



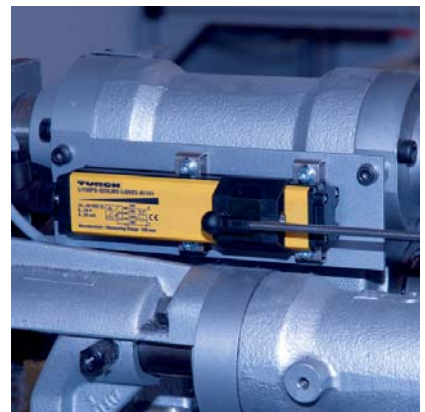
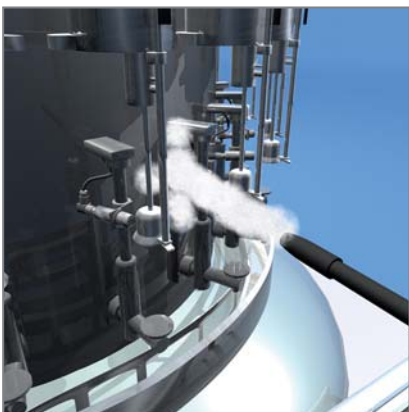
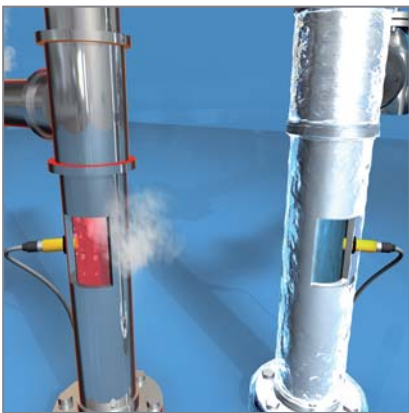
TURCK

Industrial
Automation

SENSORS

Sense it! Connect it! Bus it! Solve it!

Sensortechnik Gesamtkatalog



Das Unternehmen



Das Unternehmen

TURCK zählt zu den global führenden Unternehmensgruppen auf dem Sektor der Industrieautomation. Mit mehr als 2.600 Mitarbeitern in 27 Ländern und Vertriebspartnern in weiteren 60 Staaten ist der Sensor-, Feldbus-, Anschluss- und Interfacespezialist weltweit vertreten. Mit herausragenden Produkten und perfekten Lösungen für die Fertigungs- und Prozessautomation setzt TURCK seit Jahrzehnten immer wieder neue Maßstä-

be. Die internationale Ausrichtung des Unternehmens begann bereits 1975 mit der Gründung der TURCK Inc. in Minneapolis, USA. Durch modernste Produktionsstätten in Deutschland, der Schweiz, den USA, Mexiko und China hat TURCK die Möglichkeit, sich weltweit den Bedingungen lokaler Märkte anzupassen. Die Kernkompetenzen und zentralen Fertigungsstätten des Unternehmens bleiben auch in Zukunft in Deutschland.



Das Programm

TURCK bietet das volle Programm für die Fertigungs- und Prozessautomation: mehr als 15.000 Produkte aus der Sensor-, Interface-, Anschluss- und Feldbustechnik. Beispiele für die außerordentliche Innovationskraft des Unternehmens sind der induktive Faktor 1-Sensor *uprox*[®]+, das modulare IP67-I/O-System BL67 sowie *excom*[®], das kompakte Remote-I/O-System für den Ex-Bereich.

Ob im Maschinen- und Anlagenbau, im Bereich Automotive, Transport & Handling, Food & Beverage oder in der Chemie- und Pharmaindustrie: TURCK-Produkte erhöhen durch absolut zuverlässige Technik die Verfügbarkeit Ihrer Anlagen. Durch effektive Standardisierung senken die Produkte darüber hinaus gezielt Ihre Kosten für die Beschaffung, Lagerhaltung, Installation und Betriebssicherheit.



Service und Support

Wir wollen unseren Kunden immer nur das Beste bieten – und zwar schnell, flexibel und zuverlässig. Mit mehr als 40 Jahren Erfahrung und einem umfassenden Know-how unterstützen wir unsere Kunden in jeder Phase durch effiziente Dienstleistungen – von der ersten Analyse bis zur maßgeschneiderten Lösung Ihrer Applikation.

Im Vordergrund steht für uns der Anspruch, die Effizienz und Produktivität der Fertigung kontinuierlich zu fördern. Durch eine ausgezeichnete Qualität sorgen unsere Produkte und Leistungen in allen Branchen für eine höhere Anlagenverfügbarkeit. Ein schneller Lieferdienst und ein umfassendes e-Support-Angebot runden das TURCK-Programm ab.



Internet-Produktdatenbank

Die TURCK-Produktdatenbank auf www.turck.com eröffnet Ihnen den schnellen Weg zur Lösung Ihrer Anforderungen – rund um die Uhr, sieben Tage in der Woche, an jedem Ort der Welt und in neun verschiedenen Sprachen.

Sie haben Zugriff auf rund 13.000 Produkte und Lösungen – klar strukturiert, vollständig dokumentiert und direkt aus dem Internet abrufbar. Unser attraktives, anwenderfreundliches Internet-Angebot führt Sie schnell zu allen Informationen, die Sie für Ihre Applikation benötigen. Überzeugen Sie selbst unter: www.turck.com.

Sensortechnik

Inhaltsverzeichnis



Sensortechnik – das volle Programm

Der Gesamtkatalog Sensortechnik umfasst eine Auswahl mit mehr als 3000 Näherungssensoren, optischen Sensoren, Fluidsensoren und Positionssensoren. Ganz gleich, welche Anforderung hinsichtlich Bauform, Funktion oder Werkstoff besteht: Bei TURCK erhalten Sie nicht nur ein erstklassiges Produkt, sondern immer auch eine Lösung mit größtmöglicher Effizienz.

Einen ersten **Überblick über das Gesamtprogramm** verschafft Ihnen das Inhaltsverzeichnis. Die **Auswahlhilfe für Standardgeräte** bietet in jedem Kapitel eine Übersicht der Baureihen und wesentlichen Merkmale. Suchen Sie die Lösung für eine spezielle Applikation, ist die **Übersicht der Sensoren für besondere Anforderungen** der beste Einstieg. Falls Sie die Typenbezeichnung oder Identnummer schon kennen, führt Sie das **Typenverzeichnis** (ab Seite 932) direkt zum gewünschten Produkt.

Allgemeine Informationen

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Anschlussbilder

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Maßbilder

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Reichweitenkurven

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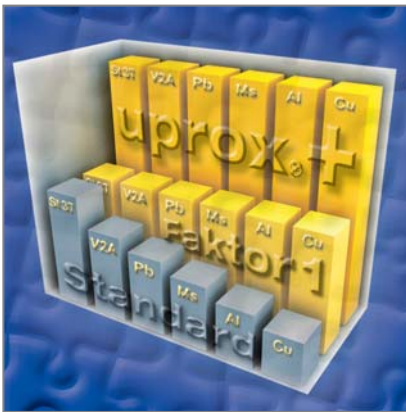
Typenverzeichnis

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| uprox®+ induktive Faktor 1-Sensoren | Übersicht Baureihen und Varianten Typen und Daten | Seite 7 Seite 14 Seite 18 | uprox®+ Faktor 1 |
| Induktive Sensoren – Gesamtprogramm | Übersicht Baureihen und Varianten Sensoren für besondere Anforderungen Typen und Daten | Seite 55 Seite 64 Seite 58 Seite 78 | Induktive Sensoren |
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At a glance

uprox®+ Inductive factor 1 sensors



The new generation of inductive sensors

The deployment of inductive sensors faces complex and continuously growing demands of modern industrial automation. An end-to-end solution is required, ranging from construction, purchase and system engineering to operation and maintenance.

TURCK demonstrates impressively how to optimize process cost and to improve the efficiency and availability of systems with the uprox®+ factor 1 sensors. The uprox®+ sensors operate with innovative non-ferritic coils and circuit boards, offering completely new application possibilities compared to conventional sensors with ferrite core and wound coil.

All inductive sensors of the new uprox®+ generation operate with highest switching distances, without reduction factor (i.e. same operating distance for all metals), are weld resistant, feature an extended temperature range, excellent EMC properties and are easily mounted.

Advantages for the user: Only a few uprox®+ sensors are needed to cover a broad range of applications. Standardization is thus guaranteed, purchase and logistics are simplified and the variety of types as well as the costs are reduced to a manageable amount.

The sensors are available as standard versions in chrome-plated brass barrels or in stainless steel housings with LPC front cap and special double lip seal for heavy use or sudden temperature changes. These are typical ambient conditions faced in cleaning processes of the food and tooling industry. The teflon-coated brass versions offer extra protection against sparks and weld-splatter as experienced in the automotive industry during car body welding.

The sensors are accommodated in a rugged, rectangular plastic housing, needing little space while offering high switching distances. We also offer other rectangular designs with relocatable active face.

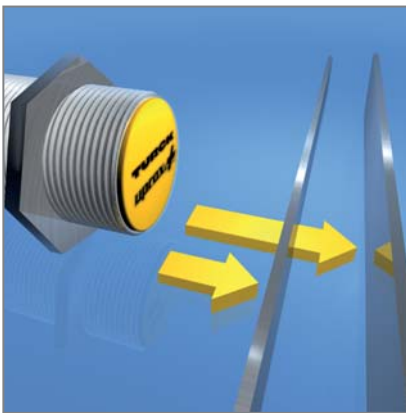
Our strengths ...



Factor 1

The innovative *uprox*®+ sensors set new benchmarks in metal detection. Thanks to the non-ferritic coil and circuit-board the sensors operate without reduction factor. Materials such as iron, stainless

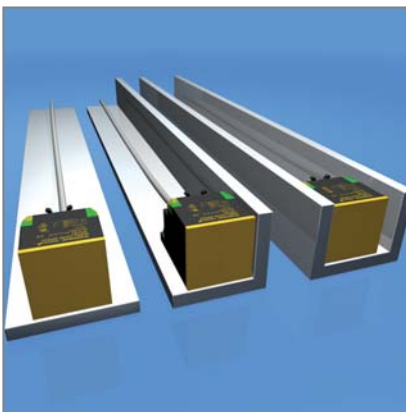
steel, copper, aluminium and brass are detected at the same distance and with the highest precision. Any application can therefore profit from the unique power spectrum of the *uprox*®+ sensors.



Highest switching distance

The new *uprox*®+ sensors have the same switching distance. Owing to their novel patented coil technology, the switching distance is up to 250 % higher than that of conventional inductive sensors with

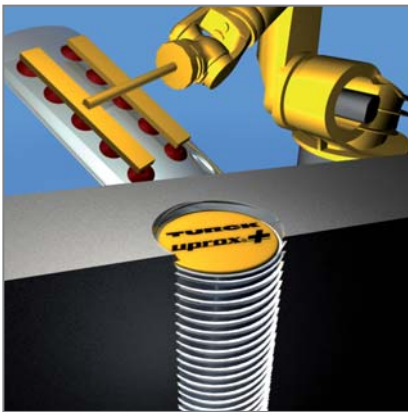
ferrite core. This means, that the *uprox*®+ sensors outclass any standard sensor of the same size in terms of switching distance and other features.



Partly-flush mounting of non-flush mountable sensors

The mounting flexibility of rectangular *uprox*®+ sensors opens up many new application possibilities. All non-flush mountable rectangular *uprox*®+ sensors allow 4-side embedded mounting with reduced switching distance. Thus, additional mechanical components and ac-

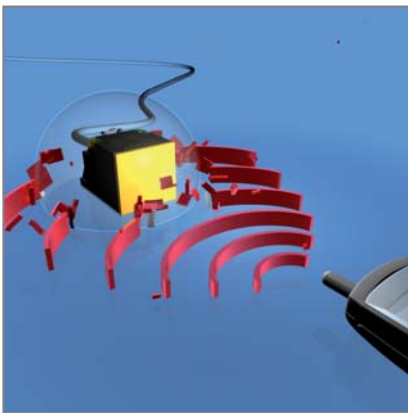
cessories are not needed, making installation not only cheaper but also quicker and easier. The unique flexibility of non-flush mountable sensors is achieved through integrated pre-damping protection: This allows the sensors to be mounted to the upper edge of the barrel.



Recessed mounting of flush sensors

The new *uprox*®+ sensors only require small metal-free zones. No matter which sensor type, flush mounting is possible without compromises. The sensors are

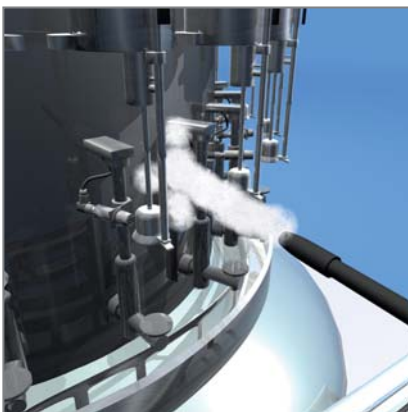
screwed in with a half turn to protect them against mechanical damage. This guarantees safe operation in all mounting positions!



Excellent EMC properties and magnetic field resistance

uprox®+ sensors fulfill the EN 60947-5-2 requirements and pass tests successfully according to EN 61000-4-6 „conducted interferences“. They are also immune to

strong magnetic fields, occurring for instance during electrical welding processes or near lifts and electrical furnaces.



High tightness and resistance

A special double lip seal in the front cap and at the connector insert prevent the ingress of liquids even during high pressure cleaning cycles. *uprox*®+ sensors thus exceed the requirements of pro-

tection class IP68 and IP69K by far. The threaded barrel and the front cap of the WD series are made of materials that are resistant to all common acid and alkaline cleaning agents and disinfectants.

Your advantages ...

Your advantages ...



Efficient standardization

A single *uprox*®+ sensor replaces many conventional sensor types. Purchase and logistics as well as end-user service are simplified.

- The widest possible application range is achieved with only a few sensor versions

- Low average prices because special devices are not required
- Minimized training effort due to a lean product line



Maximum freedom

uprox®+ extends the capability of sensor technology and provides considerable more leeway for the development of new machines and systems:

- Many possible solutions are achieved with only a few device types

- Great flexibility in machine planning through avoidance of construction errors and targeted elimination of unnecessary conflicts between mechanical and electrical construction
- Easy mounting



Extremely service-friendly

uprox®+ sensors can be mounted in many ways and are easy to maintain:

- Convenient adjustment thanks to highest switching distances
- Maximum freedom for commissioning achieved through safe operating

conditions in recessed and partially embedded mounting positions

- Minimum maintenance and staff training due to a reduced variety of sensor types

antages

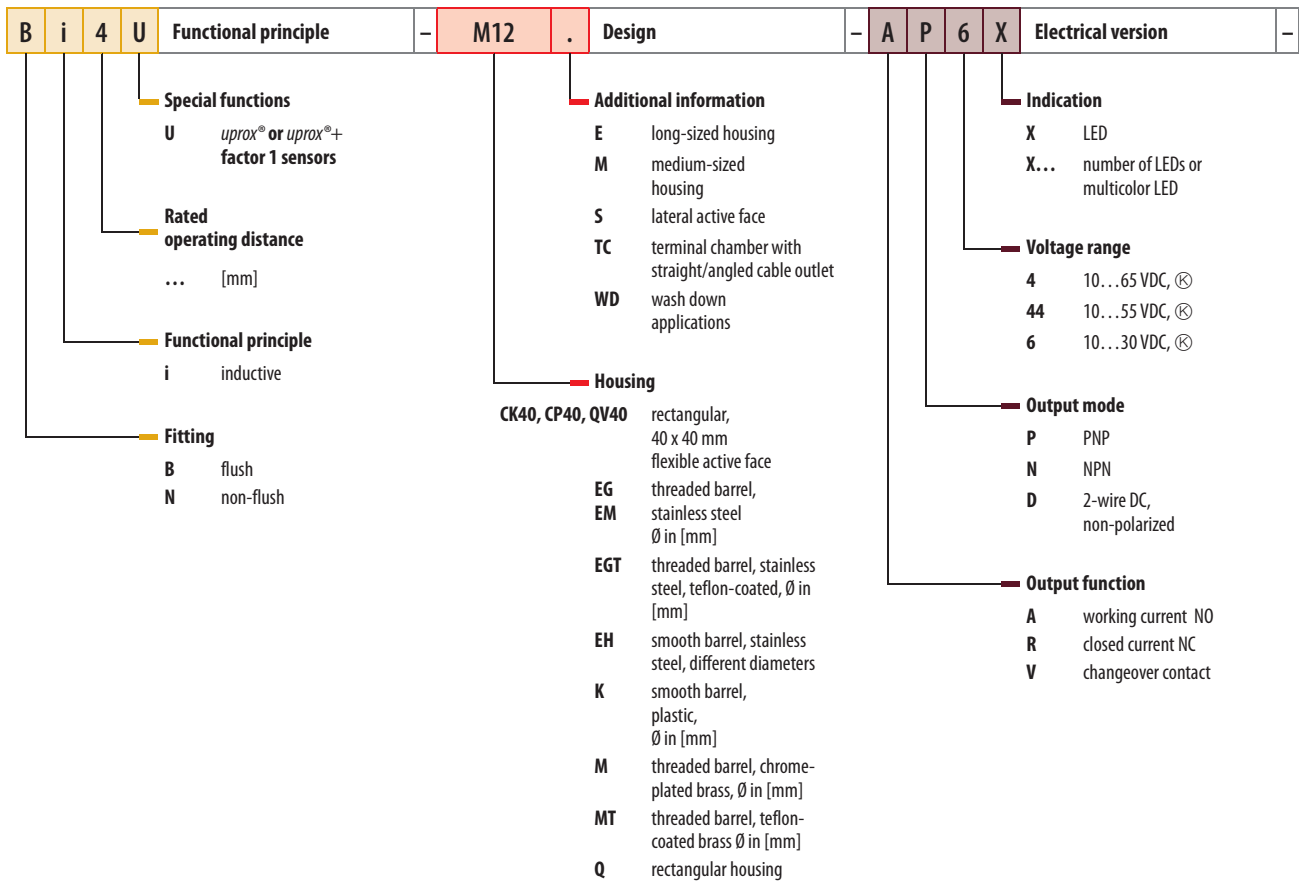


High system availability

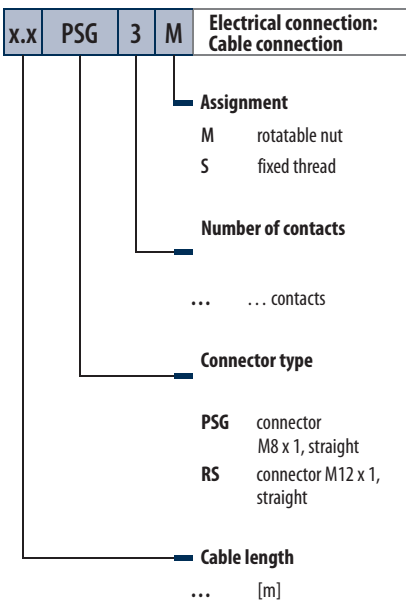
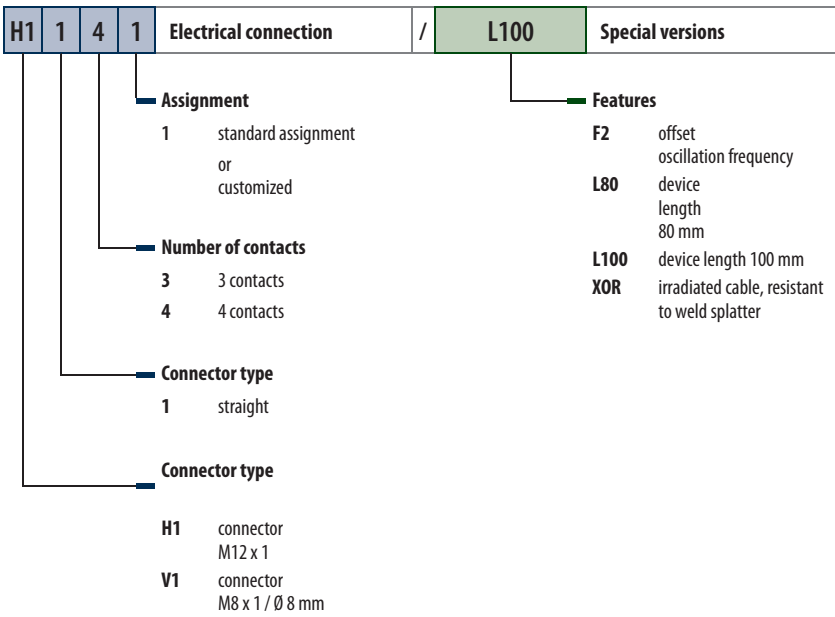
uprox®+ sensors minimize downtimes of machines and systems:

- Less mechanical damage through recessed mounting
- Protection against ingress of liquids during cleaning processes
- Prevention of downtimes due to the excellent resistance of the materials used against acid and alkaline cleaning agents and disinfectants
- Short downtimes through high availability of spare parts at lowest costs

Type code



☉ = short circuit protected



Designs and variants

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EH6.5

EG08

M12

M18

Design

smooth barrel 6.5 mm

threaded barrel M8 x 1

threaded barrel M12 x 1

threaded barrel M18 x 1

Switching distance

2 mm, 6 mm,

2 mm, 6 mm,

2 mm, 4 mm, 5 mm, 10 mm,

5 mm, 8 mm, 10 mm, 15 mm,

Electrical connection

connector, M8 x 1 cable

connector, M8 x 1
connector, M12 x 1 cable

connector, M12 x 1
connector, M8 x 1 cable
terminal chamber, removable cage clamp terminals

connector, M12 x 1 cable
terminal chamber, removable cage clamp terminals

Output

3-wire DC PNP
3-wire DC NPN

3-wire DC PNP
3-wire DC NPN

2-wire DC
3-wire DC PNP
3-wire DC NPN
4-wire DC PNP
4-wire DC NPN

2-wire DC
3-wire DC PNP
3-wire DC NPN
4-wire DC PNP
4-wire DC NPN



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M30

Q8SE

Q08

Q10S

Design





threaded barrel M30 x 1.5


rectangular Q8SE,
8 x 8 x 40 mm

rectangular Q08,
20 x 8 x 32 mm


rectangular Q10S,
16 x 10.2 x 27.8 mm

Switching distance

10 mm, 
15 mm, 
15 mm, 
30 mm, 

4 mm, 

8 mm, 

5 mm, 

Electrical connection

connector, M12 x 1
cable
terminal chamber, removable
cage clamp terminals

connector, M8 x 1
cable
cable with connector

connector, Ø 8 mm
cable

cable
cable with connector

Output

2-wire DC
3-wire DC PNP
3-wire DC NPN
4-wire DC PNP
4-wire DC NPN

3-wire DC PNP
3-wire DC NPN

3-wire DC PNP
3-wire DC NPN

3-wire DC PNP
3-wire DC NPN

Designs and variants

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| | Q12 | CK40 | QV40 | CP40 |
|------------------------------|--|---|--------------------------------------|--|
| Design | rectangular Q12, 26 x 12 x 40 mm | rectangular CK40, 40 x 40 x 65 mm | rectangular QV40, 40 x 40 x 65 mm | rectangular CP40, 40 x 40 x 114 mm |
| Switching distance | 5 mm, | 15 mm, 20 mm, 30 mm, 35 mm, 50 mm, | 20 mm, 35 mm, 50 mm, | 20 mm, 30 mm, 50 mm, |
| Electrical connection | connector, M8 x 1 connector, M12 x 1 cable | connector, M12 x 1 | connector, M12 x 1 | terminal chamber |
| Output | 3-wire DC PNP 3-wire DC NPN 4-wire DC PNP | 2-wire DC 3-wire DC PNP 3-wire DC NPN 4-wire DC PNP 4-wire DC NPN | 3-wire DC PNP | 3-wire DC PNP 3-wire DC NPN 4-wire DC PNP 4-wire DC NPN |






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Q80

K90SR

| | | |
|------------------------------|--|---|
| Design | rectangular Q80, 80 x 40 x 92 mm | rectangular K90SR, 75 x 60 x 130 mm |
| Switching distance | 50 mm,  75 mm,  | 100 mm,  |
| Electrical connection | connector, M12 x 1 | connector, M12 x 1 terminal chamber |
| Output | 3-wire DC PNP 3-wire DC NPN 4-wire DC PNP 4-wire DC NPN | 4-wire DC PNP 4-wire DC NPN |

uprox®+ compact rectangular design

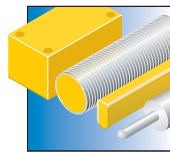


The mounting flexibility of the rectangular uprox®+ sensors opens up many new application possibilities. All variable non-flush rectangular uprox®+ sensors are 4-side embeddable with reduced switching distance. Thus additional mechanical components and accessories are not required. As a result, installation is cost-effective, quicker and easier.

Features

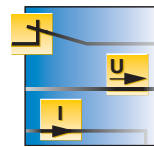
- Partial embedding of non-flush rectangular sensors
- Highest switching distance
- Factor 1, all metals
- Excellent EMC properties and magnetic field resistance

Properties



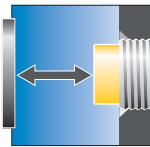
Design

From the small space-saving Q8SE to the standardized Q12 version



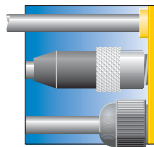
Electrical versions

3/4-wire NO/NC as well as antivalent PNP/NPN output



Switching distances

High switching distances between 4 and 12 mm on all metals



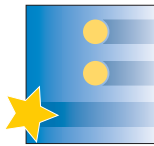
Electrical connections

Connection cable 2 m, plug connections M12, M8 or Ø 8 mm as well as M8 pigtail



Materials

Rugged and chemical resistant plastic and metal housings




Special features

High protection class IP68
Side-by-side, space-saving installation

Q8SE – 3-wire DC











General data

Dimensions 8 x 8 x 40 mm
Switching distance 4 mm, 
Operating voltage 10...30 VDC

Ambient temperature -30...+85 °C
Material housing PP

Lateral active face


Types and data – selection table

| Type | Output | Electrical connection | Material cable | w | d |
|--------------------------|---|-----------------------|----------------|------|------|
| NI4U-Q8SE-RP6X-V1131 |  , PNP | connector, M8 x 1 | - | w003 | d001 |
| NI4U-Q8SE-RP6X-0,3-PSG3M |  , PNP | cable with connector | PUR 0.3 m | w003 | d002 |
| NI4U-Q8SE-RP6X |  , PNP | cable | PUR 2 m | w006 | d003 |
| NI4U-Q8SE-AP6X-V1131 |  , PNP | connector, M8 x 1 | - | w001 | d001 |
| NI4U-Q8SE-AP6X-0,3-PSG3M |  , PNP | cable with connector | PUR 0.3 m | w001 | d002 |
| NI4U-Q8SE-AP6X |  , PNP | cable | PUR 2 m | w004 | d003 |
| NI4U-Q8SE-AN6X-V1131 |  , NPN | connector, M8 x 1 | - | w002 | d001 |
| NI4U-Q8SE-AN6X |  , NPN | cable | PUR 2 m | w005 | d003 |

Q08 – 3-wire DC



General data

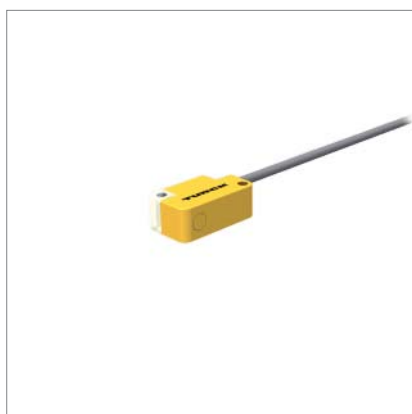
Dimensions 20 x 8 x 32 mm
Switching distance 8 mm, 
Operating voltage 10...30 VDC

Ambient temperature -25...+70 °C
Material housing GD-Zn

Types and data – selection table

| Type | Output | Electrical connection | Material cable | w | d |
|----------------------|--------|-----------------------|----------------|------|------|
| BI8U-Q08-RP6X2 | , PNP | cable | PUR | w006 | d004 |
| BI8U-Q08-AP6X2-V1131 | , PNP | connector, Ø 8 mm | - | w001 | d005 |
| BI8U-Q08-AP6X2 | , PNP | cable | PUR | w004 | d004 |
| BI8U-Q08-AN6X2-V1131 | , NPN | connector, Ø 8 mm | - | w002 | d005 |
| BI8U-Q08-AN6X2 | , NPN | cable | PUR | w005 | d004 |

Q10S – 3-wire DC



General data

Dimensions

16 x 10.2 x 27.8 mm

Switching distance

5 mm,

Operating voltage

10...30 VDC

Ambient temperature

-30...+85 °C

Material housing

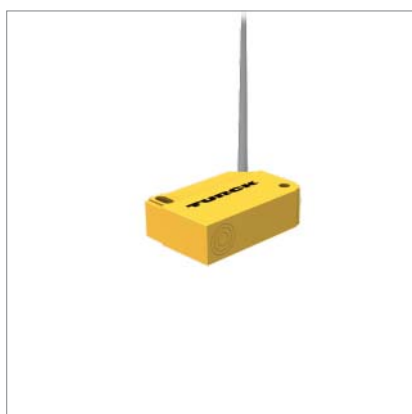
PP

Lateral active face

Types and data – selection table

| Type | Output | Electrical connection | Material cable | w | d |
|--------------------------|--------|-----------------------|----------------|------|------|
| NI5U-Q10S-AP6X-0,3-PSG3M | , PNP | cable with connector | PUR 0.3 m | w001 | d006 |
| NI5U-Q10S-AP6X | , PNP | cable | PUR 2 m | w004 | d007 |
| NI5U-Q10S-AN6X-0,3-PSG3M | , NPN | cable with connector | PUR 0.3 m | w002 | d006 |
| NI5U-Q10S-AN6X | , NPN | cable | PUR 2 m | w005 | d007 |

Q12 – 3-wire DC



General data

Dimensions

26 x 12 x 40 mm

Switching distance

5 mm,

Operating voltage

10...30 VDC








Ambient temperature

-25...+70 °C

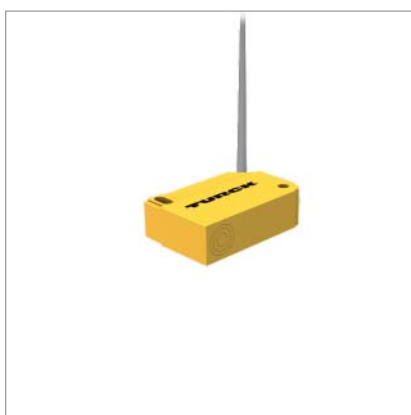
Material housing

PA

Types and data – selection table

| Type | Output | Electrical connection | Material cable | w | d |
|-------------------------|---|-----------------------|----------------|------|------|
| BI5U-Q12-AP6X2-V1131/F2 |  , PNP | connector, M8 x 1 | - | w001 | d008 |
| BI5U-Q12-AP6X2-V1131 |  , PNP | connector, M8 x 1 | - | w001 | d008 |
| BI5U-Q12-AP6X2-H1141 |  , PNP | connector, M12 x 1 | - | w001 | d009 |
| BI5U-Q12-AP6X2 |  , PNP | cable | PUR 2 m | w004 | d010 |
| BI5U-Q12-AN6X2-V1131 |  , NPN | connector, M8 x 1 | - | w002 | d008 |
| BI5U-Q12-AN6X2-H1141 |  , NPN | connector, M12 x 1 | - | w002 | d009 |
| BI5U-Q12-AN6X2 |  , NPN | cable | PUR 2 m | w005 | d010 |

Q12 – 4-wire DC



General data

Dimensions

26 x 12 x 40 mm

Switching distance

5 mm, 

Output

, PNP

Operating voltage

10...30 VDC

Ambient temperature

-25...+70 °C

Material housing

PA

Types and data – selection table

| Type | Electrical connection | Material cable | w | d |
|----------------------|-----------------------|----------------|------|------|
| BI5U-Q12-VP6X2/F2 | cable | PUR 2 m | w007 | d010 |
| BI5U-Q12-VP6X2-H1141 | connector, M12 x 1 | - | w008 | d009 |
| BI5U-Q12-VP6X2 | cable | PUR 2 m | w007 | d010 |

uprox®+ large rectangular design

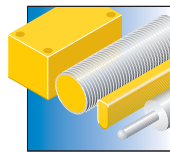


The mounting flexibility of the rectangular *uprox®+* sensors open up many new application possibilities. All variable non-flush rectangular *uprox®+* sensors are 4-side embeddable with reduced switching distance. Thus additional mechanical components and accessories are not required. As a result, installation is cost-effective, quicker and easier.

Features

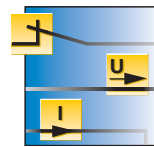
- Highest switching distance
- Factor 1
- Excellent EMC properties and magnetic field resistance
- Partial embedding of non-flush rectangular sensors

Properties



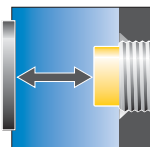
Design

From the 40 x 40 mm standard version CK 40 to the Ø 90 mm big size K90SR



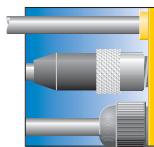
Electrical versions

3/4-wire NO/NC as well as antivalent PNP/NPN output



Switching distances

Large switching distances between 20 mm and max.100 mm on all metals



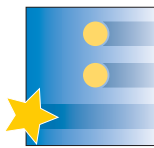
Electrical connections

Available with 2 m cable or M12 x 1 plug connection



Materials

Rugged plastic housing for harsh and uncompromizing application conditions



Special features

Protection class IP68
High luminance corner LEDs
Variable orientation of active face in 5 directions

CK40 – 2-wire DC



General data

| | |
|------------------------------|--------------------|
| Dimensions | 40 x 40 x 65 mm |
| Output | —, 2-wire |
| Electrical connection | connector, M12 x 1 |

| | |
|----------------------------|--------------|
| Operating voltage | 10...65 VDC |
| Ambient temperature | -25...+70 °C |
| Material housing | PBT |

Mechanical switches are replaced by a simple 2-wire connection and system diagnostics by short-circuit monitoring and wire-break detection.

Types and data – selection table

| Type | Switching distance | w | d |
|-----------------------|--------------------|------|------|
| BI15U-CK40-AD4X-H1144 | 15 mm, | w009 | d011 |
| NI35U-CK40-AD4X-H1144 | 35 mm, | w009 | d012 |

CK40 – 3-wire DC



General data

| | |
|------------------------------|--------------------|
| Dimensions | 40 x 40 x 65 mm |
| Electrical connection | connector, M12 x 1 |

| | |
|--------------------------|-------------|
| Operating voltage | 10...30 VDC |
| Material housing | PBT |

Variable orientation of active face in 5 directions

Types and data – selection table

| Type | Switching distance | Output | Ambient temperature | w | d |
|------------------------|--------------------|--------|---------------------|------|------|
| BI30U-CK40-AP6X2-H1141 | 30 mm, | —, PNP | -10...+60 °C | w001 | d012 |
| BI30U-CK40-AN6X2-H1141 | 30 mm, | —, NPN | -10...+60 °C | w002 | d012 |
| BI20U-CK40-AP6X2-H1141 | 20 mm, | —, PNP | -30...+85 °C | w001 | d011 |
| BI20U-CK40-AN6X2-H1141 | 20 mm, | —, NPN | -30...+85 °C | w002 | d011 |
| NI50U-CK40-AP6X2-H1141 | 50 mm, | —, PNP | -30...+85 °C | w001 | d012 |
| NI50U-CK40-AN6X2-H1141 | 50 mm, | —, NPN | -30...+85 °C | w002 | d012 |

w Wiring diagrams on page 832 ff


d Dimension drawing on page 842 ff

a Accessories on page 736 ff

CK40 – 4-wire DC





General data

Dimensions 40 x 40 x 65 mm
Switching distance 50 mm, 
Electrical connection connector, M12 x 1

Operating voltage 10...65 VDC
Ambient temperature -30...+85 °C
Material housing PBT

Variable orientation of active face in 5 directions

Types and data – selection table

| Type | Output | w | d |
|------------------------|---|------|------|
| NI50U-CK40-VP4X2-H1141 |  , PNP | w008 | d012 |
| NI50U-CK40-VN4X2-H1141 |  , NPN | w010 | d012 |

QV40 – 3-wire DC



General data

Dimensions 40 x 40 x 65 mm
Output , PNP
Electrical connection connector, M12 x 1

Operating voltage 10...30 VDC
Material housing PBT

Variable orientation of active face in 5 directions

Types and data – selection table

| Type | Switching distance | Ambient temperature | w | d |
|------------------------|--|---------------------|------|------|
| BI20U-QV40-AP6X2-H1141 | 20 mm,  | 0...+70 °C | w001 | d013 |
| NI50U-QV40-AP6X2-H1141 | 50 mm,  | -30...+85 °C | w001 | d013 |
| NI35U-QV40-AP6X2-H1141 | 35 mm,  | -30...+85 °C | w001 | d013 |

CP40 – 3-wire DC



General data

Dimensions 40 x 40 x 114 mm
Electrical connection terminal chamber

Operating voltage 10...30 VDC
Material housing PBT

Variable orientation of active face in 9 directions

Types and data – selection table

| Type | Switching distance | Output | Ambient temperature | w | d |
|------------------|--------------------|--------|---------------------|------|------|
| BI30U-CP40-AP6X2 | 30 mm, | , PNP | -10...+60 °C | w011 | d014 |
| BI30U-CP40-AN6X2 | 30 mm, | , NPN | -10...+60 °C | w012 | d014 |
| BI20U-CP40-AP6X2 | 20 mm, | , PNP | -30...+85 °C | w011 | d014 |
| BI20U-CP40-AN6X2 | 20 mm, | , NPN | -30...+85 °C | w012 | d014 |
| NI50U-CP40-AP6X2 | 50 mm, | , PNP | -30...+85 °C | w011 | d014 |
| NI50U-CP40-AN6X2 | 50 mm, | , NPN | -30...+85 °C | w012 | d014 |

CP40 – 4-wire DC



General data

Dimensions 40 x 40 x 114 mm
Switching distance 50 mm,
Electrical connection terminal chamber

Operating voltage 10...65 VDC
Ambient temperature -30...+85 °C
Material housing PBT

Variable orientation of active face in 9 directions

Types and data – selection table

| Type | Output | w | d |
|------------------|--------|------|------|
| NI50U-CP40-VP4X2 | , PNP | w014 | d014 |
| NI50U-CP40-VN4X2 | , NPN | w013 | d014 |

Q80 – 3-wire DC



General data

| | | | |
|------------------------------|--------------------|----------------------------|--------------|
| Dimensions | 80 x 40 x 92 mm | Ambient temperature | -25...+70 °C |
| Electrical connection | connector, M12 x 1 | Material housing | PBT |
| Operating voltage | 10...30 VDC | | |

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-----------------------|--------------------|--------|------|------|
| BI50U-Q80-AP6X2-H1141 | 50 mm, | —, PNP | w001 | d015 |
| BI50U-Q80-AN6X2-H1141 | 50 mm, | —, NPN | w002 | d015 |
| NI75U-Q80-AP6X2-H1141 | 75 mm, | —, PNP | w001 | d015 |
| NI75U-Q80-AN6X2-H1141 | 75 mm, | —, NPN | w002 | d015 |

Q80 – 4-wire DC



General data

| | | | |
|------------------------------|--------------------|----------------------------|--------------|
| Dimensions | 80 x 40 x 92 mm | Ambient temperature | -25...+70 °C |
| Electrical connection | connector, M12 x 1 | Material housing | PBT |
| Operating voltage | 10...65 VDC | | |

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-----------------------|--------------------|--------|------|------|
| BI50U-Q80-VP4X2-H1141 | 50 mm, | —, PNP | w008 | d015 |
| BI50U-Q80-VN4X2-H1141 | 50 mm, | —, NPN | w010 | d015 |
| NI75U-Q80-VP4X2-H1141 | 75 mm, | —, PNP | w008 | d015 |
| NI75U-Q80-VN4X2-H1141 | 75 mm, | —, NPN | w010 | d015 |

K90 – 4-wire DC




General data

Dimensions 75 x 60 x 130 mm
Switching distance 100 mm, 
Operating voltage 10...65 VDC

Ambient temperature -30...+85 °C
Material housing PBT

Types and data – selection table

| Type | Output | Electrical connection | w | d |
|--------------------------|---|-----------------------|------|------|
| NI100U-K90SR-VP4X2-H1141 |  , PNP | connector, M12 x 1 | w008 | d017 |
| NI100U-K90SR-VP4X2 |  , PNP | terminal chamber | w014 | d016 |
| NI100U-K90SR-VN4X2-H1141 |  , NPN | connector, M12 x 1 | w010 | d017 |
| NI100U-K90SR-VN4X2 |  , NPN | terminal chamber | w013 | d016 |

uprox®+ cylindrical design

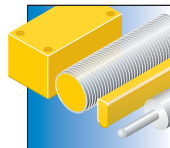


All sensors of the *uprox*®+ series owe many new features to their novel multi-coil system, providing them with distinct advantages over conventional inductive sensors. The Ø 6.5 mm standard types are available as chrome-plated versions (M12, M18, M30 x 1.5) or as stainless steel versions (EH6.5, EG08, EM12, EM18 and EM30) and excel in maximum operating distances, eliminated reduction factors, high magnetic-field immunity, excellent EMC properties and versatile mounting modes.

Features

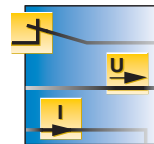
- Recessed mounting of flush sensors
- Embedding up to the barrel edge of non-flush mountable sensors
- Excellent EMC properties and magnetic field resistance
- Highest switching distance
- Factor 1, all metals

Properties



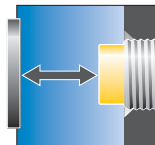
Design

From the small Ø 6.5 mm smooth barrel to the large threaded barrel version M30 x 1.5



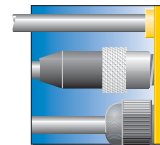
Electrical versions

3/4-wire NO/NC as well as antivalent PNP/NPN output



Switching distances

From 2 mm flush to 30 mm non-flush, on all metals



Electrical connections

Available with 2 m cable, M12 x 1 or M8 x 1 plug connection



Materials

Threaded barrels available as nickel-plated brass or stainless steel versions



Special features

Protection class IP68
Different thread sizes for individual requirements

EH6.5 – 3-wire DC – M8 x 1 plug connection



| | | | |
|------------------------------|-------------------|--------------------------|--------------|
| General data | | | |
| Dimensions | Ø6.5 x 49 mm | Operating voltage | 10...30 VDC |
| Electrical connection | connector, M8 x 1 | Material housing | V2A (1.4301) |

Types and data – selection table

| Type | Switching distance | Output | Ambient temperature | w | d |
|-----------------------|--------------------|--------|---------------------|------|------|
| BI2U-EH6,5-AP6X-V1131 | 2 mm, | , PNP | -30...+85 °C | w001 | d018 |
| BI2U-EH6,5-AN6X-V1131 | 2 mm, | , NPN | -30...+85 °C | w002 | d018 |
| NI6U-EH6,5-AP6X-V1131 | 6 mm, | , PNP | 0...+70 °C | w001 | d019 |
| NI6U-EH6,5-AN6X-V1131 | 6 mm, | , NPN | 0...+70 °C | w002 | d019 |

EH6.5 – 3-wire DC – Cable connection



| | | | |
|------------------------------|-------------|-------------------------|--------------|
| General data | | | |
| Electrical connection | cable | Material housing | V2A (1.4301) |
| Operating voltage | 10...30 VDC | Material cable | PUR 2 m |

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Ambient temperature | w | d |
|-----------------|----------------|--------------------|--------|---------------------|------|------|
| BI2U-EH6,5-AP6X | Ø6.5 x 41.6 mm | 2 mm, | , PNP | -30...+85 °C | w004 | d020 |
| BI2U-EH6,5-AN6X | Ø6.5 x 41.6 mm | 2 mm, | , NPN | -30...+85 °C | w005 | d020 |
| NI6U-EH6,5-AP6X | Ø6.5 x 42 mm | 6 mm, | , PNP | 0...+70 °C | w004 | d021 |
| NI6U-EH6,5-AN6X | Ø6.5 x 42 mm | 6 mm, | , NPN | 0...+70 °C | w005 | d021 |

EG08 – 3-wire DC – M8 x 1 plug connection



| | | | |
|------------------------------|-------------------|--------------------------|--------------|
| General data | | | |
| Dimensions | Ø8 x 49 mm | Operating voltage | 10...30 VDC |
| Electrical connection | connector, M8 x 1 | Material housing | V2A (1.4301) |

Types and data – selection table

| Type | Switching distance | Output | Ambient temperature | w | d |
|----------------------|--------------------|--------|---------------------|------|------|
| BI2U-EG08-RP6X-V1131 | 2 mm, | , PNP | -30...+85 °C | w003 | d022 |
| BI2U-EG08-AP6X-V1131 | 2 mm, | , PNP | -30...+85 °C | w001 | d022 |
| BI2U-EG08-AN6X-V1131 | 2 mm, | , NPN | -30...+85 °C | w002 | d022 |
| NI6U-EG08-RP6X-V1131 | 6 mm, | , PNP | 0...+70 °C | w003 | d023 |
| NI6U-EG08-AP6X-V1131 | 6 mm, | , PNP | 0...+70 °C | w001 | d023 |
| NI6U-EG08-AN6X-V1131 | 6 mm, | , NPN | 0...+70 °C | w002 | d023 |

EG08 – 3-wire DC – M12 x 1 plug connection



| | | | |
|------------------------------|--------------------|--------------------------|--------------|
| General data | | | |
| Dimensions | Ø8 x 57 mm | Operating voltage | 10...30 VDC |
| Electrical connection | connector, M12 x 1 | Material housing | V2A (1.4301) |

Types and data – selection table

| Type | Switching distance | Output | Ambient temperature | w | d |
|----------------------|--------------------|--------|---------------------|------|------|
| BI2U-EG08-RP6X-H1341 | 2 mm, | , PNP | -30...+85 °C | w015 | d024 |
| BI2U-EG08-AP6X-H1341 | 2 mm, | , PNP | -30...+85 °C | w001 | d024 |
| BI2U-EG08-AN6X-H1341 | 2 mm, | , NPN | -30...+85 °C | w002 | d024 |
| NI6U-EG08-RP6X-H1341 | 6 mm, | , PNP | 0...+70 °C | w015 | d025 |
| NI6U-EG08-AP6X-H1341 | 6 mm, | , PNP | 0...+70 °C | w001 | d025 |
| NI6U-EG08-AN6X-H1341 | 6 mm, | , NPN | 0...+70 °C | w002 | d025 |

EG08 – 3-wire DC – Cable connection



| | | | |
|------------------------------|--------------|-------------------------|--------------|
| General data | | Material housing | V2A (1.4301) |
| Dimensions | Ø8 x 41.6 mm | Material cable | PUR 2 m |
| Electrical connection | cable | | |
| Operating voltage | 10...30 VDC | | |

Types and data – selection table

| Type | Switching distance | Output | Ambient temperature | w | d |
|----------------|--------------------|--------|---------------------|------|------|
| B12U-EG08-AP6X | 2 mm, | —, PNP | -30...+85 °C | w004 | d026 |
| B12U-EG08-AN6X | 2 mm, | —, NPN | -30...+85 °C | w005 | d026 |
| N16U-EG08-AP6X | 6 mm, | —, PNP | 0...+70 °C | w004 | d027 |
| N16U-EG08-AN6X | 6 mm, | —, NPN | 0...+70 °C | w005 | d027 |

M12 – 2-wire DC – M12 x 1 plug connection



| | | | |
|------------------------------|--------------------|----------------------------|-------------|
| General data | | Operating voltage | 10...65 VDC |
| Dimensions | Ø12 x 62 mm | Ambient temperature | 0...+70 °C |
| Output | —, 2-wire | Material housing | CuZn-Cr |
| Electrical connection | connector, M12 x 1 | | |

Types and data – selection table

| Type | Switching distance | w | d |
|----------------------|--------------------|------|------|
| B12U-M12E-AD4X-H1144 | 2 mm, | w009 | d028 |
| N15U-M12E-AD4X-H1144 | 5 mm, | w009 | d029 |

M12 – 2-wire DC – Cable connection



General data

Dimensions Ø12 x 64 mm
Output —, 2-wire
Electrical connection cable
Operating voltage 10...65 VDC

Ambient temperature 0...+70 °C
Material housing CuZn-Cr
Material cable PVC 2 m

Types and data – selection table

| Type | Switching distance | w | d |
|----------------|--------------------|------|------|
| BI2U-M12E-AD4X | 2 mm, | w016 | d030 |
| NI5U-M12E-AD4X | 5 mm, | w016 | d031 |

M12 – 3-wire DC – M8 x 1 plug connection



General data

Dimensions Ø12 x 52 mm
Electrical connection connector, M8 x 1
Operating voltage 10...30 VDC

Ambient temperature -30...+85 °C
Material housing CuZn-Cr

Types and data – selection table

| Type | Switching distance | Output | w | d |
|----------------------|--------------------|--------|------|------|
| BI4U-M12-AP6X-V1131 | 4 mm, | —, PNP | w001 | d032 |
| BI4U-M12-AN6X-V1131 | 4 mm, | —, NPN | w002 | d032 |
| NI10U-M12-AP6X-V1131 | 10 mm, | —, PNP | w001 | d033 |
| NI10U-M12-AN6X-V1131 | 10 mm, | —, NPN | w002 | d033 |

M12 – 3-wire DC – M12 x 1 plug connection



| | | | |
|------------------------------|--------------------|----------------------------|--------------|
| General data | | | |
| Dimensions | Ø12 x 52 mm | Ambient temperature | -30...+85 °C |
| Electrical connection | connector, M12 x 1 | Material housing | CuZn-Cr |
| Operating voltage | 10...30 VDC | | |

Types and data – selection table

| Type | Switching distance | Output | w | d |
|----------------------|--------------------|--------|------|------|
| BI4U-M12-RP6X-H1141 | 4 mm, | , PNP | w015 | d034 |
| BI4U-M12-AP6X-H1141 | 4 mm, | , PNP | w001 | d034 |
| BI4U-M12-AN6X-H1141 | 4 mm, | , NPN | w002 | d034 |
| NI10U-M12-RP6X-H1141 | 10 mm, | , PNP | w015 | d035 |
| NI10U-M12-AP6X-H1141 | 10 mm, | , PNP | w001 | d035 |
| NI10U-M12-AN6X-H1141 | 10 mm, | , NPN | w002 | d035 |

M12 – 3-wire DC – Cable connection



| | | | |
|------------------------------|-------------|----------------------------|--------------|
| General data | | | |
| Dimensions | Ø12 x 54 mm | Ambient temperature | -30...+85 °C |
| Electrical connection | cable | Material housing | CuZn-Cr |
| Operating voltage | 10...30 VDC | Material cable | PVC 2 m |

Types and data – selection table

| Type | Switching distance | Output | w | d |
|----------------|--------------------|--------|------|------|
| BI4U-M12-RP6X | 4 mm, | , PNP | w006 | d036 |
| BI4U-M12-AP6X | 4 mm, | , PNP | w004 | d036 |
| BI4U-M12-AN6X | 4 mm, | , NPN | w005 | d036 |
| NI10U-M12-RP6X | 10 mm, | , PNP | w006 | d037 |
| NI10U-M12-AP6X | 10 mm, | , PNP | w004 | d037 |
| NI10U-M12-AN6X | 10 mm, | , NPN | w005 | d037 |

Wiring diagrams on page 832 ff

Dimension drawing on page 842 ff

Accessories on page 736 ff

M12 – 4-wire DC – M12 x 1 plug connection



General data

Electrical connection connector, M12 x 1
Operating voltage 10...55 VDC

Ambient temperature -30...+85 °C
Material housing CuZn-Cr

Types and data – selection table

| Type | Dimensions | Switching distance | Output | w | d |
|---------------------------|--------------|--------------------|--------|------|------|
| BI4U-M12E-VP44X-H1141 | Ø12 x 62 mm | 4 mm, | , PNP | w017 | d028 |
| BI4U-M12E-VN44X-H1141 | Ø12 x 62 mm | 4 mm, | , NPN | w010 | d028 |
| BI4U-M12-VP44X-H1141 L80 | Ø12 x 80 mm | 4 mm, | , PNP | w017 | d038 |
| BI4U-M12-VP44X-H1141 L100 | Ø12 x 100 mm | 4 mm, | , PNP | w017 | d039 |
| NI10U-M12E-VP44X-H1141 | Ø12 x 62 mm | 10 mm, | , PNP | w017 | d029 |
| NI10U-M12E-VN44X-H1141 | Ø12 x 62 mm | 10 mm, | , NPN | w010 | d029 |

M12 – 4-wire DC – Cable connection



General data

Dimensions Ø12 x 64 mm
Electrical connection cable
Operating voltage 10...55 VDC

Ambient temperature -30...+85 °C
Material housing CuZn-Cr
Material cable PVC 2 m

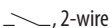
Types and data – selection table

| Type | Switching distance | Output | w | d |
|------------------|--------------------|--------|------|------|
| BI4U-M12E-VP44X | 4 mm, | , PNP | w007 | d030 |
| BI4U-M12E-VN44X | 4 mm, | , NPN | w018 | d030 |
| NI10U-M12E-VP44X | 10 mm, | , PNP | w007 | d031 |
| NI10U-M12E-VN44X | 10 mm, | , NPN | w018 | d031 |

M18 – 2-wire DC – M12 x 1 plug connection





General data

Dimensions Ø18 x 61.5 mm
Output , 2-wire
Electrical connection connector, M12 x 1

Operating voltage 10...65 VDC
Ambient temperature -25...+70 °C
Material housing CuZn-Cr

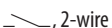
Types and data – selection table

| Type | Switching distance | w | d |
|-----------------------|--|------|------|
| B15U-M18M-AD4X-H1144 | 5 mm,  | w009 | d040 |
| NI10U-M18M-AD4X-H1144 | 10 mm,  | w009 | d041 |

M18 – 2-wire DC – Cable connection




General data

Dimensions Ø18 x 64 mm
Output , 2-wire
Electrical connection cable
Operating voltage 10...65 VDC

Ambient temperature -25...+70 °C
Material housing CuZn-Cr
Material cable PVC 2 m

Types and data – selection table

| Type | Switching distance | w | d |
|-----------------|--|------|------|
| B15U-M18M-AD4X | 5 mm,  | w016 | d042 |
| NI10U-M18M-AD4X | 10 mm,  | w016 | d043 |

M18 – 3-wire DC – M12 x 1 plug connection



General data

Electrical connection connector, M12 x 1 **Ambient temperature** -30...+85 °C
Operating voltage 10...30 VDC

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Material housing | w | d |
|------------------------|-------------|--------------------|--------|------------------|------|------|
| BI8U-M18E-AP6X-H1141 | Ø18 x 72 mm | 8 mm, | —, PNP | CuZn-Cr | w001 | d045 |
| BI8U-M18E-AN6X-H1141 | Ø18 x 72 mm | 8 mm, | —, NPN | CuZn-Cr | w002 | d045 |
| BI8U-M18-RP6X-H1141 | Ø18 x 52 mm | 8 mm, | ⊢, PNP | CuZn-Cr | w015 | d044 |
| BI8U-M18-AP6X-H1141 | Ø18 x 52 mm | 8 mm, | —, PNP | CuZn-Cr | w001 | d044 |
| BI8U-M18-AN6X-H1141 | Ø18 x 52 mm | 8 mm, | —, NPN | CuZn-Cr | w002 | d044 |
| BI8U-EM18E-AP6X-H1141 | Ø18 x 72 mm | 8 mm, | —, PNP | V2A (1.4301) | w001 | d045 |
| BI8U-EM18-AP6X-H1141 | Ø18 x 52 mm | 8 mm, | —, PNP | V2A (1.4301) | w001 | d044 |
| BI8U-EM18-AN6X-H1141 | Ø18 x 52 mm | 8 mm, | —, NPN | V2A (1.4301) | w002 | d044 |
| NI15U-M18E-AP6X-H1141 | Ø18 x 72 mm | 15 mm, | —, PNP | CuZn-Cr | w001 | d047 |
| NI15U-M18E-AN6X-H1141 | Ø18 x 72 mm | 15 mm, | —, NPN | CuZn-Cr | w002 | d047 |
| NI15U-M18-RP6X-H1141 | Ø18 x 52 mm | 15 mm, | ⊢, PNP | CuZn-Cr | w015 | d046 |
| NI15U-M18-AP6X-H1141 | Ø18 x 52 mm | 15 mm, | —, PNP | CuZn-Cr | w001 | d046 |
| NI15U-M18-AN6X-H1141 | Ø18 x 52 mm | 15 mm, | —, NPN | CuZn-Cr | w002 | d046 |
| NI15U-EM18E-AP6X-H1141 | Ø18 x 72 mm | 15 mm, | —, PNP | V2A (1.4301) | w001 | d047 |
| NI15U-EM18-AP6X-H1141 | Ø18 x 52 mm | 15 mm, | —, PNP | V2A (1.4301) | w001 | d046 |
| NI15U-EM18-AN6X-H1141 | Ø18 x 52 mm | 15 mm, | —, NPN | V2A (1.4301) | w002 | d046 |













M18 – 3-wire DC – Cable connection



General data

Electrical connection cable **Material housing** CuZn-Cr
Operating voltage 10...30 VDC **Material cable** PVC 2 m
Ambient temperature -30...+85 °C

Types and data – selection table

| Type | Dimensions | Switching distance | Output | w | d |
|----------------|-------------|--|---|------|------|
| BI8U-M18E-AP6X | Ø18 x 64 mm | 8 mm,  |  , PNP | w004 | d042 |
| BI8U-M18-RP6X | Ø18 x 54 mm | 8 mm,  |  , PNP | w006 | d048 |
| BI8U-M18-AP6X | Ø18 x 54 mm | 8 mm,  |  , PNP | w004 | d048 |
| BI8U-M18-AN6X | Ø18 x 54 mm | 8 mm,  |  , NPN | w005 | d048 |
| NI15U-M18-AP6X | Ø18 x 54 mm | 15 mm,  |  , PNP | w004 | d049 |
| NI15U-M18-AN6X | Ø18 x 54 mm | 15 mm,  |  , NPN | w005 | d049 |



M18 – 4-wire DC – M12 x 1 plug connection



General data

| | | | |
|------------------------------|--------------------|----------------------------|--------------|
| Dimensions | Ø18 x 61.5 mm | Ambient temperature | -30...+85 °C |
| Electrical connection | connector, M12 x 1 | Material housing | CuZn-Cr |
| Operating voltage | 10...55 VDC | | |

Types and data – selection table

| Type | Switching distance | Output | w | d |
|------------------------|--|---|------|------|
| BI8U-M18M-VP44X-H1141 | 8 mm,  |  , PNP | w017 | d040 |
| BI8U-M18M-VN44X-H1141 | 8 mm,  |  , NPN | w010 | d040 |
| NI15U-M18M-VP44X-H1141 | 15 mm,  |  , PNP | w017 | d041 |
| NI15U-M18M-VN44X-H1141 | 15 mm,  |  , NPN | w010 | d041 |

M18 – 4-wire DC – Cable connection



General data

| | | | |
|------------------------------|-------------|----------------------------|--------------|
| Dimensions | Ø18 x 64 mm | Ambient temperature | -30...+85 °C |
| Electrical connection | cable | Material housing | CuZn-Cr |
| Operating voltage | 10...55 VDC | Material cable | PVC 2 m |

Types and data – selection table

| Type | Switching distance | Output | w | d |
|------------------|--------------------|--------|------|------|
| BI8U-M18M-VP44X | 8 mm, | , PNP | w007 | d042 |
| BI8U-M18M-VN44X | 8 mm, | , NPN | w018 | d042 |
| BI8U-M18E-VP44X | 8 mm, | , PNP | w007 | d042 |
| NI15U-M18M-VP44X | 15 mm, | , PNP | w007 | d043 |
| NI15U-M18M-VN44X | 15 mm, | , NPN | w018 | d043 |

M30 – 2-wire DC – M12 x 1 plug connection



General data

| | | | |
|------------------------------|--------------------|----------------------------|--------------|
| Dimensions | Ø30 x 62 mm | Operating voltage | 10...65 VDC |
| Output | , 2-wire | Ambient temperature | -25...+70 °C |
| Electrical connection | connector, M12 x 1 | Material housing | CuZn-Cr |

Types and data – selection table

| Type | Switching distance | w | d |
|----------------------|--------------------|------|------|
| BI10U-M30-AD4X-H1144 | 10 mm, | w009 | d050 |
| NI15U-M30-AD4X-H1144 | 15 mm, | w009 | d051 |



M30 – 2-wire DC – Cable connection



General data

| | | | |
|------------------------------|-------------|----------------------------|--------------|
| Dimensions | Ø30 x 64 mm | Ambient temperature | -25...+70 °C |
| Output | , 2-wire | Material housing | CuZn-Cr |
| Electrical connection | cable | Material cable | PVC 2 m |
| Operating voltage | 10...65 VDC | | |

Types and data – selection table

| Type | Switching distance | w | d |
|----------------|--|------|------|
| BI10U-M30-AD4X | 10 mm,  | w016 | d052 |
| NI15U-M30-AD4X | 15 mm,  | w016 | d053 |

M30 – 3-wire DC – M12 x 1 plug connection















General data

Electrical connection connector, M12 x 1

Ambient temperature -30...+85 °C

Operating voltage 10...30 VDC

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Material housing | w | d |
|-----------------------|-------------|--|--------|------------------|------|------|
| BI15U-M30E-AP6X-H1141 | Ø30 x 77 mm | 15 mm,  | —, PNP | CuZn-Cr | w001 | d054 |
| BI15U-M30-RP6X-H1141 | Ø30 x 62 mm | 15 mm,  | ⊥, PNP | CuZn-Cr | w015 | d050 |
| BI15U-M30-AP6X-H1141 | Ø30 x 62 mm | 15 mm,  | —, PNP | CuZn-Cr | w001 | d050 |
| BI15U-M30-AN6X-H1141 | Ø30 x 62 mm | 15 mm,  | —, NPN | CuZn-Cr | w002 | d050 |
| BI15U-EM30-AP6X-H1141 | Ø30 x 62 mm | 15 mm,  | —, PNP | V2A (1.4301) | w001 | d050 |
| BI15U-EM30-AN6X-H1141 | Ø30 x 62 mm | 15 mm,  | —, NPN | V2A (1.4301) | w002 | d050 |
| NI30U-M30E-AP6X-H1141 | Ø30 x 77 mm | 30 mm,  | —, PNP | CuZn-Cr | w001 | d055 |
| NI30U-M30-RP6X-H1141 | Ø30 x 62 mm | 30 mm,  | ⊥, PNP | CuZn-Cr | w015 | d051 |
| NI30U-M30-AP6X-H1141 | Ø30 x 62 mm | 30 mm,  | —, PNP | CuZn-Cr | w001 | d051 |
| NI30U-M30-AN6X-H1141 | Ø30 x 62 mm | 30 mm,  | —, NPN | CuZn-Cr | w002 | d051 |
| NI30U-EM30-AP6X-H1141 | Ø30 x 62 mm | 30 mm,  | —, PNP | V2A (1.4301) | w001 | d051 |
| NI30U-EM30-AN6X-H1141 | Ø30 x 62 mm | 30 mm,  | —, NPN | V2A (1.4301) | w002 | d051 |

M30 – 3-wire DC – Cable connection



General data

| | |
|------------------------------|-------------|
| Dimensions | Ø30 x 64 mm |
| Electrical connection | cable |
| Operating voltage | 10...30 VDC |

| | |
|----------------------------|--------------|
| Ambient temperature | -30...+85 °C |
| Material cable | PVC 2 m |

Types and data – selection table

| Type | Switching distance | Output | Material housing | w | d |
|-----------------|--------------------|--------|------------------|------|------|
| BI15U-M30-AP6X | 15 mm, | —, PNP | CuZn-Cr | w004 | d052 |
| BI15U-M30-AN6X | 15 mm, | —, NPN | CuZn-Cr | w005 | d052 |
| BI15U-EM30-AP6X | 15 mm, | —, PNP | V2A (1.4301) | w004 | d052 |
| NI30U-M30-RP6X | 30 mm, | —, PNP | CuZn-Cr | w006 | d053 |
| NI30U-M30-AP6X | 30 mm, | —, PNP | CuZn-Cr | w004 | d053 |
| NI30U-M30-AN6X | 30 mm, | —, NPN | CuZn-Cr | w005 | d053 |

M30 – 4-wire DC – M12 x 1 plug connection



General data

| | |
|------------------------------|--------------------|
| Dimensions | Ø30 x 62 mm |
| Electrical connection | connector, M12 x 1 |
| Operating voltage | 10...55 VDC |

| | |
|----------------------------|--------------|
| Ambient temperature | -30...+85 °C |
| Material housing | CuZn-Cr |

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-----------------------|--------------------|--------|------|------|
| BI15U-M30-VP44X-H1141 | 15 mm, | —, PNP | w017 | d050 |
| BI15U-M30-VN44X-H1141 | 15 mm, | —, NPN | w010 | d050 |
| NI30U-M30-VP44X-H1141 | 30 mm, | —, PNP | w017 | d051 |
| NI30U-M30-VN44X-H1141 | 30 mm, | —, NPN | w010 | d051 |

M30 – 4-wire DC – Cable connection



General data

Dimensions Ø30 x 64 mm
Electrical connection cable
Operating voltage 10...55 VDC

Ambient temperature -30...+85 °C
Material housing CuZn-Cr
Material cable PVC 2 m

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-----------------|--------------------|--------|------|------|
| BI15U-M30-VP44X | 15 mm, | , PNP | w007 | d052 |
| BI15U-M30-VN44X | 15 mm, | , NPN | w018 | d052 |
| NI30U-M30-VP44X | 30 mm, | , PNP | w007 | d053 |
| NI30U-M30-VN44X | 30 mm, | , NPN | w018 | d053 |

uprox®+ teflon-coated sensors for the automotive industry

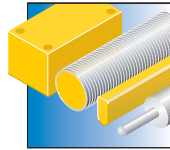


The uprox®+ sensors in teflon-coated threaded barrels are the perfect choice for the rough ambient conditions of the automotive industry. The TF80i coating protects efficiently against weld splatter and drill cuttings and the non-ferritic coil system makes the sensors resistant to strong magnetic fields.

Features

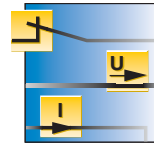
- TF80i coating
- High magnetic field immunity
- Excellent EMC immunity
- Factor 1, all metals
- Highest switching distance

Properties



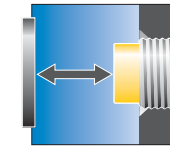
Design

Threaded barrel versions M8 x 1, M12 x 1, M18 x 1 and M30 x 1.5



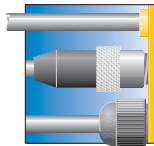
Electrical versions

2/3-wire devices with NO output PNP/NPN



Switching distances

From 2 mm flush to 30 mm non-flush, on all metals



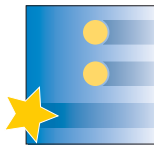
Electrical connections

Available with M12 x 1 plug connection or M12 x 1 pigtail



Materials

TF80i coating protects against weld splatter or drill cuttings



Special features

Protection class IP68
Approved for almost all automotive plants

EG08 – 3-wire DC – M12 x 1 plug connection



General data

Dimensions Ø8 x 57 mm
Output —, PNP
Electrical connection connector, M12 x 1

Operating voltage 10...30 VDC
Material housing V2A (1.4301) -T

Types and data – selection table

| Type | Switching distance | Ambient temperature | w | d |
|-----------------------|--------------------|---------------------|------|------|
| BI2U-EGT08-AP6X-H1341 | 2 mm, | -30...+85 °C | w001 | d024 |
| NI6U-EGT08-AP6X-H1341 | 6 mm, | 0...+70 °C | w001 | d056 |

M12 – 2-wire DC – M12 x 1 pigtail



Type BI2U-MT12E-AD4X-0,3-RS4.23/XOR
Dimensions Ø12 x 64 mm
Switching distance 2 mm,
Output —, 2-wire
Electrical connection connector, M12 x 1
Operating voltage 10...65 VDC

Ambient temperature 0...+70 °C
Material housing CuZn-T
Material cable PVC 0.3 m
Wiring diagram w009
Dimension drawing d057

M12 – 3-wire DC – M12 x 1 plug connection



General data
Dimensions Ø12 x 52 mm
Electrical connection connector, M12 x 1
Operating voltage 10...30 VDC

Ambient temperature -30...+85 °C
Material housing CuZn

Wiring diagrams on page 832 ff

Dimension drawing on page 842 ff

Accessories on page 736 ff

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-----------------------|--------------------|---------|------|------|
| BI4U-MT12-AP6X-H1141 | 4 mm, | — , PNP | w001 | d058 |
| BI4U-MT12-AN6X-H1141 | 4 mm, | — , NPN | w002 | d058 |
| NI10U-MT12-AP6X-H1141 | 10 mm, | — , PNP | w001 | d059 |
| NI10U-MT12-AN6X-H1141 | 10 mm, | — , NPN | w002 | d059 |

M18 – 2-wire DC – M12 x 1 plug connection



| | | | |
|------------------------------|--------------------|----------------------------|--------------|
| General data | | | |
| Dimensions | Ø18 x 61.5 mm | Operating voltage | 10...65 VDC |
| Output | — , 2-wire | Ambient temperature | -25...+70 °C |
| Electrical connection | connector, M12 x 1 | Material housing | CuZn-T |

Types and data – selection table

| Type | Switching distance | w | d |
|------------------------|--------------------|------|------|
| BI5U-MT18M-AD4X-H1144 | 5 mm, | w009 | d040 |
| NI10U-MT18M-AD4X-H1144 | 10 mm, | w009 | d060 |

M18 – 2-wire DC – M12 x 1 pigtail



| | | | |
|------------------------------|--------------------------------|----------------------------|--------------|
| Type | BI5U-MT18M-AD4X-0,3-RS4.23/XOR | Ambient temperature | -25...+70 °C |
| Dimensions | Ø18 x 64 mm | Material housing | CuZn-T |
| Switching distance | 5 mm, | Material cable | PVC 0.3 m |
| Output | — , 2-wire | Wiring diagram | w009 |
| Electrical connection | connector, M12 x 1 | Dimension drawing | d061 |
| Operating voltage | 10...65 VDC | | |

M18 – 3-wire DC – M12 x 1 plug connection



General data

| | | | |
|------------------------------|--------------------|----------------------------|--------------|
| Dimensions | Ø18 x 52 mm | Ambient temperature | -30...+85 °C |
| Electrical connection | connector, M12 x 1 | Material housing | CuZn-T |
| Operating voltage | 10...30 VDC | | |

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-----------------------|--------------------|---------|------|------|
| BI8U-MT18-AP6X-H1141 | 8 mm, | — , PNP | w001 | d062 |
| BI8U-MT18-AN6X-H1141 | 8 mm, | — , NPN | w002 | d062 |
| NI15U-MT18-AP6X-H1141 | 15 mm, | — , PNP | w001 | d063 |
| NI15U-MT18-AN6X-H1141 | 15 mm, | — , NPN | w002 | d063 |

M30 – 2-wire DC – M12 x 1 plug connection



General data

| | | | |
|------------------------------|--------------------|----------------------------|--------------|
| Dimensions | Ø30 x 62 mm | Operating voltage | 10...65 VDC |
| Output | — , 2-wire | Ambient temperature | -25...+70 °C |
| Electrical connection | connector, M12 x 1 | Material housing | CuZn-T |

Types and data – selection table

| Type | Switching distance | w | d |
|-----------------------|--------------------|------|------|
| BI10U-MT30-AD4X-H1144 | 10 mm, | w009 | d064 |
| NI15U-MT30-AD4X-H1144 | 15 mm, | w009 | d065 |

M30 – 2-wire DC – M12 x 1 pigtail



| | | | |
|------------------------------|--------------------------------|----------------------------|--------------|
| Type | BI10U-MT30-AD4X-0,3-RS4.23/XOR | Ambient temperature | -25...+70 °C |
| Dimensions | Ø30 x 64 mm | Material housing | CuZn-T |
| Switching distance | 10 mm, | Material cable | PVC 0.3 m |
| Output | , 2-wire | Wiring diagram | w009 |
| Electrical connection | connector, M12 x 1 | Dimension drawing | d066 |
| Operating voltage | 10...65 VDC | | |

M30 – 3-wire DC – M12 x 1 plug connection



| | | | |
|------------------------------|--------------------|----------------------------|--------------|
| General data | | Ambient temperature | -30...+85 °C |
| Dimensions | Ø30 x 62 mm | Material housing | CuZn-T |
| Electrical connection | connector, M12 x 1 | | |
| Operating voltage | 10...30 VDC | | |

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-----------------------|--------------------|--------|------|------|
| BI15U-MT30-AP6X-H1141 | 15 mm, | , PNP | w001 | d064 |
| BI15U-MT30-AN6X-H1141 | 15 mm, | , NPN | w002 | d064 |
| NI30U-MT30-AP6X-H1141 | 30 mm, | , PNP | w001 | d065 |
| NI30U-MT30-AN6X-H1141 | 30 mm, | , NPN | w002 | d065 |

uprox®+ for the food industry

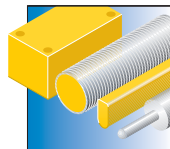


The uprox®+ sensors for the food industry feature a rugged V4A stainless steel housing with laser-engraved type label and resist temperatures of -40 °C to +100 °C easily. A special double lip seal prevents the ingress of liquids. The materials used are resistant to detergents and disinfectants. The fluid-tight housing and the excellent EMC properties of the electronics ensure failsafe operation in harsh industrial production environments.

Features

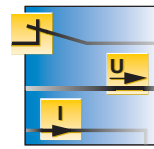
- High tightness and resistance
- Factor 1, all metals
- Rugged stainless steel housing
- High protection classes IP68 and IP69K
- Highest switching distance

Properties



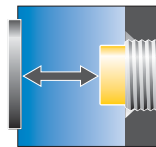
Design

Threaded barrel
M12 x 1, M18 x 1 and
M30 x 1.5



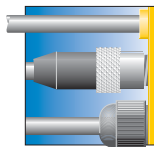
Electrical versions

3-wire NO contact
PNP/NPN



Switching distances

From 4 mm flush to
30 mm non-flush, on
all metals



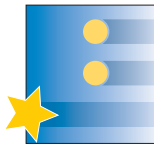
Electrical connections

Available with
M12 x 1 plug con-
nection, 2 m cable or
terminal chamber



Materials

Rugged V4A stainless
steel housing
Chemical-resistant LCP
front cap
Sealed PP connector
insert



Special features

High protection classes
IP68 and IP69K,
laser-engraved type
code,
Ecolab certificate

M12 – 3-wire DC – M12 x 1 plug connection



General data

| | | | |
|------------------------------|--------------------|----------------------------|---------------|
| Dimensions | Ø12 x 52 mm | Ambient temperature | -40...+100 °C |
| Electrical connection | connector, M12 x 1 | Material housing | V4A (1.4404) |
| Operating voltage | 10...30 VDC | | |

Pressure resistant up to 20 bar

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-------------------------|--------------------|---------|------|------|
| BI4U-EM12WD-AP6X-H1141 | 4 mm, | — , PNP | w001 | d034 |
| BI4U-EM12WD-AN6X-H1141 | 4 mm, | — , NPN | w002 | d034 |
| NI10U-EM12WD-AP6X-H1141 | 10 mm, | — , PNP | w001 | d067 |
| NI10U-EM12WD-AN6X-H1141 | 10 mm, | — , NPN | w002 | d067 |

M12 – 3-wire DC – Cable connection



General data

| | | | |
|------------------------------|-------------|----------------------------|---------------|
| Dimensions | Ø12 x 52 mm | Ambient temperature | -40...+100 °C |
| Electrical connection | cable | Material housing | V4A (1.4404) |
| Operating voltage | 10...30 VDC | Material cable | PP 2 m |

Pressure resistant up to 20 bar

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-------------------|--------------------|---------|------|------|
| BI4U-EM12WD-AP6X | 4 mm, | — , PNP | w004 | d068 |
| BI4U-EM12WD-AN6X | 4 mm, | — , NPN | w005 | d068 |
| NI10U-EM12WD-AP6X | 10 mm, | — , PNP | w004 | d069 |
| NI10U-EM12WD-AN6X | 10 mm, | — , NPN | w005 | d069 |

Wiring diagrams on page 832 ff

Dimension drawing on page 842 ff

Accessories on page 736 ff

M12 – 3-wire DC – Terminal chamber



General data

Dimensions

Ø12 x 80 mm

Output

—, PNP

Electrical connection

terminal chamber,
removable cage clamp
terminals

Operating voltage

10...30 VDC

Ambient temperature

-40...+100 °C

Material housing

V4A (1.4404)

Removable terminal strip and variable cable outlet

Types and data – selection table

| Type | Switching distance | w | d |
|---------------------|--------------------|------|------|
| BI4U-EM12WDTC-AP6X | 4 mm, | w011 | d070 |
| NI10U-EM12WDTC-AP6X | 10 mm, | w011 | d071 |

M18 – 3-wire DC – M12 x 1 plug connection



General data

Dimensions

Ø18 x 52 mm

Electrical connection

connector, M12 x 1

Operating voltage

10...30 VDC

Ambient temperature

-40...+100 °C

Material housing

V4A (1.4404)

Pressure resistant up to 15 bar

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-------------------------|--------------------|--------|------|------|
| BI8U-EM18WD-AP6X-H1141 | 8 mm, | —, PNP | w001 | d044 |
| BI8U-EM18WD-AN6X-H1141 | 8 mm, | —, NPN | w002 | d044 |
| NI15U-EM18WD-AP6X-H1141 | 15 mm, | —, PNP | w001 | d072 |
| NI15U-EM18WD-AN6X-H1141 | 15 mm, | —, NPN | w002 | d072 |

M18 – 3-wire DC – Cable connection



General data

| | |
|------------------------------|-------------|
| Dimensions | Ø18 x 52 mm |
| Electrical connection | cable |
| Operating voltage | 10...30 VDC |

| | |
|----------------------------|---------------|
| Ambient temperature | -40...+100 °C |
| Material housing | V4A (1.4404) |
| Material cable | PP 2 m |

Pressure resistant up to 15 bar

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-------------------|--------------------|--------|------|------|
| BI8U-EM18WD-AP6X | 8 mm, | , PNP | w004 | d073 |
| BI8U-EM18WD-AN6X | 8 mm, | , NPN | w005 | d073 |
| NI15U-EM18WD-AP6X | 15 mm, | , PNP | w004 | d074 |
| NI15U-EM18WD-AN6X | 15 mm, | , NPN | w005 | d074 |

M18 – 3-wire DC – Terminal chamber



General data

| | |
|------------------------------|--|
| Dimensions | Ø18 x 81 mm |
| Output | , PNP |
| Electrical connection | terminal chamber, removable cage clamp terminals |

| | |
|----------------------------|---------------|
| Operating voltage | 10...30 VDC |
| Ambient temperature | -40...+100 °C |
| Material housing | V4A (1.4404) |

Removable terminal strip and variable cable outlet

Types and data – selection table

| Type | Switching distance | w | d |
|---------------------|--------------------|------|------|
| BI8U-EM18WDTC-AP6X | 8 mm, | w011 | d075 |
| NI15U-EM18WDTC-AP6X | 15 mm, | w011 | d076 |

M30 – 3-wire DC – M12 x 1 plug connection



General data

| | | | |
|------------------------------|--------------------|----------------------------|---------------|
| Dimensions | Ø30 x 62 mm | Ambient temperature | -40...+100 °C |
| Electrical connection | connector, M12 x 1 | Material housing | V4A (1.4404) |
| Operating voltage | 10...30 VDC | | |

Pressure resistant up to 10 bar

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-------------------------|--------------------|--------|------|------|
| BI15U-EM30WD-AP6X-H1141 | 15 mm, | —, PNP | w001 | d050 |
| BI15U-EM30WD-AN6X-H1141 | 15 mm, | —, NPN | w002 | d050 |
| NI30U-EM30WD-AP6X-H1141 | 30 mm, | —, PNP | w001 | d077 |
| NI30U-EM30WD-AN6X-H1141 | 30 mm, | —, NPN | w002 | d077 |

M30 – 3-wire DC – Cable connection



General data

| | | | |
|------------------------------|-------------|----------------------------|---------------|
| Dimensions | Ø30 x 66 mm | Ambient temperature | -40...+100 °C |
| Electrical connection | cable | Material housing | V4A (1.4404) |
| Operating voltage | 10...30 VDC | Material cable | PP 2 m |

Pressure resistant up to 10 bar

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-------------------|--------------------|--------|------|------|
| BI15U-EM30WD-AP6X | 15 mm, | —, PNP | w004 | d078 |
| BI15U-EM30WD-AN6X | 15 mm, | —, NPN | w005 | d078 |
| NI30U-EM30WD-AP6X | 30 mm, | —, PNP | w004 | d079 |
| NI30U-EM30WD-AN6X | 30 mm, | —, NPN | w005 | d079 |

M30 – 3-wire DC – Terminal chamber



General data

Dimensions

Ø30 x 95 mm

Output

—, PNP

Electrical connection

terminal chamber,
removable cage clamp
terminals

Operating voltage

10...30 VDC

Ambient temperature



-40...+100 °C

Material housing

V4A (1.4404)

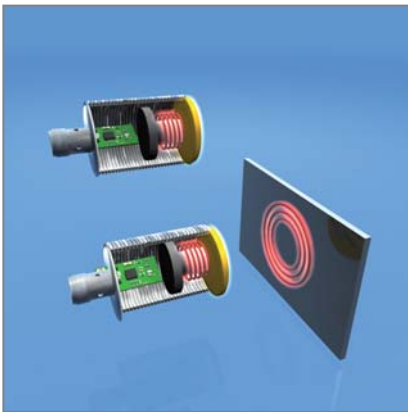
Removable terminal strip and variable cable outlet

Types and data – selection table

| Type | Switching distance | w | d |
|---------------------|--|------|------|
| BI15U-EM30WDTC-AP6X | 15 mm,  | w011 | d080 |
| NI30U-EM30WDTC-AP6X | 30 mm,  | w011 | d081 |

At a glance

Inductive sensors - complete product range



Inductive sensors – complete product range

Inductive sensors are designed for contactless and wear-free detection of metal targets. They are extremely resistant to environmental influences, very reliable, feature high switching frequencies and are durable.

There are as many application possibilities as sensor types: The sensors detect motion states at machines, open/close position of grippers and pincers or are applied for parts inspection.

The entire program of inductive sensors comprises factor 1 sensors *uprox*[®] and *uprox*[®]+ as well as versions with conventional ferrite core technology.

Nearly all types are flush as well as non-flush mountable. Moreover, the product portfolio offers very flexible non-flush mountable sensors that can also be recessed or flush mounted.

Only extremely resistant housing materials are used to comply with the demanding ambient conditions of applications.

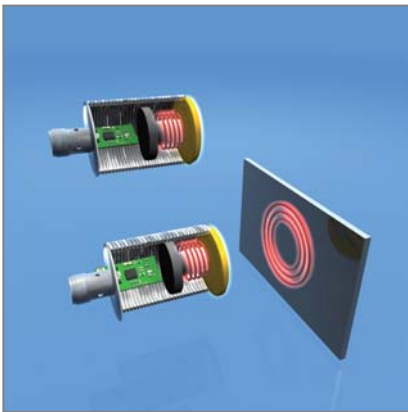
We offer of course all standard connection technologies and electrical output types.

Special applications often require special sensors. Most requirements such as factor 1, magnetic field immunity and protection class IP68/IP69K are fulfilled by standard *uprox*[®]+ sensors.

To achieve optimum performance, you find the matching sensors and functional description for all applications in the TURCK product portfolio.

- Ring sensors
- Slot sensors
- Dual sensors for valve control
- Analog inductive sensors
- Inductive sensors for underwater applications
- Pressure-resistant inductive sensors
- Selective inductive sensors
- and many more

Our strengths - Your advantages



Wear-free operation

Inductive proximity switches are designed for wear-free and contactless detection of metal objects. For this purpose they use a high-frequency electromagnetic AC field that interacts with the target. With conventional inductive sensors this field is generated by an LC resonant circuit with a ferrite coil. Eddy currents

are induced in the metal target. They withdraw energy from the field which in turn leads to a decrease of the oscillating amplitude. The decrease is detected and analysed by the inductive sensor. For more information on inductive sensors please see chapter *uprox*[®]+ inductive factor 1 sensors.



Extensive product range

TURCK customers can choose from a broad range of standard products. The entire range of sensors and accessories holds the perfect solution for your individual application and meets increasing requirements in the long term. Nearly

all types are flush as well as non-flush mountable. Moreover, the product portfolio offers very flexible non-flush mountable sensors for recessed or flush mounting. The devices are available as standard products ex stock.



Inductive sensors for special applications

Special applications often require special sensors. Most requirements such as factor 1, magnetic field immunity and protection classes IP68/IP69K are fulfilled by standard *uprox*[®]+ sensors. To achieve optimum performance, you find the matching sensors and functional descriptions

for all applications in the TURCK product portfolio. Ring, slot, dual sensors for valve control, sensors with analog output, with extended temperature range, for underwater use, pressure resistant inductive sensors and sensors with selective properties.

advantages



Many different designs

Many designs are available and each is optimally adjusted to different application conditions. From the small rectangular 5 x 5 x 25 mm to the big 90 x 130 x 60 mm version with extremely large switching distance. Also available are sensor sizes ranging from M4 to PG36 thread-

ed barrels as well as Ø 3 mm to Ø 40 mm smooth barrels. Nearly all types are flush as well as non-flush mountable. The product portfolio also includes very flexible non-flush mountable sensors for recessed or flush mounting.



Application compliant housing materials

Only extremely resistant housing materials are used. In order to comply with the ambient conditions of individual applications, we offer sensors with different housing materials: Plastic versions PA,

PP, PBT or ABS, brass (threaded barrel), chrome-plated or teflon coated, stainless steel in different qualities up to high-quality V4A, 1.4404.

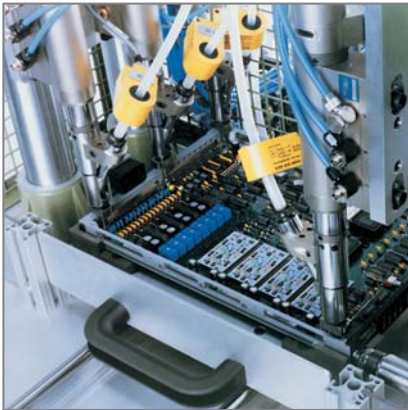


Many different output and connection possibilities

We offer all connection types available on the market: Ø 8 mm, M8, M12, 1/2" and 7/8" plug connections, cable in different lengths and jacket qualities (standard length 2 m) pigtail - preassembled with M8 or M12 plug connections, terminal chamber - the new innovative TC ver-

sion with removable terminal block and variable cable outlet. All standard electrical versions are available: NAMUR, 2, 3 and 4-wire DC, PNP/NPN output or 2-wire AC/DC. Also available are fieldbus capable dual sensors for DeviceNet™ or AS-interface®.

For special applications



Ring sensors

TURCK ring sensors with integrated electronics are compact and universally mountable. They are applied in many different systems such as in assembly lines or component feeding systems to detect small metal parts. The *uprox*[®]+ TS12 is an

innovative replacement for various ring sensors. Only one sensor is needed to operate applications with different tube diameters.

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Slot sensors

The slot sensors are U-shaped and the active face is located between the two arms. If an object passes through the slot, the sensor is actuated.

Slot sensors detect laterally approaching targets regardless of their distance to the active face.

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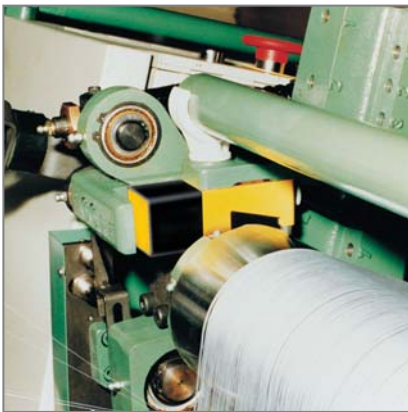
Dual sensors for rotary actuators

In the chemical, petro-chemical and food industry, position control on rotary actuators is of great importance. TURCK dual sensors detect the end position of rotary actuators reliably.

Simple mounting and cable routing of TURCK dual sensors reduce the expenses for installation considerably.

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ons



Sensors with analog output

Inductive sensors with analog output accomplish simple control tasks. They provide a current, voltage or frequency signal that is proportional to the target's distance.

The output signal provided by TURCK analog sensors is linear to the distance of the target over the entire sensing range.

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Extended temperature range

The product portfolio even includes sensors for applications with ambient temperatures of -60 °C or +250 °C. These TURCK sensors are typically used in deep freezing systems, outdoors, in metal

foundries, in drying furnaces of varnishing stations or the glass industry for.

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Inductive sensors for underwater applications

TURCK offers sensors in fully pressure and seawater tight housings for subsea applications. They are made for continuous use under water. Mounted in M18 threaded barrels made of plastic, they can even be applied at water depths of up to 500 m.

Also included in the TURCK product portfolio are CP40 sensors. They are fully encapsulated in the SG40/2 housing. In addition, they feature large switching distances, are IP68 rated and are made for water depths of up to 50 m. They are mostly applied in locks, weirs and off-shore areas.

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For special applications



Pressure-resistant sensors

We offer application optimized pressure resistant as well as high-pressure resistant devices. The *uprox*[®]+ WashDown sensors resist pressures up to 20 bar. The unique *uprox*[®] advantages are combined in one single product, such as largest switching distance, factor 1 and protection classes IP68/IP69K.

The high pressure resistant sensors are incorporated in a stainless steel housing and are ideally suited for hydraulic systems. Special gaskets and additional outer seals at the front as well as an O-ring enable the application in high pressure systems of up to 500 bar.

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Magnetic-inductive sensors

Magnetic-inductive sensors are typically applied in pig trap systems or used for gate monitoring. Since magnetic-inductive sensors are actuated by external magnetic fields, even the smaller types achieve large switching distances.

In combination with the actuation magnet DMR31-15-5, the M12 sensors attain a rated switching distance of 90 mm.

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Selective sensors

TURCK's sensor series NF, FE and NF/FE with distinctive function are particularly suited for applications in which ferritic metals have to be distinguished from non-ferritic metals. They distinguish be-

tween workpiece and tool or between workpieces made of different materials and perform simple coding tasks.

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ons

Type code

| B | i | . | 4 | U | Functional principle | - | M12 | . | Design | - | A | P | 6 | X | Electrical version | - |
|---|---|---|---|---|---|---|-----|---|--------|---|---|---|---|---|--------------------|---|
| | | | | | Special functions | | | | | | | | | | | |
| | | | | | FE selective behaviour: ferrite only | | | | | | | | | | | |
| | | | | | U <i>uprox</i> [®] or <i>uprox</i> [®] + factor 1 sensors | | | | | | | | | | | |
| | | | | | NF selective behaviour: non-ferrite only | | | | | | | | | | | |
| | | | | | R ring sensor, | | | | | | | | | | | |
| | | | | | Rated operating distance | | | | | | | | | | | |
| | | | | | ... or slot width | | | | | | | | | | | |
| | | | | | ring diameter [mm] | | | | | | | | | | | |
| | | | | | Options | | | | | | | | | | | |
| | | | | | D high-pressure resistant | | | | | | | | | | | |
| | | | | | Functional principle | | | | | | | | | | | |
| | | | | | i inductive | | | | | | | | | | | |
| | | | | | Fitting | | | | | | | | | | | |
| | | | | | B flush | | | | | | | | | | | |
| | | | | | N non-flush | | | | | | | | | | | |
| | | | | | S slot sensor | | | | | | | | | | | |
| | | | | | Additional information | | | | | | | | | | | |
| | | | | | D climate-proof | | | | | | | | | | | |
| | | | | | E long-sized housing | | | | | | | | | | | |
| | | | | | K short-sized housing | | | | | | | | | | | |
| | | | | | M medium-sized housing | | | | | | | | | | | |
| | | | | | S lateral active face | | | | | | | | | | | |
| | | | | | SK terminal chamber, angled cable outlet | | | | | | | | | | | |
| | | | | | SR, TC terminal chamber with straight/angled cable outlet | | | | | | | | | | | |
| | | | | | WD wash down resistant to aggressive cleaning agents Protection class IP68/69K | | | | | | | | | | | |
| | | | | | Housing | | | | | | | | | | | |
| | | | | | CA25 rectangular, 25 x 25 flexible active face | | | | | | | | | | | |
| | | | | | Q, QN rectangular, height in mm | | | | | | | | | | | |
| | | | | | CA40, CK40, CP40, QV40 rectangular, 40 x 40, flexible active face | | | | | | | | | | | |
| | | | | | CP80 cubic, 80 x 80 | | | | | | | | | | | |
| | | | | | DSC, DSU dual sensor for monitoring of rotary actuators height in mm | | | | | | | | | | | |
| | | | | | EG, EM threaded barrel, stainless steel, Ø in [mm] | | | | | | | | | | | |
| | | | | | GS threaded barrel, metal, lateral active face, Ø in [mm] | | | | | | | | | | | |
| | | | | | EH, H smooth barrel, metal, Ø in [mm] | | | | | | | | | | | |
| | | | | | HS smooth barrel, metal, lateral active face, Ø in [mm] | | | | | | | | | | | |
| | | | | | K smooth barrel, plastic, or slot-shaped | | | | | | | | | | | |
| | | | | | G, M threaded barrel, metal Ø in [mm] | | | | | | | | | | | |
| | | | | | EGT, GT, MT threaded barrel, metal teflon-coated, Ø in [mm] | | | | | | | | | | | |
| | | | | | P, S threaded barrel, plastic Ø in [mm], housing style 'S' also available as ring sensor BI/NI...R | | | | | | | | | | | |
| | | | | | TS tube sensor detection of small parts, height in mm | | | | | | | | | | | |
| | | | | | W ring sensor, height in mm | | | | | | | | | | | |
| | | | | | Indication | | | | | | | | | | | |
| | | | | | X LED | | | | | | | | | | | |
| | | | | | X... number of LEDs or multicolor LED | | | | | | | | | | | |
| | | | | | Voltage range | | | | | | | | | | | |
| | | | | | 3 10...300 VDC / 20...250 VAC | | | | | | | | | | | |
| | | | | | 4 10...65 VDC, ⊗ | | | | | | | | | | | |
| | | | | | 6 10...30 VDC, ⊗ | | | | | | | | | | | |
| | | | | | 7 10...30 VDC (TTL compatible) | | | | | | | | | | | |
| | | | | | 30 10...300 VDC / 20...250 VDC, ⊗ | | | | | | | | | | | |
| | | | | | 31 10...300 VDC / 20...250 VAC, ⊗ max. 100 mA | | | | | | | | | | | |
| | | | | | 41 10...55 VDC | | | | | | | | | | | |
| | | | | | 44 10...55 VDC, ⊗ | | | | | | | | | | | |
| | | | | | 45 8.4...65 VDC, ⊗, load dump and EMC protected acc. to e1 approval | | | | | | | | | | | |
| | | | | | Output mode | | | | | | | | | | | |
| | | | | | D 2-wire DC, non-polarized | | | | | | | | | | | |
| | | | | | G 2-wire DC, polarized | | | | | | | | | | | |
| | | | | | N NPN | | | | | | | | | | | |
| | | | | | P PNP | | | | | | | | | | | |
| | | | | | Z, DZ 2-wire AC/DC | | | | | | | | | | | |
| | | | | | Output function | | | | | | | | | | | |
| | | | | | A working current NO | | | | | | | | | | | |
| | | | | | ASI AS-Interface [®] connection | | | | | | | | | | | |
| | | | | | DA dynamic output, working current NO | | | | | | | | | | | |
| | | | | | Dnet DeviceNet [™] | | | | | | | | | | | |
| | | | | | F working current NO / closed current NC, programmable via connection | | | | | | | | | | | |
| | | | | | LF analog output (frequency) | | | | | | | | | | | |
| | | | | | LI analog output (current) | | | | | | | | | | | |
| | | | | | LI-Exi analog output (current), intrinsically safe | | | | | | | | | | | |
| | | | | | LIU, SIU analog output (voltage and current) | | | | | | | | | | | |
| | | | | | LU analog output (current) | | | | | | | | | | | |
| | | | | | R closed current NC | | | | | | | | | | | |
| | | | | | Y0, Y1 output acc. to EN 60947-5-6 (NAMUR) | | | | | | | | | | | |
| | | | | | V changeover contact | | | | | | | | | | | |

⊗ = short circuit protected

| | | | | | | | |
|----|---|---|---|------------------------|---|------|------------------|
| H1 | 1 | 4 | 1 | Electrical connection: | / | L100 | Special versions |
|----|---|---|---|------------------------|---|------|------------------|

- Assignment**
 - 1 standard assignment or customized
- Number of contacts**
 - contacts
- Connector type**
 - 1 straight
 - 3 straight, with adapter
- Connector type**
 - B1 connector type 7/8"
 - B3 connector type 1/2"
 - H1 connector type M12 x 1
 - V1, V2 connector type M8 x 1 / Ø 8 mm

- Features**
 - 3G approval ATEX II 3 G
 - 3D approval ATEX II 3 D
 - 3GD approval ATEX II 3 G and II 3 D
 - L100 device length 100 mm
 - L80 device length 80 mm
 - S34 magnetic-field resistant
 - S97 extended temperature range: -40 °C
 - S100 extended temperature range: +100 °C
 - S120 extended temperature range: +120 °C
 - S139 seawater-proof housing
 - S369 CP40 housing fully encapsulated in SG40 protective housing, seawater-proof
 - S907 extended temperature range: +160 °C
 - S929 extended temperature range: -60 °C
 - S1102 extended temperature range: +250 °C

| | | | | |
|-----|-----|---|---|---------------------------|
| X.X | PSG | 3 | M | Pigtail: Cable connection |
|-----|-----|---|---|---------------------------|

- Assignment**
 - M rotatable nut
 - S fixed thread
- ... contacts**
 - contacts
- Connector type**
 - PSG connector M8 x 1, straight
 - RS connector M12 x 1, straight rotatable nut
- Cable length**
 - ... [m]

| | |
|------|------------------|
| ...M | Cable connection |
|------|------------------|

- Connection**
 - empty cable connection, 2 m
Exceptions:
TC, SK, SR, CP40, CP80 with terminal chamber connection
 - ...M cable length [m]

Designs and variants

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Page 80 ff.



| | Q5SE | Q5,5 | Q06 | Q6,5 |
|------------------------------|------------------------------------|--------------------------------------|--|---------------------------------------|
| Design | rectangular Q5SE, 5 x 5 x 25 mm | rectangular Q5.5, 8 x 5.5 x 28 mm | rectangular Q06, 17.3 x 6 x 27.8 mm | rectangular Q6.5, 17 x 6.5 x 20 mm |
| Switching distance | 0.8 mm, | 2 mm, 3.5 mm, | 3 mm, | 1 mm, 2 mm, |
| Electrical connection | cable | cable | cable | cable |
| Output | 3-wire DC PNP | 3-wire DC PNP 3-wire DC NPN | 3-wire DC PNP 3-wire DC NPN | 2-wire DC NAMUR 3-wire DC PNP |

Standard variants

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Q8SE

Q08

Q9,5

Q10

Design

rectangular Q8SE,
8 x 8 x 40 mm

rectangular Q08,
20 x 8 x 32 mm

rectangular Q9.5,
17 x 9.5 x 20 mm

rectangular Q10,
25 x 10.8 x 42 mm

Switching distance

4 mm,

5 mm,
7 mm,
8 mm,

2 mm,

8 mm,

Measuring range

1...4 mm

Electrical connection

connector, M8 x 1
cable

connector, Ø 8 mm
connector, M8 x 1
cable
cable with connector

cable

connector, M8 x 1
cable

Output

3-wire DC PNP
3-wire DC NPN

2-wire DC NAMUR
3-wire DC PNP
3-wire DC NPN
4-wire DC PNP
4-wire DC NPN
4-wire DC Analog output

3-wire DC PNP

3-wire DC PNP
3-wire DC NPN

Designs and variants

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









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| | Q10S | Q12 | TS12 | Q14 |
|-------------------------------|--|---|---|--|
| Design | rectangular Q10S, 16 x 10.2 x 27.8 mm | rectangular Q12, 26 x 12 x 40 mm | rectangular TS12, 17 x 12 x 80 mm | rectangular Q14, 30 x 14 x 52 mm |
| Switching distance | 2 mm,  5 mm,  | 2 mm,  5 mm,  4 mm,  | 20 mm,  | 10 mm,  20 mm,  |
| Internal ring diameter | | | | 6.1 mm 10.1 mm 15.1 mm 20.1 mm |
| Measuring range | | | | 3...8 mm |
| Electrical connection | connector, M8 x 1 cable cable with connector | connector, M8 x 1 connector, M12 x 1 cable | connector, M8 x 1 | connector, M8 x 1 connector, M12 x 1 cable |
| Output | 2-wire DC NAMUR 2-wire AC/DC 3-wire DC PNP 3-wire DC NPN 4-wire DC PNP 4-wire DC NPN | 2-wire AC/DC 3-wire DC PNP 3-wire DC NPN 4-wire DC PNP 4-wire DC NPN | 3-wire DC PNP 3-wire DC NPN | 2-wire DC NAMUR 2-wire AC/DC 3-wire DC PNP 3-wire DC NPN 3-wire DC Analog output 4-wire DC Analog output |

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





Q18

Q20

Q20L

Q25

| | | | | |
|-------------------------------|---|--|--------------------------------------|--|
| Design | rectangular Q18, 18 x 18 x 29 mm | rectangular Q20, 40 x 20 x 68 mm | rectangular Q20L, 30 x 20 x 60 mm | rectangular Q25, 25 x 25.5 x 38.5 mm |
| Switching distance | 5 mm,  | 15 mm,  25 mm,  | | 10 mm,  |
| Internal ring diameter | | 30.1 mm | | |
| Measuring range | | 4...11 mm | 10...50 mm 15...85 mm | |
| Electrical connection | cable | connector, M12 x 1 cable | connector, M12 x 1 | cable |
| Output | 3-wire DC PNP 3-wire DC NPN | 2-wire DC NAMUR 3-wire DC PNP 3-wire DC NPN 4-wire DC Analog output | 4-wire DC Analog output | 3-wire DC PNP 3-wire DC NPN |

Designs and variants

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


CA25

Design

rectangular CA25,
25 x 25 x 40 mm

Switching distance

10 mm, 
15 mm, 

Electrical connection

connector, M8 x 1
connector, M12 x 1

Output

3-wire DC PNP

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QN26

rectangular QN26,
26 x 26 x 43 mm

10 mm, 

cable
cable with connector, M12 x 1


2-wire DC

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Q40

rectangular Q40,
40 x 52.5 x 67 mm

22 mm, 

connector, M12 x 1


3-wire DC PNP

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CA40

rectangular CA40,
40 x 40 x 48 mm

20 mm, 

connector, M12 x 1

3-wire DC PNP
3-wire DC NPN

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CK40

QV40

CP40

CQ40

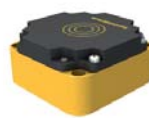
| | | | | |
|------------------------------|---|--------------------------------------|---|--------------------------------------|
| Design | rectangular CK40, 40 x 40 x 65 mm | rectangular QV40, 40 x 40 x 65 mm | rectangular CP40, 40 x 40 x 114 mm | rectangular CQ40, 40 x 40 x 52 mm |
| Switching distance | 15 mm, 20 mm, 30 mm, 20 mm, 25 mm, 35 mm, 40 mm, 50 mm, | 20 mm, 50 mm, | 15 mm, 20 mm, 30 mm, 20 mm, 35 mm, 40 mm, 50 mm, | 25 mm, |
| Measuring range | 4...11 mm 5...25 mm | | 4...11 mm 5...25 mm | |
| Electrical connection | connector, 7/8" connector, 1/2" connector, M12 x 1 | connector, M12 x 1 | connector, M12 x 1 cable terminal chamber | connector, M12 x 1 |
| Output | 2-wire DC NAMUR 2-wire AC/DC 2-wire DC 3-wire DC PNP 3-wire DC NPN 4-wire DC PNP 4-wire DC NPN 4-wire DC Analog output | 3-wire DC PNP | 2-wire DC NAMUR 2-wire AC/DC 2-wire DC 3-wire DC PNP 3-wire DC NPN 4-wire DC PNP 4-wire DC NPN 4-wire DC Analog output | |

Designs and variants

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












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| | Q80 | CP80 | CQ80 | K90 |
|------------------------------|--|--|---|---|
| Design | rectangular Q80, 80 x 40 x 92 mm | rectangular CP80, 80 x 41 x 80 mm | rectangular CQ80, 80 x 40 x 92 mm | rectangular K90SR, 75 x 60 x 130 mm |
| Switching distance | 50 mm,  60 mm,  75 mm,  | 40 mm,  40 mm,  50 mm,  75 mm,  | 40 mm,  | 50 mm,  60 mm,  100 mm,  |
| Measuring range | 10...50 mm | | | |
| Electrical connection | connector, M12 x 1 cable | connector, M12 x 1 terminal chamber | connector, M12 x 1 | connector, M12 x 1 terminal chamber |
| Output | 2-wire DC NAMUR 3-wire DC PNP 3-wire DC NPN 4-wire DC PNP 4-wire DC NPN 4-wire DC Analog output | 2-wire DC NAMUR 2-wire AC/DC 4-wire DC PNP 4-wire DC NPN | | 2-wire DC NAMUR 4-wire DC NPN 2-wire AC/DC 4-wire DC PNP |

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Q130

M5 x 0.5

M8 x 1

M12 x 1

Design

rectangular Q130,
57 x 48 x 130 mm

threaded barrel M5 x 0.5

threaded barrel M8 x 1

threaded barrel M12 x 1

Switching distance

30 mm,

1 mm,

1.5 mm,
2 mm,
3 mm,
4 mm,
6 mm,
78 mm

2 mm,
2.5 mm,
3 mm,
4 mm,
4 mm,
5 mm,
8 mm,
10 mm,
90 mm

Measuring range

0.25...1.25 mm

0.5...3 mm
1...2.5 mm
0.5...4 mm

Electrical connection

connector, 7/8"
cable

connector, M8 x 1
cable

connector, M8 x 1
connector, M12 x 1
cable

connector, 1/2"
connector, M8 x 1
connector, M12 x 1
cable
terminal chamber
terminal chamber, removable
cage clamp terminals

Output

2-wire AC/DC
4-wire DC PNP
4-wire DC NPN

2-wire DC NAMUR
3-wire DC PNP
3-wire DC NPN

2-wire DC
2-wire AC/DC
3-wire DC PNP
2-wire DC NAMUR
3-wire DC NPN
4-wire DC PNP
3-wire DC Analog output

2-wire DC NAMUR
2-wire DC
2-wire AC/DC
3-wire DC PNP
3-wire DC NPN
4-wire DC PNP
4-wire DC NPN
4-wire DC Analog output

Designs and variants

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| | M18 | M30 | G47 | EH03 |
|------------------------------|--|---|---|--------------------------------|
| Design | threaded barrel M18 x 1 | threaded barrel M30 x 1.5 | threaded barrel G47 | smooth barrel 3 mm |
| Switching distance | 2 mm, → 5 mm, → 7 mm, → 8 mm, → 7 mm, → 8 mm, → 10 mm, → 12 mm, → 14 mm, → 15 mm, → | 10 mm, → 12 mm, → 15 mm, → 15 mm, → 20 mm, → 30 mm, → | 20 mm, → 25 mm, → 25 mm, → 40 mm, → | 1 mm, → |
| Measuring range | 1...5 mm 2...4 mm 1...7 mm 0...40 mm 0...70 mm | 3...8 mm 2...10 mm 2...12 mm | | |
| Electrical connection | connector, 7/8" connector, 1/2" connector, M12 x 1 cable terminal chamber terminal chamber, removable cage clamp terminals | connector, 7/8" connector, 1/2" connector, M12 x 1 cable terminal chamber terminal chamber, removable cage clamp terminals | cable terminal chamber | cable |
| Output | 2-wire DC NAMUR 2-wire DC 2-wire AC/DC 2-wire DC Analog output 3-wire DC PNP 3-wire DC NPN 3-wire DC Analog output 4-wire DC PNP 4-wire DC NPN 4-wire DC Analog output 4-wire DC PNP/Analog output | 2-wire DC NAMUR 2-wire DC 2-wire AC/DC 2-wire DC Analog output 3-wire DC PNP 3-wire DC NPN 4-wire DC PNP 4-wire DC NPN 4-wire DC Analog output 4-wire DC PNP/Analog output | 2-wire DC NAMUR 2-wire AC/DC 3-wire DC PNP 3-wire DC NPN 4-wire DC PNP 4-wire DC NPN | 3-wire DC PNP 3-wire DC NPN |

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EH04

EH6.5

K11

K20

| | | | | |
|------------------------------|--|--|----------------------------------|---|
| Design | smooth barrel 4 mm | smooth barrel 6.5 mm | smooth barrel 11 mm | smooth barrel 20 mm |
| Switching distance | 1 mm, | 1.5 mm, 2 mm, 3 mm, 6 mm, | 2 mm, 5 mm, | 5 mm, 10 mm, 12 mm, |
| Measuring range | 0.1 ... 1.5 mm | 0.25 ... 1.25 mm | | |
| Electrical connection | connector, M8 x 1 connector, M12 x 1 cable | connector, M8 x 1 cable | cable terminal chamber | connector, M12 x 1 cable terminal chamber |
| Output | 2-wire DC NAMUR 3-wire DC PNP 3-wire DC NPN 4-wire DC Analog output | 2-wire DC NAMUR 3-wire DC PNP 3-wire DC NPN 3-wire DC Analog output | 2-wire DC NAMUR 3-wire DC PNP | 2-wire DC NAMUR 2-wire AC/DC 3-wire DC PNP 3-wire DC NPN |

Designs and variants

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K34

K40

W30

R-Q80

Design

smooth barrel 34 mm

smooth barrel 40 mm

ring sensor W30

ring sensor Q80

Switching distance

20 mm,

15 mm,
 20 mm,
 30 mm,

Internal ring diameter

30.1 mm
 6.1 mm
 10.1 mm
 15.1 mm
 20.1 mm

50 mm
 65 mm

Electrical connection

cable
 terminal chamber

terminal chamber

connector, M12 x 1

connector, M12 x 1

Output

4-wire DC PNP

2-wire AC/DC
 3-wire DC PNP
 3-wire DC NPN
 4-wire DC PNP
 4-wire DC NPN

3-wire DC PNP
 3-wire DC NPN

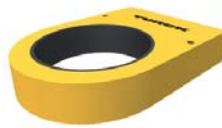
3-wire DC PNP
 4-wire DC Analog output

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S32SR

S32 xL

K08

K09

| | | | | |
|-----------------------------------|-------------------------|--------------------|---|-----------------|
| Design | ring sensor S32SR | ring sensor S32 | slot sensor K08 | slot sensor K09 |
| Slot width | | | 2 mm | 5 mm |
| Internal ring diameter | 20 mm 40 mm 65 mm | 100 mm | | |
| Steel wire diameter (St37) | 0.4 mm 1 mm 2 mm | 4 mm | | |
| Electrical connection | terminal chamber | connector, M12 x 1 | cable | cable |
| Output | 4-wire DC PNP | 4-wire DC PNP | 2-wire DC NAMUR 3-wire DC PNP 3-wire DC NPN | 2-wire DC NAMUR |

Designs and variants

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| | K10 | K30 | DSC26 | DSU35 |
|------------------------------|---|---|--|--|
| Design | slot sensor K10 | slot sensor K30 | dual sensor for valve monitoring DSC26 | dual sensor for valve monitoring DSU35 |
| Switching distance | | | 4 mm, | 4 mm, |
| Slot width | 3.5 mm | 15 mm | | |
| Electrical connection | cable | cable | connector, M12 x 1 cable | connector, M12 x 1 cable terminal chamber |
| Output | 2-wire DC NAMUR 3-wire DC PNP 3-wire DC NPN | 2-wire DC NAMUR 2-wire AC/DC 3-wire DC PNP 3-wire DC NPN | 4-wire DC NAMUR 4-wire DC PNP | 4-wire DC NAMUR 4-wire DC PNP 4-wire DC 2-wire 4-wire AC/DC |

s and variants

Rectangular design

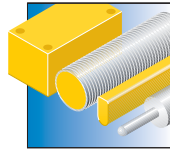


Rectangular inductive sensors fit to measure. The large switching distances provide excellent operational reliability. Only extremely resistant housing materials are used. They are quickly installed thanks to the optimally located mounting holes. All standard electrical output and connection types are available.

