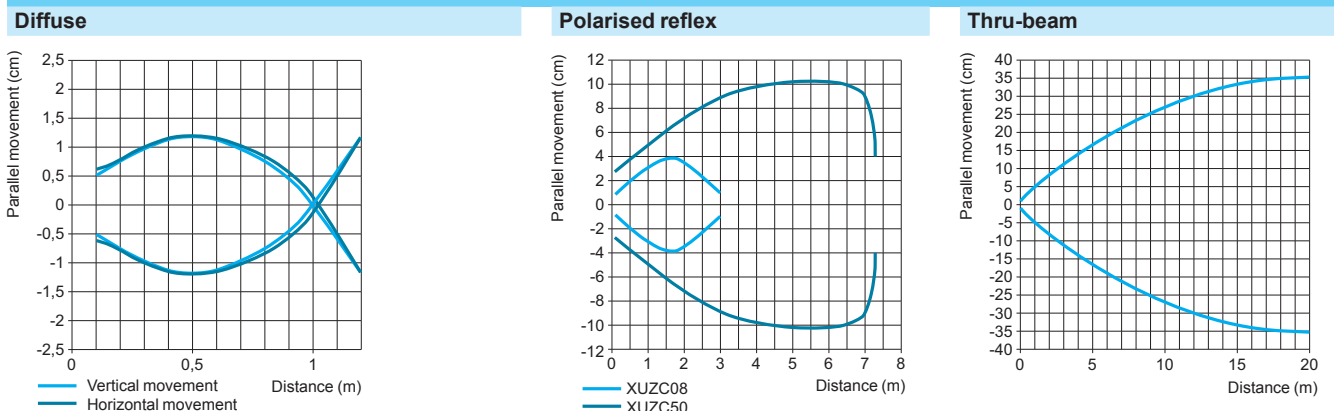


Photo-electric sensors

OsiSense XU, general purpose, single mode function

Miniature design, plastic

Three-wire DC, solid-state output

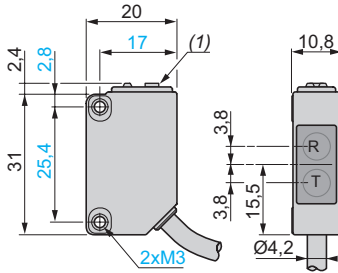
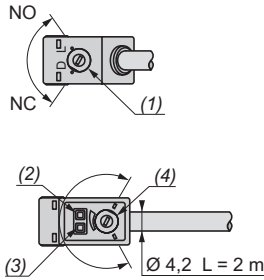
NO/NC configuration switch

Diffuse system, polarised reflex system

Pre-cabled version

Description - XUM5A●CNL2, XUM9A●CNL2

Dimensions - XUM5A●CNL2, XUM9A●CNL2



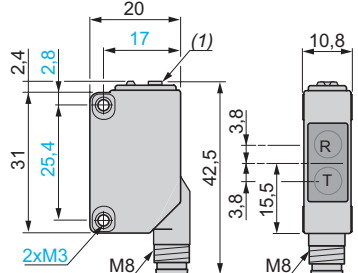
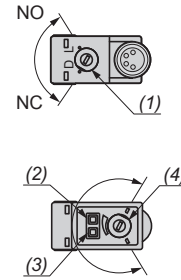
- (1) Configuration switch.
- (2) Output state LED.
- (3) Stability and power on LED.
- (4) Adjustment potentiometer.

R: Reception, T: Transmission.
(1) Potentiometer.

Connector version

Description - XUM5A●CNM8, XUM9A●CNM8

Dimensions - XUM5A●CNM8, XUM9A●CNM8



- (1) Configuration switch.
- (2) Output state LED.
- (3) Stability and power on LED.
- (4) Adjustment potentiometer.

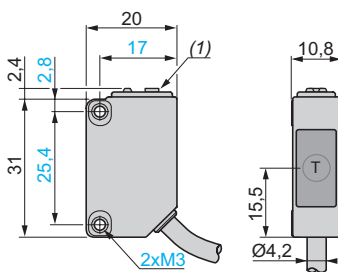
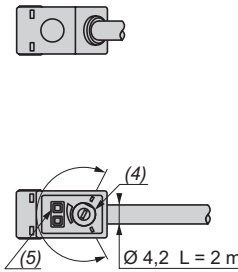
R: Reception, T: Transmission.
(1) Potentiometer.

Thru-beam system

Pre-cabled version

Description - XUM2AKCNL2T

Dimensions - XUM2AKCNL2T

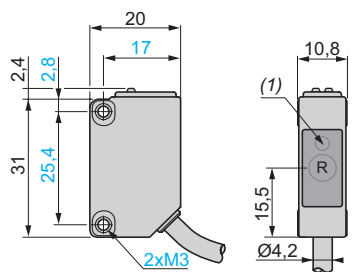
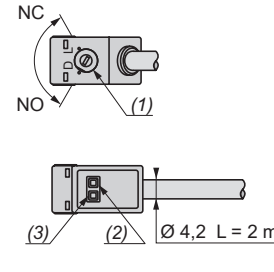


- (4) Adjustment potentiometer.
- (5) Power on LED.

T: Transmission.
(1) Potentiometer.

Description - XUM2A●CNL2R

Dimensions - XUM2A●CNL2R



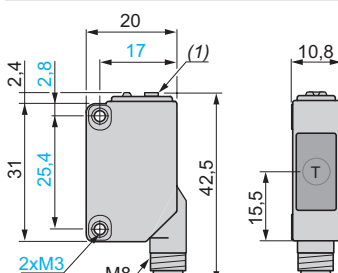
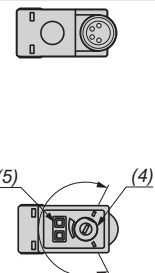
- (1) Configuration switch.
- (2) Output state LED.
- (3) Stability and power on LED.

R: Reception.
(1) Output state LED on front face.

Connector version

Description - XUM2AKCNM8T

Dimensions - XUM2AKCNM8T

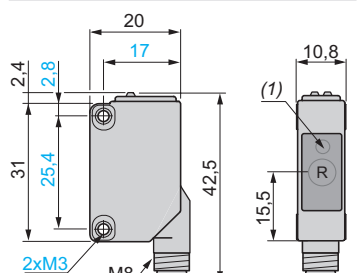
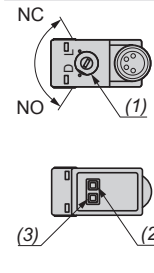


- (4) Adjustment potentiometer.
- (5) Power on LED.

T: Transmission.
(1) Potentiometer.

Description - XUM2A●CNM8R

Dimensions - XUM2A●CNM8R



- (1) Configuration switch.
- (2) Output state LED.
- (3) Stability and power on LED.

R: Reception.
(1) Output state LED on front face.

Accessories

Diaphragms

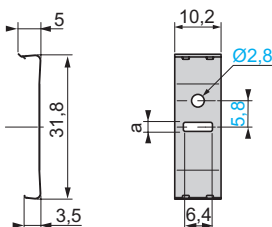
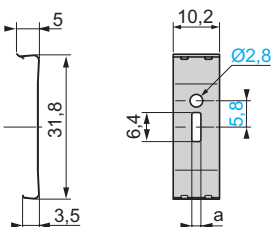
XUZMSV●●

XUZMSH●●

XUZ

Filter

XUZMU01



XUZ	a
MSV05	0.5
MSV10	1
MSV15	1.5
MSV20	2
MSH05	0.5
MSH10	1
MSH15	1.5
MSH20	2

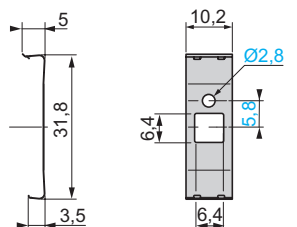


Photo-electric sensors

OsiSense XU, general purpose, single mode function

Miniature design, plastic

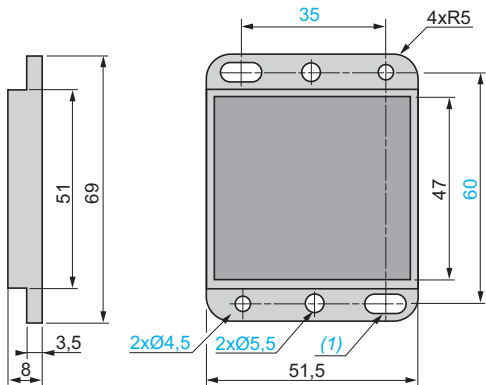
Three-wire DC, solid-state output

NO/NC configuration switch

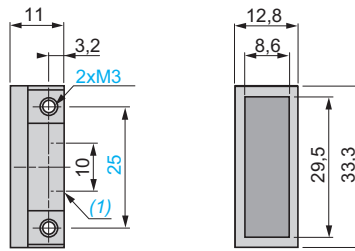
Accessories

Reflectors

XUZC50



XUZC08

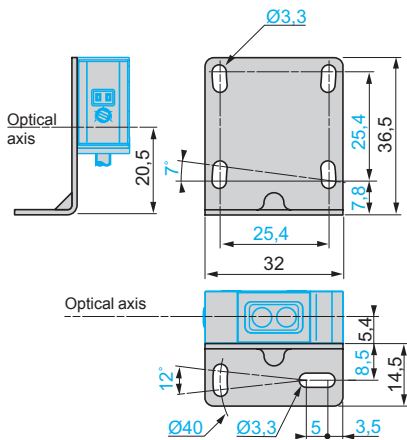


(1) 2 elongated holes Ø 4.5 x 8

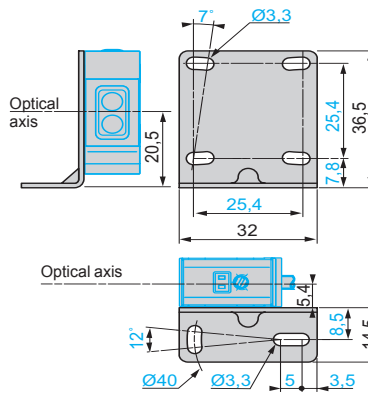
(1) 2 x M3

Fixing brackets

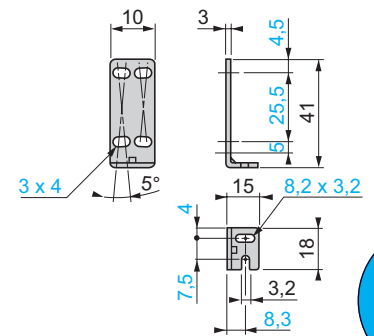
XUZAM04



XUZAM01

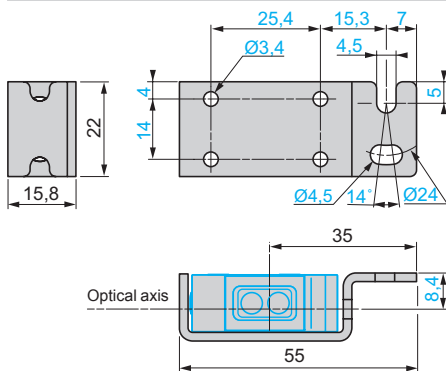


XUZA50



Fixing bracket with protective cover

XUZAM03



XUZAM02

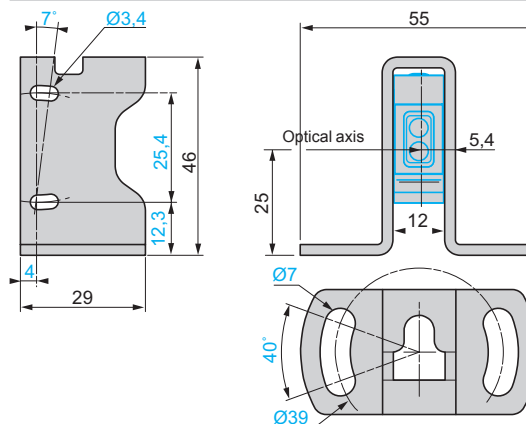


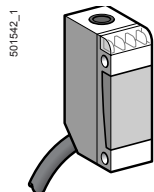
Photo-electric sensors

OsiSense XU, general purpose

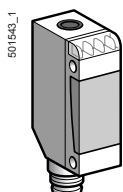
Multimode function

Miniature design

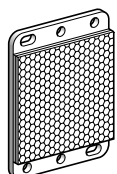
Three-wire DC, solid-state output



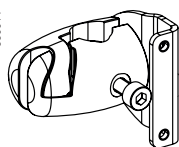
XUM0A●●●L2



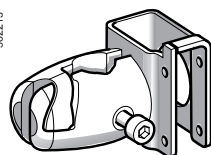
XUM0A●●●M8



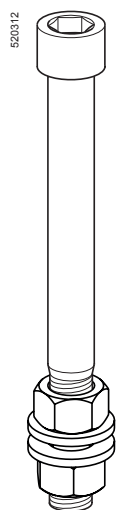
XUZC50



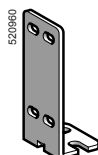
XUZM2003



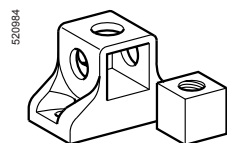
XUZM2004



XUZ2001



XUZA50



XUZ2003

Miniature design, DC

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
0...10 depending on whether accessories are used	NO or NC, by programming	PNP	Pre-cabled (L = 2 m) (1)	XUM0APSAL2	0.050
			M8 connector	XUM0APSAM8	0.035
		NPN	Pre-cabled (L = 2 m) (1)	XUM0ANSAL2	0.050
			M8 connector	XUM0ANSAM8	0.035

Accessories

Description	Connection	Reference	Weight kg
Thru-beam transmitter	Pre-cabled (L = 2 m) (1)	XUM0AKSAL2T	0.050
	M8 connector	XUM0AKSAM8T	0.035
Reflector 50 x 50 mm	–	XUZC50	0.020

Fixing accessories (2)

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XUM or XUZC50	XUZM2003	0.140
3D fixing kit for use on M12 rod and with protective cover for XUM	XUZM2004	0.155
M12 rod	XUZ2001	0.050
Support for M12 rod	XUZ2003	0.150
Fixing bracket	XUZA50	0.025

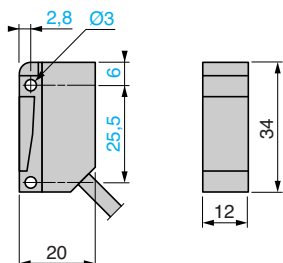
(1) For a 5 m long cable, replace L2 by L5.

Example: XUM0APSAL2 becomes XUM0APSAL5.

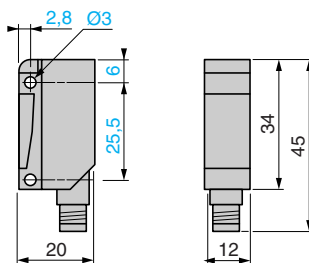
(2) For further information, see page 5/158.

Dimensions (mm)

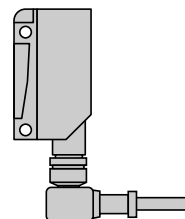
XUM0A●●●L2



XUM0A●●●M8

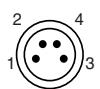
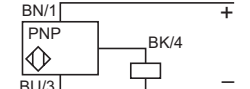
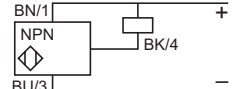
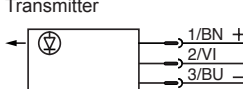


Possible orientation of elbowed connector

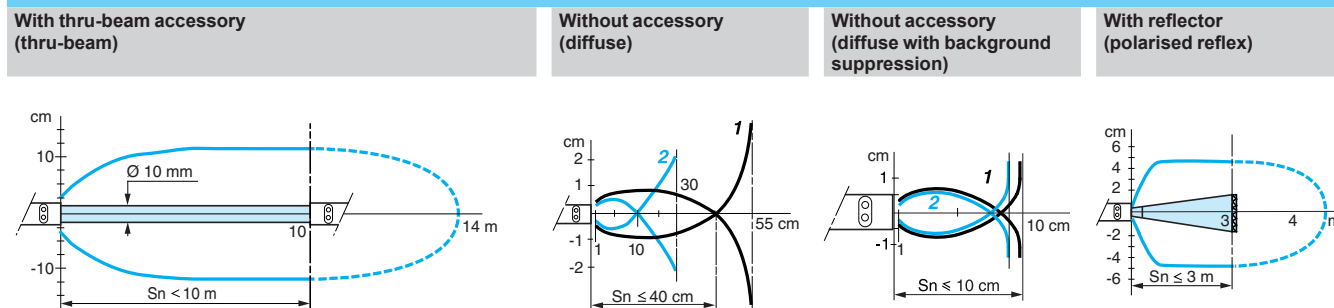


Characteristics		XUM●●●●●M8	XUM●●●●●L2
Sensor type		XUM●●●●●M8	
Product certifications		UL, CSA, CE	
Connection	Connector	M8	—
	Pre-cabled	—	Length: 2 m
Nominal sensing distance S_n (excess gain = 2)	m	0.11 / 0.11 without accessory (diffuse with background suppression)	
	m	0.4 / 0.55 without accessory (diffuse)	
	m	3 / 4 with reflector (polarised reflex)	
	m	10 / 14 with transmitter for thru-beam function (thru-beam)	
Type of transmission		Infrared, except polarised reflex (red)	
Degree of protection	Conforming to IEC 60529	IP 65, IP 67	IP 65, IP 67, double insulation \square
Storage temperature		°C	-40...+70
Operating temperature		°C	-25...+55
Materials	Case	PBT	
	Lens	PMMA	
	Cable	—	PvR
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Indicator lights	Output state	Yellow LED (transmission present for XUM0●●●●●T)	
	Supply on	Green LED	
	Optical alignment aid/dirty	Red LED (except for XUM0●●●●●T)	
Rated supply voltage		V	— 12...24 with protection against reverse polarity
Voltage limits (including ripple)		V	— 10...30
Current consumption, no-load		mA	35 (20 for XUM0●●●●●T)
Switching capacity		mA	≤ 100 with overload and short-circuit protection
Voltage drop, closed state		V	≤ 1.5
Maximum switching frequency		Hz	250 (200 for diffuse with background suppression)
Delays	First-up	ms	< 200
	Response	ms	< 2 (< 2.5 for diffuse with background suppression)
	Recovery	ms	< 2 (< 2.5 for diffuse with background suppression)

Wiring schemes

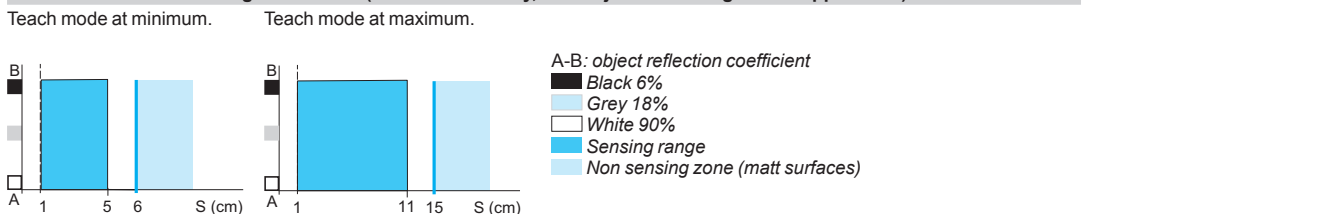
M8 connector	Pre-cabled	Receiver, PNP output	Receiver, NPN output	Thru-beam function transmitter
 <p>3 (-) 1 (+) 4 OUT/Output 2 Beam break input (1)</p>	<p>(-) BU (Blue) (+) BN (Brown) OUT/Output BK (Black) Beam break input VI (Violet) (1)</p>	 <p>BN/1 PNP BK/4 BU/3</p>	 <p>BN/1 NPN BK/4 BU/3</p>	 <p>Transmitter 1/BN + 2/VI 3/BU -</p> <p>Input 2/VI: - not connected: beam made - connected to -: beam broken</p>

Detection curves



Object: 10 x 10 cm, 1: white 90%, 2: grey 18%

Variation of usable sensing distance S_u (without accessory, with adjustable background suppression)



(1) Beam break input on thru-beam transmitter only.

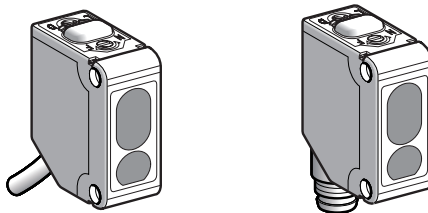
Photo-electric sensors

OsiSense XU, general purpose

With adjustable background and foreground suppression

DC supply. Solid-state output

Compact design



System	Diffuse with adjustable background and foreground suppression, long sensing distance with high accuracy
Type of transmission	Red
Nominal sensing distance (S_n)	20...300 mm
Differential travel	5% or less of the sensing distance
Adjustment	Potentiometer with 5 turns

References

3-wire	NO or NC programmable function	PNP	NPN	PNP	NPN	PNP
		XUM8APCNL2	XUM8ANCNL2	XUM8APCNM8	XUM8ANCNM8	XUM8APCNL03M12
Weight (kg)		0.065	0.065	0.020	0.020	0.035

Characteristics

Product certifications	CE, cURus		
Ambient air temperature	For operation: -25...+55°C For storage: -30...+70°C		
Vibration resistance	Conforming to IEC 60068-2-8 20 gn max, amplitude: 3 mm, frequency: 10... 500 Hz		
Shock resistance	Conforming to IEC 60068-2-27 50 gn		
Degree of protection	Conforming to IEC 60529 IP 67		
Material	Case: PBT Lenses: polycarbonate		
Indicator lights	Output state Orange LED		
	Power on, help with setting Green LED		
Connection	2 m cable Conductor c.s.a.: 0.2 mm ²	M8 4-pin connector	Remote M12 connector, 0.3 m cable Conductor c.s.a.: 0.2 mm ²
Rated supply voltage	12...24 V $\overline{\text{---}}$ with protection against reverse polarity		
Voltage limits	10...30 V $\overline{\text{---}}$ (including ripple)		
Switching capacity	≤ 100 mA with overload and short-circuit protection		
Immunity to ambient light	Natural light	3000 lux	
	Incandescent bulb	3000 lux	
Voltage drop, closed state	< 2 V		
Current consumption	≤ 20 mA		
Response time	≤ 1 ms		

Function table	Function	Diffuse system	
		No object present in the beam	Object present in the beam
State of output (PNP or NPN) and orange LED (illuminated when sensor output is ON)	NO (position L)		
	NC (position D)		

Detection curves

Variation of usable sensing distance

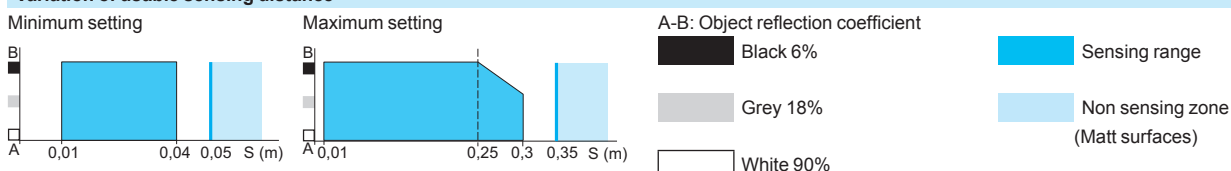


Photo-electric sensors

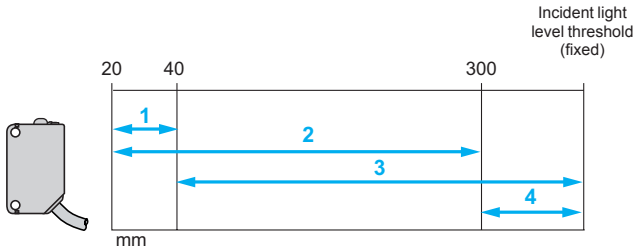
OsiSense XU, general purpose

With adjustable background and foreground suppression

DC supply. Solid-state output

Detection curves

Adjustment ranges in background or foreground suppression mode



- 1 Background suppression (on minimum setting)
- 2 Background suppression (on maximum setting)
- 3 Foreground suppression (on minimum setting)
- 4 Foreground suppression (on maximum setting)

Adjustment in background or foreground suppression mode

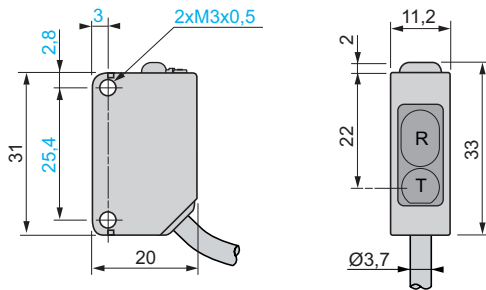
Cabling of pink wire determines the detection mode:

- Background detection mode, pink wire not connected to 0 V (blue wire)
- Foreground detection mode, pink wire connected to +V (brown wire)

Function	Cabling	Application
Background suppression	Pink wire to 0 V	To detect the object when it is detached from the background.
Foreground suppression	Pink wire to +V	To detect the object when it is in contact with the background or to suppress a foreground.

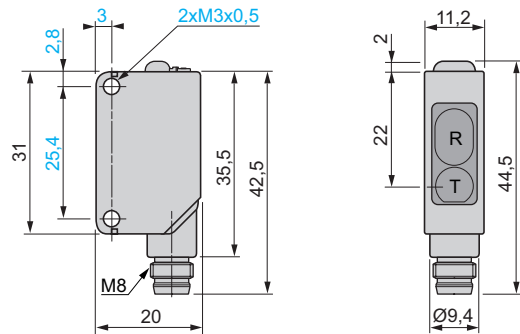
Dimensions

XUM8APCNL2, XUM8ANCNL2 and XUM8APCNL03M12

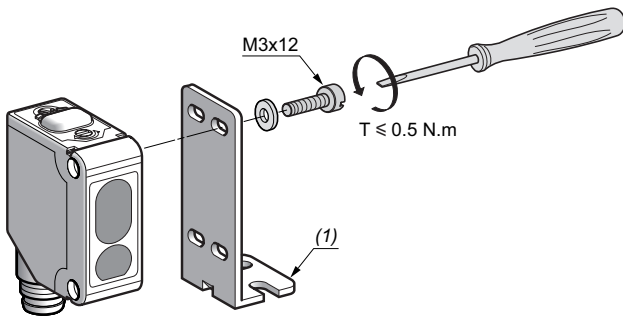


R: Reception, T: Transmission

XUM8APCNM8 and XUM8ANCNM8

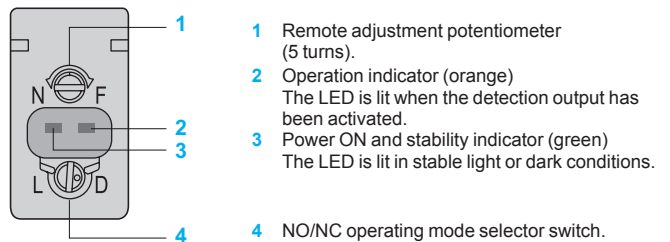


Mounting



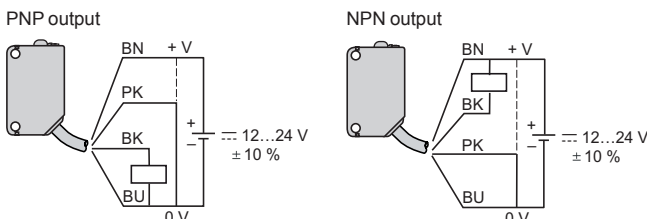
(1) XUZA50, XUZAM02 or XUZAM03 metal bracket (see pages 5/34 and 5/38).

Functions



Selector switch	Function	Description
	NO (position L)	The NO output is activated when the selector switch is turned fully clockwise.
	NC (position D)	The NC output is activated when the selector switch is turned fully anticlockwise.

Wiring schemes (3-wire ---)



Note: These schemes are represented in "background suppression" mode, cabling of pink (PK) wire to 0 V.

Cable connections

XUM8A●CNL2

- (-) BU (Blue)
- (+) BN (Brown)
- (OUT) BK (Black)
- (MODE) PK (Pink)

Connector schemes

XUM8A●CNM8

- M8 connector
- | | | |
|---|---|------------|
| 2 | 4 | 3 (-) |
| 1 | 3 | 1 (+) |
| 3 | 4 | Output |
| 4 | 2 | Mode/Input |

XUM8APCNL03M12

- M12 connector
- | | | |
|---|---|--------------|
| 4 | 3 | 3 (-) |
| 3 | 1 | 1 (+) |
| 4 | 4 | Output |
| 1 | 2 | 2 Mode/Input |

Please refer to our "Cabling accessories OsiSense XZ" catalogue.

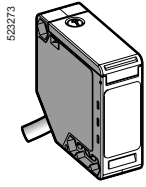
Photo-electric sensors

OsiSense XU, general purpose, single mode function

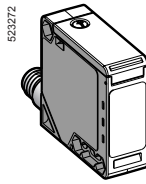
Compact design, 50 x 50

Five-wire AC or DC, 1 CO relay output

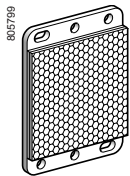
Three-wire DC, solid-state output



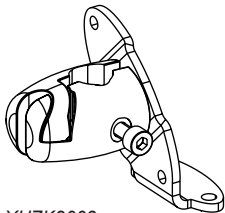
XUK●A●●●L2



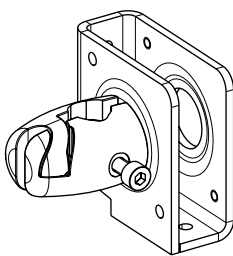
XUK●A●●●M12



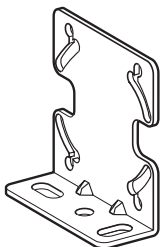
XUZC50



XUZK2003



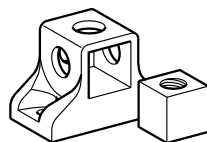
XUZK2004



XUZA51



XUZ2001



XUZ2003

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
Diffuse system with adjustable sensitivity					
DC					
1	NO	PNP	Pre-cabled (L = 2 m) (1)	XUK5APANL2	0.190
			M12 connector	XUK5APANM12	0.070
	NPN	PNP	Pre-cabled (L = 2 m) (1)	XUK5ANANL2	0.190
			M12 connector	XUK5ANANM12	0.070
	NC	PNP	Pre-cabled (L = 2 m) (1)	XUK5APBNL2	0.190
			M12 connector	XUK5APBNM12	0.070
NPN	PNP	Pre-cabled (L = 2 m) (1)	XUK5ANBNL2	0.190	
		M12 connector	XUK5ANBNM12	0.070	

AC or DC					
1	NO + NC	Relay	Pre-cabled (L = 2 m) (1)	XUK5ARCNL2	0.190

Polarised reflex system					
DC					
6	NO	PNP	Pre-cabled (L = 2 m) (1)	XUK9APANL2	0.190
			M12 connector	XUK9APANM12	0.070
	NPN	PNP	Pre-cabled (L = 2 m) (1)	XUK9ANANL2	0.190
			M12 connector	XUK9ANANM12	0.070
	NC	PNP	Pre-cabled (L = 2 m) (1)	XUK9APBNL2	0.190
			M12 connector	XUK9APBNM12	0.070
NPN	PNP	Pre-cabled (L = 2 m) (1)	XUK9ANBNL2	0.190	
		M12 connector	XUK9ANBNM12	0.070	

DC or AC					
6	NO + NC	Relay	Pre-cabled (L = 2 m) (1)	XUK9ARCNL2	0.190
	Reflector 50 x 50 mm (2)	–	–	XUZC50	0.020

Reflex system					
DC					
7	NO	PNP	Pre-cabled (L = 2 m) (1)	XUK1APANL2	0.070
			M12 connector	XUK1APANM12	0.070
	NPN	PNP	Pre-cabled (L = 2 m) (1)	XUK1ANANL2	0.070
			M12 connector	XUK1ANANM12	0.070
	NC	PNP	Pre-cabled (L = 2 m) (1)	XUK1APBNL2	0.070
			M12 connector	XUK1APBNM12	0.070
NPN	PNP	Pre-cabled (L = 2 m) (1)	XUK1ANBNL2	0.070	
		M12 connector	XUK1ANBNM12	0.070	

AC or DC					
7	NO + NC	Relay	Pre-cabled (L = 2 m) (1)	XUK1ARCNL2	0.175
	Reflector 50 x 50 mm (2)	–	–	XUZC50	0.020

Thru-beam system					
DC					
Transmitter 30	–	–	Pre-cabled (L = 2 m) (1)	XUK2AKSNL2T	0.190
	–	–	M12 connector	XUK2AKSNM12T	0.070
Receiver 30	NO	PNP	Pre-cabled (L = 2 m) (1)	XUK2APANL2R	0.140
			M12 connector	XUK2APANM12R	0.075
	NPN	PNP	Pre-cabled (L = 2 m) (1)	XUK2ANANL2R	0.140
			M12 connector	XUK2ANANM12R	0.075
	NC	PNP	Pre-cabled (L = 2 m) (1)	XUK2APBNL2R	0.140
			M12 connector	XUK2APBNM12R	0.075
NPN	PNP	Pre-cabled (L = 2 m) (1)	XUK2ANBNL2R	0.140	
		M12 connector	XUK2ANBNM12R	0.075	

AC or DC					
Transmitter, 30	–	–	Pre-cabled (L = 2 m) (1)	XUK2ARCNL2T	0.140
Receiver, 30	NO + NC	Relay	Pre-cabled (L = 2 m) (1)	XUK2ARCNL2R	0.070

Fixing accessories (2)					
Description	Reference	Weight kg			
3D fixing kit for use on M12 rod, for XUK or XUZC50	XUZK2003	0.170			
3D fixing kit for use on M12 rod, with protective cover for XUK	XUZK2004	0.270			
M12 rod	XUZ2001	0.050			
Support for M12 rod	XUZ2003	0.150			
Fixing bracket	XUZA51	0.050			

(1) For a 5 m long cable replace L2 by L5; for a 10 m long cable replace L2 by L10. Example: XUK5APANL2 becomes XUK5APANL5 or XUK5APANL10.

For availability, please consult our Customer Care Centre.

(2) For further information, see page 5/158.

Photo-electric sensors

OsiSense XU, general purpose, single mode function

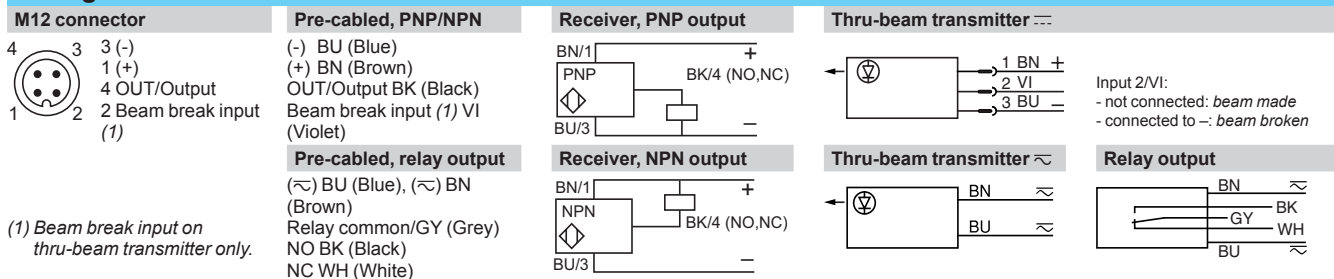
Compact design, 50 x 50

Five-wire AC or DC, 1 CO relay output

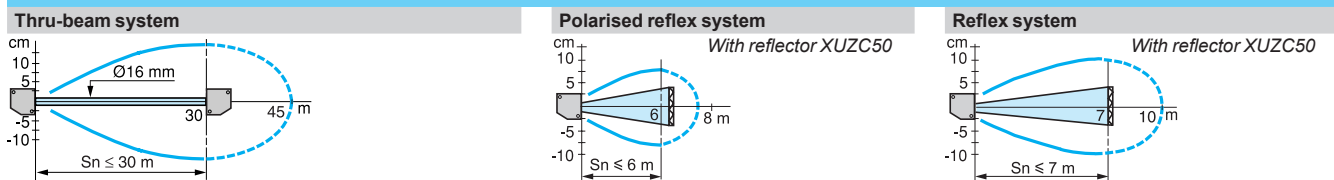
Three-wire DC, solid-state output

Characteristics		XUK●●●●M12	XUK●●●●L2
Sensor type			
Product certifications		UL, CSA, CE	
Connection		M12 connector	Pre-cabled, length: 2 m
Sensing distance nominal S_n / maximum (excess gain = 2) (excess gain = 1)	m	PNP/NPN or relay output 1 / 1.5 diffuse	
	m	PNP/NPN or relay output 6 / 8 polarised reflex	
	m	PNP/NPN or relay output 7 / 10 reflex	
	m	PNP/NPN or relay output 30 / 45 thru-beam	
Type of transmission		Infrared, except polarised reflex (red)	
Degree of protection	Conforming to IEC 60529	IP 65, double insulation II	
Storage temperature		°C - 40...+ 70	
Operating temperature		°C - 25...+ 55	
Materials	Case	PBT	
	Lens	PMMA	
	Cable	-	PVC
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Indicator lights	Output state	Yellow LED (except for XUK2●●●●●T)	
	Supply on	Green LED (only for XUK2●●●●●T)	
Rated supply voltage	PNP/NPN	V 12...24 with protection against reverse polarity	
	Relay output	V -	≈ 24...240
Voltage limits (including ripple)	PNP/NPN	V --- 10...36	
	Relay output	V -	≈ 20...264
Current consumption, no-load	PNP/NPN	mA ≤ 35	
Power consumption	Relay output	W -	≈ 2
Switching capacity	PNP/NPN	mA ≤ 100 with overload and short-circuit protection	
	Relay output	A -	≈ 3
Voltage drop, closed state		V ≤ 1.5	
Maximum switching frequency	PNP/NPN	Hz 250	
Delays	Relay output	Hz -	20
	First-up	ms < 15 (PNP/NPN); < 60 (relay output)	
	Response	ms < 2 (PNP/NPN); < 25 (relay output)	
Recovery	ms < 2 (PNP/NPN); < 25 (relay output)		

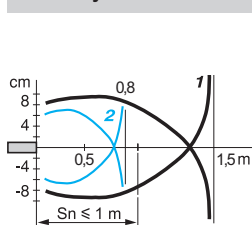
Wiring schemes



Detection curves



Diffuse system



Object: 10 x 10 cm,
1: white 90%, 2: grey 18%

Dimensions

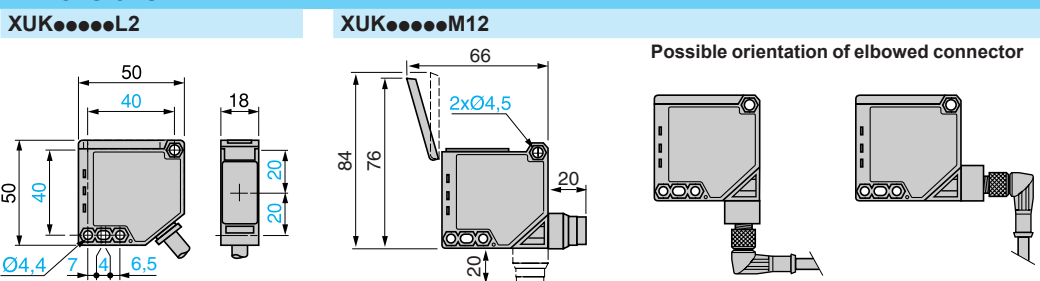


Photo-electric sensors

OsiSense XU, general purpose, multimode function. Compact design 50 x 50

Five-wire AC or DC, 1 CO relay output

Three-wire DC, solid-state output

References

DC

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
0...30 depending on whether accessories are used	NO or NC, by programming	Time delay output	Pre-cabled (L = 2 m) (1) M12 connector	XUK0AKSAL2 XUK0AKSAM12	0.175 0.090

Accessories

Description	Connection	Reference	Weight kg
Transmitter for thru-beam function	Pre-cabled (L = 2 m) (1) M12 connector	XUK0AKSAL2T XUK0AKSAM12T	0.140 0.090
Reflector 50 x 50 mm (2)	–	XUZC50	0.020

AC or DC

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
0...30 depending on whether accessories are used	NO or NC, by programming	Time delay relay	Pre-cabled (L = 2 m) (1)	XUK0ARCTL2	0.175

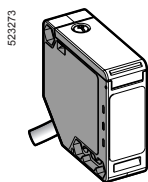
Accessories

Description	Connection	Reference	Weight kg
Transmitter for thru-beam function	Pre-cabled (L = 2 m) (1)	XUK0ARCTL2T	0.140
Reflector 50 x 50 mm (2)	–	XUZC50	0.020

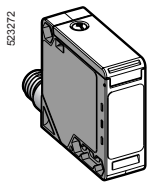
Fixing accessories (2)

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XUK or XUZC50	XUZK2003	0.170
3D fixing kit for use on M12 rod, with protective cover for XUK	XUZK2004	0.270
M12 rod	XUZ2001	0.050
Support for M12 rod	XUZ2003	0.150
Fixing bracket	XUZA51	0.050

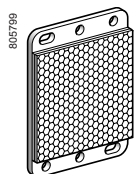
(1) For a 5 m long cable replace L2 by L5; for a 10 m long cable replace L2 by L10.
Example: XUK0AKSAL2 becomes XUK0AKSAL5 or XUK0AKSAL10.
(2) For further information, see page 5/158.



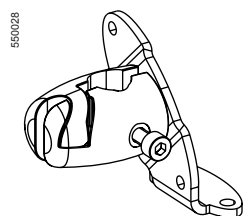
XUK0AKSAL2



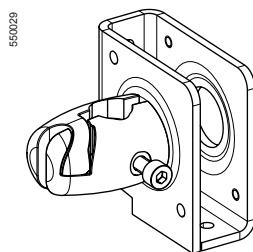
XUK0AKSAM12



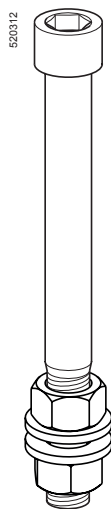
XUZC50



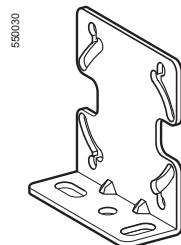
XUZK2003



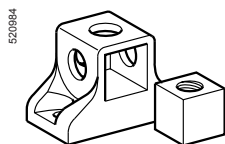
XUZK2004



XUZ2001



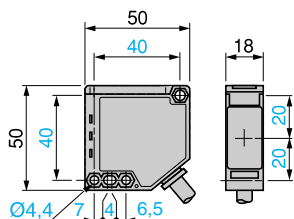
XUZA51



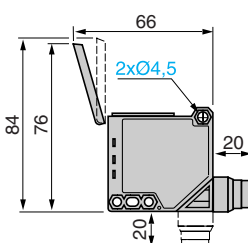
XUZ2003

Dimensions (mm)

XUK0A●●L2



XUK0A●●M12



Possible orientation of elbowed connector

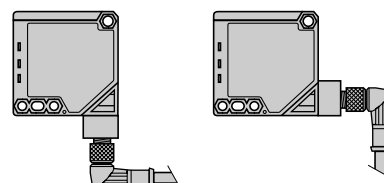


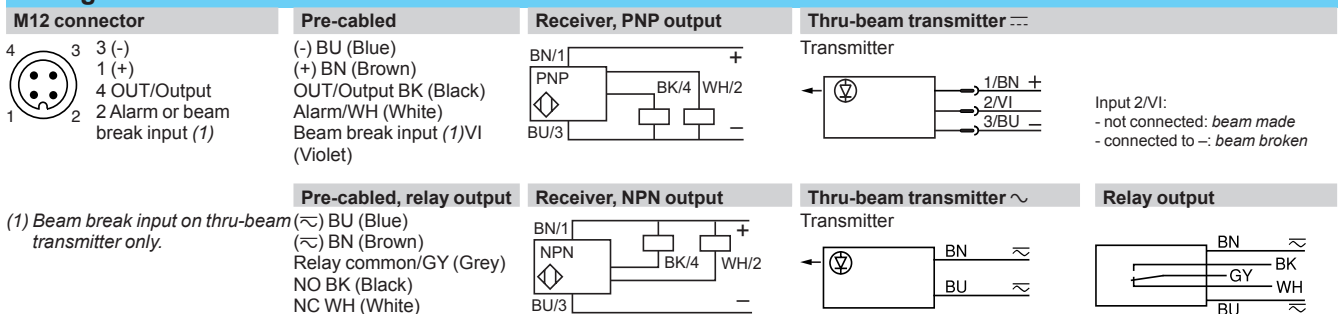
Photo-electric sensors

OsiSense XU, general purpose, multimode function. Compact design 50 x 50
Five-wire AC or DC, 1 CO relay output
Three-wire DC, solid state output

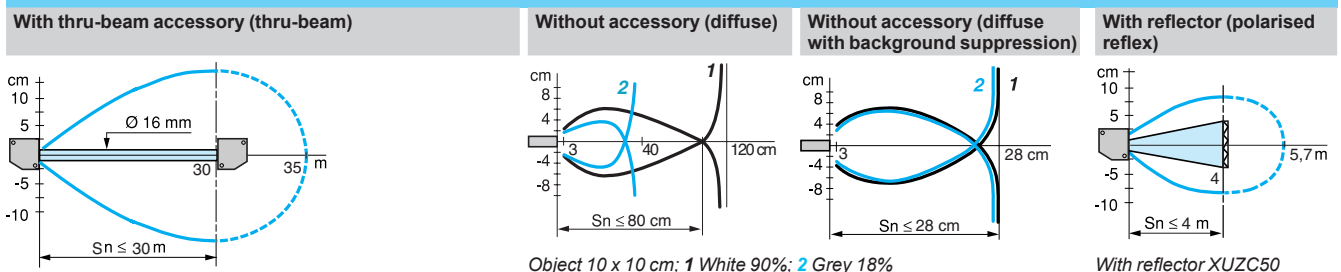
Characteristics

Sensor type		XUK●●●●●M12	XUK●●●●●L2
Product certifications		UL, CSA, CE	
Connection		M12 connector	Pre-cabled, length: 2 m
Sensing distance		m 0.28 / 0.28 without accessory (diffuse with background suppression)	
nominal Sn / maximum		m 0.8 / 1.2 without accessory (diffuse)	
(excess gain = 2) (excess gain = 1)		m 4 / 5.7 with reflector (polarised reflex)	
		m 30 / 35 with transmitter for thru-beam function (thru-beam)	
Type of transmission		Infrared, except polarised reflex (red)	
Degree of protection		Conforming to IEC 60529 IP 65, double insulation □	
Storage temperature		°C -40...+70	
Operating temperature		°C -25...+55	
Materials		Case	PBT
		Lens	PMMA
		Cable	- PvR
Vibration resistance		Conforming to IEC 60068-2-6 7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance		Conforming to IEC 60068-2-27 30 gn, duration 11 ms	
Indicator lights		Output state Yellow LED (transmission present for XUK0●●●●●T)	
		Supply on Green LED	
		Optical alignment aid/dirty Red LED (except for XUK0●●●●●T)	
Alarm output		mA ≤ 50 with overload and short-circuit protection (except XUK0ARCT●)	
Rated supply voltage		PNP/NPN	V 12...24 --- with protection against reverse polarity
		Relay output	V - ≈ 24...240
Voltage limits (including ripple)		PNP/NPN	V 10...36 ---
		Relay output	V - ≈ 20...264
Current consumption, no-load		PNP/NPN	mA ≤ 35; 20 for XUK0AK●●●●T
Power consumption		Relay output	W - 3 ~ or ---
Switching capacity		PNP/NPN	mA ≤ 100 with overload and short-circuit protection
		Relay output	A - 3 ~ or ---
Voltage drop, closed state		V ≤ 1.5	
Time delay		s 0...10 on-delay, off-delay, monostable	
Maximum switching frequency		PNP/NPN	Hz 250 (200 for diffuse with background suppression)
		Relay output	Hz - 20
Delays		First-up	ms < 200 (PNP/NPN); < 300 (relay output)
		Response	ms < 2 (PNP/NPN); < 25 (relay output) (< 2.5 for diffuse with background suppression)
		Recovery	ms < 2 (PNP/NPN); < 25 (relay output) (< 2.5 for diffuse with background suppression)

Wiring schemes



Detection curves



Variation of usable sensing distance Su (without accessory, with adjustable background suppression)

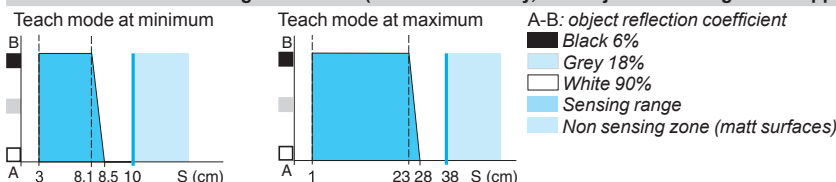


Photo-electric sensors

OsiSense XU, general purpose

With adjustable background suppression

Mechanical display of setting

DC supply. Solid-state output

Compact design



System	Diffuse with adjustable background suppression, long sensing distance with high accuracy (size of object ≥ 2 mm)
Type of transmission	Infrared
Nominal sensing distance (Sn)	1 m

References

3-wire, PNP or NPN programmable	NO or NC programmable function	XUK8AKSNL2	XUK8AKSNM12
Weight (kg)		0.190	0.070

Characteristics

Product certifications	CE, UL, CSA
Ambient air temperature	For operation: - 25... + 55°C. For storage: - 30... + 70°C
Vibration resistance	Conforming to IEC 60068-2-6 7 gn (f = 10...55 Hz)
Shock resistance	Conforming to IEC 60068-2-27 10 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529 IP 65 (IP 30 with cover open). NEMA 4X indoor use, 12 and 13 double insulation
Materials	Case: PC, lenses: PMMA, cable: PVC
Connection (1)	Pre-cabled, diameter 6 mm, length 2 m, wire c.s.a.: 5 x 0.34 mm ² M12 male connector, 4-pin, can be set at 2 positions (suitable female connectors, including pre-wired versions, see page 5/28)
Rated supply voltage	12...24 V $\overline{\text{DC}}$ with protection against reverse polarity
Voltage limits	10...36 V $\overline{\text{DC}}$ (including ripple)
Switching capacity (sealed)	≤ 100 mA with overload and short-circuit protection
Voltage drop, closed state	≤ 1.5 V
Current consumption, no-load	35 mA
Maximum switching frequency	250 Hz
Delays	First-up: ≤ 80 ms; response: ≤ 2 ms; recovery: ≤ 2 ms

Function table	Function	Diffuse system			
		No object present in the beam		Object present in the beam	
Output state (PNP or NPN) indicator: yellow LED (illuminated when sensor output is ON)	NO				
	NC				

(1) For a 10 m long cable replace L2 by L10.

Photo-electric sensors

OsiSense XU, general purpose

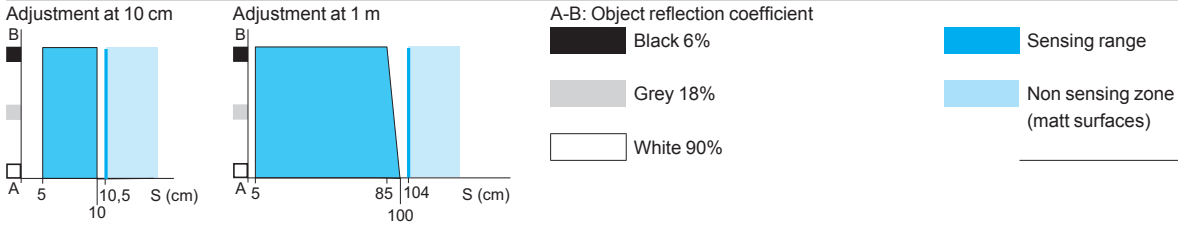
With adjustable background suppression

Mechanical display of setting

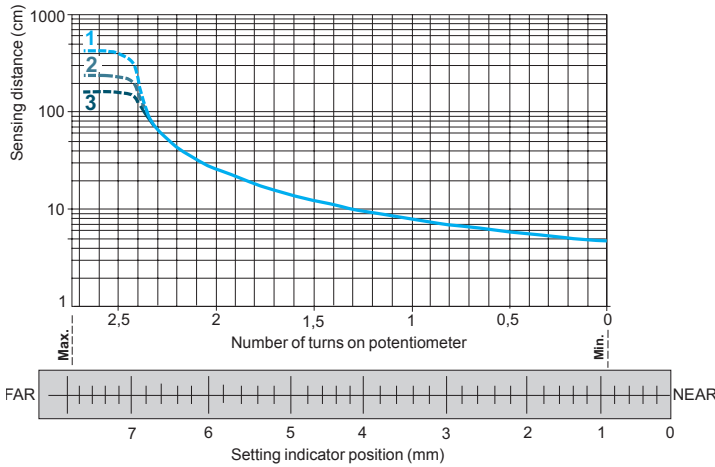
DC supply. Solid-state output

Detection curves

Variation of usable sensing distance S_u

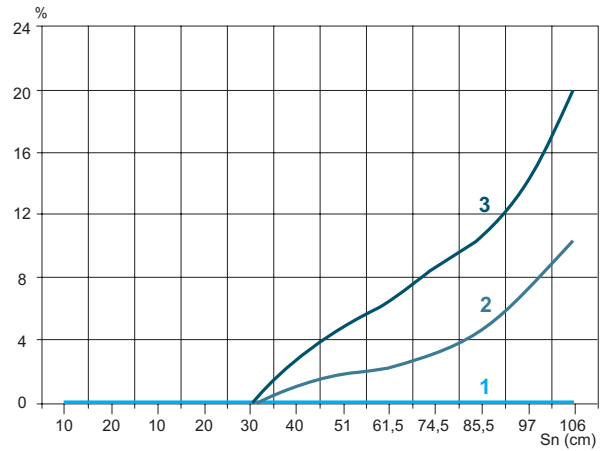


Sensing distance adjustment



- 1 White 90%
- 2 Grey 18%
- 3 Black 6%

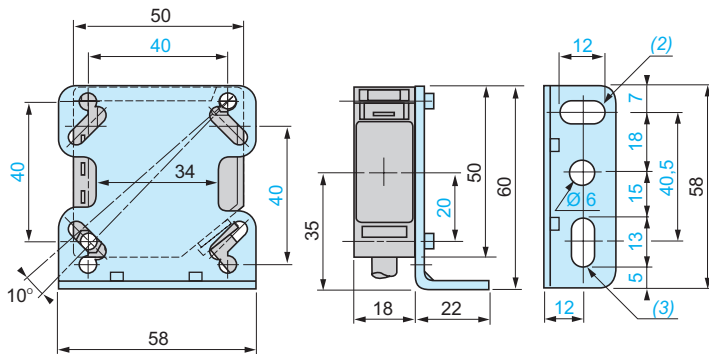
Relative difference in sensing distances according to object colour



- 1 White 90%
- 2 Grey 18%
- 3 Black 6%

Dimensions

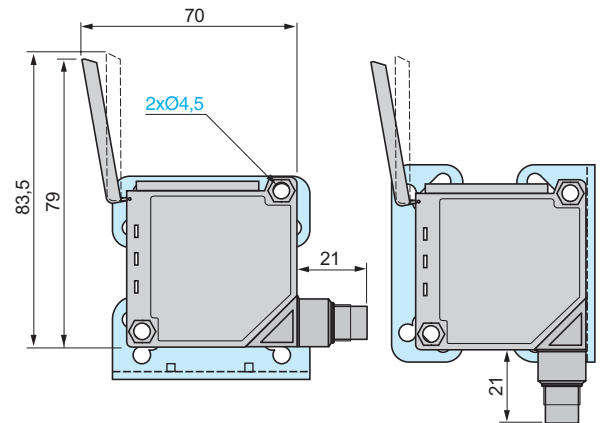
XUK8AKSNL2 (1)



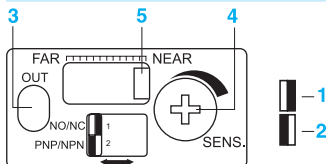
(1) The bracket **XUZA51** is included with the sensor.

(2) 1 elongated hole $\varnothing 6 \times 12$.
(3) 1 elongated hole $\varnothing 6 \times 13$.

XUK8AKSNM12 with cover open (1)



Functions



Switches

- 1 NO/NC programming
- 2 PNP or NPN output

LED

- 3 Yellow LED, output

Potentiometer

- 4 Sensing distance adjustment

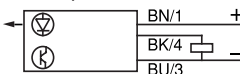
Setting indicator

- 5 Potentiometer setting indication

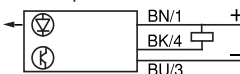
Wiring schemes (3-wire ---)

NO/NC programming

PNP output



NPN output



NO: detection of object presence
NC: detection of object absence

Cable connections

XUK8AKSNL2

- (-) BU (Blue)
- (+) BN (Brown)
- (OUT) BK (Black)

Connector schemes

XUK8AKSNM12

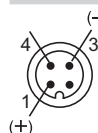


Photo-electric sensors

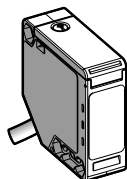
OsiSense XU, general purpose

With adjustable background suppression

Compact design, 50 x 50

Five-wire AC or DC, 1 "C/O" relay output

Compact design



System	Diffuse with adjustable background suppression
Type of transmission	Infrared
Nominal sensing distance (S _n)	0.75 m

References

3-wire, PNP or NPN programmable	NO or NC programmable function	XUK8ARCTL2
Weight (kg)		0.190

Characteristics

Product certifications		CE, UL, CSA
Ambient air temperature		For operation: - 25... + 55°C. For storage: - 30... + 70°C
Vibration resistance	Conforming to IEC 60068-2-6	7 gn (f = 10...55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	10 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 65 double insulation □ (IP 30 with cover open)
Materials		Case: PBT Lenses: PMMA Cable: PVC
Indicator lights	Output state	Yellow LED
	Supply on	Green LED
	Optical alignment aid/dirty	Red LED
Connection		Pre-cabled, diameter 6 mm, length 2 m, wire c.s.a.: 5 x 0.34 mm ²
Rated supply voltage		24...240 V ~ or ---
Voltage limits		20...264 V ~ or --- (including ripple)
Switching capacity		3 A: cos φ = 1 0.5 A: cos φ = 0.4
Voltage drop, closed state		≤ 1.5 V
Power consumption		3 W (~ or ---)
Maximum switching frequency		200 Hz (---); 20 Hz (~)
Time delay		0...15 s: on-delay, off-delay, monostable
Delays		First-up: ≤ 300 ms; response: ≤ 2 ms; recovery: ≤ 2 ms

Function table	Function	Diffuse system			
		No object present in the beam		Object present in the beam	
Output state (PNP or NPN) indicator: yellow LED (illuminated when sensor output is ON)	NO				
	NC				

Photo-electric sensors

OsiSense XU, general purpose

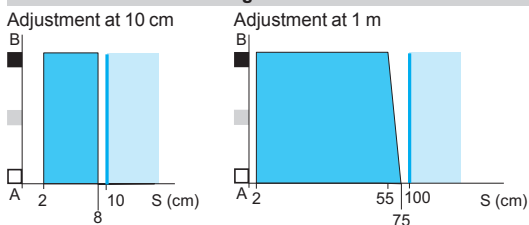
With adjustable background suppression

Compact design, 50 x 50

Five-wire AC or DC, 1 "C/O" relay output

Detection curves

Variation of usable sensing distance S_u



A-B: Object reflection coefficient

Black 6%

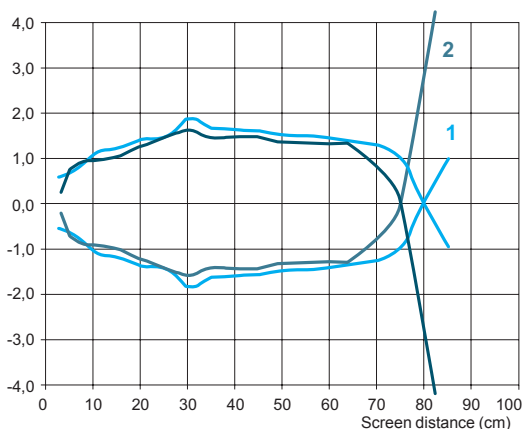
Grey 18%

White 90%

Sensing range

Non sensing zone
(Matt surfaces)

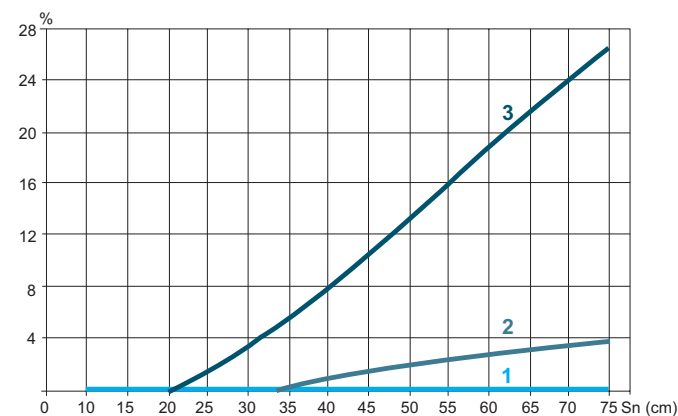
Detection curves



Screen: 20 x 20 cm

- 1 White 90%
- 2 Grey 18%

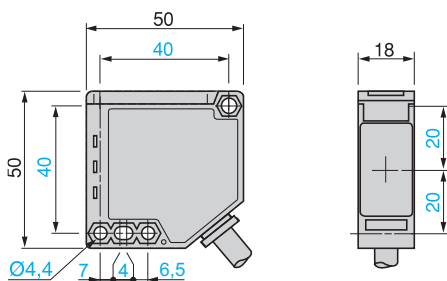
Relative difference in sensing distances according to object colour



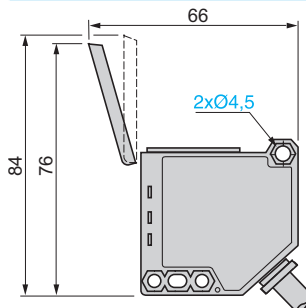
- 1 White 90%
- 2 Grey 18%
- 3 Black 6%

Dimensions

XUK8ARCTL2



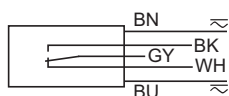
XUK8ARCTL2 with cover open



Connections

Wiring scheme

Cable connection, relay output



⊃ : BU (Blue)

⊃ : BN (Brown)

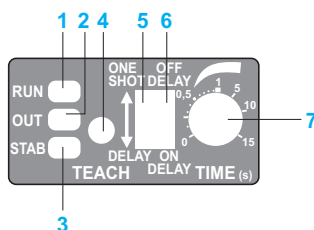
Relay common: GY (Grey)

NO: BK (Black), detection of object

NC: WH (White), detection of object absence

Description

Indicators and settings



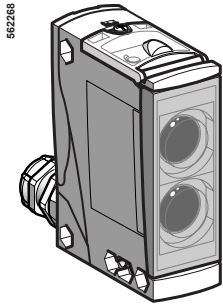
- 1 RUN (Supply on): Green LED
- 2 OUT (Output state): Yellow LED
- 3 STAB (Optical alignment aid/dirty): Red LED
- 4 TEACH: Teach mode button
- 5 ONE SHOT or DELAY (monostable or time delay)
- 6 ON DELAY, OFF DELAY (on-delay, off-delay)
- 7 Time delay potentiometer (0..15 s)

Photo-electric sensors

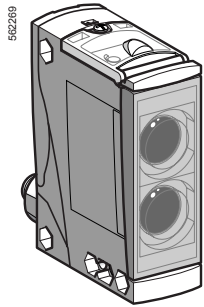
OsiSense XU, general purpose, single mode function. Compact design

Five-wire AC or DC, 1 CO relay output

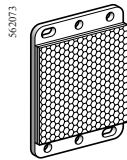
Three-wire DC, solid-state output



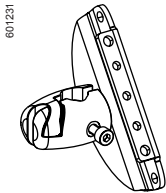
XUX●A●●●T16



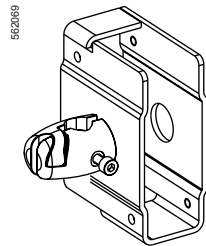
XUX●A●●●M12



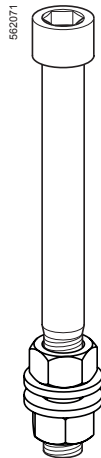
XUZC50



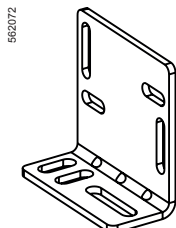
XUZX2003



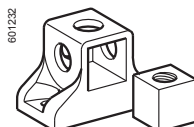
XUZX2004



XUZZ001



XUZX2000



XUZZ003

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
Diffuse system (1)					
DC					
2.1	NO	PNP	Screw terminals (3)	XUX5APANT16	0.200
			M12 connector	XUX5APANM12	0.200
			Screw terminals (3)	XUX5ANANT16	0.200
			M12 connector	XUX5ANANM12	0.200
	NC	PNP	Screw terminals (3)	XUX5APBNT16	0.200
			M12 connector	XUX5APBNM12	0.200
			Screw terminals (3)	XUX5ANBNT16	0.200
			M12 connector	XUX5ANBNM12	0.200

AC or DC					
2.1	NO + NC	Relay	Screw terminals (3)	XUX5ARCNT16	0.200

Polarised reflex system (1)					
DC					
11	NO	PNP	Screw terminals (3)	XUX9APANT16	0.200
			M12 connector	XUX9APANM12	0.200
			Screw terminals (3)	XUX9ANANT16	0.200
			M12 connector	XUX9ANANM12	0.200
	NC	PNP	Screw terminals (3)	XUX9APBNT16	0.200
			M12 connector	XUX9APBNM12	0.200
			Screw terminals (3)	XUX9ANBNT16	0.200
			M12 connector	XUX9ANBNM12	0.200

AC or DC					
11	NO + NC	Relay	Screw terminals (3)	XUX9ARCNT16	0.200
	Reflector 50 x 50 mm (2)	–	–	XUZC50	0.020

Reflex system (1)					
DC					
14	NO	PNP	Screw terminals (3)	XUX1APANT16	0.200
			M12 connector	XUX1APANM12	0.200
			Screw terminals (3)	XUX1ANANT16	0.200
			M12 connector	XUX1ANANM12	0.200
	NC	PNP	Screw terminals (3)	XUX1APBNT16	0.200
			M12 connector	XUX1APBNM12	0.200
			Screw terminals (3)	XUX1ANBNT16	0.200
			M12 connector	XUX1ANBNM12	0.200

AC or DC					
14	NO + NC	Relay	Screw terminals (3)	XUX1ARCNT16	0.200
	Reflector 50 x 50 mm (2)	–	–	XUZC50	0.020

Thru-beam system (1)					
DC					
Transmitter			Screw terminals (3)	XUX0AKSAT16T	0.200
40			M12 connector	XUX0AKSAM12T	0.200
Receiver			Screw terminals (3)	XUX2APANT16R	0.200
40	NO	PNP	M12 connector	XUX2APANM12R	0.200
					Screw terminals (3)
			M12 connector	XUX2ANANM12R	0.200
	NC	PNP	M12 connector	XUX2APBNM12R	0.200
			M12 connector	XUX2ANBNM12R	0.200

AC or DC					
Transmitter			Screw terminals (3)	XUX0ARCTT16T	0.200
40					
Receiver			Screw terminals (3)	XUX2ARCNT16R	0.200
40	NO + NC	Relay			

Fixing accessories (2)			Reference	Weight kg
Description				
3D fixing kit for use on M12 rod, for XUX or XUZC50			XUZX2003	0.220
3D fixing kit for use on M12 rod, with protective cover for XUX			XUZX2004	0.420
M12 rod			XUZZ001	0.050
Support for M12 rod			XUZZ003	0.150
Fixing bracket			XUZX2000	0.120

(1) With adjustable sensitivity.


(2) For further information, see page 5/158.

(3) Screw terminals with ISO 16 cable gland for cable Ø 7 to 10 mm.

Characteristics

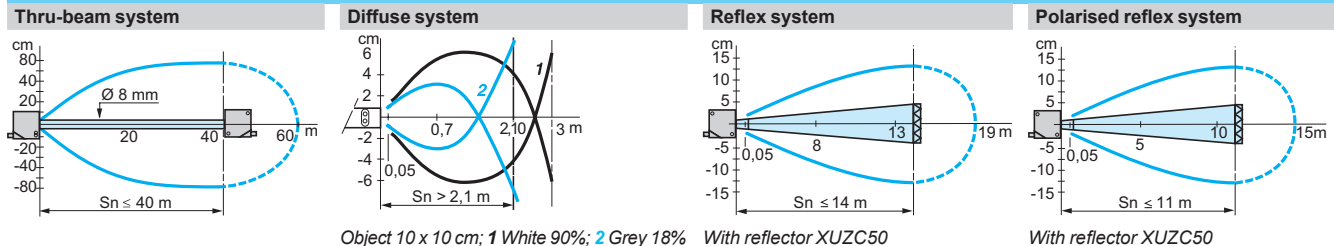
Sensor type		XUX●●●●●M12	XUX●AN●NT16, ●AP●NT16	XUX●ARC●T16
Product certifications		UL, CSA, CE		
Connection		M12 connector	Screw terminals, ISO 16 cable gland	
Sensing distance nominal Sn / maximum (excess gain = 2) (excess gain = 1)		m	2.1 / 3 diffuse with adjustable sensitivity	
		m	11 / 15 polarised reflex with adjustable sensitivity (with reflector XUZC50)	
		m	14 / 19 reflex with adjustable sensitivity	
		m	40 / 60 thru-beam with adjustable sensitivity	
Type of transmission		Infrared, except polarised reflex (red)		
Degree of protection		Conforming to IEC 60529 IP 65, IP 67, double insulation □		
Storage temperature		°C -40...+70		
Operating temperature		°C -25...+55		
Materials		Case	PBT	
		Lens	PMMA	
Vibration resistance		Conforming to IEC 60068-2-6 7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)		
Shock resistance		Conforming to IEC 60068-2-27 30 gn, duration 11 ms		
Indicator lights		Output state	Yellow LED (transmission present for XUX0●●●●●●T ---)	
		Supply on	Green LED	
		Instability	Red LED (for XUX9ARCNT16)	
Rated supply voltage		PNP/NPN	V 12...24 with protection against reverse polarity	
		Relay output	V -	24...240 ~ or ---
Voltage limits (including ripple)		PNP/NPN	V -	
		Relay output	V -	20...264 ~ or ---
Current consumption, no-load		PNP/NPN	mA ≤ 35 (20 for XUX0●●●●●●T)	
Power consumption		Relay output	W -	
			2 ~ or ---	
Switching capacity		PNP/NPN	mA ≤ 100 with overload and short-circuit protection	
		Relay output	A -	500 000 operating cycles 3 A: cos φ = 1/0.5 A: cos φ = 0.4
Voltage drop, closed state		V ≤ 1.5		
Maximum switching frequency		PNP/NPN	Hz 250	
		Relay output	Hz -	
			20	
Delays		First-up	ms < 15 (PNP/NPN); < 60 (relay output)	
		Response	ms < 2 (PNP/NPN); < 25 (relay output)	
		Recovery	ms < 2 (PNP/NPN); < 25 (relay output)	

Wiring schemes

M12 connector	Relay output ~	PNP/NPN ---	Transmitter ---	Transmitter ~
Terminals	Terminals	M12 Terminals	M12 Terminals	Terminals
 <p>1 ⊗ -</p> <p>2 ⊗ -</p> <p>3 ⊗ NO</p> <p>4 ⊗ Relay common</p> <p>5 ⊗ NC</p>	<p>1 ⊗ ~</p> <p>2 ⊗ ~</p> <p>3 ⊗ NO</p> <p>4 ⊗ Relay common</p> <p>5 ⊗ NC</p>	<p>1 ● 1 ⊗ +</p> <p>3 ● 2 ⊗ -</p> <p>4 ● 3 ⊗ Output</p>	<p>1 ● 1 ⊗ +</p> <p>3 ● 2 ⊗ -</p> <p>2 ● 3 ⊗ Beam break input (1)</p> <p>(1) Input not connected: beam made. Input connected to -: beam broken.</p>	<p>1 ⊗ ~</p> <p>2 ⊗ ~</p>

Maximum permissible conductor c.s.a.: 1 x 1.5 mm² or 1 x 0.75 mm² with cable end.

Detection curves



Dimensions

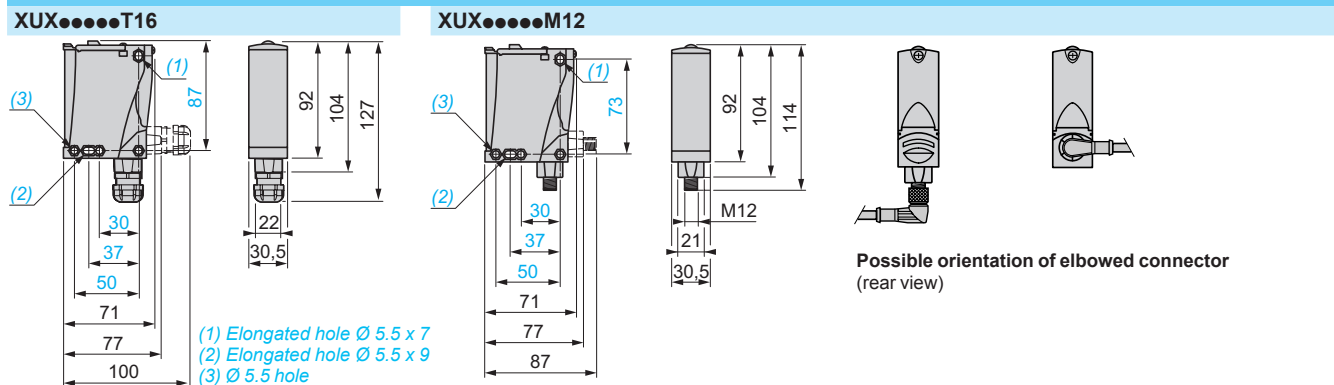


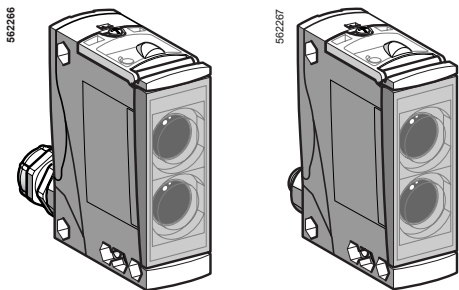
Photo-electric sensors

OsiSense XU, general purpose, multimode function ⁽¹⁾

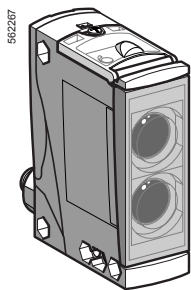
Compact design

Five-wire AC or DC, 1 CO relay output

Three-wire DC, solid-state output



XUX0ARCTT16



XUX0AKSAM12

References

DC					
Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
0...40 depending on whether accessories are used	NO or NC, by programming	PNP/NPN	Screw terminals, ISO 16 cable gland (3) M12 connector	XUX0AKSAT16 XUX0AKSAM12	0.200 0.200

Accessories			
Description	Connection	Reference	Weight kg
Transmitter for thru-beam function	Screw terminals, ISO 16 cable gland (3) M12 connector	XUX0AKSAT16T XUX0AKSAM12T	0.200 0.200

Reflector 50 x 50 mm	-	-	XUZC50	0.020
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AC or DC

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
0...40 depending on whether accessories are used	NO or NC, by programming	Time delay relay	Screw terminals, ISO 16 cable gland (3)	XUX0ARCTT16	0.200

Accessories			
Description	Connection	Reference	Weight kg
Transmitter for thru-beam function	Screw terminals, ISO 16 cable gland (3)	XUX0ARCTT16T	0.200

Reflector 50 x 50 mm	-	-	XUZC50	0.020
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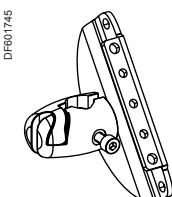
Fixing accessories (2)

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XUX or XUZC50	XUZX2003	0.220
3D fixing kit for use on M12 rod, with protective cover for XUX	XUZX2004	0.420
M12 rod	XUZ2001	0.050
Support for M12 rod	XUZ2003	0.150
Fixing bracket	XUZX2000	0.120
Adaptor, ISO 16 - 1/2" NPT	XUZX2001	0.050
Adaptor, ISO 16 - ISO 20	XUZX2002	0.050

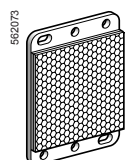
(1) For further information on the multimode function, see page 5/14.

(2) For further information, see page 5/158.

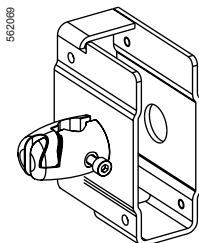
(3) For Ø 7 to 10 mm cable.



XUZC50



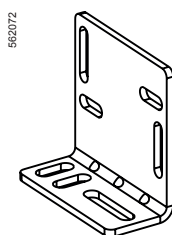
XUZC50



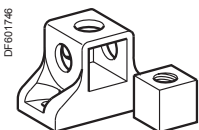
XUZ2003



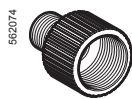
XUZ2001



XUZ2000



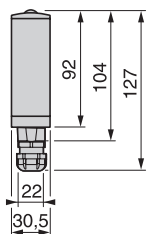
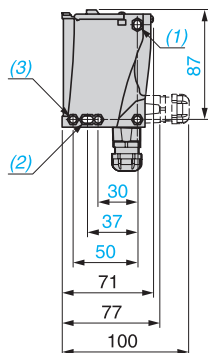
XUZ2002



XUZ2001

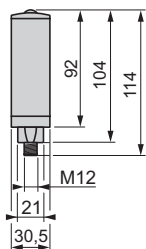
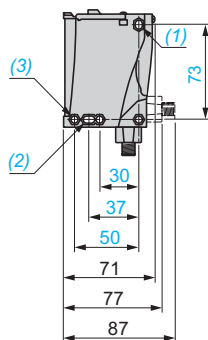
Dimensions

XUX●●●●●T16



(1) Elongated hole Ø 5.5 x 7
(2) Elongated hole Ø 5.5 x 9
(3) Ø 5.5 hole

XUX●●●●●M12



Possible orientation of elbowed connector (rear view)

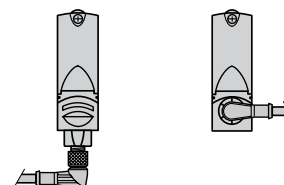


Photo-electric sensors

OsiSense XU, general purpose, multimode function


Compact design

Five-wire AC or DC, 1 CO relay output

Three-wire DC, solid-state output

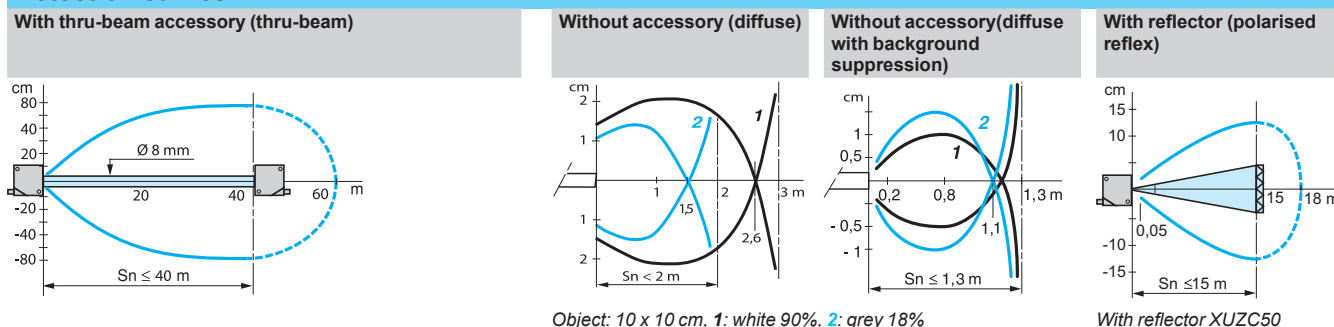
Characteristics		XUX●●●●●M12	XUX●●●●●T16
Sensor type		XUX●●●●●M12	
Product certifications		UL, CSA, CE	
Connection		M12 connector	Screw terminals, ISO 16 cable gland
Sensing distance		m 1.3 / 1.3 without accessory (diffuse with background suppression)	
nominal S_n / maximum		m 2 / 3 without accessory (diffuse)	
(excess gain = 2) (excess gain = 1)		m 15 / 18 with reflector (polarised reflex)	
		m 40 / 60 with transmitter for thru-beam function (thru-beam)	
Type of transmission		Infrared, except for polarised reflex (red)	
Degree of protection	Conforming to IEC 60529	IP 65, IP 67, double insulation \square	
Storage temperature		°C -40...+70	
Operating temperature		°C -25...+55	
Materials	Case	PBT	
	Lens	PMMA	
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm ($f = 10$ to 55 Hz)	
Shock resistance	Conforming to IEC 60067-2-27	30 gn, duration 11 ms	
Indicator lights	Output state	Yellow LED (transmission present for XUX0●●●●●T)	
	Supply on	Green LED	
	Stability	Red LED (except for XUX0●●●●●T)	
Rated supply voltage	PNP/NPN	V $\bar{\bar{}}$ 12...24 with protection against reverse polarity	
	Relay output	V -	24...240 \sim or $\bar{\bar{}}$
Voltage limits	PNP/NPN	V $\bar{\bar{}}$ 10...36	
(including ripple)	Relay output	V -	20...264 \sim or $\bar{\bar{}}$
Current consumption, no-load	PNP/NPN	mA ≤ 35 (20 for XUX0●●●●●T)	
Power consumption	Relay output	W -	2 \sim or $\bar{\bar{}}$
Alarm output		mA ≤ 100 with overload and short-circuit protection	
Switching capacity	PNP/NPN	mA ≤ 100 with overload and short-circuit protection	
	Relay output	A -	500 000 operating cycles 3 A: $\cos \varphi = 1/0.5$ A: $\cos \varphi = 0.4$
Voltage drop, closed state		V ≤ 1.5	
Maximum switching frequency	PNP/NPN	Hz 240	
	Relay output	Hz -	20
Time delay	Relay output	s -	0.02...15 on-delay, off-delay, monostable
Delays	First-up	ms < 200	
	Response	ms < 2 (PNP/NPN); < 25 (relay output)	
	Recovery	ms < 2 (PNP/NPN); < 25 (relay output)	

Wiring schemes

M12 connector	Relay output $\bar{\sim}$	PNP/NPN $\bar{\bar{}}$	Transmitter $\bar{\bar{}}$	Transmitter $\bar{\sim}$
	Terminals	M12 Terminals	M12 Terminals	Terminals
	1 $\bar{\sim}$	1 ● 1 $\bar{\bar{}}$ +	1 ● 1 $\bar{\bar{}}$ +	1 $\bar{\sim}$
	2 $\bar{\sim}$	3 ● 2 $\bar{\bar{}}$ -	3 ● 2 $\bar{\bar{}}$ -	2 $\bar{\sim}$
	3 NO	4 ● 3 Output	2 ● 3 Beam break input (1)	
	4 Relay common	2 ● 4 Alarm	(1) Input not connected: beam made. Input connected to -: beam broken.	
	5 NC			

Maximum permissible conductor c.s.a.: 1 x 1.5 mm² or 1 x 0.75 mm² with cable end.

Detection curves



Variation of usable sensing distance S_u (without accessory, with adjustable background suppression)

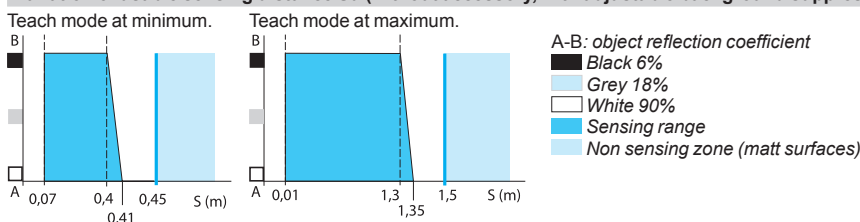


Photo-electric sensors

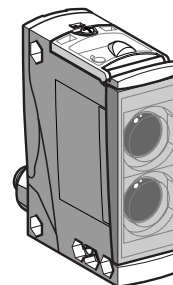
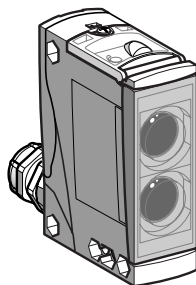
OsiSense XU, general purpose

With adjustable background suppression

Five-wire AC or DC, 1 CO relay output

Three-wire DC, solid-state output

Compact design



System	Diffuse with adjustable background suppression, long sensing distance with high accuracy
Type of transmission	Infrared
Nominal sensing distance (Sn)	2 m

References

5-wire, AC/DC with terminal connections and ISO 16 cable gland	NO or NC programmable function	XUX8ARCTT16	-	
3-wire, PNP or NPN programmable	NO or NC programmable function	-	XUX8AKSAT16	XUX8AKSAM12
Weight (kg)		0.200	0.200	0.200

Characteristics

Product certifications		CE, UL, CSA
Ambient air temperature		For operation: - 25...+ 55 °C. For storage: - 40...+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6	7 gn (f = 10...55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	10 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 65, IP 67, double insulation (IP 30 with cover open)
Materials		Case: PC, lenses: PMMA
Connection		Terminal connections via ISO 16 cable gland (7 to 10 mm cable) M12 male connector, 4-pin, can be set at 2 positions
Rated supply voltage		~ or - 24...240 V = 12...24 V with protection against reverse polarity
Voltage limits		~ or - 20...264 V (including ripple) = 10...0.36V (including ripple)
Switching capacity (sealed)	Relay output	500 000 operating cycles; 3A Cos φ = 1; 0.5 A Cos φ = 0.4
	PNP/NPN	- ≤ 100 mA with overload and short-circuit protection
Indicator light	Output state	Yellow LED
	Supply on	Green LED
	Stability	Red LED
Voltage drop, closed state		≤ 1.5 V
Current consumption, no-load		35 mA
Maximum switching frequency	Relay output	20 Hz
	PNP/NPN	- 150 Hz
Time delay	Relay output	0.02...15 s monostable, on delay or off-delay
Delays	Relay output	First-up: ≤ 200 ms; response: ≤ 25 ms; recovery: ≤ 25 ms
	PNP/NPN	- First-up: ≤ 200 ms; response: ≤ 3.5 ms; recovery: ≤ 2.5 ms

Function table	Function	Diffuse system			
		No object present in the beam		Object present in the beam	
Output state (PNP or NPN) indicator: yellow LED (illuminated when sensor output is ON)	NO				
	NC				

Photo-electric sensors

OsiSense XU, general purpose

With adjustable background suppression

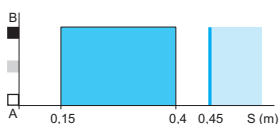
Five-wire AC or DC, 1 CO relay output

Three-wire DC, solid-state output

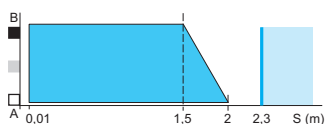
Detection curves

Variation of usable sensing distance S_u

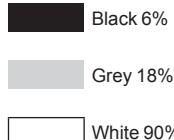
Teach mode at minimum



Teach mode at maximum



A-B: Object reflection coefficient

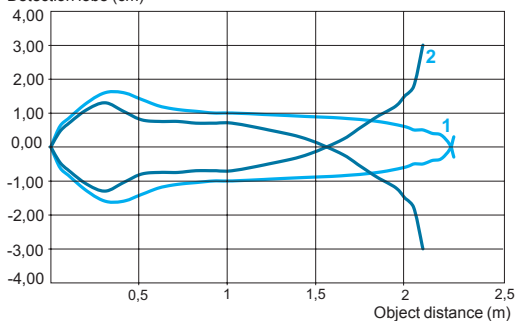


Sensing range

Non sensing zone (Matt surfaces)

Detection curves

Detection lobe (cm)

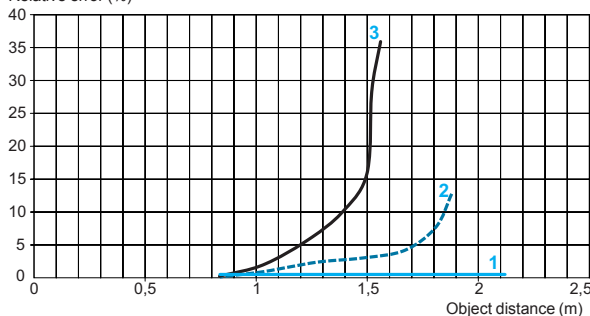


Object: 10 x 10 cm

- 1 white 90%
- 2 grey 18%

Relative difference in sensing distances according to object colour

Relative error (%)

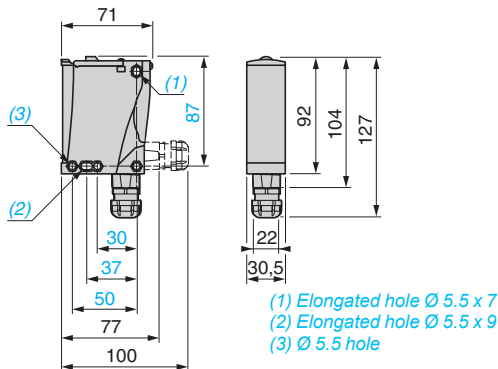


Object: 10 x 10 cm

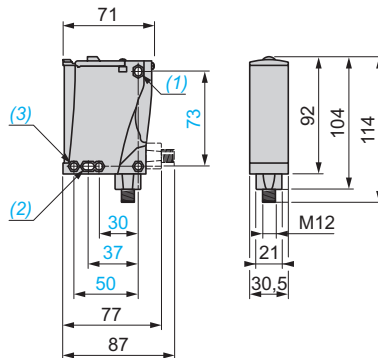
- 1 white 90%
- 2 grey 18%
- 3 black 6%

Dimensions

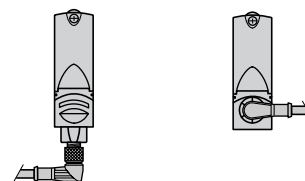
XUX●●●●T16



XUX●●●●M12



Possible orientation of elbowed connector (rear view)



Wiring schemes

M12 connector



Relay output \sim

Terminals

- 1 \varnothing \sim
- 2 \varnothing \sim
- 3 \varnothing NO
- 4 \varnothing Relay common
- 5 \varnothing NC

PNP/NPN ---

M12 Terminals

- 1 ● 1 \varnothing +
- 3 ● 2 \varnothing -
- 4 ● 3 \varnothing Output
- 2 ● 4 \varnothing Alarm inactive

Maximum permissible conductor c.s.a.: 1 x 1.5 mm² or 1 x 0.75 mm² with cable end.

Typical application

Wrapping system/outer wrapping

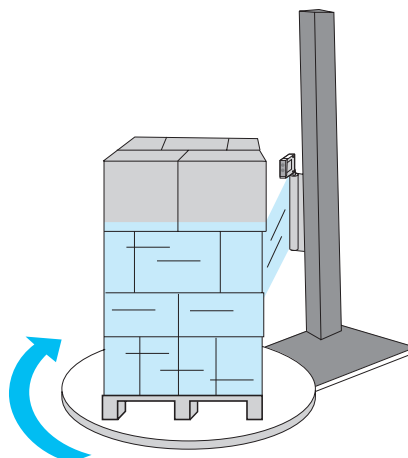
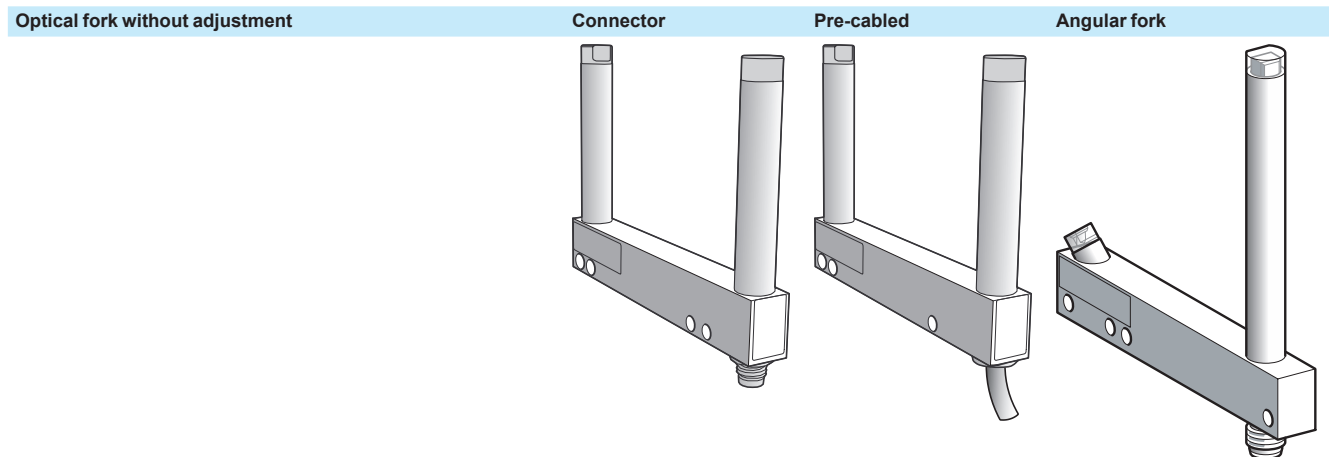


Photo-electric sensors

OsiSense XU

Optical fork without adjustment

DC supply. Solid-state output



System	Thru-beam		
Type of transmission	Red LED, modulated		
Nominal sensing distance (Sn)	2...180 mm		
Minimum size of object detected	Passageway 2...120 mm	0.8 mm	1.2 mm
	Passageway ≥ 150 mm	1 mm	1.5 mm
Fork type	XUVR●		XUVA●

References of forks type XUVR●

3-wire NO or NC function PNP or NPN output	Passageway (A)	Function	Output	Pre-cabled, length 2 m. Depth (B): 40 mm
<p>A = Passageway B = Depth</p>	30 mm	NO	PNP	XUVR0303PANL2
	50 mm	NO	PNP	M8 connector, 3-pin. Depth (B): 60 mm
			NPN	XUVR0605PANM8
		NC	PNP	XUVR0605PBNM8
			NPN	XUVR0605NBNM8
	80 mm	NO	PNP	XUVR0608PANM8
			NPN	XUVR0608NANM8
		NC	PNP	XUVR0608PBNM8
			NPN	XUVR0608NBNM8
	120 mm	NO	PNP	M8 connector, 3-pin. Depth (B): 120 mm
			NPN	XUVR1212PANM8
			NC	PNP
NPN				XUVR1212NBNM8
180 mm		NO	PNP	XUVR1218PANM8
			NPN	XUVR1218NANM8
		NC	PNP	XUVR1218PBNM8
			NPN	XUVR1218NBNM8

Weight (kg)	0.080 to 0.190 depending on model
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References of forks type XUVA●

3-wire NO function, PNP output	Type	Function	Output	M8 connector, 3-pin
<p>A = Passageway</p>	50 mm	NO	PNP	XUVA0505PANM8
	80 mm	NO	PNP	XUVA0808PANM8
	120 mm	NO	PNP	XUVA1212PANM8
	150 mm	NO	PNP	XUVA1515PANM8

Weight (kg)	0.100 to 0.195 depending on model
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Other versions: please consult our Customer Care Centre.

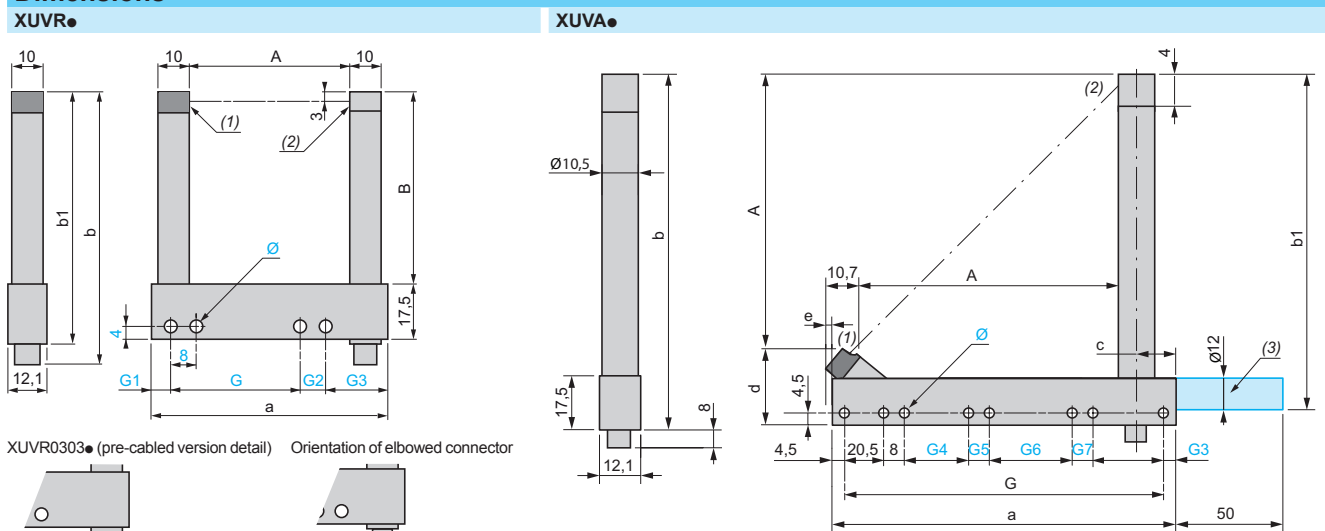
Applications: detection on conveyor, detection on vibrating rail.

Accessories

Description	Details	Length of cable	Reference	Weight kg
Pre-wired M8 connector	Straight	2 m	XZCP0566L2	0.060
	Elbowed (90°)	2 m	XZCP0666L2	0.060
	Straight	5 m	XZCP0566L5	0.120
	Elbowed (90°)	5 m	XZCP0666L5	0.120

Characteristics		XUVR●	XUVA
Product certifications		CE, UL, CSA	CE
Ambient air temperature	For operation	- 10...+ 60 °C	
	For storage	- 40...+ 80 °C	
Degree of protection	Conforming to IEC 60529	IP 65 and IP 67	
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 0.75 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Materials	Case	Painted aluminium and polyamide	
Rated supply voltage		12...24 V with protection against reverse polarity	
Voltage limits (including ripple)		10...30 V	
Immunity to ambient light	Natural light	10 000 lux	
	Incandescent bulb	5000 lux	
Switching capacity		100 mA with overload and short-circuit protection	
Voltage drop, closed state		< 1.5 V	
Current consumption, no-load		< 20 mA	
Maximum switching frequency		4000 Hz	
Delays	First-up	140 ms max.	
	Stability	± 15 µs	
Indicator lights	Yellow LED	Output signal	

Dimensions

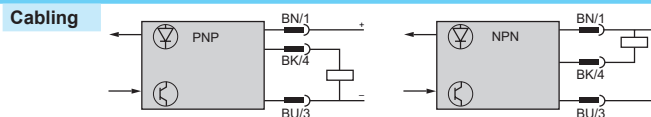
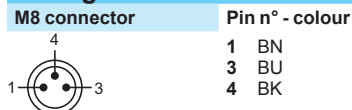


(1) Transmission LED - (2) Yellow LED: output signal

Type XUVR	Passageway A	Depth B	a	b	b1	G	G1	G2	G3	Ø
XUVR0303●●●●●	30	40	54	65.7	57.5	30	17	-	-	4 x 4.3
XUVR0605●●●●●	50	60	74	85.7	77.5	40	6.5	8	19.5	4 x 4.3
XUVR0608●●●●●	80	60	104	85.7	77.5	70	6.5	8	19.5	4 x 4.3
XUVR01212●●●●●	120	124.3	144	150.2	142	100	17	10	17	4 x 4.3
XUVR01218●●●●●	180	124.3	204	150.2	142	152	22	8	22	4 x 4.3

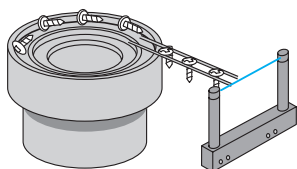
Type XUVA	Type	Depth A	a	b	b1	G	G1	G2	G3	Ø	G4	G5	G6	G7	c
XUVA0505●●●●●	50	44.3	75	83	75	66	-	-	4.5	4 x 4.3	-	-	-	-	14.75
XUVA0808●●●●●	80	74.3	105	113	105	96	-	-	4.5	4 x 4.3	-	-	-	-	14.75
XUVA1212●●●●●	120	112.3	145	154	146	136	-	-	4.5	4 x 4.3	-	-	-	-	19.75
XUVA1515●●●●●	150	142.3	175	184	176	166	-	-	4.5	8 x 4.3	24	8	60	8	19.75

Wiring schemes

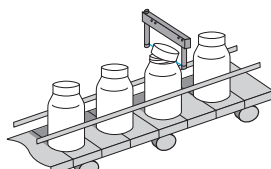


Application examples

Vibrating bowl



Monitoring height of objects passing on a conveyor



Detecting position of object on a conveyor

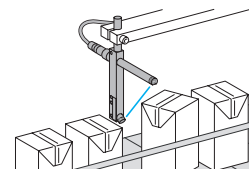


Photo-electric sensors

OsiSense XU Application

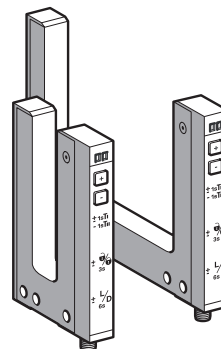
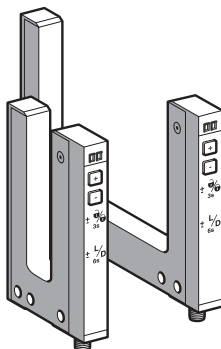
Optical fork with teach mode

DC supply. Solid-state output

Optical fork with teach mode

+/- numeric potentiometer mode
Green keypad

Teach mode
Yellow keypad



System	Thru-beam
Type of transmission	Infrared LED, modulated
Nominal sensing distance (Sn)	2...120 mm
Minimum size of object detected Passageway 2...120 mm	0.2 mm
Fork type	XUYFNEP● XUYFANEP●

References

4-wire, PNP/NPN independent outputs	NO/NC function, selectable	Passageway (A)	Depth (B)			Depth (B)		
		mm	42	59	95	42	59	95
<p>A = Passageway B = Depth</p>		2	XUY FNEP40002	XUY FNEP60002	XUY FNEP100002	XUY FANEP40002	XUY FANEP60002	XUY FANEP100002
		5	XUY FNEP40005	XUY FNEP60005	XUY FNEP100005	XUY FANEP40005	XUY FANEP60005	XUY FANEP100005
		15	XUY FNEP40015	XUY FNEP60015	XUY FNEP100015	XUY FANEP40015	XUY FANEP60015	XUY FANEP100015
		30	XUY FNEP40030	XUY FNEP60030	XUY FNEP100030	XUY FANEP40030	XUY FANEP60030	XUY FANEP100030
		50	XUY FNEP40050	XUY FNEP60050	XUY FNEP100050	XUY FANEP40050	XUY FANEP60050	XUY FANEP100050
		80	XUY FNEP40080	XUY FNEP60080	XUY FNEP100080	XUY FANEP40080	XUY FANEP60080	XUY FANEP100080
	120	XUY FNEP40120	XUY FNEP60120	XUY FNEP100120	XUY FANEP40120	XUY FANEP60120	XUY FANEP100120	

Weight (kg) 0.055 to 0.128 depending on model

Characteristics

Product certifications		CE, cULus. This product is UL Listed if supplied by a class II or isolated supply delivering c 30 V max. (isolated transformer for example) and protected by a UL fuse rated at 3 A max.
Ambient air temperature	For operation	- 20...+ 60 °C
	For storage	- 30...+ 80 °C
Degree of protection	Conforming to IEC 60529	IP 65
Connection		M8, 4-pin male connector (for 3-pin version please consult our Customer Care Centre)
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 0.75 mm (f = 10 to 55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms
Materials	Case	Painted aluminium and polyamide/glass
Rated supply voltage		12...24 V with protection against reverse polarity
Voltage limits (including ripple)		10...30 V
Immunity to ambient light	Natural light	10 000 lux
	Incandescent bulb	5000 lux
Outputs	PNP and NPN	By independent wire
	NO/NC	By programming
Switching capacity		100 mA with overload and short-circuit protection
Voltage drop, closed state		< 2 V
Current consumption, no-load		40 mA
Permissible capacitive load		330 nF
Maximum switching frequency		10 kHz
Response time	Stability	+/- 20 µs
Indicator lights	Yellow LED	Output signal
	Red LED	Adjustment mode and keypad locking

Application: Detection of labels, detection of double sheet, detection of reference marks, detection on conveyor, detection on vibrating rail.

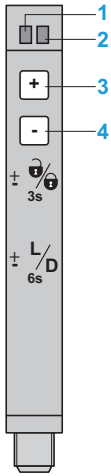
Accessories

Description	Details	Length of cable (m)	References	Weight kg
Pre-wired M8 connector	Straight	2	XZCP0941L2	0.080
	Elbowed (90°)	2	XZCP1041L2	0.080
	Straight	5	XZCP0941L5	0.180
	Elbowed (90°)	5	XZCP1041L5	0.180

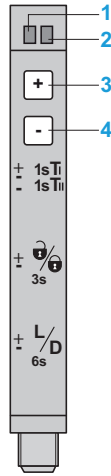
Presentation

XUYFNEP●●●

XUYFANEP●●●



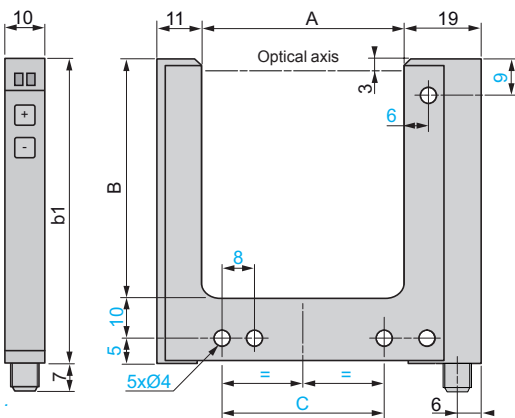
- 1 Yellow LED "ON":
Output activated
- 2 Red LED "ON":
Adjustments and keypad
locking
- 3, 4 Sensitivity adjustment
- 3 + 4 Keypad locking
(3 s ≤ press time < 6 s)
- 3 + 4 NO/NC (press time ≥ 6 s)



- 1 Yellow LED "ON":
Output activated
- 2 Red LED "ON":
Adjustments and keypad locking
- 3, 4 Sensitivity adjustment
- 3 + 4 Teach mode and automatic adjustment of sensitivity
(press time < 3 seconds)
- 3 + 4 Keypad locking (3 s ≤ press time < 6 s)
- 3 + 4 NO/NC (press time ≥ 6 s)

Dimensions

XUYFNEP●●● / XUYFANEP●●●



XUY	Passageway		Depth	
	A	B	b1	C
FNEP/FANEP●002	2	42, 59, 95	57, 74, 110	14
FNEP/FANEP●005	5	42, 59, 95	57, 74, 110	14
FNEP/FANEP●015	15	42, 59, 95	57, 74, 110	27
FNEP/FANEP●030	30	42, 59, 95	57, 74, 110	42
FNEP/FANEP●050	50	42, 59, 95	57, 74, 110	40
FNEP/FANEP●080	80	42, 59, 95	57, 74, 110	70
FNEP/FANEP●120	120	42, 59, 95	57, 74, 110	110

Wiring schemes

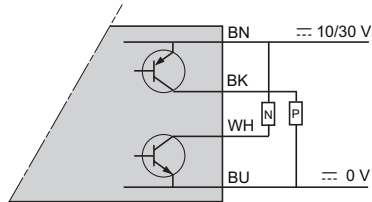
Cabling



Pin n° - colour

- 1 BN: Brown
- 2 WH: White
- 3 BU: Blue
- 4 BK: Black

M8 connector



Application examples

Green keypad: Potentiometer mode

Yellow keypad: Teach mode

Detection of labels on belt

Detection of sheet feed on printing machine

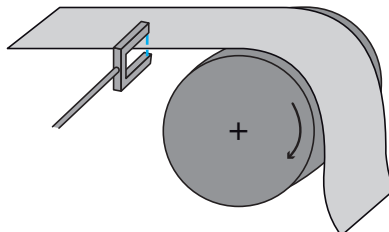
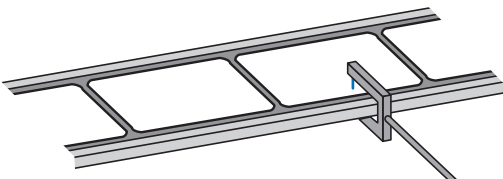
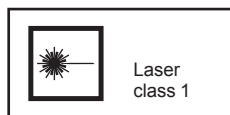


Photo-electric sensors

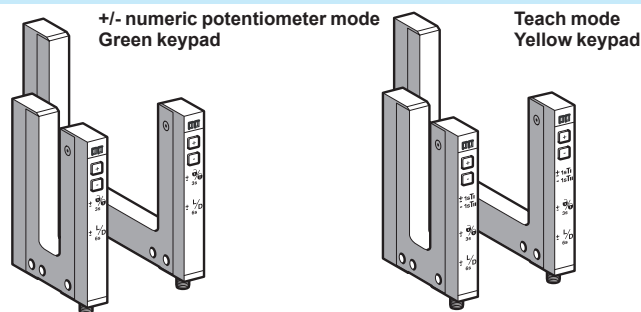
OsiSense XU Application

Optical fork with laser transmission, with teach mode
DC supply. Solid-state output

High sensitivity fork range



Laser class 1, conforming to IEC 60825-1



System	Thru-beam
Type of transmission	Red laser, modulated, class 1, wavelength: 670 m
Nominal sensing distance (Sn)	2...120 mm
Minimum size of object detected	Passageway 2...120 mm 0.05 mm (repeat accuracy 0.01 mm)
Fork type	XUYFLNEP● XUYFALNEP●

References

4-wire, PNP/NPN independent outputs	NO/NC function, selectable	Passageway (A) mm	Depth (B)			Depth (B)		
			42	59	95	42	59	95
<p>A = Passageway B = Depth</p>		2	XUY FLNEP40002	XUY FLNEP60002	XUY FLNEP100002	XUY FALNEP40002	XUY FALNEP60002	XUY FALNEP100002
		5	XUY FLNEP40005	XUY FLNEP60005	XUY FLNEP100005	XUY FALNEP40005	XUY FALNEP60005	XUY FALNEP100005
		15	XUY FLNEP40015	XUY FLNEP60015	XUY FLNEP100015	XUY FALNEP40015	XUY FALNEP60015	XUY FALNEP100015
		30	XUY FLNEP40030	XUY FLNEP60030	XUY FLNEP100030	XUY FALNEP40030	XUY FALNEP60030	XUY FALNEP100030
		50	XUY FLNEP40050	XUY FLNEP60050	XUY FLNEP100050	XUY FALNEP40050	XUY FALNEP60050	XUY FALNEP100050
		80	XUY FLNEP40080	XUY FLNEP60080	XUY FLNEP100080	XUY FALNEP40080	XUY FALNEP60080	XUY FALNEP100080
		120	XUY FLNEP40120	XUY FLNEP60120	XUY FLNEP100120	XUY FALNEP40120	XUY FALNEP60120	XUY FALNEP100120

Weight (kg) 0.055 to 0.128 depending on model

Characteristics

Product certifications		CE, cULus. This product is UL Listed if supplied by a class II or isolated supply delivering c 30 V max. (isolated transformer for example) and protected by a UL fuse rated at 3 A max.
Ambient air temperature	For operation	- 20...+ 50 °C
	For storage	- 30...+ 80 °C
Degree of protection	Conforming to IEC 60529	IP 65
Connection		M8, 4-pin male connector
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 0.75 mm (f = 10 to 55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms
Materials	Case	Painted aluminium and polyamide/glass
Rated supply voltage		12...24 V with protection against reverse polarity
Voltage limits (including ripple)		10...30 V
Immunity to ambient light	Natural light	10 000 lux
	Incandescent bulb	5000 lux
Outputs	PNP/NPN	By wiring
	NO/NC	Using teach mode
Switching capacity		100 mA with overload and short-circuit protection
Voltage drop, closed state		< 2 V
Current consumption, no-load		< 40 mA
Permissible capacitive load		330 nF
Maximum switching frequency		10 kHz
Response time		+/- 20 µs
Indicator lights		Yellow LED: output signal; red LED: keypad locking and adjustments

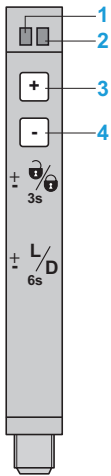
■ Applications: Detection of reference marks, detection on conveyor, detection on vibrating rail, detection of transparent object.

Accessories

Description	Details	Length of cable (m)	References	Weight kg
Pre-wired M8 connector	Straight	2	XZCP0941L2	0.080
	Elbowed (90°)	2	XZCP1041L2	0.080
	Straight	5	XZCP0941L5	0.180
	Elbowed (90°)	5	XZCP1041L5	0.180

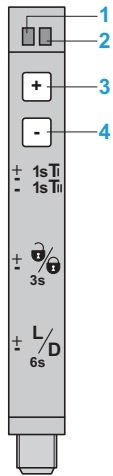
Presentation

XUYFLNEP●



- 1** Yellow LED "ON": Output activated
- 2** Red LED "ON": Adjustments and keypad locking
- 3, 4** Sensitivity adjustment
- 3 + 4** Keypad locking (3 s ≤ press time < 6 s)
- 3 + 4** NO/NC (press time ≥ 6 s)

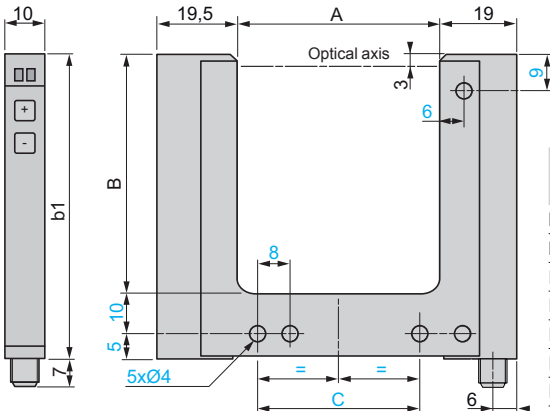
XUYFALNEP●



- 1** Yellow LED "ON": Output activated
- 2** Red LED "ON": Adjustments and keypad locking
- 3, 4** Sensitivity adjustment
- 3 + 4** Teach mode and automatic adjustment of sensitivity (press time < 3 seconds)
- 3 + 4** Keypad locking (3 s ≤ press time < 6 s)
- 3 + 4** NO/NC (press time ≥ 6 s)

Dimensions

XUYFLNEP●/XUYFALNEP●



XUY	Passageway Depth		b1	C
	A	B		
FLNEP/FALNEP●2	2	42, 59, 95	57, 74, 110	14
FLNEP/FALNEP●5	5	42, 59, 95	57, 74, 110	14
FLNEP/FALNEP●15	15	42, 59, 95	57, 74, 110	27
FLNEP/FALNEP●30	30	42, 59, 95	57, 74, 110	42
FLNEP/FALNEP●50	50	42, 59, 95	57, 74, 110	40
FLNEP/FALNEP●80	80	42, 59, 95	57, 74, 110	70
FLNEP/FALNEP●120	120	42, 59, 95	57, 74, 110	110

Wiring schemes

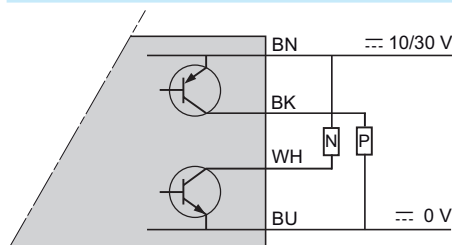
Cabling



Pin n° - colour

- 1 BN:** Brown
- 2 WH:** White
- 3 BU:** Blue
- 4 BK:** Black

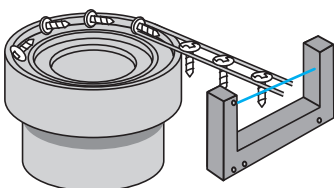
M8 connector



Application examples

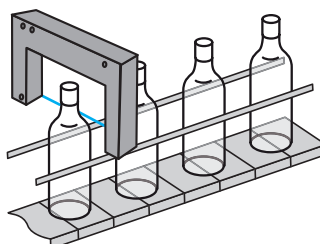
Green keypad: Potentiometer mode

Detection of an object exiting a vibrating bowl

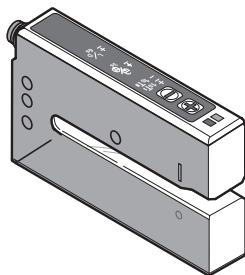


Yellow keypad: Teach mode

Detection of transparent bottles (glass, PET...)



Fork design



System	Thru-beam
Type of transmission	Ultrasonic
Nominal sensing distance (Sn)	3 mm
Depth	69 mm

References

4-wire	XUVU06M3KSNM8	XUVU06M3PSNM8	XUVU06M3NSNM8
NC or NO programmable function	PNP/NPN	PNP	NPN
Remote adjustment	No	Yes	
Adjustment	By numeric potentiometer (+/- buttons), static and dynamic teach modes.		
Protection of settings	By locking keypad		
Weight (kg)	0.130		

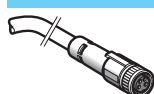
Characteristics

Product certifications	CE, IEC 60947-5-2	
Materials	Aluminium case	
Connection	M8, 4-pin connector	
Detection performance	Minimum length of label	2 mm
	Minimum distance between 2 labels	2 mm
	Maximum flow rate	180 m/min
	Detection accuracy	+/- 0.20 mm at 120 m/min
	Supply	Rated supply voltage
	Voltage limits	10...30 V (including ripple)
	Current consumption, no-load	45 mA
	Residual voltage	
	At 100 mA	< 2 V
	At 10 mA	< 1 V
Output	Maximum rated current	100 mA with overload and short-circuit protection
	Maximum switching frequency	1500 Hz
	Indicator light	
		Output state
	Adjustment and keypad locking	Red LED
Delay		300 µs, response and recovery
Environment	Operating temperature	+ 5...+ 55° C
	Storage temperature	- 20° C..+ 70° C
	Degree of protection	IP 65

Function table

	Function	Thru-beam system	
		No label present in the beam (output inactive)	Label present in the beam (output active)
Output state (PNP or NPN) indicator: yellow LED (illuminated when sensor output is ON)	NC		
	NO		

References of pre-wired connectors



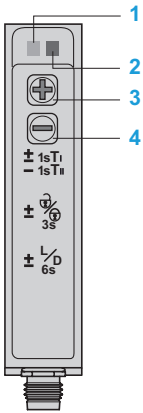
XZCP0941L●



XZCP1041L●

Type of connector	For use with forks	Type	Cable length (m)	Reference	Weight kg
Female, M8, 4 pins	XUVU06M3KSNM8, XUVU06M3PSNM8, XUVU06M3NSNM8.	Straight	2	XZCP0941L2	0.080
			5	XZCP0941L5	0.180
		Elbowed	2	XZCP1041L2	0.080
			5	XZCP1041L5	0.180

Presentation (adjustment and indicators)



- 1 Yellow LED "ON": Output activated
- 2 Red LED "ON": Adjustments and keypad locking
- 3,4 Sensitivity adjustment
- 3+4 Teach mode and automatic adjustment of sensitivity (press time < 3 seconds)
- 3+4 Keypad locking (3 s ≤ press time < 6 s)
- 3+4 NO/NC (press time ≥ 6 s)

Connections

Connector

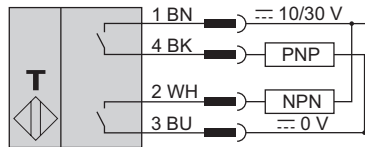


Pin no. - colour

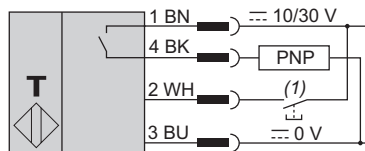
- 1 BN: Brown
- 2 WH: White (remote teaching)
- 3 BU: Blue
- 4 BK: Black

Wiring schemes

PNP/NPN: XUVU06M3KSNM8

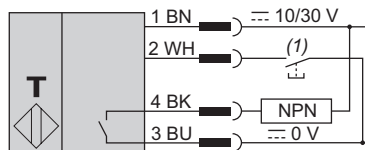


PNP: XUVU06M3PSNM8



(1) Remote teaching.

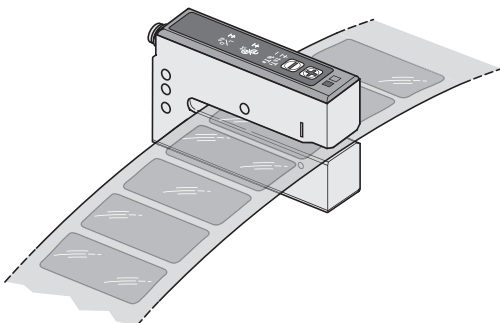
NPN: XUVU06M3NSNM8



(1) Remote teaching.

Application example

Detection of transparent labels on opaque or transparent strip



Dimensions (in mm)

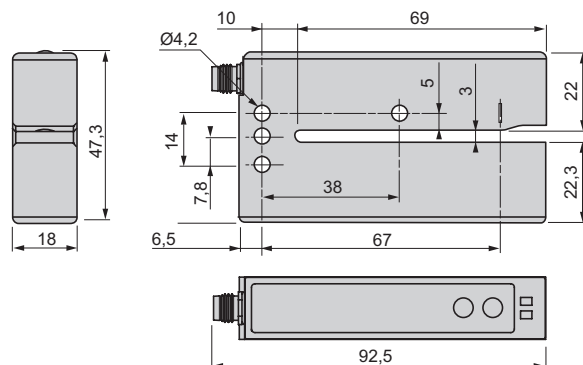
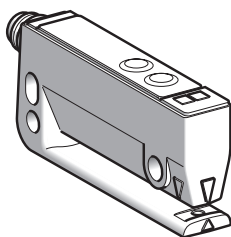


Photo-electric sensors

OsiSense XUVE Application, packaging series
Optical fork for detection of opaque labels
DC supply. Solid-state output

Fork design



System	Thru-beam
Type of transmission	Infrared
Nominal sensing distance (Sn)	3 mm
Depth	40 mm

References

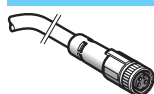
4-wire	NO or NC programmable function	XUVE04M3KSNM8	XUVE04M3PSNM8	XUVE04M3NSNM8
		PNP/NPN	PNP	NPN
Remote adjustment		No	Yes	
Adjustment	By numeric potentiometer (+/- buttons) and red LED			
Protection of settings	By locking keypad			
Weight (kg)	0.035			

Characteristics

Product certifications	CE, cULus		
Material	Thermoplastic case (PA12)		
Connection	M8, 4-pin connector		
Detection performance	Minimum length of label	2 mm	
	Minimum distance between 2 labels	2 mm	
	Maximum flow rate	200 m/min	
	Detection accuracy	+/- 50 m at 150 m/min	
Supply	Rated supply voltage	12...24 V with protection against reverse polarity	
	Voltage limits	10...30 V ~ (including ripple)	
	Current consumption, no-load	35 mA	
	Residual voltage at 100 mA	< 2 V	
Output	Maximum rated current	100 mA with overload and short-circuit protection	
	Maximum switching frequency	10 kHz	
	Indicator lights		
	Output state	Yellow LED	
	Adjustment and keypad locking	Red LED	
Delay (response and recovery)	50 µs		
Environment	Operating temperature	- 20...+ 60°C	
	Storage temperature	- 30...+ 80°C	
	Degree of protection	IP 65	

Function table	Function	Thru-beam system	
		No label present in the beam (output inactive)	Label present in the beam (output active)
Output state (PNP or NPN) indicator: yellow LED (illuminated when sensor output is ON)	NC		
	NO		

References of pre-wired connectors



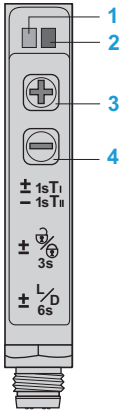
XZCP0941L●



XZCP1041L●

Type of connector	For use with forks	Type	Cable length (m)	Reference	Weight kg
Female, M8, 4 pins	XUVE04M3KSNM8, XUVE04M3PSNM8, XUVE04M3NSNM8.	Straight	2	XZCP0941L2	0,080
			5	XZCP0941L5	0,180
		Elbowed	2	XZCP1041L2	0,080
			5	XZCP1041L5	0,180

Presentation (adjustment and indicators)



- 1 Yellow LED "ON": Output activated
- 2 Red LED "ON": Adjustments and keypad locking
- 3,4 Sensitivity adjustment
- 3+4 Teach mode and automatic adjustment of sensitivity (press time < 3 seconds)
- 3+4 Keypad locking (3 s ≤ press time < 6 s)
- 3+4 NO/NC (press time ≥ 6 s)

Connections

Connector

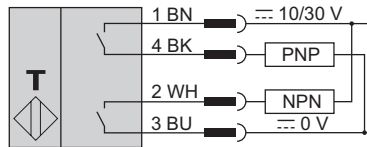


Pin no. - colour

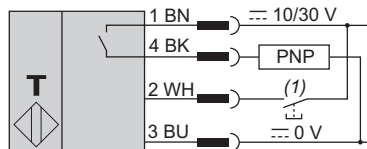
- 1 **BN**: Brown
- 2 **WH**: White (remote teaching)
- 3 **BU**: Blue
- 4 **BK**: Black

Wiring schemes

PNP/NPN: XUVE04M3KSNM8

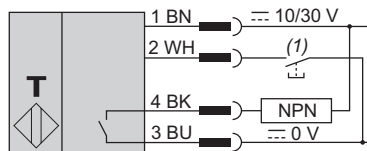


PNP: XUVE04M3PSNM8



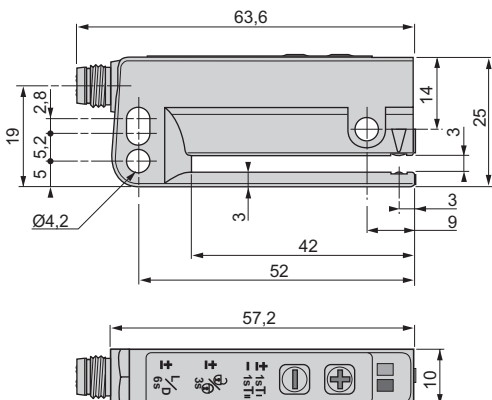
(1) Remote teaching.

