

Limit switches

OsiSense XC Special

Catalogue



Telemecanique

Sensors

■ Selection guide	page 2
■ For very severe applications, type XC2J	
□ Presentation and characteristics	page 8
□ Complete switches, fixed body	page 10
□ Variable composition: fixed or plug-in body	page 12
□ Adaptable sub-assemblies	page 14
- For low temperature applications (- 40 °C).....	page 20
- For high temperature applications (+ 120 °C).....	page 23
■ For materials handling applications, type XC1AC	
□ Presentation	page 26
□ Complete switches with slow break contacts	page 28
■ For hoisting and mechanical handling applications, types XCR and XCKMR For conveyor belt shift monitoring, type XCRT	
□ Presentation and characteristics	page 32
□ Switches types XCR and XCKMR	page 36
□ Switches type XCRT	page 38
■ Subminiature format and microswitches	
□ DIN 41635 B format, sealed and DIN 41635 D format	page 46
□ DIN 41635 A format	page 48
□ Sealed design, pre-cabled	page 50
□ General	page 52
■ Limit switches OsiSense XC: general	
□ Presentation and terminology	page 54
□ Contact blocks	page 55
□ Mounting	page 57
□ Setting-up	page 58
□ Reminder of standards	page 60
 Technical information	
■ Protective treatment of equipment according to climatic environment	page 62
■ Product standards and certifications	page 64
■ Degrees of protection provided by enclosures	page 66
■ Reference index	page 68

Limit switches

OsiSense XC Standard

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	•	•	•
	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, 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	Please refer to our catalogue "Limit switches OsiSense XC Standard"			

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)		
•	•	•	•
•	•	•	•
-	-	-	-
-	-	-	-
•	-	-	-
•	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
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

Please refer to our catalogue "Limit switches OsiSense XC Standard"

Limit switches

OsiSense XC Standard

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		CENELEC 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 or 1/2" NPT
		–		
Type reference	XCKM	XCKL	XCKS	XCKJ
Pages	Please refer to our catalogue "Limit switches OsiSense XC Standard"			

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	GENELEC 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

Please refer to our catalogue "Limit switches OsiSense XC Standard"

Limit switches

OsiSense XC Special

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					
Screw terminals (entry for cable gland)	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
Pre-cabled	–	–	–	–	–
Connector	–	–	–	–	–
Type reference	XC2J	XC1AC	XCR XCRT	XCKMR XCKVR	XEP
Pages	8 and 20	26	32	33	46 and 48

Safety limit switches and guard switches Preventa XCS							
Standard		With lever or hinge		Actuator operated			Coded magnetic for detection without contact Rectangular or cylindrical format
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	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 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	–	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	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	–	–	
XCSP: Ø 7.5 cable, PvR	–	–	XCSP: Ø 7.5 cable, PvR	–	–	–	–	PVC cable	
–	–	–	–	–	–	–	–	Remote M8, remote M12 or integral M12 depending on model	
XCSP	XCSD	XCSP, XCSPR XCSTL, XCSTR	XCSP	XCSPA XCSTA	XCSA	XCSB XCSC	XCSE	XCSTE	XCSDM/C/P/R XCSDM3/4

Please refer to our catalogue "Preventa XCS safety switches"

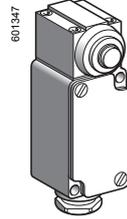
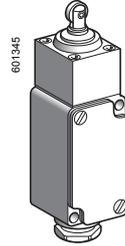
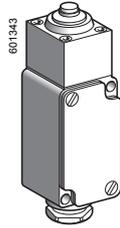
Limit switches

OsiSense XC Special

For very severe applications, type XC2J

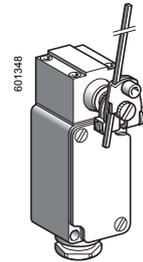
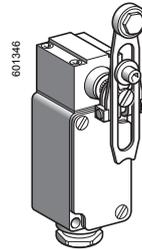
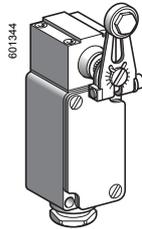
■ XC2J
with 1 cable entry

□ With head for linear movement (plunger)



Page 10

□ With head for rotary movement (lever)



Page 10

Limit switches

OsiSense XC Special

For very severe applications, type XC2J

Environment characteristics

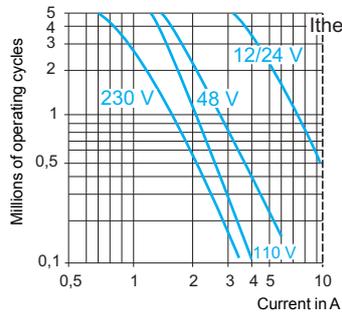
Conformity to standards	Products	IEC/EN 60947-5-1, IEC 60337-1, VDE 0660-200, UL 508, CSA C22-2 n° 14
	Machine assemblies	IEC/EN 60204-1, NF C 79-130
Product certifications	Standard version	CSA 300 V \sim HD, 60 W \sim
	Special version	UL 250 V \sim HD Listed, CSA 300 V \sim HD, 60 W with 1/2" NPT tapped 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 ($U_e = 240$ V, $I_e = 3$ A) \sim DC-13; Q300 ($U_e = 250$ V, $I_e = 0.27$ 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		≤ 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	XCKZ01 : clamping capacity, min: 1 x 0.5 mm ² , max: 2 x 2.5 mm ² XESP10•1 : 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
 \sim inductive circuit



DC supply \sim	Voltage V	24	48	120
	Power broken in W for 5 million operating cycles	10	7	4
	W \sim			

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 9)

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

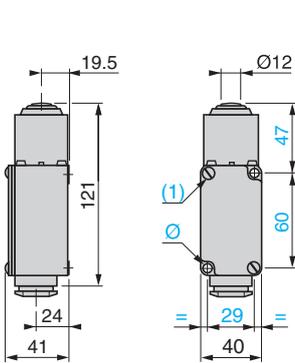
OsiSense XC Special

For very severe applications, type XC2J

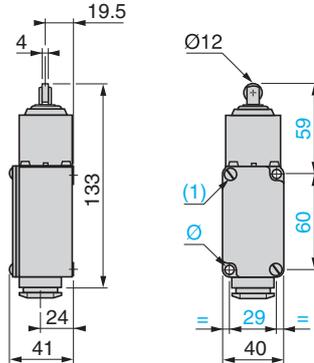
Complete switches, fixed body,

1 cable entry incorporating cable gland

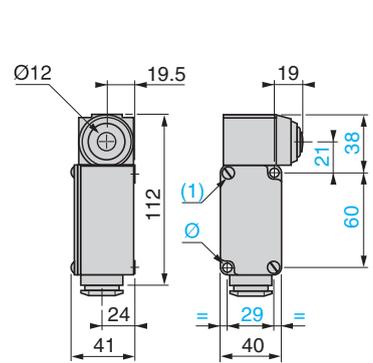
ZC2JC1 + ZC2JE61



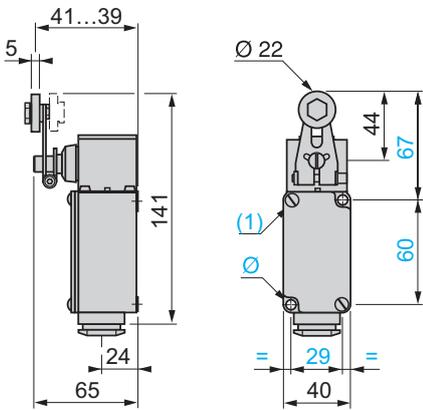
ZC2JC1 + ZC2JE62



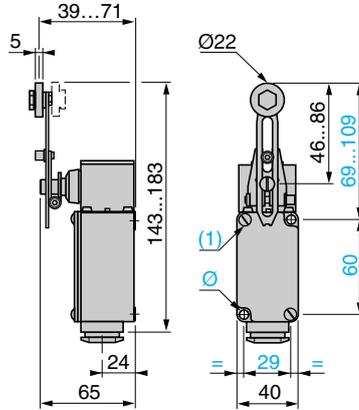
ZC2JC1 + ZC2JE63



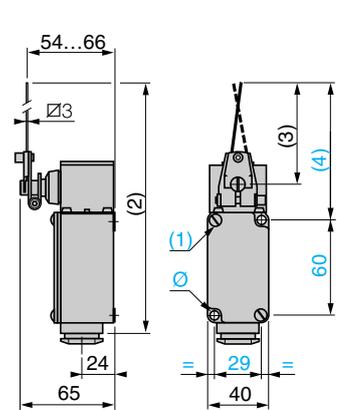
ZC2JC1 + ZC2JE0● + ZC2JY11



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).

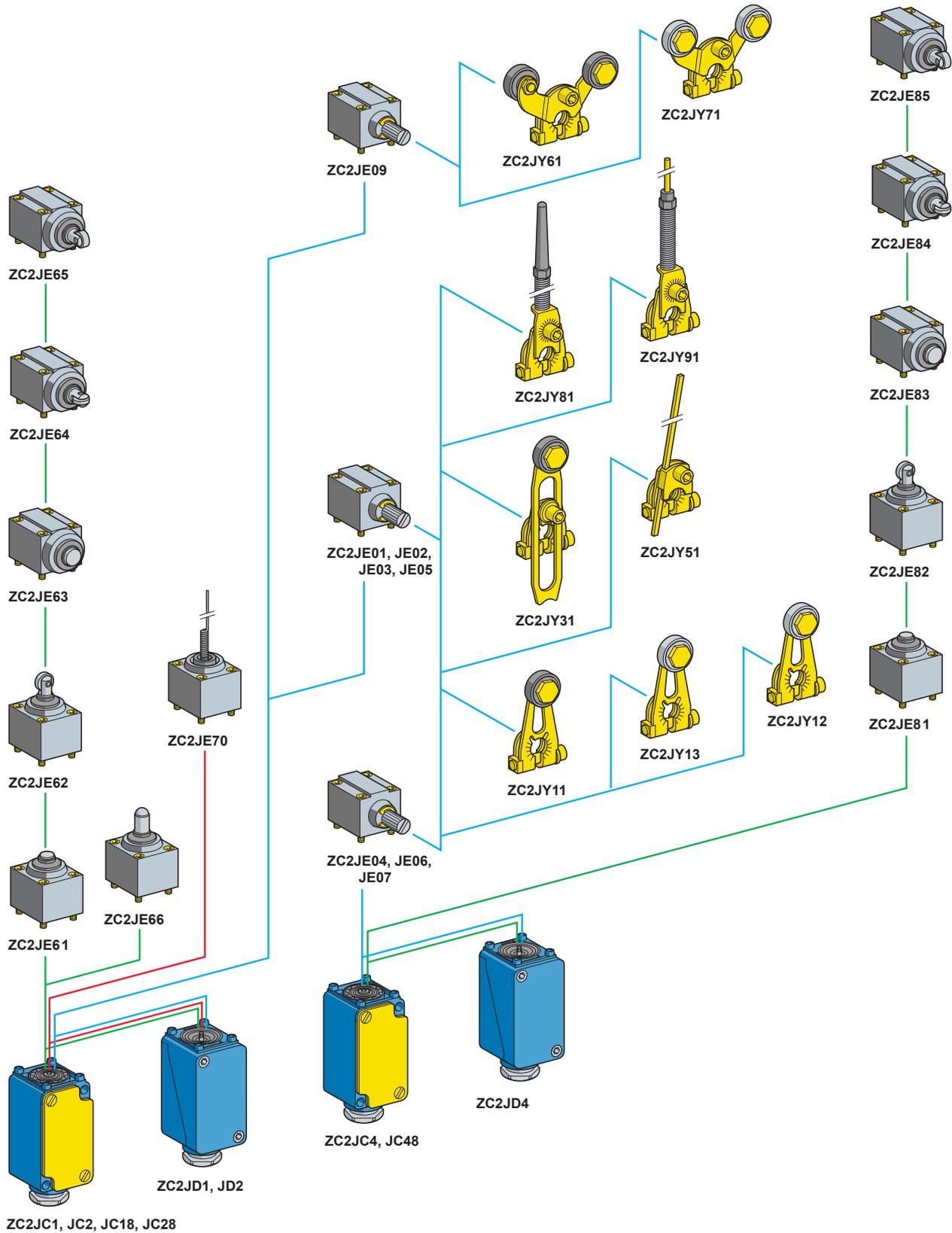
Limit switches

OsiSense XC Special

For very severe applications, type XC2J

Fixed or plug-in body

Variable composition



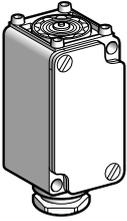
Limit switches

OsiSense XC Special

For very severe applications, type XC2J

Fixed or plug-in body

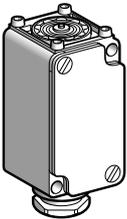
Adaptable sub-assemblies



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 18)				
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

 (see operation page 18)

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 18)				
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

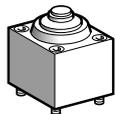
Limit switches

OsiSense XC Special

For very severe applications, type XC2J

Fixed or plug-in body

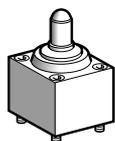
Adaptable sub-assemblies



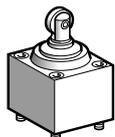
ZC2JE01



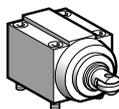
ZC2JE03



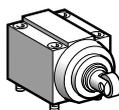
ZC2JE66



ZC2JE02



ZC2JE04



ZC2JE05

Plunger heads

Type of operator	Compatible bodies	Maximum actuation speed	Reference	Weight kg
For actuation on end				
End plunger metal	ZC2J01 ZC2J02	0.5 m/s	ZC2JE61	0.195
	ZC2J04	0.5 m/s	ZC2JE81	0.195
Side plunger metal	ZC2J01 ZC2J02	0.5 m/s	ZC2JE63	0.240
	ZC2J04	0.5 m/s	ZC2JE83	0.240
For actuation by 30° cam				
End ball bearing plunger	ZC2J01 ZC2J02	0.1 m/s	ZC2JE66	0.205
End roller plunger steel	ZC2J01 ZC2J02	1 m/s	ZC2JE62	0.200
	ZC2J04	1 m/s	ZC2JE82	0.200
Side plunger with horizontal roller steel	ZC2J01 ZC2J02	0.6 m/s	ZC2JE64	0.245
	ZC2J04	0.6 m/s	ZC2JE84	0.245
Side plunger with vertical roller steel	ZC2J01 ZC2J02	0.6 m/s	ZC2JE65	0.245
	ZC2J04	0.6 m/s	ZC2JE85	0.245

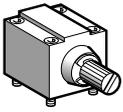
Limit switches

OsiSense XC Special

For very severe applications, type XC2J

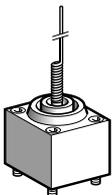
Fixed or plug-in body

Adaptable sub-assemblies



ZC2JE01

Rotary heads (without operating lever)				
Type	Compatible bodies	Maximum actuation speed	Reference	Weight kg
Spring return (see operation page 18)				
Actuation from left AND right	ZC2J●1 ZC2J●2	1.5 m/s	ZC2JE01	0.210
	ZC2J●4	1.5 m/s	ZC2JE04	0.210
Actuation from left	ZC2J●1 ZC2J●2	1.5 m/s	ZC2JE02	0.210
	ZC2J●4	1.5 m/s	ZC2JE06	0.210
Actuation from right	ZC2J●1 ZC2J●2	1.5 m/s	ZC2JE03	0.210
	ZC2J●4	1.5 m/s	ZC2JE07	0.210
Actuation from left OR right (see page 60)	ZC2J●1 ZC2J●2	1.5 m/s	ZC2JE05	0.210
Stay put (see page 60)				
Actuation from left AND right	ZC2J●1 ZC2J●2	1.5 m/s	ZC2JE09	0.210



ZC2JE70

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 18)				
"Cat's whisker"	ZC2J●1 ZC2J●2	1 m/s in any direction	ZC2JE70	0.190

Limit switches

OsiSense XC Special

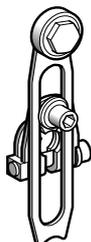
For very severe applications, type XC2J

Fixed or plug-in body

Adaptable sub-assemblies



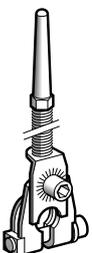
ZC2JY1



ZC2JY31



ZC2JY51



ZC2JY81



ZC2JY91



ZC2JY71



ZC2JY61

Operating levers for rotary heads

Description	Reference	Weight kg
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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
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For actuation by any moving part