Features

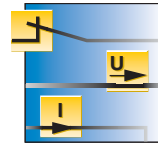
- Stable and resistant plastic housings
- Large switching distances
- Perfect mounting
- All connection types

Properties



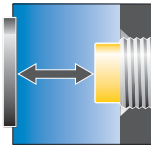
Design

From the small compact Q5SE to the big sized K90 Ø 90 mm version



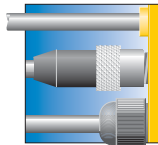
Electrical versions

NAMUR, 2/3 and 4-wire DC, 2-wire AC/DC



Switching distances

0.8 mm for exact position detection, 100 mm versions for long ranges



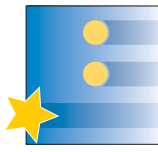
Electrical connections

All standard connection modes, cable, plug connection, terminal chamber and pigtail



Materials

Plastic and metal housings for all types of applications, rugged and chemical resistant



Special features

Factor 1
Extended temperature range
Approvals (et al. ATEX and SIL)

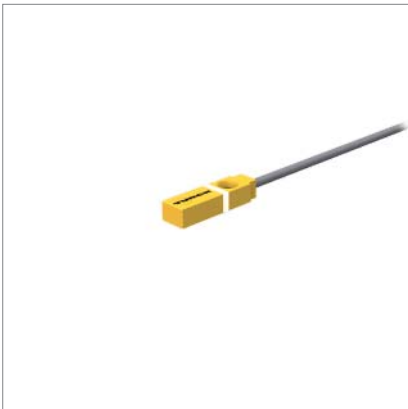
Q5SE – 3-wire DC



| | | | |
|------------------------------|-----------------|--------------------------|-------------|
| Type | BI0,8-Q5SE-AP6X | Operating voltage | 10...30 VDC |
| Dimensions | 5 x 5 x 25 mm | Material housing | AL |
| Switching distance | 0.8 mm | Material cable | PUR 2 m |
| Output | —, PNP | Wiring diagram | w004 |
| Electrical connection | cable | Dimension drawing | d082 |

Lateral active face

Q5.5 – 3-wire DC



| | | | |
|------------------------------|-----------------|-------------------------|---------|
| General data | | Material housing | PP |
| Dimensions | 8 x 5.5 x 28 mm | Material cable | PUR 2 m |
| Electrical connection | cable | | |
| Operating voltage | 10...30 VDC | | |

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-----------------|--------------------|--------|------|------|
| BI2-Q5,5-AP6X | 2 mm, | —, PNP | w004 | d083 |
| BI2-Q5,5-AN6X | 2 mm, | —, NPN | w005 | d083 |
| NI3,5-Q5,5-AP6X | 3.5 mm, | —, PNP | w004 | d083 |
| NI3,5-Q5,5-AN6X | 3.5 mm, | —, NPN | w005 | d083 |

Q06 – 3-wire DC



General data

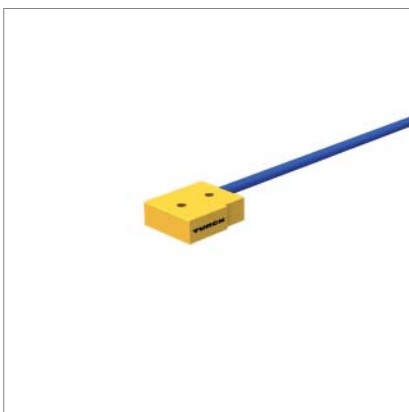
| | |
|------------------------------|--------------------|
| Dimensions | 17.3 x 6 x 27.8 mm |
| Switching distance | 3 mm, |
| Electrical connection | cable |

| | |
|--------------------------|-------------|
| Operating voltage | 10...30 VDC |
| Material housing | PBT |
| Material cable | PUR 2 m |

Types and data – selection table

| Type | Output | w | d |
|---------------|--------|------|------|
| BI3-Q06-AP6X2 | , PNP | w004 | d084 |
| BI3-Q06-AN6X2 | , NPN | w005 | d084 |

Q6.5 – NAMUR



General data

| | |
|------------------------------|------------------|
| Dimensions | 17 x 6.5 x 20 mm |
| Output | NAMUR |
| Electrical connection | cable |

| | |
|--------------------------|--------------|
| Operating voltage | nom. 8.2 VDC |
| Material housing | PP GR-20 |
| Material cable | PVC 2 m |

Types and data – selection table

| Type | Switching distance | w | d |
|-------------|--------------------|------|------|
| BI1-Q6,5-Y1 | 1 mm, | w019 | d085 |
| NI2-Q6,5-Y1 | 2 mm, | w019 | d085 |

Q6.5 – 3-wire DC



General data

| | | | |
|------------------------------|------------------|--------------------------|-------------|
| Dimensions | 17 x 6.5 x 20 mm | Operating voltage | 10...30 VDC |
| Output | —, PNP | Material housing | PP GR-20 |
| Electrical connection | cable | Material cable | PUR 2 m |

Types and data – selection table

| Type | Switching distance | w | d |
|------------------|--------------------|------|------|
| B11-Q6,5-AP6/S34 | 1 mm, | w004 | d085 |
| NI2-Q6,5-AP6/S34 | 2 mm, | w004 | d085 |

Q8SE – 3-wire DC



General data

| | | | |
|---------------------------|---------------|--------------------------|-------------|
| Dimensions | 8 x 8 x 40 mm | Operating voltage | 10...30 VDC |
| Switching distance | 4 mm, | Material housing | PP |

Lateral active face

Types and data – selection table

| Type | Output | Electrical connection | Material cable | w | d |
|----------------------|--------|-----------------------|----------------|------|------|
| NI4U-Q8SE-AP6X-V1131 | —, PNP | connector, M8 x 1 | - | w001 | d001 |
| NI4U-Q8SE-AP6X | —, PNP | cable | PUR 2 m | w004 | d003 |
| NI4U-Q8SE-AN6X-V1131 | —, NPN | connector, M8 x 1 | - | w002 | d001 |
| NI4U-Q8SE-AN6X | —, NPN | cable | PUR 2 m | w005 | d003 |

Q08 – NAMUR



| | | | |
|------------------------------|----------------|--------------------------|--------------|
| Type | BI5-Q08-Y1X | Operating voltage | nom. 8.2 VDC |
| Dimensions | 20 x 8 x 32 mm | Material housing | GD-Zn |
| Switching distance | 5 mm, | Material cable | PVC 2 m |
| Output | NAMUR | Wiring diagram | w019 |
| Electrical connection | cable | Dimension drawing | d086 |

Q08 – 3-wire DC



| | | | |
|--------------------------|----------------|-------------------------|-------|
| General data | | Material housing | GD-Zn |
| Dimensions | 20 x 8 x 32 mm | | |
| Operating voltage | 10...30 VDC | | |

Types and data – selection table

| Type | Switching distance | Output | Electrical connection | Material cable | | |
|---------------------------|--------------------|--------|--|----------------|------|------|
| BI8U-Q08-AP6X2-V1131 | 8 mm, | , PNP | connector, flange connector, Ø 8 mm | - | w001 | d005 |
| BI8U-Q08-AP6X2 | 8 mm, | , PNP | cable | PUR | w004 | d004 |
| BI8U-Q08-AN6X2-V1131 | 8 mm, | , NPN | connector, Ø 8 mm | - | w002 | d005 |
| BI8U-Q08-AN6X2 | 8 mm, | , NPN | cable | PUR | w005 | d004 |
| BI5U-Q08-AP6X2-V2131 | 5 mm, | , PNP | connector, M8 x 1 | - | w001 | d087 |
| BI5U-Q08-AP6X2-V1131 | 5 mm, | , PNP | connector, Ø 8 mm | - | w001 | d089 |
| BI5U-Q08-AP6X2-1XOR-RS4 | 5 mm, | , PNP | cable with connector | PVC 1 m | w001 | d088 |
| BI5U-Q08-AP6X2-0,5XOR-RS4 | 5 mm, | , PNP | cable with connector | PVC 0.5 m | w001 | d088 |
| BI5U-Q08-AP6X2 | 5 mm, | , PNP | cable | PUR | w004 | d086 |
| BI5U-Q08-AN6X2-V1131 | 5 mm, | , NPN | connector, Ø 8 mm | - | w002 | d089 |
| BI5U-Q08-AN6X2 | 5 mm, | , NPN | cable | PUR | w005 | d086 |

Q08 – 4-wire DC



General data

Dimensions 20 x 8 x 32 mm
Operating voltage 10...30 VDC

Material housing

GD-Zn

Types and data – selection table

| Type | Switching distance | Output | Electrical connection | Material cable | w | d |
|---------------------|--------------------|--------|-----------------------|----------------|------|------|
| BI7-Q08-VP6X2-V1141 | 7 mm, | , PNP | connector, Ø 8 mm | - | w008 | d089 |
| BI7-Q08-VP6X2 | 7 mm, | , PNP | cable | PUR 2 m | w007 | d086 |
| BI7-Q08-VN6X2-V1141 | 7 mm, | , NPN | connector,, Ø 8 mm | - | w010 | d089 |
| BI7-Q08-VN6X2 | 7 mm, | , NPN | cable | PUR 2 m | w018 | d086 |
| BI5-Q08-VP6X2 | 5 mm, | , PNP | cable | PUR 2 m | w007 | d086 |
| BI5-Q08-VN6X2 | 5 mm, | , NPN | cable | PUR 2 m | w018 | d086 |

Q9.5 – 3-wire DC



Type NI2-Q9,5-AP6/S34
Dimensions 17 x 9,5 x 20 mm
Switching distance 2 mm,
Output , PNP
Electrical connection cable

Operating voltage 10...30 VDC
Material housing PP GR-20
Material cable PUR 2 m
Wiring diagram w004
Dimension drawing d090

Q10 – 3-wire DC



General data

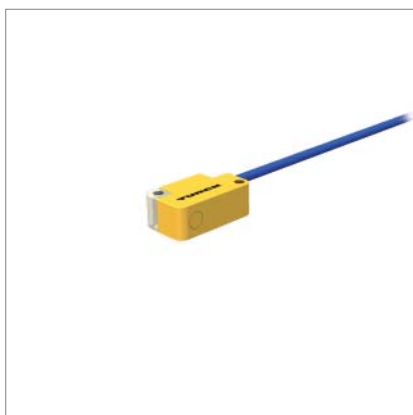
Dimensions 25 x 10.8 x 42 mm
Switching distance 8 mm,

Operating voltage 10...30 VDC
Material housing PBT

Types and data – selection table

| Type | Output | Electrical connection | Material cable | | |
|----------------------|--------|-----------------------|----------------|------|------|
| BI8U-Q10-AP6X2-V1131 | PNP | connector, M8 x 1 | - | w001 | d091 |
| BI8U-Q10-AP6X2 | PNP | cable | PUR 2 m | w004 | d092 |
| BI8U-Q10-AN6X2-V1131 | NPN | connector, M8 x 1 | - | w002 | d091 |
| BI8U-Q10-AN6X2 | NPN | cable | PUR 2 m | w005 | d092 |

Q10S – NAMUR



Type BI2-Q10S-Y1X
Dimensions 16 x 10.2 x 27.8 mm
Switching distance 2 mm,

Operating voltage nom. 8.2 VDC
Material housing PP
Material cable PVC 2 m
Wiring diagram w019
Dimension drawing d007

Lateral active face

Q10S – 3-wire DC



General data

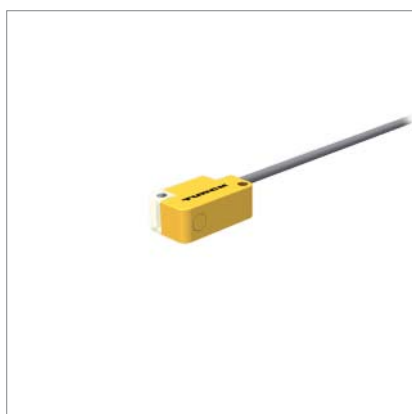
| | | | |
|--------------------------|---------------------|-------------------------|----|
| Dimensions | 16 x 10.2 x 27.8 mm | Material housing | PP |
| Operating voltage | 10...30 VDC | | |

Lateral active face

Types and data – selection table

| Type | Switching distance | Output | Electrical connection | Material cable | w | d |
|--------------------------|--------------------|--------|-----------------------|----------------|------|------|
| BI2-Q10S-AP6X-0,2-PSG3M | 2 mm, | , PNP | connector, M8 x 1 | PUR 0.2 m | w001 | d006 |
| BI2-Q10S-AP6X | 2 mm, | , PNP | cable | PUR 2 m | w004 | d007 |
| BI2-Q10S-AN6X | 2 mm, | , NPN | cable | PUR 2 m | w005 | d007 |
| NI5U-Q10S-AP6X-0,3-PSG3M | 5 mm, | , PNP | cable with connector | PUR 0.3 m | w001 | d006 |
| NI5U-Q10S-AP6X | 5 mm, | , PNP | cable | PUR 2 m | w004 | d007 |
| NI5U-Q10S-AN6X-0,3-PSG3M | 5 mm, | , NPN | cable with connector | PUR 0.3 m | w002 | d006 |
| NI5U-Q10S-AN6X | 5 mm, | , NPN | cable | PUR 2 m | w005 | d007 |

Q10S – 4-wire DC



General data

| | | | |
|------------------------------|---------------------|--------------------------|-------------|
| Dimensions | 16 x 10.2 x 27.8 mm | Operating voltage | 10...30 VDC |
| Switching distance | 2 mm, | Material housing | PP |
| Electrical connection | cable | Material cable | PUR 2 m |

Lateral active face

Types and data – selection table

| Type | Output | w | d |
|---------------|--------|------|------|
| BI2-Q10S-VP6X | , PNP | w007 | d007 |
| BI2-Q10S-VN6X | , NPN | w018 | d007 |

Wiring diagrams on page 832 ff

Dimension drawings on page 842 ff

Accessories on page 736 ff

Q10S – 2-wire AC/DC



| | | | |
|------------------------------|---------------------|--------------------------|--------------------------------|
| Type | BI2-Q10S-AZ31X | Operating voltage | 20...250 VAC / 10...300 VDC |
| Dimensions | 16 x 10.2 x 27.8 mm | Material housing | PP |
| Switching distance | 2 mm, | Material cable | PUR 2 m |
| Output | | Wiring diagram | w020 |
| Electrical connection | cable | Dimension drawing | d007 |

Lateral active face

Q12 – 3-wire DC

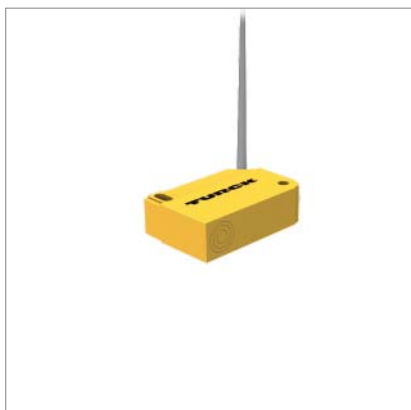


| | | | |
|---------------------------|-----------------|--------------------------|-------------|
| General data | | Operating voltage | 10...30 VDC |
| Dimensions | 26 x 12 x 40 mm | Material housing | PA |
| Switching distance | 5 mm, | | |

Types and data – selection table

| Type | Output | Electrical connection | Material cable | w | d |
|----------------------|--------|-----------------------|----------------|------|------|
| BI5U-Q12-AP6X2-V1131 | PNP | connector, M8 x 1 | - | w001 | d008 |
| BI5U-Q12-AP6X2-H1141 | PNP | connector, M12 x 1 | - | w001 | d009 |
| BI5U-Q12-AP6X2 | PNP | cable | PUR 2 m | w004 | d010 |
| BI5U-Q12-AN6X2-V1131 | NPN | connector, M8 x 1 | - | w002 | d008 |
| BI5U-Q12-AN6X2-H1141 | NPN | connector, M12 x 1 | - | w002 | d009 |
| BI5U-Q12-AN6X2 | NPN | cable | PUR 2 m | w005 | d010 |

Q12 – 4-wire DC





General data

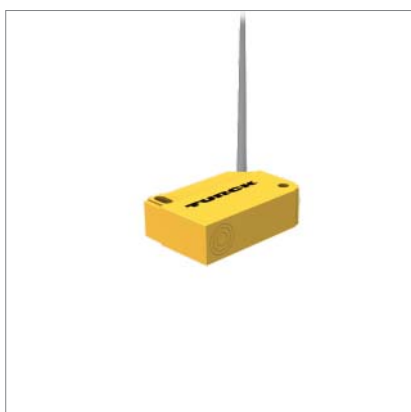
Dimensions 26 x 12 x 40 mm
Switching distance 5 mm, 
Electrical connection cable

Operating voltage 10...30 VDC
Material housing PA


Types and data – selection table

| Type | Output | Material cable | w | d |
|-------------------|---|----------------|------|------|
| B15U-Q12-VP6X2 7M |  , PNP | PUR 7 m | w007 | d010 |
| B15U-Q12-VN6X2 7M |  , NPN | PUR 2 m | w018 | d010 |

Q12 – 2-wire AC/DC



General data

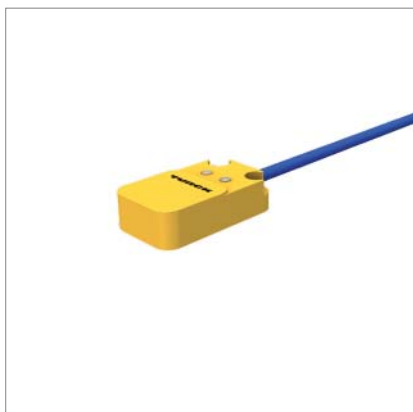
Dimensions 26 x 12 x 40 mm
Output 
Electrical connection cable


Operating voltage 20...250 VAC /
10...300 VDC
Material housing PA
Material cable PVC 2 m

Types and data – selection table

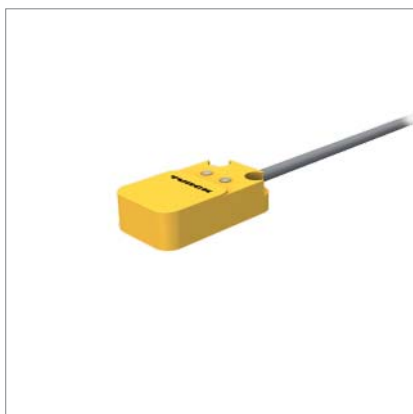
| Type | Switching distance | w | d |
|---------------|---|------|------|
| B12-Q12-AZ31X | 2 mm,  | w020 | d093 |
| N14-Q12-AZ31X | 4 mm,  | w020 | d093 |

Q14 – NAMUR



















| | | | |
|------------------------------|--|--------------------------|--------------|
| Type | BI10-Q14-Y1X | Operating voltage | nom. 8.2 VDC |
| Dimensions | 30 x 14 x 52 mm | Material housing | PBT |
| Switching distance | 10 mm,  | Material cable | PVC 2 m |
| Output | NAMUR | Wiring diagram | w019 |
| Electrical connection | cable | Dimension drawing | d094 |

Q14 – 3-wire DC

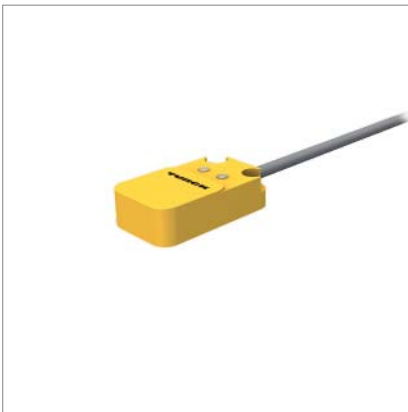


| | | | |
|--------------------------|-----------------|-------------------------|-----|
| General data | | Material housing | PBT |
| Dimensions | 30 x 14 x 52 mm | | |
| Operating voltage | 10...30 VDC | | |

Types and data – selection table

| Type | Switching distance | Output | Electrical connection | Material cable | w | d |
|-----------------------|--|---|-----------------------|----------------|------|------|
| BI10U-Q14-AP6X2-V1131 | 10 mm,  |  , PNP | connector, M8 x 1 | - | w001 | d095 |
| BI10U-Q14-AP6X2 | 10 mm,  |  , PNP | cable | PUR 2 m | w004 | d096 |
| BI10U-Q14-AN6X2-V1131 | 10 mm,  |  , NPN | connector, M8 x 1 | - | w002 | d095 |
| BI10U-Q14-AN6X2 | 10 mm,  |  , NPN | cable | PUR 2 m | w005 | d096 |
| NI20-Q14-AP6X2-V1131 | 20 mm,  |  , PNP | connector, M8 x 1 | - | w001 | d095 |
| NI20-Q14-AP6X2 | 20 mm,  |  , PNP | cable | PUR 2 m | w004 | d096 |
| NI20-Q14-AN6X2-V1131 | 20 mm,  |  , NPN | connector, M8 x 1 | - | w002 | d095 |
| NI20-Q14-AN6X2 | 20 mm,  |  , NPN | cable | PUR 2 m | w005 | d096 |

Q14 – 2-wire AC/DC



| | | | |
|------------------------------|------------------|--------------------------|--------------------------------|
| Type | BI10-Q14-ADZ32X2 | Operating voltage | 20...250 VAC / 10...300 VDC |
| Dimensions | 30 x 14 x 52 mm | Material housing | PBT |
| Switching distance | 10 mm, | Material cable | PUR 2 m |
| Output | | Wiring diagram | w020 |
| Electrical connection | cable | Dimension drawing | d096 |

Q18 – 3-wire DC



| | | | |
|------------------------------|-----------------|--------------------------|-------------|
| General data | | Operating voltage | 10...30 VDC |
| Dimensions | 18 x 18 x 29 mm | Material housing | PBT |
| Switching distance | 5 mm, | Material cable | PVC 2 m |
| Electrical connection | cable | | |

Types and data – selection table

| Type | Output | | |
|--------------|--------|------|------|
| NI5-Q18-AP6X | , PNP | w004 | d097 |
| NI5-Q18-AN6X | , NPN | w005 | d097 |

Q20 – NAMUR



General data

| | |
|---------------------------|-----------------|
| Dimensions | 40 x 20 x 68 mm |
| Switching distance | 15 mm, |
| Output | NAMUR |

| | |
|--------------------------|--------------|
| Operating voltage | nom. 8.2 VDC |
| Material housing | PBT |

Types and data – selection table

| Type | Electrical connection | Material cable | w | d |
|--------------------|-----------------------|----------------|------|------|
| BI15-Q20-Y1X-H1141 | connector, M12 x 1 | - | w021 | d098 |
| BI15-Q20-Y1X | cable | PVC 2 m | w019 | d099 |

Q20 – 3-wire DC



General data

| | |
|--------------------------|-----------------|
| Dimensions | 40 x 20 x 68 mm |
| Operating voltage | 10...30 VDC |

| | |
|-------------------------|-----|
| Material housing | PBT |
|-------------------------|-----|

Types and data – selection table

| Type | Switching distance | Output | Electrical connection | Material cable | w | d |
|-----------------------|--------------------|--------|-----------------------|----------------|------|------|
| BI15U-Q20-AP6X2-H1141 | 15 mm, | PNP | connector, M12 x 1 | - | w001 | d098 |
| BI15U-Q20-AP6X2 | 15 mm, | PNP | cable | PUR 2 m | w004 | d100 |
| BI15U-Q20-AN6X2-H1141 | 15 mm, | NPN | connector, M12 x 1 | - | w002 | d098 |
| BI15U-Q20-AN6X2 | 15 mm, | NPN | cable | PUR 2 m | w005 | d100 |
| NI25-Q20-AP6X2-H1141 | 25 mm, | PNP | connector, M12 x 1 | - | w001 | d098 |
| NI25-Q20-AP6X2 | 25 mm, | PNP | cable | PUR 2 m | w004 | d100 |
| NI25-Q20-AN6X2-H1141 | 25 mm, | NPN | connector, M12 x 1 | - | w002 | d098 |
| NI25-Q20-AN6X2 | 25 mm, | NPN | cable | PUR 2 m | w005 | d100 |

Q25 – 3-wire DC



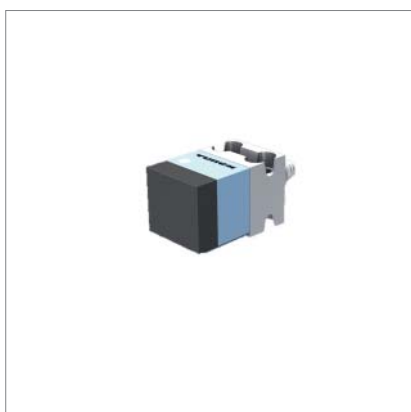
General data

| | | | |
|------------------------------|---------------------|--------------------------|-------------|
| Dimensions | 25 x 25.5 x 38.5 mm | Operating voltage | 10...30 VDC |
| Switching distance | 10 mm, | Material housing | PBT |
| Electrical connection | cable | Material cable | PVC 2 m |

Types and data – selection table

| Type | Output | w | d |
|---------------|--------|------|------|
| NI10-Q25-AP6X | , PNP | w004 | d101 |
| NI10-Q25-AN6X | , NPN | w005 | d101 |

CA25 – 3-wire DC



General data

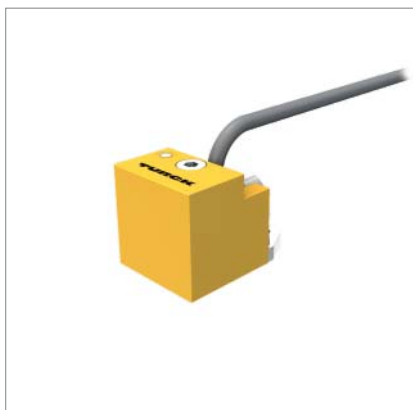
| | | | |
|-------------------|-----------------|--------------------------|-------------|
| Dimensions | 25 x 25 x 40 mm | Operating voltage | 10...30 VDC |
| Output | , PNP | Material housing | GD-CuZn |

Variable orientation of active face in 5 directions

Types and data – selection table

| Type | Switching distance | Electrical connection | w | d |
|------------------------|--------------------|-----------------------|------|------|
| BI10U-CA25-AP6X2-V1131 | 10 mm, | connector, M8 x 1 | w001 | d102 |
| BI10U-CA25-AP6X2-H1141 | 10 mm, | connector, M12 x 1 | w001 | d103 |
| NI15U-CA25-AP6X2-V1131 | 15 mm, | connector, M8 x 1 | w001 | d102 |
| NI15U-CA25-AP6X2-H1141 | 15 mm, | connector, M12 x 1 | w001 | d103 |

QN26 – 3-wire DC



General data

Dimensions

26 x 26 x 43 mm

Switching distance

10 mm,

Output

, 2-wire

Operating voltage

10...65 VDC

Material housing

PBT

Variable orientation of active face in 4 directions

Types and data – selection table

| Type | Electrical connection | Material cable | | |
|--|-------------------------------|----------------|------|------|
| BI10-QN26-AD4X/S90 | cable | PUR 2 m | w022 | d105 |
| BI10-QN26-AD4X-0,15XOR-RS4.23/S100-S1589 | cable with connector, M12 x 1 | PUR 0.15 m | w009 | d106 |
| BI10-QN26-AD4X-0,15-RS4.23/S90 | cable with connector, M12 x 1 | PUR 0.15 m | w009 | d104 |

Q40 – 3-wire DC



Type

NI22U-Q40-AP6X2-H1141

Dimensions

40 x 52.5 x 67 mm

Switching distance

22 mm,

Output

, PNP

Electrical connection

connector, M12 x 1

Operating voltage

10...30 VDC

Material housing

PBT

Wiring diagram

w001

Dimension drawing

d107

Special versions, height-adjustable, for pressing tools

CA40 – 3-wire DC



General data

| | |
|------------------------------|--------------------|
| Dimensions | 40 x 40 x 48 mm |
| Switching distance | 20 mm, |
| Electrical connection | connector, M12 x 1 |

| | |
|--------------------------|-------------|
| Operating voltage | 10...30 VDC |
| Material housing | GD-AI |

Variable orientation of active face in 5 directions

Types and data – selection table

| Type | Output | w | d |
|------------------------|--------|------|------|
| BI20U-CA40-AP6X2-H1141 | PNP | w001 | d108 |
| BI20U-CA40-AN6X2-H1141 | NPN | w002 | d108 |

CK40 – NAMUR



General data

| | |
|------------------------------|--------------------|
| Dimensions | 40 x 40 x 65 mm |
| Output | NAMUR |
| Electrical connection | connector, M12 x 1 |

| | |
|--------------------------|--------------|
| Operating voltage | nom. 8.2 VDC |
| Material housing | PBT |

Variable orientation of active face in 5 directions

Types and data – selection table

| Type | Switching distance | w | d |
|---------------------|--------------------|------|------|
| BI15-CK40-Y1X-H1141 | 15 mm, | w021 | d109 |
| NI20-CK40-Y1X-H1141 | 20 mm, | w021 | d109 |

CK40 – 2-wire DC



General data

Dimensions 40 x 40 x 65 mm
Output —, 2-wire
Electrical connection connector, M12 x 1

Operating voltage 10...65 VDC
Material housing PBT

Variable orientation of active face in 5 directions

Types and data – selection table

| Type | Switching distance | w | d |
|-----------------------|--------------------|------|------|
| BI15U-CK40-AD4X-H1144 | 15 mm, | w009 | d011 |
| BI15-CK40-AD4X-H1141 | 15 mm, | w023 | d109 |
| NI35U-CK40-AD4X-H1144 | 35 mm, | w009 | d012 |
| NI20-CK40-AD4X-H1141 | 20 mm, | w023 | d109 |

CK40 – 3-wire DC





















General data

Dimensions 40 x 40 x 65 mm
Electrical connection connector, M12 x 1

Operating voltage 10...30 VDC
Material housing PBT

Variable orientation of active face in 5 directions

Types and data – selection table

| Type | Switching distance | Output | w | d |
|------------------------|--|--------|------|------|
| BI30U-CK40-AP6X2-H1141 | 30 mm,  | —, PNP | w001 | d012 |
| BI30U-CK40-AN6X2-H1141 | 30 mm,  | —, NPN | w002 | d012 |
| BI20U-CK40-AP6X2-H1141 | 20 mm,  | —, PNP | w001 | d011 |
| BI20U-CK40-AN6X2-H1141 | 20 mm,  | —, NPN | w002 | d011 |
| BI15U-CK40-AP6X2-H1141 | 15 mm,  | —, PNP | w001 | d011 |
| BI15U-CK40-AN6X2-H1141 | 15 mm,  | —, NPN | w002 | d011 |
| BI15-CK40-AP6X2-H1141 | 15 mm,  | —, PNP | w001 | d011 |
| BI15-CK40-AN6X2-H1141 | 15 mm,  | —, NPN | w002 | d011 |
| NI50U-CK40-AP6X2-H1141 | 50 mm,  | —, PNP | w001 | d012 |
| NI50U-CK40-AN6X2-H1141 | 50 mm,  | —, NPN | w002 | d012 |
| NI40U-CK40-AP6X2-H1141 | 40 mm,  | —, PNP | w001 | d012 |
| NI35U-CK40-AP6X2-H1141 | 35 mm,  | —, PNP | w001 | d012 |
| NI35U-CK40-AN6X2-H1141 | 35 mm,  | —, NPN | w002 | d012 |
| NI35-CK40-AP6X2-H1141 | 35 mm,  | —, PNP | w001 | d011 |
| NI25U-CK40-AP6X2-H1141 | 25 mm,  | —, PNP | w001 | d012 |
| NI25U-CK40-AN6X2-H1141 | 25 mm,  | —, NPN | w002 | d012 |
| NI20-CK40-AP6X2-H1141 | 20 mm,  | —, PNP | w001 | d011 |
| NI20-CK40-AN6X2-H1141 | 20 mm,  | —, NPN | w002 | d011 |

CK40 – 4-wire DC



General data

Dimensions

40 x 40 x 65 mm

Operating voltage

10...65 VDC

Electrical connection















connector, M12 x 1

Material housing

PBT

Variable orientation of active face in 5 directions

Types and data – selection table

| Type | Switching distance | Output | w | d |
|------------------------|--|---|------|------|
| BI20U-CK40-VP4X2-H1141 | 20 mm,  |  , PNP | w008 | d011 |
| BI20U-CK40-VN4X2-H1141 | 20 mm,  |  , NPN | w010 | d011 |
| BI15U-CK40-VP4X2-H1141 | 15 mm,  |  , PNP | w008 | d011 |
| BI15U-CK40-VN4X2-H1141 | 15 mm,  |  , NPN | w010 | d011 |
| NI50U-CK40-VP4X2-H1141 | 50 mm,  |  , PNP | w008 | d012 |
| NI50U-CK40-VN4X2-H1141 | 50 mm,  |  , NPN | w010 | d012 |
| NI25U-CK40-VP4X2-H1141 | 25 mm,  |  , PNP | w008 | d012 |

CK40 – 2-wire AC/DC



General data

Dimensions

40 x 40 x 65 mm

Operating voltage

20...250 VAC /
10...300 VDC

Output




Material housing

PBT

Variable orientation of active face in 5 directions

Types and data – selection table

| Type | Switching distance | Electrical connection | w | d |
|--------------------------|--|-----------------------|------|------|
| BI15U-CK40-ADZ30X2-B3131 | 15 mm,  | connector, 1/2" | w025 | d113 |
| BI15U-CK40-ADZ30X2-B1131 | 15 mm,  | connector, 7/8" | w024 | d111 |
| NI35U-CK40-ADZ30X2-B3131 | 35 mm,  | connector, 1/2" | w025 | d112 |
| NI35U-CK40-ADZ30X2-B1131 | 35 mm,  | connector, 7/8" | w024 | d110 |

CP40 – NAMUR



General data

Dimensions

40 x 40 x 114 mm

Operating voltage

nom. 8.2 VDC

Output

NAMUR

Material housing



PBT

Electrical connection

terminal chamber

Variable orientation of active face in 9 directions

Types and data – selection table

| Type | Switching distance | w | d |
|---------------|--|------|------|
| BI20-CP40-Y1X | 20 mm,  | w026 | d114 |
| BI15-CP40-Y1X | 15 mm,  | w026 | d114 |
| NI20-CP40-Y1X | 20 mm,  | w026 | d114 |

CP40 – 2-wire DC



General data

Dimensions 40 x 40 x 114 mm
Output , 2-wire
Electrical connection terminal chamber

Operating voltage 10...65 VDC
Material housing PBT

Variable orientation of active face in 9 directions

Types and data – selection table

| Type | Switching distance | w | d |
|----------------|--|------|------|
| BI15-CP40-AD4X | 15 mm,  | w027 | d114 |
| NI20-CP40-AD4X | 20 mm,  | w027 | d114 |

CP40 – 3-wire DC




General data


Dimensions 40 x 40 x 114 mm
Operating voltage 10...30 VDC

Material housing PBT
















Variable orientation of active face in 9 directions

 Wiring diagrams on page 832 ff

 Dimension drawings on page 842 ff

 Accessories on page 736 ff

Types and data – selection table

| Type | Switching distance | Output | Electrical connection | w | d |
|------------------------|--|--------|-----------------------|------|------|
| BI30U-CP40-AP6X2 | 30 mm,  | —, PNP | terminal chamber | w011 | d014 |
| BI30U-CP40-AN6X2 | 30 mm,  | —, NPN | terminal chamber | w012 | d014 |
| BI20U-CP40-AP6X2 | 20 mm,  | —, PNP | terminal chamber | w011 | d014 |
| BI20U-CP40-AN6X2 | 20 mm,  | —, NPN | terminal chamber | w012 | d014 |
| BI15U-CP40-AP6X2 | 15 mm,  | —, PNP | terminal chamber | w011 | d014 |
| BI15U-CP40-AN6X2 | 15 mm,  | —, NPN | terminal chamber | w012 | d014 |
| BI15-CP40-AP6X2 | 15 mm,  | —, PNP | terminal chamber | w011 | d014 |
| BI15-CP40-AN6X2 | 15 mm,  | —, NPN | terminal chamber | w012 | d014 |
| NI50U-CP40-AP6X2-H1141 | 50 mm,  | —, PNP | connector, M12 x 1 | w001 | d115 |
| NI50U-CP40-AP6X2 | 50 mm,  | —, PNP | terminal chamber | w011 | d014 |
| NI50U-CP40-AN6X2 | 50 mm,  | —, NPN | terminal chamber | w012 | d014 |
| NI40U-CP40-AP6X2 | 40 mm,  | —, PNP | terminal chamber | w011 | d014 |
| NI40U-CP40-AN6X2 | 40 mm,  | —, NPN | terminal chamber | w012 | d014 |
| NI20-CP40-AP6X2 | 20 mm,  | —, PNP | terminal chamber | w011 | d014 |
| NI20-CP40-AN6X2 | 20 mm,  | —, NPN | terminal chamber | w012 | d014 |

CP40 – 4-wire DC



General data

Dimensions 40 x 40 x 114 mm

Material housing PBT

Operating voltage 10...65 VDC

Variable orientation of active face in 9 directions

Types and data – selection table

| Type | Switching distance | Output | Electrical connection | w | d |
|------------------------|--------------------|--------|-----------------------|------|------|
| BI20U-CP40-VP4X2 | 20 mm, | —, PNP | terminal chamber | w014 | d014 |
| BI20U-CP40-VN4X2 | 20 mm, | —, NPN | terminal chamber | w013 | d014 |
| BI15U-CP40-VP4X2-H1141 | 15 mm, | —, PNP | connector, M12 x 1 | w008 | d115 |
| BI15U-CP40-VP4X2 | 15 mm, | —, PNP | terminal chamber | w014 | d014 |
| BI15-CP40-VP4X2 | 15 mm, | —, PNP | terminal chamber | w014 | d014 |
| BI15-CP40-VN4X2 | 15 mm, | —, NPN | terminal chamber | w013 | d014 |
| NI50U-CP40-VP4X2 | 50 mm, | —, PNP | terminal chamber | w014 | d014 |
| NI50U-CP40-VN4X2 | 50 mm, | —, NPN | terminal chamber | w013 | d014 |
| NI40U-CP40-VP4X2-H1141 | 40 mm, | —, PNP | connector, M12 x 1 | w008 | d115 |
| NI40U-CP40-VP4X2 | 40 mm, | —, PNP | terminal chamber | w014 | d014 |
| NI40U-CP40-VN4X2 | 40 mm, | —, NPN | terminal chamber | w013 | d014 |
| NI35-CP40-VP4X2 | 35 mm, | —, PNP | terminal chamber | w014 | d014 |
| NI35-CP40-VN4X2 | 35 mm, | —, NPN | terminal chamber | w013 | d014 |
| NI20-CP40-VP4X2 | 20 mm, | —, PNP | terminal chamber | w014 | d014 |
| NI20-CP40-VN4X2 | 20 mm, | —, NPN | terminal chamber | w013 | d014 |

CP40 – 2-wire AC/DC



General data

Dimensions

40 x 40 x 114 mm

Electrical connection

terminal chamber

Output

connection programmable

Material housing

PBT

Variable orientation of active face in 9 directions


Types and data – selection table

| Type | Switching distance | Operating voltage | w | d |
|--------------------|--------------------|-----------------------------|------|------|
| BI15U-CP40-FDZ30X2 | 15 mm, | 20...250 VAC / 10...300 VDC | w028 | d014 |
| BI15-CP40-FZ3X2 | 15 mm, | 20...250 VAC / 10...300 VDC | w028 | d014 |
| NI40U-CP40-FDZ30X2 | 40 mm, | 20...250 VAC / 10...300 VDC | w028 | d014 |
| NI35-CP40-FZ3X2 | 35 mm, | 20...250 VAC / 10...300 VDC | w028 | d014 |
| NI20NF-CP40-FZ3X2 | 20 mm, | 20...250 VAC | w029 | d116 |
| NI20-CP40-FZ3X2 | 20 mm, | 20...250 VAC / 10...300 VDC | w028 | d014 |

QV40 – 3-wire DC





General data

Dimensions 40 x 40 x 65 mm
Output , PNP
Electrical connection connector, M12 x 1

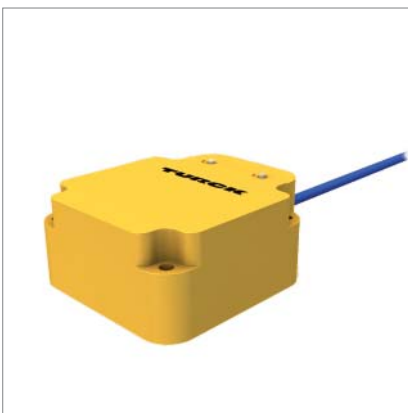
Operating voltage 10...30 VDC
Material housing PBT

Variable orientation of active face in 5 directions

Types and data – selection table

| Type | Switching distance | w | d |
|------------------------|--|------|------|
| BI20U-QV40-AP6X2-H1141 | 20 mm,  | w001 | d013 |
| NI50U-QV40-AP6X2-H1141 | 50 mm,  | w001 | d013 |

Q80 – NAMUR





General data

Dimensions 80 x 40 x 92 mm
Output NAMUR
Electrical connection cable

Operating voltage nom. 8.2 VDC
Material housing PBT
Material cable PVC 2 m

Types and data – selection table

| Type | Switching distance | w | d |
|--------------|--|------|------|
| BI50-Q80-Y1X | 50 mm,  | w019 | d117 |
| NI60-Q80-Y1X | 60 mm,  | w019 | d117 |

Q80 – 3-wire DC



General data

| | | | |
|------------------------------|--------------------|--------------------------|-------------|
| Dimensions | 80 x 40 x 92 mm | Operating voltage | 10...30 VDC |
| Electrical connection | connector, M12 x 1 | Material housing | PBT |

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-----------------------|--------------------|--------|------|------|
| BI50U-Q80-AP6X2-H1141 | 50 mm, | , PNP | w001 | d015 |
| BI50U-Q80-AN6X2-H1141 | 50 mm, | , NPN | w002 | d015 |
| NI75U-Q80-AP6X2-H1141 | 75 mm, | , PNP | w001 | d015 |

Q80 – 4-wire DC



General data


| | | | |
|------------------------------|--------------------|--------------------------|-------------|
| Dimensions | 80 x 40 x 92 mm | Operating voltage | 10...65 VDC |
| Electrical connection | connector, M12 x 1 | Material housing | PBT |

Types and data – selection table

| Type | Switching distance | Output | w | d |
|---------------------------|--------------------|--------|------|------|
| BI50U-Q80-VP4X2-H1141/3GD | 50 mm, | , PNP | w008 | d015 |
| BI50U-Q80-VP4X2-H1141 | 50 mm, | , PNP | w008 | d015 |
| BI50U-Q80-VN4X2-H1141 | 50 mm, | , NPN | w010 | d015 |
| NI75U-Q80-VP4X2-H1141 | 75 mm, | , PNP | w008 | d015 |

CP80 – NAMUR

























| | | | |
|------------------------------|--|--------------------------|--------------|
| Type | NI40-CP80-Y1 | Operating voltage | nom. 8.2 VDC |
| Dimensions | 80 x 41 x 80 mm | Material housing | PBT |
| Switching distance | 40 mm,  | Wiring diagram | w026 |
| Output | NAMUR | Dimension drawing | d118 |
| Electrical connection | terminal chamber | | |

CP80 – 4-wire DC



| | | | |
|--------------------------|-----------------|-------------------------|-----|
| General data | | Material housing | PBT |
| Dimensions | 80 x 41 x 80 mm | | |
| Operating voltage | 10...65 VDC | | |

Types and data – selection table

| Type | Switching distance | Output | Electrical connection |  |  |
|------------------------|--|---|-----------------------|---|---|
| BI40-CP80-VP4X2-H1141 | 40 mm,  |  , PNP | connector, M12 x 1 | w008 | d119 |
| BI40-CP80-VP4X2 | 40 mm,  |  , PNP | terminal chamber | w014 | d120 |
| BI40-CP80-VN4X2 | 40 mm,  |  , NPN | terminal chamber | w013 | d120 |
| NI75U-CP80-VP4X2-H1141 | 75 mm,  |  , PNP | connector, M12 x 1 | w008 | d119 |
| NI75U-CP80-VP4X2 | 75 mm,  |  , PNP | terminal chamber | w014 | d120 |
| NI75U-CP80-VN4X2 | 75 mm,  |  , NPN | terminal chamber | w013 | d120 |
| NI50-CP80-VP4X2 | 50 mm,  |  , PNP | terminal chamber | w014 | d120 |
| NI50-CP80-VN4X2 | 50 mm,  |  , NPN | terminal chamber | w013 | d120 |
| NI40-CP80-VP4X2 | 40 mm,  |  , PNP | terminal chamber | w014 | d120 |
| NI40-CP80-VN4X2 | 40 mm,  |  , NPN | terminal chamber | w013 | d120 |

CP80 – 2-wire AC/DC



General data

| | | | |
|------------------------------|-------------------------|--------------------------|--------------------------------|
| Dimensions | 80 x 41 x 80 mm | Operating voltage | 20...250 VAC / 10...300 VDC |
| Output | connection programmable | Material housing | PBT |
| Electrical connection | terminal chamber | | |

Types and data – selection table

| Type | Switching distance | w | d |
|--------------------|--------------------|------|------|
| BI40-CP80-FZ3X2 | 40 mm, | w028 | d120 |
| NI75U-CP80-FDZ30X2 | 75 mm, | w028 | d120 |
| NI50-CP80-FZ3X2 | 50 mm, | w028 | d120 |
| NI40-CP80-FZ3X2 | 40 mm, | w028 | d120 |

K90 – NAMUR



| | | | |
|------------------------------|------------------|--------------------------|--------------|
| Type | NI50-K90SR-Y1 | Operating voltage | nom. 8.2 VDC |
| Dimensions | 75 x 60 x 130 mm | Material housing | PBT |
| Switching distance | 50 mm, | Wiring diagram | w026 |
| Output | NAMUR | Dimension drawing | d121 |
| Electrical connection | terminal chamber | | |

K90 – 4-wire DC



General data

Dimensions 75 x 60 x 130 mm
Operating voltage 10...65 VDC

Material housing PBT

Types and data – selection table

| Type | Switching distance | Output | Electrical connection | w | d |
|--------------------------|--------------------|--------|-----------------------|------|------|
| NI100U-K90SR-VP4X2-H1141 | 100 mm, | , PNP | connector, M12 x 1 | w008 | d017 |
| NI100U-K90SR-VP4X2 | 100 mm, | , PNP | terminal chamber | w014 | d016 |
| NI100U-K90SR-VN4X2-H1141 | 100 mm, | , NPN | connector, M12 x 1 | w010 | d017 |
| NI100U-K90SR-VN4X2 | 100 mm, | , NPN | terminal chamber | w013 | d016 |
| NI60-K90SR-VP4X2 | 60 mm, | , PNP | terminal chamber | w014 | d016 |
| NI60-K90SR-VN4X2 | 60 mm, | , NPN | terminal chamber | w013 | d016 |

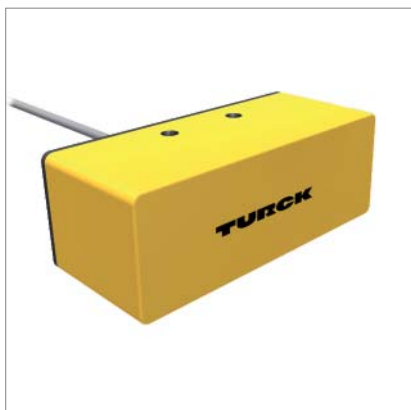
K90 – 2-wire AC/DC




Type NI60-K90SR-FZ3X2
Dimensions 75 x 60 x 130 mm
Switching distance 60 mm,
Output connection program-mable
Electrical connection terminal chamber

Operating voltage 20...250 VAC /
10...300 VDC
Material housing PBT
Wiring diagram w028
Dimension drawing d016



Q130 – 4-wire DC



General data

| | | | |
|------------------------------|--|--------------------------|-------------|
| Dimensions | 57 x 48 x 130 mm | Operating voltage | 10...65 VDC |
| Switching distance | 30 mm,  | Material housing | PBT |
| Electrical connection | cable | Material cable | PVC 2 m |



Types and data – selection table

| Type | Output | w | d |
|-----------------|---|------|------|
| NI30-Q130-VP4X2 |  , PNP | w007 | d122 |
| NI30-Q130-VN4X2 |  , NPN | w018 | d122 |

Q130 – 2-wire AC/DC



General data

| | | | |
|---------------------------|--|--------------------------|--------------------------------|
| Dimensions | 57 x 48 x 130 mm | Operating voltage | 20...250 VAC / 10...300 VDC |
| Switching distance | 30 mm,  | Material housing | PBT |
| Output |  | | |

Types and data – selection table

| Type | Electrical connection | Material cable | w | d |
|-------------------------|-----------------------|----------------|------|------|
| NI30-Q130-ADZ30X2-B1131 | connector, 7/8" | - | w030 | d123 |
| NI30-Q130-ADZ30X2 | cable | PVC 2 m | w031 | d122 |

Threaded barrel

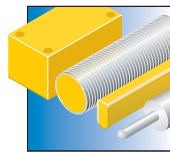


We offer threaded barrels for all types of applications, ranging from the 5 mm version up to the big size PG36. In order to comply with the ambient conditions of individual applications, most sensors are available in different housing materials. The range of accessories is broad and enhances the functionality of the sensors if needed.

Features

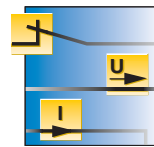
- Rugged 4-hole LED
- Different thread lengths
- Rugged housing materials
- Connection cable with approved jacket quality
- Many different electrical output functions

Properties



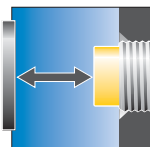
Design

All standard thread sizes M5 x 0.5, M8 x 1, M12 x 1, M18 x 1, M30 x 1.5 and PG36 (G47)



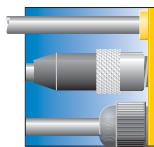
Electrical versions

NAMUR, 2/3 and 4-wire DC, 2-wire AC/DC



Switching distances

non-flush 1...25 mm
and flush
3 mm...25 mm



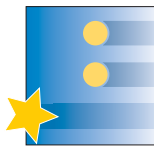
Electrical connections

Cable, plug connection, terminal chamber and pigtail



Materials

Chrome-plated brass (optionally teflon-coated), stainless steel or rugged plastic housings




Special features

Factor 1, all metals extended temperature range, approvals (et al. ATEX and SIL)

M5 – NAMUR











| | | | |
|------------------------------|---|--------------------------|--------------|
| Type | BI1-EG05-Y1 | Operating voltage | nom. 8.2 VDC |
| Dimensions | Ø5 x 30 mm | Material housing | V4A (1.4404) |
| Switching distance | 1 mm,  | Material cable | PVC 2 m |
| Output | NAMUR | Wiring diagram | w019 |
| Electrical connection | cable | Dimension drawing | d124 |

M5 – 3-wire DC



| | | | |
|---------------------------|---|-------------------------|--------------|
| General data | | Material housing | V4A (1.4404) |
| Switching distance | 1 mm,  | | |
| Operating voltage | 10...30 VDC | | |

Types and data – selection table

| Type | Dimensions | Output | Electrical connection | Material cable |  |  |
|---------------------|--------------|---|-----------------------|----------------|---|---|
| BI1-EG05-RP6X-V1331 | Ø5 x 42.5 mm |  , PNP | connector, M8 x 1 | - | w003 | d125 |
| BI1-EG05-RP6X | Ø5 x 30 mm |  , PNP | cable | PUR 2 m | w006 | d126 |
| BI1-EG05-AP6X-V1331 | Ø5 x 42.5 mm |  , PNP | connector, M8 x 1 | - | w001 | d125 |
| BI1-EG05-AN6X-V1331 | Ø5 x 42.5 mm |  , NPN | connector, M8 x 1 | - | w002 | d125 |
| BI1-EG05-AP6X | Ø5 x 30 mm |  , PNP | cable | PUR 2 m | w004 | d126 |
| BI1-EG05-AN6X | Ø5 x 30 mm |  , NPN | cable | PUR 2 m | w005 | d126 |

M8 – NAMUR



General data

Output NAMUR
Operating voltage nom. 8.2 VDC

Material housing V2A (1.4301)

Types and data – selection table

| Type | Dimensions | Switching distance | Electrical connection | Material cable | w | d |
|----------------------|--------------|--------------------|-----------------------|----------------|------|------|
| BI1,5-GS880-Y1 | Ø8 x 47 mm | 1.5 mm, | cable | PVC 2 m | w019 | d132 |
| BI1,5-EG08K-Y1-H1341 | Ø8 x 39 mm | 1.5 mm, | connector, M12 x 1 | - | w021 | d127 |
| BI1,5-EG08K-Y1 | Ø8 x 23.6 mm | 1.5 mm, | cable | PVC 2 m | w019 | d130 |
| BI1,5-EG08-Y1-H1341 | Ø8 x 57 mm | 1.5 mm, | connector, M12 x 1 | - | w021 | d128 |
| NI3-EG08K-Y1-H1341 | Ø8 x 39 mm | 3 mm, | connector, M12 x 1 | - | w021 | d129 |
| NI3-EG08K-Y1 | Ø8 x 23.6 mm | 3 mm, | cable | PVC 2 m | w019 | d131 |

M8 – 2-wire DC



General data

Output , 2-wire
Operating voltage 10...55 VDC

Material housing V2A (1.4301)

Types and data – selection table

| Type | Dimensions | Switching distance | Electrical connection | Material cable | w | d |
|----------------------|--------------|--------------------|-----------------------|----------------|------|------|
| BI2-EG08-AG41X-H1341 | Ø8 x 57 mm | 2 mm, | connector, M12 x 1 | - | w032 | d024 |
| BI2-EG08-AG41X | Ø8 x 41.6 mm | 2 mm, | cable | PUR 2 m | w033 | d026 |
| NI4-EG08-AG41X | Ø8 x 41.6 mm | 4 mm, | cable | PUR 2 m | w033 | d133 |

M8 – 3-wire DC – Cable connection



General data



| | | | |
|------------------------------|-------------|-------------------------|--------------|
| Electrical connection | cable | Material housing | V2A (1.4301) |
| Operating voltage | 10...30 VDC | Material cable | PUR 2 m |

Types and data – selection table

| Type | Dimensions | Switching distance | Output | w | d |
|------------------|--------------|--------------------|----------|------|------|
| BI2U-EG08-AP6X | Ø8 x 41.6 mm | 2 mm, | —/—, PNP | w004 | d026 |
| BI2U-EG08-AN6X | Ø8 x 41.6 mm | 2 mm, | —/—, NPN | w005 | d026 |
| BI2-EG08K-AP6X | Ø8 x 23.6 mm | 2 mm, | —/—, PNP | w004 | d141 |
| BI2-EG08K-AN6X | Ø8 x 23.6 mm | 2 mm, | —/—, NPN | w005 | d141 |
| BI2-EG08-AP6X | Ø8 x 41.6 mm | 2 mm, | —/—, PNP | w004 | d026 |
| BI2-EG08-AN6X | Ø8 x 41.6 mm | 2 mm, | —/—, NPN | w005 | d026 |
| BI1,5U-EG08-AP6X | Ø8 x 41.6 mm | 1.5 mm, | —/—, PNP | w004 | d026 |
| BI1,5U-EG08-AN6X | Ø8 x 41.6 mm | 1.5 mm, | —/—, NPN | w005 | d026 |
| BI1,5-EG08K-AP6X | Ø8 x 23.6 mm | 1.5 mm, | —/—, PNP | w004 | d141 |
| BI1,5-EG08K-AN6X | Ø8 x 23.6 mm | 1.5 mm, | —/—, NPN | w005 | d141 |
| BI1,5-EG08-AP6X | Ø8 x 41.6 mm | 1.5 mm, | —/—, PNP | w004 | d026 |
| BI1,5-EG08-AN6X | Ø8 x 41.6 mm | 1.5 mm, | —/—, NPN | w005 | d026 |
| NI6U-EG08-AP6X | Ø8 x 41.6 mm | 6 mm, | —/—, PNP | w004 | d027 |
| NI6U-EG08-AN6X | Ø8 x 41.6 mm | 6 mm, | —/—, NPN | w005 | d027 |
| NI4U-EG08-AP6X | Ø8 x 41.6 mm | 4 mm, | —/—, PNP | w004 | d027 |
| NI4U-EG08-AN6X | Ø8 x 41.6 mm | 4 mm, | —/—, NPN | w005 | d027 |
| NI3-EG08K-AP6X | Ø8 x 23.6 mm | 3 mm, | —/—, PNP | w004 | d142 |
| NI3-EG08K-AN6X | Ø8 x 23.6 mm | 3 mm, | —/—, NPN | w005 | d142 |
| NI3-EG08-AP6X | Ø8 x 41.6 mm | 3 mm, | —/—, PNP | w004 | d133 |
| NI3-EG08-AN6X | Ø8 x 41.6 mm | 3 mm, | —/—, NPN | w005 | d133 |

M8 – 4-wire DC – M12 x 1 plug connection









































| | | | |
|------------------------------|---|--------------------------|--------------|
| Type | BI2-EG08-VP6X-H1341 | Operating voltage | 10...30 VDC |
| Dimensions | Ø8 x 57 mm | Material housing | V2A (1.4301) |
| Switching distance | 2 mm,  | Wiring diagram | w008 |
| Output |  , PNP | Dimension drawing | d024 |
| Electrical connection | connector, M12 x 1 | | |



















M8 – 3-wire DC – M12 x 1 plug connection



| | | | |
|------------------------------|--------------------|--------------------------|-------------|
| General data | | Operating voltage | 10...30 VDC |
| Electrical connection | connector, M12 x 1 | | |

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Material housing |  |  |
|-------------------------|------------|---|---|------------------|---|---|
| BI2U-EGT08-AP6X-H1341 | Ø8 x 57 mm | 2 mm,  |  , NPN | V2A (1.4301) -T | w001 | d024 |
| BI2U-EG08-RP6X-H1341 | Ø8 x 57 mm | 2 mm,  |  , PNP | V2A (1.4301) | w015 | d024 |
| BI2U-EG08-AP6X-H1341 | Ø8 x 57 mm | 2 mm,  |  , NPN | V2A (1.4301) | w001 | d024 |
| BI2U-EG08-AN6X-H1341 | Ø8 x 57 mm | 2 mm,  |  , NPN | V2A (1.4301) | w002 | d024 |
| BI2-EG08K-AP6X-H1341 | Ø8 x 39 mm | 2 mm,  |  , PNP | V2A (1.4301) | w001 | d137 |
| BI2-EG08K-AN6X-H1341 | Ø8 x 39 mm | 2 mm,  |  , NPN | V2A (1.4301) | w002 | d137 |
| BI2-EG08-AP6X-H1341 | Ø8 x 57 mm | 2 mm,  |  , PNP | V2A (1.4301) | w001 | d024 |
| BI2-EG08-AN6X-H1341 | Ø8 x 57 mm | 2 mm,  |  , NPN | V2A (1.4301) | w002 | d024 |
| BI1,5U-EGT08-AP6X-H1341 | Ø8 x 57 mm | 1.5 mm,  |  , PNP | V2A (1.4301) -T | w001 | d138 |
| BI1,5U-EGT08-AN6X-H1341 | Ø8 x 57 mm | 1.5 mm,  |  , NPN | V2A (1.4301) -T | w002 | d138 |
| BI1,5U-EG08-AP6X-H1341 | Ø8 x 57 mm | 1.5 mm,  |  , PNP | V2A (1.4301) | w001 | d024 |
| BI1,5U-EG08-AN6X-H1341 | Ø8 x 57 mm | 1.5 mm,  |  , NPN | V2A (1.4301) | w002 | d024 |
| BI1,5-EG08WD-AP6X-H1341 | Ø8 x 57 mm | 1.5 mm,  |  , PNP | V2A (1.4301) | w001 | d024 |
| BI1,5-EG08WD-AN6X-H1341 | Ø8 x 57 mm | 1.5 mm,  |  , NPN | V2A (1.4301) | w002 | d024 |
| BI1,5-EG08K-AP6X-H1341 | Ø8 x 39 mm | 1.5 mm,  |  , PNP | V2A (1.4301) | w001 | d137 |
| BI1,5-EG08K-AN6X-H1341 | Ø8 x 39 mm | 1.5 mm,  |  , NPN | V2A (1.4301) | w002 | d137 |
| BI1,5-EG08-AP6X-H1341 | Ø8 x 57 mm | 1.5 mm,  |  , PNP | V2A (1.4301) | w001 | d024 |
| BI1,5-EG08-AN6X-H1341 | Ø8 x 57 mm | 1.5 mm,  |  , NPN | V2A (1.4301) | w002 | d024 |

| Type | Dimensions | Switching distance | Output | Material housing | w | d |
|----------------------|------------|---|---|------------------|------|------|
| NI6U-EG08-RP6X-H1341 | Ø8 x 57 mm | 6 mm,  |  , PNP | V2A (1.4301) | w015 | d025 |
| NI6U-EG08-AP6X-H1341 | Ø8 x 57 mm | 6 mm,  |  , PNP | V2A (1.4301) | w001 | d025 |
| NI6U-EG08-AN6X-H1341 | Ø8 x 57 mm | 6 mm,  |  , NPN | V2A (1.4301) | w002 | d025 |
| NI4U-EG08-AP6X-H1341 | Ø8 x 57 mm | 4 mm,  |  , PNP | V2A (1.4301) | w001 | d025 |
| NI4U-EG08-AN6X-H1341 | Ø8 x 57 mm | 4 mm,  |  , NPN | V2A (1.4301) | w002 | d025 |
| NI3-EG08K-AP6X-H1341 | Ø8 x 39 mm | 3 mm,  |  , PNP | V2A (1.4301) | w001 | d139 |
| NI3-EG08K-AN6X-H1341 | Ø8 x 39 mm | 3 mm,  |  , NPN | V2A (1.4301) | w002 | d139 |
| NI3-EG08-AP6X-H1341 | Ø8 x 57 mm | 3 mm,  |  , PNP | V2A (1.4301) | w001 | d140 |
| NI3-EG08-AN6X-H1341 | Ø8 x 57 mm | 3 mm,  |  , NPN | V2A (1.4301) | w002 | d140 |







































M8 – 3-wire DC – M8 x 1 plug connection




General data

Electrical connection connector, M8 x 1 **Operating voltage** 10...30VDC











Types and data – selection table

| Type | Dimensions | Switching distance | Output | Material housing | w | d |
|-------------------------|------------|---|---|------------------|------|------|
| BI2U-EGT08-AP6X-V1131 | Ø8 x 49 mm | 2 mm,  |  , PNP | V2A (1.4301) -T | w001 | d022 |
| BI2U-EG08-RP6X-V1131 | Ø8 x 49 mm | 2 mm,  |  , PNP | V2A (1.4301) | w003 | d022 |
| BI2U-EG08-AP6X-V1131 | Ø8 x 49 mm | 2 mm,  |  , PNP | V2A (1.4301) | w001 | d022 |
| BI2U-EG08-AN6X-V1131 | Ø8 x 49 mm | 2 mm,  |  , NPN | V2A (1.4301) | w002 | d022 |
| BI2-EG08K-AP6X-V1131 | Ø8 x 31 mm | 2 mm,  |  , PNP | V2A (1.4301) | w001 | d134 |
| BI2-EG08K-AN6X-V1131 | Ø8 x 31 mm | 2 mm,  |  , NPN | V2A (1.4301) | w002 | d134 |
| BI2-EG08-AP6X-V1131 | Ø8 x 49 mm | 2 mm,  |  , PNP | V2A (1.4301) | w001 | d022 |
| BI2-EG08-AN6X-V1131 | Ø8 x 49 mm | 2 mm,  |  , NPN | V2A (1.4301) | w002 | d022 |
| BI1,5U-EGT08-AP6X-V1131 | Ø8 x 49 mm | 1.5 mm,  |  , PNP | V2A (1.4301) -T | w001 | d022 |
| BI1,5U-EG08-AP6X-V1131 | Ø8 x 49 mm | 1.5 mm,  |  , PNP | V2A (1.4301) | w001 | d022 |
| BI1,5U-EG08-AN6X-V1131 | Ø8 x 49 mm | 1.5 mm,  |  , NPN | V2A (1.4301) | w002 | d022 |
| BI1,5-EG08K-AP6X-V1131 | Ø8 x 31 mm | 1.5 mm,  |  , PNP | V2A (1.4301) | w001 | d134 |
| BI1,5-EG08K-AN6X-V1131 | Ø8 x 31 mm | 1.5 mm,  |  , NPN | V2A (1.4301) | w002 | d134 |
| BI1,5-EG08-AP6X-V1131 | Ø8 x 49 mm | 1.5 mm,  |  , PNP | V2A (1.4301) | w001 | d022 |
| BI1,5-EG08-AN6X-V1131 | Ø8 x 49 mm | 1.5 mm,  |  , NPN | V2A (1.4301) | w002 | d022 |
| NI6U-EG08-RP6X-V1131 | Ø8 x 49 mm | 6 mm,  |  , PNP | V2A (1.4301) | w003 | d023 |
| NI6U-EG08-AP6X-V1131 | Ø8 x 49 mm | 6 mm,  |  , PNP | V2A (1.4301) | w001 | d023 |
| NI6U-EG08-AN6X-V1131 | Ø8 x 49 mm | 6 mm,  |  , NPN | V2A (1.4301) | w002 | d023 |
| NI4U-EG08-AP6X-V1131 | Ø8 x 49 mm | 4 mm,  |  , PNP | V2A (1.4301) | w001 | d023 |

 Wiring diagrams on page 832 ff



 Dimension drawings on page 842 ff

 Accessories on page 736 ff

| Type | Dimensions | Switching distance | Output | Material housing | w | d |
|----------------------|------------|---|---|------------------|------|------|
| NI4U-EG08-AN6X-V1131 | Ø8 x 49 mm | 4 mm,  |  , NPN | V2A (1.4301) | w002 | d023 |
| NI3-EG08K-AP6X-V1131 | Ø8 x 31 mm | 3 mm,  |  , PNP | V2A (1.4301) | w001 | d135 |
| NI3-EG08K-AN6X-V1131 | Ø8 x 31 mm | 3 mm,  |  , NPN | V2A (1.4301) | w002 | d135 |
| NI3-EG08-AP6X-V1131 | Ø8 x 49 mm | 3 mm,  |  , PNP | V2A (1.4301) | w001 | d136 |
| NI3-EG08-AN6X-V1131 | Ø8 x 49 mm | 3 mm,  |  , NPN | V2A (1.4301) | w002 | d136 |

M8 – 2-wire AC/DC – Terminal chamber







| | | | |
|------------------------------|---|--------------------------|--------------------------------|
| Type | BI2-EG08-AZ14X | Operating voltage | 20...132 VAC / 10...140 VDC |
| Dimensions | Ø8 x 41.6 mm | Material housing | V2A (1.4301) |
| Switching distance | 2 mm,  | Material cable | PUR 2 m |
| Output |  | Wiring diagram | w034 |
| Electrical connection | cable | Dimension drawing | d026 |

M12 – NAMUR – M12 x 1 plug connection



| | | | |
|---------------------|-------------|------------------------------|--------------------|
| General data | | Electrical connection | connector, M12 x 1 |
| Dimensions | Ø12 x 52 mm | Operating voltage | nom. 8.2 VDC |
| Output | NAMUR | | |

Types and data – selection table

| Type | Switching distance | Material housing | w | d |
|--------------------|---|------------------|------|------|
| BI2-M12-Y1X-H1141 | 2 mm,  | CuZn-Cr | w021 | d034 |
| BI2-EM12-Y1X-H1141 | 2 mm,  | V2A (1.4301) | w021 | d034 |
| NI5-M12-Y1X-H1141 | 5 mm,  | CuZn-Cr | w021 | d035 |
| NI5-EM12-Y1X-H1141 | 5 mm,  | V2A (1.4301) | w021 | d035 |

M12 – NAMUR – Cable connection



| | | | |
|------------------------------|-------------|--------------------------|--------------|
| General data | | | |
| Dimensions | Ø12 x 34 mm | Operating voltage | nom. 8.2 VDC |
| Output | NAMUR | Material cable | PVC 2 m |
| Electrical connection | cable | | |

Types and data – selection table









| Type | Switching distance | Material housing | w | d |
|-------------|--------------------|------------------|----------|----------|
| BI2-P12-Y1X | 2 mm, | PA | w019 | d144 |
| BI2-G12-Y1X | 2 mm, | CuZn-Cr | w019 | d145 |
| NI5-P12-Y1X | 5 mm, | PA | w019 | d144 |
| NI5-G12-Y1X | 5 mm, | CuZn-Cr | w019 | d143 |

M12 – NAMUR – Terminal chamber



| | | | |
|---------------------|-------|--------------------------|--------------|
| General data | | | |
| Output | NAMUR | Operating voltage | nom. 8.2 VDC |

Types and data – selection table

| Type | Dimensions | Switching distance | Electrical connection | Material housing | w | d |
|------------------|-------------|---|--|------------------|------|------|
| BI2-P12SK-Y1X | Ø12 x 70 mm | 2 mm,  | terminal chamber | PA | w026 | d149 |
| BI2-G12SK-Y1X | Ø12 x 65 mm | 2 mm,  | terminal chamber | CuZn-Cr | w026 | d148 |
| BI2-EM12WDTC-Y1X | Ø12 x 70 mm | 2 mm,  | terminal chamber, removable cage clamp terminals | V4A (1.4404) | w026 | d147 |
| BI2-EG12SK-Y1X | Ø12 x 65 mm | 2 mm,  | terminal chamber | V2A (1.4301) | w026 | d148 |
| NI5-P12SK-Y1X | Ø12 x 70 mm | 5 mm,  | terminal chamber | PA | w026 | d149 |
| NI5-G12SK-Y1X | Ø12 x 65 mm | 5 mm,  | terminal chamber | CuZn-Cr | w026 | d150 |
| NI5-EM12WDTC-Y1X | Ø12 x 70 mm | 5 mm,  | terminal chamber, removable cage clamp terminals | V4A (1.4404) | w026 | d146 |
| NI5-EG12SK-Y1X | Ø12 x 65 mm | 5 mm,  | terminal chamber | V2A (1.4301) | w026 | d150 |

M12 – 2-wire DC – M12 x 1 plug connection

General data
Output

—, 2-wire








Operating voltage

10...65 VDC

Electrical connection

connector, M12 x 1

Types and data – selection table

| Type | Dimensions | Switching distance | Material housing | w | d |
|-----------------------|-------------|---|------------------|------|------|
| BI2U-MT12E-AD4X-H1144 | Ø12 x 62 mm | 2 mm,  | CuZn-T | w009 | d151 |
| BI2U-M12E-AD4X-H1144 | Ø12 x 62 mm | 2 mm,  | CuZn-Cr | w009 | d028 |
| BI2-M12-AD4X-H1141 | Ø12 x 52 mm | 2 mm,  | CuZn-Cr | w023 | d034 |
| NI8-M12-AD4X-H1141 | Ø12 x 52 mm | 8 mm,  | CuZn-Cr | w023 | d035 |
| NI5U-MT12E-AD4X-H1144 | Ø12 x 62 mm | 5 mm,  | CuZn-T | w009 | d152 |
| NI5U-M12E-AD4X-H1144 | Ø12 x 62 mm | 5 mm,  | CuZn-Cr | w009 | d029 |
| NI4-M12-AD4X-H1141 | Ø12 x 52 mm | 4 mm,  | CuZn-Cr | w023 | d035 |

M12 – 2-wire DC – Cable connection



General data

Output

—, 2-wire

Electrical connection

cable











Operating voltage

10...65 VDC

Material cable

PVC 2 m

Types and data – selection table

| Type | Dimensions | Switching distance | Material housing | w | d |
|----------------|-------------|---|------------------|------|------|
| BI3-M12-AD4X | Ø12 x 54 mm | 3 mm,  | CuZn-Cr | w016 | d036 |
| BI3-G12K-AD4X | Ø12 x 34 mm | 3 mm,  | CuZn-Cr | w016 | d145 |
| BI2U-M12E-AD4X | Ø12 x 64 mm | 2 mm,  | CuZn-Cr | w016 | d030 |
| BI2-S12-AD4X | Ø12 x 60 mm | 2 mm,  | PA | w016 | d153 |
| BI2-M12-AD4X | Ø12 x 54 mm | 2 mm,  | CuZn-Cr | w016 | d036 |
| NI8-M12-AD4X | Ø12 x 54 mm | 8 mm,  | CuZn-Cr | w016 | d037 |
| NI8-G12K-AD4X | Ø12 x 34 mm | 8 mm,  | CuZn-Cr | w016 | d143 |
| NI5U-M12E-AD4X | Ø12 x 64 mm | 5 mm,  | CuZn-Cr | w016 | d031 |
| NI4-S12-AD4X | Ø12 x 64 mm | 4 mm,  | PA | w016 | d153 |
| NI4-M12-AD4X | Ø12 x 54 mm | 4 mm,  | CuZn-Cr | w016 | d037 |

M12 – 3-wire DC – M8 x 1 plug connection



General data

Dimensions

Ø12 x 52 mm

Electrical connection

connector, M8 x 1

Operating voltage

10...30 VDC

Material housing

CuZn-Cr

Types and data – selection table

| Type | Switching distance | Output | w | d |
|----------------------|--|--------|------|------|
| BI4U-M12-AP6X-V1131 | 4 mm,  | —, PNP | w001 | d032 |
| BI4U-M12-AN6X-V1131 | 4 mm,  | —, NPN | w002 | d032 |
| NI10U-M12-AP6X-V1131 | 10 mm,  | —, PNP | w001 | d033 |
| NI10U-M12-AN6X-V1131 | 10 mm,  | —, NPN | w002 | d033 |
























M12 – 3-wire DC – M12 x 1 plug connection



























General data

Electrical connection connector, M12 x 1 Operating voltage 10...30 VDC

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Material housing | w | d |
|---------------------------|-------------|---|--------|------------------|------|------|
| BI4U-MT12-AP6X-H1141 | Ø12 x 52 mm | 4 mm,  | —, PNP | CuZn-T | w001 | d058 |
| BI4U-MT12-AN6X-H1141 | Ø12 x 52 mm | 4 mm,  | —, NPN | CuZn-T | w002 | d058 |
| BI4U-M12-RP6X-H1141 | Ø12 x 52 mm | 4 mm,  | —, PNP | CuZn-Cr | w015 | d034 |
| BI4U-M12-AP6X-H1141 | Ø12 x 52 mm | 4 mm,  | —, PNP | CuZn-Cr | w001 | d034 |
| BI4U-M12-AN6X-H1141 | Ø12 x 52 mm | 4 mm,  | —, NPN | CuZn-Cr | w002 | d034 |
| BI4U-EM12WD-AP6X-H1141/3D | Ø12 x 52 mm | 4 mm,  | —, PNP | V4A (1.4404) | w001 | d034 |
| BI4U-EM12WD-AP6X-H1141 | Ø12 x 52 mm | 4 mm,  | —, PNP | V4A (1.4404) | w001 | d034 |
| BI4U-EM12WD-AN6X-H1141 | Ø12 x 52 mm | 4 mm,  | —, NPN | V4A (1.4404) | w002 | d034 |
| BI4-M12E-AP6X-H1141 | Ø12 x 62 mm | 4 mm,  | —, PNP | CuZn-Cr | w001 | d028 |
| BI4-M12-AP6X-H1141 | Ø12 x 52 mm | 4 mm,  | —, PNP | CuZn-Cr | w001 | d034 |
| BI4-M12-AN6X-H1141 | Ø12 x 52 mm | 4 mm,  | —, NPN | CuZn-Cr | w002 | d034 |
| BI3U-S12-AP6X-H1141 | Ø12 x 52 mm | 3 mm,  | —, PNP | PBT | w001 | d155 |
| BI3U-S12-AN6X-H1141 | Ø12 x 52 mm | 3 mm,  | —, NPN | PBT | w002 | d155 |
| BI3U-MT12-AP6X-H1141 | Ø12 x 52 mm | 3 mm,  | —, PNP | CuZn-T | w001 | d058 |
| BI3U-MT12-AN6X-H1141 | Ø12 x 52 mm | 3 mm,  | —, NPN | CuZn-T | w002 | d058 |
| BI3U-M12EE-AP6X-H1141 | Ø12 x 72 mm | 3 mm,  | —, PNP | CuZn-Cr | w001 | d157 |
| BI3U-M12-AP6X-H1141 | Ø12 x 52 mm | 3 mm,  | —, PNP | CuZn-Cr | w001 | d034 |
| BI3U-M12-AN6X-H1141 | Ø12 x 52 mm | 3 mm,  | —, NPN | CuZn-Cr | w002 | d034 |
| BI3U-EM12-AP6X-H1141 | Ø12 x 52 mm | 3 mm,  | —, PNP | V2A (1.4301) | w001 | d034 |
| BI3U-EM12-AN6X-H1141 | Ø12 x 52 mm | 3 mm,  | —, NPN | V2A (1.4301) | w002 | d034 |
| BI2-M12E-AP6X-H1141 | Ø12 x 62 mm | 2 mm,  | —, PNP | CuZn-Cr | w001 | d028 |
| BI2-M12E-AN6X-H1141 | Ø12 x 62 mm | 2 mm,  | —, NPN | CuZn-Cr | w002 | d028 |
| BI2-M12-AP6X-H1141 | Ø12 x 52 mm | 2 mm,  | —, PNP | CuZn-Cr | w001 | d034 |

| Type | Dimensions | Switching distance | Output | Material housing | w | d |
|----------------------------|-------------|---|--------|------------------|------|------|
| BI2-M12-AN6X-H1141 | Ø12 x 52 mm | 2 mm,  | —, NPN | CuZn-Cr | w002 | d034 |
| BI2-G12K-AP6X-H1141 | Ø12 x 42 mm | 2 mm,  | —, PNP | CuZn-Cr | w001 | d154 |
| NI10U-MT12-AP6X-H1141 | Ø12 x 52 mm | 10 mm,  | —, PNP | CuZn-T | w001 | d059 |
| NI10U-MT12-AN6X-H1141 | Ø12 x 52 mm | 10 mm,  | —, NPN | CuZn-T | w002 | d059 |
| NI10U-M12E-AP6X-H1141 | Ø12 x 62 mm | 10 mm,  | —, PNP | CuZn-Cr | w001 | d029 |
| NI10U-M12-RP6X-H1141 | Ø12 x 52 mm | 10 mm,  | —, PNP | CuZn-Cr | w015 | d035 |
| NI10U-M12-AP6X-H1141 | Ø12 x 52 mm | 10 mm,  | —, PNP | CuZn-Cr | w001 | d035 |
| NI10U-M12-AN6X-H1141 | Ø12 x 52 mm | 10 mm,  | —, NPN | CuZn-Cr | w002 | d035 |
| NI10U-EM12WD-AP6X-H1141/3D | Ø12 x 52 mm | 10 mm,  | —, PNP | V4A (1.4404) | w001 | d067 |
| NI10U-EM12WD-AP6X-H1141 | Ø12 x 52 mm | 10 mm,  | —, PNP | V4A (1.4404) | w001 | d067 |
| NI10U-EM12WD-AN6X-H1141 | Ø12 x 52 mm | 10 mm,  | —, NPN | V4A (1.4404) | w002 | d067 |
| NI8U-S12-AP6X-H1141 | Ø12 x 52 mm | 8 mm,  | —, PNP | PBT | w001 | d155 |
| NI8U-S12-AN6X-H1141 | Ø12 x 52 mm | 8 mm,  | —, NPN | PBT | w002 | d155 |
| NI8U-MT12-AP6X-H1141 | Ø12 x 52 mm | 8 mm,  | —, PNP | CuZn-T | w001 | d059 |
| NI8U-MT12-AN6X-H1141 | Ø12 x 52 mm | 8 mm,  | —, NPN | CuZn-T | w002 | d059 |
| NI8U-M12EE-AP6X-H1141 | Ø12 x 72 mm | 8 mm,  | —, PNP | CuZn-Cr | w001 | d156 |
| NI8U-M12-AP6X-H1141 | Ø12 x 52 mm | 8 mm,  | —, PNP | CuZn-Cr | w001 | d035 |
| NI8U-M12-AN6X-H1141 | Ø12 x 52 mm | 8 mm,  | —, NPN | CuZn-Cr | w002 | d035 |
| NI8U-EM12-AP6X-H1141 | Ø12 x 52 mm | 8 mm,  | —, PNP | V2A (1.4301) | w001 | d035 |
| NI8U-EM12-AN6X-H1141 | Ø12 x 52 mm | 8 mm,  | —, NPN | V2A (1.4301) | w002 | d035 |
| NI8-M12-AP6X-H1141 | Ø12 x 52 mm | 8 mm,  | —, PNP | CuZn-Cr | w001 | d035 |
| NI8-M12-AN6X-H1141 | Ø12 x 52 mm | 8 mm,  | —, NPN | CuZn-Cr | w002 | d035 |
| NI4-M12-AP6X-H1141 | Ø12 x 52 mm | 4 mm,  | —, PNP | CuZn-Cr | w001 | d035 |
| NI4-M12-AN6X-H1141 | Ø12 x 52 mm | 4 mm,  | —, NPN | CuZn-Cr | w002 | d035 |

M12 – 3-wire DC – Cable connection



































































General data

Electrical connection cable

Operating voltage 10...30 VDC

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Material housing | Material cable | w | d |
|-------------------|-------------|--|---|------------------|----------------|------|------|
| BI4U-M12-AP6X | Ø12 x 54 mm | 4 mm,  |  , PNP | CuZn-Cr | PVC 2 m | w004 | d036 |
| BI4U-M12-AN6X | Ø12 x 54 mm | 4 mm,  |  , NPN | CuZn-Cr | PVC 2 m | w005 | d036 |
| BI4U-EM12WD-AP6X | Ø12 x 52 mm | 4 mm,  |  , PNP | V4A (1.4404) | PP 2 m | w004 | d068 |
| BI4U-EM12WD-AN6X | Ø12 x 52 mm | 4 mm,  |  , NPN | V4A (1.4404) | PP 2 m | w005 | d068 |
| BI4-M12-AP6X | Ø12 x 54 mm | 4 mm,  |  , PNP | CuZn-Cr | PVC 2 m | w004 | d036 |
| BI4-M12-AN6X | Ø12 x 54 mm | 4 mm,  |  , NPN | CuZn-Cr | PVC 2 m | w005 | d036 |
| BI4-G12K-AP6X | Ø12 x 34 mm | 4 mm,  |  , PNP | CuZn-Cr | PVC 2 m | w004 | d145 |
| BI4-G12K-AN6X | Ø12 x 34 mm | 4 mm,  |  , NPN | CuZn-Cr | PVC 2 m | w005 | d145 |
| BI3U-S12-AP6X | Ø12 x 54 mm | 3 mm,  |  , PNP | PBT | PVC 2 m | w004 | d158 |
| BI3U-S12-AN6X | Ø12 x 54 mm | 3 mm,  |  , NPN | PBT | PVC 2 m | w005 | d158 |
| BI3U-M12-AP6X | Ø12 x 54 mm | 3 mm,  |  , PNP | CuZn-Cr | PVC 2 m | w004 | d036 |
| BI3U-M12-AN6X | Ø12 x 54 mm | 3 mm,  |  , NPN | CuZn-Cr | PVC 2 m | w005 | d036 |
| BI3U-EM12-AP6X | Ø12 x 54 mm | 3 mm,  |  , PNP | V2A (1.4301) | PVC 2 m | w004 | d036 |
| BI3U-EM12-AN6X | Ø12 x 54 mm | 3 mm,  |  , NPN | V2A (1.4301) | PVC 2 m | w005 | d036 |
| BI2-M12-AP6X | Ø12 x 54 mm | 2 mm,  |  , PNP | CuZn-Cr | PVC 2 m | w004 | d036 |
| BI2-M12-AN6X | Ø12 x 54 mm | 2 mm,  |  , NPN | CuZn-Cr | PVC 2 m | w005 | d036 |
| BI2-G12K-AP6X | Ø12 x 34 mm | 2 mm,  |  , PNP | CuZn-Cr | PVC 2 m | w004 | d145 |
| BI2-G12K-AN6X | Ø12 x 34 mm | 2 mm,  |  , NPN | CuZn-Cr | PVC 2 m | w005 | d145 |
| NI10U-M12-AP6X | Ø12 x 54 mm | 10 mm,  |  , PNP | CuZn-Cr | PVC 2 m | w004 | d037 |
| NI10U-M12-AN6X | Ø12 x 54 mm | 10 mm,  |  , NPN | CuZn-Cr | PVC 2 m | w005 | d037 |
| NI10U-EM12WD-AP6X | Ø12 x 52 mm | 10 mm,  |  , PNP | V4A (1.4404) | PP 2 m | w004 | d069 |
| NI10U-EM12WD-AN6X | Ø12 x 52 mm | 10 mm,  |  , NPN | V4A (1.4404) | PP 2 m | w005 | d069 |
| NI8U-S12-AP6X | Ø12 x 54 mm | 8 mm,  |  , PNP | PBT | PVC 2 m | w004 | d158 |
| NI8U-S12-AN6X | Ø12 x 54 mm | 8 mm,  |  , NPN | PBT | PVC 2 m | w005 | d158 |
| NI8U-M12-AP6X | Ø12 x 54 mm | 8 mm,  |  , PNP | CuZn-Cr | PVC 2 m | w004 | d037 |
| NI8U-M12-AN6X | Ø12 x 54 mm | 8 mm,  |  , NPN | CuZn-Cr | PVC 2 m | w005 | d037 |
| NI8U-EM12-AP6X | Ø12 x 54 mm | 8 mm,  |  , PNP | V2A (1.4301) | PVC 2 m | w004 | d037 |
| NI8U-EM12-AN6X | Ø12 x 54 mm | 8 mm,  |  , NPN | V2A (1.4301) | PVC 2 m | w005 | d037 |
| NI5-G12K-AP6X | Ø12 x 34 mm | 5 mm,  |  , PNP | CuZn-Cr | PVC 2 m | w004 | d143 |
| NI5-G12K-AN6X | Ø12 x 34 mm | 5 mm,  |  , NPN | CuZn-Cr | PVC 2 m | w005 | d143 |
| BI4-M12-AP6X 7M | Ø12 x 54 mm | 4 mm,  |  , PNP | CuZn-Cr | PVC 7 m | w004 | d036 |
| BI4-M12-AN6X 7M | Ø12 x 54 mm | 4 mm,  |  , NPN | CuZn-Cr | PVC 7 m | w005 | d036 |

M12 – 3-wire DC – Terminal chamber



General data

Operating voltage 10...30 VDC

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Electrical connection | Material housing | w | d |
|---------------------|-------------|--------------------|--------|--|------------------|------|------|
| BI4U-EM12WDTC-AP6X | Ø12 x 80 mm | 4 mm, | PNP | terminal chamber, removable cage clamp terminals | V4A (1.4404) | w011 | d070 |
| BI3U-P12SK-AP6X | Ø12 x 75 mm | 3 mm, | PNP | terminal chamber | PA | w011 | d161 |
| BI3U-P12SK-AN6X | Ø12 x 75 mm | 3 mm, | NPN | terminal chamber | PA | w012 | d161 |
| BI3U-EG12SK-AP6X | Ø12 x 75 mm | 3 mm, | PNP | terminal chamber | V2A (1.4301) | w011 | d160 |
| BI3U-EG12SK-AN6X | Ø12 x 75 mm | 3 mm, | NPN | terminal chamber | V2A (1.4301) | w012 | d160 |
| BI2-P12SK-AP6X | Ø12 x 75 mm | 2 mm, | PNP | terminal chamber | PA | w011 | d161 |
| BI2-P12SK-AN6X | Ø12 x 75 mm | 2 mm, | NPN | terminal chamber | PA | w012 | d161 |
| BI2-G12SK-AP6X | Ø12 x 75 mm | 2 mm, | PNP | terminal chamber | CuZn-Cr | w011 | d160 |
| BI2-G12SK-AN6X | Ø12 x 75 mm | 2 mm, | NPN | terminal chamber | CuZn-Cr | w012 | d160 |
| NI10U-EM12WDTC-AP6X | Ø12 x 80 mm | 10 mm, | PNP | terminal chamber, removable cage clamp terminals | V4A (1.4404) | w011 | d071 |
| NI8U-P12SK-AP6X | Ø12 x 75 mm | 8 mm, | PNP | terminal chamber | PA | w011 | d161 |
| NI8U-P12SK-AN6X | Ø12 x 75 mm | 8 mm, | NPN | terminal chamber | PA | w012 | d161 |
| NI8U-EG12SK-AP6X | Ø12 x 75 mm | 8 mm, | PNP | terminal chamber | V2A (1.4301) | w011 | d159 |
| NI8U-EG12SK-AN6X | Ø12 x 75 mm | 8 mm, | NPN | terminal chamber | V2A (1.4301) | w012 | d159 |
| NI5-P12SK-AP6X | Ø12 x 75 mm | 5 mm, | PNP | terminal chamber | PA | w011 | d161 |
| NI5-P12SK-AN6X | Ø12 x 75 mm | 5 mm, | NPN | terminal chamber | PA | w012 | d161 |
| NI5-G12SK-AP6X | Ø12 x 75 mm | 5 mm, | PNP | terminal chamber | CuZn-Cr | w011 | d159 |
| NI5-G12SK-AN6X | Ø12 x 75 mm | 5 mm, | NPN | terminal chamber | CuZn-Cr | w012 | d159 |

Wiring diagrams on page 832 ff

Dimension drawings on page 842 ff

Accessories on page 736 ff

M12 – 4-wire DC – M12 x 1 plug connection



General data

Electrical connection connector, M12 x 1 **Material housing** CuZn-Cr

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Operating voltage | w | d |
|---------------------------|--------------|--------------------|--------|-------------------|------|------|
| BI4U-M12E-VP44X-H1141 | Ø12 x 62 mm | 4 mm, | , PNP | 10...55 VDC | w017 | d028 |
| BI4U-M12E-VN44X-H1141 | Ø12 x 62 mm | 4 mm, | , NPN | 10...55 VDC | w010 | d028 |
| BI4U-M12-VP44X-H1141 L80 | Ø12 x 80 mm | 4 mm, | , PNP | 10...55 VDC | w017 | d038 |
| BI4U-M12-VP44X-H1141 L100 | Ø12 x 100 mm | 4 mm, | , PNP | 10...55 VDC | w017 | d039 |
| BI4-M12-VN6X-H1141 | Ø12 x 52 mm | 4 mm, | , NPN | 10...30 VDC | w010 | d034 |
| BI3U-M12E-VP4X-H1141 | Ø12 x 62 mm | 3 mm, | , PNP | 10...65 VDC | w008 | d028 |
| BI3U-M12E-VN4X-H1141 | Ø12 x 62 mm | 3 mm, | , NPN | 10...65 VDC | w010 | d028 |
| NI10U-M12E-VP44X-H1141 | Ø12 x 62 mm | 10 mm, | , PNP | 10...55 VDC | w017 | d029 |
| NI10U-M12E-VN44X-H1141 | Ø12 x 62 mm | 10 mm, | , NPN | 10...55 VDC | w010 | d029 |
| NI8U-M12E-VP4X-H1141 | Ø12 x 62 mm | 8 mm, | , PNP | 10...65 VDC | w008 | d029 |
| NI8U-M12E-VN4X-H1141 | Ø12 x 62 mm | 8 mm, | , NPN | 10...65 VDC | w010 | d029 |
| NI8-M12-VN6X-H1141 | Ø12 x 52 mm | 8 mm, | , NPN | 10...30 VDC | w010 | d035 |
| NI8-M12-VP6X-H1141 | Ø12 x 52 mm | 8 mm, | , PNP | 10...30 VDC | w008 | d035 |
| BI4-M12-VP6X-H1141 | Ø12 x 52 mm | 4 mm, | , PNP | 10...30 VDC | w008 | d034 |





















M12 – 4-wire DC – Cable connection



General data

Electrical connection cable **Material housing** CuZn-Cr

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Operating voltage | Material cable | w | d |
|------------------|-------------|--|---|-------------------|----------------|------|------|
| BI4U-M12E-VP44X | Ø12 x 64 mm | 4 mm,  |  , PNP | 10...55 VDC | PVC 2 m | w007 | d030 |
| BI4U-M12E-VN44X | Ø12 x 64 mm | 4 mm,  |  , NPN | 10...55 VDC | PVC 2 m | w018 | d030 |
| BI4-M12-VP6X | Ø12 x 54 mm | 4 mm,  |  , PNP | 10...30 VDC | PVC 2 m | w007 | d036 |
| BI4-M12-VN6X | Ø12 x 54 mm | 4 mm,  |  , NPN | 10...30 VDC | PVC 2 m | w018 | d036 |
| NI10U-M12E-VP44X | Ø12 x 64 mm | 10 mm,  |  , PNP | 10...55 VDC | PVC 2 m | w007 | d031 |
| NI10U-M12E-VN44X | Ø12 x 64 mm | 10 mm,  |  , NPN | 10...55 VDC | PVC 2 m | w018 | d031 |
| BI4-M12-VP6X 7M | Ø12 x 54 mm | 4 mm,  |  , PNP | 10...30 VDC | PVC 7 m | w007 | d036 |
| BI4-M12-VN6X 7M | Ø12 x 54 mm | 4 mm,  |  , NPN | 10...30 VDC | PVC 7 m | w018 | d036 |
| NI8-M12-VN6X 7M | Ø12 x 54 mm | 8 mm,  |  , NPN | 10...30 VDC | PVC 7 m | w018 | d037 |
| NI8-M12-VP6X 7M | Ø12 x 54 mm | 8 mm,  |  , PNP | 10...30 VDC | PVC 7 m | w007 | d037 |

M12 – 4-wire DC – Terminal chamber



General data

Dimensions

Ø12 x 75 mm

Electrical connection

terminal chamber


Operating voltage

10...65 VDC

Material housing

V2A (1.4301)

Types and data – selection table

| Type | Switching distance | Output | w | d |
|------------------|---|---|------|------|
| BI3U-EG12SK-VP4X | 3 mm,  |  , PNP | w014 | d160 |
| BI3U-EG12SK-VN4X | 3 mm,  |  , NPN | w013 | d160 |
| NI8U-EG12SK-VP4X | 8 mm,  |  , PNP | w014 | d159 |
| NI8U-EG12SK-VN4X | 8 mm,  |  , NPN | w013 | d159 |

M12 – 2-wire AC/DC – 1/2" plug connection



General data

Dimensions Ø12 x 71 mm

Output



Electrical connection connector, 1/2"

Operating voltage 20...250 VAC /
10...300 VDC

Material housing CuZn-Cr

Types and data – selection table

| Type | Switching distance | w | d |
|-----------------------|--------------------|------|------|
| BI2U-G12-ADZ32X-B3131 | 2 mm, | w035 | d162 |
| NI8U-G12-ADZ32X-B3131 | 8 mm, | w035 | d163 |

M12 – 2-wire AC/DC – Cable connection



General data

Output

Electrical connection cable

Operating voltage 20...250 VAC /
10...300 VDC

Material cable PVC 2 m

Types and data – selection table

| Type | Dimensions | Switching distance | Material housing | w | d |
|---------------|-------------|--------------------|------------------|------|------|
| BI2-S12-AZ31X | Ø12 x 60 mm | 2 mm, | PA | w020 | d153 |
| BI2-M12-AZ31X | Ø12 x 64 mm | 2 mm, | CuZn-Cr | w020 | d030 |
| NI4-S12-AZ31X | Ø12 x 64 mm | 4 mm, | PA | w020 | d153 |
| NI4-M12-AZ31X | Ø12 x 64 mm | 4 mm, | CuZn-Cr | w020 | d164 |

M18 – NAMUR – M12 x 1 plug connection



General data

Dimensions

Ø18 x 52 mm

Output

NAMUR

Electrical connection

connector, M12 x 1

Operating voltage

nom. 8.2 VDC

Types and data – selection table

| Type | Switching distance | Material housing | w | d |
|---------------------|--------------------|------------------|------|------|
| BI5-M18-Y1X-H1141 | 5 mm, | CuZn-Cr | w021 | d044 |
| BI5-EM18-Y1X-H1141 | 5 mm, | V2A (1.4305) | w021 | d044 |
| NI10-M18-Y1X-H1141 | 10 mm, | CuZn-Cr | w021 | d046 |
| NI10-EM18-Y1X-H1141 | 10 mm, | V2A (1.4301) | w021 | d046 |

M18 – NAMUR – Cable connection



General data

Dimensions

Ø18 x 34 mm

Output

NAMUR

Electrical connection

cable

Operating voltage

nom. 8.2 VDC

Material cable

PVC 2 m

Types and data – selection table

| Type | Switching distance | Material housing | w | d |
|--------------|--------------------|------------------|------|------|
| BI5-P18-Y1X | 5 mm, | PA | w019 | d165 |
| BI5-G18-Y1X | 5 mm, | CuZn-Cr | w019 | d166 |
| NI14-G18-Y1X | 14 mm, | CuZn-Cr | w019 | d167 |
| NI10-P18-Y1X | 10 mm, | PA | w019 | d165 |
| NI10-G18-Y1X | 10 mm, | CuZn-Cr | w019 | d167 |









M18 – NAMUR – Terminal chamber



General data

Output NAMUR **Operating voltage** nom. 8.2 VDC

Types and data – selection table

| Type | Dimensions | Switching distance | Electrical connection | Material housing | w | d |
|-------------------|-------------|--|--|------------------|------|------|
| BI5-P18SK-Y1X | Ø18 x 67 mm | 5 mm,  | terminal chamber | PA | w026 | d171 |
| BI5-G18SK-Y1X | Ø18 x 67 mm | 5 mm,  | terminal chamber | CuZn-Cr | w026 | d170 |
| BI5-EM18WDTC-Y1X | Ø18 x 71 mm | 5 mm,  | terminal chamber, removable cage clamp terminals | V4A (1.4404) | w026 | d168 |
| BI5-EG18SK-Y1X | Ø18 x 67 mm | 5 mm,  | terminal chamber | V2A (1.4301) | w026 | d170 |
| NI10-P18SK-Y1X | Ø18 x 67 mm | 10 mm,  | terminal chamber | PA | w026 | d171 |
| NI10-G18SK-Y1X | Ø18 x 67 mm | 10 mm,  | terminal chamber | CuZn-Cr | w026 | d172 |
| NI10-EM18WDTC-Y1X | Ø18 x 71 mm | 10 mm,  | terminal chamber, removable cage clamp terminals | V4A (1.4404) | w026 | d169 |
| NI10-EG18SK-Y1X | Ø18 x 67 mm | 10 mm,  | terminal chamber | V2A (1.4301) | w026 | d172 |

M18 – 2-wire DC – M12 x 1 plug connection










General data

Output , 2-wire **Operating voltage** 10...65 VDC

Electrical connection connector, M12 x 1

Types and data – selection table

| Type | Dimensions | Switching distance | Material housing | w | d |
|------------------------|---------------|--|------------------|------|------|
| BI7-M18-AD4X-H1141 | Ø18 x 52 mm | 7 mm,  | CuZn-Cr | w023 | d044 |
| BI5U-MT18M-AD4X-H1144 | Ø18 x 61.5 mm | 5 mm,  | CuZn-T | w009 | d040 |
| BI5U-M18M-AD4X-H1144 | Ø18 x 61.5 mm | 5 mm,  | CuZn-Cr | w009 | d040 |
| BI5-M18-AD4X-H1141 | Ø18 x 52 mm | 5 mm,  | CuZn-Cr | w023 | d044 |
| NI10U-MT18M-AD4X-H1144 | Ø18 x 61.5 mm | 10 mm,  | CuZn-T | w009 | d060 |
| NI10U-M18M-AD4X-H1144 | Ø18 x 61.5 mm | 10 mm,  | CuZn-Cr | w009 | d041 |
| NI8-M18-AD4X-H1141 | Ø18 x 52 mm | 8 mm,  | CuZn-Cr | w023 | d046 |

M18 – 2-wire DC – Cable connection



General data

Output

—, 2-wire

Electrical connection

cable








Operating voltage

10...65 VDC

Material cable

PVC 2 m

Types and data – selection table

| Type | Dimensions | Switching distance | Material housing | w | d |
|-----------------|-------------|--|------------------|------|------|
| BI7-M18-AD4X | Ø18 x 54 mm | 7 mm,  | CuZn-Cr | w016 | d048 |
| BI7-G18K-AD4X | Ø18 x 34 mm | 7 mm,  | CuZn-Cr | w016 | d166 |
| BI5-S18-AD4X | Ø18 x 64 mm | 5 mm,  | PA | w016 | d173 |
| BI5-M18-AD4X | Ø18 x 54 mm | 5 mm,  | CuZn-Cr | w016 | d048 |
| NI10U-M18M-AD4X | Ø18 x 64 mm | 10 mm,  | CuZn-Cr | w016 | d043 |
| NI8-S18-AD4X | Ø18 x 64 mm | 8 mm,  | PA | w016 | d173 |
| NI8-M18-AD4X | Ø18 x 54 mm | 8 mm,  | CuZn-Cr | w016 | d049 |

M18 – 3-wire DC – M12 x 1 plug connection



General data

Electrical connection















connector, M12 x 1

Operating voltage

10...30 VDC

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Material housing | w | d |
|----------------------------|-------------|--------------------|--------|------------------|------|------|
| BI8U-MT18E-AP6X-H1141 | Ø18 x 72 mm | 8 mm, | —, PNP | CuZn-T | w001 | d045 |
| BI8U-MT18-AP6X-H1141 | Ø18 x 52 mm | 8 mm, | —, PNP | CuZn-T | w001 | d062 |
| BI8U-MT18-AN6X-H1141 | Ø18 x 52 mm | 8 mm, | —, NPN | CuZn-T | w002 | d062 |
| BI8U-M18E-AP6X-H1141 | Ø18 x 72 mm | 8 mm, | —, PNP | CuZn-Cr | w001 | d045 |
| BI8U-M18E-AN6X-H1141 | Ø18 x 72 mm | 8 mm, | —, NPN | CuZn-Cr | w002 | d045 |
| BI8U-M18-RP6X-H1141 | Ø18 x 52 mm | 8 mm, | ⊢, PNP | CuZn-Cr | w015 | d044 |
| BI8U-M18-AP6X-H1141 | Ø18 x 52 mm | 8 mm, | —, PNP | CuZn-Cr | w001 | d044 |
| BI8U-M18-AN6X-H1141 | Ø18 x 52 mm | 8 mm, | —, NPN | CuZn-Cr | w002 | d044 |
| BI8U-EM18WD-AP6X-H1141/3GD | Ø18 x 52 mm | 8 mm, | —, PNP | V4A (1.4404) | w001 | d044 |
| BI8U-EM18WD-AP6X-H1141 | Ø18 x 52 mm | 8 mm, | —, PNP | V4A (1.4404) | w001 | d044 |
| BI8U-EM18WD-AN6X-H1141/3GD | Ø18 x 52 mm | 8 mm, | —, NPN | V4A (1.4404) | w002 | d044 |
| BI8U-EM18WD-AN6X-H1141 | Ø18 x 52 mm | 8 mm, | —, NPN | V4A (1.4404) | w002 | d044 |
| BI8-M18K-AP6X-H1141 | Ø18 x 46 mm | 8 mm, | —, PNP | CuZn-Cr | w001 | d175 |
| BI8-M18-AP6X-H1141 | Ø18 x 52 mm | 8 mm, | —, PNP | CuZn-Cr | w001 | d044 |
| BI8-M18-AN6X-H1141 | Ø18 x 52 mm | 8 mm, | —, NPN | CuZn-Cr | w002 | d044 |
| BI5U-S18-AP6X-H1141 | Ø18 x 52 mm | 5 mm, | —, PNP | PBT | w001 | d176 |
| BI5U-S18-AN6X-H1141 | Ø18 x 52 mm | 5 mm, | —, NPN | PBT | w002 | d176 |
| BI5U-MT18E-AP6X-H1141 | Ø18 x 72 mm | 5 mm, | —, PNP | CuZn-T | w001 | d045 |
| BI5U-MT18-AP6X-H1141 | Ø18 x 52 mm | 5 mm, | —, PNP | CuZn-T | w001 | d062 |
| BI5U-MT18-AN6X-H1141 | Ø18 x 52 mm | 5 mm, | —, NPN | CuZn-T | w002 | d062 |
| BI5U-M18-AP6X-H1141 | Ø18 x 52 mm | 5 mm, | —, PNP | CuZn-Cr | w001 | d044 |
| BI5U-M18-AN6X-H1141 | Ø18 x 52 mm | 5 mm, | —, NPN | CuZn-Cr | w002 | d044 |
| BI5U-EM18-AP6X-H1141 | Ø18 x 52 mm | 5 mm, | —, PNP | V2A (1.4301) | w001 | d044 |
| BI5U-EM18-AN6X-H1141 | Ø18 x 52 mm | 5 mm, | —, NPN | V2A (1.4301) | w002 | d044 |
| BI5-M18-AP6X-H1141 | Ø18 x 52 mm | 5 mm, | —, PNP | CuZn-Cr | w001 | d044 |
| BI5-M18-AN6X-H1141 | Ø18 x 52 mm | 5 mm, | —, NPN | CuZn-Cr | w002 | d044 |
| BI5-G18KK-AP6-H1141 | Ø18 x 30 mm | 5 mm, | —, PNP | CuZn-Cr | w001 | d174 |
| NI15U-MT18-AP6X-H1141 | Ø18 x 52 mm | 15 mm, | —, PNP | CuZn-T | w001 | d063 |
| NI15U-MT18-AN6X-H1141 | Ø18 x 52 mm | 15 mm, | —, NPN | CuZn-T | w002 | d063 |
| NI15U-M18-RP6X-H1141 | Ø18 x 52 mm | 15 mm, | ⊢, PNP | CuZn-Cr | w015 | d046 |
| NI15U-M18-AP6X-H1141 | Ø18 x 52 mm | 15 mm, | —, PNP | CuZn-Cr | w001 | d046 |
| NI15U-M18-AN6X-H1141 | Ø18 x 52 mm | 15 mm, | —, NPN | CuZn-Cr | w002 | d046 |
| NI15U-EM18WD-AP6X-H1141/3D | Ø18 x 52 mm | 15 mm, | —, PNP | V4A (1.4404) | w001 | d072 |

| Type | Dimensions | Switching distance | Output | Material housing | w | d |
|----------------------------|-------------|--|--------|------------------|------|------|
| NI15U-EM18WD-AP6X-H1141 | Ø18 x 52 mm | 15 mm,  | —, PNP | V4A (1.4404) | w001 | d072 |
| NI15U-EM18WD-AN6X-H1141/3D | Ø18 x 52 mm | 15 mm,  | —, NPN | V4A (1.4404) | w002 | d072 |
| NI15U-EM18WD-AN6X-H1141 | Ø18 x 52 mm | 15 mm,  | —, NPN | V4A (1.4404) | w002 | d072 |
| NI12U-S18-AP6X-H1141 | Ø18 x 52 mm | 12 mm,  | —, PNP | PBT | w001 | d176 |
| NI12U-S18-AN6X-H1141 | Ø18 x 52 mm | 12 mm,  | —, NPN | PBT | w002 | d176 |
| NI12U-MT18-AP6X-H1141 | Ø18 x 52 mm | 12 mm,  | —, PNP | CuZn-T | w001 | d063 |
| NI12U-MT18-AN6X-H1141 | Ø18 x 52 mm | 12 mm,  | —, NPN | CuZn-T | w002 | d063 |
| NI12U-M18E-AP6X-H1141 | Ø18 x 72 mm | 12 mm,  | —, PNP | CuZn-Cr | w001 | d047 |
| NI12U-M18-AP6X-H1141 | Ø18 x 52 mm | 12 mm,  | —, PNP | CuZn-Cr | w001 | d046 |
| NI12U-M18-AN6X-H1141 | Ø18 x 52 mm | 12 mm,  | —, NPN | CuZn-Cr | w002 | d046 |
| NI12U-EM18-AP6X-H1141 | Ø18 x 52 mm | 12 mm,  | —, PNP | V2A (1.4301) | w001 | d046 |
| NI12U-EM18-AN6X-H1141 | Ø18 x 52 mm | 12 mm,  | —, NPN | V2A (1.4301) | w002 | d046 |
| NI14-M18-AP6X-H1141 | Ø18 x 52 mm | 14 mm,  | —, PNP | CuZn-Cr | w001 | d046 |
| NI14-M18-AN6X-H1141 | Ø18 x 52 mm | 14 mm,  | —, NPN | CuZn-Cr | w002 | d046 |















M18 – 3-wire DC – Cable connection




General data

Electrical connection cable Operating voltage 10...30 VDC

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Material housing | Material cable | w | d |
|------------------|-------------|---|--------|------------------|----------------|------|------|
| BI8U-M18-AP6X | Ø18 x 54 mm | 8 mm,  | —, PNP | CuZn-Cr | PVC 2 m | w004 | d048 |
| BI8U-M18-AN6X | Ø18 x 54 mm | 8 mm,  | —, NPN | CuZn-Cr | PVC 2 m | w005 | d048 |
| BI8U-EM18WD-AP6X | Ø18 x 52 mm | 8 mm,  | —, PNP | V4A (1.4404) | PP 2 m | w004 | d073 |
| BI8U-EM18WD-AN6X | Ø18 x 52 mm | 8 mm,  | —, NPN | V4A (1.4404) | PP 2 m | w005 | d073 |
| BI8-M18-AP6X | Ø18 x 54 mm | 8 mm,  | —, PNP | CuZn-Cr | PVC 2 m | w004 | d048 |
| BI8-M18-AN6X | Ø18 x 54 mm | 8 mm,  | —, NPN | CuZn-Cr | PVC 2 m | w005 | d048 |
| BI8-M18-AP6X 7M | Ø18 x 54 mm | 8 mm,  | —, PNP | CuZn-Cr | PVC 7 m | w004 | d048 |
| BI8-M18-AN6X 7M | Ø18 x 54 mm | 8 mm,  | —, NPN | CuZn-Cr | PVC 7 m | w005 | d048 |
| BI5U-S18-AP6X | Ø18 x 64 mm | 5 mm,  | —, PNP | PBT | PVC 2 m | w004 | d173 |
| BI5U-S18-AN6X | Ø18 x 64 mm | 5 mm,  | —, NPN | PBT | PVC 2 m | w005 | d173 |
| BI5U-M18-AP6X | Ø18 x 54 mm | 5 mm,  | —, PNP | CuZn-Cr | PVC 2 m | w004 | d048 |
| BI5U-M18-AN6X | Ø18 x 54 mm | 5 mm,  | —, NPN | CuZn-Cr | PVC 2 m | w005 | d048 |
| BI5U-EM18-AP6X | Ø18 x 54 mm | 5 mm,  | —, PNP | V2A (1.4301) | PVC 2 m | w004 | d048 |
| BI5U-EM18-AN6X | Ø18 x 54 mm | 5 mm,  | —, NPN | V2A (1.4301) | PVC 2 m | w005 | d048 |

















 Wiring diagrams on page 832 ff

 Dimension drawings on page 842 ff

 Accessories on page 736 ff

Inductive sensors – Complete product range

Threaded barrel

| Type | Dimensions | Switching distance | Output | Material housing | Material cable | w | d |
|-------------------|-------------|--|--------|------------------|----------------|------|------|
| BI5-M18-AP6X | Ø18 x 54 mm | 5 mm,  | —, PNP | CuZn-Cr | PVC 2 m | w004 | d048 |
| BI5-M18-AN6X | Ø18 x 54 mm | 5 mm,  | —, NPN | CuZn-Cr | PVC 2 m | w005 | d048 |
| BI5-G18K-AP6X | Ø18 x 34 mm | 5 mm,  | —, PNP | CuZn-Cr | PVC 2 m | w004 | d166 |
| BI5-G18K-AN6X | Ø18 x 34 mm | 5 mm,  | —, NPN | CuZn-Cr | PVC 2 m | w005 | d166 |
| NI15U-M18-AP6X | Ø18 x 54 mm | 15 mm,  | —, PNP | CuZn-Cr | PVC 2 m | w004 | d049 |
| NI15U-M18-AN6X | Ø18 x 54 mm | 15 mm,  | —, NPN | CuZn-Cr | PVC 2 m | w005 | d049 |
| NI15U-EM18WD-AP6X | Ø18 x 52 mm | 15 mm,  | —, PNP | V4A (1.4404) | PP 2 m | w004 | d074 |
| NI15U-EM18WD-AN6X | Ø18 x 52 mm | 15 mm,  | —, NPN | V4A (1.4404) | PP 2 m | w005 | d074 |
| NI12U-S18-AP6X | Ø18 x 64 mm | 12 mm,  | —, PNP | PBT | PVC 2 m | w004 | d173 |
| NI12U-S18-AN6X | Ø18 x 64 mm | 12 mm,  | —, NPN | PBT | PVC 2 m | w005 | d173 |
| NI12U-M18-AP6X | Ø18 x 54 mm | 12 mm,  | —, PNP | CuZn-Cr | PVC 2 m | w004 | d049 |
| NI12U-M18-AN6X | Ø18 x 54 mm | 12 mm,  | —, NPN | CuZn-Cr | PVC 2 m | w005 | d049 |
| NI12U-EM18-AP6X | Ø18 x 54 mm | 12 mm,  | —, PNP | V2A (1.4301) | PVC 2 m | w004 | d177 |
| NI12U-EM18-AN6X | Ø18 x 54 mm | 12 mm,  | —, NPN | V2A (1.4301) | PVC 2 m | w005 | d177 |
| NI10-G18K-AP6X | Ø18 x 34 mm | 10 mm,  | —, PNP | CuZn-Cr | PVC 2 m | w004 | d167 |
| NI10-G18K-AN6X | Ø18 x 34 mm | 10 mm,  | —, NPN | CuZn-Cr | PVC 2 m | w005 | d167 |











M18 – 3-wire DC – Terminal chamber



General data

Operating voltage 10...30 VDC

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Electrical connection | Material housing | w | d |
|---------------------|-------------|--|--------|--|------------------|------|------|
| BI8U-EM18WDTC-AP6X | Ø18 x 81 mm | 8 mm,  | —, PNP | terminal chamber, removable cage clamp terminals | V4A (1.4404) | w011 | d075 |
| BI5U-P18SK-AP6X | Ø18 x 77 mm | 5 mm,  | —, PNP | terminal chamber | PBT | w011 | d179 |
| BI5U-P18SK-AN6X | Ø18 x 77 mm | 5 mm,  | —, NPN | terminal chamber | PBT | w012 | d179 |
| BI5U-EG18SK-AP6X | Ø18 x 77 mm | 5 mm,  | —, PNP | terminal chamber | V2A (1.4301) | w011 | d178 |
| BI5U-EG18SK-AN6X | Ø18 x 77 mm | 5 mm,  | —, NPN | terminal chamber | V2A (1.4301) | w012 | d178 |
| BI5-P18SK-AP6X | Ø18 x 77 mm | 5 mm,  | —, PNP | terminal chamber | PA | w011 | d179 |
| BI5-P18SK-AN6X | Ø18 x 77 mm | 5 mm,  | —, NPN | terminal chamber | PA | w012 | d179 |
| BI5-G18SK-AP6X | Ø18 x 77 mm | 5 mm,  | —, PNP | terminal chamber | CuZn-Cr | w011 | d178 |
| BI5-G18SK-AN6X | Ø18 x 77 mm | 5 mm,  | —, NPN | terminal chamber | CuZn-Cr | w012 | d178 |
| NI15U-EM18WDTC-AP6X | Ø18 x 81 mm | 15 mm,  | —, PNP | terminal chamber, removable cage clamp terminals | V4A (1.4404) | w011 | d076 |

| Type | Dimensions | Switching distance | Output | Electrical connection | Material housing | w | d |
|-------------------|-------------|--------------------|--------|-----------------------|------------------|------|------|
| NI12U-P18SK-AP6X | Ø18 x 77 mm | 12 mm, | , PNP | terminal chamber | PBT | w011 | d179 |
| NI12U-P18SK-AN6X | Ø18 x 77 mm | 12 mm, | , NPN | terminal chamber | PBT | w012 | d179 |
| NI12U-EG18SK-AP6X | Ø18 x 77 mm | 12 mm, | , PNP | terminal chamber | V2A (1.4301) | w011 | d180 |
| NI12U-EG18SK-AN6X | Ø18 x 77 mm | 12 mm, | , NPN | terminal chamber | V2A (1.4301) | w012 | d180 |
| NI10-P18SK-AP6X | Ø18 x 77 mm | 10 mm, | , PNP | terminal chamber | PA | w011 | d179 |
| NI10-P18SK-AN6X | Ø18 x 77 mm | 10 mm, | , NPN | terminal chamber | PA | w012 | d179 |
| NI10-G18SK-AP6X | Ø18 x 77 mm | 10 mm, | , PNP | terminal chamber | CuZn-Cr | w011 | d180 |
| NI10-G18SK-AN6X | Ø18 x 77 mm | 10 mm, | , NPN | terminal chamber | CuZn-Cr | w012 | d180 |

M18 – 4-wire DC – M12 x 1 plug connection



General data

Electrical connection connector, M12 x 1 **Material housing** CuZn-Cr

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Operating voltage | w | d |
|------------------------|---------------|--------------------|--------|-------------------|------|------|
| BI8U-M18M-VP44X-H1141 | Ø18 x 61.5 mm | 8 mm, | , PNP | 10...55 VDC | w017 | d040 |
| BI8U-M18M-VN44X-H1141 | Ø18 x 61.5 mm | 8 mm, | , NPN | 10...55 VDC | w010 | d040 |
| BI8-M18-VP6X-H1141 | Ø18 x 52 mm | 8 mm, | , PNP | 10...30 VDC | w008 | d044 |
| BI8-M18-VN6X-H1141 | Ø18 x 52 mm | 8 mm, | , NPN | 10...30 VDC | w010 | d044 |
| NI15U-M18M-VP44X-H1141 | Ø18 x 61.5 mm | 15 mm, | , PNP | 10...55 VDC | w017 | d041 |
| NI15U-M18M-VN44X-H1141 | Ø18 x 61.5 mm | 15 mm, | , NPN | 10...55 VDC | w010 | d041 |
| NI14-M18-VN6X-H1141 | Ø18 x 52 mm | 14 mm, | , NPN | 10...30 VDC | w010 | d046 |
| NI14-M18-VP6X-H1141 | Ø18 x 52 mm | 14 mm, | , PNP | 10...30 VDC | w008 | d046 |

M18 – 4-wire DC – Cable connection



General data

Electrical connection cable **Material housing** CuZn-Cr

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Operating voltage | Material cable | w | d |
|------------------|-------------|--------------------|--------|-------------------|----------------|------|------|
| BI8U-M18M-VP44X | Ø18 x 64 mm | 8 mm, | , PNP | 10...55 VDC | PVC 2 m | w007 | d042 |
| BI8U-M18M-VN44X | Ø18 x 64 mm | 8 mm, | , NPN | 10...55 VDC | PVC 2 m | w018 | d042 |
| BI8-M18-VP4X 7M | Ø18 x 54 mm | 8 mm, | , PNP | 10...30 VDC | PVC 7 m | w007 | d048 |
| BI8-M18-VN4X 7M | Ø18 x 54 mm | 8 mm, | , NPN | 10...30 VDC | PVC 7 m | w018 | d048 |
| BI8-M18-VP6X | Ø18 x 54 mm | 8 mm, | , PNP | 10...30 VDC | PVC 2 m | w007 | d048 |
| BI8-M18-VN6X | Ø18 x 54 mm | 8 mm, | , NPN | 10...30 VDC | PVC 2 m | w018 | d048 |
| NI15U-M18M-VP44X | Ø18 x 64 mm | 15 mm, | , PNP | 10...55 VDC | PVC 2 m | w007 | d043 |
| NI15U-M18M-VN44X | Ø18 x 64 mm | 15 mm, | , NPN | 10...55 VDC | PVC 2 m | w018 | d043 |
| NI14-M18-VP4X 7M | Ø18 x 54 mm | 14 mm, | , PNP | 10...30 VDC | PVC 7 m | w007 | d049 |
| NI14-M18-VN4X 7M | Ø18 x 54 mm | 14 mm, | , NPN | 10...30 VDC | PVC 7 m | w018 | d049 |








M18 – 4-wire DC – Terminal chamber



General data

Dimensions Ø18 x 77 mm **Operating voltage** 10...65 VDC
Electrical connection terminal chamber **Material housing** V2A (1.4301)

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-------------------|--|---|------|------|
| BI5U-EG18SK-VP4X | 5 mm,  |  , PNP | w014 | d178 |
| BI5U-EG18SK-VN4X | 5 mm,  |  , NPN | w013 | d178 |
| NI12U-EG18SK-VP4X | 12 mm,  |  , PNP | w014 | d180 |
| NI12U-EG18SK-VN4X | 12 mm,  |  , NPN | w013 | d180 |

M18 – 2-wire AC/DC – 7/8" plug connection



General data



Dimensions $\varnothing 18 \times 82 \text{ mm}$

Operating voltage 20...250 VAC /
10...300 VDC

Output 
Electrical connection connector, 7/8"

Material housing CuZn-Cr

Types and data – selection table

| Type | Switching distance | w | d |
|-------------------------|--|------|------|
| BI5U-G18-ADZ30X2-B1331 | 5 mm,  | w030 | d181 |
| NI12U-G18-ADZ30X2-B1331 | 12 mm,  | w030 | d182 |

M18 – 2-wire AC/DC – 1/2" plug connection



General data


Dimensions $\varnothing 18 \times 82 \text{ mm}$

Operating voltage 20...250 VAC /
10...300 VDC

Output 
Electrical connection connector, 1/2"

Material housing CuZn-Cr

Types and data – selection table

| Type | Switching distance | w | d |
|-------------------------|--|------|------|
| BI5U-G18-ADZ30X2-B3331 | 5 mm,  | w030 | d183 |
| NI12U-G18-ADZ30X2-B3331 | 12 mm,  | w030 | d184 |

M18 – 2-wire AC/DC – Cable connection











General data

Output 

Operating voltage 20...250 VAC /
10...300 VDC

Electrical connection cable

Types and data – selection table

| Type | Dimensions | Switching distance | Material housing | Material cable | w | d |
|----------------------|-------------|--|------------------|----------------|------|------|
| BI5U-M18-ADZ30X2 | Ø18 x 64 mm | 5 mm,  | CuZn-Cr | PVC 2 m | w031 | d185 |
| BI5-S18-AZ3X | Ø18 x 64 mm | 5 mm,  | PA | PVC 2 m | w031 | d173 |
| BI5-P18-AZ3/S139-S90 | Ø18 x 80 mm | 5 mm,  | POM | PUR 2 m | w031 | d186 |
| BI5-M18-AZ3X | Ø18 x 64 mm | 5 mm,  | CuZn-Cr | PVC 2 m | w020 | d185 |
| NI12U-M18-ADZ30X2 | Ø18 x 65 mm | 12 mm,  | CuZn-Cr | PVC 2 m | w031 | d187 |
| NI8-S18-AZ3X | Ø18 x 64 mm | 8 mm,  | PA | PVC 2 m | w031 | d173 |
| NI8-P18-AZ3/S139-S90 | Ø18 x 80 mm | 8 mm,  | POM | PUR 2 m | w031 | d186 |
| NI8-M18-AZ3X | Ø18 x 64 mm | 8 mm,  | CuZn-Cr | PVC 2 m | w020 | d043 |