NPN: XUVE04M3NSNM8



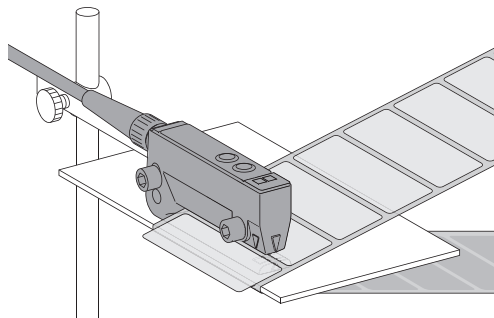
(1) Remote teaching.

Dimensions

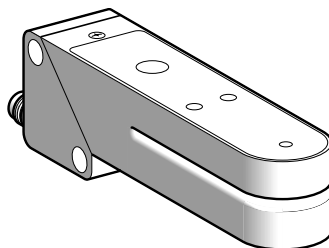


Application example

Detection of opaque labels before application to a package



Fork design



System	Thru-beam	
Type of transmission	Infrared	Red/green
Nominal sensing distance (Sn)	2 mm	

References

3-wire, PNP and NPN	NO or NC programmable function (2)	XUVK0252S	XUVK0252VS
Weight (kg)	0.120		

Characteristics

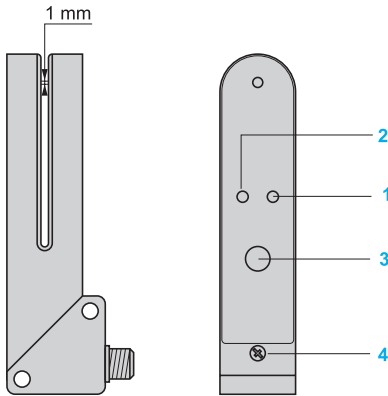
Product certifications	CE	
Ambient air temperature	For operation: 0...+ 55 °C. For storage: - 20...+ 70 °C	
Vibration resistance	Conforming to IEC 60068-2-6	Amplitude ±1.5 mm up to 55 Hz, 7 gn (f = 10...55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 65
Connection	M8 connector (suitable female connectors, see page 5/28)	
Materials	Case: zinc alloy; lenses: glass	
Rated supply voltage	⎓ 12...24 V with protection against reverse polarity	
Voltage limits	⎓ 10...30 V (including ripple)	
Switching capacity (sealed)	≤ 100 mA with overload and short-circuit protection	
Voltage drop, closed state	≤ 1.5 V	
Output clamping resistor	10 kΩ	
Current consumption, no-load	≤ 50 mA	
Maximum switching frequency	25 kHz	
Delays	First-up: ≤ 30 ms; response < 100 μs; recovery < 100 μs	
Indicator lights	Output state	Yellow LED
	Sensor ready	Green LED
	Read error	Red LED

Function table	Function	Thru-beam system	
		No label present in the beam	Label present in the beam
Output state (PNP or NPN) indicator: yellow LED (illuminated when sensor output is ON)	NC		
	NO		

(1) Applications: the infrared transmission beam sensor **XUVK0252S** is suitable for the detection of all types of opaque labels; the red/green transmission sensor **XUVK0252VS** is suitable for the detection of all types of labels of different colours.

(2) This sensor is adjustable using teach mode: the NC or NO function is selected when performing the first stage of teaching for setting-up the sensor (see programming using teach mode, page 5/67).

Presentation

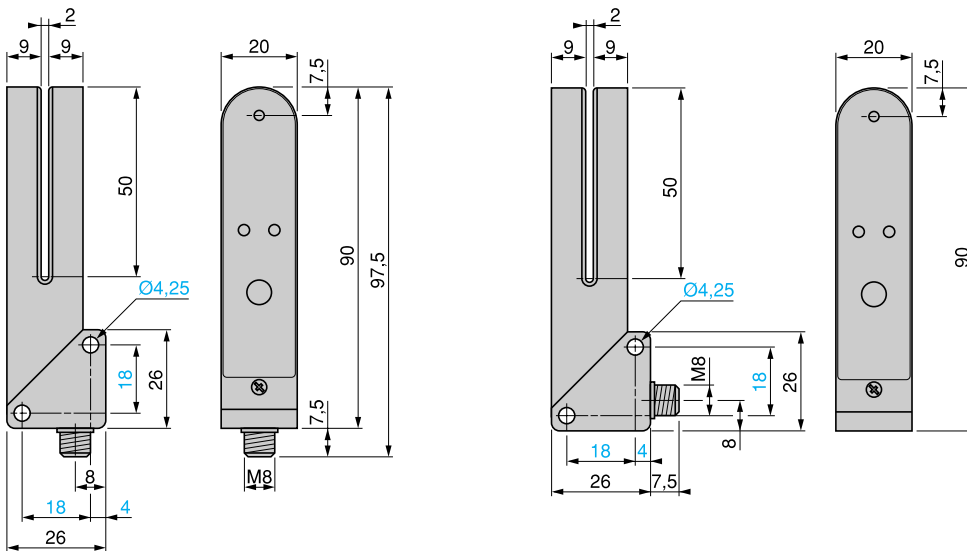


Programming using teach mode

- Place the label to be detected in the beam of the optical fork. Press the SET button and hold down until the green LED 2 goes out,
- When the green LED 2 flashes, the detector has "learned" the label. Following this, place the backing to which the label is affixed in the beam of the optical fork. Press the SET button and hold down until the green LED 2 goes out,
- When the green LED 2 illuminates as a steady light teaching is completed and the sensor is ready for operation.

- 1 Yellow LED, output state indicator
- 2 Dual colour green/red LED, Ready/Error
- 3 Teach mode programming SET button
- 4 Locking screw

Dimensions



Connector scheme (sensor connector pin view)

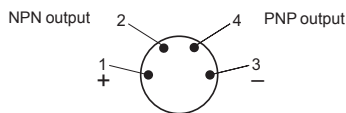


Photo-electric sensors

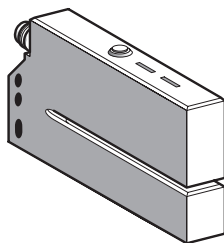
OsiSense XU Application, packaging series

Optical fork with teach mode

For detection of labels

DC supply. Solid-state output

Fork design



System	Thru-beam	
Type of transmission	Infrared, continuous	
Nominal sensing distance (Sn) (Passageway)	3 mm	5 mm

References

4-wire, PNP and NPN	NO or NC programmable function (1) Automatic adjustment using teach mode	XUYFA983003COS	XUYFA983005COS
Weight (kg)		0.07	0.07

Characteristics

Product certifications	CE, cULus	
Ambient air temperature	For operation	- 20...+ 60 °C
	For storage	- 30...+ 80 °C
Degree of protection	Conforming to IEC 60529	IP 65
Connection	M8, 4-pin connector (for pre-cabled version please consult our Customer Care Centre)	
Materials	Anodised aluminium	
Rated supply voltage	≡ 12...24 V with protection against reverse polarity	
Voltage limits (including ripple)	≡ 10...30 V	
Switching capacity (sealed)	≤ 100 mA with overload and short-circuit protection	
Immunity to ambient light	Natural light	3000 lux
	Incandescent bulb	3000 lux
Voltage drop, closed state	< 2 V	
Current consumption, no-load	40 mA	
Maximum switching frequency	10 kHz	
Delays	Response: 50 µs; recovery: 50 µs	
Indicator lights	Green LED: no object present Red LED: keypad locking and adjustments.	

Function table	Function	Thru-beam system	
		No label present in the beam	Label present in the beam
Output state (PNP or NPN) indicator: green LED (illuminated when sensor output is ON)	NC		
	NO		

(1) By reversing supply connections.

Photo-electric sensors

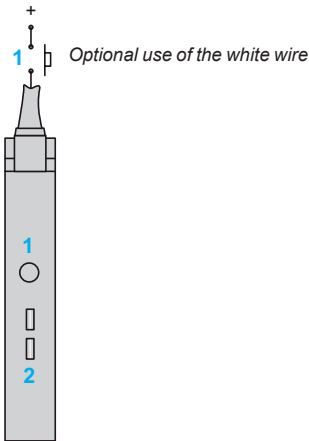
OsiSense XU Application, packaging series

Optical fork with teach mode

For detection of labels

DC supply. Solid-state output

Presentation (adjustment and indicators)



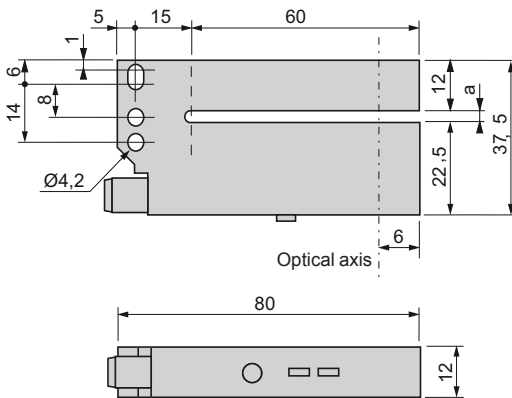
Teaching is performed on the item to which the label is affixed

1 Teach mode button

- 1 press: standard teaching (red LED flashes for 2 s)
- 2 presses: fine teaching (green LED flashes for 2 s)
- 1 prolonged press: keypad locking (red LED on)

2 Red LED and green LED flash: short-circuit or object too opaque.

Dimensions



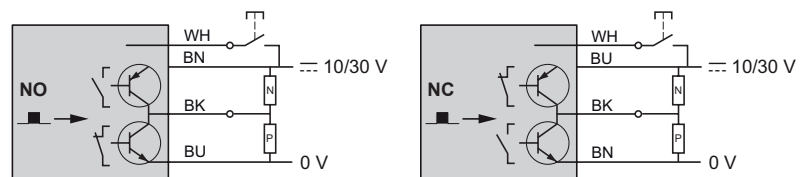
Reference	a (passageway)
XUYFA98●●●3COS	3
XUYFA98●●●5COS	5

Wiring schemes (sensor connector pin view)

Connector

Pin n° - colour

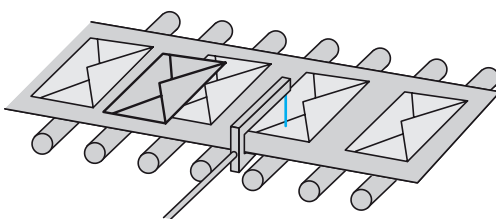
- 1 **BN**: Brown
- 2 **WH**: White (input)
- 3 **BU**: Blue
- 4 **BK**: Black (PNP and NPN outputs)



■ → Object detected
If the white wire is not used, connect to 0 V.

Application examples

Detection of overlapping envelopes



Detection of labels on belt

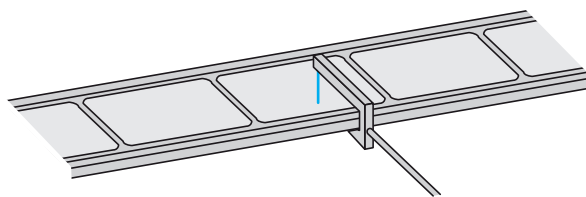
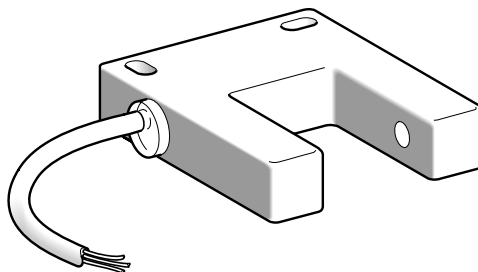


Photo-electric sensors

OsiSense XU Application, material handling series

Optical fork with integrated amplifier
DC supply. Solid-state output

Fork design




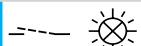
System	Thru-beam
Type of transmission	Infrared
Nominal sensing distance (Sn)	30 mm

References

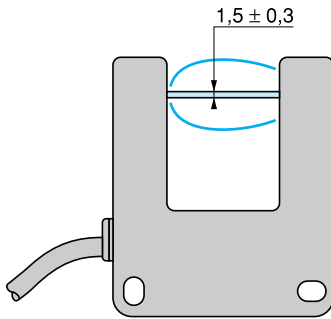
3-wire, PNP	NO function	XUVH0312
3-wire, NPN	NO function	XUVJ0312
Weight (kg)		0.130

Characteristics

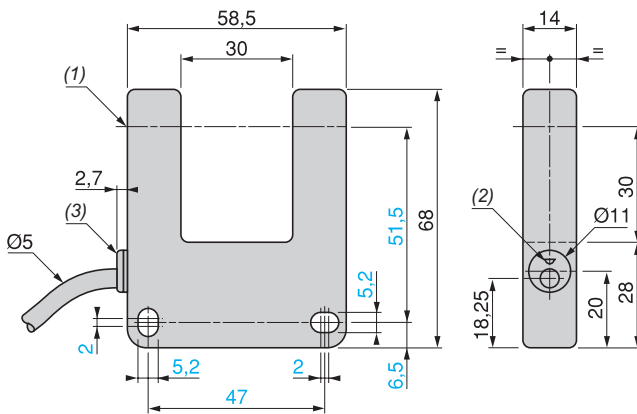
Product certifications		CE
Ambient air temperature	For operation	- 5...+ 55 °C
	For storage	- 20...+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6	Amplitude ±1 mm up to 42 Hz, 7 gn (f = 10...42 Hz)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 54
Connection		Pre-cabled: diameter 5 mm, length 2 m, wire c.s.a.: 3 x 0.34 mm ²
Materials	Case	PC/ABS
	Lenses	PMMA
	Cable	PvR
Rated supply voltage		≡ 24 V with protection against reverse polarity
Voltage limits		≡ 19...38 V (including ripple)
Switching capacity (sealed)		≤ 150 mA with overload and short-circuit protection
Voltage drop, closed state		≤ 1.5 V
Current consumption, no-load		≤ 20 mA
Maximum switching frequency		1000 Hz
Delays	First-up	≤ 30 ms
	Response	500 μs
	Recovery	500 μs

Function table	Function	Thru-beam system	
		No object present in the beam	Object present in the beam
NO function			
Output state (PNP or NPN) indicator: red LED (illuminated when sensor output is ON)	NO		

Detection curve



Dimensions



(1) Optical axis

(2) Red LED

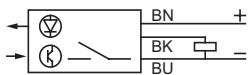
(3) Diffuser

Max. tightening torque of fixing screws: 3 N.m

Wiring schemes (3-wire ...)

NO function

PNP output



NPN output

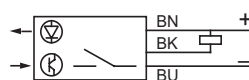


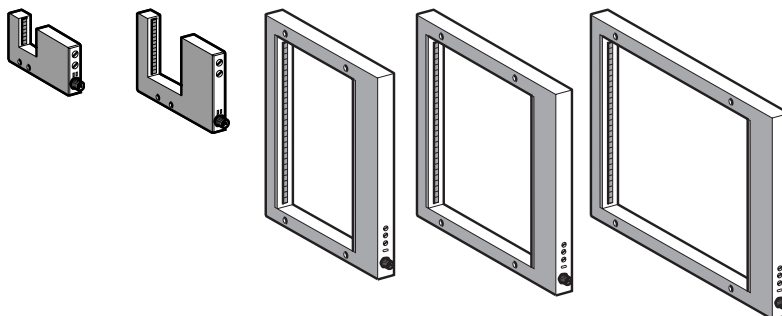
Photo-electric sensors

OsiSense XU Application, conveying series

Dynamic/static detection of passage of objects (1)

For detecting and counting parts

DC supply. Solid-state output



System	Thru-beam					
Type of transmission	Infrared					
Passageway dimensions	30 x 30 mm	60 x 60 mm	200 x 120 mm	200 x 180 mm	200 x 250 mm	
References						
4-wire, PNP or NPN NO or NC programmable function	Minimum size of object detected					
	Dynamic mode	Static mode				
	Ø 2 mm	–	XUVF30M8	XUVF60M8	–	–
	Ø 4 mm	Ø 6 mm	–	–	XUVF120M12	XUVF180M12
	Ø 10 mm	Ø 15 mm	–	–	XUYFRS120S	XUYFRS180S
					XUYFRS250S	
Weight (kg)			0.080	0.140	0.860	1.000
						1.120

References of U shape frames

Open (U shape) frames for sizes 120, 180 and 250 mm are also available.

To order an open frame, add the letter **U** to the end of the reference. Example: XUVF120M12 becomes **XUVF120M12U**.

Characteristics

Product certifications	CE, cULus	
Ambient air temperature	For operation: 0...+60°C. For storage: -20...+80°C	
Vibration resistance	7 gn, amplitude ± 1 mm (f = 10...55 Hz), conforming to IEC 60068-2-6	
Shock resistance	30 gn, duration 11 ms, conforming to IEC 60068-2-27	
Degree of protection	Conforming to IEC 60529	IP 65
Connection	M8 connector (suitable female connectors, including pre-wired versions, refer to our "OsiSense XZ" catalogue)	M12 connector (suitable female connectors, including pre-wired versions, please refer to our "Cabling accessories OsiSense XZ" catalogue)
Materials	Case Lenses	Painted aluminium Polycarbonate Altuglass
Immunity to ambient light	Sunlight: 4000 lux max. Incandescent light: 400 lux max.	Sunlight: 10,000 lux max. Incandescent light: 3000 lux max.
Passing speed of object	Min.: 10 cm/s, max.: 15 m/s (Ø 2 mm object)	Min (2): 10 cm/s, max.: 15 m/s (Ø 4 mm object) or max.: 70 m/s (Ø 10 mm object)
Rated supply voltage	24 V $\overline{\text{---}}$ with protection against reverse polarity	
Voltage limits	18...30 V $\overline{\text{---}}$ (including ripple)	
Switching capacity (sealed)	≤ 100 mA with overload and short-circuit protection	
Voltage drop, closed state	< 2 V	
Current consumption, no-load	≤ 120 mA	≤ 150 mA
Maximum switching frequency	500 Hz	5000 Hz
Delays	Response: < 1 ms Recovery: < 1 ms	Response: < 0.1 ms Recovery: < 0.1 ms
Time delay	Off-delay (reset): adjustable between 0 and 5 seconds	

Function table	Function	Thru-beam system	
		No object present in the beam	Passage of object through the beam
Output state (PNP or NPN) and orange LED: illuminated when sensor output is ON.	NC		
	NO		

(1) XUVF●● sensors are suitable for detecting the passage of all types of objects (both metal and plastic), of any shape and colour.

XUVF120M12, XUVF180M12 and XUVF250M12 frames can be used:

- In dynamic mode for counting parts or monitoring the passing of parts on injection moulding machines.

- In static mode for detecting bar or cable type moving or non-moving parts, entering machines (maintain the signal).

(2) The min. value only applies to dynamic mode.

Photo-electric sensors

OsiSense XU Application, conveying series

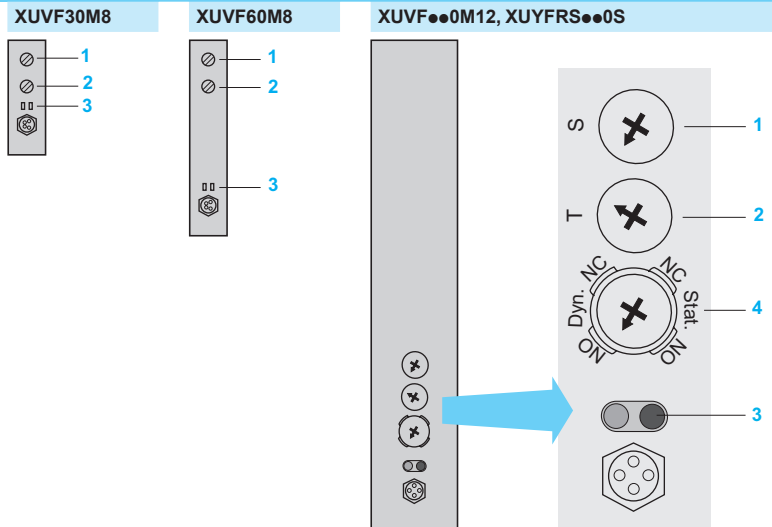
Dynamic/static detection of passage of objects

For detecting and counting parts

DC supply. Solid-state output

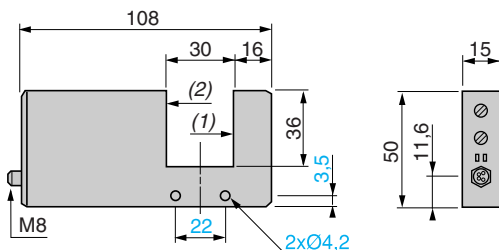
Presentation

- 1 Sensitivity adjustment potentiometer
- 2 Time delay adjustment potentiometer (XUV only)
- 3 Indicators:
 - Orange LED:
 - For XUVF30M8 and XUVF60M8: object in the beam
 - For XUVF120M12, XUVF180M12, XUVF250M12, XUVFRS120S, XUVFRS180S and XUVFRS250S: closed state of the contact
 - Red LED: solid state output overload or short-circuit (flashing)
- Notes concerning XUVF30M8 and XUVF60M8:
 - In the event of a supply malfunction, the red LED flashes
 - In the event of a short-circuit on the output, both the red and orange LEDs flash
- 4 Dynamic mode (NO or NC) or static mode (NO or NC) selector switch

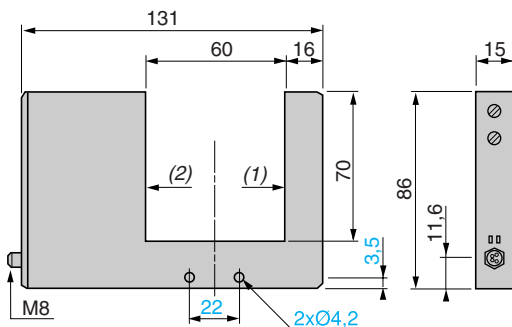


Dimensions

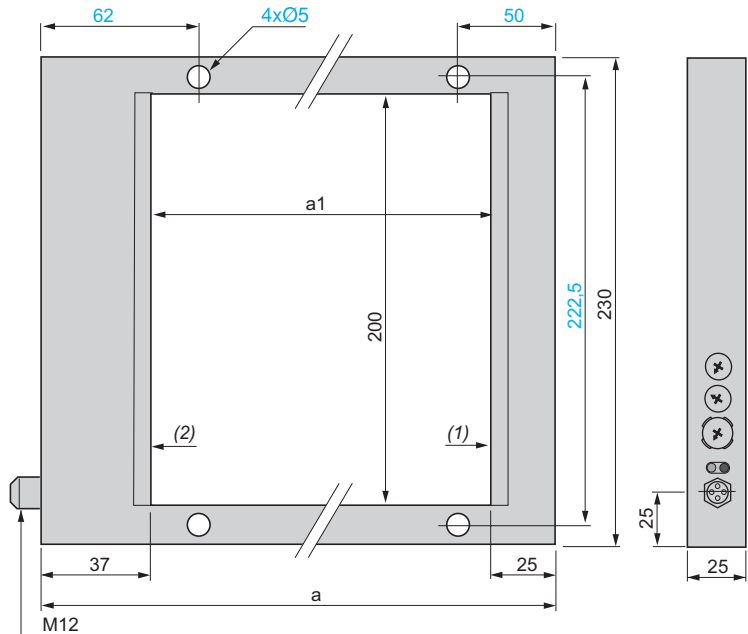
XUVF30M8



XUVF60M8



XUVF...0M12, XUYFRS...0S



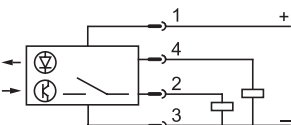
- (1) Transmitting face
(2) Reception face

Reference	Reference	a	a1
XUVF120M12	XUVFRS120S	182	120
XUVF180M12	XUVFRS180S	242	180
XUVF250M12	XUVFRS250S	312	250

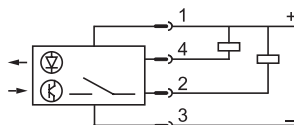
Connections

Wiring schemes (4-wire ---)

PNP output

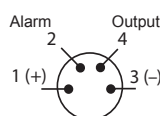


NPN output

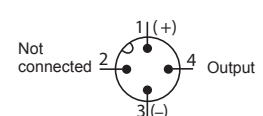


Connector scheme (sensor connector pin view)

XUVF30M8 and XUVF60M8



XUVF120M12, XUYFRS120S, XUVF180M12, XUYFRS180S, XUVF250M12 and XUYFRS250S



Note: For XUVF30M8 and XUVF60M8 only, the alarm (2) triggers in the event of an object stopping within the beam.
For XUVF30M8 and XUVF60M8, the NC output is gained by connecting terminal 3 to (+) and terminal 1 to (-).

Photo-electric sensors

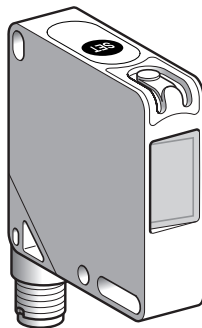
OsiSense XU Application, packaging series

Compact design, 50 x 50

Colour mark readers ⁽¹⁾

DC supply. Solid-state output

Compact design, 50 x 50



System	Diffuse
Type of transmission	White LED (400-700 nm)
Nominal sensing distance (Sn)	19 mm

References

Description	Reference
3-wire, PNP or NPN	
PNP output	XUKR1PSMM12
NPN output	XUKR1NSMM12
Weight (kg)	0.045

Characteristics

Product certifications	CE, cULus
Ambient air temperature	For operation: -10...+55 °C For storage: -20...+70 °C
Vibration resistance	Conforming to IEC 60068-2-6 Amplitude ± 0.5 mm, f = 10...55 Hz for each axis
Shock resistance	Conforming to IEC 60068-2-27 30 gn, duration 11 ms, 6 shocks on each axis
Degree of protection	Conforming to IEC 60529 IP 67
Connection	M12, 4-pin connector; can be set at 90°
Materials	Case: ABS Lenses: Glass (window tilted, anti-reflective glass)
Spot diameter	At 19 mm: Ø 3.5 mm
Resolution	0.5 mm
Depth of field	± 2 mm
Adjustment	Teach mode using button or remotely using "remote" wire
Indicator lights	Output: Yellow LED Stability: Green LED: Ready Flashing green/red: error
Rated supply voltage	DC 12...24 V
Voltage limits	DC 10...30 V (including ripple)
Switching capacity (sealed)	≤ 100 mA with protection against reverse polarity, overload and short-circuit
Voltage drop, closed state (saturation voltage)	≤ 2 V
Current consumption, no-load	≤ 30 mA
Maximum linear speed of mark	2.5 m/s for 1 mm wide mark
Maximum switching frequency	5 kHz
Delay	100 µs for response and recovery
Time delay	Time delay function: Minimum time output active: 20 ms Auxiliary functions: Remote teaching via "remote" wire; teach mode button locking Operating mode: Standard teaching: output activated on dark mark

⁽¹⁾ Applications: detection of contrasting colours on reflective, matt or embossed surfaces. Colour mark and index mark reading function on automated packaging and filling systems and on labelling, heat sealing, thermo-forming and printing machines, etc.

Photo-electric sensors

OsiSense XU Application, packaging series

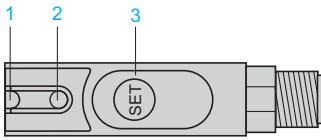
Compact design, 50 x 50

Colour mark readers

DC supply. Solid-state output

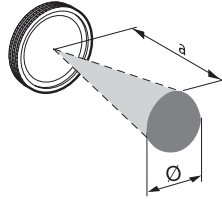
Presentation

Description

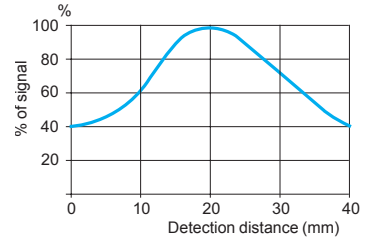


- 1 Output LED
- 2 Dual colour stability LED
- 3 SET button

Detection zone and spot size



Detection curve



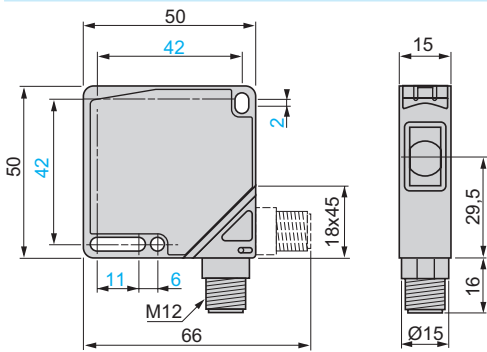
	a (mm)	Ø (mm)
XUKR1•SMM12	19	3.5

Fixing accessories

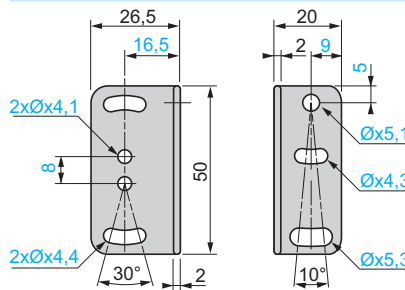
Description	Reference	Weight kg
Metal fixing bracket (2 screws, 2 nuts and 2 washers included)	XUZK2000	0.040
Metal fixing bracket (2 screws, 2 nuts, 2 washers and 1 screwdriver included)	XUZA51	0.050

Dimensions

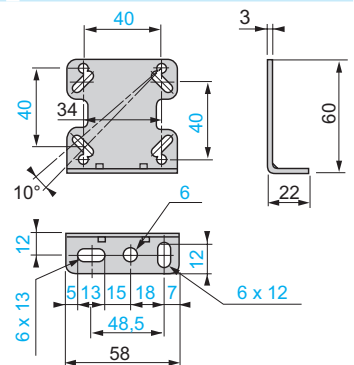
XUKR1•SMM12



Fixing bracket XUZK2000



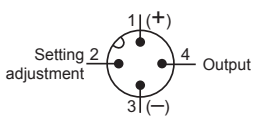
Fixing bracket XUZA51



Schemes

Connector scheme

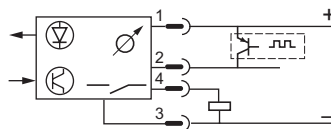
Sensor connector pin view



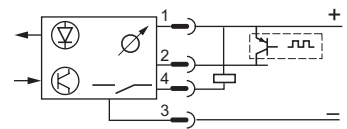
Wiring schemes

Automatic NC or NO selection depending on chronological order of teaching for the mark and the background.

PNP output



NPN output



Pin N°	Type	Colour
1	--- 10...30 V	Brown
2	Adjustment input (1)	White
3	0 V	Blue
4	Output	Black

(1) Connecting the "Remote" adjustment input to +V DC is equivalent to pressing the SET button.

Photo-electric sensors

OsiSense XU Application, packaging series

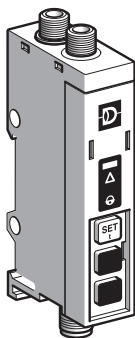
Colour mark readers

With teach mode

DC supply. Solid-state output

Colour mark reading using plastic fibre optic

Remote reading by coaxial fibre optic



System	Diffuse
Type of transmission	White LED (450 - 650 nm)
Nominal sensing distance (Sn)	18 mm with fibre optic XUYFPDC61/101 4 mm with fibre optic XUYFPDCM861/M8101

References

4-wire, PNP/NPN output	NO/NC function	XUYDCFCO966S (1)
Weight (kg)		0.047

Characteristics

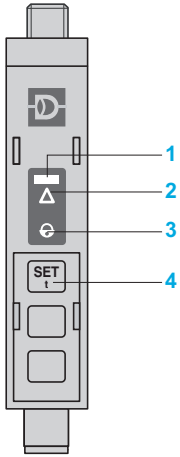
Product certifications		CE
Ambient air temperature	For operation	0...+40 °C
	For storage	-20...+80 °C
Degree of protection	Conforming to IEC 60529	IP 65
Connection		M8 male connector
Materials	Case	Polyamide
	Lens	Polyamide
Rated supply voltage		--- 24 V
Spot diameter		1.5 mm
Modulation frequency		40 kHz
Depth of field		FPDC: +7/- 5 mm Black/White, +1/- 3 mm Grey/White FPDCM8: ± 1 mm
Adjustment		By teaching background and mark
Voltage limits (including ripple)		--- 10...30 V with protection against reverse polarity
Immunity to ambient light	Incandescent bulb	10 000 lux
	Natural light	20 000 lux
Switching capacity		100 mA with overload and short-circuit protection
Voltage drop, closed state		< 2 V
Current consumption, no-load		50 mA
Maximum switching frequency		20 kHz
Delays	Response and recovery	25 µs
Output state indication		LED

Accessories

(1) Sensor XUYDCFCO966S only operates with fibres XUYFPDC●●●● and XUYFPDCM8●●●, to be ordered separately.

Description	Details	Length of fibre	Length of cable	References	Weight
		mm	m		kg
Integrated fibre optic to be ordered at the same time as the amplifier	M18	600	–	XUYFPDC61	0.100
		1000	–	XUYFPDC101	0.115
	M8	600	–	XUYFPDCM861	0.060
		1000	–	XUYFPDCM8101	0.075
Pre-wired M8 connector	Straight	–	2	XZCP0941L2	0.080
		–	2	XZCP1041L2	0.080
	Elbowed (90°)	–	5	XZCP0941L5	0.180
		–	5	XZCP1041L5	0.180

Presentation



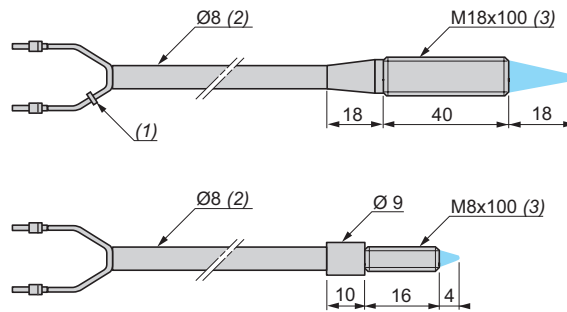
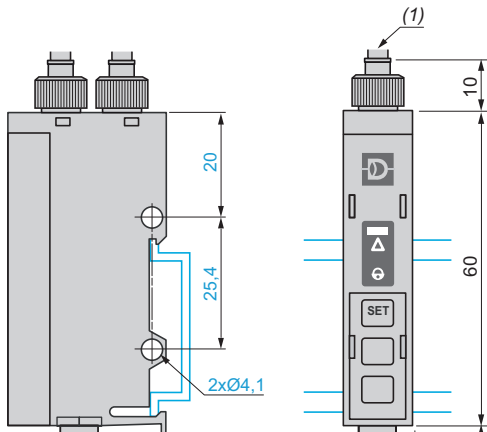
- 1 Detection of the lightest shade
- 2 Programming assistance
- 3 Alarm/press button
- 4 Programming button

Dimensions

XUYDCFCO966S

Mounting on 35 mm rail

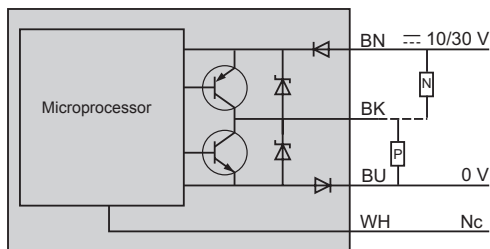
XUYFPDC●●●●●



- (1) The ring indicates that the fibre is transmitting.
- (2) Bend radius: 15 mm.
- (3) 2 nuts included with fibre optic.

Wiring schemes

Cabling



M8 connector



Pin n° - colour

1 BN: Brown

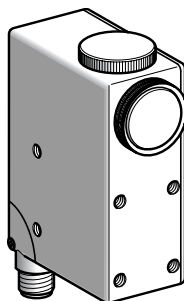
2 WH: White

3 BU: Blue

4 BK: Black

- (1) High level on first shade "taught".
- Nc: Not connected

Compact design



System	Diffuse
Type of transmission (line of sight along case axis or at 90° depending on position of lens)	Red or green, automatically selected when using teach mode
Nominal sensing distance (Sn)	9 mm (7 mm with XURZ02 or 18 mm with XURZ01) (2)
Sensitivity adjustment	Automatic when using teach mode

References

3-wire, PNP or NPN programmable	NO or NC programmable function (3)	XURK1KSMM12
Weight (kg)		0.550

Characteristics

Product certifications	CE
Ambient air temperature	For operation: - 10...+ 55 °C. For storage: - 20...+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6 7 gn, amplitude ± 0.6 mm (f = 10...55 Hz)
Shock resistance	Conforming to IEC 60068-2-27 30 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529 IP 67
Connection	M12 connector, can be set at 3 positions (suitable female connectors, including pre-wired versions, refer to page 5/28)
Materials	Case: zinc alloy; lenses: glass
Spot dimensions	At 9 mm: 1.5 x 5 mm (with lens XURZ0 see table on page 5/79)
Minimum detectable width of mark	0.5 mm
Maximum vertical inclination of reader	20°
Maximum linear speed of mark	10 m/s (for 1 mm wide mark)
Rated supply voltage	12...24 V with protection against reverse polarity
Voltage limits	10...30 V (including ripple)
Switching capacity (sealed)	≤ 200 mA with overload and short-circuit protection
Voltage drop, closed state	≤ 1 V (NPN); ≤ 2 V (PNP)
Current consumption, no-load	≤ 80 mA
Maximum switching frequency	10 kHz
Delays	First-up: ≤ 100 ms; response: ≤ 50 µs; recovery: ≤ 50 µs
Time delay	"OFF delay": 20 ms, activated/deactivated by internal switch
Analogue output	0...5.5 V (voltage proportional to light reflected by the object)

Function table	Function	Detection of dark mark on light background		Function	Detection of light mark on dark background	
		No mark present in the beam	Mark present in the beam		No mark present in the beam	Mark present in the beam
Output state (PNP or NPN) indicator: red LED (illuminated when sensor output is ON)	NC			NO		
	NO			NC		

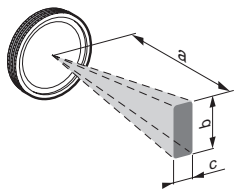
(1) Applications: detection of contrasting colours on reflective, matt or embossed surfaces. Colour mark and index mark reading function on automated packaging and filling systems and on labelling, heat sealing, thermo-forming and printing machines, etc.

(2) Lenses for reduction or magnification of spot (see page 5/161 and spot size table on page 5/79).

(3) Automatic programming depending on chronological order of teaching for the mark and the background.

XURK1KSMM12

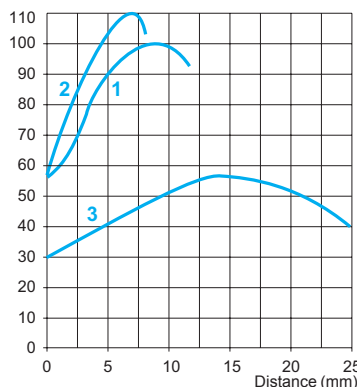
Detection zone and spot size (mm)



XUR	a	b	c
K●●●●●●	9	5	1.5
K●●●●●● + XURZ01	18	7	2
K●●●●●● + XURZ02	7	4	1

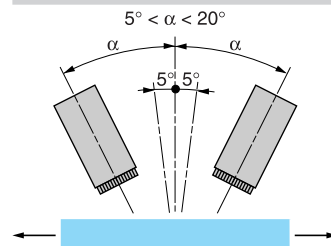
Lenses XURZ0●, see page 5/161

Detection curve



- 1 XURK●●●●●●
- 2 XURK●●●●●● + XURZ02
- 3 XURK●●●●●● + XURZ01

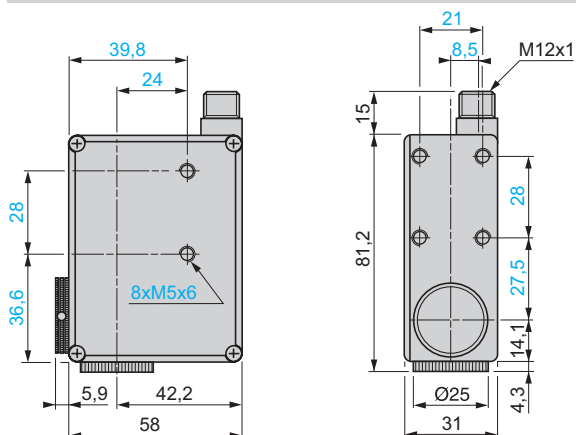
Vertical inclination



An angle of 5 to 10° from vertical is recommended for reflective or transparent surfaces.
Maximum vertical inclination: 20°.

Dimensions

XURK1KSMM12

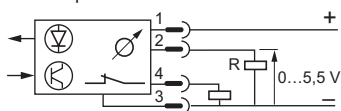


Wiring schemes (3-wire ...)

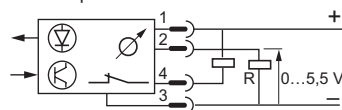
XURK1KSMM12

Automatic NC or NO selection depending on chronological order of teaching for the mark and the background

PNP output



NPN output

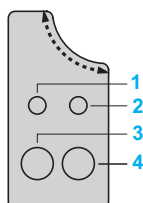
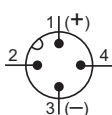


R = 2.2 kΩ

Connector scheme

Functions

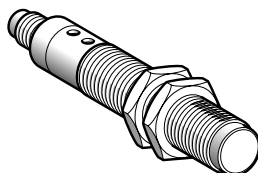
(sensor connector pin view)



- 1 Green LED, sensor in teach mode
- 2 Red LED, output state
- 3 Teach mode button for mark
Teach mode button for background
- 4 background

PNP/NPN programming and time delay by internal switches

Design 18



System	Diffuse
Type of transmission	Ultraviolet (370 nm)
Nominal sensing distance (Sn)	20 mm for colour mark reading, 0...80 mm in diffuse mode
Sensitivity adjustment	By potentiometer

References

3-wire, PNP	NO function (2)	XU5M18U1D
Weight (kg)		0.075

Characteristics

Product certifications		CE, CSA, UL
Ambient air temperature	For operation	- 25...+ 55 °C
	For storage	- 40...+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 0.6 mm (f = 10...55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 67
Connection		M12 connector (suitable female connectors, including pre-wired versions, see page 5/28)
Materials	Case	Nickel plated brass
	Lenses	PMMA
Spot diameter		At 20 mm: Ø 3 x 1 mm
Auxiliary functions		External synchronisation, locking
Indicator lights	Output state	Green LED
	Teach mode	–
Rated supply voltage		DC 12...24 V with protection against reverse polarity
Voltage limits		DC 10...30 V (including ripple)
Switching capacity (sealed)		≤ 100 mA with protection against reverse polarity, overload and short-circuit
Voltage drop, closed state		≤ 1.5 V (PNP)
Current consumption, no-load		≤ 20 mA
Maximum switching frequency		1 kHz
Delays	First-up	≤ 100 ms
	Response	≤ 500 µs
	Recovery	≤ 500 µs
Time delay		"OFF delay": 20 ms, activated/deactivated by cabling method

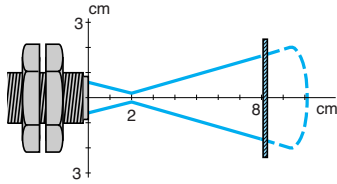
(1) Applications: detection of invisible reference marks, markings, glues or varnishes containing bluing agents.

(2) Output activated when a blued mark on a non blued background is present.

Curves

XU5M18U1D

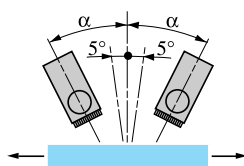
Detection curves



Object 5 x 5 cm, white 90%
Spot size at 20 mm: oval, Ø 3 x 1 mm

Vertical inclination

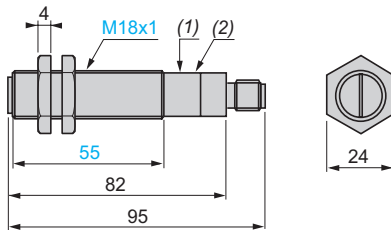
$5^\circ < \alpha < 20^\circ$



An angle of 5 to 10°
from vertical is recommended
for reflective or transparent
surfaces
Maximum vertical inclination: 20°

Dimensions

XU5M18U1D



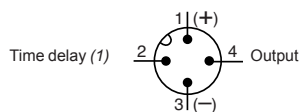
(1) Potentiometer
(2) Green LED
Fixing nut tightening torque: 15 N.m.

Wiring schemes

XU5M18U1D

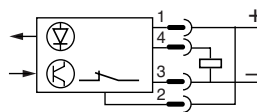
Connector scheme

(Sensor connector pin view)

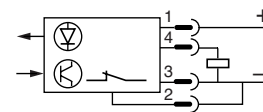


Wiring schemes (3-wire ---)

PNP output
Without output signal time delay



With output signal time delay (20 ms)



(1) "OFF delay" of output signal:
- no time delay: connect contact 2 to (+)
- 20 ms time delay: connect contact 2 to (-)

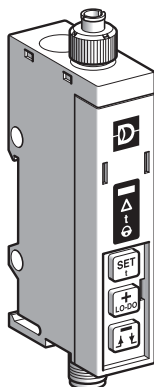
Photo-electric sensors

OsiSense XU Application, packaging series

Detection of illumination using plastic fibre optic
and teach mode

Four-wire DC. Solid-state output

Fibre design



Nominal sensing distance (Sn)	Depending on fibre optic used
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References

4-wire, PNP/NPN output	NO/NC programmable function	XUYAFLCO966S
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Weight (kg)	0.054
-------------	-------

Characteristics

Product certifications		CE
Ambient air temperature	For operation	0...+ 60 °C
	For storage	- 20...+ 80 °C
Degree of protection	Conforming to IEC 60529	IP 65
Connection		M8, 4-pin male connector
Materials	Case	Polycarbonate
Rated supply voltage		≐ 12...24 V with protection against reverse polarity
Voltage limits (including ripple)		≐ 10...30 V
Switching capacity		100 mA with overload and short-circuit protection
Voltage drop, closed state		2 V
Current consumption, no-load		< 40 mA
Maximum switching frequency		< 5 Hz
External input	Active	< 1.4 V
	Inactive	> 3 V
Delays	Response and recovery	< 100 ms
Output time delay	Range	0...5 s in 11 adjustment increments
	Duration of each increment	First increment 40 ms then 500 ms for each press
Indicator lights	Output signal	Green LED
	Limit of detection	Red LED
	Time delay active	Red LED
Sensitivity adjustment		Using teach (fine mode or standard mode) Adjustment possible using +/- button Remote teaching using external input (fine mode)

Applications

- Applications
- Verifying operation of indicator lights on electrical appliances
- Testing car headlights on production line

Accessories

Description	Details	Length of cable	References	Weight
		m		
Plastic fibre optic (1)	Ø 2.2 mm	1	XUYA005	0.007
Pre-wired M8 connector	Straight	2	XZCP0941L2	0.080
	Elbowed (90°)	2	XZCP1041L2	0.080
	Straight	5	XZCP0941L5	0.180
	Elbowed (90°)	5	XZCP1041L5	0.180

(1) End fitting, see page 5/144.

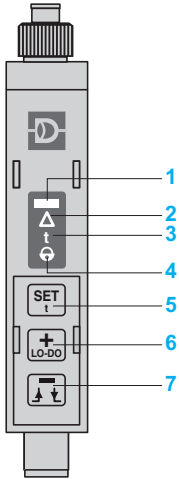
Photo-electric sensors

OsiSense XU Application, packaging series

Detection of illumination using plastic fibre optic and teach mode

Four-wire DC. Solid-state output

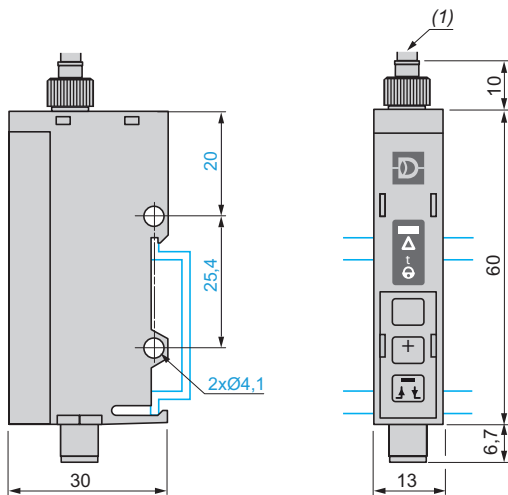
Presentation



- 1 Output signal
- 2 Limit of detection
Positioning assistance
- 3 Time delay active
- 4 Action keypad
Keypad locking
- 5 Automatic adjustment of threshold
Access to special functions
- 6 Sensitivity increase
NO/NC output
Time delay increase
- 7 Sensitivity decrease
On-delay, Off-delay inversion
Time delay decrease

Dimensions

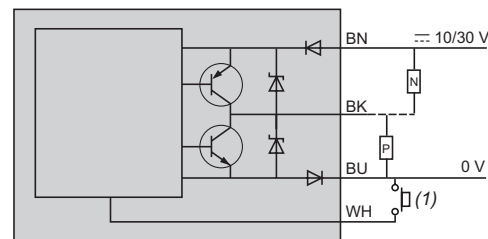
Mounting on 35 mm rail



(1) Ø 2.2 mm plastic fibre optic.

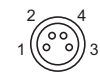
Wiring schemes

Scheme



M8 connector

Pin n° - colour



- 1 BN: Brown
- 2 WH: White
- 3 BU: Blue
- 4 BK: Black

(1) Remote teaching. If not used: connect to +.

Application examples

Verifying operation of car headlights on an assembly line

Verifying operation of indicator lights on electrical appliances

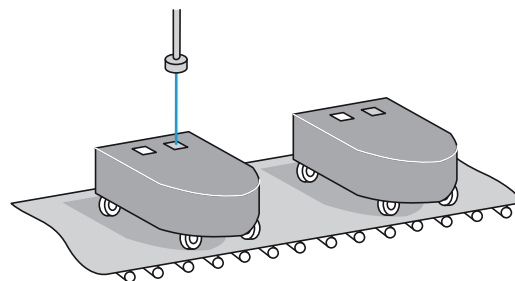
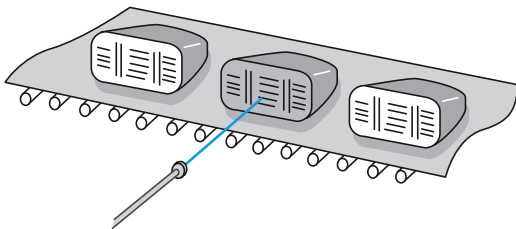


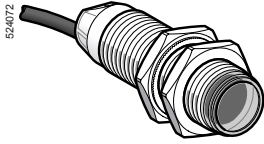
Photo-electric sensors

OsiSense XU Application, packaging series

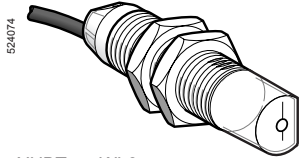
For detection of transparent materials

Design 18, plastic or stainless steel

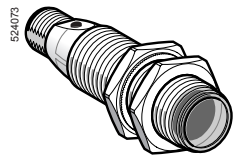
Three-wire DC, solid-state output



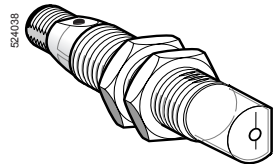
XUBT...NL2



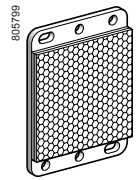
XUBT...WL2



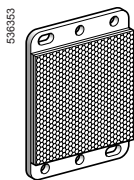
XUBT...NM12



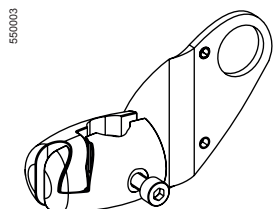
XUBT...WM12



XUZC50



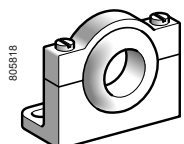
XUZC50HP



XUZB2003



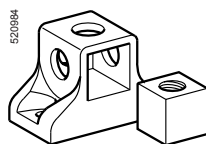
XUZA118



XUZA218



XUZZ2001



XUZZ2003

Ø 18 plastic, coaxial polarised reflex with teach mode

Sensing distance (Sn) m	Function	Line of sight	Output	Reference	Weight kg
Pre-cabled (2)					
0...1.4 With reflector XUZC50/C50HP	NO or NC, by programming	Along case axis	PNP	XUBTAPSNL2 (1)	0.110
			NPN	XUBTANSNL2 (1)	0.110
0...0.8 With reflector XUZC50/C50HP	NO or NC, by programming	90° to case axis	PNP	XUBTAPSWL2 (1)	0.113
			NPN	XUBTANSWL2 (1)	0.113
M12 connector					
0...1.4 With reflector XUZC50/C50HP	NO or NC, by programming	Along case axis	PNP	XUBTAPSNM12 (1)	0.045
			NPN	XUBTANSNM12 (1)	0.045
0...0.8 With reflector XUZC50/C50HP	NO or NC, by programming	90° to case axis	PNP	XUBTAPSWM12 (1)	0.048
			NPN	XUBTANSWM12 (1)	0.048

Ø 18 stainless steel, coaxial polarised reflex with teach mode

Sensing distance (Sn) m	Function	Line of sight	Output	Reference	Weight kg
Pre-cabled (2)					
0...1.4 With reflector XUZC50/C50HP	NO or NC, by programming	Along case axis	PNP	XUBTSPSNL2 (1)	0.135
			NPN	XUBTSNSNL2 (1)	0.135
0...0.8 With reflector XUZC50/C50HP	NO or NC, by programming	90° to case axis	PNP	XUBTSPSWL2 (1)	0.138
			NPN	XUBTSNSWL2 (1)	0.138
M12 connector					
0...1.4 With reflector XUZC50/C50HP	NO or NC, by programming	Along case axis	PNP	XUBTSPSNM12 (1)	0.070
			NPN	XUBTSNSNM12 (1)	0.070
0...0.8 With reflector XUZC50/C50HP	NO or NC, by programming	90° to case axis	PNP	XUBTSPSWM12 (1)	0.073
			NPN	XUBTNSWM12 (1)	0.073

Ø 18 plastic, reflex with teach mode

Sensing distance (Sn) m	Function	Line of sight	Output	Reference	Weight kg
Pre-cabled (2)					
0.1...0.8 With reflector XUZC50	NO or NC, by programming	Along case axis	PNP	XUBT1PSNL2	0.103
			NPN	XUBT1NSNL2	0.103
M12 connector					
0.1...0.8 With reflector XUZC50	NO or NC, by programming	Along case axis	PNP	XUBT1PSNM12	0.045
			NPN	XUBT1NSNM12	0.045

Accessories for XUBT..... (3)

Description	Dimensions	Reference	Weight kg
Universal reflector	50 x 50 mm	XUZC50	0.020
Application reflector (accuracy, detection sensitivity)	50 x 50 mm	XUZC50HP	0.020

Fixing accessories (4)

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XUBT or XUZC50/C50HP	XUZZ2003	0.170
M12 rod	XUZZ2001	0.050
Support for M12 rod	XUZZ2003	0.150
Stainless steel fixing bracket	XUZA118	0.045
Plastic fixing bracket with adjustable ball-joint	XUZA218	0.035

(1) Application reflector XUZC50HP included with sensor.

(2) For a 5 m long cable, replace L2 by L5.

Example: XUBTAPSNL2 becomes XUBTAPSNL5.

(3) For further information, see page 5/159.

(4) For further information, see page 5/158.

Photo-electric sensors

OsiSense XU Application, packaging series

For detection of transparent materials


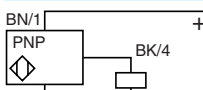
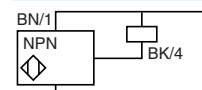
Design 18, plastic or stainless steel

Three-wire DC, solid-state output

Characteristics		XUBT●●●●M12/XUBT●●●●L2	XUBT1●●●●M12/XUBT1●●●●L2
Sensor type			
Product certifications		UL, CSA, CE	
Connection	Connector	M12 (male)	
	Pre-cabled	Length: 2 m, wire c.s.a.: 3 x 0.34 mm ²	
Nominal sensing distance Sn	Line of sight along case axis	m	0 to 1.4 with reflector XUZC50/C50HP
	Line of sight 90° to case axis	m	0 to 0.8 with reflector XUZC50/C50HP
Beam divergence		1.5° (Ø 37mm spot at 1.4 m)	
Blind zone		m	0
Preferred object approach direction		Any	Lenses on horizontal plane for horizontal passage of object
Type of transmission		Coaxial polarised red	
Degree of protection		Conforming to IEC 60529	IP 65, IP 67, double insulation □ IP 69K for connector version XUBT●●●●M12 (1)
Temperature	Storage	°C	- 40...+ 70
	Operation	°C	0...+ 55
Materials	Case	XUBTA and XUBT1 ●●●●: plastic PBT XUBTS●●●●: stainless steel (grade 304Cu)	
	Lens	PMMA	
	Cable	PvR	
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Indicator lights	Output state	Yellow LED	
	Supply on	Green LED	
	Stability	Red LED	Red LED for alignment only
Rated supply voltage		V	--- 12...24 with protection against reverse polarity
Voltage limits (including ripple)		V	--- 10...32
Current consumption, no-load		mA	45
Switching capacity		mA	≤ 100 with overload and short-circuit protection
Voltage drop, closed state		V	≤ 1.5
Maximum switching frequency		Hz	1000
Delays	First-up	ms	< 200
	Response and recovery	µs	< 500

(1) IP69K also available with PVC cable, please consult our Customer Care Center for specific adaptation.

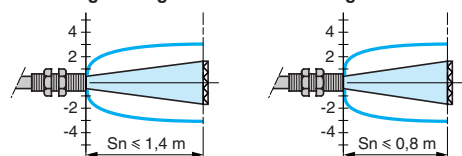
Wiring schemes

M12 connector	Pre-cabled	PNP	NPN
 <p>4 3 3 (-) 1 (+) 4 OUT/Output 1 2 Not connected</p>	<p>(-) BU (Blue) (+) BN (Brown) OUT/Output BK (Black)</p>	 <p>BN/1 PNP + BK/4 BU/3 -</p>	 <p>BN/1 NPN + BK/4 BU/3 -</p>

Detection curves

With reflector XUZC50●●

Line of sight along case axis Line of sight 90° to case axis



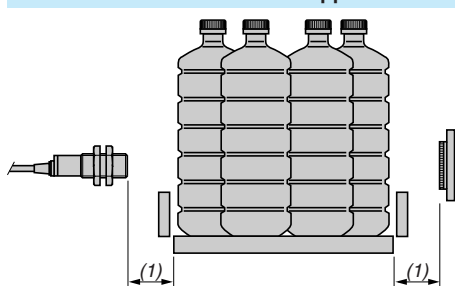
Dimensions

XUBT●●●●

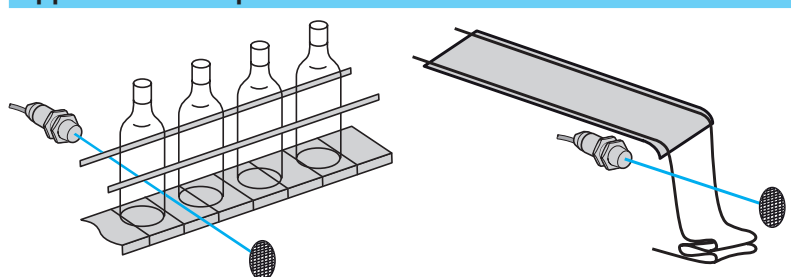
	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
Ø 18, line of sight along case axis	64	44	78	44
Ø 18, line of sight 90° to case axis	78	44	92	44

Setting-up

Recommended distances and application restraints



Application examples

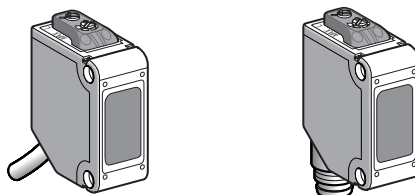


Detection of transparent bottles

Detection of plastic film

For precise detection or magnifying glass effect cases, it is advisable to use XUBT●●●●M12/L2.

Compact design



System	Reflex
Type of transmission	Infra-red
Nominal sensing distance (Sn)	0.1...1 m with reflector XUZC50CR (1) 0.8...2 m with reflector XUZC50 (1)
Adjustment	270° potentiometer

References

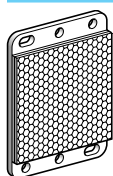
3-wire	NO or NC programmable function	PNP XUMTAPCNL2	NPN XUMTANCNL2	PNP XUMTAPCNM8	NPN XUMTANCNM8	PNP XUMTAPCNL03M12
Weight (kg)		0.155	0.155	0.055	0.055	0.055

Characteristics

Product certifications		CE, cURus		
Ambient air temperature		For operation: - 25...+ 55°C. For storage: - 30...+ 70°C		
Vibration resistance	Conforming to IEC 60068-2-8	20 gn max., amplitude: 3 mm, frequency: 10...500 Hz		
Shock resistance	Conforming to IEC 60068-2-27	50 gn		
Degree of protection	Conforming to IEC 60529	IP 67		
Material		Case: PBT Lenses: polycarbonate		
Indicator lights	Output state Power on, help with setting	Orange LED Green LED		
Connection		2 m cable Conductor c.s.a.: 0.2 mm ²	M8 4-pin connector	Remote M12 connector 0.3 m cable Conductor c.s.a.: 0.2 mm ²
Rated supply voltage		12...24 V $\overline{\text{DC}}$ with protection against reverse polarity		
Voltage limits		10...30 V $\overline{\text{DC}}$ (including ripple)		
Switching capacity		≤ 100 mA with overload and short-circuit protection		
Immunity to ambient light	Natural light	3000 lux		
	Incandescent bulb	3000 lux		
Voltage drop, closed state		< 2 V		
Current consumption		≤ 10 mA		
Response time		≤ 1 ms		

Function table	Function	Diffuse system	
		No object present in the beam	Object present in the beam
State of output (PNP or NPN) and orange LED (illuminated when sensor output is ON)	NO (position D)		
	NC (position L)		

Accessories



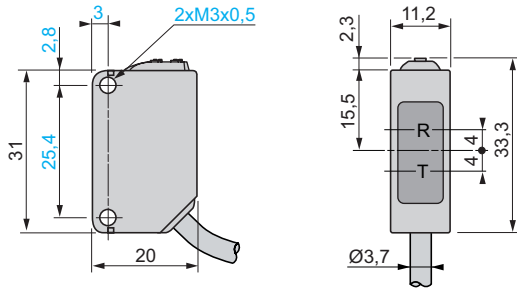
XUZC50
XUZC50CR

Description	Dimensions	Reference	Weight kg
Standard reflector Reflector distance from the product: 0.8 to 2 m	50 x 50 mm	XUZC50	0.020
Application reflector Reflector distance from the product: 0.2 to 1 m	50 x 50 mm	XUZC50CR	0.020

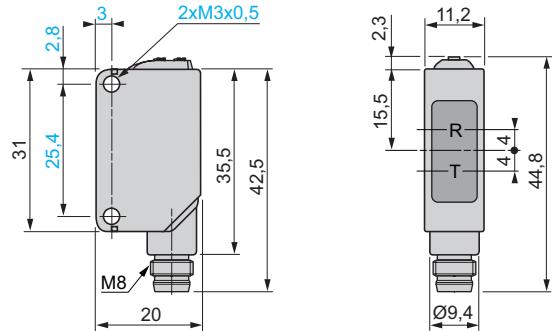
(1) Reflector to be ordered separately.

Dimensions

XUMTAPCNL2, XUMTANCNL2 and XUMTAPCNL03M12

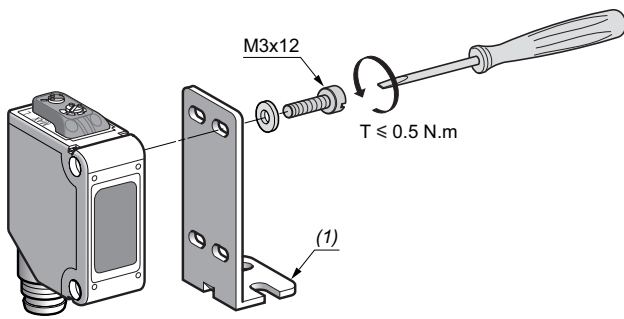


XUMTAPCNM8 and XUMTANCNM8



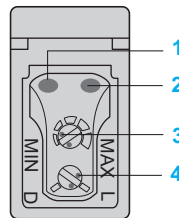
R: Reception, T: Transmission

Mounting



(1) XUZA50, XUZAM02 or XUZAM03 metal bracket (see pages 5/34 and 5/38).

Functions



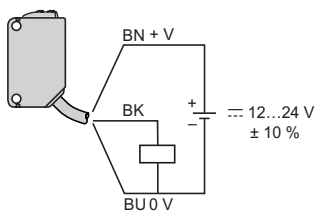
- 1 Stability indicator (green). LED on in stable detection conditions (NO or NC).
- 2 Change indicator (orange). LED lit when the detection output has been activated.
- 3 Sensitivity adjustment potentiometer.
- 4 NO/NC operating mode selector switch.

NO/NC selector switch	Function	Details
	NC (position L)	NC mode is obtained when the selector switch slot is fully turned to position L.
	NO (position D)	NO mode is obtained when the selector switch slot is fully turned to position D.

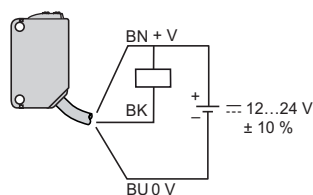
Connections

Wiring schemes (3-wire ---)

PNP output



NPN output



Cable connections

XUMTA●CNL2

(-) BU (Blue)
(+) BN (Brown)
(OUT) BK (Black)

Connector schemes

XUMTA●CNM8

M8 connector

 2 4 3 (-)
 1 (+)
 4 Output
 3 Not connected

XUMTAPCNL03M12

M12 connector

 4 3 3 (-)
 1 (+)
 4 Output
 2 Not connected

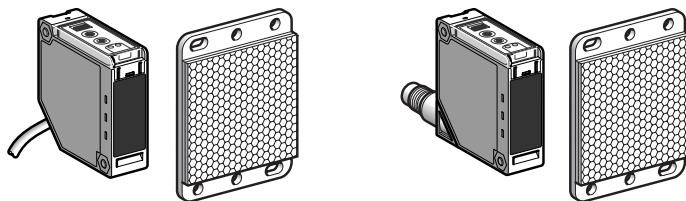
Photo-electric sensors

OsiSense XU Application, packaging series

For detection of transparent materials, with teach mode and automatic compensation for accumulation of dirt ⁽¹⁾

Solid-state output

Compact design



System	Reflex
Type of transmission	Red
Nominal sensing distance (Sn)	1.5 m (with 50 x 50 mm reflector)

References

3-wire, PNP or NPN	NO or NC programmable function	XUKT1KSML2 (2)	XUKT1KSMM12 (2)
Weight (kg)		0.280	0.120

Characteristics

Product certifications		CE, UL, CSA
Ambient air temperature	For operation	- 25...+ 55 °C
	For storage	- 30...+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6	7 gn (f = 10...55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	10 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 65
Materials	Case	PC
	Lenses	PMMA
	Cable	PVC
Connection	Pre-cabled, diameter 6 mm, length 2 m, wire c.s.a.: 4 x 0.34 mm ²	M12 male connector, can be set at 2 positions (suitable female connectors, including pre-wired versions, see page 5/28)
Rated supply voltage	--- 12...24 V with protection against reverse polarity	
Voltage limits	--- 10...30 V (including ripple)	
Switching capacity (sealed)	≤ 100 mA with overload and short-circuit protection	
Voltage drop, closed state	≤ 2 V	
Current consumption, no-load	≤ 35 mA	
Maximum switching frequency	1500 Hz	
Delays	First-up	≤ 80 ms
	Response	≤ 0.3 ms
	Recovery	≤ 0.3 ms
Time delay	Monostable, on-delay or off-delay (programmable) adjustable from 0.1 to 5 seconds	

Function table	Function	Reflex system	
		No object present in the beam	Object present in the beam
Output state (PNP or NPN) indicator: yellow LED (illuminated when sensor output is ON)	NC		
	NO		

(1) Sensor memorises, in teach mode, the environmental conditions in which the object is to be detected and adapts to any variations.

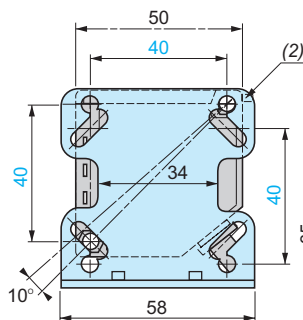
(2) 50 x 50 mm reflector **XUZC50** included with the sensor.

Photo-electric sensors

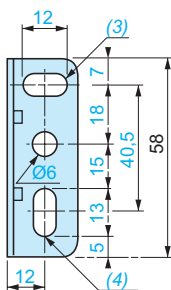
OsiSense XU Application, packaging series
For detection of transparent materials, with teach mode
and automatic compensation for accumulation of dirt
Solid-state output

Dimensions

XUKT1KSML2 (1)

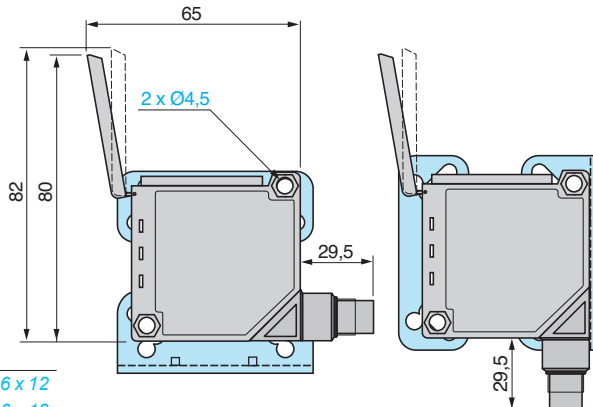


Bracket fixing (1)



XUKT1KSMM12 with cover open

Fixing bracket mounting according to position of connector (1)



(1) The bracket **XUZA51** is included with the sensor.

(2) Cover locking tongue

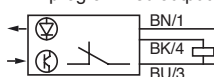
(3) 1 elongated hole $\varnothing 6 \times 12$

(4) 1 elongated hole $\varnothing 6 \times 13$

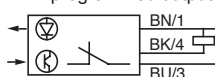
Wiring schemes (3-wire ...)

NC programmed

PNP programmed output

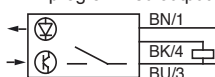


NPN programmed output

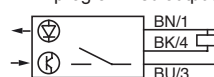


NO programmed

PNP programmed output

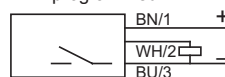


NPN programmed output

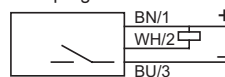


Alarm output

PNP programmed



NPN programmed



Connection

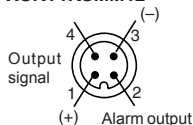
Cable connections

XUKT1KSML2

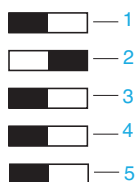
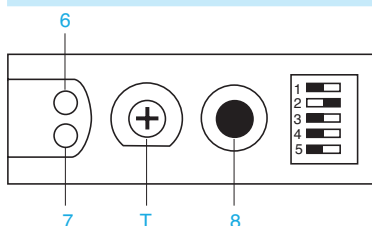
- (-) BU (Blue)
- (+) BN (Brown)
- (OUT) BK (Black)
- Alarm WH (White)

Connector scheme

XUKT1KSMM12



Functions



Switches

- 1 NC/NO programming
- 2 Time delay activated or deactivated
- 3 Normal time delay or monostable
- 4 Normal time delay "On-delay" or "Off-delay"
- 5 PNP or NPN output

LED

- 6 Yellow LED: output and teach mode aid
- 7 Red LED: alignment aid and alarm indicator

Potentiometer and button

- T Time delay adjustment
- 8 Teach mode button

Time delays

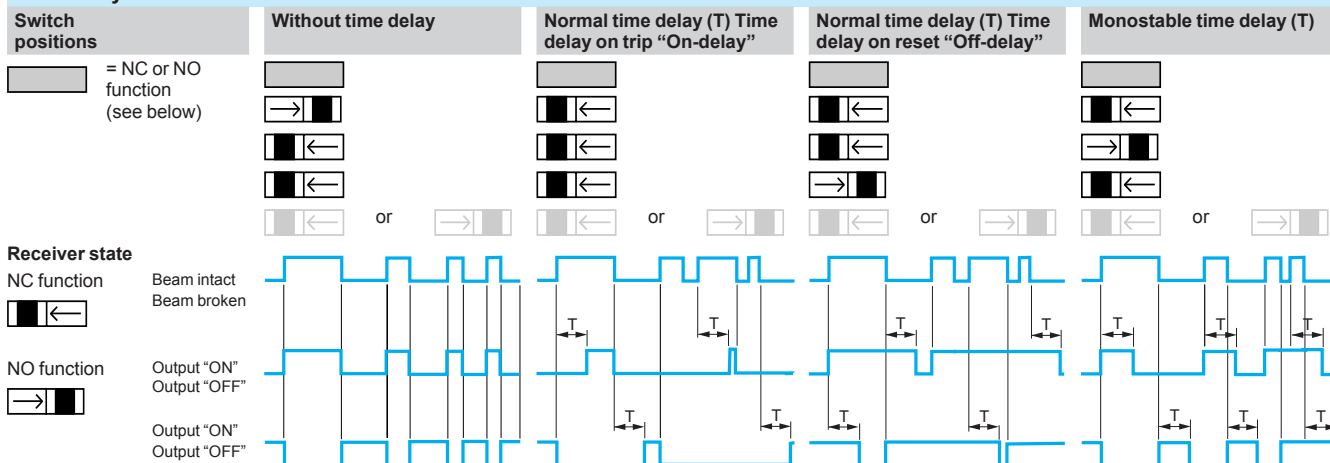


Photo-electric sensors

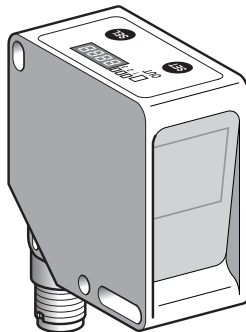
OsiSense XU Application, packaging series

Compact design, 50 x 50

For colour detection ⁽¹⁾

DC supply. Solid-state output

Compact design, 50 x 50



System	Diffuse
Type of transmission	White LED (400-700 nm)
Type of colour processing	RGB
Nominal sensing distance (Sn)	20 mm (Operational distance, see curve on page 5/91)

References

3-wire, PNP + 1 synchro input	NO function	XUKC1PSMM12
3-wire, NPN + 1 synchro input	NO function	XUKC1NSMM12
Weight (kg)		0.085

Characteristics

Product certifications		CE, cULus
Ambient air temperature	For operation	- 10...+ 55 °C
	For storage	- 20...+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 0.5 mm (f = 10...55 Hz for each axis)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms, 6 shocks on each axis
Degree of protection	Conforming to IEC 60529	IP 65
Connection		M12, 8-pin connector; can be set at 90°
Materials	Case	ABS
	Lenses	Glass (window tilted, anti-reflective glass)
Spot diameter		At 20 mm: Ø 4 mm
Adjustment	Teach mode	Teaching using SET (adjustment) and SEL (Selection) buttons
	Operating mode	C (colour) or C+I (colour + intensity), independent for each channel
	Tolerance level	Selectable tolerance for varying shades of colour from TOL 0 to TOL 9
Auxiliary functions		External synchronisation, locking
Indicator lights and display	Display	4-digit
	Output active	3 green LEDs: output 1, 2 or 3
	Output state "OUT"	Yellow LED if one output (1, 2 or 3) activated
Rated supply voltage		DC 12...24 V
Voltage limits		DC 10...30 V (including ripple)
Switching capacity (sealed)		≤ 100 mA with protection against reverse polarity, overload and short-circuit
Voltage drop, closed state		≤ 2 V
Current consumption, no-load		≤ 60 mA
Maximum switching frequency		1.5 kHz
Delay		335 µs for response and recovery
Time delay		Selectable (5, 10, 20, 30 or 40 ms)

Function table for each channel (3 channels) NO function	Colour recognised by sensor	Colour not recognised by sensor
Output state (PNP or NPN) indicator (illuminated when sensor output is ON)		

(1) Applications: OsiSense XU "Full colour" is a colour sensor that can recognise up to 3 colours. It can be used to sort objects by colour or to monitor colours, and is insensitive to surface finishes (matt or reflective), as well as ambient lighting. The sensor is suitable for use in many industrial sectors, such as packaging machines, printing machines, etc.

Photo-electric sensors

OsiSense XU Application, packaging series

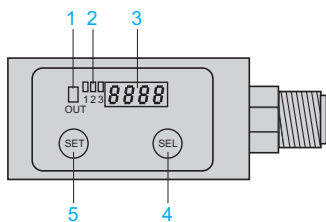
Compact design, 50 x 50

For colour detection

DC supply. Solid-state output

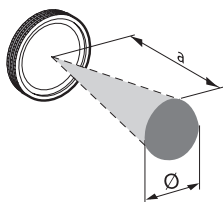
Presentation

Description



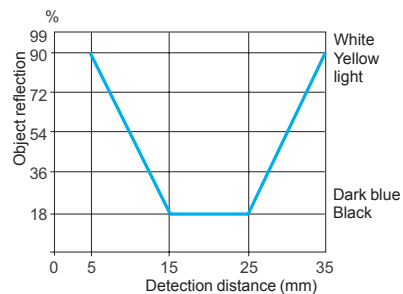
- 1 Output LED
- 2 OUT1, OUT2 and OUT3 LEDs
- 3 Display (green, 4-digit)
- 4 SEL button (adjustment)
- 5 SET button

Detection zone and spot size



	a (mm)	Ø (mm)
XUKC1●SMM12	20	4

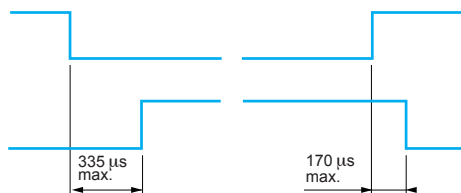
Detection curve



Detection distance related to object's degree of reflection

Diagram

SYNC passive = VDC, SYNC active = 0 V

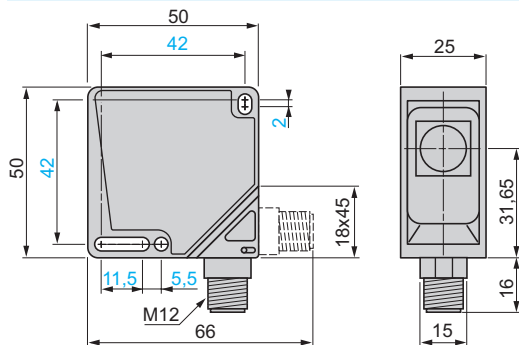


Accessories

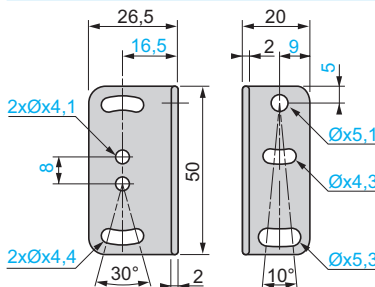
Description	Diameter mm	Length m	Reference	Weight kg
Pre-wired M12, 8-pin connectors, shielded cable (1)	6.5	3	XSZMCR03	0.230
		10	XSZMCR10	0.715
Metal fixing bracket (2 screws, 2 nuts and 2 washers included)	-	-	XUZK2000	0.040
Metal fixing bracket (2 screws, 2 nuts, 2 washers and 1 screwdriver included)	-	-	XUZA51	0.050

Dimensions

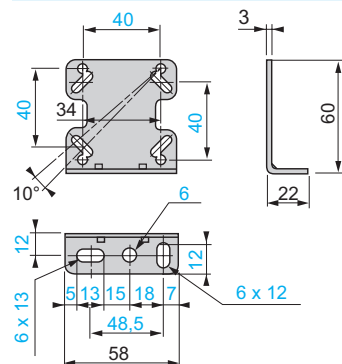
XUKC1●SMM12



Fixing bracket XUZK2000



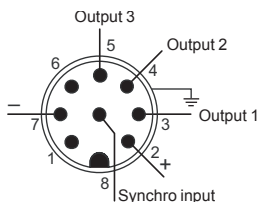
Fixing bracket XUZA51



Wiring schemes

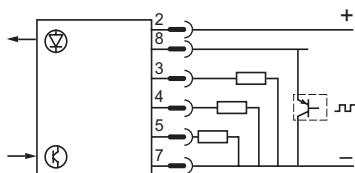
Pre-wired connector XSZMCR●●

Sensor connector pin view

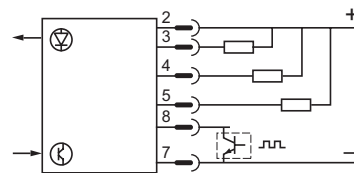


Wiring schemes

PNP output + synchro input



NPN output + synchro input



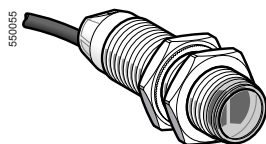
Pin N°	Type	Colour (2)
1	-	WH (white)
2	⎓ 10...30 V	BN (brown)
3	Output 1	TAN (tan)
4	Output 2	YE (yellow)
5	Output 3	GY (grey)
6	-	PK (pink)
7	0 V	VT (violet)
8	Synchro	RD (red)
-	Screening	TR (transparent)

(1) The use of shielded cable is recommended in order ensure correct operation of the sensor, especially in environments subject to electromagnetic interference.

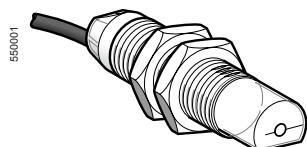
(2) With pre-wired connector XSZMCR●●.

Photo-electric sensors

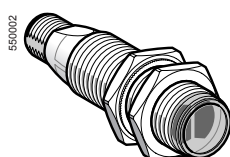
OsiSense XU Application, multimode food and beverage processing series
Design 18, metal, stainless steel
Three-wire DC, solid-state output



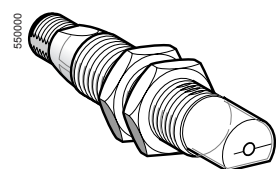
XUB0...NL2



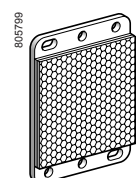
XUB0...WL2



XUB0...NM12



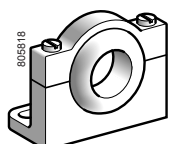
XUB0...WM12



XUZC50



XUZA118



XUZA218



XUZB2005

Ø 18 stainless steel

Pre-cabled (1)

Sensing distance (Sn) (2) m	Function	Output	Line of sight	Reference	Weight kg
0...20 depending on whether accessories are used	NO or NC, by programming	PNP	Along case axis	XUB0SPSNL2	0.105
			90° to case axis	XUB0SPSWL2 (3)	0.110
		NPN	Along case axis	XUB0SNSNL2	0.105
			90° to case axis	XUB0SNSWL2 (3)	0.110

M12 connector

0...20 depending on whether accessories are used	NO or NC, by programming	PNP	Along case axis	XUB0SPSNM12	0.055
			90° to case axis	XUB0SPSWM12 (3)	0.060
		NPN	Along case axis	XUB0SNSNM12	0.055
			90° to case axis	XUB0SNSWM12 (3)	0.060

Accessories

Description	Connecti- on	Line of sight	Reference	Weight kg
Thru-beam accessories (transmitter)	Pre-cabled (1)	Along case axis	XUB0SKSNL2T	0.105
		90° to case axis	XUB0SKSWL2T (3)	0.110
	M12 connector	Along case axis	XUB0SKSNM12T	0.055
		90° to case axis	XUB0SKSWM12T (3)	0.060
Reflector 50 x 50 mm	–	–	XUZC50	0.020

Fixing accessories (4)

Description	Reference	Weight kg
Stainless steel fixing bracket	XUZA118	0.045
Plastic fixing bracket with adjustable ball-joint	XUZA218	0.035
Plastic fixing clamp, 24.1 mm centres with locking screw	XUZB2005	0.007

(1) For a 5 m long cable, replace L2 by L5.

Example: XUB0SPSNL2 becomes XUB0SPSNL5.

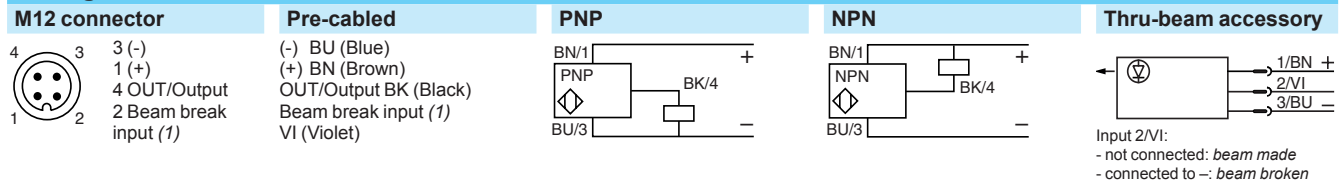
(2) For further information, see page 5/32.

(3) For line of sight 90° to case axis versions, see sensing distances on page 5/32.

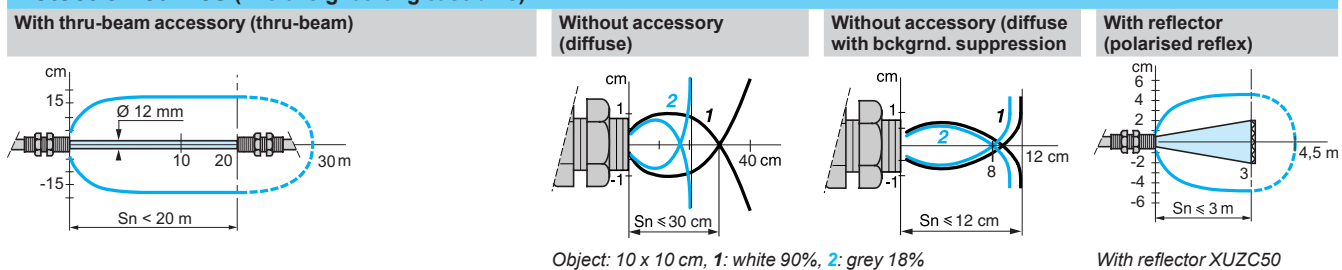
(4) For further information, see page 5/158.

Characteristics		XUB0●●●●M12, XUB0●●●●M12T	XUB0●●●●L2, XUB0●●●●L2T
Sensor type		XUB0●●●●M12, XUB0●●●●M12T	
Product certifications		UL, CSA, CE	
Connection	Connector	M12	–
	Pre-cabled	–	Length: 2 m
Sensing distance nominal S_n / maximum (excess gain = 2) (excess gain = 1)		Line of sight along case axis	Line of sight 90° to case axis
	m	0.12 / 0.12	0.11 / 0.11
	m	0.3 / 0.4	0.2 / 0.3
	m	3 / 4.5	1.5 / 2
	m	20 / 30	10 / 14
Type of transmission	Infrared, except polarised reflex (red)		
Degree of protection	IP 65, IP 67 conforming to IEC 60529; IP 69K conforming to DIN 40050; double insulation II		
Storage temperature	°C	-40...+70	
Operating temperature	°C	-25...+55	
Materials	Case: stainless steel, grade 304CU; Lens: PMMA; Cable: PvR		
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Indicator lights	Output state	Yellow LED (transmission present for XUB0●●●●●●T)	
	Supply on	Green LED	
	Optical alignment aid / dirty	Red LED (except for XUB0●●●●●●T)	
Rated supply voltage	V	12...24 with protection against reverse polarity	
Voltage limits (including ripple)	V	10...36	
Current consumption, no-load	mA	35 (20 for XUB0●●●●●●T)	
Switching capacity	mA	≤ 100 with overload and short-circuit protection	
Voltage drop, closed state	V	1.5	
Maximum switching frequency	Hz	250 (200 for diffuse with background suppression)	
Delays	First-up	ms < 200	
	Response	ms < 2 (< 2.5 for diffuse with background suppression)	
	Recovery	ms < 2 (< 2.5 for diffuse with background suppression)	

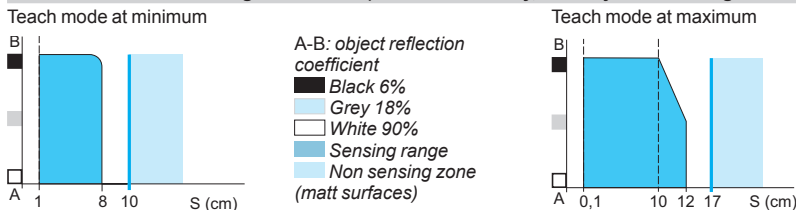
Wiring schemes



Detection curves (line of sight along case axis)



Variation of usable sensing distance S_u (without accessory, with adjustable background suppression)



Dimensions

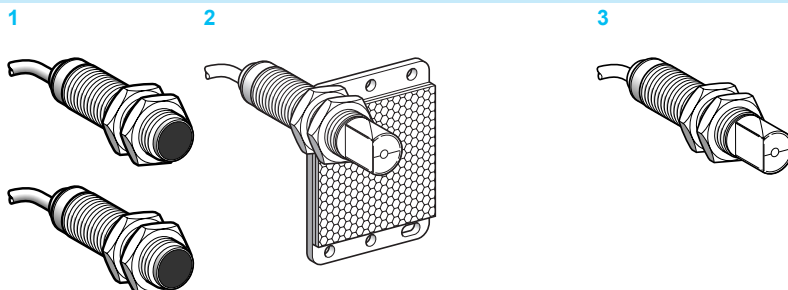
XUB	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
Ø 18, line of sight along case axis	64 (2)	44	78 (2)	44
Ø 18, line of sight 90° to case axis	78	44	92	44

(1) Beam break input on thru-beam transmitter only.
 (2) For XUB0●●●●●●T, 64 becomes 62 mm and 78 becomes 76 mm.

Photo-electric sensors

OsiSense XU Application, single mode
food and beverage processing series
Stainless steel case M18 x 1
DC. Solid-state output

Design 18



System		Thru-beam 1	Reflex 2	Polarised reflex 2	Diffuse 3
Type of transmission		Infrared	Infrared	Red	Infrared
Sensing distance	Nominal Sn (excess gain = 2)	15 m	4 m	2 m	0.10 m
	Maximum (excess gain = 1)	20 m	5.5 m (with 50 x 50 mm reflector)	3 m (with 50 x 50 mm reflector)	0.15 m

References of pre-cabled versions (1)

3-wire, PNP NO or NC programmable function	Line of sight along case axis	XU2N18PP341 (2)	XU1N18PP341 (3)	XU9N18PP341 (3)	XU5N18PP341
	Line of sight 90° to case axis	XU2N18PP341W (2)	XU1N18PP341W (3)	XU9N18PP341W (3)	XU5N18PP341W
3-wire, NPN NO or NC programmable function	Line of sight along case axis	XU2N18NP341 (2)	XU1N18NP341 (3)	XU9N18NP341 (3)	XU5N18NP341
	Line of sight 90° to case axis	XU2N18NP341W (2)	XU1N18NP341W (3)	XU9N18NP341W (3)	XU5N18NP341W
Weight (kg)		0.270	0.155	0.155	0.135

References of connector versions

3-wire, PNP NO or NC programmable function	Line of sight along case axis	XU2N18PP341D (2)	XU1N18PP341D (3)	XU9N18PP341D (3)	XU5N18PP341D
	Line of sight 90° to case axis	XU2N18PP341WD (2)	XU1N18PP341WD (3)	XU9N18PP341WD (3)	XU5N18PP341WD
3-wire, NPN NO or NC programmable function	Line of sight along case axis	XU2N18NP341D (2)	XU1N18NP341D (3)	XU9N18NP341D (3)	XU5N18NP341D
	Line of sight 90° to case axis	XU2N18NP341WD (2)	XU1N18NP341WD (3)	XU9N18NP341WD (3)	XU5N18NP341WD
Weight (kg)		0.130	0.085	0.085	0.065

Fixing accessories (4)

Description	Reference	Weight kg
Stainless steel fixing bracket	XUZA118	0.045
Plastic fixing bracket	XUZA218	0.035
Set of 2 stainless steel nuts	XSZE318	0.020
Set of 2 plastic nuts	XSZE218	0.004

(1) Sensors available with 5 m long cable: To order, add L5 to the end of the reference selected from above.

Example: sensor XU1N18PP341 with 5 m cable becomes XU1N18PP341L5.

(2) Reference for both transmitter and receiver for thru-beam system sensors.

(3) 50 x 50 mm reflector included with reflex system sensors.

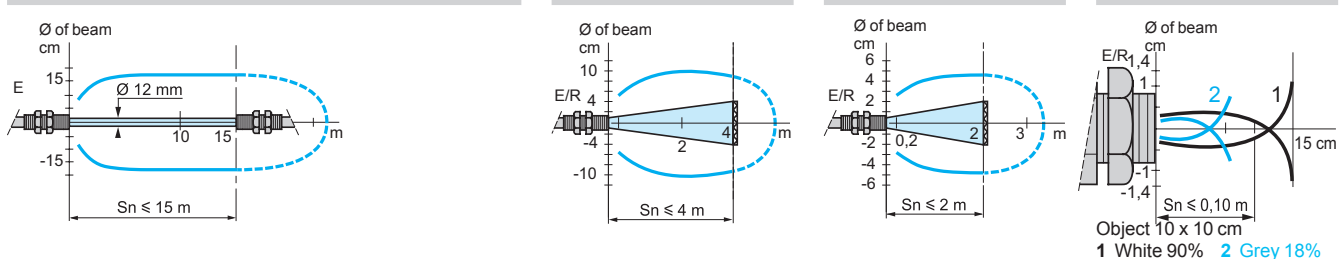
(4) For further information, see page 5/160.

Characteristics		
Product certifications		CE, UL, CSA
Ambient air temperature		For operation: - 25...0...+ 55 °C. For storage: - 40...+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 1.5 mm (f = 10...55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms
Degree of protection		IP 67
Connection	Pre-cabled	Pre-cabled, diameter 4.2 mm, length 2 m (3), wire c.s.a.: 4 x 0.34 mm ²
	Connector	M12 male connector, 4-pin (suitable female connectors, including pre-wired versions, see page 5/28)
Materials	Case	Food and beverage processing stainless steel, grade 304 Cu
	Lenses	PMMA
	Cable	PvR
Rated supply voltage		12...24 with protection against reverse polarity
Voltage limits		10...30 V (including ripple)
Switching capacity (sealed)		≤100 mA with overload and short-circuit protection
Voltage drop, closed state		≤ 1.5 V
Current consumption, no-load		≤ 30 mA (reflex and diffuse), ≤ 50 mA (thru-beam)
Maximum switching frequency		500 Hz
Delays	First-up	≤ 15 ms
	Response	≤ 1 ms
	Recovery	≤ 1 ms
Indicator lights	Supply on	Green LED, on transmitter only
	Output state	Yellow LED, on receiver only

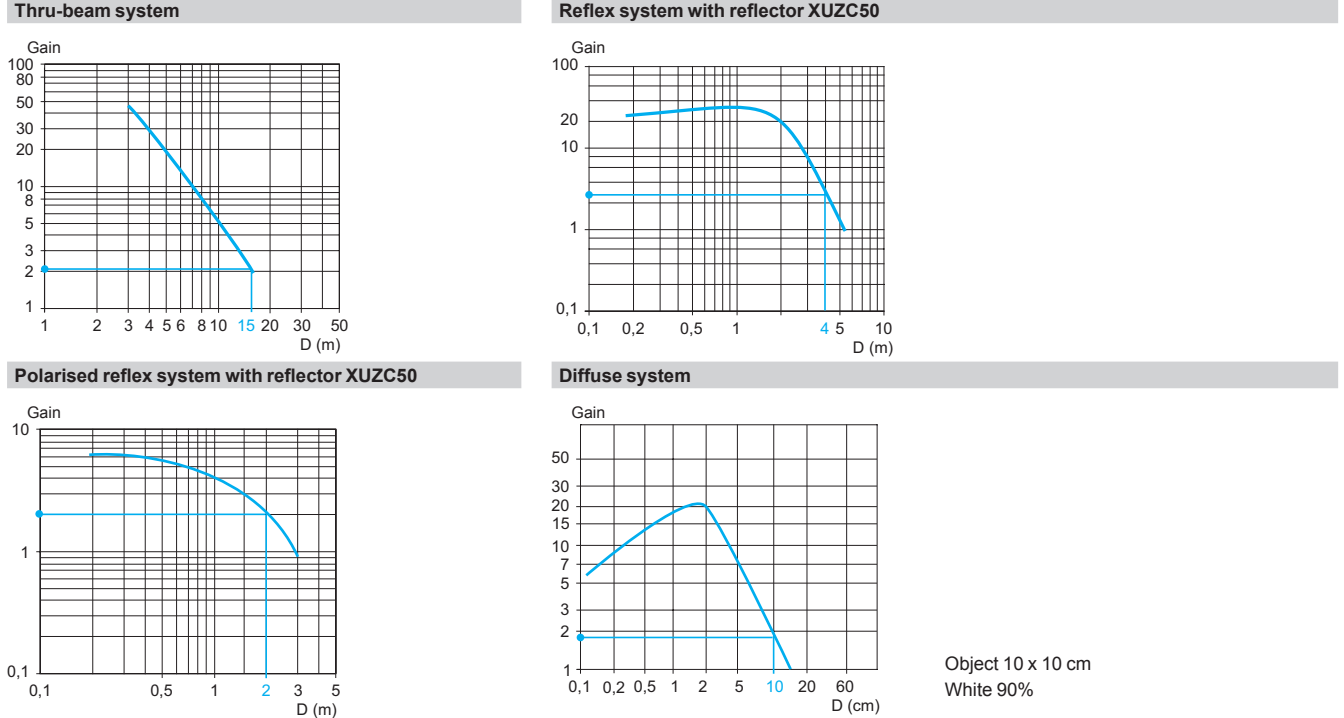
(1) Sensors available with 5 m long cable: To order, add L5 to the end of the reference selected from above.
Example: sensor XU1N18PP341 with 5 m cable becomes XU1N18PP341L5.

Curves

Detection curves	Reflex system with reflector XUZC50	Polarised reflex system with reflector XUZC50	Diffuse system
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Excess gain curves (ambient temperature: + 25 °C)



Accessories:
page 5/158

Photo-electric sensors

OsiSense XU Application, single mode

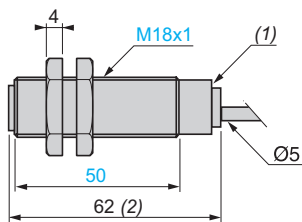
food and beverage processing series

Stainless steel case M18 x 1

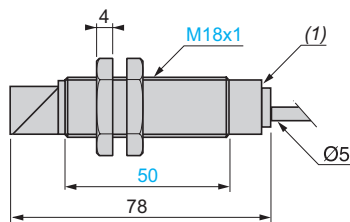
DC. Solid-state output

Dimensions

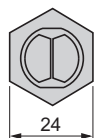
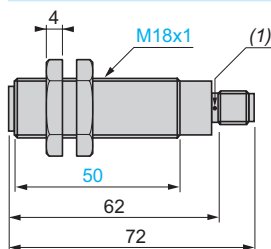
XU●N18●●341



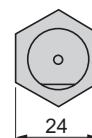
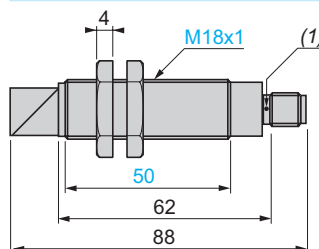
XU●N18●●341W



XU●N18●●341D



XU●N18●●341WD



(1) LED

(2) 64 for XU9N18●●341

Fixing nut tightening torque: < 15 N.m

Connector tightening torque: 2 N.m

Photo-electric sensors

OsiSense XU Application, single mode

food and beverage processing series

Stainless steel case M18 x 1

DC. Solid-state output

Wiring schemes

M12 connector



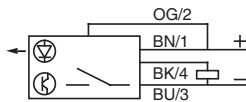
- 3 (-)
- 1 (+)
- 4 OUT/Output
- 2 Prog (or beam break input for thru-beam transmitter only)

Pre-cabled

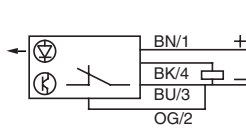
- (-) BU (Blue)
- (+) BN (Brown)
- (Out/Output) BK (Black)
- (Prog) OG (Orange)
- (Beam break input) VI (Violet) on thru-beam transmitter only

Wiring schemes - diffuse

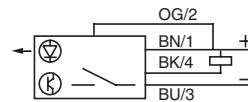
PNP NO



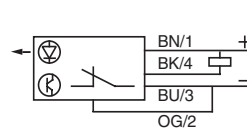
PNP NC



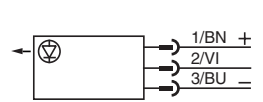
NPN NO



NPN NC

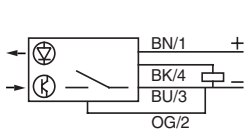


Transmitter

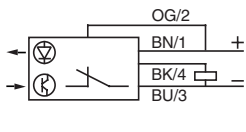


Wiring schemes - reflex and thru-beam

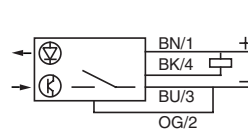
PNP NO



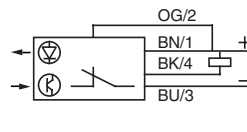
PNP NC



NPN NO

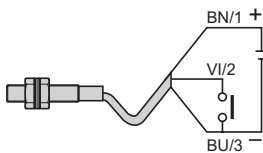


NPN NC



Beam break input on thru-beam transmitter only

Beam made



Beam broken

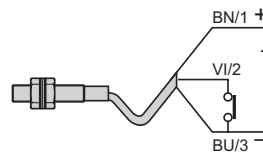
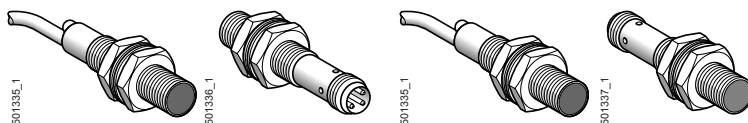


Photo-electric sensors

OsiSense XU Application, assembly series
Metal case, cylindrical, threaded M8 x 1
DC supply. Solid-state output

Design 8



Connection	Pre-cabled	■	—	■	—
	Connector	—	■	—	■
System		Thru-beam	Thru-beam	Diffuse	Diffuse
Type of transmission		Infrared	Infrared	Infrared	Infrared
Nominal sensing distance (Sn)		2 m	2 m	0.05 m	0.05 m

References

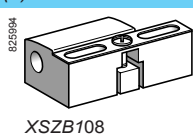
3-wire, PNP	NO function	XUAH0214	XUAH0214S	XUAH0515	XUAH0515S
	NC function	XUAH0224	XUAH0224S	XUAH0525	XUAH0525S
3-wire, NPN	NO function	XUAJ0214	XUAJ0214S	XUAJ0515	XUAJ0515S
	NC function	XUAJ0224	XUAJ0224S	XUAJ0525	XUAJ0525S
Transmitter		XUAH0203	XUAH0203S	—	—
Weight (kg)		0.050	0.015	0.50	0.015

Characteristics

Product certifications		CE, cULus			
Ambient air temperature	For operation	- 25...+ 55 °C			
	For storage	- 30...+ 70 °C			
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1 mm (f = 10...55 Hz)			
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms			
Degree of protection	Conforming to IEC 60529	IP 67 - IP 65	IP 65	IP 67 - IP 65	IP 65
Connection	Pre-cabled	Ø 3.5 mm, length 2 m, wire c.s.a.: 3 x 0.14 mm ²			
	Connector	M8 female connectors, 3-pin, see page 5/28			
Materials	Case	Nickel plated brass			
	Cable	PvR	—	PvR	—
	Lenses	PMMA			
Rated supply voltage		⎓ 12...24 V with protection against reverse polarity			
Voltage limits (including ripple)		⎓ 10...30 V			
Switching capacity (sealed)		≤ 100 mA with overload and short-circuit protection			
Voltage drop, closed state		≤ 1 V			
Current consumption, no-load	Transmitter	≤ 15 mA			
	Receiver	≤ 10 mA			
	Diffuse	≤ 25 mA			
Maximum switching frequency		2000 Hz		1000 Hz	
Delays	First-up	≤ 20 ms			
	Response and recovery	≤ 0.25 ms		≤ 0.5 ms	

Function table	Function	Diffuse or through beam system	
		No object present in the beam	Object present in the beam
Output state (PNP or NPN) indicator: yellow LED (illuminated when sensor output is ON)	NO		
	NC		

Fixing accessories (1)



Description	Reference	Weight kg
Plastic fixing clamp with locking screw	XSAZ108	0.007
Plastic fixing clamp for sensor replacement without adjustment	XSZB108	0.006

(1) For further information, see page 5/160.

Photo-electric sensors

OsiSense XU Application, assembly series

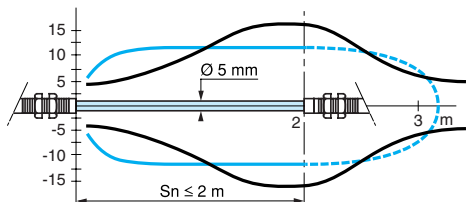
Metal case, cylindrical, threaded M8 x 1

DC supply. Solid-state output

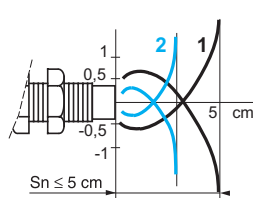
Curves

Detection curves

Thru-beam system

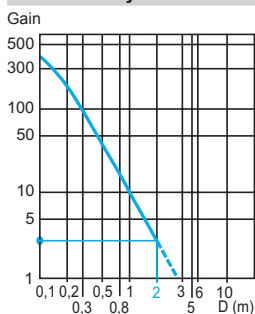


Diffuse system

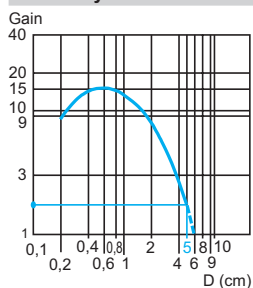


Excess gain curves (ambient temperature: ± 25 °C)

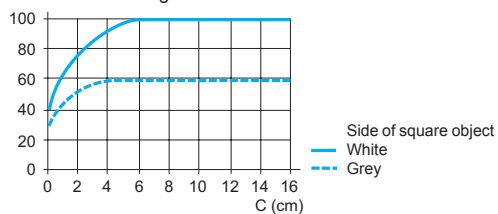
Thru-beam system



Diffuse system



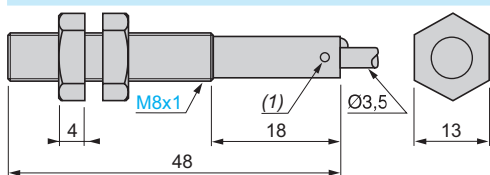
Variation of sensing distance Sn



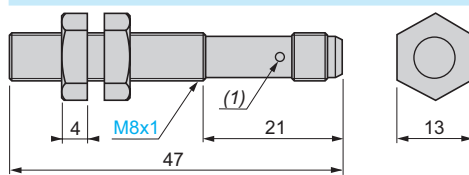
Detection differential (H) when object approaches from the front: $H \leq 25\% \text{ of } S_n$

Dimensions

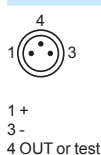
XUA



XUA●●●●●S



M8 connector



(1) LED, 4 viewing ports at 90°.

(1) LED, 4 viewing ports at 90°. **Note:** fixing nut tightening torque: < 2 N.m

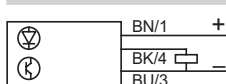
Wiring schemes (3-wire ---)

XUA

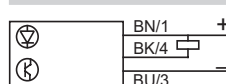
Transmitter



PNP

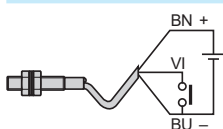


NPN

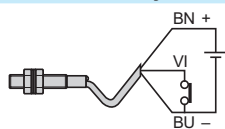


Beam break test

For thru-beam transmitter XUAH0203 only

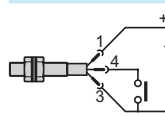


Beam made
LED on (steady light)

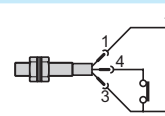


Beam broken
LED flashing

For thru-beam transmitter XUAH0203S only



Beam made
LED on (steady light)



Beam broken
LED flashing

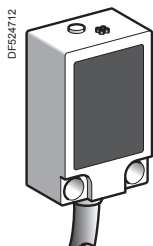
Photo-electric sensors

OsiSense XU Application

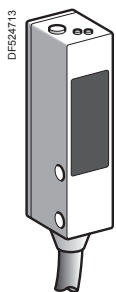
Conveying and access control series

Miniature design

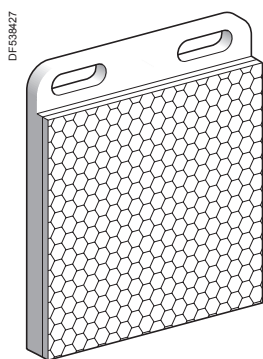
Four-wire DC, solid-state output



XUYPS989S●



XUYB989S●



XUY1111

Diffuse system with background suppression					
Sensing dist. (Sn) m	Function	Output	Connection	Reference	Weight kg
0.015...0.08	NO/NC depending on wiring	PNP	Pre-cabled (L = 2 m)	XUYPS989SP	0.075
			M8 connector	XUYPCO989SP	0.044
		NPN	Pre-cabled (L = 2 m)	XUYPS989SN	0.075
			M8 connector	XUYPCO989SN	0.044

Diffuse system with adjustable sensitivity					
Sensing dist. (Sn) m	Function	Output	Connection	Reference	Weight kg
0.03...0.25	NO/NC depending on wiring	PNP	Pre-cabled (L = 2 m)	XUY989SP	0.075
			M8 connector	XUYPCO989SP	0.044
		NPN	Pre-cabled (L = 2 m)	XUY989SN	0.075
			M8 connector	XUYPCO989SN	0.044

Polarised reflex system					
Sensing dist. (Sn) m	Function	Output	Connection	Reference	Weight kg
1 with 50 x 50 mm reflector	NO/NC depending on wiring	PNP	Pre-cabled (L = 2 m)	XUY989SP (1)	0.093
			M8 connector	XUYBCO989SP (1)	0.061
		NPN	Pre-cabled (L = 2 m)	XUY989SN (1)	0.093
			M8 connector	XUYBCO989SN (1)	0.061

(1) 50 x 50 mm reflector (XUY1111) and multi-adjustment fixing bracket included with sensor.

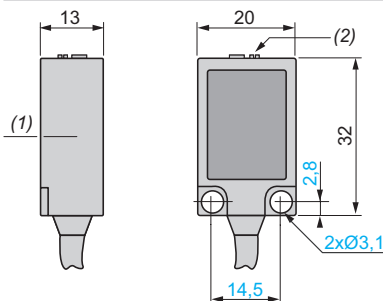
Accessory		For use with		
Reflector, 50 x 50 mm	XUYB989S●	XUY1111		0.018

Thru-beam system					
Sensing dist. (Sn) m	Function	Output	Connection	Reference	Weight kg
4 (Transmitter)		-	Pre-cabled (L = 2 m)	XUY989	0.075
			M8 connector	XUYECO989	0.044
4 (Receiver)	NO/NC depending on wiring	PNP	Pre-cabled (L = 2 m)	XUYR989SP	0.075
			M8 connector	XUYRCO989SP	0.044
		NPN	Pre-cabled (L = 2 m)	XUYR989SN	0.075
			M8 connector	XUYRCO989SN	0.044

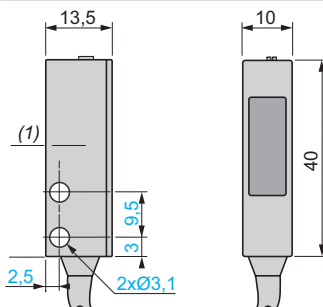
- Applications:
 - Monitoring position or presence of parts, with background suppression
 - Detection of height of objects on a conveyor
 - Detection of product, pellet, powder levels.

Dimensions

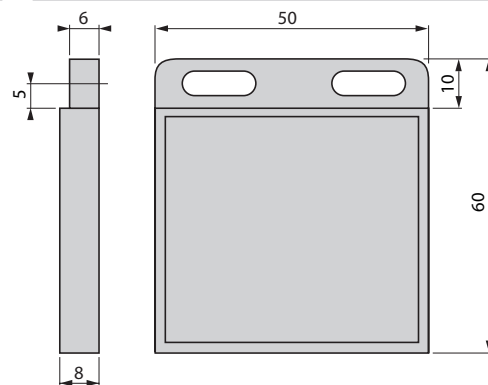
XUYPS989S●



XUYE989 and XUYR989●●

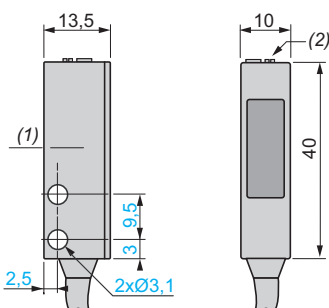


XUY1111



XUY●989S●

Transmitter/Receiver



(1) Optical axis
(2) Accuracy adjustment

Characteristics		XUY●●●●●	XUY●CO●●●●●
Sensor type			
Product certifications		CE, cULus (1)	
Connection	Connector	-	
	Pre-cabled	Length: 2 m	M8, 4-pin, on 0.2 m flying lead
Nominal sensing distance (Sn)		m	0.08 diffuse with background suppression
		m	0.25 diffuse with adjustable sensitivity
		m	1 polarised reflex (with 50 x 50 mm reflector)
		m	4 thru-beam
Type of transmission	LED	Red, pulsed	
	Modulation frequency	6 kHz (4 kHz for XUYPS●●989S●)	
Degree of protection	Conforming to IEC 60529	IP 65 and IP 67	
Ambient air temperature	For storage	°C	-20...+80
	For operation	°C	0...+50
Materials	Case	ABS	
	Lens	PMMA	
	Cable	PVC	PUR
Immunity to ambient light	Natural light	Lux	10 000 (insensitive for XUYPS●●989S●)
	Incandescent bulb	Lux	5000 (insensitive for XUYPS●●989S●)
Rated supply voltage		V	~ 12...24 with protection against reverse polarity
Voltage limits (including ripple)		V	~ 10...30
Current consumption, no-load		mA	< 25
Switching capacity per output		mA	100 with overload and short-circuit protection
Voltage drop, closed state		V	At 100 mA: < 2; at 10 mA: < 1
Maximum switching frequency		Hz	500
Delays	Response and recovery	ms	1

(1) This product is UL Listed if supplied by a class II or isolated supply delivering ~ 30 V max. (isolated transformer for example) and protected by a UL fuse rated at 3 A max.

Wiring scheme - connector

M8	Pin n° - colour
	1 BN: Brown
	2 WH: White
	3 BU: Blue
	4 BK: Black

Transmitter

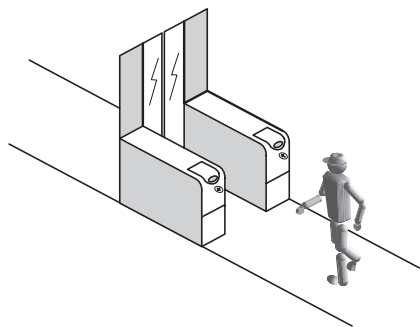
BN	~ 10-30 V	Nc: Not connected
BK	Nc	
WH	Nc	
BU	0 V	

Wiring scheme - pre-cabled

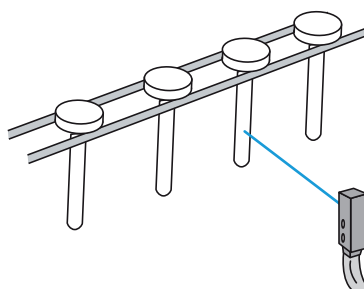
Diffuse		Polarised reflex and thru-beam	
PNP output		PNP output	
NPN output		NPN output	

Application examples

Access control



Monitoring metal rods



Detection of tin cans on a conveyor

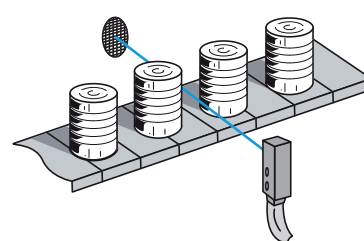
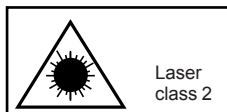


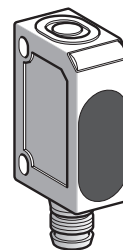
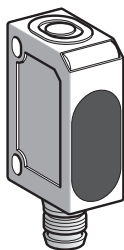
Photo-electric sensors

OsiSense XU Application, assembly series
Miniature design
with laser transmission and teach mode
Three-wire DC, solid-state output

Miniature design



Laser class 2, conforming to IEC 825-1.
Visible laser radiation: do not stare into beam.



System	Polarised reflex	Diffuse with background suppression		Colour mark reader
Type of transmission	Red laser, pulsed, Class 2, wavelength: 655 nm			
Nominal sensing distance (Sn)	100...1000 mm (1)	20...60 mm	30...110 mm	40...150 mm

References

4-wire, PNP output	NO/NC function, selectable	XUYBCO929LSP	XUYPSCO929L1SP	XUYPSCO929L2SP	XUYPCCO929LSP
Weight (kg)		0.056	0.056	0.056	0.056

Characteristics

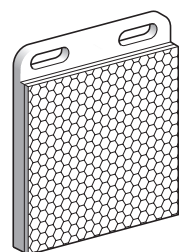
Product certifications		CE		
Ambient air temperature	For operation	- 20... + 60 °C		
	For storage	- 20... + 80 °C		
Degree of protection	Conforming to IEC 60529	IP 67		
Connection		M8, 4-pin male connector		
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms		
Materials	Case	ABS		
Rated supply voltage		--- 12...24 V with protection against reverse polarity		
Voltage limits (including ripple)		--- 10...30 V		
Immunity to ambient light		5000 lux		
Laser transmission		T pulse: 3 µs, pulse frequency: 5 kHz		
Spot diameter		< 0.7 mm	< 0.3 ... 40 mm	< 0.7 mm
Switching capacity		100 mA with overload and short-circuit protection		
Voltage drop, closed state		< 2.4 V		
Current consumption, no-load		25 mA	30 mA	25 mA
Maximum switching frequency		1000 Hz		
Indicator lights	Supply on/Dirty	Green LED		
	Output signal	Yellow LED		
Adjustment		Using teach mode button or remote teaching (external input)		

(1) With 50 x 50 mm reflector, reference XUY1111.

■ Applications

- Monitoring of small parts on production machines
- Setting-up of sensors

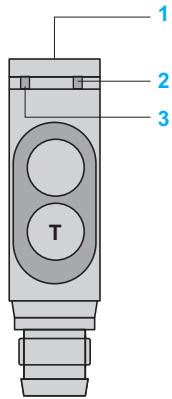
Accessories



XUY1111

Description	Details	Length of cable		References	Weight
			m		
Pre-wired M8 connector	Straight	2	XZCP0941L2	0.080	
	Elbowed (90°)	2	XZCP1041L2	0.080	
	Straight	5	XZCP0941L5	0.180	
	Elbowed (90°)	5	XZCP1041L5	0.180	
Reflector for XUYBCO929LSP	50 x 50 mm	–	XUY1111	0.018	
Fixing bracket			XUY929	0.013	
Protection bracket	Vertical rear fixing		XUY9291	0.070	
	Lower side fixing		XUY9292	0.061	

Description



XUYBC0929LSP

- 1 Teach In (T.I.)
- 2 Yellow LED: Detection LED (1)
- 3 Green LED: Supply on or fault due to accumulation of dirt (if LED off)

- **Teach mode** (yellow and green LEDs are on)
 - Line up with reflector, press T.I. for 3 seconds: both LEDs flash
 - Insert the object, press T.I. for 1 second: the green LED flashes then remains on (teaching completed).

XUYPCO929L●SP, XUYPCO929LSP

- 1 Teach In (T.I.)
- 2 Yellow LED: Detection LED
- 3 (2)
- Green LED: Supply on or fault due to accumulation of dirt (if LED off)

- **Teach mode** (yellow and green LEDs are on)
 - Line-up with object, press T.I. for 3 seconds: both LEDs flash
 - Insert the object, press T.I. for 1 second: the green LED flashes then remains on (teaching completed)

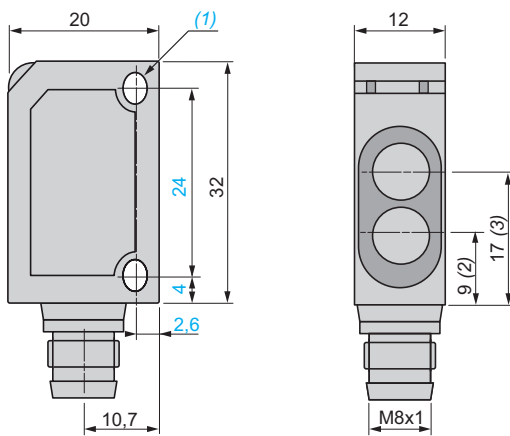
R: Receiver
T: Transmitter

- **NO/NC** Press T.I. for 13 seconds: the two LEDs alternatively flash (on the release of T.I., the green LED remains on).
- Each press on T.I. changes the output state (NO, NC, NO, NC, ...). When T.I. is not pressed for 10 seconds, the green LED goes off: the selected state is memorised.

- (1) Whether the output is direct or inverse, the "detection" LED goes off only on beam break.
- (2) Whether the output is direct or inverse, the "detection" LED comes on only when an object is present.

Dimensions

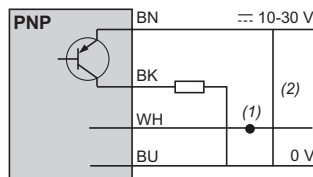
XUYBC0929LSP, XUYPCO929L●SP



- (1) 2 elongated holes $\varnothing 3.2 \times 4.2$.
- (2) Transmitter optical axis.
- (3) Receiver optical axis.

Wiring schemes

Pre-cabled



- (1) - Connected to +: external teaching.
- Connected to -: locking of functions
- (2) Output 100 mA max.