Rigid rod lever	Steel \square 3 mm, L = 125 mm (1)	ZC2JY51	0.035
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Spring lever (1)		ZC2JY81	0.040
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Spring-rod lever (1)		ZC2JY91	0.040
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For actuation by specific cam (only for operation with head ZC2 JE09, see page 60)

Forked arm with rollers thermoplastic (1)	1 track	ZC2JY71	0.055
-------------------------------------------------	---------	---------	-------

2 track	ZC2JY61	0.055
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(1) Adjustable throughout 360°

Other versions

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

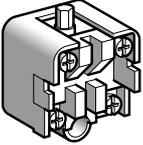
Limit switches

OsiSense XC Special

For very severe applications, type XC2J

Fixed or plug-in body

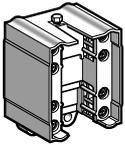
Adaptable sub-assemblies



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



XESP10●1

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
Double-pole 2 CO staggered, snap action		ZC2JC48	XESP1038	0.055

Limit switches

OsiSense XC Special

For very severe applications, type XC2J

Fixed or plug-in body

Adaptable sub-assemblies

Operation (function diagrams)

Heads ZC2JE61, JE66 with body



Head ZC2JE62 with body



Head ZC2JE63 with body



Heads ZC2JE64, JE65 with body



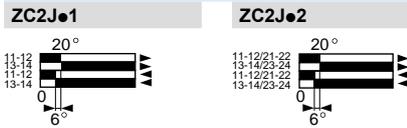
Heads ZC2JE01, JE02, JE03, JE05 with body



Head ZC2JE09 with body



Head ZC2JE70 with body



Contact operation

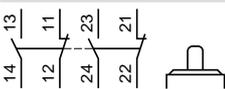
■ closed

□ open

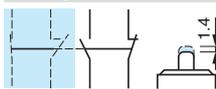
(A) = cam displacement

Heads ZC2JE81, JE82 with body ZC2J4

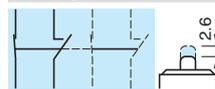
Unactuated



1st step

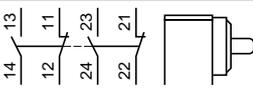


2nd step



Heads ZC2JE83, JE84, J85 with body ZC2J4

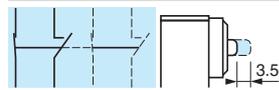
Unactuated



1st step

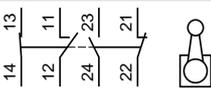


2nd step

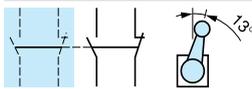


Heads ZC2JE04 with body ZC2J4

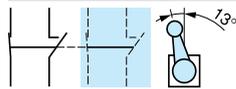
Unactuated



Actuated from left

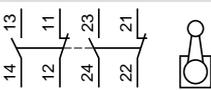


Actuated from right

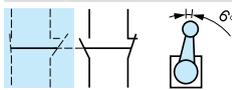


Heads ZC2JE06, JE07 with body ZC2J4

Unactuated



1st step



2nd step



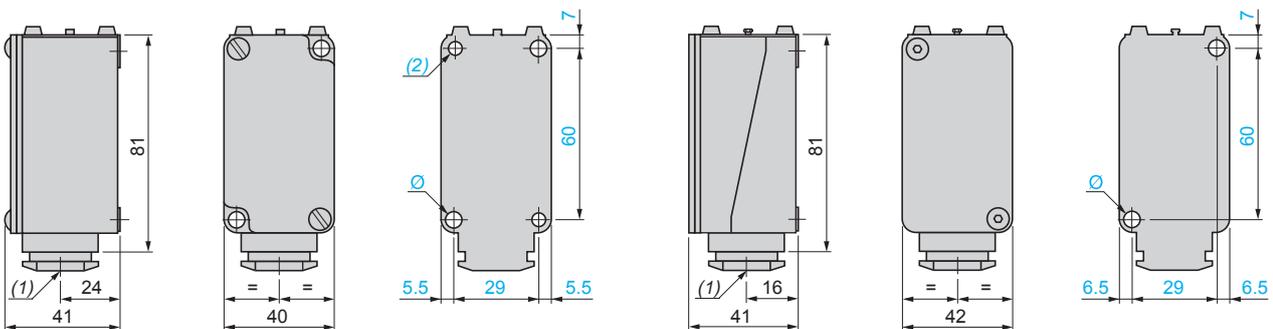
Dimensions

Fixed bodies

ZC2JC1, JC2, JC4

Plug-in bodies

ZC2JD1, JD2, JD4



(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

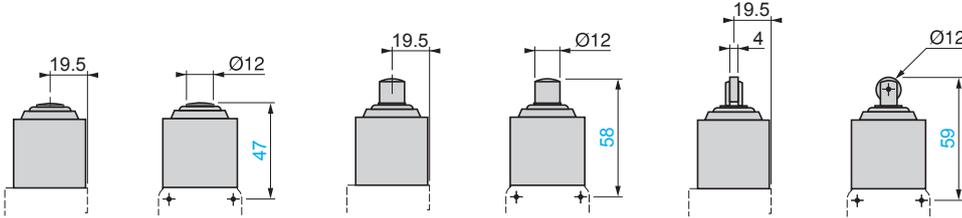
Adaptable sub-assemblies

Plunger heads

ZC2JE61, JE81

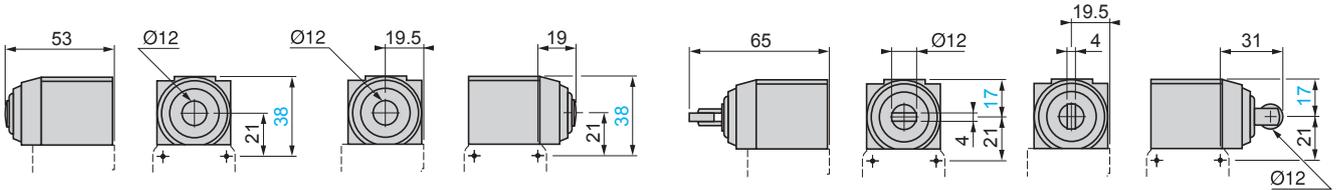
ZC2JE66

ZC2JE62, JE82



ZC2JE63, JE83 (2 position)

ZC2JE64, JE84, JE65, JE85 (2 position)

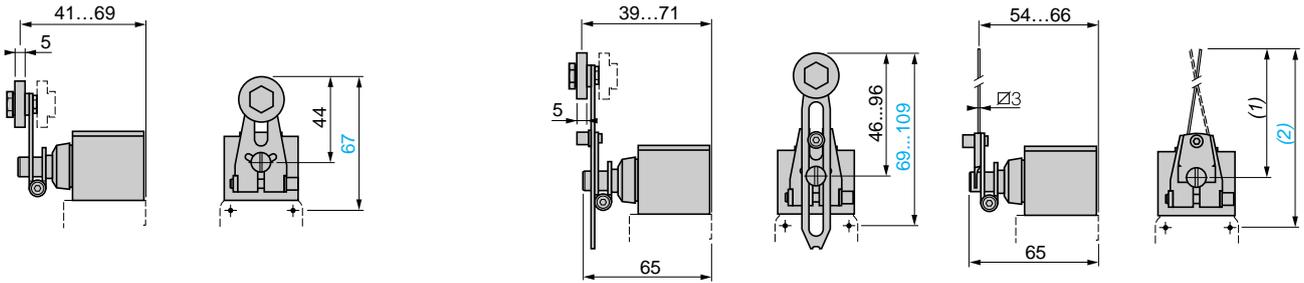


Rotary heads (ZC2JE01 to JE07) with operating lever

ZC2JY11, JY12, JY13

ZC2JY31

ZC2JY51

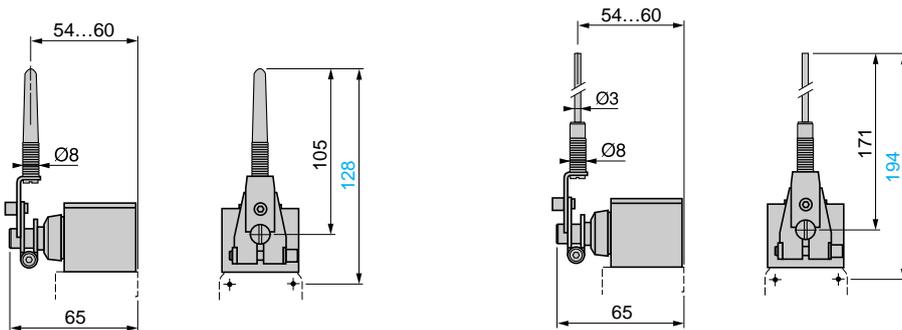


(1) 125 max.

(2) 148 max.

ZC2JY81

ZC2JY91



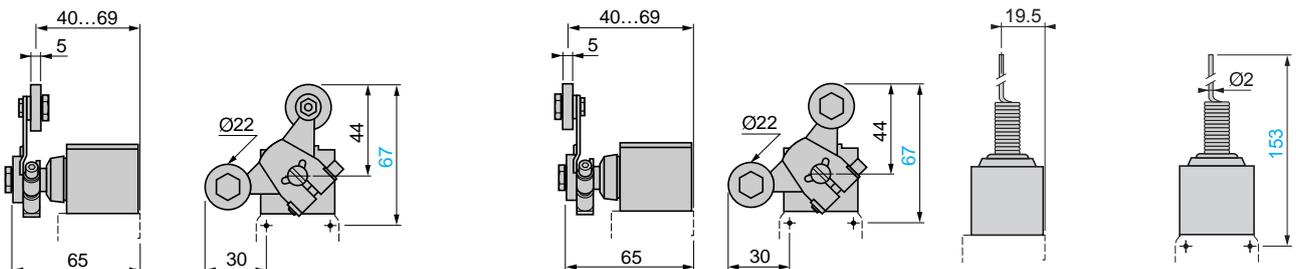
Rotary heads (ZC2JE09) with operating lever

ZC2JY61

ZC2JY71

Multi-directional heads

ZC2JE70

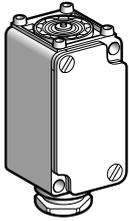


Limit switches

OsiSense XC Special

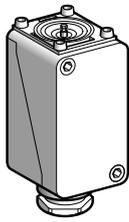
For very severe applications, type XC2J

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

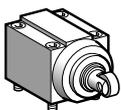


ZC2JD●6

Plug-in bodies				
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 ZC2J●26	0.1 m/s	ZC2JE666	0.205
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			
	ZC2J●46	0.6 m/s	ZC2JE846	0.245
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



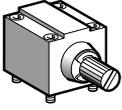
ZC2JE●56

Limit switches

OsiSense XC Special

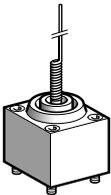
For very severe applications, type XC2J

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 ZC2J●26	1.5 m/s	ZC2JE016	0.210
	ZC2J●46	1.5 m/s	ZC2JE046	0.210
Actuation from left	ZC2J●16 ZC2J●26	1.5 m/s	ZC2JE026	0.210
	ZC2J●46	1.5 m/s	ZC2JE066	0.210
Actuation from right	ZC2J●16 ZC2J●26	1.5 m/s	ZC2JE036	0.210
	ZC2J●46	1.5 m/s	ZC2JE076	0.210
Actuation from left OR right (see page 60)	ZC2J●16 ZC2J●26	1.5 m/s	ZC2JE056	0.210
Stay put (see page 60)				
Actuation from left AND right	ZC2J●16 ZC2J●26	1.5 m/s	ZC2JE096	0.210



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 ZC2J●26	1 m/s in any direction	ZC2JE706	0.190

Limit switches

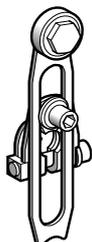
OsiSense XC Special

For very severe applications, type XC2J

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



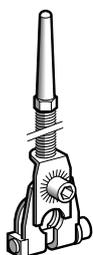
ZC2JY1



ZC2JY31



ZC2JY51



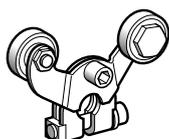
ZC2JY81



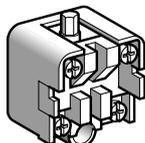
ZC2JY91



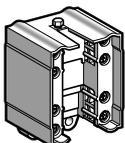
ZC2JY71



ZC2JY61



XCKZ01



XESP10

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 \square 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 60)

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

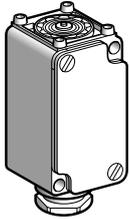
(1) Adjustable throughout 360°

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

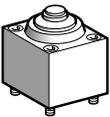
Limit switches

OsiSense XC Special

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



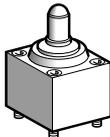
ZC2JC5



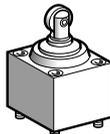
ZC2JE15



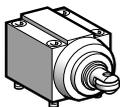
ZC2JE35



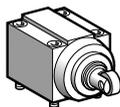
ZC2JE665



ZC2JE25



ZC2JE45



ZC2JE55

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

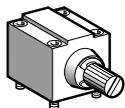
Type of operator	Compatible bodies	Maximum actuation speed	Reference	Weight kg
For actuation on end				
End plunger metal	ZC2JC15 ZC2JC25	0.5 m/s	ZC2JE615	0.195
	ZC2JC45	0.5 m/s	ZC2JE815	0.195
Side plunger metal	ZC2JC15 ZC2JC25	0.5 m/s	ZC2JE635	0.240
	ZC2JC45	0.5 m/s	ZC2JE835	0.240
For actuation by 30° 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)



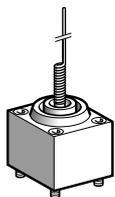
ZC2JE05

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 60)

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

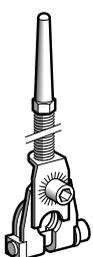
For very severe applications, type XC2J
Fixed body, adaptable sub-assemblies for high
temperature applications (+ 120°C)



ZC2JY1



ZC2JY51



ZC2JY815



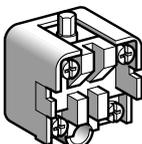
ZC2JY915



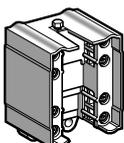
ZC2JY715



ZC2JY615



XCKZ015



XESP10

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 60)

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

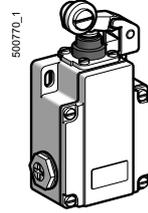
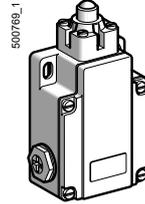
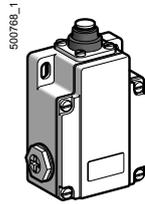
Other operating levers for rotary heads.
Please consult our Customer Care Centre.