M30 – NAMUR – M12 x 1 plug connection



General data

Dimensions Ø30 x 62 mm

Electrical connection connector, M12 x 1

Output NAMUR

Operating voltage nom. 8.2 VDC

Types and data – selection table





| Type | Switching distance | Material housing | w | d |
|---------------------|--|------------------|------|------|
| BI10-M30-Y1X-H1141 | 10 mm,  | CuZn-Cr | w021 | d050 |
| BI10-EM30-Y1X-H1141 | 10 mm,  | V2A (1.4301) | w021 | d050 |
| NI15-M30-Y1X-H1141 | 15 mm,  | CuZn-Cr | w021 | d051 |
| NI15-EM30-Y1X-H1141 | 15 mm,  | V2A (1.4301) | w021 | d051 |

M30 – NAMUR – Cable connection



| | | | |
|------------------------------|-------------|--------------------------|--------------|
| General data | | Operating voltage | nom. 8.2 VDC |
| Dimensions | Ø30 x 44 mm | Material cable | PVC 2 m |
| Output | NAMUR | | |
| Electrical connection | cable | | |

Types and data – selection table









| Type | Switching distance | Material housing | w | d |
|--------------|--|------------------|------|------|
| BI10-P30-Y1X | 10 mm,  | PA | w019 | d188 |
| BI10-G30-Y1X | 10 mm,  | CuZn-Cr | w019 | d189 |
| NI15-P30-Y1X | 15 mm,  | PA | w019 | d188 |
| NI15-G30-Y1X | 15 mm,  | CuZn-Cr | w019 | d190 |

M30 – NAMUR – Terminal chamber



| | | | |
|---------------------|-------|--------------------------|--------------|
| General data | | Operating voltage | nom. 8.2 VDC |
| Output | NAMUR | | |

Types and data – selection table

| Type | Dimensions | Switching distance | Electrical connection | Material housing | w | d |
|-------------------|-------------|--|--|------------------|------|------|
| BI10-P30SK-Y1X | Ø30 x 72 mm | 10 mm,  | terminal chamber | PA | w026 | d191 |
| BI10-G30SK-Y1X | Ø30 x 72 mm | 10 mm,  | terminal chamber | CuZn-Cr | w026 | d192 |
| BI10-EM30WDTC-Y1X | Ø30 x 80 mm | 10 mm,  | terminal chamber, removable cage clamp terminals | V4A (1.4404) | w026 | d194 |
| BI10-EG30SK-Y1X | Ø30 x 72 mm | 10 mm,  | terminal chamber | V2A (1.4301) | w026 | d192 |
| NI15-P30SK-Y1X | Ø30 x 72 mm | 15 mm,  | terminal chamber | PA | w026 | d191 |
| NI15-G30SK-Y1X | Ø30 x 72 mm | 15 mm,  | terminal chamber | CuZn-Cr | w026 | d193 |
| NI15-EM30WDTC-Y1X | Ø30 x 80 mm | 15 mm,  | terminal chamber, removable cage clamp terminals | V4A (1.4404) | w026 | d195 |
| NI15-EG30SK-Y1X | Ø30 x 72 mm | 15 mm,  | terminal chamber | V2A (1.4301) | w026 | d193 |

M30 – 2-wire DC – M12 x 1 plug connection



General data

Dimensions

Ø30 x 62 mm

Output

—, 2-wire








Electrical connection

connector, M12 x 1

Operating voltage

10...65 VDC

Types and data – selection table

| Type | Switching distance | Material housing | w | d |
|-----------------------|--|------------------|------|------|
| BI10U-MT30-AD4X-H1144 | 10 mm,  | CuZn-T | w009 | d064 |
| BI10U-M30-AD4X-H1144 | 10 mm,  | CuZn-Cr | w009 | d050 |
| BI10-M30-AD4X-H1141 | 10 mm,  | CuZn-Cr | w023 | d050 |
| NI20-M30-AD4X-H1141 | 20 mm,  | CuZn-Cr | w023 | d051 |
| NI15U-MT30-AD4X-H1144 | 15 mm,  | CuZn-T | w009 | d065 |
| NI15U-M30-AD4X-H1144 | 15 mm,  | CuZn-Cr | w009 | d051 |
| NI15-M30-AD4X-H1141 | 15 mm,  | CuZn-Cr | w023 | d051 |

M30 – 2-wire DC – Cable connection



General data

Output

—, 2-wire

Electrical connection

cable

Operating voltage

10...65 VDC

Material cable

PVC 2 m

Types and data – selection table

| Type | Dimensions | Switching distance | Material housing | w | d |
|----------------|-------------|--------------------|------------------|------|------|
| BI12-G30K-AD4X | Ø30 x 44 mm | 12 mm, | CuZn-Cr | w016 | d189 |
| BI10U-M30-AD4X | Ø30 x 64 mm | 10 mm, | CuZn-Cr | w016 | d052 |
| BI10-S30-AD4X | Ø30 x 64 mm | 10 mm, | PA | w016 | d196 |
| BI10-M30-AD4X | Ø30 x 64 mm | 10 mm, | CuZn-Cr | w016 | d052 |
| NI20-M30-AD4X | Ø30 x 64 mm | 20 mm, | CuZn-Cr | w016 | d053 |
| NI20-G30K-AD4X | Ø30 x 44 mm | 20 mm, | CuZn-Cr | w016 | d190 |
| NI15U-M30-AD4X | Ø30 x 64 mm | 15 mm, | CuZn-Cr | w016 | d053 |
| NI15-S30-AD4X | Ø30 x 64 mm | 15 mm, | PA | w016 | d196 |
| NI15-M30-AD4X | Ø30 x 64 mm | 15 mm, | CuZn-Cr | w016 | d053 |

M30 – 3-wire DC – M12 x 1 plug connection



General data

Dimensions

Ø30 x 62 mm







































Electrical connection

connector, M12 x 1

Operating voltage

10...30 VDC

Types and data – selection table

| Type | Switching distance | Output | Material housing | w | d |
|-----------------------------|--|--------|------------------|------|------|
| BI15U-MT30-AP6X-H1141 | 15 mm,  | —, PNP | CuZn-T | w001 | d064 |
| BI15U-MT30-AN6X-H1141 | 15 mm,  | —, NPN | CuZn-T | w002 | d064 |
| BI15U-M30-RP6X-H1141 | 15 mm,  | —, PNP | CuZn-Cr | w015 | d050 |
| BI15U-M30-AP6X-H1141 | 15 mm,  | —, PNP | CuZn-Cr | w001 | d050 |
| BI15U-M30-AN6X-H1141 | 15 mm,  | —, NPN | CuZn-Cr | w002 | d050 |
| BI15U-EM30WD-AP6X-H1141/3GD | 15 mm,  | —, PNP | V4A (1.4404) | w001 | d050 |
| BI15U-EM30WD-AP6X-H1141 | 15 mm,  | —, PNP | V4A (1.4404) | w001 | d050 |
| BI15U-EM30WD-AN6X-H1141/3GD | 15 mm,  | —, NPN | V4A (1.4404) | w002 | d050 |
| BI15U-EM30WD-AN6X-H1141 | 15 mm,  | —, NPN | V4A (1.4404) | w002 | d050 |
| BI15-M30-AP6X-H1141 | 15 mm,  | —, PNP | CuZn-Cr | w001 | d050 |
| BI15-M30-AN6X-H1141 | 15 mm,  | —, NPN | CuZn-Cr | w002 | d050 |
| BI10U-S30-AP6X-H1141 | 10 mm,  | —, PNP | PBT | w001 | d197 |
| BI10U-S30-AN6X-H1141 | 10 mm,  | —, NPN | PBT | w002 | d197 |
| BI10U-MT30-AP6X-H1141 | 10 mm,  | —, PNP | CuZn-T | w001 | d064 |
| BI10U-MT30-AN6X-H1141 | 10 mm,  | —, NPN | CuZn-T | w002 | d064 |
| BI10U-M30-AP6X-H1141 | 10 mm,  | —, PNP | CuZn-Cr | w001 | d050 |
| BI10U-M30-AN6X-H1141 | 10 mm,  | —, NPN | CuZn-Cr | w002 | d050 |
| BI10U-EM30-AP6X-H1141 | 10 mm,  | —, PNP | V2A (1.4301) | w001 | d050 |
| BI10U-EM30-AN6X-H1141 | 10 mm,  | —, NPN | V2A (1.4301) | w002 | d050 |
| BI10-M30-AP6X-H1141 | 10 mm,  | —, PNP | CuZn-Cr | w001 | d050 |
| BI10-M30-AN6X-H1141 | 10 mm,  | —, NPN | CuZn-Cr | w002 | d050 |
| NI30U-MT30-AP6X-H1141 | 30 mm,  | —, PNP | CuZn-T | w001 | d065 |
| NI30U-MT30-AN6X-H1141 | 30 mm,  | —, NPN | CuZn-T | w002 | d065 |
| NI30U-M30-RP6X-H1141 | 30 mm,  | —, PNP | CuZn-Cr | w015 | d051 |
| NI30U-M30-AP6X-H1141 | 30 mm,  | —, PNP | CuZn-Cr | w001 | d051 |
| NI30U-M30-AN6X-H1141 | 30 mm,  | —, NPN | CuZn-Cr | w002 | d051 |
| NI30U-EM30WD-AP6X-H1141/3D | 30 mm,  | —, PNP | V4A (1.4404) | w001 | d077 |
| NI30U-EM30WD-AN6X-H1141/3D | 30 mm,  | —, NPN | V4A (1.4404) | w002 | d077 |
| NI20U-S30-AP6X-H1141 | 20 mm,  | —, PNP | PBT | w001 | d197 |
| NI20U-S30-AN6X-H1141 | 20 mm,  | —, NPN | PBT | w002 | d197 |
| NI20U-MT30-AP6X-H1141 | 20 mm,  | —, PNP | CuZn-T | w001 | d065 |
| NI20U-MT30-AN6X-H1141 | 20 mm,  | —, NPN | CuZn-T | w002 | d065 |
| NI20U-M30-AP6X-H1141 | 20 mm,  | —, PNP | CuZn-Cr | w001 | d051 |
| NI20U-M30-AN6X-H1141 | 20 mm,  | —, NPN | CuZn-Cr | w002 | d051 |
| NI20U-EM30-AP6X-H1141 | 20 mm,  | —, PNP | V2A (1.4301) | w001 | d051 |
| NI20U-EM30-AN6X-H1141 | 20 mm,  | —, NPN | V2A (1.4301) | w002 | d051 |
| NI20-M30-AP6X-H1141 | 20 mm,  | —, PNP | CuZn-Cr | w001 | d051 |
| NI20-M30-AN6X-H1141 | 20 mm,  | —, NPN | CuZn-Cr | w002 | d051 |

M30 – 3-wire DC – Cable connection



General data

Electrical connection cable Operating voltage 10...30 VDC

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Material housing | Material cable | w | d |
|-------------------|-------------|--------------------|--------|------------------|----------------|------|------|
| BI15U-M30-AP6X | Ø30 x 64 mm | 15 mm, | —, PNP | CuZn-Cr | PVC 2 m | w004 | d052 |
| BI15U-M30-AN6X | Ø30 x 64 mm | 15 mm, | —, NPN | CuZn-Cr | PVC 2 m | w005 | d052 |
| BI15U-EM30WD-AP6X | Ø30 x 66 mm | 15 mm, | —, PNP | V4A (1.4404) | PP 2 m | w004 | d078 |
| BI15U-EM30WD-AN6X | Ø30 x 66 mm | 15 mm, | —, NPN | V4A (1.4404) | PP 2 m | w005 | d078 |
| BI15-M30-AP6X | Ø30 x 64 mm | 15 mm, | —, PNP | CuZn-Cr | PVC 2 m | w004 | d052 |
| BI15-M30-AN6X | Ø30 x 64 mm | 15 mm, | —, NPN | CuZn-Cr | PVC 2 m | w005 | d052 |
| BI15-M30-AP6X 7M | Ø30 x 64 mm | 15 mm, | —, PNP | CuZn-Cr | PVC 7 m | w004 | d052 |
| BI15-M30-AN6X 7M | Ø30 x 64 mm | 15 mm, | —, NPN | CuZn-Cr | PVC 7 m | w005 | d052 |
| BI10U-S30-AP6X | Ø30 x 64 mm | 10 mm, | —, PNP | PA | PVC 2 m | w004 | d196 |
| BI10U-S30-AN6X | Ø30 x 64 mm | 10 mm, | —, NPN | PA | PVC 2 m | w005 | d196 |
| BI10U-M30-AP6X | Ø30 x 64 mm | 10 mm, | —, PNP | CuZn-Cr | PVC 2 m | w004 | d198 |
| BI10U-M30-AN6X | Ø30 x 64 mm | 10 mm, | —, NPN | CuZn-Cr | PVC 2 m | w005 | d198 |
| BI10U-EM30-AP6X | Ø30 x 64 mm | 10 mm, | —, PNP | V2A (1.4301) | PVC 2 m | w004 | d052 |
| BI10U-EM30-AN6X | Ø30 x 64 mm | 10 mm, | —, NPN | V2A (1.4301) | PVC 2 m | w005 | d052 |
| BI10-M30-AP6X | Ø30 x 64 mm | 10 mm, | —, PNP | CuZn-Cr | PVC 2 m | w004 | d052 |
| BI10-M30-AN6X | Ø30 x 64 mm | 10 mm, | —, NPN | CuZn-Cr | PVC 2 m | w005 | d052 |
| BI10-G30K-AP6X | Ø30 x 44 mm | 10 mm, | —, PNP | CuZn-Cr | PVC 2 m | w004 | d189 |
| BI10-G30K-AN6X | Ø30 x 44 mm | 10 mm, | —, NPN | CuZn-Cr | PVC 2 m | w005 | d189 |
| NI30U-M30-AP6X | Ø30 x 64 mm | 30 mm, | —, PNP | CuZn-Cr | PVC 2 m | w004 | d053 |
| NI30U-M30-AN6X | Ø30 x 64 mm | 30 mm, | —, NPN | CuZn-Cr | PVC 2 m | w005 | d053 |
| NI20U-S30-AP6X | Ø30 x 64 mm | 20 mm, | —, PNP | PA | PVC 2 m | w004 | d196 |
| NI20U-S30-AN6X | Ø30 x 64 mm | 20 mm, | —, NPN | PA | PVC 2 m | w005 | d196 |
| NI20U-M30-AP6X | Ø30 x 64 mm | 20 mm, | —, PNP | CuZn-Cr | PVC 2 m | w004 | d053 |
| NI20U-M30-AN6X | Ø30 x 64 mm | 20 mm, | —, NPN | CuZn-Cr | PVC 2 m | w005 | d053 |
| NI20U-EM30-AP6X | Ø30 x 64 mm | 20 mm, | —, PNP | V2A (1.4301) | PVC 2 m | w004 | d053 |
| NI20U-EM30-AN6X | Ø30 x 64 mm | 20 mm, | —, NPN | V2A (1.4301) | PVC 2 m | w005 | d053 |

Wiring diagrams on page 832 ff

Dimension drawings on page 842 ff

Accessories on page 736 ff

M30 – 3-wire DC – Terminal chamber



General data

Operating voltage 10...30 VDC

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Electrical connection | Material housing | w | d |
|---------------------|--------------|--------------------|--------|--|------------------|------|------|
| BI15U-EM30WDTC-AP6X | Ø30 x 95 mm | 15 mm, | —, PNP | terminal chamber, removable cage clamp terminals | V4A (1.4404) | w011 | d080 |
| BI10U-P30SK-AP6X | Ø30 x 87 mm | 10 mm, | —, PNP | terminal chamber | PA | w011 | d201 |
| BI10U-P30SK-AN6X | Ø30 x 87 mm | 10 mm, | —, NPN | terminal chamber | PA | w012 | d201 |
| BI10U-EG30SK-AP6X | Ø30 x 87 mm | 10 mm, | —, PNP | terminal chamber | V2A (1.4301) | w011 | d199 |
| BI10U-EG30SK-AN6X | Ø30 x 87 mm | 10 mm, | —, NPN | terminal chamber | V2A (1.4301) | w012 | d199 |
| BI10-P30SR-AP6X | Ø30 x 115 mm | 10 mm, | —, PNP | terminal chamber | ABS | w011 | d202 |
| BI10-P30SR-AN6X | Ø30 x 115 mm | 10 mm, | —, NPN | terminal chamber | ABS | w012 | d202 |
| BI10-P30SK-AP6X | Ø30 x 87 mm | 10 mm, | —, PNP | terminal chamber | PA | w011 | d201 |
| BI10-G30SK-AP6X | Ø30 x 87 mm | 10 mm, | —, PNP | terminal chamber | CuZn-Cr | w011 | d199 |
| BI10-G30SK-AN6X | Ø30 x 87 mm | 10 mm, | —, NPN | terminal chamber | CuZn-Cr | w012 | d199 |
| NI30U-EM30WDTC-AP6X | Ø30 x 95 mm | 30 mm, | —, PNP | terminal chamber, removable cage clamp terminals | V4A (1.4404) | w011 | d081 |
| NI20U-P30SK-AP6X | Ø30 x 87 mm | 20 mm, | —, PNP | terminal chamber | PA | w011 | d201 |
| NI20U-P30SK-AN6X | Ø30 x 87 mm | 20 mm, | —, NPN | terminal chamber | PA | w012 | d201 |
| NI20U-EG30SK-AP6X | Ø30 x 87 mm | 20 mm, | —, PNP | terminal chamber | V2A (1.4301) | w011 | d200 |
| NI20U-EG30SK-AN6X | Ø30 x 87 mm | 20 mm, | —, NPN | terminal chamber | V2A (1.4301) | w012 | d200 |
| NI15-P30SR-AP6X | Ø30 x 115 mm | 15 mm, | —, PNP | terminal chamber | ABS | w011 | d202 |
| NI15-P30SR-AN6X | Ø30 x 115 mm | 15 mm, | —, NPN | terminal chamber | ABS | w012 | d202 |
| NI15-P30SK-AP6X | Ø30 x 87 mm | 15 mm, | —, PNP | terminal chamber | PA | w011 | d201 |
| NI15-P30SK-AN6X | Ø30 x 87 mm | 15 mm, | —, NPN | terminal chamber | PA | w012 | d201 |
| NI15-G30SK-AP6X | Ø30 x 87 mm | 15 mm, | —, PNP | terminal chamber | CuZn-Cr | w011 | d200 |
| NI15-G30SK-AN6X | Ø30 x 87 mm | 15 mm, | —, NPN | terminal chamber | CuZn-Cr | w012 | d200 |

M30 – 4-wire DC – M12 x 1 plug connection



General data

| | | | |
|------------------------------|--------------------|-------------------------|---------|
| Dimensions | Ø30 x 62 mm | Material housing | CuZn-Cr |
| Electrical connection | connector, M12 x 1 | | |

Types and data – selection table

| Type | Switching distance | Output | Operating voltage | w | d |
|-----------------------|--------------------|--------|-------------------|------|------|
| BI15U-M30-VP44X-H1141 | 15 mm, | , PNP | 10...55 VDC | w017 | d050 |
| BI15U-M30-VN44X-H1141 | 15 mm, | , NPN | 10...55 VDC | w010 | d050 |
| BI15-M30-VP6X-H1141 | 15 mm, | , PNP | 10...30 VDC | w008 | d050 |
| BI15-M30-VN6X-H1141 | 15 mm, | , NPN | 10...30 VDC | w010 | d050 |
| NI30U-M30-VP44X-H1141 | 30 mm, | , PNP | 10...55 VDC | w017 | d051 |
| NI30U-M30-VN44X-H1141 | 30 mm, | , NPN | 10...55 VDC | w010 | d051 |
| NI20-M30-VP6X-H1141 | 20 mm, | , PNP | 10...30 VDC | w008 | d051 |
| NI20-M30-VN6X-H1141 | 20 mm, | , NPN | 10...30 VDC | w010 | d051 |





















M30 – 4-wire DC – Cable connection



General data

| | | | |
|------------------------------|-------------|-------------------------|---------|
| Dimensions | Ø30 x 64 mm | Material housing | CuZn-Cr |
| Electrical connection | cable | | |

Types and data – selection table

| Type | Switching distance | Output | Operating voltage | Material cable | w | d |
|------------------|--|---|-------------------|----------------|------|------|
| BI15U-M30-VP44X | 15 mm,  |  , PNP | 10...55 VDC | PVC 2 m | w007 | d052 |
| BI15U-M30-VN44X | 15 mm,  |  , NPN | 10...55 VDC | PVC 2 m | w018 | d052 |
| BI15-M30-VN4X 7M | 15 mm,  |  , NPN | 10...30 VDC | PVC 7 m | w018 | d052 |
| BI15-M30-VP4X 7M | 15 mm,  |  , PNP | 10...30 VDC | PVC 7 m | w007 | d052 |
| BI15-M30-VN6X | 15 mm,  |  , NPN | 10...30 VDC | PVC 2 m | w018 | d052 |
| BI15-M30-VP6X | 15 mm,  |  , PNP | 10...30 VDC | PVC 2 m | w007 | d052 |
| NI30U-M30-VP44X | 30 mm,  |  , PNP | 10...55 VDC | PVC 2 m | w007 | d053 |
| NI30U-M30-VN44X | 30 mm,  |  , NPN | 10...55 VDC | PVC 2 m | w018 | d053 |
| NI20-M30-VP6X 7M | 20 mm,  |  , PNP | 10...30 VDC | PVC 7 m | w007 | d053 |
| NI20-M30-VN6X 7M | 20 mm,  |  , PNP | 10...30 VDC | PVC 7 m | w007 | d053 |

















M30 – 4-wire DC – Terminal chamber



General data


Electrical connection terminal chamber **Operating voltage** 10...65 VDC

Types and data – selection table



| Type | Dimensions | Switching distance | Output | Material housing | w | d |
|-------------------|--------------|--|---|------------------|------|------|
| BI10U-EG30SK-VP4X | Ø30 x 87 mm | 10 mm,  |  , PNP | V2A (1.4301) | w014 | d199 |
| BI10U-EG30SK-VN4X | Ø30 x 87 mm | 10 mm,  |  , NPN | V2A (1.4301) | w013 | d199 |
| BI10-P30SR-VP4X2 | Ø30 x 115 mm | 10 mm,  |  , PNP | ABS | w014 | d203 |
| BI10-P30SR-VN4X2 | Ø30 x 115 mm | 10 mm,  |  , NPN | ABS | w013 | d203 |
| NI20U-EG30SK-VP4X | Ø30 x 87 mm | 20 mm,  |  , PNP | V2A (1.4301) | w014 | d200 |
| NI20U-EG30SK-VN4X | Ø30 x 87 mm | 20 mm,  |  , NPN | V2A (1.4301) | w013 | d200 |
| NI15-P30SR-VP4X2 | Ø30 x 115 mm | 15 mm,  |  , PNP | ABS | w014 | d203 |
| NI15-P30SR-VN4X2 | Ø30 x 115 mm | 15 mm,  |  , NPN | ABS | w013 | d203 |

M30 – 2-wire AC/DC – 7/8" plug connection



| | | | |
|------------------------------|---|--------------------------|--------------------------------|
| General data | | | |
| Dimensions | Ø30 x 80 mm | Operating voltage | 20...250 VAC / 10...300 VDC |
| Output |  | Material housing | CuZn-Cr |
| Electrical connection | connector, 7/8" | | |

Types and data – selection table


| Type | Switching distance | w | d |
|-------------------------|--|------|------|
| B110U-G30-ADZ30X2-B1131 | 10 mm,  | w030 | d204 |
| NI20U-G30-ADZ30X2-B1131 | 20 mm,  | w030 | d205 |

M30 – 2-wire AC/DC – 1/2" plug connection



| | | | |
|------------------------------|---|--------------------------|--------------------------------|
| General data | | | |
| Dimensions | Ø30 x 80 mm | Operating voltage | 20...250 VAC / 10...300 VDC |
| Output |  | Material housing | CuZn-Cr |
| Electrical connection | connector, 1/2" | | |

Types and data – selection table

| Type | Switching distance | w | d |
|-------------------------|--|------|------|
| B110U-G30-ADZ30X2-B3131 | 10 mm,  | w030 | d206 |
| NI20U-G30-ADZ30X2-B3131 | 20 mm,  | w030 | d207 |

M30 – 2-wire AC/DC – Terminal chamber



General data

Dimensions Ø30 x 64 mm







Operating voltage 20...250 VAC /
10...300 VDC

Output 

Material cable PVC 2 m

Electrical connection cable

Types and data – selection table

| Type | Switching distance | Material housing | w | d |
|-------------------|--|------------------|------|------|
| BI10U-M30-ADZ30X2 | 10 mm,  | CuZn-Cr | w031 | d208 |
| BI10-S30-AZ3X | 10 mm,  | PA | w031 | d196 |
| BI10-M30-AZ3X | 10 mm,  | CuZn-Cr | w020 | d052 |
| NI20U-M30-ADZ30X2 | 20 mm,  | CuZn-Cr | w031 | d209 |
| NI15-S30-AZ3X | 15 mm,  | PA | w031 | d196 |
| NI15-M30-AZ3X | 15 mm,  | CuZn-Cr | w020 | d053 |

M30 – 2-wire AC/DC – Terminal chamber



General data

Dimensions Ø30 x 115 mm



Operating voltage 20...250 VAC /
10...300 VDC

Output connection programmable

Material housing ABS


Electrical connection Terminal chamber

Types and data – selection table

| Type | Switching distance | w | d |
|------------------|--|------|------|
| BI10-P30SR-FZ3X2 | 10 mm,  | w028 | d203 |
| NI15-P30SR-FZ3X2 | 15 mm,  | w028 | d203 |

G47 – NAMUR










| | | | |
|------------------------------|--|--------------------------|--------------|
| Type | BI20-G47-Y1X | Operating voltage | nom. 8.2 VDC |
| Dimensions | Ø47 x 70 mm | Material housing | CuZn-Cr |
| Switching distance | 20 mm,  | Material cable | PVC 2 m |
| Output | NAMUR | Wiring diagram | w019 |
| Electrical connection | cable | Dimension drawing | d210 |

G47 – 3-wire DC



| | | | |
|------------------------------|-------------|-------------------------|---------|
| General data | | Material housing | CuZn-Cr |
| Dimensions | Ø47 x 70 mm | Material cable | PVC 2 m |
| Electrical connection | cable | | |
| Operating voltage | 10...65 VDC | | |

Types and data – selection table

| Type | Switching distance | Output |  |  |
|---------------|--|---|---|---|
| BI20-G47-AP4X | 20 mm,  |  , PNP | w004 | d210 |
| BI20-G47-AN4X | 20 mm,  |  , NPN | w005 | d210 |
| NI25-G47-AP4X | 25 mm,  |  , PNP | w004 | d211 |
| NI25-G47-AN4X | 25 mm,  |  , NPN | w005 | d211 |

G47 – 4-wire DC



General data

Electrical connection terminal chamber
Operating voltage 10...65 VDC

Material housing

CuZn-Cr

Types and data – selection table

| Type | Dimensions | Switching distance | Output | w | d |
|------------------|--------------|--------------------|--------|------|------|
| BI25-G47SR-VP4X2 | Ø47 x 96 mm | 25 mm, | , PNP | w014 | d212 |
| BI25-G47SR-VN4X2 | Ø47 x 96 mm | 25 mm, | , NPN | w013 | d212 |
| NI40-G47SR-VP4X2 | Ø47 x 106 mm | 40 mm, | , PNP | w014 | d213 |
| NI40-G47SR-VN4X2 | Ø47 x 106 mm | 40 mm, | , NPN | w013 | d213 |

G47 – 2-wire AC/DC



General data

Operating voltage 20...250 VAC /
10...300 VDC

Material housing

CuZn-Cr

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Electrical connection | Material cable | w | d |
|------------------|--------------|--------------------|-------------------------|-----------------------|----------------|------|------|
| BI25-G47SR-FZ3X2 | Ø47 x 96 mm | 25 mm, | connection programmable | terminal chamber | - | w028 | d212 |
| BI20-G47-AZ3X | Ø47 x 70 mm | 20 mm, | | cable | PVC 2 m | w031 | d210 |
| NI40-G47SR-FZ3X2 | Ø47 x 106 mm | 40 mm, | connection programmable | terminal chamber | - | w028 | d213 |
| NI25-G47-AZ3X | Ø47 x 70 mm | 25 mm, | | cable | PVC 2 m | w031 | d211 |

Smooth barrel

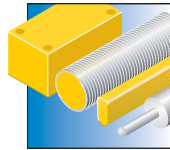


Compact 3 mm or robust \varnothing 40 mm versions: The smooth barrels feature different switching distances, many connection possibilities and a high protection class required as a standard in the sector of industrial automation.

Features

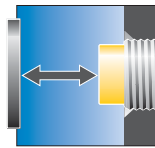
- Cable, plug connection or terminal chamber
- Mounting bracket included in delivery
- Electrical versions NAMUR, DC and AC/DC
- Stainless steel and plastic housings

Properties



Design

from \varnothing 3 mm for confined spaces up to \varnothing 40 mm for animal feed applications



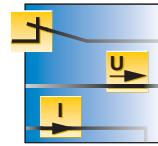
Switching distances

Large switching distances, optionally with factor 1, without reduction factor



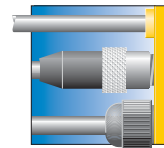
Materials

Stainless steel sensors up to \varnothing 6.5 mm diameter, bigger sizes in PA or PBT



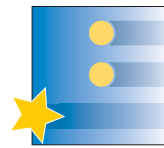
Electrical versions

NAMUR, 2/3 and 4-wire DC, 2-wire AC/DC



Electrical connections

Cable, terminal chamber, M8 and M12 plug connections



Special features

\varnothing 4 mm and 6.5 mm with lateral active face, Integrated rotation speed control

Ø 3 mm – 3-wire DC



General data

| | |
|------------------------------|------------|
| Dimensions | Ø3 x 27 mm |
| Switching distance | 1 mm, |
| Electrical connection | cable |

| | |
|--------------------------|--------------|
| Operating voltage | 10...30 VDC |
| Material housing | V2A (1.4301) |
| Material cable | PUR 2 m |

Types and data – selection table

| Type | Output | w | d |
|---------------|--------|------|------|
| BI1-EH03-AP7X | PNP | w004 | d214 |
| BI1-EH03-AN7X | NPN | w005 | d214 |

Ø 4 mm – NAMUR



General data

| | |
|------------------------------|------------|
| Dimensions | Ø4 x 30 mm |
| Switching distance | 1 mm, |
| Output | NAMUR |
| Electrical connection | cable |

| | |
|--------------------------|--------------|
| Operating voltage | nom. 8.2 VDC |
| Material housing | V4A (1.4404) |
| Material cable | PVC 2 m |

Types and data – selection table

| Type | w | d |
|--------------|------|------|
| BI1-HS540-Y1 | w019 | d216 |
| BI1-EH04-Y1 | w019 | d215 |

Ø 4 mm – 3-wire DC



General data

Switching distance 1 mm,

Operating voltage 10...30 VDC

Material housing V4A (1.4404)

Types and data – selection table

| Type | Dimensions | Output | Electrical connection | Material cable | w | d |
|---------------------|--------------|--------|-----------------------|----------------|------|------|
| BI1-HS540-RP6X | Ø4 x 30 mm | , PNP | cable | PUR 2 m | w006 | d219 |
| BI1-HS540-AP6X | Ø4 x 30 mm | , PNP | cable | PUR 2 m | w004 | d219 |
| BI1-HS540-AN6X | Ø4 x 30 mm | , NPN | cable | PUR 2 m | w005 | d219 |
| BI1-EH04-RP6X-V1331 | Ø4 x 42.5 mm | , PNP | connector, M8 x 1 | - | w003 | d217 |
| BI1-EH04-RP6X | Ø4 x 30 mm | , PNP | cable | PUR 2 m | w006 | d218 |
| BI1-EH04-AP6X-V1331 | Ø4 x 42.5 mm | , PNP | connector, M8 x 1 | - | w001 | d217 |
| BI1-EH04-AP6X | Ø4 x 30 mm | , PNP | cable | PUR 2 m | w004 | d218 |
| BI1-EH04-AN6X-V1331 | Ø4 x 42.5 mm | , NPN | connector, M8 x 1 | - | w002 | d217 |
| BI1-EH04-AN6X | Ø4 x 30 mm | , NPN | cable | PUR 2 m | w005 | d218 |

Ø 6.5 mm – NAMUR



General data

Output NAMUR

Electrical connection cable

Operating voltage nom. 8.2 VDC

Material cable PVC 2 m

Types and data – selection table

| Type | Dimensions | Switching distance | Material housing | w | d |
|-----------------|----------------|--------------------|------------------|------|------|
| BI1,5-HS865-Y1 | Ø6.5 x 31.6 mm | 1.5 mm, | CuZn-Cr | w019 | d221 |
| BI1,5-EH6,5K-Y1 | Ø6.5 x 23.6 mm | 1.5 mm, | V4A (1.4404) | w019 | d220 |
| NI3-EH6,5K-Y1 | Ø6.5 x 23.6 mm | 3 mm, | V4A (1.4404) | w019 | d222 |

Ø 6.5 mm – 3-wire DC – M18 x 1 plug connection



General data

Electrical connection

connector, M8 x 1

Operating voltage

10...30 VDC

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Material housing | w | d |
|-------------------------|--------------|--------------------|--------|------------------|------|------|
| BI2U-EH6,5-RP6X-V1131 | Ø6.5 x 49 mm | 2 mm, | , PNP | V2A (1.4301) | w003 | d018 |
| BI2U-EH6,5-AP6X-V1131 | Ø6.5 x 49 mm | 2 mm, | , PNP | V2A (1.4301) | w001 | d018 |
| BI2U-EH6,5-AN6X-V1131 | Ø6.5 x 49 mm | 2 mm, | , NPN | V2A (1.4301) | w002 | d018 |
| BI2-EH6,5K-RP6X-V1131 | Ø6.5 x 31 mm | 2 mm, | , PNP | V4A (1.4404) | w003 | d223 |
| BI2-EH6,5K-AP6X-V1131 | Ø6.5 x 31 mm | 2 mm, | , PNP | V4A (1.4404) | w001 | d223 |
| BI2-EH6,5K-AN6X-V1131 | Ø6.5 x 31 mm | 2 mm, | , NPN | V4A (1.4404) | w002 | d223 |
| BI2-EH6,5-AP6X-V1131 | Ø6.5 x 49 mm | 2 mm, | , PNP | V2A (1.4301) | w001 | d018 |
| BI2-EH6,5-AN6X-V1131 | Ø6.5 x 49 mm | 2 mm, | , NPN | V2A (1.4301) | w002 | d018 |
| BI1,5-EH6,5K-AP6X-V1131 | Ø6.5 x 31 mm | 1.5 mm, | , PNP | V4A (1.4404) | w001 | d223 |
| BI1,5-EH6,5K-AN6X-V1131 | Ø6.5 x 31 mm | 1.5 mm, | , NPN | V4A (1.4404) | w002 | d223 |
| BI1,5-EH6,5-AP6X-V1131 | Ø6.5 x 49 mm | 1.5 mm, | , PNP | V2A (1.4301) | w001 | d018 |
| BI1,5-EH6,5-AN6X-V1131 | Ø6.5 x 49 mm | 1.5 mm, | , NPN | V2A (1.4301) | w002 | d018 |
| NI6U-EH6,5-RP6X-V1131 | Ø6.5 x 49 mm | 6 mm, | , PNP | V2A (1.4301) | w003 | d019 |
| NI6U-EH6,5-AP6X-V1131 | Ø6.5 x 49 mm | 6 mm, | , PNP | V2A (1.4301) | w001 | d019 |
| NI6U-EH6,5-AN6X-V1131 | Ø6.5 x 49 mm | 6 mm, | , NPN | V2A (1.4301) | w002 | d019 |
| NI3-EH6,5K-AP6X-V1131 | Ø6.5 x 31 mm | 3 mm, | , PNP | V4A (1.4404) | w001 | d224 |
| NI3-EH6,5K-AN6X-V1131 | Ø6.5 x 31 mm | 3 mm, | , NPN | V4A (1.4404) | w002 | d224 |
| NI3-EH6,5-AP6X-V1131 | Ø6.5 x 49 mm | 3 mm, | , PNP | V2A (1.4301) | w001 | d019 |
| NI3-EH6,5-AN6X-V1131 | Ø6.5 x 49 mm | 3 mm, | , NPN | V2A (1.4301) | w002 | d019 |

Ø 6.5 mm – 3-wire DC – Cable connection



General data

Electrical connection cable
Operating voltage 10...30 VDC

Material cable

PUR 2 m

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Material housing | w | d |
|-------------------|----------------|--------------------|--------|------------------|------|------|
| BI2U-EH6,5-RP6X | Ø6.5 x 41.6 mm | 2 mm, | , PNP | V2A (1.4301) | w006 | d020 |
| BI2U-EH6,5-AP6X | Ø6.5 x 41.6 mm | 2 mm, | , NPN | V2A (1.4301) | w004 | d020 |
| BI2U-EH6,5-AN6X | Ø6.5 x 41.6 mm | 2 mm, | , NPN | V2A (1.4301) | w005 | d020 |
| BI2-EH6,5K-RP6X | Ø6.5 x 23.6 mm | 2 mm, | , PNP | V4A (1.4404) | w006 | d225 |
| BI2-EH6,5K-AP6X | Ø6.5 x 23.6 mm | 2 mm, | , NPN | V4A (1.4404) | w004 | d225 |
| BI2-EH6,5K-AN6X | Ø6.5 x 23.6 mm | 2 mm, | , NPN | V4A (1.4404) | w005 | d225 |
| BI2-EH6,5-AP6X | Ø6.5 x 41.6 mm | 2 mm, | , PNP | V2A (1.4301) | w004 | d020 |
| BI2-EH6,5-AN6X | Ø6.5 x 41.6 mm | 2 mm, | , NPN | V2A (1.4301) | w005 | d020 |
| BI1,5-HS865-AP6X | Ø6.5 x 31.6 mm | 1.5 mm, | , PNP | CuZn-Cr | w004 | d221 |
| BI1,5-HS865-AN6X | Ø6.5 x 41.6 mm | 1.5 mm, | , NPN | CuZn-Cr | w005 | d221 |
| BI1,5-EH6,5K-AP6X | Ø6.5 x 23.6 mm | 1.5 mm, | , PNP | V4A (1.4404) | w004 | d225 |
| BI1,5-EH6,5K-AN6X | Ø6.5 x 23.6 mm | 1.5 mm, | , NPN | V4A (1.4404) | w005 | d225 |
| NI6U-EH6,5-AP6X | Ø6.5 x 42 mm | 6 mm, | , PNP | V2A (1.4301) | w004 | d021 |
| NI6U-EH6,5-AN6X | Ø6.5 x 42 mm | 6 mm, | , NPN | V2A (1.4301) | w005 | d021 |
| NI3-EH6,5K-AP6X | Ø6.5 x 23.6 mm | 3 mm, | , PNP | V4A (1.4404) | w004 | d226 |
| NI3-EH6,5K-AN6X | Ø6.5 x 23.6 mm | 3 mm, | , NPN | V4A (1.4404) | w005 | d226 |
| NI3-EH6,5-AP6X | Ø6.5 x 42 mm | 3 mm, | , PNP | V2A (1.4301) | w004 | d021 |
| NI3-EH6,5-AN6X | Ø6.5 x 42 mm | 3 mm, | , NPN | V2A (1.4301) | w005 | d021 |

Ø 11 mm – NAMUR



General data

| | | | |
|------------------------------|-------------|--------------------------|--------------|
| Dimensions | Ø11 x 34 mm | Operating voltage | nom. 8.2 VDC |
| Output | NAMUR | Material housing | PA |
| Electrical connection | cable | Material cable | PVC 2 m |

Fixing clamp BS11 included in delivery

Types and data – selection table

| Type | Switching distance | w | d |
|------------|--------------------|------|------|
| BI2-K11-Y1 | 2 mm, | w019 | d227 |
| NI5-K11-Y1 | 5 mm, | w019 | d227 |

Ø 11 mm – 3-wire DC



General data

| | | | |
|--------------------------|-------------|-------------------------|----|
| Output | , PNP | Material housing | PA |
| Operating voltage | 10...30 VDC | | |

Fixing clamp BS11 included in delivery


Types and data – selection table

| Type | Dimensions | Switching distance | Electrical connection | Material cable | w | d |
|----------------|-------------|--------------------|-----------------------|----------------|------|------|
| BI2-K11SK-AP6X | Ø11 x 75 mm | 2 mm, | terminal chamber | - | w011 | d229 |
| BI2-K11-AP6X | Ø11 x 54 mm | 2 mm, | cable | PVC 2 m | w004 | d228 |
| NI5-K11SK-AP6X | Ø11 x 75 mm | 5 mm, | terminal chamber | - | w011 | d229 |
| NI5-K11-AP6X | Ø11 x 54 mm | 5 mm, | cable | PVC 2 m | w004 | d228 |

Ø 20 mm – 3-wire DC







General data

Switching distance 10 mm, 
Operating voltage 10...30 VDC

Material housing PBT

Fixing clamp BS20 included in delivery

Types and data – selection table

| Type | Dimensions | Output | Electrical connection | Material cable | w | d |
|-----------------|-------------|--|-----------------------|----------------|------|------|
| NI10-K20SK-AP6X | Ø20 x 77 mm |  , PNP | terminal chamber | - | w011 | d231 |
| NI10-K20SK-AN6X | Ø20 x 77 mm |  , NPN | terminal chamber | - | w012 | d231 |
| NI10-K20-AP6X | Ø20 x 54 mm |  , PNP | cable | PVC 2 m | w004 | d230 |
| NI10-K20-AN6X | Ø20 x 54 mm |  , NPN | cable | PVC 2 m | w005 | d230 |

Ø 20 mm – 2-wire AC/DC



General data

Switching distance 10 mm, 

Operating voltage 20...250 VAC /
10...300 VDC

Output 

Material housing PBT

Fixing clamp BS20 included in delivery

Types and data – selection table

| Type | Dimensions | Electrical connection | Material cable | w | d |
|-----------------|-------------|-----------------------|----------------|------|------|
| NI10-K20SK-AZ3X | Ø20 x 77 mm | terminal chamber | - | w036 | d231 |
| NI10-K20-AZ3X | Ø20 x 79 mm | cable | PVC 2 m | w031 | d232 |

Ø 34 mm – 4-wire DC



General data

Switching distance

20 mm,

Output

, PNP

Operating voltage

10...65 VDC

Material housing

PBT

Fixing clamp BS34.1 included in delivery

Types and data – selection table

| Type | Dimensions | Electrical connection | Material cable | w | d |
|------------------|--------------|-----------------------|----------------|------|------|
| NI20-K34SR-VP4X2 | Ø34 x 106 mm | terminal chamber | - | w014 | d234 |
| NI20-K34-VP4X | Ø34 x 80 mm | cable | PVC 2 m | w007 | d233 |

Ø 40 mm – 4-wire DC



General data

Dimensions

Ø40 x 90 mm

Electrical connection

Terminal chamber

Operating voltage

10...65 VDC

Material housing

ABS

Fixing clamp BS40 included in delivery

Types and data – selection table

| Type | Switching distance | Output | w | d |
|------------------|--------------------|--------|------|------|
| NI30-K40SR-VP4X2 | 30 mm, | , PNP | w014 | d235 |
| NI30-K40SR-VN4X2 | 30 mm, | , NPN | w013 | d235 |
| NI20-K40SR-VP4X2 | 20 mm, | , PNP | w014 | d235 |
| NI20-K40SR-VN4X2 | 20 mm, | , NPN | w013 | d235 |

Ø 40 mm – 2-wire AC/DC



General data

Dimensions

Ø40 x 90 mm

Operating voltage

20...250 VAC /
10...300 VDC

Output

connection programmable

Material housing


ABS

Electrical connection

terminal chamber

Fixing clamp BS40 included in delivery

Types and data – selection table

| Type | Switching distance | w | d |
|------------------|--|------|------|
| NI30-K40SR-FZ3X2 | 30 mm,  | w028 | d235 |
| NI20-K40SR-FZ3X2 | 20 mm,  | w028 | d235 |

Ring sensors

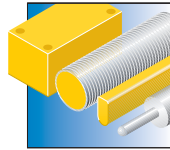


TURCK ring sensors are compact and universally mountable. They are applied in assembly lines or component feeding systems to detect small metal parts. The *uprox*[®]+ TS12 is an innovative replacement for various ring sensors, especially for applications with different tube diameters.

Features

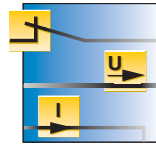
- Ring diameter 6...100 mm
- Static, dynamic and analog versions
- Integrated amplifier or separable combination of probe and amplifier
- High sensitivity, adjustable, up to Ø 0.1 mm wire diameter
- Compact design
- Innovative TS12 version from the *uprox*[®]+ factor 1 series

Properties



Design

From the compact Q14 rectangular version to the well-proven S32.



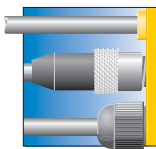
Electrical versions

3-wire NO contact or antivalent PNP/NPN switching
Static, dynamic or analog



Measuring ranges

Ring diameters of Ø 6...100 mm detect steel balls of Ø 0.6 mm as well as wires of Ø 0.4 mm and larger



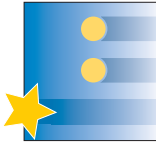
Electrical connections

M12 x 1 plug connection, terminal chamber, cable 2 m



Materials

Plastic housing in PBT, PA, ABS and POM



Special features

Versions with separate ring and amplifier
S32 XL with 100 mm ring diameter

TS12 – 3-wire DC



General data

Dimensions 17 x 12 x 80 mm
Electrical connection connector, M8 x 1

Operating voltage 10...30 VDC
Material housing PBT

For small parts detection

Types and data – selection table

| Type | Output | w | d |
|------------------------|----------|------|------|
| NI20U-TS12-AP6X2-V1131 | —/—, PNP | w001 | d236 |
| NI20U-TS12-AN6X2-V1131 | —/—, NPN | w002 | d236 |

Q14 – 3-wire DC



General data

Dimensions 30 x 14 x 62.5 mm
Electrical connection connector, M12 x 1

Operating voltage 10...30 VDC
Material housing PBT

Tailback detection possible

Types and data – selection table

| Type | Internal ring diameter | Min. object size | Output | w | d |
|-----------------------|------------------------|------------------|--------|------|------|
| BI20R-Q14-AP6X2-H1141 | 20.1 mm | 4mm | —, PNP | w001 | d240 |
| BI20R-Q14-AN6X2-H1141 | 20.1 mm | 4mm | —, NPN | w002 | d240 |
| BI15R-Q14-AP6X2-H1141 | 15.1 mm | 3mm | —, PNP | w001 | d239 |
| BI15R-Q14-AN6X2-H1141 | 15.1 mm | 3mm | —, NPN | w002 | d239 |
| BI10R-Q14-AP6X2-H1141 | 10.1 mm | 2mm | —, PNP | w001 | d238 |
| BI10R-Q14-AN6X2-H1141 | 10.1 mm | 2mm | —, NPN | w002 | d238 |
| BI6R-Q14-AP6X2-H1141 | 6.1 mm | 2mm | —, PNP | w001 | d237 |
| BI6R-Q14-AN6X2-H1141 | 6.1 mm | 2mm | —, NPN | w002 | d237 |

Q14 – Voltage output 0...10 V



| | | | |
|-------------------------------|--------------------|--------------------------|-------------|
| Type | BI20R-Q14-LU-H1141 | Operating voltage | 15...30 VDC |
| Dimensions | 30 x 14 x 62.5 mm | Material housing | PBT |
| Internal ring diameter | 20.1 mm | Wiring diagram | w037 |
| Analog output | 0...10 V | Dimension drawing | d241 |
| Electrical connection | connector, M12 x 1 | | |

Tailback detection possible

Q20 – 3-wire DC



| | | | |
|-------------------------------|-----------------|------------------------------|--------------------|
| General data | | Electrical connection | connector, M12 x 1 |
| Dimensions | 40 x 20 x 68 mm | Operating voltage | 10...30 VDC |
| Internal ring diameter | 30.1 mm | Material housing | PBT |
| Min. object size | 6 mm | | |

Tailback detection possible

Types and data – selection table

| Type | Output | w | d |
|-----------------------|--------|------|------|
| BI30R-Q20-AP6X2-H1141 | —, PNP | w001 | d242 |
| BI30R-Q20-AN6X2-H1141 | —, NPN | w002 | d242 |

W30 – 3-wire DC – Dynamic output performance



General data

| | | | |
|-----------------------|--------------------|-------------------|-------------|
| Dimensions | 35 x 30 x 60 mm | Operating voltage | 10...30 VDC |
| Electrical connection | connector, M12 x 1 | Material housing | PA |

For the detection of small and fast moving parts

Types and data – selection table

| Type | Internal ring diameter | Min. object size | Output | w | d |
|-----------------------|------------------------|------------------|--------|------|------|
| BI30R-W30-DAP6X-H1141 | 30.1 mm | 3 mm | —, PNP | w001 | d247 |
| BI30R-W30-DAN6X-H1141 | 30.1 mm | 3 mm | —, NPN | w002 | d247 |
| BI20R-W30-DAP6X-H1141 | 20.1 mm | 2 mm | —, PNP | w001 | d246 |
| BI20R-W30-DAN6X-H1141 | 20.1 mm | 2 mm | —, NPN | w002 | d246 |
| BI15R-W30-DAP6X-H1141 | 15.1 mm | 1.5 mm | —, PNP | w001 | d245 |
| BI15R-W30-DAN6X-H1141 | 15.1 mm | 1.5 mm | —, NPN | w002 | d245 |
| BI10R-W30-DAP6X-H1141 | 10.1 mm | 1 mm | —, PNP | w001 | d244 |
| BI10R-W30-DAN6X-H1141 | 10.1 mm | 1 mm | —, NPN | w002 | d244 |
| BI6R-W30-DAP6X-H1141 | 6.1 mm | 0.6 mm | —, PNP | w001 | d243 |
| BI6R-W30-DAN6X-H1141 | 6.1 mm | 0.6 mm | —, NPN | w002 | d243 |

w Wiring diagrams on page 832 ff

d Dimension drawings on page 842 ff

a Accessories on page 736 ff

Q80 – 3-wire DC



General data

| | |
|------------------------------|--------------------|
| Dimensions | 80 x 40 x 92 mm |
| Output | —, PNP |
| Electrical connection | connector, M12 x 1 |

| | |
|--------------------------|-------------|
| Operating voltage | 10...30 VDC |
| Material housing | PBT |

Tailback detection possible

Types and data – selection table

| Type | Internal ring diameter | Min. object size | w | d |
|-----------------------|------------------------|------------------|------|------|
| BI65R-Q80-AP6X2-H1141 | 65 mm | 10 mm | w001 | d249 |
| BI50R-Q80-AP6X2-H1141 | 50 mm | 8 mm | w001 | d248 |

S32SR – 4-wire DC



General data

| | |
|------------------------------|-------------------|
| Dimensions | 100 x 32 x 175 mm |
| Output | —, PNP |
| Electrical connection | terminal chamber |

| | |
|--------------------------|-------------|
| Operating voltage | 10...55 VDC |
| Material housing | ABS |

Tailback detection possible

Types and data – selection table

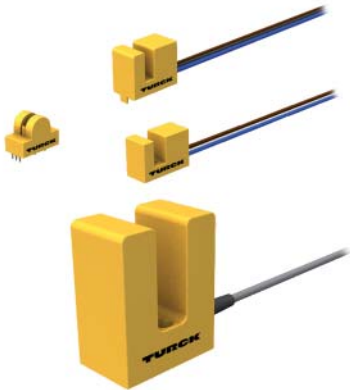
| Type | Internal ring diameter | w | d |
|-------------------|------------------------|------|------|
| NI65R-S32SR-VP44X | 65 mm | w014 | d252 |
| NI40R-S32SR-VP44X | 40 mm | w014 | d251 |
| NI20R-S32SR-VP44X | 20 mm | w014 | d250 |

S32XL – 4-wire DC

| | | | |
|-------------------------------|--------------------------|------------------------------|--------------------|
| Type | NI100R-S32XL-VP44X-H1141 | Electrical connection | connector, M12 x 1 |
| Dimensions | 137.5 x 32 x 180 mm | Operating voltage | 10...55 VDC |
| Internal ring diameter | 100 mm | Material housing | POM |
| Min. object size | 10 mm / 4 mm | Wiring diagram | w017 |
| Output | —, PNP | Dimension drawing | d253 |

Tailback detection possible

Slot sensors



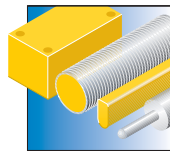
The slot sensors are U-shaped and the active face is located between the two arms. If a metal part passes through the slot, the sensor is actuated. Slot sensors detect laterally approaching targets regardless of their distance to the active face.

Slot sensors are thus applicable as limit value detectors on analog pointer instruments or on trailing chain capable conveyor systems, on which the positioning element may move due to the chain tolerance.

Features

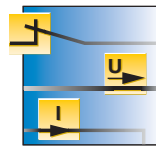
- Slot width 2 ... 15 mm
- Compact design for confined spaces
- High repeatability
- All versions available with NAMUR output (incl. SIL2)
- Robust plastic housings

Properties



Design

From the small K08 for confined spaces up to the K33 with large slot width



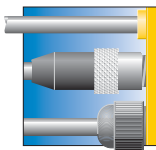
Electrical versions

3 and 4-wire DC NAMUR



Measuring ranges

Slot widths 2...15 mm



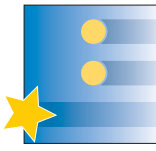
Electrical connections

0.5 mm litz wires or 2 m PVC connection cable



Materials

PA or PBT housings



Special features

ATEX approved and SIL2 qualified NAMUR devices

K08 – NAMUR



| | | | |
|------------------------------|----------------|--------------------------|--------------|
| Type | SI2-K08-Y1 | Operating voltage | nom. 8.2 VDC |
| Dimensions | 15 x 8 x 11 mm | Material housing | Vestamide |
| Slot width | 2 mm | Material cable | PVC 0.5 m |
| Output | NAMUR | Wiring diagram | w019 |
| Electrical connection | cable | Dimension drawing | d254 |

K08 – 3-wire DC

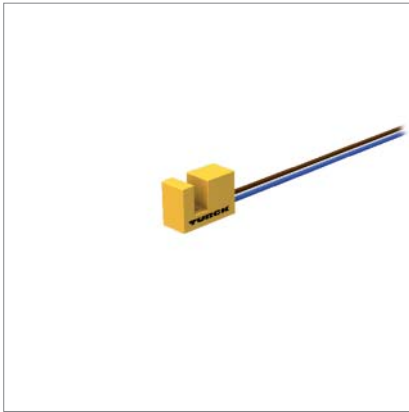


| | | | |
|------------------------------|----------------|--------------------------|-------------|
| General data | | Operating voltage | 10...30 VDC |
| Dimensions | 15 x 8 x 11 mm | Material housing | Vestamide |
| Slot width | 2 mm | Material cable | PVC 0.5 m |
| Electrical connection | cable | | |

Types and data – selection table

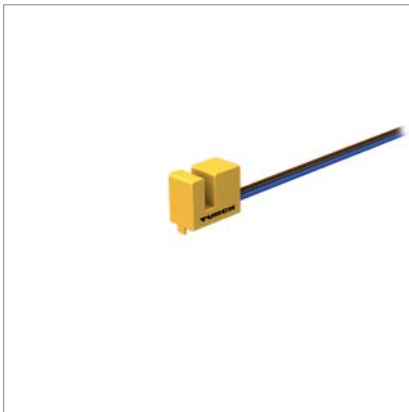
| Type | Output | w | d |
|-------------|--------|------|------|
| SI2-K08-AP7 | PNP | w004 | d255 |
| SI2-K08-AN7 | NPN | w005 | d255 |

K09 – NAMUR



| | | | |
|------------------------------|----------------|--------------------------|--------------|
| Type | SI5-K09-Y1 | Operating voltage | nom. 8.2 VDC |
| Dimensions | 9 x 14 x 20 mm | Material housing | PBT |
| Slot width | 5 mm | Material cable | PVC 0.5 m |
| Output | NAMUR | Wiring diagram | w019 |
| Electrical connection | cable | Dimension drawing | d256 |

K10 – NAMUR

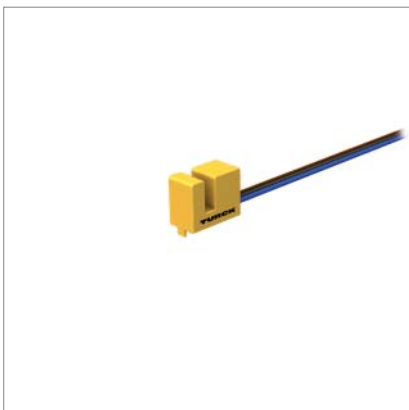


| | | | |
|------------------------------|-----------------|--------------------------|--------------|
| General data | | Operating voltage | nom. 8.2 VDC |
| Dimensions | 15 x 10 x 19 mm | Material housing | PBT |
| Slot width | 3.5 mm | Material cable | PVC 0.5 m |
| Output | NAMUR | | |
| Electrical connection | cable | | |

Types and data – selection table


| Type | w | d |
|---------------|---|---|
| SI3,5-K10-Y1 | w019 | d257 |
| SI3,5-K10-Y1X | w019 | d258 |

M10 – 3-wire DC

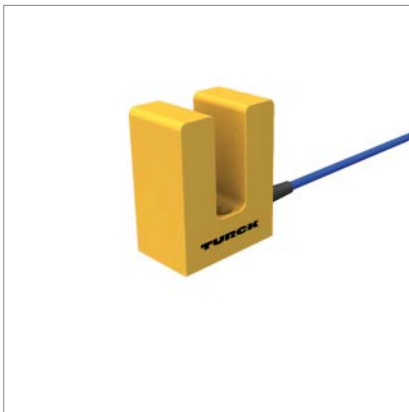


| | | | |
|------------------------------|-----------------|--------------------------|-------------|
| General data | | Operating voltage | 10...30 VDC |
| Dimensions | 15 x 10 x 19 mm | Material housing | PBT |
| Slot width | 3.5 mm | Material cable | PVC 0.5 m |
| Electrical connection | cable | | |

Types and data – selection table

| Type | Output | w | d |
|----------------|---|------|------|
| SI3,5-K10-AP6X |  , PNP | w004 | d259 |
| SI3,5-K10-AN7 |  , NPN | w005 | d259 |

K30 – NAMUR





| | | | |
|------------------------------|-----------------|--------------------------|--------------|
| Type | SI15-K30-Y1X | Operating voltage | nom. 8.2 VDC |
| Dimensions | 60 x 30 x 48 mm | Material housing | PBT |
| Slot width | 15 mm | Material cable | PVC 2 m |
| Output | NAMUR | Wiring diagram | w019 |
| Electrical connection | cable | Dimension drawing | d260 |

K30 – 3-wire DC



| | | | |
|------------------------------|-----------------|--------------------------|-------------|
| General data | | Operating voltage | 10...30 VDC |
| Dimensions | 60 x 30 x 48 mm | Material housing | PBT |
| Slot width | 15 mm | Material cable | PVC 2 m |
| Electrical connection | cable | | |

Types and data – selection table

| Type | Output | w | d |
|---------------|---|------|------|
| SI15-K30-AP6X |  , PNP | w004 | d260 |
| SI15-K30-AN6X |  , NPN | w005 | d260 |

K30 – 2-wire AC/DC



General data

Dimensions 60 x 30 x 48 mm

Slot width 15 mm



Electrical connection cable

Operating voltage 20...250 VAC /
10...300 VDC

Material housing PBT

Material cable PVC 2 m

Types and data – selection table

| Type | Output | w | d |
|--------------|---|------|------|
| SI15-K30-RZ3 |  | w038 | d261 |
| SI15-K30-AZ3 |  | w031 | d261 |

Dual sensors for rotary actuators

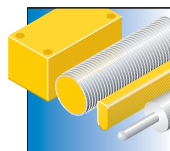


In the chemical, petro-chemical and food industry position control on rotary actuators is of great importance. TURCK dual sensors detect the end position of rotary actuators reliably. They are precisely tailored to the requirements of many different systems and application conditions. Simple mounting and cable routing of TURCK dual sensors reduce the expenses for installation.

Features

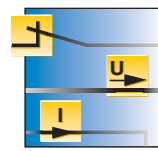
- Safe protection against environmental conditions
- High resistance to chemicals and cleaning agents
- Integrated valve control
- Bus-compatible
- Direct mounting on the rotary actuator
- Robust and impact-resistant
- Repairs of the drive system without disconnection of wiring
- Absolutely maintenance-free
- Broad product range of actuators and accessories
- Compliant with world wide standards like ATEX and SIL

Properties



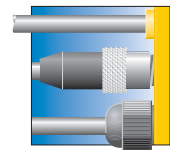
Design

Robust, impact-resistant and compact housing



Electrical versions

2, 3 and 4-wire DC
2-wire AC/DC
NAMUR



Electrical connections

Terminal chamber with pullable terminal strip, cable or M12 plug connection



Materials

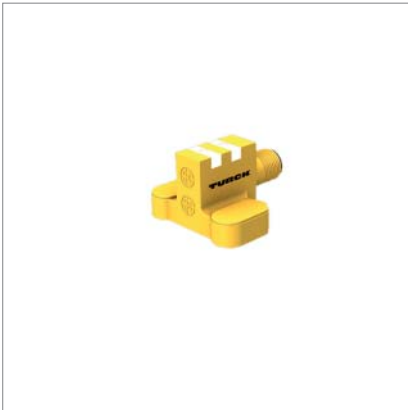
Robust and chemical resistant PP housing



Special features

ATEX approved and SIL2 qualified NAMUR devices

DSC26 – NAMUR



General data

Dimensions 42 x 26 x 28 mm
Switching distance 4 mm, 
Output NAMUR

Operating voltage nom. 8.2 VDC
Material housing PP

For more details on actuators (pucks) and mounting accessories see chapter „Accessories“.

Types and data – selection table

| Type | Electrical connection | Material cable |  |  |
|-----------------------|-----------------------|----------------|---|---|
| NI4-DSC26-2Y1X2-H1140 | connector, M12 x 1 | - | w040 | d263 |
| NI4-DSC26-2Y1X2 | cable | PVC 2 m | w039 | d262 |

DSC26 – 3-wire DC



General data

Dimensions 42 x 26 x 28 mm
Switching distance 4 mm, 
Output , PNP

Operating voltage 10...30 VDC
Material housing PP

For more details on actuators (pucks) and mounting accessories see chapter „Accessories“.

Types and data – selection table

| Type | Electrical connection | Material cable |  |  |
|------------------------|-----------------------|----------------|---|---|
| NI4-DSC26-2AP6X2-H1141 | connector, M12 x 1 | - | w041 | d263 |
| NI4-DSC26-2AP6X2 | cable | PUR 2 m | w042 | d262 |

DSU35 – NAMUR



General data

Switching distance 4 mm, 
Output NAMUR

Operating voltage nom. 8.2 VDC
Material housing plastic, PA12-GF20

For more details on actuators (pucks) and mounting accessories see chapter „Accessories“.

Types and data – selection table

| Type | Dimensions | Electrical connection | Material cable | w | d |
|------------------------|-------------------|-----------------------|----------------|------|------|
| NI4-DSU35-2Y1X2-H1140 | 60 x 35.4 x 59 mm | connector, M12 x 1 | - | w040 | d265 |
| NI4-DSU35-2Y1X2 | 60 x 35 x 59 mm | cable | PVC 2 m | w039 | d264 |
| NI4-DSU35TC-2Y1X2/S97 | 60 x 35 x 62 mm | terminal chamber | - | w043 | d266 |
| NI4-DSU35TC-2Y1X2/S933 | 60 x 35 x 62 mm | terminal chamber | - | w043 | d266 |
| NI4-DSU35TC-2Y1X2 | 60 x 35 x 62 mm | terminal chamber | - | w043 | d266 |

DSU35 – 3-wire DC








General data

Switching distance 4 mm, 
Operating voltage 10...65 VDC

Material housing plastic, PA12-GF20

For more details on actuators (pucks) and mounting accessories see chapter „Accessories“.

Types and data – selection table

| Type | Dimensions | Output | Electrical connection | Material cable | w | d |
|------------------------|-------------------|--|-----------------------|----------------|------|------|
| NI4-DSU35-2AP4X2-H1141 | 60 x 35.4 x 59 mm |  , PNP | connector, M12 x 1 | - | w041 | d265 |
| NI4-DSU35-2AP4X2 | 60 x 35 x 59 mm |  , PNP | cable | PVC 2 m | w042 | d264 |
| NI4-DSU35TC-2AP4X2/3GD | 60 x 35 x 62 mm |  , PNP | terminal chamber | - | w044 | d266 |
| NI4-DSU35TC-2AP4X2 | 60 x 35 x 62 mm |  , PNP | terminal chamber | - | w044 | d266 |
| NI4-DSU35TC-2AD4X2 | 60 x 35 x 62 mm |  , 2-wire | terminal chamber | - | w045 | d266 |

DSU35 – 2-wire AC/DC



General data

Switching distance 4 mm, 

Output 2 x 

Operating voltage 20...250 VAC /
10...300 VDC

Material housing plastic, PA12-GF20

For more details on actuators (pucks) and mounting accessories see chapter „Accessories“.

Types and data – selection table

| Type | Dimensions | Electrical connection | Material cable | w | d |
|----------------------|-----------------|-----------------------|----------------|------|------|
| NI4-DSU35-2ADZ30X2 | 60 x 35 x 59 mm | cable | PVC 2 m | w046 | d264 |
| NI4-DSU35TC-2ADZ30X2 | 60 x 35 x 62 mm | terminal chamber | - | w047 | d266 |

DSU35 – Fieldbus compatible



General data

Dimensions 60 x 35.4 x 59 mm



Switching distance 4 mm, 

Electrical connection connector, M12 x 1

Material housing plastic, PA12-GF20

For more details on actuators (pucks) and mounting accessories see chapter „Accessories“.

Types and data – selection table

| Type | Output | Operating voltage | w | d |
|-------------------------|--|-------------------|------|------|
| NI4-DSU35-2DNETX5-H1150 |  , DeviceNet™ | 11...25 VDC | w049 | d268 |
| NI4-DSU35-2ASIX4-H1140 |  , AS-i V2.1 | 18...33 VDC | w048 | d267 |

Sensors with analog output

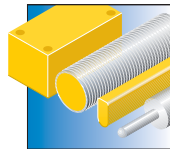


Inductive sensors with analog output provide a distance proportional current, voltage or frequency signal and are ideally suited for simple control tasks. They are used in many applications, requiring more than just simple digital position indication. Typical applications are for example tension control, winding/unwinding motion or separation of parts according to size and material.

Features

- High repeatability
- Large measuring ranges
- Current, voltage and frequency output
- Optionally adjustable switching output
- Many different designs
- High EMC protection
- Short-circuit and reverse-polarity protection
- All connection types

Properties



Design

Compact rectangular, threaded and smooth barrels as well as ring shaped versions



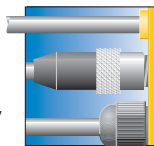
Electrical versions

0(2)...10 V or
0(4)...20 mA in 3/4-wire technology
or 4...20 mA, 2-wire
intrinsically safe



Measuring ranges

Highly precise measuring range 0.1...1.5 mm, large range 10...50 mm, ring sensors Ø 20, 50, 100 mm



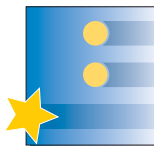
Electrical connections

Cable, plug connection or terminal chamber



Materials

Plastic and metal housings for all types of applications, rugged and chemical-resistant




Special features

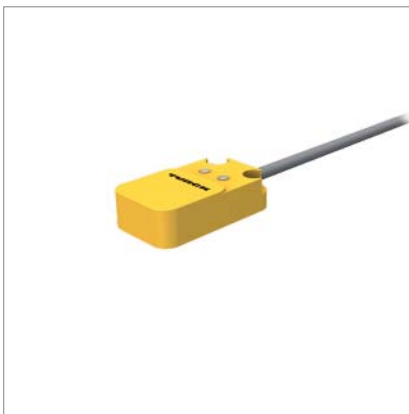
Sensors for the detection of metals
ATEX approved versions


Q08 – Voltage output 0...10 V and current output 0...20 mA





| | | | |
|----------------------------|---|--------------------------|-------------|
| Type | BI7-Q08-LIU | Operating voltage | 15...30 VDC |
| Dimensions | 20 x 8 x 32 mm | Protection class | IP67 |
| Measuring range | 1...4 mm,  | Material housing | GD-Zn |
| Repeatability | 1 % of measuring range | Material cable | PUR 2 m |
| Analog output | 0...20 mA, 0...10 V | Wiring diagram | w050 |
| Linearity deviation | 5% of full scale | Dimension drawing | d269 |

Q14 – Voltage output 0...10 V and current output 0...20 mA



| | | | |
|------------------------|---|----------------------------|------------------|
| General data | | Linearity deviation | 3% of full scale |
| Dimensions | 30 x 14 x 52 mm | Operating voltage | 15...30 VDC |
| Measuring range | 3...8 mm,  | Protection class | IP67 |
| Repeatability | 1 % of measuring range | Material housing | PBT |
| Analog output | 0...20 mA, 0...10 V | | |

Types and data - selection table

| Type | Electrical connection | Material cable |  |  |
|--------------------|-----------------------|----------------|---|---|
| BI10-Q14-LIU-V1141 | connector, M8 x 1 | - | w051 | d270 |
| BI10-Q14-LIU | cable | PUR 2 m | w050 | d271 |

Q14 – Ring sensor – Voltage output 0...10 V



| | | | |
|--------------------------|------------------------|-------------------------|------|
| General data | | Protection class | IP67 |
| Repeatability | 1 % of measuring range | Material housing | PBT |
| Analog output | 0...10 V | | |
| Operating voltage | 15...30 VDC | | |

 Wiring diagrams on page 832 ff

 Dimension drawings on page 842 ff

 Accessories on page 736 ff


Types and data - selection table

| Type | Dimensions | Electrical connection | Material cable | w | d |
|--------------------|-------------------|-----------------------|----------------|------|------|
| BI20R-Q14-LU-H1141 | 30 x 14 x 62.5 mm | connector, M12 x 1 | - | w037 | d241 |
| BI20R-Q14-LU | 30 x 14 x 52 mm | cable | PVC 2 m | w052 | d272 |

Q20 – Voltage output 0...10 V and 0...20 mA



General data


| | | | |
|------------------------|--|----------------------------|------------------|
| Dimensions | 40 x 20 x 68 mm | Linearity deviation | 3% of full scale |
| Measuring range | 4...11 mm,  | Operating voltage | 15...30 VDC |
| Repeatability | 1% of measuring range | Protection class | IP67 |
| Analog output | 0...20 mA, 0...10 V | Material housing | PBT |

Types and data – selection table

| Type | Electrical connection | Material cable | w | d |
|--------------------|-----------------------|----------------|------|------|
| BI15-Q20-LIU-H1141 | connector, M12 x 1 | - | w051 | d273 |
| BI15-Q20-LIU | cable | PUR 2 m | w050 | d274 |

Q20 – 2 voltage outputs 0...10 V – Differentiation of metals



| | | | |
|----------------------------|--|------------------------------|--------------------|
| Type | BI15-Q20-2LU-H1141/S950 | Electrical connection | connector, M12 x 1 |
| Dimensions | 40 x 20 x 68 mm | Operating voltage | 15...30 VDC |
| Measuring range | 4...11 mm,  | Protection class | IP67 |
| Repeatability | 1% of measuring range | Material housing | PBT |
| Analog output | 0...10 V | Wiring diagram | w053 |
| Linearity deviation | 3% of full scale | Dimension drawing | d273 |

Q20L – Voltage output 0...10 V and current output 4...20 mA



| | | | |
|--------------------------|--------------------------|------------------------------|--------------------|
| General data | | | |
| Repeatability | 0.5 % of measuring range | Electrical connection | connector, M12 x 1 |
| Analog output | 4...20 mA, 0...10 V | Protection class | IP67 |
| Operating voltage | 15...30 VDC | Material housing | PBT |

More information on magnetic actuators in chapter „Accessories“.

Types and data – selection table

| Type | Dimensions | Measuring range | Linearity deviation | w | d |
|--------------------------|------------------|-----------------|---------------------|----------|----------|
| WIM70-Q20L100-LIU5-H1141 | 30 x 20 x 100 mm | 15...85 mm, | 8% of full scale | w051 | d276 |
| WIM40-Q20L60-LIU5-H1141 | 30 x 20 x 60 mm | 10...50 mm, | 2% of full scale | w051 | d275 |

CK40 – Voltage output 0...10 V and current output 0...20 mA



| | | | |
|------------------------------|------------------------|--------------------------|-------------|
| General data | | | |
| Dimensions | 40 x 40 x 65 mm | Operating voltage | 15...30 VDC |
| Repeatability | 1 % of measuring range | Protection class | IP67 |
| Analog output | 0...20 mA, 0...10 V | Material housing | PBT |
| Electrical connection | connector, M12 x 1 | | |

Variable orientation of active face in 5 directions

Types and data – selection table

| Type | Measuring range | Linearity deviation | w | d |
|---------------------|-----------------|---------------------|----------|----------|
| BI15-CK40-LIU-H1141 | 4...11 mm, | 3% of full scale | w051 | d277 |
| NI25-CK40-LIU-H1141 | 5...25 mm, | 5% of full scale | w051 | d277 |


CP40 – Voltage output 0...10 V and current output 0...20 mA



| | | | |
|------------------------------|------------------------|--------------------------|-------------|
| General data | | | |
| Dimensions | 40 x 40 x 114 mm | Operating voltage | 15...30 VDC |
| Repeatability | 1 % of measuring range | Protection class | IP67 |
| Analog output | 0...20 mA, 0...10 V | Material housing | PBT |
| Electrical connection | terminal chamber | | |


Variable orientation of active face in 9 directions

Types and data – selection table

| Type | Measuring range | Linearity deviation | w | d |
|---------------|--|---------------------|------|------|
| BI15-CP40-LIU | 4...11 mm,  | 3% of full scale | w054 | d278 |
| NI25-CP40-LIU | 5...25 mm,  | 5% of full scale | w054 | d278 |

Q80 – Voltage output 0...10 V and current output 0...20 mA



| | | | |
|----------------------------|---|------------------------------|--------------------|
| Type | NI50-Q80-LIU-H1141 | Operating voltage | 15...30 VDC |
| Dimensions | 80 x 40 x 92 mm | Protection class | IP67 |
| Measuring range | 10...50 mm,  | Material housing | PBT |
| Repeatability | 1 % of measuring range | Electrical connection | connector, M12 x 1 |
| Analog output | 0...20 mA, 0...10 V | Wiring diagram | w051 |
| Linearity deviation | 5% of full scale | Dimension drawing | d279 |

Q80 – 2 voltage outputs 0...10 V – Differentiation of metals



| | | | |
|------------------------------|------------------------------|--------------------------|-------------|
| Type | BI50R-Q80-2LU-H1141/ S950 | Operating voltage | 15...30 VDC |
| Dimensions | 80 x 40 x 92 mm | Protection class | IP67 |
| Repeatability | 1 % of measuring range | Material housing | PBT |
| Analog output | 0...10 V | Wiring diagram | w053 |
| Linearity deviation | 3% of full scale | Dimension drawing | d280 |
| Electrical connection | connector, M12 x 1 | | |


S32XL – 2 voltage outputs 0...10 V – Differentiation of metals





| | | | |
|------------------------------|-----------------------------|--------------------------|-------------|
| Type | NI100R-S32XL-2LU-H1141/S950 | Operating voltage | 15...30 VDC |
| Dimensions | 137.5 x 32 x 180 mm | Protection class | IP67 |
| Repeatability | 1 % of measuring range | Material housing | POM |
| Analog output | 0...10 V | Wiring diagram | w053 |
| Linearity deviation | 3% of full scale | Dimension drawing | d281 |
| Electrical connection | connector, M12 x 1 | | |

M8 – Voltage output 0...10 V



| | | | |
|----------------------------|---|--------------------------|--------------|
| General data | | Operating voltage | 15...30 VDC |
| Measuring range | 0.25...1.25 mm,  | Protection class | IP67 |
| Repeatability | 1 % of measuring range | Material housing | V2A (1.4301) |
| Analog output | 0...10 V | | |
| Linearity deviation | 3% of full scale | | |

Types and data – selection table

| Type | Dimensions | Electrical connection | Material cable |  |  |
|---------------------|--------------|-----------------------|----------------|---|---|
| BI1,5-EG08-LU-H1341 | Ø8 x 57 mm | connector, M12 x 1 | - | w037 | d128 |
| BI1,5-EG08-LU | Ø8 x 41.6 mm | cable | PUR 2 m | w052 | d282 |

M12 – Voltage output 0...10 V and current output 0...20 mA



General data

| | | | |
|--------------------------|------------------------|-------------------------|---------|
| Repeatability | 1 % of measuring range | Protection class | IP67 |
| Analog output | 0...20 mA, 0...10 V | Material housing | CuZn-Cr |
| Operating voltage | 15...30 VDC | | |

Types and data – selection table

| Type | Dimensions | Measuring range | Linearity deviation | Electrical connection | Material cable | w | d |
|-------------------|-------------|-----------------|---------------------|-----------------------|----------------|------|------|
| BI4-M12-LIU-H1141 | Ø12 x 62 mm | 0.5...3 mm, | 5 % of full scale | connector, M12 x 1 | - | w051 | d283 |
| BI4-M12-LIU | Ø12 x 64 mm | 0.5...3 mm, | 5 % of full scale | cable | PVC 2 m | w050 | d285 |
| BI2-M12-LIU-H1141 | Ø12 x 62 mm | 1...2.5 mm, | 3 % of full scale | connector, M12 x 1 | - | w051 | d283 |
| BI2-M12-LIU | Ø12 x 64 mm | 1...2.5 mm, | 3 % of full scale | cable | PVC 2 m | w050 | d285 |
| NI5-M12-LIU-H1141 | Ø12 x 62 mm | 0.5...4 mm, | 3 % of full scale | connector, M12 x 1 | - | w051 | d284 |
| NI5-M12-LIU | Ø12 x 64 mm | 0.5...4 mm, | 3 % of full scale | cable | PVC 2 m | w050 | d286 |

M18 – Voltage output 0...10 V and current output 0...20 mA



General data


| | | | |
|--------------------------|------------------------|-------------------------|---------|
| Repeatability | 1 % of measuring range | Protection class | IP67 |
| Analog output | 0...20 mA, 0...10 V | Material housing | CuZn-Cr |
| Operating voltage | 15...30 VDC | | |

Types and data – selection table

| Type | Dimensions | Measuring range | Linearity deviation | Electrical connection | Material cable | w | d |
|---------------------|-------------|-----------------|---------------------|-----------------------|----------------|------|------|
| BI8-M18E-LIU-H1141 | Ø18 x 72 mm | 1...5 mm, | 5 % of full scale | connector, M12 x 1 | - | w051 | d287 |
| BI8-M18-LIU | Ø18 x 64 mm | 1...5 mm, | 5 % of full scale | cable | PVC 2 m | w050 | d185 |
| BI5-M18E-LIU-H1141 | Ø18 x 72 mm | 2...4 mm, | 3 % of full scale | connector, M12 x 1 | - | w051 | d287 |
| BI5-M18-LIU | Ø18 x 64 mm | 2...4 mm, | 3 % of full scale | cable | PVC 2 m | w050 | d185 |
| NI10-M18E-LIU-H1141 | Ø18 x 72 mm | 1...7 mm, | 5 % of full scale | connector, M12 x 1 | - | w051 | d288 |
| NI10-M18-LIU | Ø18 x 64 mm | 1...7 mm, | 5 % of full scale | cable | PVC 2 m | w050 | d289 |


M18 – Current output 4...20 mA – Intrinsically safe



| | | | |
|------------------------------|---|--------------------------|-------------|
| Type | BI8-M18-LI-EXI | Operating voltage | 14...30 VDC |
| Dimensions | Ø18 x 64 mm | Protection class | IP67 |
| Measuring range | 1...5 mm,  | Material housing | CuZn-Cr |
| Repeatability | 1 % of measuring range | Material cable | PVC 2 m |
| Analog output | 4...20 mA | Wiring diagram | w055 |
| Linearity deviation | 5 % of full scale | Dimension drawing | d185 |
| Electrical connection | cable | | |

M18 – Voltage output 0...10 V and 3-wire PNP



| | | | |
|------------------------------|---|--------------------------|-------------|
| Type | BI8-M18-LUAP6X | Operating voltage | 15...30 VDC |
| Dimensions | Ø18 x 54 mm | Protection class | IP67 |
| Measuring range | 1...5 mm,  | Material housing | CuZn-Cr |
| Repeatability | 1 % of measuring range | Material cable | PVC 2 m |
| Analog output | 0...10 V | Wiring diagram | w056 |
| Linearity deviation | 5 % of full scale | Dimension drawing | d290 |
| Electrical connection | cable | | |



M18 – Inductive linear position sensor – Output 0...10 V and 0...20 mA



| | | | |
|------------------------------|------------------------|-------------------------|---------|
| General data | | Protection class | IP67 |
| Repeatability | 1 % of measuring range | Material housing | CuZn-Cr |
| Analog output | 4...20 mA, 0...10 V | Material cable | PVC 2 m |
| Operating voltage | 15...30 VDC | | |
| Electrical connection | cable | | |

Actuation via short-circuiting ring (included in delivery), blind hole or similar

Types and data – selection table

| Type | Dimensions | Measuring range | Linearity deviation | w | d |
|---------------|----------------|--|---------------------|------|------|
| WI70-M18-LIU5 | Ø18 x 139 mm | 0...70 mm,  | 3% of full scale | w050 | d292 |
| WI40-M18-LIU5 | Ø18 x 107.5 mm | 0...40 mm,  | 2% of full scale | w050 | d291 |






M30 – Voltage output 0...10 V and current output 0...20 mA



General data


| | | | |
|--------------------------|------------------------|-------------------------|---------|
| Repeatability | 1 % of measuring range | Protection class | IP67 |
| Analog output | 0...20 mA, 0...10 V | Material housing | CuZn-Cr |
| Operating voltage | 15...30 VDC | | |

Types and data – selection table

| Type | Dimensions | Measuring range | Linearity deviation | Electrical connection | Material cable | w | d |
|---------------------|-------------|--|---------------------|-----------------------|----------------|------|------|
| BI15-M30E-LIU-H1141 | Ø30 x 77 mm | 2...10 mm,  | 5 % of full scale | connector, M12 x 1 | - | w051 | d054 |
| BI15-M30-LIU | Ø30 x 64 mm | 2...10 mm,  | 5 % of full scale | cable | PVC 2 m | w050 | d198 |
| BI10-M30E-LIU-H1141 | Ø30 x 77 mm | 3...8 mm,  | 3 % of full scale | connector, M12 x 1 | - | w051 | d054 |
| BI10-M30-LIU | Ø30 x 64 mm | 3...8 mm,  | 3 % of full scale | cable | PVC 2 m | w050 | d198 |
| NI15-M30-LIU-H1141 | Ø30 x 73 mm | 2...12 mm,  | 3 % of full scale | connector, M12 x 1 | - | w051 | d293 |

M30 – Current output 4...20 mA – Intrinsically safe



| | | | |
|------------------------------|--|--------------------------|-------------|
| Type | BI15-M30-LI-EXI | Operating voltage | 14...30 VDC |
| Dimensions | Ø30 x 64 mm | Protection class | IP67 |
| Measuring range | 2...10 mm,  | Material housing | CuZn-Cr |
| Repeatability | 1 % of measuring range | Material cable | PVC 2 m |
| Analog output | 4...20 mA | Wiring diagram | w055 |
| Linearity deviation | 5% of full scale | Dimension drawing | d198 |
| Electrical connection | cable | | |

M30 – Voltage output 0...10 V and 3-wire PNP



| | | | |
|------------------------------|------------------------|--------------------------|-------------|
| Type | BI15-M30-LUAP6X | Operating voltage | 15...30 VDC |
| Dimensions | Ø30 x 64 mm | Protection class | IP67 |
| Measuring range | 2...10 mm, | Material housing | CuZn-Cr |
| Repeatability | 1 % of measuring range | Material cable | PVC 2 m |
| Analog output | 0...10 V | Wiring diagram | w056 |
| Linearity deviation | 5% of full scale | Dimension drawing | d294 |
| Electrical connection | cable | | |

Ø 4 mm – Voltage output 0...10 V and current output 0...20 mA



| | | | |
|------------------------------|-------------------------------|--------------------------|--------------|
| Type | BI1,5-EH04-0,3-M12-SIU-H1141 | Protection class | IP67 |
| Dimensions | Ø4 x 30 mm | Material housing | V4A (1.4404) |
| Measuring range | 0.1...1.5 mm, | Material cable | PVC 0.3 m |
| Repeatability | 1 % of measuring range | Wiring diagram | w051 |
| Analog output | 0...20 mA, 0...10 V | Dimension drawing | d295 |
| Operating voltage | 15...30 VDC | | |
| Electrical connection | cable with connector, M12 x 1 | | |

Ø 6.5 mm – Voltage output 0...10 V



| | | | |
|------------------------------|------------------------|--------------------------|--------------|
| Type | BI1,5-EH6,5-LU | Operating voltage | 15...30 VDC |
| Dimensions | Ø6.5 x 41.6 mm | Protection class | IP67 |
| Measuring range | 0.25...1.25 mm, | Material housing | V2A (1.4301) |
| Repeatability | 1 % of measuring range | Material cable | PUR 2 m |
| Analog output | 0...10 V | Wiring diagram | w052 |
| Linearity deviation | 3% of full scale | Dimension drawing | d296 |
| Electrical connection | cable | | |

Sensors with extended temperature range



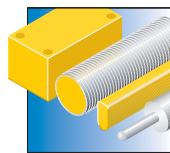
We offer many different sensors even for extreme ambient temperatures of $-60\text{ }^{\circ}\text{C}$ or $+250\text{ }^{\circ}\text{C}$. These TURCK devices are typically used in deep freezing systems, outdoor applications, in metal foundries, the glass industry or in drying furnaces of varnishing stations used in the automotive industry.

Our climate-proof versions in stainless steel housings are excellently suited for humid environments affected by sudden temperature changes of up to $120\text{ }^{\circ}\text{C}$.

Features

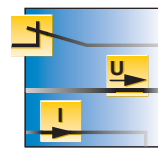
- Six different series for temperatures from $-60\text{ }^{\circ}\text{C}$ up to $+250\text{ }^{\circ}\text{C}$
- Product families comprising all housing types: M8, M12, M18, M30, 40×40 , 80×80
- Specially sealed sensors for wet environments
- Different cable materials tailored to the temperature ranges
- Excellent EMC immunity

Properties



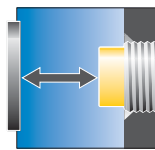
Design

Broad range of devices from the 8 mm threaded barrel up to the 80×80 mm rectangular version



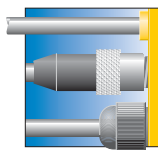
Electrical versions

NAMUR: $-40 \dots +100\text{ }^{\circ}\text{C}$,
3/4-wire DC:
 $-60 \dots +250\text{ }^{\circ}\text{C}$,
2-wire AC:
 $-40 \dots +120\text{ }^{\circ}\text{C}$



Switching distances

7 mm for temperatures up to $-60\text{ }^{\circ}\text{C}$,
40 mm for temperatures up to $+250\text{ }^{\circ}\text{C}$



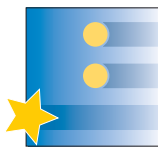
Electrical connections

Cable or M12 plug connection, sensors from $+160\text{ }^{\circ}\text{C}$ with external amplifier



Materials

Rugged, temperature resistant housing materials, application optimized cable qualities



Special features

WashDown,
pressure resistant active face

-60 °C – M12 – 3-wire DC – Cable connection



General data

| | | | |
|------------------------------|-------------|----------------------------|--------------|
| Output | — / —, PNP | Ambient temperature | -60...+60 °C |
| Electrical connection | cable | Material housing | V4A (1.4571) |
| Operating voltage | 10...30 VDC | Material cable | FEP 2 m |

Types and data – selection table

| Type | Dimensions | Switching distance | w | d |
|---------------------|-------------|--------------------|------|------|
| BI2-EM12WD-AP6/S929 | Ø12 x 63 mm | 2 mm, | w004 | d297 |
| NI4-EM12WD-AP6/S929 | Ø12 x 67 mm | 4 mm, | w004 | d298 |

-60 °C – M18 – 3-wire DC – Cable connection



General data

| | | | |
|------------------------------|-------------|----------------------------|--------------|
| Output | — / —, PNP | Ambient temperature | -60...+60 °C |
| Electrical connection | cable | Material housing | V4A (1.4571) |
| Operating voltage | 10...30 VDC | Material cable | FEP 2 m |

Types and data – selection table

| Type | Dimensions | Switching distance | w | d |
|----------------------|-------------|--------------------|------|------|
| BI5-EM18WD-AP6X/S929 | Ø18 x 67 mm | 5 mm, | w004 | d299 |
| NI7-EM18WD-AP6X/S929 | Ø18 x 75 mm | 7 mm, | w004 | d300 |

-40 °C – CP40 – NAMUR



General data

| | |
|------------------------------|------------------|
| Dimensions | 40 x 40 x 114 mm |
| Output | NAMUR |
| Electrical connection | terminal chamber |

| | |
|----------------------------|--------------|
| Operating voltage | nom. 8.2 VDC |
| Ambient temperature | -40...+70 °C |
| Material housing | PBT |

Variable orientation of active face in 9 directions

Types and data – selection table

| Type | Switching distance | w | d |
|-------------------|--------------------|------|------|
| BI15-CP40-Y1X/S97 | 15 mm, | w026 | d114 |
| NI20-CP40-Y1X/S97 | 20 mm, | w026 | d114 |

-40 °C – CP40 – 4-wire DC



General data

| | |
|------------------------------|------------------|
| Dimensions | 40 x 40 x 114 mm |
| Output | , PNP |
| Electrical connection | terminal chamber |

| | |
|----------------------------|--------------|
| Operating voltage | 10...65 VDC |
| Ambient temperature | -40...+70 °C |
| Material housing | PBT |

Variable orientation of active face in 9 directions

Types and data – selection table

| Type | Switching distance | w | d |
|---------------------|--------------------|------|------|
| BI15-CP40-VP4X2/S97 | 15 mm, | w014 | d014 |
| NI20-CP40-VP4X2/S97 | 20 mm, | w014 | d014 |

-40 °C – CP40 – 2-wire AC/DC



General data

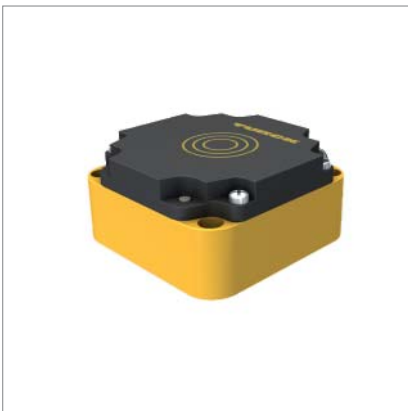
| | | | |
|------------------------------|-------------------------|----------------------------|--------------------------------|
| Dimensions | 40 x 40 x 114 mm | Operating voltage | 20...250 VAC / 10...300 VDC |
| Output | connection programmable | Ambient temperature | -40...+70 °C |
| Electrical connection | terminal chamber | Material housing | PBT |

Variable orientation of active face in 9 directions

Types and data – selection table

| Type | Switching distance | w | d |
|---------------------|--------------------|------|------|
| BI15-CP40-FZ3X2/S97 | 15 mm, | w028 | d014 |
| NI20-CP40-FZ3X2/S97 | 20 mm, | w028 | d014 |



-40 °C – CP80 – NAMUR



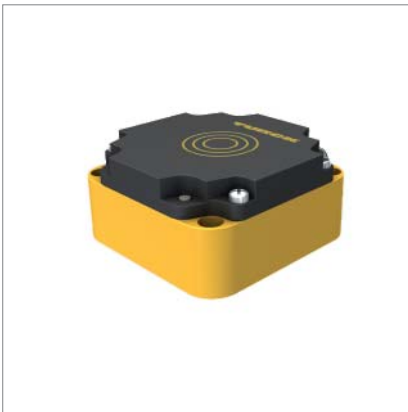
| | | | |
|------------------------------|------------------|----------------------------|--------------|
| Type | NI40-CP80-Y1/S97 | Operating voltage | nom. 8.2 VDC |
| Dimensions | 80 x 41 x 80 mm | Ambient temperature | -40...+70 °C |
| Switching distance | 40 mm, | Material housing | PBT |
| Output | NAMUR | Wiring diagram | w026 |
| Electrical connection | terminal chamber | Dimension drawing | d118 |


-40 °C – CP80 – 4-wire DC



| | | | |
|------------------------------|--|----------------------------|--------------|
| Type | NI40-CP80-VP4X2/S97 | Operating voltage | 10...65 VDC |
| Dimensions | 80 x 41 x 80 mm | Ambient temperature | -40...+70 °C |
| Switching distance | 40 mm,  | Material housing | PBT |
| Output |  , PNP | Wiring diagram | w014 |
| Electrical connection | terminal chamber | Dimension drawing | d120 |

-40 °C – CP80 – 2-wire AC/DC





| | | | |
|------------------------------|--|----------------------------|--------------------------------|
| Type | NI40-CP80-FZ3X2/S97 | Operating voltage | 20...250 VAC / 10...300 VDC |
| Dimensions | 80 x 41 x 80 mm | Ambient temperature | -40...+70 °C |
| Switching distance | 40 mm,  | Material housing | PBT |
| Output | connection program- mable | Wiring diagram | w028 |
| Electrical connection | terminal chamber | Dimension drawing | d120 |

-40 °C – M12 – NAMUR – Cable connection



| | | | |
|------------------------------|--------------|----------------------------|--------------|
| General data | | Ambient temperature | -40...+70 °C |
| Dimensions | Ø12 x 34 mm | Material housing | PA |
| Output | NAMUR | Material cable | silicone 2 m |
| Electrical connection | cable | | |
| Operating voltage | nom. 8.2 VDC | | |

Types and data – selection table

| Type | Switching distance | w | d |
|-----------------|---|------|------|
| BI2-P12-Y1X/S97 | 2 mm,  | w019 | d144 |
| NI5-P12-Y1X/S97 | 5 mm,  | w019 | d144 |

-40 °C – M12 – NAMUR – Terminal chamber





General data

| | | | |
|------------------------------|--|----------------------------|---------------|
| Dimensions | Ø12 x 70 mm | Operating voltage | nom. 8.2 VDC |
| Output | NAMUR | Ambient temperature | -40...+100 °C |
| Electrical connection | terminal chamber, removable cage clamp terminals | Material housing | V4A (1.4404) |

Removable terminal strip and variable cable outlet

Types and data – selection table

| Type | Switching distance | w | d |
|------------------|---|------|------|
| BI2-EM12WDTC-Y1X | 2 mm,  | w026 | d147 |
| NI5-EM12WDTC-Y1X | 5 mm,  | w026 | d146 |

-40 °C – M12 – 3-wire DC – M12 x 1 plug connection




General data

| | | | |
|------------------------------|--------------------|----------------------------|---------------|
| Dimensions | Ø12 x 52 mm | Ambient temperature | -40...+100 °C |
| Electrical connection | connector, M12 x 1 | Material housing | V4A (1.4404) |
| Operating voltage | 10...30 VDC | | |

Pressure resistant up to 20 bar

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-------------------------|--|---|------|------|
| BI4U-EM12WD-AP6X-H1141 | 4 mm,  |  , PNP | w001 | d034 |
| BI4U-EM12WD-AN6X-H1141 | 4 mm,  |  , NPN | w002 | d034 |
| NI10U-EM12WD-AP6X-H1141 | 10 mm,  |  , PNP | w001 | d067 |
| NI10U-EM12WD-AN6X-H1141 | 10 mm,  |  , NPN | w002 | d067 |

-40 °C – M12 – 3-wire DC – Cable connection



General data

| | | | |
|------------------------------|-------------|----------------------------|---------------|
| Dimensions | Ø12 x 52 mm | Ambient temperature | -40...+100 °C |
| Electrical connection | cable | Material housing | V4A (1.4404) |
| Operating voltage | 10...30 VDC | Material cable | PP 2 m |

Pressure resistant up to 20 bar


Types and data – selection table

| Type | Switching distance | Output | w | d |
|-------------------|--|---|------|------|
| BI4U-EM12WD-AP6X | 4 mm,  |  , PNP | w004 | d068 |
| BI4U-EM12WD-AN6X | 4 mm,  |  , NPN | w005 | d068 |
| NI10U-EM12WD-AP6X | 10 mm,  |  , PNP | w004 | d069 |
| NI10U-EM12WD-AN6X | 10 mm,  |  , NPN | w005 | d069 |

-40 °C – M12 – 3-wire DC – Terminal chamber





General data

| | | | |
|------------------------------|---|----------------------------|---------------|
| Dimensions | Ø12 x 80 mm | Operating voltage | 10...30 VDC |
| Output |  , PNP | Ambient temperature | -40...+100 °C |
| Electrical connection | terminal chamber, removable cage clamp terminals | Material housing | V4A (1.4404) |

Removable terminal strip and variable cable outlet

Types and data – selection table


| Type | Switching distance | w | d |
|---------------------|--|------|------|
| BI4U-EM12WDTC-AP6X | 4 mm,  | w011 | d070 |
| NI10U-EM12WDTC-AP6X | 10 mm,  | w011 | d071 |

-40 °C – M18 – NAMUR – Cable connection



| | | | |
|------------------------------|-------------|----------------------------|--------------|
| General data | | | |
| Dimensions | Ø18 x 34 mm | Ambient temperature | -40...+70 °C |
| Output | NAMUR | Material housing | PA |
| Electrical connection | cable | Material cable | silicone 2 m |
| Operating voltage | nom. 8.2VDC | | |

Types and data – selection table

| Type | Switching distance | w | d |
|------------------|--|------|------|
| BI5-P18-Y1X/S97 | 5 mm,  | w019 | d165 |
| NI10-P18-Y1X/S97 | 10 mm,  | w019 | d165 |



-40 °C – M18 – NAMUR – Terminal chamber



| | | | |
|------------------------------|--|----------------------------|---------------|
| General data | | | |
| Dimensions | Ø18 x 71 mm | Operating voltage | nom. 8.2VDC |
| Output | NAMUR | Ambient temperature | -40...+100 °C |
| Electrical connection | terminal chamber, removable cage clamp terminals | Material housing | V4A (1.4404) |

Removable terminal strip and variable cable outlet

Types and data – selection table

| Type | Switching distance | w | d |
|-------------------|--|------|------|
| BI5-EM18WDTC-Y1X | 5 mm,  | w026 | d168 |
| NI10-EM18WDTC-Y1X | 10 mm,  | w026 | d169 |

-40 °C – M18 – 3-wire DC – M12 x 1 plug connection



General data

| | | | |
|------------------------------|--------------------|----------------------------|---------------|
| Dimensions | Ø18 x 52 mm | Ambient temperature | -40...+100 °C |
| Electrical connection | connector, M12 x 1 | Material housing | V4A (1.4404) |
| Operating voltage | 10...30 VDC | | |

Pressure resistant up to 15 bar

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-------------------------|--|--------|------|------|
| BI8U-EM18WD-AP6X-H1141 | 8 mm,  | —, PNP | w001 | d044 |
| BI8U-EM18WD-AN6X-H1141 | 8 mm,  | —, NPN | w002 | d044 |
| NI15U-EM18WD-AP6X-H1141 | 15 mm,  | —, PNP | w001 | d072 |
| NI15U-EM18WD-AN6X-H1141 | 15 mm,  | —, NPN | w002 | d072 |

-40 °C – M18 – 3-wire DC – Cable connection



General data

| | | | |
|------------------------------|-------------|----------------------------|---------------|
| Dimensions | Ø18 x 52 mm | Ambient temperature | -40...+100 °C |
| Electrical connection | cable | Material housing | V4A (1.4404) |
| Operating voltage | 10...30 VDC | Material cable | PP 2 m |

Pressure resistant up to 15 bar

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-------------------|--|---|------|------|
| BI8U-EM18WD-AP6X | 8 mm,  |  , PNP | w004 | d073 |
| BI8U-EM18WD-AN6X | 8 mm,  |  , NPN | w005 | d073 |
| NI15U-EM18WD-AP6X | 15 mm,  |  , PNP | w004 | d074 |
| NI15U-EM18WD-AN6X | 15 mm,  |  , NPN | w005 | d074 |

-40 °C – M18 – 3-wire DC – Terminal chamber



General data

Dimensions

Ø18 x 81 mm

Output

, PNP

Electrical connection

terminal chamber,
removable cage clamp
terminals

Operating voltage

10...30 VDC

Ambient temperature


-40...+100 °C

Material housing

V4A (1.4404)

Removable terminal strip and variable cable outlet

Types and data – selection table

| Type | Switching distance | w | d |
|---------------------|--|------|------|
| BI8U-EM18WDTC-AP6X | 8 mm,  | w011 | d075 |
| NI15U-EM18WDTC-AP6X | 15 mm,  | w011 | d076 |

-40 °C – M30 – NAMUR – Cable connection



General data

Dimensions

Ø30 x 44 mm

Output

NAMUR

Electrical connection

cable

Operating voltage

nom. 8.2 VDC

Ambient temperature

-40...+70 °C



Material housing

PA

Material cable

silicone 2 m

Types and data – selection table

| Type | Switching distance | w | d |
|------------------|--|------|------|
| BI10-P30-Y1X/S97 | 10 mm,  | w019 | d188 |
| NI15-P30-Y1X/S97 | 15 mm,  | w019 | d188 |

-40 °C – M30 – NAMUR – Terminal chamber



General data

Dimensions

Ø30 x 80 mm

Output

NAMUR

Electrical connection

terminal chamber,
removable cage clamp
terminals

Operating voltage

nom. 8.2 VDC

Ambient temperature



-40...+100 °C

Material housing

V4A (1.4404)

Removable terminal strip and variable cable outlet

Types and data – selection table

| Type | Switching distance | w | d |
|-------------------|--|------|------|
| BI10-EM30WDTC-Y1X | 10 mm,  | w026 | d194 |
| NI15-EM30WDTC-Y1X | 15 mm,  | w026 | d195 |

-40 °C – M30 – 3-wire DC – M12 x 1 plug connection



General data

Dimensions

Ø30 x 62 mm

Electrical connection

connector, M12 x 1

Operating voltage

10...30 VDC

Ambient temperature

-40...+100 °C

Material housing

V4A (1.4404)

Pressure resistant up to 10 bar

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-------------------------|--|---|------|------|
| BI15U-EM30WD-AP6X-H1141 | 15 mm,  |  , PNP | w001 | d050 |
| BI15U-EM30WD-AN6X-H1141 | 15 mm,  |  , NPN | w002 | d050 |
| NI30U-EM30WD-AP6X-H1141 | 30 mm,  |  , PNP | w001 | d077 |
| NI30U-EM30WD-AN6X-H1141 | 30 mm,  |  , NPN | w002 | d077 |

-40 °C – M30 – 3-wire DC – Cable connection



General data

| | | | |
|------------------------------|-------------|----------------------------|---------------|
| Dimensions | Ø30 x 66 mm | Ambient temperature | -40...+100 °C |
| Electrical connection | cable | Material housing | V4A (1.4404) |
| Operating voltage | 10...30 VDC | Material cable | PP 2 m |

Pressure resistant up to 10 bar


Types and data – selection table

| Type | Switching distance | Output | w | d |
|-------------------|--|---|------|------|
| BI15U-EM30WD-AP6X | 15 mm,  |  , PNP | w004 | d078 |
| BI15U-EM30WD-AN6X | 15 mm,  |  , NPN | w005 | d078 |
| NI30U-EM30WD-AP6X | 30 mm,  |  , PNP | w004 | d079 |
| NI30U-EM30WD-AN6X | 30 mm,  |  , NPN | w005 | d079 |

-40 °C – M30 – 3-wire DC – Terminal chamber



General data

| | | | |
|------------------------------|---|----------------------------|---------------|
| Dimensions | Ø30 x 95 mm | Operating voltage | 10...30 VDC |
| Output |  , PNP | Ambient temperature | -40...+100 °C |
| Electrical connection | terminal chamber, removable cage clamp terminals | Material housing | V4A (1.4404) |



Removable terminal strip and variable cable outlet

 Wiring diagrams on page 832 ff

 Dimension drawings on page 842 ff

 Accessories on page 736 ff

Types and data – selection table

| Type | Switching distance | w | d |
|---------------------|--|------|------|
| BI15U-EM30WDTC-AP6X | 15 mm,  | w011 | d080 |
| NI30U-EM30WDTC-AP6X | 30 mm,  | w011 | d081 |

+100 °C – CP40 – NAMUR – Terminal chamber





General data

| | |
|------------------------------|------------------|
| Dimensions | 40 x 40 x 114 mm |
| Output | NAMUR |
| Electrical connection | terminal chamber |

| | |
|----------------------------|---------------|
| Operating voltage | nom. 8.2 VDC |
| Ambient temperature | -25...+100 °C |
| Material housing | PBT |

Variable orientation of active face in 9 directions


Types and data – selection table

| Type | Switching distance | w | d |
|--------------------|--|------|------|
| BI15-CP40-Y1X/S100 | 15 mm,  | w026 | d114 |
| NI20-CP40-Y1X/S100 | 20 mm,  | w026 | d114 |

+100 °C – CP40 – 4-wire DC – Terminal chamber





General data

| | |
|------------------------------|---|
| Dimensions | 40 x 40 x 114 mm |
| Output |  , PNP |
| Electrical connection | terminal chamber |

| | |
|----------------------------|---------------|
| Operating voltage | 10...65 VDC |
| Ambient temperature | -25...+100 °C |
| Material housing | PBT |

Variable orientation of active face in 9 directions

Types and data – selection table

| Type | Switching distance | w | d |
|----------------------|--|------|------|
| BI15-CP40-VP4X2/S100 | 15 mm,  | w014 | d014 |
| NI20-CP40-VP4X2/S100 | 20 mm,  | w014 | d014 |

+100 °C – CP40 – 2-wire AC/DC – Terminal chamber





General data

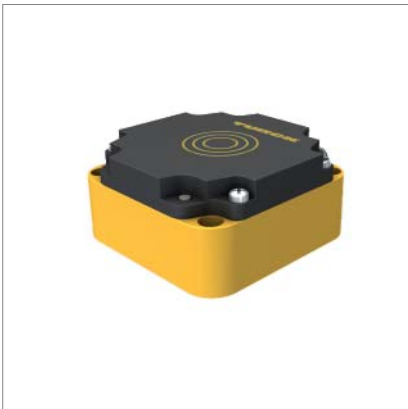
| | | | |
|------------------------------|-------------------------|----------------------------|--------------------------------|
| Dimensions | 40 x 40 x 114 mm | Operating voltage | 20...250 VAC / 10...300 VDC |
| Output | connection programmable | Ambient temperature | -25...+100 °C |
| Electrical connection | terminal chamber | Material housing | PBT |


Variable orientation of active face in 9 directions

Types and data – selection table

| Type | Switching distance | w | d |
|----------------------|--|------|------|
| BI15-CP40-FZ3X2/S100 | 15 mm,  | w028 | d014 |
| NI20-CP40-FZ3X2/S100 | 20 mm,  | w028 | d014 |



+100 °C – CP80 – NAMUR – Terminal chamber



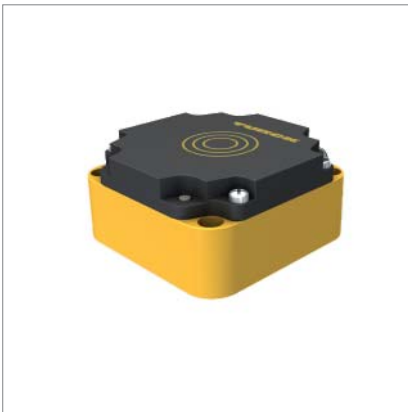
| | | | |
|------------------------------|--|----------------------------|---------------|
| Type | NI40-CP80-Y1/S100 | Operating voltage | nom. 8.2 VDC |
| Dimensions | 80 x 41 x 80 mm | Ambient temperature | -25...+100 °C |
| Switching distance | 40 mm,  | Material housing | PBT |
| Output | NAMUR | Wiring diagram | w026 |
| Electrical connection | terminal chamber | Dimension drawing | d118 |


+100 °C – CP80 – 4-wire DC – Terminal chamber



| | | | |
|------------------------------|--|----------------------------|---------------|
| Type | NI40-CP80-VP4X2/S100 | Operating voltage | 10...65 VDC |
| Dimensions | 80 x 41 x 80 mm | Ambient temperature | -25...+100 °C |
| Switching distance | 40 mm,  | Material housing | PBT |
| Output |  , PNP | Wiring diagram | w014 |
| Electrical connection | terminal chamber | Dimension drawing | d120 |


+100 °C – CP80 – 2-wire AC/DC – Terminal chamber





| | | | |
|------------------------------|--|----------------------------|--------------------------------|
| Type | NI40-CP80-FZ3X2/S100 | Operating voltage | 20...250 VAC / 10...300 VDC |
| Dimensions | 80 x 41 x 80 mm | Ambient temperature | -25...+100 °C |
| Switching distance | 40 mm,  | Material housing | PBT |
| Output | connection program- mable | Wiring diagram | w028 |
| Electrical connection | terminal chamber | Dimension drawing | d120 |

+100 °C – M8 – 3-wire DC – Cable connection



| | | | |
|------------------------------|---|----------------------------|---------------|
| General data | | Ambient temperature | -25...+100 °C |
| Dimensions | Ø8 x 41.6 mm | Material housing | V2A (1.4301) |
| Switching distance | 2 mm,  | Material cable | TPE 2 m |
| Electrical connection | cable | | |
| Operating voltage | 10...30 VDC | | |

Types and data – selection table





| Type | Output | w | d |
|--------------------|---|------|------|
| BI2-EG08-AP6X/S100 |  , PNP | w004 | d026 |
| BI2-EG08-AN6X/S100 |  , NPN | w005 | d026 |

+100 °C – M12 – NAMUR – Cable connection



| | | | |
|------------------------------|-------------|----------------------------|---------------|
| General data | | | |
| Dimensions | Ø12 x 34 mm | Operating voltage | nom. 8.2 VDC |
| Output | NAMUR | Ambient temperature | -25...+100 °C |
| Electrical connection | cable | | |

Types and data – selection table

| Type | Switching distance | Material housing | Material cable | w | d |
|----------------------|---|------------------|----------------|------|------|
| BI2-P12-Y1/S100 | 2 mm,  | PA | PVC 2 m | w019 | d301 |
| BI2-EG12-Y1X/S100 7M | 2 mm,  | V2A (1.4301) | PVC 7 m | w019 | d145 |
| NI5-P12-Y1/S100 | 5 mm,  | PA | PVC 2 m | w019 | d301 |
| NI5-EG12-Y1X/S100 7M | 5 mm,  | V2A (1.4301) | PVC 7 m | w019 | d143 |



+100 °C – M12 – NAMUR – Terminal chamber



| | | | |
|------------------------------|--|----------------------------|---------------|
| General data | | | |
| Dimensions | Ø12 x 70 mm | Operating voltage | nom. 8.2 VDC |
| Output | NAMUR | Ambient temperature | -40...+100 °C |
| Electrical connection | terminal chamber, removable cage clamp terminals | Material housing | V4A (1.4404) |

Removable terminal strip and variable cable outlet

Types and data – selection table

| Type | Switching distance | w | d |
|------------------|---|------|------|
| BI2-EM12WDTC-Y1X | 2 mm,  | w026 | d147 |
| NI5-EM12WDTC-Y1X | 5 mm,  | w026 | d146 |

+100 °C – M12 – 3-wire DC – M12 x 1 plug connection



General data

| | | | |
|------------------------------|--------------------|----------------------------|---------------|
| Dimensions | Ø12 x 52 mm | Ambient temperature | -40...+100 °C |
| Electrical connection | connector, M12 x 1 | Material housing | V4A (1.4404) |
| Operating voltage | 10...30 VDC | | |

Pressure resistant up to 20 bar

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-------------------------|--|---|------|------|
| BI4U-EM12WD-AP6X-H1141 | 4 mm,  |  , PNP | w001 | d034 |
| BI4U-EM12WD-AN6X-H1141 | 4 mm,  |  , NPN | w002 | d034 |
| NI10U-EM12WD-AP6X-H1141 | 10 mm,  |  , PNP | w001 | d067 |
| NI10U-EM12WD-AN6X-H1141 | 10 mm,  |  , NPN | w002 | d067 |

+100 °C – M12 – 3-wire DC – Cable connection




General data

| | | | |
|------------------------------|-------------|----------------------------|---------------|
| Dimensions | Ø12 x 52 mm | Ambient temperature | -40...+100 °C |
| Electrical connection | cable | Material housing | V4A (1.4404) |
| Operating voltage | 10...30 VDC | Material cable | PP 2 m |

Pressure resistant up to 20 bar

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-------------------|--|---|------|------|
| BI4U-EM12WD-AP6X | 4 mm,  |  , PNP | w004 | d068 |
| BI4U-EM12WD-AN6X | 4 mm,  |  , NPN | w005 | d068 |
| NI10U-EM12WD-AP6X | 10 mm,  |  , PNP | w004 | d069 |
| NI10U-EM12WD-AN6X | 10 mm,  |  , NPN | w005 | d069 |

+100 °C – M12 – 3-wire DC – Terminal chamber



General data

Dimensions

Ø12 x 80 mm

Output

, PNP

Electrical connection

terminal chamber,
removable cage clamp
terminals

Operating voltage

10...30 VDC

Ambient temperature

-40...+100 °C

Material housing

V4A (1.4404)

Removable terminal strip and variable cable outlet

Types and data – selection table

| Type | Switching distance | w | d |
|---------------------|--|------|------|
| BI4U-EM12WDTC-AP6X | 4 mm,  | w011 | d070 |
| NI10U-EM12WDTC-AP6X | 10 mm,  | w011 | d071 |

+100 °C – M12 – 2-wire AC/DC



General data

Output



Electrical connection

cable

Operating voltage

20...250 VAC /
10...300 VDC

Ambient temperature

-25...+100 °C



Material housing

PA

Material cable

PVC 2 m

Types and data – selection table

| Type | Dimensions | Switching distance | w | d |
|--------------------|-------------|--|------|------|
| BI2-S12-AZ31X/S100 | Ø12 x 60 mm | 2 mm,  | w020 | d153 |
| NI4-S12-AZ31X/S100 | Ø12 x 64 mm | 4 mm,  | w020 | d153 |

+100 °C – M18 – NAMUR – Cable connection



General data

Dimensions Ø18 x 34 mm





Output NAMUR

Electrical connection cable

Operating voltage nom. 8.2 VDC

Ambient temperature -25...+100 °C

Types and data – selection table

| Type | Switching distance | Material housing | Material cable | w | d |
|-----------------------|--|------------------|----------------|------|------|
| BI5-P18-Y1/S100 | 5 mm,  | PA | PVC 2 m | w019 | d302 |
| BI5-EG18-Y1X/S100 7M | 5 mm,  | V2A (1.4301) | PVC 7 m | w019 | d166 |
| NI10-P18-Y1/S100 | 10 mm,  | PA | PVC 2 m | w019 | d302 |
| NI10-EG18-Y1X/S100 7M | 10 mm,  | V2A (1.4301) | PVC 7 m | w019 | d167 |

+100 °C – M18 – NAMUR – Terminal chamber



General data

Dimensions Ø18 x 71 mm

Output NAMUR

Electrical connection terminal chamber,
removable cage clamp
terminals



Operating voltage nom. 8.2 VDC

Ambient temperature -40...+100 °C

Material housing V4A (1.4404)

Removable terminal strip and variable cable outlet

Types and data – selection table

| Type | Switching distance | w | d |
|-------------------|--|------|------|
| BI5-EM18WDTC-Y1X | 5 mm,  | w026 | d168 |
| NI10-EM18WDTC-Y1X | 10 mm,  | w026 | d169 |

+100 °C – M18 – 3-wire DC – M12 x 1 plug connection



General data

| | | | |
|------------------------------|--------------------|----------------------------|---------------|
| Dimensions | Ø18 x 52 mm | Ambient temperature | -40...+100 °C |
| Electrical connection | connector, M12 x 1 | Material housing | V4A (1.4404) |
| Operating voltage | 10...30 VDC | | |

Pressure resistant up to 15 bar

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-------------------------|--|---------|------|------|
| BI8U-EM18WD-AP6X-H1141 | 8 mm,  | — , PNP | w001 | d044 |
| BI8U-EM18WD-AN6X-H1141 | 8 mm,  | — , NPN | w002 | d044 |
| NI15U-EM18WD-AP6X-H1141 | 15 mm,  | — , PNP | w001 | d072 |
| NI15U-EM18WD-AN6X-H1141 | 15 mm,  | — , NPN | w002 | d072 |

+100 °C – M18 – 3-wire DC – Cable connection



General data

| | | | |
|------------------------------|-------------|----------------------------|---------------|
| Dimensions | Ø18 x 52 mm | Ambient temperature | -40...+100 °C |
| Electrical connection | cable | Material housing | V4A (1.4404) |
| Operating voltage | 10...30 VDC | Material cable | PP 2 m |


Pressure resistant up to 15 bar

 Wiring diagrams on page 832 ff

 Dimension drawings on page 842 ff

 Accessories on page 736 ff

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-------------------|--|---|------|------|
| BI8U-EM18WD-AP6X | 8 mm,  |  , PNP | w004 | d073 |
| BI8U-EM18WD-AN6X | 8 mm,  |  , NPN | w005 | d073 |
| NI15U-EM18WD-AP6X | 15 mm,  |  , PNP | w004 | d074 |
| NI15U-EM18WD-AN6X | 15 mm,  |  , NPN | w005 | d074 |

+100 °C – M18 – 3-wire DC – Terminal chamber




General data

Dimensions

Ø18 x 81 mm

Output

, PNP

Electrical connection

terminal chamber,
removable cage clamp
terminals

Operating voltage

10...30 VDC

Ambient temperature


-40...+100 °C

Material housing

V4A (1.4404)

Removable terminal strip and variable cable outlet

Types and data – selection table

| Type | Switching distance | w | d |
|---------------------|--|------|------|
| BI8U-EM18WDTC-AP6X | 8 mm,  | w011 | d075 |
| NI15U-EM18WDTC-AP6X | 15 mm,  | w011 | d076 |

+100 °C – M18 – 2-wire AC/DC – Cable connection



General data

Dimensions

Ø18 x 64 mm

Output



Electrical connection

cable

Operating voltage

20...250 VAC /
10...300 VDC

Ambient temperature

-25...+100 °C



Material housing

PA

Material cable

PVC 2 m

Types and data – selection table





| Type | Switching distance | w | d |
|-------------------|---|------|------|
| BI5-S18-AZ3X/S100 | 5 mm,  | w031 | d173 |
| NI8-S18-AZ3X/S100 | 8 mm,  | w031 | d173 |

+100 °C – M30 – NAMUR – Cable connection



| | | | |
|------------------------------|-------------|----------------------------|---------------|
| General data | | Operating voltage | nom. 8.2 VDC |
| Dimensions | Ø30 x 44 mm | Ambient temperature | -25...+100 °C |
| Output | NAMUR | | |
| Electrical connection | cable | | |

Types and data – selection table

| Type | Switching distance | Material housing | Material cable | w | d |
|-----------------------|--|------------------|----------------|------|------|
| BI10-P30-Y1/S100 | 10 mm,  | PA | PVC 2 m | w019 | d303 |
| BI10-EG30-Y1X/S100 7M | 10 mm,  | V2A (1.4301) | PVC 7 m | w019 | d189 |
| NI15-P30-Y1/S100 | 15 mm,  | PA | PVC 2 m | w019 | d303 |
| NI15-EG30-Y1X/S100 7M | 15 mm,  | V2A (1.4301) | PVC 7 m | w019 | d190 |


+100 °C – M30 – NAMUR – Terminal chamber



| | | | |
|------------------------------|--|----------------------------|---------------|
| General data | | Operating voltage | nom. 8.2 VDC |
| Dimensions | Ø30 x 80 mm | Ambient temperature | -40...+100 °C |
| Output | NAMUR | Material housing | V4A (1.4404) |
| Electrical connection | terminal chamber, removable cage clamp terminals | | |

Removable terminal strip and variable cable outlet

Types and data – selection table

| Type | Switching distance | w | d |
|-------------------|--|------|------|
| BI10-EM30WDTC-Y1X | 10 mm,  | w026 | d194 |
| NI15-EM30WDTC-Y1X | 15 mm,  | w026 | d195 |

+100 °C – M30 – 3-wire DC – M12 x 1 plug connection



General data

| | | | |
|------------------------------|--------------------|----------------------------|---------------|
| Dimensions | Ø30 x 62 mm | Ambient temperature | -40...+100 °C |
| Electrical connection | connector, M12 x 1 | Material housing | V4A (1.4404) |
| Operating voltage | 10...30 VDC | | |

Pressure resistant up to 10 bar

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-------------------------|--|---------|------|------|
| BI15U-EM30WD-AP6X-H1141 | 15 mm,  | — , PNP | w001 | d050 |
| BI15U-EM30WD-AN6X-H1141 | 15 mm,  | — , NPN | w002 | d050 |
| NI30U-EM30WD-AP6X-H1141 | 30 mm,  | — , PNP | w001 | d077 |
| NI30U-EM30WD-AN6X-H1141 | 30 mm,  | — , NPN | w002 | d077 |

+100 °C – M30 – 3-wire DC – Cable connection



General data

| | | | |
|------------------------------|-------------|----------------------------|---------------|
| Dimensions | Ø30 x 66 mm | Ambient temperature | -40...+100 °C |
| Electrical connection | cable | Material housing | V4A (1.4404) |
| Operating voltage | 10...30 VDC | Material cable | PP 2 m |

Pressure resistant up to 10 bar

Types and data – selection table

| Type | Switching distance | Output | w | d |
|-------------------|--|---|------|------|
| BI15U-EM30WD-AP6X | 15 mm,  |  , PNP | w004 | d078 |
| BI15U-EM30WD-AN6X | 15 mm,  |  , NPN | w005 | d078 |
| NI30U-EM30WD-AP6X | 30 mm,  |  , PNP | w004 | d079 |
| NI30U-EM30WD-AN6X | 30 mm,  |  , NPN | w005 | d079 |

+100 °C – M30 – 3-wire DC – Terminal chamber



General data

Dimensions

Ø30 x 95 mm

Output

, PNP

Electrical connection

terminal chamber,
removable cage clamp
terminals

Operating voltage

10...30 VDC

Ambient temperature



-40...+100 °C

Material housing

V4A (1.4404)

Removable terminal strip and variable cable outlet

Types and data – selection table

| Type | Switching distance | w | d |
|---------------------|--|------|------|
| BI15U-EM30WDTC-AP6X | 15 mm,  | w011 | d080 |
| NI30U-EM30WDTC-AP6X | 30 mm,  | w011 | d081 |

+100 °C – M30 – 2-wire AC/DC – Cable connection



General data

Dimensions

Ø30 x 64 mm

Output



Electrical connection

cable

Operating voltage

20...250 VAC /
10...300 VDC

Ambient temperature

-25...+100 °C



Material housing

PA

Material cable


PVC 2 m

Types and data – selection table

| Type | Switching distance | w | d |
|--------------------|--|------|------|
| BI10-S30-AZ3X/S100 | 10 mm,  | w031 | d196 |
| NI15-S30-AZ3X/S100 | 15 mm,  | w031 | d196 |

+120 °C – Ø160 mm – 3-wire DC – Cable connection





| | | | |
|------------------------------|---|----------------------------|---------------|
| Type | NI100-Q160-AP44X/S120 | Ambient temperature | -25...+120 °C |
| Switching distance | 100 mm,  | Material housing | PP0 |
| Output | —, PNP | Material cable | silicone 2 m |
| Electrical connection | cable | Wiring diagram | w004 |
| Operating voltage | 10...55 VDC | Dimension drawing | d304 |

+120 °C – M12 – 3-wire DC – Cable connection



| | | | |
|------------------------------|-------------|----------------------------|----------------|
| General data | —, PNP | Ambient temperature | -25...+120 °C |
| Output | —, PNP | Material housing | V4A (1.4571) |
| Electrical connection | cable | Material cable | Teflon FEP 2 m |
| Operating voltage | 10...30 VDC | | |

Types and data – selection table

| Type | Dimensions | Switching distance | w | d |
|--------------------|-------------|---|------|------|
| BI2-EM12D-AP6/S120 | Ø12 x 63 mm | 2 mm,  | w004 | d297 |
| NI4-EM12D-AP6/S120 | Ø12 x 67 mm | 4 mm,  | w004 | d298 |

+120 °C – M18 – 3-wire DC – Cable connection







General data

Output , PNP
Electrical connection cable
Operating voltage 10...30 VDC

Ambient temperature -25...+120 °C
Material housing CuZn-Cr
Material cable silicone 2 m

Types and data – selection table

| Type | Dimensions | Switching distance |  |  |
|-------------------|-------------|--|---|---|
| BI5-M18-AP6X/S120 | Ø18 x 87 mm | 5 mm,  | w004 | d305 |
| NI8-M18-AP6X/S120 | Ø18 x 97 mm | 8 mm,  | w004 | d306 |

+120 °C – M18 – 4-wire DC – Cable connection





General data

Output , PNP
Electrical connection cable
Operating voltage 10...30 VDC

Ambient temperature -25...+120 °C
Material housing V4A (1.4571)
Material cable Teflon FEP 2 m

Types and data – selection table

| Type | Dimensions | Switching distance |  |  |
|---------------------|--------------|--|---|---|
| BI5-EM18D-VP6X/S120 | Ø18 x 95 mm | 5 mm,  | w007 | d307 |
| NI7-EM18D-VP6X/S120 | Ø18 x 103 mm | 7 mm,  | w007 | d308 |

+120 °C – M18 – 2-wire AC – Cable connection







General data

| | |
|------------------------------|---|
| Output |  |
| Electrical connection | cable |
| Operating voltage | 20...250 VAC |

| | |
|----------------------------|---------------|
| Ambient temperature | -25...+120 °C |
| Material housing | CuZn-Cr |
| Material cable | silicone 2 m |

Types and data – selection table

| Type | Dimensions | Switching distance |  |  |
|-------------------|-------------|--|---|---|
| BI5-M18-AZ3X/S120 | Ø18 x 87 mm | 5 mm,  | w020 | d305 |
| NI8-M18-AZ3X/S120 | Ø18 x 97 mm | 8 mm,  | w020 | d306 |

+120 °C – M30 – 3-wire DC – Cable connection





General data

| | |
|------------------------------|---|
| Output |  , PNP |
| Electrical connection | cable |
| Operating voltage | 10...30 VDC |

| | |
|----------------------------|---------------|
| Ambient temperature | -25...+120 °C |
| Material housing | CuZn-Cr |
| Material cable | silicone 2 m |

Types and data – selection table

| Type | Dimensions | Switching distance |  |  |
|--------------------|-------------|---|---|---|
| BI10-M30-AP6X/S120 | Ø30 x 87 mm | 10 mm,  | w004 | d309 |
| NI15-M30-AP6X/S120 | Ø30 x 97 mm | 15 mm,  | w004 | d310 |

+120 °C – M30 – 4-wire DC – Cable connection







General data

| | |
|------------------------------|---|
| Output |  , PNP |
| Electrical connection | cable |
| Operating voltage | 10...30 VDC |

| | |
|----------------------------|----------------|
| Ambient temperature | -25...+120 °C |
| Material housing | V4A (1.4571) |
| Material cable | Teflon FEP 2 m |

Types and data – selection table

| Type | Dimensions | Switching distance |  |  |
|----------------------|--------------|---|---|---|
| B110-EM30D-VP6X/S120 | Ø30 x 100 mm | 10 mm,  | w007 | d311 |
| NI15-EM30D-VP6X/S120 | Ø30 x 110 mm | 15 mm,  | w007 | d312 |

+120 °C – M30 – 2-wire AC – Cable connection





General data

| | |
|------------------------------|---|
| Output |  |
| Electrical connection | cable |
| Operating voltage | 20...250 VAC |

| | |
|----------------------------|---------------|
| Ambient temperature | -25...+120 °C |
| Material housing | CuZn-Cr |
| Material cable | silicone 2 m |

Types and data – selection table

| Type | Dimensions | Switching distance |  |  |
|--------------------|-------------|---|---|---|
| B110-M30-AZ3X/S120 | Ø30 x 87 mm | 10 mm,  | w020 | d309 |
| NI15-M30-AZ3X/S120 | Ø30 x 97 mm | 15 mm,  | w020 | d310 |

+160 °C – M18 – 3-wire DC – Cable connection







General data

| | |
|------------------------------|---|
| Output |  , PNP |
| Electrical connection | cable |
| Operating voltage | 10...30 VDC |

| | |
|----------------------------|----------------|
| Ambient temperature | -25...+160 °C |
| Material housing | V4A (1.4571) |
| Material cable | Teflon FEP 2 m |

Types and data – selection table

| Type | Dimensions | Switching distance |  |  |
|-------------------|--------------|--|---|---|
| BI5-EM18-AP6/S907 | Ø18 x 95 mm | 5 mm,  | w004 | d313 |
| NI8-EM18-AP6/S907 | Ø18 x 103 mm | 8 mm,  | w004 | d314 |

+160 °C – M30 – 3-wire DC – Cable connection





General data

| | |
|------------------------------|---|
| Output |  , PNP |
| Electrical connection | cable |
| Operating voltage | 10...30 VDC |


| | |
|----------------------------|----------------|
| Ambient temperature | -25...+160 °C |
| Material housing | V4A (1.4571) |
| Material cable | Teflon FEP 2 m |

Types and data – selection table

| Type | Dimensions | Switching distance |  |  |
|--------------------|--------------|---|---|---|
| BI10-EM30-AP6/S907 | Ø30 x 100 mm | 10 mm,  | w004 | d315 |
| NI15-EM30-AP6/S907 | Ø30 x 110 mm | 15 mm,  | w004 | d316 |

+250 °C – Q40 – Sensor




| | | | |
|------------------------------|--|--------------------------|----------------|
| Type | NI25-CQ40/S1102 5M | Material housing | AL |
| Dimensions | 40 x 40 x 52 mm | Material cable | Teflon FEP 5 m |
| Switching distance | 25 mm,  | Wiring diagram | w057 |
| Electrical connection | connector, M12 x 1 | Dimension drawing | d317 |
| Ambient temperature | 0...+250 °C | | |

Amplifier EM30-AP6X2-H1141/S1102 required

+250 °C – Q80 – Sensor



| | | | |
|------------------------------|--|--------------------------|----------------|
| Type | NI40-CQ80/S1102 5M | Material housing | AL |
| Dimensions | 80 x 40 x 92 mm | Material cable | Teflon FEP 5 m |
| Switching distance | 40 mm,  | Wiring diagram | w057 |
| Electrical connection | connector, M12 x 1 | Dimension drawing | d318 |
| Ambient temperature | 0...+250 °C | | |

Amplifier EM30-AP6X2-H1141/S1102 required

+250 °C – EM30 – Amplifier



| | | | |
|------------------------------|----------------------------|----------------------------|--------------|
| Type | EM30-AP6X2-H1141/ S1102 | Ambient temperature | -20...+70 °C |
| Output | —, PNP | Material housing | V4A (1.4571) |
| Electrical connection | connector, M12 x 1 | Wiring diagram | w058 |
| Operating voltage | 10...30 VDC | Dimension drawing | d319 |

Required sensors Ni25-CQ40/S1102 5M or Ni40-CQ80/S1102 5M

Inductive sensors for underwater applications

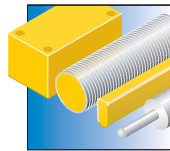


TURCK provides sensors in fully pressure and seawater tight housings for subsea applications. Mounted in M18 threaded barrels made of plastic, they can even be applied at water depths of up to 500 m. Also available are CP40 sensors, fully encapsulated in the SG40/2 housing for subsea use. These types feature a large switching distance, protection class IP68 and are made for (fresh) water depths of up to 50 m. They are mostly applied in locks, weirs and offshore plants.