M8 connector

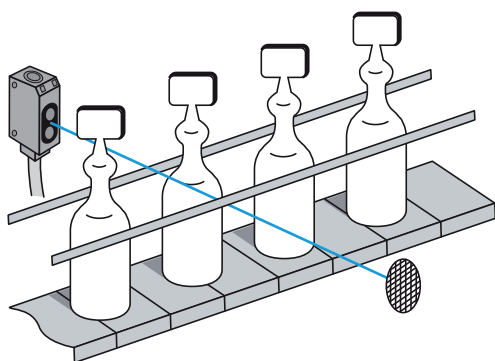


Pin n° - colour

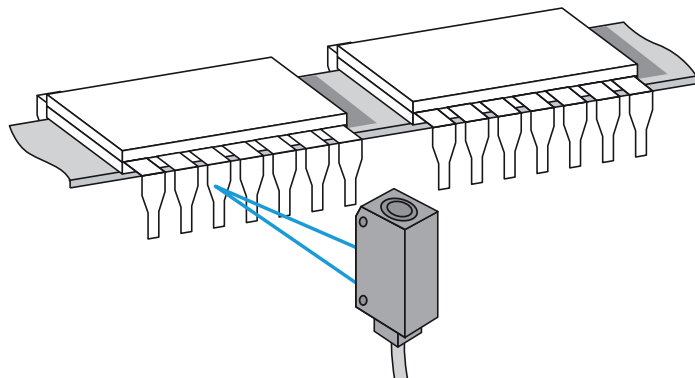
- 1 BN: Brown
- 2 WH: White
- 3 BU: Blue
- 4 BK: Black

Application examples

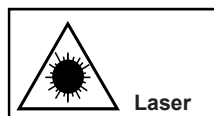
Detection of pharmaceutical ampoules



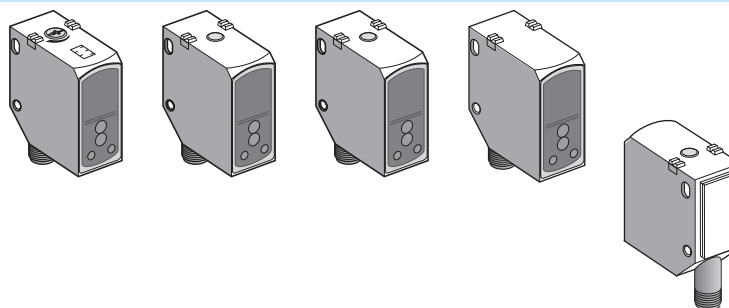
Detection of connection tags on integrated circuits passing on rail



Compact design



Class 1 or class 2 laser,
conforming to IEC 60825-1
Visible laser radiation:
do not stare into beam



System	Diffuse with background suppression	Diffuse	Polarized reflex	Thru-beam
Type of transmission	Red laser (655 nm) class 1	Red laser (650 nm) class 2	Red laser (655 nm) class 1	Red laser (655 nm) class 1
Nominal sensing distance (Sn)/Maximum sensing distance	5...800 mm, on white 90% (1) 10...600 mm, on grey 18% 30...500 mm, on black 6% (2)	5...1200 mm, on white 90% 10...700 mm, on grey 18% 100...400 mm, on black 6% (2)	0.3...12/14 m (with reflector XUZC50HP)	0...25/30 m

References

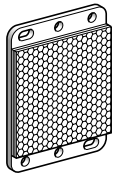
4-wire, PNP NO/NC programmable	XUK8LAPPNM12	XUK5LAPSMM12	XUK9LAPSMM12	Transmitter: XUK2LAKSMM12T	Receiver: XUK2LAPSMM12R
Weight (kg)	0.035	0.035	0.035	0.035	0.035

Characteristics

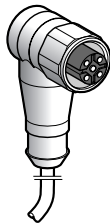
Product certifications		ECOLAB, CE, cULus				
Connection		M12, 4-pin connector				
Degree of protection	Conforming to IEC 60529	IP 67				
	Conforming to DIN 40050	IP 69K				
Ambient air temperature	For operation	-20...+60°C				
	For storage	-20...+80°C				
Material	Case	PC - ABS anti-shock				
	Lenses	PMMA				
Vibration resistance	Conforming to EN/IEC 60068-2-6	Amplitude ±0.5 mm (f = 10 to 55 Hz)				
Shock resistance	Conforming to EN/IEC 60068-2-27	30 gn, duration 11 ms				
Indicator lights	Output state	Yellow LED	Yellow LED	Yellow LED	–	Yellow LED
	Instability/alignment	Yellow LED, flashing/–			–/–	Yellow LED, flashing/ Red LED
	Supply on	Green LED				
Rated supply voltage		12...30 V $\overline{\text{---}}$	10...30 V $\overline{\text{---}}$			
Voltage limits (including ripple)		10.8...33 V $\overline{\text{---}}$ /9...33 V $\overline{\text{---}}$				
Current consumption, no-load		< 30 mA				
Switching capacity		≤ 100 mA, with protection against reverse polarity and short-circuit				
Test function	Breaking red beam	–	–	–	Yes	–
Voltage drop, closed state		≤ 2.4 V				
Maximum switching frequency		1000 Hz	600 Hz	2000 Hz	–	3500 Hz
Delays	First-up	< 300 ms				
	Response	0.5 ms	0.8 ms	0.25 ms	–	0.14 ms
	Recovery	0.5 ms	0.8 ms	0.25 ms	–	0.14 ms

(1) On the minimum setting, the background suppression distance (white) is 70 mm.
(2) % of object remission.

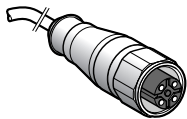
References of accessories



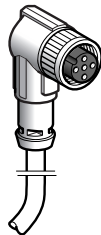
XUZC50HP



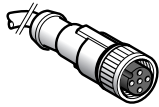
XZCPA1241L5



XZCPA1141L5



XZCPA1241L5



XZCP1141L5

Description	Dimensions	Reference	Weight kg
Fixing bracket 304 stainless steel	–	XUZA51S	0.050
Protection bracket 304 stainless steel	–	XUZASK001	0.210
Mounting bracket on dovetail	–	XUZASK002	0.050
Rigid microprism reflector	50 x 50 mm	XUZC50HP	0.020

Pre-wired connectors with PVC cable for food and beverage applications

Straight pre-wired connector M12, 4-pin, female connector, stainless steel clamping ring	5 m	XZCPA1141L5	0.210
Elbowed pre-wired connector M12, 4-pin, female connector, stainless steel clamping ring	5 m	XZCPA1241L5	0.210

Pre-wired connectors with PUR cable for industrial applications

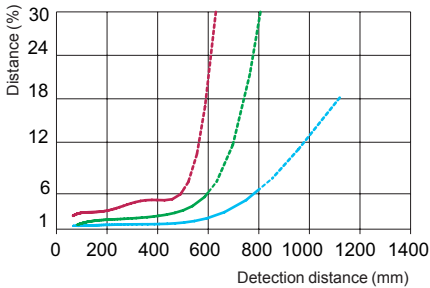
Straight pre-wired connector M12, 4-pin, female connector, nickel-plated brass clamping ring	5 m	XZCP1141L5	0.210
Elbowed pre-wired connector M12, 4-pin, female connector, nickel-plated brass clamping ring	5 m	XZCP1241L5	0.210

Note: To find other connection accessories, please consult our catalogue "OsiSense XZ cabling accessories".

Curves

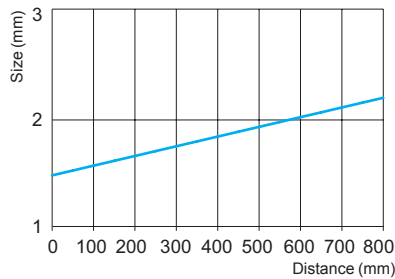
XUK8LAPPNM12

Scanning properties



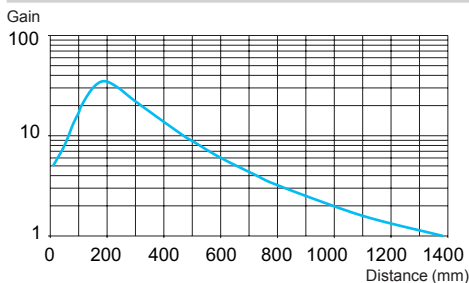
- Black/white 6%/90%
- Grey/white 18%/90%
- White/white 90%/90%

Size of luminous point

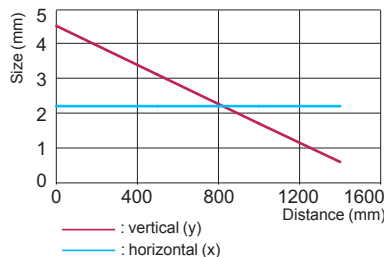


XUK5LAPSM12

Excess gain curve



Size of luminous point

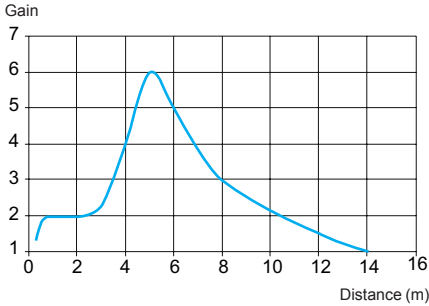


- : vertical (y)
- : horizontal (x)

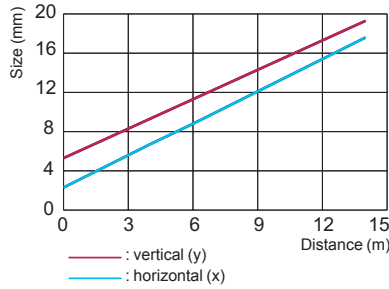
Curves (continued)

XUK9LAPSMM12

Excess gain curve

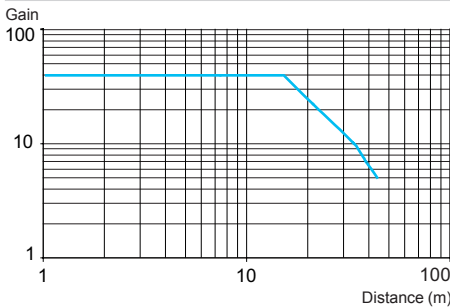


Size of luminous point

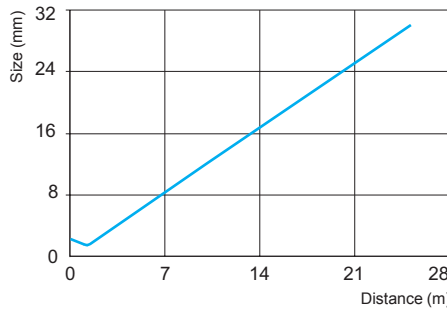


XUK2LAKSMM12T and XUK2LAPSMM12R

Excess gain curve



Size of luminous point



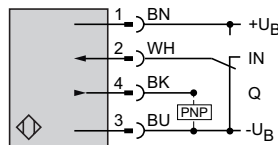
5

Wiring schemes using M12 connector

XUK8LAPPNM12



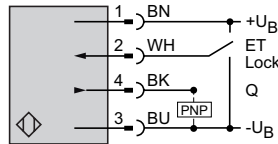
- 1 **BN**: Brown (+)
- 2 **WH**: White
- (+UB = NC, -UB = NO, not connected = NO)
- 3 **BU**: Blue (-)
- 4 **BK**: Black (Output)



XUK5LAPSMM12, XUK9LAPSMM12 and XUK2LAPSMM12R



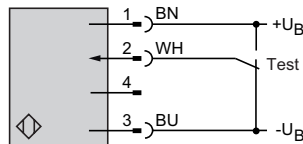
- 1 **BN**: Brown (+)
- 2 **WH**: White (ET/Lock) (1)
- 3 **BU**: Blue (-)
- 4 **BK**: Black (Output)



XUK2LAPSMM12T



- 1 **BN**: Brown (+)
- 2 **WH**: White (Test input) (2)
- 3 **BU**: Blue (-)
- 4 **BK**: Black (pin not connected)



(1) ET/Lock. ET: External Teach, Lock: pushbutton locking.

+UB: external teach. -UB: pushbutton locking.

Not connected: normal operation.

(2) Test input: +UB = test function (transmitter disconnected). -UB or not connected = normal operation.

Photo-electric sensors

OsiSense XU Application, single mode

Assembly series

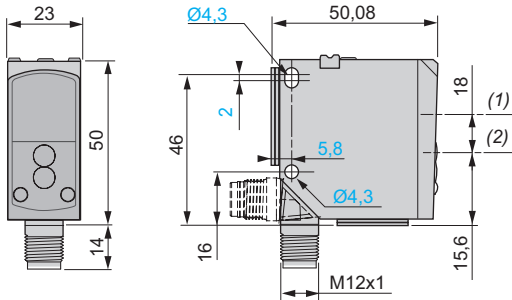
Plastic, M12 connector

DC

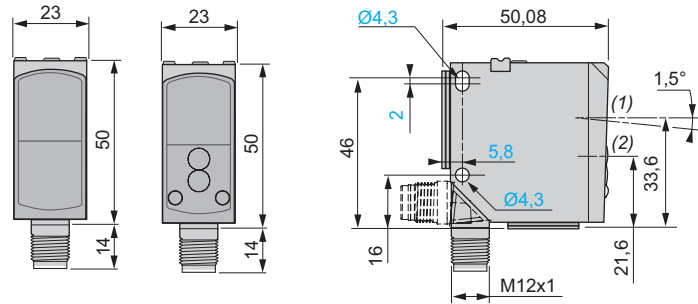
Dimensions

Sensors

XUK8LAPPNM12

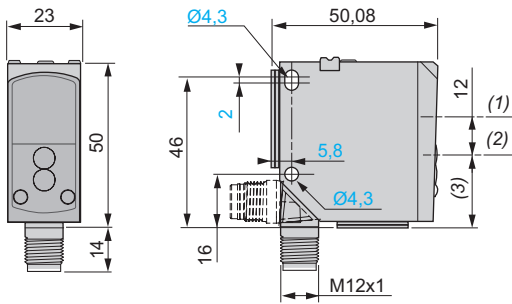


XUK2LAKSMM12T and XUK2LAPSMM12R



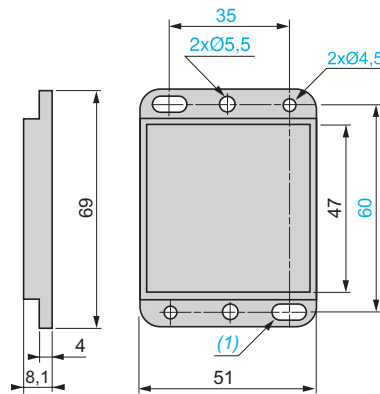
Sensors (continued)

XUK5LAPSMM12 and XUK9LAPSMM12



Reflector

XUZC50HP



- (1) Receiver optical axis.
- (2) Transmitter optical axis.
- (3) 21.4 mm for XUK5LAPSMM12,
21.6 mm for XUK9LAPSMM12.

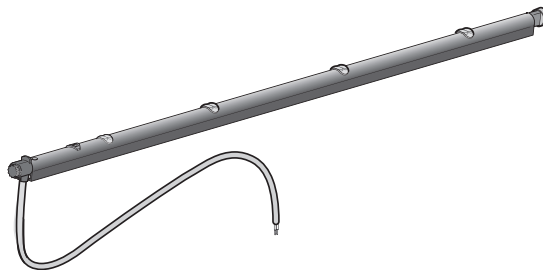
- (1) 2 elongated holes for M4 screws.

Photo-electric sensors

OsiSense XU Application, conveying series

For detecting packages on a roller conveyor

DC supply, solid-state output



Nominal sensing distance (Sn)	0.1 m
Function	NO/NC programmable
Output	PNP + NPN
Connection	Remote M12 connector, L = 0.3 m

References

3-wire type	XUY474NB4H03M12 (1)
Number of sensors (1 to 6)	4
Weight (kg)	0.075

Note: If you require more information about these products, please consult our Customer Care Centre.

Characteristics

Product certifications		CE, cCSAus
Type of transmission		Infrared
Operating mode		Diffuse
Nominal sensing distance		100 mm (white paper)
Differential travel		< 25%
Degree of protection	Conforming to IEC 60529	IP 50 (IP 65 on request)
Ambient air temperature	For operation	- 10...+ 55°C
	For storage	- 20...+ 70°C
Vibration resistance	Conforming to EN/IEC 60068-2-8	For X, Y and Z: 1 mm from 10 to 42 Hz 7 gn from 42 to 55 Hz 30 mm at resonant frequency or 55 Hz
Shock resistance	Conforming to EN/IEC 60068-2-27	For X, Y and Z: 10 gn for 11 ms
Material	Case	Aluminium and PA
	Lenses	PC
Rated supply voltage		24 V with protection against reverse polarity
Voltage limits (including ripple)		18...30 V of rated operational voltage
Switching capacity		100 mA with overload and short-circuit protection
Voltage drop, closed state		≤ 2 V
Current consumption		≤ 35 mA
Maximum switching frequency		500 Hz
Delay		1 ms response 1 ms recovery
Indicator lights	Output state	1 yellow LED
Detection accuracy		2 mm at 2 m/s

(1) These sensors are suitable for use on a 473-477 mm wide conveyor frame (-1, + 3 mm). Other possible widths are given on the next page.

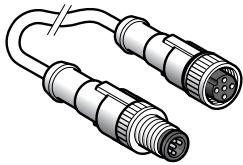
Photo-electric sensors

OsiSense XU Application, conveying series

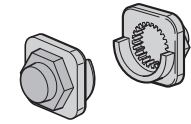
For detecting packages on a roller conveyor

DC supply, solid-state output

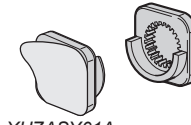
References of accessories



XZCR1511041C●



XUZASY01H



XUZASY01A

Description	Length m	Reference	Weight kg
Fixing accessories			
Pack of 20 hexagonal supports and Ø 8 mm fixing	–	XUZASY01H	0.020
Pack of 20 self-adhesive hexagonal supports	–	XUZASY01A	0.020
M12-M12 jumper cables			
4-pin, straight connector	1	XZCR1511041C1	0.065
	2	XZCR1511041C2	0.095
4-pin, elbowed connector	1	XZCR1512041C1	0.065
	2	XZCR1512041C2	0.095

Connections

M12 connector

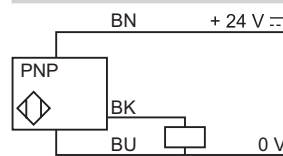


Pin no./colour

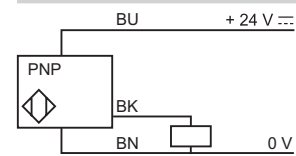
- 1 BN: Brown
- 2 WH: White (disconnected)
- 3 BU: Blue
- 4 BK: Black

PNP + NPN programmable, NO or NC output

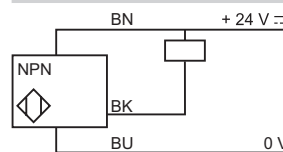
PNP, NO output



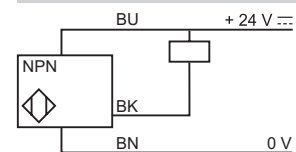
PNP, NC output



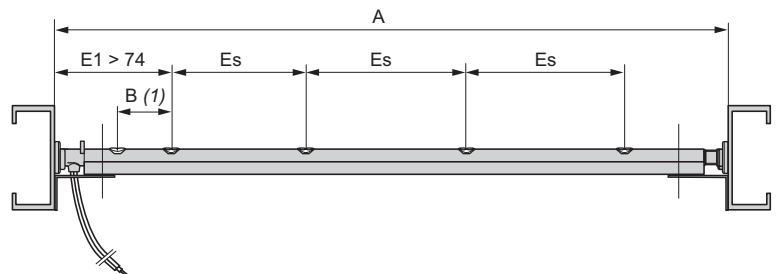
NPN, NC output



NPN, NO output



Dimensions (mm)



A: Conveyor width exact distance between lips (250 to 900 mm).

For dimensions above 900 mm, please consult our Customer Care Centre.

Examples of components in the references

	Conveyor width (A)	Additional functions (2)	Spacing between sensors (Es)	Number of sensors	Fixing type	Connection
XUY380NA5D03M8	380 mm	No	54 mm	5	Ø 8 mm	Remote M8 connector with 0.3 m cable
XUY410NC3H1M12	410 mm	No	108 mm	3	11.2 mm hexagonal support	Remote M12 connector with 1 m cable
XUY450NB3N03M8	450 mm	No	93.1 mm	3	–	Remote M8 connector with 0.3 m cable
XUY600NC5H2	600 mm	No	108 mm	5	11.2 mm hexagonal support	2 m cable
XUY707ND4P2	707 mm	No	162 mm	4	Hexagonal support on each side	2 m cable

(1) B = 29 mm for Es = 54 mm, 108 mm, 162 mm ... B = 10.4 mm for Es = 93.1 mm, 186.2 mm...

(2) Timer, special settings, IP65 degree of protection: on request from our Customer Care Centre.

Photo-electric sensors

OsiSense XU Application, conveying series

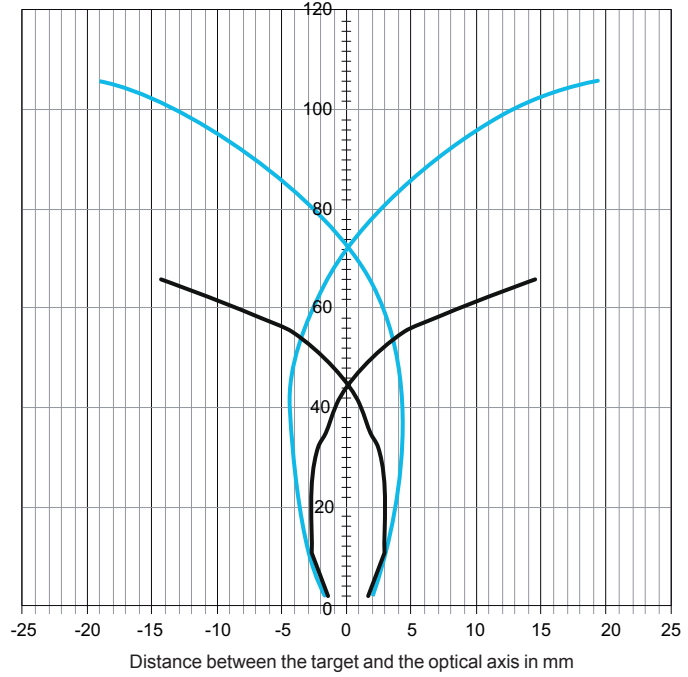
For detecting packages on a roller conveyor

DC supply, solid-state output

Detection curves

Conveyor axis - Load running direction

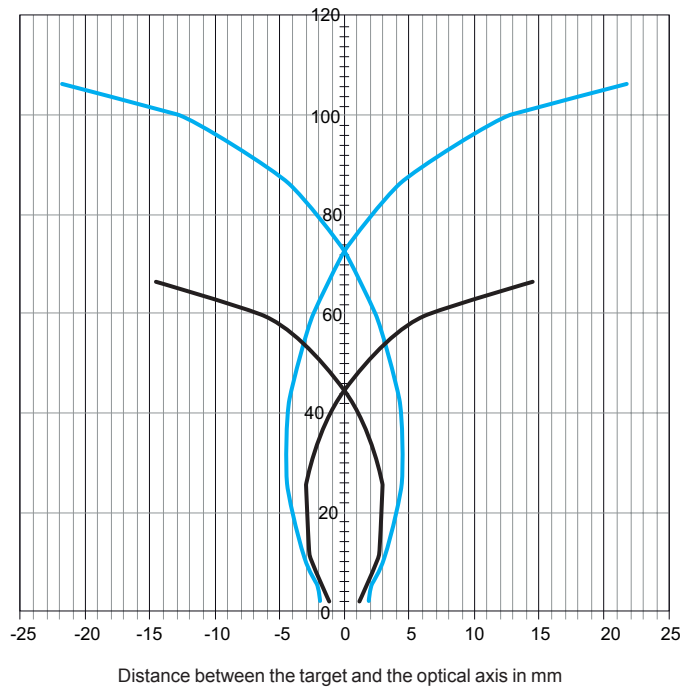
Distance between the target and the sensor in mm



— : Black 6%
 — : White 92%

Roller axis - Direction at right-angles to load running

Distance between the target and the sensor in mm



— : Black 6%
 — : White 92%

5

Photo-electric sensors

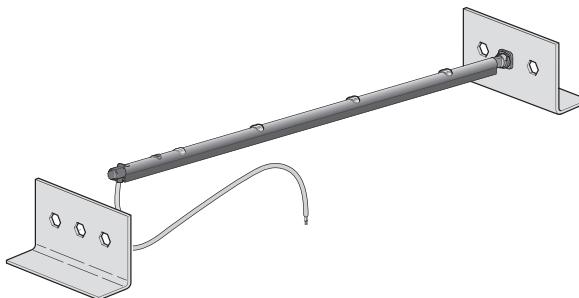
OsiSense XU Application, conveying series

For detecting packages on a roller conveyor

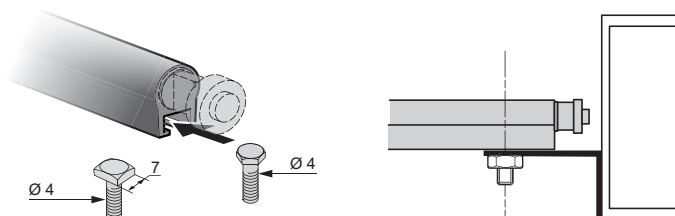
DC supply, solid-state output

Mounting

Mounting on the sides, with XUZASY01H or XUZASY01A hexagonal supports
(2 of each support are supplied with the sensor)



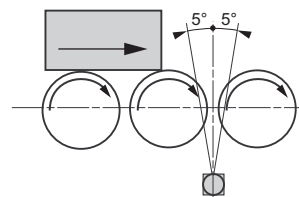
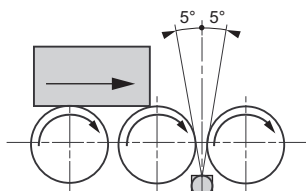
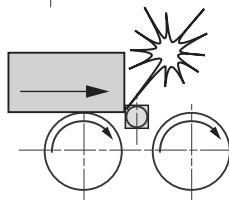
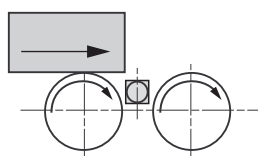
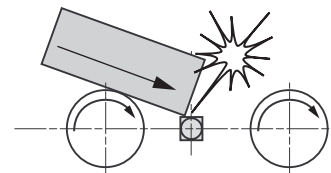
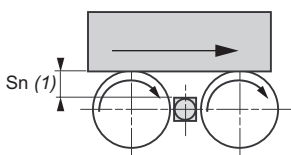
Mounting underneath (brackets, screws and nuts not supplied)



Mounting precautions

Recommended mounting

Not recommended



(1) $S_n \leq 100$ mm.

Application example

Package detection - sensor mounted between motorized rollers

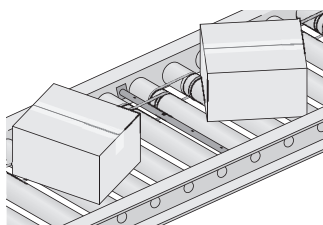
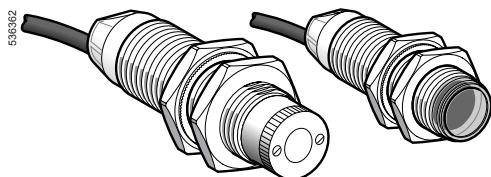


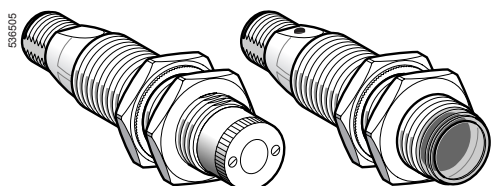
Photo-electric sensors

OsiSense XU Application, material handling series

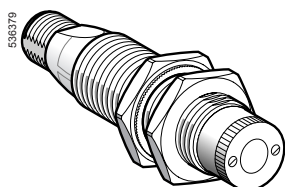
Laser transmission. Design 18, plastic or metal
Three-wire DC. Solid-state output



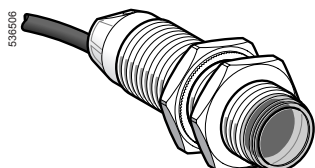
XUBL●●CNL2



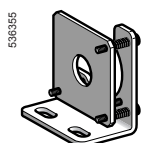
XUBL●●CNM12



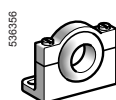
XUBL●●CNM12T



XUBL●●CNL2R



XUZA318



XUZA218



XUZA118

Ø 18, plastic, thru-beam system with teach mode, laser transmission (Transmitter + receiver)

Sensing distance (Sn) m	Function	Connection	Output	Reference	Weight kg
0...100	NO or NC, by programming	Pre-cabled	PNP	XUBLAPCNL2	0.180
			NPN	XUBLANCNL2	0.180
		M12 connector	PNP	XUBLAPCNM12	0.078
			NPN	XUBLANCNM12	0.078

Ø 18, metal, thru-beam system with teach mode, laser transmission (Transmitter + receiver)

Sensing distance (Sn) m	Function	Connection	Output	Reference	Weight kg
0...100	NO or NC, by programming	Pre-cabled	PNP	XUBLBPCNL2	0.230
			NPN	XUBLBNCNL2	0.230
		M12 connector	PNP	XUBLBPCNM12	0.130
			NPN	XUBLBNCNM12	0.130

Separate components

Ø 18 transmitter

Description	Connection	Output	For use with	Reference	Weight kg
Plastic	Pre-cabled	–	XUBLA●●CNL2	XUBLAKCNL2T	0.090
	M12 connector	–	XUBLA●●CNM12	XUBLAKCNM12T	0.040
Metal	Pre-cabled	–	XUBLB●●CNL2	XUBLBKCNL2T	0.110
	M12 connector	–	XUBLB●●CNM12	XUBLBKCNM12T	0.060

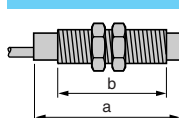
Ø 18 receiver

Description	Connection	Output	For use with	Reference	Weight kg
Plastic	Pre-cabled	PNP	XUBLAPCNL2	XUBLAPCNL2R	0.090
		NPN	XUBLANCNL2	XUBLANCNL2R	0.090
	M12 connector	PNP	XUBLAPCNM12	XUBLAPCNM12R	0.040
		NPN	XUBLANCNM12	XUBLANCNM12R	0.040
Metal	Pre-cabled	PNP	XUBLBPCNL2	XUBLBPCNL2R	0.120
		NPN	XUBLBNCNM12	XUBLBNCNL2R	0.120
	M12 connector	PNP	XUBLBPCNM12	XUBLBPCNM12R	0.070
		NPN	XUBLBNCNM12	XUBLBNCNM12R	0.070

Fixing accessories for XUBL● (1)

Description	Reference	Weight kg
Precision fixing bracket with micrometric adjustment	XUZA318	0.170
Plastic fixing bracket with adjustable ball-joint	XUZA218	0.035
Stainless steel fixing bracket	XUZA118	0.045

Dimensions



	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
Receiver (2)	62	44	76	44
Transmitter (3)	52	28	66	28

(1) For further information, see page 5/158

(2) Yellow, green and red LED on receiver


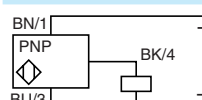
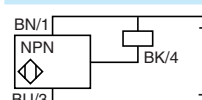
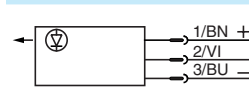
(3) Green LED on transmitter

Note: fixing nut tightening torque: < 4 Nm

Characteristics

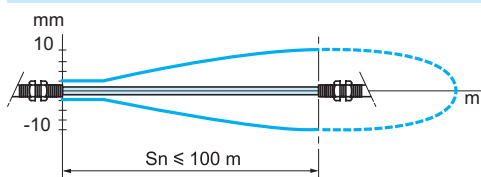
Sensor type		XUBL●●●●M12	XUBL●●●●L2
Product certifications		UL, CSA, CE	
Connection	Connector	M12	-
	Pre-cabled	-	Length: 2 m
Nominal sensing distance Sn	m	0...100, excess gain 70...3	
Blind zone		0	
Preferred object approach direction		Any	
Type of transmission		Red laser, wavelength 670 nm	
Transmission power		Power < 1 mW, class 1 conforming to IEC 60825-1	
Degree of protection	Conforming to IEC 60529	IP 67, double insulation	
Temperature	Storage	°C - 40... + 70	
	Operation	°C - 10... + 45	
Materials	Case	XUBLA●●●●●: PBT; XUBLB●●●●●: nickel plated brass	
	Lens	PMMA	
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Indicator lights	Output state and alignment aid	Yellow LED	
	Supply on and teaching	Green LED	
	Stability	Red LED	
Rated supply voltage	V	- 12...24 with protection against reverse polarity	
Voltage limits (including ripple)	V	- 10...30	
Current consumption, no-load	mA	25 for transmitter or receiver	
Switching capacity per output	mA	≤ 100 with overload and short-circuit protection	
Voltage drop, closed state	V	≤ 1.5	
Maximum switching frequency	Hz	1500	
Delays	First-up	ms < 80	
	Response and recovery	ms < 0.4	

Wiring schemes

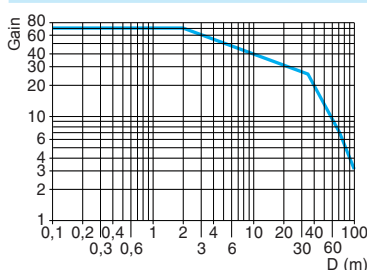
M12 connector	Pre-cabled	PNP	NPN	Transmitter
 <p>4 3 1 2</p> <p>3 (-) 1 (+) 4 OUT/Output 2 Beam break input</p>	<p>(-) BU (Blue) (+) BN (Brown) OUT/Output BK (Black) Beam break input VI (Violet)</p>	 <p>BN/1 PNP BK/4 BU/3</p>	 <p>BN/1 NPN BK/4 BU/3</p>	 <p>1/BN + 2/VI 3/BU -</p>

Curves

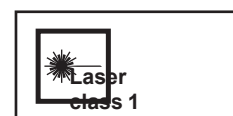
Detection curve (set to infinity)



Excess gain curve

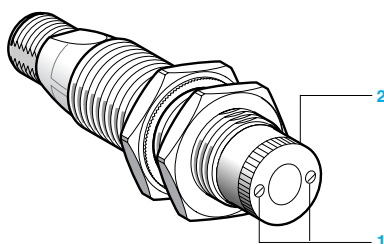


Operating precautions

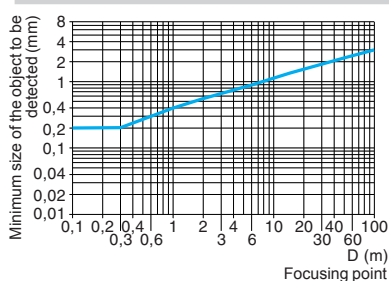


Laser class 1,
conforming to
IEC 60825-1.

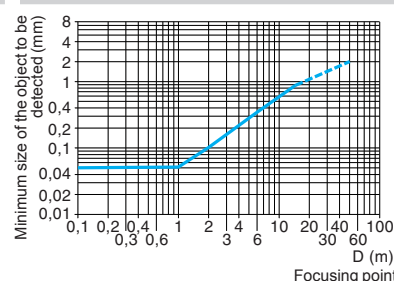
Adjustment



Standard curve



Detection limit curve



The adjustment of the focusing point enables the detection of objects down to a size of < 0.2 mm.

After slackening the fixing screws 1, adjust the focusing point of the laser beam by rotating the serrated sleeve 2 located on the face of the sensor. Re-tighten fixing screws.

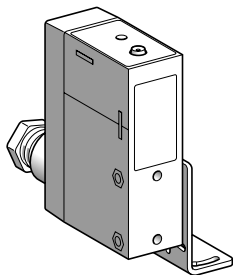
Note: fixing bracket XUZA218 with ball-joint and, in particular, bracket XUZA318 with precise micrometric adjustment and locking by 6 screws, are specially suited for mounting the sensor and adjusting beam alignment when the sensing range is several tens of metres (see page 5/158).

Photo-electric sensors

OsiSense XU Application, material handling series

With analogue output signal 4...20 mA and 0...10 V ⁽¹⁾
DC supply. Solid-state output

Compact design



System	Diffuse
Type of transmission	Infrared
Nominal sensing distance (Sn)	20...80 cm

References

3-wire	PNP	XUJK803538
Weight (kg)		0.200

Characteristics

Product certifications		CE, CSA, UL
Ambient air temperature	For operation	- 25...+ 60 °C
	For storage	- 40...+ 80 °C
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10...55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	20 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 67
	Conforming to NF C 20-010	IP 671
Connection		Screw terminals, maximum capacity: 2 x 1.5 mm ² or 1 x 2.5 mm ²
Materials		Case: PEI (2)
Rated supply voltage		--- 24 V with protection against reverse polarity
Voltage limits (including ripple)		--- 20...30 V
Output current	Maximum	20 mA
	Minimum	4 mA
Output voltage (Vs)		--- 0...10 V
Output voltage drift in relation to temperature		< 10% between - 25 and + 60 °C
Output voltage drift in relation to object colour		< 10%
Current consumption, no-load		≤ 35 mA
Maximum switching frequency		10 Hz (for an output voltage variation of 1 V)
Delays	First-up	≤ 150 ms
Indicator light		The brightness of the LED is proportional to the output voltage

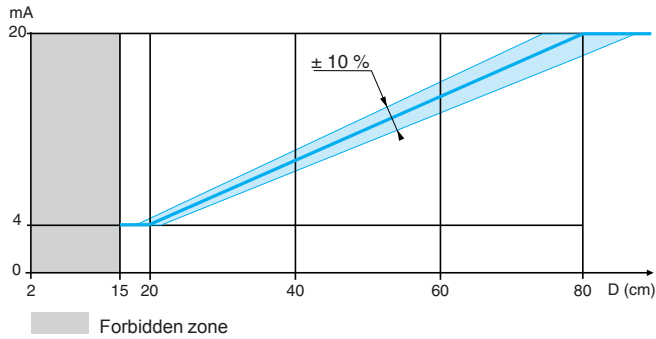
(1) Applications: position control, monitoring concentricity or eccentricity, closed loop regulation, monitoring displacement, etc.

(2) PEI: high quality synthetic resin providing excellent withstand to mechanical shocks, vibration and the effects of external agents frequently encountered in industry: alcohol, salts, petroleum, oils, greases, washing agents (diluted sodium carbonate 4%, nitric acid 2%), formaldehyde vapour, splashing lactic acid, etc.

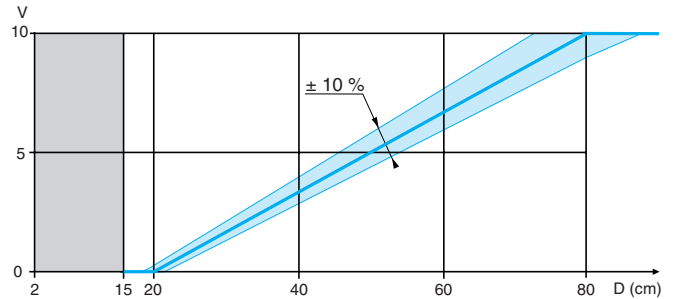
Curves

Output signal (related to distance of object). Test performed with 20 x 20 cm, white 90% object

Output current

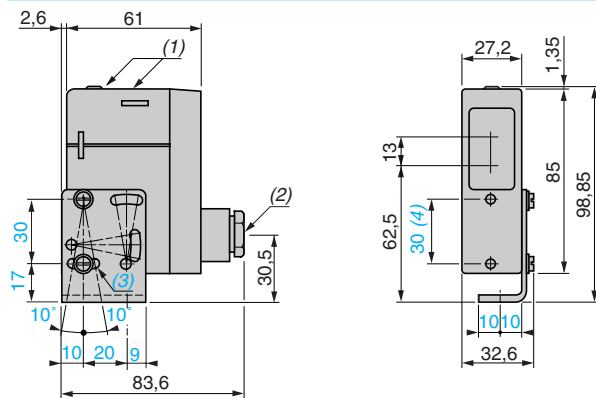


Output voltage



Dimensions

Sensor XUJK803538 (the bracket XUZA41 is included with the sensor)



(1) LED.

(2) 11P cable gland.

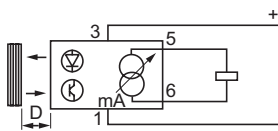
(3) 1 elongated hole $\varnothing 4.2 \times 14$.

(4) Front fixing ($\varnothing 4$ screws and inserts included).

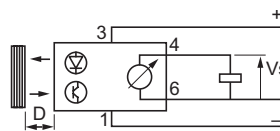
Wiring schemes

Diffuse system

Current output



Voltage output



Load characteristics

- Output current: the output current varies between 4 and 20 mA depending on the distance of the object and therefore, the load must be less than 1 k Ω .
- Voltage output: since the minimum rated output current of the sensor is 10 mA, the load must always have a resistive value of more than 1 k Ω .

Terminal connections

- 1 \varnothing - (-)
- 2 \varnothing
- 3 \varnothing - (+)
- 4 \varnothing - Output voltage
- 5 \varnothing - Output current
- 6 \varnothing - (-)

Terminals 1 and 6 connected internally.

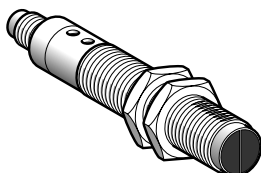
Photo-electric sensors

OsiSense XU Application, material handling series

With analogue output signal 4...20 mA (1)

DC supply

Design 18



System	Diffuse
Type of transmission	Infrared
Nominal sensing distance (S _n)	5...40 cm

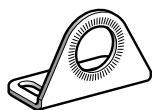
References

3-wire, PNP	XU5M18AB20D
Weight (kg)	0.075

Characteristics

Product certifications	CE, CSA, UL
Ambient air temperature	For operation: - 25... + 55 °C. For storage: - 40... + 70 °C
Vibration resistance	Conforming to IEC 60068-2-6 25 gn, amplitude ± 2 mm (f = 10...55 Hz)
Shock resistance	Conforming to IEC 60068-2-27 30 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529 IP 67
Connection	M12 male connector, 4-pin (suitable female connectors, including pre-wired versions, please refer to our catalogue "Cabling accessories OsiSense XZ")
Materials	Case: nickel plated brass, lens: PMAA
Rated supply voltage	--- 12...24 V with protection against reverse polarity
Voltage limits	--- 10...30 V (including ripple)
Output current	Maximum 20 mA Minimum 4 mA
Output current drift in relation to temperature	< 10% between - 25 and + 55 °C, < 5% between 0 and + 40 °C
Output current drift in relation to supply	< 3%
Current consumption, no-load	≤ 30 mA
Maximum switching frequency	20 Hz (for an output current variation of 10 mA)
Delays	First-up: ≤ 50 ms
Indicator light	The brightness of the green LED is proportional to the output current I _e = 20 mA: indicator light at maximum intensity I _e = 4 mA: indicator light at minimum intensity

Fixing accessory (2)



XUZA118

Description	Reference	Weight kg
Stainless steel fixing bracket	XUZA118	0,045

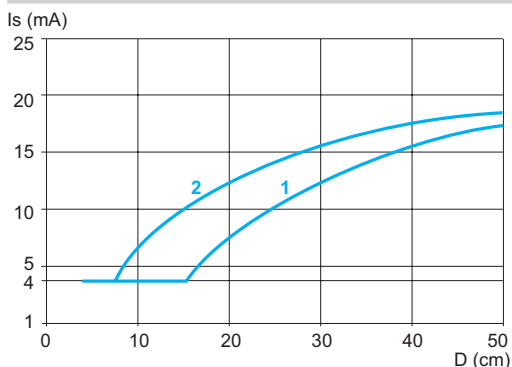
(1) Applications: position control, monitoring concentricity or eccentricity, closed loop regulation, monitoring displacement, etc.

(2) For further information, see page 5/158.

Curves

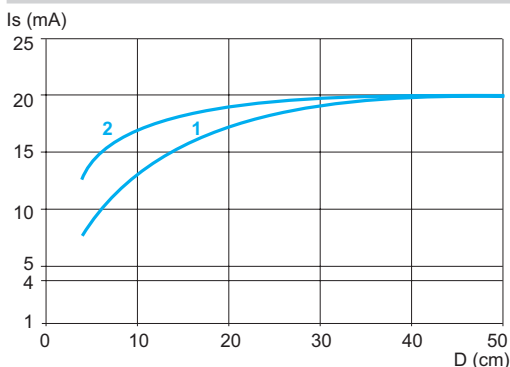
Output signal (related to distance of object)

Potentiometer set at maximum



- 1 White 90% object
- 2 Grey 15% object

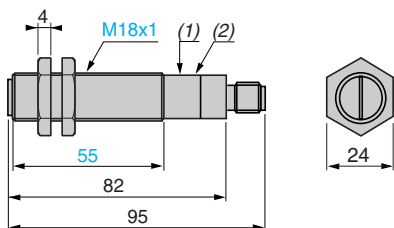
Potentiometer set at minimum



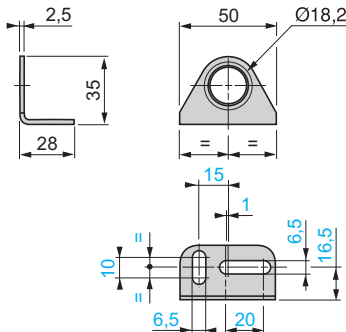
- 1 White 90% object
- 2 Grey 15% object

Dimensions

Sensor XU5M18AB20D



Fixing bracket XUZA118



(1) Potentiometer.

(2) Green LED.

Fixing nut tightening torque: 15 N.m.

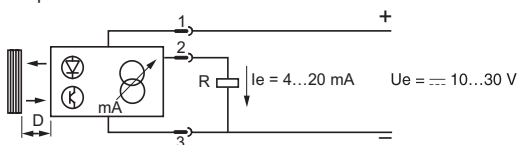
Connector tightening torque: 2 N.m.

Schemes

Wiring schemes

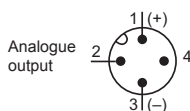
Diffuse system

Output current



Connector scheme

Sensor connector pin view

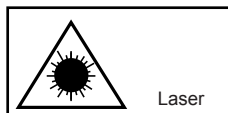


For suitable female connectors, including pre-wired versions, please refer to our catalogue "Cabling accessories OsiSense XZ".

Load characteristics (R)

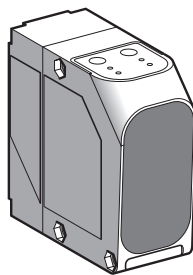
The output current varies between 4 and 20 mA, depending on the distance of the object, and therefore, the load must be less than 800 Ω for a 24 V supply and less than 300 Ω for a 12 V supply.

Design 90 x 90 mm



Laser class 1, conforming to IEC 60825-1
Laser class 2 pointer, conforming to IEC 60825-1

Visible laser radiation:
do not stare into beam



System	Object distance sensor	Reflector distance sensor
Type of transmission	Infrared laser, class 1 (905 nm) Red laser pointer, class 2 (650 nm) (1)	
Measuring distance	0.2...6 m (on white 90%) 0.2...6 m (on grey 18%) 0.2...2.5 m (on black 6%) (2)	0.2...30 m (with reflector XUZC250)

References

5-wire solid-state outputs (x 2) analog output (x 1)	PNP, 4...20 mA	XUE5AA2NM12	XUE1AA2NM12
Weight (kg)		0.2	0.2

Characteristics

Product certifications	cULus, CE		
Connection	M12, 5-pin connector		
Degree of protection	Conforming to IEC 60529	IP 67	
Vibration resistance	Conforming to EN/IEC 60947-5-2 and IEC 60947-4-2	Amplitude ± 0.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to EN/IEC 60947-5-2 and IEC 60947-4-1	30 gn, duration 11 ms	
Ambient air temperature	For operation	- 20...+ 50 °C	
	For storage	- 40...+ 80 °C	
Repeat accuracy (analog output) (3)		Fast mode: ± 15 mm Slow mode: ± 10 mm	Fast mode: ± 10 mm Slow mode: ± 5 mm
Fast mode/slow mode (response time)		13 ms/80 ms	30 ms/65 ms
Linearity		$\leq \pm 40$ mm	$\leq \pm 60$ mm
Materials	Case	ABS, mechanical shocks resistant	
	Lenses	PMMA	
Rated supply voltage	18...30 V $\overline{\text{---}}$		
Voltage limits (including ripple)	$\pm 10\%$ of rated operational voltage		
Immunity to ambient light	Conforming to EN/IEC 60947-5-2		
Output signal	Solid-state outputs: 2 x PNP analog output: 4...20 mA		
Light spot size		4 x 7 mm at 2 m 3 x 10 mm at 4 m 4 x 12 mm at 6 m	15 x 20 mm at 10 m 30 x 40 mm at 20 m 45 x 60 mm at 30 m
Switching capacity	100 mA, with protection against reverse polarity, overload and short-circuit		
Voltage drop, closed state	≤ 2.4 V		
Current consumption, no-load	≤ 125 mA on 24 V $\overline{\text{---}}$		
Maximum switching frequency	Fast mode: 38 Hz Slow mode: 16 Hz		
Indicator lights	Output state	2 yellow LEDs	
	Supply on	1 green LED	
	Slow mode	1 orange LED	
	Parametering	4 red LEDs	
Parametering	By 2 buttons: Set and Toggle		

(1) In operating mode, the red laser class 2 pointer can be stopped for working on infrared transmission.

(2) % of object remission.

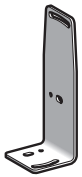
(3) Information taken into account after 30 minutes.

Photo-electric sensors

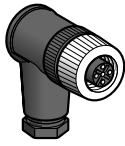
OsiSense XU Application
Material handling series

With solid-state and analogue output signal 4...20 mA
Laser transmission

References of accessories



XUZA618



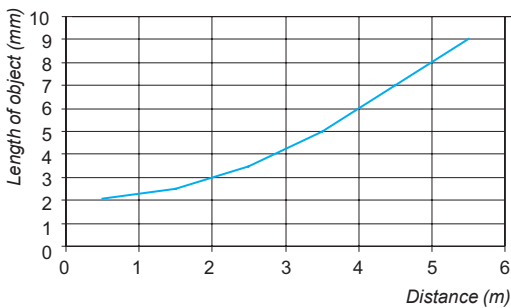
XZCC12FCM50B

Description	For use with	Dimensions (mm)	Reference	Weight kg
Fixing bracket (screws, nuts and washers included)	XUE5AA2NM12 XUE1AA2NM12	–	XUZA618	0.062
Adhesive reflector	XUE1AA2NM12	250 x 250	XUZC250	0.040
Straight connector, wired by user M12, 5-pin female	XUE5AA2NM12 XUE1AA2NM12	–	XZCC12FDM50B	0.020
Elbowed connector, wired by user M12, 5-pin female	XUE5AA2NM12 XUE1AA2NM12	–	XZCC12FCM50B	0.020

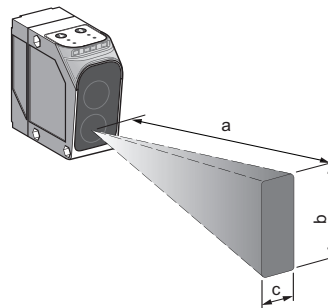
Presentation

Minimum size of detectable object related to distance

XUE5AA2NM12



Light spot size (not visible)

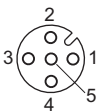


	XUE5AA2NM12				XUE1AA2NM12			
a (m)	0	2	4	6	0	10	20	30
b (mm)	10	7	10	12	10	20	40	60
c (mm)	5	4	3	4	5	15	30	45

Note: Typical values for application involving measurements on a square white object

Wiring schemes

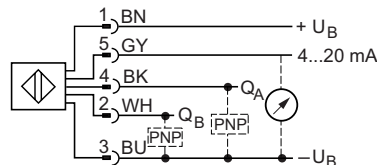
M12 connector



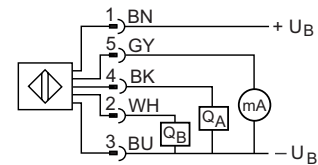
Pin n°/colour

- 1 BN: Brown
- 2 WH: White
- 3 BU: Blue
- 4 BK: Black
- 5 GY: Grey

XUE5AA2NM12

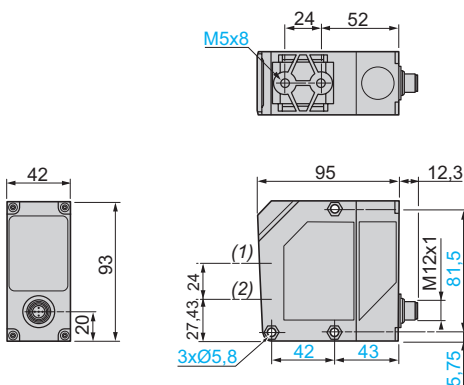


XUE1AA2NM12

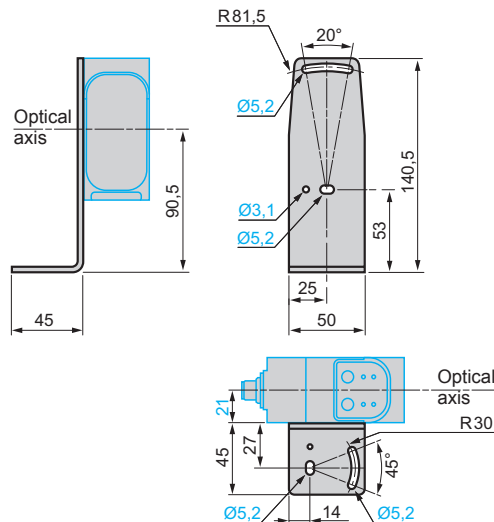


Dimensions

XUE5AA2NM12 and XUE1AA2NM12



XUE5AA2NM12 and XUE1AA2NM12 with fixing bracket XUZA618



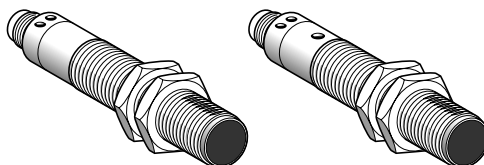
(1) Receiver optical axis.
(2) Transmitter optical axis.

Photo-electric sensors

OsiSense XU Application, material handling series

Through beam system with high "excess gain" ⁽¹⁾
Solid-state output and analogue output 4...20 mA

Design 18



System		Thru-beam
Type of transmission		Infrared
Nominal sensing distance (Sn) / maximum		50 m / 70 m (transmitter + receiver)
References		
3-wire, PNP	NO (object detection) + analogue output	XU2M18AP20D (2)
Weight (kg)		0.155
Characteristics		
Product certifications		CE, CSA, UL
Ambient air temperature	For operation	-25...+55 °C
	For storage	-40...+70 °C
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10...55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 67
Connection		M12 male connector, 4-pin (suitable female connectors, including pre-wired versions, please refer to our catalogue "Cabling accessories OsiSense XZ")
Materials	Case	Nickel plated brass
	Lenses	PMMA
Rated supply voltage		--- 12...24 V with protection against reverse polarity
Voltage limits		--- 10...30 V (including ripple)
Solid-state digital output	Switching capacity (sealed)	≤100 mA with overload and short-circuit protection
	Voltage drop, closed state	≤ 1.5 V
	Maximum switching frequency	30 Hz
	First-up delay	≤ 50 ms
	Response delay	≤ 15 ms
	Recovery delay	≤ 15 ms
Analogue output	Output current	4...20 mA Drift < 5% for temperature between 0 and + 40 °C
	Delay	≤ 15 ms
Current consumption, no-load		≤ 55 mA (transmitter + receiver)
Indicator lights	Transmitter	Green LED, supply on Yellow LED illuminated = beam transmission
	Receiver	Yellow LED illuminated = solid-state output ON = object detected within beam Green LED: the brightness of the LED is proportional to the output current: - for I = 20 mA, object slightly opaque, intensity at maximum, - for I = 4 mA, object completely opaque, intensity at minimum.

Fixing accessory (3)



XUZA118

Description	Reference	Weight kg
Stainless steel fixing bracket	XUZA118	0,045

(1) Applications: detection of objects in spite of a difficult environment (smoke, dust, mist, etc.), detection of objects inside packaging, etc.

Example of values:

Object: white sheets of 80 gsm paper. Transmitter-receiver distance = 10 cm				
Number of sheets	1	11	27	31
Analogue output current (mA)	17.3	12	6	5

(2) Reference for both transmitter and receiver for thru-beam system.

(3) For further information, see page 5/158.

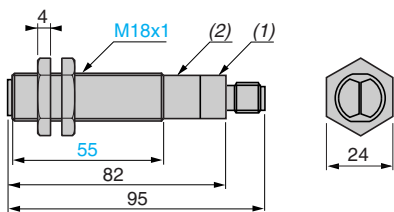
Photo-electric sensors

OsiSense XU Application, material handling series

Through beam system with high "excess gain"

Solid-state output and analogue output 4...20 mA

Dimensions

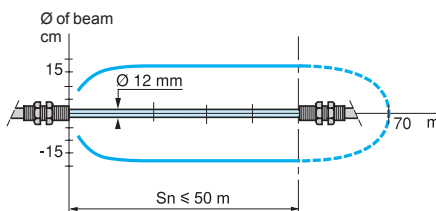


(1) LEDs
(2) Potentiometer (only on receiver)
Fixing nut tightening torque: 15 N.m
Connector tightening torque: 2 N.m

Curves

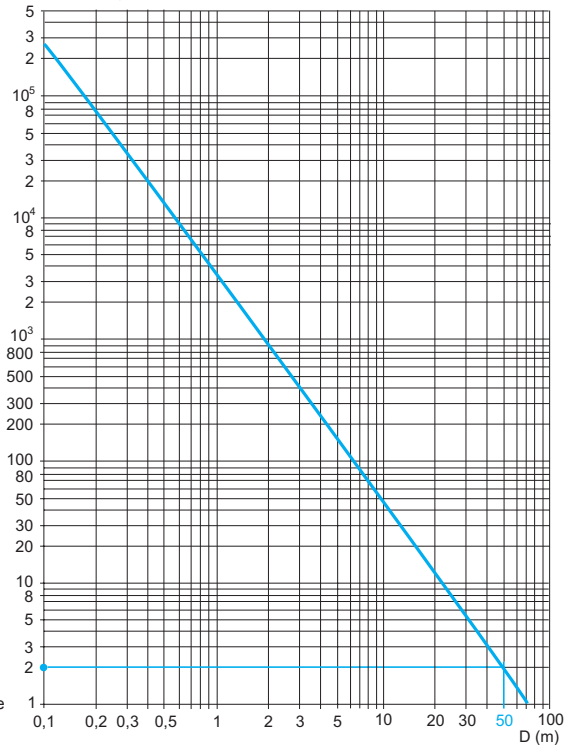
Detection curve

Thru-beam system



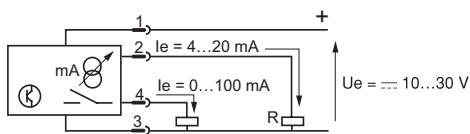
Excess gain curve (ambient temperature: + 25 °C)

Thru-beam system



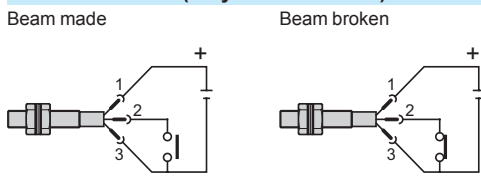
Wiring schemes

Receiver



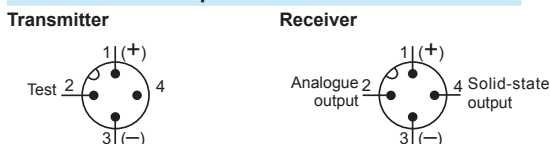
$R_{max} < 800 \Omega (U_e = 24 V), < 300 \Omega (U_e = 12 V)$

Beam break test (only on transmitter)



Connector scheme

Sensor connector pin view



For suitable female connectors, including pre-wired versions, please refer to our catalogue "Cabling accessories OsiSense XZ".

Operation, settings

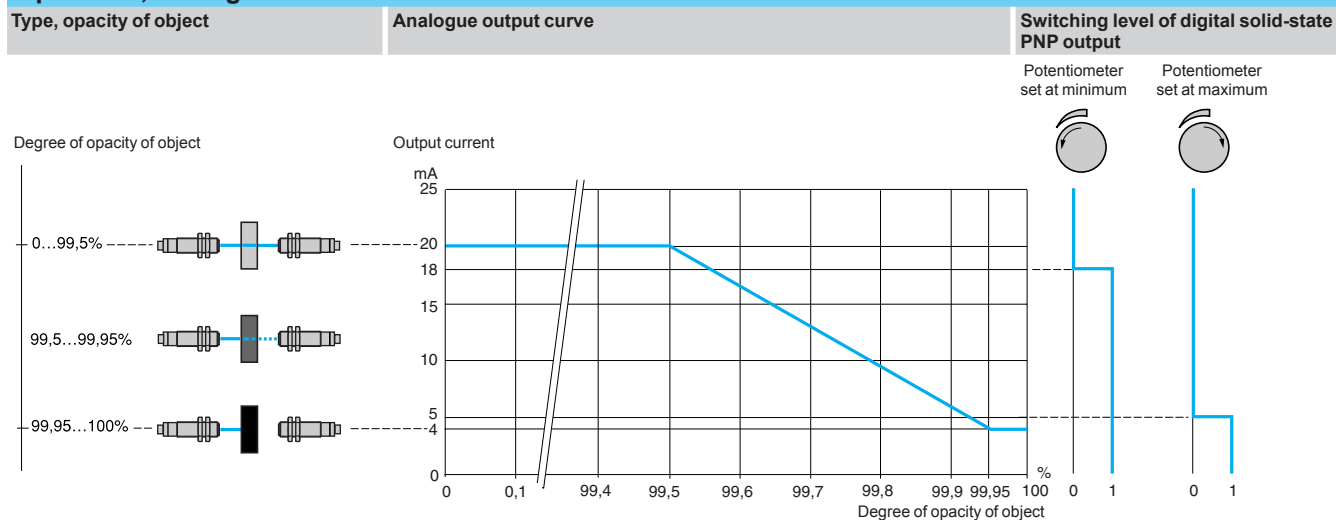
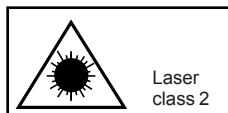


Photo-electric sensors

OsiSense XU Application, material handling series

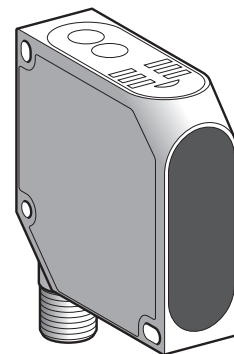
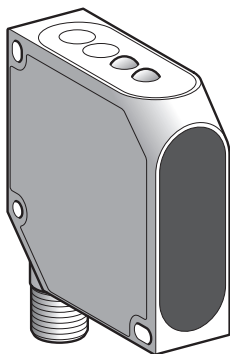
With analogue output signal 0...10 V or 4...20 mA
Laser transmission

Compact design, 50 x 50



Laser class 2, conforming to IEC 825-1

Visible laser radiation: do not stare into beam.



System		Diffuse		
Type of transmission		Red laser, pulsed, Class 2, wavelength: 670 nm		
Measuring distance		40...60 mm	45...85 mm	80...300 mm
References				
3-wire, PNP output		XUYPC0925L1ANSP	XUYPC0925L2ANSP	XUYPC0925L3ANSP
Weight (kg)		0.057	0.057	0.057
Characteristics				
Product certifications		CE		
Ambient air temperature	For operation	0...+45 °C		
	For storage	-20...+60 °C		
Degree of protection	Conforming to IEC 60529	IP 67		
Resolution		7 µm	20 µm	200 µm
Linearity		< 1%		
Temperature stability		10 µm/K	18 µm/K	22 µm/K
Connection		M12 male connector with alternative orientations		
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms		
Materials		Case: ABS, anti-shock		
Rated supply voltage		--- 24 V with protection against reverse polarity		
Voltage limits (including ripple)		--- 18...28 V		
Immunity to ambient light		5000 lux		
Output signal		0...10 V		4...20 mA
Output activation time (from 10...90%)		30 ms		0.4 ms (fast speed mode) 40 ms (medium speed mode)
Laser transmission		T pulse: 8 µs, pulse frequency: 6 kHz, time base: 250 ms		
Spot diameter		< 1 mm at 50 mm	< 0.8 mm at 65 mm	1.5 x 3.5 mm at 80 mm
Switching capacity		3 mA with overload and short-circuit protection		
Voltage drop, closed state		< 2.4 V		
Current consumption, no-load		35 mA		≤ 40 mA on --- 24 V
Maximum switching frequency		40 Hz		
Indicator lights	Dirty	Red LED		
	Supply on	Green LED		
Parametering		-		By buttons

■ Applications: position control of robot arm, measuring thickness of mechanical parts.

Accessories

Description	Details	Length of cable m	References	Weight kg
Pre-wired M12 connector	Straight, 4-pin	2	XZCP1141L2	0.090
		5	XZCP1141L5	0.190
	Straight, 5-pin	2	XZCP1164L2	0.115
		5	XZCP1164L5	0.270
Fixing bracket (1)	Stainless steel 316	-	XUZA51S	0.050

(1) For further information, see page 5/160.

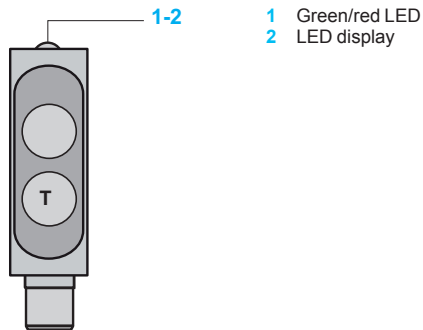
Photo-electric sensors

OsiSense XU Application, material handling series

With analogue output signal 0...10 V or 4...20 mA
Laser transmission

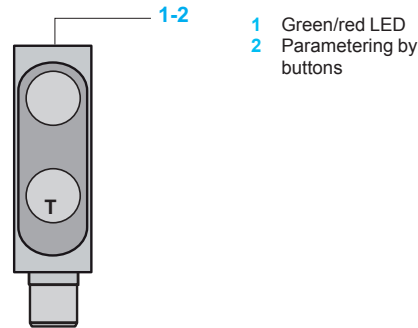
Presentation

XUYPCO925L1ANSP, XUYPCO925L2ANSP



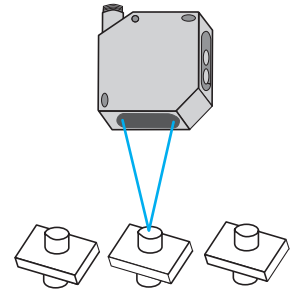
R: Receiver
T: Transmitter

XUYPCO925L3ANSP



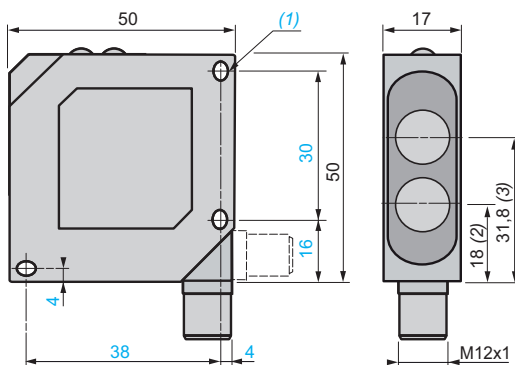
Application example

Monitoring dimensions in series

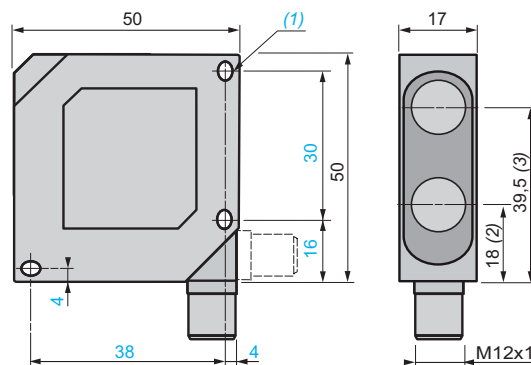


Dimensions

XUYPCO925L1ANSP, XUYPCO925L2ANSP



XUYPCO925L3ANSP



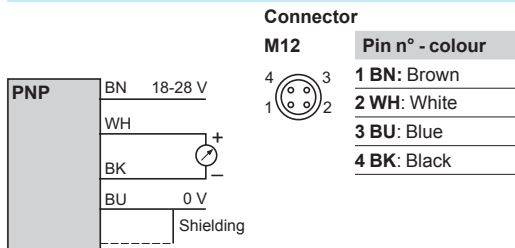
(1) 2 elongated holes $\varnothing 4.3 \times 4$.

(2) Transmitter optical axis.

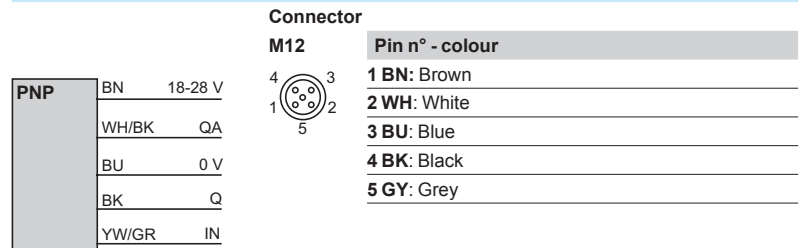
(3) Receiver optical axis.

Wiring schemes

XUYPCO925L1ANSP, XUYPCO925L2ANSP



XUYPCO925L3ANSP



Note: Shielded cable recommended.

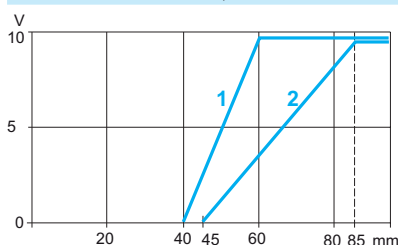
QA: 4-20 mA analogue output ($R \leq 500 \Omega$)

Q: Switching output

IN: Control input (YW/GR: Yellow/green)

Adjustment curves

XUYPCO925L1ANSP, XUYPCO925L2ANSP



1 XUYPCO925L1ANSP
2 XUYPCO925L2ANSP

XUYPCO925L3ANSP

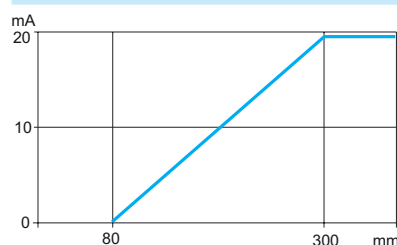


Photo-electric sensors

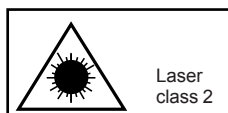
OsiSense XU Application, material handling series

Diffuse, with laser transmission

With background suppression

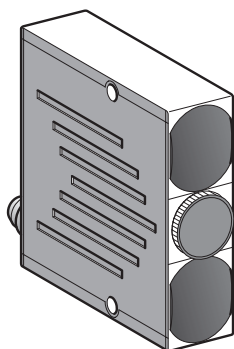
DC supply. Solid-state output

Compact design



Laser class 2, conforming to IEC 60825-1

Visible laser radiation: do not stare into beam.



System	Diffuse with background suppression
Type of transmission	Red laser, pulsed, Class 2, wavelength: 675 nm
Detection distance	Adjustable from 50 to 300 mm
Minimum size of object	0.5 mm

References

4-wire, PNP and NPN output	NO/NC depending on wiring	XUYPS1LCO965S
Weight (kg)		0.081

Characteristics

Product certifications		CE, cULus (1)
Ambient air temperature	For operation	0...+ 50 °C
	For storage	- 20...+ 80 °C
Degree of protection	Conforming to IEC 60529	IP 65
Connection		M8, 4-pin male connector (for pre-cabled version please consult our Customer Care Centre)
Materials	Case	Glass impregnated nylon
	Lens	PMMA
Rated supply voltage		⎓ 12...24 V with protection against reverse polarity
Voltage limits (including ripple)		⎓ 10...30 V
Immunity to ambient light	Incandescent bulb	500 lux
	Natural light	10 000 lux
Laser transmission	Pulsed laser LED	T pulse: 6 µs, T period < 50 µs
Spot size		Manual adjustment of focusing
Switching capacity		100 mA with overload and short-circuit protection
Voltage drop, closed state		< 2 V
Current consumption, no-load		35 mA
Maximum switching frequency		5 kHz
Delays	Response and recovery	< 150 µs
Indicator lights	Time delay active	Red indicator
	Output state	Green indicator
	NO function	Red indicator
	NC function	Indicator off
Output signal time delay		40 ms, depending on wiring

(1) This product is UL Listed if supplied by a class II or isolated supply delivering ⎓ 30 V max. (isolated transformer for example) and protected by a UL fuse rated at 3 A max.

Applications: monitoring of small parts on production machine, detection of components on a printed circuit, monitoring for crack on a component, control of level, suppression of a background.

Accessories

Description	Details	Length of cable	References	Weight
		m		kg
Pre-wired M8 connector	Straight	2	XZCP0941L2	0.080
	Elbowed (90°)	2	XZCP1041L2	0.080
	Straight	5	XZCP0941L5	0.180
	Elbowed (90°)	5	XZCP1041L5	0.180

Photo-electric sensors

OsiSense XU Application, material handling series

Diffuse, with laser transmission

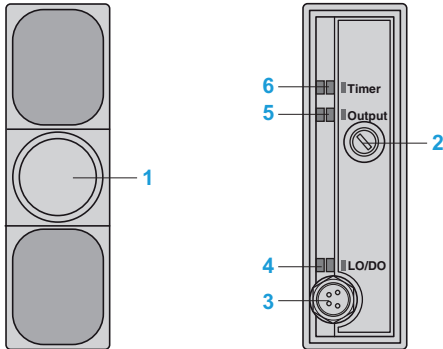
With background suppression

DC supply. Solid-state output

Presentation

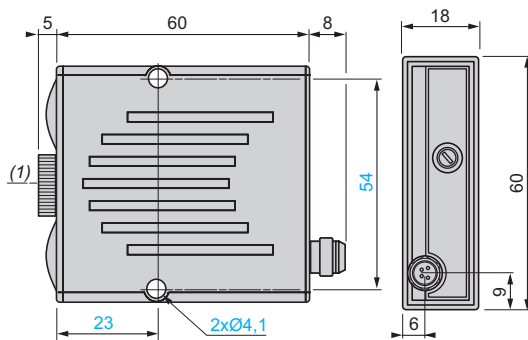
XUYPS1LCO965S

Rear view



- 1 Adjustment of spot size
- 2 Detection distance adjustment screw
- 3 M8 connector
- 4 On: NO function
Off: NC function
- 5 Object detected
- 6 Time delay active

Dimensions

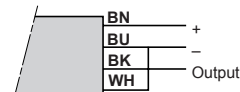


(1) Optical axis of laser

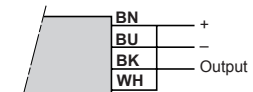
Wiring schemes

NO function

Without time delay

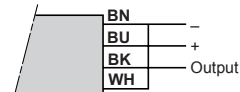


With 40 ms time delay

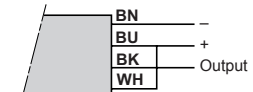


NC function

Without time delay



With 40 ms time delay



M8 connector



Pin n° - colour

1 BN: Brown

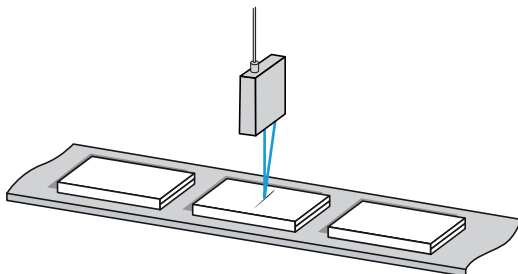
2 WH: White

3 BU: Blue

4 BK: Black

Application examples

Monitoring for crack in a component



Monitoring for a broken punch on press tool

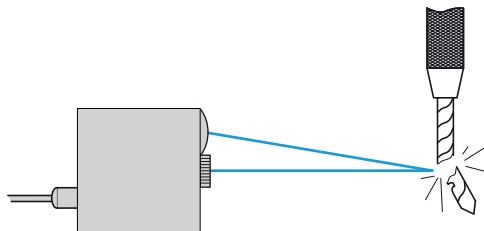
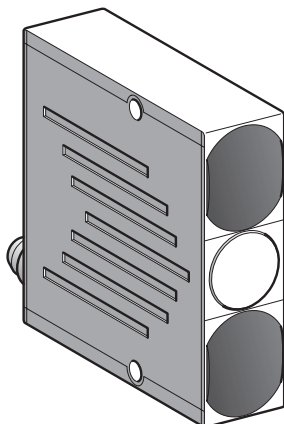


Photo-electric sensors

OsiSense XU Application, material handling series
Diffuse, with 2 channels using triangulation
with background suppression
DC supply. Solid-state output

Compact design



System	Diffuse with background suppression
Type of transmission	Infrared LED, modulated, Ø 15 mm beam
Detection distance	Adjustable from 50 to 600 mm

References

4-wire, PNP and NPN output	NO/NC programmable function	XUYPS2945S	XUYPS2C0945S
Weight (kg)		0.135	0.055

Characteristics

Product certifications		CE, cULus (1)
Ambient air temperature	For operation	0...+ 50 °C
	For storage	- 20...+ 80 °C
Degree of protection	Conforming to IEC 60529	IP 65
Connection		Pre-cabled, length 2 m M8, 4-pin male connector
Materials	Case	Glass impregnated nylon
Rated supply voltage		⎓ 12...24 V with protection against reverse polarity
Voltage limits (including ripple)		⎓ 10...30 V
Immunity to ambient light	Incandescent bulb	1300 lux
	Natural light	10 000 lux
Switching capacity		100 mA with overload and short-circuit protection
Voltage drop, closed state		< 2 V
Current consumption, no-load		< 1.5 W
Maximum switching frequency		370 Hz
Delay	Response and recovery	< 1.8 ms
Output signal time delay	For A and B/A or B (2)	Determined by wiring
Indicator light	Output signal	Green LED

(1) This product is UL Listed if supplied by a class II or isolated supply delivering ⎓ 30 V max. (isolated transformer for example) and protected by a UL fuse rated at 3 A max.

(2) See next page

- Applications:
- Control of filling, detection of object on conveyor against reflective background.

Accessories

Description	Details	Length of cable	References	Weight
				kg
Pre-wired M8 connector	Straight	2	XZCP0941L2	0.080
	Elbowed (90°)	2	XZCP1041L2	0.080
	Straight	5	XZCP0941L5	0.180
	Elbowed (90°)	5	XZCP1041L5	0.180

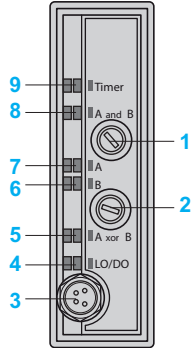
Photo-electric sensors

OsiSense XU Application, material handling series
Diffuse, with 2 channels using triangulation
with background suppression
DC supply. Solid-state output

Presentation

XUYPS2945S, XUYPS2CO945S

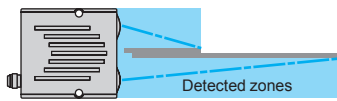
Rear view



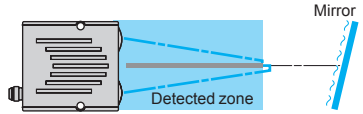
- 1 Adjustment of zone A detection distance
 - 2 Adjustment of zone B detection distance
 - 3 Pre-cabled connection (XUYPS2945S) or M8 connector (XUYPS2CO945S)
 - 4 On in direct mode
 - 5 Illuminates when the "exclusive OR" function between the two zones A and B is obtained
 - 6 On when the object is present
 - 7 in zone B
 - 8 On when the object is present in zone A
 - 9 Illuminates when the "AND" object logic function between the two zones A and B is obtained
- 5 & 8 obtained
Indicates time delay mode
Simultaneously on when the "OR" logic function between the 2 zones A or B is obtained

Description (4 operating modes)

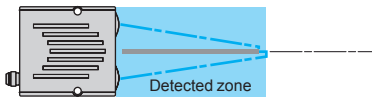
Two independent sensors with triangulation: A, B



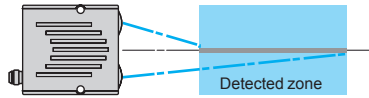
Immunity to reflection: A and B



Detection of contrasting objects: A or B

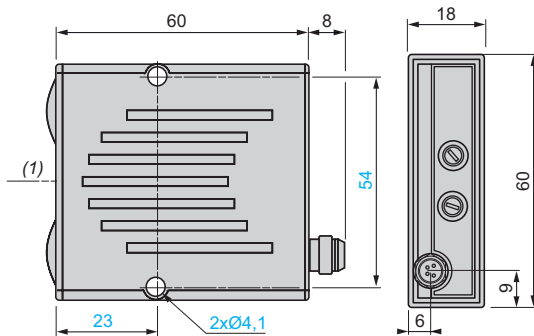


Monitoring of distance: A xor B



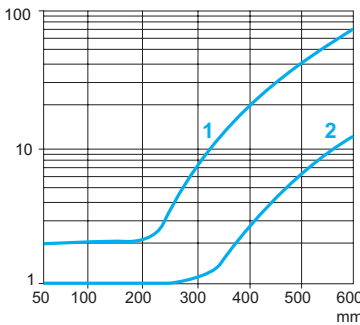
Dimensions

XUYPS2945S, XUYPS2CO945S



Detection curves (typical)

XUYPS2945S, XUYPS2CO945S



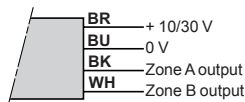
- 1 Black 6%
- 2 Grey 18% - Distance (mm) set on 92% (Kodak 1527795)

(1) Optical axis.

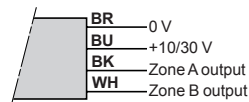
Wiring schemes and outputs

Two independent sensors with triangulation: A, B

NO output



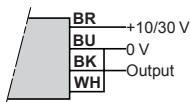
NC output



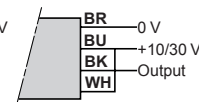
Immunity to reflection: A and B

Without time delay

NO output

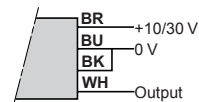


NC output

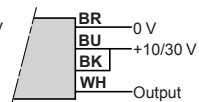


With 40 ms time delay

NO output

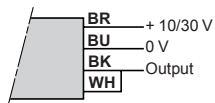


NC output

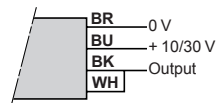


Detection of contrasting objects: A or B

NO output



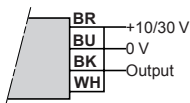
NC output



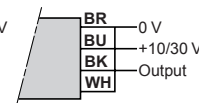
Monitoring of distance: A xor B

Without time delay

NO output

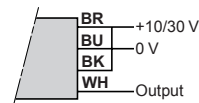


NC output

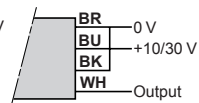


With 40 ms time delay

NO output



NC output



BR: Brown
BU: Blue
BK: Black
WH: White

Photo-electric sensors

OsiSense XU Application

Fibre design, amplifiers

Three-wire DC, solid-state output

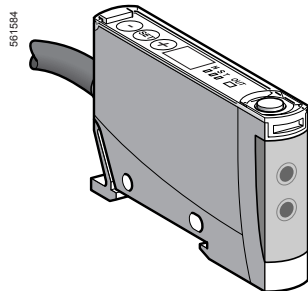
Teach mode

Amplifiers with fine adjustment and 4-digit screen

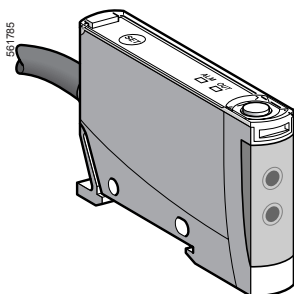
Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
Depending on fibre	NO/NC Programmable	PNP	Pre-cabled	XUDA2PSML2	0.040
			M8 connector	XUDA2PSMM8	0.040
		NPN	Pre-cabled	XUDA2NSML2	0.040
			M8 connector	XUDA2NSMM8	0.040

Amplifiers using teach mode

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
Depending on fibre	NO/NC Programmable	PNP	Pre-cabled	XUDA1PSML2	0.040
			M8 connector	XUDA1PSMM8	0.040
		NPN	Pre-cabled	XUDA1NSML2	0.040
			M8 connector	XUDA1NSMM8	0.040



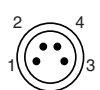
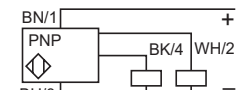
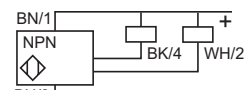
XUDA2



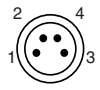

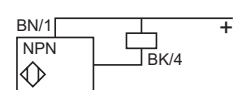
XUDA1

Characteristics		XUDA1●●SMM8, XUDA2●●SMM8	XUDA1●●SML2, XUDA2●●SML2
Sensor type		CC, cULus	
Product certifications		CE, cULus	
Connection	Connector	M8	–
	Pre-cabled	–	Length: 2 m
Sensing distance (Sn)		Depending on fibre used, see page 5/130. Sensing distance halved for XUDA2 configured for fast frequency	
Sensitivity adjustment		Teach mode on XUDA1 , Teach mode and fine adjustment (+/- button) plus 4-digit screen on XUDA2	
Type of transmission		Red	
Degree of protection		Conforming to IEC 60529	
Storage temperature		°C -30...+70	
Operating temperature		°C -10...+55	
Vibration resistance		Conforming to IEC 60068-2-6	
Shock resistance		Conforming to IEC 60068-2-27	
Indicator lights		Output state	
		Stability	
		Stability	
Signal level		By 7 segment/4-digit display for XUDA2	
Rated supply voltage		V --- 12...24 with protection against reverse polarity	
Voltage limits (including ripple)		V --- 10.8...26.4	
Current consumption, no-load		mA ≤ 50	
Switching capacity		mA ≤ 100 with overload and short-circuit protection	
Alarm output		mA ≤ 50 for XUDA2 with overload and short-circuit protection	
Protection against mutual interference		Yes for XUDA2	
Voltage drop, closed state		V ≤ 2 for XUDA●P●●●● , ≤ 1 for XUDA●N●●●●	
Maximum switching frequency		kHz 1 kHz for XUDA1 , 1 or 5 kHz configurable for XUDA2	
Output time delay		ms 0 or 40 on recovery for XUDA2	
Delays	First-up	ms < 120	
	Response	ms < 0.5 (0.1 for XUDA2 in fast frequency mode)	
	Recovery	ms < 0.5 (0.1 for XUDA2 in fast frequency mode)	

XUDA2 wiring schemes

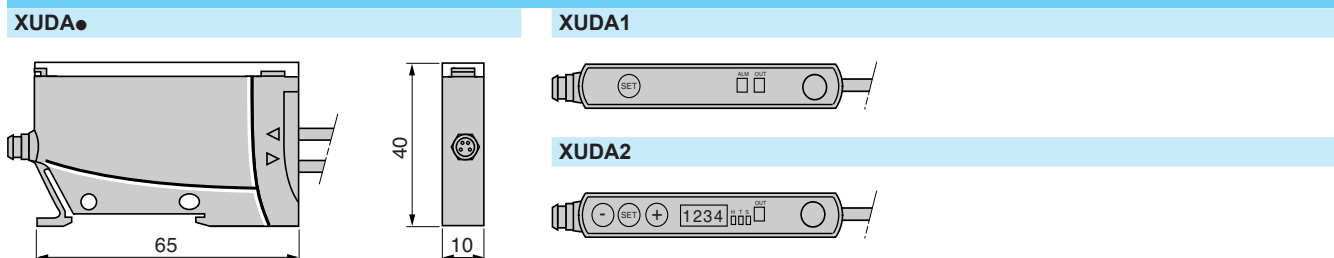
M8 connector	Pre-cabled	PNP	NPN
 <p>1 2 3 4</p> <p>1(+) 3(-) 4 (OUT/output) 2 (alarm)</p>	<p>BN Brown (+) BU Blue (-) BK Black(output) WH White (alarm) (WH only on XUDA2)</p>	 <p>BN/1 PNP + BK/4 WH/2 BU/3 -</p>	 <p>BN/1 NPN + BK/4 WH/2 BU/3 -</p>

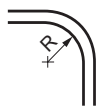
XUDA1 wiring schemes

M8 connector	Pre-cabled	PNP	NPN
 <p>1 2 3 4</p> <p>1(+) 3(-) 4 (OUT/output) 2</p>	<p>BN Brown (+) BU Blue (-) BK Black (Output)</p>	 <p>BN/1 PNP + BK/4 BU/3 -</p>	 <p>BN/1 NPN + BK/4 BU/3 -</p>

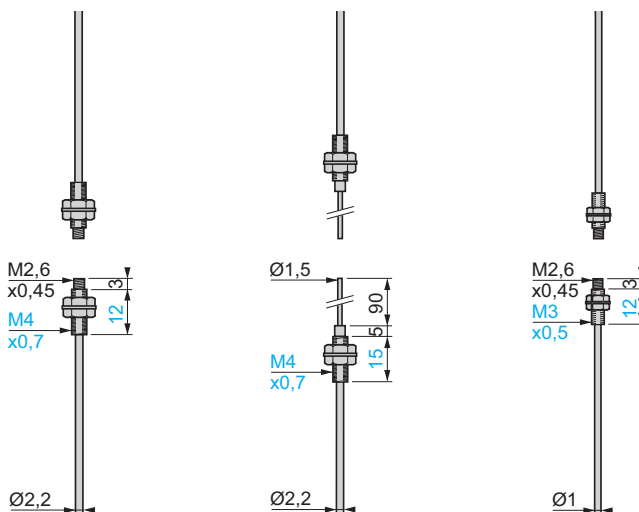
Please refer to our "Cabling accessories OsiSense XZ" catalogue.

Dimensions





R = minimum bend radius
Fibre of ext. Ø 2.2 mm, R = 25 mm
Fibre of ext. Ø 1 mm, R = 10 mm
XUFN2S01L, R = 4 mm



Nominal sensing distance (Sn)	With fibre L = 2 m	200 mm (1)	180 mm	50 mm (1)
	With lens	1500 mm (2)	–	1000 mm (2)
Application, features		General purpose		Accurate positioning

References (complete assembly - 2 fibres)

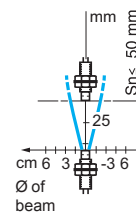
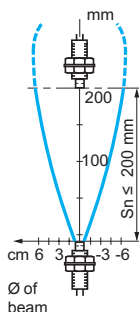
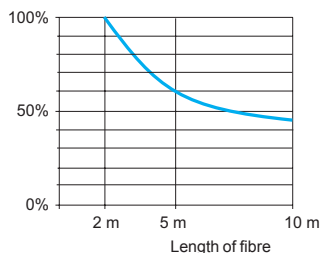
With standard end fittings	L = 2 m	XUFN12301	–	XUFN35301
	L = 10 m	XUFN12301L10	–	–
With 90 mm flexible end fittings, L = 2 m		–	XUFN12311	–
Weight (kg)		0.058 (L = 2 m)	0.030	0.045

Characteristics

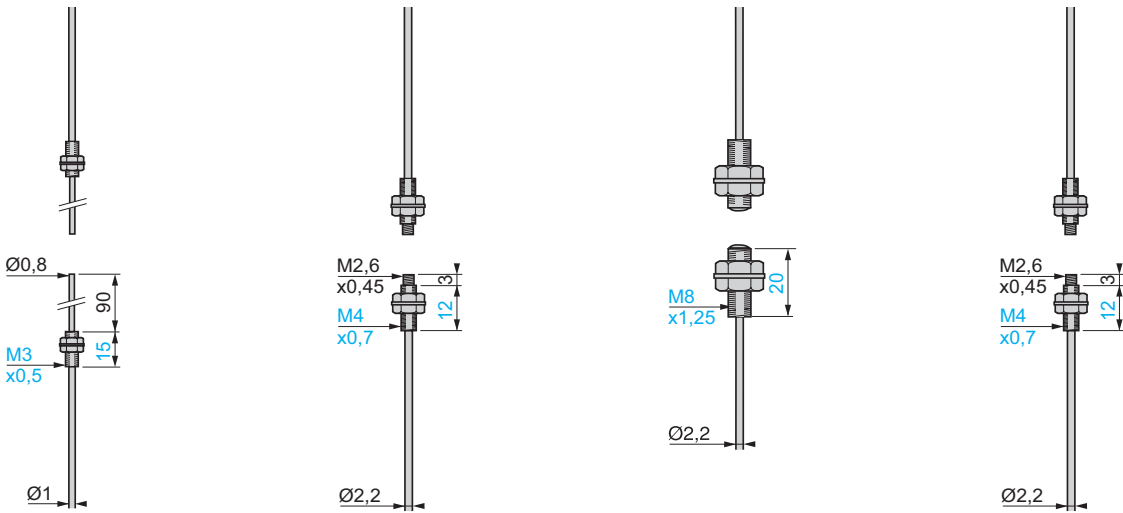
Fibre (view on sensing face)			
Core (Ø mm)	1 x Ø 1	1 x Ø 1	1 x Ø 0.5
Trimmmable to required length (trimmer XUFZ11 included)	Yes	Yes	Yes
Ambient air temperature	For operation: - 25... + 60 °C. For storage: - 40... + 80 °C		
Vibration resistance	7 gn, amplitude ± 1.5 mm (f = 10...55 Hz), conforming to IEC 60068-2-6		
Shock resistance	30 gn, duration 11 ms, conforming to IEC 60068-2-27		
Degree of protection	IP 64 conforming to IEC 60529 and IP 641 conforming to NF C 20-010		
Materials	Fibres: PMMA; sheath: PE		

Detection curves

XUFN●●●●●L10	XUFN12301, XUFN12311	XUFN35301
Percentage reduction in sensing distance related to length of fibre		



(1) Can be used with 90° mirror XUFZ02, see page 5/136.
(2) With lens accessory XUFZ01, see page 5/136.



30 mm	300 mm (1) 2000 mm (2)	2500 mm	100 mm (1) 750 mm (2)
-	Long sensing distance fibres	Fibres with integral lens Resistant to accumulation of dirt	Flexible fibres for cyclic movements, areas with restricted access
-	XUFN2P01L2	XUFN2L01L2	XUFN2S01L2
-	XUFN2P01L10	XUFN2L01L10	XUFN2S01L10
XUFN35311	-	-	-
0.045	0.058 (L = 2 m)	0.060 (L = 2 m)	0.062 (L = 2 m)

●	○	●	●
1 x Ø 0.5	1 x Ø 1.5	1 x Ø 1	1 x Ø 1
Yes	Yes	Yes	Yes

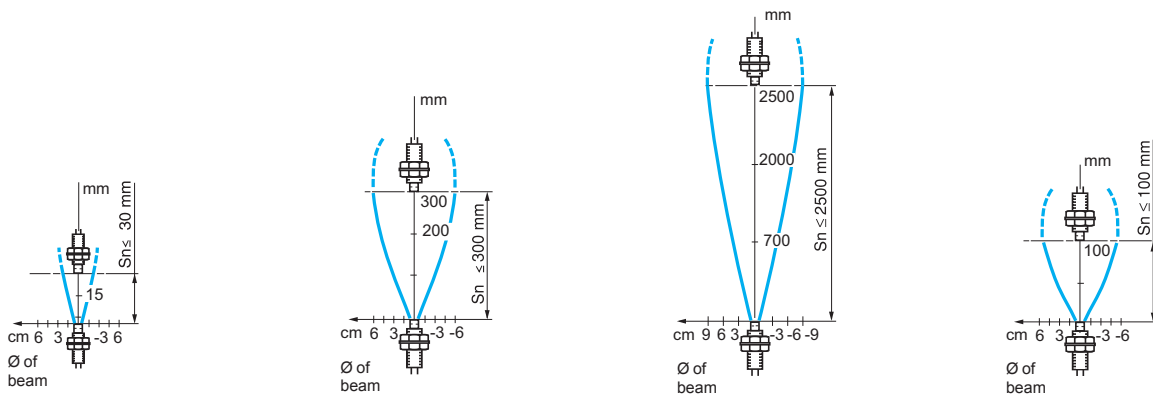
For operation: - 25...+ 60 °C. For storage: - 40...+ 80 °C
 7 gn, amplitude ± 1.5 mm (f = 10...55 Hz), conforming to IEC 60068-2-6
 30 gn, duration 11 ms, conforming to IEC 60068-2-27
 IP 64 conforming to IEC 60529 and IP 641 conforming to NF C 20-010
 Fibres: PMMA; sheath: PE

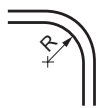
XUFN35311

XUFN2P01L2

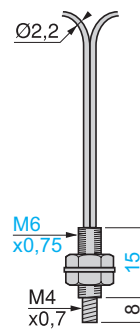
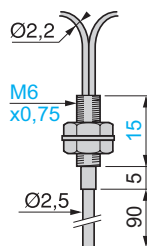
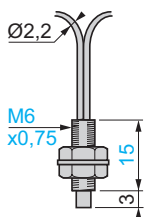
XUFN2L01L2

XUFN2S01L2





R = minimum bend radius
Fibre of ext. Ø 2.2 mm, R = 25 mm
Fibre of ext. Ø 1 mm, R = 10 mm
XUFN5S01L, R = 4 mm



Nominal sensing distance (Sn)	70 mm	60 mm	60 mm
Application, features	General purpose		Positioning

References

With standard end fittings	L = 2 m L = 10 m	XUFN05321 XUFN05321L10	– –	XUFN05323 –
With 90 mm flexible end fittings, L = 2 m		–	XUFN05331	–
Weight (kg)	0.058 (L = 2 m)	0.030		0.060

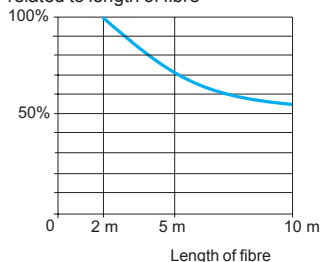
Characteristics

Fibre (view on sensing face)			
Core (Ø mm)	2 x Ø 1	2 x Ø 1	1 x Ø 1 + 16 x Ø 0.265
Trimable to required length (trimmer XUFZ11 included)	Yes	Yes	Yes
Ambient air temperature	For operation: - 25... + 60 °C. For storage: - 40... + 80 °C		
Vibration resistance	7 gn, amplitude ± 1.5 mm (f = 10...55 Hz), conforming to IEC 60068-2-27		
Shock resistance	30 gn, duration 11 ms, conforming to IEC 60068-2-27		
Degree of protection	IP 64 conforming to IEC 60529 and IP 641 conforming to NF C 20-010		
Materials	Fibres: PMMA; sheath: PE		

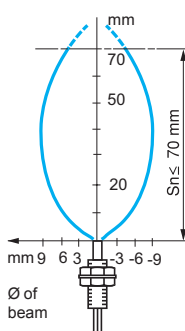
Detection curves (object 10 x 10 cm, white 90%)

XUFN●●●●L10

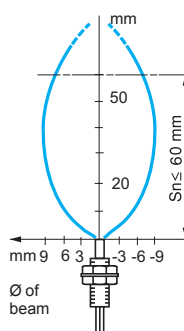
Percentage reduction in sensing distance related to length of fibre



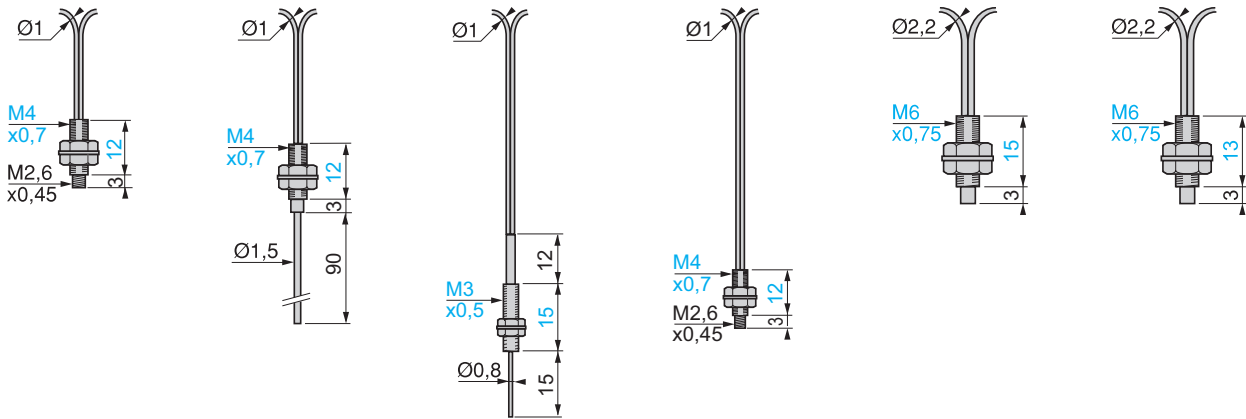
XUFN05321



XUFN05331, XUFN05323



(1) Fixing clamps included with fibre optic.



18 mm	18 mm	6 mm	15 mm	95 mm	55 mm
Positioning	Positioning	Areas with restricted access	Positioning	Long sensing distance fibres	Flexible fibres for cyclic movements, areas with restricted access
XUFN01321	-	XUFN04331	XUFN02323	XUFN5P01L2	XUFN5S01L2
-	-	-	-	XUFN5P01L10	XUFN5S01L10
-	XUFN01331	-	-	-	-
0.045	0.045	0.045	0.040	0.058 (L = 2 m)	0.062 (L = 2 m)

2 x Ø 0.5	2 x Ø 0.5	2 x Ø 0.265	1 x Ø 0.5 + 4 x Ø 0.25	2 x Ø 1.5	2 x Ø 1
Yes	Yes	Yes	Yes	Yes	Yes

For operation: - 25... + 60 °C. For storage: - 40... + 80 °C

7 gn, amplitude ± 1.5 mm (f = 10...55 Hz), conforming to IEC 60068-2-27

7 gn, amplitude ± 1.5 mm (f = 10...55 Hz), conforming to IEC 60068-2-6

30 gn, duration 11 ms, conforming to IEC 60068-2-27

IP 64 conforming to IEC 60529 and IP 641 conforming to NF C 20-010

Fibres: PMMA; sheath: PE

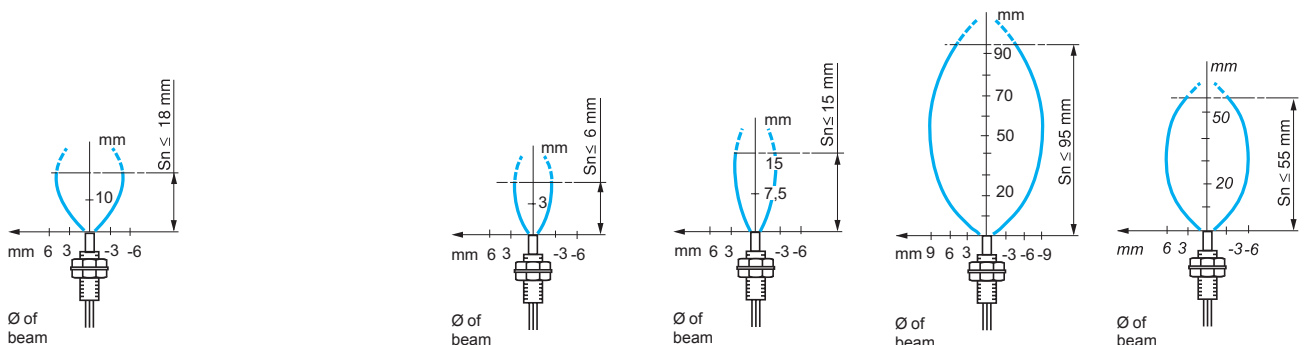
XUFN01321, XUFN01331

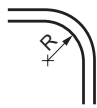
XUFN04331

XUFN02323

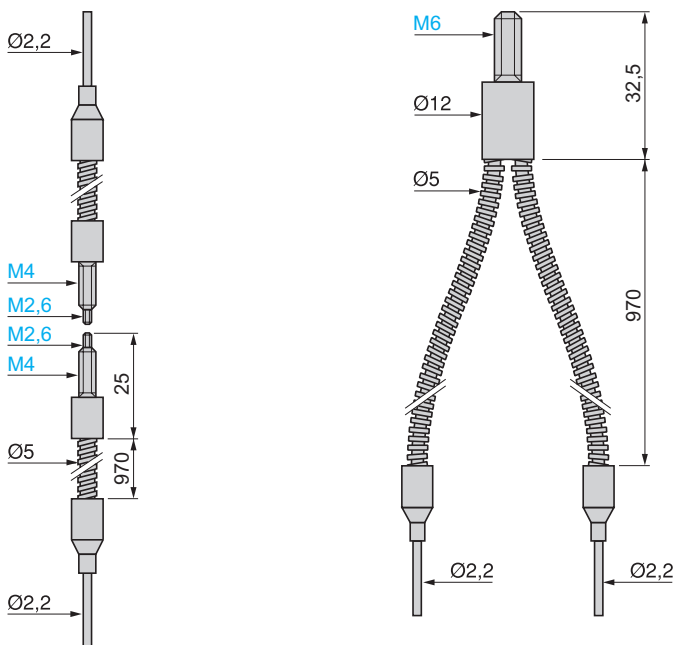
XUFN5P01L2

XUFN5S01L2





R = minimum bend radius
Metal sheath, R = 90 mm



System	Thru-beam	Diffuse
Nominal sensing distance (Sn) with fibre L = 1 m	200 mm (1) 1500 mm (2)	70 mm
Application	High temperatures	

References (complete assembly - 2 fibres for thru-beam system)

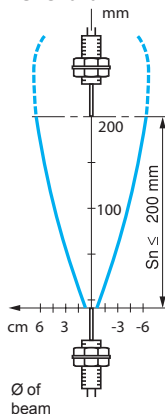
With standard end fittings	L = 1 m	XUFS2020	XUFS0520
Weight (kg)		0.070	0.075

Characteristics

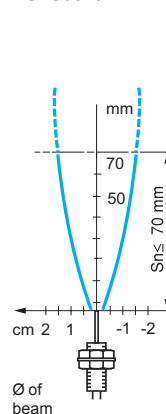
Fibre (view on sensing face)		
Core (Ø mm)	1 x Ø 1	2 x Ø 1
Ambient air temperature	For operation and storage: - 40...+ 180 °C	
Vibration resistance	7 gn, amplitude ± 1.5 mm (f = 10...55 Hz), conforming to IEC 60068-2-6	
Shock resistance	30 gn, duration 11 ms, conforming to IEC 60068-2-27	
Degree of protection	IP 64 conforming to IEC 60529 and IP 641 conforming to NF C 20-010	
Materials	Fibres: glass; sheath: metal	

Detection curves

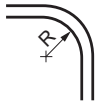
XUFS2020



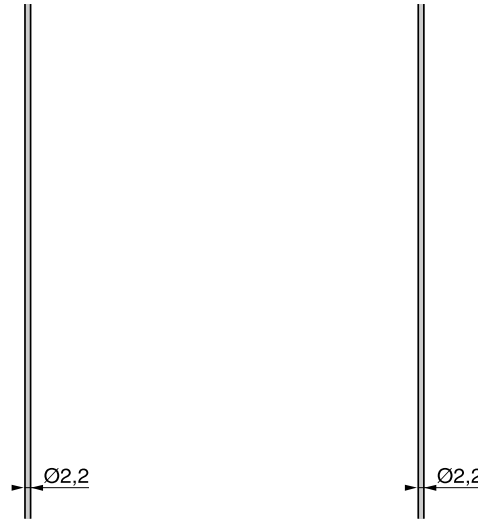
XUFS0520



(1) Can be used with 90° mirror XUFZ02, see page 5/136.
(2) With lens accessory XUFZ01, see page 5/136.



R = minimum bend radius
Fibre of ext. Ø 2.2 mm, R = 25 mm



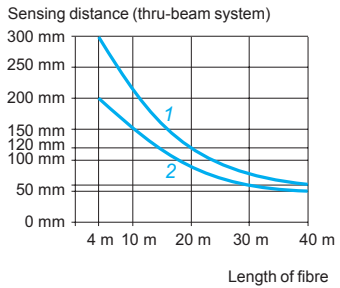
Nominal sensing distance (Sn) L = 2 m	See detection curves below (1)
Application	General purpose

References				
Fibre without end fitting	XUFZ910	XUFZ920	XUFZ911	XUFZ921
Weight (kg)	0.020	0.040	0.040	0.080

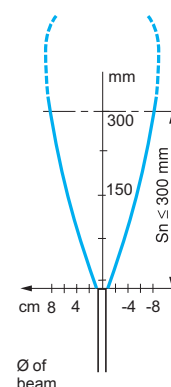
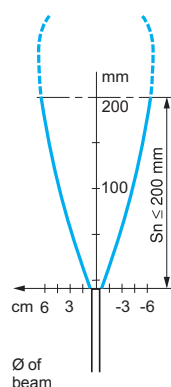
Characteristics				
Fibre				
Core (Ø mm)	1 x Ø 1		1 x Ø 1.4	
Length	10 m	20 m	10 m	20 m
Trimable to required length (trimmer XUFZ11 included)	Yes		Yes	
Ambient air temperature	For operation: - 25... + 60 °C. For storage: - 40... + 80 °C			
Vibration resistance	7 gn, amplitude ± 1.5 mm (f = 10...55 Hz), conforming to IEC 60068-2-6			
Shock resistance	30 gn, duration 11 ms, conforming to IEC 60068-2-27			
Degree of protection	IP 64 conforming to IEC 60529 and IP 641 conforming to NF C 20-010			
Materials	Fibres: PMMA; sheath: PE			

Detection curves

XUFZ911, XUFZ921 XUFZ910, XUFZ920	XUFZ910, XUFZ920	XUFZ911, XUFZ921
--------------------------------------	------------------	------------------



- 1 XUFZ911, XUFZ921
 - 2 XUFZ910, XUFZ920
- Total length = sum of the 2 strands used to constitute a thru-beam system



(1) It is possible to increase the sensing distance of fibres without end fittings by using fixing clamps with lens (XUFZ03, XUFZ04 or XUFZ05), see page 5/136.

Photo-electric sensors

OsiSense XU Application

Fibre optics for amplifiers

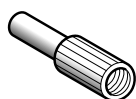
Accessories



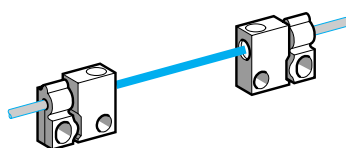
XUFZ02



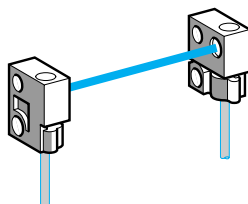
XUFZ01



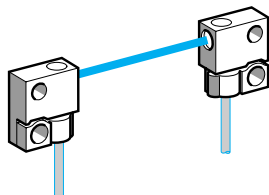
XUFZ06



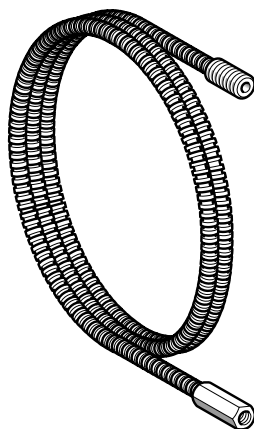
XUFZ13, XUFZ03



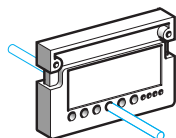
XUFZ14, XUFZ04



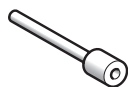
XUFZ15, XUFZ05



XUFZ10



XUFZ11



XUFZ08

Accessories for fibres with threaded end fittings

Description	For use with	Reference	Weight kg
90° mirror (set of 2)	Fibre optics XUFN1●30●, XUFN35301 and XUFS2020 (thru-beam system) XUFN2●01L●●	XUFZ02	0.005
Lenses for increasing sensing distance (set of 2)	Fibre optics XUFN1●30●, XUFN35301 and XUFS2020 (thru-beam system)	XUFZ01	0.005
Focusing lens for high precision detection. Detection of 0.5 mm objects at a distance of 7 mm. Also enables detection of objects against a background (1)	Fibre optics XUFN02323 (diffuse system)	XUFZ06	0.001

Accessories for plastic fibres without end fittings

Description	Mounting plane	For use with	Reference	Weight kg
Fixing clamps (set of 2)	Axial	Plastic fibre optics XUFZ	XUFZ13	0.002
	Frontal	Plastic fibre optics XUFZ	XUFZ14	0.002
	Lateral	Plastic fibre optics XUFZ	XUFZ15	0.002
Fixing clamps with lens (set of 2)	Axial	Plastic fibre optics XUFZ	XUFZ03	0.002
	Frontal	Plastic fibre optics XUFZ	XUFZ04	0.002
	Lateral	Plastic fibre optics XUFZ	XUFZ05	0.002

Protection accessories

Description	For use with	Reference	Weight kg
Protective tubing Length 1 m	Plastic fibre optic light guides with M4 threaded end fittings	XUFZ210	0.040
	Plastic fibre optic light guides with M6 threaded end fittings	XUFZ310	0.065

Other accessories

Description	Sold in lots of	Unit reference	Weight kg
Fibre trimmer	1	XUFZ11	0.006
Plastic end adaptor , for connecting Ø 1 mm fibres to amplifiers XUDA	2	XUFZ08	0.002

(1) Characteristics obtained when the fibre is fully screwed into the lens (screwing depth = 4 mm).

Detection curves for plastic fibre optic light guides with fixing clamps

Sensing distance of fibres XUFZ9●●● fitted with fixing clamps XUFZ●●

Fibre type	Clamp type				
	XUFZ13	XUFZ14, Z15	XUFZ03	XUFZ04, XUFZ05	Without clamp
XUFZ910, XUFZ920 (2 fibres L = 2 m) Sn	150 mm	100 mm	800 mm	600 mm	200 mm
XUFZ911, XUFZ921 (2 fibres L = 2 m) Sn	220 mm	150 mm	1200 mm	900 mm	300 mm

Other fibre lengths:

5 m fibres: reduce the sensing distance by a factor of 0.7.

10 m fibres: reduce the sensing distance by a factor of 0.5.

20 m fibres: reduce the sensing distance by a factor of 0.3.

Detection curves with lens

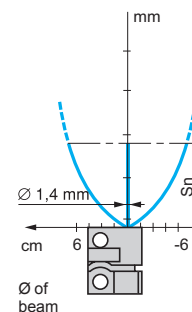
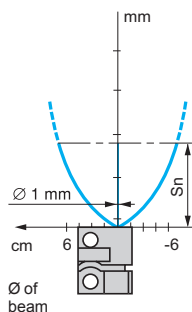
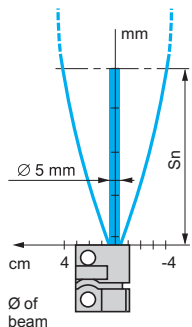
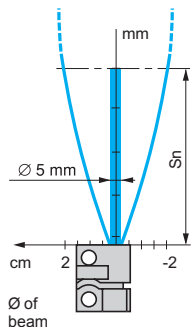
Fixing clamp XUFZ03, Z04 or Z05 + fibre XUFZ910 or XUFZ920

Fixing clamp XUFZ03, Z04 or Z05 + fibre XUFZ911 or XUFZ921

Detection curves without lens

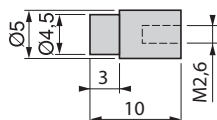
Fixing clamp XUFZ13, Z14 or Z15 + fibre XUFZ910 or XUFZ920

Fixing clamp XUFZ13, Z14 or Z15 + fibre XUFZ911 or XUFZ921

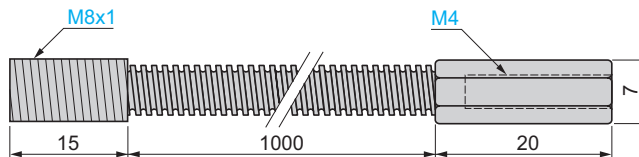


Dimensions

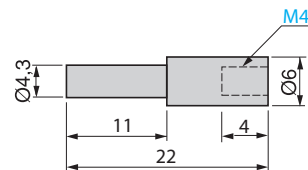
XUFZ01



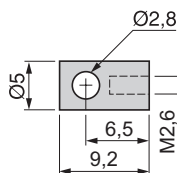
XUFZ210



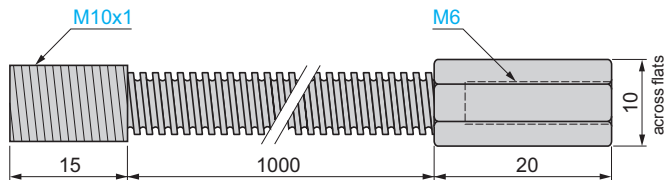
XUFZ06



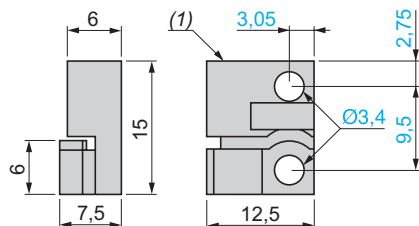
XUFZ02



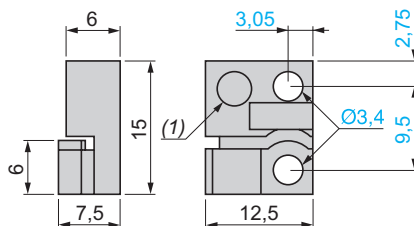
XUFZ310



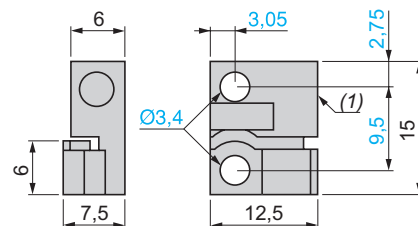
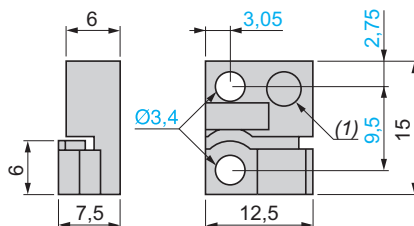
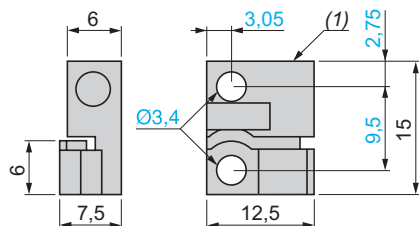
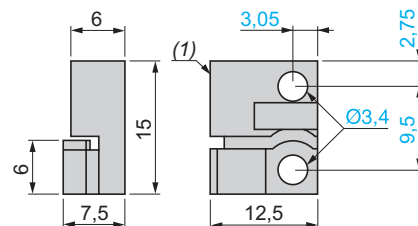
XUFZ03, XUFZ13



XUFZ04, XUFZ14

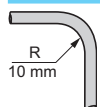


XUFZ05, XUFZ15

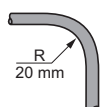


(1) Light beam window.

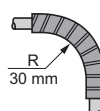
“GLASS” fibre optics for diffuse system



Standard sheath
External Ø
XUYFVP: 5 mm
XUYFVER: 3 mm

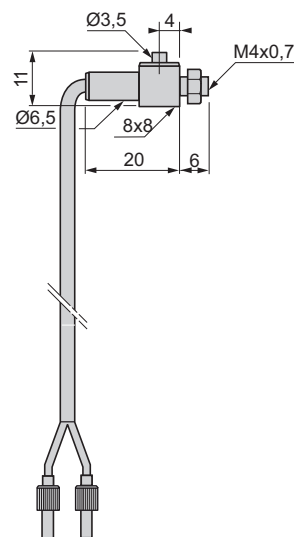
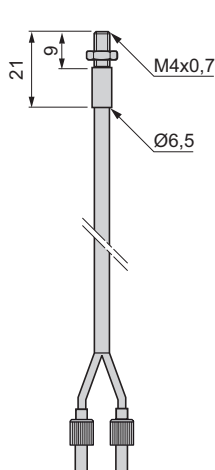


Metal reinforced sheath
XUYFVP: 5 mm
XUYFVER: 3.5 mm



High temperature sheath
XUYFVP: 5 mm
XUYFVER: 5 mm

R = minimum bend radius



Applications

- Detection in high temperature environment (up to 200 °C)
- Detection in aggressive environment
- Application requiring high level of performance

References

Type of end fitting	Straight			Lateral		
	Standard	Metal reinforced	High temperature	Standard	Metal reinforced	High temperature
Sheath						
References with 0.60 m long fibre (1)	XUYFVPSD61	XUYFVPM61	XUYFVPTD61	XUYFVPSL61	XUYFVPM61	XUYFVPTL61
Nominal sensing distance Sn (mm)	80	80	80	80	80	80
Weight (kg)	0.040	0.045	0.052	0.042	0.056	0.056

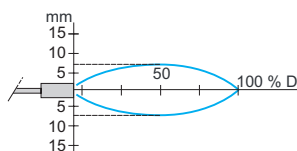
Characteristics

Fibre	400 strands per mm ²
Usable diameter of fibre	1.2 mm
Ambient air temperature	For operation Standard: - 25...+ 60 °C Metal reinforced: - 25...+ 120 °C High temperature: -25...+ 200 °C
Detection end fitting	Nickel plated brass
Materials	Fibre: 50 µ glass Sheath: Standard: PVC + thermo polyolefine, Metal reinforced: spiralled metal + polyolefine High temperature: flexible stainless steel

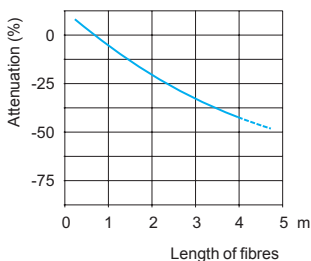
(1) For 1 m long fibre, replace 61 in the reference by 101. Example: XUYFVPSD61 becomes XUYFVPSD101 for a 1 m long fibre.
For 1.5 m long fibre, replace 61 in the reference by 151. Example: XUYFVPM61 becomes XUYFVPM151 for a 1.5 m long fibre.
For 2 m long fibre, replace 61 in the reference by 201. Example: XUYFVPTD61 becomes XUYFVPTD201 for a 2 m long fibre.

Detection and attenuation curves

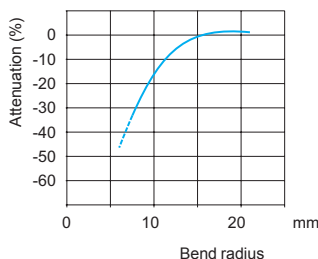
XUYFVP●●61



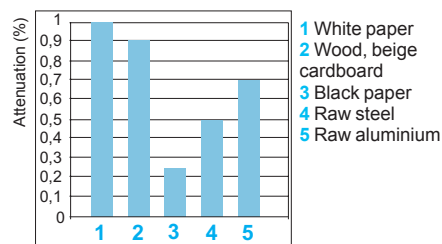
Attenuation related to length

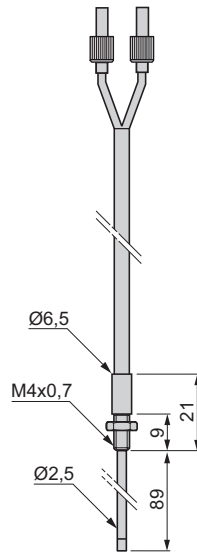
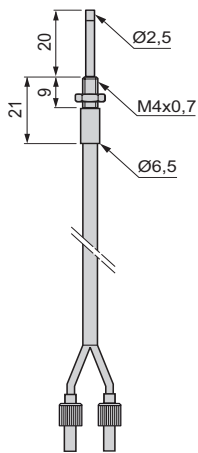


Bending influence



Material influence





Extended			Pliable		
Standard	Metal reinforced	High temperature	Standard	Metal reinforced	High temperature
XUYFVPSA61 (1)	XUYFVPMMA61 (1)	XUYFVPTA61 (1)	XUYFVPSA61 (1)	XUYFVPMC61 (1)	XUYFVPTC61 (1)
80	80	80	80	80	80
0.041	0.046	0.053	0.043	0.057	0.057

400 strands per mm²

1.2 mm

Standard: - 25...+ 60 °C

Metal reinforced: - 25...+ 120 °C

High temperature: - 25...+ 200 °C

Nickel plated brass

50 µ glass

Standard: PVC + thermo polyolefine,

Metal reinforced: spiralled metal + polyolefine

High temperature: flexible stainless steel

(1) For 1 m long fibre, replace 61 in the reference by **101**. Example: XUYFVPSA61 becomes **XUYFVPSA101** for a 1 m long fibre.

For 1.5 m long fibre, replace 61 in the reference by **151**. Example: XUYFVPMMA61 becomes **XUYFVPMMA151** for a 1.5 m long fibre.

For 2 m long fibre, replace 61 in the reference by **201**. Example: XUYFVPTA61 becomes **XUYFVPTA201** for a 2 m long fibre.

Photo-electric sensors

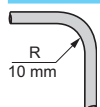
OsiSense XU Application

Fibre optics for amplifier

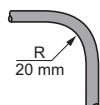
“GLASS” fibres with end fittings

For diffuse and thru-beam systems

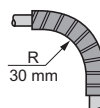
“GLASS” fibre optics for thru-beam system



Standard sheath
External Ø
XUYFVP: 5 mm
XUYFVER: 3 mm

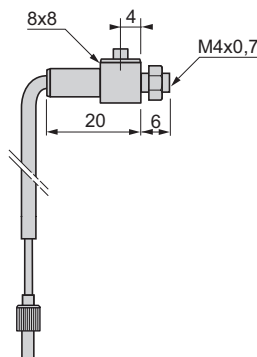
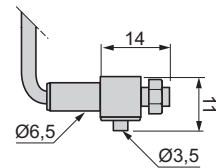
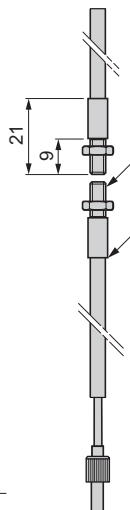


Metal reinforced sheath
XUYFVP: 5 mm
XUYFVER: 3.5 mm



High temperature sheath
XUYFVP: 5 mm
XUYFVER: 5 mm

R = minimum bend radius



Applications

- Detection in high temperature environment (up to 200 °C)
- Detection in aggressive environment
- Application requiring high level of performance

References

Type of end fitting				Lateral		
	Standard	Metal reinforced	High temperature	Standard	Metal reinforced	High temperature
Sheath						
References with 0.6 m long fibre (1)	XUYFVERSD61	XUYFVERMD61	XUYFVERTD61	XUYFVERSL61	XUYFVERML61	XUYFVERTL61
Nominal sensing distance S_n (mm)	200	200	200	200	200	200
Weight (kg)	0.042	0.046	0.060	0.052	0.061	0.075

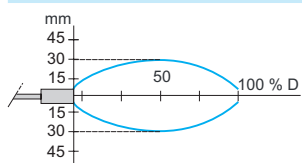
Characteristics

Fibre	400 strands per mm ²	
Usable diameter of fibre	1.2 mm	
Ambient air temperature	For operation	Standard: - 25...+ 60 °C, Metal reinforced: - 25...+ 120 °C High temperature: - 25...+ 200 °C
Detection end fitting	Nickel plated brass	
Materials	Fibre	50 µ glass
	Sheath	Standard: PVC + thermo polyolefine Metal reinforced: spiralled metal + polyolefine High temperature: flexible stainless steel

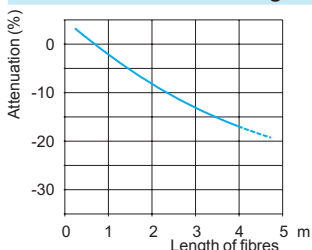
(1) For 1 m long fibre, replace 61 in the reference by 101. Example: XUYFVERSD61 becomes XUYFVERSD101 for a 1 m long fibre.
For 1.5 m long fibre, replace 61 in the reference by 151. Example: XUYFVERMD61 becomes XUYFVERMD151 for a 1.5 m long fibre.
For 2 m long fibre, replace 61 in the reference by 201. Example: XUYFVERTD61 becomes XUYFVERTD201 for a 2 m long fibre.