Limit switches

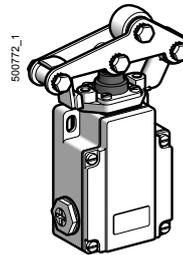
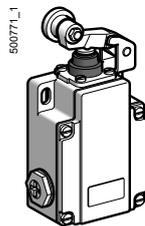
OsiSense XC Special
For material handling applications, type XC1AC

■ XC1AC
with slow break contacts

□ With head for linear movement (plunger)



Page 28



Page 28

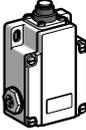
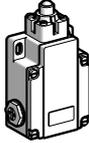
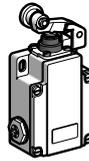
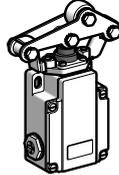
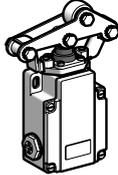
Environment characteristics																																													
Conformity to standards	IEC/EN 60947-5-1, IEC 60337-1, VDE 0660-200, CSA C22-2 n° 14																																												
Product certifications	Special version CSA 600 V (ac) HD																																												
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 																																												
	<table border="1"> <thead> <tr> <th colspan="5">Slow break contact blocks</th> </tr> <tr> <th colspan="5">Power broken in VA</th> </tr> </thead> <tbody> <tr> <td rowspan="4">AC supply 50/60 Hz ~  inductive circuit</td> <td>Voltage V</td> <td>48</td> <td>110</td> <td>230</td> </tr> <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> <tr> <td colspan="5"> </td> </tr> <tr> <td rowspan="4">DC supply ≡  inductive circuit</td> <td colspan="4">Power broken in W</td> </tr> <tr> <td>Voltage V</td> <td>48</td> <td>110</td> <td>230</td> </tr> <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>	Slow break contact blocks					Power broken in VA					AC supply 50/60 Hz ~  inductive circuit	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	Power broken in W				Voltage V	48	110	230	For 1 million operating cycles	100	100	95	For 3 million operating cycles	35	40
Slow break contact blocks																																													
Power broken in VA																																													
AC supply 50/60 Hz ~  inductive circuit	Voltage V	48	110	230																																									
	For 1 million operating cycles	450	900	1900																																									
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	Voltage V	48	110	230																																									
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	For 3 million operating cycles	35	40	33																																									

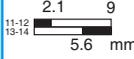
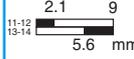
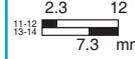
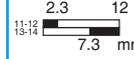
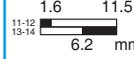
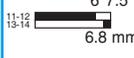
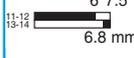
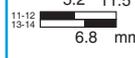
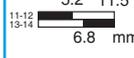
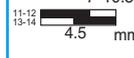
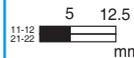
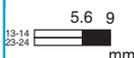
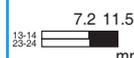
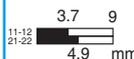
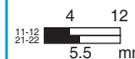
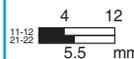
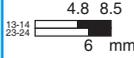
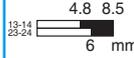
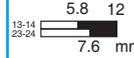
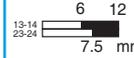
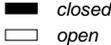
Limit switches

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.	

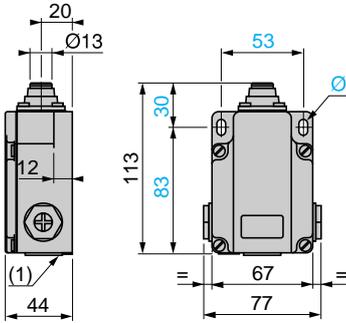
Limit switches

OsiSense XC Special

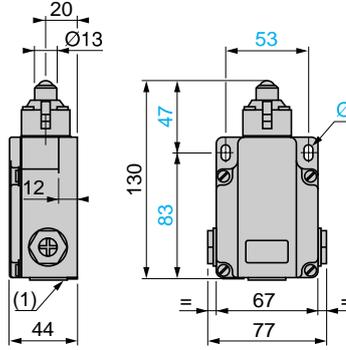
For material handling applications, type XC1AC

Complete switches with slow break contacts

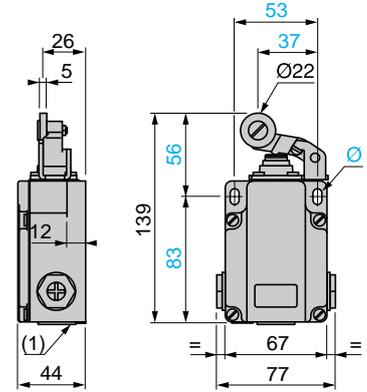
XC1AC1●1



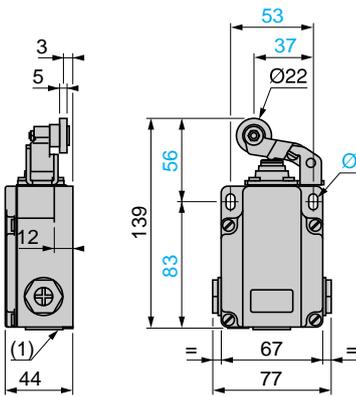
XC1AC1●5



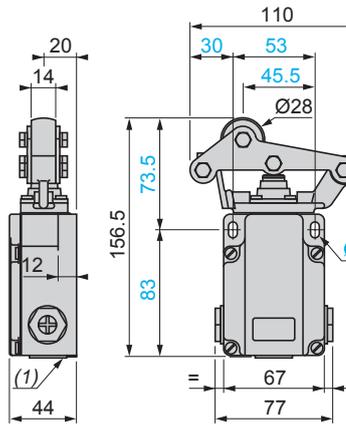
XC1AC1●6



XC1AC1●8



XC1AC1●7, XC1AC1●9



(1) 3 tapped entries for n° 13 cable gland or ISO 20 with adaptor DE9RA1620.

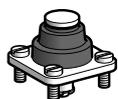
Ø: 2 elongated holes Ø 6.5 x 10.

Limit switches

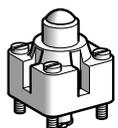
OsiSense XC Special

For material handling applications, type XC1AC

Replacement parts



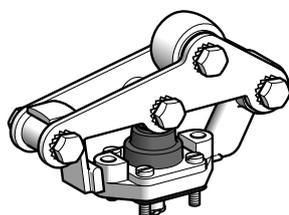
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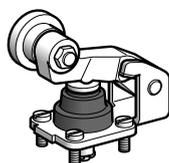
ZC1AC005



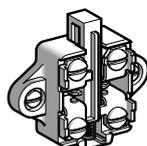
ZC1AC006



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

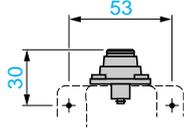
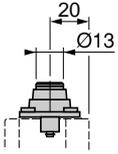
OsiSense XC Special

For material handling applications, type XC1AC

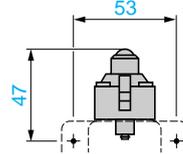
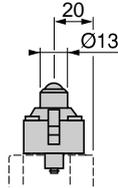
Replacement parts

Dimensions

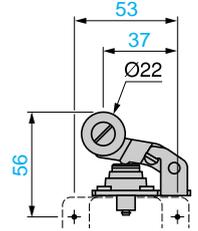
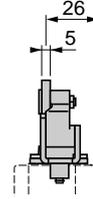
ZC1AC001



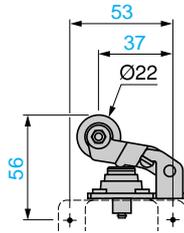
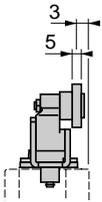
ZC1AC005



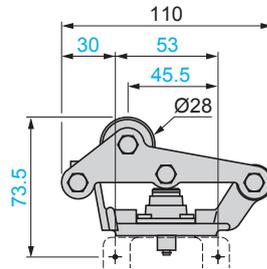
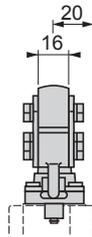
ZC1AC006



ZC1AC008



ZC1AC007, AC009



Limit switches

OsiSense XC Special

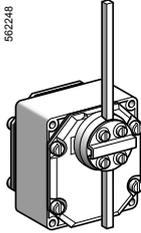
For hoisting and material handling applications,
type XCR

■ XCR

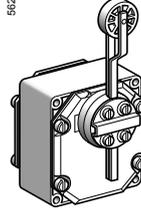
□ With head for rotary movement operators, spring return to off position

1 contact actuation position per direction

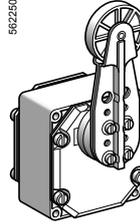
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562249



562250

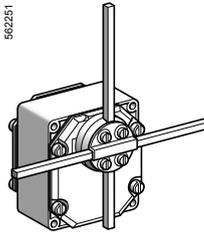


Page 36

□ With head for rotary movement operators, stay put

1 contact actuation position per direction

562251



Page 36

Limit switches

OsiSense XC Special

For hoisting and material handling applications,

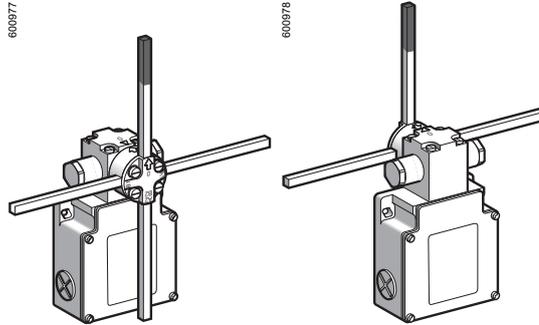
types XCKMR and XCKVR

For conveyor belt shift monitoring applications, type 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

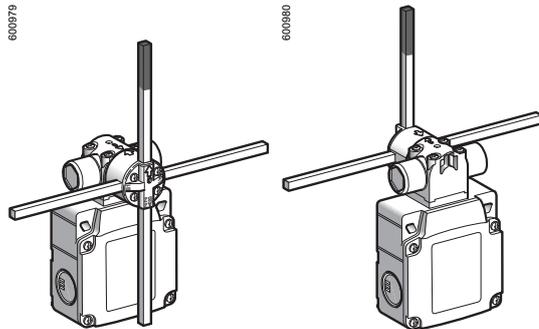


Page 42

■ 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

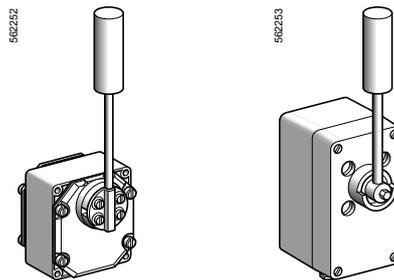


Page 42

■ 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°



Page 38

Limit switches

OsiSense XC Special

For hoisting and material handling applications,
types XCR, XCKMR and XCKVR

For conveyor belt shift monitoring applications, type XCRT

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 CE, UL, CSA, CCC, 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 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	Clamping capacity 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,

types XCR, XCKMR and XCKVR

For conveyor belt shift monitoring applications, type XCRT

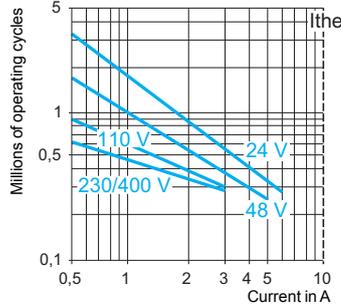
Contact block characteristics (continued)

Electrical durability

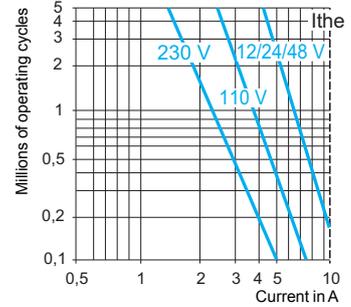
- Conforming to EN/IEC 60947-5-1 Appendix C
- Utilisation categories AC-15 and DC-13
- Maximum operating rate: 3600 operating cycles/hour
- Load factor: 0.5

AC supply
~ 50/60 Hz
~ inductive circuit

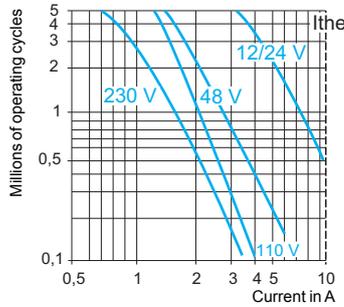
XE2SP2151



XE2NP2151



XCRT contacts



DC supply ---

	Voltage V	24	48	120
Power broken in W for 5 million operating cycles	XE2SP2151	10	7	4
	XE2NP2151	13	9	7
	XCRT contacts	10	7	4

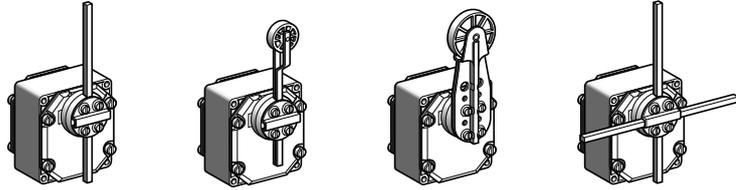
For XE2SP2151 on ~ or --- NC and NO contacts simultaneously loaded to the values shown with reverse polarity.

Limit switches

OsiSense XC Special

For hoisting and material handling applications, type 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)

Two 2-pole NC + NO snap action XE2SP2151 1 st contact 2 ^e contact	Both contacts operate in each direction	X CRA11 ⊖ (3) 	X CRA12 ⊖ (3) 	X CRA15 ⊖ (3) 	X CRE18 ⊖ (3)
	1 contact operates in each direction	X CRB11 ⊖ (3) 	X CRB12 ⊖ (3) 	X CRB15 ⊖ (3) 	X CRF17 ⊖ (3)
Two 2-pole NC + NO break before make, slow break XE2NP2151 1 st contact 2 ^e contact	Both contacts operate in each direction	X CRA51 ⊖ (3) 	X CRA52 ⊖ (3) 	X CRA55 ⊖ (3) 	X CRE58 ⊖ (3)
	1 contact operates in each direction	X CRB51 ⊖ (3) 	X CRB52 ⊖ (3) 	X CRB55 ⊖ (3) 	X CRF57 ⊖ (3)
Weight (kg)	1.110	1.145	1.155	1.135	

Contact operation

 closed (P) = positive opening point
 open (1) 1st contact
 (2) 2nd contact

Complementary characteristics

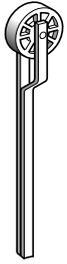
Lever maximum actuation speed	1.5 m/s		
Mechanical durability	10 million operating cycles		
Minimum torque	For tripping	0.45 N.m	0.60 N.m
	For positive opening	0.75 N.m	0.70 N.m
Cable entry	1 entry tapped for n° 13 cable gland conforming to NF C 68-300 (DIN Pg 13.5) Clamping capacity 9 to 12 mm		

(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

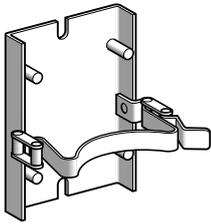
For hoisting and material handling applications, type XCR



XCRZ02



XCRZ05



XCRZ09



XCRZ11

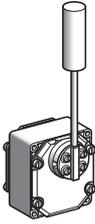
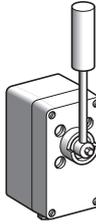
Separate components

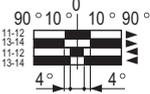
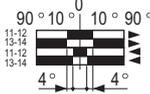
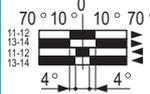
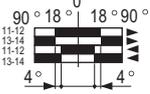
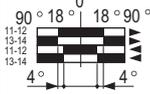
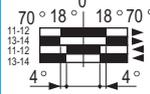
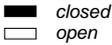
Description	For switches	Type	Reference	Weight kg
Rod, \varnothing 6 mm	XCRA XCRB XCRE XCRF	L = 200 mm	XCRZ03	0.020
	XCRF	L = 300 mm	XCRZ04	0.030
Roller lever thermoplastic roller	XCRA XCRB	–	XCRZ02	0.050
Large roller lever thermoplastic roller	XCRA XCRB	–	XCRZ05	0.090
Quick fixing/ release bracket	XCRA, 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

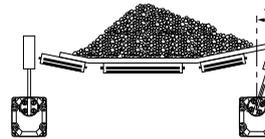
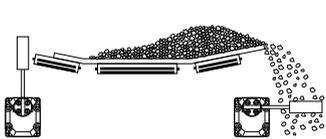
OsiSense XC Special

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

Type of switch	Standard	For corrosive atmospheres	
			
Features	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
 1 st contact			
 2 nd contact			
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			
Normal position	Fault signalling	Stopping of the conveyor belt	Maximum rotation
			

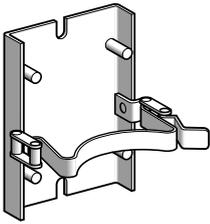
Limit switches

OsiSense XC Special

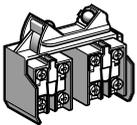
For conveyor belt shift monitoring applications,
type XCRT