Features

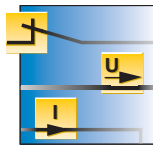
- For continuous use underwater
- M18 sensors for water depths of up to 500 m
- M18 sensors in protective CP40 housing for water depths of up to 50 m
- Application compliant housing materials
- ATEX approved versions

Properties



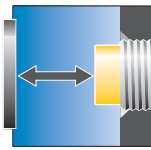
Design

M18 x 1 threaded barrel, Rectangular 40 x 40 mm, mounted in protective housing



Electrical versions

NAMUR, 3 and 4-wire DC



Switching distances

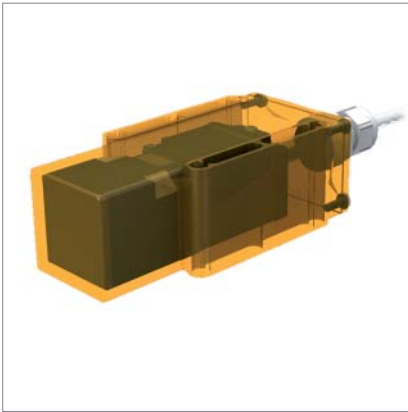
Threaded barrel 5 mm flush or 8 mm non-flush version, rectangular 35 mm non-flush



Materials

Seawater resistant longlife materials

CP40



| | | | |
|------------------------------|----------------------------------|--------------------------|-------------|
| Type | NI35-CP40-VP4X2/S938-F/S1194 30M | Operating voltage | 10...65 VDC |
| Dimensions | 67 x 50 x 190 mm | Material housing | Ultem |
| Switching distance | 35 mm, | Material cable | PUR 30 m |
| Output | , PNP | Wiring diagram | w007 |
| Electrical connection | cable | Dimension drawing | d320 |

M18 – NAMUR



| | | | |
|------------------------------|-----------------|--------------------------|--------------|
| Type | NI8-P18-Y1/S139 | Operating voltage | nom. 8.2 VDC |
| Dimensions | Ø18 x 80 mm | Material housing | POM |
| Switching distance | 8 mm, | Material cable | PVC 2 m |
| Output | NAMUR | Wiring diagram | w019 |
| Electrical connection | cable | Dimension drawing | d186 |

M18 – 3-wire DC



| | | | |
|------------------------------|-------------|-------------------------|---------|
| General data | | Material housing | POM |
| Dimensions | Ø18 x 80 mm | Material cable | PUR 2 m |
| Electrical connection | cable | | |
| Operating voltage | 10...30 VDC | | |

Types and data – selection table

| Type | Switching distance | Output | w | d |
|----------------------|---|---|------|------|
| BI5-P18-AP6/S139-S90 | 5 mm,  |  , PNP | w004 | d186 |
| BI5-P18-AN6/S139-S90 | 5 mm,  |  , NPN | w005 | d186 |
| NI8-P18-AP6/S139-S90 | 8 mm,  |  , PNP | w004 | d186 |
| NI8-P18-AN6/S139-S90 | 8 mm,  |  , NPN | w005 | d186 |

M18 – 2-wire AC/DC



General data

Dimensions

Ø18 x 80 mm

Operating voltage

20...250 VAC /
10...300 VDC

Output



Material housing

POM


Electrical connection

cable

Material cable

PUR 2 m

Types and data – selection table

| Type | Switching distance | w | d |
|----------------------|---|------|------|
| BI5-P18-AZ3/S139-S90 | 5 mm,  | w031 | d186 |
| NI8-P18-AZ3/S139-S90 | 8 mm,  | w031 | d186 |

Pressure-resistant sensors



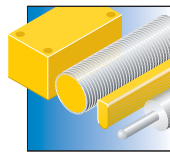
We offer pressure and high-pressure resistant sensors. The *uprox*®+ WashDown sensors resist pressures up to 20 bar. They combine the unique *uprox*® advantages, such as largest switching distance, factor 1 on all metals and protection classes IP68/IP69K.

The high-pressure resistant sensors are incorporated in a stainless steel housing and are ideally suited for hydraulic systems. Special gaskets and additional outer seals at the front as well as an O-ring enable the application in high pressure systems of up to 500 bar.

Features

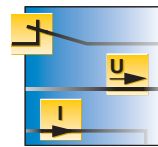
- M8 and M12 versions up to 20 bar
- M18 up to 15 bar
- M30 up to 10 bar
- *uprox*®+ WashDown sensors with largest switching distance
- Special high pressure resistant sensors up to 500 bar

Properties



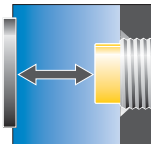
Design

Thread sizes M8 x 1, M12 x 1, M18 x 1 or M30 x 1.5



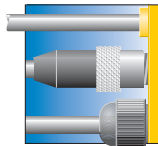
Electrical versions

NO and NC or anti-valent DC output functions



Switching distances

uprox®+ WashDown sensors up to 30 mm, high-pressure resistant sensors up to 2 mm



Electrical connections

Cable or M12 plug connection



Materials

Robust stainless steel threaded barrel with shape-stable plastic cap to protect the active face




Special features

Factor 1, all metals, temperature range -40 ... +100 °C

M8 – 3-wire DC







General data

Dimensions Ø8 x 57 mm
Switching distance 1.5 mm, 
Electrical connection connector, M12 x 1

Operating voltage 10...30 VDC
Material housing V2A (1.4301)

Pressure resistant up to 20 bar

Types and data – selection table

| Type | Output |  |  |
|-------------------------|---|---|---|
| BI1,5-EG08WD-AP6X-H1341 |  , PNP | w001 | d024 |
| BI1,5-EG08WD-AN6X-H1341 |  , NPN | w002 | d024 |

M12 – 3-wire DC



















General data

Dimensions Ø12 x 52 mm
Operating voltage 10...30 VDC

Material housing V4A (1.4404)

Pressure resistant up to 20 bar

Types and data – selection table

| Type | Switching distance | Output | Electrical connection | Material cable | w | d |
|-------------------------|--|---|-----------------------|----------------|------|------|
| BI4U-EM12WD-AP6X-H1141 | 4 mm,  |  , PNP | connector, M12 x 1 | - | w001 | d034 |
| BI4U-EM12WD-AP6X | 4 mm,  |  , PNP | cable | PP 2 m | w004 | d068 |
| BI4U-EM12WD-AN6X-H1141 | 4 mm,  |  , NPN | connector, M12 x 1 | - | w002 | d034 |
| BI4U-EM12WD-AN6X | 4 mm,  |  , NPN | cable | PP 2 m | w005 | d068 |
| NI10U-EM12WD-AP6X-H1141 | 10 mm,  |  , PNP | connector, M12 x 1 | - | w001 | d067 |
| NI10U-EM12WD-AP6X | 10 mm,  |  , PNP | cable | PP 2 m | w004 | d069 |
| NI10U-EM12WD-AN6X-H1141 | 10 mm,  |  , NPN | connector, M12 x 1 | - | w002 | d067 |
| NI10U-EM12WD-AN6X | 10 mm,  |  , NPN | cable | PP 2 m | w005 | d069 |

M12 – 4-wire DC



General data

Dimensions

Ø12 x 62 mm

Output

, PNP

Electrical connection

connector, M12 x 1

Operating voltage



10...55 VDC

Material housing

V4A (1.4404)

Pressure resistant up to 20 bar

Types and data – selection table

| Type | Switching distance | w | d |
|---------------------------|--|------|------|
| BI4U-EM12EWD-VP44X-H1141 | 4 mm,  | w017 | d028 |
| NI10U-EM12EWD-VP44X-H1141 | 10 mm,  | w017 | d152 |

M18 – 3-wire DC



General data

Dimensions

Ø18 x 52 mm

Operating voltage

















10...30 VDC

Material housing

V4A (1.4404)

Pressure resistant up to 15 bar

Types and data – selection table

| Type | Switching distance | Output | Electrical connection | Material cable | w | d |
|-------------------------|--|---|-----------------------|----------------|------|------|
| BI8U-EM18WD-AP6X-H1141 | 8 mm,  |  , PNP | connector, M12 x 1 | - | w001 | d044 |
| BI8U-EM18WD-AP6X | 8 mm,  |  , PNP | cable | PP 2 m | w004 | d073 |
| BI8U-EM18WD-AN6X-H1141 | 8 mm,  |  , NPN | connector, M12 x 1 | - | w002 | d044 |
| BI8U-EM18WD-AN6X | 8 mm,  |  , NPN | cable | PP 2 m | w005 | d073 |
| NI15U-EM18WD-AP6X-H1141 | 15 mm,  |  , PNP | connector, M12 x 1 | - | w001 | d072 |
| NI15U-EM18WD-AP6X | 15 mm,  |  , PNP | cable | PP 2 m | w004 | d074 |
| NI15U-EM18WD-AN6X-H1141 | 15 mm,  |  , NPN | connector, M12 x 1 | - | w002 | d072 |
| NI15U-EM18WD-AN6X | 15 mm,  |  , NPN | cable | PP 2 m | w005 | d074 |

M18 – 4-wire DC




General data

| | | | |
|------------------------------|--------------------|--------------------------|--------------|
| Dimensions | Ø18 x 61.5 mm | Operating voltage | 10...55 VDC |
| Electrical connection | connector, M12 x 1 | Material housing | V4A (1.4404) |

Pressure resistant up to 15 bar

Types and data – selection table

| Type | Switching distance | Output | w | d |
|---------------------------|--|---|------|------|
| BI8U-EM18MWD-VP44X-H1141 | 8 mm,  |  , PNP | w017 | d040 |
| BI8U-EM18MWD-VN44X-H1141 | 8 mm,  |  , NPN | w010 | d040 |
| NI15U-EM18MWD-VP44X-H1141 | 15 mm,  |  , PNP | w017 | d060 |

M18 – 3-Draht DC – High pressure resistant



General data

Dimensions Ø18 x 58 mm
Switching distance 2 mm, 
Output , PNP

Operating voltage 10...30 VDC
Material housing V2A (1.4305)

Pressure resistant up to 500 bar (S212) resp. 100 bar (S220)

Types and data – selection table

| Type | Electrical connection | Material cable |  |  |
|--------------------------|-----------------------|----------------|---|---|
| BID2-G180-AP6/S220 | cable | PVC 2 m | w004 | d322 |
| BID2-G180-AP6/S212 | cable | PVC 2 m | w004 | d322 |
| BID2-G180-AP6-H1141/S220 | connector, M12 x 1 | - | w001 | d321 |
| BID2-G180-AP6-H1141/S212 | connector, M12 x 1 | - | w001 | d321 |

M30 – 3-wire DC



















General data

Operating voltage 10...30 VDC

Material housing V4A (1.4404)

Pressure resistant up to 10 bar

Types and data – selection table

| Type | Dimensions | Switching distance | Output | Electrical connection | Material cable | w | d |
|-------------------------|-------------|--|---|-----------------------|----------------|------|------|
| BI15U-EM30WD-AP6X-H1141 | Ø30 x 62 mm | 15 mm,  |  , PNP | connector, M12 x 1 | - | w001 | d050 |
| BI15U-EM30WD-AP6X | Ø30 x 66 mm | 15 mm,  |  , PNP | cable | PP 2 m | w004 | d078 |
| BI15U-EM30WD-AN6X-H1141 | Ø30 x 62 mm | 15 mm,  |  , NPN | connector, M12 x 1 | - | w002 | d050 |
| BI15U-EM30WD-AN6X | Ø30 x 66 mm | 15 mm,  |  , NPN | cable | PP 2 m | w005 | d078 |
| NI30U-EM30WD-AP6X-H1141 | Ø30 x 62 mm | 30 mm,  |  , PNP | connector, M12 x 1 | - | w001 | d077 |
| NI30U-EM30WD-AP6X | Ø30 x 66 mm | 30 mm,  |  , PNP | cable | PP 2 m | w004 | d079 |
| NI30U-EM30WD-AN6X-H1141 | Ø30 x 62 mm | 30 mm,  |  , NPN | connector, M12 x 1 | - | w002 | d077 |
| NI30U-EM30WD-AN6X | Ø30 x 66 mm | 30 mm,  |  , NPN | cable | PP 2 m | w005 | d079 |

M30 – 4-wire DC



General data

Dimensions

Ø30 x 62 mm

Output

, PNP

Electrical connection

connector, M12 x 1

Operating voltage


10...55 VDC

Material housing

V4A (1.4404)

Pressure resistant up to 10 bar

Types and data – selection table

| Type | Switching distance | w | d |
|--------------------------|--|------|------|
| BI15U-EM30WD-VP44X-H1141 | 15 mm,  | w017 | d050 |
| NI30U-EM30WD-VP44X-H1141 | 30 mm,  | w017 | d077 |

Magnetic-inductive sensors

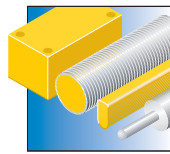


Magnetic-inductive sensors are typically applied in pig trap systems or used for gate monitoring. Since magnetic-inductive sensors are actuated by external magnetic fields, even the smaller types can operate at a large switching distance. When using the actuating magnet DMR31155, the M12 sensors attain a rated switching distance of 90 mm.

Features

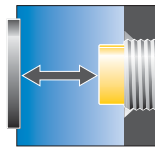
- Extremely long ranges
- Detection through non-magnetizable materials
- ATEX and SIL approved versions
- Rugged threaded barrels
- Broad selection of actuators

Properties



Design

Threaded barrels
M8 x 1 or M12 x 1



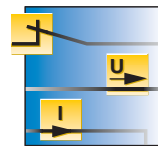
Switching distances

M8 sensors up to
78 mm and M12
sensors up to 90 mm,
depending on the
actuating magnet



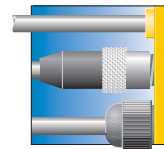
Materials

Robust threaded barrels,
chrome-plated
brass or stainless steel



Electrical versions

NAMUR, 2 or 3-wire DC



Electrical connections

2 m connection cable
or M12 x 1 plug con-
nection

M8 – NAMUR





General data

| | | | |
|---------------------------|-------|--------------------------|--------------|
| Switching distance | 78 mm | Operating voltage | nom. 8.2 VDC |
| Output | NAMUR | Material housing | V2A (1.4301) |

More information on actuating magnets in chapter „Accessories“.

Nominal switching distance 78 mm with magnet DMR31-15-5

Types and data – selection table

| Type | Dimensions | Electrical connection | Material cable |  |  |
|--------------------|--------------|-----------------------|----------------|---|---|
| BIM-EG08-Y1X-H1341 | Ø8 x 57 mm | connector, M12 x 1 | - | w021 | d323 |
| BIM-EG08-Y1X | Ø8 x 41.6 mm | cable | PVC 2 m | w019 | d026 |

M8 – 3-wire DC



General data

| | | | |
|---------------------------|-------------|-------------------------|--------------|
| Switching distance | 78 mm | Material housing | V2A (1.4301) |
| Operating voltage | 10...30 VDC | | |

More information on actuating magnets in chapter „Accessories“.

Nominal switching distance 78 mm with magnet DMR31-15-5

Types and data – selection table

| Type | Dimensions | Output | Electrical connection | Material cable | w | d |
|---------------------|--------------|--------|-----------------------|----------------|------|------|
| BIM-EG08-AP6X-V1131 | Ø8 x 49 mm | —, PNP | connector, M8 x 1 | - | w001 | d022 |
| BIM-EG08-AP6X-H1341 | Ø8 x 57 mm | —, PNP | connector, M12 x 1 | - | w001 | d323 |
| BIM-EG08-AP6X | Ø8 x 41.6 mm | —, PNP | cable | PUR 2 m | w059 | d026 |
| BIM-EG08-AN6X-H1341 | Ø8 x 57 mm | —, NPN | connector, M12 x 1 | - | w002 | d323 |
| BIM-EG08-AN6X | Ø8 x 41.6 mm | —, NPN | cable | PUR 2 m | w005 | d026 |

M12 – NAMUR



General data

Switching distance

90 mm

Operating voltage

nom. 8.2 VDC

Output

NAMUR

More information on actuating magnets in chapter „Accessories“.

Nominal switching distance 90 mm with magnet DMR31-15-5

Types and data – selection table

| Type | Dimensions | Electrical connection | Material housing | Material cable | w | d |
|--------------------|-------------|-----------------------|------------------|----------------|------|------|
| BIM-M12E-Y1X-H1141 | Ø12 x 62 mm | connector, M12 x 1 | CuZn-Cr | - | w021 | d151 |
| BIM-EM12E-Y1X | Ø12 x 64 mm | cable | V2A (1.4301) | PVC 2 m | w019 | d030 |

M12 – 3-wire DC



General data

Switching distance 90 mm

Operating voltage 10...65 VDC

More information on actuating magnets in chapter „Accessories“.

Nominal switching distance 90 mm with magnet DMR31-15-5

Types and data – selection table

| Type | Dimensions | Output | Electrical connection | Material housing | Material cable | w | d |
|----------------------|-------------|--------|-----------------------|------------------|----------------|------|------|
| BIM-M12E-AN4X-H1141 | Ø12 x 62 mm | —, NPN | connector, M12 x 1 | CuZn-Cr | - | w002 | d151 |
| BIM-M12E-AN4X | Ø12 x 64 mm | —, NPN | cable | CuZn-Cr | PUR 2 m | w005 | d030 |
| BIM-EM12E-AP4X-H1141 | Ø12 x 62 mm | —, PNP | connector, M12 x 1 | V2A (1.4301) | - | w001 | d151 |
| BIM-EM12E-AP4X | Ø12 x 64 mm | —, PNP | cable | V2A (1.4301) | PVC 2 m | w004 | d030 |

Selective sensors

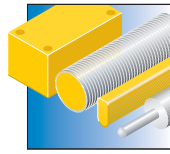


TURCK's sensor series NF, FE and NF/FE with distinctive function are particularly suited for applications in which ferritic metals have to be distinguished from non-ferritic metals. They distinguish for example between workpiece and tool or between workpieces made of different materials and perform simple coding tasks.

Features

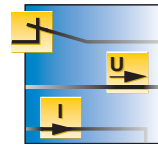
- Switching outputs for the detection of different materials
- NF with output for non-ferritic metals
- FE with output for ferritic metals
- Stainless steel housing
- Large switching distance also on non-ferritic metals
- High interference immunity

Properties



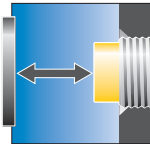
Design

Broad product range, 12, 18 and 30 mm threaded barrels as well as 40 x 40 mm rectangular types



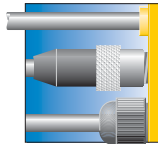
Electrical versions

3-wire DC for threaded barrels
4-wire DC / 2-wire AC rectangular type



Switching distances

Detection of ferrous metals up to 5 mm, no distinction of metals up to 20 mm



Electrical connections

Threaded barrel with M12 plug connection, rectangular type with terminal chamber

CP40 – 4-wire DC





General data

Dimensions 40 x 40 x 114 mm
Switching distance 20 mm, 
Electrical connection terminal chamber

Operating voltage 10...65 VDC
Material housing PBT

Variable orientation of active face in 9 directions

Types and data – selection table

| Type | Output | w | d |
|-------------------|---|------|------|
| NI20NF-CP40-VP4X2 |  , PNP | w014 | d116 |
| NI20NF-CP40-VN4X2 |  , NPN | w013 | d116 |

M12 – 3-wire DC









General data

Electrical connection connector, M12 x 1
Operating voltage 10...30 VDC

Material housing V2A (1.4301)

Types and data – selection table

| Type | Dimensions | Switching distance | Output | w | d |
|---------------------------|-------------|---|---|------|------|
| BI3NF-EM12HE-AP6X2-H1141 | Ø12 x 62 mm | 3 mm,  |  , PNP | w001 | d151 |
| BI3NF-EM12HE-AN6X2-H1141 | Ø12 x 62 mm | 3 mm,  |  , NPN | w002 | d151 |
| BI2,5FE-EM12FE-AP6X-H1141 | Ø12 x 60 mm | 2.5 mm,  |  , PNP | w001 | d324 |

M18 – 3-wire DC



General data

Switching distance

5 mm,

Electrical connection

connector, M12 x 1

Operating voltage

10...30 VDC

Types and data – selection table

| Type | Dimensions | Output | Material housing | w | d |
|--------------------------|-------------|--------|------------------|------|------|
| BI5NF-EM18HE-AP6X2-H1141 | Ø18 x 72 mm | , PNP | V2A (1.4301) | w001 | d045 |
| BI5NF-EM18HE-AN6X2-H1141 | Ø18 x 72 mm | , NPN | V2A (1.4301) | w002 | d045 |
| BI5FE-M18FE-AP6X-H1141 | Ø18 x 70 mm | , PNP | CuZn -OP | w001 | d325 |

M30 – 3-wire DC



General data

Dimensions

Ø30 x 77 mm

Switching distance

10 mm,

Electrical connection

connector, M12 x 1

Operating voltage

10...30 VDC

Material housing

V2A (1.4301)

Types and data – selection table

| Type | Output | w | d |
|---------------------------|--------|------|------|
| BI10NF-EM30HE-AP6X2-H1141 | , PNP | w001 | d326 |
| BI10NF-EM30HE-AN6X2-H1141 | , NPN | w002 | d326 |

At a glance

Capacitive sensors



Capacitive sensors with high application potential

Capacitive sensors operate contactless, reactionless and wear-free. Both, electrically conductive and non-conductive materials are detected reliably. Capacitive sensors can thus be applied in systems in which inductive sensors would be inappropriate.

In addition to distance and position, capacitive sensors measure deflection, thickness, filling level, eccentricity, concentricity, deformation, wear and vibration.

The functional principle of capacitive sensors is based on the arrangement of two conductors (plates) separated by a dielectric (insulator). An electric field created through the potential difference between the two conductors is stored in the dielectric. The change of field strength (capacitance) in the dielectric is used as a measure. Non-conductive materials are detected through the change of field strength in the dielectric whereby a probe on the one hand and the ambient on the other hand represent the two conductors. Conductive materials are detected through the change of material as well as through the change of distance between the conductors.

The effective switching distances of capacitive sensors can vary considerably. A maximum switching distance is achieved with metallic objects. Reduction factors do not have to be observed as with con-

ventional inductive sensors. With regard to other materials, the switching distance is reduced in dependence to the dielectric constant of the target object. The higher the value the higher the switching distance. The switching distance of nearly all capacitive sensors can be adjusted with a potentiometer.

Capacitive sensors are laid out for temperature ranges between -25 and $+70$ °C by default. Special version are also available for temperatures up to $+100$ °C.

Based on the novel technology, the close-up range suppression of TURCK sensors works also with conductive clingage. TURCK also offers a solution for electromagnetic sensitivity. The product portfolio comprises sensors with EMC filter, making them insensitive to radiated and conducted HF interference and burst.

Capacitive sensors are available in cylinder and rectangular design. Alongside the standard plastic and metal versions, sensors enclosed in a Dyflor housing are also available for extra protection against chemically aggressive environments.

Our strengths - your advantages



Novel close-up range suppression

Capacitive sensors react to all materials with a permittivity greater than 1. This may lead to interferences during operation in the event of wetting, condensation or icing on the sensor surface. Residue and humidity may also lead to detection failures. In order to rule out this effect, a signal is produced with an electrode close

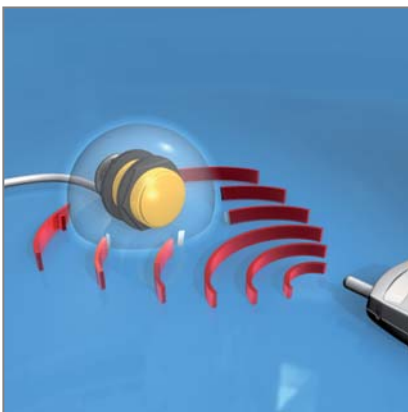
to the sensor surface, antagonizing the main signal. A zone is thus created near the electrode in which dirt and humidity are not detected by the sensor. Based on the novel technology, the close-up range suppression of TURCK sensors works also with conductive clingage.



Wear-free detection of conducting and non-conducting materials.

Capacitive proximity sensors are designed for contactless and wear-free detection of electrically conducting and non-conducting objects. These all-rounders are thus suited for many applications. In addition to distance and

position, capacitive sensors measure deflection, thickness, eccentricity, concentricity, deformation, wear, vibration and above all filling levels of liquid and solid substances.



All-round protection against interferences

Capacitive sensors work reliably and safe, even under rough environmental conditions. Special protective measures ensure failsafe operation of the sensors in ambients subject to high electromagnet-

ic interference. The sensors are also ESD immune. Automatic wetting compensation eliminates moreover interferences caused by wetting and condensation.

advantages



Rectangular design, high-performance technology within the smallest space

The rectangular devices offer high-quality components and high functionality in a rugged housing. These sensors moreover convince through easy and convenient mounting. The prescribed free

zones are considerably smaller, lowering the construction effort while enhancing the system availability. You save time and money.



Cylindrical design, metal or plastic version

Whether metal or plastic housing, the product range of standard cylindrical sensors is large, offering devices with diameters between 12 mm and 40 mm. The flush mountable sensors generate an almost linear detection field.

Besides the usual reliability, capacitive TURCK sensors feature standard functions such as automatic wetting compensation, excellent EMC and ESD properties and they are flexibly mounted.

For special applications



High-temperature resistant sensors

A growing number of applications require sensors resisting temperatures beyond the standard range of $-25 \dots +70 \text{ }^{\circ}\text{C}$. For this purpose TURCK has developed capacitive sensors which meet exactly these requirements.

The sensors feature temperature-resistant components as well as cleverly designed, fanless passive cooling concepts approved in demanding laboratory tests. These sensors resist temperatures in a range of $-25 \text{ }^{\circ}\text{C} \dots +100 \text{ }^{\circ}\text{C}$

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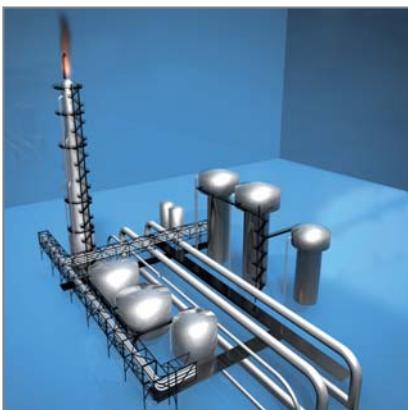
AC 2-wire sensors

Capacitive AC 2-wire sensors are available as M12, M18, M30 and CK40 types.

The established wiring, normally two wires, can still be used. Cutting down on the amount of wiring saves time.

The 2-wire sensors can be used to replace mechanical switches in existing systems.

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NAMUR sensors

NAMUR sensors are approved for zone 0 and 1. They are polarized 2-wire devices, changing their internal resistance depending on the attenuation (continuous linear/current characteristics). They can be connected to external switching amplifiers which convert current variations

into a binary output signal. The advantage: With an approved switching amplifier, they can be applied in Ex-areas and monitor wire-break and short-circuit.

Page 268

ons



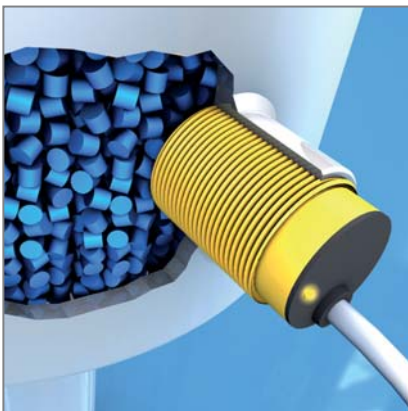
BCF sensors for demanding applications

Conventional sensors do not operate reliably in demanding ambients. Residue and humidity on the active face may inhibit proper operation of the sensor. These problems are now ruled out with the new BCF series. Even conductive clingage are not a problem any more, thanks to the novel technology.

The sensors are immune to radiated and conducted HF interference, burst as well as electrostatic discharge (ESD).

- Suited for highly viscous media
- Increased EMI and RFI shielding

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BCC sensors for level control

The BCC sensors blank out all interferences during the monitoring process. They are EMC and ESD immune. A laterally mounted shield and an integrated processing unit inhibit predamping when mounted in metal flanges. The full switching distance is thus available.

- Detection of smallest pellets
- Same switching distance, even when mounted in metal barrels
- Excellent EMC and ESD properties

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Chemical-resistant sensors

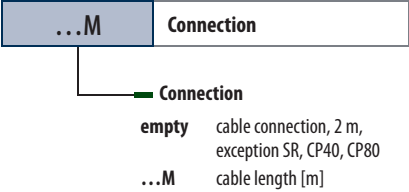
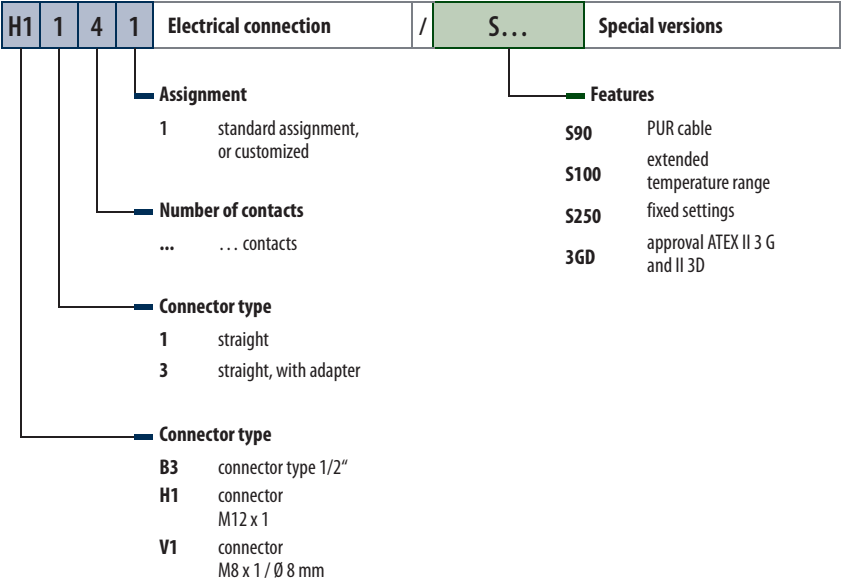
The capacitive sensors (PVDF) are the ideal solution for any application of the pharmaceutical, chemical or food industry. They help to optimize all kinds of applications for instance in dairies, breweries, industrial bakeries, frozen food production, packaging and filling machinery.

PVDF materials belong to the group of fluoride plastics. They are extremely resistant due to the high fluorine content. They also feature a high creep strength under constant load as well as good heat and cold properties.

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Type code

| B | C | F | 5 | Functional principle | - | M12 | K | Design | - | A | P | 6 | X2 | Electrical version | - |
|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|--------------------|---|
| | | | | <p>Rated operating distance</p> <p>... distance S_n in [mm]</p> <p>Special functions</p> <p>C predamping protection</p> <p>F close-up range suppression</p> <p>Functional principle</p> <p>C capacitive</p> <p>Fitting</p> <p>B flush</p> <p>N non-flush</p> | | | | <p>Additional information</p> <p>E long-sized housing</p> <p>F flat housing</p> <p>L length of housing</p> <p>K short-sized housing</p> <p>SR terminal chamber with straight or angled cable outlet</p> <p>Housing</p> <p>CP40 rectangular, (40 x 40 mm) active face flexible</p> <p>CP80 rectangular, (80 x 80 mm)</p> <p>K smooth barrel, plastic</p> <p>KT smooth barrel, plastic, teflon-coated</p> <p>M threaded barrel, metal, \varnothing in [mm]</p> <p>P plastic barrel, continuous thread</p> <p>PS threaded barrel, plastic, \varnothing in [mm]</p> <p>PT threaded barrel, plastic, teflon-coated</p> <p>Q rectangular, height and \varnothing in [mm]</p> | | | | | <p>Indication</p> <p>X LED</p> <p>X... multicolor LED</p> <p>Voltage range</p> <p>3 10...300 VDC / 20...250 VAC</p> <p>4 10...65 VDC, short-circuit proof</p> <p>6 10...30 VDC, short-circuit proof</p> <p>Output mode</p> <p>N NPN</p> <p>P PNP</p> <p>Z 2-wire AC/DC</p> <p>Output function</p> <p>A working current NO</p> <p>F working current NO/ closed current NC programmable via connection</p> <p>R closed current NC</p> <p>V changeover contact</p> <p>Y0, Y1 output acc. to EN 60947-5-6 (NAMUR)</p> | | |



Designs and variants

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QF5.5

Design

rectangular QF5.5,
20.3 x 5.5 x 54 mm

Switching distance

5 mm, 
10 mm, 

Electrical connection

cable

Output

2-wire DC NAMUR
3-wire DC PNP
3-wire DC NPN

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Q08

rectangular Q08,
20 x 8 x 32 mm

5 mm, 

connector, Ø 8 mm
cable

3-wire DC PNP
3-wire DC NPN

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Q10

rectangular Q10,
25 x 10.8 x 42 mm

8 mm, 

connector
cable

3-wire DC PNP
3-wire DC NPN

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Q14

rectangular Q14,
30 x 14 x 55.5 mm

10 mm, 

connector, M8 x 1
cable

3-wire DC PNP
3-wire DC NPN



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Q20

Q20L60

CP40

CP80

Design

rectangular Q20,
40 x 20 x 68 mm

rectangular Q20L60,
30 x 20 x 60 mm

rectangular CP40,
40 x 40 x 114 mm

rectangular CP80,
80 x 40.5 x 80 mm

Switching distance

20 mm,

10 mm,

20 mm,

50 mm,

Electrical connection

connector, M8 x 1
connector, M12 x 1
cable

connector, M12 x 1
cable

connector, M12 x 1
terminal chamber

connector, M12 x 1
terminal chamber

Output

3-wire DC PNP
3-wire DC NPN

3-wire DC PNP

2-wire AC
4-wire DC PNP
4-wire DC NPN

2-wire AC
4-wire DC PNP
4-wire DC NPN

Designs and variants

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| | M12 | M18 | S185 | M30 |
|------------------------------|--------------------------------|---|--------------------------------|---|
| Design | threaded barrel M12 x 1 | threaded barrel M18 x 1 | threaded barrel M18 x 1 | threaded barrel M30 x 1.5 |
| Switching distance | 3 mm, | 5 mm, | 5 mm, | 10 mm, |
| Electrical connection | cable | connector, 1/2" connector, M12 x 1 cable cable with connector, M12 x 1 | cable | connector, 1/2" connector, M12 x 1 cable terminal chamber |
| Output | 3-wire DC PNP 3-wire DC NPN | 2-wire DC NAMUR 2-wire AC 3-wire DC PNP 3-wire DC NPN | 3-wire DC PNP 3-wire DC NPN | 2-wire DC NAMUR 2-wire AC 3-wire DC PNP 4-wire DC PNP 4-wire DC NPN |

Standard variants

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K34

K40

| | | |
|------------------------------|---|--|
| Design | smooth barrel 34 mm | smooth barrel 40 mm |
| Switching distance | 15 mm, | 20 mm, |
| Electrical connection | connector, M12 x 1 cable terminal chamber | connector, M12 x 1 terminal chamber |
| Output | 2-wire AC 3-wire DC PNP 3-wire DC NPN 4-wire DC PNP 4-wire DC NPN | 4-wire DC PNP 4-wire DC NPN |

Rectangular design



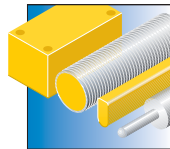
Rectangular shaped capacitive sensors are the compact solution for your facilities. The rugged housing and high-quality components provide additional options for installation and detection. The 8 mm Q08 as well as the variable CP80 convince through easy mounting and short blind zones.

The rectangular types thus simplify the assembly and enhance the operability of your systems.

Features

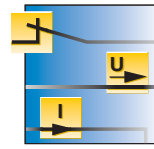
- Stable and resistant housings
- Large switching distances
- Excellent EMC immunity
- Easy to mount
- Connector and cable versions

Properties



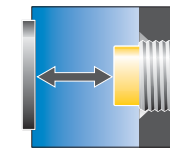
Design

From the small Q08 to the big sized CP80



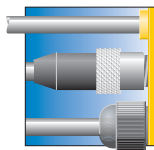
Electrical versions

3/4-wire DC, PNP/NPN



Switching distances

5 mm versions for close-range detection, 50 mm versions for long ranges



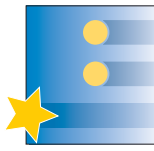
Electrical connections

2 m cable PVC/PUR, M8 x 1 plug connection, Ø 8 mm and M12 x 1



Materials

Rugged and chemical resistant plastic and metal housings



Special features

Fine adjustment via potentiometer

Q08 – 3-wire DC – Fixed settings



General data

| | |
|----------------------------|----------------|
| Dimensions | 20 x 8 x 32 mm |
| Switching distance | 5 mm, |
| Operating voltage | 10...30 VDC |
| Ambient temperature | -25...+70 °C |

| | |
|-----------------------------|-------|
| Protection class | IP67 |
| Material housing | GD-Zn |
| Material active face | PA |

Types and data – selection table

| Type | Output | Electrical connection | Material cable | w | d |
|--------------------------|--------|-----------------------|----------------|------|------|
| BC5-Q08-RP6X2/S250 | , PNP | cable | PVC 2 m | w006 | d086 |
| BC5-Q08-RP6X2-V1131/S250 | , PNP | connector, Ø 8 mm | - | w003 | d089 |
| BC5-Q08-AP6X2/S250 | , PNP | cable | PVC 2 m | w004 | d086 |
| BC5-Q08-AP6X2-V1131/S250 | , PNP | connector, Ø 8 mm | - | w001 | d089 |
| BC5-Q08-AN6X2/S250 | , NPN | cable | PVC 2 m | w005 | d086 |
| BC5-Q08-AN6X2-V1131/S250 | , NPN | connector, Ø 8 mm | - | w002 | d089 |

Q10 – 3-wire DC – Fixed settings



General data

| | |
|----------------------------|-------------------|
| Dimensions | 25 x 10.8 x 42 mm |
| Switching distance | 8 mm, |
| Operating voltage | 10...30 VDC |
| Ambient temperature | -25...+70 °C |

| | |
|-----------------------------|------|
| Protection class | IP67 |
| Material housing | PBT |
| Material active face | PBT |

Types and data – selection table

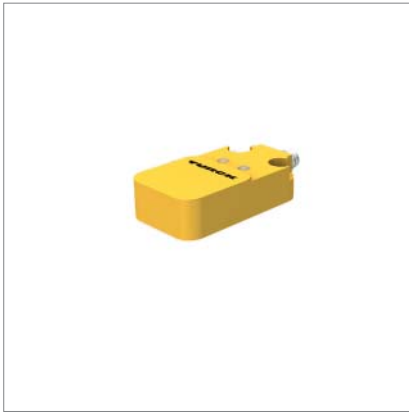
| Type | Output | Electrical connection | Material cable | w | d |
|--------------------------|--------|-----------------------|----------------|------|------|
| BC8-Q10-RP6X2/S250 | , PNP | cable | PVC 2 m | w006 | d092 |
| BC8-Q10-RP6X2-V1131/S250 | , PNP | connector, M8 x 1 | - | w003 | d091 |
| BC8-Q10-AP6X2/S250 | , PNP | cable | PVC 2 m | w004 | d092 |
| BC8-Q10-AP6X2-V1131/S250 | , PNP | connector, M8 x 1 | - | w001 | d091 |
| BC8-Q10-AN6X2/S250 | , NPN | cable | PVC 2 m | w005 | d092 |
| BC8-Q10-AN6X2-V1131/S250 | , NPN | connector, M8 x 1 | - | w002 | d091 |

Wiring diagrams on page 832 ff

Dimension drawings on page 842 ff

Accessories on page 736 ff

Q14 – 3-wire DC – Fine adjustment via potentiometer



General data

| | | | |
|----------------------------|-------------------|-----------------------------|------|
| Dimensions | 30 x 14 x 55.5 mm | Protection class | IP67 |
| Switching distance | 10 mm, | Material housing | PBT |
| Operating voltage | 10...65 VDC | Material active face | PBT |
| Ambient temperature | -25...+70 °C | | |

Types and data – selection table

| Type | Output | Electrical connection | Material cable | w | d |
|----------------------|--------|-----------------------|----------------|------|------|
| BC10-Q14-RP4X2 | , PNP | cable | PUR 2 m | w006 | d328 |
| BC10-Q14-AP4X2-V1131 | , PNP | connector, M8 x 1 | - | w001 | d327 |
| BC10-Q14-AP4X2 | , PNP | cable | PUR 2 m | w004 | d328 |
| BC10-Q14-AN4X2-V1131 | , NPN | connector, M8 x 1 | - | w002 | d327 |
| BC10-Q14-AN4X2 | , NPN | cable | PUR 2 m | w005 | d328 |

Q20 – 3-wire DC – Fine adjustment via potentiometer



General data

| | | | |
|----------------------------|-----------------|-----------------------------|------|
| Dimensions | 40 x 20 x 68 mm | Protection class | IP67 |
| Switching distance | 20 mm, | Material housing | PBT |
| Operating voltage | 10...65 VDC | Material active face | PBT |
| Ambient temperature | -25...+70 °C | | |

Types and data – selection table

| Type | Output | Electrical connection | Material cable | w | d |
|----------------------|--------|-----------------------|----------------|------|------|
| BC20-Q20-RP4X2-V1131 | , PNP | connector, M8 x 1 | - | w003 | d331 |
| BC20-Q20-RP4X2-H1143 | , PNP | connector, M12 x 1 | - | w003 | d329 |
| BC20-Q20-RP4X2 | , PNP | cable | PUR 2 m | w006 | d330 |
| BC20-Q20-AP4X2-H1141 | , PNP | connector, M12 x 1 | - | w001 | d329 |
| BC20-Q20-AP4X2 | , PNP | cable | PUR 2 m | w004 | d330 |
| BC20-Q20-AN4X2-H1141 | , NPN | connector, M12 x 1 | - | w002 | d329 |
| BC20-Q20-AN4X2 | , NPN | cable | PUR 2 m | w005 | d330 |

QF5.5 – 3-wire DC – Fine adjustment via potentiometer



General data

| | | | |
|------------------------------|--------------------|-----------------------------|---------|
| Dimensions | 20.3 x 5.5 x 54 mm | Protection class | IP67 |
| Switching distance | 10 mm, | Material housing | PP |
| Electrical connection | cable | Material active face | PP |
| Operating voltage | 10...30 VDC | Material cable | PUR 2 m |
| Ambient temperature | -25...+70 °C | | |

Types and data – selection table

| Type | Output | w | d |
|------------------|--------|------|------|
| BC10-QF5,5-AP6X2 | , PNP | w004 | d332 |
| BC10-QF5,5-AN6X2 | , NPN | w005 | d332 |

QF5.5 – 3-wire DC – Fixed settings



General data

| | | | |
|------------------------------|--------------------|-----------------------------|---------|
| Dimensions | 20.3 x 5.5 x 54 mm | Protection class | IP67 |
| Output | , PNP | Material housing | PP |
| Electrical connection | cable | Material active face | PP |
| Operating voltage | 10...30 VDC | Material cable | PUR 2 m |
| Ambient temperature | -25...+70 °C | | |


Types and data – selection table

| Type | Switching distance | w | d |
|-----------------------|--------------------|------|------|
| BC5-QF5,5-AP6X2/S250 | 5 mm, | w004 | d333 |
| BC10-QF5,5-AP6X2/S250 | 10 mm, | w004 | d333 |

CP40 – 4-wire DC – Fine adjustment via potentiometer





General data

| | | | |
|----------------------------|--|-----------------------------|------|
| Dimensions | 40 x 40 x 114 mm | Protection class | IP67 |
| Switching distance | 20 mm,  | Material housing | PBT |
| Operating voltage | 10...65 VDC | Material active face | PBT |
| Ambient temperature | -25...+70 °C | | |

Variable orientation of active face in 9 directions


Types and data – selection table

| Type | Output | Electrical connection | w | d |
|-----------------------|---|-----------------------|------|------|
| BC20-CP40-VP4X2-H1141 |  , PNP | connector, M12 x 1 | w008 | d335 |
| BC20-CP40-VP4X2 |  , PNP | terminal chamber | w014 | d334 |
| BC20-CP40-VN4X2 |  , NPN | terminal chamber | w013 | d334 |


CP80 – 4-wire DC – Fine adjustment via potentiometer



General data

| | | | |
|----------------------------|--|-----------------------------|------|
| Dimensions | 80 x 40.5 x 80 mm | Protection class | IP67 |
| Switching distance | 50 mm,  | Material housing | PBT |
| Operating voltage | 10...65 VDC | Material active face | PBT |
| Ambient temperature | -25...+70 °C | | |

Types and data – selection table

| Type | Output | Electrical connection | w | d |
|-----------------------|---|-----------------------|------|------|
| NCS0-CP80-VP4X2-H1141 |  , PNP | connector, M12 x 1 | w008 | d337 |
| NCS0-CP80-VP4X2 |  , PNP | terminal chamber | w014 | d336 |
| NCS0-CP80-VN4X2 |  , NPN | terminal chamber | w013 | d336 |

Cylindrical design - metal

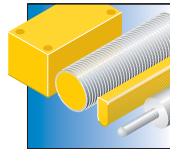


Cylindrically shaped capacitive sensors feature high switching distances and are available in a vast range of types. M12, M18 and M30 chrome-plated threaded barrels are available with connection cable or plug connection. Besides the usual reliability, capacitive sensors feature standard properties such as automatic wetting compensation, excellent EMC and ESD properties and more flexibility with respect to mounting.

Features

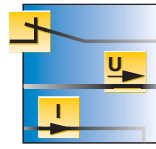
- Excellent reliability
- Automatic wetting compensation
- Excellent EMC properties
- ESD immunity
- Mounting flexibility

Properties



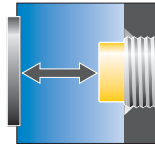
Design

Threaded barrel
M12 x 1 and M30 x 1.5



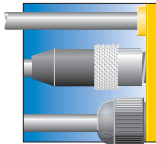
Electrical versions

3/4-wire NO/NC contact
as well as antivalent
PNP/NPN output



Switching distances

From 3 mm flush to
10 mm non-flush on all
metals and non-metals



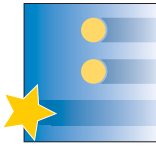
Electrical connections

2 m connection cable
or M12 x 1 plug con-
nection



Materials

Nickel-plated brass or
stainless steel threaded
barrel versions offer
many application pos-
sibilities



Special features

Fine adjustment via
potentiometer

M12 – 3-wire DC – Fine adjustment via potentiometer



General data

| | |
|------------------------------|--------------|
| Dimensions | Ø12 x 60 mm |
| Switching distance | 3 mm, |
| Electrical connection | cable |
| Operating voltage | 10...30 VDC |
| Ambient temperature | -25...+70 °C |

| | |
|-----------------------------|---------|
| Protection class | IP67 |
| Material housing | CuZn-Cr |
| Material active face | ABS |
| Material cable | PVC 2 m |

Types and data – selection table

| Type | Output | w | d |
|--------------|--------|------|------|
| BC3-M12-RP6X | , PNP | w006 | d338 |
| BC3-M12-AP6X | , PNP | w004 | d338 |
| BC3-M12-AN6X | , NPN | w005 | d338 |

M18 – 3-wire DC – Fixed settings



General data

| | |
|------------------------------|--------------------|
| Dimensions | Ø18 x 83 mm |
| Switching distance | 5 mm, |
| Electrical connection | connector, M12 x 1 |
| Operating voltage | 10...65 VDC |

| | |
|-----------------------------|--------------|
| Ambient temperature | -25...+70 °C |
| Protection class | IP67 |
| Material housing | CuZn-Cr |
| Material active face | PBT |

Types and data – selection table

| Type | Output | w | d |
|-------------------------|--------|------|------|
| BC5-M18-RP4X-H1141/S250 | , PNP | w015 | d339 |
| BC5-M18-AP4X-H1141/S250 | , PNP | w001 | d339 |
| BC5-M18-AN4X-H1141/S250 | , NPN | w002 | d339 |

M18 – 3-wire DC – Fine adjustment via potentiometer



General data

| | |
|------------------------------|--------------|
| Dimensions | Ø18 x 74 mm |
| Switching distance | 5 mm, |
| Electrical connection | cable |
| Operating voltage | 10...65 VDC |
| Ambient temperature | -25...+70 °C |

| | |
|-----------------------------|---------|
| Protection class | IP67 |
| Material housing | CuZn-Cr |
| Material active face | PBT |
| Material cable | PVC 2 m |

Types and data – selection table

| Type | Output | w | d |
|--------------|--------|------|------|
| BC5-M18-RP4X | , PNP | w006 | d340 |
| BC5-M18-AP4X | , PNP | w004 | d340 |
| BC5-M18-AN4X | , NPN | w005 | d340 |

M30 – 3-wire DC – Fine adjustment via potentiometer



General data

| | |
|----------------------------|--------------|
| Switching distance | 10 mm, |
| Operating voltage | 10...65 VDC |
| Ambient temperature | -25...+70 °C |

| | |
|-----------------------------|---------|
| Protection class | IP67 |
| Material housing | CuZn-Cr |
| Material active face | PA |

Types and data – selection table

| Type | Dimensions | Output | Electrical connection | Material cable | w | d |
|----------------------|---------------|--------|-----------------------|----------------|------|------|
| BC10-M30K-VP4X-H1141 | Ø30 x 60 mm | , PNP | connector, M12 x 1 | - | w008 | d341 |
| BC10-M30K-VP4X | Ø30 x 62.5 mm | , PNP | cable | PVC 2 m | w007 | d342 |
| BC10-M30K-VN4X-H1141 | Ø30 x 60 mm | , NPN | connector, M12 x 1 | - | w010 | d341 |
| BC10-M30K-VN4X | Ø30 x 62.5 mm | , NPN | cable | PVC 2 m | w018 | d342 |

Cylindrical design - plastic



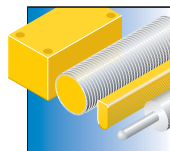
Cylindrically shaped capacitive sensors feature high switching distances and are available in a vast range of types. The standard types come in plastic housings and sizes from Ø 12 mm to Ø 40 mm, with connection cable, plug connection or terminal chamber.

Besides the usual reliability, capacitive sensors feature standard properties such as automatic wetting compensation, excellent EMC and ESD properties and more flexibility with respect to mounting.

Features

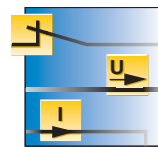
- Excellent reliability
- Automatic wetting compensation
- Excellent EMC properties
- ESD immunity
- Mounting flexibility

Properties



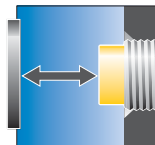
Design

Cylindrical versions
M12 x 1, M18 x 1,
M30 x 1.5, Ø 34 mm
and Ø 40 mm



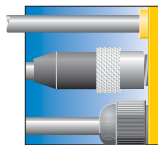
Electrical versions

3/4-wire NO/NC contact
as well as antivalent
PNP/NPN output



Switching distances

From 3 mm to 20 mm
flush mountable on all
metals and non-metals



Electrical connections

2 m connection cable
or M12 x 1 plug con-
nection



Materials

Plastic housings PA, PBT,
PVDF and ABS



Special features

Fine adjustment via
potentiometer,
protection class IP67

S12 – 3-wire DC – Fine adjustment via potentiometer



General data

| | |
|------------------------------|--------------|
| Dimensions | Ø12 x 63 mm |
| Switching distance | 3 mm, |
| Electrical connection | cable |
| Operating voltage | 10...30 VDC |
| Ambient temperature | -25...+70 °C |

| | |
|-----------------------------|---------|
| Protection class | IP67 |
| Material housing | PA |
| Material active face | PA |
| Material cable | PVC 2 m |

Types and data – selection table

| Type | Output | w | d |
|--------------|--------|------|------|
| BC3-S12-RP6X | , PNP | w006 | d343 |
| BC3-S12-AP6X | , PNP | w004 | d343 |
| BC3-S12-AN6X | , NPN | w005 | d343 |

S18 – 3-wire DC – Fixed settings



General data

| | |
|------------------------------|--------------------|
| Dimensions | Ø18 x 83 mm |
| Switching distance | 5 mm, |
| Electrical connection | connector, M12 x 1 |
| Operating voltage | 10...65 VDC |

| | |
|-----------------------------|--------------|
| Ambient temperature | -25...+70 °C |
| Protection class | IP67 |
| Material housing | PA |
| Material active face | PA |

Types and data – selection table

| Type | Output | w | d |
|-------------------------|--------|------|------|
| BC5-S18-RP4X-H1141/S250 | , PNP | w015 | d344 |
| BC5-S18-AP4X-H1141/S250 | , PNP | w001 | d344 |
| BC5-S18-AN4X-H1141/S250 | , NPN | w002 | d344 |

S18 – 3-wire DC – Fine adjustment via potentiometer



General data

| | |
|---------------------|--------------|
| Switching distance | 5 mm, |
| Operating voltage | 10...65 VDC |
| Ambient temperature | -25...+70 °C |

| | |
|----------------------|------|
| Protection class | IP67 |
| Material housing | PA |
| Material active face | PA |

Types and data – selection table

| Type | Dimensions | Output | Electrical connection | Material cable | w | d |
|-----------------------|-------------|--------|-------------------------------|----------------|------|------|
| BC5-S18-RP4X-0,15-RS4 | Ø18 x 70 mm | , PNP | cable with connector, M12 x 1 | PVC 0.15 m | w015 | d346 |
| BC5-S18-RP4X | Ø18 x 74 mm | , PNP | cable | PVC 2 m | w006 | d345 |
| BC5-S18-AP4X | Ø18 x 74 mm | , PNP | cable | PVC 2 m | w004 | d345 |
| BC5-S18-AN4X | Ø18 x 74 mm | , NPN | cable | PVC 2 m | w005 | d345 |

S30 – 4-wire DC – Fine adjustment via potentiometer



General data

| | |
|---------------------|--------------|
| Switching distance | 10 mm, |
| Operating voltage | 10...65 VDC |
| Ambient temperature | -25...+70 °C |

| | |
|----------------------|------|
| Protection class | IP67 |
| Material housing | PA |
| Material active face | PA |

Types and data – selection table

| Type | Dimensions | Output | Electrical connection | Material cable | w | d |
|---------------------|---------------|--------|-----------------------|----------------|------|------|
| BC10-S30-VP4X-H1141 | Ø30 x 71 mm | , PNP | connector, M12 x 1 | - | w008 | d347 |
| BC10-S30-VP4X | Ø30 x 62.5 mm | , PNP | cable | PVC 2 m | w007 | d348 |
| BC10-S30-VN4X-H1141 | Ø30 x 71 mm | , NPN | connector, M12 x 1 | - | w010 | d347 |
| BC10-S30-VN4X | Ø30 x 62.5 mm | , NPN | cable | PVC 2 m | w018 | d348 |

K34 – 3-wire DC – Fine adjustment via potentiometer



| | | | |
|------------------------------|--------------------|-----------------------------|--------------|
| General data | | Ambient temperature | -25...+70 °C |
| Dimensions | Ø34 x 74.5 mm | Protection class | IP67 |
| Switching distance | 15 mm, | Material housing | PBT |
| Electrical connection | connector, M12 x 1 | Material active face | PBT |
| Operating voltage | 10...65 VDC | | |

Types and data – selection table

| Type | Output | w | d |
|---------------------|--------|------|------|
| BC15-K34-AP4X-H1141 | , PNP | w001 | d349 |
| BC15-K34-AN4X-H1141 | , NPN | w002 | d349 |

K34 – 4-wire DC – Fine adjustment via potentiometer



| | | | |
|------------------------------|--------------|-----------------------------|---------|
| General data | | Protection class | IP67 |
| Dimensions | Ø34 x 80 mm | Material housing | PBT |
| Switching distance | 15 mm, | Material active face | PBT |
| Electrical connection | cable | Material cable | PVC 2 m |
| Operating voltage | 10...65 VDC | | |
| Ambient temperature | -25...+70 °C | | |

Types and data – selection table

| Type | Output | w | d |
|---------------|--------|------|------|
| BC15-K34-VP4X | , PNP | w007 | d350 |
| BC15-K34-VN4X | , NPN | w018 | d350 |

KT34 – 4-wire DC – Fine adjustment via potentiometer



General data

| | |
|------------------------------|--------------|
| Dimensions | Ø34 x 80 mm |
| Switching distance | 20 mm, |
| Electrical connection | cable |
| Operating voltage | 10...65 VDC |
| Ambient temperature | -25...+70 °C |

| | |
|-----------------------------|------|
| Protection class | IP67 |
| Material housing | PVDF |
| Material active face | PVDF |
| Material cable | 2 m |

Types and data – selection table

| Type | Output | w | d |
|-----------------|--------|------|------|
| NC20-KT34-VP4X2 | , PNP | w007 | d351 |
| NC20-KT34-VN4X2 | , NPN | w018 | d351 |

K40SR – 4-wire DC – Fine adjustment via potentiometer



General data

| | |
|----------------------------|--------------|
| Dimensions | Ø40 x 90 mm |
| Switching distance | 20 mm, |
| Operating voltage | 10...65 VDC |
| Ambient temperature | -25...+70 °C |

| | |
|-----------------------------|------|
| Protection class | IP67 |
| Material housing | ABS |
| Material active face | ABS |

Types and data – selection table

| Type | Output | Electrical connection | w | d |
|------------------------|--------|-----------------------|------|------|
| BC20-K40SR-VP4X2 | , PNP | terminal chamber | w014 | d352 |
| BC20-K40SR-VN4X2-H1141 | , NPN | connector, M12 x 1 | w010 | d353 |
| BC20-K40SR-VN4X2 | , NPN | terminal chamber | w013 | d352 |

High-temperature resistant sensors

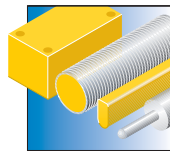


A growing number of applications require sensors resisting temperatures beyond the standard range of -25 ... +70 °C. For this purpose TURCK has developed capacitive sensors which meet exactly these requirements. The sensors feature temperature resistant components as well as cleverly designed passive cooling concepts, approved in demanding laboratory tests. These sensors resist temperatures from -25 °C to +100 °C.

Features

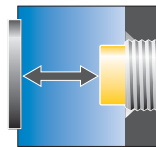
- For temperatures up to +100 °C
- Automatic wetting compensation
- Excellent EMC properties
- ESD immunity

Properties



Design

Threaded barrel
M12 x 1 and M18 x 1



Switching distances

3 mm and 5 mm flush
mounting



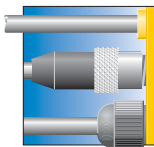
Materials

Rugged, temperature
resistant housing
materials, application
optimized cable quali-
ties



Electrical versions

3-wire DC and NAMUR



Electrical connections

2 m cable



Special features

Fixed settings via po-
tentiometer,
-25 °C to +100 °C

+100°C – S12 – 3-wire DC



| | |
|------------------------------|-------------------|
| Type | BC3-S12-AP6X/S100 |
| Dimensions | Ø12 x 63 mm |
| Switching distance | 3 mm, |
| Output | —, PNP |
| Electrical connection | cable |
| Operating voltage | 10...30 VDC |
| Ambient temperature | -25...+100 °C |

| | |
|-----------------------------|---------|
| Protection class | IP67 |
| Material housing | PA |
| Material active face | PA |
| Material cable | PUR 2 m |
| Wiring diagram | w004 |
| Dimension drawing | d343 |

+100°C – S18 – NAMUR



| | |
|------------------------------|------------------|
| Type | BC5-S18-Y1X/S100 |
| Dimensions | Ø18 x 74 mm |
| Switching distance | 5 mm, |
| Output | NAMUR |
| Electrical connection | cable |
| Operating voltage | 8.2 VDC |
| Ambient temperature | -25...+100 °C |

| | |
|-----------------------------|--------------|
| Protection class | IP67 |
| Material housing | PA |
| Material active face | PA |
| Material cable | silicone 2 m |
| Wiring diagram | w019 |
| Dimension drawing | d345 |

+100°C – S185 – 3-wire DC



| | |
|------------------------------|---------------|
| General data | |
| Dimensions | Ø18 x 74.5 mm |
| Switching distance | 5 mm, |
| Electrical connection | cable |
| Operating voltage | 10...65 VDC |
| Ambient temperature | -25...+100 °C |

| | |
|-----------------------------|---------|
| Protection class | IP67 |
| Material housing | PVDF |
| Material active face | PVDF |
| Material cable | PVC 2 m |

Types and data – selection table

| Type | Output | w | d |
|--------------------|--------|------|------|
| BC5-S185-AP4X/S100 | —, PNP | w004 | d354 |
| BC5-S185-AN4X/S100 | —, NPN | w005 | d354 |

Wiring diagrams on page 832 ff

Dimension drawings on page 842 ff

Accessories on page 736 ff

AC-2-wire sensors

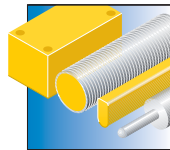


AC 2-wire sensors are easily installed, they replace mechanical switches in existing systems and simplify wiring. The established wiring, normally two wires, can still be used. Cutting down on the amount of wiring saves time.

Features

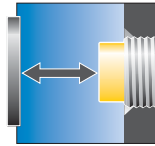
- Automatic wetting compensation
- Excellent EMC properties
- Large switching distances

Properties



Design

Cylindrical \varnothing 18, 30 and 34 mm, rectangular 40 x 40 and 80 x 80 mm



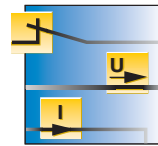
Switching distances

5 mm flush, 50 mm non-flush



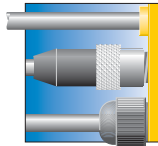
Materials

Chrome-plated brass and rugged plastic



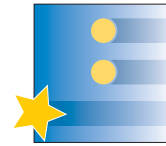
Electrical versions

2-wire AC, NO/NC or programmable version



Electrical connections

2 m connection cable, terminal chamber or 1/2-20 UNF plug connection




Special features

Fine adjustment via potentiometer, protection class IP67

M18 – 2-wire AC – Fixed settings





General data

| | |
|------------------------------|---|
| Dimensions | Ø18 x 82 mm |
| Switching distance | 5 mm,  |
| Electrical connection | connector, 1/2" |
| Operating voltage | 20...250 VAC |

| | |
|-----------------------------|--------------|
| Ambient temperature | -25...+70 °C |
| Protection class | IP67 |
| Material housing | CuZn-Cr |
| Material active face | PBT |


Types and data – selection table

| Type | Output | w | d |
|-------------------------|--|------|------|
| BC5-M18-RZ3X-B3331/S250 |  , 2-wire | w061 | d183 |
| BC5-M18-AZ3X-B3331/S250 |  , 2-wire | w060 | d183 |

M18 – 2-wire AC – Fine adjustment via potentiometer



General data

| | |
|------------------------------|---|
| Dimensions | Ø18 x 74 mm |
| Switching distance | 5 mm,  |
| Electrical connection | cable |
| Operating voltage | 20...250 VAC |
| Ambient temperature | -25...+70 °C |

| | |
|-----------------------------|---------|
| Protection class | IP67 |
| Material housing | CuZn-Cr |
| Material active face | PBT |
| Material cable | PVC 2 m |


Types and data – selection table

| Type | Output | w | d |
|--------------|--|------|------|
| BC5-M18-RZ3X |  , 2-wire | w062 | d340 |
| BC5-M18-AZ3X |  , 2-wire | w031 | d340 |

S18 – 2-wire AC – Fine adjustment via potentiometer





General data

| | |
|------------------------------|---|
| Dimensions | Ø18 x 74 mm |
| Switching distance | 5 mm,  |
| Electrical connection | cable |
| Operating voltage | 20...250 VAC |
| Ambient temperature | -25...+70 °C |

| | |
|-----------------------------|---------|
| Protection class | IP67 |
| Material housing | PA |
| Material active face | PA |
| Material cable | PVC 2 m |

Types and data – selection table

| Type | Output | w | d |
|--------------|--|------|------|
| BC5-S18-RZ3X |  , 2-wire | w038 | d345 |
| BC5-S18-AZ3X |  , 2-wire | w020 | d345 |

M30 – 2-wire AC – Fine adjustment via potentiometer







General data

| | |
|----------------------------|--|
| Switching distance | 10 mm,  |
| Operating voltage | 20...250 VAC |
| Ambient temperature | -25...+70 °C |

| | |
|-------------------------|---------|
| Protection class | IP67 |
| Material housing | CuZn-Cr |

Types and data – selection table

| Type | Dimensions | Output | Electrical connection | Material active face | Material cable | w | d |
|----------------------|---------------|--|-----------------------|----------------------|----------------|------|------|
| BC10-M30K-RZ3X-B3131 | Ø30 x 71 mm |  , 2-wire | connector, 1/2" | - | - | w061 | d355 |
| BC10-M30K-RZ3X | Ø30 x 62.5 mm |  , 2-wire | cable | PA | PVC 2 m | w062 | d342 |
| BC10-M30K-AZ3X-B3131 | Ø30 x 71 mm |  , 2-wire | connector, 1/2" | - | - | w060 | d355 |
| BC10-M30K-AZ3X | Ø30 x 62.5 mm |  , 2-wire | cable | PA | PVC 2 m | w031 | d342 |

S30 – 2-wire AC – Fine adjustment via potentiometer



General data

| | |
|---------------------|--------------|
| Switching distance | 10 mm, |
| Operating voltage | 20...250 VAC |
| Ambient temperature | -25...+70 °C |

| | |
|----------------------|------|
| Protection class | IP67 |
| Material housing | PA |
| Material active face | PA |

Types and data – selection table

| Type | Dimensions | Output | Electrical connection | Material cable | w | d |
|----------------------|---------------|----------|-----------------------|----------------|------|------|
| BCF10-S30-RZ3X-B3131 | Ø30 x 71 mm | , 2-wire | connector, 1/2" | - | w063 | d356 |
| BCF10-S30-RZ3X | Ø30 x 62.5 mm | , 2-wire | cable | PVC 2 m | w038 | d348 |
| BCF10-S30-AZ3X-B3131 | Ø30 x 71 mm | , 2-wire | connector, 1/2" | - | w025 | d356 |
| BCF10-S30-AZ3X | Ø30 x 62.5 mm | , 2-wire | cable | PVC 2 m | w020 | d348 |
| BC10-S30-RZ3X-B3131 | Ø30 x 71 mm | , 2-wire | connector, 1/2" | - | w063 | d356 |
| BC10-S30-RZ3X | Ø30 x 62.5 mm | , 2-wire | cable | PVC 2 m | w038 | d348 |
| BC10-S30-AZ3X-B3131 | Ø30 x 71 mm | , 2-wire | connector, 1/2" | - | w025 | d356 |
| BC10-S30-AZ3X | Ø30 x 62.5 mm | , 2-wire | cable | PVC 2 m | w020 | d348 |

K34 – 2-wire AC – Fine adjustment via potentiometer



General data

| | |
|-----------------------|--------------|
| Dimensions | Ø34 x 80 mm |
| Switching distance | 15 mm, |
| Electrical connection | cable |
| Operating voltage | 20...250 VAC |
| Ambient temperature | -25...+70 °C |


| | |
|----------------------|---------|
| Protection class | IP67 |
| Material housing | PBT |
| Material active face | PBT |
| Material cable | PVC 2 m |

Types and data – selection table

| Type | Output | w | d |
|----------------|----------|------|------|
| BCF15-K34-RZ3X | , 2-wire | w038 | d350 |
| BCF15-K34-AZ3X | , 2-wire | w020 | d350 |
| BC15-K34-RZ3X | , 2-wire | w038 | d350 |
| BC15-K34-AZ3X | , 2-wire | w020 | d350 |


P30SR – 2-wire AC – Fine adjustment via potentiometer



| | | | |
|------------------------------|--|-----------------------------|--------------|
| Type | BC10-P30SR-FZ3X2 | Ambient temperature | -25...+70 °C |
| Dimensions | Ø30 x 115 mm | Protection class | IP67 |
| Switching distance | 10 mm,  | Material housing | ABS |
| Output | connection programmable | Material active face | ABS |
| Electrical connection | terminal chamber | Wiring diagram | w029 |
| Operating voltage | 20...250 VAC | Dimension drawing | d357 |


K34SR – 2-wire AC – Fine adjustment via potentiometer



| | | | |
|------------------------------|--|-----------------------------|--------------|
| Type | BC15-K34SR-FZ3X2 | Ambient temperature | -25...+70 °C |
| Dimensions | Ø34 x 106 mm | Protection class | IP67 |
| Switching distance | 15 mm,  | Material housing | PBT |
| Output | connection programmable | Material active face | PBT |
| Electrical connection | terminal chamber | Wiring diagram | w029 |
| Operating voltage | 20...250 VAC | Dimension drawing | d358 |

CP40 – 2-wire AC – Fine adjustment via potentiometer




| | | | |
|------------------------------|--|-----------------------------|--------------|
| Type | BC20-CP40-FZ3X2 | Ambient temperature | -25...+70 °C |
| Dimensions | 40 x 40 x 114 mm | Protection class | IP67 |
| Switching distance | 20 mm,  | Material housing | PBT |
| Output | connection programmable | Material active face | PBT |
| Electrical connection | terminal chamber | Wiring diagram | w029 |
| Operating voltage | 20...250 VAC | Dimension drawing | d334 |

Variable orientation of active face in 9 directions

CP80 – 2-wire AC – Fine adjustment via potentiometer



| | | | |
|------------------------------|--|-----------------------------|--------------|
| Type | NC50-CP80-FZ3X2 | Ambient temperature | -25...+70 °C |
| Dimensions | 80 x 40.5 x 80 mm | Protection class | IP67 |
| Switching distance | 50 mm,  | Material housing | PBT |
| Output | connection programmable | Material active face | PBT |
| Electrical connection | terminal chamber | Wiring diagram | w029 |
| Operating voltage | 20...250 VAC | Dimension drawing | d336 |

NAMUR sensors

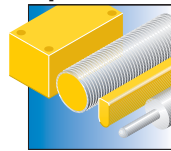


NAMUR sensors are approved for the zones 0 and 1. They are polarized 2-wire devices, changing their internal resistance in dependence on the attenuation (continuous linear/current characteristics). They can be connected to external switching amplifiers which convert current variations into binary output signals. The advantage: With an approved switching amplifier, they can be applied in Ex-areas as well as monitor wire-break and short-circuit continuously.

Features

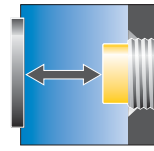
- Integrated sensor monitoring
- Automatic wetting compensation
- Excellent EMC properties
- Ex-area approved

Properties



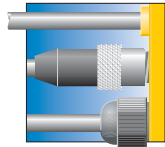
Design

Threaded barrel
M18 x 1, M30 x 1.5 and
rectangular QF5.5



Switching distances

5 mm and 10 mm, flush
mountable



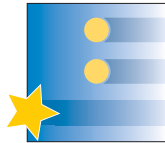
Electrical connections

2 m cable PVC and
silicone



Materials

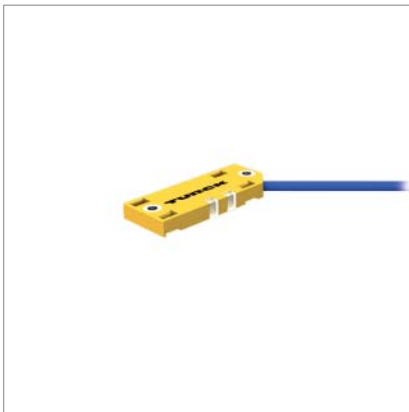
Polypropylene and
polyamide housings



Special features

Fixed settings, ATEX
and SIL approvals,
extended temperature
range

QF5.5 – NAMUR – Fixed settings



| | | | |
|------------------------------|--------------------|-----------------------------|---------|
| Type | BC5-QF5,5-Y1X/S250 | Protection class | IP67 |
| Dimensions | 20.3 x 5.5 x 54 mm | Material housing | PP |
| Switching distance | 5 mm, | Material active face | PP |
| Output | NAMUR | Material cable | PVC 2 m |
| Electrical connection | cable | Wiring diagram | w019 |
| Operating voltage | nom. 8.2 VDC | Dimension drawing | d359 |
| Ambient temperature | -25...+70 °C | | |

S18 – NAMUR – Fine adjustment via potentiometer



| | | | |
|------------------------------|-------------|-----------------------------|--------------|
| General data | | Operating voltage | nom. 8.2 VDC |
| Dimensions | Ø18 x 74 mm | Protection class | IP67 |
| Switching distance | 5 mm, | Material housing | PA |
| Output | NAMUR | Material active face | PA |
| Electrical connection | cable | | |

Types and data – selection table

| Type | Ambient temperature | Material cable | | |
|------------------|---------------------|----------------|------|------|
| BC5-S18-Y1X/S100 | -25...+100 °C | silicone 2 m | w019 | d345 |
| BC5-S18-Y1X | -25...+70 °C | PVC 2 m | w019 | d345 |

S30 – NAMUR – Fine adjustment via potentiometer



| | | | |
|------------------------------|---------------|-----------------------------|---------|
| Type | BC10-S30-Y1X | Protection class | IP67 |
| Dimensions | Ø30 x 62.5 mm | Material housing | PA |
| Switching distance | 10 mm, | Material active face | PA |
| Output | NAMUR | Material cable | PVC 2 m |
| Electrical connection | cable | Wiring diagram | w019 |
| Operating voltage | nom. 8.2 VDC | Dimension drawing | d348 |
| Ambient temperature | -25...+70 °C | | |

Wiring diagrams on page 832 ff

Dimension drawings on page 842 ff

Accessories on page 736 ff

BCF sensors with close-up range suppression

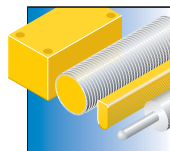


Thanks to the new switching technology in combination with optimized electrode and compensation features, the BCFs work reliably under difficult application conditions. Even conductive coatings are not a problem at all. To avoid HF cross-talk and other interferences, the potentiometer is located in a less sensitive area of the circuit, this applies to all capacitive TURCK sensors. Even applications that are subject to strong interferences do not require additional protective measures. All sensors of the BCF series are immune to radiated and conducted HF interference, burst as well as electrostatic discharge (ESD).

Features

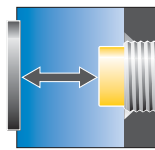
- Automatic wetting compensation
- Increased EMI and RFI shielding
- High protection class
- Novel close-up range suppression

Properties



Design

Cylinders $\varnothing 18$, $\varnothing 30$ and $\varnothing 34$ mm and rectangular Q20L60



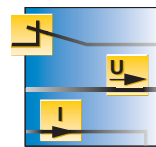
Switching distances

5 ... 15 mm, flush mounting



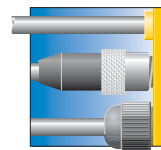
Materials

PA or PBT housings



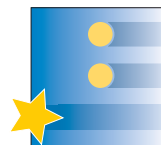
Electrical versions

2, 3 and 4-wire, PNP or NPN, NO or NC



Electrical connections

2 m cable PVC/PUR, M12 x 1 plug connection



Special features

Close-up range suppression
EMC shielded

BCF – S18 – 3-wire DC – Fixed settings



General data

Dimensions Ø18 x 83 mm
Switching distance 5 mm,
Electrical connection connector, M12 x 1
Operating voltage 10...65 VDC

Ambient temperature -25...+70 °C
Protection class IP67
Material housing PA
Material active face PA

Types and data – selection table

| Type | Output | w | d |
|--------------------------|--------|------|------|
| BCF5-S18-AP4X-H1141/S250 | , PNP | w001 | d344 |
| BCF5-S18-AN4X-H1141/S250 | , NPN | w002 | d344 |

BCF – S18 – 3-wire DC – Fine adjustment via potentiometer



General data

Dimensions Ø18 x 74 mm
Switching distance 5 mm,
Electrical connection cable
Operating voltage 10...65 VDC

Ambient temperature -25...+70 °C
Protection class IP67
Material housing PA
Material active face PA

Types and data – selection table

| Type | Output | Material cable | w | d |
|-------------------|--------|----------------|------|------|
| BCF5-S18-RP4X/S90 | , PNP | PUR 2 m | w006 | d345 |
| BCF5-S18-RN4X | , NPN | PVC 2 m | w064 | d345 |
| BCF5-S18-AP4X/S90 | , PNP | PUR 2 m | w004 | d345 |
| BCF5-S18-AP4X | , PNP | PVC 2 m | w004 | d345 |
| BCF5-S18-AN4X | , NPN | PVC 2 m | w005 | d345 |

BCF – S30 – 4-wire DC – Fine adjustment via potentiometer



General data

Switching distance 10 mm,

Operating voltage 10...65 VDC

Ambient temperature -25...+70 °C

Protection class IP67

Material housing PA

Material active face PA

Types and data – selection table

| Type | Dimensions | Output | Electrical connection | Material cable | w | d |
|----------------------|---------------|--------|-----------------------|----------------|------|------|
| BCF10-S30-VP4X-H1141 | Ø30 x 71 mm | , PNP | connector, M12 x 1 | - | w008 | d347 |
| BCF10-S30-VP4X | Ø30 x 62.5 mm | , PNP | cable | PVC 2 m | w007 | d348 |
| BCF10-S30-VN4X-H1141 | Ø30 x 71 mm | , NPN | connector, M12 x 1 | - | w010 | d347 |
| BCF10-S30-VN4X | Ø30 x 62.5 mm | , NPN | cable | PVC 2 m | w018 | d348 |

BCF – K34 – 2-wire AC – Fine adjustment via potentiometer



General data

Dimensions Ø34 x 80 mm

Switching distance 15 mm,

Electrical connection cable

Operating voltage 20...250 VAC

Ambient temperature -25...+70 °C

Protection class IP67

Material housing PBT

Material active face PBT

Material cable PVC 2 m



Types and data – selection table

| Type | Output | w | d |
|----------------|----------|------|------|
| BCF15-K34-RZ3X | , 2-wire | w038 | d350 |
| BCF15-K34-AZ3X | , 2-wire | w020 | d350 |

BCF – Q20L60 – 3-wire DC – Fine adjustment via potentiometer





General data

Dimensions 30 x 20 x 60 mm
Switching distance 10 mm, 
Output , PNP
Operating voltage 10...65 VDC

Ambient temperature -25...+70 °C
Protection class IP67
Material housing PC
Material active face PC

Types and data – selection table

| Type | Electrical connection | Material cable |  |  |
|-------------------------|-----------------------|----------------|---|---|
| BCF10-Q20L60-AP4X-H1141 | connector, M12 x 1 | - | w001 | d361 |
| BCF10-Q20L60-AP4X | cable | PVC 2 m | w004 | d360 |

BCC sensors for level control

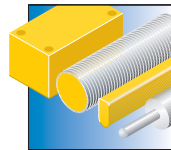


The BCC sensors blank out all interferences during the monitoring process and feature excellent EMC and ESD properties. A laterally mounted shield and an integrated processing unit inhibit predamping when mounted in metal flanges. The full switching distance is thus available.

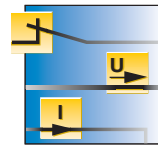
Features

- Automatic wetting compensation
- Excellent EMC properties
- High ESD immunity
- Detection of smallest pellets

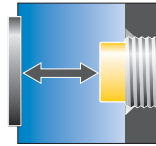
Properties



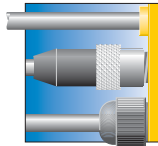
Design
Threaded barrel,
M30 x 1.5



Electrical versions
3/4-wire NO/NC, PNP as well as antivalent PNP/NPN output



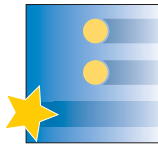
Switching distances
10 mm, flush mounting



Electrical connections
2 m cable, M12 x 1 plug connection



Materials
Polyamide housing



Special features
ESD immunity,
lateral predamping protection

BCF – S30 – 3-wire DC – Fine adjustment via potentiometer










General data

| | |
|---------------------|--|
| Switching distance | 10 mm,  |
| Operating voltage | 10...65 VDC |
| Ambient temperature | -25...+70 °C |

| | |
|----------------------|------|
| Protection class | IP67 |
| Material housing | PA |
| Material active face | PA |

Types and data – selection table

| Type | Dimensions | Output | Electrical connection | Material cable |  |  |
|----------------------|---------------|--|-----------------------|----------------|---|---|
| BCC10-S30-VP4X-H1141 | Ø30 x 71 mm |  , PNP | connector, M12 x 1 | - | w008 | d347 |
| BCC10-S30-RP4X-H1143 | Ø30 x 71 mm |  , PNP | connector, M12 x 1 | - | w003 | d347 |
| BCC10-S30-RP4X | Ø30 x 62.5 mm |  , PNP | cable | PVC 2 m | w006 | d348 |
| BCC10-S30-AP4X-H1141 | Ø30 x 71 mm |  , PNP | connector, M12 x 1 | - | w001 | d347 |
| BCC10-S30-AP4X | Ø30 x 62.5 mm |  , PNP | cable | PVC 2 m | w004 | d348 |

Chemical-resistant sensors

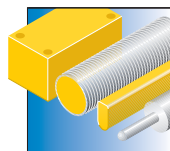


The capacitive sensors (PVDF) are the ideal solution for any application of the pharmaceutical, chemical or food industry. The broad range of functional features of TURCK sensors help to optimize all kinds of applications, for instance, in dairies, breweries, the manufacture of bakery products and frozen foods, or packaging and filling procedures. PVDF materials belong to the group of fluoride plastics. They are extremely resistant due to the high fluorine content. They also feature a high tracking resistance under constant load, good cold properties and excellent temperature resistance.

Features

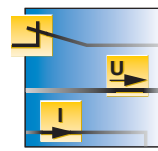
- Excellent chemical resistance
- Automatic wetting compensation
- Excellent EMC properties
- Large switching distances

Properties



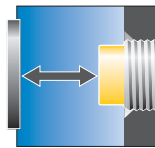
Design

Cylinders Ø 18, Ø 30 mm



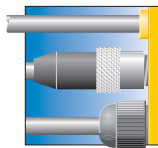
Electrical versions

3-wire NO contact or antivalent PNP/NPN switching, NAMUR



Switching distances

10 mm, flush mounting



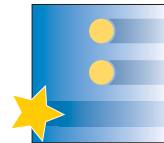
Electrical connections

2 m cable PVC or PUR



Materials

Threaded barrel, plastic PVDF





Special features

Chemical resistant


S185 – 3-wire DC – Fine adjustment via potentiometer






| | | | |
|------------------------------|---|-----------------------------|---------|
| Type | BC5-S185-AP4X | Protection class | IP67 |
| Dimensions | Ø18 x 74.5 mm | Material housing | PVDF |
| Switching distance | 5 mm,  | Material active face | PVDF |
| Output |  , PNP | Material cable | PVC 2 m |
| Electrical connection | cable | Wiring diagram | w004 |
| Operating voltage | 10...65 VDC | Dimension drawing | d354 |
| Ambient temperature | -25...+70 °C | | |

PT30 – 3-wire DC – Fine adjustment via potentiometer



| | | | |
|------------------------------|--|-----------------------------|---------|
| General data | | Protection class | IP67 |
| Dimensions | Ø30 x 80 mm | Material housing | PVDF |
| Switching distance | 10 mm,  | Material active face | PVDF |
| Electrical connection | cable | Material cable | PVC 2 m |
| Ambient temperature | -25...+70 °C | | |

Types and data – selection table

| Type | Output | Operating voltage |  |  |
|-----------------|---|-------------------|---|---|
| BC10-PT30-Y0X | NAMUR | nom. 8.2 VDC | w019 | d362 |
| BC10-PT30-VP4X2 |  , PNP | 10...65 VDC | w007 | d362 |
| BC10-PT30-VN4X2 |  , NPN | 10...65 VDC | w018 | d362 |

At a glance

Magnetic field sensors



Magnetic field sensors for pneumatic cylinders

Magnetic field sensors are activated by magnetic fields and are especially suited for the detection of pistons in pneumatic cylinders. Based on the fact that magnetic fields can permeate non-magnetizable metals, sensors of this type detect a permanent magnet mounted on a piston through the aluminium wall of a cylinder.

Magnetic-inductive sensors from TURCK operate on a patented function principle. The sensing range is adjusted to a core width to rule out multiple switchpoints. Permanent magnets of different field strengths are thus reliably detected in all common cylinder types. The sensors operate wear-free, are rugged and short-circuit protected and feature protection class IP67.

The product range offers many solutions for standard applications, welding facilities as well as Ex-areas. TURCK also offers magnetic field sensors for analog detection tasks. They are easy to operate and even fulfill higher requirements equally reliable.

To monitor the piston position on all standard pneumatic cylinders, sensors from only one family are required, namely BIM-UNT and BIM-UNR. NAMUR sensors for explosion hazardous areas are also available.

BIM-UNT and BIM-UNR can be mounted directly on T- and C-groove cylinders. Matching accessories are available for round, tie-rod and dovetail cylinders, making the use of special versions with manual fine adjustment or external switchpoint setting redundant.

The family of universal magnetic field sensors for pneumatic cylinders is completed by the WIM45-UNT with analog current and voltage output. Already existing solutions with indirect analog detection can be replaced easily by this new type.

Our strengths - Your advantages



Universal magnetic field sensors

The piston position is monitored very comfortably on all standard pneumatic cylinders with the universal magnetic field sensors. But what's more, the new magnetic field sensors by TURCK not only support efficient standardization but also provide enormous potential in

terms of optimization, from construction over purchase and production up to system support for operators and service personnel. Use the unique performance spectrum of these sensors for effective cost reduction!



High system availability

The universally applicable magnetic field sensors operate extremely reliable, even in rough production environments. This is guaranteed through excellent EMC immunity, protection class IP67 as well as the especially safe installation method of the sensors. We placed great emphasis

on practical functionality of the housings and solid mounting accessories. Magnetic field sensors thus withstand the rough ambient conditions of machine building without any problems. Use these benefits to optimize your production processes.

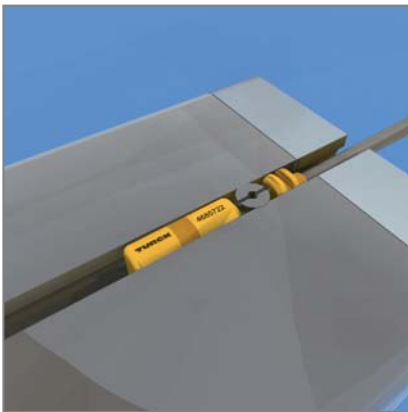


Maximum freedom

Numerous connection possibilities, simple mounting and flexible accessories guarantee maximum freedom in planning with minimal mounting effort. From single switchpoint monitoring, over twin-sets, analog position detection up

to combined binary/analog monitoring: Profit from the extensive standard product range of TURCK magnetic field sensors providing more flexibility for your application.

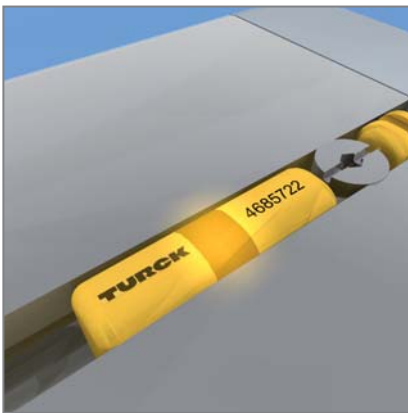
advantages



Safe installation

A pre-fixation lip enables one-handed mounting in the groove. Once inserted in the groove, the sensor is moved to its final position. Screwed tight with a wing screw near the cable exit prevents an uplift of the sensor when pulling the

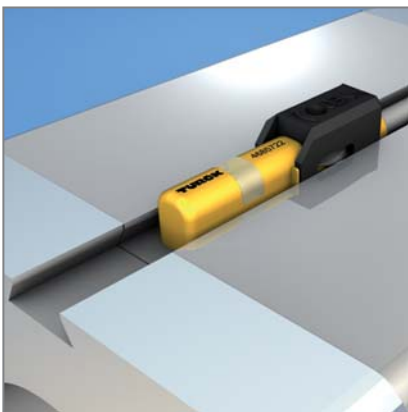
cable. The screw is made of tool steel alloy and thus extremely stable. For vibration-resistant mounting it is simply enough to tighten the screw with a quarter revolution, using a standard screw driver or a 1.5 mm Allen key.



Compact design

With a total length of only 28 (UNT) resp. 18 mm (UNR) the standard sensors are the most compact devices on the market. The active face is located directly at the sensor end. This enables the piston position to be detected up to the end of compact short-stroke cylinders.

Thanks to the bright and all-round visible LED, the switching state is perfectly visible from any perspective and proves helpful when the sensors are aligned and mounted. The best mounting position is thus obtained.



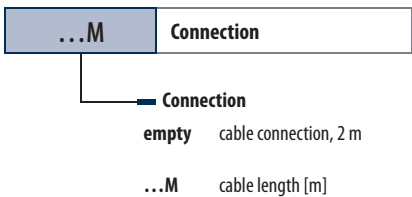
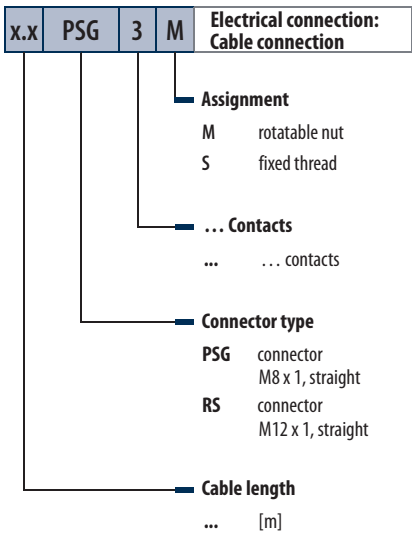
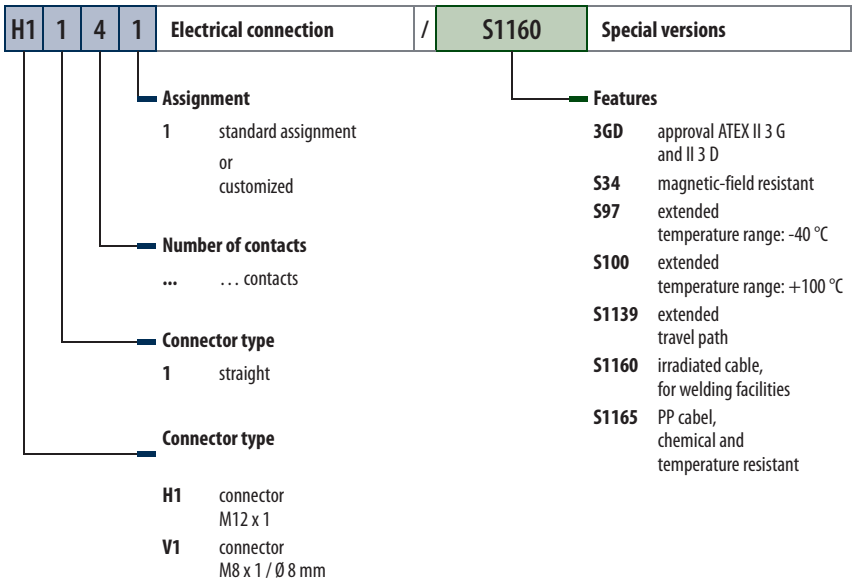
Optional accessories

An extensive range of accessories round off the performance spectrum of the new, universally applicable magnetic field sensors. We offer mounting aids for all standard cylinders, adjustment and fixation tools, as well as the fixation clips for save cable routing. Due to a novel MR sensor

element all magnets in standard pneumatic cylinders can be detected safely and without multiple switchpoints. Thus exact position detection is possible, allowing you to benefit from the high level of flexibility.

Type code

| BIM | Functional principle | UNT | Housing | A | P | 6 | X | Electrical version |
|---|----------------------|---|---------|---|--|---|---|--------------------|
| Functional principle BIM magnetic-inductive/ magnetostrictive WiM45 analog position detection magnetically actuated, 45 mm measuring range | | Housing IKT for tie-rod and profile cylinders mounted with fixing clamp, active face centered NST for groove cylinders, mounted with fixing clamp, incl. accessories adaptable to dovetail and tie-rod cylinders active face centered UNR for C-groove cylinders without accessories, adaptable to other cylinder types with accessories UNT for T-groove cylinders without accessories, adaptable to other cylinder types with accessories UNTL long size, with analog output, for T-groove cylin- ders without accessories, adaptable to other cylinder types with accessories | | | Indication X 1 x LED X... number of LEDs or multicolor LED Voltage range 6 10...30 VDC, ☉ Output mode N NPN P PNP Output function A working current NO LIU analog output (voltage and current), $U_b = 15...30$ VDC AY1 digital (NAMUR acc. to EN 60947-5-6) Y1 analog (NAMUR acc. to EN 60947-5-6) | | | |



Designs and variants

Page 287



UNT

rectangular UNT,
5 x 6 x 28 mm

Design

Measuring range

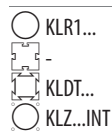
Electrical connection

cable
connector, M12 x 1
connector, fixed
thread, cable with connector,
Ø 8 mm
connector, rotatable
thread, M8 x 1
connector, M8 x 1

Output

2-wire DC NAMUR
3-wire DC PNP
3-wire DC NPN
4-wire DC PNP
4-wire DC NPN

Accessories cylindrical design



Page 291



UNR

rectangular UNR,
2.9 x 4.6 x 18 mm

cable
connector, fixed
thread, cable with connector,
Ø 8 mm
connector, rotatable
thread, M8 x 1
connector, M12 x 1

3-wire DC PNP
3-wire DC NPN



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WIM

rectangular UNTL,
5 x 14.5 x 73 mm

45 mm

cable with connector, M8 x 1
cable with connector, M12 x 1
connector, M12 x 1

4-wire DC Analog output
4-wire DC PNP/analog output



Page 295

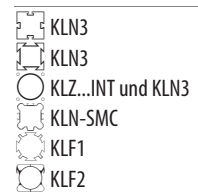


NST

rectangular NST,
17 x 14 x 28 mm

connector, M12 x 1
connector, M8 x 1
cable


2-wire DC NAMUR
3-wire DC PNP
3-wire DC NPN



Standard variants

Page 296



| | IKT |
|---|---|
| Design | rectangular IKT, 14.6 x 17 x 30 mm |
| Electrical connection | connector, M8 x 1 connector, M12 x 1 cable |
| Output | 2-wire DC NAMUR 3-wire DC PNP 3-wire DC NPN |
| Accessories cylindrical design |  KLI... KLI... KLI... |

Magnetic field sensors - UNT series

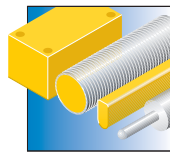


UNTs are mounted quickly and firmly. A pre-fixation lip enables one-handed mounting, even overhead. With the extended range of accessories, the sensors can be mounted on nearly all standard pneumatic cylinders. All standard connection types are available.

Features

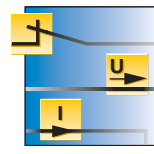
- Compact design
- Quickly and firmly mounted
- Excellent EMC immunity
- For T-groove cylinders without accessories
- Mounting accessories for all standard cylinders.
- Clearly visible LED
- Twin set for switchpoint monitoring

Properties



Design

One type for all standard pneumatic cylinders



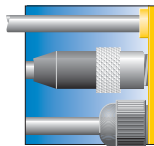
Electrical versions

NAMUR, 2, 3 and 4-wire DC



Measuring ranges

Reliable position detection on all standard pneumatic cylinders



Electrical connections

All standard connection types available, cable, connector or pigtail



Materials

Rugged PP housing for a wide range of applications

UNT – Cable connection



General data

| | | | |
|------------------------------|---------------|-----------------------------|------|
| Dimensions | 5 x 6 x 28 mm | Protection class | IP67 |
| Electrical connection | cable | Material housing | PP |
| Switching frequency | 1 kHz | Material active face | PP |

Types and data – selection table

| Type | Output | Operating voltage | Ambient temperature | Material cable | w | d |
|------------------------------|-----------|-------------------|---------------------|----------------|------|------|
| BIM-UNT-AP6X | —, PNP | 10...30 VDC | -25...+70 °C | PUR 2 m | w059 | d363 |
| BIM-UNT-AP6X 7M | —, PNP | 10...30 VDC | -25...+70 °C | PUR 7 m | w059 | d363 |
| BIM-UNT-AP6X/S1139 | —, PNP | 10...30 VDC | -25...+70 °C | PUR 2 m | w059 | d363 |
| BIM-UNT-AP6X/S1160 | —, PNP | 10...30 VDC | -25...+70 °C | TPU 2 m | w059 | d363 |
| BIM-UNT-AP6X/S100/S1165 | —, PNP | 10...30 VDC | -25...+100 °C | TPE 2 m | w059 | d363 |
| BIM-UNT-AP6X/3GD | —, PNP | 10...30 VDC | -25...+70 °C | PUR 2 m | w059 | d363 |
| BIM-UNT-AN6X | —, NPN | 10...30 VDC | -25...+70 °C | PUR 2 m | w005 | d363 |
| BIM-UNT-AG41X/S1139/S1160 | —, 2-wire | 10...55 VDC | -25...+70 °C | TPU 2 m | w065 | d363 |
| BIM-UNT-AG41X/S1139/S1160 7M | —, 2-wire | 10...55 VDC | -25...+70 °C | TPU 7 m | w065 | d363 |
| BIM-UNT-AY1X/S1139 | NAMUR | nom. 8.2 VDC | -25...+70 °C | PVC 2 m | w019 | d363 |
| BIM-UNT-AY1X/S1139 7M | NAMUR | nom. 8.2 VDC | -25...+70 °C | PVC 7 m | w019 | d363 |







UNT – Pigtail with M8 x 1 connector



General data

| | | | |
|----------------------------|---------------|-----------------------------|-----------|
| Dimensions | 5 x 6 x 28 mm | Material housing | PP |
| Switching frequency | 1 kHz | Material active face | PP |
| Ambient temperature | -25...+70 °C | Material cable | PUR 0.3 m |
| Protection class | IP67 | | |

Types and data – selection table

| Type | Output | Electrical connection | Operating voltage | w | d |
|------------------------------|---|------------------------------------|-------------------|------|------|
| BIM-UNT-AP6X-0,3-PSG3S |  , PNP | connector, fixed thread, Ø 8 mm | 10...30 VDC | w001 | d364 |
| BIM-UNT-AP6X-0,3-PSG3S/S1139 |  , PNP | connector, fixed thread, Ø 8 mm | 10...30 VDC | w001 | d364 |
| BIM-UNT-AN6X-0,3-PSG3S |  , NPN | connector, fixed thread, Ø 8 mm | 10...30 VDC | w002 | d364 |
| BIM-UNT-AP6X-0,3-PSG3M |  , PNP | connector rotatable thread, M8 x 1 | 10...30 VDC | w001 | d365 |
| BIM-UNT-AP6X-0,3-PSG3M/S1139 |  , PNP | connector rotatable thread, M8 x 1 | 10...30 VDC | w001 | d365 |
| BIM-UNT-AN6X-0,3-PSG3M |  , NPN | connector rotatable thread, M8 x 1 | 10...30 VDC | w002 | d365 |





UNT – Pigtail with M12 x 1 connector



General data

| | | | |
|------------------------------|--------------------|-----------------------------|------|
| Dimensions | 5 x 6 x 28 mm | Protection class | IP67 |
| Electrical connection | connector, M12 x 1 | Material housing | PP |
| Switching frequency | 1 kHz | Material active face | PP |
| Ambient temperature | -25...+70 °C | | |

Types and data – selection table

| Type | Output | Operating voltage | Material cable | w | d |
|--------------------------------------|--|-------------------|----------------|------|------|
| BIM-UNT-AP6X-0,3-RS4 |  , PNP | 10...30 VDC | PUR 0.3 m | w001 | d366 |
| BIM-UNT-AP6X-0,3-RS4/S1139 |  , PNP | 10...30 VDC | PUR 0.3 m | w001 | d366 |
| BIM-UNT-AP6X-0,3-RS4/S1160 |  , PNP | 10...30 VDC | TPU 0.3 m | w001 | d366 |
| BIM-UNT-AG41X-0,3-RS4.23/S1139/S1160 |  , 2-wire | 10...55 VDC | TPU 0.3 m | w032 | d366 |
| BIM-UNT-AY1X-0,3-RS4.21/S1139 | NAMUR | nom. 8.2 VDC | PVC 0.3 m | w021 | d366 |

UNT – M12 x 1 or M8 x 1 connector



General data

| | | | |
|----------------------------|----------------|-----------------------------|------|
| Dimensions | 5 x 22 x 30 mm | Protection class | IP67 |
| Operating voltage | 10...30 VDC | Material housing | PP |
| Switching frequency | 1 kHz | Material active face | PP |
| Ambient temperature | -25...+70 °C | | |

Types and data – selection table

| Type | Output | Electrical connection | w | d |
|---------------------|------------|-----------------------|------|------|
| BIM-UNT-AP6X2-V1131 | — / —, PNP | connector, M8 x 1 | w001 | d367 |
| BIM-UNT-AP6X2-H1141 | — / —, PNP | connector, M12 x 1 | w001 | d368 |
| BIM-UNT-AN6X2-V1131 | — / —, NPN | connector, M8 x 1 | w002 | d367 |
| BIM-UNT-AN6X2-H1141 | — / —, NPN | connector, M8 x 1 | w002 | d368 |

UNT – Twin set



General data

| | | | |
|----------------------------|----------------|-----------------------------|-----------|
| Dimensions | 5 x 22 x 30 mm | Protection class | IP67 |
| Operating voltage | 10...30 VDC | Material housing | PP |
| Switching frequency | 1 kHz | Material active face | PP |
| Ambient temperature | -25...+70 °C | Material cable | PUR 0.3 m |

Types and data – selection table

| Type | Output | Electrical connection | w | d |
|------------------------------|------------|-----------------------|------|------|
| BIM-UNT-0,3-UNT-2AP6X3-V1141 | — / —, PNP | connector, M8 x 1 | w066 | d369 |
| BIM-UNT-0,3-UNT-2AP6X3-H1141 | — / —, PNP | connector, M12 x 1 | w066 | d370 |
| BIM-UNT-0,3-UNT-2AN6X3-H1141 | — / —, NPN | connector, M12 x 1 | w066 | d370 |

Magnetic field sensors UNR design

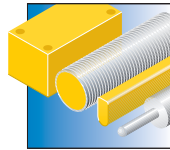


Magnetic field sensors for short-stroke cylinders and parallel grippers are very compactly designed. The all-round visible LED allows the switching state to be observed from any position. All standard connection types are available.