Detection and attenuation curves

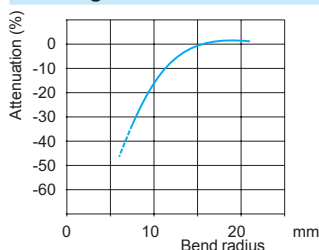
XUYFVER●●61



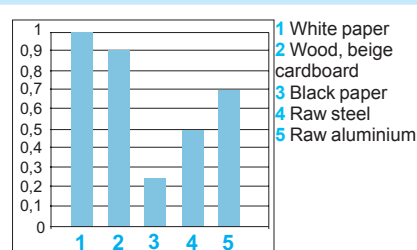
Attenuation related to length

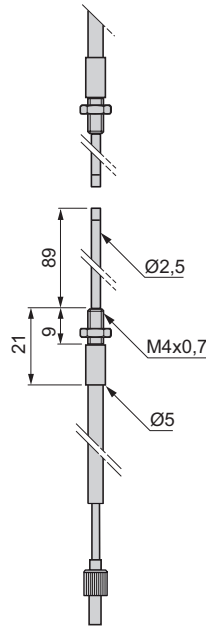
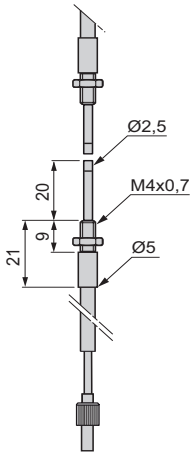


Bending influence



Material influence





Extended			Pliable		
Standard	Metal reinforced	High temperature	Standard	Metal reinforced	High temperature
XUYFVERSA61 (1)	XUYFVERMA61 (1)	XUYFVERTA61 (1)	XUYFVERSC61 (1)	XUYFVERMC61 (1)	XUYFVERTC61 (1)
80	80	80	80	80	80
0.043	0.047	0.061	0.053	0.061	0.076

400 strands per mm²

1.2 mm

Standard: - 25...+ 60 °C,
Metal reinforced: - 25...+ 120 °C
High temperature: - 25...+ 200 °C

Nickel plated brass

50 µ glass

Standard: PVC + thermo polyolefine
Metal reinforced: spiralled metal + polyolefine
High temperature: flexible stainless steel

(1) For 1 m long fibre, replace 61 in the reference by **101**. Example: XUYFVERSA61 becomes **XUYFVERSA101** for a 1 m long fibre.
 For 1.5 m long fibre, replace 61 in the reference by **151**. Example: XUYFVERMA61 becomes **XUYFVERMA151** for a 1.5 m long fibre.
 For 2 m long fibre, replace 61 in the reference by **201**. Example: XUYFVERTA61 becomes **XUYFVERTA201** for a 2 m long fibre.

Photo-electric sensors

OsiSense XU Application

Fibre optics for amplifier

"GLASS" fibres with end fittings

For diffuse and thru-beam systems

Accessories

Focusers for diffuse system fibre optics

Description	For use with	Nominal sensing distance (Sn)	Unit reference	Weight
		mm		kg
Focusers for pinpoint reading of reference marks, contrasts, faults, etc.	XUYFVERSD61	10	XUY1120	0.003
	XUYFVERMD61	30	XUY1125	0.004
	XUYFVERTD61			

Focusers for thru-beam system fibre optics

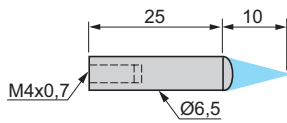
Description	For use with	Nominal sensing distance (Sn)	Unit reference	Weight
		mm		kg
Focusers for increasing sensing distances (sold in lots of 2)	XUYFVERSD61	800	XUY1121 (1)	0.004
	XUYFVERMD61	3000	XUY1124 (2)	0.012
	XUYFVERTD61	800	XUY1122 (1)	0.006

(1) 70° max.

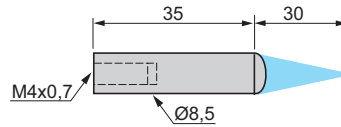
(2) 250° max.

Focuseurs

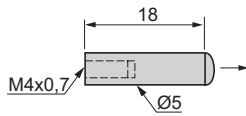
XUY1120



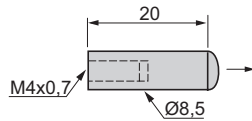
XUY1125



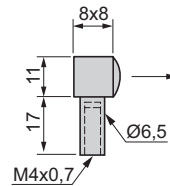
XUY1121



XUY1124



XUY1122R



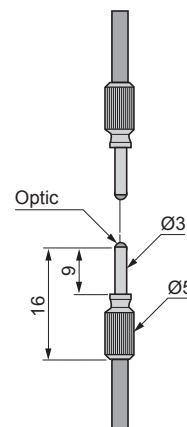
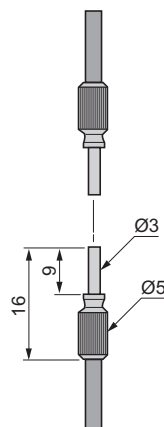
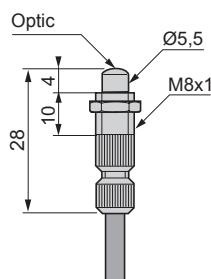
Ecofibre concept

Assemble your own fibre optics.

Fibres without end fitting



End fittings



End fittings

Nominal sensing distance S_n (mm)	70	200	800
Reference	XUYA110	XUYA210	XUYA211
Weight (kg)	0.009	0.004	0.004

Fibres without end fitting

Type of fibre

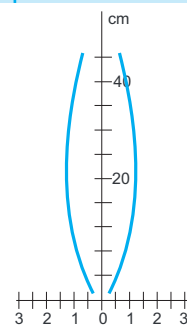
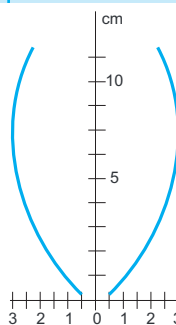
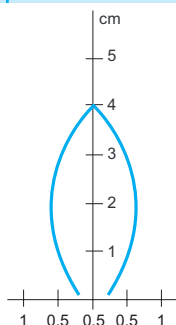
Single fibre, plastic, single strand

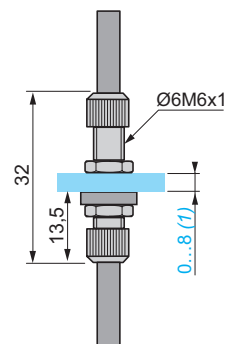
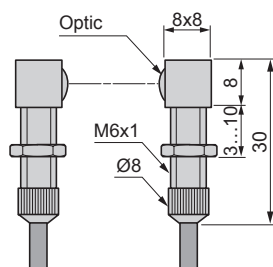
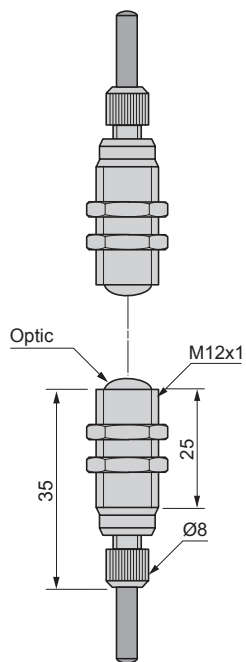
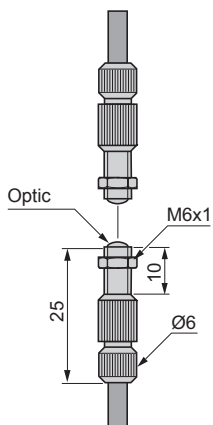


Length (m)	1	10	50
Usable diameter (mm)	1	1	1
External diameter (mm)	2.2	2.2	2.2
Reference	XUYA005	XUYA00510	XUYA00550
Weight (kg)	0.006	0.042	0.220

Curves

End fittings	XUYA110	XUYA210	XUYA211
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End fitting for passing through partition

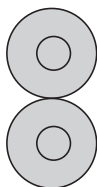
(1) Ø 6.2 cut-out

1200	4000	1200	-
XUYA212	XUYA213	XUYA220	XUYA310
0.011	0.045	0.018	0.017

Single fibre, plastic, multistrand

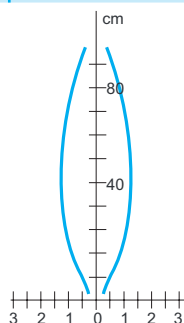
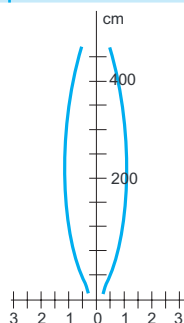
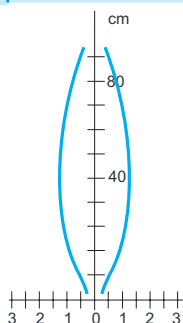


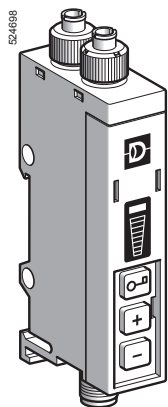
Dual fibre, plastic, single strand



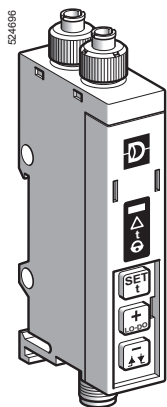
1	1
1	1
2.2	2.2
XUYAU005	XUYFP2BRINA005B
0.006	0.080

XUYA212	XUYA213	XUYA220
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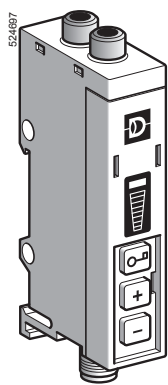




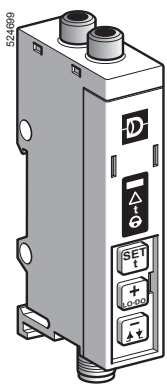
XUYAFP966S



XUYAFP946S



XUYAFV966S



XUYAFV946S

Amplifiers for plastic fibre optics (1)

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
Adjustment using +/- button (2)					
Depending on fibre	NO/NC	PNP/NPN	Pre-cabled	XUYAFP966S	0.124
	dpg. on wiring		M8 connector	XUYAFPCO966S	0.056

Adjustment using teach mode (3)

Depending on fibre	NO/NC	PNP/NPN	Pre-cabled	XUYAFP946S	0.124
	programmable		M8 connector	XUYAFPCO946S	0.056

Amplifiers for glass fibre optics

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
Adjustment using +/- button (2)					
Depending on fibre	NO/NC	dpg. on PNP/NPN wiring	Pre-cabled	XUYAFV966S	0.116
			M8 connector	XUYAFVCO966S	0.047

Adjustment using teach mode (3)

Depending on fibre	NO/NC	PNP/NPN	Pre-cabled	XUYAFV946S	0.124
	programmable		M8 connector	XUYAFVCO946S	0.047

Accessories

Description	Details	Length of cable m	Reference	Weight kg
Pre-wired M8 connector	Straight	2	XZCP0941L2	0.080
	Elbowed (90°)	2	XZCP1041L2	0.080
	Straight	5	XZCP0941L5	0.180
	Elbowed (90°)	5	XZCP1041L5	0.180

(1) Fibre trimmer included

(2) Indication of level by bargraph, adjustment by pressing button

(3) Fine mode or standard mode, adjustment using teach

Characteristics

Sensor type	XUYAF●9●6S		XUYAFCO9●6S
Product certifications	CE, cULus (4)		
Connection	Connector	-	
	Pre-cabled	Length: 2 m	M8, 4-pin
Nominal sensing distance (Sn)	Depending on fibre optic used		
Type of transmission	LED	Red LED	
	Modulation frequency	8 kHz	
Sensitivity adjustment	Using teach (fine mode or standard mode) and/or +/- button, depending on model		
Degree of protection	Conforming to IEC 60529 IP 65		
Ambient air temperature	For storage	°C	-20...+80
	For operation	°C	0...+60
Materials	Polycarbonate		
Immunity to ambient light	Incandescent bulb	Lux	10 000
	Natural light	Lux	20 000
Rated supply voltage	V $\overline{\text{---}}$ 12...24 with protection against reverse polarity		
Voltage limits (including ripple)	V $\overline{\text{---}}$ 10...30		
Current consumption, no-load	mA < 40		
Switching capacity	mA 100 with overload and short-circuit protection		
Voltage drop, closed state	V < 2		
Maximum switching frequency	kHz < 1		
External input (5)	Active	V	< 1.4
	Inactive	V	> 3
Delays	Response and recovery ms < 0.5		
Output time delay (5)	Range	s 0...5 in 11 adjustment increments	
	Duration of each increment	ms First increment 40 ms then 500 ms for each press	

(4) This product is UL Listed if supplied by a class II or isolated supply delivering $\overline{\text{---}}$ 30 V max. (isolated transformer for example) and protected by a UL fuse rated at 3 A max.

(5) Only for models with teach mode.

Applications using plastic fibre optics

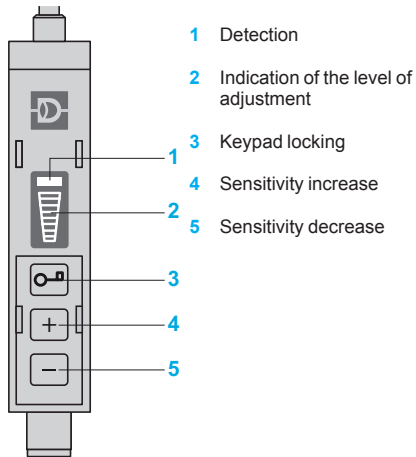
- Monitoring position or presence of parts on an assembly or packing machine
- Detection of objects on small conveyor
- Use of fibre optics in vibratory environments (robot arms)
- Detection of reference and colour marks in packaging

Applications with glass fibre optics

- Monitoring position or presence of parts on an assembly or packing machine
- Detection of presence of parts in a plastic mould
- Detection in aggressive environments
- Detection of items exiting an oven (high temperature fibres)

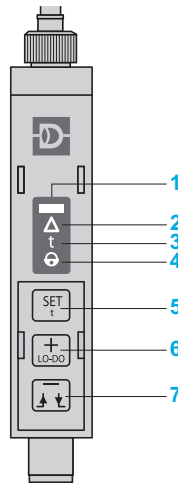
Presentation

XUYAF₀, adjustment using button



- 1 Detection
- 2 Indication of the level of adjustment
- 3 Keypad locking
- 4 Sensitivity increase
- 5 Sensitivity decrease

XUYAF₀, adjustment using teach mode

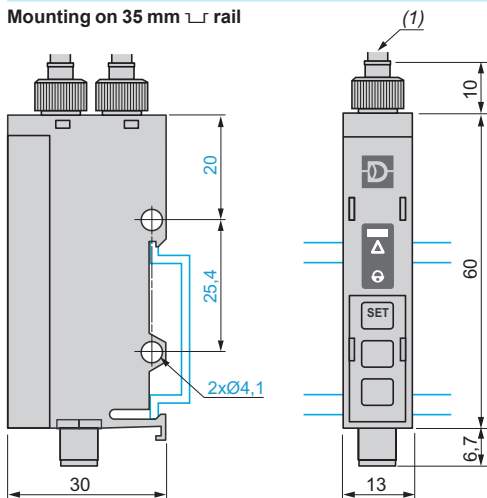


- 1 Detection
- 2 Dirty optics, limit of detection, alignment assistance
- 3 Time delay active
- 4 Action keypad, keypad locking
- 5 Automatic adjustment of the threshold, access to special functions
- 6 Sensitivity increase, direct/inverse output, time delay increase
- 7 Sensitivity decrease, On-delay, Off-delay inversion, time delay decrease

Dimensions

XUYAFP966S/AFPCO966S

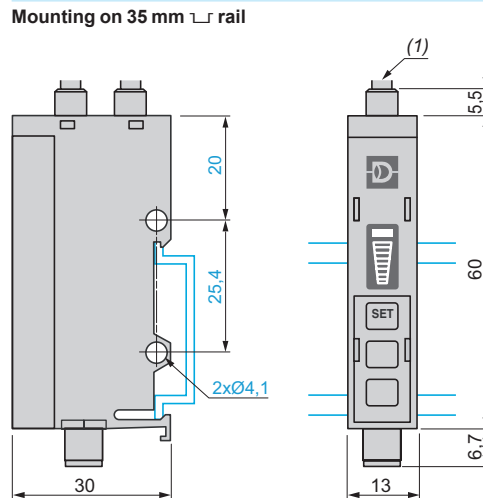
Mounting on 35 mm rail



(1) Plastic fibre optic: \varnothing 2.2 mm

XUYAFV966S/AFVCO966S

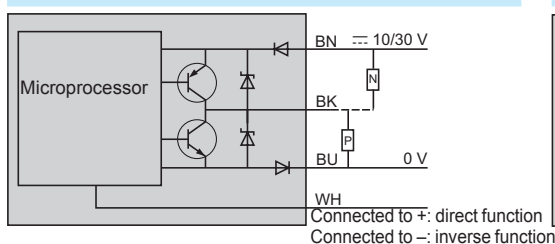
Mounting on 35 mm rail



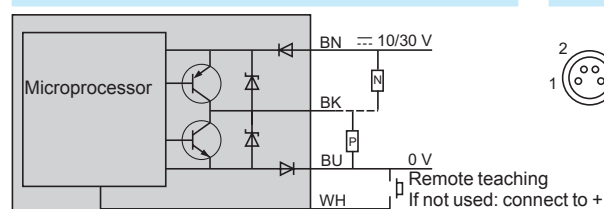
(1) Glass fibre optic: \varnothing 3 mm

Wiring schemes

XUYAFP966/AFV966



XUYAFP946/AFV946

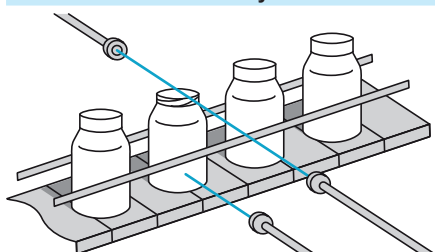


M8 connector

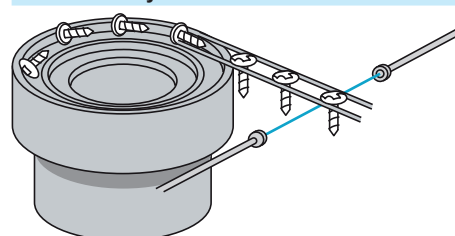
Pin N°	Colour
1	BN Brown
2	WH White
3	BU Blue
4	BK Black

Application examples

Thru-beam and diffuse system detection

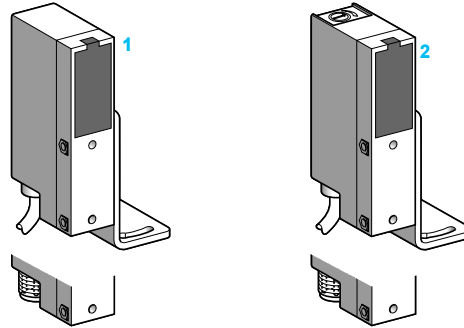


Thru-beam system detection



Compact design

Pre-cabled and connector versions



System	Reflex 1	Polarised reflex 1	Diffuse 2
Type of transmission	Infrared	Red	Infrared
Nominal sensing distance (Sn)	6 m (with Ø 80 mm reflector)	4 m (with Ø 80 mm reflector)	0.7 m

References

2-wire	NC function	Connection	Pre-cabled	XULA06021	XULA040219	XULA700115
			Connector	XULA06021K	XULA040219K	XULA700115K
	NO function	Connection	Pre-cabled	XULA06011	XULA040119	XULA700215
			Connector	XULA06011K	XULA040119K	XULA700215K
Weight (kg)		Connection	Pre-cabled	0.195		
			Connector	0.135		

Characteristics

Product certifications		CE. Special H7 version: UL, CSA	
Ambient air temperature	For operation	-25...+60 °C	
	For storage	-40...+80 °C	
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 2 mm (f = 10...55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	20 gn, duration 11 ms	
Degree of protection	Conforming to IEC 60529	IP 65	
	Conforming to NF C 20-010	IP 651	
Connection	Pre-cabled	Diameter 6 mm, length 2 m (1), wire c.s.a.: 2 x 0.34 mm ²	
	Connector	1/2"-20UNF	
Materials	Case	ABS/PC	
	Lenses	PMMA	
	Cable	PVC	
Rated supply voltage		~ or --- 24...240 V	
Voltage limits		~ or --- 20...264 V	
Switching capacity (2)	Sealed	Maximum	~ 12 or --- 12 (resistive load): 0.5 A/240 V ~ 140 (inductive load): 0.3 A/240 V --- 13 (inductive load): 0.1 A/240 V; 0.2 A/110 V; 0.5 A/48 V
		Minimum	5 mA
Inrush		3000 mA	
Voltage drop, closed state		≤ 3 V (I = 0.1...0.5 A); ≤ 5.5 V (I = 10 mA); ≤ 10 V (I = 5 mA)	
Residual current, open state		≤ 1.7 mA (on ~); ≤ 1.5 mA (on ---)	
Maximum switching frequency		20 Hz	
Delays	First-up	≤ 300 ms	
	Response	≤ 20 ms	
	Recovery	≤ 20 ms	

Function table	Function	Reflex system		Function Diffuse system	
		No object present in the beam	Object present in the beam	No object present in the beam	Object present in the beam
Output state indicator (illuminated when sensor output is ON)	NC			NO	
	NO			NC	

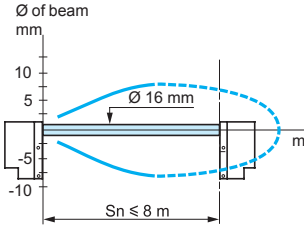
(1) For a sensor with a 5 m long cable add L05 to the end of the reference; for a 10 m long cable add L10 to the end of the reference.

Example: sensor XULA06021 with 5 m cable becomes XULA06021L05

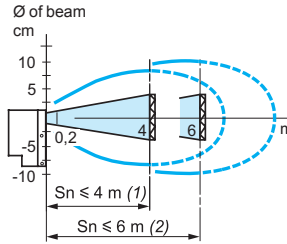
(2) These sensors do not incorporate overload or short-circuit protection and therefore, it is strongly advised to connect a "quick-blow" fuse in series with the load.

Detection curves

Thru-beam system

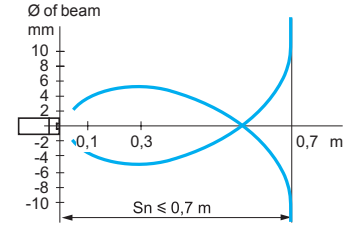


Reflex system



(1) Polarised
(2) Infrared

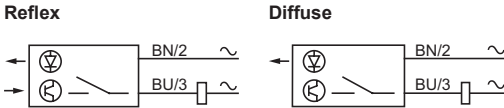
Diffuse system



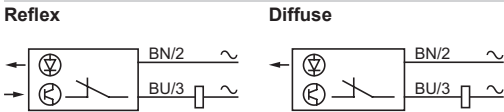
Schemes

Wiring schemes (2-wire ~)

NO function (no object present)



NC function (no object present)



Attention: it is essential to connect a load in series with the sensor

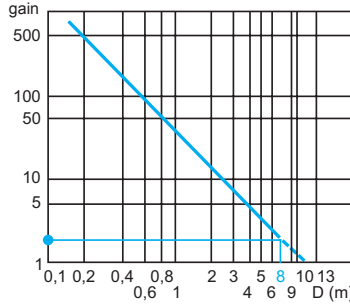
Connector scheme (sensor connector pin view)

Solid-state output (reflex and diffuse system)

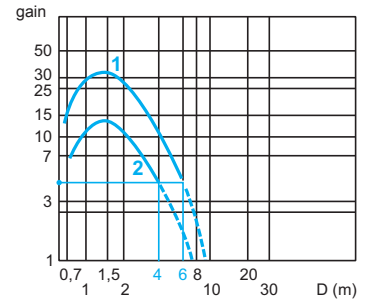


Excess gain curves (ambient temperature: + 25 °C)

Thru-beam system



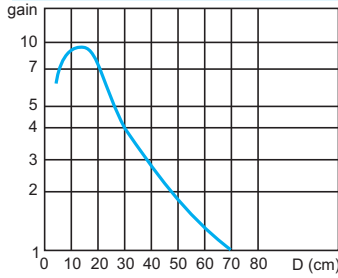
Reflex system



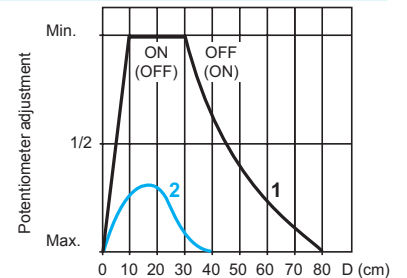
With reflector XUZC80

1 Infrared
2 Polarised

Diffuse system



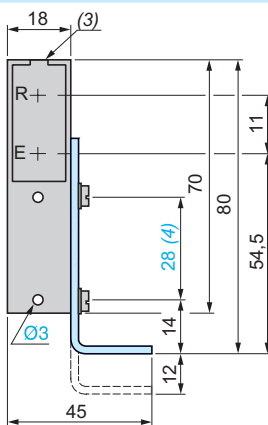
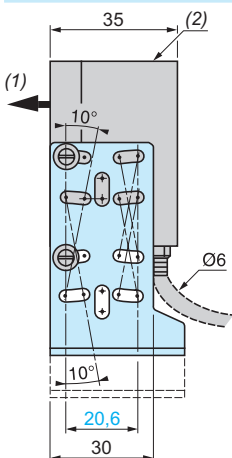
Object 20 x 20 cm
White 90%



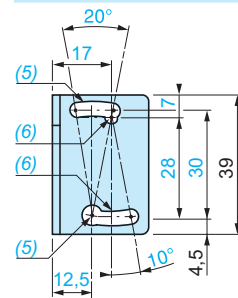
Object 20 x 20 cm
1 White 90 %
2 grey 18 %

Dimensions (The bracket XULZ41 is included with the sensor)

Sensor



Bracket fixing



(1) Optical axis
(2) Sensitivity potentiometer (diffuse model)
(3) Output LED indicator

(4) Front fixing (Ø 3 screws and inserts included)
(5) 1 elongated hole Ø 4.1 x 10 and 1 x Ø 4.1
(6) 1 elongated hole Ø 3.1 x 10 and 1 x Ø 3.1

Photo-electric sensors

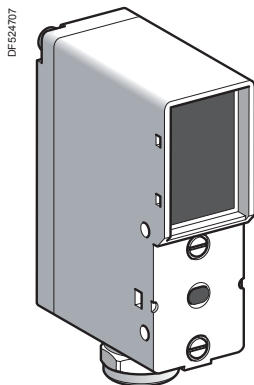
OsiSense XU Application

Conveying and access control series

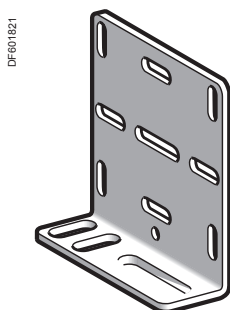
Compact design with teach mode adjustment

Five-wire AC or DC, 1 CO relay output

Three-wire DC, solid-state output



XUY●95●●



XUZA49

Diffuse system (1)				
Sensing distance (Sn) m	Function	Output	Reference	Weight kg
DC				
1.5	NO/NC programmable	PNP/NPN	XUYYP954S	0.130
4	NO/NC programmable	PNP/NPN	XUYYP952S	0.130
AC or DC				
1.5	NO/NC programmable	Relay	XUYYP954R	0.150
4	NO/NC programmable	Relay	XUYYP952R	0.150
Polarised reflex system (2)				
Sensing distance (Sn) m	Function	Output	Reference	Weight kg
DC				
6	NO/NC programmable	PNP/NPN	XUYB954S	0.130
10	NO/NC programmable	PNP/NPN	XUYB952S	0.130
AC or DC				
6	NO/NC programmable	Relay	XUYB954R	0.150
10	NO/NC programmable	Relay	XUYB952R	0.150
Fixing accessory				
Description	Reference	Weight kg		
Metal fixing bracket	XUZA49	0.120		

(1) On 300 x 300 mm white paper

(2) With Ø 84 mm reflector

Characteristics

		XUY P954S	XUY P954R	XUY P952S	XUY P952R	XUY B954S	XUY B954R	XUY B952S	XUY B952R
Product certifications		CE, cULus for XUYYP954S/952S and XUYB954S/952S							
Connection		Screw terminals							
Nominal sensing distance (Sn)	m	1.5		4		6		10	
Adjustment using teach (fine or standard mode)									
Type of transmission	LED	Infrared				Red			
Degree of protection	Conforming to IEC 60529	IP 65 and IP 67							
Ambient air temperature	For storage	°C - 20...+ 80							
	For operation	°C 0...+ 60							
Materials		Polycarbonate							
Immunity to ambient light	Incandescent bulb	Lux 10 000 at 5° to the optical axis							
	Natural light	Lux 20 000 at 5° to the optical axis							
Indicator lights	Green LED	Output signal							
	Red LED	Dirty optics, limit of detection, alignment assistance, time delay active, time function indicator							
Voltage limits	⎓ 10...30 V	●	–	●	–	●	–	●	–
(including ripple)	~ 20...250 V	–	●	–	●	–	●	–	●
Current consumption, no-load		mA 50	–	50	–	50	–	50	–
		VA –	2	–	2	–	2	–	2
Type of output		PNP/NPN	Relay	PNP/NPN	Relay	PNP/NPN	Relay	PNP/NPN	Relay
Switching capacity	PNP/NPN	mA 100 with overload and short-circuit protection							
	Relay	A 3 (max. continuous)							
Voltage drop, closed state	PNP/NPN	V At 100 mA: < 2; at 10 mA: < 1							
Maximum switching frequency		Hz 1000	25	60	25	1000	25	60	25
Delays	Response and recovery	ms 0.5	20	8	20	0.5	20	8	20
Test input	Active	V < 1.4	–	< 1.4	–	< 1.4	–	< 1.4	–
	Inactive	V > 3	–	> 3	–	> 3	–	> 3	–
Output time delay	Type	Retriggerable: leading edge and/or trailing edge							
	Duration of each increment	ms 0 to 11 s in 23 adjustment increments of 50 ms, then 0.5 s per press							
Adjustment		Using teach mode and/or fine manual adjustment							

- Applications
- Detection of belt breakage
- Material handling
- Access control

Photo-electric sensors

OsiSense XU Application

Conveying and access control series

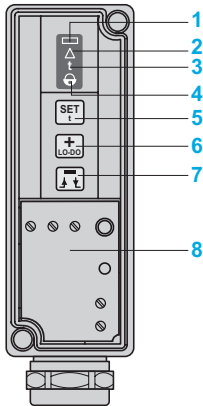
Compact design with teach mode adjustment

Five-wire AC or DC, 1 CO relay output

Three-wire DC, solid-state output

Description

Rear view



Indicator lights

- Output signal: Green LED
- 1 - Dirty optics: Red LED
- Limit of detection: Red LED
- 2 - Alignment assistance: flashing red LED
- Activation/adjustment of time delay: Red LED
- 3 - Action keypad
- Keypad: Action/Locking
- 4

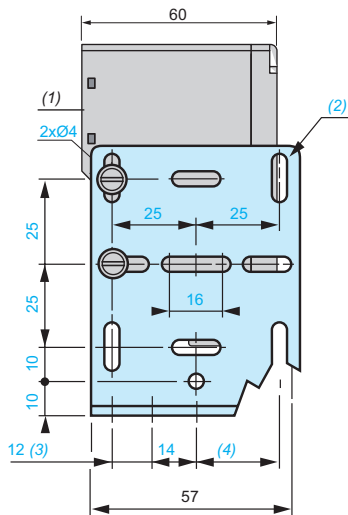
Controls

- 5 - Automatic adjustment of threshold
- Access to special functions
- Zero reset of time delay
- 6 - Sensitivity increase
- NO/NC programming
- Time delay increase
- 7 - Sensitivity decrease
- Inversion of time delay setting: On-delay, Off-delay
- Time delay decrease
- 8 - Access to terminals

Note: Both the red and green LEDs flash in the event of a short-circuit on the output (for XUYP●95●S and XUYB●95●S versions).

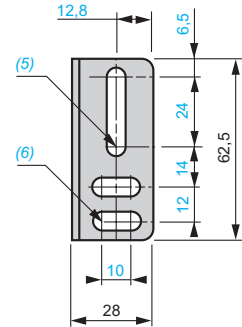
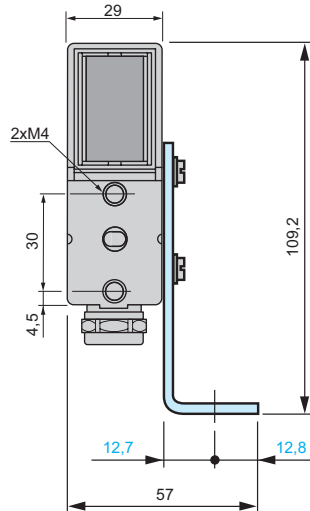
Dimensions

Sensors XUY●95●S and XUY●95●R



- (1) Optical axis. (2) 8 elongated holes $\varnothing 4.2 \times 10$.
(3) 2 elongated holes $\varnothing 6.5 \times 10$. (4) 1 elongated hole $\varnothing 6.5 \times 24$.

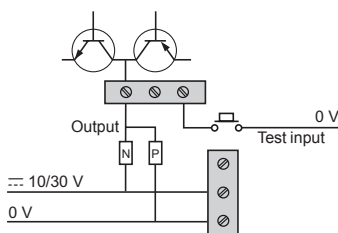
Bracket fixing XUZA49



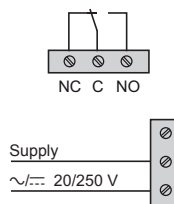
- (5) 2 elongated holes $\varnothing 6.5 \times 16.5$.
(6) 1 elongated hole $\varnothing 6.5 \times 30.5$.

Wiring schemes

XUY●95●S



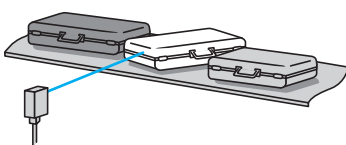
XUY●95●R



250 V, 1.5 mm² terminals.

Application examples

Monitoring for blockages on a baggage conveyor



Monitoring of gluing, fastening or labelling operations

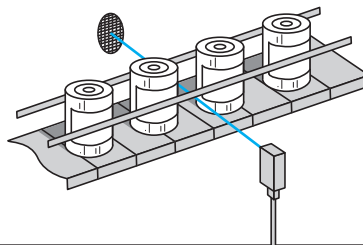
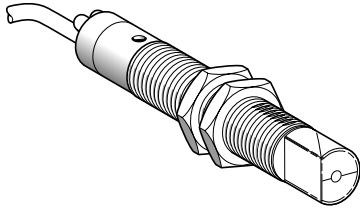


Photo-electric sensors

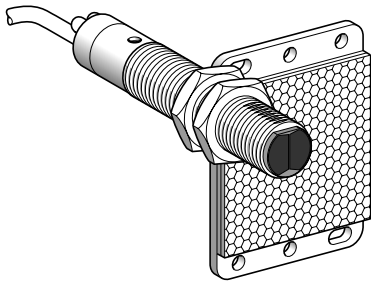
OsiSense XU Application

Design 18

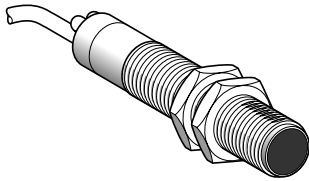
Two-wire AC ⁽¹⁾ or DC, solid-state output with adjustable sensitivity



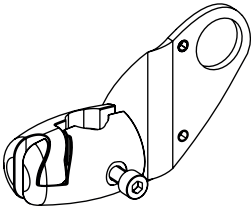
XU5M18M●230W
XU8M18M●230W



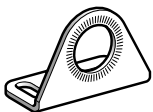
XU9M18M●230



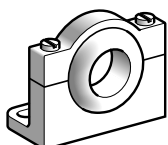
XU2M18M●230



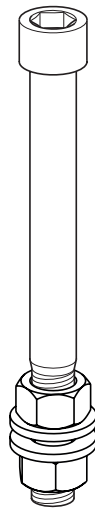
XUZA2003



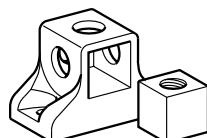
XUZA118



XUZA218



XUZ2001



XUZ2003

Diffuse system with adjustable background suppression

Sensing distance (Sn) m	Function	Line of sight	Connection	Reference	Weight kg
0.12	NO	Along case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU8M18MA230	0.150
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU8M18MA230K	0.075
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU8M18MA230WK	0.150
	NC	Along case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU8M18MB230	0.150
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU8M18MB230K	0.075
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU8M18MB230WK	0.150

Diffuse system

Sensing distance (Sn) m	Function	Line of sight	Connection	Reference	Weight kg
0.40	NO	Along case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU5M18MA230	0.150
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU5M18MA230K	0.075
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU5M18MA230WK	0.150
	NC	Along case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU5M18MB230	0.150
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU5M18MB230K	0.075
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU5M18MB230WK	0.150

Polarised reflex system ⁽³⁾

Sensing distance (Sn) m	Function	Line of sight	Connection	Reference	Weight kg
2	NO	Along case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU9M18MA230	0.170
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU9M18MA230K	0.090
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU9M18MA230WK	0.170
	NC	Along case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU9M18MB230	0.170
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU9M18MB230K	0.095
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU9M18MB230WK	0.170

Thru-beam system ⁽⁴⁾

Sensing distance (Sn) m	Function	Line of sight	Connection	Reference	Weight kg
15	NO	Along case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU2M18MA230	0.285
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU2M18MA230K	0.155
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU2M18MA230WK	0.285
	NC	Along case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU2M18MB230	0.285
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU2M18MB230K	0.155
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU2M18MB230WK	0.285

Fixing accessories ⁽⁵⁾

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XU●M18 or XUZC50	XUZB2003	0.170
M12 rod	XUZ2001	0.050
Support for M12 rod	XUZ2003	0.150
Stainless steel fixing bracket	XUZA118	0.045
Plastic fixing bracket with adjustable ball-joint	XUZA218	0.035

(1) These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a 0.4 A "quick-blow" fuse in series with the load.

(2) For a 5 m long cable add L5.

Example: XU2M18MA230 becomes XU2M18MA230L5.

(3) 50 x 50 mm reflector XUZC50 included with polarised reflex system.

(4) Comprising both thru-beam transmitter and receiver.

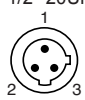
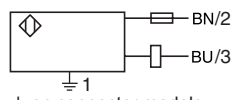
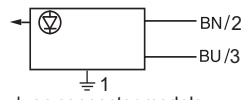
(5) For further information, see page 5/158.

Characteristics

Sensor type		XU2M, XU5M, XU8M, XU9M	XU2M, XU5M, XU8M, XU9M●●●●●●●●K
Product certifications		UL, CSA, CE	
Connection	Connector	-	1/2"-20UNF
	Pre-cabled	Length: 2 m	-
Sensing distance nominal Sn / maximum (excess gain = 2) (excess gain = 1)		0.12 / 0.12 diffuse with background suppression	
		0.4 / 0.6 diffuse	
		2 / 3 polarised reflex	
		15 / 20 thru-beam	
Type of transmission		Infrared, except XU9 (red)	
Degree of protection	Conforming to IEC 60529	IP 67, double insulation □	IP 67
Storage temperature		°C -40...+70	
Operating temperature		°C -25...+55	
Materials		Case: nickel plated brass; Lens: PMMA; Cable: PvR	
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Indicator lights	Output state	Yellow LED	
	Stability	Red LED (for reflex and thru-beam only)	
Rated supply voltage		V \sim/\sim 24...240	
Voltage limits (including ripple)		V \sim/\sim 20...264	
Residual current, open state		mA < 1.5	
Switching capacity		mA 10...200 (1)	
Voltage drop, closed state		V 6	
Maximum switching frequency		Hz 25	
Delays	First-up	ms < 300	
	Response	ms < 20	
	Recovery	ms < 20	

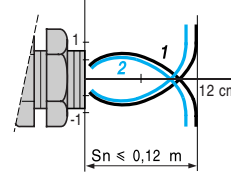
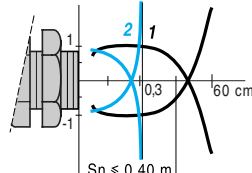
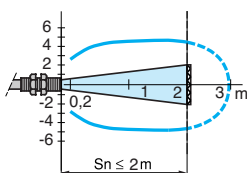
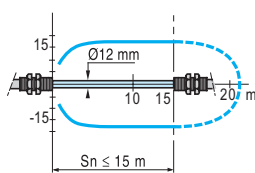
(1) These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a 0.4 A "quick-blow" fuse in series with the load.

Wiring schemes

Connector	Pre-cabled	2-wire \sim or $\sim\sim$	Transmitter
1/2"-20UNF 	(\sim) BU (Blue) (\sim) BN (Brown)		
		⊕ on connector models	⊕ on connector models

Detection curves

Thru-beam system	Polarised reflex system	Diffuse system	Diffuse system with adjustable background suppression
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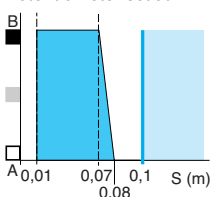


With reflector XUZC50

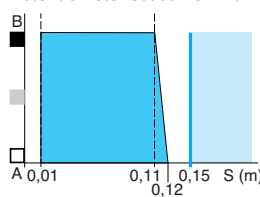
Object 10 x 10 cm; 1 White 90%; 2 Grey 18%

Variation of usable sensing distance Su

Potentiometer set at minimum



Potentiometer set at maximum

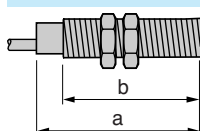


A-B: object reflection coefficient

- Black 6%
- Grey 18%
- White 90%
- Sensing range
- Non sensing zone (matt surfaces)

Dimensions

XU●



	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
Ø 18, line of sight along case axis	82	55	95	55
Ø 18, line of sight 90° to case axis	97	55	110	55

Photo-electric sensors

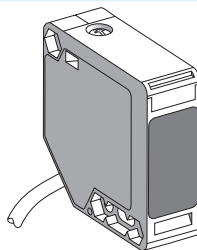
OsiSense XU Application, tertiary sector series

For access detection

AC or DC supply

1 CO relay output

Compact design



System	Reflex
Type of transmission	Infrared
Nominal sensing distance (Sn)	7 m (with 50 x 50 mm reflector)

References

5-wire	NC function	XUK1ARCNL2H60 (supplied as kit comprising: sensor, fixing bracket, 50 x 50 mm reflector and mounting instructions in French and English)	XUK1ARCNL2H61 (supplied as kit comprising: sensor, fixing bracket, 50 x 50 mm reflector and mounting instructions in French and German)
Weight (kg)		0.300	

Characteristics

Product certifications	UL, CSA, CE
Ambient air temperature	For operation: - 25...+ 55 °C. For storage: - 40...+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6 7 gn, amplitude ± 1.5 mm (f = 10...55 Hz)
Shock resistance	Conforming to IEC 60068-2-27 30 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529 IP 65, double insulation
Connection	Pre-cabled: diameter 6 mm, length 2 m, wire c.s.a.: 5 x 0.34 mm ² / AWG 22
Materials	Case: PBT; lenses: PMMA; cable: PVC
Rated supply voltage	~ or ~ 24...240 V
Voltage limits	~ or ~ 20...264 V
Switching capacity	3 A
Maximum voltage on output relay contacts	~ 250 V
Power consumption, no-load	2 W (1)
Maximum switching frequency	20 Hz
Delays	First-up: ≤ 60 ms; response: ≤ 25 ms; recovery: ≤ 25 ms

Function table	Function	Reflex system	
		No object present in the beam	Object present in the beam
Output state of relay contact indicator (illuminated when relay energised)	NO or NC	BK — GY WH — ⊗ Relay de-energised	BK — GY WH — ⊙ Relay energised

(1) No-load current consumption at ~ 220 V: ≤ 25 mA.

Photo-electric sensors

OsiSense XU Application, tertiary sector series

For access detection

AC or DC supply

1 CO relay output

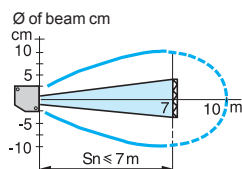
Contents of kits XUK1ARCNL2H60 and XUK1ARCNL2H61

- reflex system photo-electric sensor,
- fixing bracket XUZASK003 (screws included),
- 50 x 50 mm reflector,
- mounting instructions
- in french and english for XUK1ARCNL2H60,
- in french and german for XUK1ARCNL2H61.



Detection curve

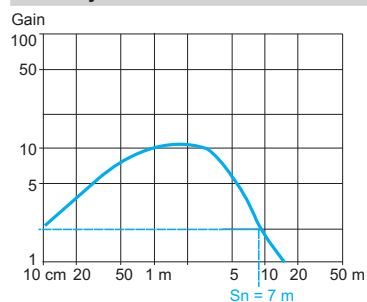
Reflex system ~ or ---



Excess gain curve

(ambient temperature: + 25 °C)

Reflex system ~ or ---



Wiring scheme

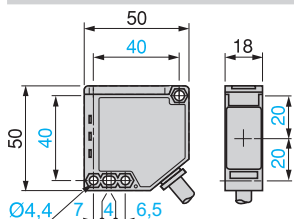
5-wire ~ or ---



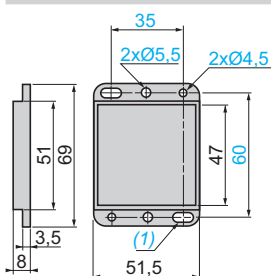
With reflector XUZC50

Dimensions

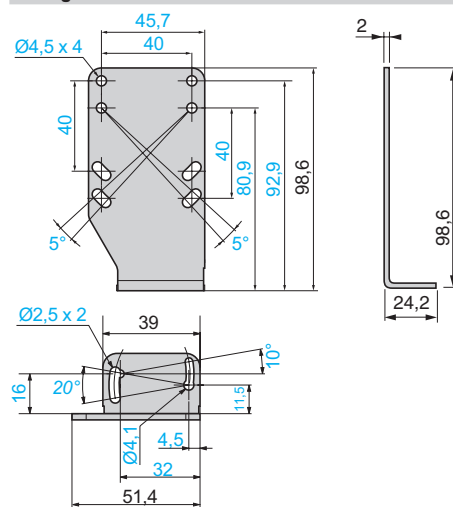
Sensor XUK1ARCNL2



Reflector XUZC50



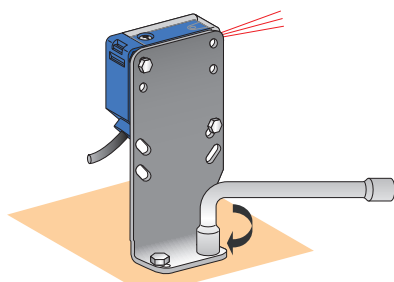
Fixing bracket XUZASK003



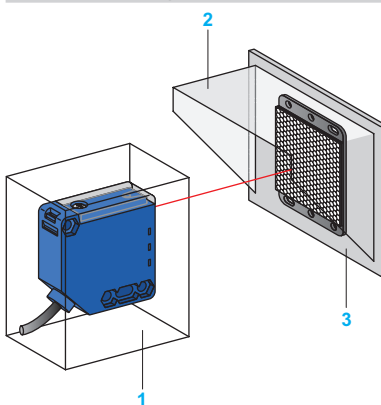
(1) 2 elongated holes Ø 4.5 x 8

Mounting precautions

Rigid fixing for trouble free detection



Outdoor mounting under protective cover



- 1 Protective housing.
- 2 Lens hood.
- 3 Thermal insulator to avoid frost or condensation forming on the optical parts.

Photo-electric sensors

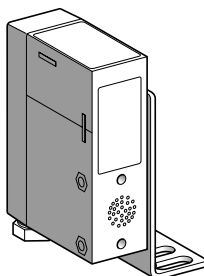
OsiSense XU Application, tertiary sector series

With integral buzzer

AC or DC supply

1 NO relay output

Compact design







System	Reflex
Type of transmission	Infrared
Nominal sensing distance (Sn)	6 m (with Ø 80 mm reflector)
Cable gland	9P, mounted in base

References

NO function	XUJB06031H60 (supplied as kit comprising: sensor, fixing bracket, Ø 80 mm reflector and mounting instructions)
Weight (kg)	0.330

Characteristics

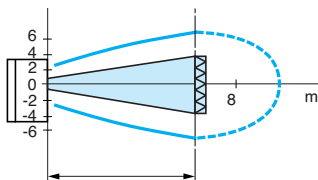
Product certifications	CE
Ambient air temperature	For operation: - 25...+ 55 °C. For storage: - 40...+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6 7 gn, amplitude ± 1.5 mm (f = 10...55 Hz)
Shock resistance	Conforming to IEC 60068-2-27 30 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529 IP 40, double insulation □
Connection	Screw terminals, maximum capacity: 1 x 1.5 mm ²
Materials	Case: PEI (1)
Rated supply voltage	~ 24...240 V or ~ 24...48 V
Voltage limits	~ 20...264 V or ~ 20...60 V (including ripple)
Switching capacity	2000 mA (cos φ = 1), 500 mA (cos φ = 0.4) for a contact life of 1 million operating cycles at an operating rate of 1 operating cycle per second, at 250 V
Maximum voltage on output relay contacts	~ 250 V or ~ 30 V
Current consumption, no-load	≤ 30 mA
Maximum switching frequency	20 Hz
Delays	First-up: ≤ 60 ms; response: ≤ 25 ms; recovery: ≤ 25 ms
Time delay	Adjustable from 0.3 to 3 seconds

Function table	Function	Reflex system	
		No object present in the beam	Object present in the beam
Output state of relay contacts indicator: yellow LED (illuminated when relay energised)	NO	 Relay de-energised	 yellow Relay energised
		 Relay energised	 yellow

(1) PEI: high quality synthetic resin providing excellent withstand to mechanical shocks, vibration and the effects of external agents frequently encountered in industry: alcohol, salts, petroleum, oils, greases, washing agents (diluted sodium carbonate 4%, nitric acid 2%), formaldehyde vapour, splashing lactic acid, etc.

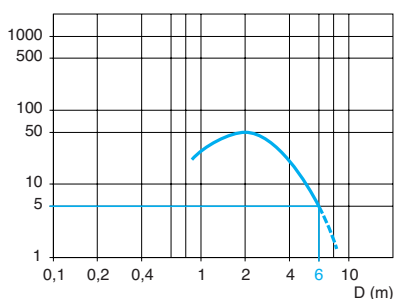
Detection curve

Reflex system



Excess gain curve (ambient temperature: + 25 °C)

Infrared reflex system



Contents of kit XUJB06031H60

- reflex system photo-electric sensor,
- fixing bracket,
- Ø 80 mm reflector,
- mounting instructions.



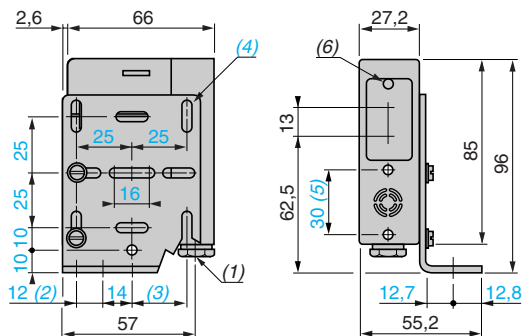
With reflector XUZC80

Dimensions

XUJB06031H60

Face view

Bracket fixing



(1) 9P cable gland.

(2) 2 elongated holes Ø 6.5 x 10.

(3) 1 elongated hole Ø 6.5 x 24.

(4) 8 elongated holes Ø 4.2 x 10.

(5) Front fixing (Ø 4 screws and inserts included).

(6) Yellow LED.

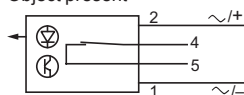
(7) 2 elongated holes Ø 6.5 x 16.5.

(8) 1 elongated hole Ø 6.5 x 30.5.

Wiring schemes (~ or ---)

NO function

Object present



Terminal connections

1 NO relay output

1 Ø - A1 (~/-)

2 Ø - A2 (~/+)

3 Ø -

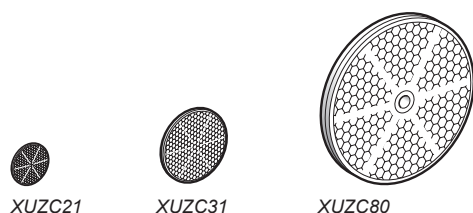
4 Ø - ~ 250 V, 100 VA max.

5 Ø - --- 30 V, 2 A max.

Photo-electric sensors

OsiSense XU

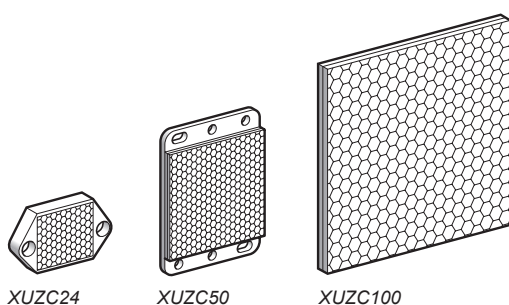
Accessories



XUZC21

XUZC31

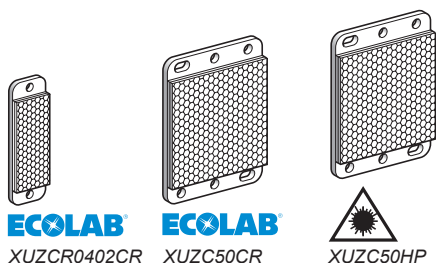
XUZC80



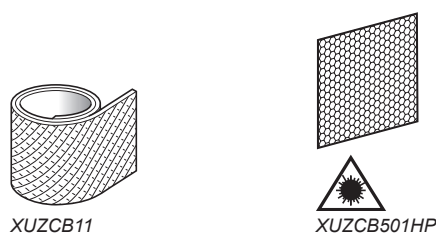
XUZC24

XUZC50

XUZC100


ECOLAB
XUZCR0402CR

ECOLAB
XUZC50CR

XUZC50HP


XUZCB11

XUZCB501HP

Reflectors

Description	Dimensions mm	Fixing mode	Chemical resistance	Micro-prism (1)	Reference	Weight kg
Rigid reflectors						
Rigid circular reflectors	Ø 21	–	No	No	XUZC16	0.002
	Ø 25	–	No	No	XUZC21	0.002
	Ø 35	–	No	No	XUZC31	0.005
	Ø 46	–	No	No	XUZC39	0.008
	Ø 84	1 hole	No	No	XUZC80	0.029
Rigid square reflectors	20 x 32	2 holes	No	Yes	XUZCR0201CR	0.004
	13 x 33	2 inserts	No	No	XUZC08	0.010
	23 x 40	Adhesive	No	No	XUZC40S22	0.015
	29 x 45	2 holes	No	No	XUZC24	0.007
			Ecolab	Yes	XUZCR0401CRHP (2)	
	19 x 60	2 holes	No	Yes	XUZCR0401HP (2)	0.010
			Ecolab	No	XUZCR0402CR (2)	
	18 x 60	2 holes	No	No	XUZCR0402 (2)	0.015
			Ecolab	No	XUZCR0402	
	30 x 82	2 holes	No	No	XUZC30	0.015
	50 x 70	6 holes	Ecolab	No	XUZC50CR (2)	0.020
			No	No	XUZC50	
No			Yes	XUZC50HP		
40 x 60	2 holes	No	No	XUZC60S11	0.022	
42 x 182	2 holes	No	No	XUZC180S21	0.080	
100 x 100	2 brackets	No	No	XUZC100	0.062	
Adhesive tape						
For polarized reflex sensor	1 x 22	Adhesive	No	No	XUZB11	0.020
	5 x 22	Adhesive	No	No	XUZB15	0.085
For laser sensor	50 x 50	Adhesive	No	Yes	XUZCB0501HP	–
	250 x 250	Adhesive	No	Yes	XUZC250	–





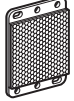

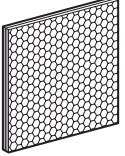











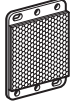
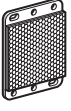


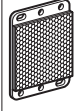



Note: All reflectors are IP 67 and IP 69K. They are suitable for use at operating temperatures between - 20 °C and + 60 °C except Ecolab certified products (- 20°C...+ 140 °C).

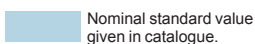
(1) Microprism: enables effective short distance detection. Used with laser beams.
 (2) Operating temperature between - 20 °C and + 140 °C.

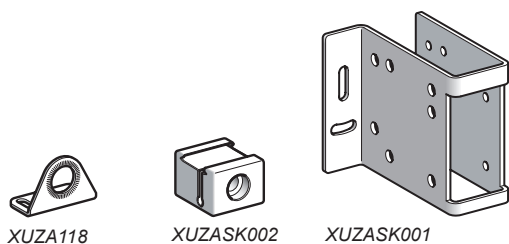
Photo-electric sensors

OsiSense XU

Accessories: sensors/reflectors table

	Blind zone	XUZC16 Ø 16	XUZC24 20x25	XUZC39 Ø 39	XUZC50 50x50	XUZC80 Ø 80	XUZC100 100x100
XUB0 	5 mm	 0.9 m	 1 m	 2.5 m	 3 m	 4 m	 4.5 m
XUB1 	10 mm	1 m	2 m	3 m	4 m	5 m	5 m
XUB9 	10 mm	0.6 m	0.6 m	1.4 m	2 m	4 m	4 m
XUM0 	10 mm	0.9 m	1.4 m	2 m	3 m	4 m	4.5 m
XUM9 	10 mm	1.5 m	2.5 m	3.2 m	5 m	6.5 m	6.5 m
XUK0 	4 cm	1 m	1 m	2.6 m	4 m	5.5 m	6.5 m
XUK1 	5 cm	2.5 m	4 m	7.5 m	7 m	14 m	16 m
XUK9 	5 cm	1.2 m	2 m	3.7 m	6 m	7.5 m	10 m
XUX0 	10 cm	3.5 m	5 m	8 m	15 m	21 m	22 m
XUX1 	10 cm	5.5 m	5.5 m	10 m	14 m	17.5 m	21 m
XUX9 	10 cm	4.5 m	4.5 m	8 m	11 m	13.5 m	17 m
		XUZCR0402CR Ecolab 16x40 	XUZC50CR Ecolab 50x50 	XUZC50 Ecolab 50x50 	XUZCR0401CRHP Ecolab Laser 16x40 	XUZCB501HP Tape Laser 50x50 	XUZC50HP Laser 50x70 
XU9N18 	0.7 m	1 m	2 m	–	–	–	–
XUK9L 	–	–	–	1.8 m	6 m	12 m	–
XUBTA 	–	–	–	0.35 m	0.7 m	1.4 m	–

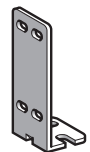
 Nominal standard value given in catalogue.



XUZA118

XUZASK002

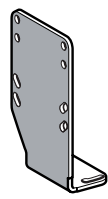
XUZASK001



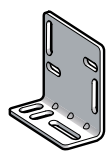
XUZA50



XUZA51



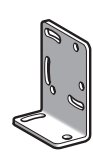
XUZASK003



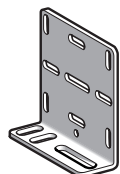
XUZX2000



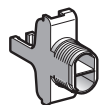
XULZ41



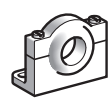
XUZA41



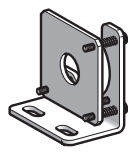
XUZA49



XUZASM001



XUZA218



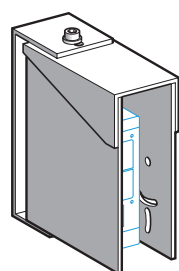
XUZA318



XSAZ108



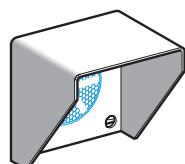
XSZB108



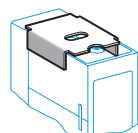
XUZA25



XUZA218



XUZA15



XUJZ01

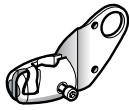
Fixing accessories

Description	For use with sensors	Reference	Weight kg
Stainless steel grade 304 fixing brackets	XUB (Ø 18)	XUZA118	0.045
	XUK●L and XUK●S	XUZASK001	0.130
Stainless steel grade 316 fixing brackets	XUB (Ø 18)	XUZASB001	0.018
	XUK●L and XUK●S	XUZA51S	0.050
Aluminium dovetail	XUK●L and XUK●S	XUZASK002	0.030
Metal fixing brackets	XUM	XUZA50	0.025
	XUK (except XUK●L and XUK●S)	XUZA51	0.050
		XUZASK003 (1)	0.060
	XUX	XUZX2000	0.065
	XUL	XULZ41	0.050
	XUJ	XUZA41	0.050
	XUJB	XUZA49	0.120
Plastic fixing bracket	XUM (except XUM0)	XUZASM001	0.010
Plastic fixing bracket with adjustable ball-joint	XU● (Ø 18 mm)	XUZA218	0.035
Precision fixing bracket with micrometric adjustment	XU● (Ø 18 mm) with laser transmission	XUZA318	0.170
Plastic fixing clamps with locking screw	XUA (Ø 8 mm)	XSAZ108	0.007
		XSZB108	0.006
	XU● (Ø 18 mm) With indexing pin	XSAZ118	0.020
	With position reference	XSZB118	0.010
	With 24.1 mm centres	XUZB2005	0.007
Set of 2 plastic nuts	XU● (Ø 18 mm)	XSZE218	0.004
Set of 2 metal nuts	XU● (Ø 18 mm)	XSZE118	0.015
Set of 2 stainless steel nuts	XU● (Ø 18 mm)	XSZE318	0.015

Protective covers

Description	For use with	Reference	Weight kg
Protective cover	XUK and XUJ sensors	XUZA25	0.920
Potentiometer protective covers	XUZC80 or XUZC24 reflectors	XUZA15	0.270
	XUJ sensors	XUJZ01	0.015

(1) Bracket XUZASK003 can be used to replace an XUL sensor with an XUK sensor.



XUZH2003



XUZH2003



XUZH2003



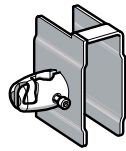
XUZH2003



XUZH2004



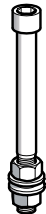
XUZH2004



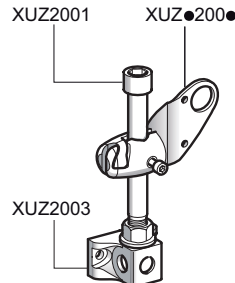
XUZH2004



XUZH2003



XUZH2001



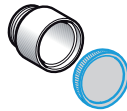
3D fixing kit example



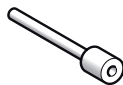
XUZH2001



XUZH201



XUZH202



XUZH08

3D fixing kit (1)

Description	For use with sensor type	Reference	Weight kg
Ball-joint mounted fixing bracket for mounting on M12 rod	XUB or XUZH50	XUZH2003	0.170
	XUM 0 or XUZH50	XUZH2003	0.140
	XUK or XUZH50	XUZH2003	0.170
	XUX or XUZH50	XUZH2003	0.220
Ball-joint mounted fixing bracket with protective cover for mounting on M12 rod	XUM0	XUZH2004	0.155
	XUK	XUZH2004	0.270
	XUX	XUZH2004	0.420
Support for M12 rod	–	XUZH2003	0.150
M12 rod (adjustment possible over complete height)	–	XUZH2001	0.050

(1) To obtain a 3D fixing kit, order:

- rod support XUZH2003

- M12 rod XUZH2001

- ball-joint mounted fixing bracket XUZH●200●

Cabling accessories

Description	Reference	Weight kg
Adaptor, ISO 16 - 1/2" NPT	XUZH2001	0.050
Adaptor, ISO 16 - ISO 20	XUZH2002	0.050

Lenses

Description	For use with	Reference	Weight kg
Lens for spot enlargement	XUR sensors	XURZ01	0.010
Lens for spot reduction	XUR sensors	XURZ02	0.015

Spare parts

Description	For use with	Sold in lots of	Unit reference	Weight kg
Plastic end adaptor for connecting Ø 1 mm optical fibres	Amplifiers XUDA	2	XUFZ08	0.002

Protection fuses

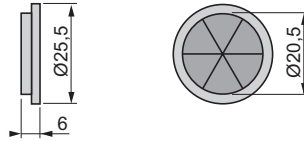
Description	For use with	Sold in lots of	Unit reference	Weight kg
Cartridge fuse 5 x 20 0.4 A "quick-blow"	Sensors without short-circuit protection	10	XUZE04	0.001
Fuse terminal block	Cartridge fuses XUZE0●	50	AB1FU10135U	0.040

Rigid circular reflectors

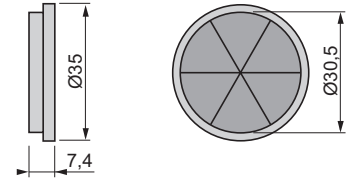
XUZC16



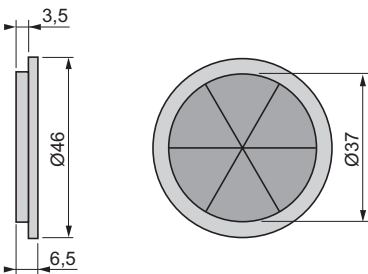
XUZC21



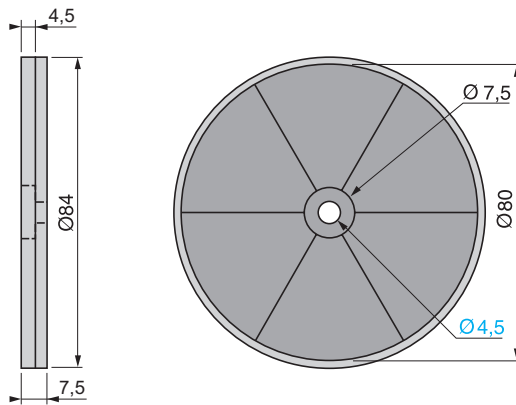
XUZC31



XUZC39

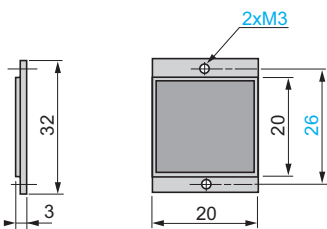


XUZC80

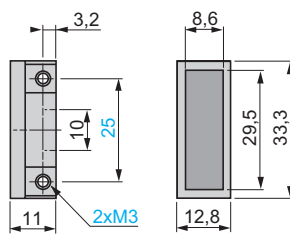


Rigid square reflectors

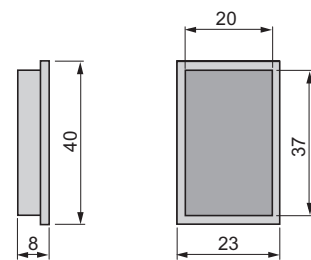
XUZCR0201CR



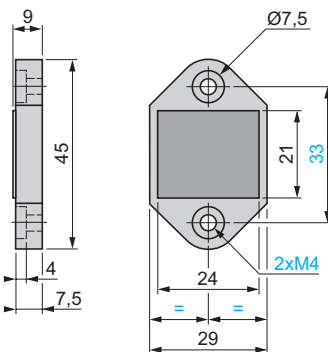
XUZC08



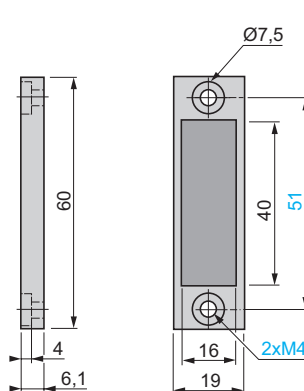
XUZC40S22



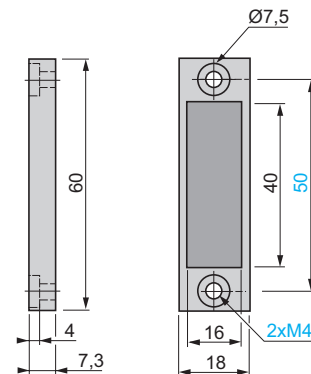
XUZC24



XUZCR0401●●●●

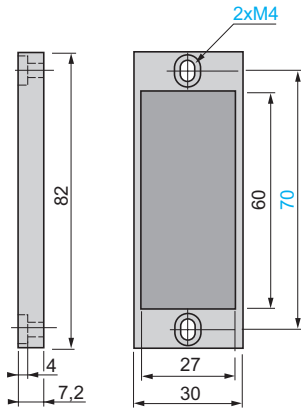


XUZCR0402●●

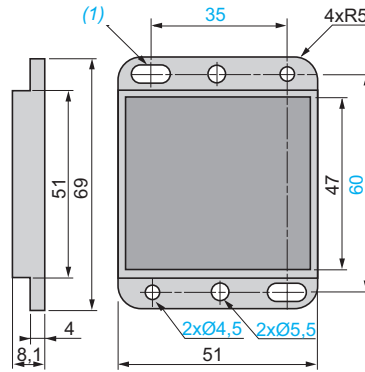


5

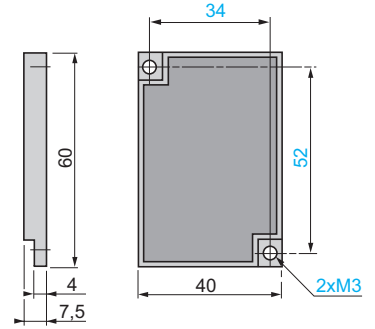
XUZC30



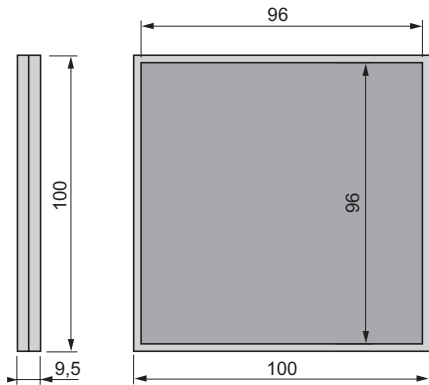
XUZC50, XUZC50●●



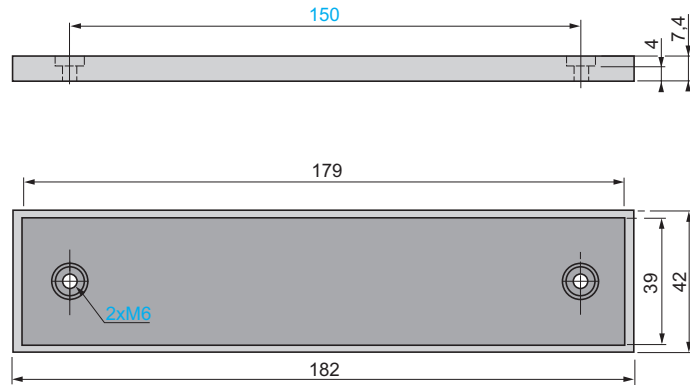
XUZC60S11



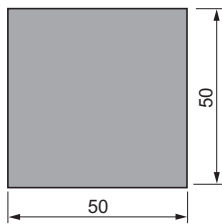
XUZC100



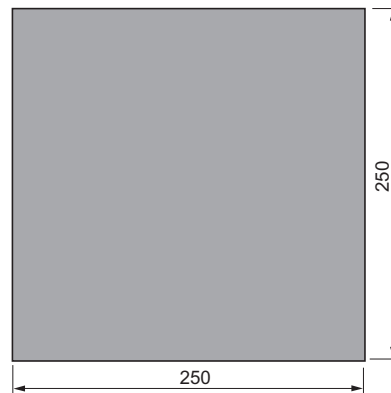
XUZC180S21



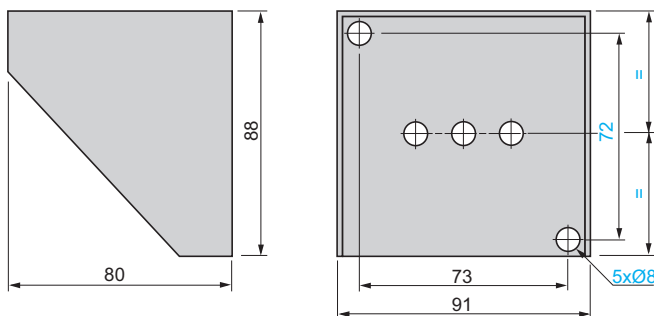
XUZCB0501HP



XUZC250

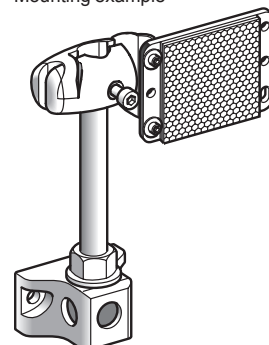


XUZD15



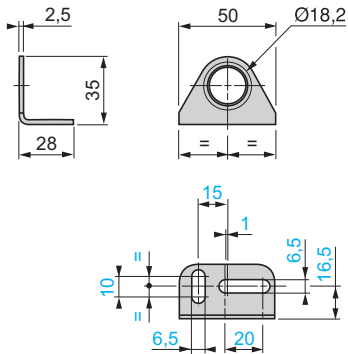
XUZM2003 + XUZ2001 + XUZ2003 + XUZC50

Mounting example



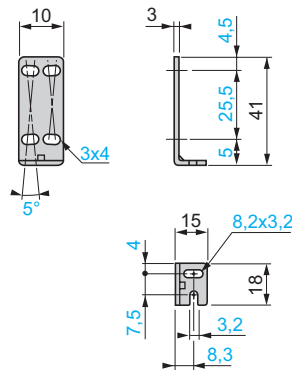
XUZA118

Fixing bracket for XUB

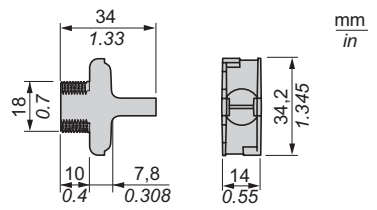


XUZA50

Fixing bracket for XUM (1)

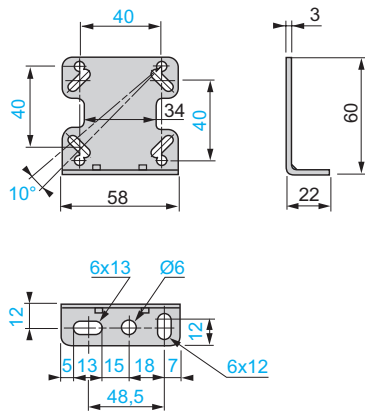


XUZASM001

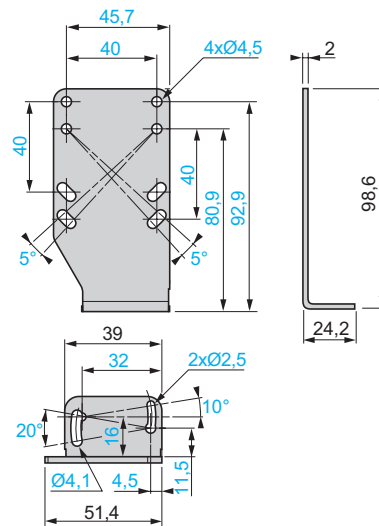


XUZA51

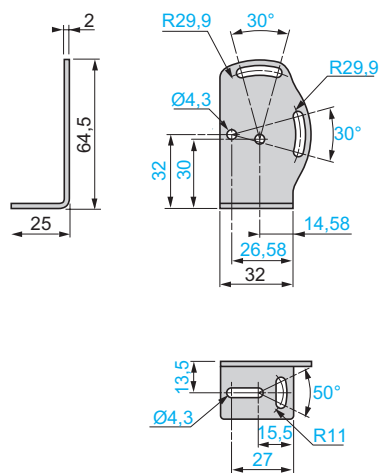
Fixing bracket for XUK (1)



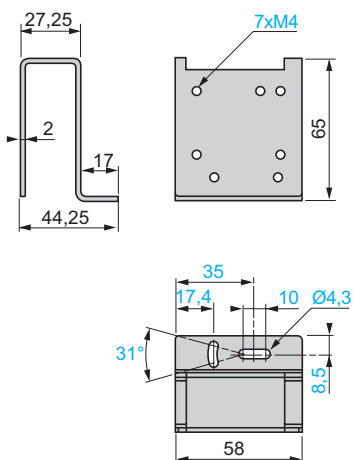
XUZASK003



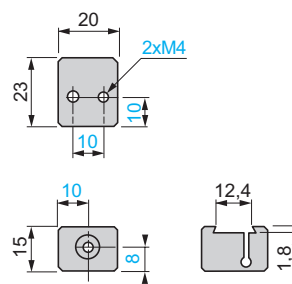
XUZA51S



XUZASK001

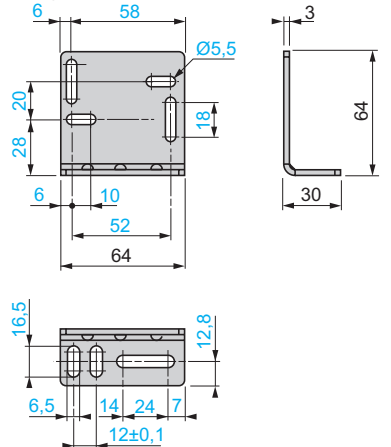


XUZASK002



XUX2000

Fixing bracket for XUX (1)

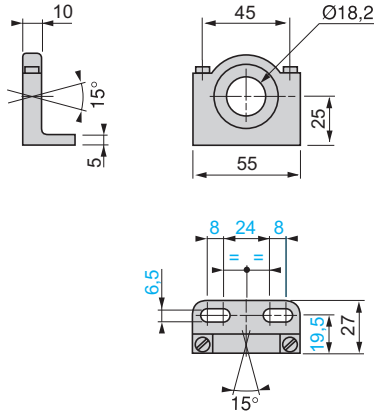


(1) Accessory fixing screws included.

5

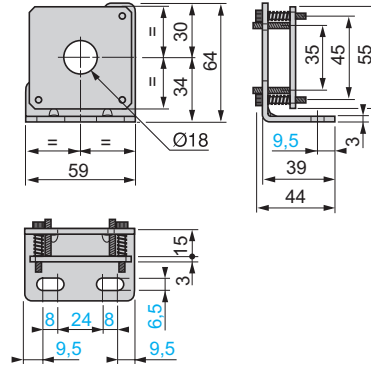
XUZA218

Fixing bracket with adjustable ball-joint for XU● (Ø 18)

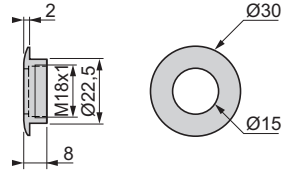


XUZA318

Fixing bracket with micrometric adjustment for XU2 (Ø 18) with laser transmission

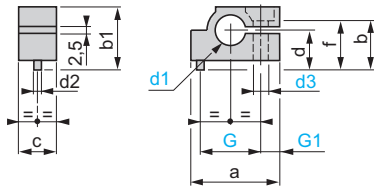


XUZASB001



XSAZ1●●

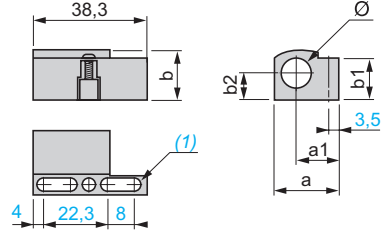
Fixing clamps for XUA, XU● (Ø 18), XUF



XSA	a	b	b1	c	d	Ød1	Ød2	Ød3	f	G	G1
Z108	23.5	14.2	16.7	10	8	8.1	2	4	10.5	16	5
Z118	41	30	33	17	18	18.1	3.9	6	24	30	7
Z145	23.5	14.2	16.7	10	8	4.7	2	4	10.5	16	5
Z155	23.5	14.2	16.7	10	8	5.7	2	4	10.5	16	5
Z185	23.5	14.2	16.7	10	8	8.6	2	4	10.5	16	5

XSZB108, XSZB118

Fixing clamps for XUA and XU● (Ø 18)

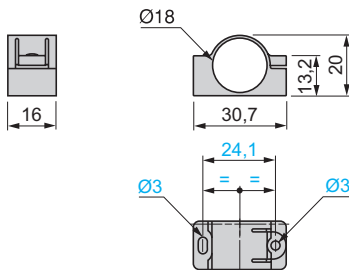


XCZ	a	a1	b	b1	b2	Ø
B108	21.1	14.5	14.2	12.8	7.5	8
B118	26	15.7	22.3	20.1	11.5	18

(1) 2 elongated holes Ø 4 x 8

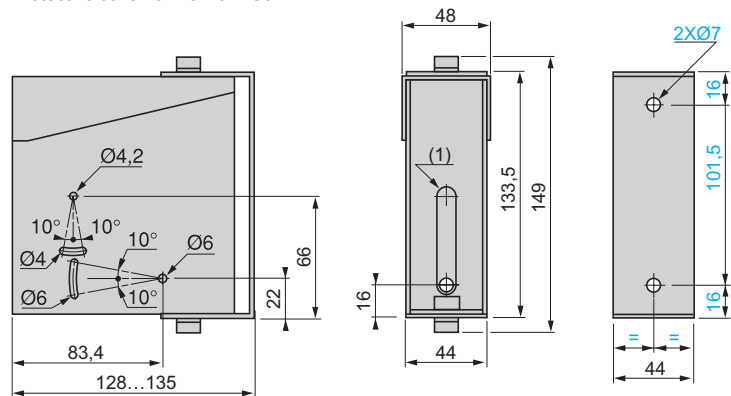
XUZB2005

Fixing clamps with 24.1 mm centres for XU● (Ø 18)



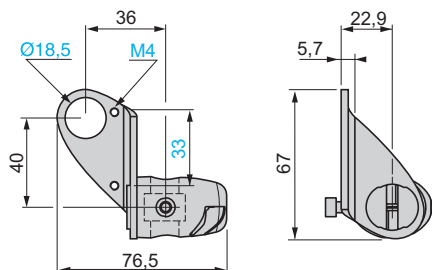
XUZD25

Protective cover for XUX or XUJ



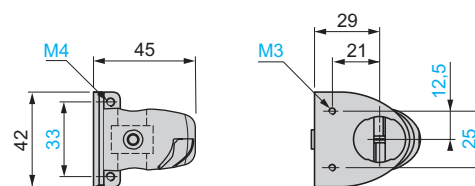
XUZB2003

Ball-joint mounted fixing bracket for XUB or XUJ50



XUZM2003

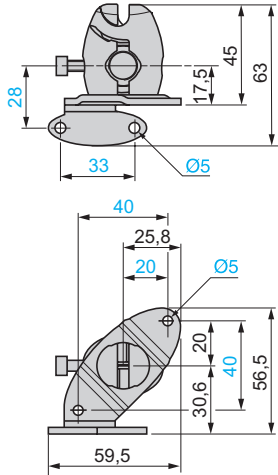
Ball-joint mounted fixing bracket for XUM (1) or XUJ50



(1) Accessory fixing screws included.

XUZK2003

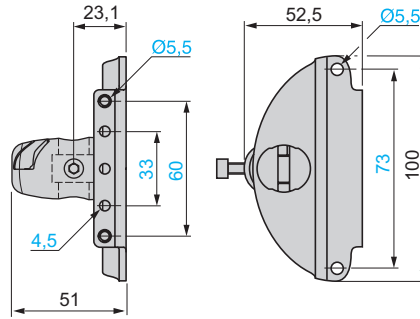
Ball-joint mounted fixing bracket for XUK (1) or XUZC50



(1) Accessory fixing screws included.

XUZX2003

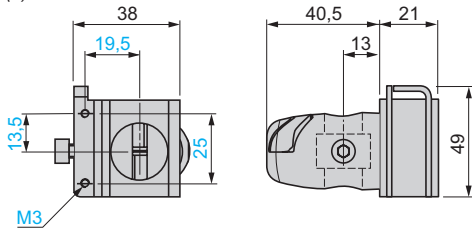
Ball-joint mounted fixing bracket for XUX (1) or XUZC50



(1) Accessory fixing screws included.

XUZM2004

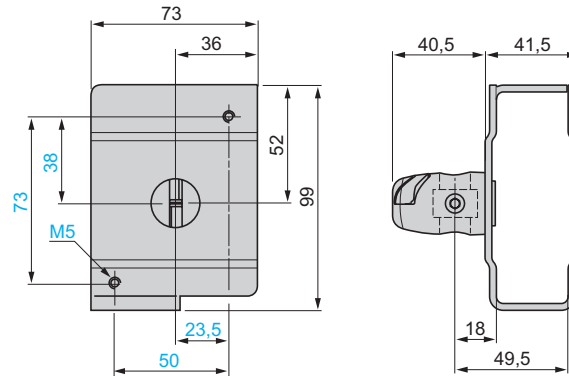
Ball-joint mounted fixing bracket with protective cover for XUM (1)



(1) Accessory fixing screws included.

XUZX2004

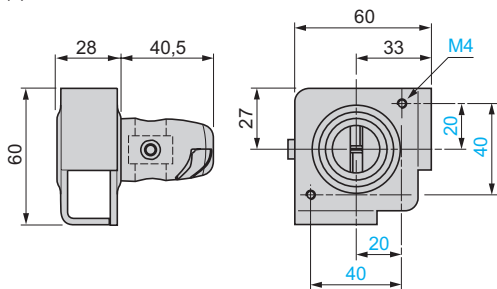
Ball-joint mounted fixing bracket with protective cover for XUX (1)



(1) Accessory fixing screws included.

XUZK2004

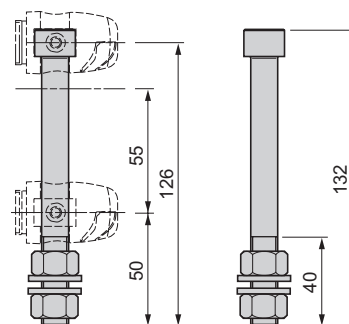
Ball-joint mounted fixing bracket with protective cover for XUK (1)



(1) Accessory fixing screws included.

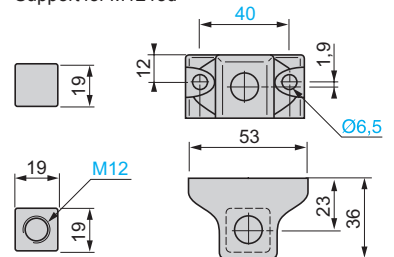
XUZ2001

M12 rod

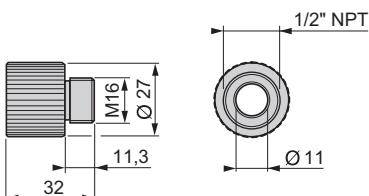


XUZ2003

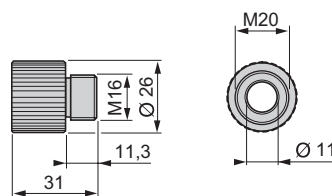
Support for M12 rod



XUZX2001

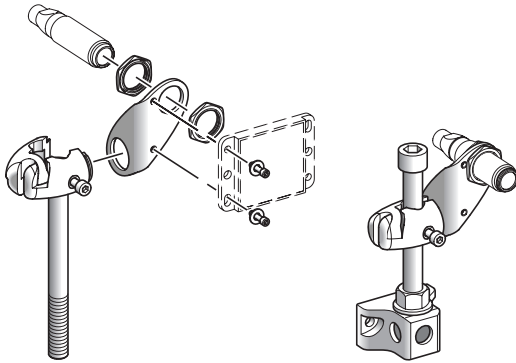


XUZX2002



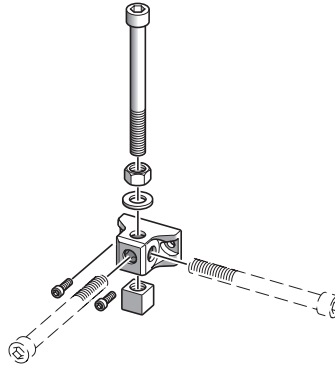
XUZB2003 + XUZ2001 + XUZ2003

3D fixing kit for XUB or XUZC50



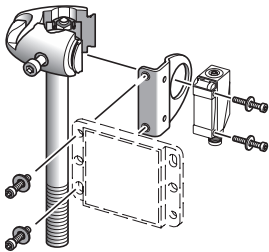
XUZ2001 + XUZ2003

M12 rod + rod support



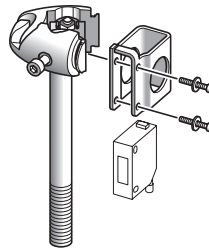
XUZM2003 + XUZ2001

3D fixing kit for XUM or XUZC50



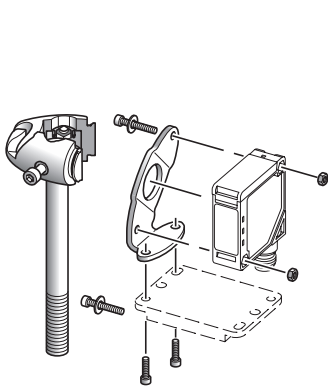
XUZM2004 + XUZ2001

3D fixing kit with protective cover for XUM



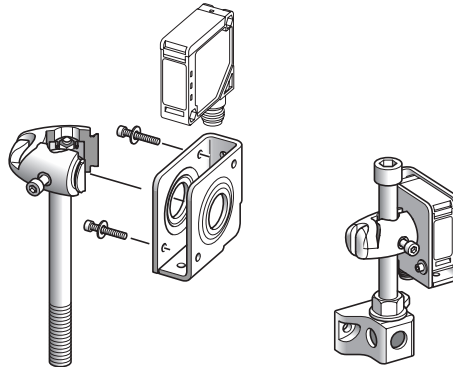
XUZK2003 + XUZ2001

3D fixing kit for XUK or XUZC50



XUZK2004 + XUZ2001 + XUZ2003

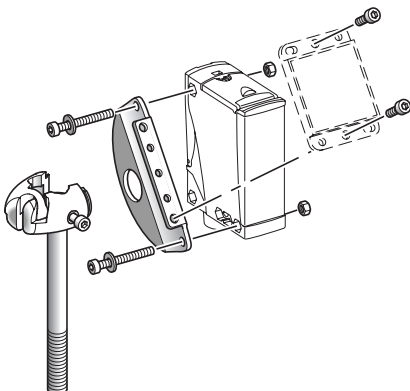
3D fixing kit with protective cover for XUK



Mounting example

XUZX2003 + XUZ2001

3D fixing kit for XUX or XUZC50



XUZX2004 + XUZ2001

3D fixing kit with protective cover for XUX

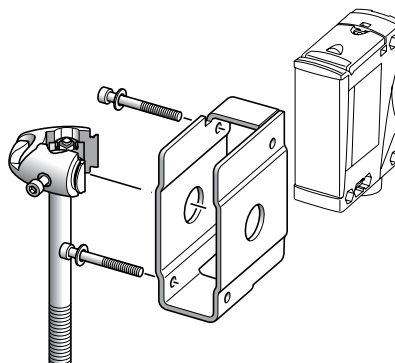


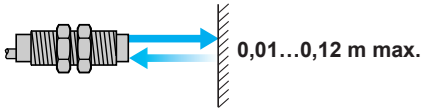
Photo-electric sensors

OsiSense XU, general purpose

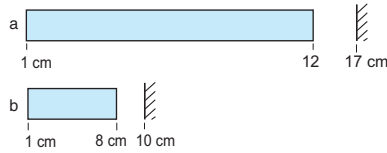
XUB0 Multimode function with line of sight along case axis

Sensing distance and operating margin

Background suppression mode

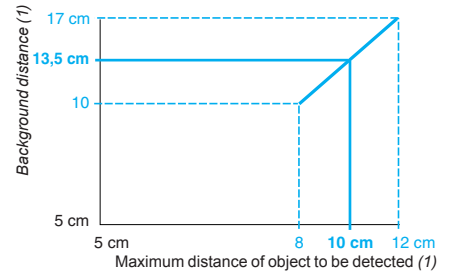


Without accessory



Background

a: with background teaching at maximum recommended distance.
b: with background teaching at minimum recommended distance.



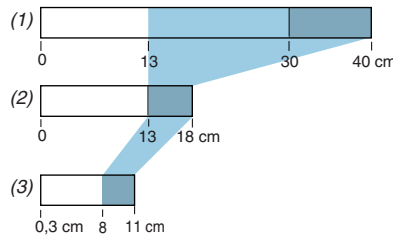
Example: teaching against a background located at 13.5 cm enables detection of an object at 1 to 10 cm.

(1) From white 90% to black 6%.

Diffuse mode



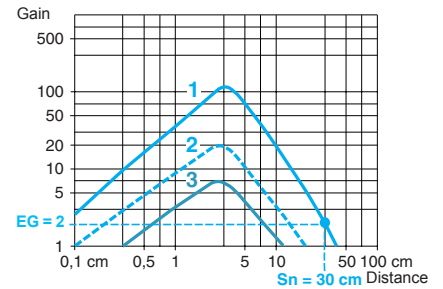
Without accessory



(1) White 90%. (2) Grey 18%. (3) Black 6%.

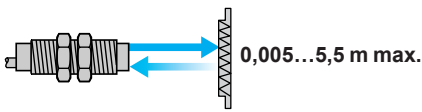
Object teaching zone

In diffuse mode, teaching of the position of the object to be detected, located between 0 and 12 cm, automatically configures the product to "background suppression" mode. This provides a constant usable sensing distance, whatever the colour of the object.

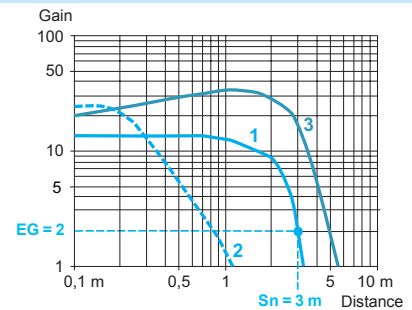
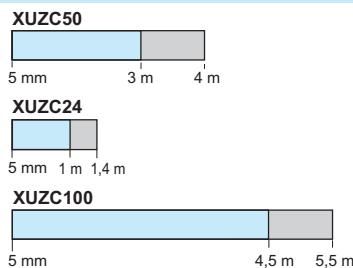


- 1 White object
- 2 Grey object
- 3 Black object

Polarised reflex mode

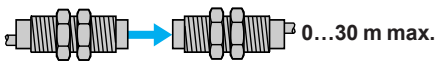


With reflector

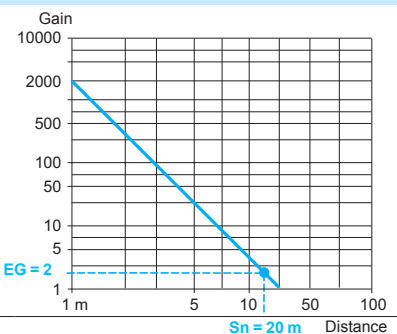


- 1 With reflector XUZC50
- 2 With reflector XUZC24
- 3 With reflector XUZC100

Thru-beam mode



With thru-beam accessory



Nominal sensing distance. $EG \geq 2$.

Maximum sensing distance. The maximum sensing distances indicated are average values.

EG: Excess gain, operating margin.

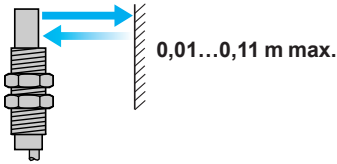
Photo-electric sensors

OsiSense XU, general purpose

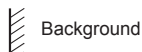
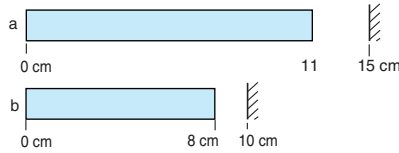
XUB0 Multimode function with line of sight 90° to case axis

Sensing distance and operating margin

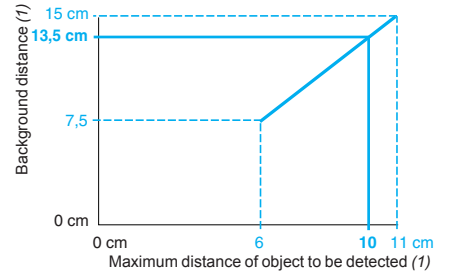
Background suppression mode



Without accessory



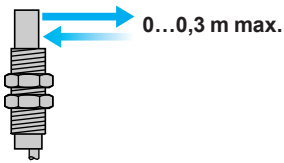
a: with background teaching at maximum recommended distance.
b: with background teaching at minimum recommended distance.



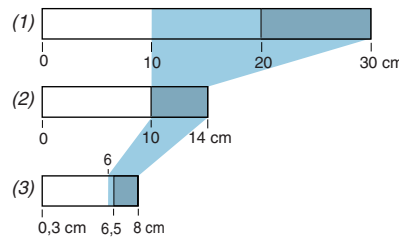
Example: teaching against a background located at 13,5 cm enables detection of an object at 0 to 10 cm.

(1) From white 90% to black 6%.

Diffuse mode

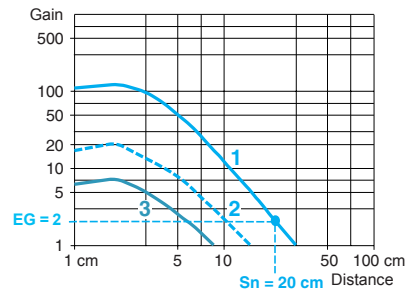


Without accessory



(1) White 90%. (2) Grey 18%. (3) Black 6%.

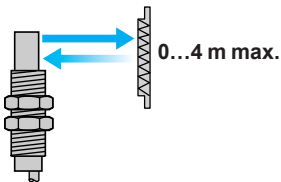
Object teaching zone



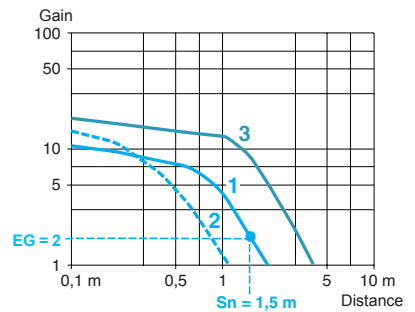
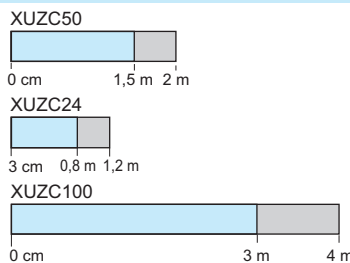
- 1 White object
- 2 Grey object
- 3 Black object

In diffuse mode, teaching of the position of the object to be detected, located between 0 and 11 cm, automatically configures the product to "background suppression" mode. This provides a constant usable sensing distance, whatever the colour of the object.

Polarised reflex mode

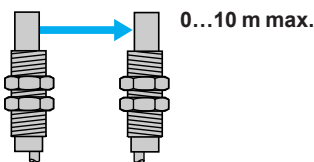


With reflector

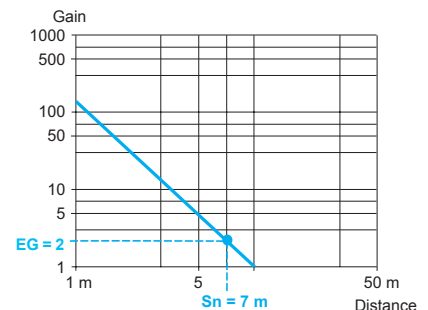


- 1 With reflector XUZC50
- 2 With reflector XUZC24
- 3 With reflector XUZC100

Thru-beam mode



With thru-beam accessory



Nominal sensing distance. EG ≥ 2.

Maximum sensing distance. The maximum sensing distances indicated are average values.

EG: Excess gain, operating margin.

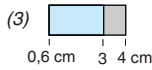
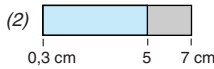
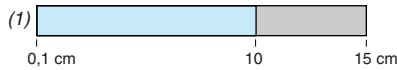
Photo-electric sensors

OsiSense XU, general purpose, single mode function

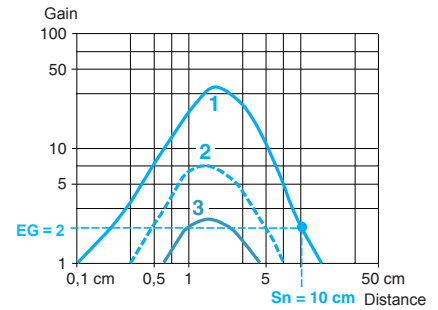
XUB●●●●● with line of sight along or at 90° to case axis

Sensing distance and operating margin

Diffuse sensor XUB4●●●●● with line of sight along case axis

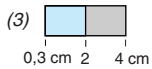
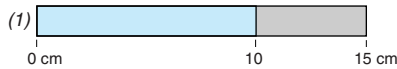


(1) White 90%. (2) Grey 18%. (3) Black 6%.

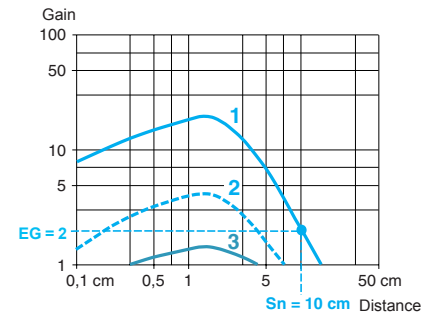


1 White object
2 Grey object
3 Black object

Diffuse sensor XUB4●●●●● with line of sight 90° to case axis

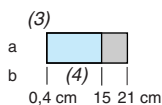
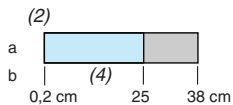
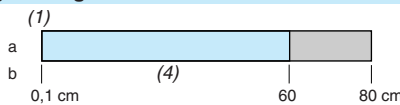


(1) White 90%. (2) Grey 18%. (3) Black 6%.

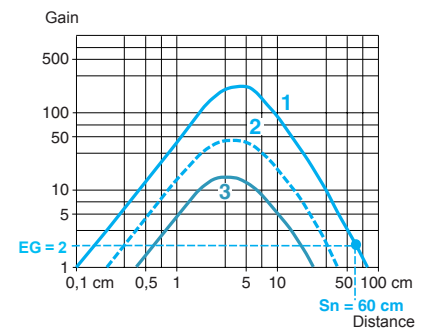


1 White object
2 Grey object
3 Black object

Diffuse sensor XUB5●●●●● with line of sight along or at 90° to case axis



(1) White 90%. (2) Grey 18%. (3) Black 6%.
(4) No detection.



1 White object
2 Grey object
3 Black object

Nominal sensing distance. $EG \geq 2$.

Maximum sensing distance. The maximum sensing distances indicated are average values.

EG: Excess gain, operating margin.

a: Potentiometer set at maximum.

b: Potentiometer set at minimum.

5

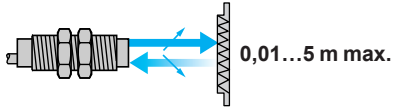
Photo-electric sensors

OsiSense XU, general purpose, single mode function

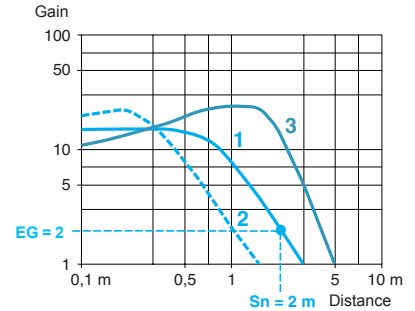
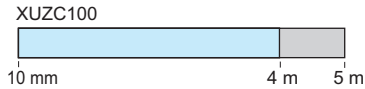
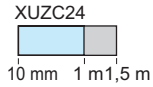
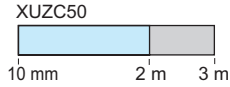
XUB●●●●● with line of sight along or at 90° to case axis

Sensing distance and operating margin

Polarised reflex sensor XUB9●●●●● with line of sight along or at 90° to case axis

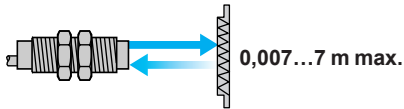


With reflector

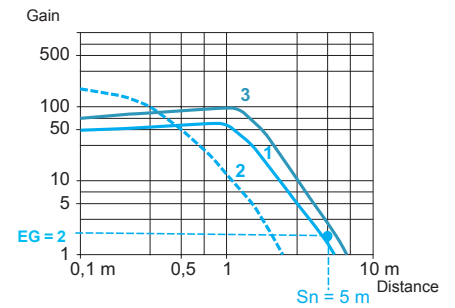
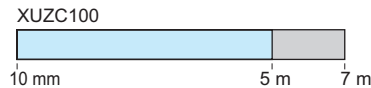
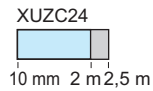
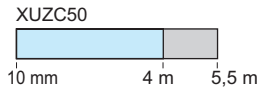


- 1 With reflector XUZ C50
- 2 With reflector XUZ C24
- 3 With reflector XUZ C100

Reflex sensor XUB1●●●●● with line of sight along or at 90° to case axis

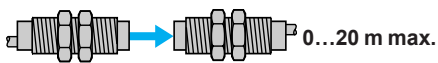


With reflector

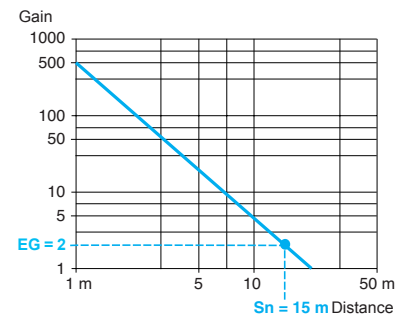


- 1 With reflector XUZC50
- 2 With reflector XUZC24
- 3 With reflector XUZC100

Thru-beam sensor XUB2●●●●● with line of sight along or at 90° to case axis



With thru-beam accessory



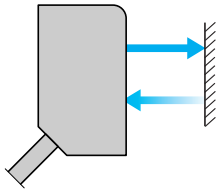
Nominal sensing distance. $EG \geq 2$.

Maximum sensing distance. The maximum sensing distances indicated are average values.

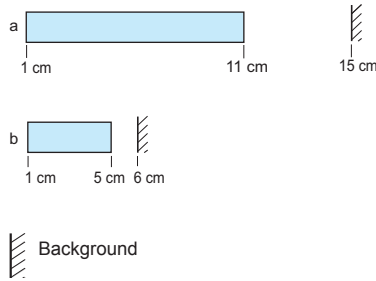
EG: Excess gain, operating margin.

Sensing distance and operating margin

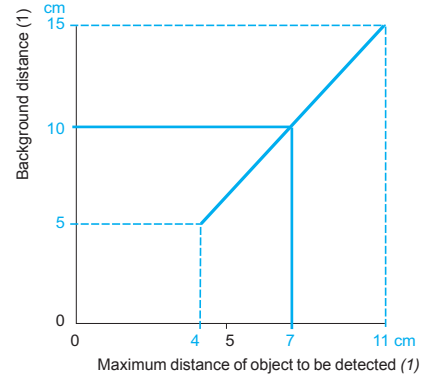
Background suppression mode



0...0,11 m max.



Without accessory

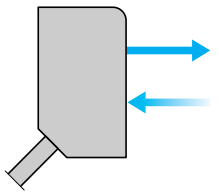


a: with background teaching at maximum recommended distance.
 b: with background teaching at minimum recommended distance.

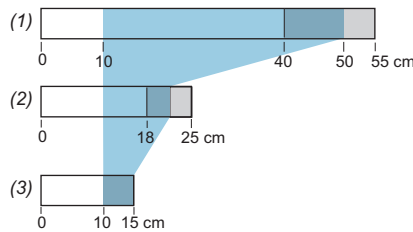
Example: teaching against a background located at 10 cm enables detection of an object at 1 to 7 cm.

(1) From white 90% to black 6%.

Diffuse mode



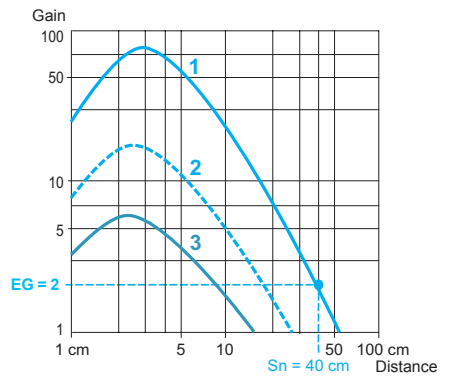
0...0,55 m max.



Without accessory

(1) White 90%. (2) Grey 18%. (3) Black 6%.

Object teaching zone



- 1 White object
- 2 Grey object
- 3 Black object

In diffuse mode, teaching of the position of the object to be detected, located between 0 and 10 cm, automatically configures the product to "background suppression" mode. This provides a constant usable sensing distance, whatever the colour of the object.

Nominal sensing distance. $EG \geq 2$.

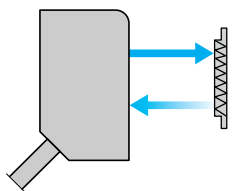
Maximum sensing distance. The maximum sensing distances indicated are average values.

EG: Excess gain, operating margin.

5

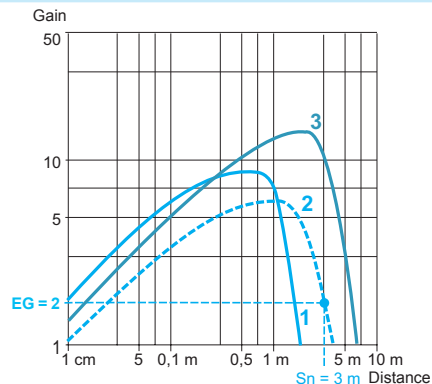
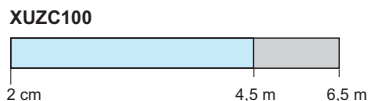
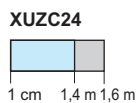
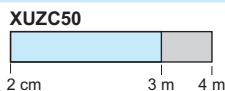
Sensing distance and operating margin (continued)

Polarised reflex mode



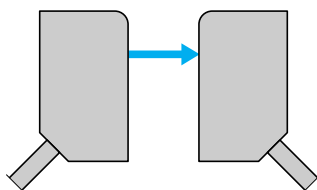
0,01...6,5 m max.

With reflector



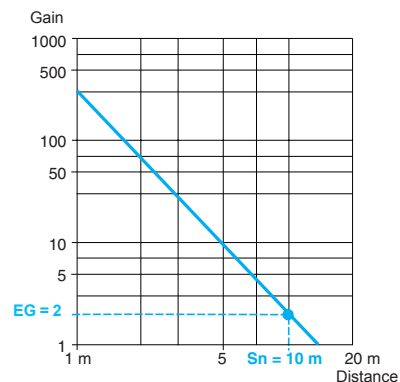
- 1 With reflector XUZC50
- 2 With reflector XUZC24
- 3 With reflector XUZC100

Thru-beam mode



0...14 m max.

With thru-beam accessory



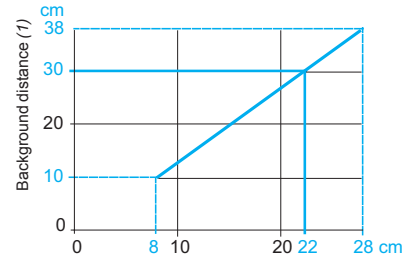
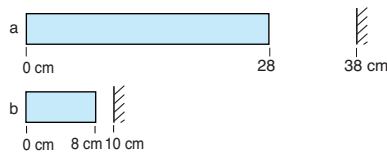
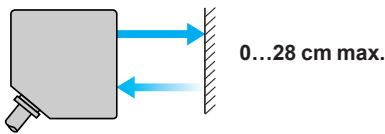
Nominal sensing distance. $EG \geq 2$.

Maximum sensing distance. The maximum sensing distances indicated are average values.

EG: Excess gain, operating margin.

Sensing distance and operating margin

Background suppression mode



Maximum distance of object to be detected (1)

Example: teaching against a background located at 30 cm enables detection of an object at 0 to 22 cm.

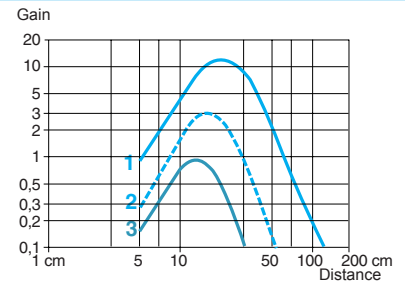
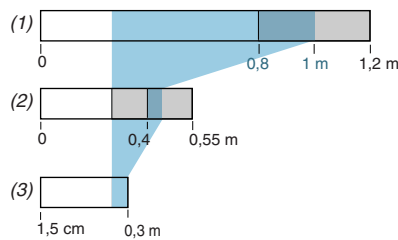
(1) From white 90% to black 6%.

Without accessory

Background

a: with background teaching at maximum recommended distance.
b: with background teaching at minimum recommended distance.

Diffuse mode



(1) White 90%. (2) Grey 18%. (3) Black 6%.

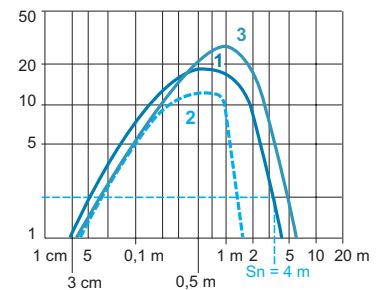
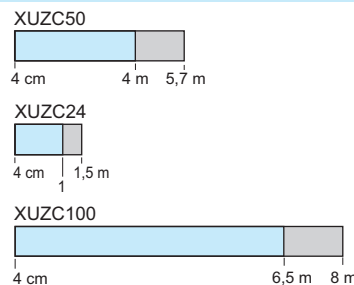
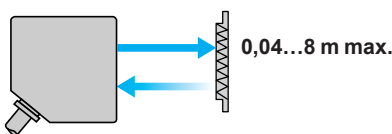
Object teaching zone

- 1 White object
- 2 Grey object
- 3 Black object

In diffuse mode, teaching of the position of the object to be detected, located between 0 and 0.3 m, automatically configures the product to "background suppression" mode. This provides a constant usable sensing distance, whatever the colour of the object.

Without accessory

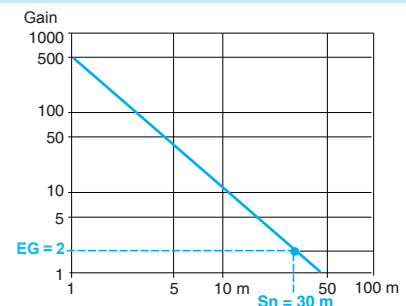
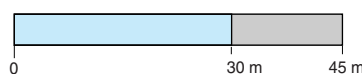
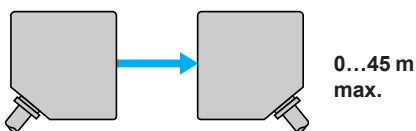
Polarised reflex mode



- 1 With reflector XUZC50
- 2 With reflector XUZC24
- 3 With reflector XUZC100

With reflector

Thru-beam mode



With thru-beam accessory

Nominal sensing distance. $EG \geq 2$.

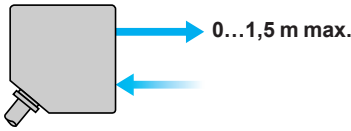
Maximum sensing distance. The maximum sensing distances indicated are average values.

EG: Excess gain, operating margin.

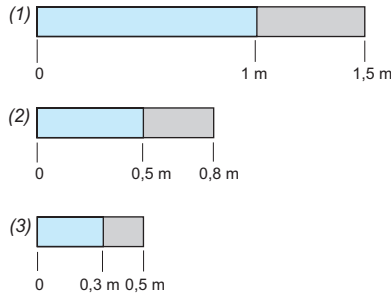
5

Sensing distance and operating margin

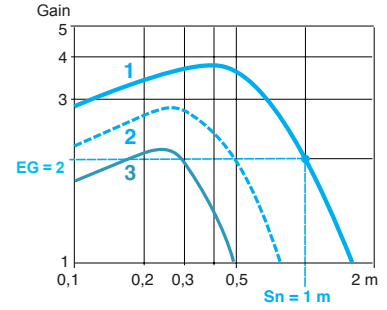
Diffuse sensor XUK5A●●●



Without accessory

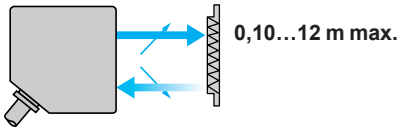


- (1) White 90%.
- (2) Grey 18%.
- (3) Black 6%.

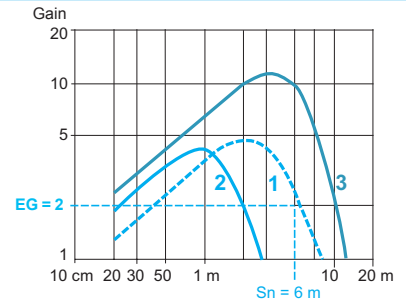
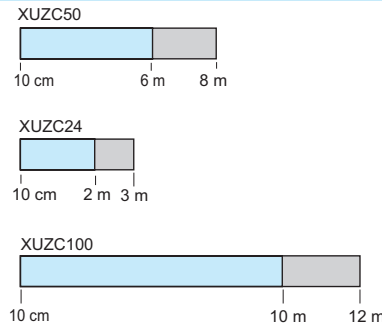


- 1 White object
- 2 Grey object
- 3 Black object

Polarised reflex sensor XUK9A●●●

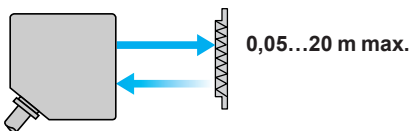


With reflector

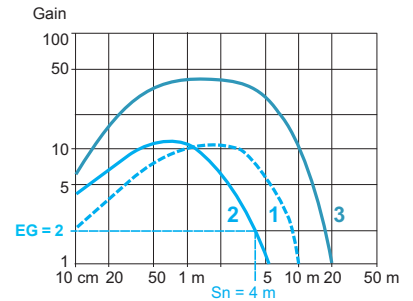
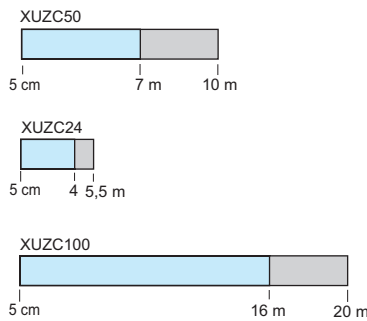


- 1 With reflector XUZC50
- 2 With reflector XUZC24
- 3 With reflector XUZC100

Reflex sensor XUK1A●●●

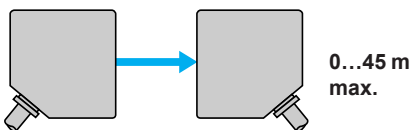


With reflector

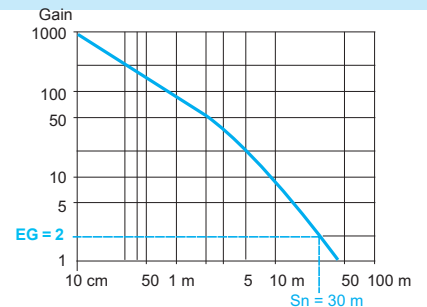


- 1 With reflector XUZC50
- 2 With reflector XUZC24
- 3 With reflector XUZC100

Thru-beam sensor XUK2A●●●



With thru-beam accessory



Light blue bar: Nominal sensing distance. $EG \geq 2$.
 Grey bar: Maximum sensing distance. The maximum sensing distances indicated are average values.

EG: Excess gain, operating margin.

Photo-electric sensors

OsiSense XU Application, material handling and hoisting series.

With 4...20 mA and 0...10 V analog output signal.
DC supply, solid-state output. "Time of flight" technology.

Product type	Laser transmission sensors. Distance measurement	Laser transmission sensors. With background suppression
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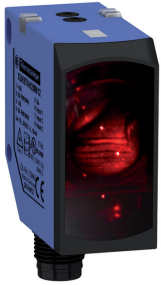
Applications	<ul style="list-style-type: none"> ■ Packaging and conveying. ■ Material handling. 	
Range	0.1... 5 m/0.33...16.40 ft	0... 5 m/0...16.40 ft
Type of light	Class 1 laser, red, 650 nm	
Resolution	< 5 mm (12-bit)	–
Repeat accuracy	< 0.3%	–
Linearity	± 30 mm	–
Differential travel	40 mm	
Materials	Front panel (screen): PMMA. Casing: PC-ABS shock-resistant. M12 connectors: metal	
Degree of protection	IP 67 and IP 69K, depending on connector	
Operating temperature	- 40... + 60°C / - 40... + 140°F (- 40... + 50°C / - 40... + 117°F for XUK8TE2MM12)	
Storage temperature	- 40... + 80°C / - 40... + 176°F	
Dimensions (without connectors)	50 x 50 x 23 mm / 1.97 x 1.97 x 0.91 in.	
Supply voltage + U _B	18...30 V ^{DC}	
No-load supply current	≤ 60 mA	
Output current I _e	≤ 100 mA	
Switching frequency f/Response time	≤ 500 Hz	
Type of outputs	1 x 4...20 mA and 0...10 V analog output + 1 auto-detect PNP switching output	1 or 2 auto-detect PNP switching outputs
Certifications	ECOLAB, CE, cULus	
References	XUK8TAE1MM12 and XUK8TAE2MM12	XUK8TAKSMM12 and XUK8TAKDMM12
Pages	5/179	5/179

5

**Laser transmission sensors.
Anti-collision mode and tandem mode**

Accessories

Brackets, clamps and connectors



■ Hoisting and mobile equipment.

0.3... 70 m/0.98...230 ft

Class 1 laser, red, 650 nm

< 17 mm (12-bit) for scaling the analog output between 1 and 70 m

<11 mm (for the discrete outputs)

± 70 mm

120 mm

Front panel (screen): PMMA. Casing: PC-ABS shock-resistant. M12 connectors: metal

IP 67 and IP 69K, depending on connector

- 30... + 50°C/- 22...+ 122°F

- 30... + 60°C/- 22...+ 140°F

50 x 50 x 23 mm/1.97 x 1.97 x 0.91 in.

18...30 V $\overline{\text{--}}$

≤ 60 mA

100 mA

10 ms

1 x 4...20 mA analog output + 2 PNP or NPN switching outputs

CE, cULus

Brackets and clamps for fixing sensors.

Connectors for connecting sensors.

XUK9TAH2MM12

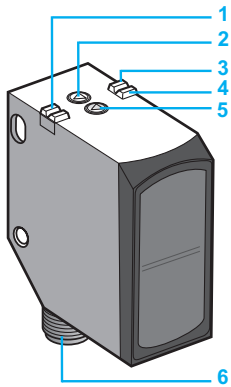
**XUZAS●●●,
XUZCPV11V12●●● and XUZCPV12V12●●●**

5/181

5/179 and 5/181



Class 1 laser
conforming to IEC 60825-1
Visible laser radiation:
do not stare into beam

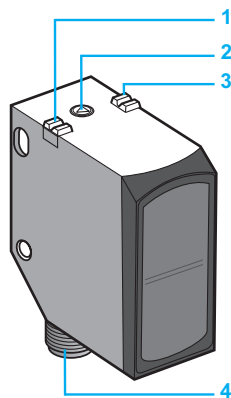


XUK8TAE1MM12 and XUK8TAE2MM12:

- 1 Yellow LED: switching output Q indicator
- 2 Push button (teach-in) Q: switching output
- 3 Yellow LED: switching output QA indicator
- 4 Green LED: operating voltage indicator
- 5 Push button (teach-in) QA: analog output
- 6 M12 connector

XUK8TAKDMM12:

- 1 Yellow LED: switching output Q1 indicator
- 2 Push button (teach-in) Q1: switching output
- 3 Yellow LED: switching output Q2 indicator
- 4 Green LED: operating voltage indicator
- 5 Push button (teach-in) Q2: switching output
- 6 M12 connector



XUK8TAKSMM12:

- 1 Yellow LED: switching output Q indicator
- 2 Push button (teach-in) Q: switching output
- 3 Green LED: operating voltage indicator
- 4 M12 connector

Presentation

OsiSense XUK8T products are distance measurement sensors operating according to the Time of Flight (TOF) principle: light measured by time of flight.

These sensors are dedicated to tasks involving the measurement and control of objects with a variety of surfaces, over long distances. They provide reliable and accurate distance measurement, even with tilted, clear, reflective or luminous objects.