XCRZ9●●



XCRZ09



XCRZ42

Separate components

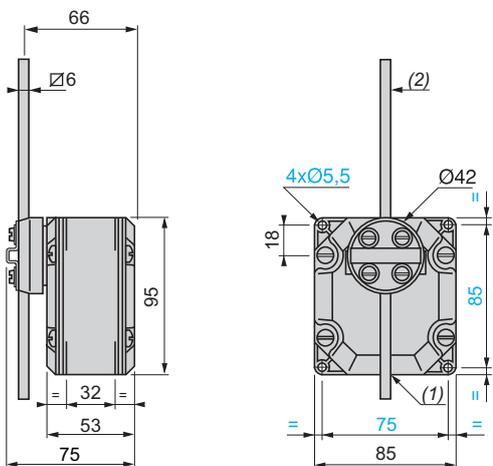
Description	Type	For switches	Reference	Weight kg
Roller with lever	Zinc plated steel	XCRT115	XCRZ901	0.230
		XCRT215		
	Stainless steel	XCRT115	XCRZ902	0.230
		XCRT215		
		XCRT315	XCRZ903	0.230
Quick fixing/release bracket	–	XCRT115 XCRT215	XCRZ09	0.520
Contact block (2 contacts) with mounting plate	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

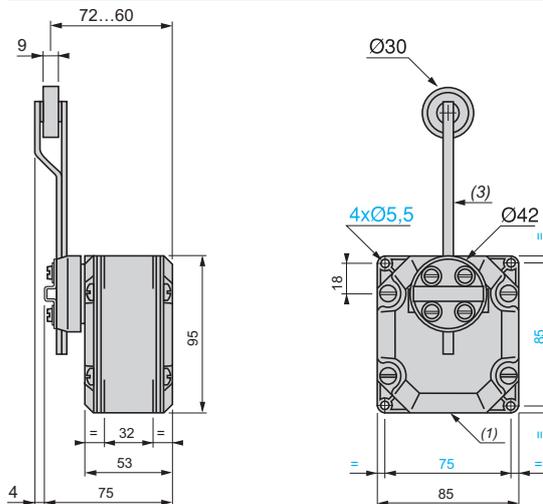
OsiSense XC Special

For hoisting and material handling applications, type XCR

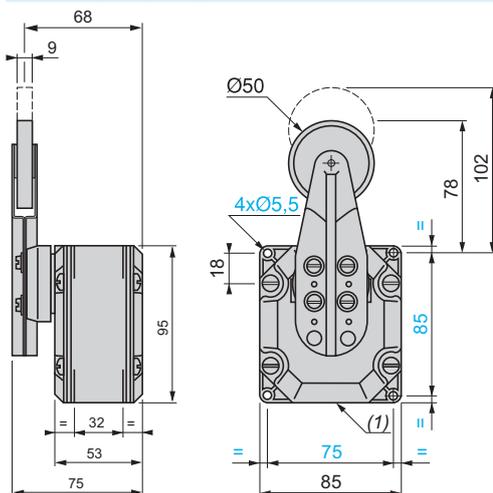
XCRA11, B11, A51, B51



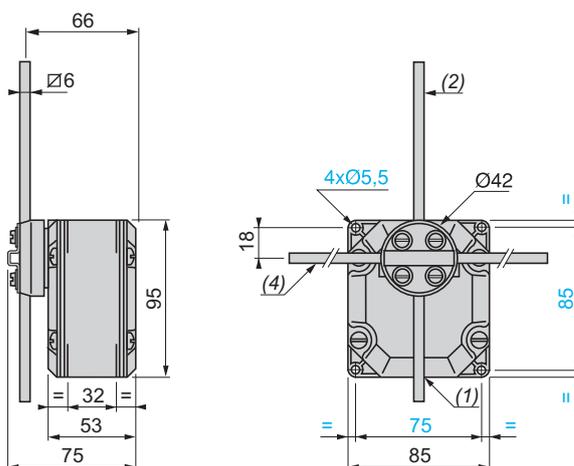
XCRA12, B12, A52, B52



XCRA15, B15, A55, B55



XCRE18, E58, F17, F57



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

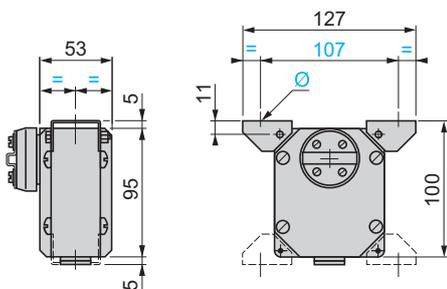
(2) Rod length: 200 mm.

(3) Rod + roller length: 160 mm.

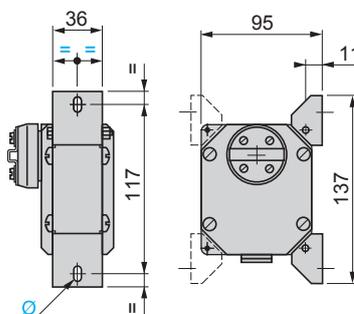
(4) Rod length: 300 mm for XCRF17 and F57, 200 mm for XCRE18 and E58.

Supplementary fixing using 2 adjustable lugs (included with switch)

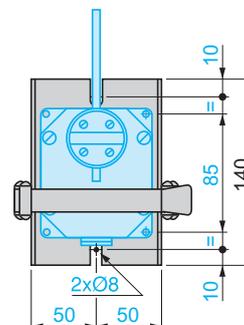
Horizontally positioned



Vertically positioned



Quick fixing/release bracket XCRZ09



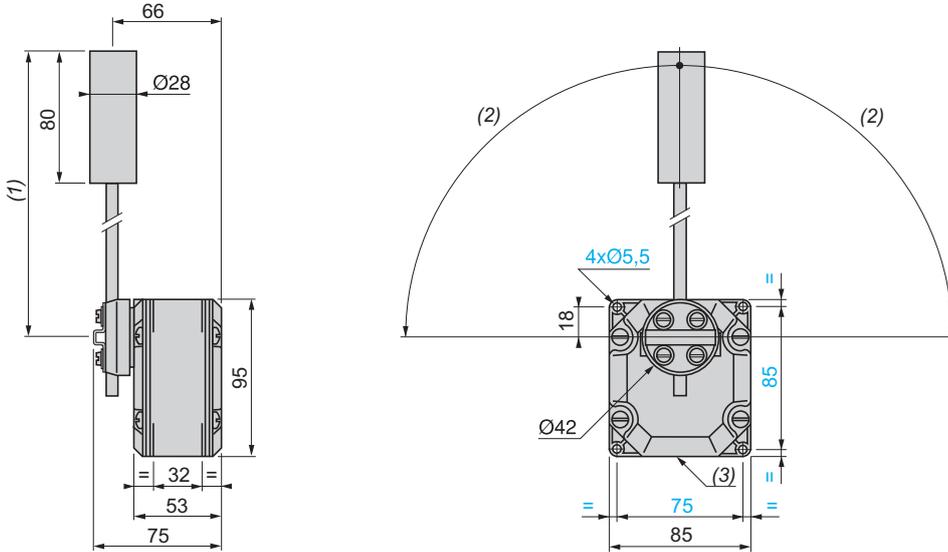
Ø: 1 elongated hole Ø 6 x 8.

Limit switches

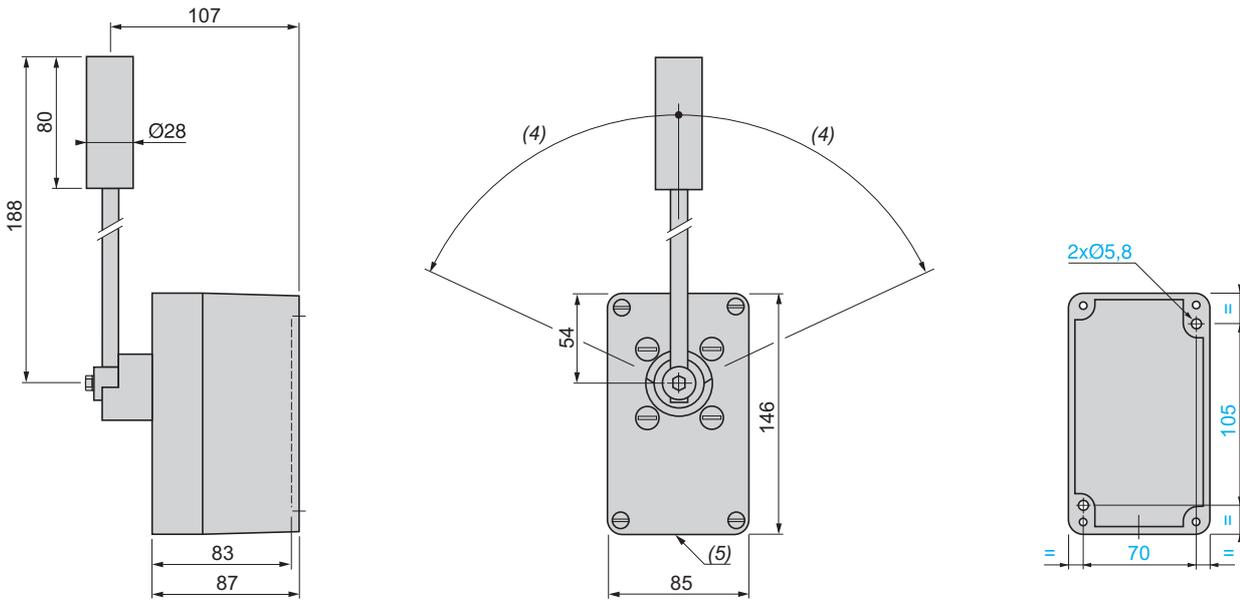
OsiSense XC Special

For conveyor belt shift monitoring applications, type XCRT

XCRT115, T215



XCRT315



(1) 200 max., 83 min.

(4) 70° max.

(2) 90° max.

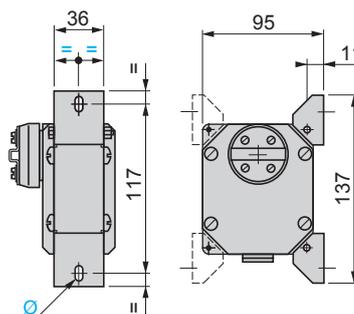
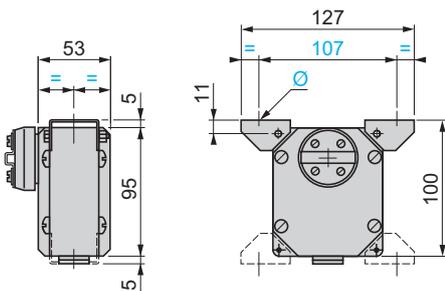
(5) 1 plain entry for n° 13 cable gland.

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

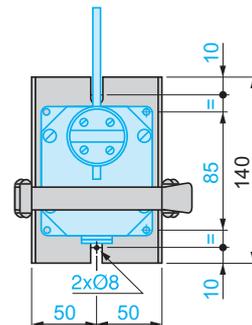
Supplementary fixing using 2 adjustable lugs (included with XCRT115 and T215)

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,

type XCKMR and XCKVR

Complete switches with 3 cable entries

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

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

	2 x 2-pole NC+NO break before make, slow break (XE2NP2151)	XCKMR44D1H29	XCKMR44D2H29	XCKVR44D1H29	XCKVR44D2H29
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“Double speed” switches (⊖ NC contact with positive opening operation on contacts 21-22)

	2 x 2-pole NC+NC break before make, slow break (non interchangeable contacts)	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	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 For positive opening	0.5 N.m 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

DE9 PEM20010

(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,
type XCKMR and XCKVR

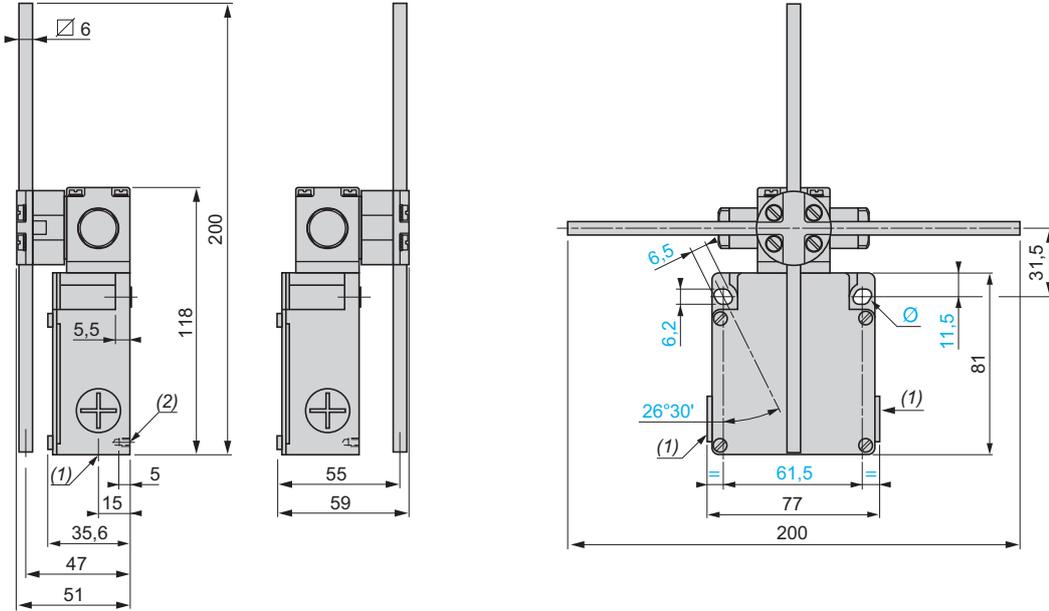
Complete switches with 3 cable entries

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.

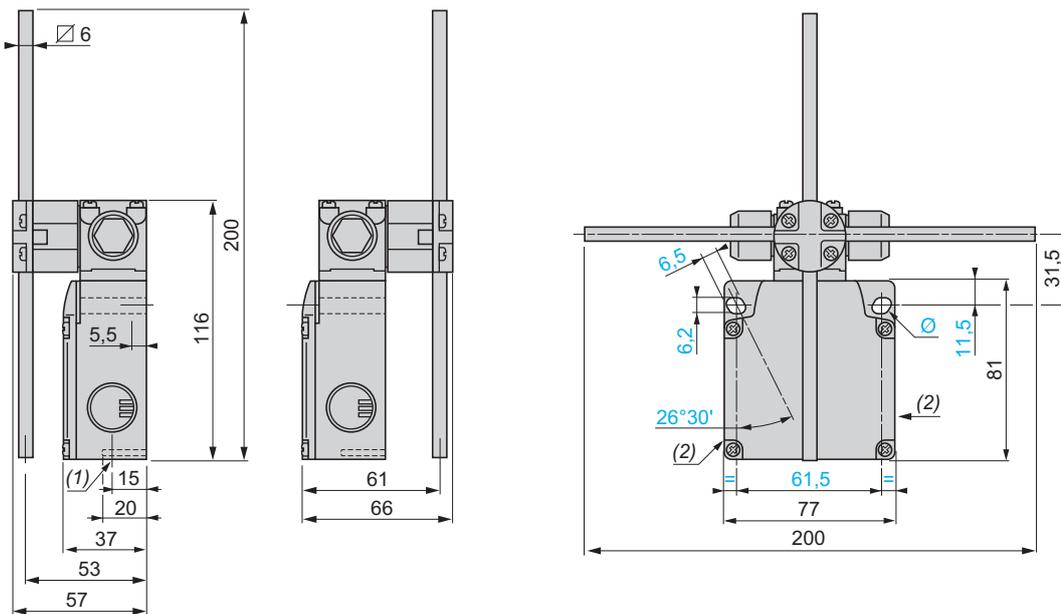
(2) 2 centring holes $\varnothing 3.9 \pm 0.2$, for cover fixing holes alignment.