Features

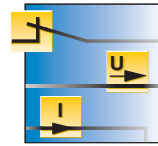
- Compact design
- For C-groove cylinders
- Quickly and firmly mounted
- Excellent EMC properties
- Clearly visible LED

Properties



Design

Small size, length
18 mm



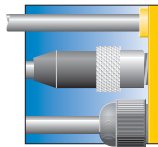
Electrical versions

3-wire DC outputs NPN/
PNP switching



Measuring ranges

Reliable position detec-
tion on all standard
pneumatic cylinders



Electrical connections

All standard connection
types available, cable,
connector or pigtail



Materials

Rugged PP housing for
a wide range of applica-
tions











UNR – 3-wire DC



General data

| | | | |
|----------------------------|-------------------|-----------------------------|------|
| Dimensions | 2.9 x 4.6 x 18 mm | Protection class | IP67 |
| Operating voltage | 10...30 VDC | Material housing | PP |
| Switching frequency | 0.3 kHz | Material active face | PP |
| Ambient temperature | -25...+70 °C | | |

Types and data – selection table

| Type | Output | Electrical connection | Material cable | w | d |
|------------------------|---|-------------------------------------|----------------|------|------|
| BIM-UNR-AP6X-0,3-RS4 |  , PNP | connector, M12 x 1 | PUR 0.3 m | w001 | d374 |
| BIM-UNR-AP6X-0,3-PSG3S |  , PNP | connector, fixed thread, Ø 8 mm | PUR 0.3 m | w001 | d372 |
| BIM-UNR-AP6X-0,3-PSG3M |  , PNP | connector, rotatable thread, M8 x 1 | PUR 0.3 m | w001 | d373 |
| BIM-UNR-AP6X 7M |  , PNP | cable | PUR 7 m | w059 | d371 |
| BIM-UNR-AP6X |  , PNP | cable | PUR 2 m | w059 | d371 |
| BIM-UNR-AN6X-0,3-RS4 |  , NPN | connector, M12 x 1 | PUR 0.3 m | w002 | d374 |
| BIM-UNR-AN6X-0,3-PSG3S |  , NPN | connector, fixed thread, Ø 8 mm | PUR 0.3 m | w002 | d372 |
| BIM-UNR-AN6X-0,3-PSG3M |  , NPN | connector, rotatable thread, M8 x 1 | PUR 0.3 m | w002 | d373 |
| BIM-UNR-AN6X 7M |  , NPN | cable | PUR 7 m | w005 | d371 |
| BIM-UNR-AN6X |  , NPN | cable | PUR 2 m | w005 | d371 |

Magnetic field sensors - analog position gauging systems

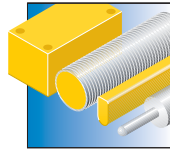


The universal magnetic field sensors for pneumatic cylinders are now also available with analog current and voltage output. The new analog sensor WIM45-UNTL by TURCK provides obvious advantages, especially in situations where additional flexibility and monitoring properties are required.

Features

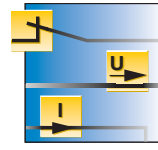
- Compact design
- Quickly and firmly mounted
- Inserted in the groove from the top
- Hardly affected by external magnetic fields
- Status of magnetic field displayed via 2 LEDs
- Measured value memory

Properties



Design

One type for all standard pneumatic cylinders



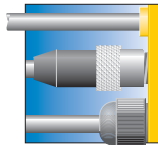
Electrical versions

Analog outputs
4... 20 mA, 0...10 VDC,
3-wire DC switching
output



Measuring ranges

Analog position detection up to 45 mm on all standard pneumatic cylinders



Electrical connections

Standard connection with cable and M8/M12 connector



Materials

Rugged PA housing for a wide range of applications



Special features

Also available with combined analog and switching output in one device.

UNTL – Current and voltage output



| | | | |
|----------------------------|---------------------|-----------------------------|------|
| General data | | Protection class | IP67 |
| Dimensions | 5 x 14,5 x 73 mm | Material housing | PA |
| Analog output | 4...20 mA, 0...10 V | Material active face | PA |
| Operating voltage | 15...30 VDC | | |
| Ambient temperature | -25...+70 °C | | |

Types and data – selection table

| Type | Electrical connection | w | d |
|-----------------------------|-------------------------------|------|------|
| WIM45-UNTL-LIU5X2-0,3-PSG4M | cable with connector, M8 x 1 | w051 | d375 |
| WIM45-UNTL-LIU5X2-0,3-RS4 | cable with connector, M12 x 1 | w051 | d376 |

UNTL – Twin set



| | | | |
|------------------------------|---------------------------------------|----------------------------|----------------|
| Type | WIM45-UNTL-0,3-BIM-UNT-LUAP6X 4-H1141 | Ambient temperature | -25...+70 °C |
| Output | —, PNP/analog output | Protection class | IP67 |
| Analog output | 0...10 V | Material housing | PA12-GF30 / PP |
| Electrical connection | connector, M12 x 1 | Material cable | PUR 0.3 m |
| Operating voltage | 15...30 VDC | Wiring diagram | w067 |
| Switching frequency | 1 kHz | Dimension drawing | d377 |

Magnetic field sensors for harsh environments

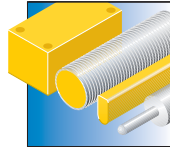


The rugged magnetic field sensors are particularly suited for harsh environments. With the extended range of accessories the sensors can be mounted on nearly all standard pneumatic cylinders. All standard connection types are available.

Features

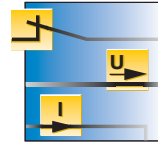
- Rugged design
- Many different mounting options
- Optional weld field immunity
- Excellent EMC properties

Properties



Design

standard design suited for harsh environments.



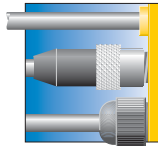
Electrical versions

NAMUR, 2/3-wire DC



Measuring ranges

Reliable position detection on all standard pneumatic cylinders



Electrical connections

All standard connection types available, cable, connector



Materials

Rugged PA12-GF30 resp. GD-ZN housing for a wide range of applications

NST – NAMUR



General data

| | | | |
|----------------------------|-----------------|-----------------------------|--------------|
| Dimensions | 17 x 14 x 28 mm | Ambient temperature | -25...+70 °C |
| Output | NAMUR | Protection class | IP67 |
| Operating voltage | nom. 8.2 VDC | Material housing | PA |
| Switching frequency | 1 kHz | Material active face | PA |

Types and data – selection table

| Type | Electrical connection | Material cable | w | d |
|-------------------|-----------------------|----------------|------|------|
| BIM-NST-Y1X-H1141 | connector, M12 x 1 | - | w021 | d378 |
| BIM-NST-Y1X | cable | PVC 2 m | w019 | d379 |

NST – 3-wire DC



General data

| | | | |
|----------------------------|-----------------|-----------------------------|------|
| Dimensions | 17 x 14 x 28 mm | Protection class | IP67 |
| Operating voltage | 10...30 VDC | Material housing | PA |
| Ambient temperature | -25...+70 °C | Material active face | PA |

Types and data – selection table

| Type | Output | Electrical connection | Switching frequency | Material cable | w | d |
|------------------------|--------|-----------------------|---------------------|----------------|------|------|
| BIM-NST-AP6X-V1131 | PNP | connector, M8 x 1 | 1 kHz | - | w001 | d380 |
| BIM-NST-AP6X-H1141/S34 | PNP | connector, M12 x 1 | 0.02 kHz | - | w001 | d381 |
| BIM-NST-AP6X-H1141 | PNP | connector, M12 x 1 | 1 kHz | - | w001 | d378 |
| BIM-NST-AP6X | PNP | cable | 1 kHz | PVC 2 m | w059 | d379 |
| BIM-NST-AN6X-V1131 | NPN | connector, M8 x 1 | 1 kHz | - | w002 | d380 |
| BIM-NST-AN6X-H1141/S34 | NPN | connector, M12 x 1 | 0.02 kHz | - | w002 | d381 |
| BIM-NST-AN6X-H1141 | NPN | connector, M12 x 1 | 1 kHz | - | w002 | d378 |
| BIM-NST-AN6X | NPN | cable | 1 kHz | PVC 2 m | w005 | d379 |

IKT – NAMUR



General data

Output NAMUR
Operating voltage nom. 8.2 VDC
Switching frequency 1 kHz
Ambient temperature -25...+70 °C

Protection class IP67
Material housing GD-Zn
Material active face PA

Types and data – selection table

| Type | Dimensions | Electrical connection | Material cable | w | d |
|-------------------|-------------------|-----------------------|----------------|------|------|
| BIM-IKT-Y1X-H1141 | 14.6 x 28 x 30 mm | connector, M12 x 1 | - | w021 | d382 |
| BIM-IKT-Y1X | 14.6 x 17 x 30 mm | cable | PVC 2 m | w019 | d383 |

IKT – 3-wire DC



General data

Operating voltage 10...30 VDC
Switching frequency 1 kHz
Ambient temperature -25...+70 °C

Protection class IP67
Material housing GD-Zn
Material active face PA

Types and data – selection table

| Type | Dimensions | Output | Electrical connection | Material cable | w | d |
|--------------------|-------------------|--------|-----------------------|----------------|------|------|
| BIM-IKT-AP6X-V1131 | 14.6 x 17 x 30 mm | —, PNP | connector, M8 x 1 | - | w001 | d384 |
| BIM-IKT-AP6X-H1141 | 14.6 x 28 x 30 mm | —, PNP | connector, M12 x 1 | - | w001 | d382 |
| BIM-IKT-AP6X | 14.6 x 17 x 30 mm | —, PNP | cable | PVC 2 m | w059 | d383 |
| BIM-IKT-AN6X-V1131 | 14.6 x 17 x 30 mm | —, NPN | connector, M8 x 1 | - | w002 | d384 |
| BIM-IKT-AN6X-H1141 | 14.6 x 28 x 30 mm | —, NPN | connector, M12 x 1 | - | w002 | d382 |
| BIM-IKT-AN6X | 14.6 x 17 x 30 mm | —, NPN | cable | PVC 2 m | w005 | d383 |

At a glance

Photoelectric sensors



Photoelectric sensors – more solutions more advantages

Photoelectric sensors use visible or infrared light to detect many different objects, regardless of their quality and consistency. Unlike inductive or capacitive sensors, they cover larger measuring ranges.

The most common tasks are positioning, counting, sorting and classifying. They are mostly applied in the automotive industry, machine-building, assembly lines, storage and transport systems.

Photoelectric sensors operate on the principle of emitting and receiving light. A diode emits light which is either cut off or reflected by an object and the detection event is subsequently processed.

Photoelectric sensors are available as opposed mode, retroreflective mode, diffuse mode or fiber-optic systems.

Diffuse mode sensors detect the light beam reflected by an object. The sensing range of these sensors depends largely on the reflectivity factor of the object.

A retroreflective sensor, contains emitter and receiver in the same housing. A light beam is established between emitter, re-

flector and receiver. If an object cuts off the beam, the sensor reacts.

Opposed mode sensors operate similarly. Unlike retroreflective sensors, emitter and receiver are separate units covering greater sensing ranges.

Optic fibers made of glass or plastic pipe the light beam from the sensor to the object and back. Fiber optics are especially suited for confined spaces or demanding environmental conditions.

Whether standard or programmable multifunctional versions, compact devices or devices with external amplifier etc., each sensor has special features suited for different applications. TURCK not only offers the most comprehensive product range of photoelectric sensors and fiber optic systems, you also get individual service and support to find the optimal solution for your application.

Our strengths - Your advantages



QS30ELVC – High-End opposed mode sensor for clear-glass recognition

The QS30ELVC is a user-friendly powerful opposed mode sensor for detecting bright, transparent or opaque objects. PET bottles, glass jars and reflecting sur-

faces such as mirrors, LCDs with polarization coating are reliably detected. The sensor is insensitive to the reflections of the objects.



QS30 H2O – High-power sensor for the detection of water

The QS30H2O detects water reliably. The photoelectric components are adjusted to the absorption band of water in the long-wave infrared spectrum. The emitted infrared beam permeates most plastic and glass containers but not water-based liquids, wood, metal or cardboard.

For damping and shaping the light beam in applications with low excess gain, like for example clear water in a transparent bottle, blinds are additionally available.



Q20 series - Compact, powerful and versatile

The Q20 are not only versatile in terms of operating modes but equally powerful like bigger sensors. The plastic housings are fully encapsulated and excellently durable and tight.

Their compact design enables easy mounting even in confined spaces. Bores with integrated thread make the use of additional mounting nuts redundant.

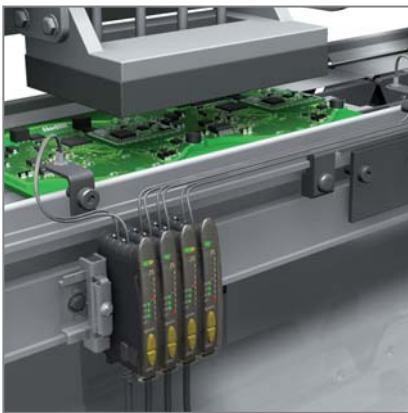
advantages



Expert mode – Easy set-up – Teach-and-ready

The Expert sensors pave the way to simple system setup. The QS18 Expert is either configured via pushbutton at the sensor or remotely via teach line. Different configurations can be taught through certain pulse sequences, like for example the pushbutton lock.

The ON and OFF conditions are individually set in the static teach mode, whereas in dynamic teach mode the light and dark conditions are automatically taught during operation and the switching threshold is continuously updated while the sensor is working.



D10 Expert – Innovative sensor for use with plastic fibers

The D10 Expert is a user-friendly fiber optic sensor suited for DIN rail mounting. The sensor works reliably, even in low contrast applications. Available are devices with, switching, two switching and analog/switching output.

down setting options as well as manual fine adjustment and external programming.

A big and well readable display resp. bargraph and LEDs support programming and monitoring during operation.

The expert version provides functions such as static and dynamic teaching, win-



Ex area – Solutions for hazardous applications

TURCK provides the full range of performance even for explosion hazardous areas.

relevant norms such as EN 60947-5-6, EN 60079-0, part 1 and EN 60079-11.

The NAMUR sensors series MINI-BEAM® and Q45 are approved according to KE-MA certificate 03 ATEX 1441 X ignition protection type Ex ia IIC T6 and fulfill all

Available are opposed and retroreflective mode, convergent and diffuse mode sensors as well as base units for fiber optics.

Designs and variants

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Miniature VS1

Page 317



Miniature VS2

Page 319



Miniature VS3

Page 320



Miniature VS4

| | | | | |
|----------------------------|--------------------------------------|---|--|---|
| Design | rectangular, 8.3 x 25.7 x 11.6 mm | rectangular, 12 x 25.1 x 4.7 mm | rectangular, 9 x 25.4 x 16.6 mm | rectangular, 4.75 x 25.4 x 12.5 mm |
| Output function | PNP | PNP | PNP | PNP |
| Protection class | IP67 | IP67 | IP67 | IP67 |
| Ambient temperature | -20...+55 °C | -20...+55 °C | -20...+55 °C | -20...+55 °C |
| Operating mode | convergent mode sensor | opposed mode sensor (emitter) opposed mode sensor (receiver) convergent mode sensor | retro-reflective sensor retro-reflective sensor with polarisation filter | opposed mode sensor (emitter) opposed mode sensor (receiver) |
| Max. range | 20 mm | 1200 mm | 250 mm | 1000 mm |
| Light type | red | red | red | red |

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Miniature T8

Miniature Q12

Compact M12

Compact QS18

Design

threaded barrel,
Ø16.3 x 15.8 mm

rectangular,
8 x 26.6 x 12.4 mm,
8 x 28.8 x 12.5 mm

threaded barrel,
Ø12 x 67.5 mm
Ø12 x 74 mm

rectangular,
15 x 35 x 31 mm,
15 x 41.5 x 27.7 mm,
15 x 35 x 27.7 mm,
15 x 35 x 21.1 mm,
15 x 41.5 x 21.1 mm,
15 x 34.5 x 21.1 mm,
15 x 35 x 33.2 mm

Output function

PNP

pnp/npn

PNP

PNP

Protection class

IP67

IP67

IP67

IP67

Ambient temperature

-20...+55 °C

-20...+55 °C

-20...+60 °C
0...+40 °C

-20...+70 °C
-10...+50 °C
0...+55 °C

Operating mode

opposed mode sensor
(emitter)
opposed mode sensor
(receiver)
diffuse mode sensor

opposed mode sensor
(emitter)
opposed mode sensor
(receiver)
retro-reflective sensor
retro-reflective sensor with
polarisation filter
diffuse mode sensor with
fixed-field background sup-
pression

opposed mode sensor
(emitter)
opposed mode sensor
(receiver)
retro-reflective sensor
retro-reflective sensor with
polarisation filter
diffuse mode sensor
diffuse mode sensor with
fixed-field background sup-
pression

opposed mode sensor
(emitter)
opposed mode sensor
(receiver)
retro-reflective sensor
retro-reflective sensor with
polarisation filter
diffuse mode sensor
diffuse mode sensor with
fixed-field background
suppression
diffuse mode sensor with
adjustable background
suppression
convergent mode sensor

Max. range

2000 mm

2000 mm

5000 mm

30000 mm

Light type

red

red

red

IR
red

Designs and variants

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Compact QS18 Expert

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Compact Q20

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MINI-BEAM NAMUR

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Compact QS30

| | | | | |
|----------------------------|--|--|--|---|
| Design | rectangular, 15 x 35 x 31 mm, 15 x 35 x 21.1 mm | rectangular, 12 x 32 x 20 mm, 12 x 42 x 20 mm | rectangular, 12.3 x 30.7 x 66 mm, 12.3 x 30.7 x 84 mm, 12.3 x 30.7 x 51.8 mm, 12.3 x 30.7 x 69.8 mm | rectangular, 22 x 49 x 35 mm, 22 x 57 x 35 mm, 22 x 57 x 54.3 mm |
| Output function | PNP | PNP | NAMUR | pnp/npn |
| Protection class | IP67 | IP67 | IP67 | IP67 IP68 / IP69K |
| Ambient temperature | -20...+70 °C | -20...+60 °C | -40...+70 °C | -20...+60 °C -20...+70 °C -10...+55 °C -10...+50 °C |
| Operating mode | retro-reflective sensor with polarisation filter diffuse mode sensor convergent mode sensor | opposed mode sensor (emitter) opposed mode sensor (receiver) retro-reflective sensor retro-reflective sensor with polarisation filter diffuse mode sensor | opposed mode sensor (emitter) opposed mode sensor (receiver) retro-reflective sensor retro-reflective sensor with polarisation filter diffuse mode sensor convergent mode sensor fibre optic sensor | opposed mode sensor (emitter) opposed mode sensor (receiver) retro-reflective sensor retro-reflective sensor with polarisation filter diffuse mode sensor diffuse mode sensor with fixed-field background suppression diffuse mode sensor with adjustable background suppression |
| Max. range | 3500 mm | 15000 mm | 6000 mm | 300000 mm |
| Light type | IR red | IR red | IR red | IR red |

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Compact EZ-BEAM M18

Compact EZ-BEAM S18

Compact EZ-BEAM T18

Compact EZ-BEAM Q25

| | | | | |
|----------------------------|---|---|---|--|
| Design | cylindrical/threaded, Ø18 x 59.2 mm, Ø18 x 78 mm, Ø18 x 83.8 mm, Ø18 x 65 mm | cylindrical/threaded, Ø18 x 78.7 mm, Ø18 x 88 mm, Ø18 x 69.5 mm, Ø18 x 59.2 mm, Ø18 x 84.1 mm, Ø18 x 65 mm | cylindrical/threaded, 30 x 41.5 x 30 mm, 30 x 54 x 30 mm | rectangular, 25 x 50.2 x 30 mm, 25 x 62.7 x 30 mm |
| Output function | PNP | PNP | PNP | PNP |
| Protection class | IP67 | IP68 / IP69K IP67 | IP68 / IP69K | IP68 / IP69K |
| Ambient temperature | -40...+70 °C | -40...+70 °C -10...+50 °C | -40...+70 °C | -40...+70 °C |
| Operating mode | opposed mode sensor (emitter) opposed mode sensor (receiver) retro-reflective sensor retro-reflective sensor with polarisation filter diffuse mode sensor with fixed-field background suppression | opposed mode sensor (emitter) opposed mode sensor (receiver) retro-reflective sensor retro-reflective sensor with polarisation filter diffuse mode sensor with fixed-field background suppression | opposed mode sensor (emitter) opposed mode sensor (receiver) retro-reflective sensor retro-reflective sensor with polarisation filter diffuse mode sensor with fixed-field background suppression | opposed mode sensor (emitter) opposed mode sensor (receiver) retro-reflective sensor with polarisation filter diffuse mode sensor with fixed-field background suppression |
| Max. range | 20000 mm | 20000 mm | 20000 mm | 20000 mm |
| Light type | IR red | IR red | IR red | IR red |

Designs and variants

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Compact EZ-BEAM S30

cylindrical/threaded,
 Ø30 x 68.7 mm,
 Ø30 x 77.5 mm

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Compact EZ-BEAM T30

cylindrical/threaded,
 40 x 51.5 x 45 mm,
 40 x 64 x 45 mm

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Compact EZ-BEAM Q40

rectangular,
 40 x 69.8 x 46 mm
 40 x 82.5 x 46 mm

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Q45 NAMUR

rectangular,
 54.1 x 44.5 x 87 mm,
 54.1 x 44.5 x 103 mm,
 44.5 x 87.6 x 54.1 mm,
 44.5 x 102.6 x 54.1 mm,
 44.5 x 87.6 x 56.4 mm,
 44.5 x 102.6 x 56.4 mm,
 44.5 x 87.6 x 60.5 mm,
 44.5 x 102.6 x 60.5 mm

Design

Output function

PNP

Protection class

IP68 / IP69K

Ambient temperature

-40...+70 °C

Operating mode

opposed mode sensor (emitter)
 opposed mode sensor (receiver)
 retro-reflective sensor with polarisation filter
 diffuse mode sensor with fixed-field background suppression

Max. range

60000 mm

Light type

IR
 red

PNP

IP68 / IP69K

-40...+70 °C

opposed mode sensor (emitter)
 opposed mode sensor (receiver)
 retro-reflective sensor with polarisation filter
 diffuse mode sensor with fixed-field background suppression

60000 mm

IR
 red

PNP

IP68 / IP69K

-40...+70 °C

opposed mode sensor (emitter)
 retro-reflective sensor with polarisation filter
 diffuse mode sensor with fixed-field background suppression

60000 mm

IR
 red

NAMUR

IP67

-40...+70 °C

opposed mode sensor (emitter)
 opposed mode sensor (receiver)
 retro-reflective sensor
 retro-reflective sensor with polarisation filter
 diffuse mode sensor
 convergent mode sensor
 fibre optic sensor

9000 mm

Standard variants

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SLM – Slot sensor

Fiber optic sensor QS18F/FP

Fiber optic sensors FI22

Fiber optic sensor D10

Design

slot sensor,
12 x 42 x 80 mm,
12 x 62 x 80 mm,
12 x 112 x 80 mm,
12 x 152 x 140 mm,
12 x 252 x 140 mm,
12 x 82 x 80 mm

rectangular,
15 x 35 x 36.9 mm,
15 x 49 x 36.9 mm,
15 x 34.5 x 27.5 mm,
15 x 41.5 x 27.5 mm,
15 x 49 x 27.5 mm

rectangular, 2
3 x 14.5 x 50 mm

rectangular,
10 x 35.9 x 68.1 mm,
10 x 35.9 x 84.4 mm,
10.5 x 35.9 x 68.1 mm,
10.5 x 35.9 x 84.4 mm

Output function

pnp/npn
PNP

PNP

pnp/npn

pnp/npn
PNP

Protection class

IP67

IP67

IP67

IP50

Ambient temperature

-20...+60 °C

-20...+70 °C

-10...+55 °C

-10...+55 °C
-20...+55 °C

Operating mode

bifurcated retro-reflective
sensor

fibre optic sensor

fibre optic sensor

fibre optic sensor

Light type

red

IR
red

red

red
green

Designs and variants

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Fiber optic sensors D12

Fiber optic sensors R55F

| | | |
|----------------------------|---|---|
| Design | rectangular, 12 x 30 x 70 mm, 12 x 30 x 64 mm | rectangular, 30 x 25 x 85.4 mm, 30 x 25 x 97 mm |
| Output function | PNP pnp/hpn | pnp/npn |
| Protection class | IP66 | IP67 |
| Ambient temperature | -20...+70 °C -40...+70 °C | -10...+55 °C |
| Operating mode | fibre optic sensor | fibre optic sensor |
| Light type | red | red green blue white |

s and variants

Miniature sensors Q12, T8, VS1, VS2, VS3, VS4



We offer different types of miniature sensors. From the well-priced compact T8 with 8 mm thread, over the extremely small, powerful VS1, VS2, VS3 and VS4 rectangular series, up to the robust and universally applicable QS12 series.

Made for limited space conditions, these sensors cover the entire power spectrum in terms of operating modes, functionality, range and robustness.

Features

- High performance series for limited spaces
- Short response time of 1 ms
- Easily aligned through a visible light beam
- LED indicating power-on and light detection
- 3-wire connection, adjustment of light and dark operation, PNP or NPN output
- Protection class IP67
- 2 m connection cable and 150 mm pigtail with M8 x 1 plug connection

Type code miniature sensors

| | | | | | |
|-----|---|---|---|-----|---|
| VS3 | A | P | 5 | XLV | Q |
|-----|---|---|---|-----|---|

| VS3 | Series | A | P | Output | 5 | Operating voltage |
|-----|---|---|---|---|---|--|
| | Series Q12 rectangular 8 x 26.6 x 12.4 mm T8 cylinder 15.8 x 16.3 mm VS1 rectangular, 8.3 x 25.7 x 11.6 mm VS2 rectangular 12 x 25.1 x 4.7 mm VS3 rectangular 9 x 25.4 x 16.6 mm VS4 rectangular 4.75 x 25.4 x 12.5 mm | | | Output B PNP/NPN N NPN P PNP | | Operating voltage 5 10 ... 30 VDC max. 20 mA 6 10 ... 30 VDC max. 25 mA |
| | | | | Output function A light operation R dark operation | | |

| XLV | Operating mode | Q | Electrical connection |
|-----|--|---|--|
| | Operating mode CV convergent mode D diffuse mode E opposed mode emitter EV emitter, visible red light FF diffuse mode, fixed field L opposed mode LP opposed mode, polarizing filter LV opposed mode, visible red light R opposed mode receiver XLV retroreflective mode polarizing filter XLV retroreflective mode visible red light CR chemical resistant housing | | Electrical connection Q pigtail, connector M8 cable 150 mm, 3-pole blank cable connection, 2 m |

Q12 – Opposed mode sensor – Emitter



| | | | |
|---------------------------------------|--------------------|----------------------------|---------------------|
| General data | | Housing material | plastic, Elastomere |
| Operating voltage | 10...30 VDC | Lens material | plastic |
| Power-on, indicator | LED | Ambient temperature | -20...+55 °C |
| Indication of excess gain type | LED | Light type | red |
| Dimensions | 8 x 26.6 x 12.4 mm | Range | 0...2000 mm |
| Protection class | IP67 | | |

A receiver is required.

Types and data – selection table

| Type | Electrical connection | w | d | e |
|--------|------------------------------|------|------|------|
| Q126EQ | cable with connector, M8 x 1 | w068 | d386 | e001 |
| Q126E | cable | w068 | d385 | e001 |

Q12 – Opposed mode sensor – Emitter – Chemical resistance



| | | | |
|---------------------------------------|--------------------|------------------------------|--------------|
| Type | Q126ECR | Electrical connection | cable |
| Operating voltage | 10...30 VDC | Ambient temperature | -20...+55 °C |
| Power-on, indicator | LED | Light type | red |
| Indication of excess gain type | LED | Range | 0...1500 mm |
| Dimensions | 8 x 28.8 x 12.5 mm | Wiring diagram | w068 |
| Protection class | IP67 | Dimension drawing | d387 |
| Housing material | plastic, PFA | Excess gain curve | e002 |
| Lens material | plastic | | |

CR = Chemical resistant housing

A receiver is required.

Q12 – Opposed mode sensor – Receiver



General data

| | | | |
|---------------------------------------|--------------------|----------------------------------|---------------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | plastic, Elastomere |
| Indication of excess gain type | LED | Lens material | plastic |
| Switching frequency | ≤ 450 Hz | Ambient temperature Range | -20...+55 °C |
| Dimensions | 8 x 26.6 x 12.4 mm | | 0...2000 mm |

An emitter is required.

Types and data – selection table

| Type | Output | Electrical connection | w | d | e |
|----------|-----------------------------|------------------------------|------|------|------|
| Q12RB6RQ | —, dark operation, pnp/npn | cable with connector, M8 x 1 | w069 | d386 | e001 |
| Q12AB6RQ | —, light operation, pnp/npn | cable with connector, M8 x 1 | w069 | d386 | e001 |
| Q12AB6R | —, light operation, pnp/npn | cable | w069 | d385 | e001 |
| Q12RB6R | —, dark operation, pnp/npn | cable | w069 | d385 | e001 |

Q12 – Opposed mode sensor – Receiver – Chemical resistance



General data

| | | | |
|---------------------------------------|--------------------|----------------------------------|--------------|
| Operating voltage | 10...30 VDC | Housing material | plastic, PFA |
| Power-on, indicator | LED | Lens material | plastic |
| Indication of excess gain type | LED | Electrical connection | cable |
| Switching frequency | ≤ 450 Hz | Ambient temperature Range | -20...+55 °C |
| Dimensions | 8 x 28.8 x 12.5 mm | | 0...1500 mm |
| Protection class | IP67 | | |

CR = Chemical resistant housing

An emitter is required.

Types and data – selection table

| Type | Output | w | d | e |
|-----------|-----------------------------|------|------|------|
| Q12AB6RCR | —, light operation, pnp/npn | w069 | d387 | e002 |
| Q12RB6RCR | —, dark operation, pnp/npn | w069 | d387 | e002 |

Q12 – Retroreflective sensor



| | | | |
|---------------------------------------|--------------------|----------------------------|---------------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Housing material | plastic, Elastomere |
| Power-on, indicator | LED | Lens material | plastic |
| Indication of excess gain type | LED | Ambient temperature | -20...+55 °C |
| Switching frequency | ≤ 700 Hz | Light type | red |
| Dimensions | 8 x 26.6 x 12.4 mm | Range | 0...1500 mm |
| Protection class | IP67 | | |

A reflector is required.

Types and data – selection table

| Type | Output | Electrical connection | w | d | e |
|-----------|-----------------------------|------------------------------|------|------|------|
| Q12AB6LVQ | —, light operation, pnp/npn | cable with connector, M8 x 1 | w069 | d386 | e003 |
| Q12RB6LVQ | —, dark operation, pnp/npn | cable with connector, M8 x 1 | w069 | d386 | e003 |
| Q12AB6LV | —, light operation, pnp/npn | cable | w069 | d385 | e003 |
| Q12RB6LV | —, dark operation, pnp/npn | cable | w069 | d385 | e003 |

Q12 – Retroreflective sensor with polarizing filter



| | | | |
|---------------------------------------|--------------------|----------------------------|---------------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Housing material | plastic, Elastomere |
| Power-on, indicator | LED | Lens material | plastic |
| Indication of excess gain type | LED | Ambient temperature | -20...+55 °C |
| Switching frequency | ≤ 700 Hz | Light type | red |
| Dimensions | 8 x 26.6 x 12.4 mm | Range | 0...1000 mm |
| Protection class | IP67 | | |

A reflector is required.

Types and data – selection table

| Type | Output | Electrical connection | w | d | e |
|-----------|-----------------------------|------------------------------|------|------|------|
| Q12AB6LPQ | —, light operation, pnp/npn | cable with connector, M8 x 1 | w069 | d389 | e004 |
| Q12RB6LPQ | —, dark operation, pnp/npn | cable with connector, M8 x 1 | w069 | d389 | e004 |
| Q12AB6LP | —, light operation, pnp/npn | cable | w069 | d388 | e004 |
| Q12RB6LP | —, dark operation, pnp/npn | cable | w069 | d388 | e004 |

w Wiring diagrams on page 832 ff d Dimension drawing on page 842 ff e Excess gain curves on page 922 ff a Accessories on page 788 ff

Q12 – Diffuse mode sensor with fixed-field



General data

| | | | |
|---------------------------------------|--------------------|----------------------------|---------------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | plastic, Elastomere |
| Indication of excess gain type | LED | Lens material | plastic |
| Switching frequency | ≤ 700 Hz | Ambient temperature | -20...+55 °C |
| Dimensions | 8 x 26.6 x 12.4 mm | Light type | red |

Types and data – selection table

| Type | Output | Electrical connection | Range | w | d | e |
|-------------|-----------------------------|------------------------------|-----------|------|------|------|
| Q12AB6FF15 | —, light operation, pnp/npn | cable | 3...15 mm | w069 | d385 | e005 |
| Q12AB6FF15Q | —, light operation, pnp/npn | cable with connector, M8 x 1 | 3...15 mm | w069 | d386 | e005 |
| Q12RB6FF15 | —, dark operation, pnp/npn | cable | 3...15 mm | w069 | d385 | e005 |
| Q12RB6FF15Q | —, dark operation, pnp/npn | cable with connector, M8 x 1 | 3...15 mm | w069 | d386 | e005 |
| Q12AB6FF30 | —, light operation, pnp/npn | cable | 3...30 mm | w069 | d385 | e006 |
| Q12AB6FF30Q | —, light operation, pnp/npn | cable with connector, M8 x 1 | 3...30 mm | w069 | d386 | e006 |
| Q12RB6FF30 | —, dark operation, pnp/npn | cable | 3...30 mm | w069 | d385 | e006 |
| Q12RB6FF30Q | —, dark operation, pnp/npn | cable with connector, M8 x 1 | 3...30 mm | w069 | d386 | e006 |
| Q12AB6FF50 | —, light operation, pnp/npn | cable | 3...50 mm | w069 | d385 | e007 |
| Q12RB6FF50 | —, dark operation, pnp/npn | cable | 3...50 mm | w069 | d385 | e007 |
| Q12AB6FF50Q | —, light operation, pnp/npn | cable with connector, M8 x 1 | 3...50 mm | w069 | d386 | e007 |
| Q12RB6FF50Q | —, dark operation, pnp/npn | cable with connector, M8 x 1 | 3...50 mm | w069 | d386 | e007 |

Q12 – Diffuse mode sensor with fixed-field – Chemical resistance



General data

| | | | |
|---------------------------------------|--------------------|------------------------------|--------------|
| Operating voltage | 10...30 VDC | Housing material | plastic, PFA |
| Power-on, indicator | LED | Lens material | plastic |
| Indication of excess gain type | LED | Electrical connection | cable |
| Switching frequency | ≤ 700 Hz | Ambient temperature | -20...+55 °C |
| Dimensions | 8 x 28.8 x 12.5 mm | Light type | red |
| Protection class | IP67 | | |

CR = Chemical-resistant housing

Types and data – selection table

| Type | Output | Range | w | d | e |
|--------------|---------------------------------|-----------|------|------|------|
| Q12AB6FF15CR | — / —, light operation, pnp/npn | 3...13 mm | w069 | d387 | e008 |
| Q12RB6FF15CR | — / —, dark operation, pnp/npn | 3...13 mm | w069 | d387 | e008 |
| Q12AB6FF30CR | — / —, light operation, pnp/npn | 4...28 mm | w069 | d387 | e009 |
| Q12RB6FF30CR | — / —, dark operation, pnp/npn | 4...28 mm | w069 | d387 | e009 |
| Q12AB6FF50CR | — / —, light operation, pnp/npn | 5...48 mm | w069 | d387 | e010 |
| Q12RB6FF50CR | — / —, dark operation, pnp/npn | 5...48 mm | w069 | d387 | e010 |

T8 – Opposed mode sensor – Emitter



General data

| | | | |
|----------------------------|-----------------|----------------------------|--------------|
| Power-on, indicator | LED | Lens material | plastic |
| Dimensions | Ø16.3 x 15.8 mm | Ambient temperature | -20...+55 °C |
| Protection class | IP67 | Light type | red |
| Housing material | plastic, ABS | Range | 0...2000 mm |

A receiver is required.

Types and data – selection table

| Type | Electrical connection | w | d | e |
|--------|------------------------------|------|------|------|
| T86EVQ | cable with connector, M8 x 1 | w068 | d391 | e011 |
| T86EV | cable | w068 | d390 | e011 |

T8 – Opposed mode sensor – Receiver



General data

| | | | |
|----------------------------|-----------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | plastic, ABS |
| Error message type | LED | Lens material | plastic |
| Switching frequency | ≤ 666 Hz | Ambient temperature | -20...+55 °C |
| Dimensions | Ø16.3 x 15.8 mm | Range | 0...2000 mm |

An emitter is required.

Types and data – selection table

| Type | Output | Electrical connection | w | d | e |
|---------|-------------------------|------------------------------|------|------|------|
| T8AP6RQ | —, light operation, PNP | cable with connector, M8 x 1 | w070 | d391 | e011 |
| T8RP6RQ | —, dark operation, PNP | cable with connector, M8 x 1 | w070 | d391 | e011 |
| T8AP6R | —, light operation, PNP | cable | w070 | d390 | e011 |
| T8RP6R | —, dark operation, PNP | cable | w070 | d390 | e011 |

T8 – Diffuse mode sensor



General data

| | | | |
|----------------------------|-----------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | plastic, ABS |
| Error message type | LED | Lens material | plastic |
| Switching frequency | ≤ 500 Hz | Ambient temperature | -20...+55 °C |
| Dimensions | Ø16.3 x 15.8 mm | Light type | red |

Types and data – selection table

| Type | Output | Electrical connection | Range | w | d | e |
|------------|-------------------------|------------------------------|------------|------|------|------|
| T8AP6D50 | —, light operation, PNP | cable | 0...50 mm | w070 | d390 | e012 |
| T8AP6D50Q | —, light operation, PNP | cable with connector, M8 x 1 | 0...50 mm | w070 | d391 | e012 |
| T8RP6D50 | —, dark operation, PNP | cable | 0...50 mm | w070 | d390 | e012 |
| T8RP6D50Q | —, dark operation, PNP | cable with connector, M8 x 1 | 0...50 mm | w070 | d391 | e012 |
| T8AP6D100 | —, light operation, PNP | cable | 0...100 mm | w070 | d390 | e012 |
| T8AP6D100Q | —, light operation, PNP | cable with connector, M8 x 1 | 0...100 mm | w070 | d391 | e012 |
| T8RP6D100 | —, dark operation, PNP | cable | 0...100 mm | w070 | d390 | e012 |
| T8RP6D100Q | —, dark operation, PNP | cable with connector, M8 x 1 | 0...100 mm | w070 | d391 | e012 |

VS1 – Convergent mode sensor



| | | | |
|----------------------------|----------------------|------------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Housing material | plastic, ABS |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Electrical connection | cable |
| Switching frequency | ≤ 500 Hz | Ambient temperature | -20...+55 °C |
| Dimensions | 8.3 x 25.7 x 11.6 mm | Light type | red |
| Protection class | IP67 | | |

Types and data – selection table

| Type | Output | Range | Focal distance | w | d | e |
|------------|----------------------|-------|----------------|------|------|------|
| VS1AP5CV10 | light operation, PNP | 10 mm | 10 mm | w151 | d593 | e013 |
| VS1RP5CV10 | dark operation, PNP | 10 mm | 10 mm | w151 | d593 | e013 |
| VS1AP5CV20 | light operation, PNP | 20 mm | 20 mm | w151 | d593 | e013 |
| VS1RP5CV20 | dark operation, PNP | 20 mm | 20 mm | w151 | d593 | e013 |

VS2 – Opposed mode sensor – Emitter



| | | | |
|----------------------------|--------------------|------------------------------|--------------|
| Type | VS25EV | Electrical connection | cable |
| Operating voltage | 10...30 VDC | Ambient temperature | -20...+55 °C |
| Power-on, indicator | LED | Light type | red |
| Dimensions | 12 x 25.1 x 4.7 mm | Range | 0...1200 mm |
| Protection class | IP67 | Wiring diagram | w068 |
| Housing material | plastic, ABS | Dimension drawing | d594 |
| Lens material | plastic | Excess gain curve | e014 |

A receiver is required.


VS2 – Opposed mode sensor – Receiver



| | | | |
|----------------------------|--------------------|------------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Housing material | plastic, ABS |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Electrical connection | cable |
| Switching frequency | ≤ 500 Hz | Ambient temperature | -20...+55 °C |
| Dimensions | 12 x 25.1 x 4.7 mm | Range | 0...1200 mm |
| Protection class | IP67 | | |

An emitter is required.

Types and data – selection table









| Type | Output | w | d | e |
|---------|--|------|------|------|
| VS2AP5R |  , light operation, PNP | w070 | d594 | e014 |
| VS2RP5R |  , dark operation, PNP | w070 | d594 | e014 |

VS2 – Convergent mode sensor




| | | | |
|----------------------------|--------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | plastic, ABS |
| Error message type | LED | Lens material | plastic |
| Switching frequency | ≤ 500 Hz | Ambient temperature | -20...+55 °C |
| Dimensions | 12 x 25.1 x 4.7 mm | Light type | red |

Types and data – selection table

| Type | Output | Electrical connection | Focal distance | w | d | e |
|-------------|--|------------------------------|----------------|------|------|------|
| VS2RP5CV15 |  , dark operation, PNP | cable | 15 mm | w070 | d595 | e015 |
| VS2AP5CV15Q |  , light operation, PNP | cable with connector, M8 x 1 | 15 mm | w070 | d596 | e015 |
| VS2RP5CV15Q |  , dark operation, PNP | cable with connector, M8 x 1 | 15 mm | w070 | d596 | e015 |
| VS2AP5CV15 |  , light operation, PNP | cable | 15 mm | w070 | d595 | e015 |
| VS2AP5CV30 |  , light operation, PNP | cable | 30 mm | w070 | d597 | e015 |
| VS2RP5CV30 |  , dark operation, PNP | cable | 30 mm | w070 | d597 | e015 |
| VS2AP5CV30Q |  , light operation, PNP | cable with connector, M8 x 1 | 30 mm | w070 | d598 | e015 |
| VS2RP5CV30Q |  , dark operation, PNP | cable with connector, M8 x 1 | 30 mm | w070 | d598 | e015 |

VS3 – Retroreflective sensor



| | | | |
|----------------------------|---|------------------------------|--------------|
| Type | VS3RP5XLV | Lens material | plastic |
| Operating voltage | 10...30 VDC | Electrical connection | cable |
| Power-on, indicator | LED | Ambient temperature | -20...+55 °C |
| Error message type | LED | Light type | red |
| Output |  , dark operation, PNP | Range | 250 mm |
| Switching frequency | ≤ 500 Hz | Wiring diagram | w070 |
| Dimensions | 9 x 25.4 x 16.6 mm | Dimension drawing | d599 |
| Protection class | IP67 | Excess gain curve | e016 |
| Housing material | plastic, ABS | | |

A reflector is required.






VS3 – Retroreflective sensor with polarizing filter



| | | | |
|----------------------------|--------------------|----------------------------|--------------|
| General data | | Housing material | plastic, ABS |
| Operating voltage | 10...30 VDC | Lens material | glass |
| Power-on, indicator | LED | Ambient temperature | -20...+55 °C |
| Error message type | LED | Light type | red |
| Switching frequency | ≤ 500 Hz | Range | 250 mm |
| Dimensions | 9 x 25.4 x 16.6 mm | | |
| Protection class | IP67 | | |

A reflector is required.

Types and data – selection table

| Type | Output | Electrical connection |  |  |  |
|------------|--|-----------------------|---|---|---|
| VS3RP5XLPQ |  , dark operation, PNP | connector, M8 x 1 | w070 | d600 | e016 |
| VS3AP5XLP |  , light operation, PNP | cable | w070 | d599 | e016 |

VS4 – Opposed mode sensor – Emitter



| | | | |
|----------------------------|-----------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Housing material | plastic, PC |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | -20...+55 °C |
| Dimensions | 4.75 x 25.4 x 12.5 mm | Light type | red |
| Protection class | IP67 | Range | 0...1000 mm |

A receiver is required.

Types and data – selection table

| Type | Electrical connection | w | d | e |
|--------|------------------------------|------|------|------|
| VS4EVQ | cable with connector, M8 x 1 | w068 | d601 | e014 |
| VS4EV | cable | w068 | d602 | e014 |

VS4 – Opposed mode sensor – Receiver



| | | | |
|----------------------------|-----------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | plastic, PC |
| Error message type | LED | Lens material | plastic |
| Switching frequency | ≤ 660 Hz | Ambient temperature | -20...+55 °C |
| Dimensions | 4.75 x 25.4 x 12.5 mm | Range | 0...1000 mm |

An emitter is required.

Types and data – selection table

| Type | Output | Electrical connection | w | d |
|----------|------------------------|------------------------------|------|------|
| VS4RP5RQ | —, dark operation, PNP | cable with connector, M8 x 1 | w070 | d603 |
| VS4RP5R | —, dark operation, PNP | cable | w070 | d604 |
| VS4AP5RQ | —, PNP | cable with connector, M8 x 1 | w070 | d603 |
| VS4AP5R | —, PNP | cable | w070 | d604 |

EZ-BEAM M18, S18, T18, Q25, S30, T30, Q40



EZ-BEAM sensors are compact, easy to install and integrate in any application, even under rough operating conditions.

Sensitivity adjustments are redundant for most of the types.

EZ-BEAM sensors are available in different sizes and designs, such as plastic and threaded barrel or rectangular versions. The operating modes are opposed, retro-reflective with/without polarizing filter as well as diffuse mode with background suppression.

Features

- The well-priced high performance sensors are IP69K rated (most types)
- No sensitivity adjustments (most types)
- Auto-diagnostics with separate display for insufficient excess gain and alarm output
- Extended range of operating temperature -40 ... +70 °C
- Antivalent PNP/NPN output, AC versions available
- Blind for opposed mode sensors available

Type code EZ-BEAM

| | | | | | |
|-----|---|---|---|----|---|
| Q25 | S | P | 6 | LP | Q |
|-----|---|---|---|----|---|

| | | | | | |
|-----|--------|---|-----------------|---|--------|
| Q25 | Series | S | Output function | P | Output |
|-----|--------|---|-----------------|---|--------|

Series

| | |
|------------|---|
| M18 | thread, metal, Ø 18 mm |
| Q25 | rectangular 25 x 50.2 x 30 mm |
| Q40 | rectangular 40 x 40 x 46 mm |
| S18 | thread, Ø 18 mm |
| S30 | thread, plastic, Ø 30 mm |
| T18 | thread Ø 18 mm, angled 30 x 54 x 30 mm |
| T30 | thread Ø 30 mm, angled dimensions 40 x 64 x 45 mm |

Output function

| | |
|----------|---------------|
| S | programmable* |
|----------|---------------|

*selectable light/dark operation or light operation and alarm

Output

| | |
|----------|-----|
| P | PNP |
| N | NPN |

| | | | | | |
|---|-------------------|----|----------------|---|-----------------------|
| 6 | Operating voltage | LP | Operating mode | Q | Electrical connection |
|---|-------------------|----|----------------|---|-----------------------|

Operating voltage

| | |
|----------|---------------|
| 6 | 10 ... 30 VDC |
|----------|---------------|

Operating mode

| | |
|--------------|--|
| E | opposed mode emitter |
| R | receiver |
| D | diffuse mode |
| DL | diffuse mode, long distance |
| FF600 | diffuse mode, fixed field 0 ... 600 mm |
| LP | retroreflective mode polarizing filter |
| L | retroreflective mode infrared light |
| ELD | opposed mode laser emitter (only S18) |

Electrical connection

| | |
|--------------|-----------------------|
| Q | connector, M12 x 1 |
| blank | cable connection, 2 m |

M18 – Opposed mode sensor – Emitter



General data

| | | | |
|----------------------------|---------------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Lens material | plastic |
| Power-on, indicator | LED | Ambient temperature | -40...+70 °C |
| Protection class | IP67 | Light type | IR |
| Housing material | metal, V2A (1.4305) | Range | 0...20000 mm |

A receiver is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|--------|---------------|-----------------------|------|------|------|
| M186EQ | Ø18 x 78 mm | connector, M12 x 1 | w068 | d606 | e017 |
| M186E | Ø18 x 59.2 mm | cable | w068 | d605 | e017 |

S18 – Opposed mode sensor – Emitter



General data

| | | | |
|----------------------------|--------------|----------------------|--------------|
| Operating voltage | 10...30 VDC | Lens material | plastic |
| Power-on, indicator | LED | Range | 0...20000 mm |
| Housing material | plastic, PBT | | |

A receiver is required.

Types and data – selection table

| Type | Dimensions | Protection class | Electrical connection | Ambient temperature | Light type | Laser class | w | d | e |
|----------|---------------|------------------|-----------------------|---------------------|------------|-------------------------|------|------|------|
| S186EQ | Ø18 x 78.7 mm | IP68 / IP69K | connector, M12 x 1 | -40...+70 °C | IR | - | w068 | d607 | e017 |
| S186ELDQ | Ø18 x 88 mm | IP67 | connector, M12 x 1 | -10...+50 °C | red | 2 (EN 60825, IEC 60825) | w152 | d608 | e017 |
| S186ELD | Ø18 x 69.5 mm | IP67 | cable | -10...+50 °C | red | 2 (EN 60825, IEC 60825) | w152 | d609 | e017 |
| S186E | Ø18 mm | IP68 / IP69K | cable | -40...+70 °C | IR | - | w068 | d610 | e017 |

w Wiring diagrams on page 832 ff d Dimension drawing on page 842 ff e Excess gain curves on page 922 ff a Accessories on page 788 ff

T18 – Opposed mode sensor – Emitter



General data

| | | | |
|----------------------------|--------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Lens material | plastic |
| Power-on, indicator | LED | Ambient temperature | -40...+70 °C |
| Protection class | IP68 / IP69K | Light type | IR |
| Housing material | plastic, PBT | Range | 0...20000 mm |

A receiver is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|--------|-------------------|-----------------------|------|------|------|
| T186EQ | 30 x 54 x 30 mm | connector, M12 x 1 | w068 | d612 | e018 |
| T186E | 30 x 41.5 x 30 mm | cable | w068 | d611 | e018 |

Q25 – Opposed mode sensor – Emitter



General data

| | | | |
|----------------------------|--------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Lens material | plastic |
| Power-on, indicator | LED | Ambient temperature | -40...+70 °C |
| Protection class | IP68 / IP69K | Light type | IR |
| Housing material | plastic, PBT | Range | 0...20000 mm |

A receiver is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|--------|-------------------|-----------------------|------|------|------|
| Q256EQ | 25 x 62.7 x 30 mm | connector, M12 x 1 | w068 | d614 | e017 |
| Q256E | 25 x 50.2 x 30 mm | cable | w068 | d613 | e017 |

S30 – Opposed mode sensor – Emitter



General data

| | | | |
|----------------------------|--------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Lens material | plastic |
| Power-on, indicator | LED | Ambient temperature | -40...+70 °C |
| Protection class | IP68 / IP69K | Light type | IR |
| Housing material | plastic, PBT | Range | 0...60000 mm |

A receiver is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|--------|---------------|-----------------------|------|------|------|
| S306EQ | Ø30 x 77.5 mm | connector, M12 x 1 | w068 | d616 | e019 |
| S306E | Ø30 x 68.7 mm | cable | w068 | d615 | e019 |

T30 – Opposed mode sensor – Emitter



General data

| | | | |
|----------------------------|--------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Lens material | plastic |
| Power-on, indicator | LED | Ambient temperature | -40...+70 °C |
| Protection class | IP68 / IP69K | Light type | IR |
| Housing material | plastic, PBT | Range | 0...60000 mm |

A receiver is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|--------|-------------------|-----------------------|------|------|------|
| T306EQ | 40 x 64 x 45 mm | connector, M12 x 1 | w068 | d618 | e020 |
| T306E | 40 x 51.5 x 45 mm | cable | w068 | d617 | e020 |

Q40 – Opposed mode sensor – Emitter



General data

| | | | |
|----------------------------|--------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Lens material | plastic |
| Power-on, indicator | LED | Ambient temperature | -40...+70 °C |
| Protection class | IP68 / IP69K | Light type | IR |
| Housing material | plastic, PBT | Range | 0...60000 mm |

A receiver is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|--------|-------------------|-----------------------|------|------|------|
| Q406EQ | 40 x 82.5 x 46 mm | connector, M12 x 1 | w068 | d620 | e019 |
| Q406E | 40 x 69.8 x 46 mm | cable | w068 | d619 | e019 |

M18 – Opposed mode sensor – Receiver



General data

| | | | |
|----------------------------|------------------------------|----------------------------|---------------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | metal, V2A (1.4305) |
| Error message type | LED | Lens material | plastic |
| Output | connection programmable, PNP | Ambient temperature | -40...+70 °C |
| Switching frequency | ≤ 160 Hz | Range | 0...20000 mm |

An emitter is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|----------|---------------|-----------------------|------|------|------|
| M18SP6RQ | Ø18 x 78 mm | connector, M12 x 1 | w153 | d606 | e017 |
| M18SP6R | Ø18 x 59.2 mm | cable | w153 | d605 | e017 |

S18 – Opposed mode sensor – Receiver



| | | | |
|----------------------------|------------------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Protection class | IP68 / IP69K |
| Power-on, indicator | LED | Housing material | plastic, PBT |
| Error message type | LED | Lens material | plastic |
| Output | connection programmable, PNP | Ambient temperature | -40...+70 °C |
| Switching frequency | ≤ 160 Hz | Range | 0...20000 mm |

An emitter is required.

Types and data – selection table

| Type | Switching frequency | Dimensions | Electrical connection | w | d | e |
|----------|---------------------|---------------|-----------------------|------|------|------|
| S18SP6RQ | ≤ 0.16 kHz | ∅18 x 78.7 mm | connector, M12 x 1 | w153 | d607 | e017 |
| S18SP6R | - | ∅18 x 59.2 mm | cable | w153 | d610 | e017 |

T18 – Opposed mode sensor – Emitter



| | | | |
|----------------------------|------------------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Protection class | IP68 / IP69K |
| Power-on, indicator | LED | Housing material | plastic, PBT |
| Error message type | LED | Lens material | plastic |
| Output | connection programmable, PNP | Ambient temperature | -40...+70 °C |
| Switching frequency | ≤ 160 Hz | Range | 0...20000 mm |

An emitter is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|----------|-------------------|-----------------------|------|------|------|
| T18SP6RQ | 30 x 54 x 30 mm | connector, M12 x 1 | w153 | d612 | e018 |
| T18SP6R | 30 x 41.5 x 30 mm | cable | w153 | d611 | e018 |

Q25 – Opposed mode sensor – Receiver



| | | | |
|----------------------------|---------------------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Protection class | IP68 / IP69K |
| Power-on, indicator | LED | Housing material | plastic, PBT |
| Error message type | LED | Lens material | plastic |
| Output | connection programmable, PNP | Ambient temperature | -40...+70 °C |
| Switching frequency | ≤ 160 Hz | Range | 0...20000 mm |

An emitter is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|----------|-------------------|-----------------------|------|------|------|
| Q25SP6RQ | 25 x 62.7 x 30 mm | connector, M12 x 1 | w153 | d614 | e017 |
| Q25SP6R | 25 x 50.2 x 30 mm | cable | w153 | d613 | e017 |

S30 – Opposed mode sensor – Receiver



| | | | |
|----------------------------|---------------------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Protection class | IP68 / IP69K |
| Power-on, indicator | LED | Housing material | plastic, PBT |
| Error message type | LED | Lens material | plastic |
| Output | connection programmable, PNP | Ambient temperature | -40...+70 °C |
| Switching frequency | ≤ 160 Hz | Range | 0...60000 mm |

An emitter is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|----------|---------------|-----------------------|------|------|------|
| S30SP6RQ | Ø30 x 77.5 mm | connector, M12 x 1 | w153 | d616 | e019 |
| S30SP6R | Ø30 x 68.7 mm | cable | w153 | d615 | e019 |

T30 – Opposed mode sensor – Receiver



| | | | |
|----------------------------|---------------------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Protection class | IP68 / IP69K |
| Power-on, indicator | LED | Housing material | plastic, PBT |
| Error message type | LED | Lens material | plastic |
| Output | connection programmable, PNP | Ambient temperature | -40...+70 °C |
| Switching frequency | ≤ 160 Hz | Range | 0...60000 mm |

An emitter is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|----------|-------------------|-----------------------|------|------|------|
| T30SP6RQ | 40 x 64 x 45 mm | connector, M12 x 1 | w153 | d618 | e020 |
| T30SP6R | 40 x 51.5 x 45 mm | cable | w153 | d617 | e020 |

Q40 – Opposed mode sensor – Receiver



| | | | |
|----------------------------|---------------------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Protection class | IP68 / IP69K |
| Power-on, indicator | LED | Housing material | plastic, PBT |
| Error message type | LED | Lens material | plastic |
| Output | connection programmable, PNP | Ambient temperature | -40...+70 °C |
| Switching frequency | ≤ 160 Hz | Range | 0...60000 mm |
| Dimensions | 40 x 40 x 46 mm | | |

An emitter is required.

Types and data – selection table

| Type | Electrical connection | w | d |
|----------|-----------------------|------|------|
| Q40SP6RQ | connector, M12 x 1 | w153 | d620 |
| Q40SP6R | cable | w153 | d619 |

M18 – Retroreflective sensor



| | | | |
|----------------------------|---------------------------------|----------------------------|---------------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Housing material | metal, V2A (1.4305) |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | -40...+70 °C |
| Output | connection programmable, PNP | Light type | IR |
| Switching frequency | ≤ 160 Hz | Range | 50...2000 mm |
| Protection class | IP67 | | |

A reflector is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|----------|---------------|-----------------------|------|------|------|
| M18SP6LQ | Ø18 x 78 mm | connector, M12 x 1 | w153 | d606 | e021 |
| M18SP6L | Ø18 x 59.2 mm | cable | w153 | d605 | e021 |

S18 – Retroreflective sensor



| | | | |
|----------------------------|---------------------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Housing material | plastic, PBT |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | -40...+70 °C |
| Output | connection programmable, PNP | Light type | IR |
| Switching frequency | ≤ 160 Hz | Range | 50...2000 mm |
| Protection class | IP68 / IP69K | | |

A reflector is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|----------|---------------|-----------------------|------|------|------|
| S18SP6LQ | Ø18 x 78.7 mm | connector, M12 x 1 | w153 | d607 | e021 |
| S18SP6L | Ø18 x 59.2 mm | cable | w153 | d610 | e021 |

T18 – Retroreflective sensor



| | | | |
|----------------------------|---------------------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Housing material | plastic, PBT |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | -40...+70 °C |
| Output | connection programmable, PNP | Light type | IR |
| Switching frequency | ≤ 160 Hz | Range | 50...2000 mm |
| Protection class | IP68 / IP69K | | |

A reflector is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|----------|-------------------|-----------------------|------|------|------|
| T18SP6LQ | 30 x 54 x 30 mm | connector, M12 x 1 | w153 | d612 | e021 |
| T18SP6L | 30 x 41.5 x 30 mm | cable | w153 | d611 | e021 |

M18 – Retroreflective sensor with polarizing filter



| | | | |
|----------------------------|---------------------------------|----------------------------|---------------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Housing material | metal, V2A (1.4305) |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | -40...+70 °C |
| Output | connection programmable, PNP | Light type | red |
| Switching frequency | ≤ 160 Hz | Range | 50...2000 mm |
| Protection class | IP67 | | |

A reflector is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|-----------|---------------|-----------------------|------|------|------|
| M18SP6LPQ | Ø18 x 78 mm | connector, M12 x 1 | w153 | d606 | e021 |
| M18SP6LP | Ø18 x 59.2 mm | cable | w153 | d605 | e021 |

S18 – Retroreflective sensor with polarizing filter



| | | | |
|----------------------------|---------------------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Housing material | plastic, PBT |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | -40...+70 °C |
| Output | connection programmable, PNP | Light type | red |
| Switching frequency | ≤ 160 Hz | Range | 50...2000 mm |
| Protection class | IP68 / IP69K | | |

A reflector is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|-----------|---------------|-----------------------|------|------|------|
| S18SP6LPQ | Ø18 x 78.7 mm | connector, M12 x 1 | w153 | d607 | e021 |
| S18SP6LP | Ø18 x 59.2 mm | cable | w153 | d610 | e021 |

T18 – Retroreflective sensor with polarizing filter



| | | | |
|----------------------------|---------------------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Housing material | plastic, PBT |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | -40...+70 °C |
| Output | connection programmable, PNP | Light type | red |
| Switching frequency | ≤ 160 Hz | Range | 50...2000 mm |
| Protection class | IP68 / IP69K | | |

A reflector is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|-----------|-------------------|-----------------------|------|------|------|
| T18SP6LPQ | 30 x 54 x 30 mm | connector, M12 x 1 | w153 | d612 | e021 |
| T18SP6LP | 30 x 41.5 x 30 mm | cable | w153 | d611 | e021 |

Q25 – Retroreflective sensor with polarizing filter



| | | | |
|----------------------------|---------------------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Housing material | plastic, PBT |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | -40...+70 °C |
| Output | connection programmable, PNP | Light type | red |
| Switching frequency | ≤ 160 Hz | Range | 50...2000 mm |
| Protection class | IP68 / IP69K | | |

A reflector is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|-----------|-------------------|-----------------------|------|------|------|
| Q25SP6LPQ | 25 x 62.7 x 30 mm | connector, M12 x 1 | w153 | d614 | e021 |
| Q25SP6LP | 25 x 50.2 x 30 mm | cable | w153 | d613 | e021 |

S30 – Retroreflective sensor with polarizing filter



| | | | |
|----------------------------|---------------------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Housing material | plastic, PBT |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | -40...+70 °C |
| Output | connection programmable, PNP | Light type | red |
| Switching frequency | ≤ 160 Hz | Range | 50...6000 mm |
| Protection class | IP68 / IP69K | | |

A reflector is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|-----------|---------------|-----------------------|------|------|------|
| S30SP6LPQ | Ø30 x 77.5 mm | connector, M12 x 1 | w153 | d616 | e022 |
| S30SP6LP | Ø30 x 68.7 mm | cable | w153 | d615 | e022 |

T30 – Retroreflective sensor with polarizing filter



| | | | |
|----------------------------|---------------------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Housing material | plastic, PBT |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | -40...+70 °C |
| Output | connection programmable, PNP | Light type | red |
| Switching frequency | ≤ 160 Hz | Range | 50...6000 mm |
| Protection class | IP68 / IP69K | | |

A reflector is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|-----------|-------------------|-----------------------|------|------|------|
| T30SP6LPQ | 40 x 64 x 45 mm | connector, M12 x 1 | w153 | d618 | e022 |
| T30SP6LP | 40 x 51.5 x 45 mm | cable | w153 | d617 | e022 |

Q40 – Retroreflective sensor with polarizing filter



| | | | |
|----------------------------|---------------------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Housing material | plastic, PBT |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | -40...+70 °C |
| Output | connection programmable, PNP | Light type | red |
| Switching frequency | ≤ 160 Hz | Range | 50...6000 mm |
| Protection class | IP68 / IP69K | | |

A reflector is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|-----------|-------------------|-----------------------|------|------|------|
| Q40SP6LPQ | 40 x 82.5 x 46 mm | connector, M12 x 1 | w153 | d620 | e022 |
| Q40SP6LP | 40 x 69.8 x 46 mm | cable | w153 | d619 | e022 |

M18 – Diffuse mode sensor with fixed-field



| | | | |
|----------------------------|------------------------------|----------------------------|---------------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | metal, V2A (1.4305) |
| Error message type | LED | Lens material | plastic |
| Output | connection programmable, PNP | Ambient temperature | -40...+70 °C |
| Switching frequency | ≤ 160 Hz | Light type | IR |

Types and data – selection table

| Type | Dimensions | Electrical connection | Range | w | d | e |
|--------------|---------------|-----------------------|------------|------|------|------|
| M18SP6FF25Q | Ø18 x 83.8 mm | connector, M12 x 1 | 0...25 mm | w153 | d621 | e023 |
| M18SP6FF25 | Ø18 x 65 mm | cable | 0...25 mm | w153 | d622 | e023 |
| M18SP6FF50 | Ø18 x 65 mm | cable | 0...50 mm | w153 | d622 | e024 |
| M18SP6FF50Q | Ø18 x 83.8 mm | connector, M12 x 1 | 0...50 mm | w153 | d621 | e024 |
| M18SP6FF100 | Ø18 x 65 mm | cable | 0...100 mm | w153 | d622 | e024 |
| M18SP6FF100Q | Ø18 x 83.8 mm | connector, M12 x 1 | 0...100 mm | w153 | d621 | e024 |

S18 – Diffuse mode sensor with fixed-field



| | | | |
|----------------------------|------------------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Protection class | IP68 / IP69K |
| Power-on, indicator | LED | Housing material | plastic, PBT |
| Error message type | LED | Lens material | plastic |
| Output | connection programmable, PNP | Ambient temperature | -40...+70 °C |
| Switching frequency | ≤ 160 Hz | Light type | IR |

Types and data – selection table

| Type | Dimensions | Electrical connection | Range | w | d | e |
|--------------|---------------|-----------------------|------------|------|------|------|
| S18SP6FF25Q | Ø18 x 84.1 mm | connector, M12 x 1 | 0...25 mm | w153 | d623 | e023 |
| S18SP6FF25 | Ø18 x 65 mm | cable | 0...25 mm | w153 | d624 | e023 |
| S18SP6FF50 | Ø18 x 65 mm | cable | 0...50 mm | w153 | d624 | e024 |
| S18SP6FF50Q | Ø18 x 84.1 mm | connector, M12 x 1 | 0...50 mm | w153 | d623 | e024 |
| S18SP6FF100 | Ø18 x 65 mm | cable | 0...100 mm | w153 | d624 | e024 |
| S18SP6FF100Q | Ø18 x 84.1 mm | connector, M12 x 1 | 0...100 mm | w153 | d623 | e024 |

w Wiring diagrams on page 832 ff d Dimension drawing on page 842 ff e Excess gain curves on page 922 ff a Accessories on page 788 ff

T18 – Diffuse mode sensor with fixed-field



General data

| | | | |
|----------------------------|---------------------------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP68 / IP69K |
| Power-on, indicator | LED | Housing material | plastic, PBT |
| Error message type | LED | Lens material | plastic |
| Output | connection programmable, PNP | Ambient temperature | -40...+70 °C |
| Switching frequency | ≤ 160 Hz | Light type | IR |

Types and data – selection table

| Type | Dimensions | Electrical connection | Range | w | d | e |
|--------------|-------------------|-----------------------|------------|------|------|------|
| T18SP6FF25Q | 30 x 54 x 30 mm | connector, M12 x 1 | 0...25 mm | w153 | d612 | e023 |
| T18SP6FF25 | 30 x 41.5 x 30 mm | cable | 0...25 mm | w153 | d611 | e023 |
| T18SP6FF50 | 30 x 41.5 x 30 mm | cable | 0...50 mm | w153 | d611 | e024 |
| T18SP6FF50Q | 30 x 54 x 30 mm | connector, M12 x 1 | 0...50 mm | w153 | d612 | e024 |
| T18SP6FF100 | 30 x 41.5 x 30 mm | cable | 0...100 mm | w153 | d611 | e024 |
| T18SP6FF100Q | 30 x 54 x 30 mm | connector, M12 x 1 | 0...100 mm | w153 | d612 | e024 |

Q25 – Diffuse mode sensor with fixed-field



General data

| | | | |
|----------------------------|---------------------------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP68 / IP69K |
| Power-on, indicator | LED | Housing material | plastic, PBT |
| Error message type | LED | Lens material | plastic |
| Output | connection programmable, PNP | Ambient temperature | -40...+70 °C |
| Switching frequency | ≤ 160 Hz | Light type | IR |

Types and data – selection table

| Type | Dimensions | Electrical connection | Range | w | d | e |
|--------------|-------------------|-----------------------|------------|------|------|------|
| Q25SP6FF25Q | 25 x 62.7 x 30 mm | connector, M12 x 1 | 0...25 mm | w153 | d614 | e023 |
| Q25SP6FF25 | 25 x 50.2 x 30 mm | cable | 0...25 mm | w153 | d613 | e023 |
| Q25SP6FF50 | 25 x 50.2 x 30 mm | cable | 0...50 mm | w153 | d613 | e024 |
| Q25SP6FF50Q | 25 x 62.7 x 30 mm | connector, M12 x 1 | 0...50 mm | w153 | d614 | e024 |
| Q25SP6FF100 | 25 x 50.2 x 30 mm | cable | 0...100 mm | w153 | d613 | e024 |
| Q25SP6FF100Q | 25 x 62.7 x 30 mm | connector, M12 x 1 | 0...100 mm | w153 | d614 | e024 |

S30 – Diffuse mode sensor with fixed-field



General data

| | | | |
|----------------------------|------------------------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP68 / IP69K |
| Power-on, indicator | LED | Housing material | plastic, PBT |
| Error message type | LED | Lens material | plastic |
| Output | connection programmable, PNP | Ambient temperature | -40...+70 °C |
| Switching frequency | ≤ 160 Hz | Light type | IR |

Types and data – selection table

| Type | Dimensions | Electrical connection | Range | w | d | e |
|--------------|---------------|-----------------------|------------|------|------|------|
| S30SP6FF200 | Ø30 x 68.7 mm | cable | 0...200 mm | w153 | d615 | e025 |
| S30SP6FF200Q | Ø30 x 77.5 mm | connector, M12 x 1 | 0...200 mm | w153 | d616 | e025 |
| S30SP6FF400 | Ø30 x 68.7 mm | cable | 0...400 mm | w153 | d615 | e025 |
| S30SP6FF400Q | Ø30 x 77.5 mm | connector, M12 x 1 | 0...400 mm | w153 | d616 | e025 |
| S30SP6FF600 | Ø30 x 68.7 mm | cable | 0...600 mm | w153 | d615 | e026 |
| S30SP6FF600Q | Ø30 x 77.5 mm | connector, M12 x 1 | 0...600 mm | w153 | d616 | e026 |

T30 – Diffuse mode sensor with fixed-field



General data

| | | | |
|----------------------------|------------------------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP68 / IP69K |
| Power-on, indicator | LED | Housing material | plastic, PBT |
| Error message type | LED | Lens material | plastic |
| Output | connection programmable, PNP | Ambient temperature | -40...+70 °C |
| Switching frequency | ≤ 160 Hz | Light type | IR |

Types and data – selection table

| Type | Dimensions | Electrical connection | Range | w | d | e |
|--------------|-------------------|-----------------------|------------|------|------|------|
| T30SP6FF200 | 40 x 51.5 x 45 mm | cable | 0...200 mm | w153 | d617 | e025 |
| T30SP6FF200Q | 40 x 64 x 45 mm | connector, M12 x 1 | 0...200 mm | w153 | d618 | e025 |
| T30SP6FF400 | 40 x 51.5 x 45 mm | cable | 0...400 mm | w153 | d617 | e025 |
| T30SP6FF400Q | 40 x 64 x 45 mm | connector, M12 x 1 | 0...400 mm | w153 | d618 | e025 |
| T30SP6FF600Q | 40 x 64 x 45 mm | connector, M12 x 1 | 0...600 mm | w153 | d618 | e026 |
| T30SP6FF600 | 40 x 51.5 x 45 mm | cable | 0...600 mm | w153 | d617 | e026 |

Q40 – Diffuse mode sensor with fixed-field



General data

| | | | |
|----------------------------|---------------------------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP68 / IP69K |
| Power-on, indicator | LED | Housing material | plastic, PBT |
| Error message type | LED | Lens material | plastic |
| Output | connection programmable, PNP | Ambient temperature | -40...+70 °C |
| Switching frequency | ≤ 160 Hz | Light type | IR |

Types and data – selection table

| Type | Dimensions | Electrical connection | Range | w | d | e |
|--------------|-------------------|-----------------------|------------|------|------|------|
| Q40SP6FF200 | 40 x 69.8 x 46 mm | cable | 0...200 mm | w153 | d619 | e025 |
| Q40SP6FF200Q | 40 x 82.5 x 46 mm | connector, M12 x 1 | 0...200 mm | w153 | d620 | e025 |
| Q40SP6FF400 | 40 x 69.8 x 46 mm | cable | 0...400 mm | w153 | d619 | e025 |
| Q40SP6FF400Q | 40 x 82.5 x 46 mm | connector, M12 x 1 | 0...400 mm | w153 | d620 | e025 |
| Q40SP6FF600 | 40 x 69.8 x 46 mm | cable | 0...600 mm | w153 | d619 | e026 |
| Q40SP6FF600Q | 40 x 82.5 x 46 mm | connector, M12 x 1 | 0...600 mm | w153 | d620 | e026 |

M18 – Diffuse mode sensor



General data

| | | | |
|----------------------------|---------------------------------|----------------------------|---------------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | metal, V2A (1.4305) |
| Error message type | LED | Lens material | plastic |
| Output | connection programmable, PNP | Ambient temperature | -40...+70 °C |
| Switching frequency | ≤ 160 Hz | Light type | IR |

Types and data – selection table

| Type | Dimensions | Electrical connection | Range | w | d | e |
|-----------|---------------|-----------------------|------------|------|------|------|
| M18SP6D | Ø18 x 59.2 mm | cable | 0...100 mm | w153 | d605 | e027 |
| M18SP6DQ | Ø18 x 78 mm | connector, M12 x 1 | 0...100 mm | w153 | d606 | e027 |
| M18SP6DL | Ø18 x 59.2 mm | cable | 2...300 mm | w153 | d605 | e027 |
| M18SP6DLQ | Ø18 x 78 mm | connector, M12 x 1 | 2...300 mm | w153 | d606 | e027 |

S18 – Diffuse mode sensor



| | | | |
|----------------------------|------------------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Protection class | IP68 / IP69K |
| Power-on, indicator | LED | Housing material | plastic, PBT |
| Error message type | LED | Lens material | plastic |
| Output | connection programmable, PNP | Ambient temperature | -40...+70 °C |
| Switching frequency | ≤ 160 Hz | Light type | IR |

Types and data – selection table

| Type | Dimensions | Electrical connection | Range | w | d | e |
|-----------|---------------|-----------------------|------------|------|------|------|
| S18SP6D | Ø18 x 59.2 mm | cable | 0...100 mm | w153 | d610 | e027 |
| S18SP6DQ | Ø18 x 78.7 mm | connector, M12 x 1 | 0...100 mm | w153 | d607 | e027 |
| S18SP6DL | Ø18 x 59.2 mm | cable | 2...300 mm | w153 | d610 | e027 |
| S18SP6DLQ | Ø18 x 78.7 mm | connector, M12 x 1 | 2...300 mm | w153 | d607 | e027 |

T18 – Diffuse mode sensor



| | | | |
|----------------------------|------------------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Housing material | plastic, PBT |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | -40...+70 °C |
| Output | connection programmable, PNP | Light type | IR |
| Switching frequency | ≤ 160 Hz | Range | 0...500 mm |
| Protection class | IP68 / IP69K | | |

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|----------|-------------------|-----------------------|------|------|------|
| T18SP6DQ | 30 x 54 x 30 mm | connector, M12 x 1 | w153 | d625 | e028 |
| T18SP6D | 30 x 41.5 x 30 mm | cable | w153 | d611 | e028 |

Compact sensors M12



The M12 provide many functions incorporated in a rugged metal housing. With a diameter of only 12 mm, they can be mounted even in poorly accessible places. Even under rough operating conditions the IP67 rated sensors work convincingly powerfull, such as their bigger counterparts.

The operating modes are opposed, retroreflective with/without polarizing filter as well as diffuse mode with background suppression.

Features

- M12 sensor series, threaded barrel, metal
- All operating modes
- Easily aligned through a visible red light beam
- LED indicating power-on and light detection
- PNP or NPN output
- Protection class IP67
- 2 m connection cable, M12 x 1 plug connection or cable with M12 x 1 plug connection

Type code M12

| | | | |
|-----|---|------|----|
| M12 | P | FF25 | Q8 |
|-----|---|------|----|

| | | | | | |
|-----|--------|---|--------|------|----------------|
| M12 | Series | P | Output | FF25 | Operating mode |
|-----|--------|---|--------|------|----------------|

Series
M12 thread, Ø 12 thread

Output
N NPN
P PNP

Operating mode
D diffuse mode
E opposed mode emitter
FF25 diffuse mode fixed field 0...25 mm
LP retroreflective mode polarizing filter
LV retroreflective mode visible red light
R receiver
6E1LD 10...30 VDC laser emitter, class 1
6E2LD 10...30 VDC, laser emitter, class 2

| | |
|----|-----------------------|
| Q8 | Electrical connection |
|----|-----------------------|

Electrical connection
Q5 pigtail with connector, Ø 8 mm
Q8 connector, M12 x 1
blank cable connection, 2 m

M12 – Opposed mode sensor – Emitter



General data

| | | | |
|----------------------------|-------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Lens material | plastic |
| Power-on, indicator | LED | Ambient temperature | -20...+60 °C |
| Error message type | LED | Light type | red |
| Protection class | IP67 | Range | 0...5000 mm |
| Housing material | metal, CuZn | | |

A receiver is required.


Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|--------|---------------|-----------------------|------|------|------|
| M12EQ8 | Ø12 x 74 mm | connector, M12 x 1 | w068 | d627 | e029 |
| M12E | Ø12 x 67.5 mm | cable | w068 | d626 | e029 |

M12 – Opposed mode sensor – Receiver



General data

| | | | |
|---------------------------------------|---|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | metal, CuZn |
| Error message type | LED | Lens material | plastic |
| Indication of excess gain type | LED | Ambient temperature | -20...+60 °C |
| Output |  , PNP | Range | 0...5000 mm |
| Switching frequency | ≤ 500 Hz | | |

An emitter is required.


Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|---------|---------------|-----------------------|------|------|------|
| M12PRQ8 | Ø12 x 74 mm | connector, M12 x 1 | w155 | d627 | e029 |
| M12PR | Ø12 x 67.5 mm | cable | w155 | d626 | e029 |

M12 – Retroreflective sensor



General data

| | | | |
|---------------------------------------|---|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | metal, CuZn |
| Error message type | LED | Lens material | plastic |
| Indication of excess gain type | LED | Ambient temperature | -20...+60 °C |
| Output |  , PNP | Light type | red |
| Switching frequency | ≤ 1 kHz | Range | 0...3000 mm |

A reflector is required.


Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|----------|---------------|-----------------------|------|------|------|
| M12PLVQ8 | Ø12 x 74 mm | connector, M12 x 1 | w155 | d627 | e030 |
| M12PLV | Ø12 x 67.5 mm | cable | w155 | d626 | e030 |

M12 – Retroreflective sensor with polarizing filter



General data

| | | | |
|---------------------------------------|---|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | metal, CuZn |
| Error message type | LED | Lens material | plastic |
| Indication of excess gain type | LED | Ambient temperature | -20...+60 °C |
| Output |  , PNP | Light type | red |
| Switching frequency | ≤ 1 kHz | Range | 0...1500 mm |

A reflector is required.


Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|----------|---------------|-----------------------|------|------|------|
| M12PLPQ8 | Ø12 x 74 mm | connector, M12 x 1 | w155 | d627 | e031 |
| M12PLP | Ø12 x 67.5 mm | cable | w155 | d626 | e031 |

M12 – Diffuse mode sensor



General data

| | | | |
|---------------------------------------|---|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | metal, CuZn |
| Error message type | LED | Lens material | plastic |
| Indication of excess gain type | LED | Ambient temperature | -20...+60 °C |
| Output |  , PNP | Light type | red |
| Switching frequency | ≤ 1 kHz | Range | 0...400 mm |


Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|---------|---------------|-----------------------|------|------|------|
| M12PDQ8 | Ø12 x 74 mm | connector, M12 x 1 | w155 | d627 | e032 |
| M12PD | Ø12 x 67.5 mm | cable | w155 | d626 | e032 |

M12 – Diffuse mode sensor with fixed-field



General data

| | | | |
|---------------------------------------|---|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | metal, CuZn |
| Error message type | LED | Lens material | plastic |
| Indication of excess gain type | LED | Ambient temperature | -20...+60 °C |
| Output |  , PNP | Light type | red |
| Switching frequency | ≤ 1 kHz | | |

Types and data – selection table

| Type | Dimensions | Electrical connection | Range | w | d | e |
|------------|---------------|-----------------------|-----------|------|------|------|
| M12PFF25 | Ø12 x 67.5 mm | cable | 0...25 mm | w155 | d626 | e033 |
| M12PFF25Q8 | Ø12 x 74 mm | connector, M12 x 1 | 0...25 mm | w155 | d627 | e033 |
| M12PFF50 | Ø12 x 67.5 mm | cable | 0...50 mm | w155 | d626 | e034 |
| M12PFF50Q8 | Ø12 x 74 mm | connector, M12 x 1 | 0...50 mm | w155 | d627 | e034 |
| M12PFF75 | Ø12 x 67.5 mm | cable | 0...75 mm | w155 | d626 | e035 |
| M12PFF75Q8 | Ø12 x 74 mm | connector, M12 x 1 | 0...75 mm | w155 | d627 | e035 |

M12 – Opposed mode laser sensor – Emitter



General data

| | |
|----------------------------|-------------|
| Operating voltage | 10...30 VDC |
| Power-on, indicator | LED |
| Dimensions | 57 mm |
| Protection class | IP67 |

| | |
|----------------------------|------------|
| Housing material | metal, AL |
| Lens material | plastic |
| Ambient temperature | 0...+40 °C |
| Light type | red |

Combinable with all standard TURCK receivers; range depending on emitter used.

Types and data – selection table

| Type | Electrical connection | Laser class | w | d |
|-----------|--|-------------------------|------|------|
| M126E1LD | cable with connector | 1 (EN 60825, IEC 60825) | w154 | d628 |
| M126E1LDQ | cable with connector, flange connector, Ø 8 mm | 1 (EN 60825, IEC 60825) | w154 | d629 |
| M126E2LDQ | cable with connector, flange connector, Ø 8 mm | 2 (EN 60825, IEC 60825) | w154 | d629 |
| M126E2LD | cable with connector | 2 (EN 60825, IEC 60825) | w154 | d628 |

Compact sensors QS18



The compact QS18 fit in almost any place. Equipped with standard bores and optionally available M18, they can replace M18 threaded barrel as well as rectangular shaped sensors without thread.

The QS18 are available in many operating modes and achieve an optical power exceeding by far the usual performance of sensors of this size.

Features

- Universal rectangular design, flexible mounting
- Many operating modes, functions and application possibilities
- Response time less than 1 ms
- Rugged, fully encapsulated plastic housing, protected circuit
- Protection class IP67
- Bright LED display, all-round visibility
- 2 m connection cable, M12 x 1 plug connection, cable with M12 x 1 plug connection
- Blind for opposed mode sensors available
- Expert™ QS18E: Easy startup via pushbutton or remote via cable

Type code QS18

| | | | | | |
|------|---|---|---|--------|----|
| QS18 | V | P | 6 | LAF250 | Q5 |
|------|---|---|---|--------|----|

| | | | | | | |
|------|--------|---|---|--------|---|-------------------|
| QS18 | Series | V | P | Output | 6 | Operating voltage |
|------|--------|---|---|--------|---|-------------------|

Series
QS18 rectangular
 height 35 mm, width 15 mm
 depth 21...33 mm

Output
N NPN
P PNP

Operating voltage
6 10...30 VDC

| | |
|--------|----------------|
| LAF250 | Operating mode |
|--------|----------------|

Operating mode

AF100 diffuse mode adjustable field 20...100 mm

CV15 C = convergent mode V = visible red light, focal distance 15 mm

CV16 C = convergent mode V = visible red light focal distance 16 mm

D diffuse mode

DB diffuse mode, without blind zone

DV diffuse mode, visible red light

E emitter, opposed mode

EB emitter, opposed mode sensor range 3 m

FF50 diffuse mode, fixed field 0...50 mm

LAF laser, diffuse mode adjustable field 30...150 mm, class 1

Output function
E teach-in/NO
V NO/NC

LAF250 laser, diffuse mode adjustable field 50...250 mm, class 2

LD laser, diffuse mode

LE laser emitter

LE10 laser emitter, point

LE11 laser emitter, vertical line

LE12 laser emitter, horizontal line

LE14 laser emitter, cross

LLP laser, retroreflective mode polarizing filter

LP retroreflective mode polarizing filter, visible red light

LV retroreflective mode visible red light,

R receiver, opposed mode

RB receiver, opposed mode range 3 m

W diffuse mode, wide angle

| | |
|----|-----------------------|
| Q5 | Electrical connection |
|----|-----------------------|

Electrical connection

Q pigtail with connector, Ø 8 mm

Q5 pigtail with connector, M12 x 1 connector, Ø 8 mm

Q7 connector, Ø 8 mm

Q8 connector, M12 x 1

blank cable connection, 2 m

QS18 – Opposed mode sensor – Emitter – M18 thread



General data

| | | | |
|----------------------------|-----------------|-------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | plastic, ABS |
| Dimensions | 15 x 35 x 31 mm | Lens material | plastic |

A receiver is required.

Types and data – selection table

| Type | Electrical connection | Ambient temperature | Light type | Range | Laser class | w | d | e |
|-------------|-----------------------|---------------------|------------|--------------|-------------------------|------|------|------|
| QS186EQ8 | connector, M12 x 1 | -20...+70 °C | IR | 0...20000 mm | - | w156 | d630 | e036 |
| QS186LE11Q8 | connector, M12 x 1 | -10...+50 °C | red | 0...2000 mm | 1 (EN 60825, IEC 60825) | w158 | d633 | |
| QS186LE12Q8 | connector, M12 x 1 | -10...+50 °C | red | 0...2000 mm | 1 (EN 60825, IEC 60825) | w158 | d633 | |
| QS186LE11 | cable | -10...+50 °C | red | 0...2000 mm | 1 (EN 60825, IEC 60825) | w157 | d631 | |
| QS186LE12 | cable | -10...+50 °C | red | 0...2000 mm | 1 (EN 60825, IEC 60825) | w068 | d631 | |
| QS186E | cable | -20...+70 °C | IR | 0...20000 mm | - | w068 | d631 | e036 |
| QS186LE | cable | -10...+50 °C | red | 0...30000 mm | 1 (EN 60825, IEC 60825) | w157 | d632 | |
| QS186LEQ8 | connector, M12 x 1 | -10...+50 °C | red | 0...30000 mm | 1 (EN 60825, IEC 60825) | w158 | d633 | |
| QS186LE10Q8 | connector, M12 x 1 | -10...+50 °C | red | 0...5000 mm | 1 (EN 60825, IEC 60825) | w158 | d633 | |
| QS186LE14Q8 | connector, M12 x 1 | -10...+50 °C | red | 0...5000 mm | 1 (EN 60825, IEC 60825) | w158 | d633 | |
| QS186LE10 | cable | -10...+50 °C | red | 0...5000 mm | 1 (EN 60825, IEC 60825) | w157 | d631 | |
| QS186LE14 | cable | -10...+50 °C | red | 0...5000 mm | 1 (EN 60825, IEC 60825) | w157 | d631 | |

QS18 – Opposed mode sensor – Emitter



General data

| | | | |
|----------------------------|-------------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Lens material | plastic |
| Power-on, indicator | LED | Ambient temperature | -20...+70 °C |
| Dimensions | 15 x 35 x 27.7 mm | Light type | IR |
| Protection class | IP67 | Range | 0...3000 mm |
| Housing material | plastic, ABS | | |

A receiver is required.

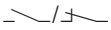
Types and data – selection table

| Type | Electrical connection | w | d | e |
|-----------|-----------------------|------|------|------|
| QS186EBQ8 | connector, M12 x 1 | w068 | d634 | e036 |
| QS186EB | cable | w068 | d635 | e036 |

QS18 – Opposed mode sensor – Receiver – M18 thread



General data

| | | | |
|---------------------------------------|---|----------------------------|-----------------|
| Operating voltage | 10...30 VDC | Dimensions | 15 x 35 x 31 mm |
| Power-on, indicator | LED | Protection class | IP67 |
| Error message type | LED | Housing material | plastic, ABS |
| Indication of excess gain type | LED | Lens material | plastic |
| Output |  , PNP | Ambient temperature | -20...+70 °C |
| Switching frequency | ≤ 400 Hz | Range | 0...20000 mm |

An emitter is required.

Types and data – selection table

| Type | Electrical connection | w | d | e |
|------------------|-----------------------|------|------|------|
| QS18VP6RQ8 | connector, M12 x 1 | w155 | d630 | e036 |
| QS18VP6RQ8-02790 | connector, M12 x 1 | w155 | d630 | e036 |
| QS18VP6R | cable | w155 | d631 | e036 |

QS18 – Opposed mode sensor – Receiver



General data

Operating voltage 10...30 VDC

Power-on, indicator LED

Error message type LED

Indication of excess gain type LED

Output  , PNP

Switching frequency ≤ 400 Hz

Dimensions 15 x 35 x 27.7 mm

Protection class IP67

Housing material plastic, ABS

Lens material plastic

Ambient temperature -20...+70 °C

Range 0...3000 mm

An emitter is required.

Types and data – selection table

| Type | Electrical connection | w | d | e |
|-------------|-----------------------|------|------|------|
| QS18VP6RBQ8 | connector, M12 x 1 | w155 | d634 | e036 |
| QS18VP6RB | cable | w155 | d635 | e036 |

QS18 – Retroreflective sensor



General data

Operating voltage 10...30 VDC

Power-on, indicator LED

Error message type LED

Indication of excess gain type LED

Output  , PNP

Switching frequency ≤ 800 Hz

Dimensions 15 x 35 x 31 mm

Protection class IP67

Housing material plastic, ABS

Lens material plastic

Ambient temperature -20...+70 °C

Light type red

Range 0...6500 mm

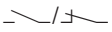
A reflector is required.

Types and data – selection table

| Type | Electrical connection | w | d | e |
|-------------|-----------------------|------|------|------|
| QS18VP6LVQ8 | connector, M12 x 1 | w155 | d637 | e037 |
| QS18VP6LV | cable | w155 | d636 | e037 |

QS18 – Retroreflective sensor with polarizing filter



| | | | |
|---------------------------------------|---|----------------------------|--------------|
| General data | | Protection class | IP67 |
| Operating voltage | 10...30 VDC | Housing material | plastic, ABS |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | -20...+70 °C |
| Indication of excess gain type | LED | Light type | red |
| Output |  , PNP | Range | 50...3500 mm |
| Switching frequency | ≤ 800 Hz | | |
| Dimensions | 15 x 35 x 31 mm | | |

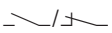
A reflector is required.

Types and data – selection table

| Type | Electrical connection | w | d | e |
|-------------|-----------------------|------|------|------|
| QS18VP6LPQ8 | connector, M12 x 1 | w155 | d637 | e037 |
| QS18VP6LP | cable | w155 | d636 | e037 |

QS18 – Retroreflective laser sensor with polarizing filter



| | | | |
|---------------------------------------|---|----------------------------|-------------------------|
| General data | | Protection class | IP67 |
| Operating voltage | 10...30 VDC | Housing material | plastic, ABS |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | -10...+50 °C |
| Indication of excess gain type | LED | Light type | red |
| Output |  , PNP | Range | 100...10000 mm |
| Switching frequency | ≤ 700 Hz | Laser class | 1 (EN 60825, IEC 60825) |
| Dimensions | 15 x 35 x 31 mm | | |

Reflector included in scope of supply.


Types and data – selection table

| Type | Electrical connection | w | d | e |
|--------------|-----------------------|------|------|------|
| QS18VP6LLPQ8 | connector, M12 x 1 | w155 | d637 | e038 |
| QS18VP6LLP | cable | w155 | d636 | e038 |

QS18 – Diffuse mode sensor – M18 thread



General data

| | | | |
|---------------------------------------|---|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | plastic, ABS |
| Error message type | LED | Lens material | plastic |
| Indication of excess gain type | LED | Ambient temperature | -20...+70 °C |
| Output |  , PNP | Light type | IR |
| Switching frequency | ≤ 800 Hz | Range | 0...450 mm |
| Dimensions | 15 x 35 x 31 mm | | |


Types and data – selection table

| Type | Electrical connection | w | d | e |
|------------|-----------------------|------|------|------|
| QS18VP6DQ8 | connector, M12 x 1 | w155 | d637 | e039 |
| QS18VP6D | cable | w155 | d636 | e039 |

QS18 – Diffuse mode sensor



General data

| | | | |
|---------------------------------------|---|----------------------------|-------------------|
| Operating voltage | 10...30 VDC | Dimensions | 15 x 35 x 21.1 mm |
| Power-on, indicator | LED | Protection class | IP67 |
| Error message type | LED | Housing material | plastic, ABS |
| Indication of excess gain type | LED | Lens material | plastic |
| Output |  , PNP | Ambient temperature | -20...+70 °C |
| Switching frequency | ≤ 800 Hz | Light type | IR |

Types and data – selection table

| Type | Electrical connection | Range | w | d | e |
|-------------|-----------------------|------------|------|------|------|
| QS18VP6W | cable | 0...100 mm | w155 | d638 | e039 |
| QS18VP6WQ8 | connector, M12 x 1 | 0...100 mm | w155 | d639 | e039 |
| QS18VP6DB | cable | 0...450 mm | w155 | d638 | e039 |
| QS18VP6DBQ8 | connector, M12 x 1 | 0...450 mm | w155 | d639 | e039 |

QS18 – Diffuse mode sensor with fixed-field



General data

Operating voltage 10...30 VDC

Power-on, indicator LED

Error message type LED

Indication of excess gain type LED

Output , PNP

Switching frequency ≤ 625 Hz

Dimensions 15 x 35 x 31 mm

Protection class IP67

Housing material plastic, ABS

Lens material plastic

Ambient temperature -20...+70 °C

Light type red

Types and data – selection table

| Type | Electrical connection | Range | w | d | e |
|----------------|-----------------------|------------|------|------|------|
| QS18VP6FF50 | cable | 0...50 mm | w155 | d631 | e041 |
| QS18VP6FF50Q8 | connector, M12 x 1 | 0...50 mm | w155 | d630 | e041 |
| QS18VP6FF100 | cable | 0...100 mm | w155 | d631 | e042 |
| QS18VP6FF100Q8 | connector, M12 x 1 | 0...100 mm | w155 | d630 | e042 |

QS18 – Diffuse mode sensor with adjustable field



General data

Operating voltage 10...30 VDC

Power-on, indicator LED

Error message type LED

Indication of excess gain type LED

Output , PNP

Switching frequency ≤ 700 Hz

Dimensions 15 x 34.5 x 21.1 mm

Protection class IP67

Housing material plastic, ABS

Lens material plastic

Light type red

Types and data – selection table

| Type | Electrical connection | Ambient temperature | Range | Laser class | w | d | e |
|-----------------|-------------------------------|---------------------|------------|-------------------------|------|------|------|
| QS18VP6AF100 | cable | 0...+55 °C | 1...100 mm | - | w155 | d640 | e043 |
| QS18VP6AF100Q5 | cable with connector, M12 x 1 | 0...+55 °C | 1...100 mm | - | w155 | d641 | e043 |
| QS18VP6LAF | cable | -10...+50 °C | 1...150 mm | 1 (EN 60825, IEC 60825) | w155 | d640 | e044 |
| QS18VP6LAFQ5 | cable with connector, M12 x 1 | -10...+50 °C | 1...150 mm | 1 (EN 60825, IEC 60825) | w155 | d641 | e044 |
| QS18VP6LAF250 | cable | -10...+50 °C | 1...250 mm | 2 (EN 60825, IEC 60825) | w155 | d640 | e045 |
| QS18VP6LAF250Q5 | cable with connector, M12 x 1 | -10...+50 °C | 1...250 mm | 2 (EN 60825, IEC 60825) | w155 | d641 | e045 |

QS18 – Convergent mode sensor



General data

Operating voltage 10...30 VDC

Power-on, indicator LED

Error message type LED

Indication of excess gain type LED

Output , PNP

Switching frequency ≤ 800 Hz

Dimensions 15 x 35 x 33.2 mm

Protection class IP67

Housing material plastic, ABS

Lens material plastic

Ambient temperature -20...+70 °C

Light type red

Types and data – selection table

| Type | Electrical connection | Focal distance | w | d | e |
|---------------|-----------------------|----------------|------|------|------|
| QS18VP6CV15Q8 | connector, M12 x 1 | 16 mm | w155 | d643 | e046 |
| QS18VP6CV45Q8 | connector, M12 x 1 | 43 mm | w155 | d643 | e046 |
| QS18VP6CV15 | cable | 16 mm | w155 | d642 | e046 |
| QS18VP6CV45 | cable | 43 mm | w155 | d642 | e046 |

QS18 – Diffuse mode laser sensor – M18 thread



General data

Operating voltage 10...30 VDC

Power-on, indicator LED

Error message type LED

Indication of excess gain type LED

Output , PNP

Switching frequency ≤ 700 Hz

Dimensions 15 x 35 x 31 mm

Protection class IP67

Housing material plastic, ABS

Lens material plastic

Ambient temperature -10...+50 °C

Light type red

Range 0...300 mm

Laser class 1 (EN 60825, IEC 60825)

Types and data – selection table

| Type | Electrical connection | w | d | e |
|-------------|-----------------------|------|------|------|
| QS18VP6LDQ8 | connector, M12 x 1 | w155 | d637 | e040 |
| QS18VP6LD | cable | w155 | d636 | e040 |

QS18E – Retroreflective sensor with polarizing filter



General data

| | | | |
|----------------------------|-----------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | plastic, ABS |
| Error message type | LED | Lens material | plastic |
| Output | —, PNP | Ambient temperature | -20...+70 °C |
| Switching frequency | ≤ 800 Hz | Light type | red |
| Dimensions | 15 x 35 x 31 mm | Range | 50...3500 mm |

A reflector is required.

Types and data – selection table

| Type | Electrical connection | w | d | e |
|-------------|-----------------------|------|------|------|
| QS18EP6LP | cable | w159 | d644 | e037 |
| QS18EP6LPQ8 | connector, M12 x 1 | w159 | d645 | e037 |

QS18E – Diffuse mode sensor



General data

| | | | |
|----------------------------|-------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | plastic, ABS |
| Error message type | LED | Lens material | plastic |
| Output | —, PNP | Ambient temperature | -20...+70 °C |
| Switching frequency | ≤ 800 Hz | Light type | IR |

Types and data – selection table

| Type | Dimensions | Electrical connection | Range | w | d | e |
|-------------|-------------------|-----------------------|------------|------|------|------|
| QS18EP6W | 15 x 35 x 21.1 mm | cable | 0...300 mm | w159 | d646 | e039 |
| QS18EP6WQ8 | 15 x 35 x 21.1 mm | connector, M12 x 1 | 0...300 mm | w159 | d647 | e039 |
| QS18EP6DB | 15 x 35 x 21.1 mm | cable | 0...500 mm | w159 | d646 | e039 |
| QS18EP6DBQ8 | 15 x 35 x 21.1 mm | connector, M12 x 1 | 0...500 mm | w159 | d647 | e039 |
| QS18EP6D | 15 x 35 x 31 mm | cable | 0...800 mm | w159 | d644 | e039 |
| QS18EP6DQ8 | 15 x 35 x 31 mm | connector, M12 x 1 | 0...800 mm | w159 | d645 | e039 |

QS18E – Convergent mode sensor



General data

| | |
|----------------------------|-----------------|
| Operating voltage | 10...30 VDC |
| Power-on, indicator | LED |
| Error message type | LED |
| Output | \neg , PNP |
| Switching frequency | ≤ 800 Hz |
| Dimensions | 15 x 35 x 31 mm |

| | |
|----------------------------|--------------|
| Protection class | IP67 |
| Housing material | plastic, ABS |
| Lens material | plastic |
| Ambient temperature | -20...+70 °C |
| Light type | red |

Types and data – selection table

| Type | Electrical connection | Focal distance | w | d | e |
|---------------|-----------------------|----------------|------|------|------|
| QS18EP6CV15Q8 | connector, M12 x 1 | 16 mm | w159 | d645 | e046 |
| QS18EP6CV45Q8 | connector, M12 x 1 | 43 mm | w159 | d645 | e046 |
| QS18EP6CV15 | cable | 16 mm | w159 | d644 | e046 |
| QS18EP6CV45 | cable | 43 mm | w159 | d644 | e046 |

Compact sensors Q20



The rectangular Q20 are quickly and easily mounted. Bores with integrated thread make the use of additional mounting nuts redundant.

Whether applied as opposed mode, retro-reflective or diffuse mode sensor, the compact Q20 are striking for their outstanding optical power and reliability. Their flat design enables easy mounting even in confined spaces.

Features

- 3 mm thread bores, 25.4 mm distance inbetween
- Easily aligned through visible light beam (most types)
- Protection class IP67
- Excellent protection against interferences and crosstalk
- Antivalent transistor outputs (NO/NC), PNP/NPN depending on the type
- 2 m connection cable, M8 x 1 plug connection, cable with M8 x 1 plug connection, cable with M12 x 1 plug connection

Type code Q20



Series

Q20 rectangular dimensions
12 x 32 x 20 mm (cable device)
12 x 42 x 20 mm (plug-in device)

Output

P PNP
N NPN

Operating mode

E opposed mode emitter
R opposed mode receiver
EL emitter, long range
RL receiver, long range
LV retroreflective mode visible red light
LP retroreflective mode polarizing filter
DL diffuse mode, long range
DXL diffuse mode sensor extra long range
DV diffuse mode, visible red light



Electrical connection

Q pigtail with connector, M8 x 1
Q5 pigtail with connector, M12 x 1
Q7 connector, M8 mm
blank cable connection, 2 m

Q20 – Opposed mode sensor – Emitter



General data

| | | | |
|----------------------------|-------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Housing material | plastic, ABS |
| Power-on, indicator | LED | Lens material | plastic |
| Protection class | IP67 | Ambient temperature | -20...+60 °C |

A receiver is required.


Types and data – selection table

| Type | Dimensions | Electrical connection | Light type | Range | w | d | e |
|---------|-----------------|-------------------------------|------------|--------------|------|------|------|
| Q20E | 12 x 32 x 20 mm | cable | red | 0...10000 mm | w068 | d648 | e047 |
| Q20EQ | 12 x 32 x 20 mm | cable with connector, M8 x 1 | red | 0...10000 mm | w068 | d649 | e047 |
| Q20EQ5 | 12 x 32 x 20 mm | cable with connector, M12 x 1 | red | 0...10000 mm | w068 | d650 | e047 |
| Q20EQ7 | 12 x 42 x 20 mm | connector, M8 x 1 | red | 0...10000 mm | w068 | d651 | e047 |
| Q20EL | 12 x 32 x 20 mm | cable | IR | 0...15000 mm | w068 | d648 | e047 |
| Q20ELQ | 12 x 32 x 20 mm | cable with connector, M8 x 1 | IR | 0...15000 mm | w068 | d649 | e047 |
| Q20ELQ5 | 12 x 32 x 20 mm | cable with connector, M12 x 1 | IR | 0...15000 mm | w068 | d650 | e047 |
| Q20ELQ7 | 12 x 42 x 20 mm | connector, M8 x 1 | IR | 0...15000 mm | w068 | d651 | e047 |

Q20 – Opposed mode sensor – Receiver



General data

| | | | |
|---------------------------------------|---|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Switching frequency | ≤ 600 Hz |
| Power-on, indicator | LED | Protection class | IP67 |
| Error message type | LED | Housing material | plastic, ABS |
| Indication of excess gain type | LED | Lens material | plastic |
| Output |  , PNP | Ambient temperature | -20...+60 °C |

An emitter is required.

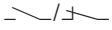
Types and data – selection table

| Type | Dimensions | Electrical connection | Range | w | d | e |
|----------|-----------------|----------------------------------|--------------|------|------|------|
| Q20PRQ | 12 x 32 x 20 mm | cable with connector, M8 x 1 | 0...10000 mm | w155 | d649 | e047 |
| Q20PRQ5 | 12 x 32 x 20 mm | cable with connector, M12 x 1 | 0...10000 mm | w155 | d650 | e047 |
| Q20PRQ7 | 12 x 42 x 20 mm | connector, M8 x 1 | 0...10000 mm | w155 | d651 | e047 |
| Q20PR | 12 x 32 x 20 mm | cable | 0...10000 mm | w155 | d648 | e047 |
| Q20PRL | 12 x 32 x 20 mm | cable | 0...15000 mm | w155 | d648 | e047 |
| Q20PRLQ | 12 x 32 x 20 mm | cable with connector, M8 x 1 | 0...15000 mm | w155 | d649 | e047 |
| Q20PRLQ5 | 12 x 32 x 20 mm | cable with connector, M12 x 1 | 0...15000 mm | w155 | d650 | e047 |
| Q20PRLQ7 | 12 x 42 x 20 mm | connector, M8 x 1 | 0...15000 mm | w155 | d651 | e047 |

Q20 – Retroreflective sensor



General data

| | | | |
|---------------------------------------|---|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | plastic, ABS |
| Error message type | LED | Lens material | plastic |
| Indication of excess gain type | LED | Ambient temperature | -20...+60 °C |
| Output |  , PNP | Light type | red |
| Switching frequency | ≤ 600 Hz | Range | 0...6000 mm |

A reflector is required.

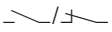
Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|----------|-----------------|-------------------------------|------|------|------|
| Q20PLVQ7 | 12 x 42 x 20 mm | connector, M8 x 1 | w155 | d655 | e048 |
| Q20PLVQ | 12 x 32 x 20 mm | cable with connector, M8 x 1 | w155 | d652 | e048 |
| Q20PLVQ5 | 12 x 32 x 20 mm | cable with connector, M12 x 1 | w155 | d654 | e048 |
| Q20PLV | 12 x 32 x 20 mm | cable | w155 | d653 | e048 |

Q20 – Retroreflective sensor with polarizing filter






General data

| | | | |
|---------------------------------------|---|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | plastic, ABS |
| Error message type | LED | Lens material | plastic |
| Indication of excess gain type | LED | Ambient temperature | -20...+60 °C |
| Output |  , PNP | Light type | red |
| Switching frequency | ≤ 600 Hz | Range | 0...4000 mm |

A reflector is required.

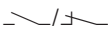
Types and data – selection table

| Type | Dimensions | Electrical connection |  |  |  |
|----------|-----------------|-------------------------------|---|---|---|
| Q20PLPQ7 | 12 x 42 x 20 mm | connector, M8 x 1 | w155 | d655 | e049 |
| Q20PLPQ | 12 x 32 x 20 mm | cable with connector, M8 x 1 | w155 | d652 | e049 |
| Q20PLPQ5 | 12 x 32 x 20 mm | cable with connector, M12 x 1 | w155 | d654 | e049 |
| Q20PLP | 12 x 32 x 20 mm | cable | w155 | d653 | e049 |

Q20 – Diffuse mode sensor



General data

| | | | |
|---------------------------------------|---|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Switching frequency | ≤ 600 Hz |
| Power-on, indicator | LED | Protection class | IP67 |
| Error message type | LED | Housing material | plastic, ABS |
| Indication of excess gain type | LED | Lens material | plastic |
| Output |  , PNP | Ambient temperature | -20...+60 °C |

Types and data – selection table

| Type | Dimensions | Electrical connection | Light type | Range | w | d | e |
|-----------|-----------------|-------------------------------|------------|-------------|------|------|------|
| Q20PD | 12 x 32 x 20 mm | cable | red | 0...250 mm | w155 | d653 | e050 |
| Q20PDQ | 12 x 32 x 20 mm | cable with connector, M8 x 1 | red | 0...250 mm | w155 | d652 | e050 |
| Q20PDQ5 | 12 x 32 x 20 mm | cable with connector, M12 x 1 | red | 0...250 mm | w155 | d654 | e050 |
| Q20PDQ7 | 12 x 42 x 20 mm | connector, M8 x 1 | red | 0...250 mm | w155 | d655 | e050 |
| Q20PDL | 12 x 32 x 20 mm | cable | red | 0...800 mm | w155 | d653 | e051 |
| Q20PDLQ | 12 x 32 x 20 mm | cable with connector, M8 x 1 | red | 0...800 mm | w155 | d652 | e051 |
| Q20PDLQ5 | 12 x 32 x 20 mm | cable with connector, M12 x 1 | red | 0...800 mm | w155 | d654 | e051 |
| Q20PDLQ7 | 12 x 42 x 20 mm | connector, M8 x 1 | red | 0...800 mm | w155 | d655 | e051 |
| Q20PDXL | 12 x 32 x 20 mm | cable | IR | 0...1500 mm | w155 | d653 | e051 |
| Q20PDXLQ | 12 x 32 x 20 mm | cable with connector, M8 x 1 | IR | 0...1500 mm | w155 | d652 | e051 |
| Q20PDXLQ5 | 12 x 32 x 20 mm | cable with connector, M12 x 1 | IR | 0...1500 mm | w155 | d654 | e051 |
| Q20PDXLQ7 | 12 x 42 x 20 mm | connector, M8 x 1 | IR | 0...1500 mm | w155 | d655 | e051 |

Compact sensors QS30



The compact QS30 fit in almost any place. With an optionally available M30 thread and standard bores, they can replace M30 threaded barrel as well as rectangular sensors without thread

The QS30 series offers many operating modes, functions and application possibilities

Features

- Universal rectangular design, flexible mounting
- Many operating modes, functions and application possibilities
- Pushbutton or external programming
- Easy-to-read status indication via 8-segment bargraph display
- Plastic housing, protection class IP67
- Bipolar digital outputs, PNP/NPN
- 30 ms switch-off delay (adjustable)
- 2 m connection cable or M12 x 1 plug connection

Type code QS30

| | | | | |
|------|----|---|-------|---|
| QS30 | VR | 3 | FF600 | Q |
|------|----|---|-------|---|

| | | | | | |
|------|--|--|---|---|-------------------|
| QS30 | Series | VR | Output | 3 | Operating voltage |
| | <p>Series</p> <p>QS30 rectangular 22 x 49 x 35 mm (cable device) 22 x 57 x 35 mm (plug-in device)</p> | <p>Output</p> <p>VR relay output changeover contact NO/NC</p> <p>blank PNP/NPN</p> | <p>Operating voltage</p> <p>3 12...250 VDC, 24...250 VAC</p> <p>blank 10...30 VDC</p> | | |

| | |
|-------|---|
| FF600 | Operating mode |
| | <p>Operating mode</p> <p>AF diffuse mode, adjustable field, bargraph display</p> <p>ARX receiver, high-power light operation</p> <p>D diffuse mode</p> <p>E opposed mode emitter</p> <p>EDV diffuse mode, teachable visible red light bargraph display</p> <p>ELVC retroreflective mode, visible red light, clear-glass recognition, bargraph display</p> <p>EX opposed mode emitter high-power</p> <p>EXH20 opposed mode emitter high-power, water detection</p> <p>FF600 diffuse mode, fixed field 0...600 mm</p> <p>LD laser, diffuse mode bargraph display</p> <p>LDL laser, diffuse mode, long distance, bargraph display</p> |

| | |
|---------------|--|
| LLP | laser, retroreflective mode polarizing filter bargraph display |
| LLPC | laser, retroreflective mode polarizing filter, clear-glass recognition, bargraph display |
| LP | retroreflective mode polarizing filter |
| LV | retroreflective mode |
| R | opposed mode receiver |
| RRH20 | receiver, dark operation water detection |
| RRX | receiver, high-power dark operation |
| RRXH20 | receiver, high-power dark operation water detection |

| | |
|---|--|
| Q | Electrical connection |
| | <p>Electrical connection</p> <p>Q connector, M12 x 1</p> <p>Q5 pigtail with connector, M12 x 1</p> <p>blank cable connection, 2 m</p> |

QS30 – Opposed mode sensor – Emitter



General data

| | | | |
|----------------------------|--------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Lens material | plastic |
| Power-on, indicator | LED | Ambient temperature | -20...+70 °C |
| Error message type | LED | Light type | IR |
| Protection class | IP67 | Range | 0...60000 mm |
| Housing material | plastic, ABS | | |

A receiver is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d |
|--------|-----------------|-----------------------|------|------|
| QS30EQ | 22 x 57 x 35 mm | connector, M12 x 1 | w068 | d657 |
| QS30E | 22 x 49 x 35 mm | cable | w068 | d656 |

QS30 – Opposed mode sensor – Receiver



General data

| | | | |
|---------------------------------------|-------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | plastic, ABS |
| Error message type | LED | Lens material | plastic |
| Indication of excess gain type | LED | Ambient temperature | -20...+70 °C |
| Output | pnp/npn | Range | 0...60000 mm |

An emitter is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d |
|--------|-----------------|-----------------------|------|------|
| QS30RQ | 22 x 57 x 35 mm | connector, M12 x 1 | w161 | d657 |
| QS30R | 22 x 49 x 35 mm | cable | w161 | d656 |

QS30 – Retroreflective sensor



General data

| | | | |
|---------------------------------------|-------------|-------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | plastic, ABS |
| Error message type | LED | Lens material | plastic |
| Indication of excess gain type | LED | Light type | red |
| Output | pnp/hpn | | |

A reflector is required.

Types and data – selection table

| Type | Switching frequency | Dimensions | Electrical connection | Ambient temperature | Range | w | d | e |
|-----------|---------------------|-----------------|-----------------------|---------------------|---------------|------|------|------|
| QS30LV | ≤ 250 Hz | 22 x 49 x 35 mm | cable | -20...+70 °C | 10...12000 mm | w161 | d662 | e053 |
| QS30LVQ | ≤ 250 Hz | 22 x 57 x 35 mm | connector, M12 x 1 | -20...+70 °C | 10...12000 mm | w161 | d663 | e053 |
| QS30ELVCQ | ≤ 1000 Hz | 22 x 57 x 35 mm | connector, M12 x 1 | -10...+55 °C | 100...2000 mm | w078 | d664 | |
| QS30ELVC | ≤ 1000 Hz | 22 x 49 x 35 mm | cable | -10...+55 °C | 100...2000 mm | w078 | d665 | |

QS30 – Retroreflective laser sensor with polarizing filter



General data

| | | | |
|---------------------------------------|-------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Housing material | plastic, ABS |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | -20...+70 °C |
| Indication of excess gain type | LED | Light type | red |
| Output | pnp/hpn | Range | 0...8000 mm |
| Protection class | IP67 | | |

A reflector is required.

Types and data – selection table

| Type | Switching frequency | Dimensions | Electrical connection | w | d | e |
|---------|---------------------|-----------------|-----------------------|------|------|------|
| QS30LPQ | ≤ 250 Hz | 22 x 57 x 35 mm | connector, M12 x 1 | w161 | d663 | e054 |
| QS30LP | ≤ 33 Hz | 22 x 49 x 35 mm | cable | w161 | d662 | e054 |

QS30 – Retroreflective laser sensor with polarizing filter



General data

| | | | |
|---------------------------------------|-------------|----------------------------|-------------------------|
| Operating voltage | 10...30 VDC | Housing material | plastic, ABS |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | -10...+50 °C |
| Indication of excess gain type | LED | Light type | red |
| Output | pnp/npn | Range | 200...18000 mm |
| Switching frequency | ≤ 1 kHz | Laser class | 1 (EN 60825, IEC 60825) |
| Protection class | IP67 | | |

Reflector included in scope of supply.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|-----------|-----------------|-----------------------|------|------|------|
| QS30LLPQ | 22 x 57 x 35 mm | connector, M12 x 1 | w078 | d664 | e055 |
| QS30LLPCQ | 22 x 57 x 35 mm | connector, M12 x 1 | w078 | d664 | e055 |
| QS30LLP | 22 x 49 x 35 mm | cable | w078 | d665 | e055 |
| QS30LLPC | 22 x 49 x 35 mm | cable | w078 | d665 | e055 |

QS30 – Diffuse mode sensor



General data

| | | | |
|---------------------------------------|-------------|-------------------------|--------------|
| Operating voltage | 10...30 VDC | Output | pnp/npn |
| Power-on, indicator | LED | Protection class | IP67 |
| Error message type | LED | Housing material | plastic, ABS |
| Indication of excess gain type | LED | Lens material | plastic |

Types and data – selection table

| Type | Switching frequency | Dimensions | Electrical connection | Ambient temperature | Light type | Range | w | d | e |
|----------|---------------------|-----------------|-----------------------|---------------------|------------|-------------|------|------|------|
| QS30D | ≤ 250 Hz | 22 x 49 x 35 mm | cable | -20...+70 °C | IR | 2...1000 mm | w163 | d662 | e056 |
| QS30DQ | ≤ 250 Hz | 22 x 57 x 35 mm | connector, M12 x 1 | -20...+70 °C | IR | 2...1000 mm | w163 | d663 | e056 |
| QS30EDV | ≤ 270 Hz | 22 x 49 x 35 mm | cable | -10...+55 °C | red | 2...1400 mm | w078 | d665 | e057 |
| QS30EDVQ | ≤ 270 Hz | 22 x 57 x 35 mm | connector, M12 x 1 | -10...+55 °C | red | 2...1400 mm | w078 | d664 | e057 |

w Wiring diagrams on page 832 ff d Dimension drawing on page 842 ff e Excess gain curves on page 922 ff a Accessories on page 788 ff

QS30 – Diffuse mode sensor with fixed-field



General data

| | | | |
|---------------------------------------|-------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | plastic, ABS |
| Error message type | LED | Lens material | plastic |
| Indication of excess gain type | LED | Ambient temperature | -20...+70 °C |
| Output | pnp/npn | Light type | red |
| Switching frequency | ≤ 250 Hz | | |

Types and data – selection table

| Type | Dimensions | Electrical connection | Range | w | d | e |
|------------|-----------------|-----------------------|------------|------|------|------|
| QS30FF200 | 22 x 49 x 35 mm | cable | 0...200 mm | w163 | d656 | e058 |
| QS30FF200Q | 22 x 57 x 35 mm | connector, M12 x 1 | 0...200 mm | w163 | d657 | e058 |
| QS30FF400 | 22 x 49 x 35 mm | cable | 0...400 mm | w163 | d656 | e059 |
| QS30FF400Q | 22 x 57 x 35 mm | connector, M12 x 1 | 0...400 mm | w163 | d657 | e059 |
| QS30FF600 | 22 x 49 x 35 mm | cable | 0...600 mm | w163 | d656 | e060 |
| QS30FF600Q | 22 x 57 x 35 mm | connector, M12 x 1 | 0...600 mm | w163 | d657 | e060 |

QS30 – Diffuse mode sensor with adjustable field



General data

| | | | |
|---------------------------------------|-------------|----------------------------|--------------|
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | plastic, ABS |
| Error message type | LED | Lens material | plastic |
| Indication of excess gain type | LED | Ambient temperature | -10...+55 °C |
| Output | pnp/npn | Light type | red |
| Switching frequency | ≤ 500 Hz | Range | 50...300 mm |

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|---------|-----------------|-----------------------|------|------|------|
| QS30AFQ | 22 x 57 x 35 mm | connector, M12 x 1 | w078 | d664 | e061 |
| QS30AF | 22 x 49 x 35 mm | cable | w078 | d665 | e061 |

QS30 – Diffuse mode laser sensor



| | | | |
|---------------------------------------|-------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | plastic, ABS |
| Error message type | LED | Lens material | plastic |
| Indication of excess gain type | LED | Ambient temperature | -10...+50 °C |
| Output | pnp/npn | Light type | red |
| Switching frequency | ≤ 1 kHz | | |

Types and data – selection table

| Type | Dimensions | Electrical connection | Range | Laser class | w | d | e |
|----------|-----------------|-----------------------|------------|-------------------------|------|------|------|
| QS30LDQ | 22 x 57 x 35 mm | connector, M12 x 1 | 0...400 mm | 1 (EN 60825, IEC 60825) | w078 | d664 | e062 |
| QS30LD | 22 x 49 x 35 mm | cable | 0...400 mm | 1 (EN 60825, IEC 60825) | w078 | d665 | e062 |
| QS30LDL | 22 x 49 x 35 mm | cable | 0...800 mm | 2 (EN 60825, IEC 60825) | w078 | d665 | e063 |
| QS30LDLQ | 22 x 57 x 35 mm | connector, M12 x 1 | 0...800 mm | 2 (EN 60825, IEC 60825) | w078 | d664 | e063 |

QS30 – Opposed mode sensor – Emitter – Water detection



| | | | |
|----------------------------|-------------------|------------------------------|-------------------------------|
| Type | QS30EXH20Q5 | Electrical connection | cable with connector, M12 x 1 |
| Operating voltage | 10...30 VDC | Ambient temperature | -20...+60 °C |
| Power-on, indicator | LED | Light type | IR |
| Error message type | LED | Range | 0...4000 mm |
| Output | (emitter) | Response time | 3 ms |
| Dimensions | 22 x 57 x 54.3 mm | Wiring diagram | w160 |
| Protection class | IP67 | Dimension drawing | d660 |
| Housing material | plastic, ABS | | |
| Lens material | plastic | | |

QS30 – Opposed mode sensor – Receiver – Water detection



| | | | |
|---------------------------------------|----------------------------|------------------------------|-------------------------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Protection class | IP67 |
| Power-on, indicator | LED | Housing material | plastic, ABS |
| Error message type | LED | Lens material | plastic |
| Indication of excess gain type | LED | Electrical connection | cable with connector, M12 x 1 |
| Output | —, dark operation, pnp/npn | Ambient temperature | -20...+60 °C |
| Dimensions | 22 x 57 x 54.3 mm | Response time | 3 ms |

Types and data – selection table

| Type | Range | w | d |
|--------------|-------------|------|------|
| QS30RRH20Q5 | 0...2000 mm | w162 | d661 |
| QS30RRXH20Q5 | 0...4000 mm | w162 | d661 |

QS30 – Opposed mode sensor – Emitter – High Power



| | | | |
|----------------------------|--------------|----------------------------|---------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Ambient temperature | -20...+60 °C |
| Power-on, indicator | LED | Light type | IR |
| Housing material | plastic, ABS | Range | 0...300000 mm |
| Lens material | plastic | | |

Types and data – selection table

| Type | Dimensions | Protection class | Electrical connection | w | d | e |
|---------|-----------------|------------------|-----------------------|------|------|------|
| QS30EXQ | 22 x 57 x 35 mm | IP68 / IP69K | connector, M12 x 1 | w160 | d659 | e052 |
| QS30EX | 22 x 49 x 35 mm | IP67 | cable | w160 | d658 | e052 |

QS30 – Opposed mode sensor – Receiver – High Power



General data

| | | | |
|---------------------------------------|-------------|----------------------------|---------------|
| Operating voltage | 10...30 VDC | Switching frequency | ≤ 16 Hz |
| Power-on, indicator | LED | Housing material | plastic, ABS |
| Error message type | LED | Lens material | plastic |
| Indication of excess gain type | LED | Ambient temperature | -20...+60 °C |
| Output | pnp/npn | Range | 0...300000 mm |

Types and data – selection table

| Type | Dimensions | Protection class | Electrical connection | w | d | e |
|----------|-----------------|------------------|-----------------------|------|------|------|
| QS30RRXQ | 22 x 57 x 35 mm | IP68 / IP69K | connector, M12 x 1 | w162 | d659 | e052 |
| QS30ARXQ | 22 x 57 x 35 mm | IP68 / IP69K | connector, M12 x 1 | w162 | d659 | e052 |
| QS30RRX | 22 x 49 x 35 mm | IP67 | cable | w162 | d658 | e052 |
| QS30ARX | 22 x 49 x 35 mm | IP67 | cable | w162 | d658 | e052 |

NAMUR sensors MINI-BEAM and Q45



The NAMUR sensors MINI-BEAM® and Q45 feature intrinsically safe amplifiers and are made for rough industrial applications. Conform to the NAMUR standard, light operating sensors are supplied with < 1 mA in dark state and with > 2.1 mA in light state.