Thanks to the various output configurations, XUK8T sensors offer excellent flexibility in order to meet the highest number of requirements:

- reversible analog outputs, 4...20 mA or 0...10 V
- one or two switching outputs, 24 VDC, PNP/NPN type (1)

XUK8T sensor setting is simplified by three teach modes:

- background
- fixed object
- scrolling objects

The sensors can also be set by the external input: teach-in mode.

The visible laser radiation (class 1 laser) makes it easier to align and contributes to operator safety. With compact dimensions (50 x 50 x 23 mm), available in degrees of protection IP 67 and IP 69K, XUK8T sensors can easily be integrated to detect a variety of materials and surfaces:

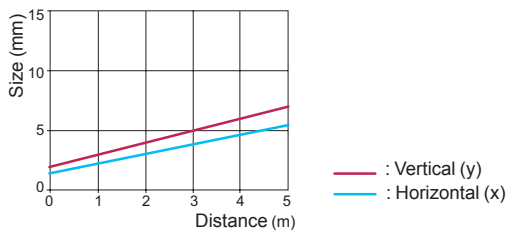
- metal
- plastic and rubber
- wood
- non-transparent liquids

They are therefore suitable for a number of sectors:

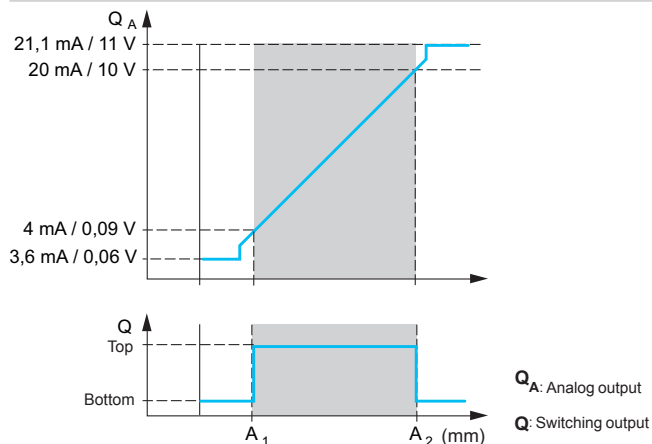
- the timber industry, sawmills, furniture making
- the automotive industry, assembly, detection of dark objects
- conveying and material handling
- the metallurgy industry, etc.

Curves

Size of light spot (typical)



Characteristic output curve



(1) For detailed characteristics, please visit our website www.tesensors.com.

5

Photo-electric sensors

OsiSense XU Application, material handling series
 “Time of flight” technology.

Distance measurement. Background suppression.



XUK8TAE1MM12



XUK8TAE2MM12



XUK8TAKSMM12



XUK8TAKDMM12



XUZASK004



XUZASW001



XUZASK001



XUZASW002



XUZA51S



XZCPV11V12L



XZCPV12V12L

Distance measurement sensors

Sensing distance (Sn): 0.1...5 m (white 90%), 3 m (black 6%)

Connection method	Analog output type	Switching output type	Reference	Weight kg
M12, 5-pin connector	0...10 V	1 x auto-detect PNP/NPN	XUK8TAE1MM12	0.055
	4...20 mA	1 x auto-detect PNP/NPN	XUK8TAE2MM12	0.055

Laser transmission proximity sensors with background suppression

Sensing distance (Sn): 0...5 m (white 90%), 3 m (black 6%)

Connection method	Switching output type	Reference	Weight kg
M12, 4-pin connector	1 x auto-detect PNP/NPN	XUK8TAKSMM12	0.055
M12, 5-pin connector	2 x auto-detect PNP/NPN	XUK8TAKDMM12	0.055

Mounting accessories

Description	Reference	Weight kg
Precision bracket with precise micrometric adjustment and locking by 3 screws in order to align the beam	XUZASK004	0.240
Aluminium dovetail bracket	XUZASW001	0.014
Protective fixing bracket for the sensor 304 stainless steel, supplied with screws	XUZASK001	0.130
Fixing bracket 316 stainless steel	XUZA51S	0.050
Simple metal fixing bracket	XUZASW002	0.017

Cabling accessories

Description	Type	Cable length	Reference	Weight
		m		kg
M12 female connectors, 5-pin, PVC cable	Straight	2	XZCPV11V12L2	0.090
		5	XZCPV11V12L5	0.201
		10	XZCPV11V12L10	0.360
	Elbowed	2	XZCPV12V12L2	0.090
		5	XZCPV12V12L5	0.201
		10	XZCPV12V12L10	0.360

Photo-electric sensors

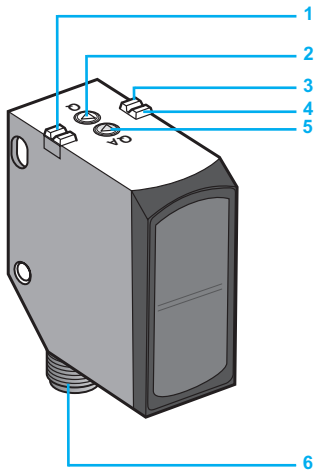
OsiSense XU Application, hoisting series

Anti-collision mode and tandem mode for overhead cranes

Presentation



Class 1 laser, conforming to IEC 60825-1
Visible laser radiation:
do not stare into beam



- 1 Yellow LED: switching output Q1 indicator.
- 2 Push button (teach-in) Q: teaches near and far distances for anti-collision mode.
- 3 Yellow LED: switching output Q2 or analog output QA indicator.
- 4 Green LED: operating voltage indicator.
- 5 Push button (teach-in) QA: teaches the analog range.
- 6 M12 connector.

The **XUK9TAH2MM12** sensor is a distance measurement sensor operating according to the Time of Flight (TOF) principle: light measured by time of flight.

It is dedicated to tasks involving measurement and control over long distances. Robust and compact, operating from -10 to +60°C, it is specifically designed for overhead cranes (1).

The visible laser radiation (class 1 laser) makes it easier to align and contributes to operator safety.

Operating from 0.3 to 70 meters with great accuracy (60 mm differential travel), the sensor is set to detect the reflector located on a fixed object or another overhead crane.

The system thus allows two operating modes:

- anti-collision mode
- tandem mode

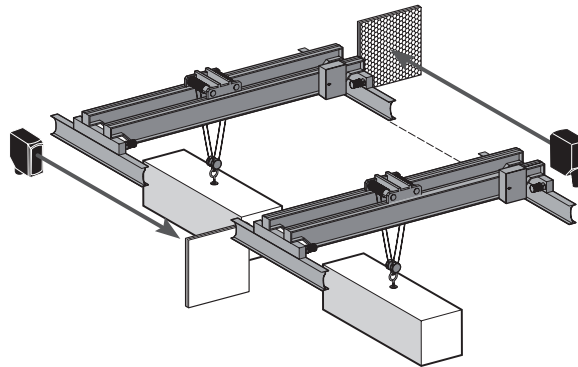
Anti-collision mode

Anti-collision mode is used to keep two overhead cranes a defined distance apart, in order to prevent equipment or loads bumping into one another.

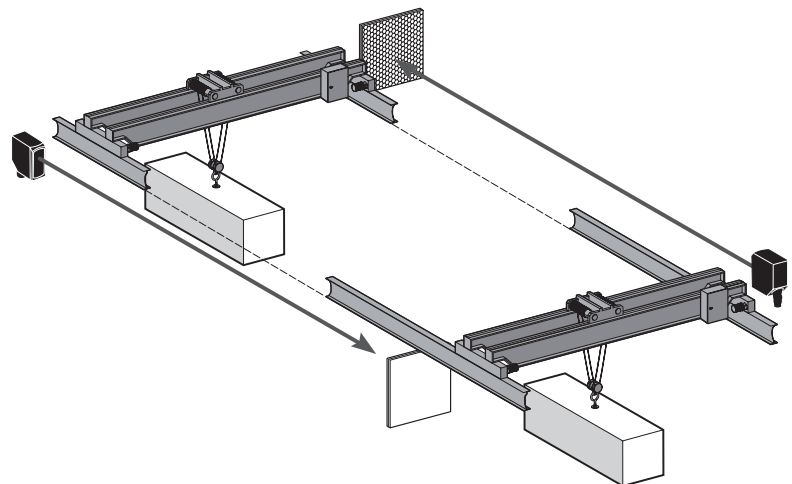
This mode can also be set by a push button on the sensor (item 2) or remotely, by the external input.

In both cases, the "near distance" and "far distance" positions (see below) are stored in the sensor. These distances can be modified by executing a new teach procedure.

Near distance



Far distance



(1) Detailed characteristics are available on our website www.tesensors.com.

Photo-electric sensors

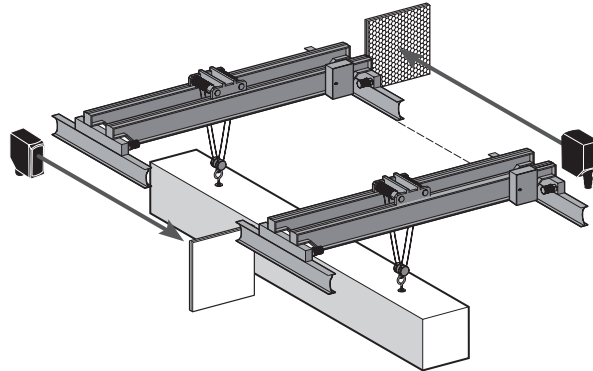
OsiSense XU Application, hoisting series

Anti-collision mode and tandem mode for overhead cranes

Presentation (continued)

Tandem mode

Tandem mode is used to split a load that cannot be supported by just one crane between two overhead cranes. When coupled together, overhead cranes can be used to transport long or heavy loads in the same bay of an industrial site. With this mode, a single operator can control two cranes simultaneously. Tandem mode is taught and activated by the external input.



The **XUK9TAH2MM12** sensor is also used for checking teaching and whether the cable has broken (1).

Sensor reference

Sensing distance (Sn): 0.3...70 m with the XUZC250 reflector

Connection method	Analog output type	Switching output type	Reference	Weight kg
M12, 8-pin connector	4...20 mA	PNP or NPN	XUK9TAH2MM12	0.055



XUK9TAH2MM12



XUASK004



XUZASW001



XUASK001



XUZASW002



XUZA51S



XZCP29P12L●

References of mounting accessories

Description	Reference	Weight kg
Precision bracket with precise micrometric adjustment and locking by 3 screws in order to align the beam	XUASK004	0.240
Aluminium dovetail bracket	XUZASW001	0.014
Protective fixing bracket for the sensor 304 stainless steel, supplied with screws	XUASK001	0.130
Fixing bracket 316 stainless steel	XUZA51S	0.050
Simple metal fixing bracket	XUZASW002	0.017
250 x 250 mm adhesive reflector	XUZC250	-

References of connection accessories

Description	Type	Cable length m	Reference	Weight kg
M12 female connectors, 8-pin, PUR cable	Straight	2	XZCP29P12L2	0.100
		5	XZCP29P12L5	0.240
		10	XZCP29P12L10	0.470

(1) The additional functions are described in the sensor instruction sheet. Please visit our website www.tesensors.com.

Photo-electric sensors

OsiSense XUW

Vision sensors for inspection of manufactured parts

Product type

Vision sensors, configurable via PC software

White light

Red light



Applications

For manufactured parts:
 quality control, presence, position, orientation, sorting, integrity
 marking checks
 guiding and gripping

Type of lighting

8 LEDs

Focal length

6 mm and 12 mm, adjustable by potentiometer

Detection distance/size of field of vision
 Focal length 6 mm
 Focal length 12 mm

Minimum distance: 6 mm for a 5 x 4 mm field of vision.
 Maximum distance: 350 mm for a 260 x 175 mm field of vision.
 Minimum distance: 30 mm for an 8 x 6 mm field of vision.
 Maximum distance: 650 mm for a 250 x 170 mm field of vision.

Resolution

WVGA: 736 x 480 pixels

Materials

Front face: PMMA. Enclosure: ABS and aluminium
 M12 connectors: metal

Degree of protection

IP 65/67, depending on connector

Operating temperature

0...50 °C

Dimensions (without connectors)

65 x 45 x 45 cm

Nominal voltage

24 V $\overline{---}$

Type of discrete I/O

4 outputs/2 inputs, PNP or NPN

Configuration software
 Number of jobs
 Parts inspection tools
 Frequency and cycle time

2 jobs, selectable by discrete input
 5 tools: pattern matching, contour, contrast, brightness and grey-scale level. These tools can be combined to obtain up to 32 check zones in a single job.
 25 images/second max. Typical cycle times: pattern matching (40 ms), contour (60 ms), contrast (4 ms), brightness (4 ms) and grey-scale level (4 ms).

Network interfaces

Ethernet IP

Certifications

CE

References

XUWSA06W and XUWSA12W

XUWSA06R and XUWSA12R

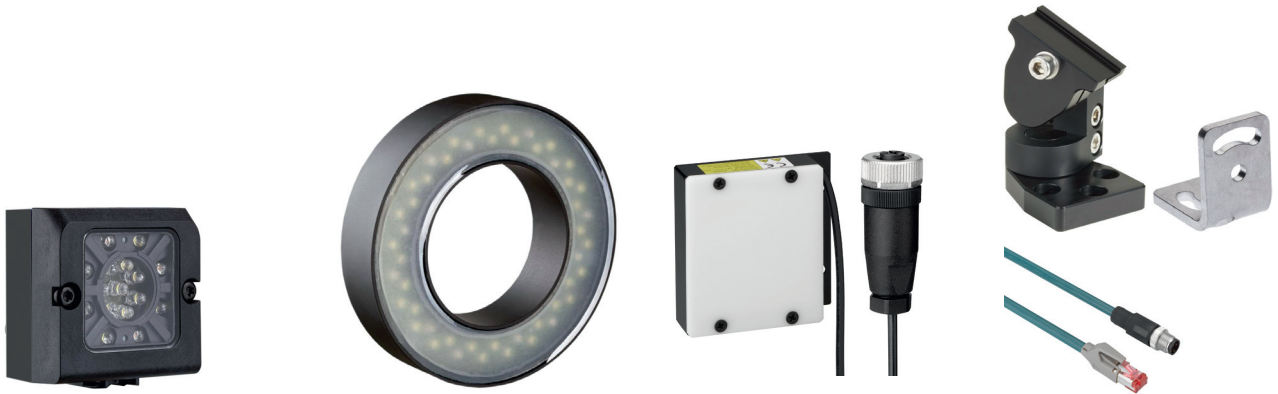
Page

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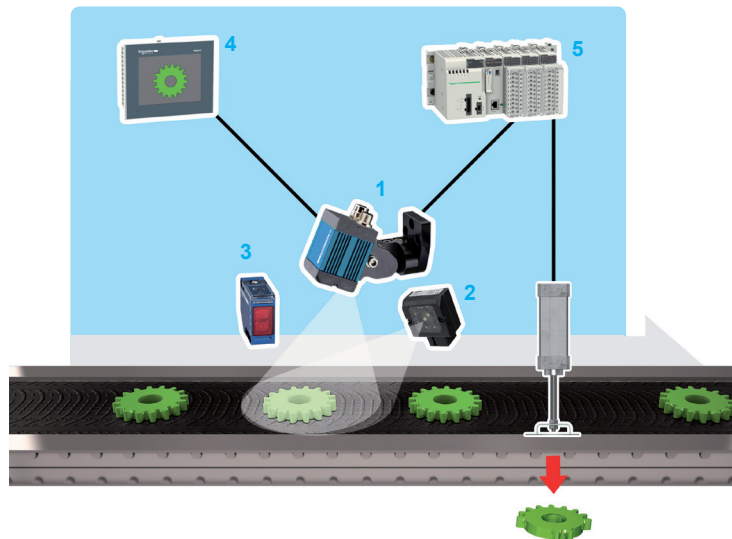
5

Additional lighting			Accessories
Direct linear lighting	Ring lighting	Back-lighting	Brackets, clamps, pre-wired connectors and jumper cables



To eliminate reflections generated by light from the sensor.	To ensure a consistent image of reflective or irregularly-shaped parts.	To highlight a silhouette and through holes, based on the shadow play principle.	Brackets and clamps for fixing and mounting sensors and lighting devices. Pre-wired connectors and jumper cables for connection of sensors and lighting devices.
LED, white or red	LED, white or red	LED, red	
-	-	-	
-	-	-	
-	-	-	
Front face: PMMA Enclosure: ABS	Front face: PMMA Enclosure: aluminium	Front face: acrylic Enclosure: aluminium	
IP 65	IP 65	IP 30	
0...50 °C	0...50 °C	0...35 °C	
45 x 45 x 24 mm	Ø 115 mm, depth 25 mm	47 x 47 x 15 mm 94 x 94 x 10 mm 133 x 133 x 10 mm	
24 V ~	24 V ~	24 V ~	
-	-	-	
-	-	-	
-	-	-	
CE	CE	CE	
XUZLW001 and XUZLR001	XUZLW002 and XUZLR002	XUZLR033, XUZLR063 and XUZLR103	XUZASW00●, XZC●B●● and XGSZ●2E45●●
5/188	5/188	5/188	5/188 and 5/189

General



- 1 : Vision sensor XUW.
- 2 : Additional lighting.
- 3 : Photo-electric sensor.
- 4 : Human/machine interface.
- 5 : Automation platform.

With high industrial production rates and a constant need to improve quality and boost profits, industrial companies are increasingly anxious to automate their production methods.

Vision sensors for the inspection of manufactured parts provide an answer to these concerns.

Vision sensors, such as OsiSense XUW, allow checking of high rate production operations and ensure good repeat accuracy of checking. These XUW sensors can also be used to manage object flows.



Vision sensor



Direct linear lighting

Types of application for manufactured parts:

- quality control
- presence
- position, orientation, sorting, integrity
- checking markings
- guiding and gripping

Operating Principle

Once the application to be created is well defined, i.e. when "good" and "bad" parts have been identified, implementation of the XUW vision sensors is simple.

The sensor is configured via the software. This software is supplied on CD-ROM and must be installed on a PC. An image of the "good" part and its acceptance tolerances are saved in the XUW sensor memory. Once the sensor has been configured, it is independent. The PC is no longer required.

Inspection results: the "good part" or "bad part" result is obtained via discrete outputs or Ethernet IP network outputs.

The inspection of parts is therefore simple to perform.



"Good" part
(marking complete)



"Bad" part
(marking incomplete)

Presentation

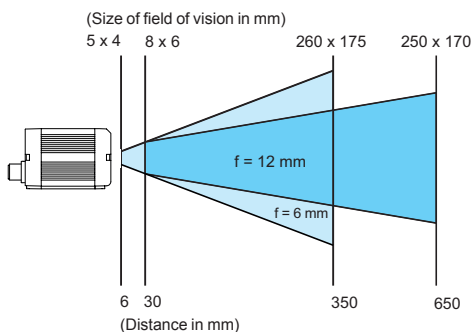
The Telemecanique Sensors "vision" offer comprises:

- 4 vision sensors
- additional lighting (if necessary, depending on the application)
- configuration software
- fixing, mounting and cabling accessories

OsiSense XUW vision sensors

The main characteristics of these sensors are as follows:

- a grey-scale image
- compact size: 45 x 45 x 65 mm
- rugged construction: metal enclosure and connections
- connection by M12 connector
- a wide range of focal adjustment, for image sharpness
- white or red light, via LED (integrated and adjustable)
- integrated lens:
 - 12 mm focal length: high precision and long distance
 - 6 mm focal length: for close object and wide field of vision



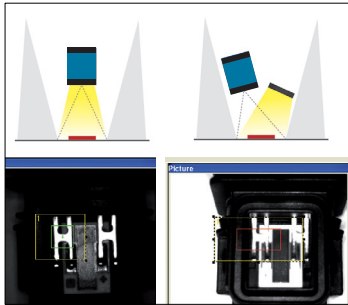


Figure 1: Direct linear lighting

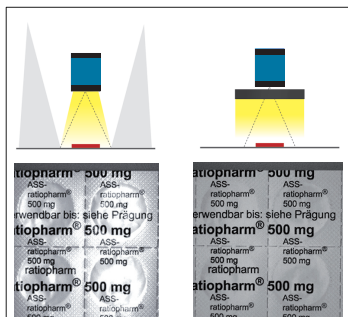


Figure 2: Ring lighting

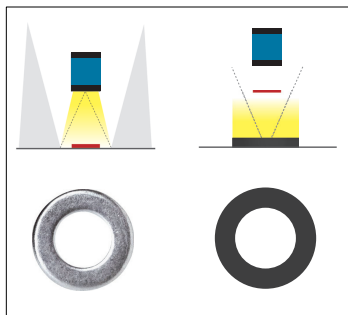
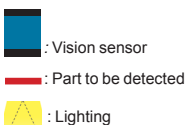


Figure 3: Back-lighting

Key for the 3 figures:



Presentation (continued)

Configuration software (see following pages)

In 5 simple steps, without any special training, the configuration software allows the user to:

- obtain the image quality needed to view the flaw being detected
- select the appropriate tool for the required inspection and set tolerances:
 - pattern matching
 - contour
 - contrast
 - brightness
 - grey-scale level
- assign inspection results to the discrete outputs or to the network outputs
- test the jobs created and view statistics
- save the jobs and set up the sensor

Inspections can be viewed using “viewer” mode.

Additional lighting

XUW sensors have integrated lighting.

However, it may be necessary to add further lighting for correct viewing of the flaw being sought.

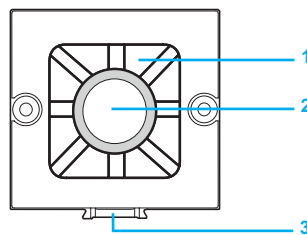
Three types of lighting, with white or red light, are offered:

- **direct linear lighting** to eliminate a reflection, on a part, generated by direct light from the sensor (Figure 1).
- **ring lighting** gives a consistent and uniform image of a highly reflective or irregularly-shaped part, for example a sheet of aluminium foil (Figure 2).
- **back-lighting** based on the shadow play principle, makes it possible to obtain more sharply contrasted contours. Object = black, light = white (Figure 3).

Accessories

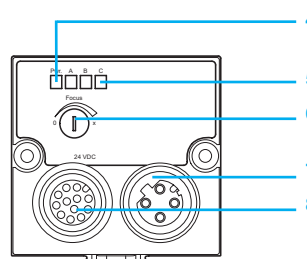
To simplify the installation of lighting, Telemecanique Sensors offers installation and adjustment accessories, jumper cables and pre-wired connectors in PUR.

Description of vision sensors



On the front panel:

- 1 LED lighting. White or red light, depending on model
- 2 Lens. Focal length 6 or 12 mm, depending on model
- 3 Dovetail fixing



Rear view:

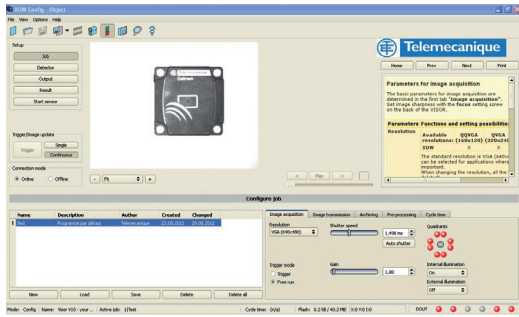
- 4 Operating LED: green
- 5 A, B and C outputs LED: yellow
- 6 Focal adjustment potentiometer
- 7 Metal M12 connector, for connection to the Ethernet IP network
- 8 Metal M12 connector, for the power supply and the inputs/outputs

Photo-electric sensors

OsiSense XUW

Configuration software

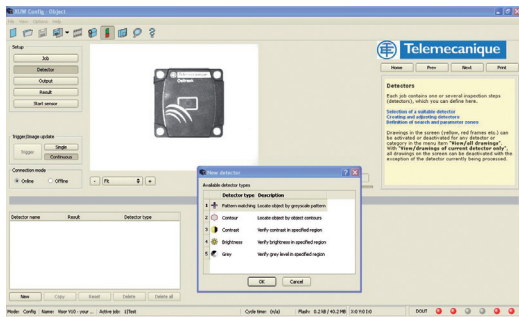
In 5 steps, the software installed on a PC allows you to configure your application. The software is supplied on CD-ROM, in English, French and German.



Step 1: adjustment of image quality

This step is used to:

- adjust the focusing for image sharpness
- adjust the exposure time
- modify the number of lighting LEDs used or switch off the lighting
- use an external trigger (sensor) or an internal trigger (in continuous mode)



Step 2: tool selection and setting of tolerances

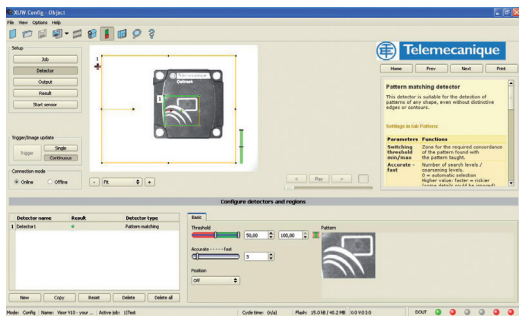
Tool selection

This step is used to select the tool or tools best suited to the required inspection.

The 5 inspection tools are:

- pattern matching (typical cycle time: 40 ms)
- contour (typical cycle time: 60 ms)
- contrast (typical cycle time: 4 ms)
- brightness (typical cycle time: 4 ms)
- grey-scale level (typical cycle time: 4 ms)

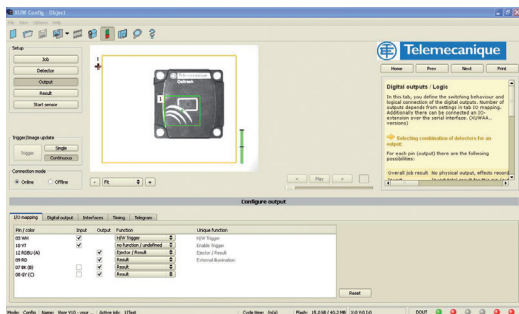
The 5 tools can be combined to obtain up to 32 check zones for a single part.



Setting of tolerances

This step is used to set the detection zone (in yellow), the teach zone (in green) and to set the tolerances of the tool or tools selected:

- acceptance threshold
- rotation angle
- mask modification
- position checking

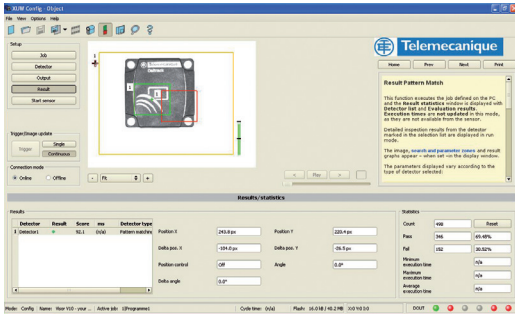


Step 3: I/O module assignment

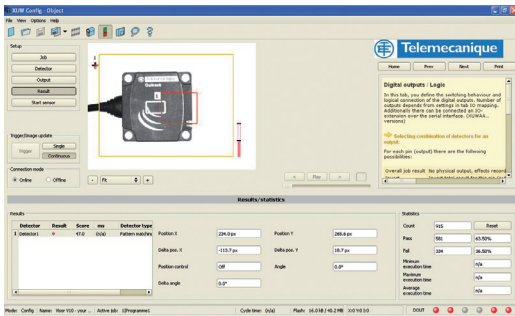
This step is used to:

- specify the assignment of discrete I/O
- configure the Ethernet IP network output
- assign logic functions for each output
- set a switching time

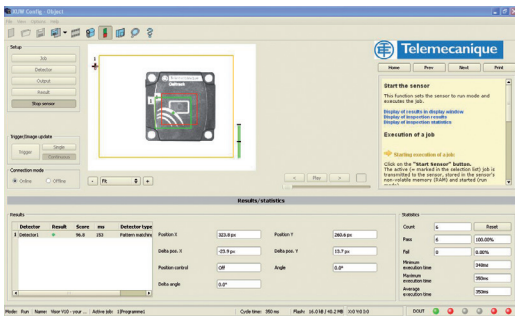
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Good part: marking complies



Bad part: marking does not comply



Step 4: tests and results

This step is used for testing the jobs created on “good” and “bad” parts:

- good part: teach zone green and red and result bargraph green
- bad part: teach zone all red and result bargraph red
- score display (correspondence in relation to part saved, as %)
- display of X and Y positions
- display of rotation angle

Step 5: saving

This step is used to save the jobs in the vision sensor’s memory and to start the application.

At this stage, the cycle time for each check can be seen. Once the program has been saved in the sensor, the computer is no longer necessary. The sensor operates independently.



Photo-electric sensors

OsiSense XUW

Vision sensors and additional lighting systems

Fixing and mounting accessories



XUWSA●●W
XUWSA●●R



XUZL●002



XUZL●001



XUZLR033



XUZASW003



XUZASW002



XUZASW001



XUZASW009



XUZASW008



XUZASW006

Vision sensors

Description	Nominal voltage	Focal length	Reference	Weight kg
Vision sensors with white light				
Vision sensor	24 V $\overline{\text{---}}$	6 mm	XUWSA06W (1)	0.160
		12 mm	XUWSA12W (1)	0.160
Vision sensors with red light				
Vision sensor	24 V $\overline{\text{---}}$	6 mm	XUWSA06R (1)	0.160
		12 mm	XUWSA12R (1)	0.160

Configuration software

Configuration of XUW vision sensors requires the use of software installed on a PC. The software is provided on a CD-ROM supplied with the sensor. Up-dates are available from our web site www.tesensors.com.

Additional lighting (if necessary, depending on the application)

Description	Nominal voltage	Size in mm	Reference	Weight kg
Direct linear lighting by LED				
White light	24 V $\overline{\text{---}}$	45 x 45	XUZLW001 (2)	0.060
Red light	24 V $\overline{\text{---}}$	45 x 45	XUZLR001 (2)	0.060

Ring lighting by LED

White light	24 V $\overline{\text{---}}$	Ø 115	XUZLW002	0.150
Red light	24 V $\overline{\text{---}}$	Ø 115	XUZLR002	0.150

Back-lighting by LED

Description	Nominal voltage	Size in mm	Reference	Weight kg
Red light	24 V $\overline{\text{---}}$	47 x 47 x 15	XUZLR033	0.045
	24 V $\overline{\text{---}}$	94 x 94 x 10	XUZLR063	0.160
	24 V $\overline{\text{---}}$	133 x 133 x 10	XUZLR103	0.290

Fixing and mounting accessories

Description	Reference	Weight kg
Vision sensor fixing accessories		
Dovetail bracket supplied with sensor XUW SA●●●	XUZASW001	0.014
Simple bracket	XUZASW002	0.017
2-axis dovetail clamp	XUZASW003	0.210
Lighting system fixing and connection accessories		
Clamp for direct lighting XUZ LW001 and XUZ LR001 (supplied with the lighting system)	XUZASW001	0.014
Bracket for ring lighting XUZ LW002 and XUZ LR002	XUZASW009	0.140
Assembly accessories		
Ø 12 mm fixing rod Length: 30 cm	XUZASW006	0.260
Mounting clamp for Ø 12 mm rod XUZASW006	XUZASW008	0.039
Mounting and adjustment clamp for 2 x Ø 12 mm tubes XUZASW006	XUZASW005	0.300

(1) The sensor is supplied with:

- a dovetail fixing clamp XUZASW001
- a CD-ROM containing: the configuration software and a user guide for the software and sensor (in French, English and German)
- a screwdriver and a hexagon key.

(2) Lighting systems XUZLW001 and XUZLR001 are supplied with fixing clamp XUZASW001 and a hexagon key.

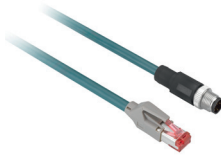
Cabling accessories



XZC PB44P14L●●



XZC PB45P14L●●



XGS Z12E45●●



XGS Z22E45●●



XZC RB4444P14L●●



XZC RB4545P14L●●



XUZSW003

Description	Cable material	Length	Reference	Weight kg
-------------	----------------	--------	-----------	-----------

For connecting the vision sensor: power supply and I/O

Straight pre-wired connectors shielded female M12 connector, 12-wire	PUR	5 m	XZCPB44P14L5	0.460
		10 m	XZCPB44P14L10	0.870
Pre-wired elbowed connectors shielded female M12 connector, 12-wire	PUR	5 m	XZCPB45P14L5	0.460
		10 m	XZCPB45P14L10	0.870

For connecting the vision sensor directly to the PC when configuring, or to a network

Ethernet jumper cables, M12 straight/RJ45 shielded cable, straight cabling	PUR	3 m	XGSZ12E4503	0.140
		10 m	XGSZ12E4510	0.440
Ethernet jumper cables, M12 elbowed/RJ45 shielded cable, straight cabling	PUR	3 m	XGSZ22E4503	0.140
		10 m	XGSZ22E4510	0.440

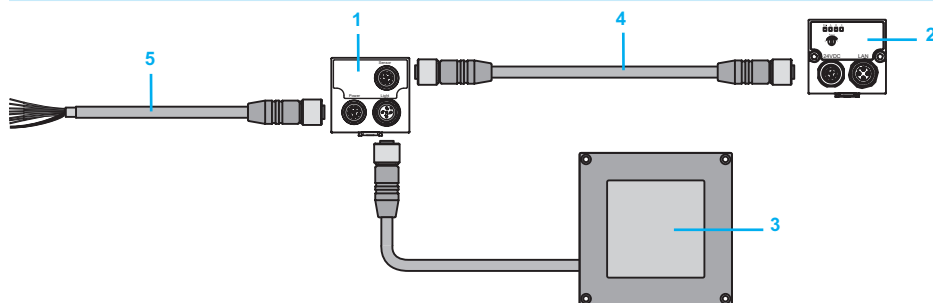
For connecting the vision sensor to additional lighting

Jumper cable, female M12 straight/ female M12 straight shielded cable, 12-wire	PUR	0.5 m	XZCRB4444P14L05	0.030
		2 m	XZCRB4444P14L2	0.120
Jumper cable, female M12 elbowed/ female M12 elbowed shielded cable, 12-wire	PUR	0.5 m	XZCRB4545P14L05	0.030
		2 m	XZCRB4545P14L2	0.120

For linking an XZCRB4●●●P14L● jumper cable, a back-lighting device and the sensor (see drawing below)

Description	Material	Size in mm	Reference	Weight kg
Connection adaptor for back-lighting devices supplied with a dovetail fixing clamp XUZASW001	ABS	45 x 45 x 25	XUZSW003	0.060

Use of the back-lighting connection adaptor

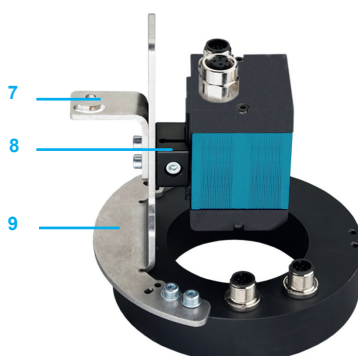


- 1 Connection adaptor XUZSW003
- 2 Vision sensor XUWSA●●●
- 3 Back-lighting XUZLR●●3
- 4 Jumper cable, female M12
XZCRB4444P14L●● or XZCRB4545P14L●●
- 5 Pre-wired M12 connector,
XZCPB44P14L●● or XZCPB45P14L●●

Examples of vision sensor installation



6



7

8

9

- 6 2-axis dovetail clamp XUZASW003
- 7 Simple bracket XUZASW002
- 8 Dovetail bracket XUZASW001
(supplied with the sensor)
- 9 Bracket XUZASW009 for ring lighting

Guide de choix page 6/2

■ General page 6/6

OsiSense XX, General purpose

■ DC supply, solid-state output

□ Cylindrical, plastic or metal page 6/14

□ Flat format, plastic page 6/18

OsiSense XX, Application


■ Sensors for monitoring 2 levels

□ Cylindrical plastic case page 6/22

OsiSense XX

■ Accessories page 6/24

> Selection guide based on application

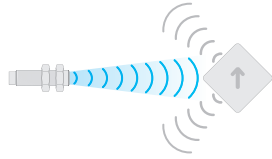
Type of detection	Detection "Digital"					
	Assembly			Conveying		
	Machine part	Vibrating bowl	Presence Absence	Transparent bottles	Jam	Flow
Sensor type						
Ø18 (M18x1)	█		█			
Ø12 (M12x1)	█			█		
Ø18 (M18x1)	█	█	█	█	█	█
Ø30 (M30x1,5)	█				█	█
7,6x19x33			█	█		█
16x30x74			█	█	█	
18x33x60 Ø18 (M18x1)		█		█	█	█
80X80X34					█	█

6

 Diffuse mode



 Reflex mode

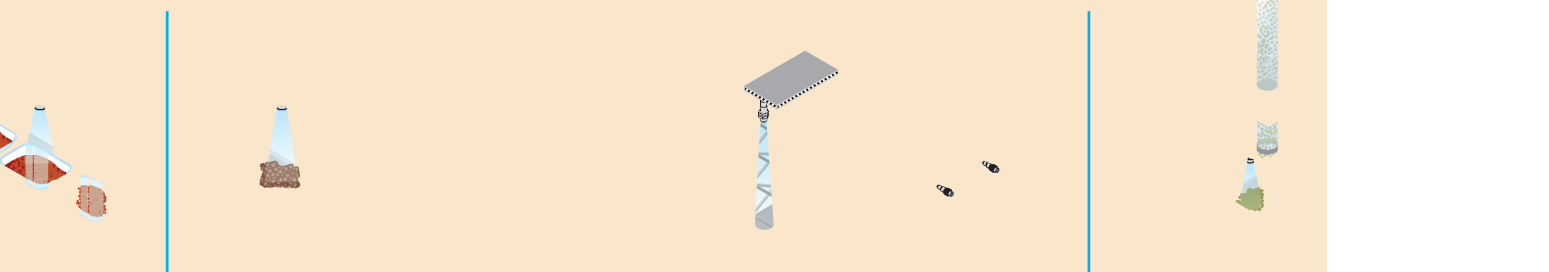


 Thru-beam mode



Regulation “Analogue output”

Level monitoring



Packaging	Conveying		Packaging	Handling	Handling	Process	
Transparent film	Material level	Height of part	Radius of strip roll	Height of elevating table	Aircraft boarding bridge	Monitoring 2 thresholds	Filling Emptying
<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	
<input type="checkbox"/>	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input type="checkbox"/>	
<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input type="checkbox"/>	

Applications
 Detection of any object, without physical contact, irrespective of: material (metal, plastic, wood, cardboard, etc.), nature (solid, liquid, powder, etc.), colour, degree of transparency, etc.

Dimensions (mm)

Sensors with solid-state digital output

Cylindrical type

Ø 12
(M12 x 1)

Ø 18
(M18 x 1)



Sensing distance Sn
 Diffuse
 Reflex
 Thru-beam

Assured operating distance (mm)

Type of output

Degree of protection

Function

Connection

Power supply

Sensor type

Page

5 cm	10 cm	–	5 cm	15 cm	50 cm (adjustable)	–	–
–	–	–	–	–	50 cm (adjustable)	–	–
–	–	20 cm	–	–	–	61 cm	1 m
6.4...51 fixed	6.4...102 fixed	0...200 fixed	2...50 fixed	25...152 fixed	Adjustable using teach mode	Fixed	Fixed
PNP/NPN	NPN or PNP	PNP/NPN	PNP or NPN	PNP/NPN	NPN or PNP	PNP/NPN	PNP/NPN
IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
NO	NO	NO/NC	NO NC	NO	NO	NO NC	NO NC
M8	M8	M8	M12 or pre-cabled	M12	M12 or pre-cabled (1)	M12	M12
12...24 V $\bar{\bar{}}$ with protection against reverse polarity							
XX5 12A1●	XX5 12A2●	XX●12 A8●	XXV 18B1●	XX5 18A1●	XX5 18A3● XXB 18A3●	XX●18 A3●	XX●18 A4●

6/14

Sensors with analogue output

Cylindrical type

Ø 18 (M12 x 1)

Ø 30 (M30 x 1.5)



Sensing distance Sn

Assured operating distance (mm)

Type of output

Degree of protection

Connection

Power supply

Sensor type

Page

50 cm (adjustable)	1 m (adjustable)	2 m (adjustable)
Adjustable using teach mode	Adjustable using teach mode	
4-20 mA/0-10 V	4-20 mA/0-10 V	
IP 67	IP 65	
M12	M12	
12...24 V $\bar{\bar{}}$ (2)	15...24 V $\bar{\bar{}}$ (2)	
XX918A3●	XX930A1●	XX930S1●
		XX930A2●

6/18

(1) XXB18A3●: M12 connector only. (2) With protection against reverse polarity.

	Cylindrical type		Flat format			
	Application, monitoring 2 levels					
Ø 30 (M30 x 1.5)	Ø 18 (M18 x 1)	Ø 30 (M30 x 1.5)	7.6 x 19 x 33	16 x 30 x 74	18 x 33 x 60 + Ø 18 (M18 x 1)	80 x 80 x 34



1 m/2 m depending on model (adjustable)	8 m (adjustable)	50 cm	1 m/2 m dep. on model	10 cm	–	25 cm	–	50 cm (adjustable)	1 m (adjustable)	
–	1 m (adjustable)	–	–	–	–	–	–	50 cm (adjustable)	1 m (adjustable)	
–	–	–	–	–	20 cm	–	61 cm/1 m	–	–	
Adjustable using teach mode		Adjustable using teach mode		6.4...102 fixed	0...200 fixed	51...254 fixed	0...1000 fixed	Adjustable using teach mode		
PNP/NPN or NPN or PNP	PNP or NPN	PNP or NPN	PNP or NPN	PNP/NPN	NPN or PNP	NPN/PNP	NPN or PNP	NPN/PNP	NPN or PNP	NPN or PNP
IP 65	IP 67	IP 65	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
NO + NO or NO + NC	NO or NO + NC	NO + NC	NO	NO + NO	NO	NO NC	NO	NO + NO NC + NC	NO	NO
M12	M12	M12	M12	M12	Connector on flying lead	M12	M12	M12	M12	M12
12...24 V $\overline{\text{---}}$ with protection against reverse polarity										
XX630A1●	XX6V3A1●	XX630A3●	XX218A3●	XX230A1●	XX7F1A2●	XX● F1A8●	XX7 K1A2●	XX● K1A3●	XX7 V1A1●	XX8 D1A1●
XX630A2●	XXBV3A1●			XX230A2●				XX● K1A4●	XXB V1A1●	XXB D1A1●
XX630S1●										
6/14			6/20		6/18					

Ø 30 (M30 x 1.5)	Flat format
	18 x 33 x 65 + Ø 18 (M18 x 1)
	80 x 80 x 34



1 m (adjustable)	8 m (adjustable)	50 cm (adjustable)	1 m (adjustable)
Adjustable using teach mode		Adjustable using teach mode	
4-20 mA	0-10 V	4-20 mA	0-10 V
IP 67		IP 67	IP 67
M12	M12	M12	M12
15...24 V $\overline{\text{---}}$ (2)		12...24 V $\overline{\text{---}}$ (2)	
XX9V3A1●	XX930A3●	XX9V1A1●	XX9D1A1●
6/18			

Quality, standards and certifications

Quality control

The OsiSense XX ultrasonic sensors are subjected to special precautions in order to guarantee their reliability in the most arduous industrial environments.

■ Qualification

A **qualification procedure** on the characteristics of OsiSense XX ultrasonic sensors is carried out in our laboratories.

■ Production

The electrical characteristics, sensing distances at the ambient temperature and operating temperatures are 100% verified. Sensors are statistically selected during the course of production and subjected to **monitoring tests** on all qualified characteristics.

■ Customer returns

Returned ultrasonic sensors are subjected to systematic analysis and corrective actions are implemented to eliminate recurrence of the fault.

Conformity to standards

The OsiSense XX ultrasonic sensors conform to the standards IEC 60947-5-2. Standards and characteristics: refer to pages 6/17, 6/19, 6/21 et 6/23.

Resistance to chemicals in the environment

To ensure lasting efficient operation, it is essential that any chemicals coming into contact with the ultrasonic sensors will not affect their casing and, in doing so, prevent their reliable operation.

Due to the materials used, OsiSense XX ultrasonic sensors are very resistant to:

■ Chemical agents:

salts, aliphatic and aromatic oils, petroleum, diluted bases and acids.

Depending on their nature and concentration, tests should be carried out beforehand for the following chemical agents: alcohols, ketones and phenols.

■ Food and beverage industry products:

vegetable oils, animal fats, fruit juices, milk proteins, etc.

Resistance to the environment

■ IP 65: protection against water jets.

Tested in accordance with IEC 60529: the device is subjected to water sprayed from a Ø 6.3 mm nozzle, at a flow rate of 12.5 litres/min for 3 min at a distance of 3 m. No deterioration in either operating or insulation characteristics is permitted.

■ IP 67: protection against the effects of immersion.

Tested in accordance with IEC 60529: the sensor is immersed for 30 minutes in 1 m of water. No deterioration in either operating or insulation characteristics is permitted.

■ IP 69K: protection against the effects of high pressure cleaning. Adherence to standard DIN 40050 which stipulates that the product must withstand a water jet at a pressure of 90 bar and temperature of +80°C for 3 minutes.

No deterioration in either operating or insulation characteristics is permitted.

Recommendations

The ultrasonic sensors are designed for use in standard industrial applications involving presence detection. Since these sensors do not incorporate a redundant electrical circuit, they are not suitable for use in safety applications. For safety applications, please refer to our "Safety functions and solutions using Preventa" catalogue.

Principle of ultrasonic detection



Presentation

Ultrasonic sensors enable detection, without contact, of any object irrespective of its:

- material (metal, plastic, wood, cardboard, etc.),
- nature (solid, liquid, powder, etc.),
- colour,
- degree of transparency.

They are used in industrial applications for detecting, for example:

- the position of machine parts,
- the presence of the windscreen during automobile assembly,
- the flow of objects on a conveyor system: glass bottles, cardboard packages, cakes, etc.,
- the level
 - of different colour paints in pots,
 - of plastic pellets in injection moulding machine feeders.

The ultrasonic sensors are simple to install due to their integral connector and availability of cabling and fixing accessories.

Operating principle

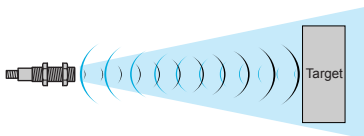
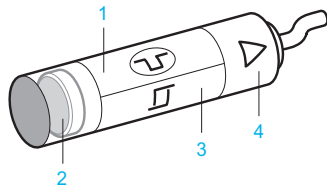
The principle of ultrasonic detection is based on measuring the time taken between transmission of an ultrasonic wave (pressure wave) and reception of its echo (return of transmitted wave).

OsiSense XX ultrasonic sensors comprise:

- 1 a high voltage generator
- 2 a piezoelectric transducer (transmitter and receiver)
- 3 a signal processing stage
- 4 an output stage

Excited by the high voltage generator **1**, the transducer (transmitter-receiver) **2** generates a pulsed ultrasonic wave (200 to 500 kHz depending on the product) which travels through the ambient air at the speed of sound. When the wave strikes an object, it reflects (echo) and travels back towards the transducer. A micro controller **3** analyses the signal received and measures the time interval between the transmitted signal and the echo. By comparison with the preset or taught times, it determines and controls the output states **4**.

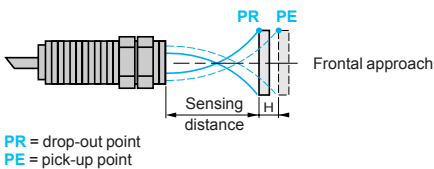
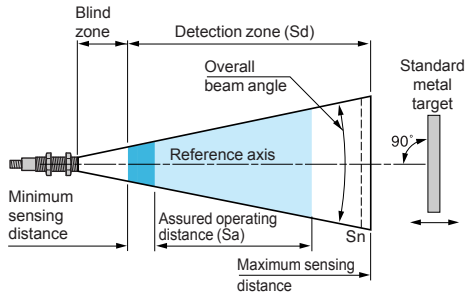
The output stage **4** controls a solid-state switch (PNP or NPN transistor) corresponding to a NO or NC contact (detection of object).



Advantages of ultrasonic detection

- No physical contact with the object to be detected, therefore, no wear and detection possible of fragile and/or freshly painted objects, etc.
- Detection of any material, irrespective of colour, at the same distance, without adjustment or correction factor.
- Teach mode function, by simply pressing a button, for defining the effective detection zone. Teaching of the minimum and maximum sensing distances (very precise foreground and background suppression, ± 6 mm).
- Very good resistance to industrial environments (robust products entirely encapsulated in resin).
- Solid-state units: no moving parts in the sensor, therefore, service life independent of the number of operating cycles.
- Various types of outputs to suit requirements:
 - Digital output for level control or detection of any type of object
 - Analogue output for controlling systems that require a signal that is proportional to the distance at which the object is detected.

Terminology



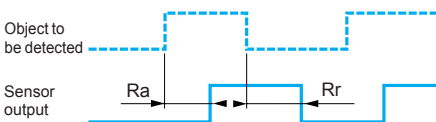
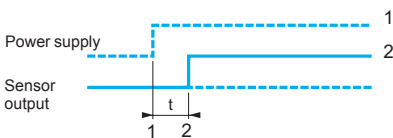
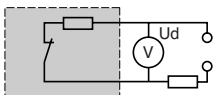
Definitions

The terms listed below are defined by the standard IEC 60947-5-2:

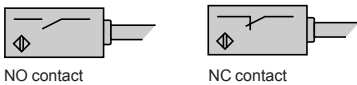
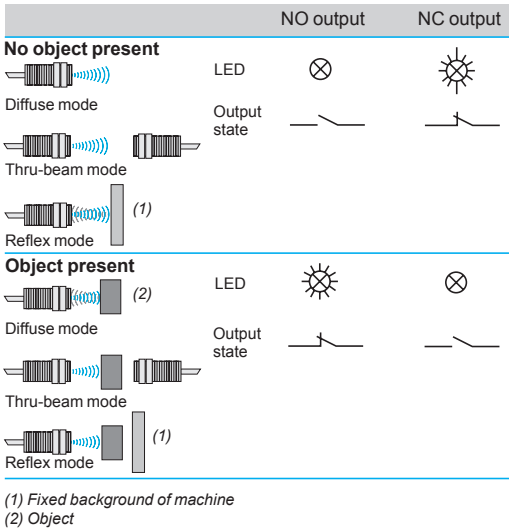
- **Nominal sensing distance (S_n)**
Conventional value for indicating the sensing distance. It does not take into account manufacturing tolerances nor variations caused by external conditions such as voltage and temperature.
- **Detection zone (S_d)**
Zone in which the sensor is sensitive to objects.
- **Minimum sensing distance**
Lower limit of the specified detection zone.
- **Maximum sensing distance**
Upper limit of the specified detection zone.
- **Assured operating distance (S_a)**
This corresponds to the operating zone of the sensor (activation of outputs), and is included in the detection zone. It is also known as the "detection window". Its limits are fixed:
 - at the factory for fixed sensing distance sensors,
 - when setting-up within the application for sensors with teach mode.
- **Blind zone:** Zone located in front of the sensing face of the sensor.
 - For diffuse sensors, it is the zone in which the object will not be reliably detected. For reflex sensors, it is the zone in which the target (fixed background of machine for example) will not be reliably detected, but the object can be in this zone.
 - For thru-beam sensors, there is no blind zone.
- **Differential travel**
The differential travel (H) or hysteresis is the distance between the pick-up point as the standard metal target moves towards the sensor and the drop-out point as it moves away from the sensor.
- **Repeat accuracy**
The repeat accuracy (R) is the precision of reproduction between two successive measurements of the sensing distance, made in identical conditions.
- **Overall beam angle**
Fixed angle around the reference axis of an ultrasonic proximity sensor.
- **Standard metal target**
The standard IEC 60947-5-2 defines the standard target as a square metal plate, 1 mm thick with rolled finish, placed perpendicularly to the reference axis. Its side dimension depends on the detection zone:

Detection zone (mm)	Size of target (mm)
< 300	10 x 10
300 < d < 800	20 x 20
> 800	100 x 100

- **Voltage drop (U_d)**
The voltage drop (U_d) corresponds to the voltage at the terminals of the sensor when in the closed state (value measured at the nominal current of the sensor).
- **First-up delay**
Time required to ensure operation of the sensor's output signal following power-up.
 - 1 Power-up
 - 2 Output signal state (0 or 1)
- **Response time**
 - **Response time (R_a):** time taken between the instant the object to be detected enters the active zone and the changing of the output signal state. This time limits the passing speed of the target in relation to its dimensions.
 - **Recovery time (R_r):** time taken between the object being detected leaving the active zone and the changing of the output signal state. This time limits the interval between 2 objects.



Digital outputs



LED indicators

The majority of OsiSense XX ultrasonic sensors incorporate light-emitting diode output state indicators.

- Ø 12 sensor
 - Green LED (power on)
 - Yellow LED (object present)
- Ø 18 sensor, sensitivity 500 mm (except thru-beam versions XXT18 and XXR18)
 - Yellow LED (object present) or green LED (power on) + user assistance when adjusting the detection zone
- Ø 30 sensor
 - Multicolour LED for assisting the user when adjusting the detection distance
 - Yellow LED (object present)
 - Analogue version with LED (object present, with luminosity increasing as output signal increases)
- Parallelepiped format sensor
 - XXpF: Dual colour yellow (object present) or green (power on) LED
 - XXpV: Dual colour yellow (object present) or green (power on) LED + user assistance when adjusting the detection zone
 - XX7K: Yellow LED (object present); green LED (power on)
 - XXTK, XXRK: Yellow LED (object present) only
 - v XXpD: Yellow LED (object present); green LED (power on)
 - v Analogue version with LED (object present, with luminosity increasing as output signal increases)

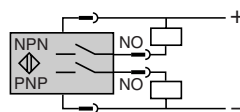
Sensors with digital switching

Output contact logic

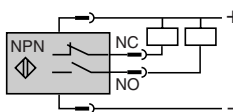
- NO contact (normally open)
Corresponds to a sensor whose output changes to the closed state when an object is present in the detection window.
- NC contact (normally closed)
Corresponds to a sensor whose output changes to the open state when an object is present in the detection window.

4-wire technique ---

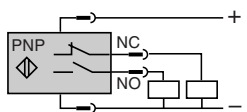
NO output/PNP and NPN



NO + NC output/NPN



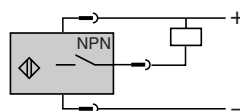
NO + NC output/PNP



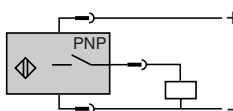
These sensors comprise 2 wires for the supply and 1 wire for each output signal

3-wire technique ---

NO output/NPN



NO output/PNP



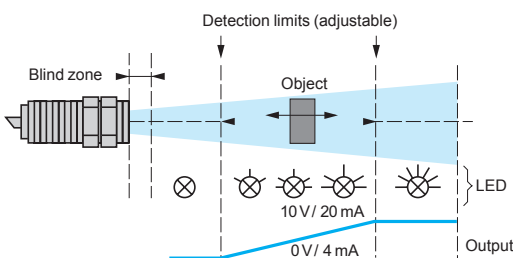
These sensors comprise 2 wires for the supply and 1 wire for the output signal,

- PNP type:** switching the positive side to the load.
- NPN type:** switching the negative side to the load.

Sensors with analogue output

Operation

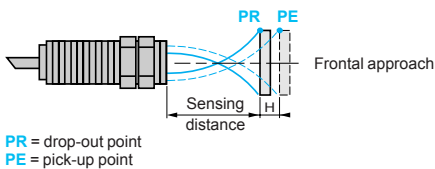
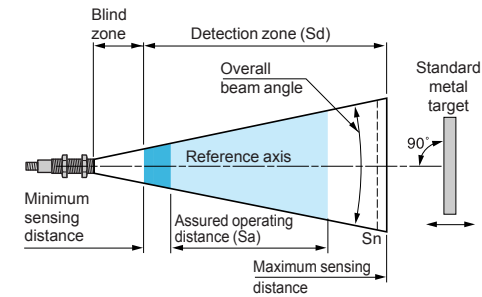
The characteristic feature of these sensors is the output which delivers a signal (either current or voltage) that is proportional to the distance of the object being detected. Within the detection limits, which are adjustable using teach mode, the value of the output signal increases or decreases in relation to the distance of the object. When an object is detected, an LED indicator (D) illuminates and its luminosity increases in relation to the value of the output signal. The slope of the signal can simply be changed by pressing the teach button



Advantages

- Visual information available relating to the sensor/object distance.
- Protection against reverse polarity.
- Protection against overloads and short-circuits.
- No residual current, low voltage drop.

Terminology

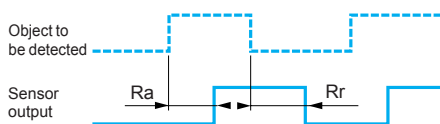
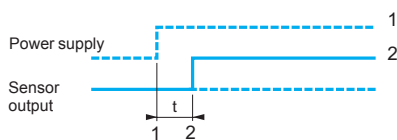
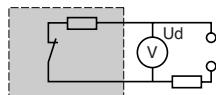


Definitions

The terms listed below are defined by the standard IEC 60947-5-2:

- Nominal sensing distance (S_n)**
 Conventional value for indicating the sensing distance. It does not take into account manufacturing tolerances nor variations caused by external conditions such as voltage and temperature.
- Detection zone (S_d)**
 Zone in which the sensor is sensitive to objects.
- Minimum sensing distance**
 Lower limit of the specified detection zone.
- Maximum sensing distance**
 Upper limit of the specified detection zone.
- Assured operating distance (S_a)**
 This corresponds to the operating zone of the sensor (activation of outputs), and is included in the detection zone. It is also known as the "detection window". Its limits are fixed:
 - at the factory for fixed sensing distance sensors,
 - when setting-up within the application for sensors with teach mode.
- Blind zone:** Zone located in front of the sensing face of the sensor. For diffuse sensors, it is the zone in which the object will not be reliably detected. For reflex sensors, it is the zone in which the target (fixed background of machine for example) will not be reliably detected, but the object can be in this zone. For thru-beam sensors, there is no blind zone.
- Differential travel**
 The differential travel (H) or hysteresis is the distance between the pick-up point as the standard metal target moves towards the sensor and the drop-out point as it moves away from the sensor.
- Repeat accuracy**
 The repeat accuracy (R) is the precision of reproduction between two successive measurements of the sensing distance, made in identical conditions.
- Overall beam angle**
 Fixed angle around the reference axis of an ultrasonic proximity sensor.
- Standard metal target**
 The standard IEC 60947-5-2 defines the standard target as a square metal plate, 1 mm thick with rolled finish, placed perpendicularly to the reference axis. Its side dimension depends on the detection zone:

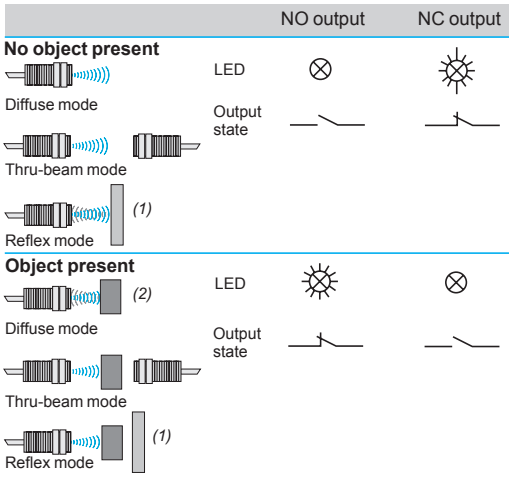
Detection zone (mm)	Size of target (mm)
< 300	10 x 10
300 < d < 800	20 x 20
> 800	100 x 100
- Voltage drop (U_d)**
 The voltage drop (U_d) corresponds to the voltage at the terminals of the sensor when in the closed state (value measured at the nominal current of the sensor).



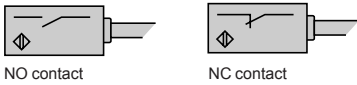
- First-up delay**
 Time required to ensure operation of the sensor's output signal following power-up.
 - 1 Power-up
 - 2 Output signal state (0 or 1)
- Response time**
 Response time (R_a): time taken between the instant the object to be detected enters the active zone and the changing of the output signal state. This time limits the passing speed of the target in relation to its dimensions.
 Recovery time (R_r): time taken between the object being detected leaving the active zone and the changing of the output signal state. This time limits the interval between 2 objects.

6

Digital outputs



(1) Fixed background of machine
(2) Object



LED indicators

The majority of OsiSense XX ultrasonic sensors incorporate light-emitting diode output state indicators.

- Ø 12 sensor
 - Green LED (power on)
 - Yellow LED (object present)
- Ø 18 sensor, sensitivity 500 mm (except thru-beam versions XXT18 and XXR18)
 - Yellow LED (object present) or green LED (power on) + user assistance when adjusting the detection zone
- Ø 30 sensor
 - Multicolour LED for assisting the user when adjusting the detection distance
 - Yellow LED (object present)
 - Analogue version with LED (object present, with luminosity increasing as output signal increases)
- Parallelepiped format sensor
 - XX●F: Dual colour yellow (object present) or green (power on) LED
 - XX●V: Dual colour yellow (object present) or green (power on) LED + user assistance when adjusting the detection zone
 - XX7K: Yellow LED (object present); green LED (power on)
 - XXTK, XXRK: Yellow LED (object present) only
 - XX●D: Yellow LED (object present); green LED (power on)
 - Analogue version with LED (object present, with luminosity increasing as output signal increases)

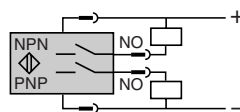
Sensors with digital switching

Output contact logic

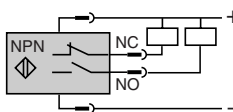
- NO contact (normally open)
Corresponds to a sensor whose output changes to the closed state when an object is present in the detection window.
- NC contact (normally closed)
Corresponds to a sensor whose output changes to the open state when an object is present in the detection window.

4-wire technique ---

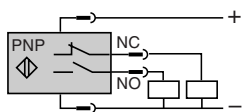
NO output/PNP and NPN



NO + NC output/NPN



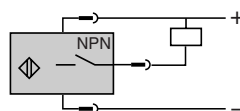
NO + NC output/PNP



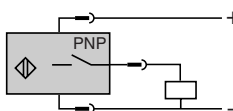
These sensors comprise 2 wires for the supply and 1 wire for each output signal

3-wire technique ---

NO output/NPN



NO output/PNP



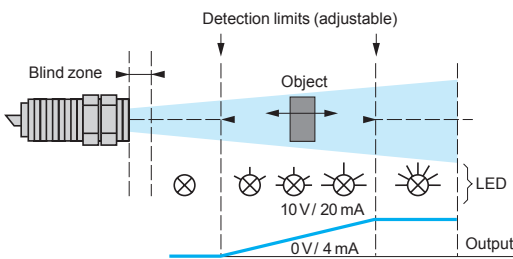
These sensors comprise 2 wires for the supply and 1 wire for the output signal,

- PNP type:** switching the positive side to the load.
- NPN type:** switching the negative side to the load.

Sensors with analogue output

Operation

The characteristic feature of these sensors is the output which delivers a signal (either current or voltage) that is proportional to the distance of the object being detected. Within the detection limits, which are adjustable using teach mode, the value of the output signal increases or decreases in relation to the distance of the object. When an object is detected, an LED indicator (D) illuminates and its luminosity increases in relation to the value of the output signal. The slope of the signal can simply be changed by pressing the teach button



Advantages

- Visual information available relating to the sensor/object distance.
- Protection against reverse polarity.
- Protection against overloads and short-circuits.
- No residual current, low voltage drop.

Power supply

Sensors for DC circuits

- **DC source:** Check that the voltage limits of the sensor and the acceptable level of ripple, are compatible with the supply used.
- **AC source** (comprising transformer, rectifier, smoothing capacitor): The supply voltage must be within the operating limits specified for the sensor.

Where the voltage is derived from a single phase AC supply, the voltage must be rectified and smoothed to ensure that:

- the peak voltage of the DC supply is lower than the maximum voltage rating of the sensor.

Peak voltage = nominal voltage x $\sqrt{2}$

- the minimum voltage of the supply is greater than the minimum voltage rating of the sensor,

given that:

$$\Delta V = (I \times t) / C$$

ΔV = max. ripple: 10% (V),

I = anticipated load current (mA),

t = period of 1 cycle (10 ms full-wave rectified for a 50 Hz supply frequency),

C = capacitance (μ F).

As a general rule, use a transformer with a lower secondary voltage (U_e) than the required DC voltage (U).

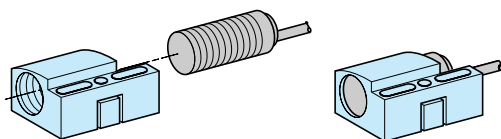
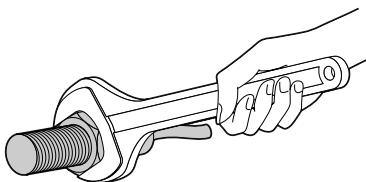
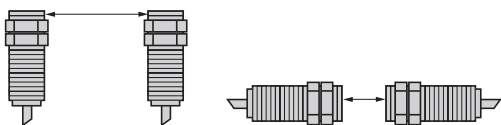
Example:

18 V \sim to obtain 24 V --- ,

36 V \sim to obtain 48 V --- .

Setting-up precautions

For diffuse sensors:



XSZB1●●

Mounting

Mounting distance between ultrasonic sensors

If 2 standard sensors are mounted too close to each other, the wave transmitted by one sensor is likely to interfere with the other and result in erratic operation.

In order to avoid this, it is necessary to adhere to the minimum distances between sensors. See setting-up precautions on page 6/30.

Maximum tightening torque

Cylindrical sensors	Diameter mm	Tightening torque	Flat sensors Screw	Tightening Torque
XX●12●	Ø 12	0.7 N.m/ 0.52 lb-ft	XX●F● M3	0.7 N.m/ 0.52 lb-ft
XX●18●	Ø 18	1 N.m/ 0.74 lb-ft	XX●K● M4	1 N.m/ 0.74 lb-ft
XX●30●	Ø 30	1.35 N.m/ 1 lb-ft	XX●V● M3	0.7 N.m/ 0.52 lb-ft
XX●V3●	Ø 30	1.35 N.m/ 1 lb-ft	Ø 18	1 N.m/ 0.74 lb-ft

Interchangeability

Interchangeability is made easy by using indexed fixing clamps:

- XSZB112 (Ø 12 mm),
- XSZB118 (Ø 18 mm),
- XSZB130 (Ø 30 mm).

Cabling

Electrical connection

- **Connect the sensor before switching on the supply**

- **Length of cable**

No limitation up to 200 m or up to a line capacitance of < 0.1 μ F.

It is, however, advisable to take into account the voltage drop on the line.

- **Separation of control and power cables**

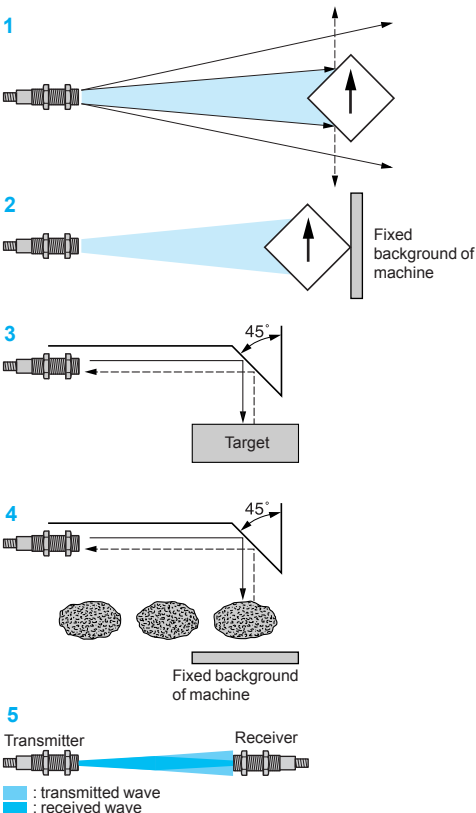
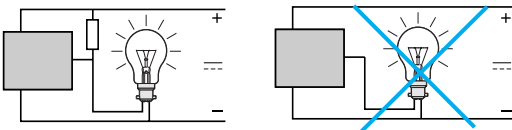
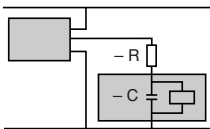
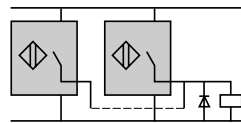
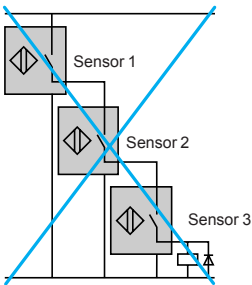
The sensors are immune to electrical interference encountered in normal industrial conditions.

Where extreme conditions of electrical "noise" could occur (large motors, spot welders, etc.),

it is advisable to protect against transients in the normal way:

- suppress interference at source,
- separate power and control wiring from each other,
- smooth the supply,
- limit the length of cable.

Setting-up precautions (continued)



Connection in series

This connection method is not recommended.

- Correct operation of the sensors cannot be assured and, if this method is used, tests should be made before installation.

The following points should be taken into account:

Sensor 1 carries the load current in addition to the no-load current consumption values of the other sensors connected in series. For certain models, this connection method is not possible unless a current limiting resistor is used.

When in the closed state, each sensor will produce a voltage drop and, therefore, the load voltage should be selected accordingly.

As sensor 1 closes, sensor 2 will not operate until a certain time "T" has elapsed (corresponding to the first-up delay) and likewise for the following sensors in the sequence.

"Flywheel" diodes should be used when the load being switched is inductive.

Sensors and units in series with an external mechanical contact

- The following points should be taken into account:

When the mechanical contact is open, the sensor is not supplied.

When the contact closes, the sensor will not operate until a certain time "T" has elapsed (corresponding to the first-up delay).

Connection in parallel

- No specific restrictions. The use of "flywheel" diodes is recommended when an inductive load (relay) is being switched.

Capacitive load (C > 0.1 mF)

- At switch-on, it is necessary to limit (by resistor) the charging current of the capacitive load C. The voltage drop in the sensor can also be taken into account by subtracting it from the supply voltage for calculation of R.

$$R = \frac{U \text{ (supply)}}{I_{\text{max. (sensor)}}$$

Load comprising an incandescent lamp

- If the load comprises an incandescent lamp, the cold state resistance can be 10 times lower than the hot state resistance. This can cause very high current levels on switching. Fit a pre-heat resistance in parallel with the sensor.

$$R = \frac{U^2}{P} \times 10, U = \text{supply voltage and } P = \text{lamp power}$$

Detection

Influencing factors

The ultrasonic sensors are particularly suited for the detection of objects that are capable of reflecting an acoustic wave and, in general, having a flat surface perpendicular to the detection axis. However, the correct operation of the ultrasonic sensor can be disrupted by:

- air currents, which can accelerate or divert the acoustic wave transmitted by the sensor (ejection of part by air jet),
- high temperature gradients within the detection zone: an object emitting considerable heat can create zones of varying temperature that will modify the propagation time of the wave and thus prevent reliable operation,
- sound insulators: sound absorbing materials (cotton, fabrics, rubber, etc.),
- the angle between the face of the object to be detected and the reference axis of the sensor: when the angle is offset from 90°, the wave is no longer reflected back along the sensor axis and the operating distance is reduced. The greater the distance between the sensor and the target, the greater the effect. Detection is not possible when the angle exceeds ± 10°.
- the shape of the object to be detected: similar to the example above, an excessively angular object can be difficult to detect 1. In this case, use reflex mode detection.

Detection systems

Diffuse mode

In this mode, it is the object itself that reflects the ultrasonic wave back to the sensor which, in turn, switches its output. It is the most widely used and the most simple mode. In this mode, the object will not be detected in the blind zone.

Reflex or beam break mode

The sensor is in a permanently detecting state on a fixed background of the machine and when the object to be detected breaks the acoustic beam the output switches state 2. This mode is particularly recommended in cases where the shape of the object changes (irregular, angular, non perpendicular) and also for objects that absorb sound (see above). This mode can be achieved by using a diffuse mode sensor (with background teaching) or, more simply, by using a ready to use reflex mode sensor.

In cases where space is restricted, a reflector 3 and 4, angled at 45°, can be used. This system can be used for both the diffuse and reflex modes. This reflector can be a flat part of the machine or a separate element. In this mode, the background of the machine must not be within the blind zone. But if the object is within this zone, it will be reliably detected.

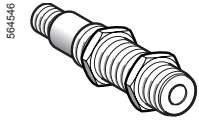
Thru-beam mode

Detection is achieved using both a transmitter and receiver, with the transmitter permanently transmitting an acoustic wave to the receiver. The breaking of the beam by the presence of an object switches the output of the receiver. This mode provides long detection distances 5. In this mode there is no blind zone.

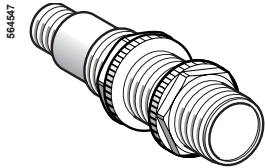
Ultrasonic sensors

OsiSense XX, General purpose

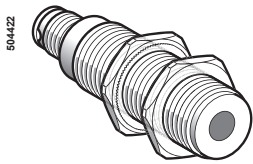
Cylindrical, plastic or metal
DC supply, solid-state output



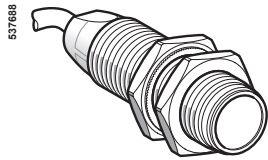
XX512A1KAM8



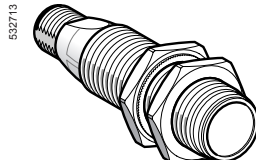
XX518A1KAM12



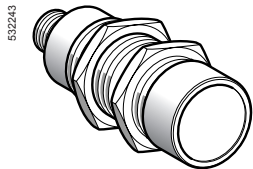
XXV18B1M12



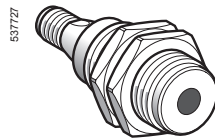
XX518A3L2



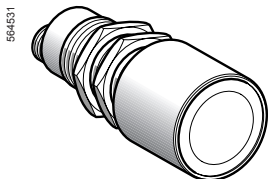
XX518A3AM12



XX630A1M12
XX630A2M12



XX6V3A1AM12



XX630A3CM12

Diffuse system

Fixed sensing distance sensors

Sensors	Sensing distance (Sn) m	Function/output	Connection	Reference	Weight kg	
Ø 12 Plastic	0.05	NO/PNP + NO/NPN	M8 connector	XX512A1KAM8	0.011	
	0.10	NO/NPN	M8 connector	XX512A2NAM8	0.011	
		NO/PNP	M8 connector	XX512A2PAM8	0.011	
Ø 18 Plastic	0.15	NO/PNP + NO/NPN	M12 connector	XX518A1KAM12	0.033	
Ø 18 Metal	0.05	NO/NPN	Pre-cabled (L = 2 m)	XXV18B1NAL2	0.110	
			Pre-cabled (L = 5 m)	XXV18B1NAL5	0.200	
			Pre-cabled (L = 10 m)	XXV18B1NAL10	0.340	
			M12 connector	XXV18B1NAM12	0.050	
			NO/PNP	Pre-cabled (L = 2 m)	XXV18B1PAL2	0.110
				Pre-cabled (L = 5 m)	XXV18B1PAL5	0.200
	Pre-cabled (L = 10 m)	XXV18B1PAL10		0.340		
	NC/NPN	0.05	M12 connector	Pre-cabled (L = 10 m)	XXV18B1PAM12	0.050
				Pre-cabled (L = 2 m)	XXV18B1NBL2	0.110
				Pre-cabled (L = 5 m)	XXV18B1NBL5	0.200
				Pre-cabled (L = 10 m)	XXV18B1NBL10	0.340
				M12 connector	XXV18B1NBM12	0.050
NC/PNP				0.05	M12 connector	Pre-cabled (L = 2 m)
	Pre-cabled (L = 5 m)	XXV18B1PBL5	0.200			
	Pre-cabled (L = 10 m)	XXV18B1PBL10	0.340			
	M12 connector	XXV18B1PBM12	0.050			

Adjustable sensing distance sensors

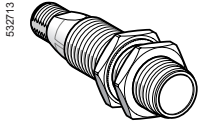
Ø 18 Plastic	0.50 (adjustable)	NO/NPN	Pre-cabled (L = 2 m)	XX518A3NAL2	0.080	
		NO/PNP	Pre-cabled (L = 2 m)	XX518A3PAL2	0.080	
		NO/NPN	M12 connector	XX518A3NAM12	0.033	
		NO/PNP	M12 connector	XX518A3PAM12	0.033	
Ø 30 Plastic	1 (adjustable)	NO/PNP + NO/NPN	M12 connector	XX630A1KAM12	0.090	
		NO/NPN	M12 connector	XX6V3A1NAM12	0.090	
		NO/PNP	M12 connector	XX6V3A1PAM12	0.090	
		NO/NPN + NC/NPN	M12 connector	XX630A1NCM12	0.090	
			M12 connector	XX630S1NCM12 (1)	0.090	
		NO/PNP + NC/PNP	M12 connector	XX630A1PCM12	0.090	
			M12 connector	XX630S1PCM12 (1)	0.090	
		2 (adjustable)	NO/NPN + NC/NPN	M12 connector	XX630A2NCM12	0.090
			NO/PNP + NC/PNP	M12 connector	XX630A2PCM12	0.090
		8 (adjustable)	NO/NPN + NC/NPN	M12 connector	XX630A3NCM12	0.110
			NO/PNP + NC/PNP	M12 connector	XX630A3PCM12	0.110

(1) Stainless steel 303 case.

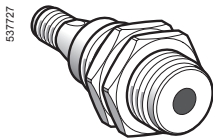
Ultrasonic sensors

OsiSense XX, General purpose

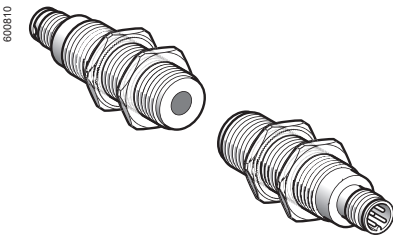
Cylindrical, plastic or metal
DC supply, solid-state output



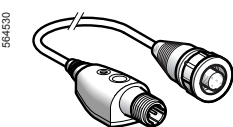
XXB18A3PAM12



XXBV3A1PAM12



XXT18● + XXR18● (thru-beam system)



XXZPB100

Reflex system

Adjustable sensing distance sensors

Sensors	Sensing distance (Sn) m	Function/output	Connection	Reference	Weight kg
Ø 18 Plastic	0.50 (adjustable)	NO/PNP	M12 connector	XXB18A3PAM12	0.033
Ø 30 Plastic	1 (adjustable)	NO/PNP	M12 connector	XXBV3A1PAM12	0.090

Thru-beam system

Sensors	Sensing distance (Sn) m	Function/output	Connection	Reference	Weight kg
Ø 12					
Transmitter	0.20		M8 connector	XXT12A8M8	0.020
Receiver	0.20	NO/PNP + NO/NPN	M8 connector	XXR12A8KAM8	0.020
		NC/PNP + NC/NPN	M8 connector	XXR12A8KBM8	0.020
Ø 18					
Transmitter	0.61		M12 connector	XXT18A3M12	0.040
Receiver	0.61	NO/PNP + NO/NPN	M12 connector	XXR18A3KAM12	0.040
		NC/PNP + NC/NPN	M12 connector	XXR18A3KBM12	0.040
Transmitter	1		M12 connector	XXT18A4M12	0.040
Receiver	1	NO/PNP + NO/NPN	M12 connector	XXR18A4KAM12	0.040
		NC/PNP + NC/NPN	M12 connector	XXR18A4KBM12	0.040

Accessories

Teach pushbutton	For use with sensors	Reference	Weight kg
Selection of detection window Input: M12 female connector Output: M12 male connector	XX518A3●AM12, XXB18A3●AM12, XXBV3A1●AM12 and XX6V3A●AM12	XXZPB100	0.035

Other connection and fixing accessories

See page 6/24.

Ultrasonic sensors

OsiSense XX, General purpose
Cylindrical, plastic or metal
DC supply, solid-state output

Sensor type		XX5 12A1●	XX5 12A2●	XX● 12A8●	XXV 18B1●	XX5 18A1●	XX● 18A3● XX● 18A4●	XX5 18A3● XXB 18A3●	XX6 V3A1● XXB V3A1●	XX630A1● XX630A2● XX630S1●	XX6 30A3●	
General characteristics												
Conformity to standards		CE, IEC 60947-5-2										
Product certifications		UL	UL	UL	cULus		UL	UL, cCSAus (1)	UL, cCSAus (2)			
Nominal sensing distance (Sn)		m	0.05	0.1	0.2	0.05	0.15	0.60 or 1 (3)	0.50	1	1 or 2 (4)	8
Blind zone (in diffuse mode the object is not detected in this zone, in reflex mode the background is not detected in this zone)		mm	0...6.4	0...6.4	–	0...2	0...19	–	0 ... 51 (XX518A3●) 0 ... 165 (XXB18A3●)	0 ... 100 (XX6V3A1●) 0 ... 315 (XXBV3A1●)	0...51 (XX630●1 XX630A2●)	0...300
Detection window		mm	Fixed						Remotely adjustable or by using external teach button		Adjustable using teach button on sensor	
Detection system			●	●	–	●	●	–	●	●	●	●
		Diffuse	●	●	–	●	●	–	●	●	●	●
		Reflex	–	–	–	–	–	–	●	●	–	–
		Thru-beam	–	–	●	–	–	●	–	–	–	–
Transmission frequency (transmitter resonance)		kHz	500			360	200	300	300	180	200	75
Differential travel		mm	< 0.7	< 0.7	–	< 3	–	< 2.5	< 2.5	< 2.5	< 2.5	< 12.7
Repeat accuracy		mm	± 0.7		± 0.79	± 1.5	± 0.79	± 1.27	± 1.27	± 1.6	± 0.87	± 2.54
Overall beam angle (see detection lobe)			11°	10°	10°	10°	20	6°	6°	7°	10°	16°
Minimum size of object to be detected			Cylinder Ø (in mm), at distance (in mm)									
			Ø 2.5 at 38	Ø 2.5 at 50	Ø 12 at 200	Ø 2.5 at 20	Ø 1.6 at 63	Ø 38 at 600 Ø 114 at 1000	Ø 2.5 at 150	Ø 50 at 1000	Ø 1.6 at 635	Ø 51 at 4732
Deviation angle from 90° of the object to be detected			± 10°	± 10°	–	± 8°	± 10°	–	± 7°	± 5°	± 7° or ± 10° (4)	± 5°
Materials		Case	ULTEM®			Nickel plated brass	ULTEM®	ULTEM®	Valox®	Valox®	ULTEM®	ULTEM®
			Stainless steel 303 for XX630AS1●●●●									
		Sensing face (5)	Epoxy			Epoxy	Silicone	Silicone	Epoxy	Epoxy	Silicone	Epoxy
Connection		Connector	M8, 4-pin	M8, 3-pin	M8, 4-pin	M12, 4-pin	M12, 4-pin	M12, 4-pin	M12, 4-pin	M12, 4-pin	M12, 4-pin	M12, 4-pin
		Pre-cabled (wire c.s.a.)	–	–	–	3 x 0.34 mm ² /AWG 22	–	–	4 x 0.08 mm ² /AWG 28	–	–	–

(1) Only XX518A3● sensors are cCSAus certified.
 (2) Only XX6V3A1●, XX630A1●, XX630A2●, XX630S1● and XX630A3● sensors are cCSAus certified.
 (3) The first value is given for XX●18A3●, the second value for XX●18A4●.
 (4) The first value is given for XX630A1● and XX630S1●, the second value for XX630A2●.
 (5) Silicone face for optimum chemical resistance.



Ultrasonic sensors

OsiSense XX, General purpose
Cylindrical, plastic or metal
DC supply, solid-state output

Sensor type		XX5 12A1●	XX5 12A2●	XX● 12A8●	XXV 18B1●	XX5 18A1●	XX● 18A3	XX5 18A3●	XX6 V3A1●	XX630A1● XX630A2● XX630S1●	XX6 30A3●	
Supply characteristics												
Rated supply voltage	V	12...24 V --- with protection against reverse polarity										
Voltage limits (including ripple)	V	10...28 V ---			10...36 V ---	10...28 V ---						
Current consumption, no-load	mA	25	50	15	60	40	40	60	50 or 100 (1)	50		
Output characteristics												
LED indicators	Output state	Yellow LED			–	–	Yellow LED					
	Power on	Green LED			–	–	Green LED					
	Setting-up assistance	–	–	–	–	–	Multicolour LED					
Switching capacity (with overload and short-circuit protection)	mA	< 100			< 200	< 100						
Voltage drop	V	< 1 (NPN); < 1.5 (PNP); 1.1 for XX●12A8, < 2 for XXV18B1●; 0.5 for XX630A2●										
Maximum switching frequency	Hz	125	125	125	80	80	40	40	70	10 or 16 (1)	2	
Delays	First-up	ms	20	20	20	5	350	100	100	75	720	800
	Response	ms	2	3	0.4	4	3	10	10	15	20 or 25 (1)	200
	Recovery	ms	2	3	0.4	4	3	10	10	75	20	200
Environment characteristics												
Degree of protection	Conforming to IEC 60529 and IEC 60947-5-2	IP 67			IP 65, IP 67 or IP 69K (2)	IP 67	IP 67	IP 67	IP 67	IP 65 or IP 67 (1)	IP 67	
Storage temperature	°C	- 40...+ 80										
Operating temperature	°C	- 20...+ 65			0...+ 60	0...+ 50	0...+ 60	- 20...+ 65	0...+ 70	0...+ 60 or 0...+ 50 (1)	- 20...+ 60	
Vibration resistance	Conforming to IEC 60068-2-6	Amplitude ± 1 mm (f = 10...55 Hz); ± 2 mm for XXV18B1●										
Mechanical shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms, in all 3 axes 50 gn, duration 11 ms, in all 3 axes for XXV18B1●										
Resistance to electromagnetic interference		Conforming to IEC 60947-5-2										

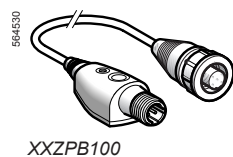
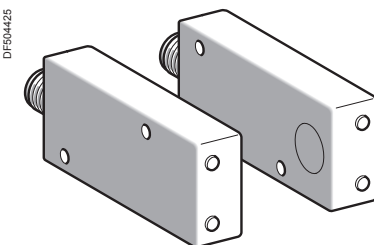
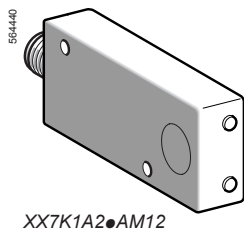
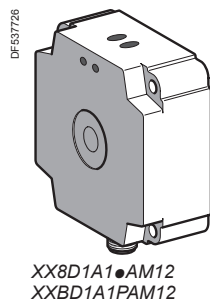
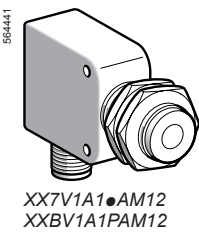
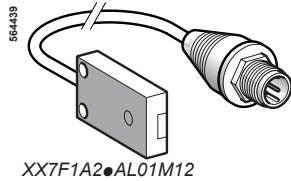
(1) The first value is given for XX630A1● and XX630S1●, the second value for XX630A2●.
(2) Double insulation for pre-cabled sensors. IP 69K for sensors with M12 connector.



Ultrasonic sensors

OsiSense XX, General purpose

Flat format, plastic
DC supply, solid-state output



Diffuse system

Fixed sensing distance sensors

Sensors	Sensing distance (Sn)	Function/output	Connection	Reference	Weight
mm	m				kg
7.6 x 19 x 33	0.10	NO/NPN	152 mm flying lead + M12 connector	XX7F1A2NAL01M12	0.040
		NO/PNP	152 mm flying lead + M12 connector	XX7F1A2PAL01M12	0.040
16 x 30 x 74	0.25	NO/NPN	M12 connector	XX7K1A2NAM12	0.050
		NO/PNP	M12 connector	XX7K1A2PAM12	0.050

Adjustable sensing distance sensors

Sensors	Sensing distance (Sn)	Function/output	Connection	Reference	Weight
mm	m				kg
18 x 33 x 60 + Ø 18	0.50 (adjustable)	NO/NPN	M12 connector	XX7V1A1NAM12	0.060
		NO/PNP	M12 connector	XX7V1A1PAM12	0.060
80 x 80 x 34	1 (adjustable)	NO/NPN	M12 connector	XX8D1A1NAM12	0.300
		NO/PNP	M12 connector	XX8D1A1PAM12	0.300

Reflex system

Adjustable sensing distance sensors

Sensors	Sensing distance (Sn)	Function/output	Connection	Reference	Weight
mm	m				kg
18 x 33 x 60 + Ø 18	0.50 (adjustable)	NO/PNP	M12 connector	XXBV1A1PAM12	0.060
80 x 80 x 34	1 (adjustable)	NO/PNP	M12 connector	XXBD1A1PAM12	0.300

Thru-beam system

Sensors	Sensing distance (Sn)	Function/output	Connection	Reference	Weight
mm	m				kg
7.6 x 19 x 33					
Transmitter	0.20		152 mm flying lead + M12 connector	XXTF1A8M12L	0.030
Receiver	0.20	NO/PNP + NO/NPN	152 mm flying lead + M12 connector	XXRF1A8KAM12L	0.030
		NC/PNP + NC/NPN	152 mm flying lead + M12 connector	XXRF1A8KBM12L	0.030
16 x 30 x 74					
Transmitter	0.61		M12 connector	XXTK1A3M12	0.060
Receiver	0.61	NO/PNP + NO/NPN	M12 connector	XXRK1A3KAM12	0.060
		NC/PNP + NC/NPN	M12 connector	XXRK1A3KBM12	0.060
Transmitter	1		M12 connector	XXTK1A4M12	0.060
Receiver	1	NO/PNP + NO/NPN	M12 connector	XXRK1A4KAM12	0.060
		NC/PNP + NC/NPN	M12 connector	XXRK1A4KBM12	0.060

Accessories

Description	For use with sensor	Reference	Weight kg
Teach pushbutton Selection of detection window Length of cable: 152 mm Input: M12 female connector Output: M12 male connector	XX7V1A1●AM12, XX8D1A1●AM12, XXBV1A1●AM12 and XXBD1A1●AM12	XXZPB100	0.035

Other connection and fixing accessories

See page 6/24.

Ultrasonic sensors

OsiSense XX, General purpose
Flat format, plastic
DC supply, solid-state output

Sensor type	XX7F●	XXTF● XXRF●	XX7K●	XXTK● XXRK●	XX7V● XXBV1●	XX8D● XXBD●
General characteristics						
Conformity to standards	CE, IEC 60947-5-2					
Product certifications	UL, cCSAus	UL	cCSAus	UL	UL, cCSAus (1)	UL, cCSAus (1)
Nominal sensing distance (Sn)	m 0.1	0.2	0.25	0.6 (XX●K1A3) 1 (XX●K1A4)	0.5	1
Blind zone (in diffuse mode the object is not detected in this zone, in reflex mode the background is not detected in this zone)	mm 0...6.4	–	0...51	–	0 ... 51 (XX7V1●) 0 ... 165 (XXBV1●)	0 ... 100 (XX8D●) 0 ... 315 (XXBD●)
Detection window	Fixed	Fixed	Fixed	Fixed	Remotely adjustable or by using teach button	
Detection system						
Diffuse	●	–	●	–	●	●
Reflex	–	–	–	–	●	●
Thru-beam	–	●	–	●	–	–
Transmission frequency	kHz 500	500	500	200	300	180
Differential travel	mm < 0.7	–	< 0.35	–	< 2.5	< 2.5
Repeat accuracy	mm ± 0.7	± 0.79	± 0.7	± 0.79	± 1.27	± 1.6
Overall beam angle (see detection lobe)	14°	10°	14°	20°	12°	7°
Minimum size of object to be detected	Cylinder Ø 2.5 mm or flat bar 1 mm wide up to 50 mm	Cylinder Ø 12.2 mm at a distance of 200 mm	Cylinder Ø 1.6 mm up to 76 mm	XX●K1A3: Cylinder Ø 38 mm at a sensing distance of 600 mm XX●K1A4: Cylinder Ø 114 mm at a distance of 1 m	Cylinder Ø 2.5 mm or flat bar 1 mm wide for a sensing distance of 150 mm	Cylinder Ø 50 mm up to 1 m
Materials						
Case	ULTEM®	ULTEM®	ULTEM®	ULTEM®	Valox®	Valox®
Sensing face (2)	Epoxy	Epoxy	Silicone	Silicone	Epoxy	Epoxy
Connection						
Connector	M12, 4-pin, on 152 mm flying lead	M12, 4-pin, on 152 mm flying lead	M12, 4-pin	M12, 4-pin	M12, 4-pin	M12, 4-pin

Supply characteristics							
Rated supply voltage	V	12...24 V --- with protection against reverse polarity					
Voltage limits (including ripple)	V	10...28 V ---					
Current consumption, no-load	mA	25	50	60	XX●K1A3: 60 XX●K1A4: 100	40	70

Output characteristics							
LED indicators		Yellow LED					
Output state		Green LED					
Power on		Green LED					
Setting-up assistance		–	–	–	–	Multicolour LED	
Switching capacity (PNP and NPN)	mA	< 100, NO or NC function					
Voltage drop (PNP and NPN)	V	< 1	< 1.1	< 1	< 1	< 1	
Maximum switching frequency	Hz	100	125	80	125	40	72
Delays							
First-up	ms	20	20	350	200	100	75
Response	ms	4	4	5	5	10	15
Recovery	ms	4	4	5	5	10	75

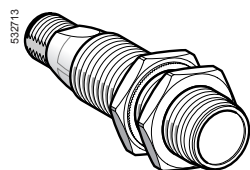
Environment characteristics						
Degree of protection	Conforming to IEC 60529 and IEC 60947-5-2	IP 67				
Storage temperature	°C	- 40...+ 80				
Operating temperature	°C	- 20...+ 65	0...+ 50	- 20...+ 65	- 20...+ 65	0...+ 70
Vibration resistance	Conforming to IEC 60068-2-6	Amplitude ± 1 mm (f = 10...55 Hz)				
Mechanical shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms, in all 3 axes				
Resistance to electromagnetic interference		Conforming to IEC 60947-5-2				

(1) Only XX7V● and XX8D● sensors are cCSAus certified.
(2) Silicone face for optimum chemical resistance.

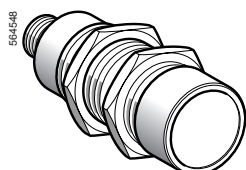
Ultrasonic sensors

OsiSense XX, Application

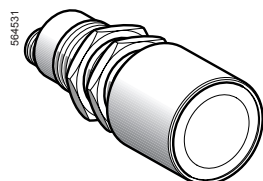
Plastic case, cylindrical type and flat format
Sensors with analogue output signal 0...10 V
or 4-20 mA



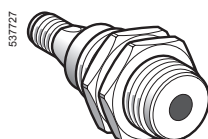
XX918A3●●M12



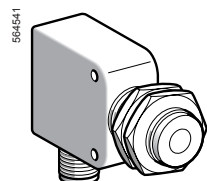
XX930A1A●M12



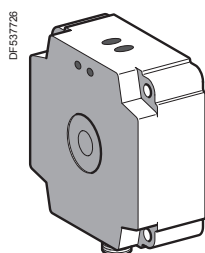
XX930A3A●M12



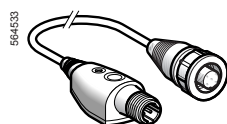
XX9V3A1●●M12



XX9V1A1●●M12



XX9D1A1●●M12



XXZPB100

Cylindrical sensors

Sensors	Sensing distance (Sn) m (adjustable)	Analogue output (Slope selection using teach button)	Reference	Weight kg
Standard analogue output				
Ø 18	0.5	4-20 mA	XX918A3C2M12	0.033
		0-10 V	XX918A3F1M12	0.033
Ø 30	1	4-20 mA	XX930A1A2M12	0.095
		0-10 V	XX930S1A2M12 (1)	0.095
		0-10 V	XX930A1A1M12	0.095
	2	4-20 mA	XX930S1A1M12 (1)	0.095
		0-10 V	XX9V3A1C2M12	0.090
		0-10 V	XX9V3A1F1M12	0.090
8	4-20 mA	0-10 V	XX930A2A2M12	0.095
		0-10 V	XX930A2A1M12	0.095
8	4-20 mA	0-10 V	XX930A3A2M12	0.115
		0-10 V	XX930A3A1M12	0.115

250 ms delayed analogue output (for unstable object)

Ø 30	1	4-20 mA	XX930A1A2230M12	0.095
		0-10 V	XX930A1A1230M12	0.095
	2	4-20 mA	XX930A2A2230M12	0.095
		0-10 V	XX930A2A1230M12	0.095

Flat format sensors

Sensors	Sensing distance (Sn) m (adjustable)	Analogue output (Slope selection using teach button)	Reference	Weight kg
18 x 33 x 65 + Ø 18	0.5	4-20 mA	XX9V1A1C2M12	0.090
		0-10 V	XX9V1A1F1M12	0.060
80 x 80 x 34	1	4-20 mA	XX9D1A1C2M12	0.300
		0-10 V	XX9D1A1F1M12	0.300

Accessories

Teach pushbutton

Teach pushbutton	For use with sensors	Reference	Weight kg
Selection of detection window	XX918A●	XXZPB100	0.035
Length of cable: 152 mm	XX9V3A●		
Input: M12 female connector	XX9D1A●		
Output: M12 male connector			

Other connection and fixing accessories

See page 6/24.

(1) Stainless steel 303 case.

Ultrasonic sensors

OsiSense XX, Application

Plastic case, cylindrical type and flat format

Sensors with analogue output signal 0...10 V or 4-20 mA

Sensor type		XX918A3●	XX9V1A1●	XX930A1● XX930A2● XX930S1●	XX930A3●	XX9V3A1●	XX9D1A1●		
General characteristics									
Conformity to standards		CE, IEC 60947-5-2							
Product certifications		UL, cCSAus		UL, cCSAus					
Nominal sensing distance (Sn)		m	0.5	0.5	1 or 2 (1)	8	1	1	
Blind zone (no object must pass through this zone whilst the sensor is operating)		mm	0...51		0...51 or 0...120 (1)	0...203	0...100	0...100	
Detection window		mm	Remotely adjustable or by using external teach button		Adjustable using teach button on sensor		Remotely adjustable or by using external teach button		
Transmission frequency		kHz	300	200	75	180	180		
Repeat accuracy		mm	1.27	± 0.9		± 2.54	± 0.9	± 1.6	
Overall beam angle (see detection lobe)			6°	10°	16°	7°	7°		
Minimum size of object to be detected			Cylinder Ø 2.5 mm or flat bar 1 mm wide for a sensing distance of 150 mm	Cylinder Ø 1.6 mm up to a sensing distance of 635 mm	Cylinder Ø 50.68 mm up to a sensing distance of 4732 mm	Cylinder Ø 50 mm up to a sensing distance of 1 m	Cylinder Ø 50 mm up to a sensing distance of 1 m		
Deviation angle from 90° of the object to be detected			± 7°	± 8°	± 5°	± 5°	± 5°		
Materials		Case	Valox®		ULTEM®: XX930A1● and XX930A2● Stainless steel 303: XX930S1●	ULTEM®	Valox®	Valox®	
		Sensing face (2)	Epoxy	Silicone	Epoxy				
Connection		Connector	M12, 4-pin						
Supply characteristics									
Rated supply voltage (with protection against reverse polarity)		V	12...24 V $\overline{\text{---}}$		15...24 V $\overline{\text{---}}$	15...24 V $\overline{\text{---}}$	15...24 V $\overline{\text{---}}$	15...24 V $\overline{\text{---}}$	
Voltage limits (including ripple)		V	10...28 V $\overline{\text{---}}$						
Current consumption, no-load		mA	40	40	60 or 80 (1)	60	60	70	
Output characteristics									
Slope type			Direct or inverse by using teach button, see page 6/31.						
LED indicators		Output state	Yellow LED						
		Power on	Green LED						
		Setting-up assistance	Dual colour LED						
Delays		First-up	ms	100	100	720	1200	75	75
Recovery time			ms	150	150	250 (delayed) 50 (standard)	250	180	180
Resistive load impedance		4-20 mA	Ω	10...500		10...500	10...350	10...350	
		0-10 V	Ω	1 k...∞		1 k...∞	2 k...∞	2 k fixed	
Environment characteristics									
Degree of protection		Conforming to IEC 60529 and IEC 60947-5-2		IP 67	IP 67	IP 65	IP 67	IP 67	
Storage temperature			°C	- 40...+ 80					
Operating temperature			°C	- 20...+ 65	0...+ 50	- 20...+ 60	0...+ 70	0...+ 70	
Vibration resistance		Conforming to IEC 60068-2-6		Amplitude ± 1 mm (f = 10...55 Hz)					
Mechanical shock resistance		Conforming to IEC 60068-2-27		30 gn, duration 11 ms, in all 3 axes					
Resistance to electromagnetic interference				Conforming to IEC 60947-5-2					

(1) The first value is given for XX930A1● and XX930S1●, the second value for XX930A2●.

(2) Silicone face for optimum chemical resistance.

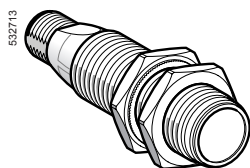
Ultrasonic sensors

OsiSense XX, Application

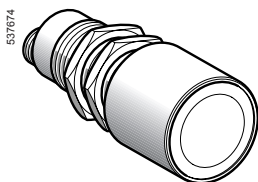
Sensors for monitoring 2 levels

Cylindrical plastic case, M18 x 1 and M30 x 1.5

DC supply, solid-state output



XX218A3●●M12



XX230A●1/●2●●●00M12

Sensors for monitoring levels

Sensors	Sensing distance (Sn)	Function/output	Reference	Weight
				kg
Ø 18, threaded M18 x 1				
2 emptying levels	0.5 (adjustable)	NO/NPN	XX218A3NHM12	0.035
		NO/PNP	XX218A3PHM12	0.035
2 filling levels	0.5 (adjustable)	NO/NPN	XX218A3NFM12	0.035
		NO/PNP	XX218A3PFM12	0.035
Ø 30, threaded M30 x 1.5				
2 levels 2 independent outputs	1 (adjustable)	NO/NPN + NO/NPN	XX230A12NA00M12	0.090
		NO/PNP + NO/PNP	XX230A12PA00M12	0.090
	2 (adjustable)	NO/NPN + NO/NPN	XX230A22NA00M12	0.090
		NO/PNP + NO/PNP	XX230A22PA00M12	0.090
2 emptying levels	1 (adjustable)	NO/PNP + NO/PNP	XX230A10PA00M12	0.090
	2 (adjustable)	NO/PNP + NO/PNP	XX230A20PA00M12	0.090
2 filling levels	1 (adjustable)	NO/PNP + NO/PNP	XX230A11PA00M12	0.090
	2 (adjustable)	NO/PNP + NO/PNP	XX230A21PA00M12	0.090

Accessories

Teach pushbutton

Teach pushbutton	For use with sensors	Reference	Weight	
				kg
Selection of detection window Length of cable: 152 mm Input: M12 female connector Output: M12 male connector	XX218A3●	XXZPB100	0.035	

Other connection and fixing accessories

See page 6/24.

Ultrasonic sensors

OsiSense XX, Application

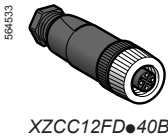
Sensors for monitoring 2 levels

Cylindrical plastic case, M18 x 1 and M30 x 1.5

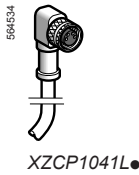
DC supply, solid-state output

Sensor type		XX218A3●●●●	XX230A1●●●●	XX230A2●●●●
General characteristics				
Conformity to standards		CE, IEC 60947-5-2		
Product certifications		UL, cCSAus	UL, cCSAus	UL, cCSAus
Nominal sensing distance (Sn)		m 0.50 (adjustable)	1 (adjustable)	2 (adjustable)
Blind zone (no object must pass through this zone whilst the sensor is operating)		mm 0...51	0...51	0...120
Detection window		Remotely adjustable or by using external teach button	Adjustable using teach button on sensor	
Transmission frequency		kHz 300	200	
Differential travel		mm < 2.5	< 2.5	< 2.5
Repeat accuracy		mm ± 1.27	± 0.9	
Overall beam angle (see detection lobe)		6°	10°	10°
Minimum size of object to be detected		Cylinder Ø 2.5 mm up to a sensing distance of 150 mm	Cylinder Ø 1.6 mm up to a sensing distance of 305 mm	
Deviation angle from 90° of the object to be detected		± 7°	± 10° on 305 x 305 mm	
Materials	Case	Valox®	ULTEM®	
	Sensing face (1)	Epoxy	Silicone	
Connection	Connector	M12, 4-pin		
Supply characteristics				
Rated supply voltage		V 12...24 V $\overline{\text{---}}$ with protection against reverse polarity		
Voltage limits (including ripple)		V 10...28 V $\overline{\text{---}}$		
Current consumption, no-load		mA 40	100	
Output characteristics				
LED indicators	Output state		Yellow LED	Multicolour LED
	Power on		Green LED	–
	Setting-up assistance		Dual colour LED	Multicolour LED
	Distance indication		–	Yellow LED
Switching capacity		mA < 100 (PNP and NPN) with overload and short-circuit protection		
Voltage drop		V < 1 (PNP and NPN)		
Delays	First-up	ms 100	1000	1000
	Response	ms 15	150	150
	Recovery	ms 1000	1000	1000
Environment characteristics				
Degree of protection		Conforming to IEC 60529 and IEC 60947-5-2	IP 67	IP 65
Storage temperature		°C - 40...+ 80	- 10...+ 80	
Operating temperature		°C - 20...+ 65	0...+ 50	
Vibration resistance		Conforming to IEC 60068-2-6	Amplitude ± 1 mm (f = 10...55 Hz)	
Mechanical shock resistance		Conforming to IEC 60068-2-27	30 gn, duration 11 ms, in all 3 axes	
Resistance to electromagnetic interference			Conforming to IEC 60947-5-2	

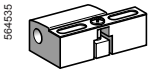
(1) Silicone face for optimum chemical resistance.



XZCC12FD40B



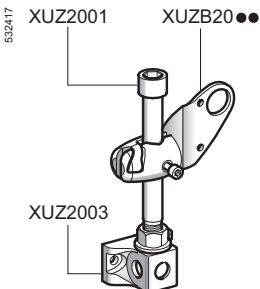
XZCP1041L



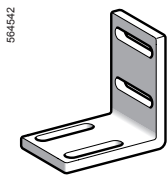
XSZB11



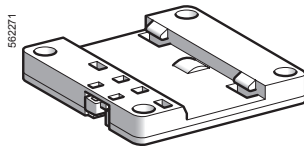
XUZA118



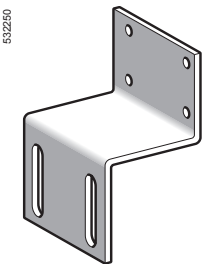
3D fixing kit example



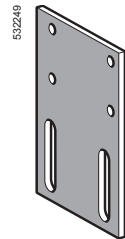
XXZ1933



XSZBD10



XXZ3074S



XXZ3074F

References of accessories

Cabling accessories

Connectors	For use with sensor	Type of connection		Reference	Weight kg
M8 3-pin	Ø 12 XX512A2	(Insulation Displacement Connector)	Straight	XZCC8FDM30V	0.010
			Elbowed	XZCC8FCM30V	0.010
M8 4-pin	XX512A1 XX12A8		Straight	XZCC8FDM40V	0.010
			Elbowed	XZCC8FCM40V	0.010
M12	Ø 18, Ø 30	Screw terminals, metal clamping ring	Straight	XZCC12FDM40B	0.020
			Elbowed	XZCC12FCM40B	0.020
		Screw terminals, plastic clamping ring	Straight	XZCC12FDP40B	0.020
			Elbowed	XZCC12FCP40B	0.020

Pre-wired connectors	For use with sensor	Type	Cable length m	Reference	Weight kg
M8 3-pin	Ø 12 XX512A2	Straight	2	XZCP0166L2 (1)	0.080
		Elbowed	2	XZCP0266L2 (1)	0.080
M12	Ø 18, Ø 30	Straight	2	XZCP1141L2 (1)	0.090
		Elbowed	2	XZCP1241L2 (1)	0.090

Fixing accessories

Description	For use with sensor	Reference	Weight kg	
Fixing clamps	Ø 12	XSZB112	0.006	
	Ø 18	XSZB118	0.010	
	Ø 30	XSZB130	0.020	
Fixing clamps (mounting on 35 mm rail)	XXD	XSZBD10	0.065	
90° fixing bracket	Ø 12	XXZ12	0.025	
	Ø 18	XUZA118	0.038	
	Ø 30	XXZ30	0.115	
	XX7F	XXZ1933	0.025	
Flat mounting plate	XX7K	XXZ3074F	0.025	
Cranked mounting plate	XX7K	XXZ3074S	0.075	
3D fixing kit (2)	M12 rod	Ø 12, Ø 18 and Ø 30	XUZ2001	0.050
	Support for M12 rod	Ø 12, Ø 18 and Ø 30	XUZ2003	0.160
	Ball-joint mounted fixing bracket	Ø 12	XUZB2012	0.175
	Ø 18	XUZB2003	0.175	
	Ø 30	XUZB2030	0.160	

(1) For a 5 m long cable replace L2 by L5, for a 10 m long cable replace L2 by L10.

(2) To obtain a 3D fixing kit, order:

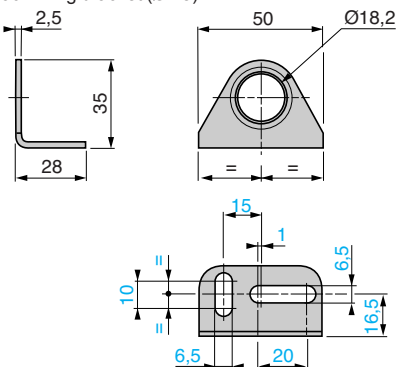
rod support XUZ2003, M12 rod XUZ2001 and ball-joint mounted fixing bracket XUZB20

Dimensions

Fixing accessories

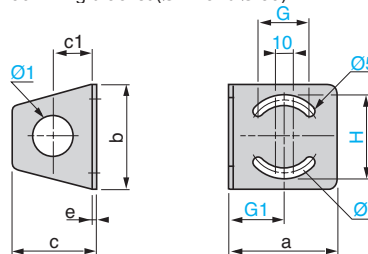
XUZA118

90° fixing bracket (Ø 18)



XXZ12, XXZ30

90° fixing bracket (Ø 12 and Ø 30)



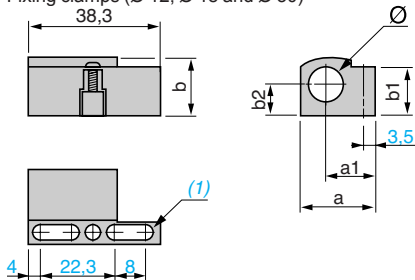
XXZ	a	b	c	c1	e	H	G	G1	Ø	Ø1
12	35	40	33	18	2	31	18	18	25	13
30	67	65	52	25	3	51	35	33	50	31

Dimensions (continued)

Fixing accessories (continued)

XSZB112, XSZB118

Fixing clamps (Ø 12, Ø 18 and Ø 30)

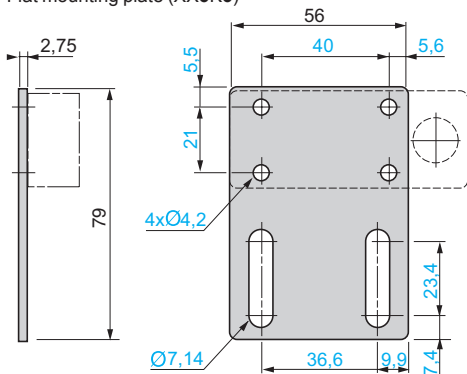


XSZ	a	a1	b	b1	b2	Ø
B112	21.9	14.5	16	15.5	8.5	12
B118	26	15.7	22.3	20.1	11.5	18
B130	39	21.7	35.5	31	18.5	30

(1) 2 elongated holes Ø 4 x 8.

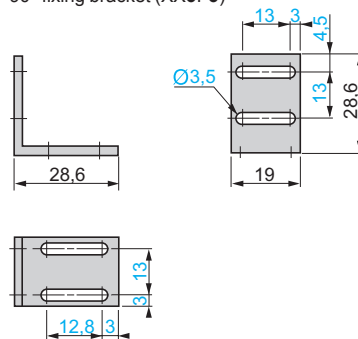
XXZ3074F

Flat mounting plate (XX●K●)



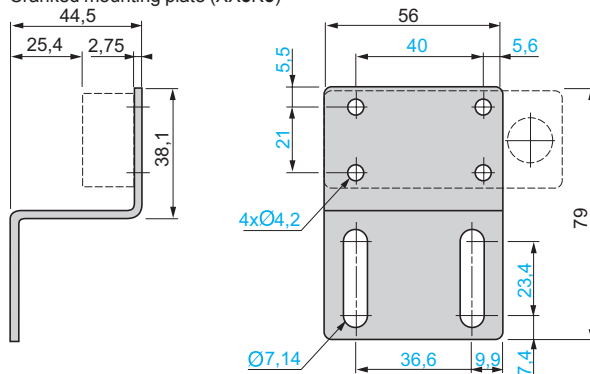
XXZ1933

90° fixing bracket (XX●F●)



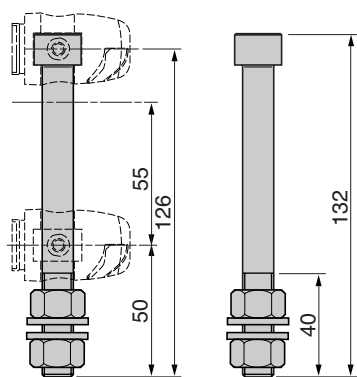
XXZ3074S

Cranked mounting plate (XX●K●)



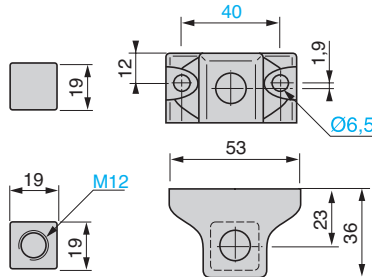
XUZ2001

M12 rod

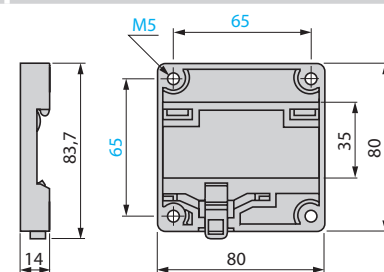


XUZ2003

Support for M12 rod

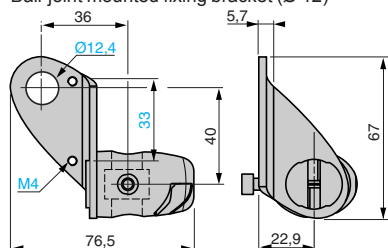


XSZBD10



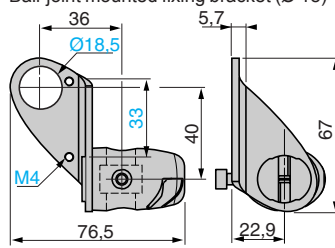
XUZB2012

Ball-joint mounted fixing bracket (Ø 12)



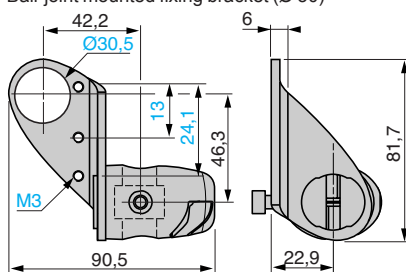
XUZB2003

Ball-joint mounted fixing bracket (Ø 18)



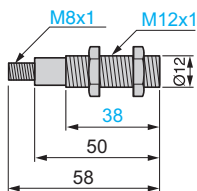
XUZB2030

Ball-joint mounted fixing bracket (Ø 30)

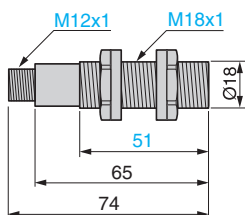


Dimensions

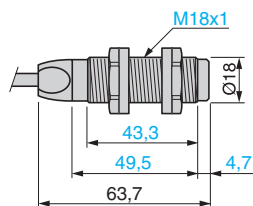
XX●12A●●●M8



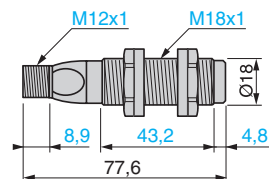
XX518A1KAM12
XXT18A●M12
XXR18A●●●●



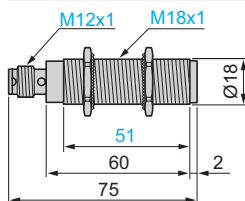
XX518A3●●L2



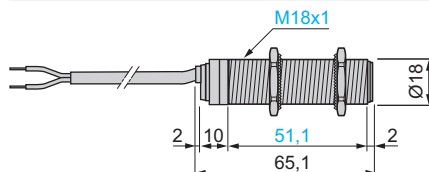
XX518A3●AM12
XXB18A3●AM12
XX918A3●AM12
XX218A3●●M12



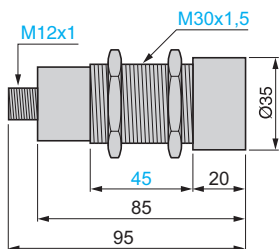
XXV18B1●●●M12



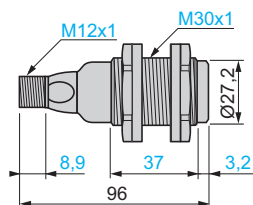
XXV18B1●●L●



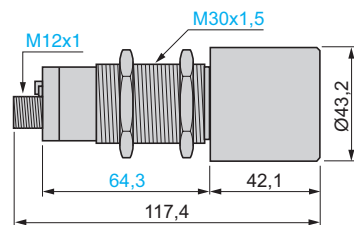
XX630A1●●M12
XX630S1●●M12
XX630A2●●M12
XX930A1A●M12
XX230A1●●A00M12
XX230A2●●A00M12



XX6V3A1●AM12
XXBV3A1●AM12
XX9V3A1●●M12



XX630A3●●M12
XX930A3A●M12

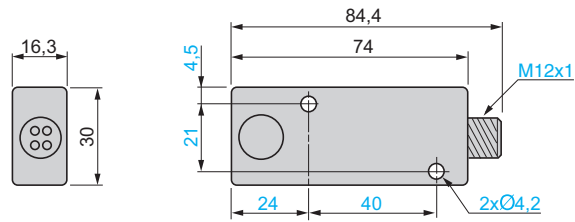
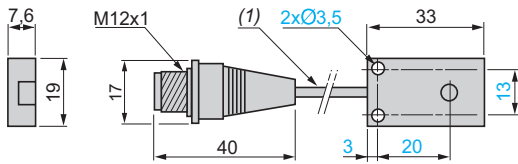


6

Dimensions

XX7F1A2●AL01M12
XXTF1A8●/XXR F1A8●

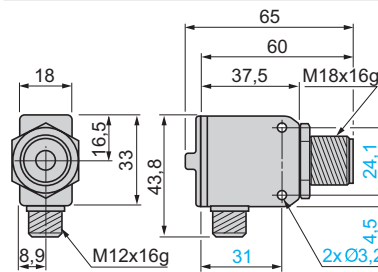
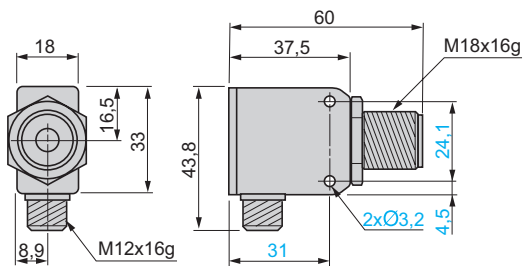
XX7K1A2●AM12
XXTK1A3●/A4●, XXRK1A3●/A4●



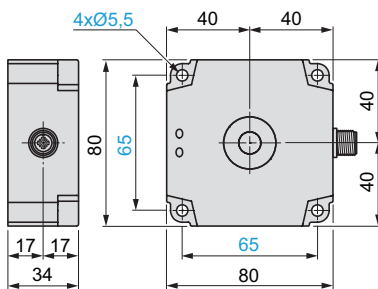
(1) Cable, length: 152 mm.

XX7V1A1●AM12
XXBV1A1●AM12

XX9V1A1●●M12

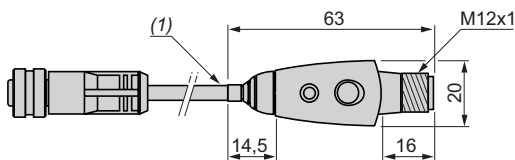


XX8D1A1●AM12
XXBD1A1●AM12
XX9D1A1●●AM12



XXZPB100

Teach pushbutton

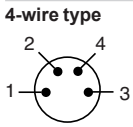


(1) Cable, length: 152 mm.

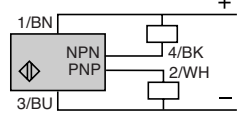
Schemes

Digital output, Ø 12 sensor, M8 connector

XX512A1KAM8



NO outputs, PNP and NPN

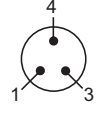


1 (+) 2 PNP output
3 (-) 4 NPN output

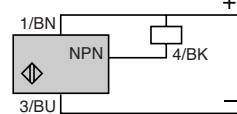
(-) BU (Blue) (+) BN (Brown)
WH (White) BK (Black)

XX512A2●

3-wire type



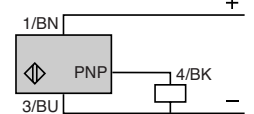
NO outputs, NPN



1 (+) 3 (-)
4 NPN or PNP output

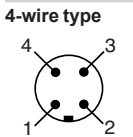
(-) BU (Blue) (+) BN (Brown)
BK (Black)

NO outputs, PNP

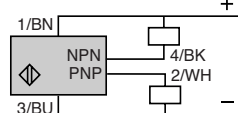


Digital output, Ø 18 sensor, M12 connector, Ø 30 (XX6V3●, XXBV3●)

XX518A1KAM12



NO outputs, PNP and NPN

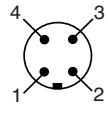


1 (+) 2 PNP output
3 (-) 4 NPN output

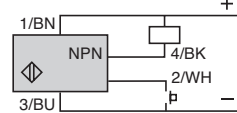
(-) BU (Blue) (+) BN (Brown)
WH (White) BK (Black)

XX518A3●, XXB18A3●, XX6V3●, XXBV3●, XX218A3●, XX7V1●, XXBV1●, XX8D1●, XXBD1●

3-wire type



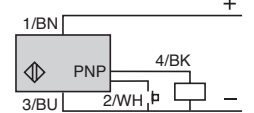
NO outputs, NPN



1 (+) 2 Teach input (WH)
3 (-) 4 NPN or PNP output

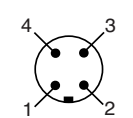
(-) BU (Blue) (+) BN (Brown)
BK (Black)

NO outputs, PNP

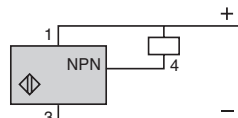


XXV18B1●●●M12

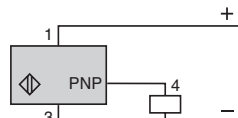
3-wire type



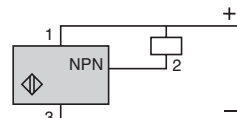
NO outputs, NPN



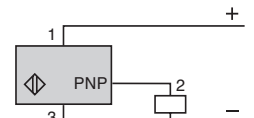
NO outputs, PNP



NC outputs, NPN



NC outputs, PNP

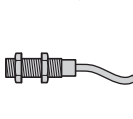


1 (+)
3 (-)

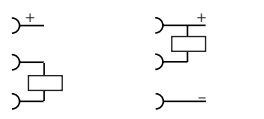
Digital output, Ø 18 sensor, pre-cabled

XXV18B1●●●L●

3-wire type



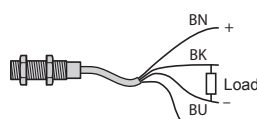
PNP/NO, NC NPN/NO, NC



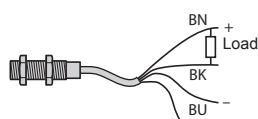
(-) BU (Blue) (+) BN (Brown) BK (Black)

XX518A3●●●L2

PNP output



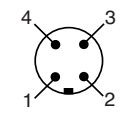
NPN output



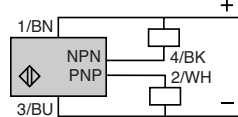
Digital output, Ø 30 sensor, M12 connector (XX630A●)

XX630A1KAM12

4-wire type



NO outputs, PNP and NPN

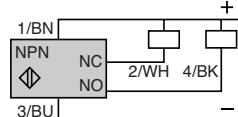


1 (+) 2 PNP output
3 (-) 4 NPN output

(-) BU (Blue) (+) BN (Brown)
WH (White) BK (Black)

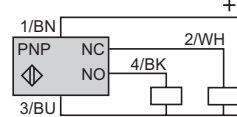
XX630A●●●M12

NO + NC outputs, NPN



(-) BU (Blue) (+) BN (Brown)
WH (White) BK (Black)

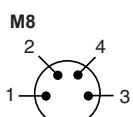
NO + NC outputs, PNP



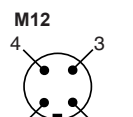
Thru-beam sensors: XXT12●/XXR12●, XXT18●/XXR18●, XXTF1●/XXRF1●, XXTK1●/XXRK1●

Transmitter

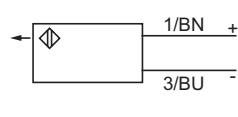
XXT12A8M8, XXT18A3M12, XXTF1A8M12L, XXTK1A●M12



1 (+)
3 (-)

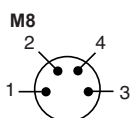


1 (+)
3 (-)

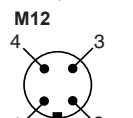


Receiver

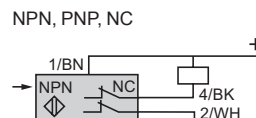
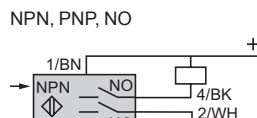
XXR12A8K●M8, XXRF1A8●K●M12L, XXRK1A●K●M12



1 (+)
2 (PNP)
3 (-)
4 (NPN)



1 (+)
2 (PNP)
3 (-)
4 (NPN)

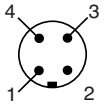


Note: See "NO output/NC output according to the detection mode" table on page 6/29.