\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

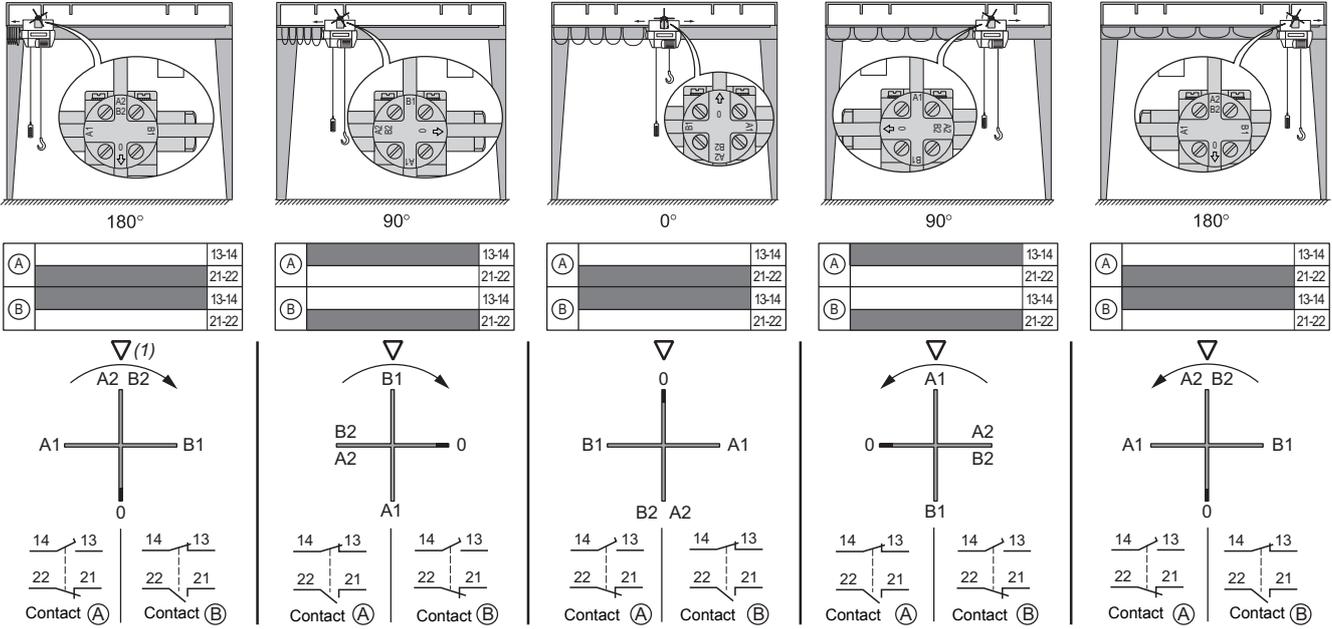
OsiSense XC Special

For hoisting and material handling applications,
type XCKMR and XCKVR

Complete switches with 3 cable entries

Operation

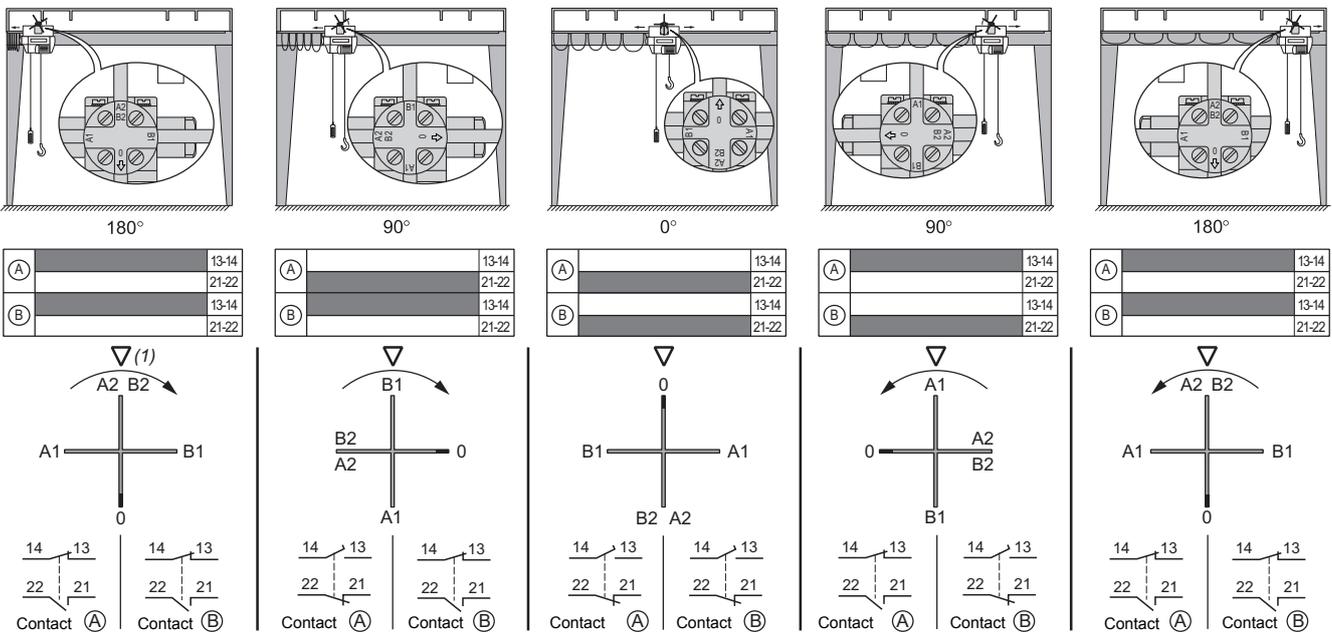
Limit switches XCK●R24SR1H29: "By pass"



(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

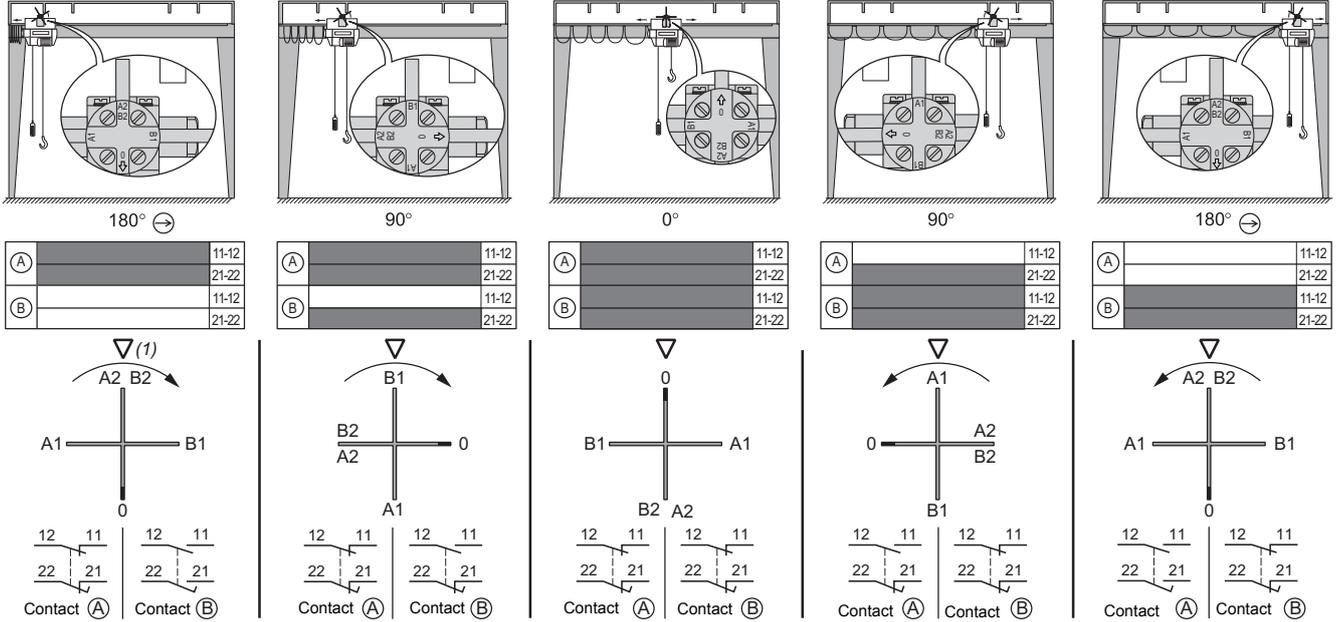
OsiSense XC Special

For hoisting and material handling applications,
type 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 Wiring: 1 Black 2 Grey 4 Blue</p>	2.8 mm cable clip tag connections XEP4E1W7 (3) Weight (g) 2.4	XEP4E1W7A326 (3) Weight (g) 3.1	XEP4E1W7A454 (3) Weight (g) 3.2
	Pre-cabled connections XEP4E1FD (3) Weight (g) 14.1	XEP4E1FDA326 (3) Weight (g) 14.8	XEP4E1FDA454 (3) Weight (g) 14.9
Separate components	Flat lever (2) ZEP4L326 (3) Weight (g) 0.7	-	-
	Roller lever (2) ZEP4L454 (3) Weight (g) 0.8	-	-
	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) Weight (g) 1.4	XEP5P1W2Z55B (3) Weight (g) 1.9
	Weight (g) 1.4	Weight (g) 1.9

Dimensions

XEP4E1W7	XEP4E1W7A326	XEP4E1W7A454

(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

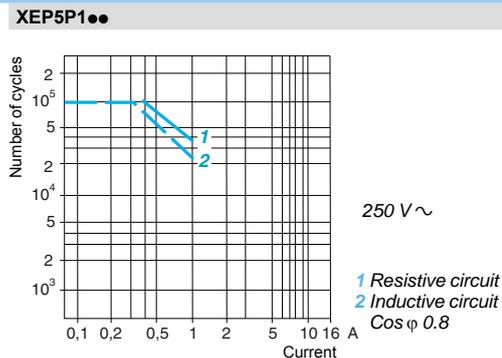
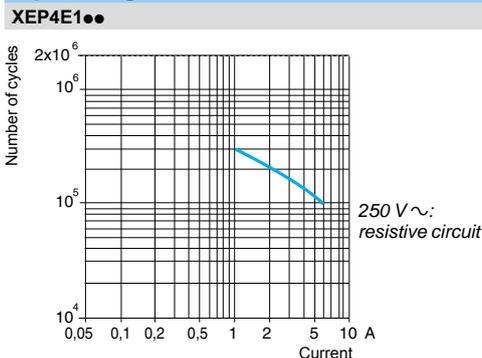
Sub-subminiature design, DIN 41635 D format

Switch type	XEP4E1●●, XEP5P1W2	XEP4E1●●A326, XEP5P1W2Z55B	XEP4E1●●A454
	Plunger	Flat lever	Roller lever
Environment characteristics			
Lever fixing position (1)	–	A	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-phtalate 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 ^{+/-0.3} mm	10.7 ^{+/-1.7} mm	15.5 ^{+/-1.4} mm	
		B	8.40 ^{+/-0.3} mm	9.6 ^{+/-1.0} mm	14.5 ^{+/-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			

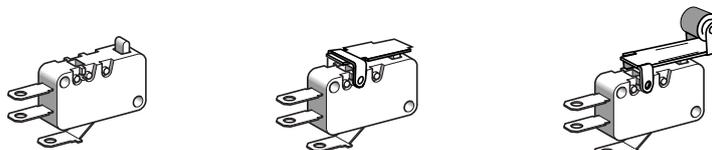
Electrical characteristics		
Operational characteristics	XEP4	AC-15: B300 (Ue: 240 V, Ie: 1.5 A) DC-13: R300 (Ue: 250 V, Ie: 0.1 A) conforming to IEC 60947-5-1, EN 60947-5-1 Appendix A 125-250 V AC 6.0 A conforming to UL 1054 6 (1) A 250 V AC 10 000 cycles conforming to EN 61058
	XEP5	AC-15: D300 (Ue: 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 46). 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 46).
(2) Position of the operator in relation to the switch fixings (fixing hole centre line) at the instant the switch contact changes state.

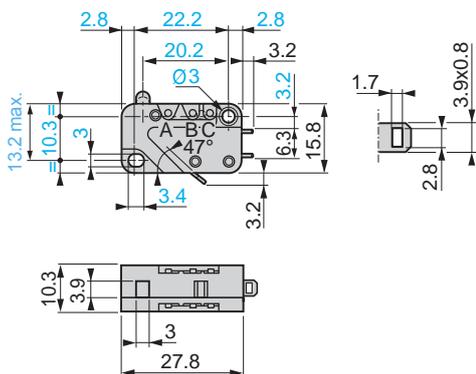
References



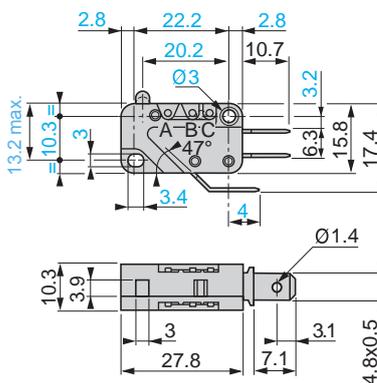
Type of operator		Plunger	Flat lever (1)	Roller lever (1)	
<p>Single-pole CO snap action</p>	Standard contacts	Solder tags	XEP3S1W2 (2)	XEP3S1W2B524 (2)	XEP3S1W2B529 (2)
		4.8 mm cable clip tags	XEP3S1W6 (2)	XEP3S1W6B524 (2)	XEP3S1W6B529 (2)
		6.35 mm cable clip tags	XEP3S1W3 (2)	XEP3S1W3B524 (2)	XEP3S1W3B529 (2)
	Very low operating force contacts	Solder tags	XEP3S2W2 (2)	XEP3S2W2B524 (2)	XEP3S2W2B529 (2)
		4.8 mm cable clip tags	XEP3S2W6 (2)	XEP3S2W6B524 (2)	XEP3S2W6B529 (2)
		6.35 mm cable clip tags	XEP3S2W3 (2)	XEP3S2W3B524 (2)	XEP3S2W3B529 (2)
Separate components	Flat lever (3)	ZEP3L524 (2)			
	Weight (g)	0.7			
	Roller lever (3)	ZEP3L529 (2)			
	Weight (g)	1			

Dimensions

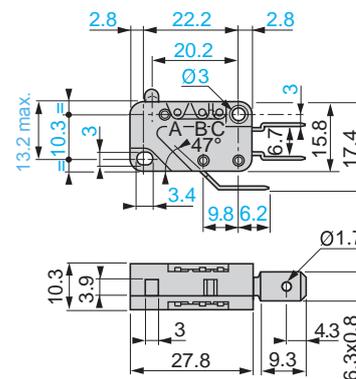
XEP3S●W2



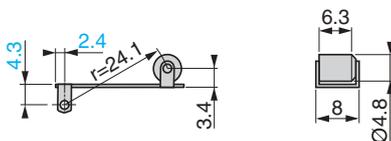
XEP3S●W6



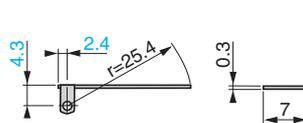
XEP3S●W3



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.

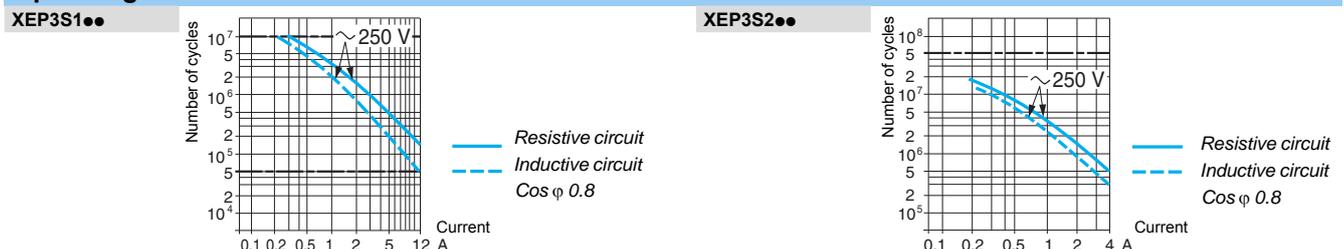
(3) Levers only for mounting on basic (plunger) snap switches (XEP3S●W2, XEP3S●W3, XEP3S●W6), in fixing positions A, B or C.

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
	Contact	AgNi	Stainless steel, glass reinforced polyamide roller

Mechanical characteristics			
		Lever fixing position (1)	
Maximum tripping force	Standard	A	0.8 N
		B	0.8 N
		C	0.8 N
	Very low force	A	0.25 N
		B	0.25 N
		C	0.25 N
Minimum release force	Standard	A	0.20 N
		B	0.20 N
		C	0.20 N
	Very low force	A	0.05 N
		B	0.05 N
		C	0.05 N
Maximum permissible end of travel force	Standard, very low force	A	20 N
		B	20 N
		C	20 N
Tripping point (TP) (2)	Standard, very low force	A	14.70 ^{+/-0.4} mm
		B	14.70 ^{+/-0.4} mm
		C	14.70 ^{+/-0.4} mm
Maximum differential travel	Standard, very low force	A	0.35 mm
		B	0.35 mm
		C	0.35 mm
Minimum overtravel	Standard	A	1.20 mm
		B	1.20 mm
		C	1.20 mm
	Very low force	A	1.10 mm
		B	1.10 mm
		C	1.10 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 48). 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 48).