Available are opposed and retroreflective mode, convergent and diffuse mode sensors and base units for fiber optics. NOTE: NAMUR sensors have to be operated via intrinsically safe switching amplifiers in areas subject to explosion hazards.

Features

- Ex approval acc. to KEMA certificate 03 ATEX 1441 X ignition protection type Ex ia IIC T6
- acc. to EN 60947-5-6: 2000, EN 60079-0: 2006, part 1 and EN 60079-11: 2007 A1...A2
- Sensitivity exactly adjustable via a 15-turn potentiometer
- 2 m connection cable or M12 x 1 plug connection

Type code NAMUR sensors

| | | | | |
|----|----|---|------|---|
| MI | AD | 9 | LVAG | Q |
|----|----|---|------|---|

| | | | | | |
|----|--|--|--------|---------------------------------|--|
| MI | Series | AD | Output | 9 | Input |
| | <p>Series</p> <p>Q45 rectangular 44.5 x 87.6 x 56.4 mm</p> <p>MI MINI-BEAM, rectangular, 12.3 x 30.7 x 66 mm</p> | <p>Output</p> <p>AD 2-wire, NAMUR sensor</p> | | <p>Input</p> <p>9 5...15VDC</p> | <p>Input</p> <p>voltage supply via isolating switching amplifier</p> |

| | | | |
|------|---|---|-----------------------|
| LVAG | Operating mode | Q | Electrical connection |
| | <p>Operating mode</p> <p>CV convergent mode, visible red light MINI-BEAM, 16 mm, Q45: 38 mm</p> <p>CV2 convergent mode, visible red light focal distance 43 mm</p> <p>CV4 convergent mode, visible red light focal distance 100 mm</p> <p>D diffuse mode</p> <p>DL diffuse mode, long distance</p> <p>E opposed mode emitter</p> <p>F basic device for glass fibers</p> <p>FP basic device for plastic fibers</p> <p>LP retroreflective mode polarizing filter</p> <p>LV retroreflective mode visible red light,</p> <p>LVAG retroreflective mode polarizing filter low contrast application</p> <p>R receiver</p> <p>W diffuse mode, divergent</p> | <p>Electrical connection</p> <p>Q connector, M12 x 1</p> <p>blank cable connection, 2 m</p> | |

Q45 – NAMUR – Emitter



General data

| | |
|----------------------------|--------------|
| Operating voltage | 8.2 VDC |
| Output | (emitter) |
| Protection class | IP67 |
| Housing material | plastic, PBT |
| Lens material | plastic |
| Ambient temperature | -40...+70 °C |

| | |
|---|--------------------|
| Light type | IR |
| Range | 0...6000 mm |
| Ex approval acc. to conformity certificate | KEMA 03ATEX 1441 X |
| Protection type | Ex ia IIC T6 |
| Voltage | nom. 8.2 VDC |

A receiver is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|--------|----------------------|-----------------------|------|------|------|
| Q459EQ | 54.1 x 44.5 x 103 mm | connector, M12 x 1 | w021 | d667 | e064 |
| Q459E | 54.1 x 44.5 x 87 mm | cable | w021 | d666 | e064 |

Q45 – NAMUR – Receiver



General data

| | |
|----------------------------|------------------------|
| Operating voltage | 8.2 VDC |
| Output | light operation, NAMUR |
| Switching frequency | ≤ 250 Hz |
| Protection class | IP67 |
| Housing material | plastic, PBT |
| Lens material | plastic |
| Ambient temperature | -40...+70 °C |

| | |
|---|--------------------|
| Range | 0...6000 mm |
| Ex approval acc. to conformity certificate | KEMA 03ATEX 1441 X |
| Protection type | Ex ia IIC T6 |
| Voltage | nom. 8.2 VDC |
| Actuated current consumption | 2.1 mA |
| Non-actuated current consumption | 1 mA |

An emitter is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|----------|----------------------|-----------------------|------|------|------|
| Q45AD9RQ | 54.1 x 44.5 x 103 mm | connector, M12 x 1 | w021 | d667 | e064 |
| Q45AD9R | 54.1 x 44.5 x 87 mm | cable | w021 | d666 | e064 |

Q45 – NAMUR – Retroreflective sensor



General data

| | | | |
|----------------------------|------------------------|---|--------------------|
| Output | light operation, NAMUR | Light type | red |
| Switching frequency | ≤ 100 Hz | Ex approval acc. to conformity certificate | KEMA 03ATEX 1441 X |
| Protection class | IP67 | Protection type | Ex ia IIC T6 |
| Housing material | plastic, PBT | Voltage | nom. 8.2 VDC |
| Lens material | plastic | Actuated current consumption | 2.1 mA |
| Ambient temperature | -40...+70 °C | Non-actuated current consumption | 1 mA |

A reflector is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | Range | w | d | e |
|-----------|------------------------|-----------------------|---------------|------|------|------|
| Q45AD9LV | 44.5 x 87.6 x 54.1 mm | cable | 80...9000 mm | w021 | d666 | e065 |
| Q45AD9LVQ | 44.5 x 102.6 x 54.1 mm | connector, M12 x 1 | 80...9000 mm | w021 | d667 | e065 |
| Q45AD9LP | 44.5 x 87.6 x 54.1 mm | cable | 150...6000 mm | w021 | d666 | e065 |
| Q45AD9LPQ | 44.5 x 102.6 x 54.1 mm | connector, M12 x 1 | 150...6000 mm | w021 | d667 | e065 |

Q45 – NAMUR – Diffuse mode sensor



General data

| | | | |
|----------------------------|------------------------|---|--------------------|
| Operating voltage | 8.2 VDC | Light type | IR |
| Output | light operation, NAMUR | Ex approval acc. to conformity certificate | KEMA 03ATEX 1441 X |
| Switching frequency | ≤ 100 Hz | Protection type | Ex ia IIC T6 |
| Protection class | IP67 | Voltage | nom. 8.2 VDC |
| Housing material | plastic, PBT | Actuated current consumption | 2.1 mA |
| Lens material | plastic | Non-actuated current consumption | 1 mA |
| Ambient temperature | -40...+70 °C | | |

Types and data – selection table

| Type | Dimensions | Electrical connection | Range | w | d | e |
|-----------|----------------------|-----------------------|-------------|------|------|------|
| Q45AD9D | 54.1 x 44.5 x 87 mm | cable | 0...300 mm | w021 | d666 | |
| Q45AD9DQ | 54.1 x 44.5 x 103 mm | connector, M12 x 1 | 0...300 mm | w021 | d667 | |
| Q45AD9DL | 54.1 x 44.5 x 87 mm | cable | 0...1070 mm | w021 | d666 | e066 |
| Q45AD9DLQ | 54.1 x 44.5 x 103 mm | connector, M12 x 1 | 0...1070 mm | w021 | d667 | e066 |

Q45 – NAMUR – Convergent mode sensor



General data

| | | | |
|----------------------------|------------------------|---|--------------------|
| Output | light operation, NAMUR | Light type | red |
| Switching frequency | ≤ 100 Hz | Ex approval acc. to conformity certificate | KEMA 03ATEX 1441 X |
| Protection class | IP67 | Protection type | Ex ia IIC T6 |
| Housing material | plastic, PBT | Voltage | nom. 8.2 VDC |
| Lens material | plastic | Actuated current consumption | 2.1 mA |
| Ambient temperature | -40...+70 °C | Non-actuated current consumption | 1 mA |

Types and data – selection table

| Type | Dimensions | Electrical connection | Focal distance | w | d | e |
|------------|------------------------|-----------------------|----------------|------|------|------|
| Q45AD9CVQ | 44.5 x 102.6 x 56.4 mm | connector, M12 x 1 | 38 mm | w021 | d667 | e067 |
| Q45AD9CV4Q | 44.5 x 102.6 x 56.4 mm | connector, M12 x 1 | 100 mm | w021 | d667 | e067 |
| Q45AD9CV | 44.5 x 87.6 x 56.4 mm | cable | 38 mm | w021 | d666 | e067 |
| Q45AD9CV4 | 44.5 x 87.6 x 56.4 mm | cable | 100 mm | w021 | d666 | e067 |

Q45 – NAMUR – Basic device for glass fibers



General data

| | | | |
|----------------------------|------------------------|---|--------------------|
| Output | light operation, NAMUR | Light type | IR |
| Switching frequency | ≤ 100 Hz | Ex approval acc. to conformity certificate | KEMA 03ATEX 1441 X |
| Protection class | IP67 | Protection type | Ex ia IIC T6 |
| Housing material | plastic, PBT | Voltage | nom. 8.2 VDC |
| Lens material | plastic | Actuated current consumption | 2.1 mA |
| Ambient temperature | -40...+70 °C | Non-actuated current consumption | 1 mA |

A glass fiber is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|----------|------------------------|-----------------------|------|------|------|
| Q45AD9FQ | 44.5 x 102.6 x 60.5 mm | connector, M12 x 1 | w021 | d669 | e068 |
| Q45AD9F | 44.5 x 87.6 x 60.5 mm | cable | w021 | d668 | e068 |

Q45 – NAMUR – Basic device for plastic fibers



| | | | |
|----------------------------|------------------------|---|--------------------|
| General data | | | |
| Output | light operation, NAMUR | Light type | red |
| Switching frequency | ≤ 100 Hz | Ex approval acc. to conformity certificate | KEMA 03ATEX 1441 X |
| Protection class | IP67 | Protection type | Ex ia IIC T6 |
| Housing material | plastic, PBT | Voltage | nom. 8.2 VDC |
| Lens material | plastic | Actuated current consumption | 2.1 mA |
| Ambient temperature | -40...+70 °C | Non-actuated current consumption | 1 mA |

A plastic fiber is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|-----------|------------------------|-----------------------|------|------|------|
| Q45AD9FPQ | 44.5 x 102.6 x 60.5 mm | connector, M12 x 1 | w021 | d669 | e069 |
| Q45AD9FP | 44.5 x 87.6 x 60.5 mm | cable | w021 | d668 | e069 |

MINI-BEAM – NAMUR – Emitter



| | | | |
|----------------------------|------------------|---|--------------------|
| General data | | | |
| Output | (emitter), NAMUR | Light type | IR |
| Protection class | IP67 | Range | 0...6000 mm |
| Housing material | plastic, PBT | Ex approval acc. to conformity certificate | KEMA 03ATEX 1441 X |
| Lens material | plastic | Protection type | Ex ia IIC T6 |
| Ambient temperature | -40...+70 °C | Voltage | nom. 8.2 VDC |

A receiver is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|-------|---------------------|-----------------------|------|------|------|
| MI9EQ | 12.3 x 30.7 x 84 mm | connector, M12 x 1 | w021 | d671 | e070 |
| MI9E | 12.3 x 30.7 x 66 mm | cable | w021 | d670 | e070 |

MINI-BEAM – NAMUR – Receiver



| | | | |
|---------------------------------------|------------------------|---|--------------------|
| General data | | | |
| Indication of excess gain type | LED | Range | 0...6000 mm |
| Output | light operation, NAMUR | Ex approval acc. to conformity certificate | KEMA 03ATEX 1441 X |
| Switching frequency | ≤ 100 Hz | Protection type | Ex ia IIC T6 |
| Protection class | IP67 | Voltage | nom. 8.2 VDC |
| Housing material | plastic, PBT | Actuated current consumption | 2.1 mA |
| Lens material | plastic | Non-actuated current consumption | 1.2 mA |
| Ambient temperature | -40...+70 °C | | |

An emitter is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|---------|---------------------|-----------------------|------|------|------|
| MIAD9RQ | 12.3 x 30.7 x 84 mm | connector, M12 x 1 | w021 | d671 | e070 |
| MIAD9R | 12.3 x 30.7 x 66 mm | cable | w021 | d670 | e070 |

MINI-BEAM – NAMUR – Retroreflective sensor



| | | | |
|---------------------------------------|------------------------|---|--------------------|
| General data | | | |
| Indication of excess gain type | LED | Light type | red |
| Output | light operation, NAMUR | Range | 0...5000 mm |
| Switching frequency | ≤ 100 Hz | Ex approval acc. to conformity certificate | KEMA 03ATEX 1441 X |
| Protection class | IP67 | Protection type | Ex ia IIC T6 |
| Housing material | plastic, PBT | Voltage | nom. 8.2 VDC |
| Lens material | plastic | Actuated current consumption | 2.1 mA |
| Ambient temperature | -40...+70 °C | Non-actuated current consumption | 1.2 mA |

A reflector is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|----------|---------------------|-----------------------|------|------|------|
| MIAD9LVQ | 12.3 x 30.7 x 84 mm | connector, M12 x 1 | w021 | d671 | e071 |
| MIAD9LV | 12.3 x 30.7 x 66 mm | cable | w021 | d670 | e071 |

MINI-BEAM – NAMUR – Retroreflective sensor with polarizing filter



General data

| | | | |
|---------------------------------------|------------------------|---|--------------------|
| Indication of excess gain type | LED | Light type | red |
| Output | light operation, NAMUR | Range | 0...2000 mm |
| Switching frequency | ≤ 100 Hz | Ex approval acc. to conformity certificate | KEMA 03ATEX 1441 X |
| Protection class | IP67 | Protection type | Ex ia IIC T6 |
| Housing material | plastic, PBT | Voltage | nom. 8.2 VDC |
| Lens material | plastic | Actuated current consumption | 2.1 mA |
| Ambient temperature | -40...+70 °C | Non-actuated current consumption | 1.2 mA |

A reflector is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|------------|---------------------|-----------------------|------|------|------|
| MIAD9LVAGQ | 12.3 x 30.7 x 84 mm | connector, M12 x 1 | w021 | d671 | e071 |
| MIAD9LVAG | 12.3 x 30.7 x 66 mm | cable | w021 | d670 | e071 |

MINI-BEAM – NAMUR – Diffuse mode sensor



General data

| | | | |
|---------------------------------------|------------------------|---|--------------------|
| Indication of excess gain type | LED | Light type | IR |
| Output | light operation, NAMUR | Ex approval acc. to conformity certificate | KEMA 03ATEX 1441 X |
| Switching frequency | ≤ 100 Hz | Protection type | Ex ia IIC T6 |
| Protection class | IP67 | Voltage | nom. 8.2 VDC |
| Housing material | plastic, PBT | Actuated current consumption | 2.1 mA |
| Lens material | plastic | Non-actuated current consumption | 1.2 mA |
| Ambient temperature | -40...+70 °C | | |

Types and data – selection table

| Type | Dimensions | Electrical connection | Range | w | d | e |
|---------|-----------------------|-----------------------|------------|------|------|------|
| MIAD9D | 12.3 x 30.7 x 66 mm | cable | 0...380 mm | w021 | d670 | e072 |
| MIAD9DQ | 12.3 x 30.7 x 84 mm | connector, M12 x 1 | 0...380 mm | w021 | d671 | e072 |
| MIAD9W | 12.3 x 30.7 x 51.8 mm | cable | 0...75 mm | w021 | d672 | e072 |
| MIAD9WQ | 12.3 x 30.7 x 69.8 mm | connector, M12 x 1 | 0...75 mm | w021 | d673 | e072 |

MINI-BEAM – NAMUR – Convergent mode sensor



| | | | |
|---------------------------------------|------------------------|---|--------------------|
| General data | | | |
| Indication of excess gain type | LED | Light type | red |
| Output | light operation, NAMUR | Ex approval acc. to conformity certificate | KEMA 03ATEX 1441 X |
| Switching frequency | ≤ 100 Hz | Protection type | Ex ia IIC T6 |
| Protection class | IP67 | Voltage | nom. 8.2 VDC |
| Housing material | plastic, PBT | Actuated current consumption | 2.1 mA |
| Lens material | plastic | Non-actuated current consumption | 1.2 mA |
| Ambient temperature | -40...+70 °C | | |

Types and data – selection table

| Type | Dimensions | Electrical connection | Focal distance | w | d | e |
|-----------|---------------------|-----------------------|----------------|------|------|------|
| MIAD9CVQ | 12.3 x 30.7 x 84 mm | connector, M12 x 1 | 16 mm | w021 | d671 | e073 |
| MIAD9CV2Q | 12.3 x 30.7 x 84 mm | connector, M12 x 1 | 43 mm | w021 | d671 | e073 |
| MIAD9CV2 | 12.3 x 30.7 x 66 mm | cable | 43 mm | w021 | d670 | e073 |
| MIAD9CV | 12.3 x 30.7 x 66 mm | cable | 16 mm | w021 | d670 | e073 |

MINI-BEAM – NAMUR – Basic device for glass fibers



| | | | |
|---------------------------------------|------------------------|---|--------------------|
| General data | | | |
| Indication of excess gain type | LED | Light type | IR |
| Output | light operation, NAMUR | Ex approval acc. to conformity certificate | KEMA 03ATEX 1441 X |
| Switching frequency | ≤ 100 Hz | Protection type | Ex ia IIC T6 |
| Protection class | IP67 | Voltage | nom. 8.2 VDC |
| Housing material | plastic, PBT | Actuated current consumption | 2.1 mA |
| Ambient temperature | -40...+70 °C | Non-actuated current consumption | 1.2 mA |

A glass fiber is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|---------|---------------------|-----------------------|------|------|------|
| MIAD9FQ | 12.3 x 30.7 x 84 mm | connector, M12 x 1 | w021 | d675 | e074 |
| MIAD9F | 12.3 x 30.7 x 66 mm | cable | w021 | d674 | e074 |

Slot sensors SLM



SLM slot sensors consist of a compact pair of opposed mode sensors hosted in a U-shaped die-cast metal housing. The sensors are thus well protected and easily mounted. Emitter-receiver alignment is not required.

Different designs with 8 slot widths from 10 mm to 220 mm are available for many applications. The sensitivity is adjusted via a single turn potentiometer.

Features

- Compact slot design with integrated opposed mode sensor
- Rugged die-cast metal housing, IP67 rated
- 8 slot widths from 10 mm to 220 mm
- PNP, NPN or bipolar output (1 x NPN and 1 x PNP)
- Short response time of 0.5 ms
- Visible red beam
- Light or dark operation selectable via sealed switch.
- 2 m connection cable or M12 x 1 plug connection

Type code SLM



Series

SLM slot sensor
 12 x 42 x 80 mm
 12 x 62 x 80 mm
 12 x 82 x 80 mm
 12 x 112 x 80 mm
 12 x 152 x 140 mm
 12 x 252 x 140 mm

Slot width

120 slot width, mm
 8 slot widths 10...220 m

Output

B PNP/NPN
N NPN
P PNP



Operating voltage

6 10...30VDC

Electrical connection

Q connector, M12 x 1
blank cable connection, 2 m

SLM – Slot sensor



General data

| | |
|----------------------------|-------------|
| Operating voltage | 10...30 VDC |
| Power-on, indicator | LED |
| Switching frequency | ≤ 1 kHz |
| Protection class | IP67 |

| | |
|----------------------------|-------------------|
| Housing material | metal/plastic, ZN |
| Lens material | plastic |
| Ambient temperature | -20...+60 °C |
| Light type | red |

Types and data – selection table

| Type | Output | Dimensions | Electrical connection | Slot width | w | d |
|-----------|------------|-------------------|-----------------------|------------|------|------|
| SLM10P6Q | —, PNP | 12 x 42 x 80 mm | connector, M8 x 1 | 10 mm | w070 | d677 |
| SLM30P6Q | —, PNP | 12 x 62 x 80 mm | connector, M8 x 1 | 30 mm | w070 | d679 |
| SLM80P6Q | —, PNP | 12 x 112 x 80 mm | connector, M8 x 1 | 80 mm | w070 | d681 |
| SLM120P6Q | —, PNP | 12 x 152 x 140 mm | connector, M8 x 1 | 120 mm | w070 | d683 |
| SLM50P6Q | —, PNP | 12 x 82 x 80 mm | connector, M8 x 1 | 50 mm | w070 | d685 |
| SLM220P6Q | —, PNP | 12 x 252 x 140 mm | connector, M8 x 1 | 220 mm | w070 | d686 |
| SLM10B6 | —, pnp/npn | 12 x 42 x 80 mm | cable | 10 mm | w069 | d676 |
| SLM30B6 | —, pnp/npn | 12 x 62 x 80 mm | cable | 30 mm | w069 | d678 |
| SLM80B6 | —, pnp/npn | 12 x 112 x 80 mm | cable | 80 mm | w069 | d680 |
| SLM120B6 | —, pnp/npn | 12 x 152 x 140 mm | cable | 120 mm | w069 | d682 |
| SLM220B6 | —, pnp/npn | 12 x 252 x 140 mm | cable | 220 mm | w069 | d684 |
| SLM50B6 | —, pnp/npn | 12 x 82 x 80 mm | cable | 50 mm | w069 | d687 |

Fiber optic sensors D10



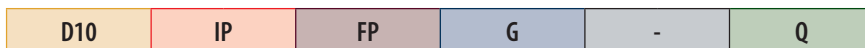
The D10 and D10 expert series provides user-friendly plastic fiber sensors for DIN rail mounting. Numerous possibilities for configuration and the slim design of only 10 mm make these sensors the perfect choice for demanding application conditions.

The user can select functions such as static, dynamic and single-point teach mode as well as manual fine adjustment, external programming and keylock. A big and well readable display resp. bargraph and LEDs support programming and monitoring during operation.

Features

- High-power sensors for use with plastic fibers
- Extremely slim housing (10 mm) for DIN rail mounting
- Standard versions with bipolar switching output (1 x PNP and 1 x NPN)
- Expert version, optionally available with two analog outputs, one analog and one switching output, two separate switching outputs
- Teachable version with numeric and bargraph display
- Automatic crosstalk protection
- Adjustable switch-off delay
- Status indicated via red or green LED

Type code D10



Series

D10 basic device for plastic fibers
DIN rail mounting
10 x 36 x 61.3 mm

Output

IP expert: analog output 4...20 mA
switching output, PNP, teach input
numeric display

DP expert: 2 analog outputs,
PNP, teach input
numeric display

UP expert: analog output 0...10V
switching output, PNP,
teach input, numeric display

B switching output, bipolar, bargraph
teach input

A switching output, bipolar,
potentiometer

Fibers

FP plastic fiber



Lights

G green
blank red

Response time

Y high-speed
(higher switching frequency)

blank standard

Electrical connection

Q connector, Ø 8 mm
blank cable connection, 2 m

D10A – Basic unit for plastic fibers – Potentiometer



General data

| | |
|---------------------------------------|-------------|
| Operating voltage | 10...30 VDC |
| Power-on, indicator | LED |
| Indication of excess gain type | LED |
| Output | —, pnp/npn |

| | |
|----------------------------|--------------|
| Protection class | IP50 |
| Housing material | plastic, ABS |
| Ambient temperature | -10...+55 °C |

A plastic fiber is required.

Types and data – selection table

| Type | Switching frequency | Dimensions | Electrical connection | Light type | w | d |
|-----------|---------------------|---------------------|-----------------------|------------|----------|----------|
| D10AFPQ | ≤ 1 kHz | 10 x 35.9 x 84.4 mm | connector, Ø 8 mm | red | w069 | d689 |
| D10AFPYQ | ≤ 2.5 kHz | 10 x 35.9 x 84.4 mm | connector, Ø 8 mm | red | w069 | d689 |
| D10AFP | ≤ 1 kHz | 10 x 35.9 x 68.1 mm | cable | red | w069 | d688 |
| D10AFPY | ≤ 2.5 kHz | 10 x 35.9 x 68.1 mm | cable | red | w069 | d688 |
| D10AFPGQ | ≤ 1 kHz | 10 x 35.9 x 84.4 mm | connector, Ø 8 mm | green | w069 | d689 |
| D10AFPGYQ | ≤ 2.5 kHz | 10 x 35.9 x 84.4 mm | connector, Ø 8 mm | green | w069 | d689 |
| D10AFPG | ≤ 1 kHz | 10 x 35.9 x 68.1 mm | cable | green | w069 | d688 |
| D10AFPGY | ≤ 2.5 kHz | 10 x 35.9 x 68.1 mm | cable | green | w069 | d688 |

D10B – Basic device for plastic fibers – Teach input



General data

| | |
|---------------------------------------|-------------|
| Operating voltage | 10...30 VDC |
| Power-on, indicator | LED |
| Indication of excess gain type | LED chain |
| Output | —, pnp/npn |

| | |
|----------------------------|--------------|
| Switching frequency | ≤ 2.5 kHz |
| Protection class | IP50 |
| Housing material | plastic, ABS |
| Ambient temperature | -10...+55 °C |

A plastic fiber is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | Light type | w | d |
|----------|-----------------------|-----------------------|------------|------|------|
| D10BFPQ | 10.5 x 35.9 x 84.4 mm | connector, Ø 8 mm | red | w164 | d691 |
| D10BFP | 10.5 x 35.9 x 68.1 mm | cable | red | w164 | d690 |
| D10BFPGQ | 10.5 x 35.9 x 84.4 mm | connector, Ø 8 mm | green | w164 | d691 |
| D10BFPG | 10.5 x 35.9 x 68.1 mm | cable | green | w164 | d690 |

D10Expert – Basic device for plastic fibers – Teach input









General data

| | |
|----------------------------|-------------|
| Operating voltage | 12...24 VDC |
| Power-on, indicator | LED |
| Switching frequency | ≤ 10 kHz |
| Protection class | IP50 |

| | |
|----------------------------|--------------|
| Housing material | plastic, ABS |
| Ambient temperature | -20...+55 °C |
| Light type | red |

A plastic fiber is required.

Types and data – selection table

| Type | Output | Dimensions | Electrical connection | Analog output | w | d |
|----------|---|-----------------------|-----------------------|---------------|------|------|
| D10DPFPQ | 2 x  , PNP | 10.5 x 35.9 x 84.4 mm | connector, Ø 8 mm | - | w165 | d693 |
| D10UPFPQ |  , PNP | 10.5 x 35.9 x 84.4 mm | connector, Ø 8 mm | 0...10 V | w166 | d693 |
| D10IPFPQ |  , PNP | 10.5 x 35.9 x 84.4 mm | connector, Ø 8 mm | 4...20 mA | w166 | d693 |
| D10DPFP | 2 x  , PNP | 10.5 x 35.9 x 68.1 mm | cable | - | w165 | d692 |
| D10UPFP |  , PNP | 10.5 x 35.9 x 68.1 mm | cable | 0...10 V | w166 | d692 |
| D10IPFP |  , PNP | 10.5 x 35.9 x 68.1 mm | cable | 4...20 mA | w166 | d692 |

Fiber optic sensors D12



The D12 and D12 Expert series feature sensors for glass and plastic fibers. The user-friendly sensors are only 12 mm wide and suited for DIN rail mounting. Each sensor features auto-diagnostics and an alarm function. A 7-segment LED bargraph indicates the signal strength at the input and output as well as the overload at the output. Antivalent NPN or PNP outputs are available.

The D12E expert version with integrated teach function enables optimal adjustment of sensitivity. Sensors of this type are thus especially suited for low-contrast applications, as well as the dynamic versions with automatic range control and continuous readjustment of the emitted luminous intensity.

Features

- High-power sensor for use with plastic and glass fibers
- Robust design, IP66 rated
- Mounting on DIN rail
- Standard version with manual adjustment of sensitivity
- Expert version with automatic adjustment of sensitivity, selected via pushbutton or via external control cable
- Dynamic version with automatic range control and regulation of luminous intensity
- Alarm output for indication of insufficient excess gain
- PNP or NPN transistor output, antivalent
- Visible red light

Type code D12

| | | | | | |
|-----|-----|---|----|---|---|
| D12 | DAB | 6 | FV | - | Q |
|-----|-----|---|----|---|---|

| | | | | | |
|-----|--------|-----|-----------------|---|-------|
| D12 | Series | DAB | Output/Function | 6 | Input |
|-----|--------|-----|-----------------|---|-------|

Series

D12 basic device for glass and plastic fibers
DIN rail mounting, dimensions
12 x 30 x 64 mm (plastic fiber)
12 x 30 x 70 mm (glass fiber)

Output/Function

DAB dynamic sensor with automatic range control, PNP/NPN
EN expert: NPN, teach input
EP expert: PNP, teach input
SN NO/NC, NPN, potentiometer
SP NO/NC, PNP, potentiometer

Input

6 10...30 VDC

| | | | | | |
|----|--------|---|---------------|---|-----------------------|
| FV | Fibers | - | Specification | Q | Electrical connection |
|----|--------|---|---------------|---|-----------------------|

Fibers

FP plastic fiber
FV glass fiber

Specification

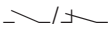
H extra high excess gain
Y high-speed (higher frequency), no alarm output
Y1 off delay, high-speed (high frequency)
no alarm output
blank no specification

Electrical connection

W/30 cable connection, 9 m
Q pigtail with connector, Ø 8 mm
blank cable connection, 2 m

D12 – Basic unit for glass fibers – Potentiometer



| | | | |
|---------------------------------------|---|----------------------------|-----------------|
| General data | | Dimensions | 12 x 30 x 70 mm |
| Operating voltage | 10...30 VDC | Protection class | IP66 |
| Power-on, indicator | LED | Housing material | plastic, ABS |
| Error message type | LED | Ambient temperature | -20...+70 °C |
| Indication of excess gain type | LED chain | Light type | red |
| Output |  , PNP | | |

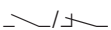
A glass fiber is required.

Types and data – selection table

| Type | Switching frequency | Electrical connection | w | d | e |
|-------------|---------------------|------------------------------|------|------|------|
| D12SP6FVYQ | ≤ 10 kHz | cable with connector, Ø 8 mm | w153 | d695 | e076 |
| D12SP6FVY1Q | ≤ 10 kHz | cable with connector, Ø 8 mm | w153 | d695 | e076 |
| D12SP6FVQ | ≤ 1 kHz | cable with connector, Ø 8 mm | w153 | d695 | e075 |
| D12SP6FV | ≤ 1 kHz | cable | w153 | d694 | e075 |
| D12SP6FVY1 | ≤ 10 kHz | cable | w153 | d694 | e076 |
| D12SP6FVH | ≤ 1 kHz | cable | w153 | d694 | e075 |
| D12SP6FVY | ≤ 10 kHz | cable | w153 | d694 | e076 |

D12 – Basic device for plastic fibers – Potentiometer



| | | | |
|---------------------------------------|---|----------------------------|-----------------|
| General data | | Dimensions | 12 x 30 x 64 mm |
| Operating voltage | 10...30 VDC | Protection class | IP66 |
| Power-on, indicator | LED | Housing material | plastic, ABS |
| Error message type | LED | Ambient temperature | -20...+70 °C |
| Indication of excess gain type | LED chain | Light type | red |
| Output |  , PNP | | |

A plastic fiber is required.

Types and data – selection table

| Type | Switching frequency | Electrical connection | w | d | e |
|-------------|---------------------|--------------------------------|------|------|------|
| D12SP6FPHQ | ≤ 1 kHz | cable with connector, Ø 8 mm | w153 | d697 | e078 |
| D12SP6FPYQ | ≤ 10 kHz | cable with connector, f Ø 8 mm | w153 | d697 | e077 |
| D12SP6FPY1Q | ≤ 10 kHz | cable with connector, Ø 8 mm | w153 | d697 | e077 |
| D12SP6FPQ | ≤ 1 kHz | cable with connector, Ø 8 mm | w153 | d697 | e075 |
| D12SP6FP | ≤ 1 kHz | cable | w153 | d696 | e075 |
| D12SP6FPY | ≤ 10 kHz | cable | w153 | d696 | e077 |
| D12SP6FPH | ≤ 1 kHz | cable | w153 | d696 | e078 |
| D12SP6FPY1 | ≤ 10 kHz | cable | w153 | d696 | e077 |

D12 – Basic device for glass fibers



General data

| | |
|---------------------------------------|-------------|
| Operating voltage | 10...30 VDC |
| Power-on, indicator | LED |
| Indication of excess gain type | LED |
| Output | —, pnp/npn |
| Switching frequency | ≤ 10 kHz |

| | |
|----------------------------|-----------------|
| Dimensions | 12 x 30 x 70 mm |
| Protection class | IP66 |
| Housing material | plastic, ABS |
| Ambient temperature | -40...+70 °C |
| Light type | red |

A glass fiber is required.

Types and data – selection table

| Type | Electrical connection | w | d |
|------------|------------------------------|------|------|
| D12DAB6FVQ | cable with connector, Ø 8 mm | w167 | d699 |
| D12DAB6FV | cable | w167 | d698 |

D12 – Dynamic basic device for plastic fibers



General data

| | |
|---------------------------------------|-------------|
| Operating voltage | 10...30 VDC |
| Power-on, indicator | LED |
| Indication of excess gain type | LED |
| Output | —, pnp/npn |
| Switching frequency | ≤ 10 kHz |

| | |
|----------------------------|-----------------|
| Dimensions | 12 x 30 x 64 mm |
| Protection class | IP66 |
| Housing material | plastic, ABS |
| Ambient temperature | -40...+70 °C |
| Light type | red |

A plastic fiber is required.

Types and data – selection table

| Type | Electrical connection | w | d |
|------------|------------------------------|------|------|
| D12DAB6FPQ | cable with connector, Ø 8 mm | w167 | d701 |
| D12DAB6FP | cable | w167 | d700 |

D12 Expert – Basic device for glass fibers – Teach input



| | | | |
|---------------------------------------|-----------------|------------------------------|--------------|
| Type | D12EP6FV | Housing material | plastic, ABS |
| Operating voltage | 10...30 VDC | Electrical connection | cable |
| Power-on, indicator | LED | Ambient temperature | -20...+70 °C |
| Indication of excess gain type | 7-digit LED | Light type | red |
| Output | —, PNP | Wiring diagram | w168 |
| Switching frequency | ≤ 2.5 kHz | Dimension drawing | d702 |
| Dimensions | 12 x 30 x 70 mm | Excess gain curve | |
| Protection class | IP66 | | |

A glass fiber is required.

D12Expert – Basic device for plastic fibers – Teach input



| | | | |
|---------------------------------------|-----------------|------------------------------|--------------|
| Type | D12EP6FP | Housing material | plastic, ABS |
| Operating voltage | 10...30 VDC | Electrical connection | cable |
| Power-on, indicator | LED | Ambient temperature | -20...+70 °C |
| Indication of excess gain type | 7-digit LED | Light type | red |
| Output | —, PNP | Wiring diagram | w168 |
| Switching frequency | ≤ 2.5 kHz | Dimension drawing | d703 |
| Dimensions | 12 x 30 x 64 mm | Excess gain curve | |
| Protection class | IP66 | | |

A plastic fiber is required.

Fiber optic sensors FI22



The plastic fiber sensor FI22 operates reliably even in low-contrast applications.

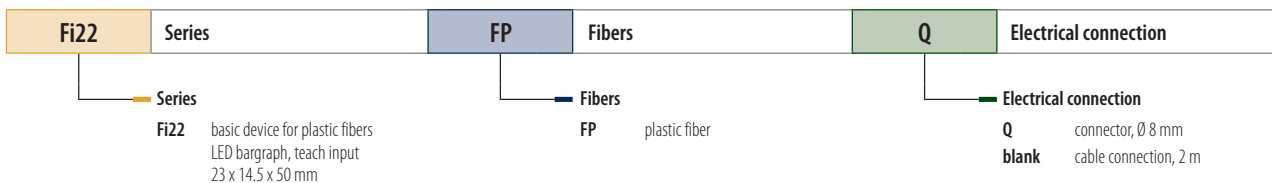
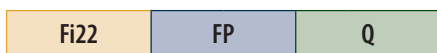
The expert version provides functions such as static, dynamic and single-point teach mode as well as manual fine adjustment, external programming and keylock. A large, well readable bargraph and bright LEDs support programming and monitoring during operation.

Owing to its compact design, the sensor can be mounted almost anywhere. It is simply snapped on with the supplied bracket. The housing is IP67 protected, allowing the sensor to be applied in polluted ambients.

Features

- Compact plastic fiber sensor
- Protection class IP67
- 8-segment LED bargraph indicates the relative signal strength at the input, the contrast, the programming and alarm status.
- Automatic teach modes, including static, dynamic, and single-point programming as well as manual fine adjustment.
- PNP or NPN outputs
- Programmable 30 ms pulse expansion (switch-off delay)
- Flexible programming via two pushbuttons or remote via cable
- Visible red light

Type code Fi22



FI22 – Basic device for plastic fibers – Teach input



General data

| | |
|----------------------------|-------------------|
| Operating voltage | 10...30 VDC |
| Power-on, indicator | LED |
| Output | —, pnp/npn |
| Switching frequency | ≤ 1 kHz |
| Dimensions | 23 x 14.5 x 50 mm |

| | |
|----------------------------|--------------|
| Protection class | IP67 |
| Housing material | plastic, ABS |
| Ambient temperature | -10...+55 °C |
| Light type | red |

A plastic fiber is required.

Types and data – selection table

| Type | Electrical connection | w | d |
|---------|-----------------------|------|------|
| FI22FPQ | connector, Ø 8 mm | w164 | d705 |
| FI22FP | cable | w164 | d704 |

Fiber optic sensors QS18F/FP



The QS18 series offers well-priced solutions, even for applications requiring fiber optics. Robust basic units are available for plastic as well as for glass fibers.

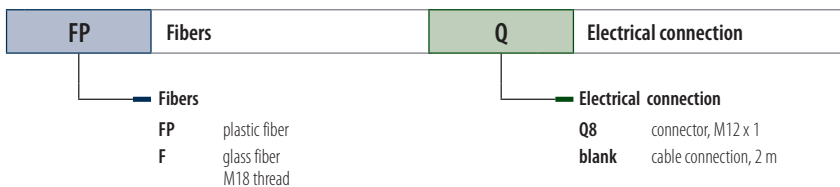
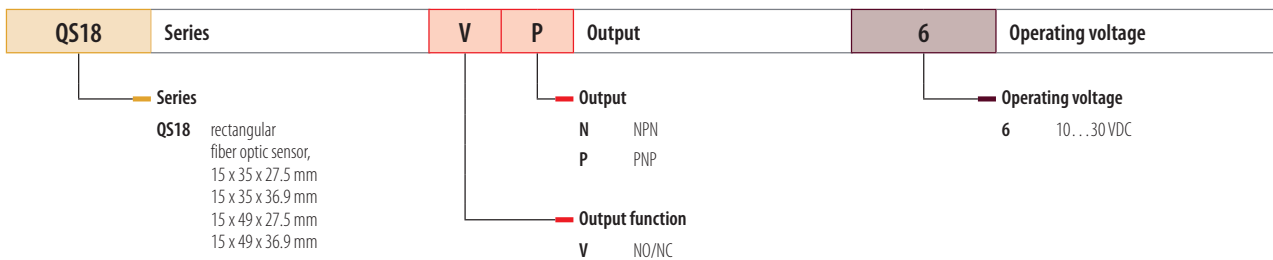
The sensitivity is adjusted via potentiometer. A green flashing LED indicates overload at the output. A yellow LED indicates the switching status and excess gain.

Owing to their functional design, the sensors are universally applicable and fit almost anywhere.

Features

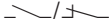
- Well-priced basic device for plastic and glass fibers
- Universal rectangular design and fit
- Versions with or without M18 thread
- Sensitivity adjusted via potentiometer
- Protection class IP67
- Indication of insufficient excess gain
- Bright LEDs, all-round visible
- Light/dark operation

Type code QS18 ... F



QS18F – Basic device for glass fibers – Potentiometer, M18 thread



| | | | |
|---------------------------------------|---|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Switching frequency | ≤ 800 Hz |
| Power-on, indicator | LED | Protection class | IP67 |
| Error message type | LED | Housing material | plastic, ABS |
| Indication of excess gain type | LED | Ambient temperature | -20...+70 °C |
| Output |  , PNP | Light type | IR |


A glass fiber is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|------------|-------------------|-----------------------|------|------|------|
| QS18VP6FQ8 | 15 x 49 x 36.9 mm | connector, M12 x 1 | w155 | d707 | e079 |
| QS18VP6F | 15 x 35 x 36.9 mm | cable | w155 | d706 | e079 |

QS18FP – Basic device for plastic fibers – Potentiometer



| | | | |
|---------------------------------------|---|----------------------------|--------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Switching frequency | ≤ 800 Hz |
| Power-on, indicator | LED | Protection class | IP67 |
| Error message type | LED | Housing material | plastic, ABS |
| Indication of excess gain type | LED | Ambient temperature | -20...+70 °C |
| Output |  , PNP | Light type | red |

A plastic fiber is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | w | d | e |
|-------------|---------------------|-----------------------|------|------|------|
| QS18VP6FPQ8 | 15 x 49 x 27.5 mm | connector, M12 x 1 | w155 | d709 | e079 |
| QS18VP6FP | 15 x 34.5 x 27.5 mm | cable | w155 | d708 | e079 |

Fiber optic sensors R55F – Color mark sensor



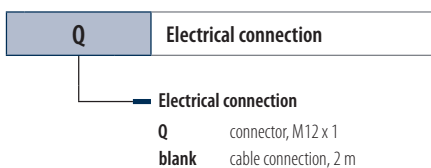
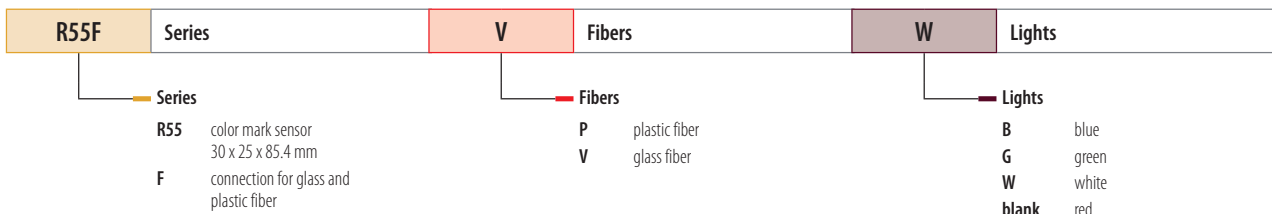
The R55F detects 16 greyscales reliably at up to 10,000 actuations per second. Green light is suited for most color mark applications. Blue light is ideally suited for the detection of yellow tones. For example, 20 % of yellow on newspaper is detected with it. Blue and green tones are detected with red light. White light is used for special applications.

The ON and OFF conditions for detection are individually defined in the static teach mode. In dynamic teach mode the light and dark conditions are automatically taught during operation and the switching threshold is continuously updated while the sensor is working. During commissioning and operation a good visible green LED chain indicates continuously the contrast quality and the switchpoint.

Features

- Contrast sensor for color mark detection used with plastic and glass fibers
- Installed with bracket or on a 35 mm DIN rail
- Devices with green, blue, red and white light
- Static or dynamic teaching
- Adjustments: Light/dark operation, switch-off delay
- 4 LEDs for indication of light/dark operation, switching status and switch-off delay.
- Bipolar outputs NPN/PNP

Type code R55F



R55FV – Color mark sensor – Basic device for glass fibers



General data

Operating voltage 10...30 VDC

Indication of excess gain type LED chain

Output —, pnp/npn

Switching frequency ≤ 10 kHz

Protection class IP67

Housing material plastic, polycarbonate/ABS

Ambient temperature -10...+55 °C

A glass fiber is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | Light type | w | d |
|---------|-------------------|-----------------------|------------|------|------|
| R55FVQ | 30 x 25 x 97 mm | connector, M12 x 1 | red | w078 | d711 |
| R55FV | 30 x 25 x 85.4 mm | cable | red | w078 | d710 |
| R55FVGQ | 30 x 25 x 97 mm | connector, M12 x 1 | green | w078 | d711 |
| R55FVG | 30 x 25 x 85.4 mm | cable | green | w078 | d710 |
| R55FVBQ | 30 x 25 x 97 mm | connector, M12 x 1 | blue | w078 | d711 |
| R55FVB | 30 x 25 x 85.4 mm | cable | blue | w078 | d710 |
| R55FVWQ | 30 x 25 x 97 mm | connector, M12 x 1 | white | w078 | d711 |
| R55FVW | 30 x 25 x 85.4 mm | cable | white | w078 | d710 |

R55FP – Color mark sensor – Basic device for plastic fibers



General data

Operating voltage 10...30 VDC

Indication of excess gain type LED chain

Output —, pnp/npn

Switching frequency ≤ 10 kHz

Protection class IP67

Housing material plastic, polycarbonate/ABS

Ambient temperature -10...+55 °C

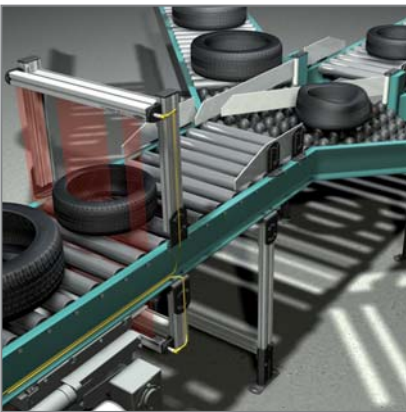
A plastic fiber is required.

Types and data – selection table

| Type | Dimensions | Electrical connection | Light type | w | d |
|---------|-------------------|-----------------------|------------|------|------|
| R55FPQ | 30 x 25 x 97 mm | connector, M12 x 1 | red | w078 | d711 |
| R55FP | 30 x 25 x 85.4 mm | cable | red | w078 | d710 |
| R55FPGQ | 30 x 25 x 97 mm | connector, M12 x 1 | green | w078 | d711 |
| R55FPG | 30 x 25 x 85.4 mm | cable | green | w078 | d710 |
| R55FPBQ | 30 x 25 x 97 mm | connector, M12 x 1 | blue | w078 | d711 |
| R55FPB | 30 x 25 x 85.4 mm | cable | blue | w078 | d710 |
| R55FPWQ | 30 x 25 x 97 mm | connector, M12 x 1 | white | w078 | d711 |
| R55FPW | 30 x 25 x 85.4 mm | cable | white | w078 | d710 |

At a glance

Inspection sensors



Measurement and inspection systems - Adaptable, precise and fast

Sensors and light screens operating with innovative infrared, red light and laser technology fulfill the most sophisticated measurement and inspection tasks efficiently. Changes of distance, scan angles, backgrounds, profiles, shapes, edges, surfaces, reflexions and even colors are easily detected. The sensors operate contactless, at great distances, with high resolution, fast and uninfluenced by interferences of any kind.

Different methods for distance measurement are applied, namely optical triangulation, phase shifting or pulse counting. As a result, clear differences emerge with respect to resolution, repeatability and accuracy.

The fields of application for measurement and inspection sensors are nearly infinite, covering tasks such as distance measurement, color contrasts, filling levels, parts detection, position determination and job sequencing.

Switching and measuring light screens, the so called area sensors, are applied where single beam detection would fail. Light screens consist of many single

beams, detecting the quality of objects through the different switching states of each single beam.

Typical applications are package sizing and profiling in sorting plants, loop and sag detection at conveyor belts, parts counting, measuring of bores and workpieces, edge and center guiding, detection of cracks in tapes and tailback of parts on conveyor belts. In pick-to-light applications they regulate the job sequence in combination with optical and acoustic alerts.

For each application the best solution! TURCK offers the best solutions of a full-service provider for all measurement and inspection systems: You can draw from the extensive variety of our product portfolio which is unrivalled in its scope and diversity. In addition, you can rely on our experience and competence which stand the test in uncountable applications every day.

Our strengths - Your advantages



L-GAGE® LT3 – Laser sensor for distance measurement

LT3 laser sensors for distance measurement provide exceptional sensing ranges and accuracy. Diffuse mode versions achieve ranges of 0.3 to 3 m for grey targets and 0.3 m to 5 m for white targets. Retroreflective sensors achieve ranges of up to 50 m.

The LT3 is easily programmed via push-button. A resolution of up to 1 mm is

achieved depending on the adjusted response time and object color.

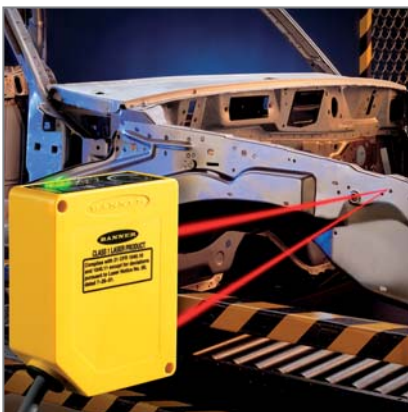
The sensor features a switching and an analog output, each with its individual measuring range. The scalable analog output automatically distributes the output signal over the entire programmed sensing range.



R58E Expert – Registration mark sensor with automatic teach routines

The R58E with excellent color sensitivity is typically used for the registration of products and materials. It achieves excellent repeatability even in high-speed applications, thanks to a response time of 50 μ s.

The static teach mode is used to set output ON and output OFF individually. In dynamic teach mode the R58E adjusts the switchpoint automatically during operation through scanning the brightest and darkest events continuously.



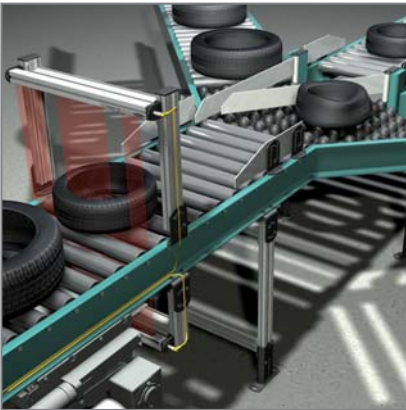
Q60 - Compact sensors with large ranges and background suppression

The compact Q60 with adjustable field and extended sensing range are attractively priced.

Objects with low reflectivity are detected reliably while objects located in the background are ignored.

The input/output timing as well as light/dark operation is adjusted via push-button or external control. The keylock provides additional protection. The cut-off point can be adjusted between 0.2 m and 2 m with a two-turn screw.

advantages

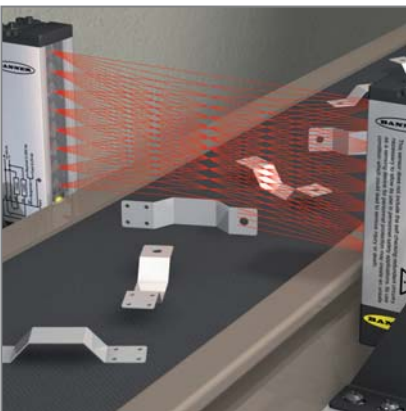


EZ-ARRAY™ – Measuring light screen

The measuring light screen A-GAGE® EZ-ARRAY™ is ideal for product sizing and profiling, edge and center guarding, loop tension control and parts counting etc.

The narrowly arranged infrared beams detect objects of 5 mm width at a range

of 4 m. The height ranges from 150 mm to 1800 mm, edge resolution 2.5 mm. 14 measuring modes can be set such as, 3 scanning methods, 2 analog and 2 digital switching outputs as well as a serial output.

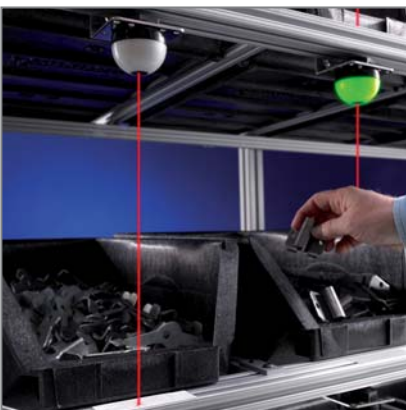


LX – Light screen for very small and flat objects

The LX is a simple, cheap and very reliable alternative for the detection of very small or flat objects. Typical applications are piece counting or parcel handling on conveyor belts. Emitter and receiver generate a very precise optical grid. Very small but also very thin, flat objects are detected reliably, such as sheets of paper

or envelopes. Even irregularly shaped objects in random positions on a conveyor belt are detected.

The LX are available in three different lengths (2, 5, 9 m) and with two different ranges (75...200 resp. 150...2000 mm).



Pick-to-light solutions – Control and monitoring of job sequences

Pick-to-light solutions control and monitor commissioning processes. An array of light beams in front of picking bins detect the hand of the operator. In addition, job lights indicate into which bin the operator has to reach next.

TURCK offers different pick-to-light solutions, also for direct mounting on picking bins. Purely visual, multicolor job lights are applied at places where the output signal of a sensor has to be monitored for example. The bright LEDs are also suitable for indication of machine states.

Our Strengths - Your Advantages

Our strengths - Your advantages



PVA – Light screen for job sequencing

The PVA controls each single bin, making manual confirmation by the operator redundant. The system is easily installed through simple cable routing. Additional job lights are not necessary.

Job sequences are enhanced with the PVA system because operators are quickly trained, workflow errors are ruled out and as a result, the quality control can be reduced. Moreover, communication at multilingual workplaces is simplified and the safety of workflows is also improved.



TL50 – General-purpose indicators

The TL50 tower lights are clearly visible, indicating the operating status throughout the entire production line. Each tower light is preassembled and preconfigured, featuring LEDs in different colors and with optional audible function. The tower lights are easily installed, no matter if mounted directly on the machine, in the cabinet or at critical control points within the production line.

Up to five different color lights are combinable in a single tower and can be on simultaneously.

The durable LED technology has a service life of more than 100,000 hrs. (11 years).

The volume of the audible alert is adjustable; max. sound pressure level 95 dB at 1 m distance.

advantages

Designs and variants

Page 415



Laser sensor PicoDot

Page 417



LED – Sensor Q50

Page 421



LED/Laser sensor Q60

Page 425



Registration mark sensor R58E

| | | | | |
|----------------------------|---|---|--|-------------------------------------|
| Design | rectangular, 12.7 x 40.6 x 45.6 mm | rectangular, 19.7 x 60 x 49.8 mm, 25 x 50 x 50 mm, 15 x 50 x 50 mm, 31 x 58 x 77 mm | rectangular, 25 x 75 x 60 mm | rectangular, 30 x 58.9 x 80.1 mm |
| Output function | NPN PNP | NPN PNP PNP/analog output | pnp/npn Relay output | pnp/npn |
| Protection class | IP54 IP67 | IP67 IP62 | IP67 | IP67 |
| Ambient temperature | -10...+45 °C | -10...+55 °C -25...+55 °C | -20...+55 °C -10...+50 °C -10...+45 °C | -10...+55 °C |
| Operating mode | Convergent mode laser sensor (triangulation) Retroreflective laser sensor (triangulation) with polarizing filter | Diffuse mode sensor with adjustable foreground and background suppression retroreflective sensor colour sensor luminescence sensor | diffuse mode sensor with adjustable background suppression Diffuse mode laser sensor (time-of-fly) with adjustable background suppression | diffuse mode contrast sensor |
| Max. range | 10600 mm | 400 mm | 2000 mm | |
| Light type | red | red IR white UV | red IR | red / green / blue |



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Laser sensors LG5/LG10

Page 411



Laser sensors LT3/LT7

Page 427



Pick-to-Light – K50

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Pick-to-Light – Job sequencing PVA/PVD

Inspection sensors

| | | | | |
|----------------------------|--|--|--|---|
| Design | rectangular, 20.2 x 55.3 x 82.3 mm | rectangular, 35.3 x 68.5 x 87 mm, 42 x 93 x 95 mm | cylindrical/threaded, Ø50 mm | rectangular, 30 x 137.8 x 15 mm, 30 x 266.4 x 15 mm, 30 x 341.4 x 15 mm, 30 x 416.6 x 15 mm |
| Output function | NPN/analog output PNP/analog output | PNP/analog output pnp/npn | PNP | PNP NPN pnp/npn |
| Protection class | IP67 | IP67 | IP67 | IP62 |
| Ambient temperature | -10...+50 °C | 0...+50 °C -10...+50 °C | -20...+50 °C | 0...+50 °C |
| Operating mode | Diffuse mode laser sensor (tri- angulation) | Retroreflective laser sensor (time-of-flight) Diffuse mode laser sensor (time-of-fly) with adjustable background suppression | retro-reflective sensor with polarisation filter diffuse mode sensor with fixed-field background suppression | light screen |
| Max. range | 125 mm | 250000 mm | 2000 mm | 2000 mm |
| Light type | red | red IR | red IR | IR red |

Designs and variants

Page 447



Light screen LX

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Light screen EZ-ARRAY™

Page 435



LED indicators EZ-LIGHT

Page 441



LED – Tower light TL50

Design

rectangular,
25.4 x 342 x 31.8 mm,
25.4 x 189.6 x 31.8 mm,
25.4 x 113.4 x 31.8 mm

rectangular,
36 x 379 x 45.2 mm,
36 x 529 x 45.2 mm,
36 x 678 x 45.2 mm,
36 x 828 x 45.2 mm,
36 x 978 x 45.2 mm,
36 x 1128 x 45.2 mm,
36 x 1278 x 45.2 mm,
36 x 1578 x 45.2 mm,
36 x 1878 x 45.2 mm,
36 x 227 x 45.2 mm,
36 x 2178 x 45.2 mm,
36 x 2478 x 45.2 mm

cylindrical/threaded,
Ø 50 mm,
Ø 18 x 61 mm,
Ø 40 x 45 mm,
Ø 30 mm

50 x 61.2 mm,
50 x 101.9 mm,
50 x 142.6 mm,
50 x 183.3 mm,
50 x 224 mm,
50 x 92 mm,
50 x 132.7 mm,
50 x 173.4 mm,
50 x 214.1 mm

Output function

pnp/hpn

PNP/analog output
NPN/analog output

Protection class

IP67

IP65

IP67
IP50

IP67
IP50

Ambient temperature

-20...+70 °C

-40...+70 °C

-40...+50 °C

-40...+50 °C
-20...+50 °C

Operating mode

light screen

light screen

Max. range

2000 mm

4000 mm

Light type

IR

IR

white
green
red / green
red / yellow / green
red / green / blue
green / red / yellow / blue /
white

red
yellow
white
green / red
green / red / yellow
green / red / yellow / blue
green / red / yellow / blue /
white

s and variants

Laser sensors LG5/LG10



The compact laser gauging sensors LG5 and LG10 work according to the principle of optical triangulation. They are a well-priced and a versatile alternative for precision measurement at short to medium distances. Typical fields of application are the control of surface qualities, dimensional accuracy of components and distance measurement.

The sensors are available with switching and analog output. The limit values are separately programmable for each output via pushbutton. The minimum window size is 1 mm.

Response time, self-diagnostics with alarm output, status indication and hold function are included in the functional scope.

Features

- Compact laser gauging system, working on the principle of optical triangulation, for short to medium distances
- No separate controller required
- Extremely slim beam for precise measurement of distance, height, thickness and other gauging applications
- Accuracy 3 µm (LG5) resp. 10 µm (LG10)
- Sensing ranges: 45 mm...60 mm or 75 mm...125 mm
- Digital switching and analog output in the same unit, individually programmable
- Simple and fast teaching via pushbutton

Type code LG5/LG10



Series

LG laser sensor, rectangular
20.2 x 55.3 x 82.3 mm

Measuring range

5A65 measuring range 45 ... 60 mm
focal point 70mm
5B65 measuring range 45 ... 60 mm
focal point 53 mm
10A65 measuring range 75 ... 125 mm
focal point 180 mm

Switching output

P PNP
N NPN



Analog output

U analog output 0 ... 10V
I analog output 4 ... 20 mA

Electrical connection

Q pigtail with connector, M12 x 1
blank cable connection, 2 m

LG5 – Range 45...60 mm – Focal point 70 mm



| | | | |
|----------------------------|--------------------------|----------------------------|-------------------------|
| General data | | | |
| Operating voltage | 12...30 VDC | Lens material | plastic |
| Power-on, indicator | LED | Ambient temperature | -10...+50 °C |
| Output | —, PNP/analog output | Light type | red |
| Switching frequency | ≤ 500 Hz | Range | 45...60 mm |
| Dimensions | 20.2 x 55.3 x 82.3 mm | Laser class | 2 (EN 60825, IEC 60825) |
| Protection class | IP67 | Focal distance | 70 mm |
| Housing material | metal, ZN, black lacquer | | |

Types and data – selection table

| Type | Electrical connection | Analog output | Load | w | d | e |
|-----------|-------------------------------|---------------|----------|------|------|------|
| LG5A65PIQ | cable with connector, M12 x 1 | 4...20 mA | ≤ 1000 Ω | w071 | d392 | e080 |
| LG5A65PI | cable | 4...20 mA | ≤ 1000 Ω | w071 | d392 | e080 |
| LG5A65PUQ | cable with connector, M12 x 1 | 0...10 V | ≥ 2500 Ω | w071 | d392 | e080 |
| LG5A65PU | cable | 0...10 V | ≥ 2500 Ω | w071 | d392 | e080 |

LG5 – Range 45...60 mm – Focal point 53 mm



| | | | |
|----------------------------|--------------------------|----------------------------|-------------------------|
| General data | | | |
| Operating voltage | 12...30 VDC | Lens material | plastic |
| Power-on, indicator | LED | Ambient temperature | -10...+50 °C |
| Output | —, PNP/analog output | Light type | red |
| Switching frequency | ≤ 500 Hz | Range | 45...60 mm |
| Dimensions | 20.2 x 55.3 x 82.3 mm | Laser class | 2 (EN 60825, IEC 60825) |
| Protection class | IP67 | Focal distance | 53 mm |
| Housing material | metal, ZN, black lacquer | | |

Types and data – selection table

| Type | Electrical connection | Analog output | Load | w | d | e |
|-----------|-------------------------------|---------------|----------|------|------|------|
| LG5B65PIQ | cable with connector, M12 x 1 | 4...20 mA | ≤ 1000 Ω | w071 | d392 | e080 |
| LG5B65PI | cable | 4...20 mA | ≤ 1000 Ω | w071 | d392 | e080 |
| LG5B65PUQ | cable with connector, M12 x 1 | 0...10 V | ≥ 2500 Ω | w071 | d392 | e080 |
| LG5B65PU | cable | 0...10 V | ≥ 2500 Ω | w071 | d392 | e080 |

LG10 – Range 75...125 mm – Focal point 180 mm



General data

| | | | |
|----------------------------|--------------------------|----------------------------|-------------------------|
| Operating voltage | 12...30 VDC | Lens material | plastic |
| Power-on, indicator | LED | Ambient temperature | -10...+50 °C |
| Output | —, PNP/analog output | Light type | red |
| Switching frequency | ≤ 500 Hz | Range | 75...125 mm |
| Dimensions | 20.2 x 55.3 x 82.3 mm | Laser class | 2 (EN 60825, IEC 60825) |
| Protection class | IP67 | Focal distance | 180 mm |
| Housing material | metal, ZN, black lacquer | | |

Types and data – selection table

| Type | Electrical connection | Analog output | Load | w | d | e |
|------------|-------------------------------|---------------|----------|------|------|------|
| LG10A65PIQ | cable with connector, M12 x 1 | 4...20 mA | ≤ 1000 Ω | w071 | d392 | e081 |
| LG10A65PI | cable | 4...20 mA | ≤ 1000 Ω | w071 | d392 | e081 |
| LG10A65PUQ | cable with connector, M12 x 1 | 0...10 V | ≥ 2500 Ω | w071 | d392 | e081 |
| LG10A65PU | cable | 0...10 V | ≥ 2500 Ω | w071 | d392 | e081 |

w Wiring diagrams on page 832 ff

d Dimension drawings on page 842 ff

e Excess gain curves on page 922 ff

Laser sensors LT3/LT7



LT3/LT7 sensors use advanced time-of-flight technology. The laser emits one million pulses per second. The microprocessor records the time each pulse needs to travel to the target and back to the sensor. One thousand pulse times are averaged every millisecond and the value is transferred to the output.

The long rangeability of the sensors enables very small parts or less prominent features to be detected, even if the LT sensor is mounted at a safe distance to the hazardous area.

The sensors are available with switching and analog output. Measuring and switching range are easily adjusted via pushbutton. A bright, visible laser spot simplifies the alignment.

Features

- Measuring range adjusted via pushbutton
- Well-priced solution for long-range detection
- Measuring range up to 10 m in diffuse mode, up to 250 m in retroreflective mode
- Fast and easy programming via pushbutton, no potentiometer adjustments
- Switching and analog outputs
- Switching and measuring range independently adjustable

Type code LT3/LT7



| LT3 | Series | BD | Output | LV | Operating mode |
|---|--------|---|--------|--|----------------|
| Series LT3 laser sensor, light propagation time rectangular 35.3 x 68.5 x 87 mm LT7 laser sensor, light propagation time rectangular 42 x 93 x 95 mm | | Output B PNP/NPN selectable D 2 switching outputs I analog output 4 ... 20 mA N NPN P PNP U analog output 0 ... 10 V | | Operating mode LV laser, retroreflective mode blank laser, diffuse mode | |

| Q | Electrical connection |
|---|-----------------------|
| Electrical connection Q in connector, M12 x 1 Q in combination with LT3 Q in connector, M16 Q in combination with LT7 blank cable connection, 2 m | |

LT3 – Retroreflective sensor



General data

| | | | |
|----------------------------|---------------------|----------------------------|-------------------------|
| Operating voltage | 12...24 VDC | Lens material | plastic |
| Power-on, indicator | LED | Ambient temperature | 0...+50 °C |
| Switching frequency | ≤ 1 kHz | Light type | red |
| Dimensions | 35.3 x 68.5 x 87 mm | Range | 500...50000 mm |
| Protection class | IP67 | Laser class | 1 (EN 60825, IEC 60825) |
| Housing material | plastic, ABS | | |

Types and data – selection table

| Type | Output | Electrical connection | Analog output | w | d | e |
|----------|----------------------|-----------------------|---------------|------|------|------|
| LT3PILVQ | —, PNP/analog output | connector, M12 x 1 | 4...20 mA | w072 | d394 | e082 |
| LT3PILV | —, PNP/analog output | cable | 4...20 mA | w072 | d393 | e082 |
| LT3BDLVQ | 2x —, pnp/npn | connector, M12 x 1 | - | w073 | d394 | e082 |
| LT3BDLV | 2x —, pnp/npn | cable | - | w073 | d393 | e082 |
| LT3PULVQ | —, PNP/analog output | connector, M12 x 1 | 0...10 V | w072 | d394 | e082 |
| LT3PULV | —, PNP/analog output | cable | 0...10 V | w072 | d393 | e082 |

LT3 – Diffuse-mode sensor



General data

| | | | |
|----------------------------|---------------------|----------------------------|-------------------------|
| Operating voltage | 12...24 VDC | Lens material | plastic |
| Power-on, indicator | LED | Ambient temperature | 0...+50 °C |
| Switching frequency | ≤ 1 kHz | Light type | red |
| Dimensions | 35.3 x 68.5 x 87 mm | Range | 300...5000 mm |
| Protection class | IP67 | Laser class | 2 (EN 60825, IEC 60825) |
| Housing material | plastic, ABS | | |

Types and data – selection table

| Type | Output | Electrical connection | Analog output | w | d | e |
|--------|----------------------|-----------------------|---------------|------|------|------|
| LT3PIQ | —, PNP/analog output | connector, M12 x 1 | 4...20 mA | w072 | d394 | e083 |
| LT3PI | —, PNP/analog output | cable | 4...20 mA | w072 | d393 | e083 |
| LT3PUQ | —, PNP/analog output | connector, M12 x 1 | 0...10 V | w072 | d394 | e083 |
| LT3PU | —, PNP/analog output | cable | 0...10 V | w072 | d393 | e083 |
| LT3BDQ | 2x —, pnp/npn | connector, M12 x 1 | - | w073 | d394 | e083 |
| LT3BD | 2x —, pnp/npn | cable | - | w073 | d393 | e083 |


w Wiring diagrams on page 832 ff

d Dimension drawings on page 842 ff

e Excess gain curves on page 922 ff


LT7 – Retroreflective sensor



| | | | |
|----------------------------|--|------------------------------|-------------------------|
| Type | LT7PLVQ | Electrical connection | connector, M16 |
| Operating voltage | 18...30 VDC | Ambient temperature | -10...+50 °C |
| Power-on, indicator | LED | Light type | IR |
| Output | 2x  , PNP | Range | 500...250000 mm |
| Switching frequency | ≤ 400 Hz | Laser class | 1 (EN 60825, IEC 60825) |
| Dimensions | 42 x 93 x 95 mm | Wiring diagram | w074 |
| Protection class | IP67 | Dimension drawing | d395 |
| Housing material | plastic, ABS | Excess gain curve | e084 |
| Lens material | plastic | | |

LT7 – Diffuse-mode sensor



| | | | |
|----------------------------|--|------------------------------|-------------------------|
| Type | LT7PIDQ | Electrical connection | connector, M16 |
| Operating voltage | 18...30 VDC | Ambient temperature | -10...+50 °C |
| Power-on, indicator | LED | Light type | IR |
| Output | 2x  , PNP/analog output | Range | 500...10000 mm |
| Switching frequency | ≤ 400 Hz | Analog output | 4...20 mA |
| Dimensions | 42 x 93 x 95 mm | Laser class | 1 (EN 60825, IEC 60825) |
| Protection class | IP67 | Wiring diagram | w074 |
| Housing material | plastic, ABS | Dimension drawing | d395 |
| Lens material | plastic | Excess gain curve | e085 |

w Wiring diagrams on page 832 ff

d Dimension drawings on page 842 ff

e Excess gain curves on page 922 ff

PicoDot™ laser precision sensors



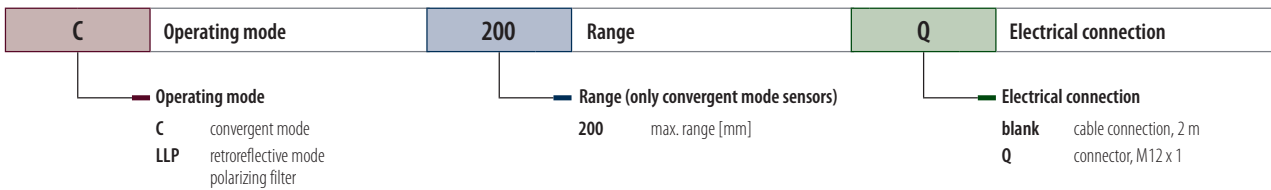
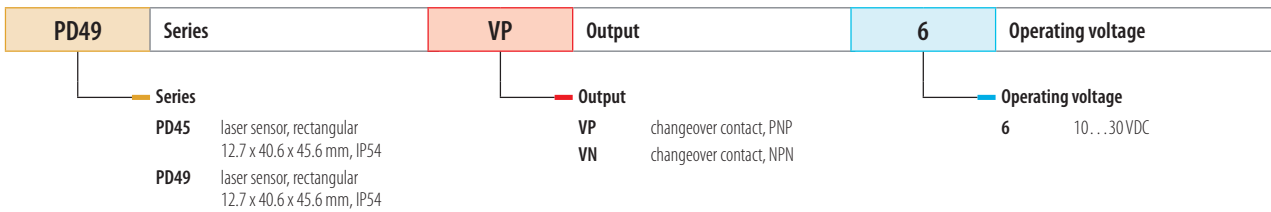
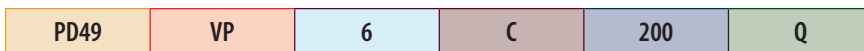
The laser precision sensors of the PicoDot™ series are available as convergent mode and retroreflective versions. The PicoDot™ convergent mode laser sensors detect the position of objects very precisely with high excess gain. The strength of retroreflective sensors lies in their long range operability.

The devices feature an antivalent PNP/NPN switching output. The sensitivity is adjusted via potentiometer. A yellow and a green LED indicate operational readiness, switching status, signal strength as well as short circuit or output overload.

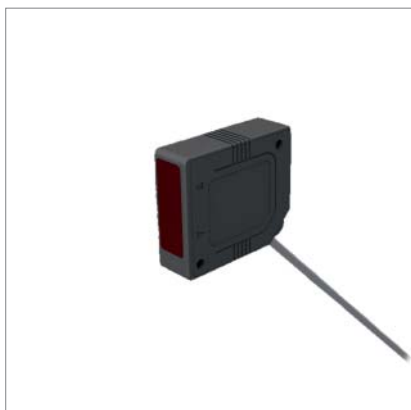
Features


- Fast laser sensor with narrow beam profile
- Convergent mode laser sensors for precise position detection, inspection and counting
- Retroreflective laser sensors for long range detection
- Sensitivity adjusted via potentiometer
- Antivalent switching outputs, PNP/NPN
- Light/dark operation
- Visible red light

Type code PicoDot



PicoDot – Convergent mode sensor

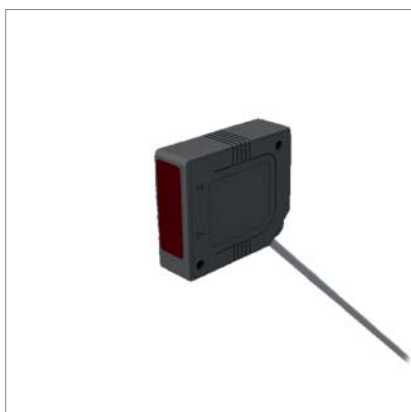



| | | | |
|----------------------------|---|----------------------------|-------------------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Housing material | plastic, ABS |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | -10...+45 °C |
| Output |  , PNP | Light type | red |
| Switching frequency | ≤ 2.5 kHz | Laser class | 2 (EN 60825, IEC 60825) |
| Dimensions | 12.7 x 40.6 x 45.6 mm | | |

Types and data – selection table

| Type | Protection class | Electrical connection | Focal distance | w | d | e |
|--------------|------------------|-------------------------------|----------------|------|------|------|
| PD45VP6C200 | IP54 | cable | 203 mm | w075 | d396 | e086 |
| PD45VP6C200Q | IP54 | cable with connector, M12 x 1 | 203 mm | w075 | d397 | e086 |
| PD49VP6C200Q | IP67 | cable with connector, M12 x 1 | 203 mm | w075 | d397 | e086 |
| PD45VP6C100Q | IP54 | cable with connector, M12 x 1 | 102 mm | w075 | d397 | e086 |
| PD45VP6C100 | IP54 | cable | 102 mm | w075 | d396 | e086 |

PicoDot – Retroreflective sensor with polarizing filter



| | | | |
|----------------------------|---|----------------------------|-------------------------|
| General data | | | |
| Operating voltage | 10...30 VDC | Housing material | plastic, ABS |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | -10...+45 °C |
| Output |  , PNP | Light type | red |
| Switching frequency | ≤ 2.5 kHz | Range | 200...10600 mm |
| Dimensions | 12.7 x 40.6 x 45.6 mm | Laser class | 2 (EN 60825, IEC 60825) |

Types and data – selection table

| Type | Protection class | Electrical connection | w | d | e |
|-------------|------------------|-------------------------------|------|------|------|
| PD49VP6LLPQ | IP67 | cable with connector, M12 x 1 | w075 | d397 | e087 |
| PD45VP6LLPQ | IP54 | cable with connector, M12 x 1 | w075 | d397 | e087 |
| PD45VP6LLP | IP54 | cable | w075 | d396 | e087 |

Triangulation sensor Q50



Q50 is a series of compact LED-based triangulation sensors. The high-performing sensors are a well-priced alternative to laser sensors for demanding measurement applications. Available are devices with switching, analog current or voltage output.

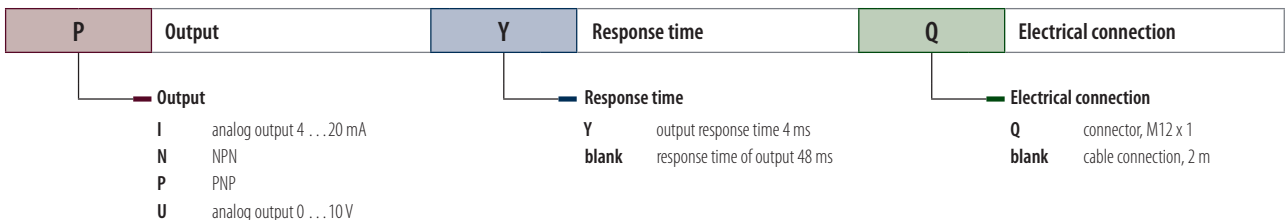
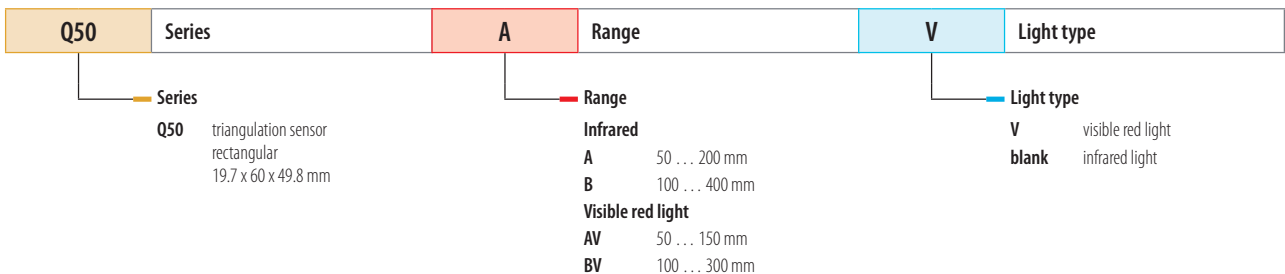
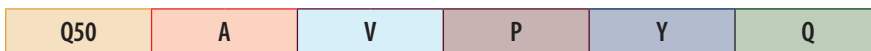
Pushbutton or remote programming of close and long distance measurement. Devices with switching output can be taught a measuring range with two switchpoints, or just one switchpoint, like sensors with background suppression.

The scalable analog output automatically distributes the output signal over the width of the programmed sensing window.

Features

- Powerful LED-based triangulation sensor
- Versions with switching output (PNP/NPN) or with analog current or voltage output
- Measuring range 50...400 mm
- Foreground and background suppression
- Fast and easy programming via pushbutton
- Remote teach input
- Two bicolor status LEDs
- Visible red and infrared light
- Protection class IP67

Type code Q50







Q50 – Visible red light – Range 50...150 mm



| | | | |
|-------------------------|---------------------|----------------------------|--------------|
| General data | | | |
| Dimensions | 19.7 x 60 x 49.8 mm | Ambient temperature | -10...+55 °C |
| Protection class | IP67 | Light type | red |
| Housing material | plastic, ABS | Range | 50...150 mm |
| Lens material | plastic | | |

Types and data – selection table





| Type | Operating voltage | Output | Switching frequency | Electrical connection | Analog output | w | d | e |
|----------|-------------------|---|---------------------|-----------------------|---------------|------|------|------|
| Q50AVPQ | 12...30 VDC |  , PNP | ≤ 7 Hz | connector | - | w076 | d399 | e088 |
| Q50AVP | 12...30 VDC |  , PNP | ≤ 7 Hz | cable | - | w076 | d398 | e088 |
| Q50AVPYQ | 12...30 VDC |  , PNP | ≤ 112 Hz | connector | - | w076 | d399 | e088 |
| Q50AVPY | 12...30 VDC |  , PNP | ≤ 112 Hz | cable | - | w076 | d398 | e088 |
| Q50AVIQ | 15...30 VDC | - | - | connector | 4...20 mA | w077 | d399 | e089 |
| Q50AVI | 15...30 VDC | - | - | cable | 4...20 mA | w077 | d398 | e089 |
| Q50AVUQ | 15...30 VDC | - | - | connector | 0...10 V | w077 | d399 | e089 |
| Q50AVU | 15...30 VDC | - | - | cable | 0...10 V | w077 | d398 | e089 |

Q50 – Infrared light – Range 50...200 mm



| | | | |
|-------------------------|---------------------|----------------------------|--------------|
| General data | | | |
| Dimensions | 19.7 x 60 x 49.8 mm | Ambient temperature | -10...+55 °C |
| Protection class | IP67 | Light type | IR |
| Housing material | plastic, ABS | Range | 50...200 mm |
| Lens material | plastic | | |

Types and data – selection table

| Type | Operating voltage | Output | Switching frequency | Electrical connection | Analog output | w | d | e |
|---------|-------------------|---|---------------------|-----------------------|---------------|------|------|------|
| Q50APQ | 12...30 VDC |  , PNP | ≤ 7 Hz | connector | - | w076 | d399 | e088 |
| Q50AP | 12...30 VDC |  , PNP | ≤ 7 Hz | cable | - | w076 | d398 | e088 |
| Q50APYQ | 12...30 VDC |  , PNP | ≤ 112 Hz | connector | - | w076 | d399 | e088 |
| Q50APY | 12...30 VDC |  , PNP | ≤ 112 Hz | cable | - | w076 | d398 | e088 |
| Q50AIQ | 15...30 VDC | - | - | connector | 4...20 mA | w077 | d399 | e089 |
| Q50AI | 15...30 VDC | - | - | cable | 4...20 mA | w077 | d398 | e089 |
| Q50AUQ | 15...30 VDC | - | - | connector | 0...10 V | w077 | d399 | e089 |
| Q50AU | 15...30 VDC | - | - | cable | 0...10 V | w077 | d398 | e089 |





Q50 – Visible red light – Range 100...300 mm



General data

| | | | |
|-------------------------|---------------------|----------------------------|--------------|
| Dimensions | 19.7 x 60 x 49.8 mm | Ambient temperature | -10...+55 °C |
| Protection class | IP67 | Light type | red |
| Housing material | plastic, ABS | Range | 100...300 mm |
| Lens material | plastic | | |

Types and data – selection table

| Type | Operating voltage | Output | Switching frequency | Electrical connection | Analog output | w | d | e |
|----------|-------------------|---|---------------------|-----------------------|---------------|------|------|------|
| Q50BVPQ | 12...30 VDC |  , PNP | ≤ 7 Hz | connector | - | w076 | d399 | e090 |
| Q50BVP | 12...30 VDC |  , PNP | ≤ 7 Hz | cable | - | w076 | d398 | e090 |
| Q50BVPYQ | 12...30 VDC |  , PNP | ≤ 112 Hz | connector | - | w076 | d399 | e090 |
| Q50BVPY | 12...30 VDC |  , PNP | ≤ 112 Hz | cable | - | w076 | d398 | e090 |
| Q50BVIQ | 15...30 VDC | - | - | connector | 4...20 mA | w077 | d399 | e091 |
| Q50BVI | 15...30 VDC | - | - | cable | 4...20 mA | w077 | d398 | e091 |
| Q50BVUQ | 15...30 VDC | - | - | connector | 0...10 V | w077 | d399 | e091 |
| Q50BVU | 15...30 VDC | - | - | cable | 0...10 V | w077 | d398 | e091 |





Q50 – Infrared light – Range 100...400 mm



General data

| | | | |
|-------------------------|---------------------|----------------------------|--------------|
| Dimensions | 19.7 x 60 x 49.8 mm | Ambient temperature | -10...+55 °C |
| Protection class | IP67 | Light type | IR |
| Housing material | plastic, ABS | Range | 100...400 mm |
| Lens material | plastic | | |

Types and data – selection table

| Type | Operating voltage | Output | Switching frequency | Electrical connection | Analog output | w | d | e |
|---------|-------------------|---|---------------------|-----------------------|---------------|------|------|------|
| Q50BPQ | 12...30 VDC |  , PNP | ≤ 7 Hz | connector | - | w076 | d399 | e090 |
| Q50BP | 12...30 VDC |  , PNP | ≤ 7 Hz | cable | - | w076 | d398 | e090 |
| Q50BPYQ | 12...30 VDC |  , PNP | ≤ 112 Hz | connector | - | w076 | d399 | e090 |
| Q50BPY | 12...30 VDC |  , PNP | ≤ 112 Hz | cable | - | w076 | d398 | e090 |
| Q50BIQ | 15...30 VDC | - | - | connector | 4...20 mA | w077 | d399 | e091 |
| Q50BI | 15...30 VDC | - | - | cable | 4...20 mA | w077 | d398 | e091 |
| Q50BUQ | 15...30 VDC | - | - | connector | 0...10 V | w077 | d399 | e091 |
| Q50BU | 15...30 VDC | - | - | cable | 0...10 V | w077 | d398 | e091 |

Laser/LED sensors Q60



The Q60 series comprises sensors working with laser or visible red LED beam. They are long-range operating devices with programmable background suppression. Objects with low reflectivity are detected reliably while objects located just beyond the sensing field are ignored. The cutoff point is set via a two-turn adjusting screw.

Output timing, light/dark operate and keylock are programmed remotely or via two pushbuttons.

Configuration and operating status are indicated by seven LEDs in run mode. Five of the seven LEDs combine to form a single light bar indicating relative ON and OFF delay.

Features

- Sensors with adjustable background suppression
- Measuring ranges 200 ... 2000 mm
- Easy setting of cutoff point
- Laser or LED sensors (infrared or visible red light)
- Easy programming via integrated pushbutton or remotely
- Light or dark operate
- Seven LEDs indicate configuration and operating status
- Rugged IP67 rated housing

Type code Q60

| | | | | | | |
|-----|----|---|---|----|------|---|
| Q60 | BB | 6 | L | AF | 1400 | Q |
|-----|----|---|---|----|------|---|

| | | | | | |
|--------|--|--------|--|-------------------|---|
| Q60 | Series | BB | Output | 6 | Operating voltage |
| Series | Q60 laser /LED sensors rectangular 25 x 75 x 60 mm | Output | BB PNP/NPN bipolar VR relay output (changeover contact) | Operating voltage | 6 10...30 VDC 3 12...250 VDC 24...250 VAC |

| | | | | | |
|-------------|------------------------------------|------------------------|--|-----------------|--------------------|
| L | Sensor type | AF | Background suppression | 1400 | Max. range [mm] |
| Sensor type | L laser sensor blank LED sensor | Background suppression | AF adjustable field, infrared light AFV adjustable field, visible red light | Max. range [mm] | 1400 max. range mm |

| | |
|-----------------------|---|
| Q | Electrical connection |
| Electrical connection | blank cable connection, 2 m Q connector, M12 x 1 |

Q60 – Visible red light – Range 200...1000 mm



| | | | |
|----------------------------|-----------------|----------------------------|---------------|
| General data | | | |
| Power-on, indicator | LED | Lens material | plastic |
| Dimensions | 25 x 75 x 60 mm | Ambient temperature | -20...+55 °C |
| Protection class | IP67 | Light type | red |
| Housing material | plastic, ABS | Range | 200...1000 mm |

Types and data – selection table

| Type | Operating voltage | Output | Switching frequency | Electrical connection | w | d | e |
|----------------|-------------------|-----------------|---------------------|-----------------------|------|------|------|
| Q60BB6AFV1000Q | 10...30 VDC | —, pnp/npn | ≤ 250 Hz | connector, M12 x 1 | w078 | d400 | e092 |
| Q60BB6AFV1000 | 10...30 VDC | —, pnp/npn | ≤ 250 Hz | cable | w078 | d401 | e092 |
| Q60VR3AFV1000 | 12...250 VDC | —, relay output | ≤ 33 Hz | cable | w079 | d401 | e092 |

Q60 – Laser class 1 – Range 200...1400 mm



| | | | |
|----------------------------|-----------------|----------------------|-------------------------|
| General data | | | |
| Power-on, indicator | LED | Lens material | plastic |
| Dimensions | 25 x 75 x 60 mm | Light type | red |
| Protection class | IP67 | Range | 200...1400 mm |
| Housing material | plastic, ABS | Laser class | 1 (EN 60825, IEC 60825) |

Types and data – selection table

| Type | Operating voltage | Output | Switching frequency | Electrical connection | Ambient temperature | w | d | e |
|----------------|-------------------|-----------------|---------------------|-----------------------|---------------------|------|------|------|
| Q60BB6LAF1400Q | 10...30 VDC | —, pnp/npn | ≤ 250 Hz | connector, M12 x 1 | -10...+50 °C | w078 | d400 | e094 |
| Q60BB6LAF1400 | 10...30 VDC | —, pnp/npn | ≤ 250 Hz | cable | -10...+50 °C | w078 | d401 | e094 |
| Q60VR3LAF1400 | 12...250 VDC | —, relay output | ≤ 33 Hz | cable | -10...+45 °C | w079 | d401 | e094 |

Q60 – Infrared light – Range 200...2000 mm



General data

| | | | |
|----------------------------|-----------------|----------------------------|---------------|
| Power-on, indicator | LED | Lens material | plastic |
| Dimensions | 25 x 75 x 60 mm | Ambient temperature | -20...+55 °C |
| Protection class | IP67 | Light type | IR |
| Housing material | plastic, ABS | Range | 200...2000 mm |

Types and data – selection table

| Type | Operating voltage | Output | Switching frequency | Electrical connection | w | d | e |
|---------------|-------------------|-----------------|---------------------|-----------------------|------|------|------|
| Q60BB6AF2000Q | 10...30 VDC | —, pnp/npn | ≤ 250 Hz | connector, M12 x 1 | w078 | d400 | e093 |
| Q60BB6AF2000 | 10...30 VDC | —, pnp/npn | ≤ 250 Hz | cable | w078 | d401 | e093 |
| Q60VR3AF2000 | 12...250 VDC | —, relay output | ≤ 33 Hz | cable | w079 | d401 | e093 |

Q60 – Laser class 2 – Range 200...2000 mm



General data

| | | | |
|----------------------------|-----------------|----------------------|-------------------------|
| Power-on, indicator | LED | Lens material | plastic |
| Dimensions | 25 x 75 x 60 mm | Light type | red |
| Protection class | IP67 | Range | 200...2000 mm |
| Housing material | plastic, ABS | Laser class | 2 (EN 60825, IEC 60825) |

Types and data – selection table

| Type | Operating voltage | Output | Switching frequency | Electrical connection | Ambient temperature | w | d | e |
|----------------|-------------------|-----------------|---------------------|-----------------------|---------------------|------|------|------|
| Q60BB6LAF2000Q | 10...30 VDC | —, pnp/npn | ≤ 250 Hz | connector, M12 x 1 | -10...+50 °C | w078 | d400 | e093 |
| Q60BB6LAF2000 | 10...30 VDC | —, pnp/npn | ≤ 250 Hz | cable | -10...+50 °C | w078 | d401 | e093 |
| Q60VR3LAF2000 | 12...250 VDC | —, relay output | ≤ 33 Hz | cable | -10...+45 °C | w079 | d401 | e093 |

w Wiring diagrams on page 832 ff

d Dimension drawings on page 842 ff

e Excess gain curves on page 922 ff

Registration mark sensor R58E



The registration mark sensor R58 Expert detects all common color marks used for product and material registration. The sensor automatically selects one of the three integrated color LEDs (red, green, blue) to achieve the highest contrast ratio. The very fast response time of 50 μ s is perfectly suited for high-speed applications.

Contrast sensitivity, switching performance and delays are adjusted via integrated pushbuttons or remote via teach line. Static or dynamic teaching of switch ON/OFF delay.

Features

- Registration mark sensor with tri-color light source
- Excellent color contrast sensitivity, detects 16 greyscales
- Vertical or horizontal light spot, depending on the model
- Light/dark operate, switch ON/OFF delay 30 ms, programmed via pushbutton or teach line
- Bipolar output PNP/NPN
- Highly visible 8-segment bargraph indicates signal strength, output status and setup.
- Rugged IP67 rated housing

Type code R58



Series
R58 registration mark sensor
rectangular
30 x 58.9 x 80.1 mm

Programming
E teachable

Scanning
CRGB convergent mode sensor,
3 emitter LEDs, red, green, blue



Detection field
1 parallel detection field relative to
the housing axis
2 vertical detection field relative to
the housing axis

Electrical connection
blank cable connection, 2 m
Q connector, M12 x 1

R58E – Parallel detection field



General data

| | |
|---------------------------------------|---------------------|
| Operating voltage | 10...30 VDC |
| Indication of excess gain type | LED chain |
| Output | —, pnp/npn |
| Switching frequency | ≤ 10 kHz |
| Dimensions | 30 x 58.9 x 80.1 mm |
| Protection class | IP67 |

| | |
|----------------------------|--------------------|
| Housing material | metal, ZN |
| Lens material | plastic |
| Ambient temperature | -10...+55 °C |
| Light type | red / green / blue |
| Focal distance | 10 mm |

Types and data – selection table

| Type | Electrical connection | w | d |
|------------|-----------------------|------|------|
| R58ECRQB1Q | connector, M12 x 1 | w078 | d403 |
| R58ECRQB1 | cable | w078 | d402 |

R58E – Vertical detection field



General data

| | |
|---------------------------------------|---------------------|
| Operating voltage | 10...30 VDC |
| Indication of excess gain type | LED chain |
| Output | —, pnp/npn |
| Switching frequency | ≤ 10 kHz |
| Dimensions | 30 x 58.9 x 80.1 mm |
| Protection class | IP67 |

| | |
|----------------------------|--------------------|
| Housing material | metal, ZN |
| Lens material | plastic |
| Ambient temperature | -10...+55 °C |
| Light type | red / green / blue |
| Focal distance | 10 mm |

Types and data – selection table

| Type | Electrical connection | w | d |
|------------|-----------------------|------|------|
| R58ECRQB2Q | connector, M12 x 1 | w078 | d403 |
| R58ECRQB2 | cable | w078 | d402 |

Pick-to-Light sensors K50

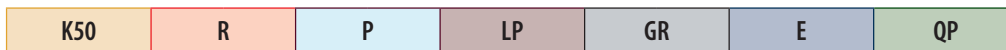


The Pick-to-Light K50 are mounted to the bins. Integrated job lights indicate the pickup order of components. If the operator takes a component from a box, the sensor detects the operator's hand and sends a correspondent signal to the control unit. The control unit checks if the right component and the right amount has been removed from the box. If so, the job light of the current box is switched off and the job light of the next box turns on. Alarm and other signals can be programmed to indicate mispick.

Features

- Sensors with integrated job light for removal control and bin-picking applications
- Compact design with sensor and integrated job light
- Job lights available in different colors
- Versions with pushbutton and passive triggering to confirm the removal
- NPN or PNP output
- Fully encapsulated IP67 build, suited for rough environments
- Protection against ambient light, immune to electromagnetic and high-frequency interferences

Type code K50



Series

K50 pick-to-light, Ø 50 mm, height 37.3 mm thread M30 x 1

Output function

A light operation
R dark operation

Output

P PNP
N NPN



Operating mode

LP retroreflective mode polarizing filter
FF50 diffuse mode fixed field 50 mm
PB pushbutton

Colors

G green
R red
X single-color

Color signals

C request green - pick-up red - picking error red
D request green - pick-up green - picking error OFF
E request green - pick-up green - picking error red



Electrical connection

blank cable connection, 2 m
Q connector, M12 x 1
QP cable connection with connection, M12 x 1

K50 – Pick-to-Light – Retroreflective sensor with polarizing filter



General data

| | | | |
|----------------------------|---------------|----------------------------|--------------|
| Operating voltage | 12...30 VDC | Lens material | plastic |
| Switching frequency | ≤ 160 Hz | Ambient temperature | -20...+50 °C |
| Dimensions | Ø50 x 37.3 mm | Light type | red |
| Protection class | IP67 | Range | 0...2000 mm |
| Housing material | plastic, PC | | |

Versions with one (GXD) or more colored signal lights (GRC/GRE) are available.

Types and data – selection table

| Type | Output | Electrical connection | w | d |
|--------------|----------------------|-------------------------------|------|------|
| K50RPLPGRCQ | dark operation, PNP | connector, M12 x 1 | w080 | d405 |
| K50APLPGXDQP | light operation, PNP | cable with connector, M12 x 1 | w080 | d404 |
| K50APLPGREQP | light operation, PNP | cable with connector, M12 x 1 | w080 | d404 |
| K50RPLPGXDQP | dark operation, PNP | cable with connector, M12 x 1 | w080 | d404 |
| K50RPLPGREQP | dark operation, PNP | cable with connector, M12 x 1 | w080 | d404 |

K50 – Pick-to-Light – Diffuse mode sensor with fixed-field



General data

| | | | |
|----------------------------|---------------|----------------------------|--------------|
| Operating voltage | 12...30 VDC | Lens material | plastic |
| Switching frequency | ≤ 160 Hz | Ambient temperature | -20...+50 °C |
| Dimensions | Ø50 x 37.3 mm | Light type | IR |
| Protection class | IP67 | Range | 0...100 mm |
| Housing material | plastic, PC | | |

Versions with one (GXD) or more colored signal lights (GRC/GRE) are available.

Types and data – selection table

| Type | Output | Electrical connection | w | d |
|-----------------|----------------------|-------------------------------|------|------|
| K50APFF100GREQ | light operation, PNP | connector, M12 x 1 | w080 | d405 |
| K50APFF100GXQD | light operation, PNP | connector, M12 x 1 | w080 | d405 |
| K50APFF100GXQDP | light operation, PNP | cable with connector, M12 x 1 | w080 | d404 |
| K50APFF100GREQP | light operation, PNP | cable with connector, M12 x 1 | w080 | d404 |
| K50APFF100GRCQP | light operation, PNP | cable with connector, M12 x 1 | w080 | d404 |
| K50RPF100GXQDP | dark operation, PNP | cable with connector, M12 x 1 | w080 | d404 |
| K50RPF100GREQP | dark operation, PNP | cable with connector, M12 x 1 | w080 | d404 |

K50 – Pick-to-Light – Pushbutton



General data

Operating voltage 12...30 VDC

Output , PNP

Switching frequency ≤ 160 Hz

Dimensions Ø50 x 37.3 mm

Protection class IP67

Housing material plastic, PC

Electrical connection cable with connector, M12 x 1

Ambient temperature -20...+50 °C

Versions with one (GXD) or more colored signal lights (GRE)

Types and data – selection table

| Type | w | d |
|--------------|------|------|
| K50APPBGXDQP | w080 | d404 |
| K50APPBGREQP | w080 | d404 |

w Wiring diagrams on page 832 ff

d Dimension drawings on page 842 ff

e Excess gain curves on page 922 ff

Job sequencing PVA/PVD



PVA and PVD sensors are used for job sequencing and monitoring of bin-picking processes. Clearly visible job lights on each emitter and receiver guide the operators at the assembly lines through the parts assembly sequence. Failures such as missing or wrongly mounted parts are considerably reduced.

The following settings can be adjusted via DIP switch: PNP/NPN output, NO/NC output, steady/flashing job light; gate polarity for activation of job light. LEDs indicate setup and system failures.

Features

- PVA: Opposed mode sensor, 2 m range; emitter and receiver with integrated job light; asynchronous emitter and receiver
- PVD: One-piece, compact sensor; automatic selection of diffuse or retroreflective mode; max. 2 m range with reflector; max. 400 mm in diffuse mode
- Protective mounting brackets are available

Type code PVA & PVD



Series

PVA light screen for bin-picking sequences, two-part
width: 15 mm, depth: 30 mm
other heights
PVA 100: 137.8 mm
PVA 225: 266.4 mm
PVA 300: 341.4 mm
PVA 375: 416.6 mm

PVD light screen for bin-picking sequences, one-part
width: 15 mm, depth: 30 mm
other heights
PVD 100: 137.8 mm
PVD 225: 266.4 mm

Monitored field (height)

225 monitored field in mm

Output (PVA)

P PNP
N NPN



Operating voltage (PVA)

6 10...30 VDC

Operating mode (PVA)

E emitter
R receiver
blank pair (emitter/receiver)


Electrical connection

blank cable connection, 2 m
Q pigtail with connector, M12 x 1



PVA – Pick-to-Light – Opposed mode sensor



General data

| | | | |
|----------------------------|---|----------------------------|--------------------------|
| Operating voltage | 12...30 VDC | Housing material | metal, AL, black lacquer |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | 0...+50 °C |
| Output |  , PNP | Light type | IR |
| Protection class | IP62 | Range | 0...2000 mm |


Types and data – selection table

| Type | Switching frequency | Dimensions | Electrical connection | Detection zone height |  |  |
|-----------|---------------------|--------------------|-------------------------------|-----------------------|---|---|
| PVA100P6Q | ≤ 250 Hz | 30 x 137.8 x 15 mm | cable with connector, M12 x 1 | 100 mm | w081 | d406 |
| PVA100P6 | ≤ 250 Hz | 30 x 137.8 x 15 mm | cable | 100 mm | w081 | d407 |
| PVA225P6Q | ≤ 125 Hz | 30 x 266.4 x 15 mm | cable with connector, M12 x 1 | 225 mm | w081 | d406 |
| PVA225P6 | ≤ 125 Hz | 30 x 266.4 x 15 mm | cable | 225 mm | w081 | d407 |
| PVA300P6Q | ≤ 100 Hz | 30 x 341.4 x 15 mm | cable with connector, M12 x 1 | 300 mm | w081 | d406 |
| PVA300P6 | ≤ 100 Hz | 30 x 341.4 x 15 mm | cable | 300 mm | w081 | d407 |
| PVA375P6Q | ≤ 80 Hz | 30 x 416.6 x 15 mm | cable with connector, M12 x 1 | 375 mm | w081 | d406 |
| PVA375P6 | ≤ 80 Hz | 30 x 416.6 x 15 mm | cable | 375 mm | w081 | d407 |

PVD – Pick-to-Light – Diffuse / Retroreflective mode sensor



General data

| | | | |
|----------------------------|---|----------------------------|--------------------------|
| Operating voltage | 12...30 VDC | Housing material | metal, AL, black lacquer |
| Power-on, indicator | LED | Lens material | plastic |
| Error message type | LED | Ambient temperature | 0...+50 °C |
| Output |  , pnp/npn | Light type | red |
| Switching frequency | ≤ 2.5 Hz | Range | 0...2000 mm |
| Protection class | IP62 | | |

PVD can also be used as retroreflective sensor with reflector (range up to 2 m).

Types and data – selection table

| Type | Dimensions | Electrical connection | Detection zone height | w | d |
|---------|--------------------|-------------------------------|-----------------------|------|------|
| PVD225Q | 30 x 266.4 x 15 mm | cable with connector, M12 x 1 | 240 mm | w082 | d408 |
| PVD225 | 30 x 266.4 x 15 mm | cable | 240 mm | w082 | d408 |
| PVD100 | 30 x 137.8 x 15 mm | cable | 111 mm | w082 | d409 |
| PVD100Q | 30 x 137.8 x 15 mm | cable with connector, M12 x 1 | 111 mm | w082 | d409 |

w Wiring diagrams on page 832 ff

d Dimension drawings on page 842 ff

e Excess gain curves on page 922 ff

Multisegment LED indicators EZ-LIGHT



The EZ-LIGHT series provides a comprehensive selection of job lights, indicator lights, general-purpose indicators and touch switches for job sequencing and monitoring of pick-to-light and assembly processes. The rugged devices are suited for rough industrial applications and feature clearly visible status indicators.

The EZ-LIGHT indicators are programmed in a few steps and are easily mounted directly on the machine, in the cabinet or at critical control points. A great variety of designs, modules, functions and accessories offer perfect solutions for any task.

Features

- Highly visible LED indicators, up to 5 colors available
- Optional audible alert
- Different designs and sizes
- Simple mounting and configuration

Type code EZ-LIGHT

| | | | |
|------|-------|---|----|
| K50L | GRYBW | P | QP |
|------|-------|---|----|

| | | | | | |
|------|--------|-------|--------------------|---|-------|
| K50L | Series | GRYBW | LED colors/signals | P | Input |
|------|--------|-------|--------------------|---|-------|

Series

| | |
|-------------|---|
| T8L | cylinder, plastic Ø 16 mm thread Ø 8 mm |
| M18 | cylinder, plastic thread, Ø 18 mm |
| T18 | cylinder, plastic Ø 30 mm thread Ø 8 mm |
| T30 | cylinder, plastic Ø 40 mm thread Ø 30 mm |
| K30L | cylinder, plastic Ø 30 mm thread Ø 22.5 mm |
| K50L | cylinder, plastic Ø 50 mm thread Ø 30 mm |
| K80L | rectangular, plastic 81 x 110 x 67 mm |

LED colors

| | |
|----------|------------------------|
| G | green |
| R | red |
| Y | yellow |
| B | blue |
| W | white |
| X | no other function |
| 2 | 3 colors / 7 functions |

Audible signals

| | |
|-------------|-----------------------|
| A1Y | continuous tone 75 dB |
| A2Y | pulsed tone |
| AL1Y | continuous tone 95 dB |

Input

| | |
|----------|-----|
| P | PNP |
| N | NPN |

QP

Electrical connection

Electrical connection

| | |
|--------------|--|
| blank | pigtail cable connection, 2 m |
| QP | 150 mm PVC cable connection with connector, M12 x 1, 5-pole |
| Q | connector, M12 x 1, 5-pole |
| Q8 | connector, M12 x 1, 8-pole |

EZ-LIGHT – 1 LED color



General data

| | | | |
|--------------------------|---------------|------------------------------|--------------|
| Operating voltage | 18...30 VDC | Lens material | plastic |
| Dimensions | Ø50 x 37.3 mm | Electrical connection | cable |
| Protection class | IP67 | Ambient temperature | -40...+50 °C |
| Housing material | plastic, PC | Response time | 250 ms |

Types and data – selection table

| Type | Light type | w | d |
|----------|------------|------|------|
| K50LWXXP | white | w083 | d410 |
| K50LGXXP | green | w083 | d410 |

EZ-LIGHT – 2 LED colors



General data

| | | | |
|-------------------------|---------|----------------------------|--------------|
| Protection class | IP67 | Ambient temperature | -40...+50 °C |
| Lens material | plastic | Response time | 250 ms |

Types and data – selection table

| Type | Operating voltage | Dimensions | Housing material | Electrical connection | Light type | w | d |
|-----------|-------------------|--------------|--------------------|-------------------------------|-------------|------|------|
| M18RGXPQ | 10...30 VDC | Ø 18 x 61 mm | metal, CuZn | connector, M12 x 1 | red / green | w083 | d411 |
| T18RGXPQ | 10...30 VDC | 53.6 x 33 mm | plastic, Polyester | connector, M12 x 1 | red / green | w083 | d412 |
| T30RGXPQ | 10...30 VDC | Ø 40 x 45 mm | plastic, Polyester | connector, M12 x 1 | red / green | w083 | d413 |
| K30LGRXPQ | 10...30 VDC | Ø 30 mm | plastic, PC | connector, M12 x 1 | red / green | w085 | d417 |
| K50LGRXPQ | 18...30 VDC | Ø 50 mm | plastic, PC | cable with connector, M12 x 1 | red / green | w084 | d414 |
| T8LGRXPQP | 10...30 VDC | - | plastic, Polyester | cable with connector | red / green | w085 | d416 |
| T8LGRXP | 10...30 VDC | - | plastic, Polyester | cable, M12 x 1 | red / green | w085 | d415 |

EZ-LIGHT – 3 LED colors



| | | | |
|-------------------------|---------|----------------------------|--------------|
| General data | | | |
| Protection class | IP67 | Ambient temperature | -40...+50 °C |
| Lens material | plastic | Response time | 250 ms |

Types and data – selection table

| Type | Operating voltage | Dimensions | Housing material | Electrical connection | Light type | w | d |
|-----------|-------------------|------------------------|--------------------|-----------------------|----------------------|------|------|
| K50LGRYPQ | 18...30 VDC | Ø 50 mm | plastic, PC | connector, M12 x 1 | red / yellow / green | w083 | d418 |
| M18GRYPQ | 10...30 VDC | Ø 18 x 61 mm | metal, CuZn | connector, M12 x 1 | red / yellow / green | w083 | d411 |
| T18GRYPQ | 10...30 VDC | 53.6 x 33 mm | plastic, Polyester | connector, M12 x 1 | red / yellow / green | w083 | d412 |
| T30GRYPQ | 10...30 VDC | Ø 40 x 45 mm | plastic, Polyester | connector, M12 x 1 | red / yellow / green | w083 | d413 |
| K30LGRYPQ | 10...30 VDC | Ø30 mm | plastic, PC | connector, M12 x 1 | red / yellow / green | w085 | d417 |
| K50LGRYP | 18...30 VDC | Ø50 mm | plastic, PC | cable | red / yellow / green | w083 | d410 |
| K80LGRYPQ | 18...30 VDC | 109.5 x 66.3 x 80.8 mm | plastic, ABS | connector, M12 x 1 | red / yellow / green | w083 | d419 |
| K50LGRBPQ | 18...30 VDC | Ø50 mm | plastic, PC | connector, M12 x 1 | red / green / blue | w083 | d418 |

EZ-LIGHT – 3 LED colors – 7 functions



| | | | |
|------------------------------|--------------------|----------------------------|--------------|
| General data | | | |
| Protection class | IP67 | Ambient temperature | -40...+50 °C |
| Lens material | plastic | Response time | 250 ms |
| Electrical connection | connector, M12 x 1 | | |

Types and data – selection table

| Type | Operating voltage | Dimensions | Housing material | Light type | w | d | e |
|------------|-------------------|------------------------|------------------|----------------------|------|------|------|
| K50LGRY2PQ | 18...30 VDC | Ø50 mm | plastic, PC | red / yellow / green | w083 | d418 | e095 |
| M18GRY2PQ | 10...30 VDC | Ø18 x 61 mm | metal, CuZn | red / yellow / green | w083 | d411 | e095 |
| K80LGRB2PQ | 18...30 VDC | 109.5 x 66.3 x 80.8 mm | plastic, ABS | red / green / blue | w083 | d419 | e095 |
| K80LGRY2PQ | 18...30 VDC | 109.5 x 66.3 x 80.8 mm | plastic, ABS | red / yellow / green | w083 | d419 | e095 |

EZ-LIGHT – 5 LED colors



General data

| | | | |
|--------------------------|-------------|----------------------------|-------------------------------------|
| Operating voltage | 18...30 VDC | Ambient temperature | -40...+50 °C |
| Protection class | IP67 | Light type | green / red / yellow / blue / white |
| Lens material | plastic | Response time | 250 ms |

Types and data – selection table

| Type | Dimensions | Housing material | Electrical connection | w | d |
|--------------|------------------------|------------------|-----------------------|------|------|
| K50LGRYBWPQ8 | Ø50 mm | plastic, PC | connector, M12 x 1 | w086 | d418 |
| K80LGRYBWPQ8 | 109.5 x 66.3 x 80.8 mm | plastic, ABS | connector, M12 x 1 | w086 | d419 |
| K50LGRYBWP | Ø50 mm | plastic, PC | cable | w086 | d410 |

EZ-LIGHT – 3 LED colors – Continuous tone 75 dB



General data

| | | | |
|--------------------------|-------------|----------------------------|----------------------|
| Operating voltage | 18...30 VDC | Ambient temperature | -40...+50 °C |
| Protection class | IP50 | Light type | green / red / yellow |
| Lens material | plastic | Response time | 250 ms |

Types and data – selection table

| Type | Electrical connection | w | d |
|--------------|-------------------------------|------|------|
| K50LGRA1YP | cable | w087 | d420 |
| K50LGRA1YPQ | connector, M12 x 1 | w087 | d421 |
| K50LGRA1YPQP | cable with connector, M12 x 1 | w087 | d422 |
| K80LGRA1YP | cable | w087 | d423 |
| K80LGRA1YPQ | connector, M12 x 1 | w087 | d424 |
| K80LGRA1YPQP | cable with connector, M12 x 1 | w087 | d425 |

EZ-LIGHT – 3 LED colors – Pulsed signal 75 dB



General data

Operating voltage 18...30 VDC
Protection class IP50
Lens material plastic

Ambient temperature -40...+50 °C
Light type green / red / yellow
Response time 250 ms

Types and data – selection table

| Type | Electrical connection | w | d |
|--------------|-------------------------------|------|------|
| K50LGRA2YP | cable | w087 | d420 |
| K50LGRA2YPQ | connector, M12 x 1 | w087 | d421 |
| K50LGRA2YPQP | cable with connector, M12 x 1 | w087 | d422 |
| K80LGRA2YP | cable | w087 | d423 |
| K80LGRA2YPQ | connector, M12 x 1 | w087 | d424 |
| K80LGRA2YPQP | cable with connector, M12 x 1 | w087 | d425 |

EZ-LIGHT – 3 LED colors – Continuous tone 95 dB



General data

Operating voltage 18...30 VDC
Protection class IP50
Lens material plastic

Ambient temperature -40...+50 °C
Light type green / red / yellow
Response time 250 ms

Types and data – selection table

| Type | Electrical connection | w | d |
|--------------|-----------------------|------|------|
| K50LGRAL1YPQ | connector, M12 x 1 | w087 | d421 |
| K80LGRAL1YPQ | connector, M12 x 1 | w087 | d424 |
| K80LGRAL1YP | cable | w087 | d423 |

LED – Tower light TL50



TL50 tower lights indicate the operating status clearly throughout the entire production line. Each tower light is pre-assembled and preconfigured, featuring LEDs in different colors and with optional audible alert. The tower lights are easily installed, no matter if mounted directly on the machine, in the cabinet or at critical control points within the production line.

Up to five different color lights are combinable in a single tower and can be on simultaneously. The signal intensity of devices with audible alert is adjustable.