Schemes (continued)

M12 connector, digital output (XXF●, XXK●)

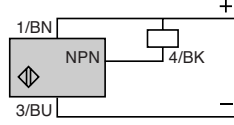
3-wire type



1 (+)
3 (-)
4 NPN or PNP output

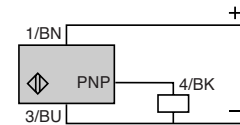
**XX7F1A2NAL01M12 (1),
XX7K1A2NAM12**

NO outputs, NPN



XX7F1A2PAL01M12 (1), XX7K1A2PAM12,

NO outputs, PNP



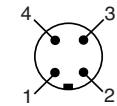
(-) BU (Blue)
(+) BN (Brown)
BK (Black)

(1) Remote connector on flying lead approximately 15 cm long.

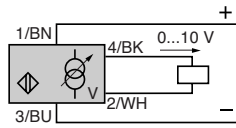
M12 connector, analogue output

XX930A●/XX930S●

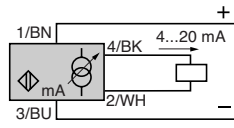
4-wire type



1 (+)
2 Return signal or teach
3 (-)
4 Output signal

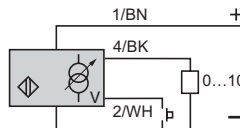


BN (Brown)
WH (White)
BU (Blue)
BK (Black)

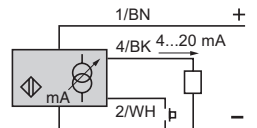


BN (Brown)
WH (White)
BU (Blue)
BK (Black)

XX918A●/XX9V1A●/XX9V3A●/XX9D1●



For impedance of resistive load refer to values on page 6/19.

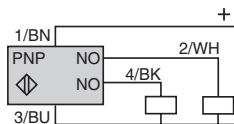
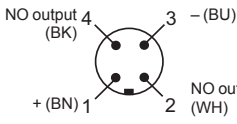


BN (Brown)
WH (White)
BU (Blue)
BK (Black)

Ø 30 sensor, 2 digital outputs for monitoring 2 levels

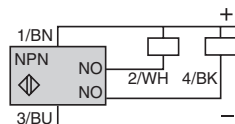
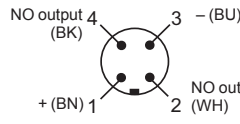
XX230A●0●/XX230A●1●

NO + NO outputs, PNP

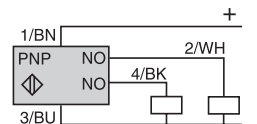


XX230A●2●

NO + NO outputs, NPN



NO + NO outputs, PNP

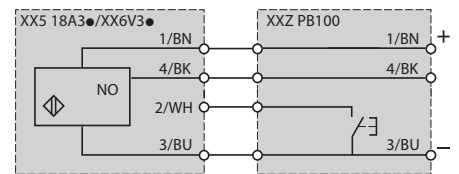
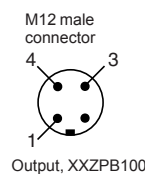
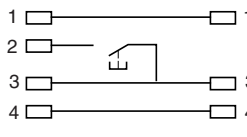
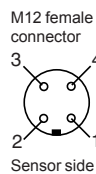
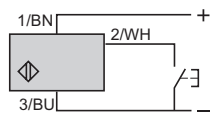


BN (Brown) WH (White) BU (Blue) BK (Black)

Wiring for teaching of detection window

Using external contact
XX●18A3●/XX●V3●/XX●D1●

With **XXZPB100**



Note: Terminal 2 must be disconnected during product use.

1 (+) BN (Brown) 3 (-) BU (Blue)
2 WH (White) 4 BK (Black)

NO output/NC output according to the detection mode

	NO output	NC output
No object present	LED ⊗	LED ☀
Diffuse mode	Output state: Closed	Output state: Open
Thru-beam mode	Output state: Closed	Output state: Open
Reflex mode (1)	Output state: Closed	Output state: Open
Object present	LED ☀	LED ⊗
Diffuse mode	Output state: Open	Output state: Closed
Thru-beam mode	Output state: Open	Output state: Closed
Reflex mode (1)	Output state: Open	Output state: Closed

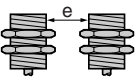
(1) Fixed background of machine
(2) Object

Setting-up precautions

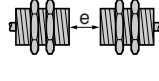
Minimum mounting distances

Diffuse sensors, cylindrical type

Side by side



Face to face

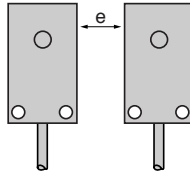


e: respect the distances indicated on the detection curves

$$e \geq 4 \times S_n$$

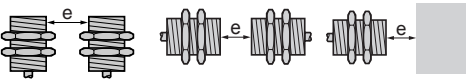
Diffuse sensors, flat format

Side by side



e: respect the distances indicated on the detection curves

XXV18●

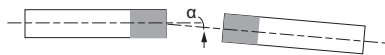


e > 25 mm

e > 700 mm

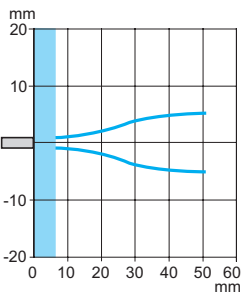
e > 60 mm

Thru-beam sensors

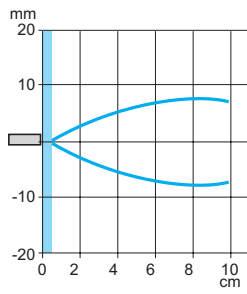


Sensors	α
XX●12●●/XX●F1●●	$\pm 5^\circ$
XX●18A3●●/XX●K1A3●●●	$\pm 8^\circ$
XX●18A4●●/XX●K1A4	$\pm 10^\circ$
XX●18A2●●/XX●K1A2	

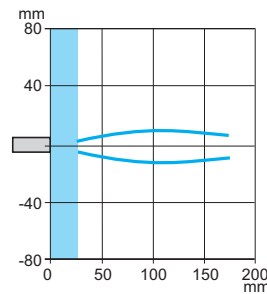
XX512A1KAM8



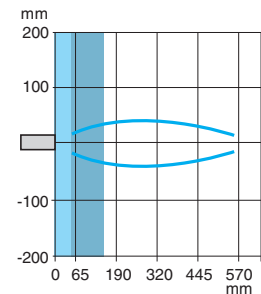
XX512A2●NAM8



XX518A1KAM12

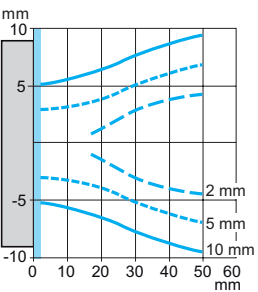


XX218A3●●M12, XX518A3●●L2,
XXB18A3●AM12, XX518A3●AM12
XX7V1A1●AM12, XXBV1A1●AM12
XX918A3●M12, XX9V1A1●M12

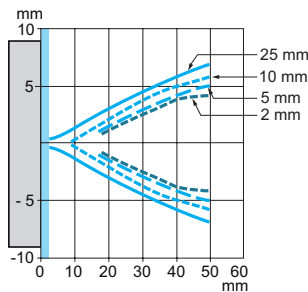


XXV18B1●

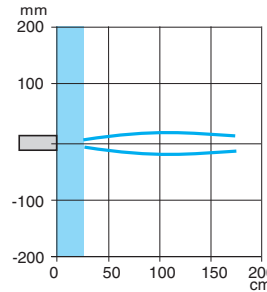
Square object



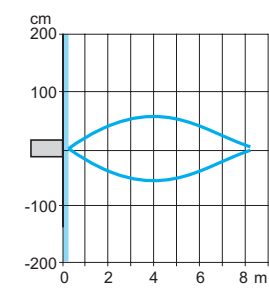
Cylindrical object



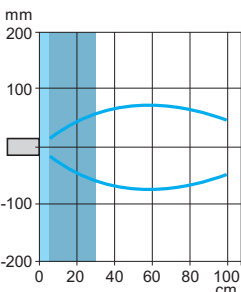
XX630A2●CM12



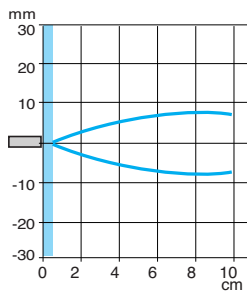
XX630A3●CM12 XX930A3●M12



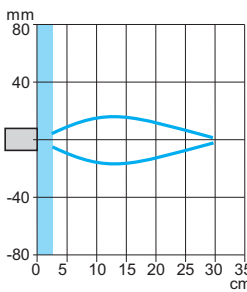
XX230A1●, XX630A1●CM12,
XX6V3A1●AM12, XXBV3A1●AM12,
XX930A1●M12, XX9V3A1●M12,
XX8D1A1●AM12, XXBD1A1●AM12



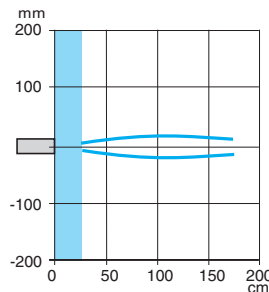
XX7F1A2●AL01M12



XX7K1A2●AM12



XX230A2●

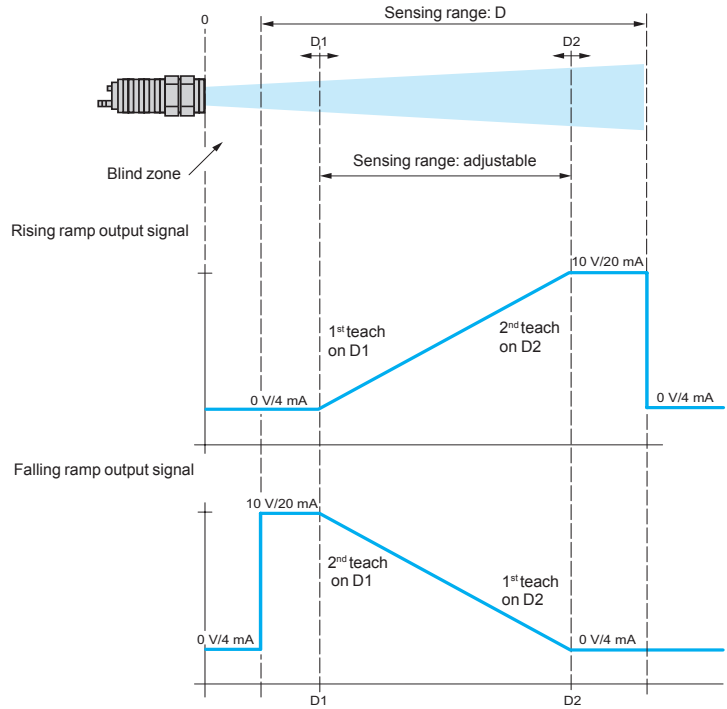


Blind zone for diffuse sensors.

Blind zone for reflex sensors.

Output signal curve

Sensors with analogue output signal 0... 10 V or 4-20 mA



The direction of the slope of the signal is obtained by teaching the first limit:
 - D1 for rising ramp
 - D2 for falling ramp

Maximum deviation < 0.5%

Operating curves

XX218A3●H●/XX230A●0●

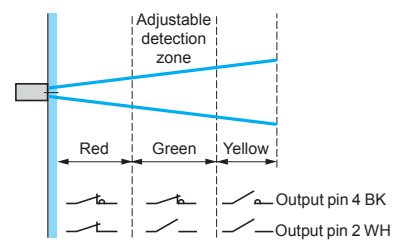
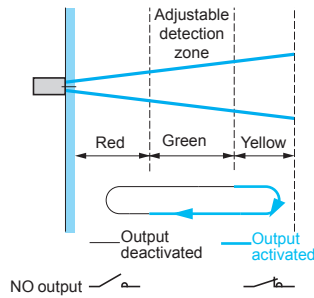
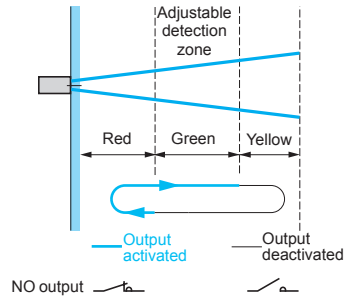
XX218A3●F●/XX230A●1●

XX230A●2●

Emptying (stored in high threshold memory)

Filling (stored in low threshold memory)

2 levels, 2 independent outputs



Note:

One output is available on the Ø 18 (XX218●)
 Two outputs are available on the Ø 30 (XX230●)



Selection guide page 7/2

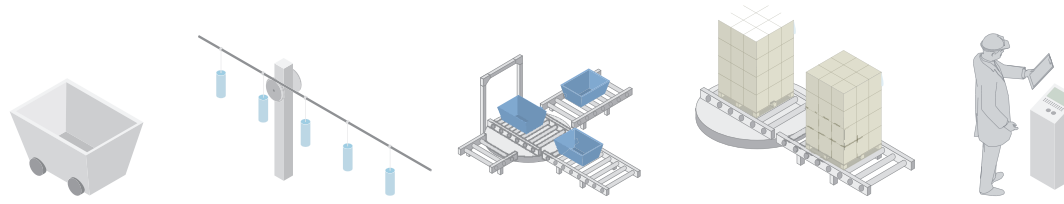
- Description..... page 7/6
- Characteristics..... page 7/16
- References page 7/18
- Dimensions page 7/22
- Connections page 7/24
- Curves..... page 7/26

Selection guide Compact smart antennas, Ø 22 mm mounting page 7/28

- Characteristics..... page 7/30
- References page 7/32

Selection guide

Material handling



Reading system	Trolley	Narrow conveyor or overhead line	Medium width conveyor	Wide conveyor	Operator
1 XGCS4901201					
2 XGCS8901201 and XGCS850C201					
3 XGCS4901201 + XGFEC540					
4 XGCS4901201 + XGFEC2525					
5 XGST2422					
RFID tags					
6 XGHB123345					
7 XGHB211345					
8 XGHB221346					
9 XGHB320345					
10 XGHB520246					
11 XGHB90E340					
12 XGHB444345					
13 XGHB320246					
14 XGHB440245					
15 XGHB440845					
16 XGHB441645					
17 XGHB443245					

7



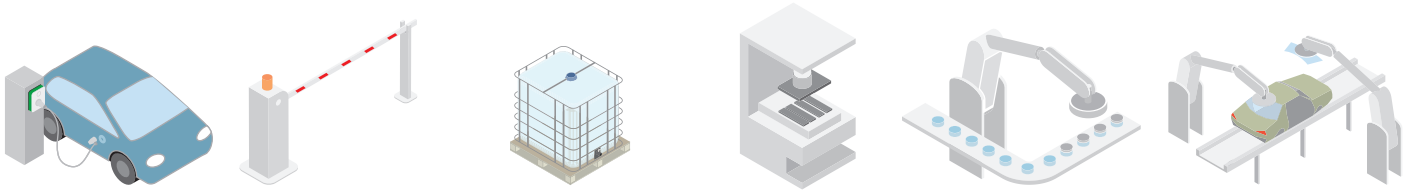
- 1 XGCS4901201
- 2 XGCS8901201 and XGCS850C201
- 3 XGCS4901201 + XGFEC540
- 4 XGCS4901201 + XGFEC2525

5 XGST2422

Access control

Traceability

Flexible assembly



Service

Vehicle

Container

Tools

Simple

Tools



Overall size of dialogue zone

Length x width (mm)	Distance (mm)											
	18	18	40	48	70	70	33	45	45	25	25	25
39 x 35	18	18	40	48	70	70	33	45	45	25	25	25
79 x 75	20	20	55	65	100	100	48	65	65	39	39	39
390 x 45	-	-	-	42	70	90	-	45	45	-	-	-
240 x 240	-	-	42	80	150	150	-	40	40	-	-	-
Memory capacity (bytes)	304	256	256	112	112	256	3408	2000	2000	8192	16384	32768



OsiSense XG

Radio frequency identification

13.56 MHz



Compact smart antenna



Electronic tags



RFID handheld terminal



Network connecting box

Presentation

RFID (Radio Frequency IDentification) refers to radio frequency identification systems. These frequencies range between 50 kHz and 2.5 GHz. The most widely used is 13.56 MHz.

The OsiSense XG RFID system makes it possible to perform traceability, object identification (tracking) and access control functions.

The information is stored in a memory that can be accessed using a simple radio frequency link. This memory is in the form of an electronic tag, which contains an antenna and an integrated circuit.

The tag contains the information associated with the object to which it is fixed. When a tag enters the field generated by the reader/smart antenna, it detects the signal and exchanges the data (read or write) between its memory and the reader/smart antenna.

The applications are numerous:

- Logistics: Goods Out, Goods In, transit, etc.
- Tracking and sorting of baggage
- Traceability in the food processing industry
- Flexible assembly lines in the automotive sector
- Automatic toll booths
- Access control, etc.

The OsiSense XG RFID system is also suitable for use in difficult environments (humidity, temperature, mechanical shock, vibration, dust, etc.).

OsiSense XG RFID system

The OsiSense XG identification system is open to the majority of ISO 18000-3, ISO 15693 and ISO 14443 electronic tags.

The OsiSense XG system integrates Modbus RTU, Uni-Telway, Modbus TCP/IP, PROFIBUS-DP and EtherNet/IP protocols.

The OsiSense XG RFID offer comprises:

- 4 models of 13.56 MHz RFID reader (read/write)
- 12 models of 13.56 MHz electronic tag
- 1 RFID handheld terminal
- 3 models of network connection box
- 2 models of field expander (accessories enabling modification of the shape of the dialogue zone between the tag and compact smart antenna)
- Connection and mounting accessories

Setup

OsiSense XG RFID readers are simple to set up:

- Integrated RFID and network functions
- No programming
- Automatic detection of the RFID electronic tags (read or write)
- Automatic setting of the communication parameters (speed, format, parity, protocol, etc.)
- Network address configuration (1 to 15) using the RFID card provided with the smart antenna or via PC software for the Ethernet smart antenna
- Read/write compatibility with the majority of 13.56 MHz tags on the market
- Low sensitivity to metal environments

Installation

OsiSense XG readers are compact and robust. They can easily be integrated into flexible manufacturing production lines:

- quick connection using M12 connector
- clip-on mounting

An extensive range of connecting cables and adaptor boxes enables OsiSense XG readers to be easily connected to communication networks.

OsiSense XG

Radio frequency identification

13.56 MHz



RFID reader: compact smart antenna, flat form 40



RFID readers: compact smart antennas, flat form 80



RFID reader: wand antenna with flexible head

Description

13.56 MHz OsiSense XG RFID readers

XGCS readers enable reading and writing of 13.56 MHz RFID tags that are compatible with standards ISO 15693 and ISO 14443 A and B.

Four models of OsiSense XG reader are available:

- Compact smart antenna, flat form 40, **XGCS4901201**:
 - Dimensions (mm): 40 x 40 x 15
 - Nominal sensing distance: 10 to 70 mm depending on the associated tag
- Compact smart antenna, flat form 80, **XGCS8901201**:
 - Dimensions (mm): 80 x 80 x 26
 - Nominal sensing distance: 20 to 100 mm depending on the associated tag
- Compact smart antenna, with the XGST2020 handheld terminal, **XGCS850C201**:
 - Dimensions (mm): 80 x 93 x 40
 - Nominal sensing distance: 20 to 100 mm depending on the associated tag
- **XGW4F111** wand antenna with flexible head for location of tags located in places that are difficult to access, with the XGST2020 handheld terminal
 - Dimensions (mm): 290 x 40 x 25

■ Functions integrated in RFID readers:

OsiSense XG RFID readers integrate functions which simplify communication between tags, readers and controllers (automation platform, PC, etc.).

These embedded functions are activated by standard requests to read/write words, sent by the automation platform:

- **Firmware version:** Polling of the reader to discover its version.
- **Reset:** The RFID reader is reinitialized and assumes its factory default configuration (network address at 1, transmission speed at 19,200 bauds, parameters deleted).
- **Init:** The reader is reinitialized and operates as it would after being switched back on (address unchanged, transmission speed unchanged, parameters deleted).
- **Sleep mode:** Transmission of the reader's electromagnetic field is only activated upon receipt of a read or write instruction. This mode reduces the reader's power consumption and prevents interference when the readers are close to one another.
- **Auto Read/Write:** This mode enables the reader to execute up to 10 read or write instructions in a tag automatically as soon as it enters the dialogue zone (up to 87 write words and up to 109 read words).

Communication

RS485 serial port

■ **XGCS4901201** and **XGCS8901201** readers, equipped with an RS485 serial port, support Modbus RTU and Unitelway protocols, enabling up to 123 words to be exchanged per read or write request.

■ The communication parameters and protocol are detected automatically. The smart antennas require no configuration.

■ Up to 15 smart antennas can be connected to the same network. All connections are made via M12 connectors, using a complete range of cables, T-connectors and network adaptors.

Ethernet

■ The **XGCS850C201** Ethernet smart antenna is equipped with two M12 connectors, enabling up to 32 smart antennas to be daisy-chained. Looping of the ring network is supported.

■ The protocols supported are Modbus/TCP and EtherNet/IP. They permit up to 123 words to be exchanged per transaction.

■ The supported I/O scanning and assembly services enable permanent access to the smart antenna status and synchronization as the tags pass in front of the smart antenna.

■ The network address parameters are easily set, using:

- dedicated software, supplied with the smart antenna (on USB stick)
- or handheld terminal **XGST2020** (from version V2.37)

OsiSense XG

Radio frequency identification

13.56 MHz



Electronic tags



Handheld terminal



Field expanders

Description (continued)

OsiSense XG RFID electronic tags

■ **XGHB** electronic tags with EEPROM or FeRAM type memory (1) offer the following advantages:

- Fast access to data
- Wide range of memory capacities
- Secure access to contents
- Batteryless operation
- Positioning flexibility
- Protection suited to the environmental conditions

The nominal transmission distance is 18 to 100 mm, depending on the tag model and associated reader.

RFID handheld terminal

The **XGST2020** RFID terminal, with firmware and wand antenna, is a powerful tool for easy and efficient operations on RFID tags.

The removable wand antenna communicates with a wide range of ISO 14443 and ISO 15693 electronic tags. It is also has a wide dialogue range of up to 70 mm.

The integrated battery provides the terminal with excellent autonomy (at least one full day of intensive use).

Field expanders

Field expanders are accessories designed to operate with OsiSense XG smart antennas. They enable the shape of the dialogue field of the **XGCS4901201** smart antenna to be adapted to conveying/handling applications.

The concept is a connection-free induction link between the smart antenna and the field expander. Two standard models are available:

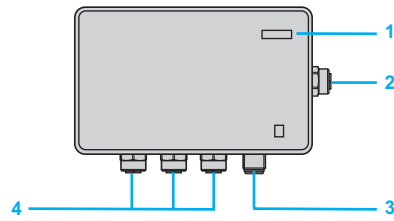
- The **XGFEC540** conveyor model detects ISO 15693 tags on a narrow strip covering the width of the conveyor (mounted between two rollers of the conveyor).
 - Dimensions (mm): 400 x 23 x 50
 - Nominal sensing distance: 30 to 90 mm depending on the associated tag
- The **XGFEC2525** universal model increases the area and distance for detection of ISO 15693 tags, which also enables higher passing speeds of the tags.
 - Dimensions: 250 x 250 x 10
 - Nominal sensing distance: 26 to 150 mm depending on the associated tag
- Read/write compatibility with the majority of 13.56 MHz ISO 15693 tags on the market
(Caution: these accessories are not compatible with ISO 14443 tags).

(1) **EEPROM** (Electrically-Erasable Programmable Read-Only Memory).
FeRAM (Ferroelectric Read-Only Memory): non-volatile RAM.

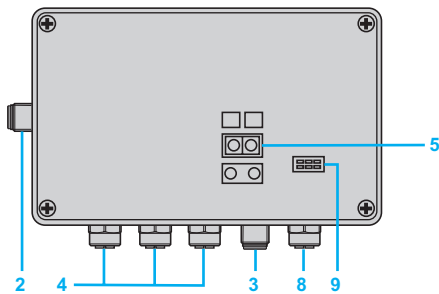
OsiSense XG

Radio frequency identification

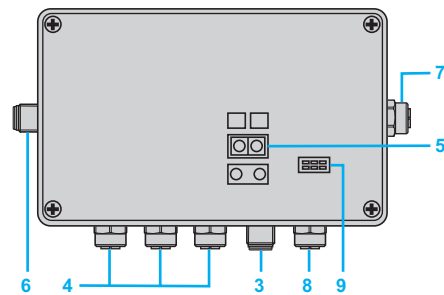
13.56 MHz



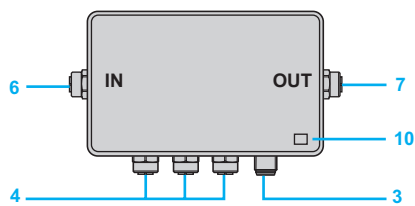
XGSZ33ETH Ethernet box



XGSZ33EIP EtherNet/IP box



XGSZ33PDP PROFIBUS-DP box



TCSAMT31FP tap-off box

- 1 Power on and Ethernet indicator LEDs
- 2 One M12 type Ethernet socket, D-coded
- 3 One M12 type power supply socket, male 4-pin
- 4 Three M12 type female sockets, A-coded, for connecting XGCS smart antennas
- 5 Network address configuration
- 6 One male M12 type network input socket
- 7 One female M12 type network output socket
- 8 One female M12 type configuration port
- 9 Network and connection box status LEDs
- 10 One green LED: power on

Description (continued)

OsiSense XG connection boxes

Four types of quick connection box are available:

- XGSZ33ETH Ethernet box for Ethernet Modbus TCP/IP network
- XGSZ33EIP EtherNet/IP box for EtherNet/IP network
- XGSZ33PDP PROFIBUS-DP box for PROFIBUS-DP network
- TCSAMT31FP tap-off box for Modbus and Uni-Telway communication bus

XGSZ33ETH Modbus TCP/IP box

The XGSZ33ETH OsiSense box enables connection of XGCS smart antennas to the Ethernet network (Modbus TCP/IP protocol).

It enables an automation platform or PC to access the XGCS smart antenna functions:

- Reading/writing tags
- Control and command
- Monitoring
- Diagnostics

The XGSZ33ETH box is fitted with M12 connectors. It is used to connect the power supply, the Ethernet network and 1 to 3 XGCS smart antennas (up to 8 smart antennas, by daisy-chaining).

XGSZ33EIP EtherNet/IP box

The XGSZ33EIP OsiSense box enables connection of XGCS smart antennas to the EtherNet/IP network.

It enables an automation platform or PC to access the XGCS smart antenna functions:

- Reading/writing tags
- Control and command
- Monitoring
- Diagnostics

The XGSZ33EIP box is fitted with M12 connectors. It is used to connect the power supply, the EtherNet/IP network and 1 to 3 XGCS smart antennas (up to 15 smart antennas, by daisy-chaining).

XGSZ33PDP PROFIBUS-DP box

The XGSZ33PDP OsiSense box enables connection of XGCS smart antennas to the PROFIBUS-DP network.

It enables an automation platform or PC to access the XGCS smart antenna functions:

- Reading/writing tags
- Control and command
- Monitoring
- Diagnostics

The XGSZ33PDP box is fitted with M12 connectors. It is used to connect the power supply, the PROFIBUS-DP network and 1 to 3 XGCS smart antennas (up to 15 smart antennas, by daisy-chaining).

TCSAMT31FP tap-off box

The TCSAMT31FP OsiSense tap-off box enables connection of XGCS smart antennas to Modbus and Uni-Telway communication buses.

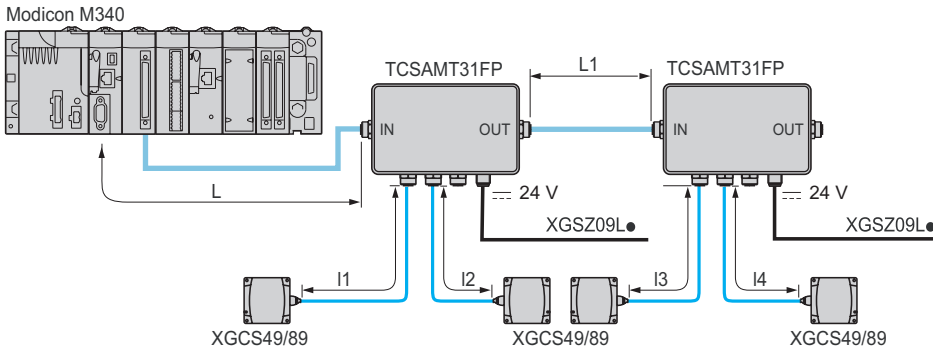
The TCSAMT31FP box is fitted with M12 connectors.

It is used to connect the power supply, the communication bus (Modbus) and 1 to 3 XGCS smart antennas (up to 15 smart antennas, by daisy-chaining).

It consists of a dust and damp-proof metal enclosure.

Description (continued)

Mounting example for a Modbus network

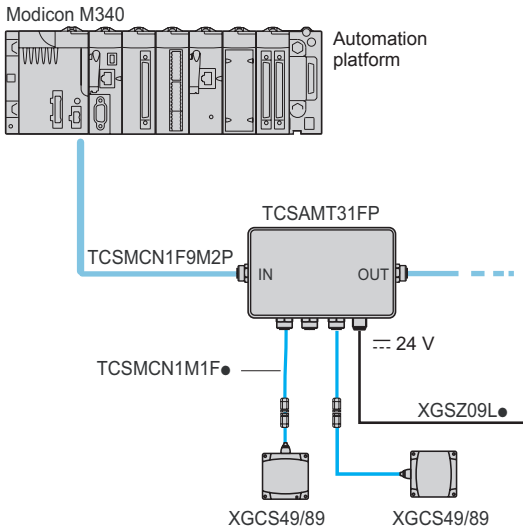


Maximum length of bus
The maximum length of the bus ($L + L1 + I4$) depends on the speed of the network:
- 9600 bauds: 1000 m
- 19,200 bauds: 500 m

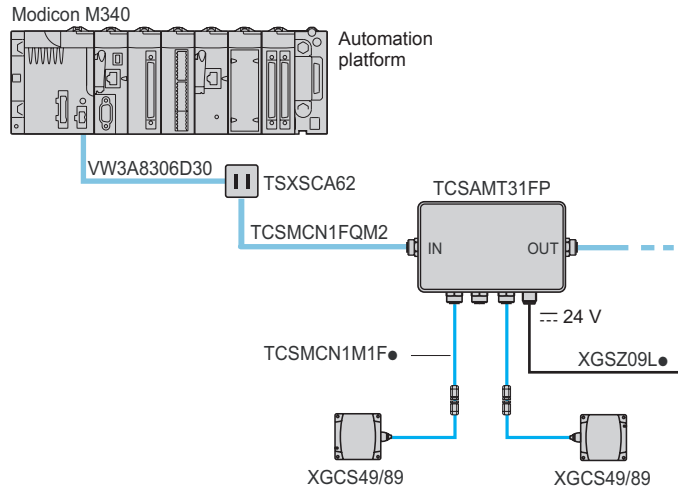
Maximum length of tap-offs:
I1, I2 and I3: 10 m

Examples of connection to a Schneider Electric automation platform

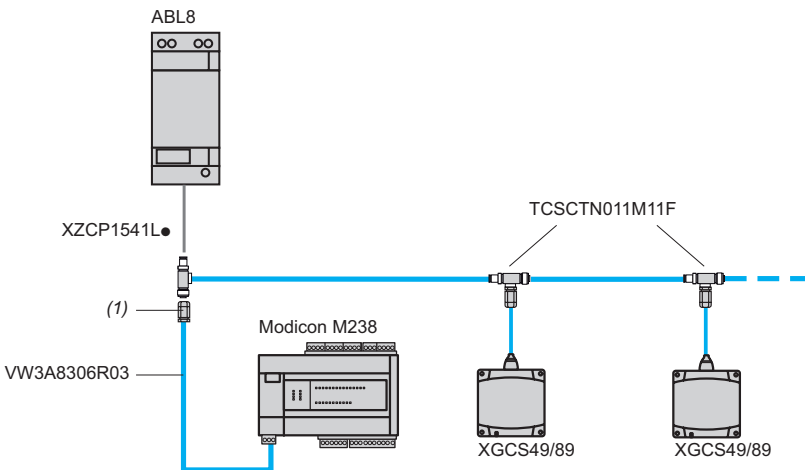
Direct connection



Connection via a TSXSACA62



Daisy-chain connection



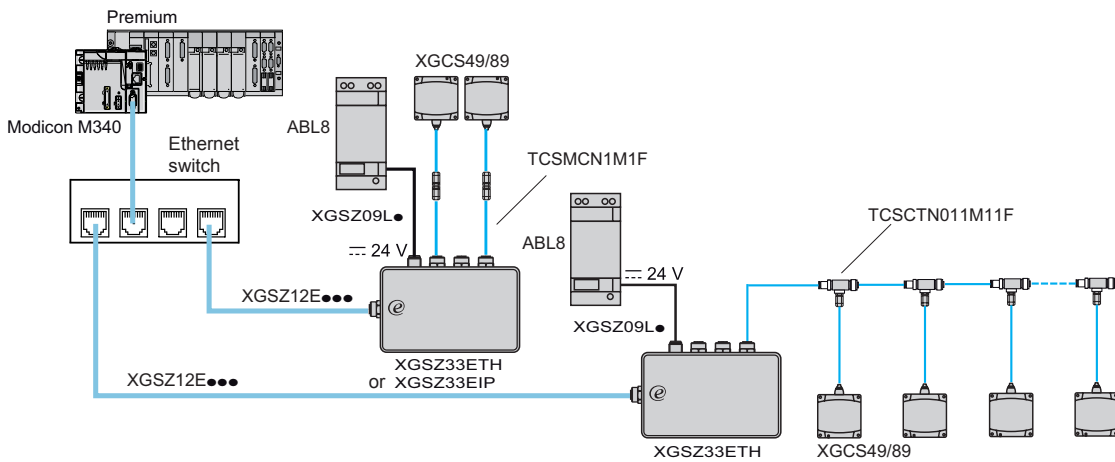
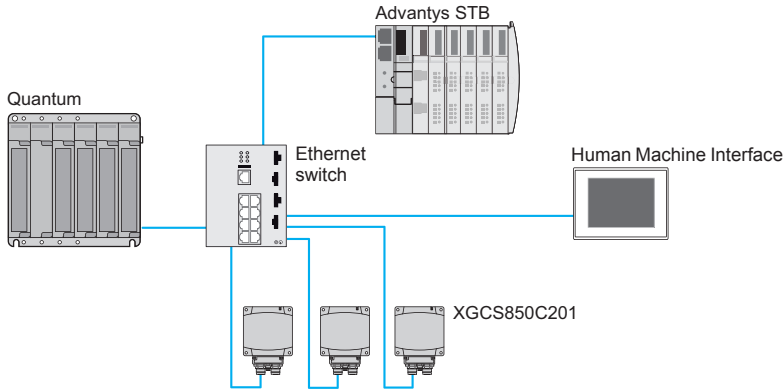
(1) XZCC12MDB50R male M12 connector, to be ordered separately (see page 7/19).

RFID readers can be connected directly to the Modbus port of an automation platform. Up to 15 RFID readers can be linked to the RS 485 port using "T" connectors (in cases where the length of the network exceeds 100 m, fit a line terminator, reference TM7ACTLA). This cabling system is specific to OsiSense XG (powered network). No other Modbus slave equipment must be connected to it.

Description (continued)

Mounting examples for an Ethernet network

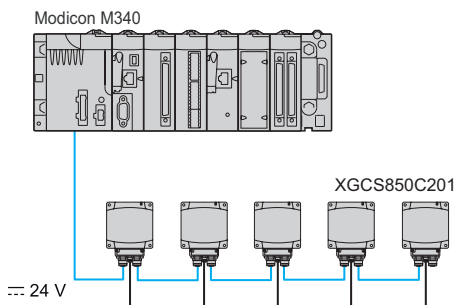
Star topology



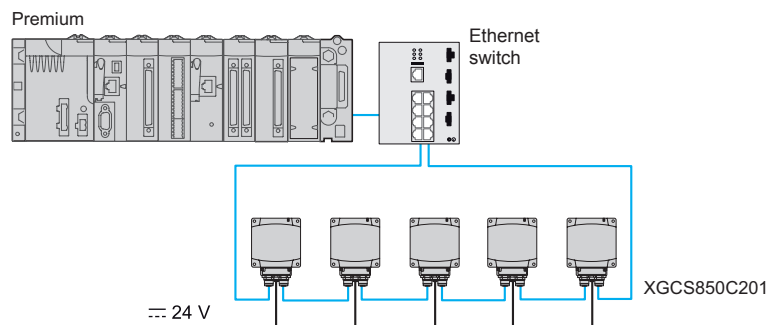
The number of smart antennas connected to each box can be increased by using M12 “T” connectors (ref. TCSCTN011M11F).

Note concerning use of the XGSZ33ETH box on Modbus/TCP: to maintain high-performance operation it is recommended that a maximum of 8 RFID smart antennas are connected (the Ethernet box has 8 communication ports that can be open simultaneously on TCP/IP). In cases where the I/O scanning function is used (which requires an additional communication port), do not connect more than 7 smart antennas. The total length of the smart antenna-side network for XGCS49/89 smart antennas is limited to 160 m.

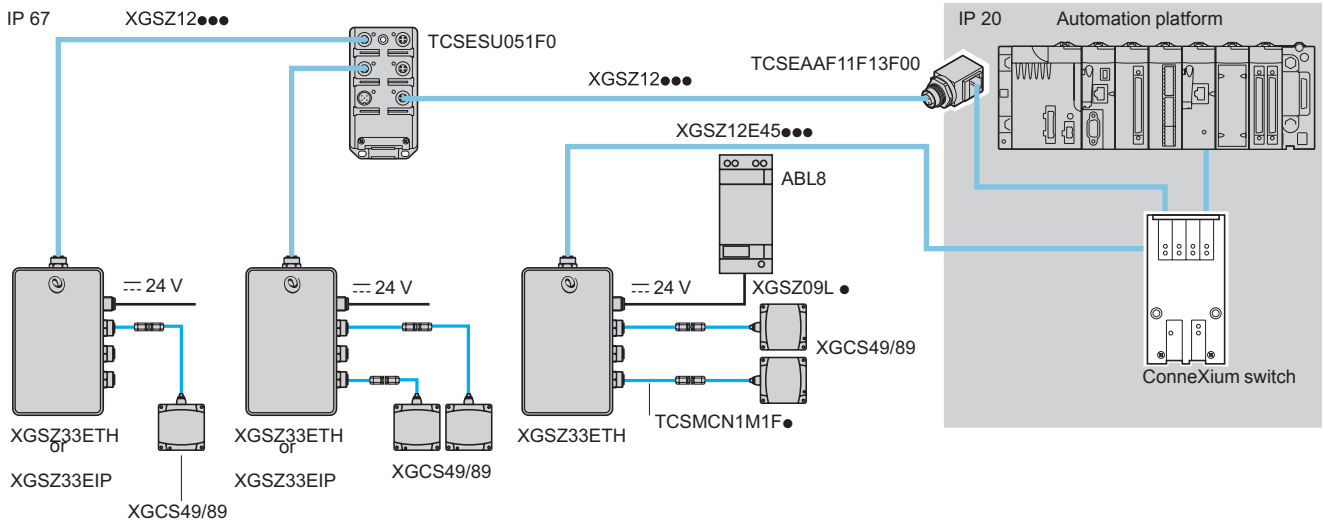
Daisy chain topology



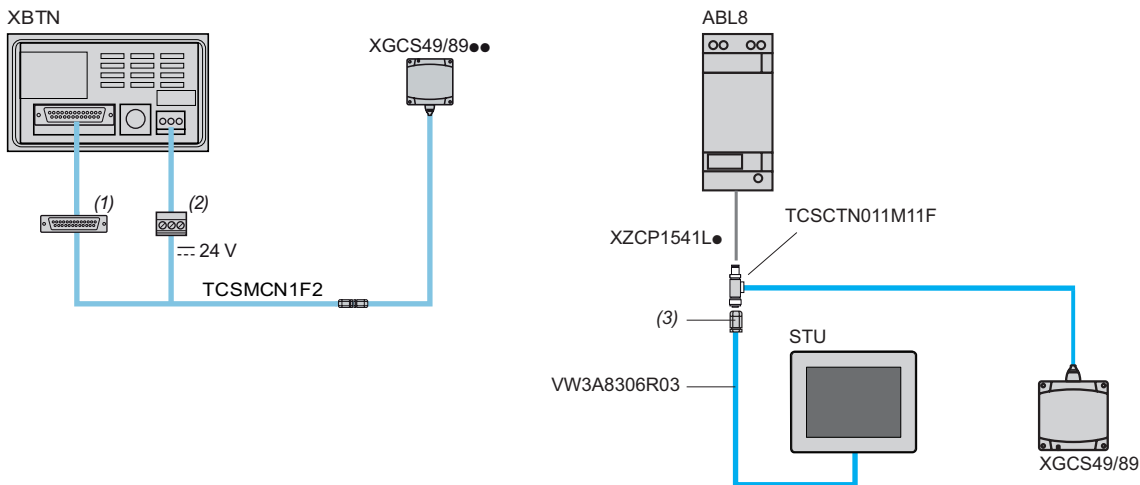
Ring topology



Example of mixed IP 20 and IP 67 connection on Ethernet network



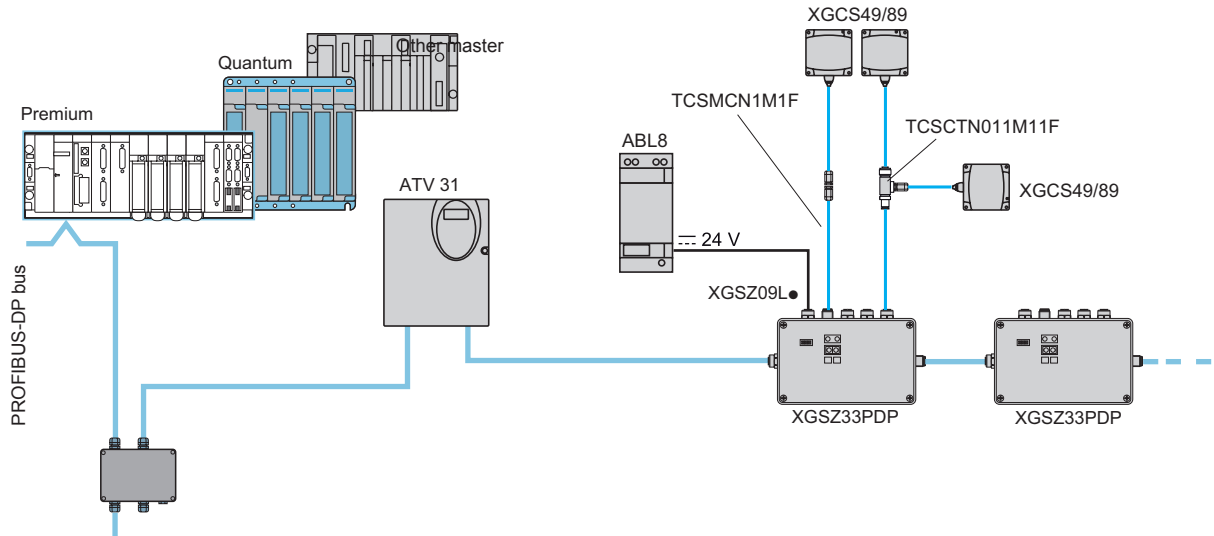
Examples of connection to a Magelis terminal



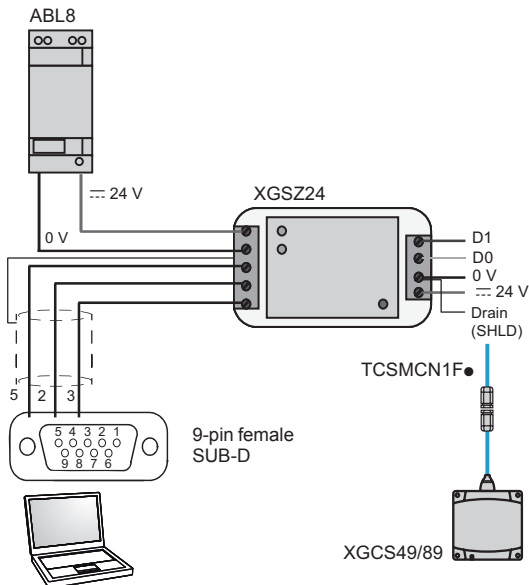
- (1) 25-pin male SUB-D connector.
- (2) Magelis terminal power supply connector (supplied with the Magelis terminal).
- (3) XZCC12MDB50R M12 male connector, to be ordered separately (see page 7/19).

RFID smart antennas can be connected directly to the Modbus port of an automation platform. Up to 15 RFID smart antennas can be linked to the RS 485 port using "T" connectors (in cases where the length of the network exceeds 100 m, fit a line terminator, reference TM7ACTLA). This cabling system is specific to OsiSense XG (powered network). No other Modbus slave equipment must be connected to it.

Example of architecture in a PROFIBUS-DP network



Example of connection to a PC



RFID smart antennas can be connected directly to the Modbus port of an automation platform. Up to 15 RFID smart antennas can be linked to the RS 485 port using "T" connectors (in cases where the length of the network exceeds 100 m, fit a line terminator, reference TM7ACTLA). This cabling system is specific to OsiSense XG (powered network). No other Modbus slave equipment must be connected to it.

OsiSense XG

Radio frequency identification

13.56 MHz

Handheld terminal



Handheld terminal



Main screen



Tag tools

XGST2020 handheld terminal

Functions

Three types of function are embedded in the terminal:

- Direct operations on RFID tags
- Mapping (screens predefined by the operator)
- Configuration

Direct processing of RFID tags

■ **Read/Write words.** Groups containing up to 15 words can be read/written from a given start address. Dates can be displayed in different formats: Decimal/Signed decimal/Binary/Decimal IP/Hexadecimal/ASCII.

■ **Copy tag** from one tag to another. The whole tag memory or part of it can be copied.

■ **Tag initialization.** The whole tag memory or a defined part of it can be written using a value chosen by the operator.

■ **Tag presence.** Cyclic test for presence of the tag in front of the RFID reader linked to the terminal. An indicator light and a bargraph provide information regarding the test results.

■ **Tag identification.** The RFID protocol, unique identifier and user memory size of a tag, which are in front of the reader, are detected by a scanner activated by the handheld terminal and displayed on screen.

Mapping

A mapping is a list of variables, stored permanently in the terminal memory for quick and simple access by the operators.

Each mapping variable is associated with a name and displayed in the selected format in the selection list, in read only or read/write mode.

Creation, modification and backup tools are embedded in the handheld terminal software.

Up to 256 mappings can be stored in the memory (each being identifiable by a number and a name).

Each mapping can contain up to 256 variables. Each variable is defined by its position within the tag memory, its size and its type (word or byte) and its display format on screen.

The formats supported by the handheld terminal are:

- Decimal (1 word): 0 to 65535
- Decimal (1 byte): 0 to 255
- Signed decimal (1 byte): -128 to +127
- Decimal IP (2 words): 0.0.0.0 to 255.255.255.255
- Hexadecimal (4 bytes): 0000 to FFFF
- Boolean bit (one bit):
- Binary (1 byte): 00000000 to 11111111
- List (1 byte): 0 to 15. A string, associated with each byte value, is displayed on screen in place of the byte value
- ASCII string: 1 to 21 characters
- Hexadecimal string: 2 to 30 hexadecimal characters (1 to 15 bytes)
- Date (8 bytes): YYYY/MM/DD
- Time (2 bytes): HH:MM

The data displayed on a mapping can be stored in the terminal memory or written to an RFID tag.

A backup of each mapping or all mappings can be stored on a USB memory stick inserted in the USB socket of the handheld terminal.

OsiSense XG

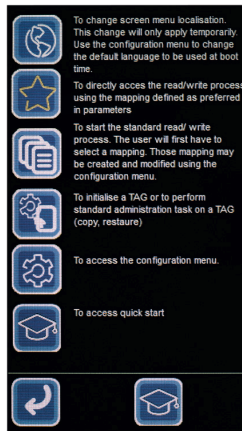
Radio frequency identification

13.56 MHz

Handheld terminal



Mapping management



Online help

XGST2020 handheld terminal (continued)

Functions (continued)

Configuration

■ Updating the terminal

This function is password-protected and provides access to the following elements:

- Updating the RFID reader linked to the handheld terminal
- Changing the boot screen picture by uploading a file from a USB memory stick
- Restoring the handheld terminal to factory settings
- Changing the password

■ Terminal parameters

This function is used to modify the following elements:

- Screen localization
- Shutdown delay
- Preferred mapping number
- Ethernet port gateway and IP addresses
- Backlighting level

■ Mapping management

This function is used to access the following elements:

- Backup and restoration of all user mappings from and to the USB memory stick
- Exporting and importing a user mapping from and to the USB memory stick
- Creation, modification, copying and deletion of mappings. Each mapping is password-protected.

Online help

Contextual online help is permanently accessible for users.

Furthermore, a tutorial on mapping creation can be accessed via the main screen.

Battery management

The handheld terminal is powered by a high-capacity lithium battery.

- The battery charge status is displayed on the menu screen.
- A blue LED flashes when the battery needs recharging.
- An orange LED flashes while the battery is charging.

Accessories

Handheld terminal accessories

The handheld terminal is supplied in an XGST2422 plastic case, with the following accessories:

- A USB charger with international plugs
- An XGST2BA high-capacity lithium battery
- An XGSZK1 2 GB USB flash memory stick for transferring data between handheld terminals or to and from the PC. This USB memory stick also contains all the technical documents on the OsiSense XG RFID range: catalogues, training and examples.
- A stylus for the touch screen
- A wrist strap for safe handling of the terminal
- An Allen key

The RFID reader connected to the terminal should be ordered separately, see page 7/16.

RFID readers associated with the handheld terminal

Two RFID reader versions are available:

- XGCS4901201 compact smart antenna for mounting on the back of the handheld terminal
- XGW4F111 wand antenna with flexible head for remote operations on tags located in confined places (under pallets, for example)



XGST2422







XGW4F111

OsiSense XG

Radio frequency identification
13.56 MHz

Characteristics of electronic tags

Tag type		XGHB123345	XGHB211345	XGHB221346	XGHB320345	
						
Ambient air temperature	For operation	°C	- 25...+ 70	- 25...+ 70	- 25...+ 70	- 25...+ 85 (4)
	For storage	°C	- 40...+ 85	- 40...+ 85	- 40...+ 85	- 40...+ 90
Degree of protection			IP 68	IP 68	IP 68	IP 68
Standard supported			ISO 15693	ISO 15693	ISO 15693	ISO 15693
Vibration resistance	Conforming to EN 60068.2.6		2 mm from 5 to 29.5 Hz/7 gn from 29.5 to 150 Hz			
Shock resistance	Conforming to EN 60068.2.27		30 gn/11 ms			
	Conforming to EN 50102		Degree IK02			
Dimensions		mm	Ø 12 x 8	M18 x 1 x 12	26 x 26 x 13	Ø 30 x 3
Housing material			PBT	PBT	PBT	PPA
Fixing method			Glued	Screw	Screw or clip	Screw
Memory capacity		bytes	304	256	256	112
Type of memory			EEPROM			
Type of operation			Read/Write			
Nominal sensing distance (Read/Write)	With XGCS4901201	mm	18	18	40	48
	With XGCS8901201 or XGCS850C201	mm	20	20	55	65
	With XGCS4901201 smart antenna + XGFEC540	mm	–	–	–	42
	With XGCS4901201 smart antenna + XGFEC2525	mm	–	–	42	80
Number of read cycles			Unlimited			
Number of write cycles	Guaranteed minimum (per data bit, throughout the temperature range)		100,000			
	At 30°C		2.5 million typical value			
Read time		ms	12 + 0.825 x n (1)	12 + 0.825 x n (1)	12 + 0.825 x n (1)	12 + 0.825 x n (1)
Write time		ms	20 + 11.8 x n (1)	19 + 4.1 x n (1)	20 + 11.8 x n (1)	12 + 5.6 x n (1)
Max. speed XGCS49●●	Read a serial number	ms	1.8	1.8	2.8	3.1
	Read a word (2)	ms	0.6	0.6	0.8	1.4
	Read or write 10 words (2)	ms	0.2	0.2	0.3	0.7
Max. speed XGCS89●● and XGCS850C201	Read a serial number	ms	3	3.2	4.2	5.8
	Read a word (2)	ms	0.9	1.1	2.6	2.7
	Read or write 10 words (2)	ms	0.4	0.6	0.5	0.9
Data retention time			10 years			
Mounting on metal support			No	No	Yes (3)	No

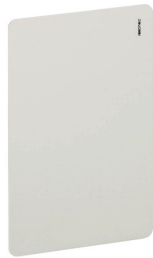
(1) n = number of 16-bit words.

(2) With use of the Auto read/write function.

(3) Installation precautions: see page 7/27.

(4) + 140°C for 10 minutes maximum, except for data exchange.

XGHB520246	XGHB90E340	XGHB444345	XGHB320246	XGHB440245	XGHB440845, XGHB441645 and XGHB443245
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- 25... + 85 (4)	- 25... + 50	- 25... + 70	- 25... + 70	- 25... + 70	- 25... + 70
- 40... + 90	- 40... + 55	- 40... + 85	- 40... + 85	- 40... + 85	- 40... + 85
IP 68	IP 65	IP 68	IP 68	IP 68	IP 68
ISO 15693	ISO 15693	ISO 14443	ISO 15693	ISO 15693	ISO 14443
2 mm from 5 to 29.5 Hz/7 gn from 29.5 to 150 Hz					
30 gn/11 ms			30 gn/11 ms		
Degree IK02			Degree IK02		
Ø 50 x 3	54 x 85.5 x 1	40 x 40 x 15	Ø 30 x 3	40 x 40 x 15	40 x 40 x 15
PPA	PVC	PBT	PPA	PBT	PBT
Screw	-	Screw or clip	Screw	Screw or clip	Screw or clip
112	256	3408	2000	2000	8192 (XGHB440845) 16,384 (XGHB441645) 32,768 (XGHB443245)
EEPROM			FeRAM		
Read/Write			Read/Write		
70	70	33	45	45	25
100	100	48	65	65	39
70	90	-	45	45	-
150	150	-	40	40	-
Unlimited			10 ¹⁰		
100,000			10 ¹⁰		
2.5 million typical value			-		
12 + 0.825 x n (1)	12 + 0.825 x n (1)	9.25 + 0.375 x n (1)	7 + 2 x n (1)	7 + 2 x n (1)	6 + 0.25 x n (1)
12 + 5.6 x n (1)	20 + 11.8 x n (1)	13 + 0.8 x n (1)	7 + 2.4 x n (1)	7 + 2.4 x n (1)	6 + 0.25 x n (1)
5.3	5.3	3.1	2.1	2.1	2.3
1.6	1.6	1.4	1.5	1.5	1.8
0.6	0.6	1.2	0.6	0.6	1.7
7.1	7.1	4.8	3.5	3.5	3.8
4.0	4.0	2.7	2.5	2.5	3.0
0.8	0.8	1.8	1	1	2.6
10 years					
No	No	Yes (3)	No	Yes	Yes

OsiSense XG

Radio frequency identification
13.56 MHz

Characteristics of OsiSense XG readers							
RFID reader type		XGCS850C201	XGCS8901201	XGCS4901201	XGW4F111		
Certifications		UL, FCC part 15c CE					
Conforming to standards		EN 301489-1, EN 301489-3, ETS 300330-1 and ETS 300330-2					
Ambient air temperature	For operation	°C	- 25...+ 70				
	For storage	°C	- 40...+ 85				
Degree of protection	Conforming to IEC 60529	IP 65					
Vibration resistance	Conforming to EN 60068.2.6	2 mm from 5 to 29.5 Hz/7 gn from 29.5 to 150 Hz					
Shock resistance	Conforming to EN 60068.2.27	30 gn/11 ms					
	Conforming to EN 50102	Degree IK02					
Resistance to interference	Conforming to IEC 61000	Resistance to electrostatic discharge, radiated electromagnetic fields, fast transients, electrical surges, conducted and induced interference and network frequency magnetic fields.					
Dimensions, W x H x D		mm	Flat form: 80 x 93 x 40	Flat form: 80 x 80 x 26	Flat form: 40 x 40 x 15	290 x 40 x 25	
RFID frequency		MHz	13.56				
Nominal sensing distance		mm	20 to 100 depending on associated tags		10 to 70 depending on associated tags		
Type of associated tag		ISO 15693 and ISO 14443 standardized tags. Automatic detection of the tag type					
Examples of RFID compatible chips		Fujitsu (MB89R118), INSIDE (micropass) NXP (I-Code SL2, SL1, Ultralight, Std 1K/4K, Desfire), STM (CRIX4K) Texas (Tag-it HFI), µEM4135					
Nominal supply voltage		V	24 --- PELV (Protective Extra Low Voltage)				
Supply voltage limits (including ripple)		V	19.2...29 ---				
Consumption		mA	< 150		< 60		
Communication ports	Physical interface		10BASE-T/ 100BASE-TX	RS 485			
	Protocol		Modbus/TCP and EtherNet/IP	Modbus RTU and Uni-Telway		Modbus RTU	
	Data rate		10/100 Mbps	9600...115,000 bauds (automatic detection)			
	Medium (see cable references on page 7/20)		Ethernet cable with M12 connector, D-coded	Two shielded twisted pair cable with M12 connector, A-coded			
Display	For network communication		4 two-tone LEDs (Ethernet)	1 two-tone LED (Modbus/Uni-Telway)			
	For RFID communication		2 two-tone LEDs	1 two-tone LED (Presence of tag/Reader/tag dialogue)			
Connections			2 female M12 connectors, D-coded for Ethernet 1 male 4-pin M8 connector for power supply	A single male 5-pin shielded M12 connector, A-coded, for connection to the communication network and power supply			
Tightening torque	Screw		< 3 Nm/2.21 lb-ft	< 3 Nm/2.21 lb-ft	< 1 Nm/0.74 lb-ft	–	

Characteristics of the XGST2020 handheld terminal					
Certifications		CE			
Conforming to standards		IEC 61000-6-2, IEC 61000-6-4			
Ambient air temperature	For operation	°C	0 ... + 45		
	For storage	°C	- 20... + 45		
Material	Casing	ABS			
Power supply	Internal	3.7 V/4000 mAh lithium battery. Full charge duration: 8 hours			
	Charging connector	Mini USB			
Autonomy	Typical	> 8 hours (reading one tag per minute - screen brightness = standard)			
	Minimum	> 3 hours (continuous reading)			
Charging time	Maximum	< 8 hours (to fully charge a completely flat battery)			
Degree of protection	Conforming to IEC 60529	IP 40			
	Conforming to IEC 62262	IK02 (touch screen)			
	Drop test	Free fall onto a concrete floor: 1 meter			
RFID reader serial link connection	Connector	M12 female socket			
	Type	RS485			
	Protocol	Modbus RTU master			
	Speed	Bauds	115,000		
External port		USB for memory stick (2 GB maximum)			
Operating system		Proprietary operating system			
Display		OLED resistive touch screen: 480 x 272 pixels, 16 M colours			
Signalling		Two-tone (blue/orange) power supply and status LED			

OsiSense XG

Radio frequency identification
13.56 MHz

Characteristics of connection boxes				
Connection box type		XGSZ33ETH Ethernet Modbus/TCP box	XGSZ33EIP EtherNet/IP box	XGSZ33PDP PROFIBUS-DP box
Certifications		UL	–	PROFIBUS
Conforming to standards		CE		
Ambient air temperature	For operation	°C 0...+ 70	0...+ 55	0...+ 55
	For storage	°C - 40...+ 85	- 25...+ 85	- 25...+ 85
Relative humidity		RH 30...95% non-condensing		
Degree of protection		IP 65		
Supply voltage		V 24 V PELV (limits 19.2 V...29 V). Male 4-pin M12 connector, A-coded	24 V PELV (limits 21.6 V...26.4 V). Male 4-pin M12 connector, A-coded	
Consumption (box only)		W < 1	< 2.5	< 2.5
Smart antenna connection		Female 5-pin M12 connector, A-coded Total cable length < 160 meters		
Electromagnetic interference	Conforming to IEC 61000	Level 3		
	Conforming to EN 55022	Class B		
Protocol		Modbus TCP/IP	EtherNet/IP	PROFIBUS-DP V1
LED display		- Ethernet network activity (RUN, green) - Collision detection (COL, red) - Diagnostics (STS, yellow) - Fault (Err, red) - Power on (green)	- Ethernet network activity (RUN, green) - Ethernet network activity (OFF, red) - Communication bus (Error, flashing red) - Modbus (RUN, green) - Gateway configuration (green)	- PROFIBUS-DP network activity (RUN, green) - PROFIBUS network activity (OFF, red) - Communication bus (Error, flashing red) - Modbus (RUN, green) - Gateway configuration (green)
Transparent Ready Services	Class	A10	–	–
	Standard Web server	IP configuration address	–	–
	Standard communication services	Modbus messaging (read/write words: 1 to 123 words per request)	Read/write words (1 to 123 per request) via the periodic exchanges service.	Read/write words (1 to 49 read operations per request) via the PROFIBUS-DP periodic exchanges service. PROFIBUS-DP V2 aperiodic exchanges not supported.
Connection	Physical interface	10BASE-T/100BASE-TX		
	Data rate	10/100 Mbps		
	Medium	Ethernet cable with M12 connector, D-coded, reference XGSZ12E●● (see page 7/20)		
Connection box type		TCSAMT31FP tap-off box		
Certifications		UL		
Conforming to standards		CE		
Ambient air temperature	For operation	°C - 25...+ 55		
	For storage	°C - 40...+ 85		
Relative humidity		RH 30...95% non-condensing		
Degree of protection		IP 65		
Supply voltage		V 24 V PELV (limits 19.2 V...29 V). Male 4-pin M12 connector, A-coded		
Smart antenna connection		Female 5-pin M12 connector, A-coded		
Electromagnetic interference	Conforming to IEC 61000	Level 3		
	Conforming to EN 55022	Class B		
LED display		Power supply (green)		

OsiSense XG

Radio frequency identification

13.56 MHz



XGCS850C201



XGCS4901201



XGW4F111



XGHB444345

XGHB90E340



XGHB221346



XGHB320345



XGHB211345

13.56 MHz RFID readers

Description	Protocols	Dimensions mm	Reference	Weight kg
Ethernet compact smart antenna Form 80 2 x M12 connectors 1 x M8 connector	Modbus TCP and EtherNet/IP	80 x 93 x 40	XGCS850C201	0.360
Compact smart antenna Flat form 80 (1) Male M12 connector on flying lead	Modbus RTU and Uni-Telway	80 x 80 x 26	XGCS8901201	0.257
Compact smart antenna Flat form 40 (1) Male M12 connector on flying lead	Modbus RTU and Uni-Telway	40 x 40 x 15	XGCS4901201	0.057
Wand antenna with flexible head and 1-meter cable Male M12 connector on flying lead	Modbus RTU	290 x 40 x 25	XGW4F111	0.228

Electronic tags (2)

Tag type	Nominal sensing distance according to smart antenna (mm) XGCS49● XGCS89●		Dimensions (mm)	Sold in lots of	Unit reference	Weight kg
Tag with EEPROM type memory						
Cylindrical 304 bytes	10	–	Ø 12 x 8	5	XGHB123345	0.008
Cylindrical 256 bytes	18	20	M18 x 1 x 12	5	XGHB211345	0.020
Flat form 26 256 bytes	40	55	26 x 26 x 13	1	XGHB221346	0.025
Disc 112 bytes	48	65	Ø 30 x 3	5	XGHB320345	0.005
Disc 112 bytes	70	100	Ø 50 x 3	5	XGHB520246	0.015
ISO RFID card (3) 256 bytes	70	100	54 x 85.5 x 1	10	XGHB90E340	0.005
Flat form 40 3408 bytes	33	48	40 x 40 x 15	1	XGHB444345	0.031
Tag with FeRAM type memory						
Disc 2000 bytes	45	65	Ø 30 x 3	5	XGHB320246	0.005
Flat form 40 2000 bytes	45	65	40 x 40 x 15	1	XGHB440245	0.031
Flat form 40 8192 bytes	25	39	40 x 40 x 15	1	XGHB440845	0.031
Flat form 40 16,384 bytes	25	39	40 x 40 x 15	1	XGHB441645	0.031
Flat form 40 32,768 bytes	25	39	40 x 40 x 15	1	XGHB443245	0.031

(1) Supplied with an **XGSZCNF01** configuration badge. Installation guide to be downloaded from www.tesensors.com.

(2) Other versions (high temperature, adhesive, flexible tags, etc.): please contact our Customer Care Centre.

(3) Customized versions on request.

OsiSense XG

Radio frequency identification

13.56 MHz



TCSAMT31FP



XGFEC2525



XGFEC540



XGST2422



XGST2BA

Connection boxes

Description	For use with	Voltage	Reference	Weight kg
Modbus/TCP Ethernet box	Compact smart antennas XGCS49● and XGCS89●	24 V ~	XGSZ33ETH	1.060
EtherNet/IP box (1)	Compact smart antennas XGCS49● and XGCS89●	24 V ~	XGSZ33EIP	1.060
PROFIBUS-DP box (1)	Compact smart antennas XGCS49● and XGCS89●	24 V ~	XGSZ33PDP	1.060
Tap-off box, 3-channel Modbus and Uni-Telway	Compact smart antennas XGCS49● and XGCS89●	24 V ~	TCSAMT31FP	1.060

Field expanders

Description	Nominal sensing distance	For use with	Reference	Weight kg
Conveying type field expander Dimensions (mm) 400 x 23 x 50 (2)	30 ... 90 mm depending on tag used (ISO 15693 only)	Smart antenna XGCS4901201 Tags XGHB90E340 XGHB320345 XGHB520246 XGHB320246 XGHB440245	XGFEC540	0.640
Universal type field expander Dimensions (mm) 250 x 250 x 10 (2)	26 ... 150 mm depending on tag used (ISO 15693 only)	Smart antenna XGCS4901201 Tags XGHB90E340 XGHB221346 XGHB320345 XGHB520246 XGHB320246 XGHB440245	XGFEC2525	0.565

OsiSense XG handheld terminal

Description	Composition	Reference	Weight kg
RFID handheld terminal set in a plastic case	<ul style="list-style-type: none"> ■ 1 handheld terminal ■ 1 wrist strap ■ 1 lithium battery ■ 1 battery charger pack ■ 1 stylus ■ 1 USB memory stick 	XGST2422	1.000

Note: RFID reader to be ordered separately (see page 7/16).

Accessories

Description	Reference	Weight kg
Screen protector sheets Sold in lots of 5	XGST2FP	0.005

Spare parts

Description	Reference	Weight kg
Handheld terminal Terminal unit only (without battery, charger or RFID reader)	XGST2020	0.295
Lithium battery 3.7 V, 4000 mAh	XGST2BA	0.078
USB memory stick 2 GB	XGSZK1	0.008

(1) Configuration file and installation guide to be downloaded from www.tesensors.com.

(2) Field expanders with other dimensions: please contact our Customer Care Centre.

OsiSense XG

Radio frequency identification

13.56 MHz



TCSMCN1FQM2



TCSMCN1F9M2P



TCSCTN011M11F



TCSESU051F0



TCSEAAF11F13F00



ABL8MEM24003

Modbus network connection accessories

Description	For use with	Length m	Reference	Weight kg
Shielded cable: Modbus black IP 67 M12 connectors, male/female, A-coded (1)	RS 485 connection between a compact smart antenna and a tap-off box or between 2 TCSAMT31FP tap-off boxes	1	TCSMCN1M1F1	0.080
		2	TCSMCN1M1F2	0.115
		5	TCSMCN1M1F5	0.270
		10	TCSMCN1M1F10	0.520
Shielded pre-wired connector: Modbus IP 67 female M12 connector/bare wires, A-coded (1)	Connection between a TCSAMT31FP tap-off box and a Modbus/Uni-Telway (TSXSCA50) network	2	TCSMCN1F2	0.115
		5	TCSMCN1F5	0.270
		10	TCSMCN1F10	0.520
Shielded cable: Modbus black M12/SUBD-15, A-coded	Connection between a TCSAMT31FP tap-off box and a Modbus/Uni-Telway (TSXSCA62) network	2	TCSMCN1FQM2	0.270
Shielded cable: Modbus black M12/Mini-DIN, 8-pin, A-coded	Modbus connection between a TCSAMT31FP tap-off box and an automation platform (Premium, Twido, etc.)	2	TCSMCN1F9M2P	0.350
Modbus SL serial link cable (RS 485 double shielded twisted pair main cables)	Modbus SL serial link	100	TSXCSA100	5.680
		200	TSXCSA200	10.920
		500	TSXCSA500	30.000
Network Tee, M12 1M/2F A-coded, 5-pin	RS485 network	–	TCSCTN011M11F	0.035

Ethernet connection accessories

Description	End fittings	Length m	Reference	Weight kg
Copper connecting cables, straight	1 IP 67 4-pin M12 connector and 1 RJ45 connector	1	XGSZ12E4501	–
		3	XGSZ12E4503	–
		10	XGSZ12E4510	–
Copper connecting cables, elbowed	2 IP 67 4-pin M12 connectors	1	XGSZ12E1201	–
		3	XGSZ12E1203	–
		10	XGSZ12E1210	–
		25	XGSZ12E1225	–
		3	XGSZ22E4503	–
	10	XGSZ22E4510	–	
Ethernet switch, M12 IP 67, ConneXium (2)	–	–	TCSESU051F0	0.210
Female M12/RJ45 adaptor	Ethernet connection	–	TCSEAAF11F13F00	–

“Do it Yourself” Ethernet copper cable and connectors

The “Do It Yourself” ConneXium range enables Ethernet copper connecting cables to be made up to the required length, on site. They are intended for connection to the Ethernet 110/100 Mbps network.

The maximum length of connecting cables made up in this way is 80 m.

They are quick to assemble using only a knife and ordinary wire cutters (no special tool is required).

Description	Characteristics	Length (m)	Reference	Weight kg
Ethernet copper cable	Conforms to current standards and approvals	300	TCSECN300R2	–
RJ45 connector	Conforms to EIA/TIA-568-D	–	TCSEK3MDS	–
M12 connector	Conforms to IEC 60176-2-101	–	TCSEK1MDRS	–

Power supplies (Schneider Electric)

Description	Output voltage	Nominal power	Nominal current	Reference	Weight kg
	V ~	W	A		
100/240 V regulated power supply	24	7	0.3	ABL8MEM24003	0.180
		30	1.2	ABL8MEM24012	0.520

(1) Holder for identification legend included with product.

(2) Other ConneXium connection accessories: visit www.schneider-electric.com.

OsiSense XG

Radio frequency identification

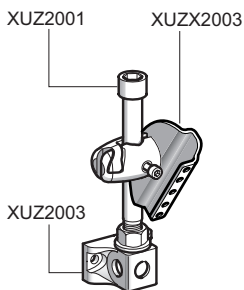
13.56 MHz



XGSZ24



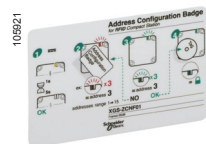
XGSZ3P



XUZ2003



XGSZ05



XGSZCNF01

Connection accessories

Description	For use with	Length m	Reference	Weight kg
Female M8 pre-wired supply connector, 4-pin	XGCS850C201 compact smart antenna	2	XZCP0941L2	0.080
		5	XZCP0941L5	0.180
		10	XZCP0941L10	0.360
Female M12 pre-wired supply connector, A-coded, 4-pin (1)	24 V $\overline{\text{DC}}$ supply to XGSZ33ETH and TCSAMT31FP boxes	2	XGSZ09L2	0.115
		5	XGSZ09L5	0.270
		10	XGSZ09L10	0.520
Female M12 connector, 5-pin, A-coded	–	–	XZCC12FDB50R	0.050
Male M12 connector, 5-pin, A-coded	–	–	XZCC12MDB50R	0.050
M12 supply connector, straight, A-coded, screw terminal	–	–	XZCC12FDM40B	0.020
Protective cap (Sold in lots of 10)	Female M12 connector	–	ASI67FACC1	0.013
Network terminator, male M12, 120 Ω	–	–	TM7ACTLA	0.010
Line adaptor RS 232C/RS 485 without modem signals Power supply: 18...30 V $\overline{\text{DC}}$ - Consumption: 20 mA Maximum transmission speed: 19,200 bauds Mounting on 35 mm $\overline{\text{D}}$ rail	–	–	XGSZ24	–

Mounting accessories

Description	For use with	Reference	Weight kg
Clip-on 90° mounting bracket	Flat form 40 smart antenna: XGCS4901201	XSZBC90	0.060
	Flat form 40 tags: XGHB44●345 XGHB221346 tags		
Clip-on mounting plate	Flat form 40 smart antenna: XGCS4901201	XSZBC00	0.025
	Flat form 40 tags: XGHB44●345 XGHB221346 tags		
Mounting plate	TCSAMT31FP and XGSZ33ETH connection boxes	XGSZ3P	0.195
3D fixing system (2)	XGFEC2525 field expander		
Support for M12 rod		XUZ2003	0.220
M12 rod		XUZ2001	0.050
Ball-joint mounted fixing bracket		XUXZ2003	0.220

Accessories

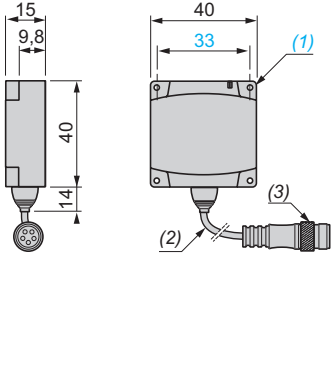
Description	Sold in lots of	Reference	Weight kg
Key for screwing in/unscrewing cylindrical tag \varnothing 18 mm XGHB211●●	5	XGSZ05	0.011
RFID card For RFID reader address configuration	1	XGSZCNF01	0.005
Identification legend for 23 x 4 mm connecting cables	200	XGSZ08MKW	0.056

(1) Holder for identification legend included with product.

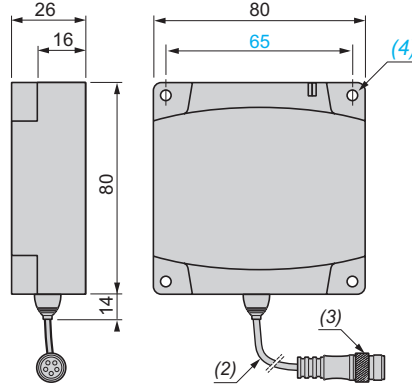
(2) To create a 3D fixing system, order: rod support XUZ2003, M12 rod XUZ2001 and ball-joint mounted fixing bracket XUXZ2003.

RFID smart antennas

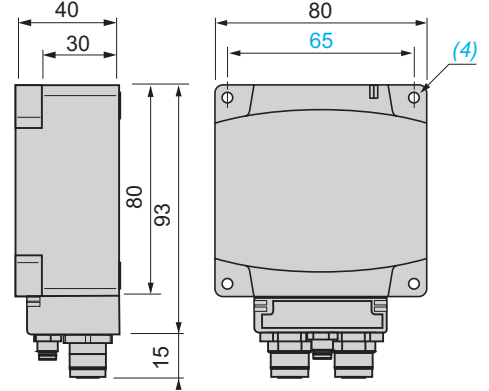
XGCS4901201



XGCS8901201



XGCS850C201



(1) 4 x Ø 4.5. For CHC type screws.

(3) Male 5-pin M12 connector, A-coded.

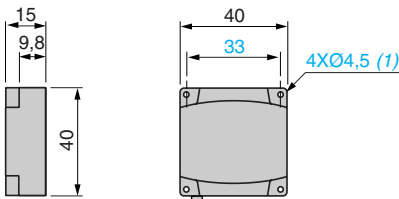
(2) Shielded cable (length: 20 cm).

(4) 4 x Ø 5.5. For CHC type screws.

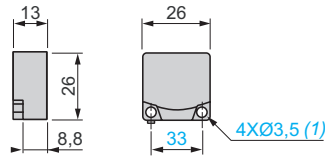
Updatable code electronic tags

Square format tags

XGHB44●●

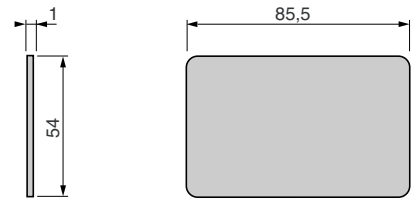


XGHB221346



Rectangular format tags

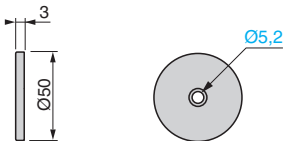
XGHB90E340



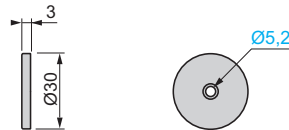
(1) For CHC type screws.

Cylindrical format tags

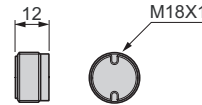
XGHB520246



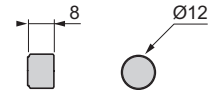
XGHB32●●



XGHB211345

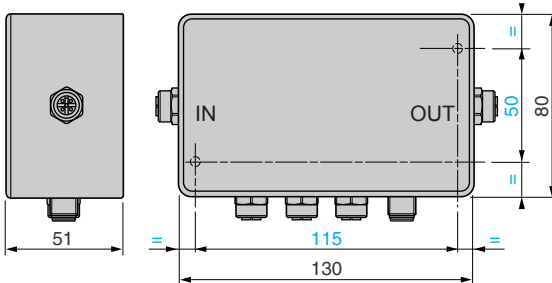


XGHB123345

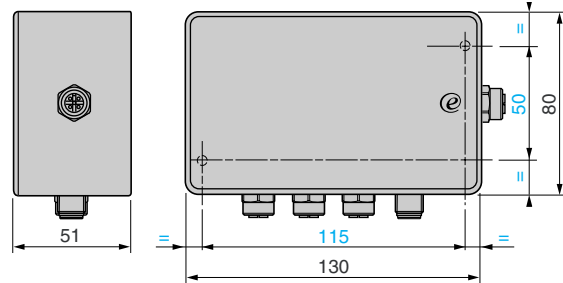


Connection boxes (1)

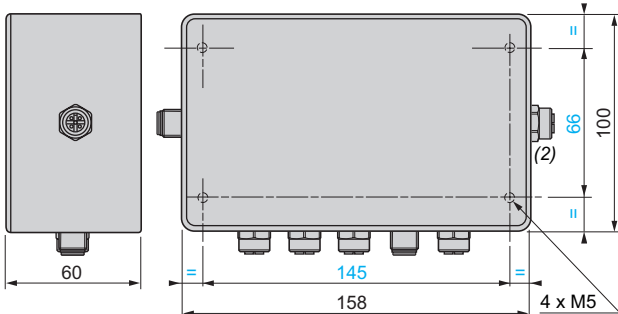
TCSAMT31FP tap-off box



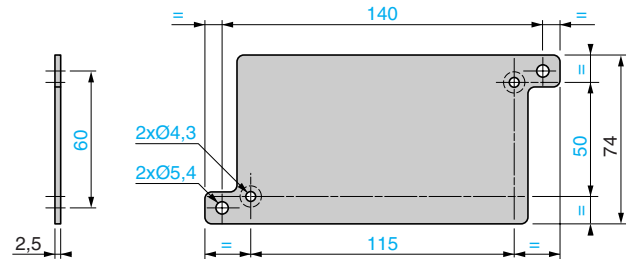
XGSZ33ETH (Ethernet) box



XGSZ33PDP (PROFIBUS DP) and XGSZ33EIP (EtherNet/IP) boxes



XGSZ3P mounting plate

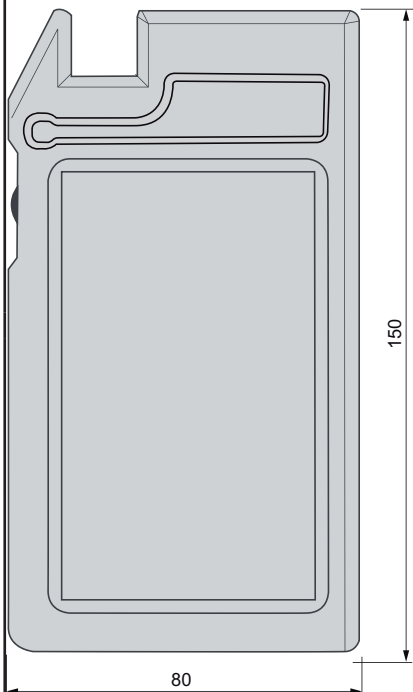


(1) Allow a 110 mm clearance zone for connecting the cables.

(2) This connector is only present on the PROFIBUS-DP box.

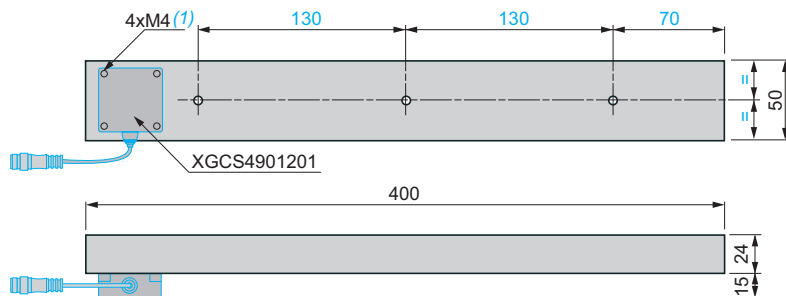
RFID handheld terminal

XGST2020 (30 mm deep)



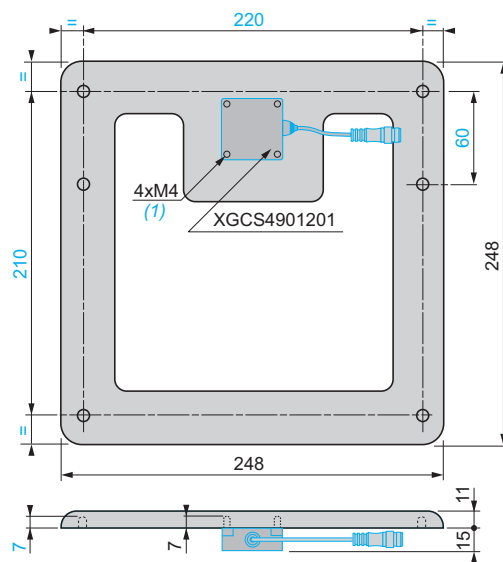
Field expanders

XGFEC540 conveying type



(1) 4 x M4 screws (included).

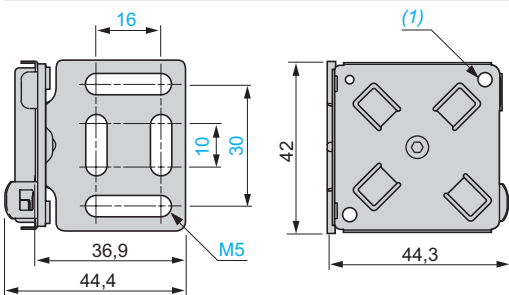
XGFEC2525 universal type



(1) 4 x M4 screws (included).

Mounting brackets

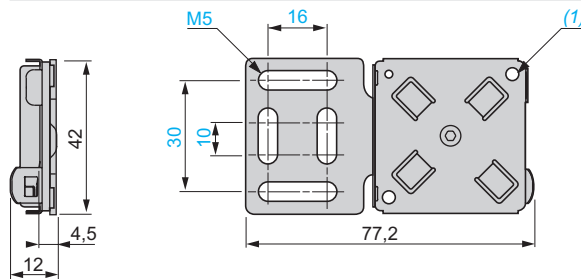
For XGCS49●● smart antennas and XGHB44●● tags
XSZBC90



(1) 4 M4 x 14 screws (included).

Mounting plates

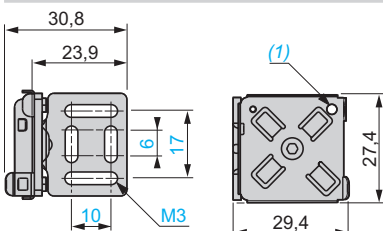
For XGCS49●● smart antennas and XGHB44●● tags
XSZBC00



(1) 4 M4 x 14 screws (included).

For XGHB221346 tags

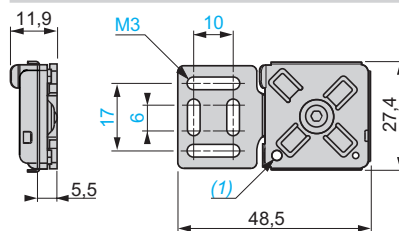
XSZBE90



(1) 2 M3 x 12 screws (included).

For XGHB221346 tags

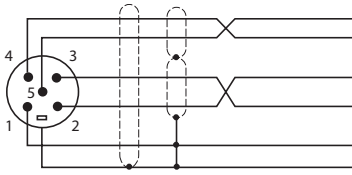
XSZBE00



(1) 2 M3 x 12 screws (included).

Modbus connections

XGCS●901201 smart antennas



Pin no.

1
2
3
4
5
Connector casing

Modbus smart antenna signal

Drain (Modbus-SHLD)
+ 24 V ⋯
0 V/Modbus-GND
D0
D1
Shielding

TCSAMT31FP tap-off box

Socket to smart antenna cabling

Pin no.	Signal
1	–
2	Drain (Modbus-SHLD)
3	+ 24 V ⋯
4	0 V/Modbus-GND
5	D0
6	D1

Socket to power supply cabling

Pin no.	Signal
1	+ 24 V ⋯
2	+ 24 V ⋯
3	0 V ⋯
4	0 V ⋯

Socket to another connection box cabling

Pin no.	Signal
1	Drain (Modbus-SHLD)
2	–
3	0 V/Modbus-GND
4	D0
5	D1

Socket to automation platform cabling

Pin no.	Signal
1	Drain (Modbus-SHLD)
2	–
3	0 V/Modbus-GND
4	D0
5	D1

Cable connections

TCSMCN1F● cables and pre-wired connectors

Pin no.	Signal
1	–
2	Drain (Modbus-SHLD)
3	+ 24 V ⋯
4	Black
5	0 V/Modbus-GND
6	White
7	D0
8	Blue
9	D1
10	Connector casing
11	Shielding

XGSZ09L●● pre-wired connectors

Pin no.	Signal
1	Red
2	+ 24 V ⋯
3	NC
4	Black
5	0 V ⋯
6	NC

PROFIBUS-DP connections

PROFIBUS-DP box: XGSZ33PDP

Socket to smart antenna cabling

Pin no.	Signal
1	Earth
2	+ 24 V ⋯
3	0 V
4	D0
5	D1

Socket to power supply cabling

Pin no.	Signal
1	+ 24 V ⋯
2	+ 24 V ⋯
3	0 V
4	0 V

PROFIBUS-DP network connections


Input	Output	Pin no.	Signal	Description
		1	VP	Line terminator polarization
		2	RxD/TxD-N	Receive/transmit data (-) (red wire)
		3	DGND	GND PROFIBUS
		4	RxD/TxD-P	Receive/transmit data (+) (green wire)
		5	Shielding	Shielding or earth
		Connector casing	Shielding	Shielding or earth

Ethernet connections

XGSZ33ETH and XGSZ33EIP Ethernet boxes


Socket to smart antenna cabling

Pin no.	Signal
1	Earth
2	+ 24 V $\overline{\text{---}}$
3	0 V
4	D0
5	D1




Socket to power supply cabling

Pin no.	Signal
1	+ 24 V $\overline{\text{---}}$
2	+ 24 V $\overline{\text{---}}$
3	0 V $\overline{\text{---}}$
4	0 V $\overline{\text{---}}$

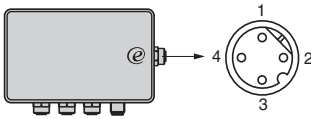


XGSZ09L●● pre-wired connectors

Pin no.	Signal
1	Red + 24 V $\overline{\text{---}}$
2	NC
3	Black 0 V $\overline{\text{---}}$
4	NC

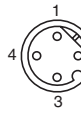


Socket to Ethernet connection



Socket to Ethernet cabling (M12 connectors)

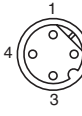
Pin no.	Signal
1	TD +
2	TD -
3	RD +
4	RD -



Ethernet compact smart antenna: XGCS850C201

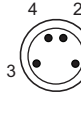
Socket to Ethernet cabling (M12 connectors)

Pin no.	Signal
1	TD +
2	TD -
3	RD +
4	RD -



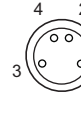
Socket to power supply cabling (M8 connector)

Pin no.	Signal
1	+ 24 V $\overline{\text{---}}$
2	NC
3	$\overline{\text{---}}$ 0 V
4	NC



XZCP0941L●● pre-wired connectors (M8 connector)

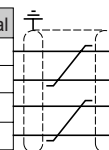
Pin no.	Signal
1	Brown + 24 V $\overline{\text{---}}$
2	White NC
3	Blue $\overline{\text{---}}$ 0 V
4	Black NC



Ethernet cable connections


XGSZ12E45●● and XGSZ22E45●● cables

M12	Signal	Signal	RJ45
1	TD +	TD +	1
3	TD -	TD -	2
2	RD +	RD +	3
4	RD -	RD -	6



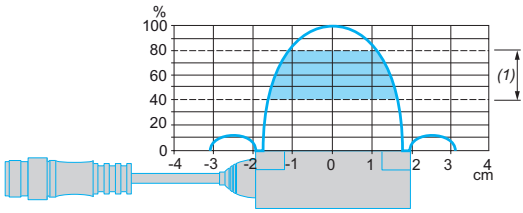
XGSZ12E12●● cables

M12	Signal	Signal	M12
1	TD +	TD +	1
3	TD -	TD -	3
2	RD +	RD +	2
4	RD -	RD -	4

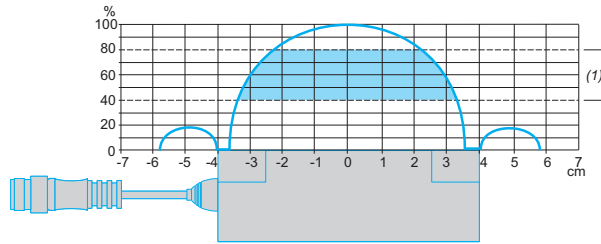


Dialogue zones of RFID smart antennas

XGCS4901201



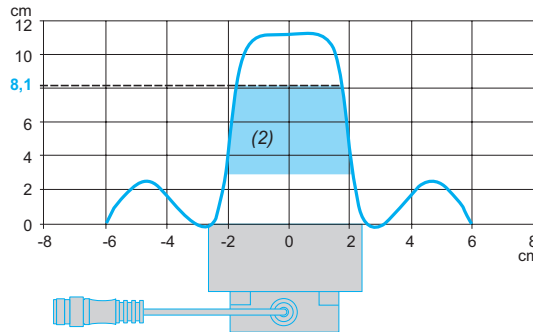
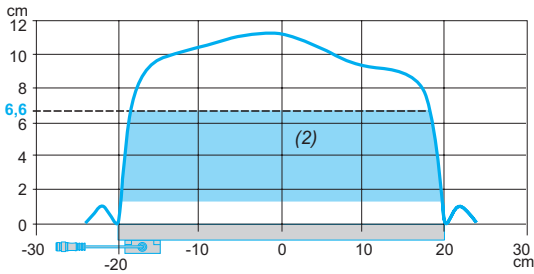
XGCS8901201 and XGCS850C201



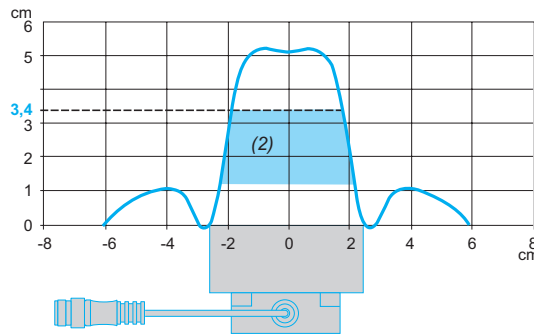
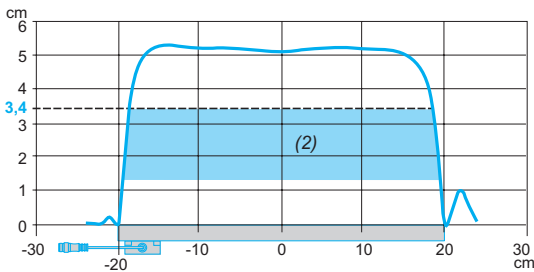
(1) Recommended movement zone: between 0.4 and 0.8 Pn.

Dialogue zones for field expanders

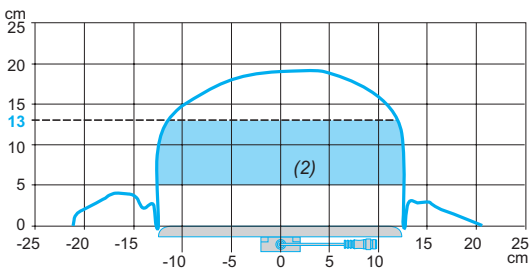
XGFEC540 + XGHB90E340 or XGHB520246 tag



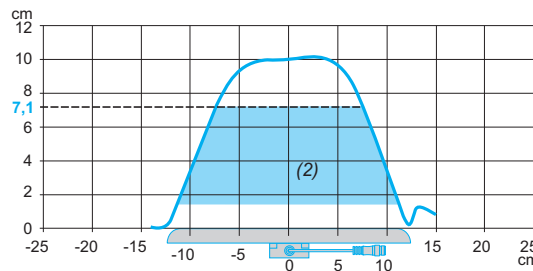
XGFEC540 + XGHB320345 tag



XGFEC2525 + XGHB90E340 or XGHB520246 tag

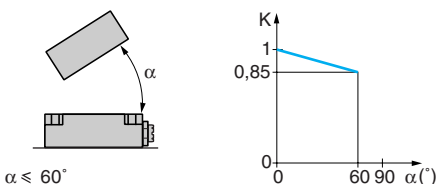


XGFEC2525 + XGHB320345 tag



(2) Recommended working zone.

Angular positioning between smart antenna and tag

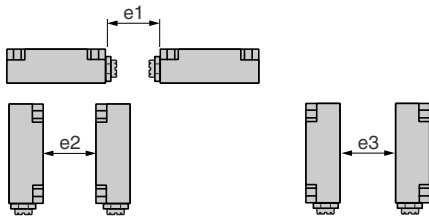


K = correction coefficient to be applied to the nominal sensing distance. Read distance = nominal sensing distance $\times K$.

Minimum mounting distances between system components

Distance between smart antennas

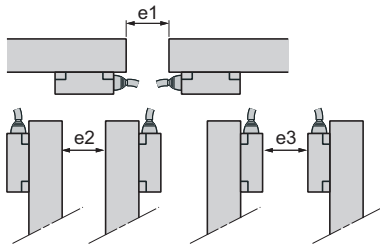
Minimum distance between 2 identical smart antennas according to their positioning and type of tag used (mm)



Tag	XGCS4901201 smart antenna (form 40)			XGCS8●● smart antennas (form 80)		
	e1	e2	e3	e1	e2	e3
XGHB90E340	310	550	120	430	750	280
XGHB520246						
XGHB221346	200	320	100	280	530	260
XGHB320●●●	140	360	110	310	540	240
XGHB211345	210	180	60	200	370	170
XGHB123345						
XGHB44●●●	90	190	30	310	400	160

Distance between field expanders

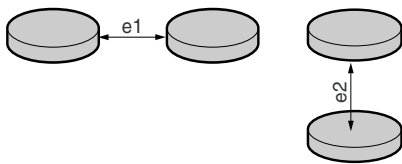
Minimum distance between 2 identical field expanders according to their positioning and type of tag used (mm)



Tag	XGFEC540 field expander			XGFEC2525 field expander		
	e1	e2	e3	e1	e2	e3
XGHB90E340	195	285	195	570	890	960
XGHB520246						
XGHB320345	420	540	450	720	1275	1200

Distance between tags

Minimum distance between 2 identical tags according to their positioning and type of smart antenna used (mm)

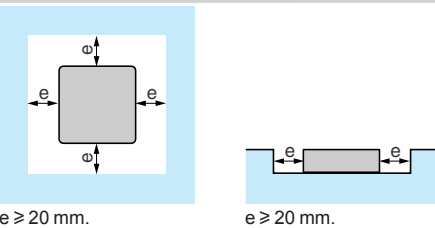


Tag	XGCS4901201 smart antenna (form 40)		XGCS8●● smart antenna (form 80)	
	e1	e2	e1	e2
XGHB90E340	35	60	110	140
XGHB520246				
XGHB221346	50	10	120	50
XGHB320345	70	50	190	60
XGHB440245				
XGHB320246				
XGHB211345	40	10	120	20
XGHB123345				
XGHB444345	20	10	70	40
XGHB440845	30	10	60	10
XGHB441645				
XGHB443245				

Minimum permissible mounting distances in a metal structure

Smart antennas and tags

XGCS49/XGCS89/XGCS85 smart antennas and XGHB221346/XGHB44●● tags

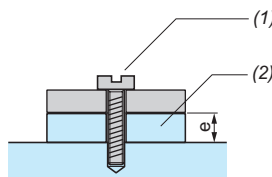


$e \geq 20$ mm.

$e \geq 20$ mm.

XGHB32●● and XGHB52●● tags

No metal parts within 15 mm of the tag.



$e \geq 15$ mm.

XGHB90E340, XGHB211345, XGHB123345 tags

No metal parts within 25 mm of the tag.

Tags

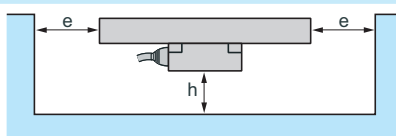
Tags	Nominal sensing distance Pn (mm)	
	XGCS49	XGCS89/S85
XGHB90E340	70	100
XGHB520246		
XGHB221346	40	55
XGHB320345	48	65
XGHB211345	18	20
XGHB123345		
XGHB444345	33	48
XGHB440245	45	65
XGHB440845	25	39
XGHB441645		
XGHB443245		

Reduced sensing distance in the presence of metal (mm)

XGCS49	XGCS89/S85
58	80
30	33
45	56
16	15
28	34
30	45
20	28

Field expanders

	e (mm)	h (mm)
XGFEC540	15	30
XGFEC2525	0	75



(1) Tightening torque ≤ 1 Nm/0.74 lb-ft.

(2) Insulation material.

OsiSense XG

Radio frequency identification
13.56 MHz
Compact smart antennas, Ø 22 mm mounting

OsiSense XG

RFID is the abbreviated term used to designate radio frequency identification systems. Frequencies range between 50 kHz and 2.5 GHz. The most widely used is 13.56 MHz.

The OsiSense XG RFID system is used to identify operators on machines by means of contactless RFID cards or key fobs.

Operator ID information is stored in a memory that can be accessed using a simple radio frequency link. This memory is in the form of an electronic tag, which contains an antenna and an integrated circuit.

When a tag enters the field generated by the reader/smart antenna, it detects the signal and exchanges data (read or write) between its memory and the reader/smart antenna.

Telemecanique Sensors offers 2 smart antennas for mounting on a control panel. These OsiSense XG smart antennas are designed for identifying operators on systems such as:

- mobile access platforms for trucks and elevators
- car charging stations
- machine control panels
- automated tools, presses, and assembly lines, etc.



Mounted in a standard
Ø 22 mm hole



Rapid and efficient access control

- > OsiSense XG smart antennas identify operators by means of their RFID card or electronic key fob in order to determine which operations they are authorized to access.
- > One model has 2 integrated LEDs on the front. These multi-color LEDs are used to guide the operator by means of visual indications controlled by the automation system via the smart antenna's Modbus serial link. There is a choice of 7 different colors that can also be combined with flashing.

Easy to install

- > Less machining: The smart antenna is mounted on a panel through a standard Ø 22 mm hole and manually tightened to secure in place using a single locking nut.
- > Less wiring: A single M12 connector is required for the smart antenna power supply and network connection. Dedicated accessories, such as network T-connectors and M12 cables, are available to facilitate daisy-chain connections (1).

Easy to configure

- > The network address can be set simply by presenting the RFID card supplied with the smart antenna.
- > Integrated network and RFID functions
- > No programming
- > Automatic detection of RFID electronic tags (read or write)
- > Automatic setting of communication parameters (speed, format, parity, protocol, etc.)
- > Read/write compatibility with the majority of 13.56 MHz tags on the market
- > Low sensitivity to metal environments

(1) Up to 15 OsiSense XG compact smart antennas can be connected to the same network. All connections are made via M12 connectors, using a complete range of cables and T-connectors. Please consult our website www.tesensors.com.



+ Easily integrate operator ID functionality into your machines

Rugged and compact

A monobloc device designed for harsh environments

- > OsiSense XG smart antennas, with their sleek, clean design with no screws on the front face, are intended for use in industrial environments, particularly in cleaning applications in the medical and food and beverage sectors.
- > The extended operating temperature range means that OsiSense XG smart antennas can operate in some of the harshest conditions.
- > OsiSense XG smart antennas are highly compact, measuring just 40 x 40 x 40 mm, and have a simple mounting system via a nut on the rear, meaning they can be easily integrated into even the smallest of spaces.
- > OsiSense XG compact smart antennas offer a tried-and-tested solution that has been validated through numerous laboratory and field tests.

Worldwide compatibility

With 13.56 MHz standards

- > The OsiSense XG identification system is open to the majority of ISO 18000-3, ISO 15693, and ISO 14443 electronic tags.
- > With their low power consumption (< 60 mA) and a choice of suitable materials, OsiSense XG smart antennas are environmentally-friendly.

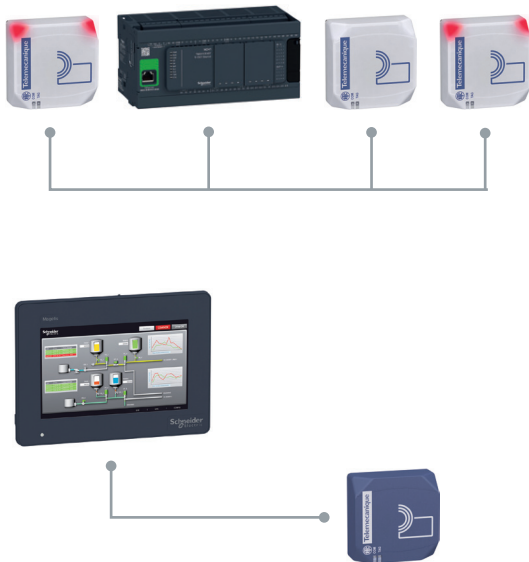
Use

- > The **XGCS49LB201** compact smart antenna features integrated multi-color LEDs that can be controlled remotely by the automation system via the Modbus RTU communication network.
- > These LEDs provide intuitive information to the operator when they present their RFID card to the reader and their profile is read by the automation system (for example, steady green light if they are authorized to use the control station, or flashing red if their profile is not accepted, etc.).
The 2 integrated LEDs are controlled in parallel via Modbus word write requests. They are visible from all angles regardless of the operator's viewing angle.
- > The **XGCS490B201** compact smart antenna can be easily combined with any industrial terminal that supports Modbus RTU. No specific driver or dedicated function is required, since all exchanges are managed by standard word read or write requests.
- > Example of use: A user or operator profile is contained in the RFID card. When the card is read, the terminal automatically selects the accessible pages. It is capable of differentiating between an inexperienced operator who is not authorized to access machine settings and a maintenance engineer who has access to these settings.

Description



- 1 LEDs for informing the operator (7 different colors can be selected and combined with flashing)
- 2 Network address configuration
- 3 RFID and communication diagnostic LEDs
- 4 Seal
- 5 M12 connector for power supply and connection to the Modbus RTU network
- 6 Locking nut for mounting in Ø 22 mm hole



OsiSense XG

Radio frequency identification
13.56 MHz
Compact smart antennas, Ø 22 mm mounting

Characteristics of OsiSense XG compact smart antennas

Smart antenna type	XGCS49LB201	XGCS490B201
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Certification		cULus, FCC part 15, IC, CE	
Conforming to standards		EN 301489-1, EN 301489-3, EN 300330-1, and EN 300330-2	
Ambient air temperature	For operation	°C	-25...+70
	For storage	°C	-40...+85
Degree of protection	Conforming to IEC 60529	IP 69K (front)	IP 65
		IP 65 (rear)	
Vibration resistance	Conforming to EN 60068.2.6	2 mm from 5 to 29.5 Hz/7 gn from 29.5 to 150 Hz	
Shock resistance	Conforming to EN 60068.2.27	30 gn/11 ms	
	Conforming to EN 50102	IK 04	
Resistance to interference	Conforming to IEC 61000	Resistance to electrostatic discharge, radiated electromagnetic fields, fast transients, electrical surges, conducted and induced interference, and network frequency magnetic fields	
Dimensions (W x H x D)	mm	40 x 40 x 40	40 x 40 x 40
RFID frequency	MHz	13.56	
Nominal sensing distance	mm	20 to 70 depending on associated tags	
Type of associated tag		ISO 15693 and ISO 14443 standardized tags Automatic detection of tag type	
Examples of RFID compatible chips		Fujitsu (MB89R118), INSIDE (MicroPass) NXP (I-Code SL2, SL1, Ultralight, Std 1K/4K, Desfire), STM (CRIX4K) Texas (Tag-it HFI), µEM4135	
Nominal supply voltage	V	24 --- PELV (protective extra-low voltage)	
Supply voltage limits (including ripple)	V	19.2...29 ---	
Power consumption	mA	< 60	
Communication ports	Physical interface	RS485	
	Protocol	Modbus RTU	
	Data rate	9,600...115,000 baud (automatic detection)	
	Medium (see cable references on page 7/32)	2-pair shielded twisted pair cable with M12 connector, A-coded	
Display	To inform the operator	2 multi-color LEDs (choice of 7 colors) controlled by Modbus requests	—
	For communication	1 bi-color LED (Tag presence/Dialog between smart antenna and tag) 1 bi-color LED (Modbus network activity)	
Connections		1 male M12 5-pin connector (see connections on page 7/33)	
Tightening torque	Locking nut	2.2 Nm ± 0.2/19.5 lb-in ± 1.8	

7

Characteristics of electronic tags

Tag type	Electronic key fob XGHBPB3345	ISO RFID card XGHB90E340
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Ambient air temperature	For operation	°C	-5...+80	-25...+50
	For storage	°C	-25...+80	-40...+55
Degree of protection			IP 67	IP 65
Standard supported			ISO 14443	ISO 15693
Vibration resistance	Conforming to EN 60068.2.6		2 mm from 5 to 29.5 Hz 7 gn from 29.5 to 150 Hz	2 mm from 5 to 29.5 Hz 7 gn from 29.5 to 150 Hz
Shock resistance	Conforming to EN 60068.2.27		30 gn/11 ms	30 gn/11 ms
	Conforming to EN 50102		IK02	IK02
Dimensions		mm	40 x 31 x 4.8	54 x 85.5 x 1
Housing material			PC	PVC
Memory capacity		Bytes	736	256
Type of memory			EEPROM	EEPROM
Type of operation			Read/Write	Read/Write
Nominal sensing distance (Read/Write)	With compact smart antennas, Ø 22 mm mounting	mm	30	70
Number of read cycles			Unlimited	Unlimited
Number of write cycles	Guaranteed minimum (per data bit, throughout the temperature range)		100,000	100,000

OsiSense XG

Radio frequency identification
13.56 MHz

Compact smart antennas, Ø 22 mm mounting



XGCS49LB201



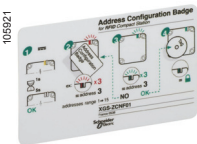
XGCS490B201



XGHBPB3345



XGHB90E340



XGSZCNF01



ZB5AZ905



TCSMCN1M1F●



TCSMCN1F●



TCSCN011M11F

Compact smart antennas, 13.56 MHz

Description	Protocol	Dimensions mm	Reference	Weight kg
Compact smart antenna for panel-mounting (1) M12 male connector	Modbus RTU	40 x 40 x 40	XGCS49LB201	0.257
Compact smart antenna for panel-mounting with LEDs (1) M12 male connector	Modbus RTU	40 x 40 x 40	XGCS490B201	0.257

Electronic tags

Tag type	Nominal sensing distance mm	Dimensions mm	Order in multiples of	Unit reference	Weight kg
Tag with EEPROM memory					
Electronic key fob 736 bytes	10	40 x 31 x 4.8	10	XGHBPB3345	0.005
ISO RFID card (2) 256 bytes	70	54 x 85.5 x 1	10	XGHB90E340	0.005

Configuration and mounting accessories

Description	Unit reference	Weight kg
RFID card For smart antenna address configuration (supplied with smart antenna)	XGSZCNF01	0.005
Locking nut tightening tool (3)	ZB5AZ905	0.016

Modbus network connection accessories

Description	Used for	Length m	Reference	Weight kg
Modbus shielded cable, black IP 67 M12 connectors, male/female, A-coded (4)	RS485 and power supply connection between 2 smart antennas or between a compact smart antenna and a tap-off box (5)	1	TCSMCN1M1F1	0.080
		2	TCSMCN1M1F2	0.115
		5	TCSMCN1M1F5	0.270
		10	TCSMCN1M1F10	0.520
Modbus IP 67 shielded pre-wired connector Female M12 connector/ bare wires, A-coded (4)	Connecting a smart antenna to a Modbus network and a power supply	2	TCSMCN1F2	0.115
		5	TCSMCN1F5	0.270
		10	TCSMCN1F10	0.520
M12 network T-connector 1M/2F A-coded, 5-pin For RS485 network	Daisy-chain connection between 2 smart antennas using TCSMCN1M1F● cables	–	TCSCN011M11F	0.035
Male M12 connector 5-pin, A-coded	–	–	XZCC12MDB50R	0.050

(1) Supplied with configuration badge XGSZCNF01, a locking nut, and the User Guide.

(2) Customized versions available on request.

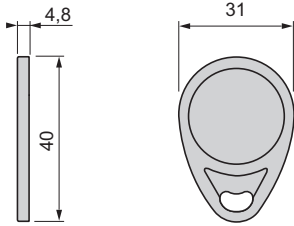
(3) Schneider Electric product.

(4) Supplied with holder for identification legend included with product.

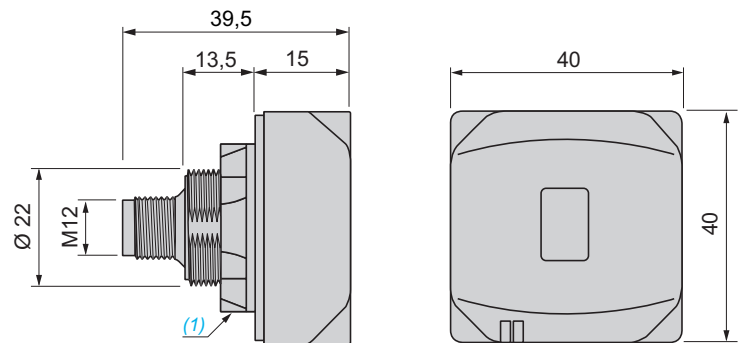
(5) Please consult the "OsiSense XG - Radio frequency identification" catalog.

Dimensions

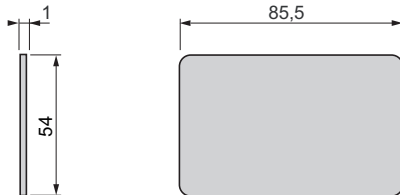
XGHPBP3345 electronic key fob



XGCS49LB201 and XGCS490B201 compact smart antennas

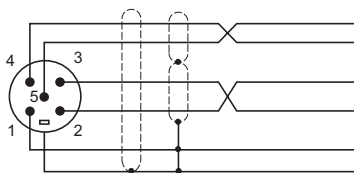


XGHB90E340 ISO RFID card



Modbus connections

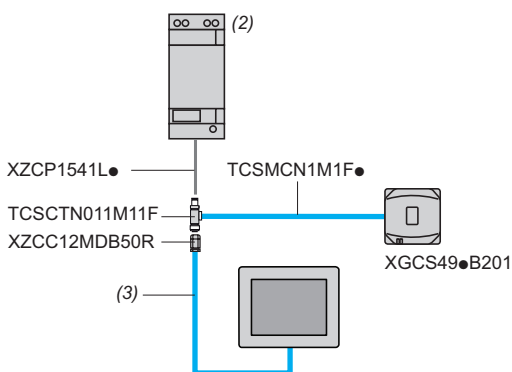
XGCS49LB201 and XGCS490B201 compact smart antennas



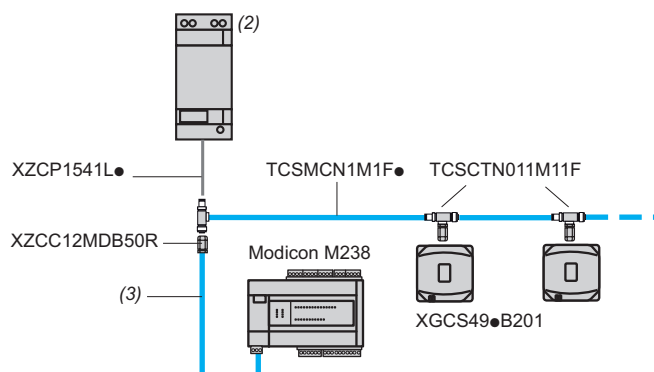
Pin no.	Modbus smart antenna signal
1	Drain (Modbus-SHLD)
2	+24 V $\overline{\text{--}}$
3	0 V/Modbus-GND
4	D0
5	D1

Connection examples

Connection to a Schneider Electric Magelis terminal



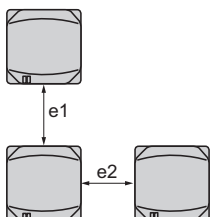
Daisy-chain connection to a Schneider Electric automation platform



Minimum mounting distances between system components

Distances between smart antennas

Minimum distance between 2 identical smart antennas according to their positioning and the type of tag used (mm)



Tag	XGCS49LB201 and XGCS490B201 smart antennas	
	e1	e2
XGHPBP3345	90	90
XGHB90E340	310	310

(1) Locking nut

(2) Schneider Electric ABL8 power supply

(3) Schneider Electric VW3A8306R03 cable

Selection guide page 8/2

- **General**
 - Incremental encoder, absolute coder: principle page 8/4
 - Binary coding, Gray coding page 8/6
 - Characteristics required to define an encoder page 8/7
 - Installation precautions page 8/8

Incremental encoders

- **Ø 40 mm encoders**
 - Characteristics and schemes. page 8/10
 - References page 8/11
 - Dimensions and connections. pages 8/18 to 8/20
- **Ø 58 mm encoders, aluminium and stainless steel**
 - Characteristics and schemes. page 8/12
 - References page 8/14
 - Dimensions and connections. pages 8/18 to 8/20
- **Ø 90 mm encoders**
 - Characteristics and schemes. page 8/16
 - References page 8/17
 - Dimensions and connections. pages 8/18 to 8/20

Single turn absolute encoders

- **Ø 58 mm encoders, aluminium and stainless steel**
 - Characteristics and schemes. page 8/22
 - References page 8/23
 - Dimensions and connections. page 8/26
- **Ø 90 mm encoders**
 - Characteristics and schemes. page 8/24
 - References page 8/25
 - Dimensions and connections. page 8/26

Multiturn absolute encoders

- **Ø 58 mm encoders, aluminium and stainless steel**
 - Characteristics and schemes. page 8/28
 - References page 8/29
 - Dimensions and connections. page 8/32
- **Ø 90 mm encoders**
 - Characteristics and schemes. page 8/30
 - References page 8/31
 - Dimensions and connections. page 8/32

Rotary encoders

- Characteristics. page 8/36
- References page 8/37
- Dimensions and connections. page 8/38

Multiturn absolute encoders on bus

- **CANopen Ø 58 mm encoders**
 - Presentation page 8/42
 - References page 8/44
 - Dimensions and connections. page 8/45
- **PROFIBUS-DP Ø 58 mm encoders**
 - Presentation page 8/46
 - References page 8/48
 - Dimensions and connections. page 8/49



Encoder type			Incremental encoders			
Applications			Counting indication			
						
Diameter of housing			Ø 40 mm	Ø 58 mm	Ø 58 mm parameterable (multi-resolution) (1)	Ø 90 mm
Shaft	Solid		Ø 6 mm	Ø 6 mm and Ø 10 mm (3)	Ø 10 mm	Ø 12 mm
	Through		Ø 6 mm	Ø 14 mm Ø 6, 8, 10 and 12 mm (with reduction collar)	Ø 14 mm Ø 6, 8, 10 and 12 mm (with reduction collar)	Ø 30 mm Ø 12, 20 and 25 mm (with reduction collar)
Resolution	Incremental encoders	100 points	100 points	100 points	–	100 points
		256 points	–	–	256 to 4096 points	–
		360 points	360 points	360 points (3)	360 to 5760 points	360 points
		500 points	500 points	500 points	500 to 8000 points	500 points
		1000 points	1000 points	1000 points	–	1000 points
		1024 points	1024 points	1024 points (3)	1024 to 16,384 points	1024 points
		2500 points	–	2500 points	–	2500 points
		3600 points	–	–	–	3600 points
		4096 points	–	–	–	–
		5000 points	–	5000 points (3)	5000 to 80,000 points	5000 points
	10,000 points	–	–	–	10,000 points	
	Absolute encoders	4096 points/8192 turns (12-bit/13-bit)	–	–	–	–
		8192 points (13-bit)	–	–	–	–
		8192 points/4096 turns (13-bit/12-bit)	–	–	–	–
–		–	–	–	–	
Output stage Supply (2)	Incremental encoders	Type R (N)	5 V, RS 422, 4.5...5.5 V	–	–	–
		Type K (N)	Push-pull, 11...30 V	–	–	Push-pull, 11...30 V
		Type X	–	5 V, RS 422, 4.75...30 V	5 V, RS 422, 4.75...30 V	–
	Absolute encoders	Type Y	–	Push-pull, 5...30 V (3)	Push-pull, 5...30 V	–
		Type KB (N) or KG (N)	–	–	–	–
		Type SB (N) or SG (N)	–	–	–	–
		Type C	–	–	–	–
		Type F	–	–	–	–
Connection	Pre-cabled, radial or axial Connector, radial, M23 Terminal block, radial	•	• (for stainless steel versions only)	–	–	
		–	•	•	•	
		–	–	–	–	
Type reference		XCC14●●●●●	XCC15●●●●●	XCC15●●●●●M●●●	XCC19●●●●●	
Pages		8/11	8/13 to 8/15		8/17	

(1) Parameterable version: multiplication of the basic resolution of the disc using dip switches, the factory setting being that of the lowest value.

(2) Characteristics of the output stage/supply types:

- **Type R (N)**: 5 V output driver, RS 422, 4.5...5.5 V. **Type K (N)**: push-pull output driver, 11...30 V.

- **Type X**: 5 V output driver, RS 422, 4.75...30 V. **Type Y**: push-pull output driver, 5...30 V.

- **KB (N)** or **KG (N)** output: push-pull output driver, 11...30 V, binary code **KB (N)** or Gray code **KG (N)**.

Single turn absolute encoders

Multiturn absolute encoders

Accessories for encoders

Absolute position indication within a revolution

Absolute position indication within a revolution and indication of the number of revolutions

Fieldbus: CANopen, PROFIBUS-DP

					
Ø 58 mm	Ø 90 mm	Ø 58 mm	Ø 90 mm	Ø 58 mm	- Shaft couplings with spring, - anti-rotation devices, - reduction collars, - pre-wired connectors, - etc.
Ø 6 mm and Ø 10 mm (3) Ø 14 mm Ø 6, 8, 10 and 12 mm (with reduction collar)	Ø 12 mm Ø 30 mm Ø 12, 20 and 25 mm (with reduction collar)	Ø 6 mm and Ø 10 mm (3) Ø 14 mm Ø 6, 8, 10 and 12 mm (with reduction collar)	Ø 12 mm Ø 30 mm Ø 16, 20 and 25 mm (with reduction collar)	Ø 10 mm Ø 15 mm (hollow shaft) Ø 6, 8, 10, 12 and 14 mm (with reduction collar)	
-	-	-	-	-	
-	-	-	-	-	
-	-	-	-	-	
-	-	-	-	-	
-	-	-	-	-	
-	-	-	-	-	
-	-	-	-	-	
-	-	-	-	-	
-	-	-	-	-	
-	-	-	-	-	
-	-	-	-	-	
-	-	4096 points/8192 turns (3)	-	-	
8192 points (3)	8192 points	-	-	-	
-	-	8192 points/4096 turns	8192 points/4096 turns	8192 points/4096 turns	
-	-	-	-	-	
-	-	-	-	-	
-	-	-	-	-	
Push-pull, binary or Gray, 5...30 V or 11...30 V (3)	Push-pull, binary or Gray, 11...30 V,	-	-	-	
SSI, 13-bit, binary or Gray 5...30 V or 11...30 V (3)	SSI, 13-bit, binary or Gray 11...30 V	SSI, 25-bit, binary or Gray 5...30 V or 11...30 V (3)	SSI, 25-bit, binary or Gray 11...30 V	-	
-	-	-	-	11...30 V, CANopen	
-	-	-	-	11...30 V, PROFIBUS-DP	
● (for stainless steel encoders only)	-	● (for stainless steel encoders only)	-	-	
●	●	●	●	●	
-	-	-	-	●	
XCC25●●●●●	XCC29●●●●●	XCC35●●●●●	XCC39●●●●●	XCC35●●●●●CBN XCC35●●●●●FBN	
8/23	8/25	8/29	8/31	8/44 and 8/48	
				8/35 to 8/37, 8/50 and 8/51	

(2) Characteristics of the output stage/supply types (continued):
 - **Type SB (N)** or **SG (N)**: SSI output without parity, 13-bit or 25-bit, 5...30 V or 11...30 V, binary code SB (N) or Gray code SG (N).
 - **Type KB (N)** or **KG (N)**: push-pull output driver, 5...30 V or 11...30 V, binary code KB (N) or Gray code KG (N) with multiturn connecting cable.
 - **Type C**: binary CANopen serial link. **Type F**: binary PROFIBUS serial link, RS 485.
 (3) For all encoders versions (including stainless steel versions).

Applications

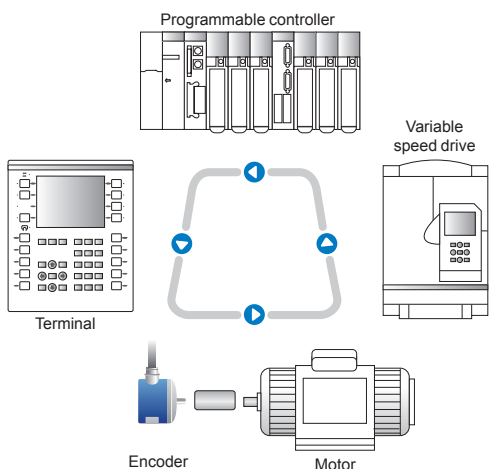
The increase in the power of processing systems, coupled with the requirements for high productivity, has created the need for continuous information in all areas of production regarding:

- counting, positioning by counting,
- absolute positioning,
- speed control.

Example

The positioning of a moving part is fully controlled by the processing system via the encoder.

- Processing units
please refer to our “Premium automation platform” catalogue.
- Variable speed drives
please refer to our “Variable speed drives and starters” catalogue.



Principle of the opto-electronic rotary encoder

The opto-electronic rotary encoder is an angular position sensor.

Mechanically coupled to a driving spindle of a machine, the shaft of the encoder rotates a disc that comprises a succession of opaque and transparent sectors.

Light from light emitting diodes (LEDs) passes through the transparent sectors of the disc as they appear and is detected by photosensitive diodes.