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

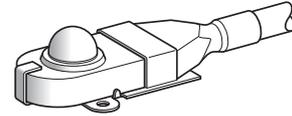
Miniature snap switches

OsiSense XC Special

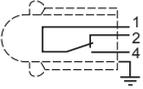
Sealed design

Pre-cabled

Type of head	Plunger (fixing by the body)	
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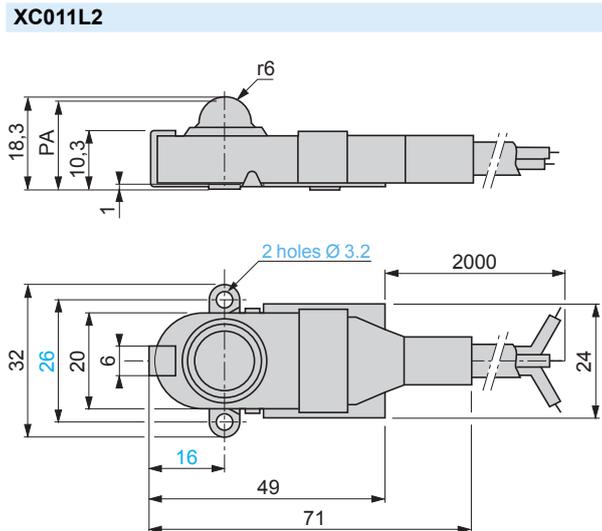
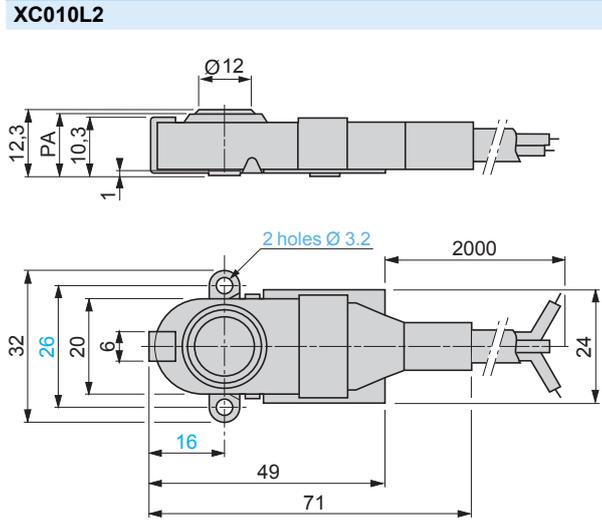


Type of operator	Head with flat plunger	Head with domed encased plunger
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References	XC010L2	XC011L2
 <p>Single-pole CO snap action Wiring: 1 Black 2 Brown 4 Blue</p>		

Weight (kg)	0.145	0.150
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Dimensions



Miniature snap switches

OsiSense XC Special

Sealed design

Pre-cabled

Switch type	XC010●	XC011●
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.

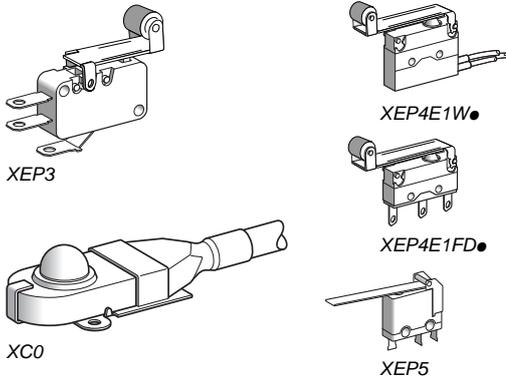
One of the two fixing holes must also be used as an earth protection terminal.

(2) Distance between the base of the switch and the top of the plunger at the instant the contact changes state (see dimensions, page 50).

Miniature snap switches

OsiSense XC
Miniature design
General

Presentation



Electromechanical detection

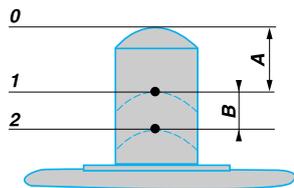
- OsiSense XC miniature snap switches, featuring electromechanical technology, assure the following functions:
 - detection of presence or absence,
 - detection of position.

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.

Terminology



Forces

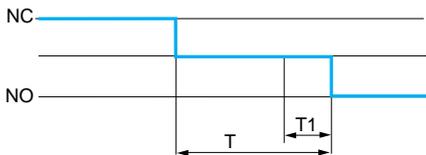
- Maximum tripping force: maximum force which must be applied to the operator to move it from the rest (unactuated) position to the trip position (tripping point).
- Minimum release force: value to which the force on the operator must be reduced to allow the snap action mechanism to return to its rest (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

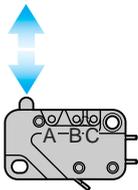
- 1 **Tripping point:** position of the operator in relation to the switch fixings (fixing hole centre line) at the instant the switch contact changes state.
- A **Differential travel:** distance between the tripping point and the position at which the snap action mechanism returns to its initial state 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.

Mechanical characteristics



T1: bounce time
T: changeover time



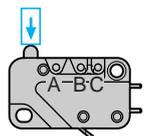
Changeover time

- 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



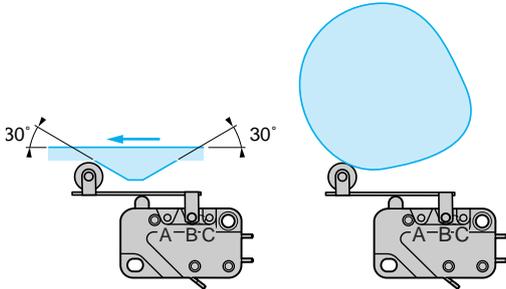
Mounting and operation

- 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

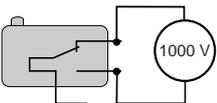
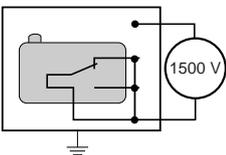
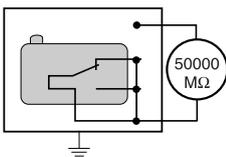
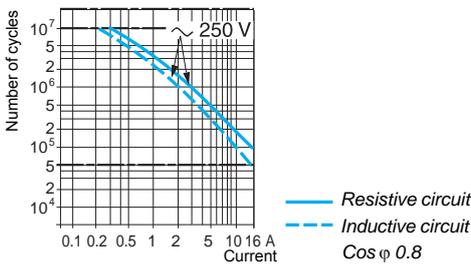
- The tightening torque of the fixing screws must conform to the following values:

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

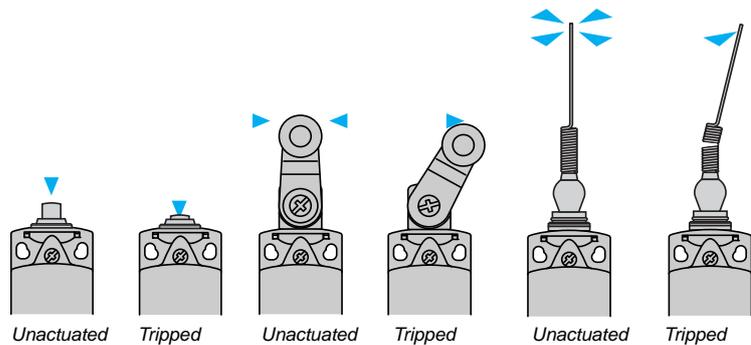
- galvanic separation of circuits,
- models suitable for low power switching combined with good electrical durability,
- very good short-circuit withstand in coordination with appropriate fuses,
- total immunity to electromagnetic interference,
- high rated operational voltage.

■ 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



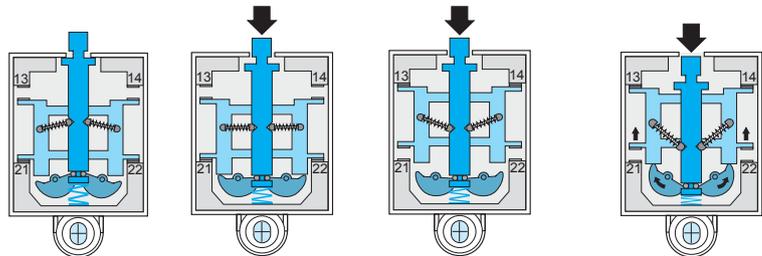
Terminology

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 Ie/Ie. ■ 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 Ie/Ie.
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

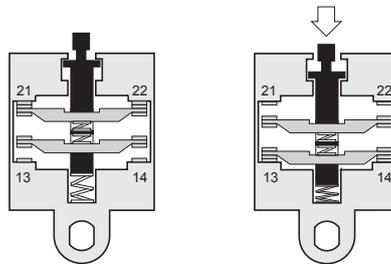
- Snap action contacts are characterised by different tripping and reset points (differential travel).
- The displacement speed of the moving contacts is not related to the speed of the operator.
- This feature ensures satisfactory electrical performance in applications involving low speed actuators.



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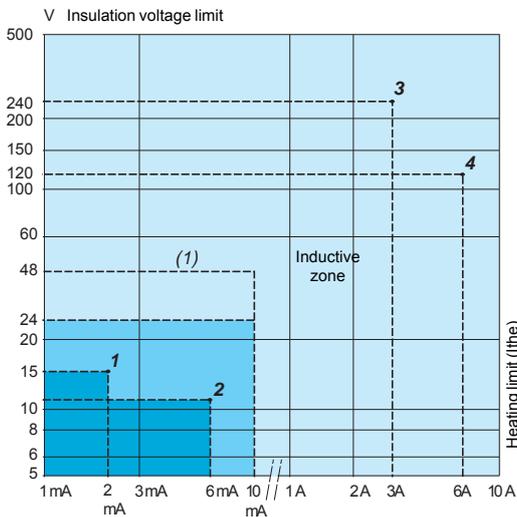
4 Switching capacity conforming to IEC 60947-5-1, utilisation category AC-15, DC-13

A300	120 V	6 A	B300	120 V	3 A
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Q300	125 V	0.55 A	R300	125 V	0.27 A
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Electrical durability for small loads

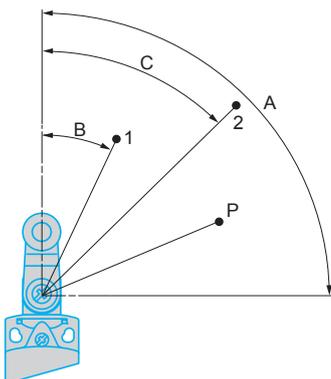
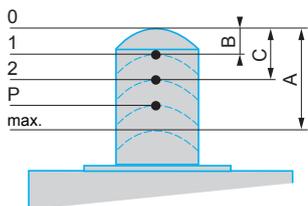
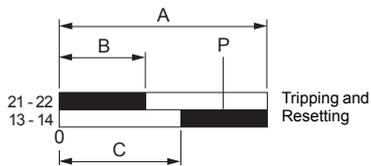
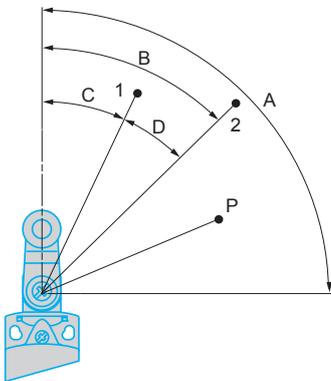
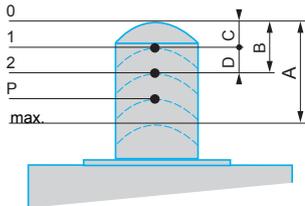
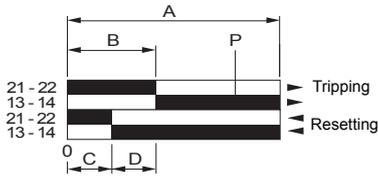
- The use of limit switches with programmable controllers is becoming more common.
- With small loads, limit switches offer the following levels of reliability:
 - failure rate of less than 1 for 100 million operating cycles using snap action contacts (contacts XE2SP),
 - failure rate of less than 1 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
Continuous service (frequent switching)	XE2NP●●●● Contacts of XCMD XE3●P●●●●
Gold flashed contacts on resistive load	Occasional service Infrequent switching, ≤ 1 operating cycle/ day, and/or corrosive atmosphere

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

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.

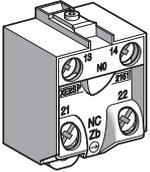
□ Linear movement (plunger)

- 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.

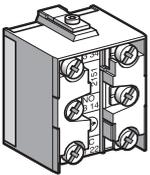
□ Rotary movement (lever)

- 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

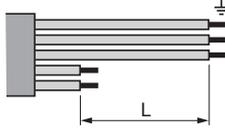


XE3•P screw clamp terminal connections

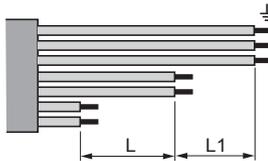
Mounting

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,

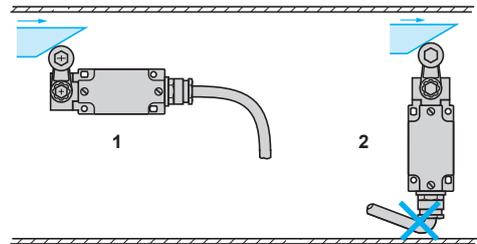


- for XE3•P, L = 14 mm, L1 = 11 mm.



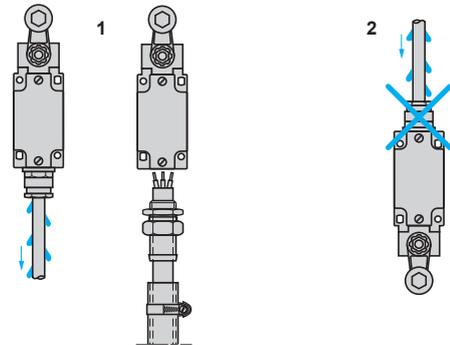
Sweep of connecting cable

- 1 Recommended
- 2 To be avoided



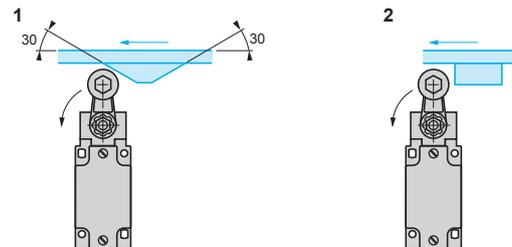
Position of cable gland

- 1 Recommended
- 2 To be avoided



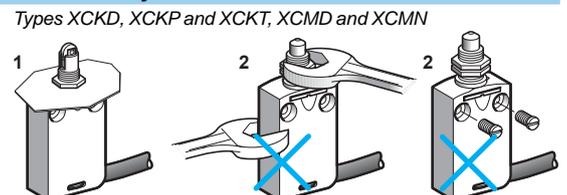
Type of cam

- 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

Limit switches

OsiSense XC

General

Setting-up

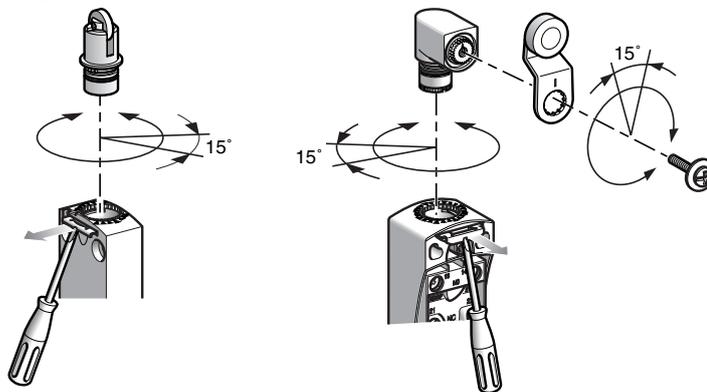
Tightening torque

- 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	1	1.5
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:



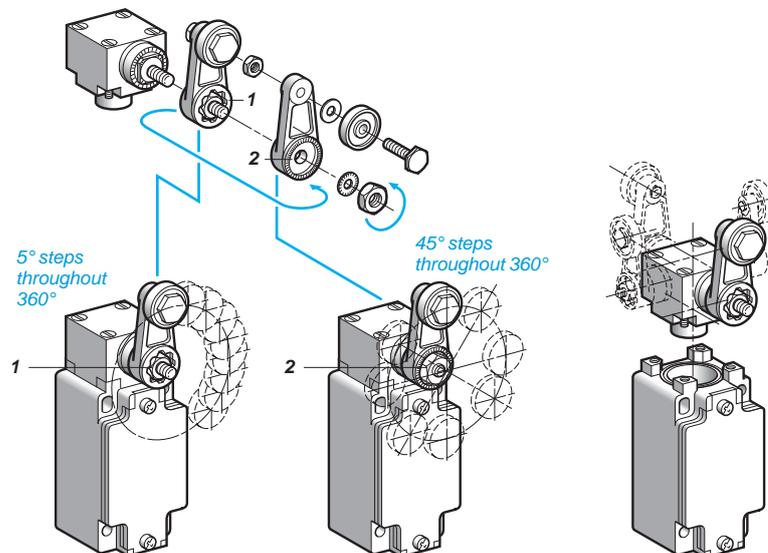
All the heads can be adjusted in 15° steps throughout 360°, in relation to the body.