Features

- Multicolor multisegment indicators
- Green, yellow, red, blue or white LEDs
- Optional audible alert with variable intensity (max. 95 dB)
- Longlife LED technology, low-power consumption
- Protection class IP67 (with audible function IP50)
- Water and oil-tight
- Insensitive to ambient lights, shock, vibration and electromagnetic interference
- Wide range of accessories for variable and easy mounting

Type code TL50

| | | | |
|------|------|---|----|
| TL50 | BGYR | A | QP |
|------|------|---|----|

| | | | | | |
|------|--------|------|------------|---|---------------|
| TL50 | Series | BGYR | LED colors | A | Audible alert |
|------|--------|------|------------|---|---------------|

Series

TL50 multifunction display TL50
 Ø 50 mm, different heights depending on number of LEDs
without audible alert
 1) 61.2 mm
 2) 101.9 mm
 3) 142.6 mm
 4) 183.3 mm
 5) 224.0 mm
with audible alert
 1) 92.0 mm
 2) 132.7 mm
 3) 173.4 mm
 4) 214.1 mm

LED colors

B blue
G green
Y yellow
R red
W white

Audible alert

blank without audible alert
A with audible alert

| | |
|----|-----------------------|
| QP | Electrical connection |
|----|-----------------------|

Electrical connection

blank connection cable, 2 m
Q connector, M12 x 1
QP pigtail with connector, M12 x 1

TL50 – 1 color



General data

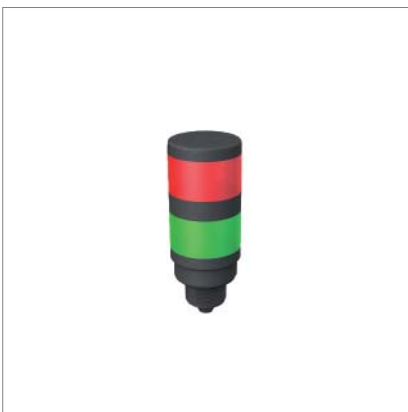
| | |
|--------------------------|--------------|
| Operating voltage | 18...30 VDC |
| Dimensions | 50 x 61.2 mm |
| Protection class | IP67 |

| | |
|----------------------------|----------------------------|
| Housing material | plastic, polycarbonate/ABS |
| Ambient temperature | -40...+50 °C |
| Response time | 10 ms |

Types and data – selection table

| Type | Electrical connection | Light type | w | d |
|---------|-------------------------------|------------|------|------|
| TL50R | cable | red | w088 | d426 |
| TL50RQ | connector, M12 x 1 | red | w088 | d427 |
| TL50RQP | cable with connector, M12 x 1 | red | w088 | d428 |
| TL50YQ | connector, M12 x 1 | yellow | w088 | d427 |
| TL50WQ | connector, M12 x 1 | white | w088 | d427 |

TL50 – 2 colors



General data

| | |
|--------------------------|---------------|
| Operating voltage | 18...30 VDC |
| Dimensions | 50 x 101.9 mm |
| Protection class | IP67 |

| | |
|----------------------------|----------------------------|
| Housing material | plastic, polycarbonate/ABS |
| Ambient temperature | -40...+50 °C |
| Response time | 10 ms |

Types and data – selection table

| Type | Electrical connection | Light type | w | d |
|----------|-------------------------------|-------------|------|------|
| TL50GR | cable | green / red | w088 | d429 |
| TL50GRQ | connector, M12 x 1 | green / red | w088 | d430 |
| TL50GRQP | cable with connector, M12 x 1 | green / red | w088 | d431 |
| TL50WRQ | connector, M12 x 1 | white / red | w088 | d430 |

TL50 – 3 colors



General data

Operating voltage 18...30 VDC
Dimensions 50 x 142.6 mm
Protection class IP67

Housing material plastic, polycarbonate/ABS
Ambient temperature -40...+50 °C
Response time 10 ms

Types and data – selection table

| Type | Electrical connection | Light type | w | d |
|-----------|-------------------------------|----------------------|------|------|
| TL50GYR | cable | green / red / yellow | w088 | d432 |
| TL50GYRQ | connector, M12 x 1 | green / red / yellow | w088 | d433 |
| TL50GYRQP | cable with connector, M12 x 1 | green / red / yellow | w088 | d434 |
| TL50YBRQ | connector, M12 x 1 | yellow | w088 | d433 |

TL50 – 4 colors



General data

Operating voltage 18...30 VDC
Dimensions 50 x 183.3 mm
Protection class IP67
Housing material plastic, polycarbonate/ABS

Ambient temperature -40...+50 °C
Light type green / red / yellow / blue
Response time 10 ms

Types and data – selection table

| Type | Electrical connection | w | d |
|------------|-------------------------------|------|------|
| TL50BGYRQ | connector, M12 x 1 | w089 | d435 |
| TL50BGYRQP | cable with connector, M12 x 1 | w089 | d436 |
| TL50BGYR | cable | w089 | d437 |

TL50 – 5 colors



General data

Operating voltage

18...30 VDC

Dimensions

50 x 224 mm

Protection class

IP67

Housing material

plastic, polycarbonate/ABS

Ambient temperature

-40...+50 °C

Light type

green / red / yellow / blue / white

Response time

10 ms

Types and data – selection table

| Type | Electrical connection | w | d |
|-------------|-------------------------------|------|------|
| TL50WBGYR | cable | w090 | d438 |
| TL50WBGYRQ | connector, M12 x 1 | w090 | d439 |
| TL50WBGYRQP | cable with connector, M12 x 1 | w090 | d440 |

TL50 – 1 color – Signal tone



General data

Operating voltage

18...30 VDC

Dimensions

50 x 92 mm

Protection class

IP50

Housing material

plastic, polycarbonate/ABS

Ambient temperature

-20...+50 °C

Light type

red

Response time

10 ms

Types and data – selection table

| Type | Electrical connection | w | d |
|----------|-------------------------------|------|------|
| TL50RA | cable | w088 | d441 |
| TL50RAQ | connector, M12 x 1 | w088 | d442 |
| TL50RAQP | cable with connector, M12 x 1 | w088 | d443 |

TL50 – 2 colors – Signal tone



| | | | |
|--------------------------|----------------------------|----------------------------|--------------|
| General data | | | |
| Operating voltage | 18...30 VDC | Ambient temperature | -20...+50 °C |
| Dimensions | 50 x 132.7 mm | Light type | green / red |
| Protection class | IP50 | Response time | 10 ms |
| Housing material | plastic, polycarbonate/ABS | | |

Types and data – selection table

| Type | Electrical connection | w | d |
|-----------|-------------------------------|------|------|
| TL50GRAQP | cable with connector, M12 x 1 | w088 | d444 |
| TL50GRAQ | connector, M12 x 1 | w088 | d445 |
| TL50GRA | cable | w088 | d446 |

TL50 – 3 colors – Signal tone



| | | | |
|--------------------------|----------------------------|----------------------------|----------------------|
| General data | | | |
| Operating voltage | 18...30 VDC | Ambient temperature | -20...+50 °C |
| Dimensions | 50 x 173.4 mm | Light type | green / red / yellow |
| Protection class | IP50 | Response time | 10 ms |
| Housing material | plastic, polycarbonate/ABS | | |

Types and data – selection table

| Type | Electrical connection | w | d |
|------------|-------------------------------|------|------|
| TL50GYRA | cable | w089 | d447 |
| TL50GYRAQ | connector, M12 x 1 | w089 | d448 |
| TL50GYRAQP | cable with connector, M12 x 1 | w089 | d449 |

TL50 – 4 colors – Signal tone



General data

| | | | |
|--------------------------|----------------------------|----------------------------|-----------------------------|
| Operating voltage | 18...30 VDC | Ambient temperature | -20...+50 °C |
| Dimensions | 50 x 214.1 mm | Light type | green / red / yellow / blue |
| Protection class | IP50 | Response time | 10 ms |
| Housing material | plastic, polycarbonate/ABS | | |

Types and data – selection table

| Type | Electrical connection | w | d |
|-------------|-------------------------------|------|------|
| TL50BGYRA | cable | w090 | d450 |
| TL50BGYRAQP | cable with connector, M12 x 1 | w090 | d451 |
| TL50BGYRAQ | connector, M12 x 1 | w090 | d452 |

Switching light screen LX



The LX switching light screen detects very small but also extremely flat objects, for example a sheet of paper or an envelope. Typical applications are counting tasks or parcel handling on conveyor belts. The two-piece system consists of an emitter and a receiver identical in size and range.

The distance between emitter and receiver can be up to 75 mm for short-range applications and 200 mm to 2 m for standard-range applications. High reliability and precision is achieved through a 5 ms switch-off delay.

Features

- Switching light screen
- Multiple-beam infrared pattern
- Detects small and extremely flat objects of 5.6 or 9.5 mm
- Available in different sizes 113, 189, 342 mm
- Sensing ranges from 75 mm to 2 m
- Response time in 0.8 to 3.2 ms
- Simple wiring, synchronizing line is not required
- NPN and PNP transistor outputs
- Rugged IP67 rated housing
- Temperature range: -20...+70 °C

Type code LX - Switching light screens



Series

LX switching light screen
height: 31.8 mm, depth: 25.4 mm
other heights
LX3 = 113.4 mm
LX6 = 189.6 mm
LX9 = 265.8 mm
LX12 = 342.0 mm
LX15 = 418.2 mm
LX18 = 494.4 mm
LX21 = 570.6 mm
LX24 = 646.8 mm

Monitored field [height mm]

| | |
|----|--------|
| 3 | 67 mm |
| 6 | 143 mm |
| 9 | 218 mm |
| 12 | 295 mm |
| 15 | 371 mm |
| 18 | 447 mm |
| 21 | 523 mm |
| 24 | 99 mm |

Sensor type

| | |
|---|----------|
| R | receiver |
| E | emitter |



Resolution

| | |
|-------|----------------------------|
| SR | minimum object size 5.6 mm |
| blank | minimum object size 9.5 mm |

Electrical connection

| | |
|-------|---------------------------------|
| Q | pigtail with connector, M12 x 1 |
| blank | connection cable, 2 m |

LX – Emitter



General data

| | |
|----------------------------|-------------|
| Operating voltage | 10...30 VDC |
| Power-on, indicator | LED |
| Error message type | LED |
| Protection class | IP67 |

| | |
|----------------------------|--------------|
| Housing material | Metal, AL |
| Lens material | plastic |
| Ambient temperature | -20...+70 °C |
| Light type | IR |

Types and data – selection table

| Type | Dimensions | Electrical connection | Range | Detection zone height | w | d |
|----------|------------------------|-------------------------------|---------------|-----------------------|------|------|
| LX12ESR | 25.4 x 342 x 31.8 mm | cable | 75...200 mm | 295 mm | w091 | d453 |
| LX12ESRQ | 25.4 x 342 x 31.8 mm | cable with connector, M12 x 1 | 75...200 mm | 295 mm | w091 | d453 |
| LX6ESR | 25.4 x 189.6 x 31.8 mm | cable | 75...200 mm | 143 mm | w091 | d454 |
| LX6ESRQ | 25.4 x 189.6 x 31.8 mm | cable with connector, M12 x 1 | 75...200 mm | 143 mm | w091 | d454 |
| LX3ESR | 25.4 x 113.4 x 31.8 mm | cable | 75...200 mm | 67 mm | w091 | d455 |
| LX3ESRQ | 25.4 x 113.4 x 31.8 mm | cable with connector, M12 x 1 | 75...200 mm | 67 mm | w091 | d455 |
| LX12E | 25.4 x 342 x 31.8 mm | cable | 300...2000 mm | 295 mm | w091 | d453 |
| LX12EQ | 25.4 x 342 x 31.8 mm | cable with connector, M12 x 1 | 300...2000 mm | 295 mm | w091 | d453 |
| LX6E | 25.4 x 189.6 x 31.8 mm | cable | 300...2000 mm | 143 mm | w091 | d454 |
| LX6EQ | 25.4 x 189.6 x 31.8 mm | cable with connector, M12 x 1 | 300...2000 mm | 143 mm | w091 | d454 |
| LX3E | 25.4 x 113.4 x 31.8 mm | cable | 300...2000 mm | 67 mm | w091 | d455 |
| LX3EQ | 25.4 x 113.4 x 31.8 mm | cable with connector, M12 x 1 | 300...2000 mm | 67 mm | w091 | d455 |

LX – Receiver



General data

| | |
|---------------------------|-------------|
| Operating voltage | 10...30 VDC |
| Error message type | LED |
| Output | —, pnp/npn |
| Protection class | IP67 |

| | |
|----------------------------|--------------|
| Housing material | Metal, AL |
| Lens material | plastic |
| Ambient temperature | -20...+70 °C |

Types and data – selection table

| Type | Switching frequency | Dimensions | Electrical connection | Range | Detection zone height | w | d |
|----------|---------------------|------------------------|-------------------------------|---------------|-----------------------|------|------|
| LX12RSRQ | ≤ 85 Hz | 25.4 x 342 x 31.8 mm | cable with connector, M12 x 1 | 75...200 mm | 295 mm | w092 | d453 |
| LX12RSR | ≤ 85 Hz | 25.4 x 342 x 31.8 mm | cable | 75...200 mm | 295 mm | w092 | d453 |
| LX6RSR | ≤ 120 Hz | 25.4 x 189.6 x 31.8 mm | cable | 75...200 mm | 143 mm | w092 | d454 |
| LX6RSRQ | ≤ 120 Hz | 25.4 x 189.6 x 31.8 mm | cable with connector, M12 x 1 | 75...200 mm | 143 mm | w092 | d454 |
| LX3RSR | ≤ 150 Hz | 25.4 x 113.4 x 31.8 mm | cable | 75...200 mm | 67 mm | w092 | d455 |
| LX3RSRQ | ≤ 150 Hz | 25.4 x 113.4 x 31.8 mm | cable with connector, M12 x 1 | 75...200 mm | 67 mm | w092 | d455 |
| LX12R | ≤ 85 Hz | 25.4 x 342 x 31.8 mm | cable | 300...2000 mm | 295 mm | w092 | d453 |
| LX12RQ | ≤ 85 Hz | 25.4 x 342 x 31.8 mm | cable with connector, M12 x 1 | 300...2000 mm | 295 mm | w092 | d453 |
| LX6R | ≤ 120 Hz | 25.4 x 189.6 x 31.8 mm | cable | 300...2000 mm | 143 mm | w092 | d454 |
| LX6RQ | ≤ 120 Hz | 25.4 x 189.6 x 31.8 mm | cable with connector, M12 x 1 | 300...2000 mm | 143 mm | w092 | d454 |
| LX3R | ≤ 150 Hz | 25.4 x 113.4 x 31.8 mm | cable | 300...2000 mm | 67 mm | w092 | d455 |
| LX3RQ | ≤ 150 Hz | 25.4 x 113.4 x 31.8 mm | cable with connector, M12 x 1 | 300...2000 mm | 67 mm | w092 | d455 |

w Wiring diagrams on page 832 ff

d Dimension drawings on page 842 ff

e Excess gain curves on page 922 ff

Measuring light screen EZ-ARRAY™



The measuring light screen EZ-ARRAY is ideal for hole sizing, product sizing and profiling, edge and center guarding, loop tension control and parts counting.

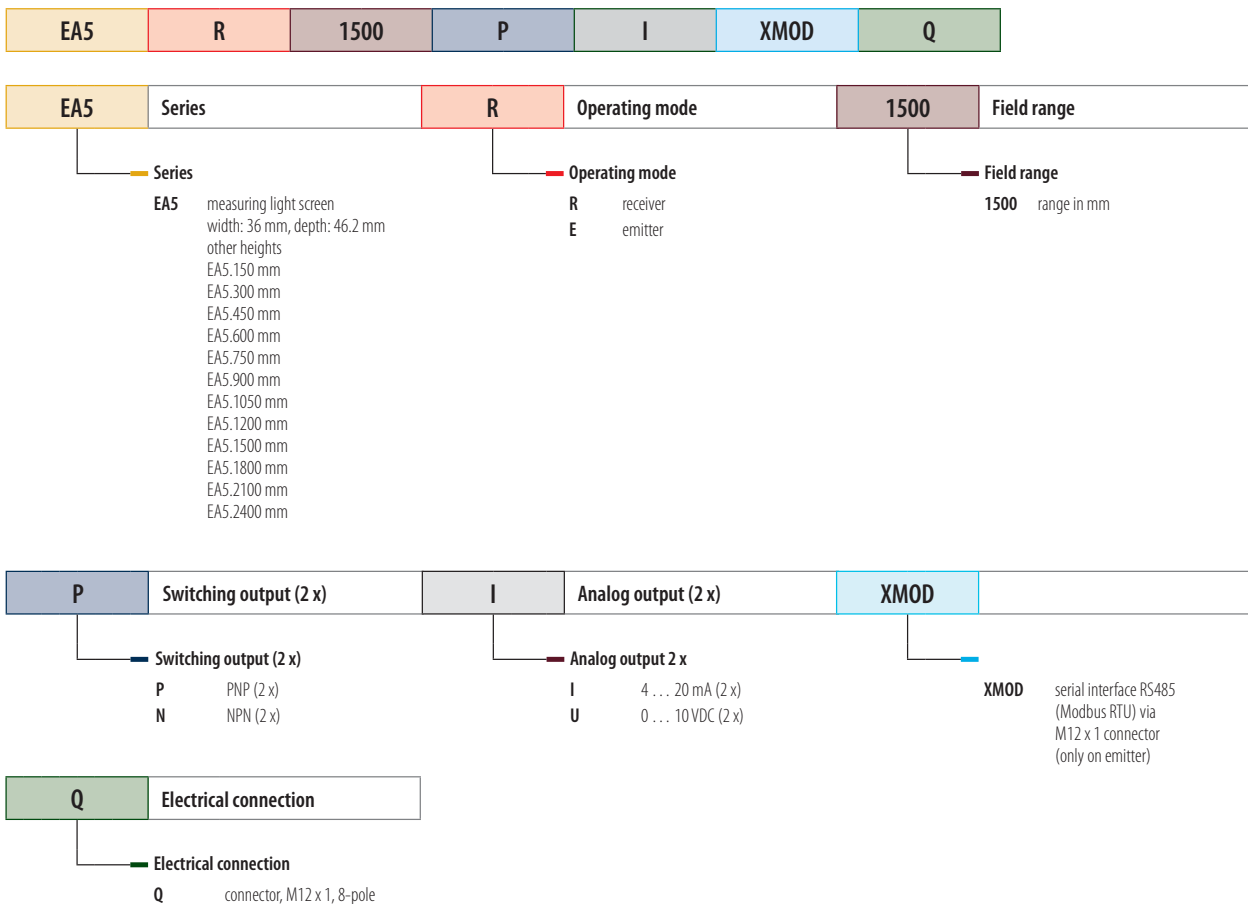
The controller functionality is integrated in the receiver and can be configured via 6 DIP switches. Status and alignment of emitter and receiver are indicated by a 3-digit display and LED bargraph. The light screen can be configured alternatively via RS485 interface at the receiver (software included in delivery).

The EZ-ARRAY can be adjusted to almost any application with a resolution limit above 5 mm. The functionality comprises first, last or middle beam blocked, number of beams blocked, invert and blanking.

Features

- Measuring light screen with multiple operating modes
- Adjustable resolution 5 mm and higher
- Range up to 4 m
- Two-piece device with controller functionality integrated in receiver
- Configuration via DIP switch or software
- Serial interface RS485 Modbus-RTU
- Two switching outputs (PNP or NPN) and two analog outputs (0...10 V or 4...20 mA)
- Display and LED bargraph for status indication
- Temperature range -40...+70 °C
- Protection class IP65

Type code EZ-ARRAY - Measuring light screens



EZ-ARRAY – Emitter



General data

| | | | |
|----------------------------|---------------------|------------------------------|--------------------|
| Operating voltage | 12...30 VDC | Electrical connection | connector, M12 x 1 |
| Power-on, indicator | LED | Ambient temperature | -40...+70 °C |
| Protection class | IP65 | Light type | IR |
| Housing material | metal, AL, anodized | Range | 400...4000 mm |
| Lens material | plastic | | |

Types and data – selection table

| Type | Dimensions | Detection zone height | w | d |
|-----------|---------------------|-----------------------|------|------|
| EASE150Q | 36 x 227 x 45.2 mm | 150 mm | w093 | d456 |
| EASE300Q | 36 x 379 x 45.2 mm | 300 mm | w093 | d456 |
| EASE450Q | 36 x 529 x 45.2 mm | 450 mm | w093 | d456 |
| EASE600Q | 36 x 678 x 45.2 mm | 600 mm | w093 | d456 |
| EASE750Q | 36 x 828 x 45.2 mm | 750 mm | w093 | d456 |
| EASE900Q | 36 x 978 x 45.2 mm | 900 mm | w093 | d456 |
| EASE1050Q | 36 x 1128 x 45.2 mm | 1050 mm | w093 | d456 |
| EASE1200Q | 36 x 1278 x 45.2 mm | 1200 mm | w093 | d456 |
| EASE1500Q | 36 x 1578 x 45.2 mm | 1500 mm | w093 | d456 |
| EASE1800Q | 36 x 1878 x 45.2 mm | 1800 mm | w093 | d456 |
| EASE2100Q | 36 x 2178 x 45.2 mm | 2100 mm | w093 | d456 |
| EASE2400Q | 36 x 2478 x 45.2 mm | 2400 mm | w093 | d456 |

EZ-ARRAY – Receiver – Switching and current output



General data

| | | | |
|---------------------------------------|-------------------------|------------------------------|--------------------|
| Operating voltage | 12...30 VDC | Electrical connection | connector, M12 x 1 |
| Error message type | LED | Ambient temperature | -40...+70 °C |
| Indication of excess gain type | LED | Light type | IR |
| Output | 2 x , PNP/analog output | Range | 400...4000 mm |
| Protection class | IP65 | Analog output | 4...20 mA |
| Housing material | metal, AL, anodized | Load | ≤ 1350 Ω |
| Lens material | plastic | | |


Types and data – selection table

| Type | Dimensions | Response time | Detection zone height | w | d |
|-----------------|---------------------|---------------|-----------------------|------|------|
| EA5R150PIXMODQ | 36 x 227 x 45.2 mm | 2.8 ms | 150 mm | w094 | d457 |
| EA5R300PIXMODQ | 36 x 379 x 45.2 mm | 5 ms | 300 mm | w094 | d457 |
| EA5R450PIXMODQ | 36 x 529 x 45.2 mm | 7.1 ms | 450 mm | w094 | d457 |
| EA5R600PIXMODQ | 36 x 678 x 45.2 mm | 9.3 ms | 600 mm | w094 | d457 |
| EA5R750PIXMODQ | 36 x 828 x 45.2 mm | 11.4 ms | 750 mm | w094 | d457 |
| EA5R900PIXMODQ | 36 x 978 x 45.2 mm | 13.6 ms | 900 mm | w094 | d457 |
| EA5R1050PIXMODQ | 36 x 1128 x 45.2 mm | 15.7 ms | 1050 mm | w094 | d457 |
| EA5R1200PIXMODQ | 36 x 1278 x 45.2 mm | 17.9 ms | 1200 mm | w094 | d457 |
| EA5R1500PIXMODQ | 36 x 1578 x 45.2 mm | 22.2 ms | 1500 mm | w094 | d457 |
| EA5R1800PIXMODQ | 36 x 1878 x 45.2 mm | 26.5 ms | 1800 mm | w094 | d457 |
| EA5R2100PIXMODQ | 36 x 2178 x 45.2 mm | 30.8 ms | 2100 mm | w094 | d457 |
| EA5R2400PIXMODQ | 36 x 2478 x 45.2 mm | 35.1 ms | 2400 mm | w094 | d457 |

EZ-ARRAY – Receiver – Switching and voltage output



General data

| | | | |
|---------------------------------------|---|------------------------------|--------------------|
| Operating voltage | 15...30 VDC | Electrical connection | connector, M12 x 1 |
| Error message type | LED | Ambient temperature | -40...+70 °C |
| Indication of excess gain type | LED | Light type | IR |
| Output | 2 x  , PNP/analog output | Range | 400...4000 mm |
| Protection class | IP65 | Analog output | 0...10 V |
| Housing material | metal, AL, anodized | Load | ≥ 2000 Ω |
| Lens material | plastic | | |

Types and data – selection table

| Type | Dimensions | Response time | Detection zone height | w | d |
|-----------------|---------------------|---------------|-----------------------|------|------|
| EA5R150PUXMODQ | 36 x 227 x 45.2 mm | 2.8 ms | 150 mm | w094 | d457 |
| EA5R300PUXMODQ | 36 x 379 x 45.2 mm | 5 ms | 300 mm | w094 | d457 |
| EA5R450PUXMODQ | 36 x 529 x 45.2 mm | 7.1 ms | 450 mm | w094 | d457 |
| EA5R600PUXMODQ | 36 x 678 x 45.2 mm | 9.3 ms | 600 mm | w094 | d457 |
| EA5R750PUXMODQ | 36 x 828 x 45.2 mm | 11.4 ms | 750 mm | w094 | d457 |
| EA5R900PUXMODQ | 36 x 978 x 45.2 mm | 13.6 ms | 900 mm | w094 | d457 |
| EA5R1050PUXMODQ | 36 x 1128 x 45.2 mm | 15.7 ms | 1050 mm | w094 | d457 |
| EA5R1200PUXMODQ | 36 x 1278 x 45.2 mm | 17.9 ms | 1200 mm | w094 | d457 |
| EA5R1500PUXMODQ | 36 x 1578 x 45.2 mm | 22.2 ms | 1500 mm | w094 | d457 |
| EA5R1800PUXMODQ | 36 x 1878 x 45.2 mm | 26.5 ms | 1800 mm | w094 | d457 |
| EA5R2100PUXMODQ | 36 x 2178 x 45.2 mm | 30.8 ms | 2100 mm | w094 | d457 |
| EA5R2400PUXMODQ | 36 x 2478 x 45.2 mm | 35.1 ms | 2400 mm | w094 | d457 |

w Wiring diagrams on page 832 ff

d Dimension drawings on page 842 ff

e Excess gain curves on page 922 ff

At a glance

Pressure sensors



Pressure sensors – Reliability and flexibility on highest levels

Pressure is most commonly detected and monitored in applications of process and manufacturing industries. Equally complex are the demands on pressure sensors:

Whether applied in standard systems or exposed to extreme temperature changes, vibration, impacts or aggressive media: Each application requires a perfect solution in every respect. High-quality materials, flexible process connections, easy programming as well as highest accuracy and many display functions are therefore essential standards of electronic pressure measurement.

Pressure is not measured as a general physical property; a pressure value has rather a special reference. The positive and negative pressure is defined as the difference between the measured pressure and the atmospheric pressure. Therefore, most measuring devices require a reference terminal open to the atmosphere. This type of pressure is also described as relative pressure or gauge.

The absolute pressure however is related to a vacuum. In actual practice, the reference side of the measuring device is hermetically sealed. The pressure and temperature of gases are mainly regulated this way in industrial applications. With regard to differential pressure, the process pressure is connected to the reference side of the device. Filling levels, flow rates and leaks are detected by this means in systems.

Most electronic pressure sensors transduce the measured pressure in deformation force which is subsequently converted into an electrical signal by strain gauges, piezo-crystals, piezoresistive, capacitive or inductive measuring principles.

TURCK pressure sensors detect and measure absolute, relative pressure as reference pressures of liquids, gases and air in nearly all industrial applications and under the most diverse conditions. The **PK series** is especially designed for pneumatic and vacuum applications. Rugged, compact and at the same time lightweight designed, these sensors are made for handling and automation systems.

Ideally suited for demanding hydraulic and pneumatic systems are pressure sensors of the **PS series**. The devices are incorporated in a stainless steel housing and operate with a ceramic measuring cell. Different versions with switching and analog output as well as 4-digit 7-segment display are user friendly and easily integrated in your system. Open standards such as VDMA menu guide and IO-Link are also supported.

The **PT-series** features transmitter in robust cylindrical housings made of stainless steel, without display and with linear current or voltage output.

More information on the **PS series** on p. 456, **PK series** on p. 521 and **PT series** on p. 529.



Our strengths...



The full range of performance

The sensors of this series cover all important pressure ranges from -1...+600 bar with an accuracy of 0.5% f.s.. Bar, psi and further 12 standard pressure units can be selected for measurement. The 4-digit 7-segment LED display indicates the pressure status and makes programming more comfortable. The devices are available with two transistor switching

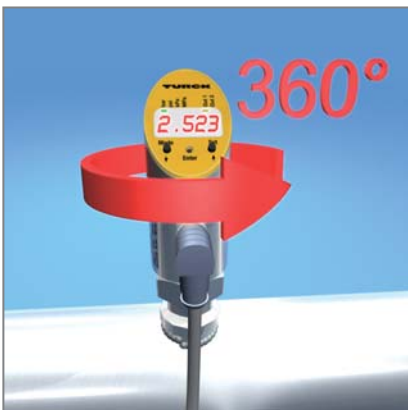
outputs or with one switching and one analog output. High EMC immunity and protection classes IP67/IP69K guarantee reliable operation, even under harsh conditions. All sensors are equipped with an IO-Link interface. Flexible integration and diagnostics is guaranteed, making the PS series a cost-effective solution.



Clearly visible display

The 4-digit 7-segment display indicates the applied pressure during normal operation and is easily programmed. The sloped display allows the sensors to be mounted on top or in front according

to the position of the process connection. The read direction can be reversed by 180° degrees via software. Values are thus perfectly readable, even if the sensor is mounted horizontally.



Flexible mounting

Inclined by 45° the display is well readable from any position and even from a great distance. After locking the pressure connection, the PS500 can be moved in any desired position because it is freely rotatable. Once the final position is ac-

quired, the device is fixed in place with a second coupling nut. Special mounting aids are not required. With a diameter of only 34 mm, several sensors can be mounted side by side in confined spaces.

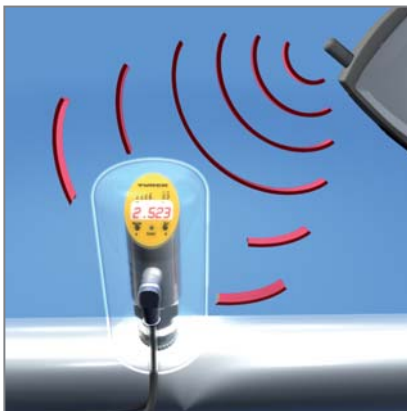
maths



Easy programming

Thanks to the user friendly menu guide parameters such as switch and release points, output type, analog range and various other special functions are easily taught. The PS sensors are programmed with the buttons MODE and SET. Tools

are not needed to view the parameter values. To avoid accidental changes of programmed data, the ENTER button for storing the values is recessed. The button can only be pressed with a pointed object, such as a ball pen for example.



Rugged design

The sensor body, process and electrical connection of the PS series are made of stainless steel. Based on proven ceramic component technology, these shock and vibration proof sensors operate safely and reliably even in harsh environments. All sensors feature excellent EMC proper-

ties and are IP67 or IP69K protected. Even in an undesired exceptional situation, safety comes first: Should the measuring cell burst, a patented medium-stop system prevents the discharge of liquids up to a pressure of 2400 bar, depending on the medium temperature.

Your advantages...

Your advantages...



High system availability

The PS series excels in excellent EMC properties and is IP67 rated. Sensor body pressure and electrical connection are made of stainless steel and are therefore highly reliable and rugged. Should the measuring cell burst, a patented medium-stop system prevents the discharge of liquids

up to a pressure of 2400 bar, depending on the medium temperature.

- Excellent EMC properties
- Protection against mechanical impacts is provided through a rugged design
- Short down-times through high system availability and short replacement times



Extremely service-friendly

Due to the extremely flexible mounting options, user-friendly operation and high accuracy, the sensors offer you distinct and calculable advantages.

- Upper sensor part rotatable by 360° (PS500 series)

- Minimum maintenance effort through streamlined product range.
- Simple operation via two finger-operated pushbuttons
- Failsafe operation through a recessed ENTER button for the storage of values



Efficient standardization

A single sensor replaces many „conventional“ types. Even if a PS sensor is applied to measure only half of its nominal pressure, it will operate highly accurate, as required by the machine engineering industry. Standardization helps to reduce the inventory which pays off for the customer.

- Only a few sensor versions are needed to cover a large range of applications
- Reduced training effort due to simple and failsafe operation
- High system safety achieved through a rugged design

antagies



Maximum freedom

Due to many solutions achievable with only a few devices, the new sensors of the PS series offer maximum planning freedom, while minimizing the mounting efforts.

- Upper sensor part rotatable by 360°
- Display rotatable by 180°
- Sloped display by 45°
- Bright illuminated LED display legible at long ranges
- Highest accuracy, 0.5 % f.s.
- Two switching outputs or a combination of switching and analog output
- IO-Link communication
- VDMA menu guide (optional)

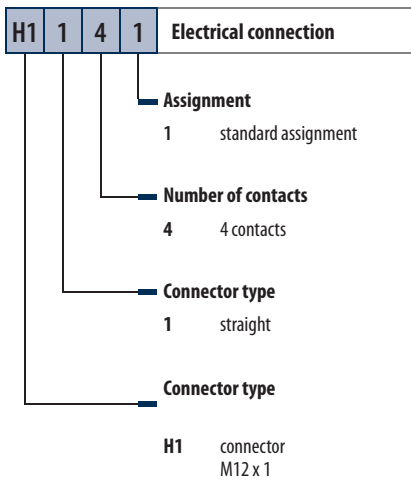
Type code

| PS | 010V | Functional principle | - | 5 | 01 | Mechanical version | - | LI2U | PN | 8 | X | Electrical version | - |
|----|------|--|---|---|---|--------------------|---|--|----|---|---|--------------------|---|
| | | <p>Measuring range</p> <p>01VR Measuring range -1...0 bar g ¹⁾</p> <p>001R Measuring range 0...1 bar g ¹⁾</p> <p>001V Measuring range -1...1 bar g ¹⁾</p> <p>003V Measuring range -1...2.5 bar g ¹⁾</p> <p>010V Measuring range -1...10 bar g</p> <p>016V Measuring range -1...16 bar g</p> <p>025V Measuring range -1...25 bar g</p> <p>040V Measuring range -1...40 bar g</p> <p>100R Measuring range 0...100 bar g</p> <p>250R Measuring range 0...250 bar g</p> <p>400R Measuring range 0...400 bar g</p> <p>600R Measuring range 0...600 bar g ²⁾</p> <p>001A Measuring range 0...1 bar a ^{1) 3)}</p> <p>003A Measuring range 0...2.5 bar a ^{1) 3)}</p> <p>010A Measuring range 0...10 bar a ^{1) 3)}</p> <p>016A Measuring range 0...16 bar a ^{1) 3)}</p> <p>025A Measuring range 0...25 bar a ^{1) 3)}</p> <p>Functional principle</p> <p>PS pressure sensor</p> <p>Special types for oxygen applications available on request!</p> | | | <p>Pressure connection</p> <p>01 G1/4" female thread</p> <p>02 1/4"-18NPT female thread</p> <p>03 1/4"-18NPT male thread</p> <p>04 G1/4" male thread</p> <p>05 7/16" UNF male thread (only for design 6)</p> <p>06 G3/4" male thread front-flush (only for design 6)</p> <p>07 1 1/2" Tri-Clamp (only for design 6)</p> <p>08 G1/2" male thread manometer connection (only for design 5)</p> <p>09 G1/2" male thread front-flush (only for design 6)</p> <p>10 R 1/4" male thread</p> <p>11 R 1/4" female thread</p> <p>Design</p> <p>3 adjustable, with display, non-rotatable sensor</p> <p>5 adjustable, with display, rotatable sensor</p> <p>6 adjustable, with display, non-rotatable sensor, diaphragm seal with front-flush</p> | | | <p>Indication</p> <p>X... LED display</p> <p>Voltage range</p> <p>8 15 (18)...30 VDC</p> <p>Output mode</p> <p>PN PNP/NPN output</p> <p>Output function</p> <p>2U output 1: switching output output 2: switching output</p> <p>LUU output 1: switching output output 2: voltage output</p> <p>LI2U output 1: switching output output 2: current/switching output, reprogrammable</p> | | | | | |

¹⁾ Not available for design/pressure connection 609

²⁾ Not available for design 600

³⁾ Not available for design 300



Designs and variants

Page 467



PS...-301

G 1/4" female thread

Mechanical connection

connector, M12 x 1

Electrical connection

Output 1 (PIN 4)

switching output or IO-Link mode

Output 2 (PIN 2)

switching output
analog or switching output
analog output

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PS...-302

NPT1/4" - 18 female threads

connector, M12 x 1

switching output or IO-Link mode

switching output
analog or switching output
analog output

Page 473



PS...-303

NPT 1/4" - 18 male thread

connector, M12 x 1

switching output or IO-Link mode

switching output
analog or switching output
analog output

Page 476



PS...-304

G 1/4" male thread

connector, M12 x 1

switching output or IO-Link mode

switching output
analog or switching output
analog output



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PS...-310

Mechanical connection

R1/4" female thread per DIN 2999

Electrical connection

connector, M12 x 1

Output 1 (PIN 4)

switching output or IO-Link mode

Output 2 (PIN 2)

switching output
analog or switching output
analog output

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PS...-311

R1/4" female thread per DIN 2999

connector, M12 x 1

switching output or IO-Link mode

switching output
analog or switching output
analog output

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PS...-501

G 1/4" female thread

connector, M12 x 1

switching output or IO-Link mode

switching output
analog or switching output
analog output

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PS...-502

NPT1/4" - 18 female threads

connector, M12 x 1

switching output or IO-Link mode

switching output
analog or switching output
analog output

Designs and variants

Page 493



PS...-503

NPT 1/4" - 18 male thread

Mechanical connection

connector, M12 x 1

Electrical connection

Output 1 (PIN 4)

switching output or IO-Link mode

Output 2 (PIN 2)

switching output
analog or switching output
analog output

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PS...-504

G 1/4" male thread

connector, M12 x 1

switching output or IO-Link mode

switching output
analog or switching output
analog output

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PS...-505

7/16-20 UNF

connector, M12 x 1

switching output or IO-Link mode

switching output
analog or switching output
analog output

Page 502



PS...-508

G 1/2" male threaded manometer acc. to DIN 3852-E

connector, M12 x 1

switching output or IO-Link mode

switching output
analog or switching output
analog output



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PS...-510

Mechanical connection

R1/4" female thread per DIN 2999

Electrical connection

connector, M12 x 1

Output 1 (PIN 4)

switching output or IO-Link mode

Output 2 (PIN 2)

switching output
analog or switching output
analog output

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PS...-511

R1/4" female thread per DIN 2999

connector, M12 x 1

switching output or IO-Link mode

switching output
analog or switching output
analog output

Page 513



PS...-606

G 3/4" front flush

connector, M12 x 1

switching output or IO-Link mode

switching output
analog or switching output
analog output

Page 516



PS...-609

G 1/2" front flush

connector, M12 x 1

switching output or IO-Link mode

switching output
analog or switching output
analog output

PS300 series – For hydraulic applications

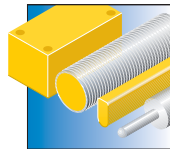


The PS300 series has been designed especially for hydraulic applications. The devices operate with a ceramic measuring cell. Available are versions with two switching outputs or one switching and one analog output. IO-Link communication is integrated as a standard. Highest process safety is achieved through a stainless steel housing, fully encapsulated electronics and protection class IP69K.

Features

- IO-Link capable
- Measuring range -1...600 bar
- Fully encapsulated stainless steel housing
- Protection class IP69K
- VDMA menu guide (optional)
- Permanent indication of pressure (bar, psi, kPa, MPa, misc)
- Highest pressure resistance

Properties



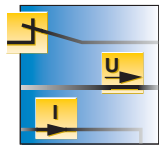
Design

Cylindrical design, non-rotatable, with display



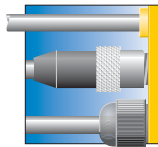
Measuring ranges

-1...600 bar relative pressure



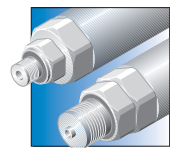
Electrical versions

IO-Link capable, dual-channel, switching, current or voltage output



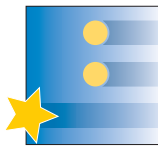
Electrical connections

4-pole M12 x 1 plug connection



Mechanical connections

G1/4\", 1/4\" NPT, R1/4\" male or female thread



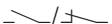
Special features

Failsafe 3-key operation, VDMA menu guide (optional), IP67, fully encapsulated electronics



G1/4" – Female – 2 switching outputs



General data

| | | | |
|----------------------------------|---|---|---|
| Operating voltage | 15...30 VDC | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Protection type and class | IP69K / III | Temperature coefficient span T_{k5} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Medium temperature | -40...85 °C |
| Output 2 (PIN 2) | switching output | Ambient temperature | -40...80 °C |
| Output function |  , pnp/npn | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Switching point accuracy | 0.5% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Repeatability | 0.1% of full scale | Sealing material | FPM |
| Switching frequency | 180 Hz | Electrical connection | connector, M12 x 1 |
| Response time | 3 ms | Mechanical connection | G 1/4" female thread |


Types and data – selection table

| Type | Measuring range | Admissible overpressure |  |  |
|-------------------------|-------------------|-------------------------|---|---|
| PS01VR-301-2UPN8X-H1141 | -1...0 bar rel. | 5.5 bar | w095 | d458 |
| PS001R-301-2UPN8X-H1141 | 0...1 bar rel. | 5.5 bar | w095 | d458 |
| PS001V-301-2UPN8X-H1141 | -1...1 bar rel. | 5.5 bar | w095 | d458 |
| PS003V-301-2UPN8X-H1141 | -1...2.5 bar rel. | 12 bar | w095 | d458 |
| PS010V-301-2UPN8X-H1141 | -1...10 bar rel. | 50 bar | w095 | d458 |
| PS016V-301-2UPN8X-H1141 | -1...16 bar rel. | 80 bar | w095 | d458 |
| PS025V-301-2UPN8X-H1141 | -1...25 bar rel. | 120 bar | w095 | d458 |
| PS040V-301-2UPN8X-H1141 | -1...40 bar rel. | 200 bar | w095 | d458 |
| PS100R-301-2UPN8X-H1141 | 0...100 bar rel. | 450 bar | w095 | d458 |
| PS250R-301-2UPN8X-H1141 | 0...250 bar rel. | 600 bar | w095 | d458 |
| PS400R-301-2UPN8X-H1141 | 0...400 bar rel. | 800 bar | w095 | d458 |
| PS600R-301-2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w095 | d458 |

G1/4" – Female – 1 switching and 1 current output



General data

| | | | |
|--------------------------------------|---|---|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP69K / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analog or switching output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Operating range | 4...20/0...20/20...4/ 20...0 mA | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | G 1/4" female thread |

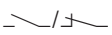
Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|---------------------------|-------------------|-------------------------|------|------|
| PS01VR-301-LI2UPN8X-H1141 | -1...0 bar rel. | 5.5 bar | w096 | d458 |
| PS001R-301-LI2UPN8X-H1141 | 0...1 bar rel. | 5.5 bar | w096 | d458 |
| PS001V-301-LI2UPN8X-H1141 | -1...1 bar rel. | 5.5 bar | w096 | d458 |
| PS003V-301-LI2UPN8X-H1141 | -1...2.5 bar rel. | 12 bar | w096 | d458 |
| PS010V-301-LI2UPN8X-H1141 | -1...10 bar rel. | 50 bar | w096 | d458 |
| PS016V-301-LI2UPN8X-H1141 | -1...16 bar rel. | 80 bar | w096 | d458 |
| PS025V-301-LI2UPN8X-H1141 | -1...25 bar rel. | 120 bar | w096 | d458 |
| PS040V-301-LI2UPN8X-H1141 | -1...40 bar rel. | 200 bar | w096 | d458 |
| PS100R-301-LI2UPN8X-H1141 | 0...100 bar rel. | 450 bar | w096 | d458 |
| PS250R-301-LI2UPN8X-H1141 | 0...250 bar rel. | 600 bar | w096 | d458 |
| PS400R-301-LI2UPN8X-H1141 | 0...400 bar rel. | 800 bar | w096 | d458 |
| PS600R-301-LI2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w096 | d458 |



G1/4" – Female – 1 switching and 1 voltage output



General data

| | | | |
|--------------------------------------|---|---|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP69K / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analogue output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Voltage output, programmable | 0...10V/0...5V/ 1...6V/10...0V/ 5...0V/6...1V | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | G 1/4" female thread |

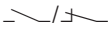
Types and data – selection table

| Type | Measuring range | Admissible overpressure |  |  |
|--------------------------|-------------------|-------------------------|---|---|
| PS01VR-301-LUUPN8X-H1141 | -1...0 bar rel. | 5.5 bar | w097 | d458 |
| PS001R-301-LUUPN8X-H1141 | 0...1 bar rel. | 5.5 bar | w097 | d458 |
| PS001V-301-LUUPN8X-H1141 | -1...1 bar rel. | 5.5 bar | w097 | d458 |
| PS003V-301-LUUPN8X-H1141 | -1...2.5 bar rel. | 12 bar | w097 | d458 |
| PS010V-301-LUUPN8X-H1141 | -1...10 bar rel. | 50 bar | w097 | d458 |
| PS016V-301-LUUPN8X-H1141 | -1...16 bar rel. | 80 bar | w097 | d458 |
| PS025V-301-LUUPN8X-H1141 | -1...25 bar rel. | 120 bar | w097 | d458 |
| PS040V-301-LUUPN8X-H1141 | -1...40 bar rel. | 200 bar | w097 | d458 |
| PS100R-301-LUUPN8X-H1141 | 0...100 bar rel. | 450 bar | w097 | d458 |
| PS250R-301-LUUPN8X-H1141 | 0...250 bar rel. | 600 bar | w097 | d458 |
| PS400R-301-LUUPN8X-H1141 | 0...400 bar rel. | 800 bar | w097 | d458 |
| PS600R-301-LUUPN8X-H1141 | 0...600 bar rel. | 900 bar | w097 | d458 |

1/4" NPT – Female – 2 switching outputs



General data


| | | | |
|----------------------------------|---|---|---|
| Operating voltage | 15...30 VDC | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Protection type and class | IP69K / III | Temperature coefficient span T_{k5} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Medium temperature | -40...85 °C |
| Output 2 (PIN 2) | switching output | Ambient temperature | -40...80 °C |
| Output function |  , pnp/npn | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Switching point accuracy | 0.5% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Repeatability | 0.1% of full scale | Sealing material | FPM |
| Switching frequency | 180 Hz | Electrical connection | connector, M12 x 1 |
| Response time | 3 ms | Mechanical connection | NPT1/4" - 18 female threads |

Types and data – selection table



| Type | Measuring range | Admissible overpressure | w | d |
|-------------------------|-------------------|-------------------------|------|------|
| PS01VR-302-2UPN8X-H1141 | -1...0 bar rel. | 5.5 bar | w095 | d459 |
| PS001R-302-2UPN8X-H1141 | 0...1 bar rel. | 5.5 bar | w095 | d459 |
| PS001V-302-2UPN8X-H1141 | -1...1 bar rel. | 5.5 bar | w095 | d459 |
| PS003V-302-2UPN8X-H1141 | -1...2.5 bar rel. | 12 bar | w095 | d459 |
| PS010V-302-2UPN8X-H1141 | -1...10 bar rel. | 50 bar | w095 | d459 |
| PS016V-302-2UPN8X-H1141 | -1...16 bar rel. | 80 bar | w095 | d459 |
| PS025V-302-2UPN8X-H1141 | -1...25 bar rel. | 120 bar | w095 | d459 |
| PS040V-302-2UPN8X-H1141 | -1...40 bar rel. | 200 bar | w095 | d459 |
| PS100R-302-2UPN8X-H1141 | 0...100 bar rel. | 450 bar | w095 | d459 |
| PS250R-302-2UPN8X-H1141 | 0...250 bar rel. | 600 bar | w095 | d459 |
| PS400R-302-2UPN8X-H1141 | 0...400 bar rel. | 800 bar | w095 | d459 |
| PS600R-302-2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w095 | d459 |

1/4" NPT – Female – 1 switching and 1 current output



| | | | |
|--------------------------------------|---|--|---|
| General data | | | |
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP69K / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{ks} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analog or switching output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Operating range | 4...20/0...20/20...4/ 20...0 mA | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | NPT1/4" - 18 female threads |

Types and data – selection table

| Type | Measuring range | Admissible overpressure |  |  |
|---------------------------|-------------------|-------------------------|---|---|
| PS01VR-302-LI2UPN8X-H1141 | -1...0 bar rel. | 5.5 bar | w096 | d459 |
| PS001R-302-LI2UPN8X-H1141 | 0...1 bar rel. | 5.5 bar | w096 | d459 |
| PS001V-302-LI2UPN8X-H1141 | -1...1 bar rel. | 5.5 bar | w096 | d459 |
| PS003V-302-LI2UPN8X-H1141 | -1...2.5 bar rel. | 12 bar | w096 | d459 |
| PS010V-302-LI2UPN8X-H1141 | -1...10 bar rel. | 50 bar | w096 | d459 |
| PS016V-302-LI2UPN8X-H1141 | -1...16 bar rel. | 80 bar | w096 | d459 |
| PS025V-302-LI2UPN8X-H1141 | -1...25 bar rel. | 120 bar | w096 | d459 |
| PS040V-302-LI2UPN8X-H1141 | -1...40 bar rel. | 200 bar | w096 | d459 |
| PS100R-302-LI2UPN8X-H1141 | 0...100 bar rel. | 450 bar | w096 | d459 |
| PS250R-302-LI2UPN8X-H1141 | 0...250 bar rel. | 600 bar | w096 | d459 |
| PS400R-302-LI2UPN8X-H1141 | 0...400 bar rel. | 800 bar | w096 | d459 |
| PS600R-302-LI2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w096 | d459 |

1/4" NPT – Female – 1 switching and 1 voltage output



General data

Operating voltage 18...30 VDC

Protection type and class IP69K / III

Output 1 (PIN 4) switching output or IO-Link mode

Output 2 (PIN 2) analogue output

Output function , pnp/npn

Switching point accuracy 0.5% of full scale

Repeatability 0.1% of full scale

Switching frequency 180 Hz

Voltage output, programmable
0...10V/0...5V/
1...6V/10...0V/
5...0V/6...1V

Accuracy (Lin. + Hys. + Rep.) 0.5% of final value BSL

Response time 3 ms

Temperature coefficient zero point T_{k0} 0.15% of full scale / 10 K

Temperature coefficient span T_{kS} 0.15% of full scale / 10 K

Medium temperature -40...85 °C

Ambient temperature -40...80 °C

Housing material stainless-steel/
plastic, 1.4305 (AISI 303)/PC
material pressure element ceramics Al_2O_3

Sealing material FPM

Electrical connection connector, M12 x 1


Mechanical connection NPT1/4" - 18 female threads

Types and data – selection table



| Type | Measuring range | Admissible overpressure | w | d |
|--------------------------|-------------------|-------------------------|------|------|
| PS01VR-302-LUUPN8X-H1141 | -1...0 bar rel. | 5.5 bar | w097 | d459 |
| PS001R-302-LUUPN8X-H1141 | 0...1 bar rel. | 5.5 bar | w097 | d459 |
| PS001V-302-LUUPN8X-H1141 | -1...1 bar rel. | 5.5 bar | w097 | d459 |
| PS003V-302-LUUPN8X-H1141 | -1...2.5 bar rel. | 12 bar | w097 | d459 |
| PS010V-302-LUUPN8X-H1141 | -1...10 bar rel. | 50 bar | w097 | d459 |
| PS016V-302-LUUPN8X-H1141 | -1...16 bar rel. | 80 bar | w097 | d459 |
| PS025V-302-LUUPN8X-H1141 | -1...25 bar rel. | 120 bar | w097 | d459 |
| PS040V-302-LUUPN8X-H1141 | -1...40 bar rel. | 200 bar | w097 | d459 |
| PS100R-302-LUUPN8X-H1141 | 0...100 bar rel. | 450 bar | w097 | d459 |
| PS250R-302-LUUPN8X-H1141 | 0...250 bar rel. | 600 bar | w097 | d459 |
| PS400R-302-LUUPN8X-H1141 | 0...400 bar rel. | 800 bar | w097 | d459 |
| PS600R-302-LUUPN8X-H1141 | 0...600 bar rel. | 900 bar | w097 | d459 |

1/4" NPT – Male – 2 switching outputs



| | | | |
|----------------------------------|---|---|---|
| General data | | | |
| Operating voltage | 15...30 VDC | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Protection type and class | IP69K / III | Temperature coefficient span T_{k5} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Medium temperature | -40...85 °C |
| Output 2 (PIN 2) | switching output | Ambient temperature | -40...80 °C |
| Output function |  , pnp/npn | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Switching point accuracy | 0.5% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Repeatability | 0.1% of full scale | Sealing material | FPM |
| Switching frequency | 180 Hz | Electrical connection | connector, M12 x 1 |
| Response time | 3 ms | Mechanical connection | NPT 1/4" - 18 male thread |

Types and data – selection table

| Type | Measuring range | Admissible overpressure |  |  |
|-------------------------|-------------------|-------------------------|---|---|
| PS01VR-303-2UPN8X-H1141 | -1...0 bar rel. | 5.5 bar | w095 | d460 |
| PS001R-303-2UPN8X-H1141 | 0...1 bar rel. | 5.5 bar | w095 | d460 |
| PS001V-303-2UPN8X-H1141 | -1...1 bar rel. | 5.5 bar | w095 | d460 |
| PS003V-303-2UPN8X-H1141 | -1...2.5 bar rel. | 12 bar | w095 | d460 |
| PS010V-303-2UPN8X-H1141 | -1...10 bar rel. | 50 bar | w095 | d460 |
| PS016V-303-2UPN8X-H1141 | -1...16 bar rel. | 80 bar | w095 | d460 |
| PS025V-303-2UPN8X-H1141 | -1...25 bar rel. | 120 bar | w095 | d460 |
| PS040V-303-2UPN8X-H1141 | -1...40 bar rel. | 200 bar | w095 | d460 |
| PS100R-303-2UPN8X-H1141 | 0...100 bar rel. | 450 bar | w095 | d460 |
| PS250R-303-2UPN8X-H1141 | 0...250 bar rel. | 600 bar | w095 | d460 |
| PS400R-303-2UPN8X-H1141 | 0...400 bar rel. | 800 bar | w095 | d460 |
| PS600R-303-2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w095 | d460 |

1/4" NPT – Male – 1 switching and 1 current output



General data

| | | | |
|--------------------------------------|--------------------------------------|--|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP69K / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{ks} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analog or switching output | Medium temperature | -40...85 °C |
| Output function | — / —, pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Operating range | 4...20/ 0...20/ 20...4/ 20...0 mA | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | NPT 1/4" - 18 male thread |

Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|---------------------------|-------------------|-------------------------|------|------|
| PS01VR-303-LI2UPN8X-H1141 | -1...0 bar rel. | 5.5 bar | w096 | d460 |
| PS001R-303-LI2UPN8X-H1141 | 0...1 bar rel. | 5.5 bar | w096 | d460 |
| PS001V-303-LI2UPN8X-H1141 | -1...1 bar rel. | 5.5 bar | w096 | d460 |
| PS003V-303-LI2UPN8X-H1141 | -1...2.5 bar rel. | 12 bar | w096 | d460 |
| PS010V-303-LI2UPN8X-H1141 | -1...10 bar rel. | 50 bar | w096 | d460 |
| PS016V-303-LI2UPN8X-H1141 | -1...16 bar rel. | 80 bar | w096 | d460 |
| PS025V-303-LI2UPN8X-H1141 | -1...25 bar rel. | 120 bar | w096 | d460 |
| PS040V-303-LI2UPN8X-H1141 | -1...40 bar rel. | 200 bar | w096 | d460 |
| PS100R-303-LI2UPN8X-H1141 | 0...100 bar rel. | 450 bar | w096 | d460 |
| PS250R-303-LI2UPN8X-H1141 | 0...250 bar rel. | 600 bar | w096 | d460 |
| PS400R-303-LI2UPN8X-H1141 | 0...400 bar rel. | 800 bar | w096 | d460 |
| PS600R-303-LI2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w096 | d460 |

1/4" NPT – Male – 1 switching and 1 voltage output



General data


| | | | |
|--------------------------------------|---|--|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP69K / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{ks} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analogue output | Medium temperature | -40...85 °C |
| Output function | — / —, pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Voltage output, programmable | 0...10V/0...5V/ 1...6V/10...0V/ 5...0V/6...1V | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | NPT 1/4" - 18 male thread |

Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|--------------------------|-------------------|-------------------------|------|------|
| PS01VR-303-LUUPN8X-H1141 | -1...0 bar rel. | 5.5 bar | w097 | d460 |
| PS001R-303-LUUPN8X-H1141 | 0...1 bar rel. | 5.5 bar | w097 | d460 |
| PS001V-303-LUUPN8X-H1141 | -1...1 bar rel. | 5.5 bar | w097 | d460 |
| PS003V-303-LUUPN8X-H1141 | -1...2.5 bar rel. | 12 bar | w097 | d460 |
| PS010V-303-LUUPN8X-H1141 | -1...10 bar rel. | 50 bar | w097 | d460 |
| PS016V-303-LUUPN8X-H1141 | -1...16 bar rel. | 80 bar | w097 | d460 |
| PS025V-303-LUUPN8X-H1141 | -1...25 bar rel. | 120 bar | w097 | d460 |
| PS040V-303-LUUPN8X-H1141 | -1...40 bar rel. | 200 bar | w097 | d460 |
| PS100R-303-LUUPN8X-H1141 | 0...100 bar rel. | 450 bar | w097 | d460 |
| PS250R-303-LUUPN8X-H1141 | 0...250 bar rel. | 600 bar | w097 | d460 |
| PS400R-303-LUUPN8X-H1141 | 0...400 bar rel. | 800 bar | w097 | d460 |
| PS600R-303-LUUPN8X-H1141 | 0...600 bar rel. | 900 bar | w097 | d460 |

G1/4" – Male – 2 switching outputs



| | | | |
|----------------------------------|---|---|---|
| General data | | | |
| Operating voltage | 15...30 VDC | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Protection type and class | IP69K / III | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Medium temperature | -40...85 °C |
| Output 2 (PIN 2) | switching output | Ambient temperature | -40...80 °C |
| Output function |  , pnp/npn | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Switching point accuracy | 0.5% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Repeatability | 0.1% of full scale | Sealing material | FPM |
| Switching frequency | 180 Hz | Electrical connection | connector, M12 x 1 |
| Response time | 3 ms | Mechanical connection | G 1/4" male thread |


Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|-------------------------|-------------------|-------------------------|------|------|
| PS01VR-304-2UPN8X-H1141 | -1...0 bar rel. | 5.5 bar | w095 | d461 |
| PS001R-304-2UPN8X-H1141 | 0...1 bar rel. | 5.5 bar | w095 | d461 |
| PS001V-304-2UPN8X-H1141 | -1...1 bar rel. | 5.5 bar | w095 | d461 |
| PS003V-304-2UPN8X-H1141 | -1...2.5 bar rel. | 12 bar | w095 | d461 |
| PS010V-304-2UPN8X-H1141 | -1...10 bar rel. | 50 bar | w095 | d461 |
| PS016V-304-2UPN8X-H1141 | -1...16 bar rel. | 80 bar | w095 | d461 |
| PS025V-304-2UPN8X-H1141 | -1...25 bar rel. | 120 bar | w095 | d461 |
| PS040V-304-2UPN8X-H1141 | -1...40 bar rel. | 200 bar | w095 | d461 |
| PS100R-304-2UPN8X-H1141 | 0...100 bar rel. | 450 bar | w095 | d461 |
| PS250R-304-2UPN8X-H1141 | 0...250 bar rel. | 600 bar | w095 | d461 |
| PS400R-304-2UPN8X-H1141 | 0...400 bar rel. | 800 bar | w095 | d461 |
| PS600R-304-2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w095 | d461 |



G1/4" – Male – 1 switching and 1 current output



General data

| | | | |
|--------------------------------------|---|--|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP69K / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{ks} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analog or switching output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Operating range | 4...20/0...20/20...4/ 20...0 mA | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | G 1/4" male thread |

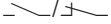
Types and data – selection table

| Type | Measuring range | Admissible overpressure |  |  |
|---------------------------|-------------------|-------------------------|---|---|
| PS01VR-304-LI2UPN8X-H1141 | -1...0 bar rel. | 5.5 bar | w096 | d461 |
| PS001R-304-LI2UPN8X-H1141 | 0...1 bar rel. | 5.5 bar | w096 | d461 |
| PS001V-304-LI2UPN8X-H1141 | -1...1 bar rel. | 5.5 bar | w096 | d461 |
| PS003V-304-LI2UPN8X-H1141 | -1...2.5 bar rel. | 12 bar | w096 | d461 |
| PS010V-304-LI2UPN8X-H1141 | -1...10 bar rel. | 50 bar | w096 | d461 |
| PS016V-304-LI2UPN8X-H1141 | -1...16 bar rel. | 80 bar | w096 | d461 |
| PS025V-304-LI2UPN8X-H1141 | -1...25 bar rel. | 120 bar | w096 | d461 |
| PS040V-304-LI2UPN8X-H1141 | -1...40 bar rel. | 200 bar | w096 | d461 |
| PS100R-304-LI2UPN8X-H1141 | 0...100 bar rel. | 450 bar | w096 | d461 |
| PS250R-304-LI2UPN8X-H1141 | 0...250 bar rel. | 600 bar | w096 | d461 |
| PS400R-304-LI2UPN8X-H1141 | 0...400 bar rel. | 800 bar | w096 | d461 |
| PS600R-304-LI2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w096 | d461 |

G1/4" – Male – 1 switching and 1 voltage output



General data

| | | | |
|--------------------------------------|---|---|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP69K / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analogue output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Voltage output, programmable | 0...10V/0...5V/ 1...6V/10...0V/ 5...0V/6...1V | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | G 1/4" male thread |

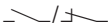
Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|--------------------------|-------------------|-------------------------|------|------|
| PS01VR-304-LUUPN8X-H1141 | -1...0 bar rel. | 5.5 bar | w097 | d461 |
| PS001R-304-LUUPN8X-H1141 | 0...1 bar rel. | 5.5 bar | w097 | d461 |
| PS001V-304-LUUPN8X-H1141 | -1...1 bar rel. | 5.5 bar | w097 | d461 |
| PS003V-304-LUUPN8X-H1141 | -1...2.5 bar rel. | 12 bar | w097 | d461 |
| PS010V-304-LUUPN8X-H1141 | -1...10 bar rel. | 50 bar | w097 | d461 |
| PS016V-304-LUUPN8X-H1141 | -1...16 bar rel. | 80 bar | w097 | d461 |
| PS025V-304-LUUPN8X-H1141 | -1...25 bar rel. | 120 bar | w097 | d461 |
| PS040V-304-LUUPN8X-H1141 | -1...40 bar rel. | 200 bar | w097 | d461 |
| PS100R-304-LUUPN8X-H1141 | 0...100 bar rel. | 450 bar | w097 | d461 |
| PS250R-304-LUUPN8X-H1141 | 0...250 bar rel. | 600 bar | w097 | d461 |
| PS400R-304-LUUPN8X-H1141 | 0...400 bar rel. | 800 bar | w097 | d461 |
| PS600R-304-LUUPN8X-H1141 | 0...600 bar rel. | 900 bar | w097 | d461 |

R1/4" – Male – 2 switching outputs



General data

| | | | |
|----------------------------------|---|---|--|
| Operating voltage | 15...30 VDC | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Protection type and class | IP69K / III | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Medium temperature | -40...85 °C |
| Output 2 (PIN 2) | switching output | Ambient temperature | -40...80 °C |
| Output function |  , pnp/npn | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC ceramics Al ₂ O ₃ |
| Switching point accuracy | 0.5% of full scale | material pressure element | |
| Repeatability | 0.1% of full scale | Sealing material | FPM |
| Switching frequency | 180 Hz | Electrical connection | connector, M12 x 1 |
| Response time | 3 ms | Mechanical connection | R1/4" female thread per DIN 2999 |


Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|--------------------------|-------------------|-------------------------|------|------|
| PS01VR-310-2UPN8X-H11141 | -1...0 bar rel. | 5.5 bar | w095 | d462 |
| PS001R-310-2UPN8X-H11141 | 0...1 bar rel. | 5.5 bar | w095 | d462 |
| PS001V-310-2UPN8X-H11141 | -1...1 bar rel. | 5.5 bar | w095 | d462 |
| PS003V-310-2UPN8X-H11141 | -1...2.5 bar rel. | 12 bar | w095 | d462 |
| PS010V-310-2UPN8X-H11141 | -1...10 bar rel. | 50 bar | w095 | d462 |
| PS016V-310-2UPN8X-H11141 | -1...16 bar rel. | 80 bar | w095 | d462 |
| PS025V-310-2UPN8X-H11141 | -1...25 bar rel. | 120 bar | w095 | d462 |
| PS040V-310-2UPN8X-H11141 | -1...40 bar rel. | 200 bar | w095 | d462 |
| PS100R-310-2UPN8X-H11141 | 0...100 bar rel. | 450 bar | w095 | d462 |
| PS250R-310-2UPN8X-H11141 | 0...250 bar rel. | 600 bar | w095 | d462 |
| PS400R-310-2UPN8X-H11141 | 0...400 bar rel. | 800 bar | w095 | d462 |
| PS600R-310-2UPN8X-H11141 | 0...600 bar rel. | 900 bar | w095 | d462 |

R1/4" – Male – 1 switching and 1 current output



General data

| | | | |
|--------------------------------------|---|---|--|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP69K / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{ks} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analog or switching output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC ceramics Al ₂ O ₃ |
| Repeatability | 0.1% of full scale | material pressure element | |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Operating range | 4...20/0...20/20...4/ 20...0 mA | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | R1/4" female thread per DIN 2999 |


Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|----------------------------|-------------------|-------------------------|------|------|
| PS01VR-310-LI2UPN8X-H11141 | -1...0 bar rel. | 5.5 bar | w096 | d462 |
| PS001R-310-LI2UPN8X-H11141 | 0...1 bar rel. | 5.5 bar | w096 | d462 |
| PS001V-310-LI2UPN8X-H11141 | -1...1 bar rel. | 5.5 bar | w096 | d462 |
| PS003V-310-LI2UPN8X-H11141 | -1...2.5 bar rel. | 12 bar | w096 | d462 |
| PS010V-310-LI2UPN8X-H11141 | -1...10 bar rel. | 50 bar | w096 | d462 |
| PS016V-310-LI2UPN8X-H11141 | -1...16 bar rel. | 80 bar | w096 | d462 |
| PS025V-310-LI2UPN8X-H11141 | -1...25 bar rel. | 120 bar | w096 | d462 |
| PS040V-310-LI2UPN8X-H11141 | -1...40 bar rel. | 200 bar | w096 | d462 |
| PS100R-310-LI2UPN8X-H11141 | 0...100 bar rel. | 450 bar | w096 | d462 |
| PS250R-310-LI2UPN8X-H11141 | 0...250 bar rel. | 600 bar | w096 | d462 |
| PS400R-310-LI2UPN8X-H11141 | 0...400 bar rel. | 800 bar | w096 | d462 |
| PS600R-310-LI2UPN8X-H11141 | 0...600 bar rel. | 900 bar | w096 | d462 |

R1/4" – Male – 1 switching and 1 voltage output



General data

| | | | |
|--------------------------------------|---|---|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP69K / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analogue output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al_2O_3 |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Voltage output, programmable | 0...10 V/0...5 V/ 1...6 V/10...0 V/ 5...0 V/6...1 V | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | R1/4" female thread per DIN 2999 |

Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|---------------------------|-------------------|-------------------------|----------|----------|
| PS01VR-310-LUUPN8X-H11141 | -1...0 bar rel. | 5.5 bar | w097 | d462 |
| PS001R-310-LUUPN8X-H11141 | 0...1 bar rel. | 5.5 bar | w097 | d462 |
| PS001V-310-LUUPN8X-H11141 | -1...1 bar rel. | 5.5 bar | w097 | d462 |
| PS003V-310-LUUPN8X-H11141 | -1...2.5 bar rel. | 12 bar | w097 | d462 |
| PS010V-310-LUUPN8X-H11141 | -1...10 bar rel. | 50 bar | w097 | d462 |
| PS016V-310-LUUPN8X-H11141 | -1...16 bar rel. | 80 bar | w097 | d462 |
| PS025V-310-LUUPN8X-H11141 | -1...25 bar rel. | 120 bar | w097 | d462 |
| PS040V-310-LUUPN8X-H11141 | -1...40 bar rel. | 200 bar | w097 | d462 |
| PS100R-310-LUUPN8X-H11141 | 0...100 bar rel. | 450 bar | w097 | d462 |
| PS250R-310-LUUPN8X-H11141 | 0...250 bar rel. | 600 bar | w097 | d462 |
| PS400R-310-LUUPN8X-H11141 | 0...400 bar rel. | 800 bar | w097 | d462 |
| PS600R-310-LUUPN8X-H11141 | 0...600 bar rel. | 900 bar | w097 | d462 |

R1/4" – Female – 2 switching outputs



General data

Operating voltage 15...30 VDC

Protection type and class IP69K / III

Output 1 (PIN 4) switching output or IO-Link mode

Output 2 (PIN 2) switching output

Output function  , pnp/npn

Switching point accuracy 0.5% of full scale

Repeatability 0.1% of full scale

Switching frequency 180 Hz

Response time 3 ms

Temperature coefficient zero point T_{k0} 0.15% of full scale / 10 K

Temperature coefficient span T_{kS} 0.15% of full scale / 10 K

Medium temperature -40...85 °C

Ambient temperature -40...80 °C

Housing material stainless-steel/
plastic, 1.4305 (AISI 303)/PC
ceramics Al₂O₃

material pressure element

Sealing material FPM

Electrical connection connector, M12 x 1

Mechanical connection R1/4" female thread per
DIN 2999


Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|--------------------------|-------------------|-------------------------|------|------|
| PS01VR-311-2UPN8X-H11141 | -1...0 bar rel. | 5.5 bar | w095 | d463 |
| PS001R-311-2UPN8X-H11141 | 0...1 bar rel. | 5.5 bar | w095 | d463 |
| PS001V-311-2UPN8X-H11141 | -1...1 bar rel. | 5.5 bar | w095 | d463 |
| PS003V-311-2UPN8X-H11141 | -1...2.5 bar rel. | 12 bar | w095 | d463 |
| PS010V-311-2UPN8X-H11141 | -1...10 bar rel. | 50 bar | w095 | d463 |
| PS016V-311-2UPN8X-H11141 | -1...16 bar rel. | 80 bar | w095 | d463 |
| PS025V-311-2UPN8X-H11141 | -1...25 bar rel. | 120 bar | w095 | d463 |
| PS040V-311-2UPN8X-H11141 | -1...40 bar rel. | 200 bar | w095 | d463 |
| PS100R-311-2UPN8X-H11141 | 0...100 bar rel. | 450 bar | w095 | d463 |
| PS250R-311-2UPN8X-H11141 | 0...250 bar rel. | 600 bar | w095 | d463 |
| PS400R-311-2UPN8X-H11141 | 0...400 bar rel. | 800 bar | w095 | d463 |
| PS600R-311-2UPN8X-H11141 | 0...600 bar rel. | 900 bar | w095 | d463 |



R1/4" – Female – 1 switching and 1 current output



General data

| | | | |
|--------------------------------------|---|--|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP69K / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{ks} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analog or switching output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Operating range | 4...20/0...20/20...4/ 20...0 mA | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | R1/4" female thread per DIN 2999 |


Types and data – selection table

| Type | Measuring range | Admissible overpressure |  |  |
|----------------------------|-------------------|-------------------------|---|---|
| PS01VR-311-LI2UPN8X-H11141 | -1...0 bar rel. | 5.5 bar | w096 | d463 |
| PS001R-311-LI2UPN8X-H11141 | 0...1 bar rel. | 5.5 bar | w096 | d463 |
| PS001V-311-LI2UPN8X-H11141 | -1...1 bar rel. | 5.5 bar | w096 | d463 |
| PS003V-311-LI2UPN8X-H11141 | -1...2.5 bar rel. | 12 bar | w096 | d463 |
| PS010V-311-LI2UPN8X-H11141 | -1...10 bar rel. | 50 bar | w096 | d463 |
| PS016V-311-LI2UPN8X-H11141 | -1...16 bar rel. | 80 bar | w096 | d463 |
| PS025V-311-LI2UPN8X-H11141 | -1...25 bar rel. | 120 bar | w096 | d463 |
| PS040V-311-LI2UPN8X-H11141 | -1...40 bar rel. | 200 bar | w096 | d463 |
| PS100R-311-LI2UPN8X-H11141 | 0...100 bar rel. | 450 bar | w096 | d463 |
| PS250R-311-LI2UPN8X-H11141 | 0...250 bar rel. | 600 bar | w096 | d463 |
| PS400R-311-LI2UPN8X-H11141 | 0...400 bar rel. | 800 bar | w096 | d463 |
| PS600R-311-LI2UPN8X-H11141 | 0...600 bar rel. | 900 bar | w096 | d463 |

R1/4" – Female – 1 switching and 1 voltage output



General data

| | | | |
|--------------------------------------|---|---|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP69K / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analogue output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Voltage output, programmable | 0...10V/0...5V/ 1...6V/10...0V/ 5...0V/6...1V | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | R1/4" female thread per DIN 2999 |

Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|---------------------------|-------------------|-------------------------|------|------|
| PS01VR-311-LUUPN8X-H11141 | -1...0 bar rel. | 5.5 bar | w097 | d463 |
| PS001R-311-LUUPN8X-H11141 | 0...1 bar rel. | 5.5 bar | w097 | d463 |
| PS001V-311-LUUPN8X-H11141 | -1...1 bar rel. | 5.5 bar | w097 | d463 |
| PS003V-311-LUUPN8X-H11141 | -1...2.5 bar rel. | 12 bar | w097 | d463 |
| PS010V-311-LUUPN8X-H11141 | -1...10 bar rel. | 50 bar | w097 | d463 |
| PS016V-311-LUUPN8X-H11141 | -1...16 bar rel. | 80 bar | w097 | d463 |
| PS025V-311-LUUPN8X-H11141 | -1...25 bar rel. | 120 bar | w097 | d463 |
| PS040V-311-LUUPN8X-H11141 | -1...40 bar rel. | 200 bar | w097 | d463 |
| PS100R-311-LUUPN8X-H11141 | 0...100 bar rel. | 450 bar | w097 | d463 |
| PS250R-311-LUUPN8X-H11141 | 0...250 bar rel. | 600 bar | w097 | d463 |
| PS400R-311-LUUPN8X-H11141 | 0...400 bar rel. | 800 bar | w097 | d463 |
| PS600R-311-LUUPN8X-H11141 | 0...600 bar rel. | 900 bar | w097 | d463 |

PS500 series – For hydraulic and pneumatic applications

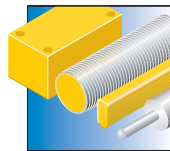


The PS500 sensors operate with ceramic measuring cells. Through pressure exerted on the ceramics a proportional signal is created and then electronically processed. Depending on the sensor version, the processed signal is either provided at a switching or an analog output. IO-Link communication is integrated as a standard. A rotatable sensor body, a large number of available thread types and an accuracy of 0.5% f.s. guarantee highest mounting flexibility and a safe integration in the process.

Features

- IO-Link capable
- Sensor rotatable by 360°
- 4-digit 7-segment display
- Measuring range -1...600 bar relative pressure
- Measuring range 0...25 bar absolute pressure
- Stainless steel housing
- Permanent display of pressure (bar, psi, kPa, MPa, misc)

Properties



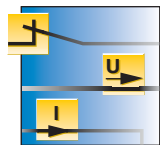
Design

Cylindrical design, rotatable by 360°, with display



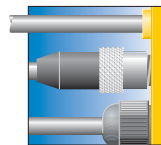
Measuring ranges

-1...600 bar relative and 0...25 bar absolute



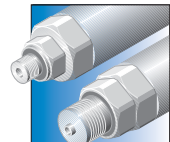
Electrical versions

IO-Link capable, dual-channel, switching, current or voltage output



Electrical connections

4-pin M12 x 1 plug connection



Mechanical connections

G1/4", 1/4" NPT, R1/4" male or female thread, 7/16" UNF and G1/2" male thread



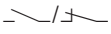
Special features

Fail-safe three-key operation, VDMA menu guide (optional), IP67

G1/4" – Female – 2 switching outputs



General data

| | | | |
|----------------------------------|---|---|---|
| Operating voltage | 15...30 VDC | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Protection type and class | IP67 / III | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Medium temperature | -40...85 °C |
| Output 2 (PIN 2) | switching output | Ambient temperature | -40...80 °C |
| Output function |  , pnp/npn | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Switching point accuracy | 0.5% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Repeatability | 0.1% of full scale | Sealing material | FPM |
| Switching frequency | 180 Hz | Electrical connection | connector, M12 x 1 |
| Response time | 3 ms | Mechanical connection | G 1/4" female thread |

Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|-------------------------|-------------------|-------------------------|------|------|
| PS001R-501-2UPN8X-H1141 | 0...1 bar rel. | 3 bar | w095 | d464 |
| PS001V-501-2UPN8X-H1141 | -1...1 bar rel. | 3 bar | w095 | d464 |
| PS01VR-501-2UPN8X-H1141 | -1...0 bar rel. | 3 bar | w095 | d464 |
| PS001A-501-2UPN8X-H1141 | 0...1 bar abs. | 3 bar | w095 | d464 |
| PS003V-501-2UPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w095 | d464 |
| PS003A-501-2UPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w095 | d464 |
| PS010V-501-2UPN8X-H1141 | -1...10 bar rel. | 25 bar | w095 | d464 |
| PS010A-501-2UPN8X-H1141 | 0...10 bar abs. | 25 bar | w095 | d464 |
| PS016V-501-2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w095 | d464 |
| PS016A-501-2UPN8X-H1141 | 0...16 bar abs. | 40 bar | w095 | d464 |
| PS025V-501-2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w095 | d464 |
| PS025A-501-2UPN8X-H1141 | 0...25 bar abs. | 65 bar | w095 | d464 |
| PS040V-501-2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w095 | d464 |
| PS100R-501-2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w095 | d464 |
| PS250R-501-2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w095 | d464 |
| PS400R-501-2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w095 | d464 |
| PS600R-501-2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w095 | d464 |

G1/4" – Female – 1 switching and 1 current output



General data

| | | | |
|--------------------------------------|---------------------------------------|---|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP67 / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analog or switching output | Medium temperature | -40...85 °C |
| Output function | , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5 % of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1 % of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Operating range | 4...20/ 0...20/ 20...4/ 20... 0 mA | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | G 1/4" female thread |


Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|---------------------------|-------------------|-------------------------|------|------|
| PS001A-501-LI2UPN8X-H1141 | 0...1 bar abs. | 3 bar | w096 | d464 |
| PS001V-501-LI2UPN8X-H1141 | -1...1 bar rel. | 3 bar | w096 | d464 |
| PS01VR-501-LI2UPN8X-H1141 | -1...0 bar rel. | 3 bar | w096 | d464 |
| PS001R-501-LI2UPN8X-H1141 | 0...1 bar rel. | 3 bar | w096 | d464 |
| PS003A-501-LI2UPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w096 | d464 |
| PS003V-501-LI2UPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w096 | d464 |
| PS010A-501-LI2UPN8X-H1141 | 0...10 bar abs. | 25 bar | w096 | d464 |
| PS010V-501-LI2UPN8X-H1141 | -1...10 bar rel. | 25 bar | w096 | d464 |
| PS016A-501-LI2UPN8X-H1141 | 0...16 bar abs. | 40 bar | w096 | d464 |
| PS016V-501-LI2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w096 | d464 |
| PS025A-501-LI2UPN8X-H1141 | 0...25 bar abs. | 65 bar | w096 | d464 |
| PS025V-501-LI2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w096 | d464 |
| PS040V-501-LI2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w096 | d464 |
| PS100R-501-LI2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w096 | d464 |
| PS250R-501-LI2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w096 | d464 |
| PS600R-501-LI2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w096 | d464 |
| PS400R-501-LI2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w096 | d464 |



G1/4" – Female – 1 switching and 1 voltage output



General data

| | | | |
|--------------------------------------|---|---|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP67 / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analogue output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Voltage output, programmable | 0...10V/0...5V/ 1...6V/10...0V/ 5...0V/6...1V | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | G 1/4" female thread |

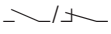
Types and data – selection table

| Type | Measuring range | Admissible overpressure |  |  |
|--------------------------|-------------------|-------------------------|---|---|
| PS001A-501-LUUPN8X-H1141 | 0...1 bar abs. | 3 bar | w097 | d464 |
| PS001V-501-LUUPN8X-H1141 | -1...1 bar rel. | 3 bar | w097 | d464 |
| PS01VR-501-LUUPN8X-H1141 | -1...0 bar rel. | 3 bar | w097 | d464 |
| PS001R-501-LUUPN8X-H1141 | 0...1 bar rel. | 3 bar | w097 | d464 |
| PS003A-501-LUUPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w097 | d464 |
| PS003V-501-LUUPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w097 | d464 |
| PS010A-501-LUUPN8X-H1141 | 0...10 bar abs. | 25 bar | w097 | d464 |
| PS010V-501-LUUPN8X-H1141 | -1...10 bar rel. | 25 bar | w097 | d464 |
| PS016A-501-LUUPN8X-H1141 | 0...16 bar abs. | 40 bar | w097 | d464 |
| PS016V-501-LUUPN8X-H1141 | -1...16 bar rel. | 40 bar | w097 | d464 |
| PS025A-501-LUUPN8X-H1141 | 0...25 bar abs. | 65 bar | w097 | d464 |
| PS025V-501-LUUPN8X-H1141 | -1...25 bar rel. | 65 bar | w097 | d464 |
| PS040V-501-LUUPN8X-H1141 | -1...40 bar rel. | 100 bar | w097 | d464 |
| PS100R-501-LUUPN8X-H1141 | 0...100 bar rel. | 250 bar | w097 | d464 |
| PS250R-501-LUUPN8X-H1141 | 0...250 bar rel. | 625 bar | w097 | d464 |
| PS600R-501-LUUPN8X-H1141 | 0...600 bar rel. | 900 bar | w097 | d464 |
| PS400R-501-LUUPN8X-H1141 | 0...400 bar rel. | 900 bar | w097 | d464 |

1/4" NPT – Female – 2 switching outputs



General data

| | | | |
|----------------------------------|---|---|---|
| Operating voltage | 15...30 VDC | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Protection type and class | IP67 / III | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Medium temperature | -40...85 °C |
| Output 2 (PIN 2) | switching output | Ambient temperature | -40...80 °C |
| Output function |  , pnp/npn | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Switching point accuracy | 0.5% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Repeatability | 0.1% of full scale | Sealing material | FPM |
| Switching frequency | 180 Hz | Electrical connection | connector, M12 x 1 |
| Response time | 3 ms | Mechanical connection | NPT1/4" - 18 female threads |


Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|-------------------------|-------------------|-------------------------|------|------|
| PS001R-502-2UPN8X-H1141 | 0...1 bar rel. | 3 bar | w095 | d465 |
| PS001V-502-2UPN8X-H1141 | -1...1 bar rel. | 3 bar | w095 | d465 |
| PS01VR-502-2UPN8X-H1141 | -1...0 bar rel. | 3 bar | w095 | d465 |
| PS001A-502-2UPN8X-H1141 | 0...1 bar abs. | 3 bar | w095 | d465 |
| PS003V-502-2UPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w095 | d465 |
| PS003A-502-2UPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w095 | d465 |
| PS010V-502-2UPN8X-H1141 | -1...10 bar rel. | 25 bar | w095 | d465 |
| PS010A-502-2UPN8X-H1141 | 0...10 bar abs. | 25 bar | w095 | d465 |
| PS016V-502-2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w095 | d465 |
| PS016A-502-2UPN8X-H1141 | 0...16 bar abs. | 40 bar | w095 | d465 |
| PS025V-502-2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w095 | d465 |
| PS025A-502-2UPN8X-H1141 | 0...25 bar abs. | 65 bar | w095 | d465 |
| PS040V-502-2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w095 | d465 |
| PS100R-502-2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w095 | d465 |
| PS250R-502-2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w095 | d465 |
| PS400R-502-2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w095 | d465 |
| PS600R-502-2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w095 | d465 |



1/4" NPT – Female – 1 switching and 1 current output



General data

| | | | |
|--------------------------------------|---|--|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP67 / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{ks} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analog or switching output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5 % of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1 % of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Operating range | 4...20/ 0...20/ 20...4/ 20... 0 mA | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | NPT1/4" - 18 female threads |


Types and data – selection table

| Type | Measuring range | Admissible overpressure |  |  |
|---------------------------|-------------------|-------------------------|---|---|
| PS001A-502-LI2UPN8X-H1141 | 0...1 bar abs. | 3 bar | w096 | d465 |
| PS001V-502-LI2UPN8X-H1141 | -1...1 bar rel. | 3 bar | w096 | d465 |
| PS01VR-502-LI2UPN8X-H1141 | -1...0 bar rel. | 3 bar | w096 | d465 |
| PS001R-502-LI2UPN8X-H1141 | 0...1 bar rel. | 3 bar | w096 | d465 |
| PS003A-502-LI2UPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w096 | d465 |
| PS003V-502-LI2UPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w096 | d465 |
| PS010A-502-LI2UPN8X-H1141 | 0...10 bar abs. | 25 bar | w096 | d465 |
| PS010V-502-LI2UPN8X-H1141 | -1...10 bar rel. | 25 bar | w096 | d465 |
| PS016A-502-LI2UPN8X-H1141 | 0...16 bar abs. | 40 bar | w096 | d465 |
| PS016V-502-LI2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w096 | d465 |
| PS025A-502-LI2UPN8X-H1141 | 0...25 bar abs. | 65 bar | w096 | d465 |
| PS025V-502-LI2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w096 | d465 |
| PS040V-502-LI2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w096 | d465 |
| PS100R-502-LI2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w096 | d465 |
| PS250R-502-LI2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w096 | d465 |
| PS600R-502-LI2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w096 | d465 |
| PS400R-502-LI2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w096 | d465 |

1/4" NPT – Female – 1 switching and 1 voltage output



General data

| | | | |
|--------------------------------------|---|---|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP67 / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analogue output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Voltage output, programmable | 0...10V/0...5V/ 1...6V/10...0V/ 5...0V/6...1V | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | NPT1/4" - 18 female threads |

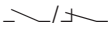
Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|--------------------------|-------------------|-------------------------|------|------|
| PS001A-502-LUUPN8X-H1141 | 0...1 bar abs. | 3 bar | w097 | d465 |
| PS001V-502-LUUPN8X-H1141 | -1...1 bar rel. | 3 bar | w097 | d465 |
| PS001R-502-LUUPN8X-H1141 | 0...1 bar rel. | 3 bar | w097 | d465 |
| PS01VR-502-LUUPN8X-H1141 | -1...0 bar rel. | 3 bar | w097 | d465 |
| PS003A-502-LUUPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w097 | d465 |
| PS003V-502-LUUPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w097 | d465 |
| PS010A-502-LUUPN8X-H1141 | 0...10 bar abs. | 25 bar | w097 | d465 |
| PS010V-502-LUUPN8X-H1141 | -1...10 bar rel. | 25 bar | w097 | d465 |
| PS016A-502-LUUPN8X-H1141 | 0...16 bar abs. | 40 bar | w097 | d465 |
| PS016V-502-LUUPN8X-H1141 | -1...16 bar rel. | 40 bar | w097 | d465 |
| PS025A-502-LUUPN8X-H1141 | 0...25 bar abs. | 65 bar | w097 | d465 |
| PS025V-502-LUUPN8X-H1141 | -1...25 bar rel. | 65 bar | w097 | d465 |
| PS040V-502-LUUPN8X-H1141 | -1...40 bar rel. | 100 bar | w097 | d465 |
| PS100R-502-LUUPN8X-H1141 | 0...100 bar rel. | 250 bar | w097 | d465 |
| PS250R-502-LUUPN8X-H1141 | 0...250 bar rel. | 625 bar | w097 | d465 |
| PS600R-502-LUUPN8X-H1141 | 0...600 bar rel. | 900 bar | w097 | d465 |
| PS400R-502-LUUPN8X-H1141 | 0...400 bar rel. | 900 bar | w097 | d465 |

1/4" NPT – Male – 2 switching outputs



General data

| | | | |
|----------------------------------|---|---|---|
| Operating voltage | 15...30 VDC | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Protection type and class | IP67 / III | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Medium temperature | -40...85 °C |
| Output 2 (PIN 2) | switching output | Ambient temperature | -40...80 °C |
| Output function |  , pnp/npn | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Switching point accuracy | 0.5% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Repeatability | 0.1% of full scale | Sealing material | FPM |
| Switching frequency | 180 Hz | Electrical connection | connector, M12 x 1 |
| Response time | 3 ms | Mechanical connection | NPT 1/4" - 18 male thread |

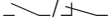
Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|-------------------------|-------------------|-------------------------|----------|----------|
| PS001R-503-2UPN8X-H1141 | 0...1 bar rel. | 3 bar | w095 | d466 |
| PS001V-503-2UPN8X-H1141 | -1...1 bar rel. | 3 bar | w095 | d466 |
| PS01VR-503-2UPN8X-H1141 | -1...0 bar rel. | 3 bar | w095 | d466 |
| PS001A-503-2UPN8X-H1141 | 0...1 bar abs. | 3 bar | w095 | d466 |
| PS003V-503-2UPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w095 | d466 |
| PS003A-503-2UPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w095 | d466 |
| PS010V-503-2UPN8X-H1141 | -1...10 bar rel. | 25 bar | w095 | d466 |
| PS010A-503-2UPN8X-H1141 | 0...10 bar abs. | 25 bar | w095 | d466 |
| PS016V-503-2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w095 | d466 |
| PS016A-503-2UPN8X-H1141 | 0...16 bar abs. | 40 bar | w095 | d466 |
| PS025V-503-2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w095 | d466 |
| PS025A-503-2UPN8X-H1141 | 0...25 bar abs. | 65 bar | w095 | d466 |
| PS040V-503-2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w095 | d466 |
| PS100R-503-2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w095 | d466 |
| PS250R-503-2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w095 | d466 |
| PS400R-503-2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w095 | d466 |
| PS600R-503-2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w095 | d466 |

1/4" NPT – Male – 1 switching and 1 current output



General data

| | | | |
|--------------------------------------|---|---|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP67 / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analog or switching output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Operating range | 4...20/ 0...20/ 20...4/ 20... 0 mA | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | NPT 1/4" - 18 male thread |


Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|---------------------------|-------------------|-------------------------|------|------|
| PS001A-503-LI2UPN8X-H1141 | 0...1 bar abs. | 3 bar | w096 | d466 |
| PS001V-503-LI2UPN8X-H1141 | -1...1 bar rel. | 3 bar | w096 | d466 |
| PS01VR-503-LI2UPN8X-H1141 | -1...0 bar rel. | 3 bar | w096 | d466 |
| PS001R-503-LI2UPN8X-H1141 | 0...1 bar rel. | 3 bar | w096 | d466 |
| PS003A-503-LI2UPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w096 | d466 |
| PS003V-503-LI2UPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w096 | d466 |
| PS010A-503-LI2UPN8X-H1141 | 0...10 bar abs. | 25 bar | w096 | d466 |
| PS010V-503-LI2UPN8X-H1141 | -1...10 bar rel. | 25 bar | w096 | d466 |
| PS016A-503-LI2UPN8X-H1141 | 0...16 bar abs. | 40 bar | w096 | d466 |
| PS016V-503-LI2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w096 | d466 |
| PS025A-503-LI2UPN8X-H1141 | 0...25 bar abs. | 65 bar | w096 | d466 |
| PS025V-503-LI2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w096 | d466 |
| PS040V-503-LI2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w096 | d466 |
| PS100R-503-LI2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w096 | d466 |
| PS250R-503-LI2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w096 | d466 |
| PS600R-503-LI2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w096 | d466 |
| PS400R-503-LI2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w096 | d466 |



1/4" NPT – Male – 1 switching and 1 voltage output



General data

| | | | |
|--------------------------------------|---|---|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP67 / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analogue output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Voltage output, programmable | 0...10V/0...5V/ 1...6V/10...0V/ 5...0V/6...1V | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | NPT 1/4" - 18 male thread |

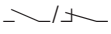
Types and data – selection table

| Type | Measuring range | Admissible overpressure |  w |  d |
|--------------------------|-------------------|-------------------------|---|---|
| PS001A-503-LUUPN8X-H1141 | 0...1 bar abs. | 3 bar | w097 | d466 |
| PS001V-503-LUUPN8X-H1141 | -1...1 bar rel. | 3 bar | w097 | d466 |
| PS001R-503-LUUPN8X-H1141 | 0...1 bar rel. | 3 bar | w097 | d466 |
| PS01VR-503-LUUPN8X-H1141 | -1...0 bar rel. | 3 bar | w097 | d466 |
| PS003A-503-LUUPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w097 | d466 |
| PS003V-503-LUUPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w097 | d466 |
| PS010A-503-LUUPN8X-H1141 | 0...10 bar abs. | 25 bar | w097 | d466 |
| PS010V-503-LUUPN8X-H1141 | -1...10 bar rel. | 25 bar | w097 | d466 |
| PS016A-503-LUUPN8X-H1141 | 0...16 bar abs. | 40 bar | w097 | d466 |
| PS016V-503-LUUPN8X-H1141 | -1...16 bar rel. | 40 bar | w097 | d466 |
| PS025A-503-LUUPN8X-H1141 | 0...25 bar abs. | 65 bar | w097 | d466 |
| PS025V-503-LUUPN8X-H1141 | -1...25 bar rel. | 65 bar | w097 | d466 |
| PS040V-503-LUUPN8X-H1141 | -1...40 bar rel. | 100 bar | w097 | d466 |
| PS100R-503-LUUPN8X-H1141 | 0...100 bar rel. | 250 bar | w097 | d466 |
| PS250R-503-LUUPN8X-H1141 | 0...250 bar rel. | 625 bar | w097 | d466 |
| PS600R-503-LUUPN8X-H1141 | 0...600 bar rel. | 900 bar | w097 | d466 |
| PS400R-503-LUUPN8X-H1141 | 0...400 bar rel. | 900 bar | w097 | d466 |

G1/4" – Male – 2 switching outputs



General data

| | | | |
|----------------------------------|---|---|---|
| Operating voltage | 15...30 VDC | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Protection type and class | IP67 / III | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Medium temperature | -40...85 °C |
| Output 2 (PIN 2) | switching output | Ambient temperature | -40...80 °C |
| Output function |  , pnp/npn | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Switching point accuracy | 0.5% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Repeatability | 0.1% of full scale | Sealing material | FPM |
| Switching frequency | 180 Hz | Electrical connection | connector, M12 x 1 |
| Response time | 3 ms | Mechanical connection | G 1/4" male thread |


Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|-------------------------|-------------------|-------------------------|------|------|
| PS001R-504-2UPN8X-H1141 | 0...1 bar rel. | 3 bar | w095 | d467 |
| PS001V-504-2UPN8X-H1141 | -1...1 bar rel. | 3 bar | w095 | d467 |
| PS01VR-504-2UPN8X-H1141 | -1...0 bar rel. | 3 bar | w095 | d467 |
| PS001A-504-2UPN8X-H1141 | 0...1 bar abs. | 3 bar | w095 | d467 |
| PS003V-504-2UPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w095 | d467 |
| PS003A-504-2UPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w095 | d467 |
| PS010V-504-2UPN8X-H1141 | -1...10 bar rel. | 25 bar | w095 | d467 |
| PS010A-504-2UPN8X-H1141 | 0...10 bar abs. | 25 bar | w095 | d467 |
| PS016V-504-2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w095 | d467 |
| PS016A-504-2UPN8X-H1141 | 0...16 bar abs. | 40 bar | w095 | d467 |
| PS025V-504-2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w095 | d467 |
| PS025A-504-2UPN8X-H1141 | 0...25 bar abs. | 65 bar | w095 | d467 |
| PS040V-504-2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w095 | d467 |
| PS100R-504-2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w095 | d467 |
| PS250R-504-2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w095 | d467 |
| PS400R-504-2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w095 | d467 |
| PS600R-504-2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w095 | d467 |



G1/4" – Male – 1 switching and 1 current output



General data

| | | | |
|--------------------------------------|---|---|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP67 / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analog or switching output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Operating range | 4...20/ 0...20/ 20...4/ 20... 0 mA | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | G 1/4" male thread |

Types and data – selection table

| Type | Measuring range | Admissible overpressure |  |  |
|---------------------------|-------------------|-------------------------|---|---|
| PS001A-504-LI2UPN8X-H1141 | 0...1 bar abs. | 3 bar | w096 | d467 |
| PS001V-504-LI2UPN8X-H1141 | -1...1 bar rel. | 3 bar | w096 | d467 |
| PS01VR-504-LI2UPN8X-H1141 | -1...0 bar rel. | 3 bar | w096 | d467 |
| PS001R-504-LI2UPN8X-H1141 | 0...1 bar rel. | 3 bar | w096 | d467 |
| PS003A-504-LI2UPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w096 | d467 |
| PS003V-504-LI2UPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w096 | d467 |
| PS010A-504-LI2UPN8X-H1141 | 0...10 bar abs. | 25 bar | w096 | d467 |
| PS010V-504-LI2UPN8X-H1141 | -1...10 bar rel. | 25 bar | w096 | d467 |
| PS016A-504-LI2UPN8X-H1141 | 0...16 bar abs. | 40 bar | w096 | d467 |
| PS016V-504-LI2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w096 | d467 |
| PS025A-504-LI2UPN8X-H1141 | 0...25 bar abs. | 65 bar | w096 | d467 |
| PS025V-504-LI2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w096 | d467 |
| PS040V-504-LI2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w096 | d467 |
| PS100R-504-LI2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w096 | d467 |
| PS250R-504-LI2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w096 | d467 |
| PS600R-504-LI2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w096 | d467 |
| PS400R-504-LI2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w096 | d467 |

G1/4" – Male – 1 switching and 1 voltage output



General data

Operating voltage 18...30 VDC

Protection type and class IP67 / III

Output 1 (PIN 4) switching output or IO-Link mode

Output 2 (PIN 2) analogue output

Output function $\frac{\square}{\square}$ / $\frac{\square}{\square}$, pnp/npn

Switching point accuracy 0.5% of full scale

Repeatability 0.1% of full scale

Switching frequency 180 Hz

Voltage output, programmable 0...10V/0...5V/
1...6V/10...0V/
5...0V/6...1V

Accuracy (Lin. + Hys. + Rep.) 0.5% of final value BSL

Response time 3 ms

Temperature coefficient zero point T_{k0} 0.15% of full scale / 10 K

Temperature coefficient span T_{kS} 0.15% of full scale / 10 K

Medium temperature -40...85 °C

Ambient temperature -40...80 °C

Housing material stainless-steel/
plastic, 1.4305 (AISI 303)/PC

material pressure element ceramics Al₂O₃

Sealing material FPM

Electrical connection connector, M12 x 1

Mechanical connection G 1/4" male thread

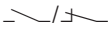
Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|--------------------------|-------------------|-------------------------|------|------|
| PS001A-504-LUUPN8X-H1141 | 0...1 bar abs. | 3 bar | w097 | d467 |
| PS001V-504-LUUPN8X-H1141 | -1...1 bar rel. | 3 bar | w097 | d467 |
| PS001R-504-LUUPN8X-H1141 | 0...1 bar rel. | 3 bar | w097 | d467 |
| PS01VR-504-LUUPN8X-H1141 | -1...0 bar rel. | 3 bar | w097 | d467 |
| PS003A-504-LUUPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w097 | d467 |
| PS003V-504-LUUPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w097 | d467 |
| PS010A-504-LUUPN8X-H1141 | 0...10 bar abs. | 25 bar | w097 | d467 |
| PS010V-504-LUUPN8X-H1141 | -1...10 bar rel. | 25 bar | w097 | d467 |
| PS016A-504-LUUPN8X-H1141 | 0...16 bar abs. | 40 bar | w097 | d467 |
| PS016V-504-LUUPN8X-H1141 | -1...16 bar rel. | 40 bar | w097 | d467 |
| PS025A-504-LUUPN8X-H1141 | 0...25 bar abs. | 65 bar | w097 | d467 |
| PS025V-504-LUUPN8X-H1141 | -1...25 bar rel. | 65 bar | w097 | d467 |
| PS040V-504-LUUPN8X-H1141 | -1...40 bar rel. | 100 bar | w097 | d467 |
| PS100R-504-LUUPN8X-H1141 | 0...100 bar rel. | 250 bar | w097 | d467 |
| PS250R-504-LUUPN8X-H1141 | 0...250 bar rel. | 625 bar | w097 | d467 |
| PS600R-504-LUUPN8X-H1141 | 0...600 bar rel. | 900 bar | w097 | d467 |
| PS400R-504-LUUPN8X-H1141 | 0...400 bar rel. | 900 bar | w097 | d467 |

7/16" UNF – Male – 2 switching outputs



General data

| | | | |
|----------------------------------|---|---|---|
| Operating voltage | 15...30 VDC | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Protection type and class | IP67 / III | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Medium temperature | -40...85 °C |
| Output 2 (PIN 2) | switching output | Ambient temperature | -40...80 °C |
| Output function |  , pnp/npn | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Switching point accuracy | 0.5% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Repeatability | 0.1% of full scale | Sealing material | FPM |
| Switching frequency | 180 Hz | Electrical connection | connector, M12 x 1 |
| Response time | 3 ms | Mechanical connection | 7/16-20 UNF |


Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|-------------------------|-------------------|-------------------------|------|------|
| PS001R-505-2UPN8X-H1141 | 0...1 bar rel. | 3 bar | w095 | d468 |
| PS001V-505-2UPN8X-H1141 | -1...1 bar rel. | 3 bar | w095 | d468 |
| PS01VR-505-2UPN8X-H1141 | -1...0 bar rel. | 3 bar | w095 | d468 |
| PS001A-505-2UPN8X-H1141 | 0...1 bar abs. | 3 bar | w095 | d468 |
| PS003V-505-2UPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w095 | d468 |
| PS003A-505-2UPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w095 | d468 |
| PS010V-505-2UPN8X-H1141 | -1...10 bar rel. | 25 bar | w095 | d468 |
| PS010A-505-2UPN8X-H1141 | 0...10 bar abs. | 25 bar | w095 | d468 |
| PS016V-505-2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w095 | d468 |
| PS016A-505-2UPN8X-H1141 | 0...16 bar abs. | 40 bar | w095 | d468 |
| PS025V-505-2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w095 | d468 |
| PS025A-505-2UPN8X-H1141 | 0...25 bar abs. | 65 bar | w095 | d468 |
| PS040V-505-2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w095 | d468 |
| PS100R-505-2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w095 | d468 |
| PS250R-505-2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w095 | d468 |
| PS400R-505-2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w095 | d468 |
| PS600R-505-2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w095 | d468 |

7/16" UNF – Male – 1 switching and 1 current output



General data

| | | | |
|--------------------------------------|---|--|--|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP67 / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{ks} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analog or switching output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC ceramics Al ₂ O ₃ |
| Repeatability | 0.1% of full scale | material pressure element | |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Operating range | 4...20/ 0...20/ 20...4/ 20... 0 mA | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | 7/16-20 UNF |


Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|---------------------------|-------------------|-------------------------|------|------|
| PS001A-505-LI2UPN8X-H1141 | 0...1 bar abs. | 3 bar | w096 | d468 |
| PS001V-505-LI2UPN8X-H1141 | -1...1 bar rel. | 3 bar | w096 | d468 |
| PS001R-505-LI2UPN8X-H1141 | 0...1 bar rel. | 3 bar | w096 | d468 |
| PS01VR-505-LI2UPN8X-H1141 | -1...0 bar rel. | 3 bar | w096 | d468 |
| PS003A-505-LI2UPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w096 | d468 |
| PS003V-505-LI2UPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w096 | d468 |
| PS010A-505-LI2UPN8X-H1141 | 0...10 bar abs. | 25 bar | w096 | d468 |
| PS016A-505-LI2UPN8X-H1141 | 0...16 bar abs. | 40 bar | w096 | d468 |
| PS016V-505-LI2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w096 | d468 |
| PS025A-505-LI2UPN8X-H1141 | 0...25 bar abs. | 65 bar | w096 | d468 |
| PS025V-505-LI2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w096 | d468 |
| PS040V-505-LI2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w096 | d468 |
| PS100R-505-LI2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w096 | d468 |
| PS250R-505-LI2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w096 | d468 |
| PS600R-505-LI2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w096 | d468 |
| PS400R-505-LI2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w096 | d468 |

7/16" UNF – Male – 1 switching and 1 voltage output



General data

| | | | |
|--------------------------------------|---|---|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP67 / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analogue output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Voltage output, programmable | 0...10V/0...5V/ 1...6V/10...0V/ 5...0V/6...1V | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | 7/16-20 UNF |

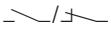
Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|--------------------------|-------------------|-------------------------|------|------|
| PS01VR-505-LUUPN8X-H1141 | -1...0 bar rel. | 3 bar | w097 | d468 |
| PS001R-505-LUUPN8X-H1141 | 0...1 bar rel. | 3 bar | w097 | d468 |
| PS001V-505-LUUPN8X-H1141 | -1...1 bar rel. | 3 bar | w097 | d468 |
| PS001A-505-LUUPN8X-H1141 | 0...1 bar abs. | 3 bar | w097 | d468 |
| PS003V-505-LUUPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w097 | d468 |
| PS003A-505-LUUPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w097 | d468 |
| PS010V-505-LUUPN8X-H1141 | -1...10 bar rel. | 25 bar | w097 | d468 |
| PS010A-505-LUUPN8X-H1141 | 0...10 bar abs. | 25 bar | w097 | d468 |
| PS016V-505-LUUPN8X-H1141 | -1...16 bar rel. | 40 bar | w097 | d468 |
| PS016A-505-LUUPN8X-H1141 | 0...16 bar abs. | 40 bar | w097 | d468 |
| PS025V-505-LUUPN8X-H1141 | -1...25 bar rel. | 65 bar | w097 | d468 |
| PS025A-505-LUUPN8X-H1141 | 0...25 bar abs. | 65 bar | w097 | d468 |
| PS040V-505-LUUPN8X-H1141 | -1...40 bar rel. | 100 bar | w097 | d468 |
| PS100R-505-LUUPN8X-H1141 | 0...100 bar rel. | 250 bar | w097 | d468 |
| PS250R-505-LUUPN8X-H1141 | 0...250 bar rel. | 625 bar | w097 | d468 |
| PS400R-505-LUUPN8X-H1141 | 0...400 bar rel. | 900 bar | w097 | d468 |
| PS600R-505-LUUPN8X-H1141 | 0...600 bar rel. | 900 bar | w097 | d468 |

G1/2" – Male – Manometer connection – 2 switching outputs



General data

| | | | |
|----------------------------------|---|---|---|
| Operating voltage | 15...30 VDC | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Protection type and class | IP67 / III | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Medium temperature | -40...85 °C |
| Output 2 (PIN 2) | switching output | Ambient temperature | -40...80 °C |
| Output function |  , pnp/npn | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Switching point accuracy | 0.5% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Repeatability | 0.1% of full scale | Sealing material | FPM |
| Switching frequency | 180 Hz | Electrical connection | connector, M12 x 1 |
| Response time | 3 ms | Mechanical connection | G 1/2" male threaded manometer acc. to DIN 3852-E |


Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|-------------------------|-------------------|-------------------------|------|------|
| PS001R-508-2UPN8X-H1141 | 0...1 bar rel. | 3 bar | w095 | d469 |
| PS001V-508-2UPN8X-H1141 | -1...1 bar rel. | 3 bar | w095 | d469 |
| PS01VR-508-2UPN8X-H1141 | -1...0 bar rel. | 3 bar | w095 | d469 |
| PS001A-508-2UPN8X-H1141 | 0...1 bar abs. | 3 bar | w095 | d469 |
| PS003V-508-2UPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w095 | d469 |
| PS003A-508-2UPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w095 | d469 |
| PS010V-508-2UPN8X-H1141 | -1...10 bar rel. | 25 bar | w095 | d469 |
| PS010A-508-2UPN8X-H1141 | 0...10 bar abs. | 25 bar | w095 | d469 |
| PS016V-508-2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w095 | d469 |
| PS016A-508-2UPN8X-H1141 | 0...16 bar abs. | 40 bar | w095 | d469 |
| PS025V-508-2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w095 | d469 |
| PS025A-508-2UPN8X-H1141 | 0...25 bar abs. | 65 bar | w095 | d469 |
| PS040V-508-2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w095 | d469 |
| PS100R-508-2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w095 | d469 |
| PS250R-508-2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w095 | d469 |
| PS400R-508-2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w095 | d469 |
| PS600R-508-2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w095 | d469 |

G1/2" – Male – Manometer connection – 1 switching and 1 current output



General data

| | | | |
|--------------------------------------|---|--|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP67 / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{ks} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analog or switching output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5 % of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1 % of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Operating range | 4...20/ 0...20/ 20...4/ 20... 0 mA | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | G 1/2" male threaded manometer acc. to DIN 3852-E |


Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|---------------------------|-------------------|-------------------------|------|------|
| PS001A-508-LI2UPN8X-H1141 | 0...1 bar abs. | 3 bar | w096 | d469 |
| PS001V-508-LI2UPN8X-H1141 | -1...1 bar rel. | 3 bar | w096 | d469 |
| PS01VR-508-LI2UPN8X-H1141 | -1...0 bar rel. | 3 bar | w096 | d469 |
| PS001R-508-LI2UPN8X-H1141 | 0...1 bar rel. | 3 bar | w096 | d469 |
| PS003A-508-LI2UPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w096 | d469 |
| PS003V-508-LI2UPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w096 | d469 |
| PS010A-508-LI2UPN8X-H1141 | 0...10 bar abs. | 25 bar | w096 | d469 |
| PS010V-508-LI2UPN8X-H1141 | -1...10 bar rel. | 25 bar | w096 | d469 |
| PS016A-508-LI2UPN8X-H1141 | 0...16 bar abs. | 40 bar | w096 | d469 |
| PS016V-508-LI2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w096 | d469 |
| PS025A-508-LI2UPN8X-H1141 | 0...25 bar abs. | 65 bar | w096 | d469 |
| PS025V-508-LI2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w096 | d469 |
| PS040V-508-LI2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w096 | d469 |
| PS100R-508-LI2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w096 | d469 |
| PS250R-508-LI2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w096 | d469 |
| PS600R-508-LI2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w096 | d469 |
| PS400R-508-LI2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w096 | d469 |

G1/2" – Male – Manometer connection – 1 switching and 1 current output



General data

| | | | |
|--------------------------------------|---|---|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP67 / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analogue output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Voltage output, programmable | 0...10V/0...5V/ 1...6V/10...0V/ 5...0V/6...1V | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | G 1/2" male threaded manometer acc. to DIN 3852-E |

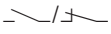
Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|--------------------------|-------------------|-------------------------|------|------|
| PS001A-508-LUUPN8X-H1141 | 0...1 bar abs. | 3 bar | w097 | d469 |
| PS001V-508-LUUPN8X-H1141 | -1...1 bar rel. | 3 bar | w097 | d469 |
| PS001R-508-LUUPN8X-H1141 | 0...1 bar rel. | 3 bar | w097 | d469 |
| PS01VR-508-LUUPN8X-H1141 | -1...0 bar rel. | 3 bar | w097 | d469 |
| PS003A-508-LUUPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w097 | d469 |
| PS003V-508-LUUPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w097 | d469 |
| PS010A-508-LUUPN8X-H1141 | 0...10 bar abs. | 25 bar | w097 | d469 |
| PS010V-508-LUUPN8X-H1141 | -1...10 bar rel. | 25 bar | w097 | d469 |
| PS016A-508-LUUPN8X-H1141 | 0...16 bar abs. | 40 bar | w097 | d469 |
| PS016V-508-LUUPN8X-H1141 | -1...16 bar rel. | 40 bar | w097 | d469 |
| PS025A-508-LUUPN8X-H1141 | 0...25 bar abs. | 65 bar | w097 | d469 |
| PS025V-508-LUUPN8X-H1141 | -1...25 bar rel. | 65 bar | w097 | d469 |
| PS040V-508-LUUPN8X-H1141 | -1...40 bar rel. | 100 bar | w097 | d469 |
| PS100R-508-LUUPN8X-H1141 | 0...100 bar rel. | 250 bar | w097 | d469 |
| PS250R-508-LUUPN8X-H1141 | 0...250 bar rel. | 625 bar | w097 | d469 |
| PS600R-508-LUUPN8X-H1141 | 0...600 bar rel. | 900 bar | w097 | d469 |
| PS400R-508-LUUPN8X-H1141 | 0...400 bar rel. | 900 bar | w097 | d469 |

R1/4" – Male – 2 switching outputs



General data

| | | | |
|----------------------------------|---|---|---|
| Operating voltage | 15...30 VDC | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Protection type and class | IP67 / III | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Medium temperature | -40...85 °C |
| Output 2 (PIN 2) | switching output | Ambient temperature | -40...80 °C |
| Output function |  , pnp/npn | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Switching point accuracy | 0.5% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Repeatability | 0.1% of full scale | Sealing material | FPM |
| Switching frequency | 180 Hz | Electrical connection | connector, M12 x 1 |
| Response time | 3 ms | Mechanical connection | R1/4" female thread per DIN 2999 |


Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|-------------------------|-------------------|-------------------------|------|------|
| PS001R-510-2UPN8X-H1141 | 0...1 bar rel. | 3 bar | w095 | d470 |
| PS001V-510-2UPN8X-H1141 | -1...1 bar rel. | 3 bar | w095 | d470 |
| PS01VR-510-2UPN8X-H1141 | -1...0 bar rel. | 3 bar | w095 | d470 |
| PS001A-510-2UPN8X-H1141 | 0...1 bar abs. | 3 bar | w095 | d470 |
| PS003V-510-2UPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w095 | d470 |
| PS003A-510-2UPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w095 | d470 |
| PS010V-510-2UPN8X-H1141 | -1...10 bar rel. | 25 bar | w095 | d470 |
| PS010A-510-2UPN8X-H1141 | 0...10 bar abs. | 25 bar | w095 | d470 |
| PS016V-510-2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w095 | d470 |
| PS016A-510-2UPN8X-H1141 | 0...16 bar abs. | 40 bar | w095 | d470 |
| PS025V-510-2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w095 | d470 |
| PS025A-510-2UPN8X-H1141 | 0...25 bar abs. | 65 bar | w095 | d470 |
| PS040V-510-2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w095 | d470 |
| PS100R-510-2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w095 | d470 |
| PS250R-510-2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w095 | d470 |
| PS400R-510-2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w095 | d470 |
| PS600R-510-2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w095 | d470 |

R1/4" – Male – 1 switching and 1 current output



General data

| | | | |
|--------------------------------------|---|---|--|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP67 / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{ks} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analog or switching output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC ceramics Al ₂ O ₃ |
| Repeatability | 0.1% of full scale | material pressure element | |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Operating range | 4...20/0...20/20...4/ 20...0 mA | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | R1/4" female thread per DIN 2999 |

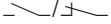
Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|---------------------------|-------------------|-------------------------|------|------|
| PS001A-510-LI2UPN8X-H1141 | 0...1 bar abs. | 3 bar | w096 | d470 |
| PS001V-510-LI2UPN8X-H1141 | -1...1 bar rel. | 3 bar | w096 | d470 |
| PS001R-510-LI2UPN8X-H1141 | 0...1 bar rel. | 3 bar | w096 | d470 |
| PS01VR-510-LI2UPN8X-H1141 | -1...0 bar rel. | 3 bar | w096 | d470 |
| PS003A-510-LI2UPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w096 | d470 |
| PS003V-510-LI2UPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w096 | d470 |
| PS010A-510-LI2UPN8X-H1141 | 0...10 bar abs. | 25 bar | w096 | d470 |
| PS010V-510-LI2UPN8X-H1141 | -1...10 bar rel. | 25 bar | w096 | d470 |
| PS016A-510-LI2UPN8X-H1141 | 0...16 bar abs. | 40 bar | w096 | d470 |
| PS016V-510-LI2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w096 | d470 |
| PS025A-510-LI2UPN8X-H1141 | 0...25 bar abs. | 65 bar | w096 | d470 |
| PS025V-510-LI2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w096 | d470 |
| PS040V-510-LI2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w096 | d470 |
| PS100R-510-LI2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w096 | d470 |
| PS250R-510-LI2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w096 | d470 |
| PS600R-510-LI2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w096 | d470 |
| PS400R-510-LI2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w096 | d470 |

R1/4" – Male – 1 switching and 1 voltage output



General data

| | | | |
|--------------------------------------|---|---|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP67 / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analogue output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Voltage output, programmable | 0...10V/0...5V/ 1...6V/10...0V/ 5...0V/6...1V | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | R1/4" female thread per DIN 2999 |

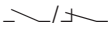
Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|--------------------------|-------------------|-------------------------|------|------|
| PS01VR-510-LUUPN8X-H1141 | -1...0 bar rel. | 3 bar | w097 | d470 |
| PS001R-510-LUUPN8X-H1141 | 0...1 bar rel. | 3 bar | w097 | d470 |
| PS001V-510-LUUPN8X-H1141 | -1...1 bar rel. | 3 bar | w097 | d470 |
| PS001A-510-LUUPN8X-H1141 | 0...1 bar abs. | 3 bar | w097 | d470 |
| PS003V-510-LUUPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w097 | d470 |
| PS003A-510-LUUPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w097 | d470 |
| PS010V-510-LUUPN8X-H1141 | -1...10 bar rel. | 25 bar | w097 | d470 |
| PS010A-510-LUUPN8X-H1141 | 0...10 bar abs. | 25 bar | w097 | d470 |
| PS016V-510-LUUPN8X-H1141 | -1...16 bar rel. | 40 bar | w097 | d470 |
| PS016A-510-LUUPN8X-H1141 | 0...16 bar abs. | 40 bar | w097 | d470 |
| PS025V-510-LUUPN8X-H1141 | -1...25 bar rel. | 65 bar | w097 | d470 |
| PS025A-510-LUUPN8X-H1141 | 0...25 bar abs. | 65 bar | w097 | d470 |
| PS040V-510-LUUPN8X-H1141 | -1...40 bar rel. | 100 bar | w097 | d470 |
| PS100R-510-LUUPN8X-H1141 | 0...100 bar rel. | 250 bar | w097 | d470 |
| PS250R-510-LUUPN8X-H1141 | 0...250 bar rel. | 625 bar | w097 | d470 |
| PS400R-510-LUUPN8X-H1141 | 0...400 bar rel. | 900 bar | w097 | d470 |
| PS600R-510-LUUPN8X-H1141 | 0...600 bar rel. | 900 bar | w097 | d470 |

R1/4" – Female – 2 switching outputs



General data

| | | | |
|----------------------------------|---|---|---|
| Operating voltage | 15...30 VDC | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Protection type and class | IP67 / III | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Medium temperature | -40...85 °C |
| Output 2 (PIN 2) | switching output | Ambient temperature | -40...80 °C |
| Output function |  , pnp/npn | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Switching point accuracy | 0.5% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Repeatability | 0.1% of full scale | Sealing material | FPM |
| Switching frequency | 180 Hz | Electrical connection | connector, M12 x 1 |
| Response time | 3 ms | Mechanical connection | R1/4" female thread per DIN 2999 |


Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|-------------------------|-------------------|-------------------------|------|------|
| PS001R-511-2UPN8X-H1141 | 0...1 bar rel. | 3 bar | w095 | d471 |
| PS001V-511-2UPN8X-H1141 | -1...1 bar rel. | 3 bar | w095 | d471 |
| PS01VR-511-2UPN8X-H1141 | -1...0 bar rel. | 3 bar | w095 | d471 |
| PS001A-511-2UPN8X-H1141 | 0...1 bar abs. | 3 bar | w095 | d471 |
| PS003V-511-2UPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w095 | d471 |
| PS003A-511-2UPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w095 | d471 |
| PS010V-511-2UPN8X-H1141 | -1...10 bar rel. | 25 bar | w095 | d471 |
| PS010A-511-2UPN8X-H1141 | 0...10 bar abs. | 25 bar | w095 | d471 |
| PS016V-511-2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w095 | d471 |
| PS016A-511-2UPN8X-H1141 | 0...16 bar abs. | 40 bar | w095 | d471 |
| PS025V-511-2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w095 | d471 |
| PS025A-511-2UPN8X-H1141 | 0...25 bar abs. | 65 bar | w095 | d471 |
| PS040V-511-2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w095 | d471 |
| PS100R-511-2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w095 | d471 |
| PS250R-511-2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w095 | d471 |
| PS400R-511-2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w095 | d471 |
| PS600R-511-2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w095 | d471 |

R1/4" – Female – 1 switching and 1 current output



General data

| | | | |
|--------------------------------------|---|--|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP67 / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{ks} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analog or switching output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Operating range | 4...20/0...20/20...4/ 20...0 mA | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | R1/4" female thread per DIN 2999 |

Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|---------------------------|-------------------|-------------------------|------|------|
| PS001A-511-LI2UPN8X-H1141 | 0...1 bar abs. | 3 bar | w096 | d471 |
| PS001V-511-LI2UPN8X-H1141 | -1...1 bar rel. | 3 bar | w096 | d471 |
| PS001R-511-LI2UPN8X-H1141 | 0...1 bar rel. | 3 bar | w096 | d471 |
| PS01VR-511-LI2UPN8X-H1141 | -1...0 bar rel. | 3 bar | w096 | d471 |
| PS003A-511-LI2UPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w096 | d471 |
| PS003V-511-LI2UPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w096 | d471 |
| PS010A-511-LI2UPN8X-H1141 | 0...10 bar abs. | 25 bar | w096 | d471 |
| PS010V-511-LI2UPN8X-H1141 | -1...10 bar rel. | 25 bar | w096 | d471 |
| PS016A-511-LI2UPN8X-H1141 | 0...16 bar abs. | 40 bar | w096 | d471 |
| PS016V-511-LI2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w096 | d471 |
| PS025A-511-LI2UPN8X-H1141 | 0...25 bar abs. | 65 bar | w096 | d471 |
| PS025V-511-LI2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w096 | d471 |
| PS040V-511-LI2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w096 | d471 |
| PS100R-511-LI2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w096 | d471 |
| PS250R-511-LI2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w096 | d471 |
| PS600R-511-LI2UPN8X-H1141 | 0...600 bar rel. | 900 bar | w096 | d471 |
| PS400R-511-LI2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w096 | d471 |

w Wiring diagrams on page 832 ff


d Dimension drawing on page 842 ff

a Accessories on page 772 ff

R1/4" – Female – 1 switching and 1 voltage output



General data

| | | | |
|--------------------------------------|---|---|---|
| Operating voltage | 18...30 VDC | Response time | 3 ms |
| Protection type and class | IP67 / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analogue output | Medium temperature | -40...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1% of full scale | material pressure element | ceramics Al ₂ O ₃ |
| Switching frequency | 180 Hz | Sealing material | FPM |
| Voltage output, programmable | 0...10V/0...5V/ 1...6V/10...0V/ 5...0V/6...1V | Electrical connection | connector, M12 x 1 |
| Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL | Mechanical connection | R1/4" female thread per DIN 2999 |

Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|--------------------------|-------------------|-------------------------|------|------|
| PS01VR-511-LUUPN8X-H1141 | -1...0 bar rel. | 3 bar | w097 | d471 |
| PS001R-511-LUUPN8X-H1141 | 0...1 bar rel. | 3 bar | w097 | d471 |
| PS001V-511-LUUPN8X-H1141 | -1...1 bar rel. | 3 bar | w097 | d471 |
| PS001A-511-LUUPN8X-H1141 | 0...1 bar abs. | 3 bar | w097 | d471 |
| PS003V-511-LUUPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w097 | d471 |
| PS003A-511-LUUPN8X-H1141 | 0...2.5 bar abs. | 7 bar | w097 | d471 |
| PS010V-511-LUUPN8X-H1141 | -1...10 bar rel. | 25 bar | w097 | d471 |
| PS010A-511-LUUPN8X-H1141 | 0...10 bar abs. | 25 bar | w097 | d471 |
| PS016V-511-LUUPN8X-H1141 | -1...16 bar rel. | 40 bar | w097 | d471 |
| PS016A-511-LUUPN8X-H1141 | 0...16 bar abs. | 40 bar | w097 | d471 |
| PS025V-511-LUUPN8X-H1141 | -1...25 bar rel. | 65 bar | w097 | d471 |
| PS025A-511-LUUPN8X-H1141 | 0...25 bar abs. | 65 bar | w097 | d471 |
| PS040V-511-LUUPN8X-H1141 | -1...40 bar rel. | 100 bar | w097 | d471 |
| PS100R-511-LUUPN8X-H1141 | 0...100 bar rel. | 250 bar | w097 | d471 |
| PS250R-511-LUUPN8X-H1141 | 0...250 bar rel. | 625 bar | w097 | d471 |
| PS400R-511-LUUPN8X-H1141 | 0...400 bar rel. | 900 bar | w097 | d471 |
| PS600R-511-LUUPN8X-H1141 | 0...600 bar rel. | 900 bar | w097 | d471 |

PS600 series – For viscous media or contamination

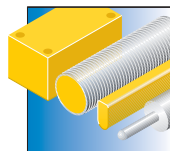


The PS600 series operates with a front-flush mounted diaphragm seal. Pressure applied on the stainless steel diaphragm is transmitted via the filling medium to the ceramic substrate of the measuring cell. Depending on the sensor type, the processed signal is either provided at a switching or an analog output. IO-Link is standard. Highest flexibility achieved with a front-flush or dead space free diaphragm and an accuracy of 0.5% f.s. guarantees safe integration in the process.