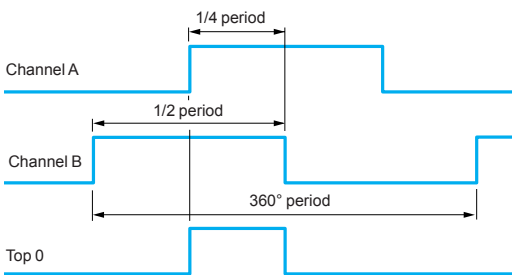
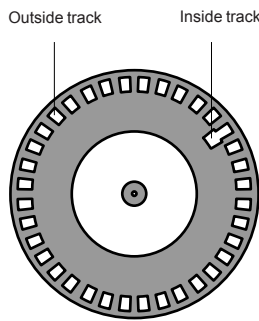
The photosensitive diodes, in turn, generate an electrical signal which is amplified and converted into a digital signal before being transmitted to a processing system or an electronic variable speed drive.

The electrical output of the encoder therefore represents, in digital form, the angular position of the input shaft.

Types of opto-electronic rotary encoder

- Incremental encoders:
Counting, positioning by counting, speed.
- Parameterable incremental encoders:
Multiplication of the basic resolution of the disc using dip switches (the factory setting being that of the lowest value).
- Single turn and multiturn absolute encoders:
Absolute positioning.
- Fieldbus multiturn absolute encoders:
CANopen and PROFIBUS-DP.

Incremental encoder



Principle

The disc of an incremental encoder comprises 2 types of track:

- one or several outside tracks (channels A and B), comprising "n" equal angular steps that are alternately opaque and transparent, with "n" being the resolution or number of periods of the encoder,
- an inside track comprising a single window, which serves as the reference point and enables reinitialisation at each revolution (top 0).

Schemes and settings

The operation of the photosensitive elements (LEDs + photosensitive diodes) is based on the real-time differential optical reading principle:

- the photosensitive elements of tracks A and B are offset so that each will simultaneously read only its respective slot (channels A and B are 90° electrically offset),
- the electronics operate following the principle of real-time differential measurement.

Channel B (rising edge) arriving before A in the clockwise direction viewed from base side.

Period: 360° electrical.
Cyclic ratio: 180° electrical ± 10%.
Phase displacement: 90° electrical ± 25%.

Advantages of real-time differential optical reading

Reading by offset photosensitive elements

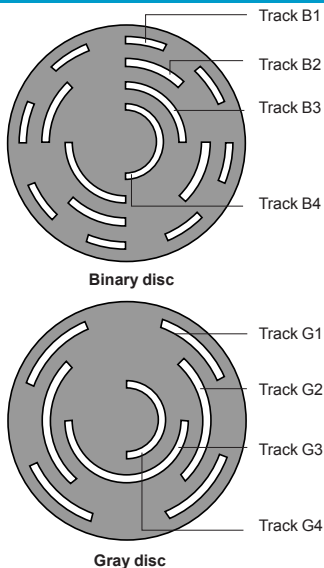
- Radial play of encoder shaft greater than 30%, which is higher than traditional optical reading encoders.
- Maintains a phase displacement of channels A and B within the tolerance limits of the unit.

Triple light source emission

- Maintains cyclic ratio, even in the event of:
 - failure of one of the 3 light sources,
 - diminishing efficiency of the light sources (up to 30%),
 - fine dust deposit on the optical components, reducing signal strength of the photosensitive elements (up to 30%).

These advantages are the reliability factors of the XCC encoders.

Absolute encoder



Principle

The disc of an absolute encoder comprises "n" concentric tracks, equally divided into alternate opaque and transparent segments, and each track has its own transmitter and receiver.

The inside track is half opaque and half transparent. Reading of this MSB (Most Significant Bit) track determines in which half-turn the encoder is situated.

The next track is divided into 4 quarters, alternately opaque and transparent. The reading of this track, in conjunction with the previous track, determines in which quarter-turn the encoder is situated.

The following tracks enable successive determination of which eighth-turn, sixteenth-turn, etc. the encoder is situated.

The outside track corresponds to the LSB (Least Significant Bit) and provides the final accuracy. It has 2ⁿ points corresponding to the resolution of the encoder. Therefore, for each angular position of the shaft, the disc provides a code. This code can either be binary or Gray.

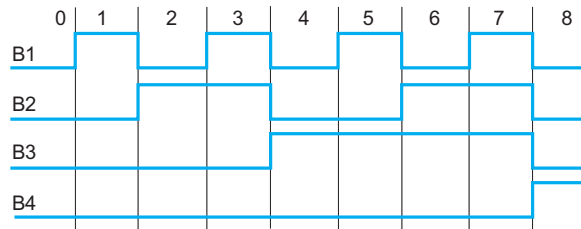
Following one complete revolution of the encoder, the same coded values are repeated.

The multiturn absolute encoder, in addition to providing the digital position within the revolution, also provides the total number of revolutions.

Absolute encoder (continued)

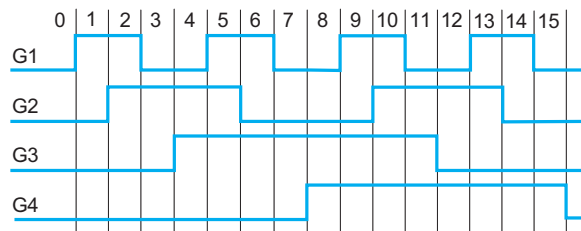
Binary coding

The binary code is directly usable by processing systems (programmable controllers for example) in order to execute calculations or comparisons, but has the disadvantage of having several bits which change state between 2 positions.



Gray coding

The Gray code offers the advantage of only changing one bit between 2 consecutive numbers.



Example of Gray code disc

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
2^0	0	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0
2^2	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	0	1	1	1	1	0	0	0	0	0
2^4	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
2^8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
2^{16}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1

Representation of the first 24 decimal values corresponding to the reading of the first 5 tracks.

Advantages of position detection by an absolute encoder

An absolute encoder continuously provides a code that is an image of the actual position of the moving object being monitored.

On power-up, or restart following a supply failure, the encoder provides data that is directly exploitable by the processing system.

7 characteristics to be established

1 Function

- Incremental encoder
Provides counting indication.
- Single turn absolute encoder
Provides absolute position within each revolution.
- Multiturn absolute encoder
Provides absolute position within each revolution and indicates total number of revolutions.

2 Diameter of housing

- Incremental encoders
Ø 40, 58 and 90
- Single turn and multiturn absolute encoders
Ø 58 and 90

3 Diameter of shaft

- Ø 6 mm to 30 mm, depending on model
- Reduction collars
For Ø 58 and 90 mm encoders, with Ø 14, 15 and 30 mm through shaft, reduction collars are available to reduce the diameters:
 - from 14 to 6, 8, 10 and 12
 - from 15 to 6, 8, 10, 12 and 14
 - from 30 to 12, 16, 20 and 25.

4 Type of shaft

- Solid shaft
The shaft of the encoder is mechanically linked to a drive shaft using a flexible coupling, which eliminates alignment inaccuracies.
- Through shaft/Hollow shaft
The encoder is mounted directly on the drive shaft. A flexible mounting kit prevents encoder rotation and compensates for alignment inaccuracies.

5 Connection method

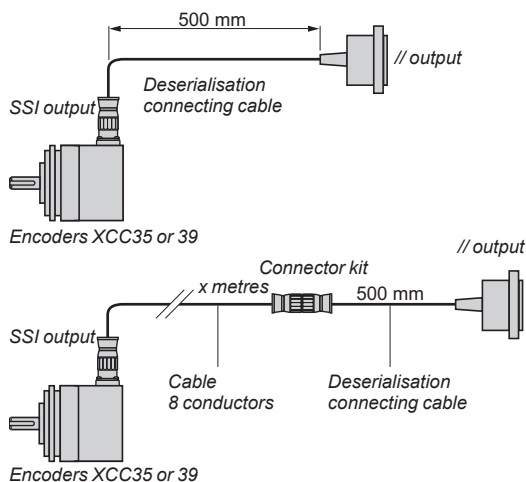
- Pre-cabled with 2 m long shielded cable or M23/M12 connector.
- Radial type connection.

6 Resolution

- Number of points per revolution.
- Number of revolutions (for multiturn absolute encoders).
- On Ø 58 parameterable incremental encoders, this resolution can be adjusted using dip switches (multiplication factor up to 16 times on 9 basic resolutions).

7 Type of output

- Incremental encoders
5 V output driver, RS 422, 4.75...30 V.
Push-pull output driver, 5...30 V, 11...30 V.
- Single turn absolute encoders (depending on model)
Push-pull output driver, 11...30 V, binary code or Gray code.
SSI output without parity, 13-bit clock, 11...30 V, binary code or Gray code.
- Multiturn absolute encoders (depending on model)
SSI output without parity, 25-bit clock, 11...30 V, binary code or Gray code.
- Parallel outputs obtainable using converter connecting cables
The SSI versions can be converted to a parallel version by using the deserialisation connecting cable (see page 8/35).
- Multiturn absolute encoders, communicating version, fieldbus:
 - CANopen: 11...30 V (see page 8/42).
 - PROFIBUS-DP: 11...30 V (see page 8/46).



Installation precautions

Type of cables

In an environment subject to considerable electrical interference, it is recommended that cables with several twisted pairs, reinforced by general shielding, be used.

For the signals, it is recommended that standard 0.14 mm²/0.22 mm² conductors be used.

For 5 V supply encoders.

Due to line voltage drops, it is recommended that the 0 V and + V supply cables have the following minimum cross-sectional areas:

- 0.14 mm² if the encoder-supply distance is less than 30 m,
- 0.22 mm² if the encoder-supply distance is greater than 30 m.

Cabling

Separate, by as much as possible, the connecting cables to encoders and power cables. Also, avoid parallel cable runs. Maintain a distance of at least 20 cm and, in the event of cables crossing, ensure that the crossovers are at right-angles.

When using cables with twisted pairs (shielded or non shielded) group signal cables in common pairs.

In environments subject to electrical interference, it is recommended to earth the encoder base using one of the fixing screws.

Connect the control inputs to a potential (absolute encoder).

Connect all 0 V connections back to a star point, i.e. only one and same referential.

Earth the shielding throughout 360° using tap-off braids. This is to be done at both ends of each cable. To earth the shielding use at least 4 mm² cable.

As much as possible, earth the 0 V of the supply to the encoders on the supply side.

Maximum frequency of signals for SSI depending on distance:

Indicative values that can vary depending on the cable characteristics.

Distance (m)	Frequency (kHz)
50	400
100	300
200	200
400	100

Supply

It is imperative that regulated and smoothed power supplies, with a ripple factor on 24 V of 500 mV and on 5 V of 200 mV, are used that are specifically for the encoder. Schneider Electric ABL7 range power supplies are available. Please refer to the website: www.schneider-electric.com.

For 5...30 V encoders, the supply via a transformer with a 24 V rms rectified and smoothed secondary is prohibited, since the DC voltage obtained is higher than the supply voltage limits of the encoder.

Prior to powering-up for the first time, ensure that the rated supply voltage of the encoder is suitable for the supply.

Opto-electronic rotary encoders

Characteristics required to define an encoder, installation, powering-up

Connection and powering-up precautions

Connection

The plugging-in or unplugging of a connector version encoder must only be done whilst the supply is disconnected.

Encoder supplied by central unit:

- disconnect supply to central unit,
- proceed with connection or disconnection,
- re-establish supply to central unit.

Encoder supplied by source external to central unit:

- disconnect supply to central unit, then disconnect supply to encoder,
- proceed with connection or disconnection,
- re-establish supply to encoder, then re-establish supply to central unit.

Powering-up

For synchronisation reasons, the powering-up or switching-off of the encoder must coincide with that of its associated electronics.

Environment

Encoder type		XCC1406P●●●●	XCC1406T●●●●
Conformity		CE	
Temperature	Operation (housing)	°C - 20...+ 80	
	Storage	°C - 30...+ 85	
Degree of protection	Conforming to IEC 60529	IP 54	IP 52
Vibration resistance	Conforming to IEC 60068-2-6	10 gn (f = 10...500 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Resistance to electromagnetic interference	Electrostatic discharges	Conforming to IEC 61000-4-2: level 3, 8 kV air; 4 kV contact	
	Radiated electromagnetic fields (electromagnetic waves)	Conforming to IEC 61000-4-3: level 3, 10 V/m	
	Fast transients (Start/Stop interference)	Conforming to IEC 61000-4-4: level 3, 2 kV (1 kV for inputs/outputs)	
	Surge withstand	Conforming to IEC 61000-4-5: level 2, 1 kV	
Materials	Base	Aluminium or Zamak	
	Housing	Aluminium or Zamak	
	Shaft	Stainless steel or aluminium	
	Ball bearings	688AZZ1	

Mechanical characteristics

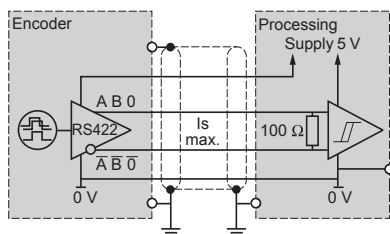
		mm	Ø 6, solid shaft (g7)	Ø 6, through shaft (H7)
Shaft type				
Maximum rotational speed	Continuous		9000 rpm	
Shaft moment of inertia		g.cm ²	10	5
Torque		N.cm	0.2	0.25
Maximum load	Radial	daN	2	
	Axial	daN	1	

Electrical characteristics

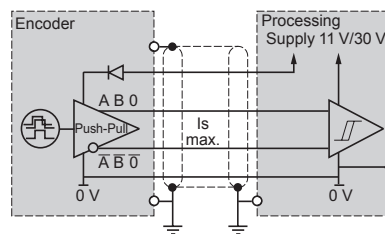
Connection		Radial: pre-cabled, 8 x 0.14 mm ² shielded, Ø ext = 6 mm, length = 2 m Crimped metal cable entry	Pre-cabled 8 x 0.14 mm ² shielded, Ø ext = 6 mm, length = 2 m Crimped metal cable entry
Frequency		kHz 100	
Number of channels		3 channels: A, B, top 0 and complements $\bar{A}, \bar{B}, \bar{0}$	
Encoders with type R output stage: 5 V output driver, RS 422, 4.5...5.5 V supply			
Supply voltage		± 5 V ± 10% Maximum ripple: 200 mV	
Current consumption, no-load		mA 100 maximum	
Output current		mA 40 maximum	
Output levels	Low level	0.5 V maximum (I _s = 20 mA)	
	High level	2.5 V minimum (I _s = 20 mA)	
Encoders with type K output stage: push-pull output driver, 11...30 V supply			
Supply voltage		± 11 V...30 V. Maximum ripple: 500 mV	
Current consumption, no-load		mA 75 maximum	
Protection		Against short-circuits and reverse polarity	
Output current		mA 40 maximum	
Output levels	Low level	1.5 V maximum (I _s = 20 mA)	
	High level	V supply - 3 V minimum (I _s = 20 mA)	

Schemes

Type R output stage



Type K output stage



105160



XCC1406PR●●●

Solid shaft, Ø 6 mm

Resolution	Connection method	Output stage type (1)	Supply voltage	Reference	Weight kg
100 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5...5.5 V	XCC1406PR01R	0.355
		Push-pull	11...30 V	XCC1406PR01K	0.355
360 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5...5.5 V	XCC1406PR03R	0.355
		Push-pull	11...30 V	XCC1406PR03K	0.355
500 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5...5.5 V	XCC1406PR05R	0.355
		Push-pull	11...30 V	XCC1406PR05K	0.355
1000 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5...5.5 V	XCC1406PR10R	0.355
		Push-pull	11...30 V	XCC1406PR10K	0.355
1024 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5...5.5 V	XCC1406PR11R	0.355
		Push-pull	11...30 V	XCC1406PR11K	0.355

105161



XCC1406TR●●●

Through shaft, Ø 6 mm (2)

Resolution	Connection method	Output stage type (1)	Supply voltage	Reference	Weight kg
100 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5...5.5 V	XCC1406TR01R	0.405
		Push-pull	11...30 V	XCC1406TR01K	0.405
360 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5...5.5 V	XCC1406TR03R	0.405
		Push-pull	11...30 V	XCC1406TR03K	0.405
500 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5...5.5 V	XCC1406TR05R	0.405
		Push-pull	11...30 V	XCC1406TR05K	0.405
1000 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5...5.5 V	XCC1406TR10R	0.405
		Push-pull	11...30 V	XCC1406TR10K	0.405
1024 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5...5.5 V	XCC1406TR11R	0.405
		Push-pull	11...30 V	XCC1406TR11K	0.405

(1) For characteristics of the output stage type (indicated by last letter of the reference), see page 8/7.

(2) Anti-rotation device included with encoder.

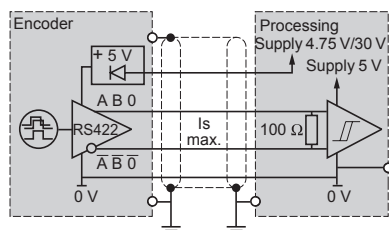
Environment		XCC1506P●●●●	XCC1510P●●●●	XCC1510S●●●●	XCC1514T●●●●
Encoder type		Cε			
Conformity		Cε			
Temperature	Operation (housing)	°C - 30...+ 100 (except XCCTSM●●X and XCCTSM●●Y: - 30...+ 70)			
	Storage	°C - 30...+ 85	- 30...+ 85	- 40...+ 100	- 30...+ 85
Degree of protection	Conforming to IEC 60529	IP 65	IP 65 (IP 67 with collar option XCCRB3)	IP 68 / IP 69K	IP 65
Vibration resistance	Conforming to IEC 60068-2-6	10 gn (f = 55...2000 Hz)			
Shock resistance	Conforming to IEC 60068-2-27	50 gn, duration 6 ms			
Resistance to electromagnetic interference	Electrostatic discharges	Conforming to IEC 61000-4-2: level 3, 8 kV air, 4 kV contact			
	Radiated electromagnetic fields (electromagnetic waves)	Conforming to IEC 61000-4-3: level 3, 10 V/m			
	Fast transients (Start/Stop interference)	Conforming to IEC 61000-4-4: level 3, 2 kV (1 kV for inputs/outputs)			
	Surge withstand	Conforming to IEC 61000-4-5: level 2, 1 kV			
Materials	Base	Aluminium		Stainless steel 316L	Aluminium
	Housing	Zamak		Stainless steel 316L	Zamak
	Shaft	Stainless steel 303		Stainless steel 316L	Stainless steel 303
	Ball bearings	6000			6803ZZ
	Shaft seal	-		Teflon ring	-

Mechanical characteristics			Ø 6, solid shaft (g7)	Ø 10 mm, solid shaft	Ø 14, through shaft (H7)
Shaft type					
Maximum rotational speed	Continuous		9000 rpm	9000 rpm	3000 rpm
Shaft moment of inertia		g.cm²	10	10	12
Torque		N.cm	0.4	0.4	9
Maximum load	Radial	daN	10	10	25
	Axial	daN	5	5	50
					2

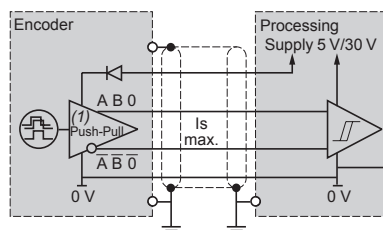
Electrical characteristics			
Connection	Connector		M23, 12-pin male connector (2 m silicone cable for XCC1510S●●●●)
Frequency		kHz	300
Number of channels			3 channels: A, B, top 0 and complements \bar{A} , \bar{B} , $\bar{0}$
Encoders with type X output stage: 5 V output driver, RS 422, 4.75...30 V supply			
Supply voltage			--- 4.75...30 V Maximum ripple: 500 mV
Current consumption, no-load		mA	75 maximum
Protection			Against short-circuits and reverse polarity
Output current		mA	40 maximum
Output levels	Low level		0.5 V maximum (I _s = 20 mA)
	High level		4.5 V minimum (I _s = 20 mA)
Encoders with type Y output stage: push-pull output driver, 5...30 V supply			
Supply voltage			--- 5...30 V Maximum ripple: 500 mV
Current consumption, no-load		mA	75 maximum
Protection			Against short-circuits and reverse polarity
Output current		mA	40 maximum
Output levels (for U supply = 30 V) (1)	Low level		0.5 V maximum (I _s = 20 mA)
	High level		V supply - 2.5 V minimum (I _s = 20 mA)

Schemes

Type X output stage



Type Y output stage



(1) RS 422 compatible on 5 V supply.

Incremental encoders

OsiSense XCC

Ø 58 mm encoders, aluminium and stainless steel versions

105163



XCC1506PS●●●

Solid shaft, Ø 6 mm

Resolution	Connection method (1)	Output stage type (2)	Supply voltage	Reference	Weight kg
100 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1506PS01X	0.495
		Push-pull	5...30 V	XCC1506PS01Y	0.495
360 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1506PS03X	0.495
		Push-pull	5...30 V	XCC1506PS03Y	0.495
500 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1506PS05X	0.495
		Push-pull	5...30 V	XCC1506PS05Y	0.495
1000 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1506PS10X	0.495
		Push-pull	5...30 V	XCC1506PS10Y	0.495
1024 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1506PS11X	0.495
		Push-pull	5...30 V	XCC1506PS11Y	0.495
2500 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1506PS25X	0.495
		Push-pull	5...30 V	XCC1506PS25Y	0.495
5000 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1506PS50X	0.495
		Push-pull	5...30 V	XCC1506PS50Y	0.495

1203118



XCC1510SPA●●●

105164



XCC1510PS●●●

Solid shaft, Ø 10 mm

Resolution	Connection method (1)	Output stage type (2)	Supply voltage	Reference	Weight kg
100 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1510PS01X	0.465
		Push-pull	5...30 V	XCC1510PS01Y	0.465
360 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1510PS03X	0.465
		Push-pull	5...30 V	XCC1510PS03Y	0.465
		Cable (2 m)	Push-pull	5...30 V	XCC1510SPA03Y (3)
500 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1510PS05X	0.465
		Push-pull	5...30 V	XCC1510PS05Y	0.465
1000 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1510PS10X	0.465
		Push-pull	5...30 V	XCC1510PS10Y	0.465
1024 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1510PS11X	0.465
		Push-pull	5...30 V	XCC1510PS11Y	0.465
		Cable (2 m)	Push-pull	5...30 V	XCC1510SPA11Y (3)
2500 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1510PS25X	0.465
		Push-pull	5...30 V	XCC1510PS25Y	0.465
5000 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1510PS50X	0.465
		Push-pull	5...30 V	XCC1510PS50Y	0.465
		Cable (2 m)	Push-pull	5...30 V	XCC1510SPA50Y (3)

(1) For female connector use **XZCC23FDP120S** or pre-wired connectors (L = 2, 5 or 10 m), see page 8/35.

(2) For characteristics of the output stage type (indicated by last letter of the reference), see page 8/12.

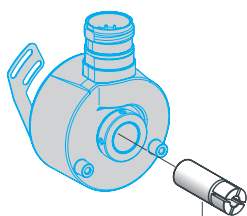
(3) Stainless steel 316L version.

105166



XCC1514TS●●●

514218



XCCR158RDA●●

Through shaft, Ø 14 mm (1)

Resolution	Connection method (2)	Output stage type (3)	Supply voltage	Reference	Weight kg
100 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1514TS01X	0.435
		Push-pull	5...30 V	XCC1514TS01Y	0.435
360 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1514TS03X	0.435
		Push-pull	5...30 V	XCC1514TS03Y	0.435
500 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1514TS05X	0.435
		Push-pull	5...30 V	XCC1514TS05Y	0.435
1000 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1514TS10X	0.435
		Push-pull	5...30 V	XCC1514TS10Y	0.435
1024 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1514TS11X	0.435
		Push-pull	5...30 V	XCC1514TS11Y	0.435
2500 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1514TS25X	0.435
		Push-pull	5...30 V	XCC1514TS25Y	0.435
5000 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1514TS50X	0.435
		Push-pull	5...30 V	XCC1514TS50Y	0.435

Reduction collars for encoders with through shaft, Ø 14 mm

For use with	Diameter	Reference	Weight kg
Encoders with through shaft XCC1514TS●●●	Ø 6 mm	XCCR158RDA06	0.015
	Ø 8 mm	XCCR158RDA08	0.010
	Ø 10 mm	XCCR158RDA10	0.010
	Ø 12 mm	XCCR158RDA12	0.010

(1) Anti-rotation device included with encoder.

(2) For female connector use **XZCC23FDP120S** or pre-wired connectors (L = 2, 5 or 10 m), see page 8/35.

(3) For characteristics of the output stage type (indicated by last letter of the reference), see page 8/12.

Incremental encoders

OsiSense XCC

Ø 58 mm encoders

Parameterable versions (1)

105184



XCC1510PSM02X

Parameterable with solid shaft, Ø 10 mm

Resolution	Connection method (2)	Output stage type (3)	Supply voltage	Reference	Weight kg
256...4096 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1510PSM02X	0.465
		Push-pull	5...30 V	XCC1510PSM02Y	0.465
360...5760 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1510PSM03X	0.465
		Push-pull	5...30 V	XCC1510PSM03Y	0.465
500...8000 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1510PSM05X	0.465
		Push-pull	5...30 V	XCC1510PSM05Y	0.465
1024...16,384 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1510PSM11X	0.465
		Push-pull	5...30 V	XCC1510PSM11Y	0.465
5000...80,000 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1510PSM50X	0.465
		Push-pull	5...30 V	XCC1510PSM50Y	0.465

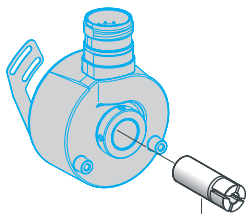
Parameterable with through shaft, Ø 14 mm (4)

Resolution	Connection method (2)	Output stage type (3)	Supply voltage	Reference	Weight kg
256...4096 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1514TSM02X	0.435
		Push-pull	5...30 V	XCC1514TSM02Y	0.435
360...5760 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1514TSM03X	0.435
		Push-pull	5...30 V	XCC1514TSM03Y	0.435
500...8000 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1514TSM05X	0.435
		Push-pull	5...30 V	XCC1514TSM05Y	0.435
1024...16,384 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1514TSM11X	0.435
		Push-pull	5...30 V	XCC1514TSM11Y	0.435
5000...80,000 points	Connector, radial M23 male	5 V, RS 422	4.75...30 V	XCC1514TSM50X	0.435
		Push-pull	5...30 V	XCC1514TSM50Y	0.435

Reduction collars for parameterable encoders with through shaft, Ø 14 mm

For use with	Diameter	Reference	Weight kg
Encoders with through shaft XCC1514TSM●●●	Ø 6	XCCR158RDA06	0.015
	Ø 8	XCCR158RDA08	0.010
	Ø 10	XCCR158RDA10	0.010
	Ø 12	XCCR158RDA12	0.010

514214



XCCR158RDA●●

(1) Parameter configuration: refer to table indicating position of dip switches on page 8/21.

(2) For female connector use XZCC23FDP120S or pre-wired connectors (L = 2, 5 or 10 m), see page 8/35.

(3) For characteristics of the output stage type (indicated by last letter of the reference), see page 8/12.

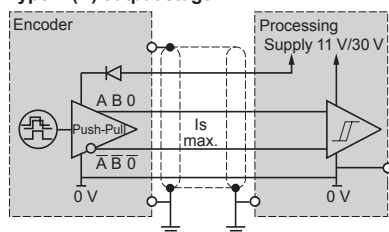
(4) Anti-rotation device included with encoder.

Environment			
Encoder type		XCC1912P●●●●	XCC1930T●●●●
Conformity		CE	
Temperature	Operation (housing)	°C	- 20...+ 80
	Storage	°C	- 30...+ 85
Degree of protection	Conforming to IEC 60529	IP 66	IP 65
Vibration resistance	Conforming to IEC 60068-2-6	10 gn (f = 10...1 kHz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Resistance to electromagnetic interference	Electrostatic discharges	Conforming to IEC 61000-4-2: level 3, 8 kV air; 4 kV contact	
	Radiated electromagnetic fields (electromagnetic waves)	Conforming to IEC 61000-4-3: level 3, 10 V/m	
	Fast transients (Start/Stop interference)	Conforming to IEC 61000-4-4: level 3, 2 kV (1 kV for inputs/outputs)	
	Surge withstand	Conforming to IEC 61000-4-5: level 2, 1 kV	
Materials	Base	Aluminium	
	Housing	Zamak	
	Shaft	Stainless steel	
	Ball bearings	6001ZZ	6807

Mechanical characteristics			
Shaft type		Ø 12, solid shaft (g6)	Ø 30, through shaft (H7)
Maximum rotational speed	Continuous	6000 rpm	3600 rpm
Shaft moment of inertia		g.cm ²	150
Torque		N.cm	1
Maximum load	Radial	daN	20
	Axial	daN	10

Electrical characteristics			
Encoders with type K (N) output stage: push-pull output driver, 11...30 V supply			
Connection		Connector	M23, 12-pin male connector
Frequency		kHz	100
Number of channels		3 channels: A, B, top 0 and complements \bar{A} , \bar{B} , $\bar{0}$	
Supply voltage		\approx 11 V...30 V Maximum ripple: 500 mV	
Current consumption, no-load		mA	75 maximum
Protection		Against short-circuits and reverse polarity	
Output current		mA	40 maximum
Output levels	Low level	1.5 V maximum (I _s = 20 mA)	
	High level	V supply - 3 V minimum (I _s = 20 mA)	

Scheme
Type K (N) output stage



105168



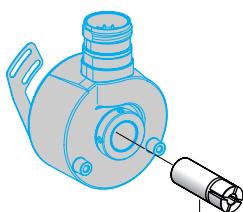
XCC1912PS●●KN

105171



XCC1930TS●●KN

523200



XCCR290RDP●●

Solid shaft, Ø 12 mm

Resolution	Connection method (1)	Output stage type (2)	Supply voltage	Reference	Weight kg
360 points	Connector, radial M23 male	Push-pull	11...30 V	XCC1912PS03KN	1.360
500 points	Connector, radial M23 male	Push-pull	11...30 V	XCC1912PS05KN	1.360
1000 points	Connector, radial M23 male	Push-pull	11...30 V	XCC1912PS10KN	1.360
1024 points	Connector, radial M23 male	Push-pull	11...30 V	XCC1912PS11KN	1.360
2500 points	Connector, radial M23 male	Push-pull	11...30 V	XCC1912PS25KN	1.360
3600 points	Connector, radial M23 male	Push-pull	11...30 V	XCC1912PS36KN	1.360
5000 points	Connector, radial M23 male	Push-pull	11...30 V	XCC1912PS50KN	1.360
10,000 points	Connector, radial M23 male	Push-pull	11...30 V	XCC1912PS00KN	1.360

Through shaft, Ø 30 mm (3)

Resolution	Connection method (1)	Output stage type (2)	Supply voltage	Reference	Weight kg
360 points	Connector, radial M23 male	Push-pull	11...30 V	XCC1930TS03KN	0.960
500 points	Connector, radial M23 male	Push-pull	11...30 V	XCC1930TS05KN	0.960
1000 points	Connector, radial M23 male	Push-pull	11...30 V	XCC1930TS10KN	0.960
1024 points	Connector, radial M23 male	Push-pull	11...30 V	XCC1930TS11KN	0.960
2500 points	Connector, radial M23 male	Push-pull	11...30 V	XCC1930TS25KN	0.960
3600 points	Connector, radial M23 male	Push-pull	11...30 V	XCC1930TS36KN	0.960
5000 points	Connector, radial M23 male	Push-pull	11...30 V	XCC1930TS50KN	0.960

Reduction collars for encoders with through shaft, Ø 30 mm

For use with	Diameter	Reference	Weight kg
Encoders with through shaft XCC1930TS●●●●N	Ø 12 mm	XCCR290RDP12	0.060
	Ø 16 mm	XCCR290RDP16	0.060
	Ø 20 mm	XCCR290RDP20	0.030
	Ø 25 mm	XCCR290RDP25	0.025

(1) For female connector use **XZCC23FDP120S** or pre-wired connectors (L = 2, 5 or 10 m), see page 8/35.

(2) For characteristics of the output stage type (indicated by last letter of the reference), see page 8/16.

(3) Anti-rotation device included with encoder.

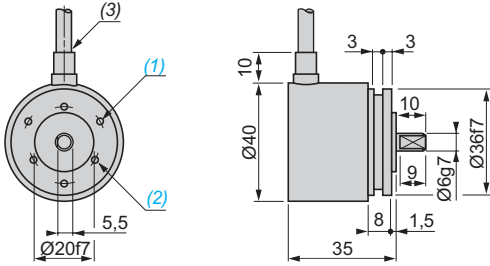
Incremental encoders

OsiSense XCC

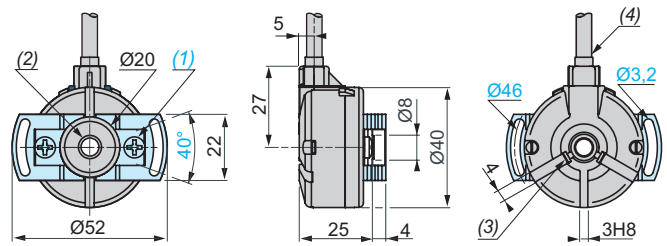
Ø 40 mm and Ø 58 mm encoders

Ø 40 mm encoders

XCC1406PR●●●N



XCC1406TR●●●N

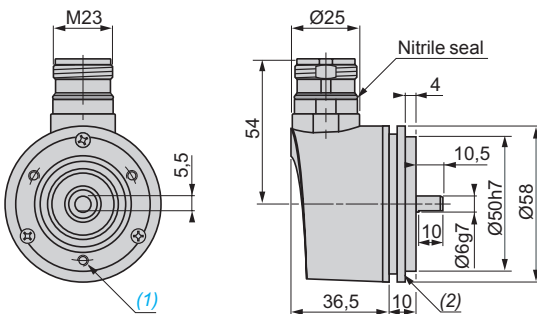


- (1) 3 holes M3 x 0.5 at 120° on 28 PCD, depth: 5 mm.
- (2) 3 holes M3 x 0.5 at 120° on 24 PCD, depth: 5 mm.
- (3) Ø 6 cable, length 2 m, minimum bend radius: 30 mm.

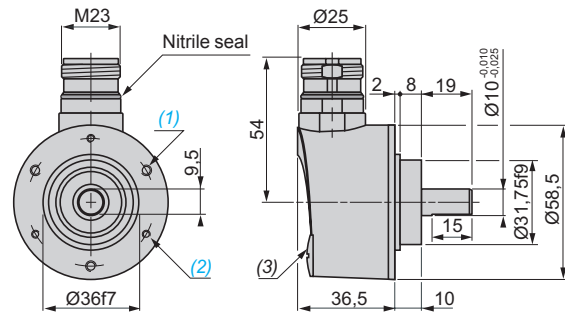
- (1) 2 M4 holes at 120° for cross-headed screws on 30 PCD, depth: 6 mm.
- (2) Through shaft, Ø 6 (H7).
- (3) 2 M2 x 3 flat cross-headed locking screws.
- (4) Ø 6 cable, length 2 m, minimum bend radius: 30 mm.

Ø 58 mm encoders

XCC1506PS●●X, XCC1506PS●●Y



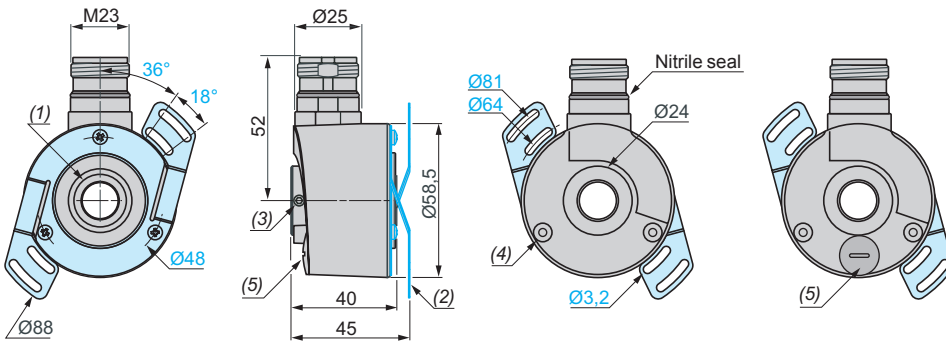
XCC1510PS●●X, 1510PS●●Y / XCC1510PSM●●X, 1510PSM●●Y



- (1) 3 holes M3 x 4 at 120° on 42 PCD, depth: 10 mm.
- (2) Collar XCCRB1 mounted.

- (1) 3 M4 holes at 120° on 48 PCD, depth: 8 mm.
- (2) 3 M3 holes at 120° on 48 PCD, depth: 8 mm.
- (3) Blanking plug, for encoders XCC1510PSM●●X and 1510PSM●●Y only.

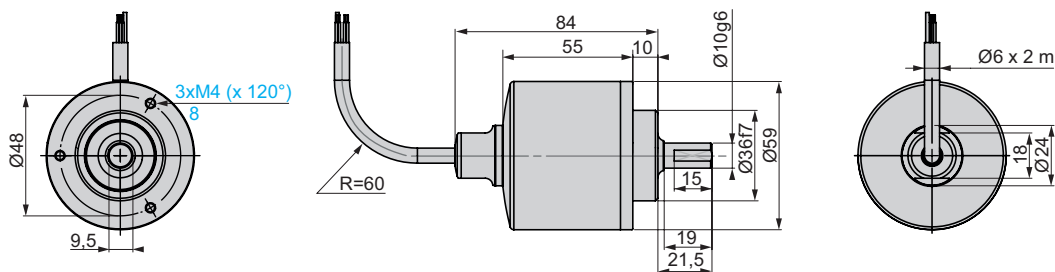
XCC1514TS●●X, 1514TS●●Y / XCC1514TSM●●X, 1514TSM●●Y



- (1) Through shaft, Ø 14 (H7).
- (2) Flexible mounting kit, 1 x XCCRF5N mounted.
- (3) 2 HC M4 x 4 locking screws.
- (4) Hole for M3 x 6 self-threading screw.
- (5) Blanking plug, for encoders XCC1514TSM●●X and 1514TSM●●Y only.

Ø 58 mm encoders (continued)

XCC1510SPA●●Y

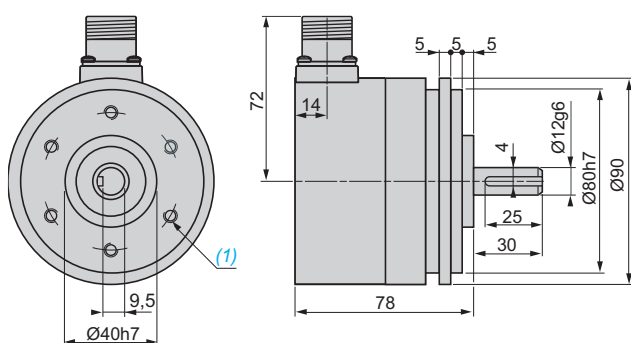


R: minimum bend radius = 60 mm.

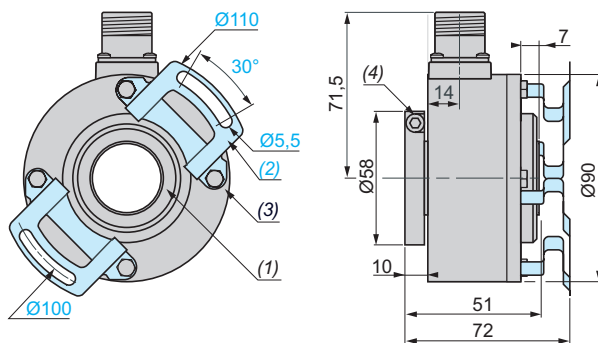
Ø 90 mm encoders

XCC1912PS●●●N

XCC1930TS●●●N



(1) 6 holes M6 x 1 at 120° on 60 PCD, maximum depth: 12 mm.



(1) Through shaft, Ø 30 (H7).
 (2) Anti-rotation device, 1 x XCCRF9, mounted.
 (3) 4 M5 x 6 on 78 PCD.
 (4) 1 CHC M5 x 12 stainless steel A2 locking screw.

Incremental encoders

OsiSense XCC

Ø 40 mm, Ø 58 mm and Ø 90 mm encoders

Pre-cabled version encoders (1)

8 x 0.14 mm² shielded cable connections for Ø 58 encoders stainless steel version

Wire colour	PK	BN	GY	RD	YE	BU	GN	WH
Signal	A ⁻	+V	0	0 ⁻	B	B ⁻	A	0V

PK = Pink
 BN = Brown
 GY = Grey
 RD = Red
 YE = Yellow
 BU = Blue
 GN = Green
 WH = White

8 x 0.14 mm² shielded cable connections for Ø 40 encoders

Wire colour	BN	RD	VT	BU	YE	OG	GN	BK
Signal	A	+V	0	0 ⁻	B	B ⁻	A	0V

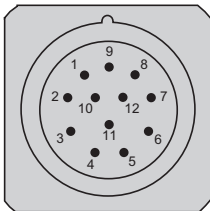
BN = Brown
 RD = Red
 VT = Violet
 BU = Blue
 YE = Yellow
 OG = Orange
 GN = Green
 BK = Black

Note: In environments subject to electrical interference, it is recommended to earth the encoder base using one of the fixing screws.

Connector version encoders (1)

M23, 12-pin connector connections

Male connector on encoder (pin view)



Pin number	1	2	3	4	5	6	7	8	9	10	11	12
Signal	A	+V	0	0	B	B	R	A	R	0V	0V	+V

Note: In environments subject to electrical interference, it is recommended to earth the encoder base using one of the fixing screws.
 R = reserved, do not connect.

(1) Connect each unused channel to 0 V in series with a 10 kΩ resistor.

Incremental encoders

OsiSense XCC

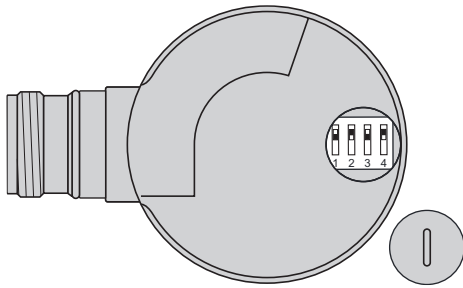
Ø 40 mm, Ø 58 mm and Ø 90 mm encoders

Resolutions

Resolutions for parameterable Ø 58 mm encoders XCC1510PSM●●● and XCC1514TSM●●●

Simple multiplication of the basic resolution of the disc using dip switches (1) (Plastic Ø 2.5 screwdriver recommended).

The factory setting is for factor X1.



Interpolation factor		Basic resolution					Position of dip switches			
Counting	Speed	256	360	500	1024	5000	1	2	3	4
x 1	x 1	256	360	500	1024	5000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
x 2	x 2	512	720	1000	2048	10,000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
x 3	x 3	768	1080	1500	3072	15,000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
x 4	x 4	1024	1440	2000	4096	20,000	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
x 5	-	1280	1800	2500	5120	25,000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
x 8	-	2048	2880	4000	8192	40,000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
x 10	-	2560	3600	5000	10,240	50,000	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
x 12	-	3072	4320	6000	12,288	60,000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
x 16	-	4096	5760	8000	16,384	80,000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(1) Setting the switches to other configurations will result in the encoder providing an unpredictable resolution.

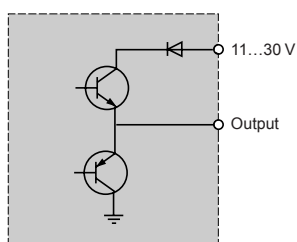
Environment			XCC2506P●●●●●	XCC2510P●●●●●	XCC2510S●●●●●	XCC2514T●●●●●
Encoder type						
Conformity			CE			
Temperature	Operation (housing)	°C	-20...+90	-20...+90	-20...+90	-20...+90
	Storage	°C	-30...+95	-30...+95	-40...+100	-30...+95
Degree of protection	Conforming to IEC 60529		IP 65	IP 65 (IP 67 with collar option XCCR3)	IP 68 / IP 69K	IP 65
Vibration resistance	Conforming to IEC 60068-2-6		10 gn (f = 55...2 kHz)			
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms			
Resistance to electromagnetic interference	Electrostatic discharges		Conforming to IEC 61000-4-2: level 3, 8 kV air; 4 kV contact			
	Radiated electromagnetic fields (electromagnetic waves)		Conforming to IEC 61000-4-3: level 3, 10 V/m			
	Fast transients (Start/Stop interference)		Conforming to IEC 61000-4-4: level 3, 2 kV (1 kV for inputs/outputs)			
	Surge withstand		Conforming to IEC 61000-4-5: level 2, 1 kV			
Materials	Base		Aluminium		Stainless steel 316L	Aluminium
	Housing		Zamak		Stainless steel 316L	Zamak
	Shaft		Stainless steel 303		Stainless steel 316L	Stainless steel 303
	Ball bearings		6000			6803ZZ
	Shaft seal		-		Teflon ring	-

Mechanical characteristics			Ø 6, solid shaft (g7)	Ø 10 mm, solid shaft	Ø 10 mm, solid shaft	Ø 14, through shaft (H7)
Shaft type						
Maximum rotational speed	Continuous		9000 rpm	9000 rpm	3000 rpm	6000 rpm
Shaft moment of inertia		g.cm ²	10	10	12	22
Torque		N.cm	0.4	0.4	9	0.6
Maximum load	Radial	daN	10	10	25	5
	Axial	daN	5	5	50	2

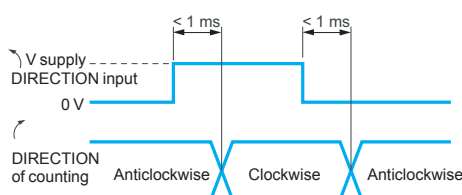
Electrical characteristics			
Connection	Connector		Encoders with parallel output stage types KG (N), KB: M23, 16-pin male connector (2 m TPU cable for XCC2510S●●●). Encoders with SSI output stage types SB (N), SG (N): M23, 12-pin male connector. (2 m PUR cable for XCC2510S●●●).
Frequency		kHz	Encoders with parallel output stage types KG (N), KB: 100 kHz on LSB (Least Significant Bit) Encoders with SSI output stage types SB (N), SG (N): 100 kHz to 1 MHz clock
Encoders with type KB and KG (N) output stage: push-pull output driver, Gray code			
Supply voltage			≐ 11...30 V Maximum ripple: 500 mV. (For XCC2510SPA81●●●: 5...30 V. Maximum ripple 200 mV, if supply voltage < 6 V; 500 mV, if supply voltage ≥ 6V).
Current consumption, no-load		mA	100 maximum
Protection			Against short-circuits and reverse polarity
Output current		mA	20 maximum
Output levels (for U supply = 30 V)	Low level		0.5 V maximum (I _s = 20 mA)
	High level		V supply - 2.5 V minimum (I _s = 20 mA)

Schemes

Type KB and KG (N) output stage



KB and KG (N) DIRECTION input



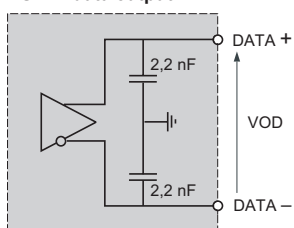
Electrical characteristics (continued)

Encoders with type SB (N) or SG (N) output stage: SSI output without parity, 13-bit clock, 11...30 V supply, binary code (SB) or Gray code (SG)

Supply voltage		11...30 V. Maximum ripple: 500 mV
Current consumption, no-load	mA	100
Protection		Against short-circuits and reverse polarity
Output level		$I_{data} = 20 \text{ mA}$ $ V_{OD} > 2 \text{ V}$

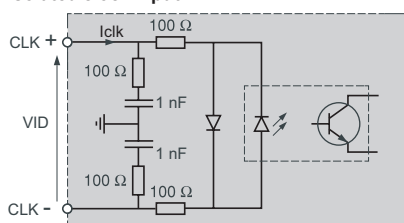
Schemes

RS 422 data output



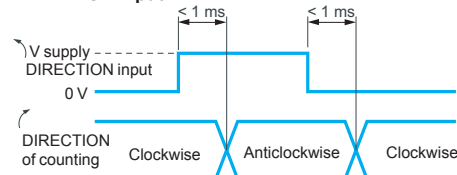
$I_{data} = 20 \text{ mA}$ $|V_{OD}| > 2 \text{ V}$

Isolated clock input



$|V_{ID}|$ maximum: 5 V
 $|I_{clk}|$ maximum: 15 mA

DIRECTION input



References

105173



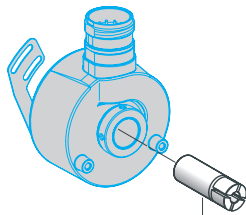
XCC2506PS81●●●

1203118



XCC2510SPA81●GN

514214



XCCR158RDA●●

Resolution	Connection method (1)	Output stage type (2)	Supply voltage	Reference	Weight kg
Solid shaft, Ø 6 mm					
8192 points	Connector, radial M23 male	Push-pull, 13-bit, binary	11...30 V	XCC2506PS81KB	0.495
		Push-pull, 13-bit, Gray	11...30 V	XCC2506PS81KGN	0.495
		SSI, 13-bit, binary	11...30 V	XCC2506PS81SBN	0.490
		SSI, 13-bit, Gray	11...30 V	XCC2506PS81SGN	0.490
Solid shaft, Ø 10 mm					
8192 points	Connector, radial M23 male	Push-pull, 13-bit, binary	11...30 V	XCC2510PS81KB	0.465
		Push-pull, 13-bit, Gray	11...30 V	XCC2510PS81KGN	0.465
		SSI, 13-bit, binary	11...30 V	XCC2510PS81SBN	0.460
		SSI, 13-bit, Gray	11...30 V	XCC2510PS81SGN	0.460
	Cable (2 m)	Push-pull, Gray	5...30 V	XCC2510SPA81KGN (4)	0.915
		SSI, 13-bit, Gray	5...30 V	XCC2510SPA81SGN (4)	0.925
Through shaft, Ø 14 mm (3)					
8192 points	Connector, radial M23 male	Push-pull, 13-bit, binary	11...30 V	XCC2514TS81KB	0.435
		Push-pull, 13-bit, Gray	11...30 V	XCC2514TS81KG	0.435
		SSI, 13-bit, binary	11...30 V	XCC2514TS81SB	0.430
		SSI, 13-bit, Gray	11...30 V	XCC2514TS81SG	0.430
Reduction collars for encoders with through shaft, Ø 14 mm					
For use with		Diameter	Reference	Weight kg	
Encoders with through shaft XCC2514TS81●●		Ø 6 mm	XCCR158RDA06	0.015	
		Ø 8 mm	XCCR158RDA08	0.010	
		Ø 10 mm	XCCR158RDA10	0.010	
		Ø 12 mm	XCCR158RDA12	0.010	

(1) For female connector use:

- XZCC23FDP120S for encoders type SBN and SGN

- XZCC23FDP160S for encoders type KB and KGN,

or pre-wired connectors (L = 2, 5 and 10 m), see page 8/35.

(2) For characteristics of the output stage type (indicated by last letter of the reference), see page 8/22.

(3) Anti-rotation device included with encoder.

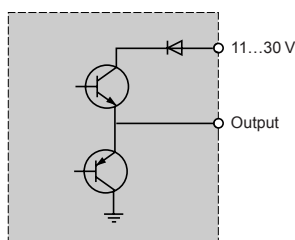
(4) Stainless steel 316L version.

Environment			
Encoder type		XCC2912P●●●●●	XCC2930T●●●●●
Conformity		CE	
Temperature	Operation (housing)	°C - 20...+ 85	
	Storage	°C - 40...+ 85	
Degree of protection	Conforming to IEC 60529	IP 66	IP 65
Vibration resistance	Conforming to IEC 60068-2-6	10 gn (f = 10...2 kHz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Resistance to electromagnetic interference	Electrostatic discharges	Conforming to IEC 61000-4-2: level 3, 8 kV air; 4 kV contact	
	Radiated electromagnetic fields (electromagnetic waves)	Conforming to IEC 61000-4-3: level 3, 10 V/m	
	Fast transients (Start/Stop interference)	Conforming to IEC 61000-4-4: level 3, 2 kV (1 kV for inputs/outputs)	
	Surge withstand	Conforming to IEC 61000-4-5: level 2, 1 kV	
Materials	Base	Aluminium	
	Housing	Zamak	
	Shaft	Stainless steel	
	Ball bearings	6001ZZ	6807

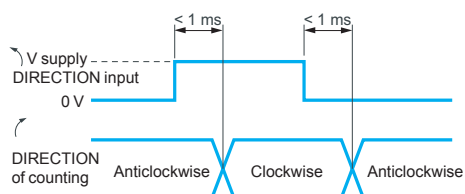
Mechanical characteristics			
Shaft type		Ø 12, solid shaft (g6)	Ø 30, through shaft (H7)
Maximum rotational speed	Continuous	6000 rpm	3600 rpm
Shaft moment of inertia		g.cm² 150	500
Torque		N.cm 1	2.5
Maximum load	Radial	daN 20	8
	Axial	daN 10	5

Electrical characteristics			
Connection	Connector	Encoders with parallel output stage types KB (N) , KG (N) : M23, 16-pin male connector. Encoders with SSI output stage types SB (N) , SG (N) : M23, 12-pin male connector	
Frequency		Encoders with parallel output stage types KB (N) , KG (N) : 100 kHz on LSB (Least Significant Bit) Encoders with SSI output stage types SB (N) , SG (N) : 100 kHz to 1 MHz clock	
Encoders with type KB (N) or KG (N) output stage: push-pull output driver, 11...30 V supply, binary code KB (N) or Gray code KG (N)			
Supply voltage		--- 11...30 V. Maximum ripple: 500 mV (For XCC2510S●●●: 5...30 V. Maximum ripple 200 mV, if supply voltage < 6 V; 500 mV, if supply voltage ≥ 6V).	
Current consumption, no-load		mA 100 maximum	
Protection		Against short-circuits and reverse polarity	
Output current		mA 20 maximum	
Output levels (for U supply = 30 V)	Low level	0.5 V maximum (I _s = 20 mA)	
	High level	V supply - 3 V minimum (I _s = 20 mA)	

Schemes
Type **KB (N)** and **KG (N)** output stage



KB (N) and **KG (N)** DIRECTION input



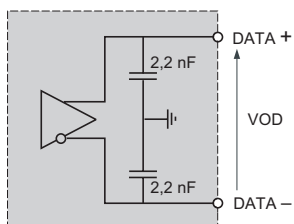
Electrical characteristics (continued)

Encoders with type SB (N) or SG (N) output stage: SSI output without parity, 13-bit clock, 11...30 V supply, binary code SB (N) or Gray code SG (N)

Supply voltage		11...30 V Maximum ripple: 500 mV
Current consumption, no-load	mA	100
Protection		Against short-circuits and reverse polarity
Output level		$I_{data} = 20 \text{ mA}$ $ VOD > 2 \text{ V}$

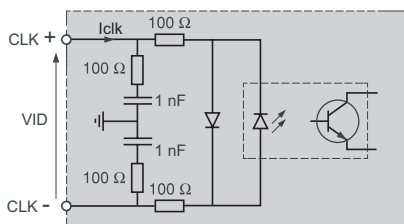
Schemes

RS 422 data output



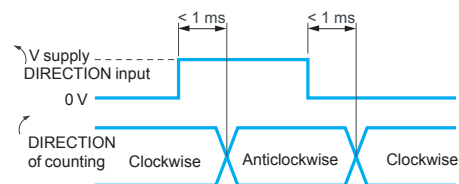
$I_{data} = 20 \text{ mA}$ $|VOD| > 2 \text{ V}$

Isolated clock input



$|VID|$ maximum: 5 V
 I_{clk} maximum: 15 mA

DIRECTION input



References

105168



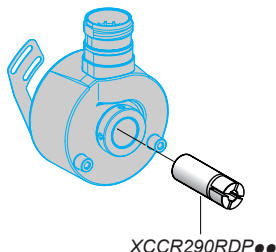
XCC2912PS●●●●

105171



XCC2930TS●●●●

5232001



XCCR290RDP●●

Resolution	Connection method (1)	Output stage type (2)	Supply voltage	Reference	Weight kg
Solid shaft, Ø 12 mm					
8192 points	Connector, radial M23 male	Push-pull, 13-bit, binary	11...30 V	XCC2912PS81KBN	1.365
		Push-pull, 13-bit, Gray	11...30 V	XCC2912PS81KGN	1.365
		SSI, 13-bit, Gray	11...30 V	XCC2912PS81SGN	1.370

Through shaft, Ø 30 mm (3)					
8192 points	Connector, radial M23 male	Push-pull, 13-bit, binary	11...30 V	XCC2930TS81KBN	0.975
		Push-pull, 13-bit, Gray	11...30 V	XCC2930TS81KGN	0.975
		SSI, 13-bit, binary	11...30 V	XCC2930TS81SBN	0.980
		SSI, 13-bit, Gray	11...30 V	XCC2930TS81SGN	0.980

Reduction collars for encoders with through shaft, Ø 30 mm				
For use with	Diameter	Reference	Weight kg	
Encoders with through shaft XCC2930TS81●●●	Ø 12 mm	XCCR290RDP12	0.060	
	Ø 16 mm	XCCR290RDP16	0.060	
	Ø 20 mm	XCCR290RDP20	0.030	
	Ø 25 mm	XCCR290RDP25	0.020	

(1) For female connector use:

- XZCC23FDP120S for encoders type SB (N) and SG (N)
- XZCC23FDP160S for encoders type KB (N) and KG (N), or pre-wired connectors (L = 2, 5 and 10 m), see page 8/35.

(2) For characteristics of the output stage type (indicated by last letter of the reference), see page 8/24.

(3) Anti-rotation device included with encoder.

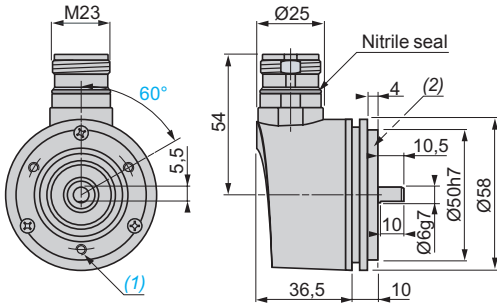
Single turn absolute encoders

OsiSense XCC

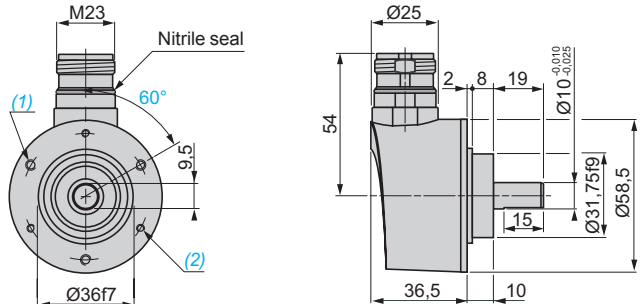
Ø 58 mm and Ø 90 mm encoders

Ø 58 mm encoders

XCC2506PS81KB, XCC2506PS81KGN, XCC2506PS81SBN, XCC2506PS81SGN



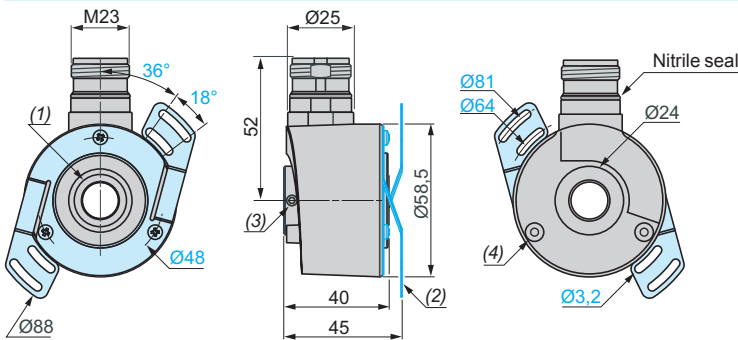
XCC2510PS81KB, XCC2510PS81KGN, XCC2510PS81SBN, XCC2510PS81SGN



(1) 3 M4 holes at 120° on 42 PCD, depth: 10 mm.
(2) Collar XCCRB1 mounted.

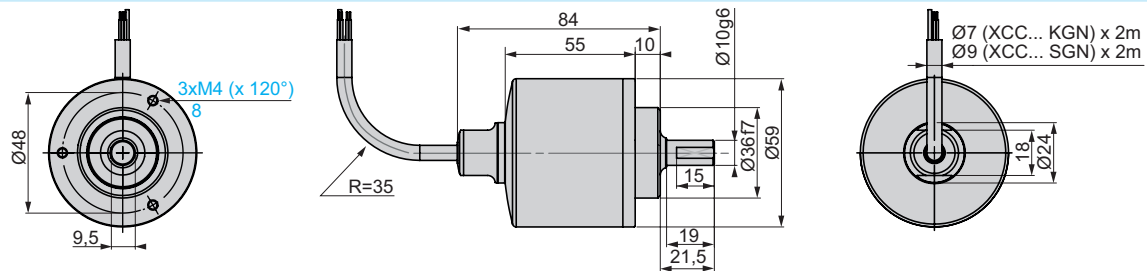
(1) 3 M4 holes at 120° on 48 PCD, depth: 8 mm.
(2) 3 M3 holes at 120° on 48 PCD, depth: 8 mm.

XCC2514TS81KB, XCC2514TS81KGN, XCC2514TS81SB, XCC2514TS81SG



(1) Through shaft, Ø 14 (H7).
(2) Flexible mounting kit, 1 x XCCRF5N mounted.
(3) 2 HC M4 x 4 locking screws.
(4) Hole for M3 x 6 self-threading screw.

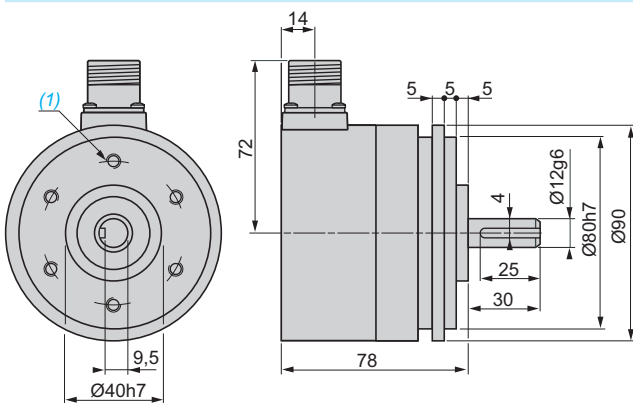
XCC2510SPA81KGN, XCC2510SPA81SGN



R: minimum bend radius = 35 mm for XCC2510SPA81KGN, 65 mm for XCC2510SPA81SGN.

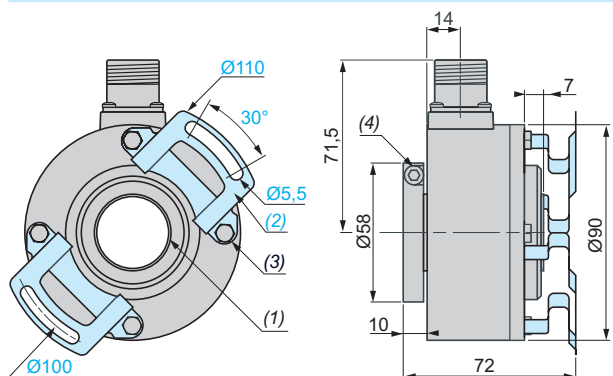
Ø 90 mm encoders

XCC2912PS81KBN, XCC2912PS81KGN



(1) 6 holes M6 x 1 at 120° on 60 PCD, depth: 12 mm maximum.

XCC2930TS81SBN, XCC2930TS81SGN



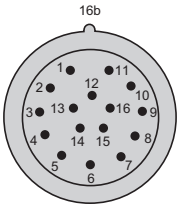
(1) Through shaft, Ø 30 (H7).
(2) Anti-rotation device, 1 x XCCRF9, mounted.
(3) 4 M5 x 6 on 78 PCD.
(4) 1 CHC M5 x 12 stainless steel A2 locking screw.

Connector version encoders

Encoders type KB (N) and KG (N)

M23, 16-pin connector, anticlockwise connections

Male connector on encoder (pin view)



Pin number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Signal/Supply	0 V	+ V	d0	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11	d12	Direction (1)

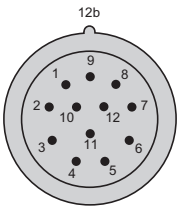
If a resolution less than 13 bits (8192 points) is required, only the corresponding number of bits need to be connected:
 Example:
 - D5 to D12 for 8 bits (256 points)
 - D3 to D12 for 10 bits (1024 points)
 - D2 to D12 for 11 bits (2048 points)

(1) : Clockwise direction, 16 to + V.
 : Anticlockwise direction, 16 to 0 V.

Encoders type SB (N) and SG (N)

M23, 12-pin connector, anticlockwise connections

Male connector on encoder (pin view)



Pin number	1	2	3	4	5	6	7	8	9	10	11	12
Signal/Supply	0 V	Data +	Clk +	R	Direction R	R	+ V	R	Data -	Clk -	R	

R = Reserved (do not connect).
 (2) : Clockwise direction, 5 to 0 V.
 : Anticlockwise direction, 5 to + V.

Cable version encoders

XCC2510SPA81KGN

Wire colour	WH White	BN Brown	GN Green	YE Yellow	GY Grey	OG Orange	BU Blue	RD Red
Signal/Supply	0 V	+ V	d0	d1	d2	d3	d4	d5
	BK Black	VT Violet	WH/BN White/ brown	WH/GN White/ green	WH/YE White/ yellow	WH/BK White/ black	WH/OG White/ orange	WH/RD White/ red
	d6	d7	d8	d9	d10	d11	d12	Direction (3)

(3) : Clockwise direction, to + V.
 : Anticlockwise direction, to 0 V.

XCC2510SPA81SGN

Wire colour	BK Black	BN Brown	GN Green	VT Violet	BU Blue	RD Red	OG Orange	YE Yellow
Signal/Supply	0 V	Data +	Clock +	Direction (4)	Reset to zero	+ V	Data -	Clock -

(4) : Clockwise direction, to 0 V.
 : Anticlockwise direction, to + V.



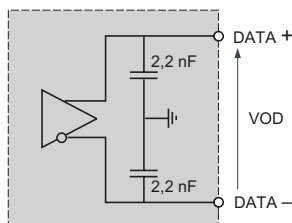
Environment			
Encoder type	Multiturn absolute		XCC3506P●●●●● XCC3510P●●●●● XCC3510SPA48●●● XCC3514T●●●●●
Conformity			CE
Temperature	Operation (housing)	°C	- 20...+ 85
	Storage	°C	- 20...+ 85
Degree of protection	Conforming to IEC 60529		IP 65 IP 65 (IP 67 with collar option XCCRB3) IP 68 / IP 69K IP 65
Vibration resistance	Conforming to IEC 60068-2-6		10 gn (f = 10...2 kHz)
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms
Resistance to electromagnetic interference	Electrostatic discharges		Conforming to IEC 61000-4-2: level 3, 8 kV air; 4 kV contact
	Radiated electromagnetic fields (electromagnetic waves)		Conforming to IEC 61000-4-3: level 3, 10 V/m
	Fast transients (Start/Stop interference)		Conforming to IEC 61000-4-4: level 3, 2 kV (1 kV for inputs/outputs)
	Surge withstand		Conforming to IEC 61000-4-5: level 2, 1 kV
Materials	Base		Aluminium Stainless steel 316L Aluminium
	Housing		Steel Stainless steel 316L Steel
	Shaft		Stainless steel 303 Stainless steel 316L Stainless steel 303
	Ball bearings		6000 6000 6803ZZ
	Shaft seal		- Teflon ring -

Mechanical characteristics			
Shaft type			Ø 6, solid shaft (g7) Ø 10 mm, solid shaft Ø 14, through shaft (H7)
Maximum rotational speed	Continuous		6000 rpm 3000 rpm 6000 rpm
Shaft moment of inertia		g.cm²	10 12 22
Torque		N.cm	0.4 9 0.6
Maximum load	Radial	daN	10 25 5
	Axial	daN	5 25 2

Electrical characteristics			
Connection	Connector		Encoders with SSI output stage types SB (N), SG (N): M23, 12-pin male connector, (2 m PUR cable for XCC3510SPA48●●●).
Frequency			Encoders with SSI output stage types SB (N), SG (N): 100 to 500 kHz clock
Supply voltage			~ 11...30 V. Maximum ripple: 500 mV (For XCC3510SPA48●●●: 5...30 V. Maximum ripple 200 mV, if supply voltage < 6 V; 500 mV, if supply voltage ≥ 6V).
Current consumption, no-load		mA	100 maximum
Protection			Against short-circuits and reverse polarity
Output level			I _{data} = 20 mA VOD > 2 V

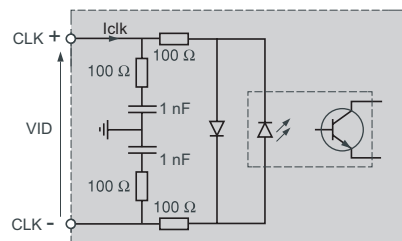
Schemes

RS 422 data output



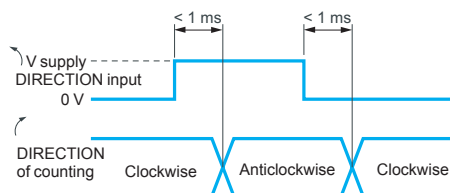
I_{data} = 20 mA |VOD| > 2 V

Isolated clock input

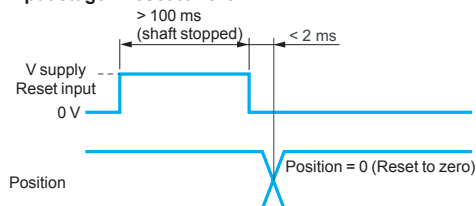


|VID| maximum: 5 V
|I_{clk}| maximum: 15 mA

DIRECTION input



Input stage - Reset to zero



Multiturn absolute encoders

OsiSense XCC

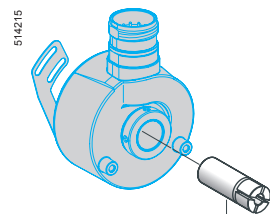
Ø 58 mm encoders, aluminium and stainless steel versions



XCC3506PS84SBN



XCC3510SPA48SGN



XCCR158RDA●●

Ø 58 mm multiturn absolute encoders with SSI output convertible to parallel output

The SSI versions can be converted to a parallel version using the deserialisation connecting cable XCCRM23SUB37●●, see pages 8/34 and 8/35.

Solid shaft, Ø 6 mm

Resolution	Connection method (1)	Output stage type (2)	Supply voltage	Reference	Weight kg
4096 points 8192 turns	Connector, radial M23 male	SSI, 25-bit, binary	11...30 V	XCC3506PS48SBN	0.725
8192 points 4096 turns	Connector, radial M23 male	SSI, 25-bit, binary	11...30 V	XCC3506PS84SBN	0.725
		SSI, 25-bit, Gray	11...30 V	XCC3506PS84SGN	0.725

Solid shaft, Ø 10 mm

Resolution	Connection method (1)	Output stage type (2)	Supply voltage	Reference	Weight kg
4096 points 8192 turns	Connector, radial M23 male	SSI, 25-bit, binary	11...30 V	XCC3510PS48SBN	0.685
	Cable (2 m)	SSI, 25-bit, binary	5...30 V	XCC3510SPA48SGN (3)	0.935
8192 points 4096 turns	Connector, radial M23 male	SSI, 25-bit, binary	11...30 V	XCC3510PS84SBN	0.685
		SSI, 25-bit, Gray	11...30 V	XCC3510PS84SGN	0.685

Through shaft, Ø 14 mm (4)

Resolution	Connection method (1)	Output stage type (2)	Supply voltage	Reference	Weight kg
8192 points 4096 turns	Connector, radial M23 male	SSI, 25-bit, binary	11...30 V	XCC3514TS84SB	0.655

Reduction collars for encoders with through shaft, Ø 14 mm

For use with	Diameter	Reference	Weight kg
Encoders with through shaft XCC3514TS84●●	Ø 6 mm	XCCR158RDA06	0.015
	Ø 8 mm	XCCR158RDA08	0.010
	Ø 10 mm	XCCR158RDA10	0.010
	Ø 12 mm	XCCR158RDA12	0.010
	0.375"	XCCR158RDAU37	0.011
	0.5"	XCCR158RDAU50	0.007

(1) For female connector use XZCC23FDP120S or pre-wired connectors (L = 2, 5 or 10 m), see page 8/35.

(2) For characteristics of the output stage type (indicated by last letter of the reference), see page 8/28.

(3) Stainless steel 316L version.

(4) Anti-rotation device included with encoder.

Environment

Encoder type		XCC3912P●●●●●	XCC3930T●●●●●
Conformity		CE	
Temperature	Operation (housing)	°C - 20...+ 85	- 10...+ 75
	Storage	°C - 30...+ 85	- 20...+ 85
Degree of protection	Conforming to IEC 60529	IP 66	IP 65
Vibration resistance	Conforming to IEC 60068-2-6	10 gn (f = 10...2 kHz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Resistance to electromagnetic interference	Electrostatic discharges	Conforming to IEC 61000-4-2: level 3, 8 kV air; 4 kV contact	
	Radiated electromagnetic fields (electromagnetic waves)	Conforming to IEC 61000-4-3: level 3, 10 V/m	
	Fast transients (Start/Stop interference)	Conforming to IEC 61000-4-4: level 3, 2 kV (1 kV for inputs/outputs)	
	Surge withstand	Conforming to IEC 61000-4-5: level 2, 1 kV	
Materials	Base	Aluminium	
	Housing	Zamak	
	Shaft	Stainless steel	
	Ball bearings	6001ZZ	6807ZZ

Mechanical characteristics

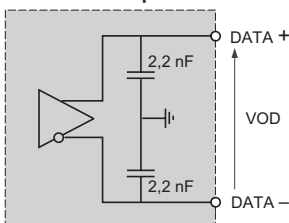
Shaft type		Ø 12, solid shaft (g6)	Ø 30, through shaft (H7)
Maximum rotational speed	Continuous	6000 rpm	3600 rpm
Shaft moment of inertia		g.cm² 150	56
Torque		N.cm 1	0.8
Maximum load	Radial	daN 20	8
	Axial	daN 10	5

Electrical characteristics

Connection	Connector	Encoders with SSI output stage types SB (N), SG (N): M23, 12-pin male connector	
Frequency		Encoders with SSI output stage types SB (N), SG (N): 100 to 500 kHz clock	
Encoders with type SBN or SGN (Gray) output stage: SSI output without parity, 25-bit clock, 11...30 V supply, binary code (SB) or Gray code (SG)			
Supply voltage		11...30 V Maximum ripple: 500 mV	
Current consumption, no-load		mA 100 maximum	
Protection		Against short-circuits and reverse polarity	
Output level		I _{data} = 20 mA VOD > 2 V	

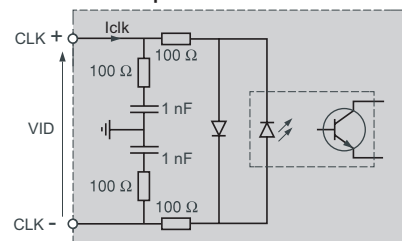
Schemes

RS 422 data output



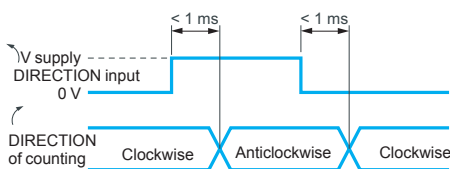
I_{data} = 20 mA |VOD| > 2 V

Isolated clock input



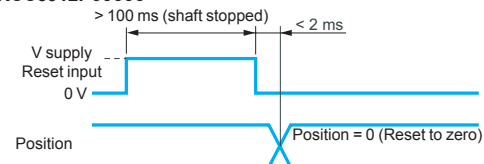
|VID| maximum: 5 V
|Iclk| maximum: 15 mA

DIRECTION input

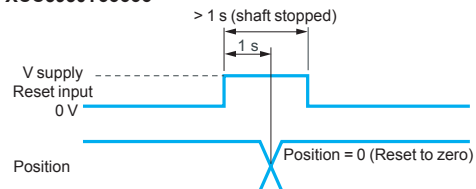


Input stage - Reset to zero

XCC3912P●●●●●



XCC3930T●●●●●



Ø 90 mm multiturn absolute encoders with SSI output convertible to parallel output

The SSI versions can be converted to a parallel version using the deserialisation connecting cable **XCCRM23SUB37●●**, see pages 8/34 and 8/35.

105178



XCC3912PS●●●●

Solid shaft, Ø 12 mm

Resolution	Connection method (1)	Output stage type (2)	Supply voltage	Reference	Weight kg
8192 points 4096 turns	Connector, radial M23 male	SSI, 25-bit, binary	11...30 V	XCC3912PS84SBN	1.840
		SSI, 25-bit, Gray	11...30 V	XCC3912PS84SGN	1.840

105179

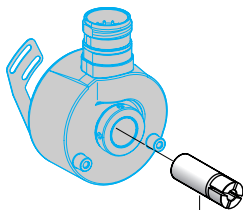


XCC3930TS●●●●

Through shaft, Ø 30 mm (3)

Resolution	Connection method (1)	Output stage type (2)	Supply voltage	Reference	Weight kg
8192 points 4096 turns	Connector, radial M23 male	SSI, 25-bit, binary	11...30 V	XCC3930TS84SBN	1.060
		SSI, 25-bit, Gray	11...30 V	XCC3930TS84SGN	1.060

623200



XCCR290RDP●●

Reduction collars for encoders with through shaft, Ø 30 mm

For use with	Diameter	Reference	Weight kg
Encoders with through shaft XCC3930TS84●●●●	Ø 12 mm	XCCR290RDP12	0.060
	Ø 16 mm	XCCR290RDP16	0.060
	Ø 20 mm	XCCR290RDP20	0.030
	Ø 25 mm	XCCR290RDP25	0.020

(1) For female connector use **XZCC23FDP120S** or pre-wired connectors (L = 2, 5 or 10 m), see page 8/35.

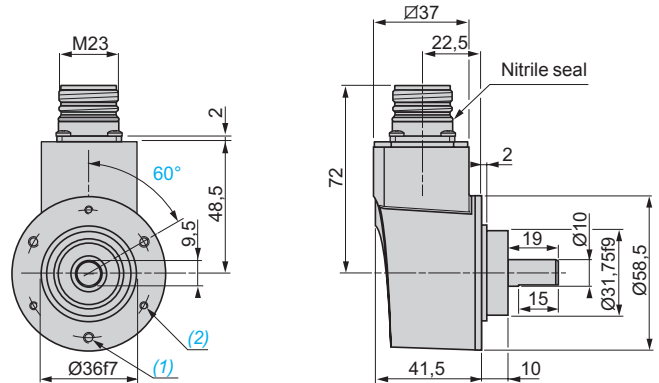
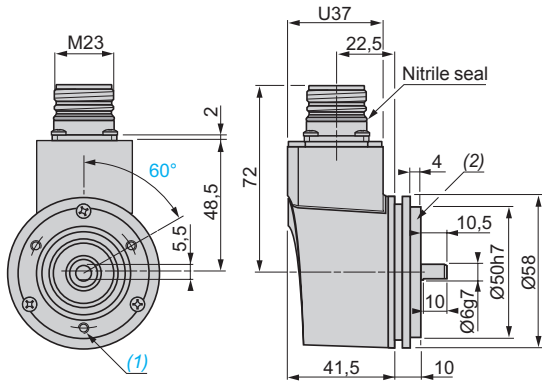
(2) For characteristics of the output stage type (indicated by last letter of the reference), see page 8/30.

(3) Anti-rotation device included with encoder.

Ø 58 mm encoders

XCC3506PS84SBN, XCC3506PS84SGN

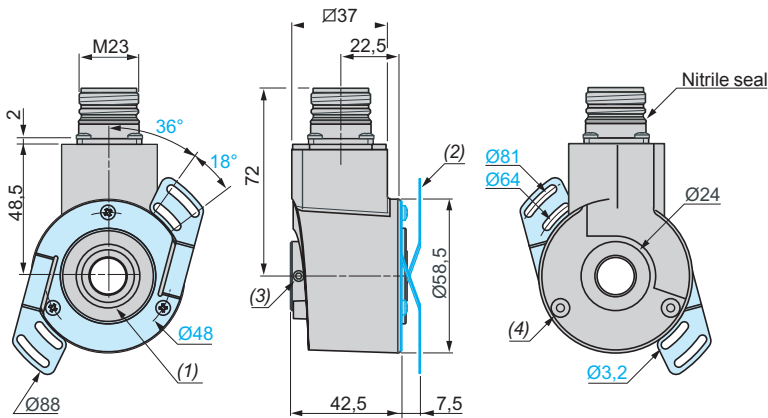
XCC3510PS84SBN, XCC3510PS84SGN



(1) 3 M4 holes at 120° on 42 PCD, depth: 10 mm.
(2) Collar XCCRB1 mounted.

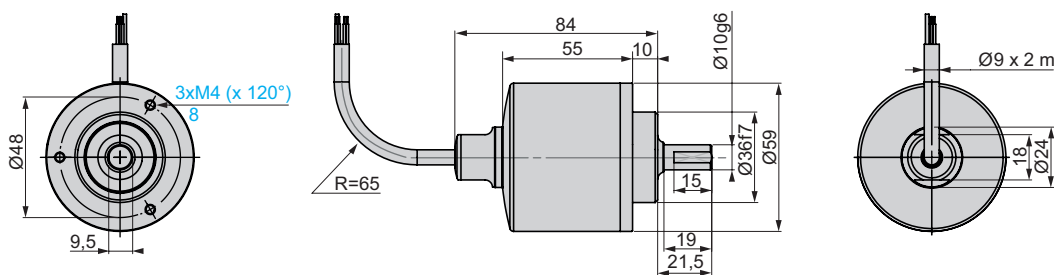
(1) 3 M4 holes at 120° on 48 PCD, depth: 8 mm.
(2) 3 M3 holes at 120° on 48 PCD, depth: 8 mm.

XCC3514TS84SB, XCC3514TS84SG



(1) Through shaft, Ø 14 (H7).
(2) Flexible mounting kit, 1 x XCCRF5N mounted.
(3) 2 HC M4 x 4 locking screws.
(4) Hole for M3 x 6 self-threading screw.

XCC3510SPA48SGN

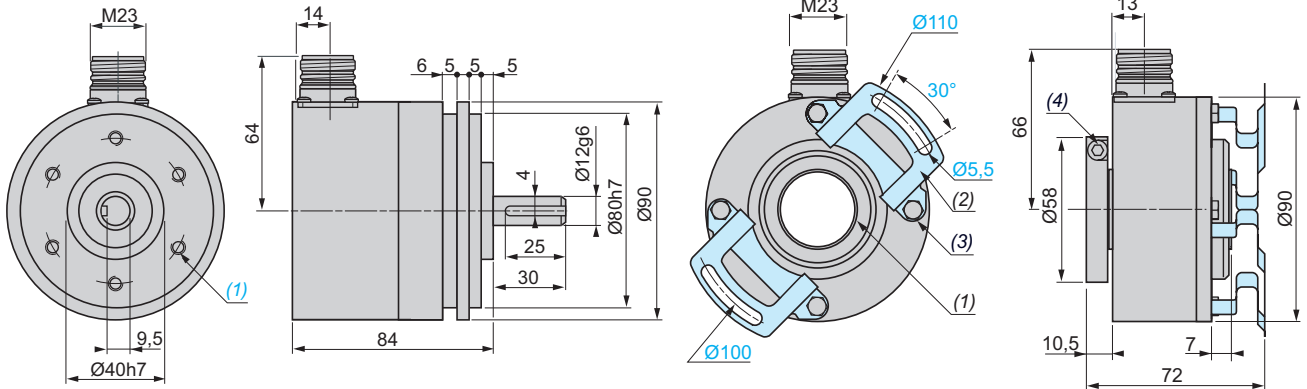


R: minimum bend radius = 65 mm.

Ø 90 mm encoders

XCC3912PS84S●N

XCC3930TS84S●N



(1) 6 holes M6 x 1 at 120° on 60 PCD, depth: 12 mm maximum.

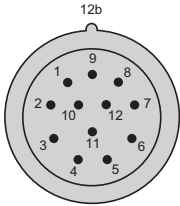
(1) Through shaft, Ø 30 (H7).
 (2) Anti-rotation device, 1 x XCCRF9, mounted.
 (3) 4 M5 x 6 on 78 PCD.
 (4) 3 HC M5 x 6 stainless steel A2 locking screws.

Connector version encoders

Encoder with SSI output (types SBN and SGN)

M23, 12-pin connector, anticlockwise connections

Male connector on encoder (pin view)



Twisted cable pairs + general shielding must be used.

Pin number	1	2	3	4	5	6	7	8	9	10	11	12
Signal/Supply	0 V	Data +	Clk +	R	Direction	Reset	R	+ V	R	Data -	Clk -	R
					(↻) (1)	to zero						

R = Reserved (do not connect).

(1) (↻) : Clockwise direction, (↺) : Anticlockwise direction.

Selection of code progression direction

The DIRECTION input enables the code progression to match the rotational direction of the encoder shaft (clockwise or anticlockwise).

Clockwise direction: connect pin 5 to 0 V.

Anticlockwise direction: connect pin 5 to + V.

Reset to zero

The RESET input enables the encoder to be set to the zero position.

It is actuated by applying an 11...30 V DC supply to pin 6, whilst the shaft is stopped, for the following times:

- over 100 ms for XCC3506, XCC3510 and XCC3912,
- over 1 s for XCC3930T.

Following a reset to zero, the pin 6 connection must be re-established to 0 V.

Note: In environments subject to electrical interference, it is recommended to earth the encoder base using one of the fixing screws.

Cable version encoder

XCC3510SPA48SGN

Wire colour	BK	BN	GN	VT	BU	RD	OG	YE
	Black	Brown	Green	Violet	Blue	Red	Orange	Yellow
Signal/Supply	0 V	Data +	Clock +	Direction	Reset	+ V	Data -	Clock -
				(↻) (2)	to zero			

(2) (↻) : Clockwise direction, to 0 V.

(↺) : Anticlockwise direction, to + V.

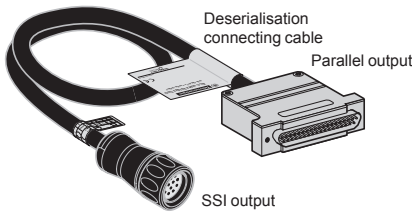
Multiturn absolute encoders

OsiSense XCC

Ø 58 mm and Ø 90 mm encoders

Connection accessories

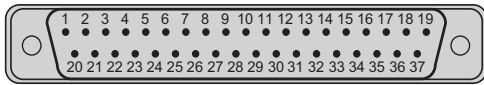
Connector version multiturn absolute encoders



The deserialisation connecting cable **XCCRM23SUB37** (see page 8/35) enables conversion, by simple connection, of encoders **XCC35** and **XCC39** with SSI output to parallel output.

Characteristics

Supply	11 to 30 V
Encoder input/output	Levels RS 422
Parallel outputs	Push-pull protection against short-circuits
Operating temperature	0 to 50 °C



Male connector (pin view)

Selection of code progression direction

The DIRECTION input enables the code progression to match the rotational direction of the encoder shaft (clockwise or anticlockwise).

Clockwise direction: connect pin 30 to an 11...30 V DC supply.
Anticlockwise direction: connect pin 30 to 0 V.

Reset to zero

The RESET input enables the encoder to be set to the zero position. It is actuated by applying an 11...30 V DC supply to pin 27 for more than 1 second.

Encoder selection

The SELECT input enables encoder selection when several units are connected in parallel on the same data bus.
Encoder selected: apply 0 V potential to pin 28.
Encoder not selected: apply 11...30 V DC to pin 28.

Data locking

The LATCH input, particularly useful for high speed applications, enables the freezing of the encoder data output whilst reading the code.

Function not actuated: apply 0 V potential to pin 29.

Function actuated: apply 11...30 V DC to pin 29.

36 x 0.14 mm² shielded cable and SUB-D 37-pin end connector connections

Pin number	Signal	Encoders 4096 points 8192 turns	Encoders 8192 points 4096 turns
1	2 ⁰ (LSB)	Resolution per revolution	Resolution per revolution
2	2 ¹		
3	2 ²		
4	2 ³		
5	2 ⁴		
6	2 ⁵		
7	2 ⁶		
8	2 ⁷		
9	2 ⁸		
10	2 ⁹		
11	2 ¹⁰		
12	2 ¹¹	Number of revolutions	Number of revolutions
13	2 ¹²		
14	2 ¹³		
15	2 ¹⁴		
16	2 ¹⁵		
17	2 ¹⁶		
18	2 ¹⁷		
19	2 ¹⁸		
20	2 ¹⁹		
21	2 ²⁰		
22	2 ²¹		
23	2 ²²		
24	2 ²³		
25	2 ²⁴ (MSB)		
26	R		
27	Reset to zero		
28	Select		
29	Latch		
30	Direction (1) (↻)		
31, 32, 33, 34, 35	R		
36	+ V		
37	0 V		

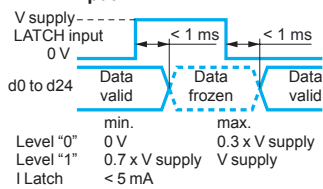
R = Reserved, do not connect

(1) (↻) : clockwise direction, (↺) : anticlockwise direction.

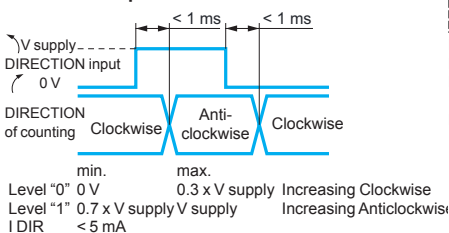
Note: In environments subject to electrical interference, it is recommended to earth the encoder base using one of the fixing screws.

Schemes

LATCH input

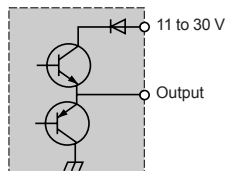


DIRECTION input



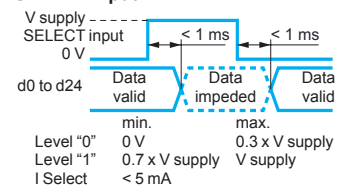
PUSH-PULL

Supply: 11 to 30 V
Maximum ripple: 500 mV
Protection against reverse polarity
Max. no-load consumption: 50 mA (30 mA typical on 24 V)

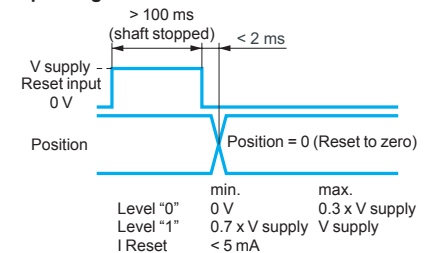


Max. current: 20 mA
Level "0" max.: 1.5 V
Level "1" min.: V supply - 2.5 V
Protection against short-circuits
NPN/PNP compatible

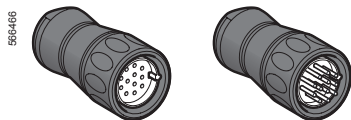
SELECT input



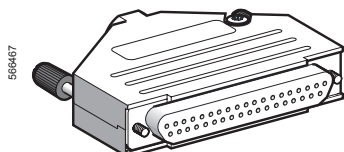
Input stage - Reset to zero



Note: Do not neglect the LATCH and SELECT inputs. Connecting them to 0 V makes the outputs active.



XZCC23FMDP120S



XZCCHFDM370S



XCCRM23SUB37PG



XCCPM23161L2

Cables					
Description	For encoders	Number of wires/c.s.a.	Ø mm	Reference	Weight kg
Shielded cables Length: 100 m UL/CSA	Incremental	10 wires/0.14 mm ²	6	XCCR X 10	5.000
	Absolute, single turn //	16 wires/0.14 mm ²	6.8	XCCR X 16	5.600
	Absolute, single turn and multiturn SSI, and incremental	1 twisted pair of 0.50 mm ² wires and 3 twisted pairs of 0.14 mm ² wires	8.6	XCCR X S8	11.750

Connectors					
Description	For use with	Number of pins	Type	Reference	Weight kg
M23 female connectors	Encoders Incremental, absolute SSI	12	Straight	XZCC23FDP120S	0.040
	Absolute encoders, single turn parallel	16	Straight	XZCC23FDP160S	0.040
Connector kit 1 female + 1 male	SSI jumper cable or incremental encoders	–	–	XZCC23FMDP120S	0.090
SUB-D 37-pin female connector	Absolute encoders, multiturn parallel	37	Straight	XZCCHFDM370S	0.115

Deserialisation jumper cables (1)				
Description	Type	Reference	Weight kg	
M23 F - SUB-D37 M jumper cables, straight M23, cable length 0.5 m	SSI Gray//Gray PNP (PG)	XCCRM23SUB37PG	0.225	
	SSI Gray//Gray NPN (NG)	XCCRM23SUB37NG	0.225	
	SSI Binary//Binary PNP (PB)	XCCRM23SUB37PB	0.225	
	SSI Binary//Binary NPN (NB)	XCCRM23SUB37NB	0.225	

Pre-wired connectors					
Description	Number of wires	Length	Reference	Weight kg	
M23 F straight	8 wires Absolute SSI	2 m	XCCPM23122L2	0.190	
		5 m	XCCPM23122L5	0.470	
		10 m	XCCPM23122L10	0.900	
	10 wires Incremental	2 m	XCCPM23121L2	0.160	
		5 m	XCCPM23121L5	0.330	
		10 m	XCCPM23121L10	0.620	
	16 wires Absolute single turn //	2 m	XCCPM23161L2	0.175	
		5 m	XCCPM23161L5	0.415	
		10 m	XCCPM23161L10	0.790	

(1) See General, page 8/7.

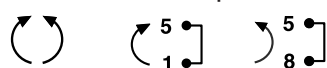
Pre-wired connector connections

XCCPM23122L●		
Pin	Function	Colour
1	0V	BK
2	Data (+)	BN
3	Clk (+)	GN
4	R	–
5	()	VT
6	Reset	BU
7	R	–
8	+V	RD
9	R	–
10	Data (-)	OG
11	Clk (-)	YE
12	R	–

XCCPM23121L●		
Pin	Function	Colour
1	A/	BN
2	V Supply	RD
3	Top 0	VT
4	Top 0/	BU
5	B	YE
6	B/	OG
7	R	–
8	A	GN
9	R	–
10	Gnd	BK
11	Gnd	WH
12	V Supply	GY

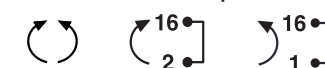
XCCPM23161L●		
Pin	Function	Colour
1	Gnd	WH
2	V Supply	BN
3	d0	GN
4	d1	YE
5	d2	GY
6	d3	OG
7	d4	BU
8	d5	RD
9	d6	BK
10	d7	VT
11	d8	WH/BN
12	d9	WH/GN
13	d10	WH/YE
14	d11	WH/BK
15	d12	WH/OG
16	()	WH/RD

Direction of rotation for pin 5



R: reserved, do not connect

Direction of rotation for pin 16



Shaft couplings with spring (1)

Maximum torque	N.cm	300
Maximum angular misalignment		5°
Maximum radial misalignment	mm	± 1.5
Materials	Collars	Zamak
	Spring	Nickel plated steel
Compression/Expansion	mm	± 1 maximum

Homokinetic (flexible) shaft couplings with bellows

Maximum torque	N.cm	80
Maximum angular misalignment		4°
Maximum lateral misalignment	mm	± 0.3
Maximum axial misalignment	mm	± 0.5
Materials	Bellows	Stainless steel
	Fixing collar	Aluminium
	Screws	Stainless steel

Elastic monobloc shaft couplings

Maximum torque	N.cm	20
Maximum angular misalignment		± 2.5°
Maximum radial misalignment	mm	± 0.3
Compression/Expansion	mm	± 2 maximum
Materials		Glass fibre reinforced polyamide

References

Shaft couplings (for encoders with solid shaft)

Type	Bore diameter (encoder side)	Bore diameter (machine side)	Reference	Weight kg	
With spring (1)	6 mm	6 mm	XCCRAR0606	0.125	
		8 mm	XCCRAR0608	0.125	
		10 mm	XCCRAR0610	0.125	
		12 mm	XCCRAR0612	0.120	
		14 mm	XCCRAR0614	0.120	
		16 mm	XCCRAR0616	0.120	
	10 mm	8 mm	XCCRAR1008	0.120	
		10 mm	XCCRAR1010	0.120	
		12 mm	XCCRAR1012	0.110	
		14 mm	XCCRAR1014	0.110	
		16 mm	XCCRAR1016	0.105	
		12 mm	XCCRAR1208	0.110	
	Homokinetic (flexible) with bellows	6 mm	6 mm	XCCRAS0606	0.020
			8 mm	XCCRAS0608	0.020
			10 mm	XCCRAS0610	0.020
			12 mm	XCCRAS0612	0.015
0.25"			XCCRAS06U25	0.018	
0.375"			XCCRAS06U37	0.016	
10 mm		8 mm	XCCRAS1008	0.015	
		10 mm	XCCRAS1010	0.015	
			XCCRAS1010S (2)	0.015	
		12 mm	XCCRAS1012	0.015	
			XCCRAS1012S (2)	0.015	
		0.25"	XCCRAS10U25	0.016	
		0.375"	XCCRAS10U37	0.014	
			XCCRAS10U37S (2)	0.014	
12 mm	8 mm	XCCRAS1208	0.010		
	12 mm	XCCRAS1212	0.010		
	0.25"	XCCRAS12U25	0.015		
	0.375"	XCCRAS12U37	0.013		
	0.5"	XCCRAS12U50	0.012		
	Elastic, monobloc	6 mm	6 mm	XCCRAE0606	0.010

(1) Not recommended for resolutions higher than 500 points.

(2) Stainless steel 316L version.

105191



XCCRAR●●●●

105192



XCCRAS●●●●●

8093909



XCCRAE0606

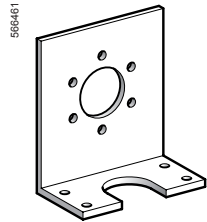
Rotary encoders

OsiSense XCC

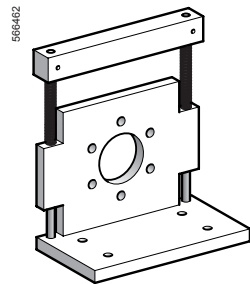
Mounting and fixing accessories



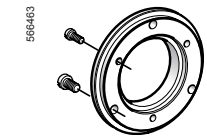
XCCRF●



XCCRE9SN



XCCRE5R



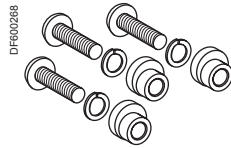
XCCRB1



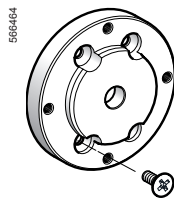
XCCR158RDA08



XCCR290RDP20



XCCRG●



XCCRB2

Anti-rotation devices (for encoders with through shaft)

Description	Features	For encoders	Reference	Weight kg
Flexible mounting kit	Set of 2 flexible fixings + screws	Ø 40 XCC1406T	XCCRF4	0.010
	1 flexible fixing + screws	Ø 58 XCC15●●T, XCC25●●T, XCC3514T	XCCRF5N	0.020
	Set of 2 flexible fixings + screws	Ø 90 XCC19●●T, XCC29●●T, XCC39●●T	XCCRF9	0.030

Mounting and fixing accessories (for encoders with solid shaft)

Description	For encoders	Reference	Weight kg
Set of 3 eccentric clamps + 3 fixing screws (1) + 3 washers	XCC15●●P, XCC25●●P, XCC35●●P	XCCRG5	0.010
	XCC1912P, XCC2912P, XCC3912P	XCCRG9	0.030
Plain brackets for Ø 58 (2)	XCC1506, XCC2506	XCCRE5S	1.300
	XCC1510P, XCC2510P, XCC3510P	XCCRE5SN	0.130
Fixing collar (2") for Ø 58 mm	XCC1510, XCC2510, XCC3510	XCCRB6	0.060
Plain brackets for Ø 90 (2)	XCC1912P, XCC2912P, XCC3912P	XCCRE9SN	0.290
Brackets with play compensator (2)	XCC1510P, XCC2510P, XCC3510PS●●S●●	XCCRE5RN	0.345
	XCC1912P, XCC2912P, XCC3912P	XCCRE9RN	0.890
Collar for synchro mounting, for Ø 58 (2)	XCC1510P, XCC2510P, XCC3510P	XCCRB1	0.040
Substitution interface collar for Ø 90 (2)	XCC1912P, XCC2912P, XCC3912P	XCCRB2	0.175
IP 67 sealed collar for Ø 58 (2)	XCC1510P, XCC2510P, XCC3510PS●●S●●N	XCCRB3	0.030

Reduction collars for encoders with through shaft

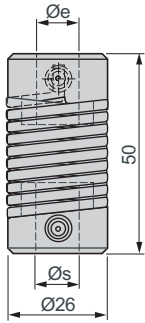
Description	For use with	Reduction	Reference	Weight kg
Reduction collars	Incremental encoders Ø 58	14 mm to 6 mm	XCCR158RDA06	0.015
		14 mm to 8 mm	XCCR158RDA08	0.010
		14 mm to 10 mm	XCCR158RDA10	0.010
		14 mm to 12 mm	XCCR158RDA12	0.010
		14 mm to 0.375"	XCCR158RDAU37	0.011
		14 mm to 0.5"	XCCR158RDAU50	0.007
		Incremental encoders Ø 90 Absolute single turn and multiturn encoders Ø 90	30 mm to 12 mm	XCCR290RDP12
	30 mm to 16 mm		XCCR290RDP16	0.060
	30 mm to 20 mm		XCCR290RDP20	0.030
	30 mm to 25 mm		XCCR290RDP25	0.020
	30 mm to 0.375"		XCCR290RDP37	0.080
	30 mm to 0.5"		XCCR290RDP50	0.060
	30 mm to 0.75"		XCCR290RDP75	0.030
	30 mm to 1"	XCCR290RDP1	0.018	

(1) 3 M3 x 12 screws for XCCRG5, 3 M4 x 25 screws for XCCRG9.

(2) Screws included with brackets and collars.

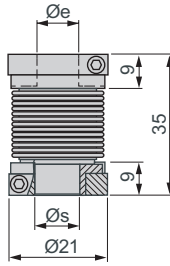
Shaft couplings

XCCRAR●●●●

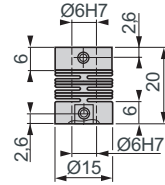


Reference	Ø e	Ø s
XCCRAR0606	6 mm	6 mm
XCCRAR0608	6 mm	8 mm
XCCRAR0610	6 mm	10 mm
XCCRAR0612	6 mm	12 mm
XCCRAR0614	6 mm	14 mm
XCCRAR0616	6 mm	16 mm
XCCRAR1008	10 mm	8 mm
XCCRAR1010	10 mm	10 mm
XCCRAR1012	10 mm	12 mm
XCCRAR1014	10 mm	14 mm
XCCRAR1016	10 mm	16 mm
XCCRAR1208	12 mm	8 mm
XCCRAR1212	12 mm	12 mm
XCCRAR1214	12 mm	14 mm
XCCRAR1216	12 mm	16 mm

XCCRAS●●●●



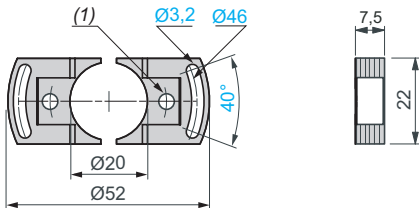
Reference	Ø e	Ø s
XCCRAS0606	6 mm	6 mm
XCCRAS0608	6 mm	8 mm
XCCRAS0610	6 mm	10 mm
XCCRAS0612	6 mm	12 mm
XCCRAS1008	10 mm	8 mm
XCCRAS1010	10 mm	10 mm
XCCRAS1010S	10 mm	10 mm
XCCRAS1012	10 mm	12 mm
XCCRAS1012S	10 mm	12 mm
XCCRAS1208	12 mm	8 mm
XCCRAS1212	12 mm	12 mm
XCCRAS06U25	6 mm to 0.25"	
XCCRAS06U37	6 mm to 0.375"	
XCCRAS10U25	10 mm to 0.25"	
XCCRAS10U37	10 mm to 0.375"	
XCCRAS10U37S	10 mm to 0.375"	
XCCRAS12U25	12 mm to 0.25"	
XCCRAS12U37	12 mm to 0.375"	
XCCRAS12U50	12 mm to 0.5"	



Anti-rotation devices (flexible mounting kit)

XCCRF4

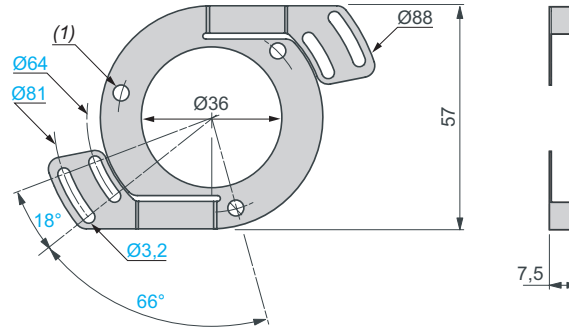
Mounting on Ø 40 mm encoder XCC1406T



(1) 2 holes Ø 4 at 180° on 30 PCD. TC M4 x 5 screw fixings.

XCCRF5N

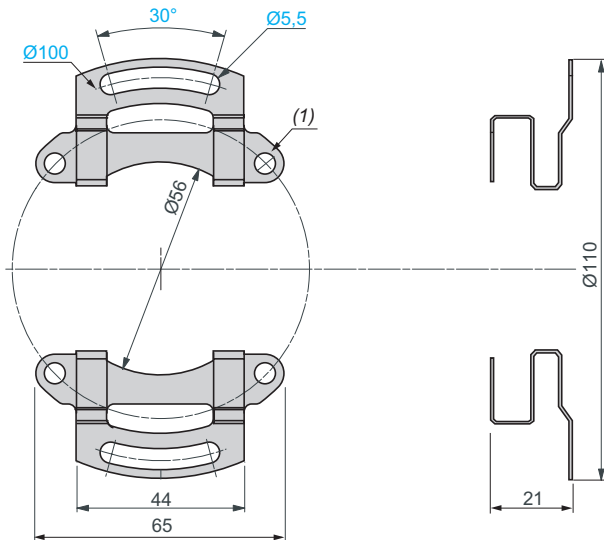
Mounting on Ø 58 mm encoders XCC1514T, XCC2514T and XCC3514T



(1) 3 holes Ø 4.1 at 120° on 48 PCD. TC M3 x 6 screw fixings.

XCCRF9

Mounting on Ø 90 mm encoders XCC1930T, XCC2930T and XCC3930T



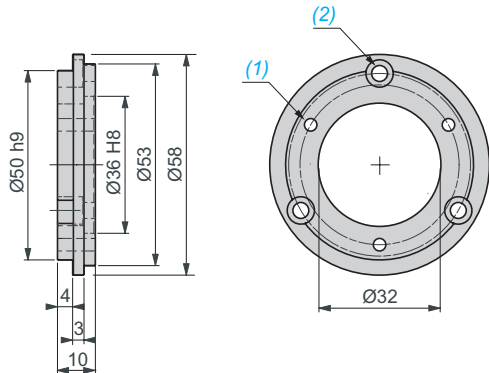
(1) 4 holes Ø 5.2 at 90° on 78 PCD. TH M5 x 6 screw fixings.

8

Collar kits

XCCRB1

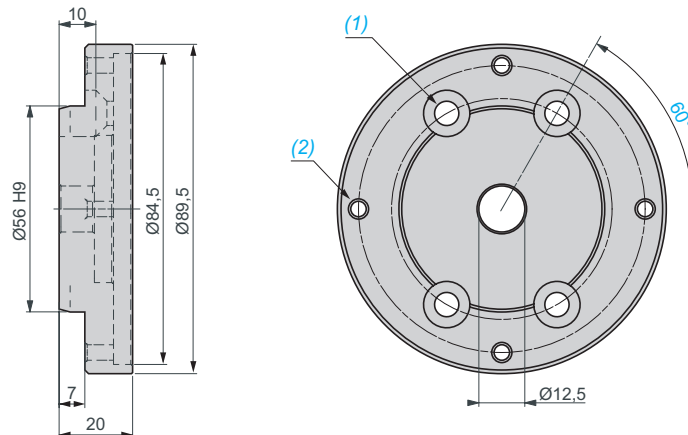
Collar for synchro mounting, for $\varnothing 58$ encoders:
XCC15●●P, XCC25●●P and XCC35●●P



- (1) 3 holes M4 x 0.7 at 120° on 42 PCD. TC M3 x 8 screw fixings.
- (2) 3 counterbored holes for TC M4 x 8 screws at 120° on 48 PCD.

XCCRB2

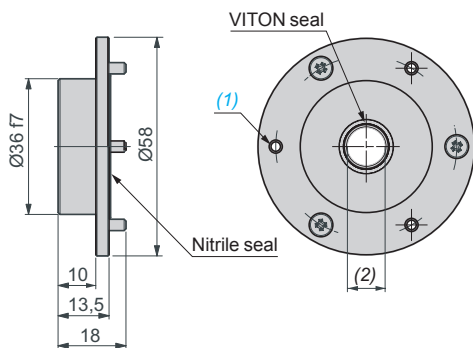
Interface collar for $\varnothing 90$ encoders:
XCC1912P, XCC2912P, XCC3912P



- (1) 4 holes $\varnothing 6.6$ at 120° on 60 PCD. Countersunk for TZ M6 x 16 screws.
- (2) 4 holes M5 x 0.8 at 90° on 78 PCD.

XCCRB3

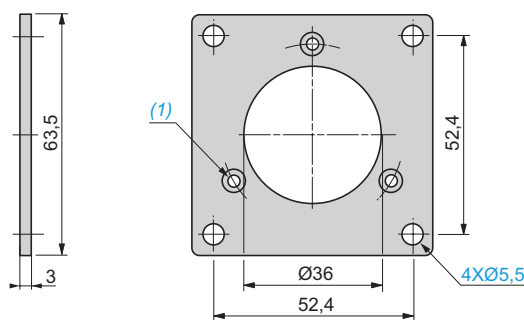
IP 67 sealed collar for $\varnothing 58$ encoders:
XCC1510P, XCC2510P and XCC3510PS●●S●N



- (1) 3 holes M3 x 0.5 at 120° on 48 PCD. TZ M3 x 8 screw fixings.
- (2) Shaft $\varnothing 10$ mm.

Fixing collar XCCRB6

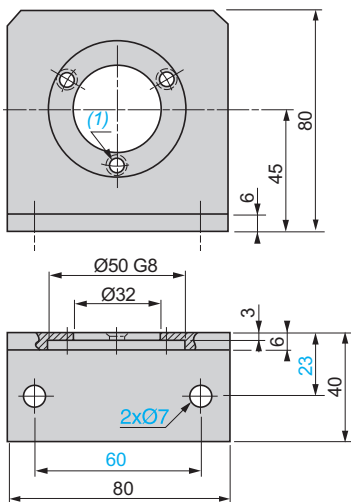
Fixing collar fixation 2" for $\varnothing 58$ encoders:
XCC1510, XCC2510 and XCC3510



- (1) 3 holes M3.2 at 120° on $\varnothing 48$ mm.

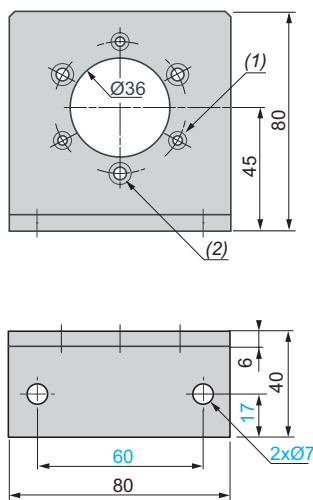
Plain brackets

XCCRE5S



(1) 3 holes Ø 4.5 at 120° on 42 PCD.

XCCRE5SN

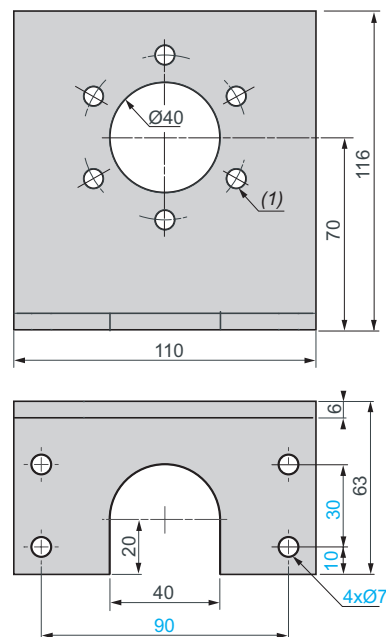


3 CHC M3 x 8 screws included.

(1) 3 counterbored holes for CHC M3 screws at 120° on 48 PCD.

(2) 3 counterbored holes for CHC M4 screws at 120° on 48 PCD.

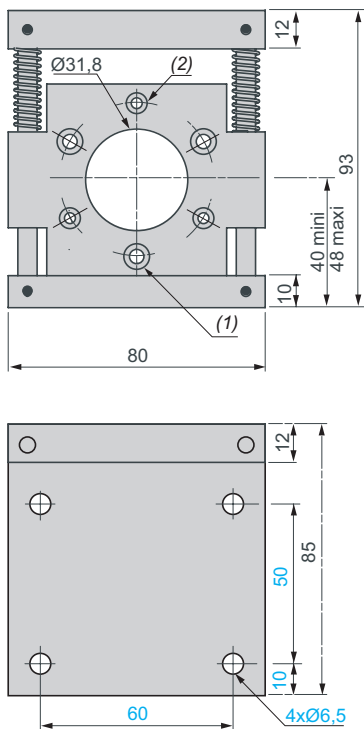
XCCRE9SN



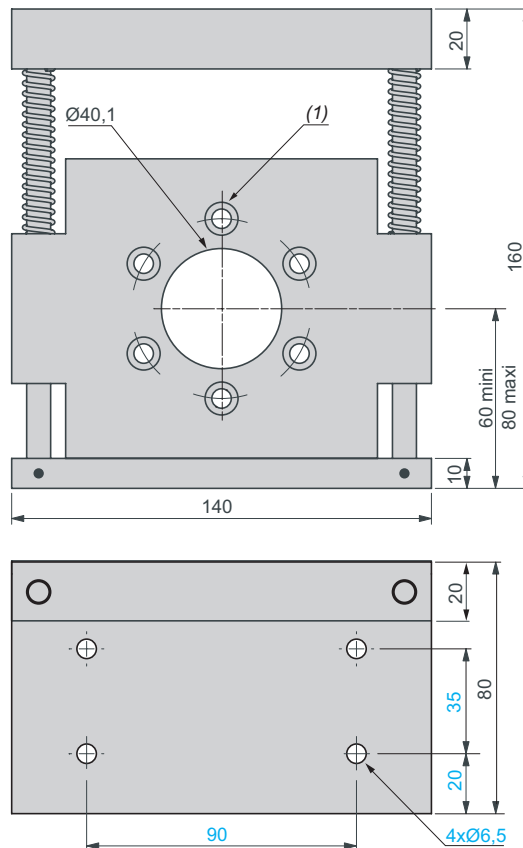
(1) 6 holes Ø 7 for CHC M6 screws at 60° on 60 PCD.

Brackets with play compensator

XCCRE5RN



XCCRE9RN



CHC M3 x 12 screws included

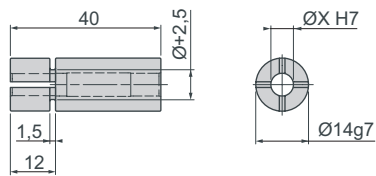
(1) 3 counterbored holes for CHC M3 screws at 120° on 48 PCD.
(2) 3 counterbored holes for CHC M4 screws at 120° on 48 PCD.

(1) 6 counterbored holes for CHC M6 screws at 120° on 60 PCD.

Reduction collars for through shaft

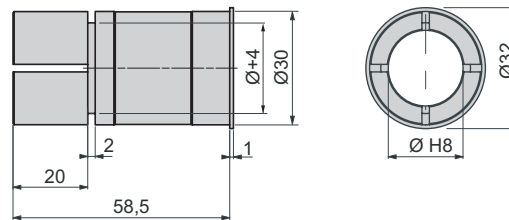
XCCR158RDA●●

For $\varnothing 58$ incremental and absolute single turn and multiturn encoders



XCCR290RDP●●

For $\varnothing 90$ incremental and absolute single turn and multiturn encoders



Reference	\varnothing
XCCR158RDA06	6 mm
XCCR158RDA08	8 mm
XCCR158RDA10	10 mm
XCCR158RDA12	12 mm
XCCR158RDAU37	0.375"
XCCR158RDAU50	0.5"

Reference	\varnothing
XCCR290RDP12	12 mm
XCCR290RDP16	16 mm
XCCR290RDP20	20 mm
XCCR290RDP25	25 mm
XCCR290RDP37	0.375"
XCCR290RDP50	0.5"
XCCR290RDP75	0.75"
XCCR290RDP1	1"

Presentation

The OsiSense XCC CANopen multiturn absolute Ø 58 mm encoder is designed to meet the requirements for configurations encountered in communicating industrial installations. Models **XCC3510PS84CBN** and **XCC3515CS84CBN** integrate CANopen communication protocols as standard.

The CAN-Bus interface integrated in the absolute rotary encoder supports all CANopen functions. The following modes can be programmed and made operational or stopped: Pooling mode, Cyclic mode and Sync mode. The application specific protocol supports the programming of the following additional functions:

- code sequence,
- resolution per revolution,
- global resolution,
- presets,
- speed and address.

The connection housing ensures simple assembly and addressing. It performs the function of a T coupler and has M12 connectors for the bus incoming and outgoing signals.

The rotary encoder can be supplied via the CANopen bus or by using the dedicated PG9 cable gland. The address of the equipment is adjusted from the rotary switches. Encoders **XCC3510PS84CBN** and **XCC3515CS84CBN** have 2 LEDs located on the rear face of the housing to facilitate monitoring and diagnostics conforming to standard DR303-3 v1.3.0 (CiA). The LEDs provide information regarding the operative mode, bus errors, supply problems.

Standards

Encoders **XCC3510PS84CBN** and **XCC3515CS84CBN** conform to:

- standard ISO 11898,
- specifications DS301 V4.02/CAN2.A, DS406 V3.2, DR303-1 V1.7 (cabling and connector), DR303-3 V1.3 (light indicator).

They are CiA certified and meet the requirements of the Schneider Electric interoperability standards.

Encoder setting-up/configuration software

The CANopen bus is configured with the aid of SyCon version 2.9 software, reference SYC SPU LF, to be ordered separately.

The EDS file, reference TEXCC35CBN_0101E.eds, required for encoder configuration can be downloaded from our website www.tesensors.com.

Configurable parameters

■ Transmission speed

Default value: 250 Kbaud, configurable from 10 Kbaud (distance 6700 m) to 1 Mbaud (distance 12 m).

■ Address

defines encoder identification on the bus, 1 to 99. Default value: id = 1. It is defined using 2 coding wheels located in the housing.

■ Resolution

defines the number of points per revolution (0 to 8191).

■ Global resolution

defines the total number of codes of the encoder (0 to 33,554,431).

■ Direction

enables defining of the counting direction of the encoder (increasing clockwise or anticlockwise) in relation to its mechanical position.

■ Reset to X

defines the value of its actual position (reset to X or reset to amount).

Communication modes

■ Pooling mode

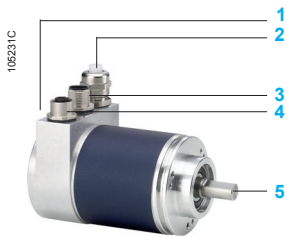
The encoder responds to requests from the master. This mode enables programming and reading to the encoder parameters whilst in position.

■ Cyclic mode

The encoder transmits its data cyclically. The transmission period is programmable from 0 to 65,535 ms.

■ Sync mode

The encoder transmits its data when the master sends a synchro.



- 1 2 LEDs
- 2 PG9 cable gland for supply cable
- 3 M12 male connector (CANopen incoming bus)
- 4 M12 female connector (CANopen outgoing bus)
- 5 Encoder shaft

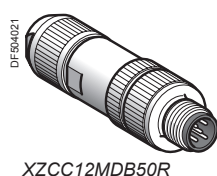
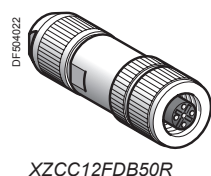
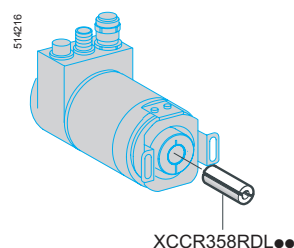
Characteristics			
Encoder type		XCC3510PS84CBN	XCC3515CS84CBN
Conformity		CE	
Temperature	Operation (housing)	°C	- 40...+ 85
	Storage	°C	- 40...+ 85
Degree of protection	Conforming to IEC 60529	IP 64	
Vibration resistance	Conforming to IEC 60068-2-6	10 gn (f = 10...2 kHz)	
Shock resistance	Conforming to IEC 60068-2-27	100 gn (6 ms, 1/2 sine wave)	
Resistance to electromagnetic interference	Electrostatic discharges	Conforming to IEC 61000-4-2: level 2, 4 kV air; 2 kV contact	
	Radiated electromagnetic fields (electromagnetic waves)	Conforming to IEC 61000-4-3: level 3, 10 V/m	
	Fast transients (Start/Stop interference)	Conforming to IEC 61000-4-4: level 3, 2 kV (1 kV for inputs/outputs)	
	Surge withstand	Conforming to IEC 61000-4-5: level 1, 500 V	
Materials	Base	Aluminium	
	Housing	Aluminium	
	Shaft	Stainless steel	
	Ball bearings	6000ZZ1	6803ZZ
Mechanical characteristics			
Shaft type		mm	Ø 10, solid shaft (h8) Ø 15, hollow shaft (F7)
Maximum rotational speed	Continuous		6000 rpm
Shaft moment of inertia		g.cm ²	30
Torque		N.cm	3
Maximum load	Radial	daN	11
Electrical characteristics			
Connection	Connector		CANopen bus network by M12 connector (input: male; output: female), 5-pin, A coding. Supply via PG9 of the encoder
Frequency		kHz	800
Supply	Nominal voltage	V	--- 24 (10-30) Recommended PELV supply (Protective Extra Low Voltage)
Current consumption, no-load		mA	100 maximum
Protection			Against reverse polarity and voltage surges
Signalling			Green LED: CAN_RUN; red LED: CAN_ERR
Communication			
CANopen service	Conformity class		S10 (Transparent Ready)
	Profile		DS406 V3.1, class C2
	Specifications		ISO 11898, DS301 V4.02/CAN2.A, DR303-1 V1.7, DR303-3 V1.3.
Structure	Speed	Kbps	10, 20, 50, 125, 250, 500, 800 and 1000
Product certification			CiA Schneider Electric interoperability standards
Distance depending on speed			250 m at 250 kbps, 100 m at 500 kbps, 30 m at 800 kbps, 12 m at 1000 kbps



Multiturn absolute encoders on bus

OsiSense XCC

CANopen Ø 58 mm encoders



CANopen Ø 58 mm encoders

Description	Connection method	Output stage type	Supply voltage	Reference	Weight kg
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Solid shaft, Ø 10 mm

Ø 58 mm multiturn absolute CANopen bus encoder Resolution 8192 pts/4096 turns	Radial 2 x M12 connectors A coding 1 x PG9	CANopen, 25-bit, binary	11...30 V	XCC3510PS84CBN	0.560
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Hollow shaft, Ø 15 mm (1)

Ø 58 mm multiturn absolute CANopen bus encoder Resolution 8192 pts/4096 turns	Radial 2 x M12 connectors A coding 1 x PG9	CANopen, 25-bit, binary	11...30 V	XCC3515CS84CBN	0.570
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Reduction collars for encoders with hollow shaft, Ø 15 mm

For use with	Diameter	Reference	Weight kg
Encoder with hollow shaft XCC3515CS84CBN	Ø 6 mm	XCCR358RDL06	0.040
	Ø 8 mm	XCCR358RDL08	0.030
	Ø 10 mm	XCCR358RDL10	0.025
	Ø 12 mm	XCCR358RDL12	0.020
	Ø 14 mm	XCCR358RDL14	0.010
	0.375"	XCCR358RDLU37	0.011
	0.5"	XCCR358RDLU50	0.007

Connection accessories for CANopen bus

Connecting cables for CANopen bus

Description	Length m	Reference	Weight kg
Connecting cables fitted with 2 straight type M12 connectors, A coding	1	TCSMCN1M1F1	0.080
	2	TCSMCN1M1F2	0.115
	5	TCSMCN1M1F5	0.520
	10	TCSMCN1M1F10	0.520

CANopen cables

Description	Length	Unit reference	Weight kg
Standard CANopen cables conforming to IEC 60332-1	50 m	TSXCANCA50	4.930
	100 m	TSXCANCA100	8.800
	300 m	TSXCANCA300	24.560
CANopen cables for severe environments (2) or moving installations, CE marking: low smoke emission. Halogen free. No flame propagation (IEC 60332-1). Resistance to oils.	50 m	TSXCANCD50	3.510
	100 m	TSXCANCD100	7.770
	300 m	TSXCANCD300	21.760

Shielded connectors, cabled by user

Description	Type	Unit reference	Weight kg
M12 female connector 5 spring terminals	Straight	XZCC12FDB50R	0.020
M12 male connector 5 spring terminals	Straight	XZCC12MDB50R	0.025

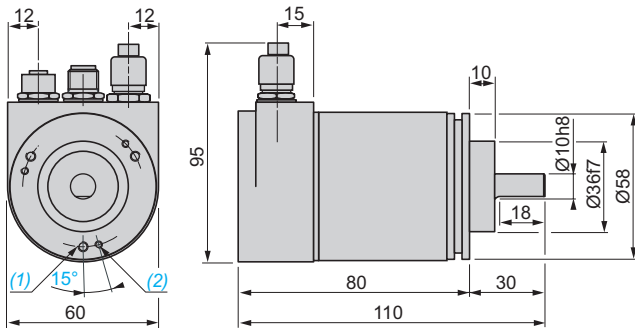
(1) Anti-rotation device included with encoder.