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.

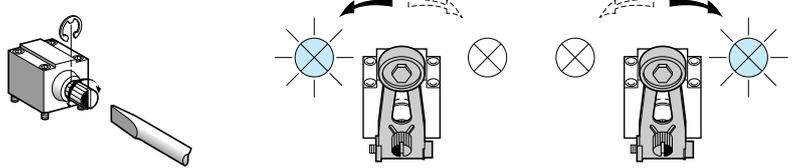
- 1 Reversed $\alpha = 5^\circ$
- 2 Forward $\alpha = 45^\circ$



Setting-up (continued)

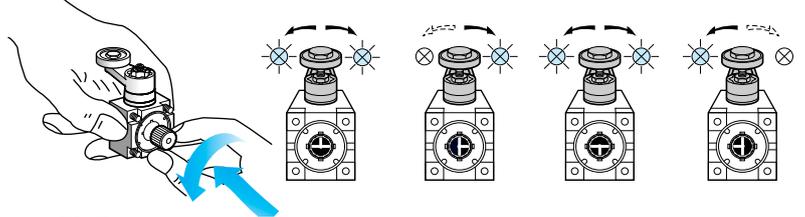
Direction of actuation programming

■ XC2J



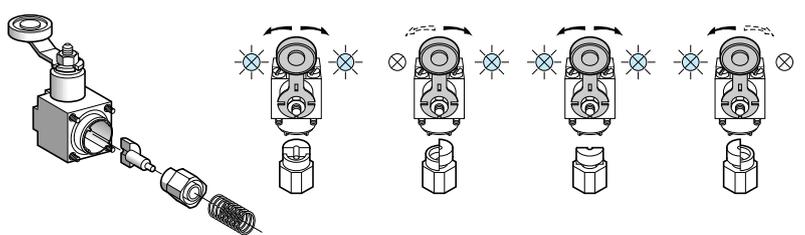
Head ZC2JE05

■ XCKJ



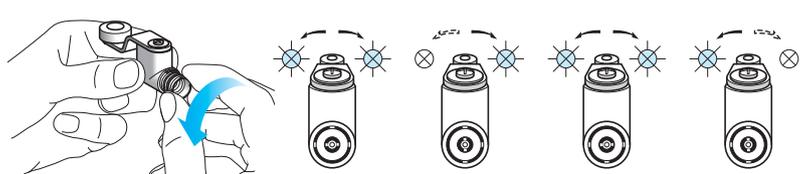
Head ZCKE05

■ XCKS



Head ZCKD05

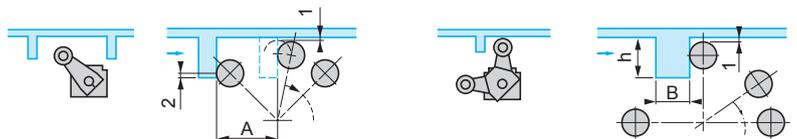
■ XCKD, XCKP, XCKT and XCMD



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.

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

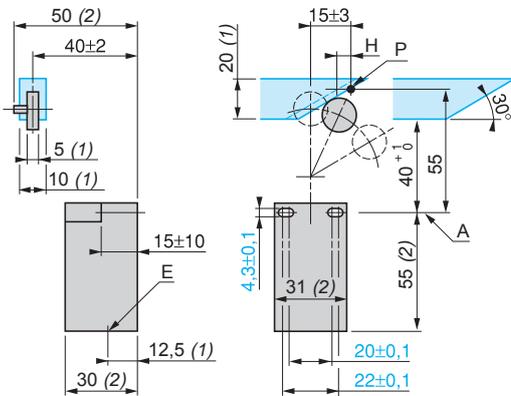
The European standards organisation CENELEC, which has 14 member countries, has defined in this standard the first type of limit switch.

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

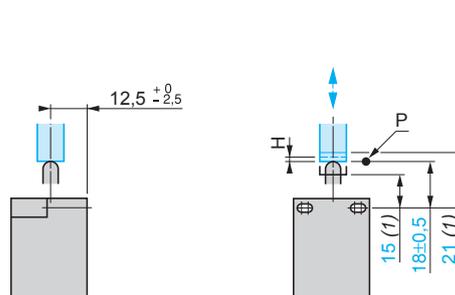
(1) Minimum value
(2) Maximum value

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

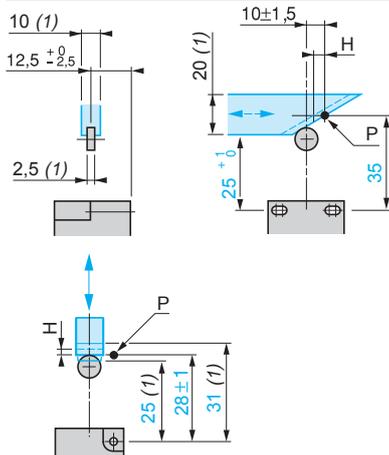
Form A, with roller lever



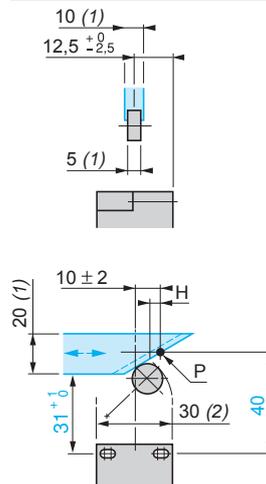
Form B, with end plunger (rounded)



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.

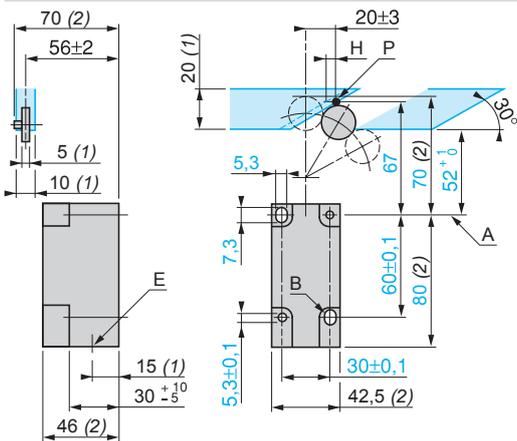
It defines 6 variants of devices (forms A, B, C, D, F, G).
Limit switches XCKJ and XCKS conform to standard EN 50041.

(1) Minimum value
(2) Maximum value

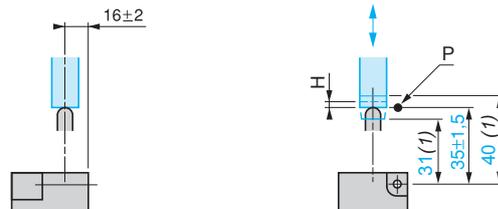
A: reference axis
B: optional elongated holes
H: differential travel
P: tripping point
E: cable entry

Za: tripping zone
Sa: tripping threshold

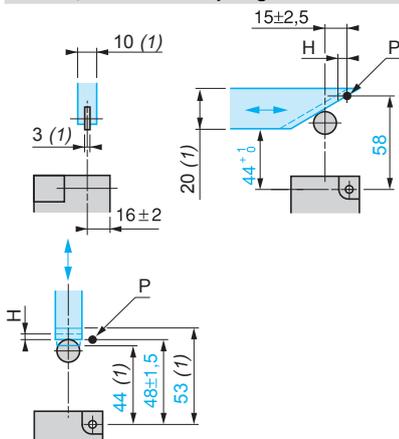
Form A, with roller lever



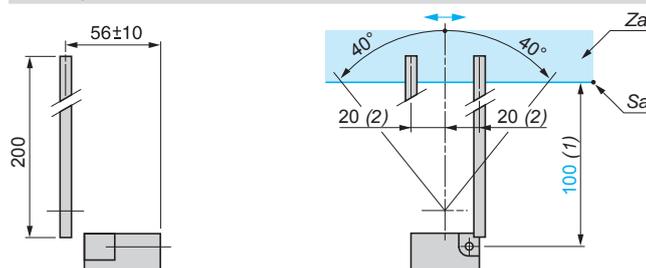
Form B, with end plunger (rounded)



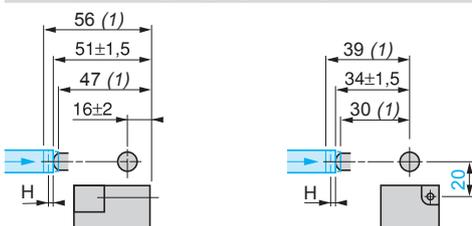
Form C, with end roller plunger



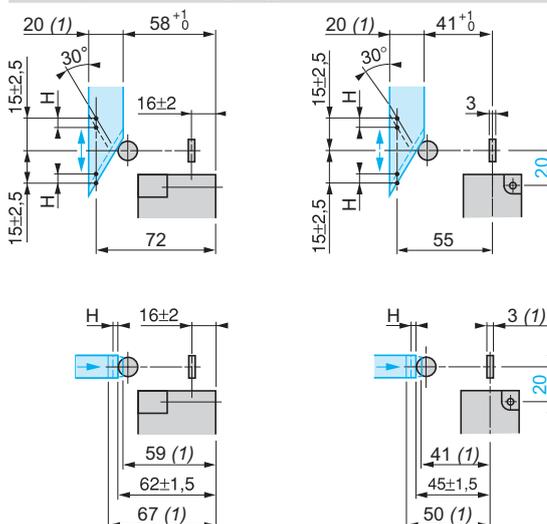
Form D, with rod lever



Form F, with side plunger (rounded)



Form G, with side roller plunger



Technical information

Protective treatment of equipment according to climatic environment

Depending on the climatic and environmental conditions in which the equipment is placed, Telemecanique Sensors can offer specially adapted products to meet your requirements.

In order to make the correct choice of protective finish, two points should be remembered:

- the prevailing climate of the country is never the only criterion,
- only the atmosphere in the immediate vicinity of the equipment need be considered.

All climates treatment “TC”

This is the standard treatment for Telemecanique Sensors brand equipment and is suitable for the vast majority of applications. It is the equivalent of treatments described as “Klimafest”, “Climateproof”.

In particular, it meets the requirements specified in the following publications:

- Publication UTE C 63-100 (method I), successive cycles of humid heat at: + 40 °C and 95 % relative humidity.
- DIN 50016 - Variations of ambient conditions within a climatic chamber: + 23 °C and 83 % relative humidity, + 40 °C and 92 % relative humidity.

It also meets the requirements of the following marine classification societies: BV-LR-GL-DNV-RINA.

Characteristics

- Steel components are usually treated with zinc. When they have a mechanical function, they may also be painted.
- Insulating materials are selected for their high electrical, dielectric and mechanical characteristics.
- Metal enclosures have a stoved paint finish, applied over a primary phosphate protective coat, or are galvanised (e.g. some prefabricated busbar trunking components).

Limits for use of “TC” (All climates) treatment

- “TC” treatment is suitable for the following temperatures and humidity:

Temperature (°C)	Relative humidity (%)
20	95
40	80
50	50

“TC” treatment is therefore suitable for all latitudes and in particular tropical and equatorial regions where the equipment is mounted in normally ventilated industrial premises. Being sheltered from external climatic conditions, temperature variations are small, the risk of condensation is minimised and the risk of dripping water is virtually non-existent.

Extension of use of “TC” (All climates) treatment

In cases where the humidity around the equipment exceeds the conditions described above, or in equatorial regions if the equipment is mounted outdoors, or if it is placed in a very humid location (laundries, sugar refineries, steam rooms, etc.), “TC” treatment can still be used if the following precautions are taken:

- The enclosure in which the equipment is mounted must be protected with a “TH” finish (see next page) and must be well ventilated to avoid condensation and dripping water (e.g. enclosure base plate mounted on spacers).
- Components mounted inside the enclosure must have a “TC” finish.
- If the equipment is to be switched off for long periods, a heater must be provided (0.2 to 0.5 kW per square decimetre of enclosure), that switches on automatically when the equipment is turned off. This heater keeps the inside of the enclosure at a temperature slightly higher than the outside surrounding temperature, thereby avoiding any risk of condensation and dripping water (the heat produced by the equipment itself during normal running is sufficient to provide this temperature difference).
- Special considerations for “Operator dialog” and “Detection” products: for certain pilot devices, the use of “TC” treatment can be extended to outdoor use provided their enclosure is made of light alloys, zinc alloys or plastic material. In this case, it is also essential to ensure that the degree of protection against penetration of liquids and solid objects is suitable for the applications involved.

Technical information

Protective treatment of equipment according to climatic environment

“TH” treatment for hot and humid environments

This treatment is suitable for hot and humid atmospheres where installations are regularly subject to condensation, dripping water and the risk of fungi.

In addition, plastic insulating components are resistant to attacks from insects such as termites and cockroaches. These properties have often led to this treatment being described as “Tropical Finish”, but this does not mean that all equipment installed in tropical and equatorial regions must systematically have undergone “TH” treatment. On the other hand, certain operating conditions in temperate climates may well require the use of “TH” treated equipment (see limitations for use of “TC” treatment).

Special characteristics of “TH” treatment

- All insulating components are made of materials which are either resistant to fungi or treated with a fungicide, and which have increased resistance to creepage (Standards IEC 60112, NF C 26-220, DIN 5348).
- Metal enclosures receive a top-coat of stoved, fungicidal paint, applied over a rust inhibiting undercoat. Components with “TH” treatment may be subject to a surcharge (1). Please consult your Customer Care Centre.

Protective treatment selection guide

Surrounding environment	Duty cycle	Internal heating of enclosure when not in use	Type of climate	Protective treatment	
				of equipment	of enclosure
Indoors					
No dripping water or condensation	Unimportant	Not necessary	Unimportant	“TC”	“TC”
Presence of dripping water or condensation	Frequent switching off for periods of more than 1 day	No	Temperate	“TC”	“TH”
		Yes	Equatorial	“TH”	“TH”
	Continuous	Not necessary	Unimportant	“TC”	“TH”
Outdoors (sheltered)					
No dripping water or dew	Unimportant	Not necessary	Temperate	“TC”	“TC”
			Equatorial	“TH”	“TH”
Exposed outdoors or near the sea					
Frequent and regular presence of dripping water or dew	Frequent switching off for periods of more than 1 day	No	Temperate	“TC”	“TH”
		Yes	Equatorial	“TH”	“TH”
	Continuous	Not necessary	Unimportant	“TC”	“TH”

These treatments cover, in particular, the applications defined by methods I and II of guide UTE C 63-100.

Special precautions for electronic equipment

Electronic products always meet the requirements of “TC” treatment. A number of them are “TH” treated as standard.

Some electronic products (for example: programmable controllers, flush mountable controllers CCX and flush mountable operator terminals XBT) require the use of an enclosure providing a degree of protection to at least IP 54, as defined by standards IEC 60664 and NF C 20 040, for use in industrial applications or in environmental conditions requiring “TH” treatment.

These electronic products, including flush mountable products, must have a degree of protection to at least IP 20 (provided either by their own enclosure or by their installation method) for restricted access locations where the degree of pollution does not exceed 2 (a test booth not containing machinery or other dust producing activities, for example).