(2) Severe environment:

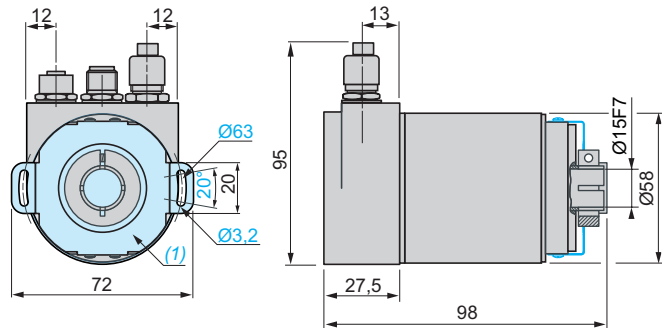
- resistance to hydrocarbons, industrial oils, detergents, weld spatter,
- relative humidity up to 100 %,
- saline atmosphere,
- extreme variations in temperature,
- operating temperature between - 10 °C and + 70 °C,
- moving installation.

Dimensions

XCC3510PS84CBN



XCC3515CS84CBN

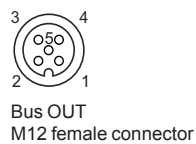
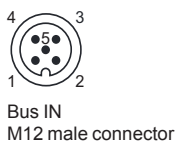
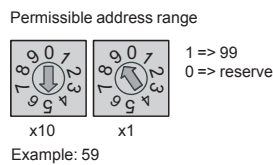
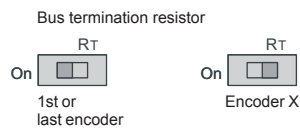
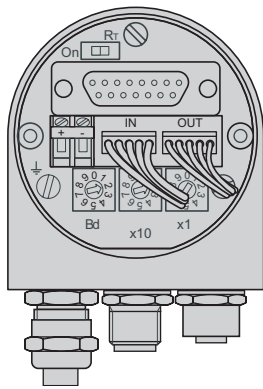


(1) 3 M4 holes at 120° on 48 PCD, depth: 6 mm.
(2) 3 M3 holes at 120° on 48 PCD, depth: 6 mm.

(1) Flexible mounting kit, 1 x XCCRF5B mounted.

Connections

CANopen



Pin	1	2	3	4	5
Function	CAN_SHLD	(CAN_V+)	CAN_GND	CAN_H	CAN_L
Terminal	+	-			
Function	24 V	0 V			

Presentation

The OsiSense XCC PROFIBUS-DP multiturn absolute Ø 58 mm encoder is designed to meet the requirements for configurations encountered in communicating industrial installations. Models **XCC3510PV84FBN** and **XCC3515CV84FBN** integrate PROFIBUS-DP communication protocols as standard.

The PROFIBUS-DP bus interface integrated in the absolute rotary encoder is based on RS 485 transmission and enables speeds of up to 12 Mbps. Exchanges are possible from the master to the encoder. The application specific protocol DP-V0 conforms to the class 2 profile for encoders and supports the following functions:

- code sequence,
- resolution per revolution,
- global resolution,
- presets,
- soft stops,
- speed and address.

The housing of the encoders provides easy access to 2 coding wheels for configuration of the address. 2 LEDs are integrated to facilitate diagnostics. It performs the function of a T coupler with 3 x PG9 cable glands (2 for the bus incoming and outgoing signals, 1 for the encoder supply).

PROFIBUS-DP encoders have 2 LEDs to indicate the encoder status:

- Green LED: "Sta"
- Red LED: "Err".

Standards

PROFIBUS-DP encoders **XCC3510PV84FBN** and **XCC3515CV84FBN** conform to:

- international standards IEC 61158 and IEC 61784 for PROFIBUS-DP communication

- the PROFIBUS-DP standard EN 50170 Class 2 in accordance with profile 3.062 V 1.1 for the encoder application.

They are certified by the PNO organisation and meet the requirements of the Schneider Electric interoperability standards.

Encoder setting-up/configuration software

The PROFIBUS-DP bus is configured with the aid of SyCon version 2.9 software, reference SYC SPU LF, to be ordered separately.

The GSD "gsd file" required for encoder configuration can be downloaded from our website www.tesensors.com, under reference TELE4711.GSD.

Configurable parameters

■ Speed

defines the instantaneous speed in 16-bit binary. It can be data according to 1 of 4 modes:

- Steps/10 ms,
- Steps/100 ms,
- Steps/s or rpm.

■ Address

Addressing is performed using 2 coding wheels located in the housing. The addresses possible are 1 to 99.

■ Resolution

defines the number of points per revolution (0 to 8191)

■ Global resolution

defines the total number of codes of the encoder (0 to 33,554,431)

■ Direction

enables defining of the counting direction of the encoder (increasing clockwise or anticlockwise) in relation to its mechanical position

■ 2 soft stops

one high stop and one low stop can be defined and extracted from the position word

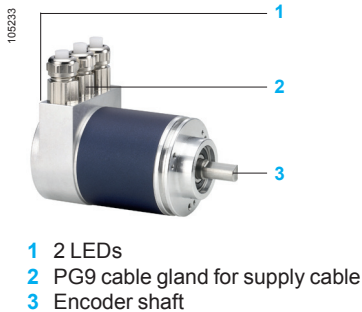
■ Reset to X

defines the value of its actual position (reset to X or reset to amount).

Communication modes

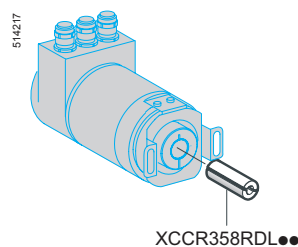
2 communication modes are possible:

- simple and fast, cyclic and deterministic exchanges between the master and the encoder,
- acyclic exchanges.



- 1 2 LEDs
- 2 PG9 cable gland for supply cable
- 3 Encoder shaft

Characteristics				
Encoder type			XCC3510PV84FBN	XCC3515CV84FBN
Conformity			DIN VDE 0160	
Temperature	Operation (housing)	°C	- 40...+ 85	
	Storage	°C	- 40...+ 85	
Degree of protection	Conforming to IEC 60529		IP 64	
Vibration resistance	Conforming to IEC 60068-2-6		10 gn (f = 10...2 kHz)	
Shock resistance	Conforming to IEC 60068-2-27		100 gn (6 ms, 1/2 sine wave)	
Resistance to electromagnetic interference	Electrostatic discharges		Conforming to IEC 61000-4-2: level 2, 4 kV air; 2 kV contact	
	Radiated electromagnetic fields (electromagnetic waves)		Conforming to IEC 61000-4-3: level 3, 10 V/m	
	Fast transients (Start/Stop interference)		Conforming to IEC 61000-4-4: level 3, 2 kV (1 kV for inputs/outputs)	
	Surge withstand		Conforming to IEC 61000-4-5: level 1, 500 V	
Materials	Base		Aluminium	
	Housing		Aluminium	
	Shaft		Stainless steel	
	Ball bearings		6000ZZ1	6803ZZ
Mechanical characteristics				
Shaft type		mm	Ø 10, solid shaft (h8)	Ø 15, hollow shaft (F7)
Maximum rotational speed			6000 rpm	
Shaft moment of inertia		g.cm ²	30	
Torque		N.cm	3	
Maximum load	Radial	daN	11	
Electrical characteristics				
Connection	Via PG9		3 x PG9 entries: - 2 x PG9 entries for the PROFIBUS-DP bus - 1 x PG9, positioned in middle, for external supply (10-30 V) Due to the T integrated in the housing, the supply can be distributed on the bus. Connections are made using screw terminals.	
Frequency		kHz	800	
Supply	Nominal voltage	V	~ 24 (10-30) Recommended PELV supply (Protective Extra Low Voltage)	
Current consumption, no-load		mA	100	
Protection			Against reverse polarity and voltage surges	
Signalling			Green LED: "Sta"; red LED: "Err"	
Communication				
PROFIBUS-DP V0 service	Profile for encoder Specifications		3.062 V1.1. IEC 61158, IEC 61784, EN 50170 class 2, EN 50254	
Interface			RS 485	
Speed			9.6 Kbps...12 Mbps maximum	
Product certification			PNO Schneider Electric interoperability standards	



References

Description	Connection method	Output stage type	Supply voltage	Reference	Weight kg
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Solid shaft, Ø 10 mm

Ø 58 mm multiturn absolute PROFIBUS-DP encoder Resolution 8192 pts/4096 turns	3 x PG9 radial	PROFIBUS-DP, 25-bit, binary	11...30 V	XCC3510PV84FBN	0.560
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Hollow shaft, Ø 15 mm (1)

Ø 58 mm multiturn absolute PROFIBUS-DP encoder Resolution 8192 pts/4096 turns	3 x PG9 radial	PROFIBUS-DP, 25-bit, binary	11...30 V	XCC3515CV84FBN	0.570
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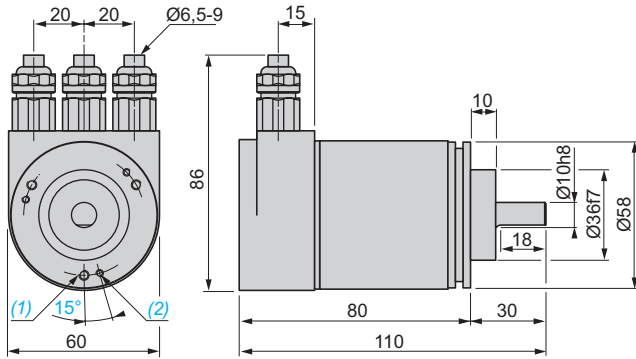
Reduction collars for encoders with hollow shaft, Ø 15 mm

For use with	Diameter	Reference	Weight kg
Encoder with hollow shaft XCC3515CV84FBN	Ø 6 mm	XCCR358RDL06	0.040
	Ø 8 mm	XCCR358RDL08	0.030
	Ø 10 mm	XCCR358RDL10	0.025
	Ø 12 mm	XCCR358RDL12	0.020
	Ø 14 mm	XCCR358RDL14	0.010
	Ø 0.375"	XCCR358RDLU37	0.011
	Ø 0.5"	XCCR358RDLU50	0.007

(1) Anti-rotation device included with encoder.

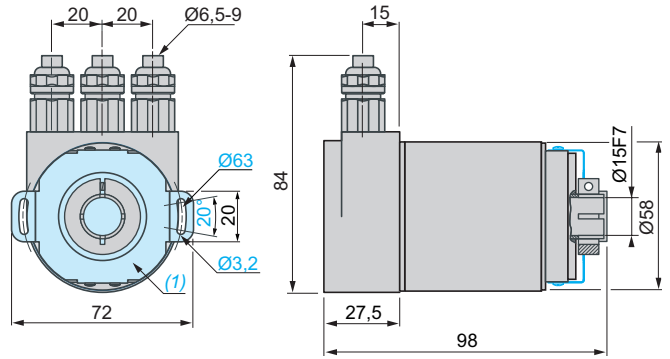
PROFIBUS-DP Ø 58 mm encoders

XCC3510PV84FBN



(1) 3 M4 holes at 120° on 48 PCD, depth: 6 mm.
(2) 3 M3 holes at 120° on 48 PCD, depth: 6 mm.

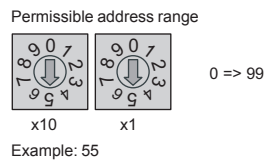
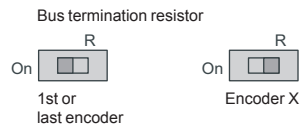
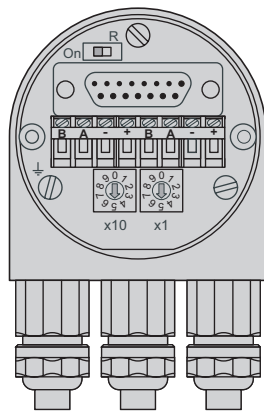
XCC3515CV84FBN



(1) Flexible mounting kit, 1 x XCCRF5B mounted.

Connections

PROFIBUS-DP



Terminal	⏚	B (left)	A (left)	-	+
Function	Earth	Bus line B (Bus in)	Bus line A (Bus in)	0 V	11-30 V

Terminal	B (right)	A (right)	-	+
Function	Bus line B (Bus out)	Bus line A (Bus out)	0 V	11-30 V

Homokinetic (flexible) shaft couplings with bellows

Maximum torque	N.cm	80
Maximum angular misalignment		4°
Maximum lateral misalignment	mm	± 0.3
Maximum axial misalignment	mm	± 0.5
Materials	Bellows	Stainless steel
	Fixing collar	Aluminium
	Screws	Stainless steel

References

Shaft couplings (for encoders with solid shaft)

Type	Bore diameter (encoder side)	Bore diameter (machine side)	Reference	Weight kg
Homokinetic (flexible) with bellows	10 mm	8 mm	XCCRAS1008	0.015
		10 mm	XCCRAS1010	0.015
		12 mm	XCCRAS1012	0.015

106192



XCCRAS●●●●

Anti-rotation devices (for encoders with hollow shaft)

Description	Features	For encoders	Reference	Weight kg
Flexible mounting kit	1 flexible fixing + screws	CANopen and PROFIBUS-DP	XCCRF5B	0.010

Reduction collars for encoders with hollow shaft

Description	For use with	Reduction	Reference	Weight kg
Reduction collars	CANopen and PROFIBUS-DP encoders	15 mm to 6 mm	XCCR358RDL06	0.040
		15 mm to 8 mm	XCCR358RDL08	0.030
		15 mm to 10 mm	XCCR358RDL10	0.025
		15 mm to 12 mm	XCCR358RDL12	0.020
		15 mm to 14 mm	XCCR358RDL14	0.010
		15 mm to 0.375"	XCCR358RDLU37	0.011
		15 mm to 0.5"	XCCR358RDLU50	0.007

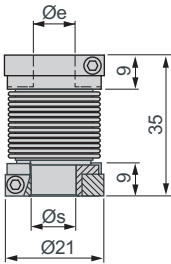
106189



XCCR358RDL06

Shaft couplings

XCCRAS●●●●

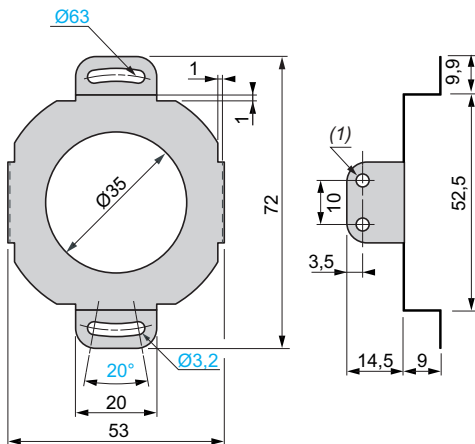


Reference	Ø e	Ø s
XCCRAS1008	10	8
XCCRAS1010	10	10
XCCRAS1012	10	12

Anti-rotation device

XCCRF5B

Mounting on Ø 58 mm CANopen and PROFIBUS-DP encoders XCC3510●●●FBN, XCC3510●●●CBN, XCC3515C●●●FBN, XCC3515C●●●CBN

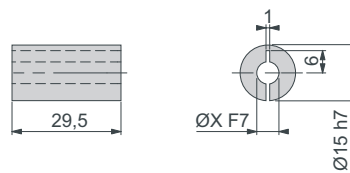


(1) 4 holes Ø 3.2. M3 x 6 screw fixings.

Reduction collars

XCCR358RDL●●

For CANopen and PROFIBUS-DP encoders



Reference	Ø
XCCR358RDL06	6 mm
XCCR358RDL08	8 mm
XCCR358RDL10	10 mm
XCCR358RDL12	12 mm
XCCR358RDL14	14 mm
XCCR358RDLU37	0.375"
XCCR358RDLU50	0.5"

A									
AB1FU10135U	3/116								
	5/161								
AB1R11	1/86								
ABL8MEM24003	7/20								
ABL8MEM24012	7/20								
ACW10M119012	2/125								
ACW10M129012	2/125								
ACW1M119012	2/124								
ACW1M129012	2/124								
ACW20M119012	2/125								
ACW20M129012	2/125								
ACW21M119012	2/124								
ACW21M129012	2/124								
ACW22M119012	2/125								
ACW22M129012	2/125								
ACW23M119012	2/124								
ACW23M129012	2/124								
ACW24M119012	2/124								
ACW24M129012	2/124								
ACW25M119012	2/124								
ACW25M129012	2/124								
ACW26M119012	2/125								
ACW26M129012	2/125								
ACW27M119012	2/125								
ACW27M129012	2/125								
ACW28M119012	2/125								
ACW28M129012	2/125								
ACW29M119012	2/125								
ACW29M129012	2/125								
ACW3M119012	2/125								
ACW3M129012	2/124								
ACW4M119012	2/124								
ACW4M129012	2/124								
ACW5M119012	2/124								
ACW5M129012	2/124								
ACW6M119012	2/125								
ACW6M129012	2/125								
ACW7M119012	2/125								
ACW7M129012	2/125								
ACW8M119012	2/125								
ACW8M129012	2/125								
ACW9M119012	2/125								
ACW9M129012	2/125								
ADW23M129012	2/126								
ADW24M129012	2/126								
ADW25M129012	2/127								
ADW26M129012	2/127								
ADW27M129012	2/126								
ADW3M119012	2/126								
ADW3M129012	2/126								
ADW4M119012	2/126								
ADW4M129012	2/126								
ADW5M119012	2/127								
ADW5M129012	2/127								
ADW6M119012	2/127								
ADW6M129012	2/127								
ADW7M119012	2/126								
ADW7M129012	2/126								
ADW7S1M129012	2/127								
ASI67FACC1	7/21								
D									
DE9PEM20010	1/196								
DE9PL116044	1/220								
DE9PM1201	2/134								
	2/152								
DE9PM1202	2/134								
	2/152								
DE9PM1203	2/134								
	2/152								
DE9RA1012	1/50								
	1/64								
	1/65								
	1/71								
DE9RA1212	1/99								
	1/93								
DE9RA2012	1/99								
	1/93								
DE9RP13520	1/190								
	1/192								
F									
FSG2	2/139								
FSG2NE	2/139								
FSG9	2/139								
FSG9NE	2/139								
FTG2	2/138								
FTG2NE	2/138								
FTG9	2/138								
FTG9NE	2/138								
FIG22	2/140								
FIG22NE	2/140								
FIG32	2/140								
FIG32NE	2/140								
T									
TCSAMT31FP	7/19								
TCSCNTN011M11F	7/20								
	7/32								
TCSEAAF11F13F00	7/20								
TCSECN300R2	7/20								
TCSEK1MDRS	7/20								
TCSEK3MDS	7/20								
TCSESU051F0	7/20								
TCSCMCN1F10	7/20								
	7/32								
TCSCMCN1F2	7/20								
	7/32								
TCSCMCN1F5	7/20								
	7/32								
TCSCMCN1F9M2P	7/20								
TCSCMCN1FQM2	7/20								
TCSCMCN1M1F1	7/20								
TCSCMCN1M1F10	7/20								
	7/32								
TCSCMCN1M1F1	8/44								
TCSCMCN1M1F10	7/20								
	7/32								
TCSCMCN1M1F2	7/20								
	7/32								
TCSCMCN1M1F5	7/20								
	7/32								
TCSCMCN1M1F5	7/20								
	7/32								
TM7ACTLA	7/21								
TSXCANCA100	8/44								
TSXCANCA300	8/44								
TSXCANCA50	8/44								
TSXCANCD100	8/44								
TSXCANCD50	8/44								
TSXCANCD50	8/44								
TSXCANCD50	8/44								
TSXCSA100	7/20								
TSXCSA200	7/20								
TSXCSA500	7/20								
X									
XALZ09	1/50								
XC010L2	1/204								
XC011L2	1/204								
XC1AC111	1/182								
XC1AC115	1/182								
XC1AC116	1/182								
XC1AC117	1/182								
XC1AC118	1/182								
XC1AC119	1/182								
XC1AC121	1/182								
XC1AC125	1/182								
XC1AC126	1/182								
XC1AC127	1/182								
XC1AC128	1/182								
XC1AC129	1/182								
XC1AC131	1/182								
XC1AC135	1/182								
XC1AC136	1/182								
XC1AC137	1/182								
XC1AC138	1/182								
XC1AC139	1/182								
XC1AC141	1/182								
XC1AC145	1/182								
XC1AC146	1/182								
XC1AC147	1/182								
XC1AC148	1/182								
XC1AC149	1/182								
XC1AC151	1/182								
XC1AC155	1/182								
XC1AC156	1/182								
XC1AC157	1/182								
XC1AC158	1/182								
XC1AC159	1/182								
XC1AC161	1/182								
XC1AC165	1/182								
XC1AC166	1/182								
XC1AC167	1/182								
XC1AC168	1/182								
XC1AC169	1/182								
XC1AC171	1/182								
XC1AC175	1/182								

XCCRAS10U37	8/36	XCKJ10559D	1/108	XCKS159H29	1/92	XCMD2501L1	1/25	XEP3S1W6B●●●	1/202
XCCRAS10U37S	8/36	XCKJ10559H29	1/104	XCKS1●●H29	1/92	XCMD2502L1	1/12	XEP3S2W2	1/202
XCCRAS1208	8/36	XCKJ1105●●H29	1/106	XCKS501H29	1/92	XCMD2506L1	1/13	XEP3S2W2B●●●	1/202
XCCRAS1212	8/36	XCKJ1161H29	1/106	XCKS502H29	1/92	XCMD2510L1	1/12	XEP3S2W3	1/202
XCCRAS12U25	8/36	XCKJ1167H29	1/106	XCKS531H29	1/92	XCMD2511L1	1/12	XEP3S2W3B●●●	1/202
XCCRAS12U37	8/36	XCKJ161A	1/110	XCKS533H29	1/92	XCMD2515L1	1/13	XEP3S2W6	1/202
XCCRAS12U50	8/36	XCKJ161D	1/108	XCKS539H29	1/92	XCMD2516L1	1/13	XEP3S2W6B●●●	1/202
XCCRB1	8/37	XCKJ161H29	1/104	XCKS541H29	1/92	XCMD2517L1	1/13	XEP4E1FD	1/200
XCCRB2	8/37	XCKJ167A	1/110	XCKS543H29	1/92	XCMD2524L1	1/12	XEP4E1FDA●●●	1/200
XCCRB3	8/37	XCKJ167D	1/108	XCKS549H29	1/92	XCMD2545L1	1/13	XEP4E1W7	1/200
XCCRB6	8/37	XCKJ167H29	1/104	XCKS559H29	1/92	XCMD25F0L1	1/12	XEP4E1W7A●●●	1/200
XCCRE5RN	8/37	XCKJ505●●H29	1/104	XCKT2101G11	1/50	XCMD25F2L1	1/12	XEP5P1W2	1/200
XCCRE5S	8/37	XCKJ561H29	1/104	XCKT2101P16	1/50	XCMD25G1L1	1/12	XEP5P1W2Z55B	1/200
XCCRE5SN	8/37	XCKJ567H29	1/104	XCKT2102P16	1/44	XC MN2102L1	1/28	XEPA1081D64	1/220
XCCRE9RN	8/37	XCKL1●●	1/78	XCKT2106P16	1/44	XC MN2103L1	1/28	XESP1021	1/152
XCCRE9SN	8/37	XCKL5●●	1/78	XCKT2110P16	1/44	XC MN2106L1	1/29		1/174
XCCRF4	8/37	XCKM1●●H29	1/76	XCKT2111P16	1/44	XC MN2107L1	1/29	XESP1021S	1/178
XCCRF5B	8/50	XCKM5●●H29	1/76	XCKT2118P16	1/45	XC MN2110L1	1/28	XESP1028	1/152
XCCRF5N	8/37	XCKML1●●	1/80	XCKT2121P16	1/44	XC MN2115L1	1/29	XESP1031	1/152
XCCRF9	8/37	XCKML1●●H29	1/80	XCKT2139P16	1/45	XC MN2121L1	1/28		1/174
XCCRG5	8/37	XCKML5●●	1/80	XCKT2145P16	1/45	XC MN2145L1	1/29	XESP1031S	1/178
XCCRG9	8/37	XCKML5●●H29	1/80	XCKT21H0P16	1/45	XC MN2159L1	1/29	XESP1038	1/152
XCCRM23SUB37NB	8/35	XCKMR24SR1H29	1/196	XCKT21H2P16	1/45	XC MN21F●L1	1/28	XESP2021	1/126
XCCRM23SUB37NG	8/35	XCKMR44D1H29	1/196	XCKT2501G11	1/50	XC MZ06	1/25	XESP2021S	1/129
XCCRM23SUB37PB	8/35	XCKMR44D2H29	1/196	XCKT2501P16	1/50	XC MZ07	1/25	XESP2031	1/118
XCCRM23SUB37PG	8/35	XCKMR54D1H29	1/196	XCKVR24SR1H29	1/196		1/50		1/126
XCCRX10	8/35	XCKMR54D2H29	1/196	XCKVR44D1H29	1/196	XC NR21●●P20	1/70	XESP2031S	1/129
XCCRX16	8/35	XCKN21●●P20	1/62	XCKVR44D2H29	1/196	XC NR25●●P20	1/70	XESP20●1	1/118
XCCRXS8	8/35		1/63	XCKVR54D1H29	1/196	XC NR27●●P20	1/70	XESP3021	1/99
XCDR21●●P20	1/56	XCKN25●●P20	1/62	XCKVR54D2H29	1/196	XC NR29●●P20	1/70		1/93
XCDR25●●P20	1/56		1/63	XCKW101	1/140	XC NT21●●P16	1/64	XGCS4901201	7/18
XCKD2101G11	1/50	XCKN27●●P20	1/62	XCKW102	1/140	XC NT25●●P16	1/64	XGCS490B201	7/32
XCKD2101M12	1/50		1/63	XCKW131	1/140	XC NT27●●P16	1/64	XGCS49LB201	7/32
XCKD2101P16	1/50	XCKN29●●P20	1/62	XCKW133	1/140	XC NTR21●●P16	1/71	XGCS850C201	7/18
XCKD2102M12	1/42		1/63	XCKW139	1/140	XC NTR25●●P16	1/71	XGCS8901201	7/18
XCKD2102P16	1/38	XCKP2101G11	1/50	XCKW141	1/140	XC NTR27●●P16	1/71	XGFEC2525	7/19
XCKD2106M12	1/43	XCKP2101M12	1/50	XCKW143	1/140	XC PR21●●P20	1/54	XGFEC540	7/19
XCKD2106P16	1/39	XCKP2101P16	1/50	XCKW149	1/140	XC PR25●●P20	1/54	XGHB123345	7/18
XCKD2110M12	1/42	XCKP2102M12	1/36	XCKW159	1/140	XC PR29●●P20	1/54	XGHB211345	7/18
XCKD2110P16	1/38	XCKP2102P16	1/32	XCKWD02	1/145	XC RA11	1/190	XGHB221346	7/18
XCKD2111M12	1/42	XCKP2106M12	1/37	XCKWD31	1/145	XC RA12	1/190	XGHB320246	7/18
XCKD2111P16	1/38	XCKP2106P16	1/33	XCKZ01	1/152	XC RA15	1/190	XGHB320345	7/18
XCKD2118M12	1/43	XCKP2110M12	1/36	XCKZ01	1/174	XC RA51	1/190	XGHB440245	7/18
XCKD2118P16	1/39	XCKP2110P16	1/32	XCKZ015	1/178	XC RA52	1/190	XGHB440845	7/18
XCKD2121M12	1/42	XCKP2111M12	1/36	XCKZ018	1/152	XC RA55	1/190	XGHB441645	7/18
XCKD2121P16	1/38	XCKP2111P16	1/32	XCKZ09	1/86	XC RB11	1/190	XGHB443245	7/18
XCKD2127M12	1/42	XCKP2118M12	1/37	XC MD2101C12	1/25	XC RB12	1/190	XGHB444345	7/18
XCKD2127P16	1/38	XCKP2118P16	1/33	XC MD2101L1	1/25	XC RB15	1/190	XGHB520246	7/18
XCKD2128M12	1/42	XCKP2121M12	1/36	XC MD2101M12	1/25	XC RB51	1/190	XGHB90E340	7/18
XCKD2128P16	1/38	XCKP2121P16	1/32	XC MD2102C12	1/16	XC RB52	1/190		7/32
XCKD2139M12	1/43	XCKP2127M12	1/36	XC MD2102L1	1/12	XC RB55	1/190	XGHBPB3345	7/32
XCKD2139P16	1/39	XCKP2127P16	1/32	XC MD2102M12	1/16	XC RE18	1/190	XGST2020	7/19
XCKD2145M12	1/43	XCKP2128M12	1/36	XC MD2106C12	1/17	XC RE58	1/190	XGST2422	7/19
XCKD2145P16	1/39	XCKP2128P16	1/32	XC MD2106L1	1/13	XC RF17	1/190	XGST2BA	7/19
XCKD2149M12	1/43	XCKP2139M12	1/37	XC MD2106M12	1/17	XC RF57	1/190	XGST2FP	7/19
XCKD2149P16	1/39	XCKP2139P16	1/33	XC MD2110C12	1/16	XC RT115	1/192	XGSZ05	7/21
XCKD21H0M12	1/43	XCKP2145M12	1/37	XC MD2110L1	1/12	XC RT215	1/192	XGSZ08MKW	7/21
XCKD21H0P16	1/39	XCKP2145P16	1/33	XC MD2110M12	1/16	XC RT315	1/192	XGSZ09L10	7/21
XCKD21H2M12	1/43	XCKP2149M12	1/37	XC MD2111C12	1/16	XC RZ02	1/190	XGSZ09L2	7/21
XCKD21H2P16	1/39	XCKP2149P16	1/33	XC MD2111L1	1/12	XC RZ03	1/190	XGSZ09L5	7/21
XCKD2501G11	1/50	XCKP21H0M12	1/37	XC MD2111M12	1/16		1/196	XGSZ12E1201	7/20
XCKD2501P16	1/50	XCKP21H0P16	1/33	XC MD2115C12	1/17	XC RZ03R	1/196	XGSZ12E1203	7/20
XCKD2502P16	1/38	XCKP21H2M12	1/37	XC MD2115L1	1/13	XC RZ04	1/190	XGSZ12E1210	7/20
XCKD2506P16	1/39	XCKP21H2P16	1/33	XC MD2115M12	1/17	XC RZ05	1/190	XGSZ12E1225	7/20
XCKD2510P16	1/38	XCKP2501G11	1/50	XC MD2116C12	1/17	XC RZ09	1/190	XGSZ12E4501	7/20
XCKD2511P16	1/38	XCKP2501P16	1/50	XC MD2116L1	1/13		1/192	XGSZ12E4503	5/189
XCKD2518P16	1/39	XCKP2502P16	1/32	XC MD2116M12	1/17	XC RZ12	1/190		7/20
XCKD2521P16	1/38	XCKP2506P16	1/33	XC MD2117C12	1/17	XC RZ15	1/190	XGSZ12E4510	5/189
XCKD2527P16	1/38	XCKP2510P16	1/32	XC MD2117L1	1/13	XC RZ42	1/192		7/20
XCKD2528P16	1/38	XCKP2511P16	1/32	XC MD2117M12	1/17	XC RZ901	1/192	XGSZ22E4503	5/189
XCKD2539P16	1/39	XCKP2518P16	1/33	XC MD2124C12	1/16	XC RZ902	1/192		7/20
XCKD2545P16	1/39	XCKP2521P16	1/32	XC MD2124L1	1/12	XC RZ903	1/192	XGSZ22E4510	5/189
XCKD2549P16	1/39	XCKP2527P16	1/32	XC MD2124M12	1/16	XC TR21●●P16	1/51		7/20
XCKD25H0P16	1/39	XCKP2528P16	1/32	XC MD2145C12	1/17		1/58	XGSZ24	7/21
XCKD25H2P16	1/39	XCKP2539P16	1/33	XC MD2145L1	1/13	XC TR25●●P16	1/58	XGSZ33EIP	7/19
XCKJ10511A	1/110	XCKP2545P16	1/33	XC MD2145M12	1/17	XE3NP2141	1/86	XGSZ33ETH	7/19
XCKJ10511D	1/108	XCKP2549P16	1/33	XC MD21F0C12	1/16		1/99	XGSZ33PDP	7/19
XCKJ10511H29	1/104	XCKP25H0P16	1/33	XC MD21F0L1	1/12		1/118	XGSZ3P	7/21
XCKJ10513A	1/110	XCKP25H2P16	1/33	XC MD21F0M12	1/16		1/93	XGSZCNF01	7/21
XCKJ10513D	1/108	XCKS131H29	1/92	XC MD21F2C12	1/16		1/51		7/32
XCKJ10513H29	1/104	XCKS133H29	1/92	XC MD21F2L1	1/12	XE3NP21●1	1/51	XGSZK1	7/19
XCKJ10541A	1/110	XCKS139H29	1/92	XC MD21F2M12	1/16	XEP3S1W2B●●	1/202	XGW4F111	7/18
XCKJ10541D	1/108	XCKS141H29	1/92	XC MD21G1C12	1/16	XEP3S1W3	1/202	XL1DB011	1/230
XCKJ10541H29	1/104	XCKS143H29	1/92	XC MD21G1L1	1/12	XEP3S1W3B●●●	1/202	XL1DB04	1/230
XCKJ10559A	1/110	XCKS149H29	1/92	XC MD21G1M12	1/16	XEP3S1W6	1/202	XL1DB05	1/230

XMAH06L2135	2/133	XMLA300N2C11	2/108	XMLB300N2S12	2/109	XMLCL35S2S13	2/76	XMLG250D73TQ	2/19
XMAH06L2435	2/133	XMLA300N2S12	2/108	XMLB500D2C11	2/113	XMLCM02T2S12	2/66	XMLG400D21	2/19
XMAH12L2135	2/133	XMLA500D2C11	2/112	XMLB500D2S12	2/113	XMLCM02V2S12	2/66	XMLG400D23	2/19
XMAH12L2435	2/133	XMLA500D2S12	2/112	XMLB500D2S13	2/113	XMLCM05B2S12	2/71	XMLG400D31TQ	2/20
XMAH25L2135	2/133	XMLA500D2S13	2/112	XMLB500E2C11	2/113		2/73	XMLG400D41TQ	2/20
XMAH25L2435	2/133	XMLA500E2C11	2/112	XMLB500E2S12	2/113	XMLCM05C2S12	2/71	XMLG400D71	2/19
XMAV06L2135	2/133	XMLA500E2S12	2/112	XMLB500N2C11	2/113		2/73	XMLG400D73TQ	2/19
XMAV06L2435	2/133	XMLA500E2S13	2/112	XMLB500N2S12	2/113	XMLCS02B2S12	2/83	XMLGM01D21	2/17
XMAV12L2135	2/133	XMLA500N2C11	2/112	XMLB500N2S12	2/113	XMLCS02B2S13	2/83	XMLGM01D23	2/17
XMAV12L2435	2/133	XMLA500N2S12	2/112	XMLBL05S2S12	2/69	XMLCS04B2S12	2/86	XMLGM01D31TQ	2/20
XMAV25L2135	2/133	XMLAM01T2C11	2/64	XMLBL35P2C11	2/74	XMLCS10A2S12	2/90	XMLGM01D41TQ	2/20
XMAV25L2435	2/133	XMLAM01T2S12	2/64	XMLBL35P2S12	2/74	XMLCS20A2S12	2/94	XMLGM01D71	2/17
XMAZL001	2/134	XMLAM01V2C11	2/64	XMLBL35R2C11	2/74	XMLCS35R2S12	2/76	XMLGM01D73TQ	2/17
	2/152	XMLAM01V2S12	2/64	XMLBL35R2S12	2/74	XMLCS35R2S13	2/76	XMLGZ001	2/21
XMLA001R2C11	2/78	XMLAM01V2S13	2/64	XMLBL35R2S13	2/74	XMLD004B1S12	2/87	XMLK006B2C21	2/13
XMLA001R2S12	2/78	XMLB001P2S12	2/79	XMLBL35S2C11	2/74	XMLD010B1S11	2/91	XMLK006B2C71	2/13
XMLA001S2C11	2/78	XMLB001R2C11	2/79	XMLBL35S2S12	2/74	XMLD010B1S12	2/91	XMLK006B2D21	2/13
XMLA001S2S12	2/78	XMLB001R2S12	2/79	XMLBL05R2S12	2/69	XMLD010C1S11	2/91	XMLK006B2D71	2/13
XMLA001S2S13	2/78	XMLB001R2S13	2/79	XMLBL05S2S12	2/69	XMLD020B1S12	2/95	XMLK010B2C21	2/13
XMLA002A2C11	2/81	XMLB001S2C11	2/79	XMLBL35P2C11	2/74	XMLD020B1S13	2/95	XMLK010B2C71	2/13
XMLA002A2S12	2/81	XMLB001S2S12	2/79	XMLBL35P2S12	2/74	XMLD020C1S12	2/95	XMLK010B2D21	2/13
XMLA002A2S13	2/81	XMLB001S2S13	2/79	XMLBL35R2C11	2/74	XMLD035B1S12	2/99	XMLK010B2D71	2/13
XMLA002B2C11	2/81	XMLB002A2C11	2/82	XMLBL35R2S12	2/74	XMLD070D1S12	2/107	XMLK016B2C21	2/13
XMLA002B2S12	2/81	XMLB002A2S12	2/82	XMLBL35R2S13	2/74	XMLD070D1S13	2/107	XMLK016B2C71	2/13
XMLA002C2C11	2/81	XMLB002A2S13	2/82	XMLBL05R2S12	2/69	XMLD070N1S12	2/107	XMLK016B2D21	2/13
XMLA002C2S12	2/81	XMLB002A2S13	2/82	XMLBL35P2C11	2/74	XMLD160D1S12	2/107	XMLK016B2D71	2/13
XMLA004A2C11	2/84	XMLB002B2C11	2/82	XMLBL35P2S12	2/74	XMLD160D1S13	2/107	XMLK025B2C21	2/13
XMLA004A2S12	2/84	XMLB002B2S12	2/82	XMLBL35R2C11	2/74	XMLD160E1S12	2/107	XMLK025B2D21	2/13
XMLA004A2S13	2/84	XMLB002C2C11	2/82	XMLBL35R2S12	2/74	XMLD300D1S12	2/111	XMLK025B2D71	2/13
XMLA004B2C11	2/84	XMLB002C2S12	2/82	XMLBL35R2S13	2/74	XMLD300D1S13	2/111	XMLK100P2C23	2/14
XMLA004B2S12	2/84	XMLB004A2C11	2/85	XMLBL05S2S12	2/69	XMLD300E1S12	2/111	XMLK100P2C73	2/14
XMLA004C2C11	2/84	XMLB004A2S12	2/85	XMLBL05S2S13	2/69	XMLD300N1S12	2/111	XMLK100P2D23	2/14
XMLA004C2S12	2/84	XMLB004A2S13	2/85	XMLBL05R2S12	2/69	XMLD300N1S13	2/111	XMLK100P2D73	2/14
XMLA004P2C11	2/84	XMLB004B2C11	2/85	XMLBM02T2C11	2/65	XMLDL35R1S12	2/77	XMLK100P2P23	2/14
XMLA004P2S12	2/84	XMLB004B2S12	2/85	XMLBM02T2S12	2/65	XMLDM02T1S12	2/67	XMLK150P2C23	2/14
XMLA010A2C11	2/88	XMLB004C2C11	2/85	XMLBM02V2C11	2/65	XMLDM02V1S12	2/67	XMLK150P2C73	2/14
XMLA010A2S12	2/88	XMLB004C2S12	2/85	XMLBM02V2S12	2/65		2/67	XMLK150P2D23	2/14
XMLA010A2S13	2/88	XMLB004C2S13	2/85	XMLBM02V2S13	2/65	XMLEZ001	2/37	XMLK150P2D73	2/14
XMLA010B2C11	2/88	XMLB004A2C11	2/85	XMLBM03R2S12	2/68	XMLEZ025	2/37	XMLK150P2P23	2/14
XMLA010B2S12	2/88	XMLB004A2S12	2/85	XMLBM03R2S13	2/68	XMLEZ060	2/37	XMLK200P2C23	2/14
XMLA010C2C11	2/88	XMLB004A2S13	2/85	XMLBM05A2C11	2/70	XMLEZ100	2/37	XMLK200P2C73	2/14
XMLA010C2S12	2/88	XMLB010A2C11	2/89	XMLBM05B2C11	2/70	XMLEZ250	2/37	XMLK200P2D23	2/14
XMLA010C2S13	2/88	XMLB010A2S12	2/89	XMLBM05B2S12	2/70	XMLEZ600	2/37	XMLK200P2D73	2/14
XMLA010P2C11	2/88	XMLB010A2S13	2/89	XMLBM05C2C11	2/70	XMLEZM01	2/37	XMLK200P2P23	2/14
XMLA010P2S12	2/88	XMLB010B2C11	2/89	XMLBM05C2S12	2/70	XMLEZM1	2/37	XMLK300P2C23	2/14
XMLA020A2C11	2/92	XMLB010B2S12	2/89	XMLBM05P2C11	2/70	XMLG001D21	2/17	XMLK300P2C73	2/14
XMLA020A2S12	2/92	XMLB010B2S13	2/89	XMLBM05P2S12	2/70	XMLG001D23	2/17	XMLK300P2D23	2/14
XMLA020A2S13	2/92	XMLB010C2C11	2/89		2/72	XMLG001D31TQ	2/20	XMLK300P2D73	2/14
XMLA020B2C11	2/92	XMLB010C2C11	2/89	XMLBS02B2S12	2/82	XMLG001D41TQ	2/20	XMLK300P2P23	2/14
XMLA020B2S12	2/92	XMLB010C2S12	2/89	XMLBS04B2S12	2/85	XMLG001D71	2/17	XMLP001GC11F	2/26
XMLA020B2S13	2/92	XMLB010C2S13	2/89	XMLBS10A2S12	2/89	XMLG001D73TQ	2/17	XMLP001GC21F	2/26
XMLA020C2C11	2/92	XMLB010P2C11	2/89	XMLBS20A2S12	2/93	XMLG006D21	2/17	XMLP001GC2BF	2/26
XMLA020C2S12	2/92	XMLB010P2S12	2/89	XMLBS20A2S13	2/93	XMLG006D23	2/17	XMLP001GC71F	2/26
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XMLA020P2S12	2/92	XMLB020A2S12	2/93	XMLC001R2S13	2/80	XMLG010D21	2/18	XMLP001GD11F	2/26
XMLA035A2C11	2/96	XMLB020A2S13	2/93	XMLC001S2S12	2/80	XMLG010D23	2/18	XMLP001GD21F	2/26
XMLA035A2S12	2/96	XMLB020B2C11	2/93	XMLC001S2S13	2/80	XMLG010D31TQ	2/20	XMLP001GD2BF	2/26
XMLA035A2S13	2/96	XMLB020B2S12	2/93	XMLC002B2S12	2/83	XMLG010D41TQ	2/20	XMLP001GD71F	2/26
XMLA035B2C11	2/96	XMLB020B2S13	2/93	XMLC002B2S13	2/83	XMLG010D71	2/18	XMLP001GD7BF	2/26
XMLA035B2S12	2/96	XMLB020C2C11	2/93	XMLC004B2S12	2/86	XMLG010D73	2/18	XMLP001GL21F	2/26
XMLA035B2S13	2/96	XMLB020C2S12	2/93	XMLC004B2S13	2/86	XMLG010D73TQ	2/18	XMLP004GC11F	2/27
XMLA035C2C11	2/96	XMLB020P2C11	2/93	XMLC004C2S12	2/86	XMLG016D21	2/18	XMLP004GC21F	2/27
XMLA035C2S12	2/96	XMLB020P2S12	2/93	XMLC004C2S13	2/86	XMLG016D23	2/18	XMLP004GC71F	2/27
XMLA035P2C11	2/96	XMLB035A2C11	2/97	XMLC010B2S12	2/90	XMLG016D71	2/18	XMLP004GD11F	2/27
XMLA035P2S12	2/96	XMLB035A2S12	2/97	XMLC010B2S13	2/90	XMLG025D21	2/18	XMLP004GD21F	2/27
XMLA070D2C11	2/100	XMLB035A2S13	2/97	XMLC010C2S12	2/90	XMLG025D23	2/18	XMLP004GD71F	2/27
XMLA070D2S12	2/100	XMLB035B2C11	2/97	XMLC010C2S13	2/90	XMLG025D41TQ	2/20	XMLP006GC11F	2/27
XMLA070D2S13	2/100	XMLB035B2S12	2/97	XMLC020B2S12	2/94	XMLG025D71	2/18	XMLP006GC21F	2/27
XMLA070E2C11	2/100	XMLB035C2C11	2/97	XMLC020B2S13	2/94	XMLG025D73TQ	2/20	XMLP006GC71F	2/27
XMLA070E2S12	2/100	XMLB035C2S12	2/97	XMLC020C2S12	2/94	XMLG025D71TQ	2/20	XMLP006GD11F	2/27
XMLA070E2S13	2/100	XMLB035C2S13	2/97	XMLC020C2S13	2/94	XMLG025Q21TQ	2/18	XMLP006GD21F	2/27
XMLA070N2C11	2/100	XMLB070D2C11	2/107	XMLC035B2S12	2/98	XMLG100D21	2/19	XMLP006GL21F	2/27
XMLA070N2S12	2/100	XMLB070D2S12	2/107	XMLC035B2S13	2/98	XMLG100D23	2/19	XMLP006GL71F	2/27
XMLA160D2C11	2/108	XMLB070D2S13	2/107	XMLC035C2S12	2/98	XMLG100D31TQ	2/20	XMLP010BC11V	2/28
XMLA160D2S12	2/108	XMLB070E2C11	2/107	XMLC035C2S13	2/98	XMLG100D41TQ	2/20	XMLP010BC21V	2/28
XMLA160D2S13	2/108	XMLB070E2S12	2/107	XMLC070D2S12	2/108	XMLG100D71	2/19	XMLP010BC29	2/28
XMLA160E2C11	2/108	XMLB070N2C11	2/107	XMLC070D2S13	2/108	XMLG100D73TQ	2/19	XMLP010BC71V	2/28
XMLA160E2S12	2/108	XMLB070N2S12	2/107	XMLC160D2S12	2/108	XMLG250D23	2/19	XMLP010BD11V	2/28
XMLA160E2S13	2/108	XMLB070N2S13	2/107	XMLC160D2S13	2/108	XMLG250D31TQ	2/20	XMLP010BD19	2/28
XMLA160N2C11	2/108	XMLB160D2C11	2/107	XMLC160E2S12	2/108	XMLG250D41TQ	2/20	XMLP010BD21V	2/28
XMLA160N2S12	2/108	XMLB160D2S12	2/107	XMLC160E2S13	2/108	XMLG250D71	2/19	XMLP010BD27	2/28
XMLA160N2S13	2/108	XMLB160E2C11	2/107	XMLC160N2S12	2/108		2/19		
XMLA300D2C11	2/108	XMLB160E2S12	2/107	XMLC300D2S12	2/110				
XMLA300D2S12	2/108	XMLB160E2S13	2/107	XMLC300E2S12	2/110				
XMLA300D2S13	2/108	XMLB160N2C11	2/107	XMLC500D2S12	2/114				
XMLA300E2C11	2/108	XMLB160N2S12	2/107	XMLC500N2S12	2/114				
XMLA300E2S12	2/108	XMLB300D2C11	2/109	XMLCL35R2S12	2/76				
XMLA300E2S13	2/108	XMLB300D2S12	2/109		2/76				
		XMLB300D2S13	2/109						
		XMLB300E2C11	2/109						
		XMLB300E2S12	2/109						
		XMLB300E2S13	2/109						

XMLP010BD29	2/28	XMLP160BC72	2/31	XMLPM00GL71F	2/24	XMLR025G1N25	2/44	XMLR400M1P26	2/46
XMLP010BD71V	2/28	XMLP160BD12	2/31	XMLPM00RC13F	2/32	XMLR025G1N26	2/44	XMLR400M1P75	2/46
XMLP010BD79	2/28	XMLP160BD22	2/31	XMLPM00RC23F	2/32	XMLR025G1N75	2/44	XMLR400M2N05	2/46
XMLP015RC23F	2/33	XMLP160BD72	2/31	XMLPM00RC73F	2/32	XMLR025G1P25	2/44	XMLR400M2N06	2/46
XMLP015RC73F	2/33	XMLP1K0PD13	2/35	XMLPM00RD13F	2/32	XMLR025G1P26	2/44	XMLR400M2N25	2/46
XMLP015RD23F	2/33	XMLP1K0PD23	2/35	XMLPM00RD23F	2/32	XMLR025G1P75	2/44	XMLR400M2P05	2/46
XMLP015RD73F	2/33	XMLP1K0PD73	2/35	XMLPM00RD73F	2/32	XMLR025G2N05	2/44	XMLR400M2P06	2/46
XMLP015RP23F	2/33	XMLP1K0PP23	2/35	XMLPM00RP13F	2/32	XMLR025G2N06	2/44	XMLR400M2P25	2/46
XMLP015RP73F	2/33	XMLP1K0PP73	2/35	XMLPM00RP23F	2/32	XMLR025G2P05	2/44	XMLR600M0T25	2/46
XMLP016BC11V	2/28	XMLP200PD13	2/34	XMLPM00RP73F	2/32	XMLR025G2P06	2/44	XMLR600M0T75	2/46
XMLP016BC21V	2/28	XMLP200PD23	2/34	XMLPM01GC21F	2/24	XMLR040G0T25	2/45	XMLR600M1P25	2/46
XMLP016BC27	2/28	XMLP200PD73	2/34	XMLPM01GC71F	2/24	XMLR040G0T26	2/45	XMLR600M1P75	2/46
XMLP016BC29	2/28	XMLP200PP23	2/34	XMLPM01GD21F	2/24	XMLR040G0T75	2/45	XMLR600M2P05	2/46
XMLP016BC71V	2/28	XMLP200PP73	2/34	XMLPM01GD71F	2/24	XMLR040G1N25	2/45	XMLR600M2P25	2/46
XMLP016BD11V	2/28	XMLP250BC12	2/31	XMLPM019BD11V	2/25	XMLR040G1N26	2/45	XMLR600M1G1N25	2/43
XMLP016BD19	2/28	XMLP250BC22	2/31	XMLPM019BD21V	2/25	XMLR040G1N75	2/45	XMLR600M1G1N26	2/43
XMLP016BD21V	2/28	XMLP250BC72	2/31	XMLPM05GC21F	2/24	XMLR040G1P25	2/45	XMLR600M1G1N75	2/43
XMLP016BD27	2/28	XMLP250BD12	2/31	XMLPM05GC71F	2/24	XMLR040G1P26	2/45	XMLR600M1G1N25	2/43
XMLP016BD29	2/28	XMLP250BD22	2/31	XMLPM05GD71F	2/24	XMLR040G1P75	2/45	XMLR600M1G1N26	2/43
XMLP016BD71V	2/28	XMLP250BD72	2/31	XMLPM09BC21V	2/25	XMLR040G1P75	2/45	XMLR600M1G1N75	2/43
XMLP016BD79	2/28	XMLP250BD72	2/31	XMLPM09BC71V	2/25	XMLR040G2N05	2/45	XMLR600M1G1P25	2/43
XMLP025BC11V	2/29	XMLP250MC11F	2/26	XMLPM09BD11V	2/25	XMLR040G2N06	2/45	XMLR600M1G1P26	2/43
XMLP025BC11V	2/29	XMLP250MC21F	2/26	XMLPM09BD21V	2/25	XMLR040G2N25	2/45	XMLR600M1G1P75	2/43
XMLP025BC21V	2/29	XMLP250MC71F	2/26	XMLPM09BD71V	2/25	XMLR040G2P05	2/45	XMLR600M1G2N05	2/43
XMLP025BC27	2/29	XMLP250MD11F	2/26	XMLPM15RC23F	2/32	XMLR040G2P06	2/45	XMLR600M1G2N06	2/43
XMLP025BC29	2/29	XMLP250MD21F	2/26	XMLPM15RD23F	2/32	XMLR040G2P25	2/45	XMLR600M1G2N25	2/43
XMLP025BC71V	2/29	XMLP250MD71F	2/26	XMLPM15RD73F	2/32	XMLR100M0T25	2/45	XMLR600M1G2N25	2/43
XMLP025BD11V	2/29	XMLP2D5GC11F	2/27	XMLPM15RP23F	2/32	XMLR100M0T26	2/45	XMLR600M1G2P05	2/43
XMLP025BD21V	2/29	XMLP2D5GC21F	2/27	XMLPM25BD21V	2/25	XMLR100M0T75	2/45	XMLR600M1G2P06	2/43
XMLP025BD27	2/29	XMLP2D5GC71F	2/27	XMLPM60RC23F	2/32	XMLR100M1N25	2/45	XMLR600M1G2P25	2/43
XMLP025BD29	2/29	XMLP2D5GD11F	2/27	XMLPM60RD23F	2/32	XMLR100M1N26	2/45	XMLR600M1G2P26	2/43
XMLP025BD71V	2/29	XMLP2D5GD21F	2/27	XMLPM60RD73F	2/32	XMLR100M1N75	2/45	XMLZA024	2/116
XMLP025BD77	2/29	XMLP2D5GD71F	2/27	XMLPM60RP23F	2/32	XMLR100M1P25	2/45	XMLZA120	2/116
XMLP025BD79	2/29	XMLP2D5GL21F	2/27	XMLPZLH01	2/39	XMLR100M1P26	2/45	XMLZB024	2/116
XMLP030RC23F	2/33	XMLP2D5GL71F	2/27	XMLPZLV01	2/39	XMLR100M1P75	2/45	XMLZB120	2/116
XMLP030RC73F	2/33	XMLP2K0PD13	2/36	XMLR001G0T25	2/43	XMLR100M2N05	2/45	XMLZL001	2/116
XMLP030RD23F	2/33	XMLP2K0PD23	2/36	XMLR001G0T26	2/43	XMLR100M2N06	2/45	XMLZL002	2/116
XMLP030RD73F	2/33	XMLP2K0PD73	2/36	XMLR001G0T75	2/43	XMLR100M2P05	2/45	XMLZL003	2/116
XMLP030RP23F	2/33	XMLP300PD13	2/35	XMLR001G0T76	2/43	XMLR100M2P06	2/45	XMLZL003	2/134
XMLP030RP73F	2/33	XMLP300PD23	2/35	XMLR001G1N25	2/43	XMLR160M0T25	2/45	XMLZL004	2/116
XMLP040BC11V	2/29	XMLP300PD73	2/35	XMLR001G1N26	2/43	XMLR160M0T75	2/45	XMLZL005	2/116
XMLP040BC21V	2/29	XMLP300PP13	2/35	XMLR001G1N75	2/43	XMLR160M1N25	2/45	XMLZL006	2/116
XMLP040BC27	2/29	XMLP300PP23	2/35	XMLR001G1P25	2/43	XMLR160M1N75	2/45	XMLZL009	2/116
XMLP040BC29	2/29	XMLP300PP73	2/35	XMLR001G1P26	2/43	XMLR160M1P25	2/45	XMLZL010	2/116
XMLP040BC71V	2/29	XMLP3K0PD13	2/36	XMLR001G1P75	2/43	XMLR160M1P75	2/45	XMLZL011	2/116
XMLP040BD11V	2/29	XMLP3K0PD23	2/36	XMLR001G2N05	2/43	XMLR160M2N05	2/45	XMLZL012	2/116
XMLP040BD19	2/29	XMLP3K0PD73	2/36	XMLR001G2N06	2/43	XMLR160M2N09	2/45	XMLZL013	2/116
XMLP040BD21V	2/29	XMLP3K0PP23	2/36	XMLR001G2P05	2/43	XMLR160M2P05	2/45	XMLZL014	2/116
XMLP040BD27	2/29	XMLP3K0PP73	2/36	XMLR001G2P06	2/43	XMLR160M2P09	2/45	XMLZL015	2/116
XMLP040BD29	2/29	XMLP400BC12	2/31	XMLR010G0T25	2/44	XMLR250M0T25	2/46	XMLZL016	2/37
XMLP040BD71V	2/29	XMLP400BC22	2/31	XMLR010G0T26	2/44	XMLR250M0T26	2/46	XMLZL017	2/37
XMLP040BD79	2/29	XMLP400BC72	2/31	XMLR010G0T75	2/44	XMLR250M0T75	2/46	XMLZL017	2/47
XMLP050RC23F	2/33	XMLP400BD12	2/31	XMLR010G0T76	2/44	XMLR250M1N25	2/46	XMLZZ024	2/116
XMLP050RD23F	2/33	XMLP400BD22	2/31	XMLR010G1N25	2/44	XMLR250M1N26	2/46	XMLZZ120	2/116
XMLP050RD73F	2/33	XMLP400BD72	2/31	XMLR010G1N26	2/44	XMLR250M1N75	2/46	XMPA06B2131	2/144
XMLP050RP23F	2/33	XMLP500MC11F	2/26	XMLR010G1N75	2/44	XMLR250M1P25	2/46	XMPA06B2242	2/145
XMLP060BC11V	2/30	XMLP500MC21F	2/26	XMLR010G1N76	2/44	XMLR250M1P26	2/46	XMPA06C2131	2/144
XMLP060BC21V	2/30	XMLP500MC71F	2/26	XMLR010G1P25	2/44	XMLR250M1P75	2/46	XMPA06C2242	2/145
XMLP060BC29	2/30	XMLP500MD11F	2/26	XMLR010G1P26	2/44	XMLR250M1P76	2/46	XMPA12B2131	2/146
XMLP060BC71V	2/30	XMLP500MD21F	2/26	XMLR010G1P75	2/44	XMLR250M2N05	2/46	XMPA12B2242	2/147
XMLP060BD11V	2/30	XMLP600BC22	2/31	XMLR010G1P76	2/44	XMLR250M2N06	2/46	XMPA12C2131	2/146
XMLP060BD21V	2/30	XMLP600BC72	2/31	XMLR010G2N05	2/44	XMLR250M2N09	2/46	XMPA12C2242	2/147
XMLP060BD27	2/30	XMLP600BC72	2/31	XMLR010G2N06	2/44	XMLR250M2N25	2/46	XMPA25B2131	2/148
XMLP060BD29	2/30	XMLP600BD12	2/31	XMLR010G2N09	2/44	XMLR250M2P05	2/46	XMPA25C2131	2/149
XMLP060BD71V	2/30	XMLP600BD22	2/31	XMLR010G2N25	2/44	XMLR250M2P06	2/46	XMPB06B2131	2/144
XMLP060BD79	2/30	XMLP600BD72	2/31	XMLR010G2N26	2/44	XMLR250M2P09	2/46	XMPB06B2242	2/145
XMLP100BC12	2/30	XMLP600PD13	2/35	XMLR010G2P05	2/44	XMLR250M2P25	2/46	XMPB12B2131	2/146
XMLP100BC22	2/30	XMLP600PD23	2/35	XMLR010G2P06	2/44	XMLR2D5G0T25	2/43	XMPB12B2242	2/147
XMLP100BC72	2/30	XMLP600PP13	2/35	XMLR010G2P09	2/44	XMLR2D5G0T75	2/43	XMPB25B2131	2/148
XMLP100BD12	2/30	XMLP600PP23	2/35	XMLR010G2P25	2/44	XMLR2D5G1N25	2/43	XMPB25B2131	2/148
XMLP100BD22	2/30	XMLP6K0PD13	2/36	XMLR010G2P26	2/44	XMLR2D5G1N26	2/43	XMPB25B2131	2/148
XMLP100BD72	2/30	XMLP6K0PD23	2/36	XMLR016G0T25	2/44	XMLR2D5G1N75	2/43	XMPB25B2131	2/148
XMLP100PD13	2/34	XMLP6K0PD73	2/36	XMLR016G0T26	2/44	XMLR2D5G1P25	2/43	XMPB25B2131	2/148
XMLP100PD23	2/34	XMLP6K0PP13	2/36	XMLR016G0T75	2/44	XMLR2D5G1P26	2/43	XMPB25B2131	2/148
XMLP100PD73	2/34	XMLP6K0PP73	2/36	XMLR016G1N25	2/44	XMLR2D5G1P75	2/43	XMPB25B2131	2/148
XMLP100PP13	2/34	XMLPM00GC11F	2/24	XMLR016G1N26	2/44	XMLR2D5G2N05	2/43	XMPB25B2131	2/148
XMLP100PP23	2/34	XMLPM00GC21F	2/24	XMLR016G1P25	2/44	XMLR2D5G2N06	2/43	XMPB25B2131	2/148
XMLP100PP73	2/34	XMLPM00GC71F	2/24	XMLR016G1P26	2/44	XMLR2D5G2P05	2/43	XMPB25B2131	2/148
XMLP100RD23F	2/33	XMLPM00GC7BF	2/24	XMLR016G1P75	2/44	XMLR2D5G2P06	2/43	XMPB25B2131	2/148
XMLP150PD13	2/34	XMLPM00GD11F	2/24	XMLR016G2N06	2/44	XMLR400M0T25	2/46	XMPB25B2131	2/148
XMLP150PD23	2/34	XMLPM00GD21F	2/24	XMLR016G2P05	2/44	XMLR400M0T26	2/46	XMPB25B2131	2/148
XMLP150PD73	2/34	XMLPM00GD2BF	2/24	XMLR016G2P25	2/44	XMLR400M1N25	2/46	XMPB25B2131	2/148
XMLP150PP23	2/34	XMLPM00GD71F	2/24	XMLR025G0T25	2/44	XMLR400M1N26	2/46	XMPB25B2131	2/148
XMLP150PP73	2/34	XMLPM00GD7BF	2/24	XMLR025G0T26	2/44	XMLR400M1N75	2/46	XMPB25B2131	2/148
XMLP160BC22	2/31	XMLPM00GL21F	2/24	XMLR025G0T75	2/44	XMLR400M1P25	2/46	XMPB25B2131	2/148

XMPD12C2131	2/146	XR2BB13K●●	1/229	XS118BLPAM12	3/63	XS1N05NB310	3/68	XS218AAPAM12	3/94
XMPD12C2242	2/147	XR2BB19K●●	1/229	XS118BLPBL2	3/63	XS1N05NB311	3/68	XS218BLNAL2	3/63
XMPD12C2431	2/147	XR2BB23K●●	1/229	XS118BLPBM12	3/63	XS1N05NB311S	3/68	XS218BLNAL5	3/63
XMPE06B2131	2/144	XR2BB27K●●	1/229	XS130B3NAL2	3/35	XS1N05PA310	3/68	XS218BLNAL7	3/63
XMPE06C2131	2/144	XRBA4●●●●	1/220	XS130B3NAM12	3/35	XS1N05PA311	3/68	XS218BLNAM12	3/63
XMPE06C2242	2/145	XRBA6●●●●	1/220	XS130B3NAM12TQ	3/35	XS1N05PA311S	3/68	XS218BLNBL2	3/63
XMPE06C2431	2/145	XRBA901	1/220	XS130B3NBL2	3/35	XS1N05PB310	3/68	XS218BLPAL2	3/63
XMPE12B2131	2/146	XRBA902	1/220	XS130B3NBM12	3/35	XS1N05PB311	3/68	XS218BLPAL5	3/63
XMPE12B242	2/147	XRBA903	1/220	XS130B3PAL2	3/35	XS1N05PB311S	3/68	XS218BLPAM12	3/63
XMPE12B2431	2/147	XRZ9100	1/220	XS130B3PAL2TQ	3/35	XS1N08NA349	3/66	XS218BLPBL2	3/63
XMPE12C2131	2/146	XRZ912	1/220	XS130B3PAM12	3/35	XS1N08NA349D	3/66	XS218SAMAL2	3/92
XMPE12C2242	2/147	XRZ914	1/220	XS130B3PAM12TQ	3/35	XS1N08NA349S	3/66	XS218SAMAU20	3/92
XMPE12C2431	2/147	XRZ916	1/220	XS130B3PBL2	3/35	XS1N08NB349	3/66	XS218SANAL2	3/90
XMPMDR01	2/152	XS106B3NAL2	3/34	XS130B3PBM12	3/35	XS1N08NB349D	3/66	XS218SANAM12	3/90
XMPR06B2133	2/150	XS106B3NAM8	3/34	XS130BLNAL2	3/63	XS1N08NB349S	3/66	XS218SAPAL2	3/90
XMPR06B2433	2/151	XS106B3NBL2	3/34	XS130BLNAL3	3/63	XS1N08PA349	3/66	XS218SAPAM12	3/90
XMPR06C2133	2/150	XS106B3NBM8	3/34	XS130BLNAM12	3/63	XS1N08PA349D	3/66	XS230AAMAL2	3/96
XMPR06C2433	2/151	XS106B3PAL2	3/34	XS130BLPAL2	3/63	XS1N08PA349S	3/66	XS230AAMAU20	3/96
XMPR12B2131	2/146	XS106B3PAL2TQ	3/34	XS130BLPAM12	3/63	XS1N08PB349	3/66	XS230AANAL2	3/94
XMPR12B2133	2/150	XS106B3PAM12	3/34	XS130BLPBL2	3/63	XS1N08PB349D	3/66	XS230AANAM12	3/94
XMPR12B2433	2/151	XS106B3PAM8	3/34	XS130BLPBM12	3/63	XS1N08PB349S	3/66	XS230AAPAL2	3/94
XMPR12C2131	2/146	XS106B3PAM8TQ	3/34	XS1L04NA310	3/68	XS1N12NA349	3/66	XS230AAPAM12	3/94
XMPR12C2133	2/150	XS106B3PBL2	3/34	XS1L04NA310S	3/68	XS1N12NA349D	3/66	XS230BLNAL2	3/63
XMPR12C2433	2/151	XS106B3PBM8	3/34	XS1L04NA311	3/68	XS1N12NB349	3/66	XS230BLNAL7	3/63
XMPR25B2131	2/148	XS108B3NAL2	3/34	XS1L04NA311S	3/68	XS1N12NB349D	3/66	XS230BLNAM12	3/63
XMPR25B2133	2/150	XS108B3NAL2TQ	3/34	XS1L04NB310	3/68	XS1N12NC410	3/54	XS230BLPAL2	3/63
XMPR25B2433	2/151	XS108B3NAM12	3/34	XS1L04NB310S	3/68	XS1N12NC410D	3/54	XS230BLPAL5	3/63
XMPR25C2131	2/149	XS108B3NAM8	3/34	XS1L04NB311	3/68	XS1N12PA349	3/66	XS230BLPAM12	3/63
XMPR25C2133	2/150	XS108B3NAM8TQ	3/34	XS1L04NB311S	3/68	XS1N12PA349D	3/66	XS230BLPBL2	3/63
XMPR25C2433	2/151	XS108B3NBL2	3/34	XS1L04PA310	3/68	XS1N12PB349	3/66	XS230BSAMAL2	3/92
XMPZ31	2/134	XS108B3NBM12	3/34	XS1L04PA310S	3/68	XS1N12PB349D	3/66	XS230SAMAU20	3/92
XMPZ31	2/152	XS108B3NBM8	3/34	XS1L04PA311	3/68	XS1N12PC410	3/54	XS230SANAL2	3/90
XMPZ33	2/134	XS108B3PAL2	3/34	XS1L04PA311S	3/68	XS1N12PC410D	3/54	XS230SANAM12	3/90
XMPZ33	2/152	XS108B3PAL2TQ	3/34	XS1L04PB310	3/68	XS1N18NA349	3/66	XS230SAPAL2	3/90
MXXA06L2135	2/132	XS108B3PAM12	3/34	XS1L04PB310S	3/68	XS1N18NA349D	3/66	XS230SAPAM12	3/90
MXXA06L2435	2/132	XS108B3PAM12TQ	3/34	XS1L04PB311	3/68	XS1N18NB349	3/66	XS2L06NA340	3/68
MXXA12L2135	2/132	XS108B3PAM8	3/34	XS1L04PB311S	3/68	XS1N18NB349D	3/66	XS2L06NA340D	3/68
MXXA12L2435	2/132	XS108B3PAM8TQ	3/34	XS1L06NA349	3/66	XS1N18NC410	3/55	XS2L06NA340S	3/68
MXXA25L2135	2/132	XS108B3PBL2	3/34	XS1L06NA349D	3/66	XS1N18NC410D	3/55	XS2L06NB340	3/68
MXXA25L2435	2/132	XS108B3PBM12	3/34	XS1L06NA349S	3/66	XS1N18PA349	3/66	XS2L06NB340D	3/68
XR2AA03K●●	1/229	XS108B3PBM8	3/34	XS1L06NB349	3/66	XS1N18PA349D	3/66	XS2L06NB340S	3/68
XR2AB04K●●	1/229	XS108BLNAL2	3/62	XS1L06NB349S	3/66	XS1N18PB349	3/66	XS2L06NB340S	3/68
XR2AB06K●●	1/229	XS108BLNAM12	3/62	XS1L06NC410	3/54	XS1N18PB349D	3/66	XS2L06PA340	3/68
XR2AB10K●●	1/229	XS108BLPAL2	3/62	XS1L06PA349	3/66	XS1N18PC410	3/55	XS2L06PA340S	3/68
XR2AB14K●●	1/229	XS108BLPAL5	3/62	XS1L06PA349D	3/66	XS1N18PC410D	3/55	XS2L06PB340	3/68
XR2AB20K●●	1/229	XS108BLPAM12	3/62	XS1L06PA349S	3/66	XS1N30NA349	3/66	XS2L06PB340D	3/68
XR2AB24K●●	1/229	XS108BLPAM8	3/62	XS1L06PB349	3/66	XS1N30NA349D	3/66	XS2L06PB340S	3/68
XR2AB28K●●	1/229	XS112B3NAL2	3/34	XS1L06PB349S	3/66	XS1N30NB349	3/66	XS2L2SANAL2	3/90
XR2AZ001	1/228	XS112B3NAL2TQ	3/34	XS1L06PC410	3/54	XS1N30NB349D	3/66	XS2L2SANAM12	3/90
XR2AZ002	1/230	XS112B3NAM12	3/34	XS1M08NC410	3/54	XS1N30NC410	3/55	XS2L2SAPAL2	3/90
XR2AZ003	1/230	XS112B3NAM12TQ	3/34	XS1M08NC410D	3/54	XS1N30NC410D	3/55	XS2L2SAPAM12	3/90
XR2AZ212	1/228	XS112B3NBL2	3/34	XS1M08PC410	3/54	XS1N30PA349	3/66	XS2M08NC410	3/54
XR2AZ216	1/228	XS112B3NBM12	3/34	XS1M08PC410D	3/54	XS1N30PA349D	3/66	XS2M08NC410D	3/54
XR2AZ224	1/228	XS112B3PAL2	3/34	XS1M12AB120	3/79	XS1N30PB349	3/66	XS2M08PC410	3/54
XR2AZ236	1/228	XS112B3PAL2TQ	3/34	XS1M12KP340	3/58	XS1N30PB349D	3/66	XS2M08PC410D	3/54
XR2AZ248	1/228	XS112B3PAM12	3/34	XS1M12KP340D	3/58	XS1N30PC410	3/55	XS2M12KP340	3/58
XR2AZ256	1/228	XS112B3PAM12TQ	3/34	XS1M12MA250	3/52	XS1N30PC410D	3/55	XS2M12KP340D	3/58
XR2AZ302	1/220	XS112B3PBL2	3/34	XS1M12MA250K	3/52	XS208BLNAL2	3/62	XS2M12MA250	3/52
XR2AZ302	1/228	XS112B3PBM12	3/34	XS1M12MB250	3/52	XS208BLNAM12	3/62	XS2M12MA250K	3/52
XR2AZ305	1/220	XS112B3PBM12TQ	3/34	XS1M12MB250K	3/52	XS208BLPAL2	3/62	XS2M12MB250	3/52
XR2AZ305	1/228	XS112BLNAL2	3/62	XS1M18AB120	3/80	XS208BLPAL5	3/62	XS2M18KP340	3/58
XR2AZ310	1/220	XS112BLNAM12	3/62	XS1M18KP340	3/58	XS208BLPAM12	3/62	XS2M18KP340D	3/58
XR2AZ310	1/228	XS112BLPAL2	3/62	XS1M18KP340D	3/58	XS208BLPAM8	3/62	XS2M18MA250	3/52
XR2AZ31225	1/228	XS112BLPAL3	3/62	XS1M18KPM40	3/110	XS212AANAL2	3/94	XS2M18MA250K	3/52
XR2AZ31625	1/228	XS112BLPAL5	3/62	XS1M18KPM40D	3/110	XS212AANAM12	3/94	XS2M18MB250	3/52
XR2AZ32425	1/228	XS112BLPAM12	3/62	XS1M18MA250	3/52	XS212AAPAL2	3/94	XS2M18MB250K	3/52
XR2AZ32435	1/228	XS112BLPBL2	3/62	XS1M18MA250K	3/52	XS212AAPAM12	3/94	XS2M30KP340	3/58
XR2AZ34825	1/228	XS112BLPBM12	3/62	XS1M18MB250	3/52	XS212BLNAL2	3/62	XS2M30KP340D	3/58
XR2AZ41625	1/228	XS118B3NAL2	3/35	XS1M18MB250K	3/52	XS212BLNAL7	3/62	XS2M30MA250	3/52
XR2AZ42425	1/228	XS118B3NAL2TQ	3/35	XS1M18PAS20	3/114	XS212BLNAM12	3/62	XS2M30MA250K	3/52
XR2AZ42435	1/228	XS118B3NAM12	3/35	XS1M18PAS20D	3/115	XS212BLNBL2	3/62	XS2M30MB250	3/52
XR2AZ43625	1/228	XS118B3NAM12TQ	3/35	XS1M18PAS40	3/114	XS212BLPAL2	3/62	XS2M30MB250K	3/52
XR2AZ52450	1/228	XS118B3NBL2	3/35	XS1M18PAS40D	3/115	XS212BLPAL5	3/62	XS4P08MA230	3/60
XR2AZ804	1/228	XS118B3NBM12	3/35	XS1M30AB120	3/81	XS212BLPAM12	3/62	XS4P08MA230K	3/60
XR2AZ808	1/228	XS118B3PAL2	3/35	XS1M30KP340	3/58	XS212BLPBL2	3/62	XS4P08MB230	3/60
XR2AZ810	1/228	XS118B3PAL2TQ	3/35	XS1M30KP340D	3/58	XS212BLPBL5	3/62	XS4P08MB230K	3/60
XR2AZ816	1/228	XS118B3PAM12	3/35	XS1M30KPM40	3/111	XS212SANAL2	3/90	XS4P08NA340	3/60
XR2AZ820	1/228	XS118B3PAM12TQ	3/35	XS1M30KPM40LD	3/111	XS212SANAM12	3/90	XS4P08NA370	3/60
XR2AZ83	1/228	XS118B3PBL2	3/35	XS1M30MA250	3/52	XS212SAPAL2	3/90	XS4P08NB340	3/60
XR2AZ840	1/228	XS118B3PBM12	3/35	XS1M30MA250K	3/52	XS212SAPAM12	3/90	XS4P08NB370	3/60
XR2AZ86	1/228	XS118BLNAL2	3/63	XS1M30MB250	3/52	XS218AAMAL2	3/96	XS4P08PA340	3/60
XR2AZ880	1/228	XS118BLNAL5	3/63	XS1M30MB250K	3/52	XS218AAMAU20	3/96	XS4P08PA370	3/60
XR2BB03K●●	1/229	XS118BLNAM12	3/63	XS1N05NA310	3/68	XS218AANAL2	3/94	XS4P08PB340	3/60
XR2BB05K●●	1/229	XS118BLPAL2	3/63	XS1N05NA311	3/68	XS218AANAM12	3/94	XS4P08PB370	3/60
XR2BB09K●●	1/229	XS118BLPAL5	3/63	XS1N05NA311S	3/68	XS218AAPAL2	3/94	XS4P08PC410	3/54

XS4P12AB110	3/79	XS508B1PBM12	3/24	XS518BSDL2	3/28	XS612B4NAM12	3/42	XS630B1PBM12	3/36
XS4P12AB120	3/79	XS508B1PBM8	3/24	XS518BSDBM12	3/28	XS612B4NBL2	3/42	XS630B2NAL01M12	3/70
XS4P12KP340	3/58	XS508BLNAL2	3/25	XS530B1CAL08M12	3/29	XS612B4NBM12	3/42	XS630B2NBL01M12	3/70
XS4P12KP340D	3/58	XS508BLNAM12	3/25	XS530B1CAM12	3/29	XS612B4PAL2	3/42	XS630B2PAL01M12	3/70
XS4P12MA230	3/60	XS508BLNBL2	3/25	XS530B1DAL01B	3/29	XS612B4PAM12	3/42	XS630B2PBL01M12	3/70
XS4P12MA230K	3/60	XS508BLNBM12	3/25	XS530B1DAL01C	3/29	XS612B4PBL2	3/42	XS630B3DAL2	3/38
XS4P12MB230	3/60	XS508BLPAL2	3/25	XS530B1DAL01G	3/29	XS612B4PBM12	3/42	XS630B3DAM12	3/38
XS4P12MB230K	3/60	XS508BLPAM12	3/25	XS530B1DAL2	3/29	XS618B1DAL2	3/38	XS630B3DBL2	3/38
XS4P12NA340	3/60	XS508BLPBL2	3/25	XS530B1DAL2TF	3/29	XS618B1DAM12	3/38	XS630B3DBM12	3/38
XS4P12NA370	3/60	XS508BLPBM12	3/25	XS530B1DAM12	3/29	XS618B1DBL2	3/38	XS630B5NAL2	3/42
XS4P12NB340	3/60	XS508BSCAL01M12	3/28	XS530B1DBL01B	3/29	XS618B1DBM12	3/38	XS630B5NAM12	3/42
XS4P12NB370	3/60	XS508BSCAL08M12	3/28	XS530B1DBL2	3/29	XS618B1MAL01B	3/40	XS630B5NBL2	3/42
XS4P12PA340	3/60	XS508BSCAL2	3/28	XS530B1DBM12	3/29	XS618B1MAL01C	3/40	XS630B5PAL2	3/42
XS4P12PA370	3/60	XS508BSCBL01M12	3/28	XS530B1DMAL2	3/32	XS618B1MAL01G	3/40	XS630B5PAM12	3/42
XS4P12PB340	3/60	XS508BSCBL2	3/28	XS530B1MAU20	3/32	XS618B1MAL2	3/40	XS630B5PBL2	3/42
XS4P12PB370	3/60	XS512B1CAL08M12	3/29	XS530B1MBL2	3/32	XS618B1MAU20	3/40	XS630B5PBM12	3/42
XS4P12PC410	3/54	XS512B1CAM12	3/29	XS530B1MBU20	3/32	XS618B1MBL01B	3/40	XS7C1A1CAL01M12	3/46
XS4P12PC410D	3/54	XS512B1DAL08U78	3/29	XS530B1MBL01C	3/32	XS618B1MBL01G	3/40	XS7C1A1CAL08M12	3/46
XS4P18AB110	3/80	XS512B1DAL2	3/29	XS530B1NAM12	3/24	XS618B1MBL01G	3/40	XS7C1A1DAL01M12	3/46
XS4P18AB120	3/80	XS512B1DAM12	3/29	XS530B1NBL2	3/24	XS618B1MBL2	3/40	XS7C1A1DAL2	3/46
XS4P18KP340	3/58	XS512B1DBL08M12	3/29	XS530B1NBM12	3/24	XS618B1MBU20	3/40	XS7C1A1DAM8	3/46
XS4P18KP340D	3/58	XS512B1DBL2	3/29	XS530B1PAL2	3/24	XS618B1NAL01B	3/36	XS7C1A1DBL01M12	3/46
XS4P18MA230	3/60	XS512B1DBM12	3/29	XS530B1PAM12	3/24	XS618B1NAL01C	3/36	XS7C1A1DBL2	3/46
XS4P18MA230K	3/60	XS512B1MAL2	3/32	XS530B1PBL2	3/24	XS618B1NAL2	3/36	XS7C1A1DBM8	3/46
XS4P18MB230	3/60	XS512B1MAU20	3/32	XS530B1PBM12	3/24	XS618B1NAM12	3/36	XS7C1A1NAL01M12	3/46
XS4P18MB230K	3/60	XS512B1MBL2	3/32	XS530BLNAL2	3/25	XS618B1NBL01B	3/36	XS7C1A1NAL2	3/46
XS4P18NA340	3/60	XS512B1MBU20	3/32	XS530BLNBM12	3/25	XS618B1NBL01C	3/36	XS7C1A1NAM8	3/46
XS4P18NA370	3/60	XS512B1NAL2	3/24	XS530BLNBL2	3/25	XS618B1NBL2	3/36	XS7C1A1NBL01M12	3/46
XS4P18NB340	3/60	XS512B1NAM12	3/24	XS530BLNBM12	3/25	XS618B1NBM12	3/36	XS7C1A1NBL2	3/46
XS4P18NB370	3/60	XS512B1NBL2	3/24	XS530BLPAL2	3/25	XS618B1PAL01B	3/36	XS7C1A1NBM8	3/46
XS4P18PA340	3/60	XS512B1NBM12	3/24	XS530BLPAM12	3/25	XS618B1PAL01C	3/36	XS7C1A1PAL01M12	3/46
XS4P18PA370	3/60	XS512B1PAL2	3/24	XS530BLPBL2	3/25	XS618B1PAL01G	3/36	XS7C1A1PAL2	3/46
XS4P18PB340	3/60	XS512B1PAM12	3/24	XS530BLPBM12	3/25	XS618B1PAL2	3/36	XS7C1A1PAM8	3/46
XS4P18PB370	3/60	XS512B1PBL2	3/24	XS530BSCAL08M12	3/28	XS618B1PAM12	3/36	XS7C1A1PBL01M12	3/46
XS4P18PC410	3/55	XS512B1PBM12	3/24	XS530BSCAM12	3/28	XS618B1PBL01B	3/36	XS7C1A1PBL2	3/46
XS4P18PC410D	3/55	XS512BLNAL2	3/25	XS530BSDAL2	3/28	XS618B1PBL01C	3/36	XS7C1A1PBM8	3/46
XS4P30AB110	3/81	XS512BLNAM12	3/25	XS530BSDAM12	3/28	XS618B1PBL2	3/36	XS7C2A1DAM12	3/48
XS4P30AB120	3/81	XS512BLNBL2	3/25	XS530BSDBL2	3/28	XS618B1PBM12	3/36	XS7C2A1DBM12	3/48
XS4P30KP340	3/58	XS512BLNBM12	3/25	XS530BSDBM12	3/28	XS618B2NAL01M12	3/70	XS7C2A1IMAU20	3/48
XS4P30KP340D	3/58	XS512BLPAL2	3/25	XS606B1DAL2	3/38	XS618B2NBL01M12	3/70	XS7C2A1IMBU20	3/48
XS4P30MA230	3/60	XS512BLPAM12	3/25	XS606B1DBL2	3/38	XS618B2PAL01M12	3/70	XS7C2A1NAM12	3/48
XS4P30MA230K	3/60	XS512BLPBL2	3/25	XS606B3CAL01M12	3/38	XS618B2PBL01M12	3/70	XS7C2A1NBM12	3/48
XS4P30MB230	3/60	XS512BLPBM12	3/25	XS606B3CAL2	3/38	XS618B3DAL2	3/38	XS7C2A1PAM12	3/48
XS4P30MA230K	3/60	XS512BSCAL08M12	3/28	XS606B3CBL2	3/38	XS618B3DAM12	3/38	XS7C2A1PBM12	3/48
XS4P30NA340	3/60	XS512BSCAM12	3/28	XS608B1DAL2	3/38	XS618B3DBL2	3/38	XS7C4A1DPP20	3/50
XS4P30NA370	3/60	XS512BSDAL2	3/28	XS608B1DAM12	3/38	XS618B3DBM12	3/38	XS7C4A1MPP20	3/50
XS4P30NB340	3/60	XS512BSDAM12	3/28	XS608B1DBL2	3/38	XS618B3DBM12	3/38	XS7D1A1CAM12	3/46
XS4P30NB370	3/60	XS512BSDBL2	3/28	XS608B1DBM12	3/38	XS618B4DAL2	3/42	XS7D1A1DAL2	3/46
XS4P30PA340	3/60	XS512BSDBM12	3/28	XS608B1NAL2	3/36	XS618B4NBL2	3/42	XS7D1A1DAM12	3/46
XS4P30PA370	3/60	XS518B1CAL08M12	3/29	XS608B1NAM12	3/36	XS618B4NBM12	3/42	XS7D1A1DBL2	3/46
XS4P30PB340	3/60	XS518B1DAL01B	3/29	XS608B1NBL2	3/36	XS618B4PAL2	3/42	XS7D1A1DBM12	3/46
XS4P30PB370	3/60	XS518B1DAL01C	3/29	XS608B1NBM12	3/36	XS618B4PAM12	3/42	XS7D1A1NAL2	3/46
XS4P30PC410	3/55	XS518B1DAL01G	3/29	XS608B1PAL2	3/36	XS618B4PBL2	3/42	XS7D1A1NAM12	3/46
XS4P30PC410D	3/55	XS518B1DAL2	3/29	XS608B1PAM12	3/36	XS618B4PBM12	3/42	XS7D1A1NBL2	3/46
XS506B1NAL2	3/24	XS518B1DAL2TF	3/29	XS608B1PBL2	3/36	XS630B1DAL2	3/38	XS7D1A1NBLM12	3/46
XS506B1NAM8	3/24	XS518B1DAM12	3/29	XS608B1PBM12	3/36	XS630B1DAM12	3/38	XS7D1A1PAL2	3/46
XS506B1NBL2	3/24	XS518B1DBL01B	3/29	XS608B1PBL2	3/36	XS630B1DBL2	3/38	XS7D1A1PAM12	3/46
XS506B1NBM8	3/24	XS518B1DBL01B	3/29	XS608B3CAL01M12	3/38	XS630B1DBM12	3/38	XS7D1A1PBL2	3/46
XS506B1PAL2	3/24	XS518B1DBL08M12	3/29	XS608B3CAL2	3/38	XS630B1MAL01B	3/40	XS7D1A1PBM12	3/46
XS506B1PAM12	3/24	XS518B1DBL2	3/29	XS608B3CBL2	3/38	XS630B1MAL01G	3/40	XS7D1A3CAM12DIN	3/104
XS506B1PAM8	3/24	XS518B1DBM12	3/29	XS612B1DAL2	3/38	XS630B1MAL2	3/40	XS7E1A1CAL01M12	3/46
XS506B1PBL2	3/24	XS518B1MAL2	3/32	XS612B1DAM12	3/38	XS630B1MAL2	3/40	XS7E1A1CAL08M12	3/46
XS506B1PBM8	3/24	XS518B1MAU20	3/32	XS612B1DBL2	3/38	XS630B1MAU20	3/40	XS7E1A1DAL01M12	3/46
XS506BLNAL2	3/25	XS518B1MBL2	3/32	XS612B1DBM12	3/38	XS630B1MBL01B	3/40	XS7E1A1DAL2	3/46
XS506BLPAL2	3/25	XS518B1MBU20	3/32	XS612B1MAL2	3/40	XS630B1MBL01C	3/40	XS7E1A1DAM8	3/46
XS506BSCAL01M12	3/28	XS518B1NAM2	3/24	XS612B1MAU20	3/40	XS630B1MBL01G	3/40	XS7E1A1DBL01M12	3/46
XS506BSCAL2	3/28	XS518B1NAM12	3/24	XS612B1MBL2	3/40	XS630B1MBL2	3/40	XS7E1A1DBL2	3/46
XS506BSCBL2	3/28	XS518B1NBL2	3/24	XS612B1MBU20	3/40	XS630B1MBU20	3/40	XS7E1A1DBM8	3/46
XS508B1CAL08M12	3/29	XS518B1NBM12	3/24	XS612B1MBL2	3/36	XS630B1NAL01B	3/36	XS7E1A1NBL01M12	3/46
XS508B1CAM12	3/29	XS518B1PAL2	3/24	XS612B1NAM12	3/36	XS630B1NAL01C	3/36	XS7E1A1NAL2	3/46
XS508B1DAL08M12	3/29	XS518B1PAM12	3/24	XS612B1NBL2	3/36	XS630B1NAL2	3/36	XS7E1A1NAM8	3/46
XS508B1DAL2	3/29	XS518B1PBL2	3/24	XS612B1NBM12	3/36	XS630B1NAM12	3/36	XS7E1A1NBL01M12	3/46
XS508B1DAM12	3/29	XS518B1PBM12	3/24	XS612B1PAL2	3/36	XS630B1NBL01B	3/36	XS7E1A1NBL2	3/46
XS508B1DBL2	3/29	XS518BLNAL2	3/25	XS612B1PAM12	3/36	XS630B1NBL01C	3/36	XS7E1A1NBM8	3/46
XS508B1DBM12	3/29	XS518BLNAM12	3/25	XS612B1PBL2	3/36	XS630B1NBL2	3/36	XS7E1A1PAL01M12	3/46
XS508B1NAL2	3/24	XS518BLNBL2	3/25	XS612B1PBM12	3/36	XS630B1NBM12	3/36	XS7E1A1PAL2	3/46
XS508B1NAM12	3/24	XS518BLNBM12	3/25	XS612B2NAL01M12	3/70	XS630B1PAL01B	3/36	XS7E1A1PAM8	3/46
XS508B1NAM8	3/24	XS518BLPAL2	3/25	XS612B2NBL01M12	3/70	XS630B1PAL01G	3/36	XS7E1A1PBL01M12	3/46
XS508B1NBL2	3/24	XS518BLPAM12	3/25	XS612B2PAL01M12	3/70	XS630B1PAL2	3/36	XS7E1A1PBL2	3/46
XS508B1NBM12	3/24	XS518BLPBL2	3/25	XS612B2PBL01M12	3/70	XS630B1PAL2	3/36	XS7F1A1PBM8	3/44
XS508B1NAM8	3/24	XS518BLPBM12	3/25	XS612B3DAL2	3/38	XS630B1PAM12	3/36	XS7F1A1DAL01M8	3/44
XS508B1PAL2	3/24	XS518BSCAL08M12	3/28	XS612B3DAM12	3/38	XS630B1PBL01B	3/36	XS7F1A1DAL2	3/44
XS508B1PAM12	3/24	XS518BSCAM12	3/28	XS612B3DBL2	3/38	XS630B1PBL01C	3/36	XS7F1A1DBL01M8	3/44
XS508B1PBM12	3/24	XS518BSDAL2	3/28	XS612B3DBM12	3/38	XS630B1PBL01G	3/36	XS7F1A1DBL2	3/44
XS508B1PBL2	3/24	XS518BSDAM12	3/28	XS612B4NAL2	3/42	XS630B1PBL2	3/36	XS7F1A1NAL01M8	3/44

XS7F1A1NAL2	3/44	XS8E1A1PAL01M12	3/72	XSZB105	3/116	XSZBC90	7/21	XU1N18NP341W	5/94
XS7F1A1NBL01M8	3/44	XS8E1A1PAL2	3/72	XSZB108	3/24	XSZBD10	3/116	XU1N18NP341WD	5/94
XS7F1A1NBL2	3/44	XS8E1A1PAM8	3/72		3/25		6/24	XU1N18PP341	5/94
XS7F1A1PAL01M8	3/44	XS8E1A1PBL01M12	3/72		3/28	XSZBE00	3/116	XU1N18PP341D	5/94
XS7F1A1PAL2	3/44	XS8E1A1PBL2	3/72		3/29		7/21	XU1N18PP341W	5/94
XS7F1A1PBL01M8	3/44	XS8E1A1PBM8	3/72		3/35	XSZBE10	3/116	XU1N18PP341WD	5/94
XS7F1A1PBL2	3/44	XS8G12MA230	3/102		3/36	XSZBE90	3/116	XU2M18AP20D	5/120
XS7G12MA230	3/102	XS8G12MB230	3/102		3/38		7/21	XU2M18MA230	5/152
XS7G12MB230	3/102	XS8G12NA140	3/100		3/55	XSZBF00	3/116	XU2M18MA230K	5/152
XS7G12NA140	3/100	XS8G12NA140S	3/100		3/63	XSZBF90	3/116	XU2M18MA230W	5/152
XS7G12NA140S	3/100	XS8G12NC440	3/100		3/66	XSZBJ00	3/116	XU2M18MA230WK	5/152
XS7G12NC440	3/100	XS8G12PA140	3/100		3/116	XSZBJ90	3/116	XU2M18MB230	5/152
XS7G12PA140	3/100	XS8G12PA140S	3/100		5/98	XSZBPM12	3/70	XU2M18MB230K	5/152
XS7G12PA140S	3/100	XS8G12PC440	3/100	XSZB112	5/160		3/77	XU2M18MB230W	5/152
XS7G12PC440	3/100	XS908R1PAM12	3/98		3/24		3/116	XU2M18MB230WK	5/152
XS7J1A1DAL01M8	3/44		3/99		3/25	XSZBS12	3/88	XU2N18NP341	5/94
XS7J1A1DAL2	3/44	XS908R4PAM12	3/98		3/28		3/90	XU2N18NP341D	5/94
XS7J1A1DBL01M8	3/44		3/99		3/29	XSZBS30	3/88	XU2N18NP341W	5/94
XS7J1A1DBL2	3/44	XS912R1PAM12	3/98		3/32		3/90	XU2N18NP341WD	5/94
XS7J1A1NAL01M8	3/44		3/99		3/35		3/92	XU2N18PP341	5/94
XS7J1A1NAL2	3/44	XS912R4PAM12	3/98		3/36	XSZE105	3/116	XU2N18PP341D	5/94
XS7J1A1NBL01M8	3/44		3/99		3/38	XSZE108	3/116	XU2N18PP341W	5/94
XS7J1A1NBL2	3/44	XS912RWPAM12	3/106		3/40	XSZE112	3/116	XU2N18PP341WD	5/94
XS7J1A1PAL01M8	3/44		3/107		3/42	XSZE118	3/116	XU5M18AB20D	5/116
XS7J1A1PAL2	3/44	XS912S1PAM12	3/88		3/52		5/160	XU5M18MA230	5/152
XS7J1A1PBL01M8	3/44		3/89		3/55	XSZE130	3/116	XU5M18MA230K	5/152
XS7J1A1PBL2	3/44	XS912S4PAM12	3/88		3/58	XSZE208	3/116	XU5M18MA230W	5/152
XS8C1A1MAL01U20	3/72		3/89		3/63	XSZE212	3/116	XU5M18MA230WK	5/152
XS8C1A1MAL2	3/72	XS918R1PAM12	3/98		3/66	XSZE218	3/116	XU5M18MB230	5/152
XS8C1A1MBL01U20	3/72		3/99		3/70		5/94	XU5M18MB230K	5/152
XS8C1A1MBL2	3/72	XS918R4PAM12	3/98		3/94		5/160	XU5M18MB230W	5/152
XS8C1A1MBL2	3/72		3/99		3/116	XSZE230	3/116	XU5M18MB230WK	5/152
XS8C1A1NAL01M12	3/72	XS918RWPAM12	3/106		6/24	XSZE308	3/116	XU5M18U1D	5/80
XS8C1A1NAL2	3/72		3/107	XSZB118	3/24	XSZE312	3/116	XU5N18NP341	5/94
XS8C1A1NAM8	3/72	XS918S1PAM12	3/88		3/25	XSZE318	3/116	XU5N18NP341D	5/94
XS8C1A1NBL01M12	3/72		3/89		3/28		5/94	XU5N18NP341W	5/94
XS8C1A1NBL2	3/72	XS918S4PAM12	3/88		3/29		5/160	XU5N18NP341WD	5/94
XS8C1A1NBM8	3/72		3/89		3/32	XSZE330	3/116	XU5N18PP341	5/94
XS8C1A1PAL01M12	3/72	XS930R1PAM12	3/98		3/35	XSZF10	3/116	XU5N18PP341D	5/94
XS8C1A1PAL2	3/72		3/99		3/36	XSZMCR03	5/91	XU5N18PP341W	5/94
XS8C1A1PAM8	3/72	XS930R4PAM12	3/98		3/38	XSZMCR10	5/91	XU5N18PP341WD	5/94
XS8C1A1PBL01M12	3/72		3/99		3/40	XSZP112	3/116	XU8M18MA230	5/152
XS8C1A1PBL2	3/72	XS930S1PAM12	3/88		3/42	XSZP118	3/116	XU8M18MA230K	5/152
XS8C1A1PBM8	3/72		3/89		3/52	XSZP130	3/116	XU8M18MA230W	5/152
XS8C2A1DAM12	3/48	XS930S4PAM12	3/88		3/55	XSZPE13	3/116	XU8M18MA230WK	5/152
XS8C2A1DBM12	3/48		3/89		3/58	XSZPKC2	3/113	XU8M18MB230	5/152
XS8C2A1MAU20	3/48	XS9C111A1L01M12	3/83		3/63	XSZPSC2	3/113	XU8M18MB230K	5/152
XS8C2A1MBU20	3/48	XS9C111A1L2	3/83		3/66	XSZVF03	3/116	XU8M18MB230W	5/152
XS8C2A1NCM12	3/48	XS9C111A2L01M12	3/85		3/70	XSZVF04	3/116	XU8M18MB230WK	5/152
XS8C2A1PCM12	3/48	XS9C111A2L2	3/85		3/94	XSZVF05	3/116	XU9M18MA230	5/152
XS8C2A4DBM12	3/48	XS9C111RMBL01U20	3/77		3/96	XT112S1NAL2	4/8	XU9M18MA230K	5/152
XS8C2A4MAU20	3/48	XS9C111RPBL01M12	3/77		3/116	XT112S1PAL2	4/8	XU9M18MA230W	5/152
XS8C2A4MBU20	3/48	XS9C2A1NCM12	3/112		5/160	XT112S1PCL2	4/8	XU9M18MA230WK	5/152
XS8C2A4NCM12	3/48	XS9C2A1PCM12	3/112	XSZB130	6/24	XT112S1PCM12	4/8	XU9M18MB230	5/152
XS8C2A4PCM12	3/48	XS9C2A2A1M12	3/86		3/24	XT118B1FAL2	4/8	XU9M18MB230K	5/152
XS8C4A1DPP20	3/50	XS9C2A2A2M12	3/86		3/25	XT118B1FBL2	4/8	XU9M18MB230W	5/152
XS8C4A1MPP20	3/50	XS9C4A1NCP20	3/112		3/28	XT118B1NAL2	4/8	XU9M18MB230WK	5/152
XS8C4A1NCP20	3/50	XS9C4A1PCP20	3/112		3/29	XT118B1PAL2	4/8	XU9N18NP341	5/94
XS8C4A1PCP20	3/50	XS9C4A2A1P20	3/86		3/32	XT118B1PCL2	4/8	XU9N18NP341D	5/94
XS8C4A4DPP20	3/50	XS9C4A2A2P20	3/86		3/35	XT118B1PCM12	4/8	XU9N18NP341W	5/94
XS8C4A4MPP20	3/50	XS9D111A1L2	3/83		3/36	XT130B1FAL2	4/8	XU9N18NP341WD	5/94
XS8C4A4NCP20	3/50	XS9D111A1M12	3/83		3/38	XT130B1FBL2	4/8	XU9N18PP341	5/94
XS8C4A4PCP20	3/50	XS9D111A2L2	3/85		3/40	XT130B1NAL2	4/8	XU9N18PP341D	5/94
XS8D1A1MAL2	3/72	XS9D111A2M12	3/85		3/42	XT130B1PAL2	4/8	XU9N18PP341W	5/94
XS8D1A1MAU20	3/72	XS9E111A1L01M12	3/83		3/52	XT130B1PCL2	4/8	XU9N18PP341WD	5/94
XS8D1A1MBL2	3/72	XS9E111A1L2	3/83		3/55	XT130B1PCM12	4/8	XUAH02●●S	5/98
XS8D1A1MBU20	3/72	XS9E111A2L01M12	3/85		3/58	XT132B1FAL2	4/8	XUAH02●●S	5/98
XS8D1A1NAL2	3/72	XS9E111A2L2	3/85		3/63	XT132B1FBL2	4/8	XUAH05●●S	5/98
XS8D1A1NAM12	3/72	XS9E111RMBL01U20	3/77		3/66	XT218A1FAL2	4/12	XUAH05●●S	5/98
XS8D1A1NBL2	3/72	XS9E111RPBL01M12	3/77		3/70	XT218A1NAL2	4/12	XUAJ02●●	5/98
XS8D1A1NBL2	3/72	XS9F111A1L01M8	3/83		3/94	XT218A1PAL2	4/12	XUAJ02●●S	5/98
XS8D1A1PAM12	3/72	XS9F111A1L2	3/83		3/96	XT218A1PCM12	4/12	XUAJ05●●	5/98
XS8D1A1PBL2	3/72	XS9F111A2L01M8	3/85		3/116	XT230A1FAL2	4/12	XUAJ05●●S	5/98
XS8D1A1PBL2	3/72	XS9F111A2L2	3/85		6/24	XT230A1FBL2	4/12	XUB0AKSNL2T	5/32
XS8D1A1PBM12	3/72	XSAV11373	3/75	XSZB165	3/24	XT230A1NAL2	4/12	XUB0AKSNM12T	5/32
XS8E1A1MAL01U20	3/72	XSAV11801	3/75		3/25	XT230A1PAL2	4/12	XUB0AKSWL2T	5/32
XS8E1A1MAL2	3/72	XSAV12373	3/75		3/28	XT230A1PCM12	4/12	XUB0AKSWM12T	5/32
XS8E1A1MBL01U20	3/72	XSAV12801	3/75		3/35	XT232A1FAL2	4/12	XUB0ANSNL2	5/32
XS8E1A1MBL2	3/72	XSAZ108	5/98		3/38	XT232A1FBL2	4/12	XUB0ANSNM12	5/32
XS8E1A1NAL01M12	3/72	XSAZ108	5/160		3/66	XT7C40FP262	4/16	XUB0ANSWL2	5/32
XS8E1A1NAL2	3/72	XSAZ118	5/160		3/116	XT7C40NC440	4/16	XUB0ANSWM12	5/32
XS8E1A1NAM8	3/72	XSCZ01	3/116	XSZBC00	3/116	XT7C40PC440	4/16	XUB0APSNL2	5/32
XS8E1A1NBL01M12	3/72	XSAZ01	3/116		7/21	XTAZ30	3/116	XUB0APSNM12	5/32
XS8E1A1NBL2	3/72	XSAZ01	3/116	XSZBC10	3/116	XU1N18NP341	5/94	XUB0APSWL2	5/32
XS8E1A1NBM8	3/72	XSAZ034	3/116	XSZBC90	3/116	XU1N18NP341D	5/94	XUB0APSWM12	5/32

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XUZA49	5/150	XUZD15	5/160	XX918A3F1M12	6/20		6/24		2/37
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XUZA50	5/34	XUZE04	3/116	XX930A1A1M12	6/20		5/119		2/47
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	5/160	XUZE06	3/116	XX930A1A2M12	6/20	XZCC12MCM40B	2/39		3/98
XUZA51	5/42	XUZE08	3/116	XX930A2A1230M12	6/20	XZCC12MDB50R	7/21		3/106
	5/44	XUZK2000	5/91	XX930A2A1M12	6/20		7/32	XZCP1241L20	2/39
	5/75		5/42	XX930A2A2230M12	6/20		8/44	XZCP1241L●	2/15
	5/91		5/44	XX930A2A2M12	6/20	XZCC12MDM40B	2/39	XZCP1241L●●	2/15
	5/160		5/161	XX930A3A1M12	6/20	XZCC23FDP120S	8/35	XZCP1264L10	1/18
XUZA51S	5/105	XUZK200●	5/75	XX930A3A2M12	6/20	XZCC23FDP160S	8/35		1/108
	5/122	XUZLR001	5/196	XX930S1A1M12	6/20	XZCC23FMDP120S	8/35	XZCP1264L2	1/18
	5/160	XUZLR002	5/196	XX930S1A2M12	6/20	XZCC43FCP40B	2/15		1/108
	5/181	XUZLR033	5/196	XX9D1A1C2M12	6/20		2/37	XZCP1264L5	1/18
	5/181	XUZLR063	5/196	XX9D1A1F1M12	6/20		2/116		1/108
XUZA618	5/119	XUZLR103	5/196	XX9V1A1C2M12	6/20	XZCC8FCM30V	6/24	XZCP1764L10	1/110
XUZAM01	5/34	XUZLW001	5/196	XX9V1A1F1M12	6/20	XZCC8FCM40V	6/24	XZCP1764L2	1/110
XUZAM●●	5/34	XUZLW002	5/196	XX9V3A1C2M12	6/20	XZCC8FDM30V	6/24	XZCP1764L5	1/110
XUZA●18	3/88	XUZM2003	5/161	XX9V3A1F1M12	6/20	XZCC8FDM40V	6/24	XZCP1771L10	1/18
XUZASB001	5/160		5/38	XXB18A3PAM12	6/15	XZCCHFDM370S	8/35	XZCP1771L2	1/18
XUZASK001	5/105	XUZM200●	5/38	XXBD1A1PAM12	6/18	XZCP0166L2	6/24	XZCP1771L5	1/18
	5/160	XUZMSH05	5/34	XXBV1A1PAM12	6/18	XZCP0266L2	6/24	XZCP1865L10	3/49
	5/181	XUZMSH10	5/34	XXBV3A1PAM12	6/15	XZCP0566L2	5/56	XZCP1865L5	3/49
XUZASK002	5/105	XUZMSH15	5/34	XXR12A8KAM8	6/15	XZCP0566L5	5/56	XZCP1965L10	3/49
	5/160	XUZMSH20	5/34	XXR12A8KBM8	6/15	XZCP0666L2	5/56	XZCP1965L5	3/49
XUZASK003	5/160	XUZMSV05	5/34	XXR18A3KAM12	6/15	XZCP0666L5	5/56	XZCP29P12L10	5/181
XUZASK004	5/181	XUZMSV10	5/34	XXR18A3KBM12	6/15	XZCP0941L1●	7/21	XZCP29P12L2	5/181
	5/181	XUZMSV15	5/34	XXR18A4KAM12	6/15	XZCP0941L2	5/58	XZCP29P12L5	5/181
XUZASM001	5/160	XUZMSV20	5/34	XXR18A4KBM12	6/15		5/60	XZCPA1141L10	3/88
XUZASW001	5/181	XUZMU01	5/34	XXRF1A8KAM12L	6/18		5/62		3/90
	5/196	XUZSW003	5/189	XXRF1A8KBM12L	6/18		5/64		3/94
XUZASW002	5/181	XUZX2000	5/50	XXRK1A3KAM12	6/18		5/76	XZCPA1141L2	3/88
	5/196		5/52	XXRK1A3KBM12	6/18		5/82		3/90
XUZASW003	5/196		5/160	XXRK1A4KAM12	6/18		5/102		3/94
XUZASW005	5/196	XUZX2001	5/52	XXRK1A4KBM12	6/18		5/124	XZCPA1141L5	3/88
XUZASW006	5/196		5/161	XXT12A8M8	6/15		5/126		3/90
XUZASW008	5/196	XUZX2002	5/52	XXT18A3M12	6/15		5/146		3/94
XUZASW009	5/196		5/161	XXT18A4M12	6/15		7/21		5/105
XUZASY01A	5/109	XUZX2003	5/50	XXTF1A8M12L	6/18	XZCP1041L2	5/60	XZCPA1241L10	3/88
XUZASY01H	5/109		5/52	XXTK1A3M12	6/18		5/62		3/90
XUZB2003	5/28		5/161	XXTK1A4M12	6/18		5/64		3/94
	5/30		7/21	XXV18B1NAL10	6/14		5/76	XZCPA1241L2	3/88
	5/32	XUZX2004	5/50	XXV18B1NAL2	6/14		5/82		3/90
	5/84		5/52	XXV18B1NAL5	6/14		5/102		3/94
	5/152		5/161	XXV18B1NAM12	6/14		5/124	XZCPA1241L5	3/88
	5/161	XX218A3NFM12	6/24	XXV18B1NBL10	6/14		5/126		3/90
XUZB2005	6/24	XX218A3NHM12	6/24	XXV18B1NBL2	6/14		5/146		3/94
	3/90	XX218A3PFM12	6/24	XXV18B1NBL5	6/14	XZCP1041L●	5/58		5/105
	5/92	XX218A3PHM12	6/24	XXV18B1NBL10	6/14	XZCP1141L10	2/21	XZCPA1865L10	3/92
	5/160	XX230A10PA00M12	6/24	XXV18B1NBM12	6/14		2/37		3/96
XUZB2012	6/24	XX230A11PA00M12	6/24	XXV18B1PAL2	6/14		2/39	XZCPA1865L5	3/92
XUZB2030	6/24	XX230A12NA00M12	6/24	XXV18B1PAL5	6/14		2/47		3/96
XUZB32	3/116	XX230A12PA00M12	6/24	XXV18B1PAM12	6/14		3/49	XZCPA1965L10	3/92
XUZC08	5/34	XX230A20PA00M12	6/24	XXV18B1PBL10	6/14		3/98		3/96
	5/158	XX230A21PA00M12	6/24	XXV18B1PBL2	6/14		3/106	XZCPA1965L5	3/92
XUZC16	5/158	XX230A22NA00M12	6/24	XXV18B1PBL5	6/14	XZCP1141L1●	2/15		3/96
XUZC21	5/158	XX230A22PA00M12	6/24	XXV18B1PBM12	6/14	XZCP1141L2	6/24	XZCPB44P14L10	5/189
XUZC250	5/119	XX512A1KAM8	6/14	XXZ12	4/12		2/21	XZCPB44P14L5	5/189
	5/181	XX512A2NAM8	6/14	XXZ12	6/24		2/37	XZCPB45P14L10	5/189
XUZC31	5/158	XX512A2PAM8	6/14	XXZ1933	6/24		2/39	XZCPB45P14L5	5/189
XUZC39	5/158	XX518A1KAM12	6/14	XXZ30	6/24		2/47	XZCPV1141L10	2/37
XUZC40S22	5/158	XX518A3NAL2	6/14	XXZ3074F	6/24		3/49		3/63
XUZC50	5/28	XX518A3NAM12	6/14	XXZ3074S	6/24		3/98	XZCPV1141L2	2/37
	5/30	XX518A3PAL2	6/14	XXZPB100	6/15		3/106	XZCPV1141L5	2/37
	5/32	XX518A3PAM12	6/14		6/20		5/122		3/63
	5/34	XX630A1KAM12	6/14		4/12	XZCP1141L20	2/39	XZCPV11V12L10	2/47
	5/38	XX630A1NCM12	6/14		6/18	XZCP1141L●	2/15		5/181
	5/42	XX630A1PCM12	6/14	XZBWR2STT24	1/145	XZCP1164L10	1/18	XZCPV11V12L2	2/47
	5/44	XX630A2NCM12	6/14	XZCC12FCM40B	2/15		1/108		5/181
	5/50	XX630A2PCM12	6/14		2/21		1/117	XZCPV11V12L5	2/47
	5/52	XX630A3NCM12	6/14		2/37	XZCP1164L2	1/108		5/181
	5/84	XX630A3PCM12	6/14		2/39		1/117	XZCPV1241L10	2/37
	5/86	XX630S1NCM12	6/14		2/47		5/122	XZCPV1241L2	2/37
	5/92	XX630S1PCM12	6/14		6/24	XZCP1164L●	1/18	XZCPV1241L5	2/37
	5/158	XX6V3A1NAM12	6/14	XZCC12FCM50B	2/47	XZCP1169L10	1/18	XZCPV12V12L10	2/47
XUZC50CR	5/86	XX6V3A1PAM12	6/14		5/119	XZCP1169L●	1/18		5/181
	5/158	XX7F1A2NAL01M12	6/18	XZCC12FCP40B	6/24	XZCP1241L10	2/21	XZCPV12V12L2	2/47
XUZC50HP	5/84	XX7F1A2PAL01M12	6/18	XZCC12FDB50R	7/21		2/37		5/181
	5/105	XX7K1A2NAM12	6/18		8/44		2/39	XZCPV12V12L5	2/47
XUZC80	5/158	XX7K1A2PAM12	6/18	XZCC12FDM40B	2/15		2/47		5/181
XUZCR0201CR	5/158	XX7V1A1NAM12	6/18		2/21		3/49	XZCR1511040A1	2/39
XUZCR0401CRHP	5/158	XX7V1A1PAM12	6/18		2/37		3/98	XZCR1511040A2	2/39
XUZCR0401HP	5/158	XX8D1A1NAM12	6/18		2/39		3/106	XZCR1511041C1	2/47
XUZCR0402	5/158	XX8D1A1PAM12	6/18		2/47	XZCP1241L2	6/24		5/109

XZCR1511041C2	2/47	ZC2JE076	1/174	ZCD39	1/38	ZCKJ04	1/115	ZCKJ520	1/127
	5/109	ZC2JE09	1/168		1/39	ZCKJ1	1/114	ZCKJ521	1/116
XZCR1511064D1	2/47	ZC2JE095	1/178	ZCDEP16	1/38		1/124	ZCKJ521H29	1/116
XZCR1511064D2	2/47	ZC2JE096	1/174		1/39	ZCKJ11	1/115	ZCKJ534	1/116
XZCR1512040A1	2/39	ZC2JE61	1/152	ZCE01	1/13		1/124	ZCKJ534H29	1/116
XZCR1512040A2	2/39		1/172		1/17	ZCKJ1121	1/116	ZCKJ5D	1/117
XZCR1512041C1	2/47	ZC2JE615	1/176		1/33	ZCKJ1121H29	1/116	ZCKJ5H29	1/114
	5/109	ZC2JE616	1/174		1/37	ZCKJ1134	1/116		1/124
XZCR1512041C2	2/47	ZC2JE62	1/172		1/39	ZCKJ1134H29	1/116		1/127
	5/109		1/152		1/43	ZCKJ115	1/127	ZCKJ5H7	1/114
XZCR1512064D1	2/47	ZC2JE625	1/176		1/45	ZCKJ115H29	1/127		1/124
XZCR1512064D2	2/47	ZC2JE626	1/174	ZCE02	1/12	ZCKJ115H7	1/127	ZCKJ6	1/114
XZCRA151140A2	3/90	ZC2JE63	1/172		1/16	ZCKJ11H29	1/115		1/124
	3/94		1/152	ZCE02	1/32	ZCKJ11H29	1/124		1/127
XZCRA151140A5	3/90	ZC2JE635	1/176		1/36	ZCKJ11H7	1/115	ZCKJ6D	1/117
	3/94	ZC2JE636	1/174		1/38		1/124	ZCKJ6H29	1/114
XZCRB4444P14L05	5/189	ZC2JE64	1/152		1/42	ZCKJ120	1/116		1/124
XZCRB4444P14L2	5/189	ZC2JE645	1/176		1/44	ZCKJ121	1/116	ZCKJ6H7	1/114
XZCRB4545P14L05	5/189	ZC2JE646	1/174	ZCE05	1/25	ZCKJ121H29	1/116		1/127
XZCRB4545P14L2	5/189	ZC2JE65	1/152		1/50	ZCKJ134	1/116		1/114
		ZC2JE655	1/176	ZCE06	1/13	ZCKJ134H29	1/116	ZCKJ7	1/114
		ZC2JE656	1/174		1/17	ZCKJ1D	1/117		1/127
Z		ZC2JE66	1/152		1/33	ZCKJ1H29	1/114		1/114
ZB5AZ905	7/32	ZC2JE665	1/176		1/37		1/124	ZCKJ7D	1/117
ZBRA1	1/143	ZC2JE666	1/174		1/39	ZCKJ1H7	1/114	ZCKJ7H29	1/104
ZBRA2	1/143	ZC2JE70	1/168		1/43		1/127		1/114
ZBRCETH	1/143	ZC2JE705	1/178		1/44		1/124		1/127
ZBRN1	1/142	ZC2JE706	1/174		1/12		1/127		1/114
ZBRN2	1/142	ZC2JE81	1/152	ZCE11	1/16	ZCKJ2	1/114		1/124
ZBRRC	1/141	ZC2JE815	1/176		1/32		1/124	ZCKJ215	1/127
ZBRRD	1/141	ZC2JE816	1/174		1/36	ZCKJ21	1/115	ZCKJ215H29	1/127
ZC1AC001	1/184	ZC2JE82	1/152		1/38		1/124	ZCKJ215H7	1/127
ZC1AC005	1/184	ZC2JE825	1/176		1/42	ZCKJ215	1/127	ZCKJ215H7	1/115
ZC1AC006	1/184	ZC2JE826	1/174		1/44	ZCKJ215H29	1/127		1/124
ZC1AC007	1/184	ZC2JE83	1/152		1/12	ZCKJ215H7	1/127	ZCKJ8	1/114
ZC1AC008	1/184	ZC2JE835	1/176		1/16	ZCKJ21H29	1/115		1/124
ZC1AC009	1/184	ZC2JE836	1/174		1/32		1/124	ZCKJ82A	1/119
ZC1AZ11	1/184	ZC2JE84	1/152		1/36	ZCKJ21H7	1/115	ZCKJ8D	1/117
ZC1AZ12	1/184	ZC2JE845	1/176		1/38		1/124	ZCKJ8H29	1/114
ZC1AZ13	1/184	ZC2JE846	1/174		1/42	ZCKJ25	1/127		1/124
ZC1AZ14	1/184	ZC2JE85	1/152		1/44	ZCKJ25H29	1/127		1/127
ZC1AZ15	1/184	ZC2JE855	1/176	ZCE21	1/32	ZCKJ25H7	1/127	ZCKJ8H7	1/114
ZC1AZ16	1/184	ZC2JE856	1/174		1/36	ZCKJ2H29	1/114		1/124
ZC1AZ17	1/184	ZC2JY11	1/172		1/38		1/124		1/127
ZC1AZ8	1/184		1/174		1/42	ZCKJ2H7	1/114	ZCKJ9	1/114
ZC1ZB211	1/228	ZC2JY115	1/178		1/44		1/124		1/124
ZC2JC1	1/172	ZC2JY12	1/174	ZCE24	1/12	ZCKJ4	1/114		1/127
ZC2JC1	1/155		1/178		1/16		1/124	ZCKJ902	1/119
ZC2JC15	1/176	ZC2JY13	1/152		1/32	ZCKJ404	1/115	ZCKJ904	1/119
ZC2JC16	1/174		1/174	ZCE27	1/36	ZCKJ4045	1/127	ZCKJ906	1/119
ZC2JC18	1/187		1/178		1/38	ZCKJ4045H29	1/127	ZCKJ9H29	1/104
ZC2JC2	1/187	ZC2JY13	1/174		1/42	ZCKJ4045H7	1/127		1/114
ZC2JC25	1/176		1/178	ZCE28	1/32	ZCKJ4046	1/124		1/124
ZC2JC26	1/174	ZC2JY215	1/178		1/36	ZCKJ4046H29	1/124		1/127
ZC2JC28	1/187	ZC2JY31	1/172		1/38	ZCKJ4046H7	1/124	ZCKJ9H7	1/114
ZC2JC4	1/187		1/174		1/42	ZCKJ404H29	1/115		1/124
ZC2JC45	1/176	ZC2JY315	1/178	ZCEF0	1/12	ZCKJ404H7	1/115		1/127
ZC2JC46	1/174	ZC2JY415	1/178		1/16	ZCKJ41	1/115	ZCKJD31	1/114
ZC2JC48	1/187	ZC2JY51	1/172		1/12		1/124	ZCKJD31H29	1/114
ZC2JD1	1/187		1/152	ZCEF2	1/16	ZCKJ4104	1/115	ZCKJD31H7	1/114
ZC2JD16	1/174	ZC2JY61	1/152		1/16	ZCKJ41045	1/127	ZCKJD35	1/114
ZC2JD2	1/187		1/174	ZCEG1	1/16	ZCKJ41045H29	1/127	ZCKJD35H29	1/114
ZC2JD26	1/174	ZC2JY615	1/178		1/33	ZCKJ41045H7	1/127	ZCKJD35H7	1/114
ZC2JD4	1/187	ZC2JY71	1/152	ZCEH0	1/37	ZCKJ41046	1/124	ZCKJD37	1/114
ZC2JD46	1/174		1/174		1/39	ZCKJ41046H29	1/124	ZCKJD37H29	1/104
ZC2JE01	1/172	ZC2JY715	1/178		1/43	ZCKJ41046H7	1/124		1/114
ZC2JE01	1/168	ZC2JY81	1/152	ZCEH2	1/33	ZCKJ4104H29	1/115	ZCKJD37H7	1/114
ZC2JE015	1/178		1/174		1/37	ZCKJ415	1/127	ZCKJD39H29	1/104
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ZC2JE02	1/168	ZC2JY91	1/152		1/43	ZCKJ415H7	1/127	ZCKJD39H7	1/114
ZC2JE025	1/178		1/174	ZCKD●●	1/76	ZCKJ41H29	1/115	ZCKLD3●	1/85
ZC2JE026	1/174	ZC2JY915	1/178		1/78		1/124	ZCKLD3●H7	1/85
ZC2JE03	1/168	ZC4CB2	1/228		1/93	ZCKJ41H7	1/115	ZCKL●	1/78
ZC2JE035	1/178	ZCD29M12	1/42	ZCKE61	1/104		1/124	ZCKL●H7	1/84
ZC2JE036	1/174		1/43	ZCKE67	1/104	ZCKJ45	1/127	ZCKM1●29	1/84
ZC2JE04	1/168	ZCD2●	1/39	ZCKE●●●	1/125	ZCKJ45H7	1/127	ZCKM1●7	1/84
ZC2JE045	1/178		1/48		1/128	ZCKJ4H29	1/114	ZCKMD31●29	1/85
ZC2JE046	1/174	ZCD31	1/48	ZCKJ01	1/115		1/124	ZCKMD31●7	1/85
ZC2JE05	1/172	ZCD35	1/48	ZCKJ0121	1/119	ZCKJ4H7	1/114	ZCKMD3●	1/85
ZC2JE05	1/168	ZCD37	1/38	ZCKJ0134	1/119		1/124	ZCKM●	1/84
ZC2JE056	1/174		1/48	ZCKJ02	1/115	ZCKJ5	1/114	ZCKS1	1/93
ZC2JE06	1/168		1/48				1/124	ZCKS1●29	1/93
ZC2JE065	1/178		1/48				1/124		
ZC2JE066	1/174		1/38				1/114		
ZC2JE07	1/168		1/39				1/114		
ZC2JE075	1/178		1/48				1/124		

ZCKS404	1/98	ZCT27P16	1/44
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	1/98		1/49
ZCKS404H29	1/98	ZCT28G11	1/49
ZCKS●	1/98	ZCT28N12	1/49
ZCKY11	1/126	ZCT28P16	1/44
	1/129		1/45
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ZCKY●●	1/129	ZCY15	1/13
ZCKY●●●	1/119		1/17
ZCKZ0●●	1/24	ZCY16	1/13
ZCMC21E1	1/24		1/17
ZCMC21E10	1/24	ZCY17	1/13
ZCMC21E2	1/24		1/17
ZCMC21E3	1/24	ZCY18	1/33
ZCMC21E5	1/24		1/37
ZCMC21E7	1/24		1/39
ZCMC21T1	1/24		1/43
ZCMC21T2	1/24		1/45
ZCMC21T5	1/24	ZCY39	1/33
ZCMC25T06	1/24		1/37
ZCMD21L08R12	1/16		1/39
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ZCMD21L08U78	1/16	ZCY45	1/45
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ZCMD29C12	1/16		1/17
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ZCMD29L1	1/12		1/37
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ZCMD37L1	1/12		1/43
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ZCMD39L1	1/12	ZCY49	1/33
	1/13		1/37
ZCMD41L1	1/12		1/39
	1/13		1/43
ZCMD61	1/24	ZEP3L524	1/202
ZCMD61C12	1/25	ZEP3L529	1/202
ZCMD61M12	1/25	ZEP4L326	1/200
ZCMD65	1/24	ZEP4L454	1/200
ZCMD69	1/24	ZMLPA1N2SH	2/37
ZCMD69C12	1/25	ZMLPA1N2SH	2/39
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ZCMD81L1	1/24	ZMLPA1P2SH	2/37
ZCMD81L2	1/24		2/39
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ZCP21	1/48		2/39
ZCP21D44	1/48	ZMLPA2N0SH	2/37
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ZCP26	1/48	ZMLPA2P0SH	2/37
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	1/33	ZR2FA005	1/233
	1/48	ZR2FA1	1/233
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ZCT25G11	1/49		
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	1/49		
ZCT26G11	1/49		
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Schneider Electric Industries SAS

Head Office
35, rue Joseph Monier
F-92500 Rueil-Malmaison
France

www.tesensors.com

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