Special treatments

For particularly harsh industrial environments, Telemecanique Sensors is able to offer special protective treatments. Please consult your Customer Care Centre.

(1) A large number of the Telemecanique Sensors brand products are “TH” treated as standard and are, therefore, not subject to a surcharge.

Technical information

Product standards and certifications

Standardisation

Conformity to standards

Telemecanique Sensors products satisfy, in the majority of cases, national (for example: BS in Great Britain, NF in France, DIN in Germany), European (for example: CENELEC) or international (IEC) standards. These product standards precisely define the performance of the designated products (such as IEC 60947 for low voltage equipment).

When used correctly, as designated by the manufacturer and in accordance with regulations and correct practices, these products will allow users to build equipment, machine systems or installations that conform to their appropriate standards (for example: IEC 60204-1, relating to electrical equipment used on industrial machines).

Telemecanique Sensors is able to provide proof of conformity of its production to the standards it has chosen to comply with, through its quality assurance system.

On request, and depending on the situation, Telemecanique Sensors can provide the following:

- a declaration of conformity,
- a certificate of conformity (ASEFA/LOVAG),
- a homologation certificate or approval, in the countries where this procedure is required or for particular specifications, such as those existing in the merchant navy.

Code	Certification authority		Country
	Name	Abbreviation	
ANSI	American National Standards Institute	ANSI	USA
BS	British Standards Institution	BSI	Great Britain
CEI	Comitato Elettrotecnico Italiano	CEI	Italy
DIN/VDE	Verband Deutscher Electrotechniker	VDE	Germany
EN	Comité Européen de Normalisation Electrotechnique	CENELEC	Europe
GOST	Gosudarstvennoe Komitet Standartov	GOST	Russia
IEC	International Electrotechnical Commission	IEC	Worldwide
JIS	Japanese Industrial Standards Committee	JISC	Japan
NBN	Institut Belge de Normalisation	IBN	Belgium
NEN	Nederlands Normalisatie Instituut	NNI	Netherlands
NF	Union Technique de l'Electricité	UTE	France
SAA	Standards Association of Australia	SAA	Australia
UNE	Asociacion Española de Normalizacion y Certificacion	AENOR	Spain

European EN standards

These are technical specifications established in conjunction with, and with approval of, the relative bodies within the various CENELEC member countries (European Union, European Free Trade Association and many central and eastern European countries having «member» or «affiliated» status). Prepared in accordance with the principle of consensus, the European standards are the result of a weighted majority vote. Such adopted standards are then integrated into the national collection of standards, and contradictory national standards are withdrawn.

European standards incorporated within the French collection of standards carry the prefix NF EN. At the 'Union Technique de l'Electricité' (*Technical Union of Electricity*) (UTE), the French version of a corresponding European standard carries a dual number: European reference (NF EN ...) and classification index (C ...).

Therefore, the standard NF EN 60947-4-1 relating to motor contactors and starters, effectively constitutes the French version of the European standard EN 60947-4-1 and carries the UTE classification C 63-110.

This standard is identical to the British standard BS EN 60947-4-1 or the German standard DIN EN 60947-4-1.

Whenever reasonably practical, European standards reflect the international standards (IEC).

With regard to automation system components and distribution equipment, in addition to complying with the requirements of French NF standards, Telemecanique Sensors brand components conform to the standards of all other major industrial countries.

Regulations

European Directives

Opening up of European markets assumes harmonisation of the regulations pertaining to each of the member countries of the European Union.

The purpose of the European Directive is to eliminate obstacles hindering the free circulation of goods within the European Union, and it must be applied in all member countries. Member countries are obliged to transcribe each Directive into their national legislation and to simultaneously withdraw any contradictory regulations. The Directives, in particular those of a technical nature which concern us, only establish the objectives to be achieved, referred to as "essential requirements".

The manufacturer must take all the necessary measures to ensure that his products conform to the requirements of each Directive applicable to his production.

As a general rule, the manufacturer certifies conformity to the essential requirements of the Directive(s) for his product by affixing the CE mark.

The CE mark is affixed to Telemecanique Sensors brand products concerned, in order to comply with French and European regulations.

Significance of the CE mark

- The CE mark affixed to a product signifies that the manufacturer certifies that the product conforms to the relevant European Directive(s) which concern it; this condition must be met to allow free distribution and circulation within the countries of the European Union of any product subject to one or more of the E.U. Directives.
- The CE mark is intended solely for national market control authorities.
- The CE mark must not be confused with a conformity marking.

Technical information

Product standards and certifications

European Directives (continued)

For electrical equipment, only conformity to standards signifies that the product is suitable for its designated function, and only the guarantee of an established manufacturer can provide a high level of quality assurance.

For Telemecanique Sensors brand products, one or several Directives are likely to be applicable, depending on the product, and in particular:

- the Low Voltage Directive 2006/95/EC: the CE mark relating to this Directive has been compulsory since 16th January 2007.
- the Electromagnetic Compatibility Directive 89/336/EEC, amended by Directives 92/31/EEC and 93/68/EEC: the CE mark on products covered by this Directive has been compulsory since 1st January 1996.

ASEFA-LOVAG certification

The function of ASEFA (Association des Stations d'Essais Française d'Appareils électriques - Association of French Testing Stations for Low Voltage Industrial Electrical Equipment) is to carry out tests of conformity to standards and to issue certificates of conformity and test reports. ASEFA laboratories are authorised by the French authorisation committee (COFRAC). ASEFA is now a member of the European agreement group LOVAG (Low Voltage Agreement Group). This means that any certificates issued by LOVAG/ASEFA are recognised by all the authorities which are members of the group and carry the same validity as those issued by any of the member authorities.

Quality labels

When components can be used in domestic and similar applications, it is sometimes recommended that a "Quality label" be obtained, which is a form of certification of conformity.

Code	Quality label	Country
CEBEC	Comité Electrotechnique Belge	Belgium
KEMA-KEUR	Keuring van Electrotechnische Materialen	Netherlands
NF	Union Technique de l'Electricité	France
ÖVE	Österreichischer Verband für Electrotechnik	Austria
SEMKO	Svenska Elektriska Materiel Kontrollnatanalen	Sweden

Product certifications

In some countries, the certification of certain electrical components is a legal requirement. In this case, a certificate of conformity to the standard is issued by the official test authority.

Each certified device must bear the relevant certification symbols when these are mandatory:

Code	Certification authority	Country
CSA	Canadian Standards Association	Canada
UL	Underwriters Laboratories	USA
CCC	China Compulsory Certification	China

Note on certifications issued by the Underwriters Laboratories (UL). There are two levels of approval:

- "Recognized" (UL)** The component is fully approved for inclusion in equipment built in a workshop, where the operating limits are known by the equipment manufacturer and where its use within such limits is acceptable by the Underwriters Laboratories.
The component is not approved as a "Product for general use" because its manufacturing characteristics are incomplete or its application possibilities are limited.
A "Recognized" component does not necessarily carry the certification symbol.
- "Listed" (UL)** The component conforms to all the requirements of the classification applicable to it and may therefore be used both as a "Product for general use" and as a component in assembled equipment. A "Listed" component must carry the certification symbol.

Marine classification societies

Prior approval (= certification) by certain marine classification societies is generally required for electrical equipment which is intended for use on board merchant vessels.

Code	Classification authority	Country
BV	Bureau Veritas	France
DNV	Det Norske Veritas	Norway
GL	Germanischer Lloyd	Germany
LR	Lloyd's Register	Great Britain
NKK	Nippon Kaiji Kyokai	Japan
RINA	Registro Italiano Navale	Italy
RRS	Register of Shipping	Russia

Note

For further details on a specific product, please refer to the "Characteristics" pages in this catalogue or consult your Customer Care Centre.

Technical information

Degrees of protection provided by enclosures IP code

Degrees of protection against the penetration of solid bodies, water and personnel access to live parts

The European standard EN 60529 dated October 1991, IEC publication 529 (2nd edition - November 1989), defines a coding system (IP code) for indicating the degree of protection provided by electrical equipment enclosures against accidental direct contact with live parts and against the ingress of solid foreign objects or water. This standard does not apply to protection against the risk of explosion or conditions such as humidity, corrosive gasses, fungi or vermin.

Certain equipment is designed to be mounted on an enclosure which will contribute towards achieving the required degree of protection (example : control devices mounted on an enclosure).

Different parts of an equipment can have different degrees of protection (example : enclosure with an opening in the base).

Standard NF C 15-100 (May 1991 edition), section 512, table 51 A, provides a cross-reference between the various degrees of protection and the environmental conditions classification, relating to the selection of equipment according to external factors.

Practical guide UTE C 15-103 shows, in the form of tables, the characteristics required for electrical equipment (including minimum degrees of protection), according to the locations in which they are installed.

IP ●●● code

The IP code comprises **2 characteristic numerals** (e.g. **IP 55**) and may include **an additional letter** when the actual protection of personnel against direct contact with live parts is better than that indicated by the first numeral (e.g. IP 20C).

Any characteristic numeral which is unspecified is replaced by an X (e.g. IP XXB).

1st characteristic numeral:

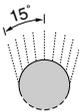
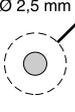
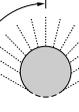
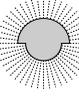
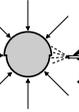
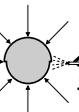
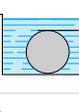
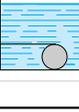
corresponds to protection of the equipment against penetration of solid objects and protection of personnel against direct contact with live parts.

2nd characteristic numeral:

corresponds to protection of the equipment against penetration of water with harmful effects.

Additional letter:

corresponds to protection of personnel against direct contact with live parts.

Protection of the equipment		Protection of personnel	Protection of the equipment		Additional letter:	
0	Non-protected	Non-protected	0	Non-protected	A	With the back of the hand.
1	 Protected against the penetration of solid objects having a diameter greater than or equal to 50 mm.	Protected against direct contact with the back of the hand (accidental contacts).	1	 Protected against vertical dripping water, (condensation).	B	With the finger.
2	 Protected against the penetration of solid objects having a diameter greater than or equal to 12.5 mm.	Protected against direct finger contact.	2	 Protected against dripping water at an angle of up to 15°.	C	With a Ø 2.5 mm tool.
3	 Protected against the penetration of solid objects having a diameter greater than or equal to 2.5 mm.	Protected against direct contact with a Ø 2.5 mm tool.	3	 Protected against rain at an angle of up to 60°.	D	With a Ø 1 mm wire.
4	 Protected against the penetration of solid objects having a diameter greater than or equal to 1 mm.	Protected against direct contact with a Ø 1 mm wire.	4	 Protected against splashing water in all directions.		
5	 Dust protected (no harmful deposits).	Protected against direct contact with a Ø 1 mm wire.	5	 Protected against water jets in all directions.		
6	 Dust tight.	Protected against direct contact with a Ø 1 mm wire.	6	 Protected against powerful jets of water and waves.		
			7	 Protected against the effects of temporary immersion.		
			8	 Protected against the effects of prolonged immersion under specified conditions.		

Technical information

Degrees of protection provided by enclosures IK code

Degrees of protection against mechanical impact

The European standard EN 50102 dated March 1995 defines a coding system (IK code) for indicating the degree of protection provided by electrical equipment enclosures against external mechanical impact.

Standard NF C 15-100 (May 1991 edition), section 512, table 51 A, provides a cross-reference between the various degrees of protection and the environmental conditions classification, relating to the selection of equipment according to external factors.

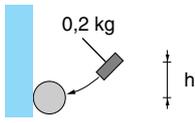
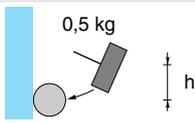
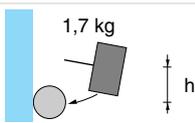
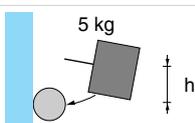
Practical guide UTE C 15-103 shows, in the form of tables, the characteristics required for electrical equipment (including minimum degrees of protection), according to the locations in which they are installed.

IK ●● code

The IK code comprises **2 characteristic numerals** (e.g. **IK 05**).

2 characteristic numerals:

corresponding to a value of impact energy.

		h (cm)	Energy (J)
00	Non-protected		
01		7.5	0.15
02		10	0.2
03		17.5	0.35
04		25	0.5
05		35	0.7
06		20	1
07		40	2
08		30	5
09		20	10
10		40	20

D					
DE9PEM20010	42	XCKMR54D2H29	42	XEP3S2W2B524	48
DE9RP13520	37	XCKVR24SR1H29	42	XEP3S2W2B529	48
	39	XCKVR44D1H29	42	XEP3S2W3	48
		XCKVR44D2H29	42	XEP3S2W3B524	48
		XCKVR54D1H29	42	XEP3S2W3B529	48
		XCKVR54D2H29	42	XEP3S2W6	48
X		XCKZ01	17	XEP3S2W6B524	48
XC1AC111	28		22	XEP3S2W6B529	48
XC1AC115	28	XCKZ015	25	XEP4E1FD	46
XC1AC116	28	XCKZ018	17	XEP4E1FDA326	46
XC1AC117	28	XCRA11	36	XEP4E1FDA454	46
XC1AC118	28	XCRA12	36	XEP4E1W7	46
XC1AC119	28	XCRA15	36	XEP4E1W7A326	46
XC1AC121	28	XCRA51	36	XEP4E1W7A454	46
XC1AC125	28	XCRA52	36	XEP5P1W2	46
XC1AC126	28	XCRA55	36	XEP5P1W2Z55B	46
XC1AC127	28	XCRB11	36	XESP1021	17
XC1AC128	28	XCRB12	36		22
XC1AC129	28	XCRB15	36	XESP1028	17
XC1AC131	28	XCRB51	36	XESP1031	17
XC1AC135	28	XCRB52	36	XESP1031	22
XC1AC136	28	XCRB55	36	XESP1038	17
XC1AC137	28	XCRE18	36	XESP10215	25
XC1AC138	28	XCRE58	36	XESP10315	25
XC1AC139	28	XCRF17	36	Z	
XC1AC141	28	XCRF57	36	ZC1AC001	30
XC1AC145	28	XCRT115	38	ZC1AC005	30
XC1AC146	28	XCRT215	38	ZC1AC006	30
XC1AC147	28	XCRT315	38	ZC1AC007	30
XC1AC148	28	XCRZ02	37	ZC1AC008	30
XC1AC149	28	XCRZ03	37	ZC1AC009	30
XC1AC151	28		42	ZC1AZ8	30
XC1AC155	28	XCRZ03R	42	ZC1AZ11	30
XC1AC156	28	XCRZ04	37	ZC1AZ12	30
XC1AC157	28	XCRZ05	37	ZC1AZ13	30
XC1AC158	28	XCRZ09	37	ZC1AZ14	30
XC1AC159	28		39	ZC1AZ15	30
XC1AC161	28	XCRZ12	37	ZC1AZ16	30
XC1AC165	28	XCRZ15	37	ZC1AZ17	30
XC1AC166	28	XCRZ42	39	ZC2JC1	10
XC1AC167	28	XCRZ901	39		13
XC1AC168	28	XCRZ902	39	ZC2JC2	13
XC1AC169	28	XCRZ903	39	ZC2JC4	13
XC1AC171	28	XEP3S1W2	48	ZC2JC15	23
XC1AC175	28	XEP3S1W2B524	48	ZC2JC16	20
XC1AC176	28	XEP3S1W2B529	48	ZC2JC18	13
XC1AC177	28	XEP3S1W3	48	ZC2JC25	23
XC1AC178	28	XEP3S1W3B524	48	ZC2JC26	20
XC1AC179	28	XEP3S1W3B529	48	ZC2JC28	13
XC010L2	50	XEP3S1W6	48	ZC2JC45	23
XC011L2	50	XEP3S1W6B524	48	ZC2JC46	20
XCKMR24SR1H29	42	XEP3S1W6B529	48	ZC2JC48	13
XCKMR44D1H29	42	XEP3S2W2	48	ZC2JD1	13
XCKMR44D2H29	42			ZC2JD2	13
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				ZC2JY615	25
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				ZEP3L524	48
				ZEP3L529	48
				ZEP4L326	46
				ZEP4L454	46

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