Features

- IO-Link capable
- Front-flush and dead space free process connections
- 4-digit 7-segment display
- Measuring range -1...400 bar relative pressure
- Measuring range 0...25 bar absolute pressure
- Stainless steel housing
- Permanent display of pressure (bar, psi, kPa, MPa, misc)

Properties



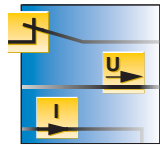
Design

Cylindrical design, non-rotatable, with display



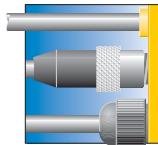
Measuring ranges

-1... 600 bar relative pressure



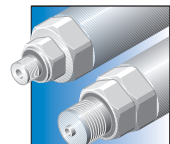
Electrical versions

IO-Link capable, dual-channel, switching, current or voltage output



Electrical connections

4-pole M12 x 1 plug connection



Mechanical connections

G1/2" and G3/4" front-flush process connections




Special features

Failsafe 3-key operation, VDMA menu guide (optional), IP67, fully encapsulated electronics



G3/4" – Front-flush diaphragm – 2 switching outputs



General data

| | | | |
|----------------------------------|---|---|---|
| Operating voltage | 15...30 VDC | Response time | 3 ms |
| Protection type and class | IP67 / III | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient span T_{ks} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | switching output | Medium temperature | -10...85 °C |
| Output function |  , pnp/npn | Ambient temperature | -40...80 °C |
| Switching point accuracy | 0.5 % of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Repeatability | 0.1 % of full scale | Electrical connection | connector, M12 x 1 |
| Switching frequency | 180 Hz | Mechanical connection | G 3/4" front flush |


Types and data – selection table

| Type | Measuring range | Admissible overpressure |  |  |
|-------------------------|-------------------|-------------------------|---|---|
| PS01VR-606-2UPN8X-H1141 | -1...0 bar rel. | 3 bar | w095 | d472 |
| PS001R-606-2UPN8X-H1141 | 0...1 bar rel. | 3 bar | w095 | d472 |
| PS001V-606-2UPN8X-H1141 | -1...1 bar rel. | 3 bar | w095 | d472 |
| PS003V-606-2UPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w095 | d472 |
| PS010V-606-2UPN8X-H1141 | -1...10 bar rel. | 25 bar | w095 | d472 |
| PS016V-606-2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w095 | d472 |
| PS025V-606-2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w095 | d472 |
| PS040V-606-2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w095 | d472 |
| PS100R-606-2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w095 | d472 |
| PS250R-606-2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w095 | d472 |
| PS400R-606-2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w095 | d472 |

G3/4" – Front-flush diaphragm – 1 switching and 1 current output



General data

| | | | |
|----------------------------------|---|---|---|
| Operating voltage | 18...30 VDC | Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL |
| Protection type and class | IP67 / III | Response time | 3 ms |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analog or switching output | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output function |  , pnp/npn | Medium temperature | -10...85 °C |
| Switching point accuracy | 0.5% of full scale | Ambient temperature | -40...80 °C |
| Repeatability | 0.1% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Switching frequency | 180 Hz | Electrical connection | connector, M12 x 1 |
| Operating range | 4...20/0...20/20...4/ 20...0 mA | Mechanical connection | G 3/4" front flush |



Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|---------------------------|-------------------|-------------------------|------|------|
| PS01VR-606-LI2UPN8X-H1141 | -1...0 bar rel. | 3 bar | w096 | d472 |
| PS001R-606-LI2UPN8X-H1141 | 0...1 bar rel. | 3 bar | w096 | d472 |
| PS001V-606-LI2UPN8X-H1141 | -1...1 bar rel. | 3 bar | w096 | d472 |
| PS003V-606-LI2UPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w096 | d472 |
| PS010V-606-LI2UPN8X-H1141 | -1...10 bar rel. | 25 bar | w096 | d472 |
| PS016V-606-LI2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w096 | d472 |
| PS025V-606-LI2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w096 | d472 |
| PS040V-606-LI2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w096 | d472 |
| PS100R-606-LI2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w096 | d472 |
| PS250R-606-LI2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w096 | d472 |
| PS400R-606-LI2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w096 | d472 |

G3/4" – Front-flush diaphragm – 1 switching and 1 voltage output



General data

| | | | |
|-------------------------------------|---|---|---|
| Operating voltage | 18...30 VDC | Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL |
| Protection type and class | IP67 / III | Response time | 3 ms |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analogue output | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output function |  /  , pnp/npn | Medium temperature | -10...85 °C |
| Switching point accuracy | 0.5% of full scale | Ambient temperature | -40...80 °C |
| Repeatability | 0.1% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Switching frequency | 180 Hz | Electrical connection | connector, M12 x 1 |
| Voltage output, programmable | 0...10V/0...5V/ 1...6V/10...0V/ 5...0V/6...1V | Mechanical connection | G 3/4" front flush |

Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|--------------------------|-------------------|-------------------------|------|------|
| PS001R-606-LUUPN8X-H1141 | 0...1 bar rel. | 3 bar | w097 | d472 |
| PS01VR-606-LUUPN8X-H1141 | -1...0 bar rel. | 3 bar | w097 | d472 |
| PS001V-606-LUUPN8X-H1141 | -1...1 bar rel. | 3 bar | w097 | d472 |
| PS003V-606-LUUPN8X-H1141 | -1...2.5 bar rel. | 7 bar | w097 | d472 |
| PS010V-606-LUUPN8X-H1141 | -1...10 bar rel. | 25 bar | w097 | d472 |
| PS016V-606-LUUPN8X-H1141 | -1...16 bar rel. | 40 bar | w097 | d472 |
| PS025V-606-LUUPN8X-H1141 | -1...25 bar rel. | 65 bar | w097 | d472 |
| PS040V-606-LUUPN8X-H1141 | -1...40 bar rel. | 100 bar | w097 | d472 |
| PS100R-606-LUUPN8X-H1141 | 0...100 bar rel. | 250 bar | w097 | d472 |
| PS250R-606-LUUPN8X-H1141 | 0...250 bar rel. | 625 bar | w097 | d472 |
| PS400R-606-LUUPN8X-H1141 | 0...400 bar rel. | 900 bar | w097 | d472 |

G1/2" – Front-flush diaphragm – 2 switching outputs



General data

Operating voltage 15...30 VDC

Protection type and class IP67 / III

Output 1 (PIN 4) switching output or IO-Link mode

Output 2 (PIN 2) switching output

Output function , pnp/npn

Switching point accuracy 0.5 % of full scale

Repeatability 0.1 % of full scale

Switching frequency 180 Hz

Response time 3 ms

Temperature coefficient zero point T_{k0} 0.15% of full scale / 10 K

Temperature coefficient span T_{kS} 0.15% of full scale / 10 K

Medium temperature -10...85 °C

Ambient temperature -40...80 °C

Housing material stainless-steel/
plastic, 1.4305 (AISI 303)/PC

Electrical connection connector, M12 x 1

Mechanical connection G 1/2" front flush


Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|-------------------------|------------------|-------------------------|------|------|
| PS010V-609-2UPN8X-H1141 | -1...10 bar rel. | 25 bar | w095 | d473 |
| PS016V-609-2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w095 | d473 |
| PS025V-609-2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w095 | d473 |
| PS040V-609-2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w095 | d473 |
| PS100R-609-2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w095 | d473 |
| PS250R-609-2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w095 | d473 |
| PS400R-609-2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w095 | d473 |



G1/2" – Front-flush diaphragm – 1 switching and 1 current output



General data

| | | | |
|----------------------------------|---|---|---|
| Operating voltage | 18...30 VDC | Accuracy (Lin. + Hys. + Rep.) | 0.5% of final value BSL |
| Protection type and class | IP67 / III | Response time | 3 ms |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analog or switching output | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output function |  , pnp/npn | Medium temperature | -10...85 °C |
| Switching point accuracy | 0.5% of full scale | Ambient temperature | -40...80 °C |
| Repeatability | 0.1% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Switching frequency | 180 Hz | Electrical connection | connector, M12 x 1 |
| Operating range | 4...20/0...20/20...4/ 20...0 mA | Mechanical connection | G 1/2" front flush |


Types and data – selection table

| Type | Measuring range | Admissible overpressure |  |  |
|---------------------------|------------------|-------------------------|---|---|
| PS010V-609-LI2UPN8X-H1141 | -1...10 bar rel. | 25 bar | w096 | d473 |
| PS016V-609-LI2UPN8X-H1141 | -1...16 bar rel. | 40 bar | w096 | d473 |
| PS025V-609-LI2UPN8X-H1141 | -1...25 bar rel. | 65 bar | w096 | d473 |
| PS040V-609-LI2UPN8X-H1141 | -1...40 bar rel. | 100 bar | w096 | d473 |
| PS100R-609-LI2UPN8X-H1141 | 0...100 bar rel. | 250 bar | w096 | d473 |
| PS250R-609-LI2UPN8X-H1141 | 0...250 bar rel. | 625 bar | w096 | d473 |
| PS400R-609-LI2UPN8X-H1141 | 0...400 bar rel. | 900 bar | w096 | d473 |

G1/2" – Front-flush diaphragm – 1 switching and 1 voltage output



General data

| | | | |
|-------------------------------------|---|---|---|
| Operating voltage | 18...30 VDC | Accuracy (Lin. + Hys. + Rep.) | 0.5% of full scale BSL |
| Protection type and class | IP67 / III | Response time | 3 ms |
| Output 1 (PIN 4) | switching output or IO-Link mode | Temperature coefficient zero point T_{k0} | 0.15% of full scale / 10 K |
| Output 2 (PIN 2) | analogue output | Temperature coefficient span T_{kS} | 0.15% of full scale / 10 K |
| Output function |  , pnp/npn | Medium temperature | -10...85 °C |
| Switching point accuracy | 0.5% of full scale | Ambient temperature | -40...80 °C |
| Repeatability | 0.1% of full scale | Housing material | stainless-steel/ plastic, 1.4305 (AISI 303)/PC |
| Switching frequency | 180 Hz | Electrical connection | connector, M12 x 1 |
| Voltage output, programmable | 0...10V/0...5V/ 1...6V/10...0V/ 5...0V/6...1V | Mechanical connection | G 1/2" front flush |

Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|--------------------------|------------------|-------------------------|------|------|
| PS010V-609-LUUPN8X-H1141 | -1...10 bar rel. | 25 bar | w097 | d473 |
| PS016V-609-LUUPN8X-H1141 | -1...16 bar rel. | 40 bar | w097 | d473 |
| PS025V-609-LUUPN8X-H1141 | -1...25 bar rel. | 65 bar | w097 | d473 |
| PS040V-609-LUUPN8X-H1141 | -1...40 bar rel. | 100 bar | w097 | d473 |
| PS100R-609-LUUPN8X-H1141 | 0...100 bar rel. | 250 bar | w097 | d473 |
| PS250R-609-LUUPN8X-H1141 | 0...250 bar rel. | 625 bar | w097 | d473 |
| PS400R-609-LUUPN8X-H1141 | 0...400 bar rel. | 900 bar | w097 | d473 |

At a glance

Pressure sensors - PK series



Multifaceted pneumatic specialists

The PK pressure sensors are especially designed for pneumatic applications and are ideally suited for pick-and-place systems, labelling machines and hoists. The N version is manometer-shaped, features a display and a process connection on the

back side. The P version has a rotatable, cylindrical body with display. The processed signal is provided at the switching output. These sensors are only made for non-aggressive gas and compressed air applications.



Compact design

The sensors are compact, rugged but at the same time lightweight and thus perfectly suited for handling and automation systems. They feature two switching outputs and are NO/NC programmable in hysteresis mode. The output configuration is easily reprogrammed for special requirements, such as monitoring of a pressure window, for example.

- For pressure and vacuum monitoring
- Compact sensors in cylindrical or manometer-like design
- 3-digit 7-segment display
- Display rotatable by 180°
- Excellent EMC properties
- One LED per output to indicate the switching status

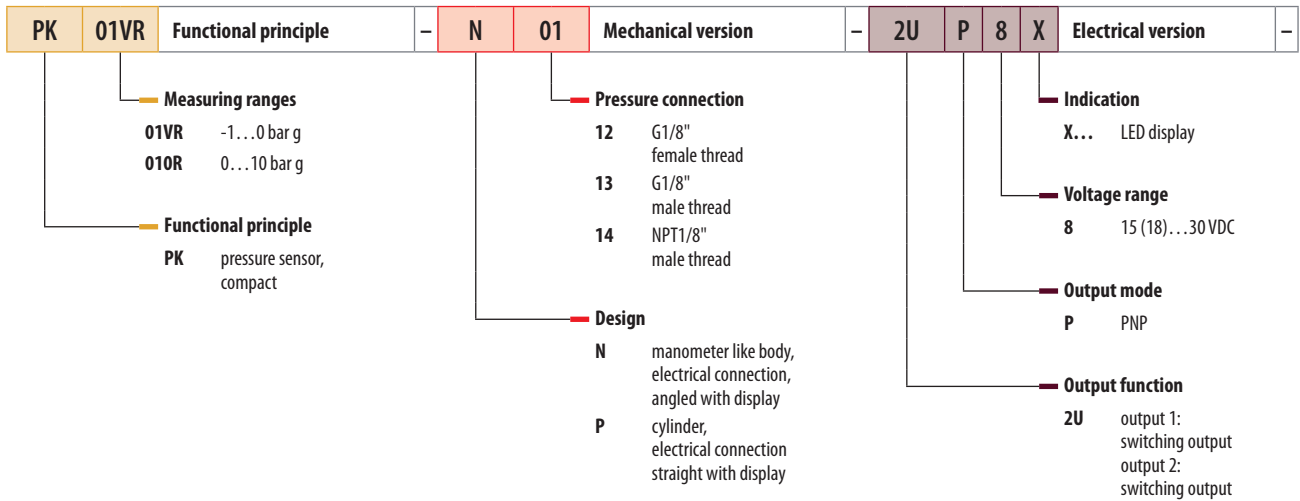


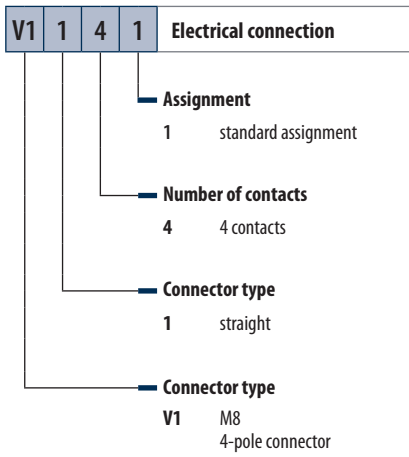
Easy programming

Thanks to the user friendly menu guide, parameters such as switch and release points, output type, analog range and

various special functions are easily taught. The buttons are finger-operated. Additional tools are not needed.

Type code





PK-N series – For pneumatic applications

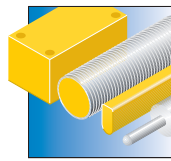


The PK-N pressure sensors operate with a piezo-resistive silicon cell. It is a silicon chip with direct medium contact. The N version is manometer-shaped, features a display and a process connection on the back side. The processed signal is provided at the switching output. These sensors are only made for non-aggressive gas and compressed air applications.

Features

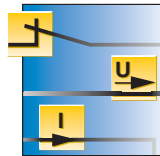
- Compact manometer-like design
- 3-digit 7-segment display
- For pressure and vacuum monitoring
- Display rotatable by 180°
- Excellent EMC properties

Properties



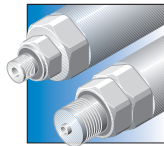
Design

Manometer-like design with display



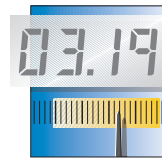
Electrical versions

Dual-channel with switching outputs



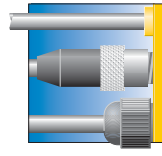
Mechanical connections

G1/4" female and 1/4"NPT male thread



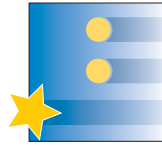
Measuring ranges

-1... 10 bar relative pressure



Electrical connections

4-pole M8 x 1 connector



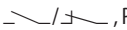
Special features

For pneumatic applications

N12 – G1/8 – Female



General data

| | |
|----------------------------------|---|
| Operating voltage | 10.8...30 VDC |
| Protection type and class | IP65 |
| Output 1 (PIN 4) | switching output |
| Output 2 (PIN 2) | switching output |
| Output function |  , PNP |
| Switching point accuracy | 1 % of full scale |

| | |
|------------------------------|---------------------|
| Repeatability | 0.2 % of full scale |
| Switching frequency | 400 Hz |
| Medium temperature | 0...50 °C |
| Ambient temperature | -20...85 °C |
| Electrical connection | connector, M8 x 1 |
| Mechanical connection | G1/8 female thread |

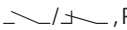
Types and data – selection table

| Type | Measuring range | Admissible overpressure | Housing material | w | d |
|--------------------------|-----------------|-------------------------|------------------|------|------|
| PK01VR-N12-2UP8X-V1141 | -1...0 bar rel. | 5 bar | plastic, ABS | w100 | d477 |
| PK010R-N12-2UP8X-V1141 | 0...10 bar rel. | 16 bar | plastic, ABS | w100 | d477 |
| PK01VR-N12AL-2UP8X-V1141 | -1...0 bar rel. | 5 bar | aluminium, ABS | w100 | d477 |
| PK010R-N12AL-2UP8X-V1141 | 0...10 bar rel. | 16 bar | aluminium, ABS | w100 | d477 |

N14 – 1/8" NPT – Male



General data

| | |
|----------------------------------|---|
| Operating voltage | 10.8...30 VDC |
| Protection type and class | IP65 |
| Output 1 (PIN 4) | switching output |
| Output 2 (PIN 2) | switching output |
| Output function |  , PNP |
| Switching point accuracy | 1 % of full scale |
| Repeatability | 0.2 % of full scale |

| | |
|------------------------------|----------------------|
| Switching frequency | 400 Hz |
| Medium temperature | 0...50 °C |
| Ambient temperature | -20...85 °C |
| Housing material | plastic, ABS |
| Electrical connection | connector, M8 x 1 |
| Mechanical connection | NPT1/8" males thread |

Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|------------------------|-----------------|-------------------------|------|------|
| PK01VR-N14-2UP8X-V1141 | -1...0 bar rel. | 5 bar | w100 | d477 |
| PK010R-N14-2UP8X-V1141 | 0...10 bar rel. | 16 bar | w100 | d477 |

PK-P series – For pneumatic applications

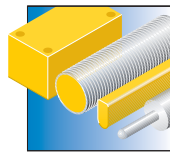


The PK-P pressure sensors operate with a piezo-resistive silicon cell. It is a silicon chip with direct medium contact. The P version has a rotatable, cylindrical body with display. These sensors are only made for non-aggressive gas and compressed air applications. The processed signal is provided at the switching output.

Features

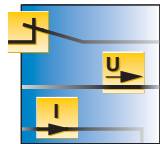
- Compact cylindrical design
- Rotatable sensor body
- 3-digit 7-segment display
- For pressure and vacuum monitoring
- Display rotatable by 180°
- Excellent EMC properties

Properties



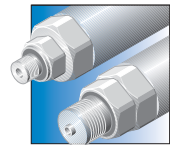
Design

Cylindrical version with laterally mounted display



Electrical versions

Dual-channel with switching outputs



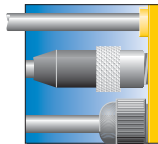
Mechanical connections

G1/4" or 1/4" NPT male thread



Measuring ranges

-1...10 bar relative pressure



Electrical connections

4-pole M8 x 1 connector




Special features

For pneumatic applications

P13 – G1/8" – Male



General data

| | | | |
|----------------------------------|---|------------------------------|-------------------|
| Operating voltage | 10.8...30 VDC | Switching frequency | 400 Hz |
| Protection type and class | IP65 | Medium temperature | 0...50 °C |
| Output 1 (PIN 4) | switching output | Ambient temperature | -20...85 °C |
| Output 2 (PIN 2) | switching output | Housing material | plastic, ABS |
| Output function |  , PNP | Electrical connection | connector, M8 x 1 |
| Switching point accuracy | 1 % of full scale | Mechanical connection | G1/8" male thread |
| Repeatability | 0.2 % of full scale | | |


Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|------------------------|-----------------|-------------------------|------|------|
| PK01VR-P13-2UP8X-V1141 | -1...0 bar rel. | 5 bar | w100 | d478 |
| PK010R-P13-2UP8X-V1141 | 0...10 bar rel. | 16 bar | w100 | d478 |

P14 – 1/8" NPT – Male



General data

| | | | |
|----------------------------------|---|------------------------------|----------------------|
| Operating voltage | 10.8...30 VDC | Switching frequency | 400 Hz |
| Protection type and class | IP65 | Medium temperature | 0...50 °C |
| Output 1 (PIN 4) | switching output | Ambient temperature | -20...85 °C |
| Output 2 (PIN 2) | switching output | Housing material | plastic, ABS |
| Output function |  , PNP | Electrical connection | connector, M8 x 1 |
| Switching point accuracy | 1 % of full scale | Mechanical connection | NPT1/8" males thread |
| Repeatability | 0.2 % of full scale | | |

Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|------------------------|-----------------|-------------------------|------|------|
| PK01VR-P14-2UP8X-V1141 | -1...0 bar rel. | 5 bar | w100 | d478 |
| PK010R-P14-2UP8X-V1141 | 0...10 bar rel. | 16 bar | w100 | d478 |

At a glance

Pressure sensors - PT series



Compact pressure transmitters – Solutions

The pressure transmitters develop their full potential in applications requiring high operational safety and accuracy. Based on proven ceramic technology, these shock and vibration proof devices work reliably even in harsh environments. Thanks to the compact design, the sen-

sors can be applied in almost all areas of industrial automation. The patented medium-stop system prevents the discharge of liquids when burst pressure exceeds 40 bar. In normal operating mode it works as a peak pressure aperture.



Made-to-measure solutions

The PT devices with diaphragm are a cost-efficient solution and a proven success regarding the control of filling levels at vessels. Other typical applications for pressure transmitters are machine tools, pneumatic systems and hydraulic power

units. The PT series proves its applicability in refrigeration technology and many other industrial fields with features such as operational safety, accuracy and temperature stability.



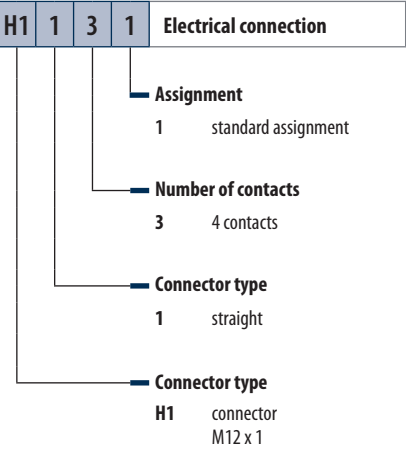
Working reliably even under extreme conditions

Equipped with a ceramic measuring cell, a stainless steel body and a FPM O-ring, the PT pressure transmitters resist temperatures of up to 125 °C without any problems. The devices fulfill industrial standards and guarantee a long-term stable performance.

- Compact and rugged design
- Accuracy 0.6 % f.s.
- Stainless steel housing and pressure connection
- 1.4305 (AISI 303)
- Medium-stop system
- Protection class IP67
- Excellent EMC properties
- -1...+600 bar relative pressure
- 0...25 bar absolute pressure

Type code

| PT | 010V | Functional principle | - | 1 | 1 | Mechanical version | - | LI | Electrical version | - |
|----|------|--|---|---|---|--|---|----|--|---|
| | | Measuring ranges 01VR -1...0 bar g 001R 0...1 bar g 002R 0...1.6 bar g 003R 0...2.5 bar g 004R 0...4 bar g 006R 0...6 bar g 010R 0...10 bar g 016R 0...16 bar g 025R 0...25 bar g 040R 0...40 bar g 100R 0...100 bar g 160R 0...160 bar g 250R 0...250 bar g 400R 0...400 bar g 600R 0...600 bar g 001A 0...1 bar a 002A 0...1.6 bar a 003A 0...2.5 bar a 004A 0...4 bar a 006A 0...6 bar a 010A 0...10 bar a 016A 0...16 bar a 025A 0...25 bar a Functional principle PT pressure transmitter | | | | Pressure connection 1 G1/4" female thread 2 1/4"-18 NPT female thread 3 1/4"-18 NPT male thread 4 G1/4" male thread Design 1 cylinder without display | | | Electrical version LI3 4...20 mA (only PT series), 2-wire LU2 0...10 V (only PT series), 3-wire | |



PT-1 series – For temperatures up to +125 °C

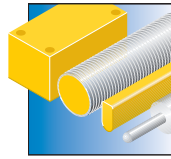


The PT1 pressure transmitters operate with ceramic measuring cells. They are cylindrically shaped, made of stainless and have no display. Depending on the type, the processed signal is output as 4...20 mA (2-wire) or 0...10 V (3-wire).

Features

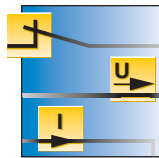
- Compact and rugged design
- Measuring range -1...600 bar relative pressure
- Temperature range - 40...+125°C
- 4...20 mA (2-wire) or 0...10 V (3-wire)
- Excellent EMC properties

Properties



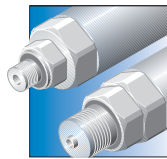
Design

Cylindrical design, non-rotatable, without display



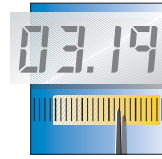
Electrical versions

Current output
4...20 mA



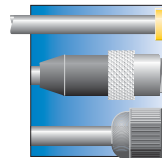
Mechanical connections

Female and male thread G1/4" and 1/4" NPT



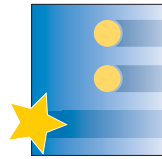
Measuring ranges

-1...600 bar relative pressure



Electrical connections

M12 x 1 plug connection, 3-pole



Special features

Media temperature
-40...+125 °C, IP67

G1/4" – Female – Current output (2-wire)



General data

| | | | |
|---|----------------------------|---|---|
| Operating voltage | 8...33 VDC | Temperature coefficient span T_{KS} | 0.15% of full scale / 10 K |
| Protection type and class | IP67 / III | Medium temperature | -40...125 °C |
| Operating range | 4...20 mA (2-wire) | Ambient temperature | -40...85 °C |
| Accuracy (Lin. + Hys. + Rep.) | 0.3% of final value BSL | Housing material | stainless-steel/plastic, 1.4305 (AISI 303)/PC |
| Calibration accuracy 0-point | 0.3% of final value | material pressure element | ceramics Al ₂ O ₃ |
| Calibration accuracy, of final value | 0.3% of final value | Sealing material | FPM |
| Response time | 3 ms | Electrical connection | connector, M12 x 1 |
| Temperature coefficient zero point T_{K0} | 0.15% of full scale / 10 K | Mechanical connection | G 1/4" female thread |

Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|---------------------|------------------|-------------------------|------|------|
| PT001R-11-LI3-H1131 | 0...1 bar rel. | 3 bar | w098 | d474 |
| PT002R-11-LI3-H1131 | 0...1.6 bar rel. | 5 bar | w098 | d474 |
| PT003R-11-LI3-H1131 | 0...2.5 bar rel. | 7 bar | w098 | d474 |
| PT004R-11-LI3-H1131 | 0...4 bar rel. | 12 bar | w098 | d474 |
| PT006R-11-LI3-H1131 | 0...6 bar rel. | 15 bar | w098 | d474 |
| PT010R-11-LI3-H1131 | 0...10 bar rel. | 25 bar | w098 | d474 |
| PT016R-11-LI3-H1131 | 0...16 bar rel. | 40 bar | w098 | d474 |
| PT025R-11-LI3-H1131 | 0...25 bar rel. | 65 bar | w098 | d474 |
| PT040R-11-LI3-H1131 | 0...40 bar rel. | 100 bar | w098 | d474 |
| PT060R-11-LI3-H1131 | 0...60 bar rel. | 150 bar | w098 | d474 |
| PT100R-11-LI3-H1131 | 0...100 bar rel. | 250 bar | w098 | d474 |
| PT160R-11-LI3-H1131 | 0...160 bar rel. | 400 bar | w098 | d474 |
| PT250R-11-LI3-H1131 | 0...250 bar rel. | 625 bar | w098 | d474 |
| PT400R-11-LI3-H1131 | 0...400 bar rel. | 900 bar | w098 | d474 |
| PT600R-11-LI3-H1131 | 0...600 bar rel. | 900 bar | w098 | d474 |

G1/4" – Female – Voltage output (3-wire)



General data

| | | | |
|---|----------------------------|---|---|
| Operating voltage | 11.4...33 VDC | Temperature coefficient span T_{KS} | 0.15% of full scale / 10 K |
| Protection type and class | IP67 / III | Medium temperature | -40...125 °C |
| Operating range | 0...10 V (3-wire) | Ambient temperature | -40...85 °C |
| Accuracy (Lin. + Hys. + Rep.) | 0.3% of final value BSL | Housing material | stainless-steel/plastic, 1.4305 (AISI 303)/PC |
| Calibration accuracy 0-point | 0.3% of final value | material pressure element | ceramics Al_2O_3 |
| Calibration accuracy, of final value | 0.3% of final value | Sealing material | FPM |
| Response time | 3 ms | Electrical connection | connector, M12 x 1 |
| Temperature coefficient zero point T_{K0} | 0.15% of full scale / 10 K | Mechanical connection | G 1/4" female thread |

Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|---------------------|------------------|-------------------------|------|------|
| PT001R-11-LU2-H1131 | 0...1 bar rel. | 3 bar | w099 | d474 |
| PT01VR-11-LU2-H1131 | -1...0 bar rel. | 3 bar | w099 | d474 |
| PT002R-11-LU2-H1131 | 0...1.6 bar rel. | 5 bar | w099 | d474 |
| PT003R-11-LU2-H1131 | 0...2.5 bar rel. | 7 bar | w099 | d474 |
| PT004R-11-LU2-H1131 | 0...4 bar rel. | 12 bar | w099 | d474 |
| PT006R-11-LU2-H1131 | 0...6 bar rel. | 15 bar | w099 | d474 |
| PT010R-11-LU2-H1131 | 0...10 bar rel. | 25 bar | w099 | d474 |
| PT016R-11-LU2-H1131 | 0...16 bar rel. | 40 bar | w099 | d474 |
| PT025R-11-LU2-H1131 | 0...25 bar rel. | 65 bar | w099 | d474 |
| PT040R-11-LU2-H1131 | 0...40 bar rel. | 100 bar | w099 | d474 |
| PT060R-11-LU2-H1131 | 0...60 bar rel. | 150 bar | w099 | d474 |
| PT100R-11-LU2-H1131 | 0...100 bar rel. | 250 bar | w099 | d474 |
| PT160R-11-LU2-H1131 | 0...160 bar rel. | 400 bar | w099 | d474 |
| PT250R-11-LU2-H1131 | 0...250 bar rel. | 625 bar | w099 | d474 |
| PT400R-11-LU2-H1131 | 0...400 bar rel. | 900 bar | w099 | d474 |
| PT600R-11-LU2-H1131 | 0...600 bar rel. | 900 bar | w099 | d474 |

1/4" NPT – Male – Current output (2-wire)



General data

| | | | |
|---|----------------------------|---|---|
| Operating voltage | 8...33 VDC | Temperature coefficient span T_{KS} | 0.15% of full scale / 10 K |
| Protection type and class | IP67 / III | Medium temperature | -40...125 °C |
| Operating range | 4...20 mA (2-wire) | Ambient temperature | -40...85 °C |
| Accuracy (Lin. + Hys. + Rep.) | 0.3% of final value BSL | Housing material | stainless-steel/plastic, 1.4305 (AISI 303)/PC |
| Calibration accuracy 0-point | 0.3% of final value | material pressure element | ceramics Al_2O_3 |
| Calibration accuracy, of final value | 0.3% of final value | Sealing material | FPM |
| Response time | 3 ms | Electrical connection | connector, M12 x 1 |
| Temperature coefficient zero point T_{K0} | 0.15% of full scale / 10 K | Mechanical connection | NPT 1/4" - 18 male thread |

Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|---------------------|------------------|-------------------------|------|------|
| PT004R-13-LI3-H1131 | 0...4 bar rel. | 12 bar | w098 | d475 |
| PT010R-13-LI3-H1131 | 0...10 bar rel. | 25 bar | w098 | d475 |
| PT016R-13-LI3-H1131 | 0...16 bar rel. | 40 bar | w098 | d475 |
| PT025R-13-LI3-H1131 | 0...25 bar rel. | 65 bar | w098 | d475 |
| PT040R-13-LI3-H1131 | 0...40 bar rel. | 100 bar | w098 | d475 |
| PT060R-13-LI3-H1131 | 0...60 bar rel. | 150 bar | w098 | d475 |
| PT100R-13-LI3-H1131 | 0...100 bar rel. | 250 bar | w098 | d475 |
| PT160R-13-LI3-H1131 | 0...160 bar rel. | 400 bar | w098 | d475 |
| PT250R-13-LI3-H1141 | 0...250 bar rel. | 625 bar | w098 | d475 |
| PT400R-13-LI3-H1141 | 0...400 bar rel. | 900 bar | w098 | d475 |
| PT600R-13-LI3-H1141 | 0...600 bar rel. | 900 bar | w098 | d475 |

1/4" NPT – Male – Voltage output (3-wire)



General data

| | | | |
|---|----------------------------|---|---|
| Operating voltage | 11.4...33 VDC | Temperature coefficient span T_{KS} | 0.15% of full scale / 10 K |
| Protection type and class | IP67 / III | Medium temperature | -40...125 °C |
| Operating range | 0...10 V (3-wire) | Ambient temperature | -40...85 °C |
| Accuracy (Lin. + Hys. + Rep.) | 0.3% of final value BSL | Housing material | stainless-steel/plastic, 1.4305 (AISI 303)/PC |
| Calibration accuracy 0-point | 0.3% of final value | material pressure element | ceramics Al_2O_3 |
| Calibration accuracy, of final value | 0.3% of final value | Sealing material | FPM |
| Response time | 3 ms | Electrical connection | connector, M12 x 1 |
| Temperature coefficient zero point T_{K0} | 0.15% of full scale / 10 K | Mechanical connection | NPT 1/4" - 18 male thread |

Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|---------------------|------------------|-------------------------|------|------|
| PT001R-13-LU2-H1141 | 0...1 bar rel. | 3 bar | w099 | d475 |
| PT01VR-13-LU2-H1131 | -1...0 bar rel. | 3 bar | w099 | d475 |
| PT002R-13-LU2-H1131 | 0...1.6 bar rel. | 5 bar | w099 | d475 |
| PT003R-13-LU2-H1131 | 0...2.5 bar rel. | 7 bar | w099 | d475 |
| PT004R-13-LU2-H1131 | 0...4 bar rel. | 12 bar | w099 | d475 |
| PT006R-13-LU2-H1131 | 0...6 bar rel. | 15 bar | w099 | d475 |
| PT010R-13-LU2-H1131 | 0...10 bar rel. | 25 bar | w099 | d475 |
| PT060R-13-LU2-H1131 | 0...60 bar rel. | 150 bar | w099 | d475 |
| PT100R-13-LU2-H1131 | 0...100 bar rel. | 250 bar | w099 | d475 |
| PT160R-13-LU2-H1131 | 0...160 bar rel. | 400 bar | w099 | d475 |
| PT250R-13-LU2-H1131 | 0...250 bar rel. | 625 bar | w099 | d475 |
| PT600R-13-LU2-H1131 | 0...600 bar rel. | 900 bar | w099 | d475 |
| PT400R-13-LU2-H1131 | 0...400 bar rel. | 900 bar | w099 | d475 |

G1/4" – Male – Current output (2-wire)



General data

| | | | |
|---|----------------------------|---|---|
| Operating voltage | 8...33 VDC | Temperature coefficient span T_{KS} | 0.15% of full scale / 10 K |
| Protection type and class | IP67 / III | Medium temperature | -40...125 °C |
| Operating range | 4...20 mA (2-wire) | Ambient temperature | -40...85 °C |
| Accuracy (Lin. + Hys. + Rep.) | 0.3% of final value BSL | Housing material | stainless-steel/plastic, 1.4305 (AISI 303)/PC |
| Calibration accuracy 0-point | 0.3% of final value | material pressure element | ceramics Al ₂ O ₃ |
| Calibration accuracy, of final value | 0.3% of final value | Sealing material | FPM |
| Response time | 3 ms | Electrical connection | connector, M12 x 1 |
| Temperature coefficient zero point T_{K0} | 0.15% of full scale / 10 K | Mechanical connection | G 1/4" male thread |

Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|---------------------|------------------|-------------------------|------|------|
| PT01VR-14-LI3-H1131 | -1...0 bar rel. | 3 bar | w098 | d476 |
| PT001R-14-LI3-H1131 | 0...1 bar rel. | 3 bar | w098 | d476 |
| PT002R-14-LI3-H1131 | 0...1.6 bar rel. | 5 bar | w098 | d476 |
| PT003R-14-LI3-H1131 | 0...2.5 bar rel. | 7 bar | w098 | d476 |
| PT004R-14-LI3-H1131 | 0...4 bar rel. | 12 bar | w098 | d476 |
| PT006R-14-LI3-H1131 | 0...6 bar rel. | 15 bar | w098 | d476 |
| PT010R-14-LI3-H1131 | 0...10 bar rel. | 25 bar | w098 | d476 |
| PT016R-14-LI3-H1131 | 0...16 bar rel. | 40 bar | w098 | d476 |
| PT025R-14-LI3-H1131 | 0...25 bar rel. | 65 bar | w098 | d476 |
| PT040R-14-LI3-H1131 | 0...40 bar rel. | 100 bar | w098 | d476 |
| PT060R-14-LI3-H1131 | 0...60 bar rel. | 150 bar | w098 | d476 |
| PT100R-14-LI3-H1131 | 0...100 bar rel. | 250 bar | w098 | d476 |
| PT160R-14-LI3-H1131 | 0...160 bar rel. | 400 bar | w098 | d476 |
| PT250R-14-LI3-H1131 | 0...250 bar rel. | 625 bar | w098 | d476 |
| PT400R-14-LI3-H1131 | 0...400 bar rel. | 900 bar | w098 | d476 |
| PT600R-14-LI3-H1131 | 0...600 bar rel. | 900 bar | w098 | d476 |

G1/4" – Male – Voltage output (3-wire)



General data

| | | | |
|---|----------------------------|---|---|
| Operating voltage | 11.4...33 VDC | Temperature coefficient span T_{KS} | 0.15% of full scale / 10 K |
| Protection type and class | IP67 / III | Medium temperature | -40...125 °C |
| Operating range | 0...10 V (3-wire) | Ambient temperature | -40...85 °C |
| Accuracy (Lin. + Hys. + Rep.) | 0.3% of final value BSL | Housing material | stainless-steel/plastic, 1.4305 (AISI 303)/PC |
| Calibration accuracy 0-point | 0.3% of final value | material pressure element | ceramics Al_2O_3 |
| Calibration accuracy, of final value | 0.3% of final value | Sealing material | FPM |
| Response time | 3 ms | Electrical connection | connector, M12 x 1 |
| Temperature coefficient zero point T_{K0} | 0.15% of full scale / 10 K | Mechanical connection | G 1/4" male thread |

Types and data – selection table

| Type | Measuring range | Admissible overpressure | w | d |
|---------------------|------------------|-------------------------|------|------|
| PT01VR-14-LU2-H1131 | -1...0 bar rel. | 3 bar | w099 | d476 |
| PT001R-14-LU2-H1131 | 0...1 bar rel. | 3 bar | w099 | d476 |
| PT002R-14-LU2-H1131 | 0...1.6 bar rel. | 5 bar | w099 | d476 |
| PT003R-14-LU2-H1131 | 0...2.5 bar rel. | 7 bar | w099 | d476 |
| PT004R-14-LU2-H1131 | 0...4 bar rel. | 12 bar | w099 | d476 |
| PT006R-14-LU2-H1131 | 0...6 bar rel. | 15 bar | w099 | d476 |
| PT010R-14-LU2-H1131 | 0...10 bar rel. | 25 bar | w099 | d476 |
| PT016R-14-LU2-H1131 | 0...16 bar rel. | 40 bar | w099 | d476 |
| PT025R-14-LU2-H1131 | 0...25 bar rel. | 65 bar | w099 | d476 |
| PT040R-14-LU2-H1131 | 0...40 bar rel. | 100 bar | w099 | d476 |
| PT060R-14-LU2-H1131 | 0...60 bar rel. | 150 bar | w099 | d476 |
| PT100R-14-LU2-H1131 | 0...100 bar rel. | 250 bar | w099 | d476 |
| PT160R-14-LU2-H1131 | 0...160 bar rel. | 400 bar | w099 | d476 |
| PT250R-14-LU2-H1131 | 0...250 bar rel. | 625 bar | w099 | d476 |
| PT400R-14-LU2-H1131 | 0...400 bar rel. | 900 bar | w099 | d476 |
| PT600R-14-LU2-H1131 | 0...600 bar rel. | 900 bar | w099 | d476 |

w Wiring diagrams on page 832 ff

d Dimension drawings on page 842 ff

a Accessories on page 772 ff

At a glance

Temperature sensors



Temperature sensors – Highly optimized specialists for any requirements

Temperature is a critical factor in many industrial processes and has to be monitored constantly in order to operate machines and systems safely and efficiently. A reliable and practical solution for temperature measurement are electronic temperature sensors and transmitters. Reliability is not just provided through high accuracy and repeatability but also through many available interfaces to the process and the operator.

surface temperatures in a range between +70 °C and +1000 °C. The distance-spot ratio is thereby of importance, indicating the diameter (S) of the spot at a given distance (D).

The TURCK product portfolio guarantees maximum flexibility for temperature measurement through numerous connection possibilities and output signals.



Temperature measurement in industrial applications is mainly implemented with resistance thermometers or thermoelements. Resistance thermometers detect temperature through the temperature-sensitive resistors. While the resistance of PTCs increases with the rise of temperature, NTCs behave opposite.

The intelligent sensors of the **TS series** fulfill all application specific requirements to the optimum through easy programming, flexible process connection and well readable displays. The compact sensors of the **TT/TC series** are available with integrated probe but also with standard M12 plug connection for separate probes. The infrared sensors of the T-Gage series measure temperatures contactless between 0 and +300 °C at wavelengths between 8 and 14 µm. A further important device of the product portfolio is the IP67 rated Pt100 resistance thermometer for temperatures between -50 and +500 °C. The temperature probes of the **TP-series** are available in different lengths and diameters. When using a thermowell for protection, the sensor can be adapted to critical application conditions.



Thermoelements are applied to detect temperatures up to +1700 °C and higher. A thermoelement consists of two different interconnected metals or semiconductors. A temperature difference between the two metals causes electric potential of corresponding magnitude at the interconnection. In practice, the temperature of a cold spot is detected with a separate probe from which the temperature of the hot spot is then deduced.

Infrared sensors **M18T** (s. P. 568) are applied for non-contact measurement of

More information on the TS series on p. 542 ff., TT/TC series on p. 553 ff. and TP series on p. 561 ff.

Our strengths...



Made-to-measure solutions

Due to its high accuracy of 0.2 K, the temperature sensors of the TS series handle a large spectrum of applications with only a few devices. Temperature is detected with a Pt100 directly connected to the M12 plug connection or via a standard connection cable. A range between -50 °C and +500 °C is covered and the 4-digit 7-segment LED display makes

programming easier. The devices are available with two transistor switching outputs or with one switching and one analog output. High EMC immunity and protection classes IP67/IP69K guarantee reliable operation, even under harsh conditions. All TS sensors are equipped with an IO-Link interface.



Flexible mounting

Inclined by 45° the display is well readable from any position and even from a great distance. Horizontal mounting is also possible. The read direction is reversible by 180° degrees via software.

After locking the pressure connection, the TS500 can be rotated by 320° degrees

and moved in any desired position. Once the final position is attained, the device is fixed in place with a second coupling nut. Special mounting aids are not required. With a diameter of only 34 mm, several sensors can be mounted side by side in confined spaces.

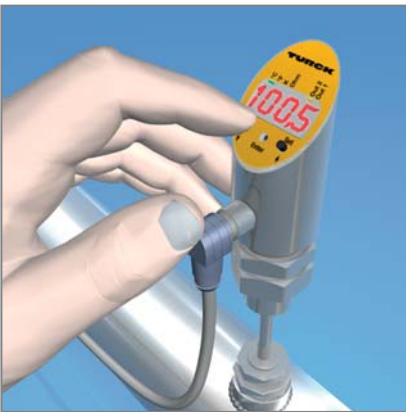


Clearly visible display

The bright 4-digit 7-segment display indicates the temperature during normal operation and is easy to program. The sloped display allows the sensors to be mounted on top or in front according to the position of the process connection.

The read direction is reversible by 180° degrees via software. Values are thus perfectly readable, even if the sensor is mounted horizontally.

maths



Easy programming

Thanks to the user friendly menu guide the switch and release point, the output function, the analog range and various special functions are easily taught via pushbuttons.

The TS series is programmed with the buttons MODE and SET. Tools are not needed

to view the parameter values. To avoid accidental changes of programmed data, the ENTER button for storing the values is recessed. The button can only be pressed with a pointed object, such as a ball pen for example.



Rugged design

The sensor body, temperature and electrical connection are made of stainless steel. All sensors feature excellent EMC properties and are IP67 protected. Absolute operational safety is thus guaranteed even in rough production environ-

ments. The mineral-insulated probes are enormously flexible and temperature-resistant. Rugged TURCK connection cables provide the necessary security for connection.

Temperature sensors

Your advantages...

Your advantages...



High system availability

The TS series excels in excellent EMC properties and is IP67 protected. Sensor body, temperature and electrical connection of the programmable devices are made of stainless steel and guarantee tremendous operational safety.

- Excellent EMC properties

- Protection against mechanical impacts thanks to the rugged design
- Minimum maintenance effort through optimized temperature coupling
- Short down-times through high system availability and short replacement times



Extremely service-friendly

Flexible mounting options, user-friendliness and accuracy provide calculable advantages, such as:

- Minimum maintenance effort through optimized performance of the sensors and a streamlined product portfolio.
- Easy configuration and operation via pushbuttons

- Failsafe operation through a recessed button for storage of values
- Large and good readable display
- The upper part of the TS500 sensor is rotatable by 320°
- IO-Link communication
- VDMA menu guide (optional)



Efficient standardization

A single sensor replaces many conventional types. The intelligent temperature sensors fulfill many different control tasks and reduce the number of required sensors considerably.

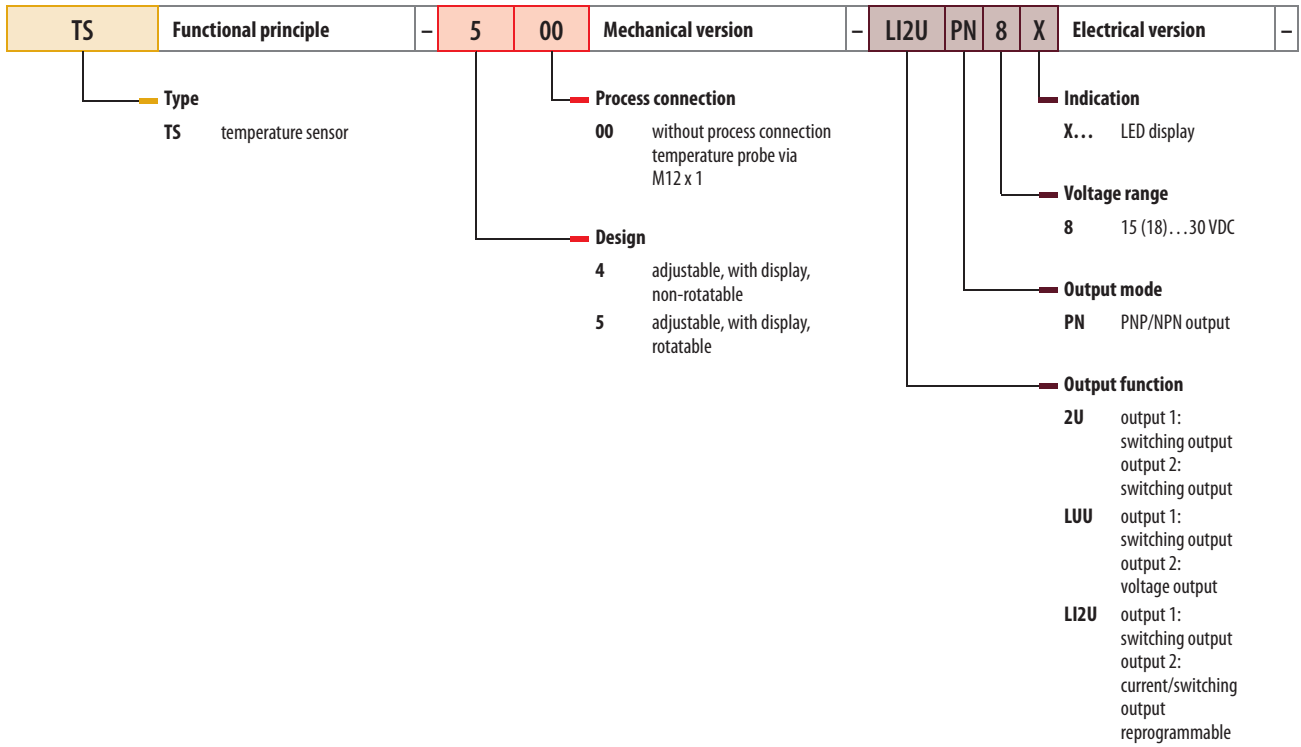
A reduced inventory pays off for you:

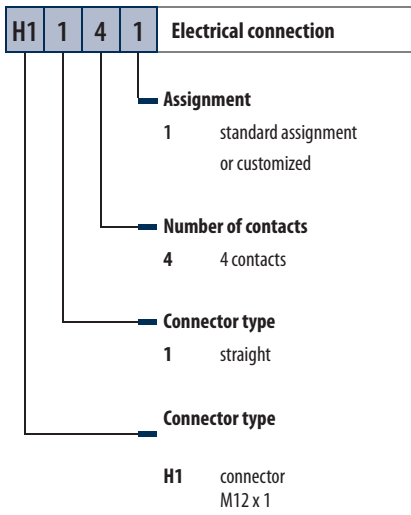
- Only a few sensors are needed to cover a large range of applications

- Reduced training effort due to simple and failsafe operation
- High system safety achieved through a rugged design
- 4-pole standard M12 plug connection at the probe and processing unit



Type code





TS400 series – Pt 100 probe (4-wire)

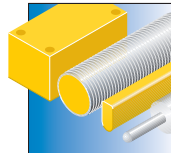


The TS400 processing units are incorporated in a non-rotatable, rugged stainless steel housing. Furthermore, they feature a standard M12 x 1 plug connection for TP probes. The bright 4-digit 7-segment display indicates the temperature during normal operation and guides the operator through the programming menu. Depending on the sensor type, they are available with switching outputs or a combination of switching and analog outputs. IO-Link communication is integrated as a standard.

Features

- M12 x 1 plug connection for TP probes.
- Housing, temperature and electrical connection are made of stainless steel
- Highest flexibility through modular system
- Programming protection through recessed pushbutton and keylock
- Permanent display of temperature (°C, °F, K, Ω)
- Storage of max/min values

Properties



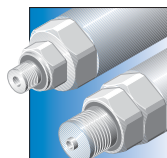
Design

Cylindrical, non-rotatable, with display



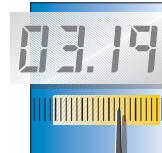
Electrical versions

IO-Link capable, dual-channel, switching, current or voltage output



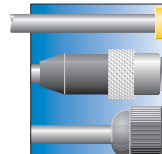
Mechanical connections

G1/2" for bores, mounted via clamping ring or thermowell depending on the probe



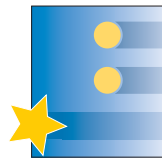
Measuring ranges

-50 ... +500 °C



Electrical connections

4-pole M12 x 1 plug connection



Special features

Failsafe 3-key operation, VDMA menu guide (optional), IP67, fully encapsulated electronics

Pt100 processing unit – Switching and analog outputs (U/I)



General data

Temperature operating range -50...500 °C

Accuracy (Lin. + Hys. + Rep.) 0.2 K

Repeatability 0.1 K

Switching point accuracy 0.2 K

Release points -50...499.8 °C

Switching point -49.8...500 °C

Ambient temperature -40...+80 °C

Storage temperature -40...+80 °C

Protective measure SELV; PELV according to EN 50178


Voltage drop at 2 V

No-load current I₀ 50 mA

Switching frequency 180 Hz

Short-circuit protection yes

Reverse polarity protection yes

Output function  programmable, pnp/npn

Rated operational current 0.2 A

Protection class IP67

Protection class III

Housing material stainless-steel/plastic, V2A (1.4305)

Electrical connection connector, M12 x 1



Coupling nut wrench size 30

Vibration resistance 20 g (9...2000 Hz), according to IEC 68-2-6

Shock resistance 50 g (11 ms) g (11 ms), according to IEC 61508

Mechanical connection G 1/2"

Types and data – selection table

| Type | Operating voltage | Current output | Voltage output | Load |  |  |
|-----------------------|-------------------|----------------|----------------|--------|---|---|
| TS-400-2UPN8X-H1141 | 15...30 VDC | - | - | - | w101 | d479 |
| TS-400-LI2UPN8X-H1141 | 18...30 VDC | 4...20 mA | - | 0.5 kΩ | w102 | d479 |
| TS-400-LUUPN8X-H1141 | 18...30 VDC | - | 0...10 V | - | w103 | d479 |

TS500 series fo Pt 100 probe (4-wire)

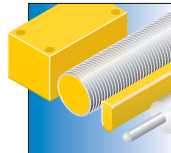


The TS500 processing units are rotatable by 320° and equipped with 4-digit 7-segment displays. A standard M12 x 1 plug connection at the rugged stainless steel housing enables the connection of a TP probe. The display indicates the temperature during normal operation and guides the operator through the programming menu. Depending on the sensor type, they are available with switching outputs or a combination of switching and analog outputs. IO-Link communication is integrated as a standard.

Features

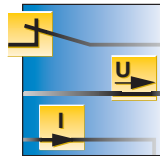
- Sensor rotatable by 320°
- M12 x 1 plug connection for TP probes
- Housing, temperature and electrical connection are made of stainless steel
- Highest flexibility through modular system
- Programming protection through recessed pushbutton and keylock
- Permanent display of temperature (°C, °F, K, Ω)
- Storage of max/min values

Properties



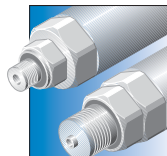
Design

Cylindrical, rotatable, with display



Electrical versions

IO-Link capable, dual-channel, switching, current or voltage output



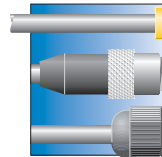
Mechanical connections

G1/2" male thread for bracket



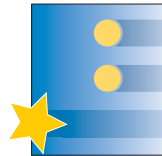
Measuring ranges

-50 ... +500 °C



Electrical connections

4-pole M12 x 1 plug connection



Special features

Failsafe 3-key operation, VDMA menu guide (optional), IP67, fully encapsulated electronics

Rotatable Pt100 processing unit – Switching and analog outputs (U/I)



General data

Temperature operating range -50...500 °C

Accuracy (Lin. + Hys. + Rep.) 0.2 K

Repeatability 0.1 K

Switching point accuracy 0.2 K

Release points -50...499.8 °C

Switching point -49.8...500 °C

Ambient temperature -40...+80 °C

Storage temperature -40...+80 °C

Protective measure SELV; PELV according to EN 50178


Voltage drop at 2 V

No-load current I₀ 50 mA

Switching frequency 180 Hz

Short-circuit protection yes

Reverse polarity protection yes

Output function  programmable, pnp/npn

Rated operational current 0.2 A

Protection class IP67

Protection class III

Housing material stainless-steel/plastic, V2A (1.4305)

Electrical connection connector, M12 x 1



Coupling nut wrench size 30

Vibration resistance 20 g (9...2000 Hz), according to IEC 68-2-6

Shock resistance 50 g (11 ms) g (11 ms), according to IEC 61508

Mechanical connection G 1/2"

Types and data – selection table

| Type | Operating voltage | Current output | Voltage output | Load |  |  |
|-----------------------|-------------------|----------------|----------------|--------|---|---|
| TS-500-2UPN8X-H1141 | 15...30 VDC | - | - | - | w101 | d480 |
| TS-500-LI2UPN8X-H1141 | 18...30 VDC | 4...20 mA | - | 0.5 kΩ | w102 | d480 |
| TS-500-LUUPN8X-H1141 | 18...30 VDC | - | 0...10 V | - | w103 | d480 |

At a glance

Temperature sensors - TT/TC series



Flexible temperature transmitter and sensor

The sensors of the TT/TC series detect temperature with a Pt100 4-wire probe. Available are compact devices with integrated probe but also with standard M12 connector for separate probes. The temperature transmitters of the TT series feature an analog output 4...20 mA (2-wire).

The devices of the TC series instead feature a switching output. Depending on the combination of sensor and probe, temperatures between -50 °C and +500 °C can be detected. Customer specific modification of the temperature range is possible.



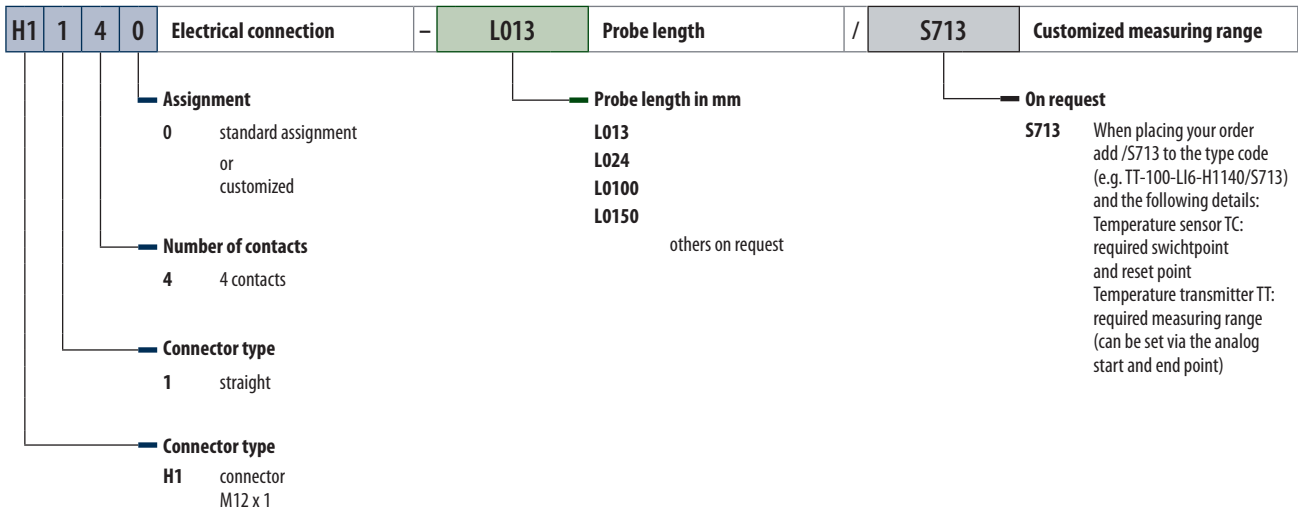
Cost-efficient transmitter solution

Temperature transmitters and switches of the TT/TC series are applied in places where transducers are not required and the customer needs highest flexibility regarding the choice of probe and thermowell:

- Temperature range between -50 °C and +500 °C
- Rugged stainless steel housing, IP67 protected
- Version with integrated probe or without probe
- Connection of separate probes via M12 connector
- Highest flexibility in choice of probe
- Further mounting aids are not required
- Analog output 4...20 mA (TT series) or switching output (TC series)

Type code

| | | | | | | | | |
|---|-----------------------------|--|-------------|---------------------------|--|-------------|---------------------------|---|
| TT | Functional principle | - | 103A | Mechanical version | - | G1/8 | Process connection | - |
| <p>Type</p> <p>TC temperature switch</p> <p>TT temperature transmitter</p> | | <p>Housing</p> <p>100A processor unit without probe, connection of probe via M12 x 1</p> <p>103A processor unit with probe Ø 3 mm, process connection via standard thread accuracy class A</p> <p>206A processor unit with probe Ø 6 mm, process connection via compression fitting thermowell, accuracy class A</p> | | | <p>Process connection (only devices with built-on probe)</p> <p>G1/8 G1/8" male thread (only 103)</p> <p>CF connection compression fitting thermowell (only 206A)</p> | | | |



TT/TC series – Temperature transmitters and switches



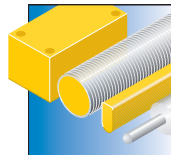
Devices of the TT and the TC series are available with or without probe. The types without probe take any Pt100 (4-wire) probe of the TP series.

The TT temperature transmitters are set to 0...+150 °C by default. The processed signal is provided via an analog current output, 4...20 mA (2-wire). The TC devices feature a switching output, switch and release point are set by default. Customized settings are available on request.

Features

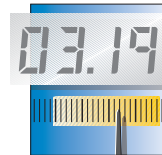
- Operating range -50...+500 °C
- Customized settings
- Transmitters with analog current output 4...20 mA (2-wire), default temperature range 0...+150 °C
- Sensor with PNP output (NO), customized switch and release point

Properties



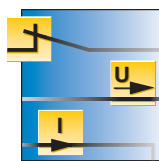
Design

Compact, cylindrical, Ø29 mm



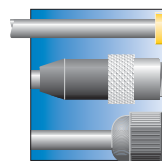
Measuring ranges

-50 ...+500 °C



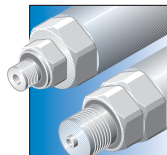
Electrical versions

Analog current output 4...20 mA (2-wire) or PNP switching output (NO)



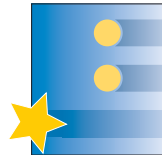
Electrical connections

4-pole M12 x 1 plug connection



Mechanical connections

Standard thread, compression fitting or thermowell, depending on the probe



Special features

Customized temperature range, many connection possibilities for the probe

Processing unit without probe – Current output (2-wire)



| | | | |
|--------------------------------------|---|------------------------------------|--|
| Type | TT-100-LI6-H1140 | Short-circuit protection | yes |
| Temperature operating range | -50...+500 °C | Reverse polarity protection | yes |
| Accuracy (Lin. + Hys. + Rep.) | 0.1% of final value BSL | Load | 1.2 kΩ |
| Ambient temperature | -40...+85 °C | Protection class | IP67 |
| Storage temperature | -40...+85 °C | Housing material | stainless steel, V4A 1.4401 (AISI 316) |
| Measuring element | for connection to probes of the TP series | Pressure resistance | 100 bar |
| Response time | dependent on connected temperature sensor | Electrical connection | connector, M12 x 1 |
| Operating voltage | 8...35 VDC | Wiring diagram | w104 |
| No-load current I₀ | 20 mA | Dimension drawing | d481 |
| Current output | 4...20 mA | | |

Transmitter with compact probe Ø 3 mm – Current output (2-wire)



| | | | |
|--------------------------------------|--|------------------------------------|--|
| General data | | Short-circuit protection | yes |
| Temperature operating range | 0...150 °C | Reverse polarity protection | yes |
| Accuracy (Lin. + Hys. + Rep.) | 0.1% of final value BSL | Load | 1.2 kΩ |
| Ambient temperature | -40...+85 °C | Protection class | IP67 |
| Storage temperature | -40...+85 °C | Housing material | stainless steel, V4A 1.4401 (AISI 316) |
| Measuring element | Pt-100 platinum measuring element, DIN EN 60 751 | Sensor material | stainless steel, AISI 316 |
| Accuracy | Class A | Pressure resistance | 100 bar |
| Operating voltage | 8...35 VDC | Electrical connection | connector, M12 x 1 |
| No-load current I₀ | 20 mA | Mechanical connection | G1/8" male thread |
| Current output | 4...20 mA | | |

Types and data – selection table

| Type | Immersion depth | w | d |
|-----------------------------|-----------------|------|------|
| TT-103A-G1/8-LI6-H1140-L013 | 13 mm | w104 | d482 |
| TT-103A-G1/8-LI6-H1140-L024 | 24 mm | w104 | d483 |

Transmitter with rod-shaped probe Ø 6 mm – Current output (2-wire)




| | | | |
|--------------------------------------|--|------------------------------------|--|
| General data | | | |
| Temperature operating range | 0...150 °C | Short-circuit protection | yes |
| Accuracy (Lin. + Hys. + Rep.) | 0.1% of final value BSL | Reverse polarity protection | yes |
| Ambient temperature | -40...+85 °C | Load | 1.2 kΩ |
| Storage temperature | -40...+85 °C | Protection class | IP67 |
| Measuring element | Pt-100 platinum measuring element, DIN EN 60 751 | Housing material | stainless steel, V4A 1.4401 (AISI 316) |
| Accuracy | Class A | Sensor material | stainless steel, AISI 316 |
| Operating voltage | 8...35 VDC | Pressure resistance | 100 bar |
| No-load current I₀ | 20 mA | Electrical connection | connector, M12 x 1 |
| Current output | 4...20 mA | Mechanical connection | for compression ferrule fittings, protective tubing or direct mounting |

Types and data – selection table

| Type | Immersion depth | w | d |
|----------------------------|-----------------|------|------|
| TT-206A-CF-LI6-H1140-L0100 | 100 mm | w104 | d484 |
| TT-206A-CF-LI6-H1140-L0150 | 150 mm | w104 | d485 |

Processing unit without probe – Switching output



| | | | |
|--------------------------------------|---|------------------------------------|---|
| General data | | | |
| Temperature operating range | -50...500 °C | Operating voltage | 15...30 VDC |
| Accuracy (Lin. + Hys. + Rep.) | 0.1% of final value BSL | Short-circuit protection | yes |
| Switching point accuracy | 0.5 °C | Reverse polarity protection | yes |
| Switch point SP1 | customized | Output function |  , PNP |
| Release point rP1 | customized | Rated operational current | 0.1 A |
| Ambient temperature | -40...+85 °C | Protection class | IP67 |
| Storage temperature | -40...+85 °C | Housing material | stainless steel, V4A 1.4401 (AISI 316) |
| Measuring element | for connection to probes of the TP series | Pressure resistance | 100 bar |
| Response time | dependent on connected temperature sensor | Electrical connection | connector, M12 x 1 |

Types and data – selection table

| Type | w | d |
|-----------------------|------|------|
| TC-100-AP6-H1140 | w105 | d481 |
| TC-100-AP6-H1140/S713 | w105 | d481 |

Transmitter with compact probe Ø 3 mm – Switching output



General data

| | | | |
|--------------------------------------|--|------------------------------------|--|
| Temperature operating range | 0...150 °C | Short-circuit protection | yes |
| Accuracy (Lin. + Hys. + Rep.) | 0.1% of final value BSL | Reverse polarity protection | yes |
| Switching point accuracy | 0.5 °C | Output function | —, PNP |
| Switch point SP1 | customized | Rated operational current | 0.1 A |
| Release point rP1 | customized | Protection class | IP67 |
| Ambient temperature | -40...+85 °C | Housing material | stainless steel, V4A 1.4401 (AISI 316) |
| Storage temperature | -40...+85 °C | Sensor material | stainless steel, AISI 316 |
| Measuring element | Pt-100 platinum measuring element, DIN EN 60 751 | Pressure resistance | 100 bar |
| Accuracy | Class A | Electrical connection | connector, M12 x 1 |
| Operating voltage | 15...30 VDC | Mechanical connection | G1/8" male thread |

Types and data – selection table

| Type | Immersion depth | w | d |
|-----------------------------|-----------------|------|------|
| TC-103A-G1/8-AP6-H1140-L013 | 13 mm | w105 | d482 |
| TC-103A-G1/8-AP6-H1140-L024 | 24 mm | w105 | d483 |

At a glance

Temperature probes- TP series



Highest possible flexibility

A temperature probe has to be flexible and robust. All Pt100 probes of the TP series are therefore mineral-insulated, equipped with a standard process connection and available ex-stock. Moreover TURCK Pt100 probes are provided in

4-wire technology. The power resistance is thus compensated and a possible influence on the measured value is avoided right from the start when using long cable connections between the probes and the processing units.



High operational safety

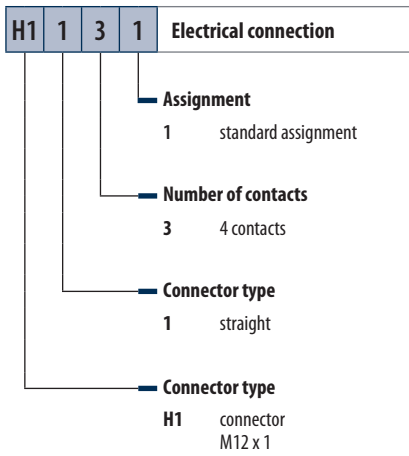
The mineral-insulated probes from TURCK are characterized by enormous flexibility and temperature resistance.

Further advantages:

- High accuracy
- Weldability (like a tube)
- Longevity even under extreme conditions (jacked cables oxidize only on one side and thus achieve double life cycles compared to tubes with the same wall thickness)

Type code

| TP | Functional principle | - | 103A | Mechanical version | - | G1/8 | Process connection | - |
|-------------------------------------|----------------------|---|--|--------------------|---|--|--------------------|---|
| Type TP temperature probe | | | Housing 103A processor unit with probe Ø 3 mm, process connection via standard thread accuracy class A 104A process connection for food applications, probe Ø 4 mm, accuracy class A 203A for compression fitting/thermowell mounting probe Ø 3 mm, accuracy class A 206A for compression fitting/thermowell mounting probe Ø 6 mm, 306A cable probe Ø 6 mm | | | Process connection (only devices with built-on probe) DN25 DN25 für milk pipe connection DIN 11851 CF connection via compression fitting or thermowell G1/8 G1/8" male thread TRI3/4 3/4" Tri-Clamp | | |



Pt100 temperature probe in 4-wire technology



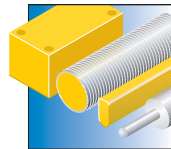
The core element of the TP series is a Pt 100 measuring resistor in 4-wire technology. All probes feature a standard M12 x 1 plug connection.

Resistance thermometers are used in places where temperatures must be detected and monitored to control and optimize processes. Typical applications are process plants, manufacturing facilities and units as well as air-conditioning systems.

Features

- Pt100 probe acc. to DIN EN 60751
- Vibration and shock proof
- class A for temp. < 350 °C
- class B for temp. > 350 °C
- Connection to TS, TT and TC series as well as to IM34, BL20 and BL67

Properties



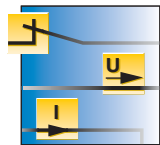
Design

All types with standard process connection, lengths, Ø 3/6 mm, freely selectable



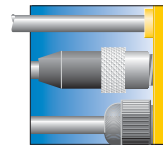
Measuring ranges

-50...+500 °C



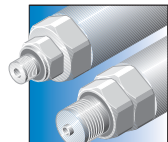
Electrical versions

Pt100 4-wire, other types on request



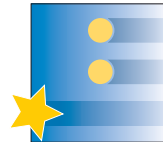
Electrical connections

4-pole M12 x 1 plug connection



Mechanical connections

Depending on the probe, standard thread, compression fitting or thermowell



Special features

Mineral insulated probe, IP68

Compact probe – Ø 3 mm – Process connection



| | | | |
|------------------------------------|--|------------------------------|---------------------------------------|
| General data | | | |
| Temperature operating range | -50...120 °C | Housing material | stainless-steel/plastic, V4A (1.4404) |
| Measuring element | Pt-100 platinum measuring element, DIN EN 60 751 | Sensor material | stainless steel, AISI 316L |
| Accuracy | class A | Pressure resistance | 100 bar |
| Response time | t _{0.5} = 1.5 s / t _{0.9} = 6.0 s in water @ 0.2 m/s | Electrical connection | connector, M12 x 1 |
| Reverse polarity protection | yes | Mechanical connection | G1/8" male thread |
| Protection class | IP67 | | |

Types and data – selection table

| Type | Immersion depth | w | d |
|-------------------------|-----------------|------|------|
| TP-103A-G1/8-H1141-L013 | 13 mm | w106 | d486 |
| TP-103A-G1/8-H1141-L024 | 24 mm | w106 | d487 |

Standard rod-shaped probe – Ø 3 mm



| | | | |
|------------------------------------|--|------------------------------|--|
| General data | | | |
| Temperature operating range | -50...500 °C | Protection class | IP67 |
| Storage temperature | -40...+85 °C | Housing material | stainless-steel/plastic, V4A (1.4404) |
| Measuring element | Pt-100 platinum measuring element, DIN EN 60 751 | Sensor material | stainless steel, AISI 316L |
| Accuracy | class A | Pressure resistance | 100 bar |
| Response time | t _{0.5} = 1.5 s / t _{0.9} = 6.0 s in water @ 0.2 m/s | Electrical connection | connector, M12 x 1 |
| Reverse polarity protection | yes | Mechanical connection | for compression ferrule fittings, protective tubing or direct mounting |

Types and data – selection table

| Type | Immersion depth | w | d |
|-----------------------|-----------------|------|------|
| TP-203A-CF-H1141-L100 | 100 mm | w106 | d488 |
| TP-203A-CF-H1141-L150 | 150 mm | w106 | d489 |
| TP-203A-CF-H1141-L250 | 250 mm | w106 | d490 |
| TP-203A-CF-H1141-L200 | 200 mm | w106 | d489 |
| TP-203A-CF-H1141-L300 | 300 mm | w106 | d491 |

Standard rod-shaped probe – Ø 6 mm



General data

Temperature operating range -50...500 °C

Storage temperature -40...+85 °C

Measuring element Pt-100 platinum measuring element, DIN EN 60 751

Accuracy class A

Response time t_{0.5} = 6 s / t_{0.9} = 15 s in water @ 0.2 m/s

Reverse polarity protection yes

Protection class IP67

Housing material stainless-steel/plastic, V4A (1.4404)

Sensor material stainless steel, AISI 316L

Pressure resistance 100 bar

Electrical connection connector, M12 x 1

Mechanical connection for compression ferrule fittings, protective tubing or direct mounting

Types and data – selection table

| Type | Immersion depth | w | d |
|-----------------------|-----------------|------|------|
| TP-206A-CF-H1141-L100 | 100 mm | w106 | d492 |
| TP-206A-CF-H1141-L150 | 150 mm | w106 | d493 |
| TP-206A-CF-H1141-L200 | 200 mm | w106 | d494 |
| TP-206A-CF-H1141-L300 | 300 mm | w106 | d495 |

Cable probe – Ø 6 mm



General data

Temperature operating range -50...105 °C

Measuring element Pt-100 platinum measuring element, DIN EN 60 751

Accuracy class A

Response time t_{0.5} = 8 s / t_{0.9} = 20 s in water @ 0.2 m/s

Reverse polarity protection yes

Protection class IP68

Housing material stainless steel, V2A (1.4301)

Sensor material rubber, TPE

Pressure resistance 15 bar

Electrical connection connector, M12 x 1

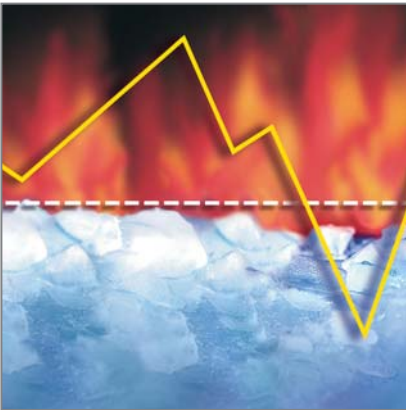
Mechanical connection for compression ferrule fittings, protective tubing or direct mounting

Types and data – selection table

| Type | Immersion depth | w | d |
|------------------------|-----------------|------|------|
| TP-306A-CF-H1141-L1000 | 1000 mm | w106 | d496 |
| TP-306A-CF-H1141-L5000 | 5000 mm | w106 | d497 |

At a glance

Temperature sensors - M18T series



Resistant infrared sensors

Infrared sensors of the M18T series detect heat contactless in a range between 0...+300 °C. The sensors operate as receivers and the objects are the heat emitting sources. The thermal radiation of an object, between 8 and 14 μm, is trans-

formed into an electrical signal by a thermopile and then converted into an output signal.

No matter which device you use, the switchpoint as well as the measuring range are easily taught.



Non-contact detection of temperature

The rugged MT18 infrared sensors monitor hot objects such as bakery products, metals or bottles. They also monitor flame brazing, blasting or straightening processes and also hot glueing applied in packaging stations, book binding and product assembly.

- Temperature range 0...+300 °C
- Versions with analog output 0...10 V or switching output
- Easy teaching of measuring range or switchpoint.
- Compact and rugged stainless steel housing for harsh environments

Infrared sensors M18T



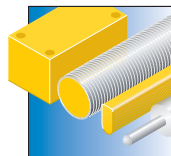
The sensors of the M18T series are essentially passive receivers and operate contactless. The thermal radiation of an object between 8 and 14 μm is transformed into an electrical signal in a thermopile and then converted into an output signal. The distance-spot ratio D:S, specifying the spot size at a defined distance is important in this context. To monitor the surface temperature of the object optimally, this field should be covered completely by the object.

Available are devices with switching output (NO/ PNP) or with analog voltage output 0...10 V. Easy teaching of measuring range or swichtpoint.

Features

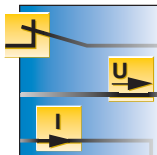
- Temperature range 0...+300 °C
- DS-ratio 6:1, 8:1 and 14:1
- Teaching via pushbutton or cable
- Switching PNP/NPN or analog output 0...10 V
- Version with analog output: PNP-alarm output signals end of measuring range at 10 V
- 2 m connection cable or M12 x 1 plug connection

Properties



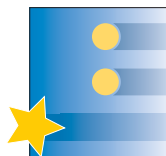
Design

Threaded barrel M18 x 1, stainless steel V2A, length 81.2 ... 96.6 mm



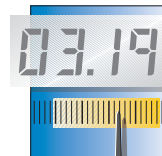
Electrical versions

5-wire DC with switching output (PNP/NO) or analog voltage output 0...10 V



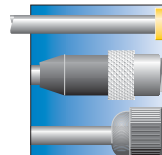
Special features

Sensors for different object sizes, spots and distances; distance-spot ration (D:S) 6:1, 8:1, 14:1



Measuring ranges

Detection of temperature changes between 0 ...+ 300 °C



Electrical connections

Connection cable 2 m (5 x 0.5 mm²) or 5-pole M12 x 1 plug connection

M18T – Switching output



General data

| | |
|------------------------------------|--------------|
| Temperature operating range | 0...300 °C |
| Switching point accuracy | 0.5 °C |
| Operating voltage | 10...30 VDC |
| Switching frequency | 20 Hz |
| Short-circuit protection | yes / cyclic |

| | |
|------------------------------------|-------------------------------|
| Reverse polarity protection | yes |
| Output function | —, pnp/npn |
| Protection class | IP67 |
| Housing material | stainless steel, V2A (1.4301) |

Types and data – selection table

| Type | Electrical connection | Cable quality | Cable cross section | w | d | e |
|----------|-----------------------|---------------|-------------------------|------|------|------|
| M18TB6E | cable | PVC, 2 m | 5 x 0.5 mm ² | w107 | d498 | e096 |
| M18TB6EQ | connector, M12 x 1 | - | - | w107 | d499 | e096 |
| M18TB8 | cable | PVC, 2 m | 5 x 0.5 mm ² | w107 | d500 | e097 |
| M18TB8Q | connector, M12 x 1 | - | - | w107 | d501 | e097 |
| M18TB14 | cable | PVC, 2 m | 5 x 0.5 mm ² | w107 | d502 | e098 |
| M18TB14Q | connector, M12 x 1 | - | - | w107 | d503 | e098 |

M18T – Analog voltage output



General data

| | |
|------------------------------------|-------------|
| Temperature operating range | 0...300 °C |
| Switching point accuracy | 0.5 °C |
| Operating voltage | 10...30 VDC |
| Switching frequency | 20 Hz |
| Voltage output | 0...10 V |

| | |
|------------------------------------|-------------------------------|
| Short-circuit protection | yes / cyclic |
| Reverse polarity protection | yes |
| Output function | —, PNP/analog output |
| Protection class | IP67 |
| Housing material | stainless steel, V2A (1.4301) |

Types and data – selection table

| Type | Electrical connection | Cable quality | Cable cross section | w | d | e |
|-----------|-----------------------|---------------|-------------------------|------|------|------|
| M18TUP8 | cable | PVC, 2 m | 5 x 0.5 mm ² | w107 | d500 | e097 |
| M18TUP8Q | connector, M12 x 1 | - | - | w107 | d501 | e097 |
| M18TUP6E | cable | PVC, 2 m | 5 x 0.5 mm ² | w107 | d498 | e096 |
| M18TUP6EQ | connector, M12 x 1 | - | - | w107 | d499 | e096 |
| M18TUP14 | cable | PVC, 2 m | 5 x 0.5 mm ² | w107 | d502 | e098 |
| M18TUP14Q | connector, M12 x 1 | - | - | w107 | d503 | e098 |

At a glance

Flow sensors



Flow sensors – Monitoring of limit values and flow patterns

Flow sensors are applied in automated manufacturing to detect deviating flow speeds of gases and liquids quickly and reliably. They monitor coolant circuits, run-dry protection of pumps or control the flow of exhaust air ducts and air conditioning systems.

Flow sensors are not applied to perform precise measurements but to monitor limit values and flow patterns. In other words, the increase or decrease of flow speed. In this context, high repeatability is the most important feature.

The output signal can either be analog or binary, depending on whether continuous flow or a limit value is to be monitored.

TURCK insertion flow sensors operate on the thermo-dynamic principle: The flow speed is determined from thermal energy dissipated by a probe. The dissipated

heat quantity serves as a measure for the flow speed.

TURCK flow sensors are available as compact devices with integrated signal processor or as insertion or inline sensor with separate processing unit. Sensor and housing are available in different materials and with different connectivity. The connection technology is made for many different industrial application conditions.

- Standard sensors for factory automation
- Sensors for high temperatures and pressures
- Sensors for the food and pharmaceutical industries
- Chemical-resistant sensors
- Sensors for the Ex area
- Flow sensors for the control of gaseous media

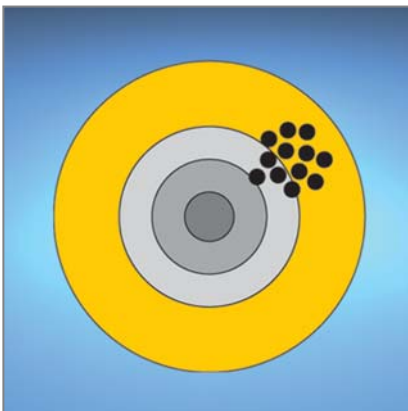
Our strengths...



Monitoring of flow speeds and patterns

Flow monitoring of media plays an important role in many applications of factory and process automation. Cooling circuits, run-dry protection of pumps or the flow control of exhaust air ducts and air

conditioning systems are typical applications. Electronic flow sensors are increasingly applied to detect critical changes in flow and to signal them to a control unit.



High repeatability

Flow sensors are mainly applied to control flow speeds. Precise and expensive measurement is not the aim but rather the control of limit values. High repeatability is therefore the most important feature. The sensors not only detect lim-

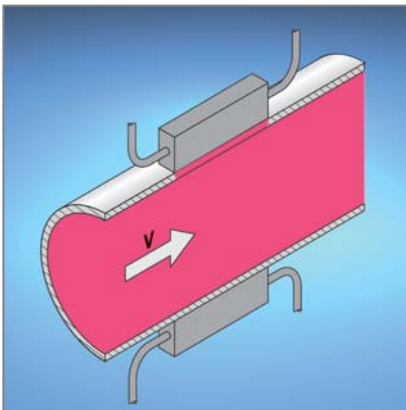
it values of flows but also flow patterns. That is, the increase or decrease of flow speed. The output signal can either be analog or binary, depending on whether continuous flow or a limit value is to be monitored.



High performance in a compact housing

A great variety of types are available, such as insertion and inline flow sensors as well as compact sensors and sensors with downstreamed electronics. They are easily integrated in existing line configurations and are space saving alternatives for new constructions. In addition, cool-

ant circuits and temperature cycles but also dosage intervals such as applied in water purification systems are precisely monitored. Limit value monitoring as well as analog linearized switching outputs are available for these tasks.



Calorimetric flow sensors

Calorimetric flow sensors work on the thermodynamic principle and are applied to monitor flow speeds of liquids and gases. Depending on the type, they also measure the media temperature. Short response times within seconds and

stable values displayed even under the influence of strong temperature fluctuations, make these sensors particularly suited for flow rate monitoring in coolant circuits.



Different designs and versions

You can choose between insertion and inline flow sensors as well as between compact devices and sensors with downstreamed electronic evaluation system. All sensors are easily integrated in existing line configurations and are space saving alternatives for new constructions. In

addition, coolant circuits and temperature cycles but also dosage intervals such as applied in water purification systems are precisely monitored. Limit value and analog switching outputs are available for these tasks.



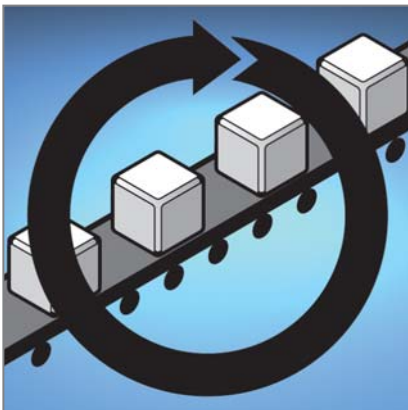
The right solution for complex applications

Depending on the application, a broad range of different flow sensors is required. TURCK offers them in different material qualities, for liquid as well as for gaseous media. The product portfolio al-

so comprises flow sensors for the Ex-area, extremely chemical-resistant versions, high-temperature and pressure-resistant versions as well as sensors for the pharmaceutical and food industries.

Your advantages...

Your advantages...



High system availability

Especially in rough environments of factory and process automation, flow meters proof their outstanding reliability. This is guaranteed through excellent EMC properties as well as protection class IP67. A practical housing, durable mounting aids

and a well readable LED chain are the main features considered in the design. Flow meters thus withstand the special ambient conditions of many applications easily. Use these benefits to optimize your production processes.



Maximum freedom

Maximum planning freedom is provided with just a few device types in combination with numerous connection possibilities and many different mounting aids. From polling of single switchpoints over

analog output signals to a well readable display, even from a long distance: Profit from the extensive standard product range of TURCK flow meters providing more flexibility to your application.



User-friendly operation

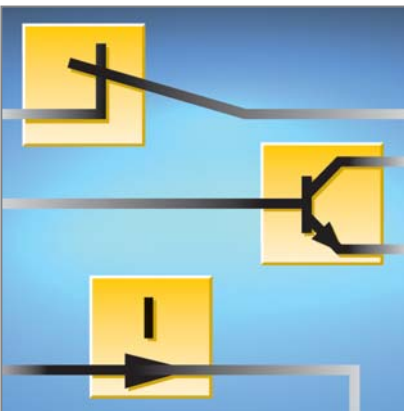
The compact flow sensors feature user-friendly potentiometers at the front for comfortable adjustment of the switchpoint. The LED chain indicates the current flow state.

Advantages



Easy mounting

Unlike insertion sensors, inline types are installed in pipes. The pipe may be connected directly via cutting ring or a matching adapter. With insert nuts at the bottom the sensor can be mounted to a baseplate. Alternatively, the baseplate can be screwed to the housing to enable front mounting of the sensor.



Many different output signals

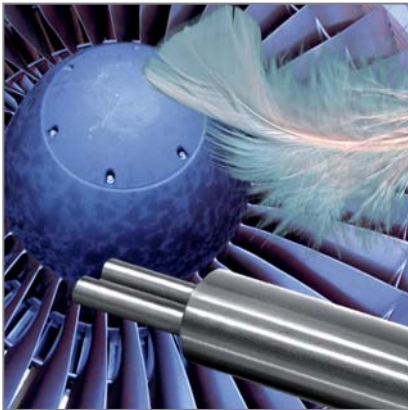
For further processing of output signals via control system, the flow sensors provide a standard PNP switching and a relay output as well as an analog 4...20 mA output. Parameters such as switchpoint, temperature, start and end value are adjusted with a potentiometer at sensors with analog output signal.



Optimal servicability

Thanks to flexible mounting options, the user-friendly operation and adjustment, the well legible 3-digit 7-segment display and last but not least, the excellent repeatability, flow sensors offer calculable advantages.

For special applications



Sensors for gaseous media

TURCK offers special versions for monitoring gaseous media which are especially adjusted to the low thermal conductivity of gases. They are typically applied in air conditioning and ventilation systems, filling and coating lines as well as in motor ventilation and cabinets.



Sensors for the Ex area

Flow sensors for areas exposed to gas and dust-explosion hazards are ATEX approved and can only be operated in combination with approved external signal processors [Ex ia]. Inline sensors are available for Ex zone 1 and Ex zone 0

and mounted with a T-piece or a weld-on adapter. The inline sensors for Ex zone 1 are mounted directly in pipes with cutting ring screws, ensuring a tight and pressure resistant connection.



Chemical-resistant sensors

Stainless steel 1.4571 is often not resistant enough for aggressive media. Depending on the application, chemical resistant materials such as PTFE (teflon) and PVDF

(Dyflor), stainless steel alloy (Hastelloy) or titanium are used. These materials are highly resistant to many chemicals.



Sensors for high temperatures and pressures

More and more applications require sensors that withstand temperatures outside the standard range. We offer sensors for extreme ambient temperatures of up to +120 °C and operating pressures of up to 500 bar. They are typically applied in pro-

duction lines and withstand rinsing with hot cleaning liquids or in plastics processing machines. These sensors are identified by D090 or D100 in the type code for high-temperature applications and D500 for high-pressure applications.



Sensors for the food and pharmaceutical industry

The mechanics and electronics have to fulfill special requirements of the food and pharmaceutical industry. Food-safe connections such as Tri-Clamp or dairy screw connections (DIN11851) are conform to the 3A sanitary standard. The standard cleaning cycles CIP and SIP with rapid temperature changes impose se-

vere strain on the electronics and thus require special protective measures. For this reason the sensors are made of special steel 1.4404 and 1.4435. Customized connections such as GEA-Varivent or APV flanges are available as well as other metal based materials.

Type code

| | | |
|-----|----------------------|---|
| FCS | Functional principle | - |
|-----|----------------------|---|

Series flow sensors

- FCL calorimetric, inline
- FCS calorimetric, insertion

| | | | |
|------|----|--------|---|
| G1/2 | A4 | Design | - |
|------|----|--------|---|

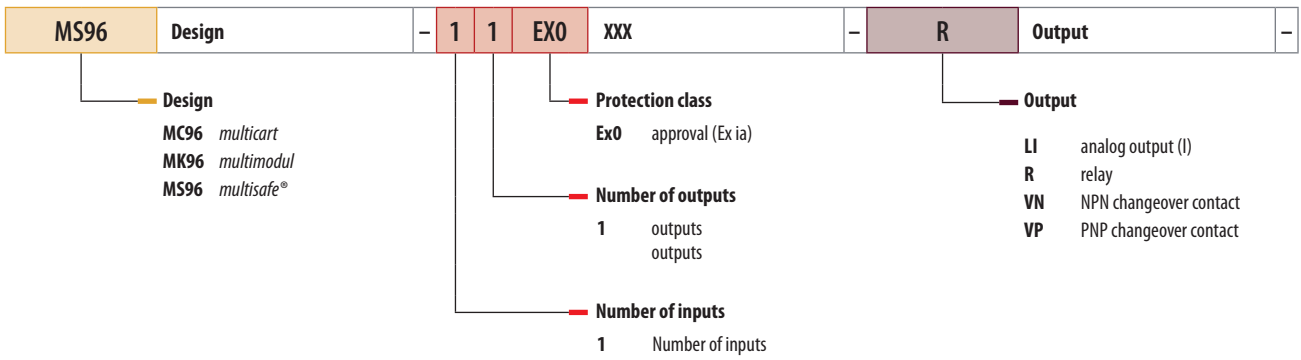
Mechanical connection

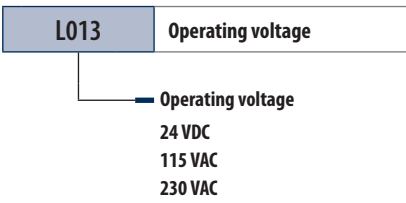
Materials

| | |
|--|---|
| <p>50 Tri-Clamp, Ø 50.5 mm</p> <p>68 Varivent, Ø 68 mm</p> <p>10D08 compression fittings for smooth barrel, outer Ø 10 mm</p> <p>34D10 Tri-Clamp, Ø 34 mm (FCL with barrel Ø 10 mm)</p> <p>D03 gland, 4 mm barrel Ø</p> <p>D03 gland, 4 mm barrel Ø</p> <p>D04 male thread G1/4", 4 mm barrel Ø</p> <p>D06 female thread G1/4", 6 mm barrel Ø</p> <p>D09 female thread, 9 mm barrel Ø</p> <p>D15 male thread G1/2", 15 mm barrel Ø</p> <p>D20 male thread G3/4", 19 mm barrel Ø</p> <p>DN25 flange DN25/PN40 or Tri-Clamp DN25</p> <p>G1/4 thread G1/4",</p> <p>G1/2 thread G1/2",</p> <p>GL1/2 thread G1/2", long</p> <p>GL3/4 thread G3/4", long</p> <p>K20 smooth barrel Ø 20 mm</p> <p>M18 threaded barrel M18 x 1</p> <p>N1/2 thread 1/2 NPT</p> <p>N3/4 thread 3/4 NPT</p> <p>TCD04 gland, Ø 4 mm, inline sensor with 3.6 mm barrel Ø</p> | <p>A4 stainless steel A4 (1.4404 or 1.4571)</p> <p>A4P sensor stainless steel A4 (1.4404 or 1.4571), housing plastic, ceramics/PTFE (teflon)</p> <p>CT ceramics/PTFE (teflon)</p> <p>DY PVDF (Dyflor)</p> <p>HA2P sensor stainless steel A2 (1.4305), housing plastic with coupling nut</p> <p>HB2 Hastelloy B2 (2.4617)</p> <p>HC22 Hastelloy C22 (2.4603)</p> <p>HC4 Hastelloy C4 (2.4610)</p> <p>P plastic housing</p> <p>T PTFE (teflon)</p> <p>TN titanium alloy (3.7235)</p> |
|--|---|

| A | P | 8 | X | Electrical version | - | H1 | 1 | 4 | 1 | Electrical connection | / | L120 | Special versions |
|---|---|---|---|--|---|----|---|---|---|-----------------------|--|------|---|
| | | | | <p>Indication</p> <p>... X number of LEDs or multicolor LED</p> <p>Voltage range</p> <p>8 19.2...28.8 VDC</p> <p>Output mode</p> <p>N NPN</p> <p>P PNP</p> <p>R relay output</p> <p>Output function</p> <p>2A 2 x NO, working current</p> <p>A 1 x NO, working current</p> <p>R 1 x NC, closed current</p> <p>V changeover contact</p> <p>LI analog output (I)</p> <p>LIU NO/NC programmable, analog + I + PNP</p> <p>LU analog output (U)</p> <p>2U NO/NC programmable, 2 x PNP</p> <p>U NO/NC programmable,</p> <p>NA sensor with downstream electronics (processor units MC96, MK96, MS96)</p> <p>NAEX sensor for Ex zone 1 with downstream electronics (processor units MC96, MS96)</p> <p>NAEXO sensor for Ex zone 0 with downstream electronics (processor units MC96, MS96)</p> | | | | | | | <p>Assignment</p> <p>0 M12 x 1, connector (modified)</p> <p>1 M12 x 1, connector (standard)</p> <p>blank 2 m cable connection</p> <p>... Contacts</p> <p>4 4 contacts</p> <p>Connector type</p> <p>1 straight</p> <p>Connector type</p> <p>H1 connector type M12 x 1</p> | | <p>Special versions</p> <p>A air-flow sensor gaseous media</p> <p>D003 process connection Varivent</p> <p>D014 process connection Tri-Clamp</p> <p>D024 material test certificate 3.1b</p> <p>D041 sensor and mounting block glued together</p> <p>D090 high-temperature version up to 100 °C</p> <p>D100 high-temperature version up to 120 °C</p> <p>D500 high-pressure version up to 500 bar</p> <p>L065 insertion depth 65 mm (incl. thread)</p> <p>L080 insertion depth 80 mm (incl. thread)</p> <p>L115 insertion depth 115 mm (incl. thread)</p> <p>L120 insertion depth 120 mm (incl. thread)</p> <p>L200 insertion depth 200 mm (incl. thread)</p> <p>M12 process connection female thread M12 x 1.5</p> <p>M16 process connection female thread M16 x 1.5</p> <p>5M cable connection, 5 m</p> <p>10M cable connection, 10 m</p> <p>24VDC supply voltage 24 VDC</p> |

Type code





Designs and variants

Page 590



Liquids – Insertion – Compact

liquids
3...300 cm/s
2...100 cm/s

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Liquids – Insertion – Compact

liquids
3...300 cm/s

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Liquids – Insertion

liquids
3...300 cm/s
2...100 cm/s

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Liquids – Inline – Compact

liquids
4...30 l/min
3...20 l/min
0,1...6 l/min
0,02...3 l/min
0,01...1 l/min
0,001...0,2 l/min

Medium

Operating range water

Oil operating range

Operating range water

Flow operating range

Mechanical connection

G 1/4"
G 1/2"
G 1/2" length
NPT 1/2"
Varivent
Tri-Clamp 1 1/2"

Medium temperature

-20...80 °C
-10...80 °C

Sensor quality

AISI 316Ti
PVDF
AISI 316L

Pressure resistance

5 bar
10 bar
100 bar

Housing material

stainless steel
plastic

1...150 cm/s
1...70 cm/s

G 1/4"
G 1/2"
G 1/2" length
NPT 1/2"

-20...80 °C

AISI 316Ti

100 bar

plastic

1...150 cm/s
1...70 cm/s

NPT 1/2"
G 1/4"
G 1/2"
G 1/2" length
G 3/4"
NPT 3/4"
threaded tube connection per DIN11851
Tri-Clamp 1 1/2"
Varivent

-20...80 °C
-10...70 °C
10...120 °C

AISI 316Ti
PTFE
AISI 316L

5 bar
10 bar
100 bar

stainless steel
plastic

4...30 l/min
3...20 l/min
0,1...6 l/min
0,02...3 l/min
0,01...1 l/min
0,001...0,2 l/min

G 3/4"
G 1/2"
G 1/4"
G 1/4" female thread
Tri-Clamp DN 10
tube 4 mm

-20...80 °C
0...60 °C
-20...60 °C

AISI 316Ti
Al₂O₃/PTFE
AISI 316L

1 bar
5 bar
20 bar

plastic



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Liquids – Inline

Page 610



Gases – Insertion – Compact

Page 612



Gases – Insertion

Page 614



Gases – Inline – Compact

| | | | | |
|---|--|--|----------------------------|--------------|
| Medium | liquids | air | air | air |
| Air operating range | | 0.5...30 m/s | 0.5...30 m/s | 0.5...40 m/s |
| Oil operating range | 15...300 ml/min 90...1800 ml/min | | | |
| Flow operating range | 0,005...0,15 l/min 0,03...0,9 l/min | | | |
| Mechanical connection | M12 x 1,5 M16 x 1,5 | G 1" female thread per DIN 3852 G 1/2" length | G 1/2" length | G 1/4" |
| Medium temperature | -20...80 °C | -20...80 °C | 10...120 °C -20...80 °C | -20...80 °C |
| Sensor quality | AISI 316Ti | AISI 303 | AISI 303 | AISI 316Ti |
| Ex approval acc. to conformity certificate | | | | |
| Pressure resistance | 10 bar 16 bar | 3 bar 30 bar | 30 bar | 20 bar |
| Housing material | stainless steel | plastic | stainless steel | plastic |

Designs and variants

Page 616



**Liquids – Insertion –
Ex zone 1**

liquids

Medium

Air operating range

Oil operating range

3...200 cm/s

Oil operating range

**Operating range
water**

1...100 cm/s

Flow operating range

**Mechanical
connection**

G 1/4"
G 1/2"
NPT 1/2"
G 1/2" length

Medium temperature

-20...85 °C

Sensor quality

AISI 316Ti

**Ex approval acc. to
conformity certificate**

TÜV 99 ATEX 1518

Pressure resistance

60 bar

Housing material

stainless steel

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**Liquids – Inline –
Ex zone 1**

liquids

25...300 ml/min
150...1800 ml/min

0,01...0,15 l/min
0,05...0,9 l/min

M12 x 1,5
M16 x 1,5

-20...70 °C

AISI 316Ti

TÜV 96 ATEX 1101

6 bar

stainless steel

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**Gases – Insertion –
Ex zone 1**

air

2...20 m/s

G 1/2" length

-20...85 °C

AISI 316Ti

TÜV 99 ATEX 1518

10 bar

stainless steel

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**Liquids – Insertion –
Ex zone 0**

liquids

3...200 cm/s

1...100 cm/s

G 3/4"
G 1/4"
G 1/2"

-20...60 °C

AISI 316Ti

TÜV 99 ATEX 1517X

60 bar

stainless steel

Page 628


**Gases – Insertion –
Ex zone 0**




| | |
|---|-------------------|
| Medium | air |
| Air operating range | 2...20 m/s |
| Mechanical connection | G 1/2" length |
| Medium temperature | -20...60 °C |
| Sensor quality | AISI 316Ti |
| Ex approval acc. to conformity certificate | TÜV 99 ATEX 1517X |
| Pressure resistance | 10 bar |
| Housing material | stainless steel |

Designs and variants

Page 631




MK96

| | |
|---|--|
| Design | terminal chambers |
| Protection type | |
| Output function | 4 ... 20 mA, analog output  , NPN  , PNP  , relay output |
| Design | terminal chambers |
| Protection class | IP20 |
| Local admissible ambient temperature | -20...+60 °C |

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MS96

| | |
|---|--|
| Design | terminal chambers |
| Protection type | [Ex ia] IIC [Ex ib] IIC |
| Output function |  , relay output |
| Design | terminal chambers |
| Protection class | IP20 |
| Local admissible ambient temperature | -20...+60 °C |

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MC96

| | |
|---|--|
| Design | Eurocard |
| Protection type | [Ex ia] IIC [Ex ib] IIC |
| Output function |  , relay output |
| Design | Eurocard |
| Protection class | IP20 |
| Local admissible ambient temperature | -20...+60 °C -20...+40 °C |

s and variants

Compact insertion devices for liquid media – stainless steel

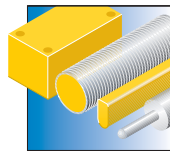


The compact devices incorporate sensor and signal processor. They are mounted with a T-piece, a weld-on adapter or with a matching adapter block. The probe is inserted in the pipe and has direct contact with the medium. The integrated LED chain indicates the current flow state. The sensors are available either with transistor, relay switching or analog current output. They are also available with different mechanical process connections.

Features

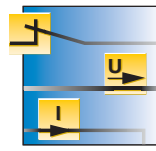
- Insertion flow sensor in a stainless steel housing
- Sensor and signal processor enclosed in the housing
- Ideal for all pipe diameters of DN20 and larger
- Adjustable to flow speeds between 1...300 cm/s
- Switchpoint freely adjustable within the operating range
- LED chain for status indication
- Transistor or relay output
- Chemical-resistant materials
- Pressure-resistant up to 100 bar

Properties



Design

Compact insertion flow sensors, for all pipe diameters of DN20 and larger



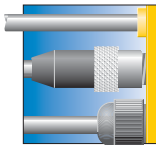
Electrical versions

PNP/NPN transistor output or relay output (NO)



Monitoring range

Adjustable to flow speeds between 1...300 cm/s



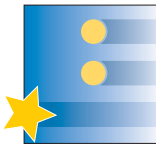
Electrical connections

Via A-coded M12 x 1 plug connection or connection cable



Materials

Housing and sensor material stainless steel 1.4571 (A4)



Special features

Switchpoint adjusted via potentiometer, LED chain for status indication

G1/4" – stainless steel A4 – M12 x 1 plug connection



General data

| | |
|------------------------------|--------------|
| Operating voltage | 21...26 VDC |
| Medium | liquids |
| Oil operating range | 3...300 cm/s |
| Operating range water | 1...150 cm/s |
| Medium temperature | -20...80 °C |

| | |
|------------------------------|--------------------|
| Sensor quality | AISI 316Ti |
| Housing quality | V4A (1.4571) |
| Mechanical connection | G 1/4" |
| Electrical connection | connector, M12 x 1 |
| Pressure resistance | 100 bar |

Types and data – selection table

| Type | Output function | w | d |
|-----------------------|-----------------|------|------|
| FCS-G1/4A4-AP8X-H1141 | —, PNP | w108 | d504 |
| FCS-G1/4A4-ARX-H1140 | —, relay output | w109 | d504 |

G1/2" – stainless steel A4 – M12 x 1 plug connection



General data

| | |
|------------------------------|--------------|
| Operating voltage | 21...26 VDC |
| Medium | liquids |
| Oil operating range | 3...300 cm/s |
| Operating range water | 1...150 cm/s |
| Medium temperature | -20...80 °C |

| | |
|------------------------------|--------------------|
| Sensor quality | AISI 316Ti |
| Housing quality | V4A (1.4571) |
| Mechanical connection | G 1/2" |
| Electrical connection | connector, M12 x 1 |
| Pressure resistance | 100 bar |

Types and data – selection table

| Type | Output function | w | d |
|-----------------------|-----------------|------|------|
| FCS-G1/2A4-AP8X-H1141 | —, PNP | w108 | d505 |
| FCS-G1/2A4-AN8X-H1141 | —, NPN | w110 | d505 |

G1/2" – Dyflor – M12 x 1 plug connection



| | | | |
|------------------------------|-----------------------|------------------------------|--------------------|
| Type | FCS-G1/2DY-AP8X-H1141 | Sensor quality | PVDF |
| Operating voltage | 21...26 VDC | Housing quality | PVDF |
| Medium | liquids | Mechanical connection | G 1/2" |
| Oil operating range | 2...100 cm/s | Electrical connection | connector, M12 x 1 |
| Operating range water | 1...70 cm/s | Pressure resistance | 5 bar |
| Medium temperature | -10...80 °C | Wiring diagram | w108 |
| Output function | —, PNP | Dimension drawing | d505 |

G1/2" – Dyflor – Cable connection



| | | | |
|------------------------------|-----------------|------------------------------|--------|
| Type | FCS-G1/2DY-AP8X | Sensor quality | PVDF |
| Operating voltage | 21...26 VDC | Housing quality | PVDF |
| Medium | liquids | Mechanical connection | G 1/2" |
| Oil operating range | 2...100 cm/s | Electrical connection | cable |
| Operating range water | 1...70 cm/s | Pressure resistance | 5 bar |
| Medium temperature | -10...80 °C | Wiring diagram | w111 |
| Output function | —, PNP | Dimension drawing | d506 |

GL1/2" – stainless steel A4 – M12 x 1 plug connection



| | | | |
|------------------------------|------------------------|------------------------------|--------------------|
| Type | FCS-GL1/2A4-AP8X-H1141 | Sensor quality | AISI 316Ti |
| Operating voltage | 21...26 VDC | Housing quality | V4A (1.4571) |
| Medium | liquids | Mechanical connection | G 1/2" length |
| Oil operating range | 3...300 cm/s | Electrical connection | connector, M12 x 1 |
| Operating range water | 1...150 cm/s | Pressure resistance | 100 bar |
| Medium temperature | -20...80 °C | Wiring diagram | w108 |
| Output function | —, PNP | Dimension drawing | d507 |

N1/2" – stainless steel A4 – M12 x 1 plug connection



| | | | |
|------------------------------|-----------------------|------------------------------|--------------------|
| Type | FCS-N1/2A4-AP8X-H1141 | Sensor quality | AISI 316Ti |
| Operating voltage | 21...26 VDC | Housing quality | V4A (1.4571) |
| Medium | liquids | Mechanical connection | NPT 1/2" |
| Oil operating range | 3...300 cm/s | Electrical connection | connector, M12 x 1 |
| Operating range water | 1...150 cm/s | Pressure resistance | 100 bar |
| Medium temperature | -20...80 °C | Wiring diagram | w108 |
| Output function | —, PNP | Dimension drawing | d508 |

Varivent – stainless steel A4 – M12 x 1 plug connection



| | | | |
|------------------------------|--------------------------|------------------------------|--------------------|
| Type | FCS-68A4-AP8X-H1141/D003 | Sensor quality | AISI 316L |
| Operating voltage | 21...26 VDC | Housing quality | V4A (1.4404) |
| Medium | liquids | Mechanical connection | Varivent |
| Oil operating range | 3...300 cm/s | Electrical connection | connector, M12 x 1 |
| Operating range water | 1...150 cm/s | Pressure resistance | 10 bar |
| Medium temperature | 0...80 °C | Wiring diagram | w108 |
| Output function | —, PNP | Dimension drawing | d509 |

1 1/2" TriClamp – stainless steel A4 – M12 x 1 plug connection



| | | | |
|------------------------------|--------------------------|------------------------------|--------------------|
| Type | FCS-50A4-AP8X-H1141/D014 | Sensor quality | AISI 316L |
| Operating voltage | 21...26 VDC | Housing quality | V4A (1.4404) |
| Medium | liquids | Mechanical connection | Tri-Clamp 1 1/2" |
| Oil operating range | 3...300 cm/s | Electrical connection | connector, M12 x 1 |
| Operating range water | 1...150 cm/s | Pressure resistance | 10 bar |
| Medium temperature | 0...80 °C | Wiring diagram | w108 |
| Output function | —, PNP | Dimension drawing | d510 |

Compact insertion devices for liquid media – plastic

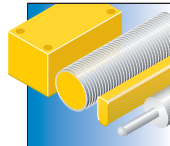


The compact devices incorporate sensor and signal processor. They are mounted with a T-piece, a weld-on adapter or with a matching adapter block. The probe is inserted in the pipe and has direct contact with the medium. The integrated LED chain indicates the current flow state. The sensors are available either with transistor, relay switching or analog current output. They are also available with different mechanical process connections.

Features

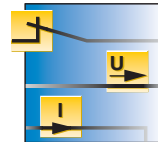
- Insertion flow sensor in a plastic housing
- Sensor and signal processor enclosed in the housing
- Ideal for all pipe diameters of DN20 and larger
- Adjustable to flow speeds between 1...300 cm/s
- Switchpoint freely adjustable within the operating range
- LED chain for status indication
- Transistor or relay output
- Chemical-resistant materials
- Pressure-resistant up to 100 bar

Properties



Design

Compact insertion flow sensor, for pipe diameters of DN20 and larger



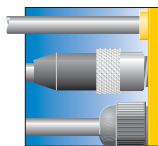
Electrical versions

PNP/NPN transistor output or relay output (change-over)



Monitoring range

Adjustable to flow speeds in a range between 1...300 cm/s



Electrical connections

Via A-coded M12 x 1 plug connection or connection cable



Materials

plastic housing, sensor material stainless steel 1.4571 (A4)



Special features

Switchpoint adjusted via potentiometer, LED chain for status indication

G1/4" – stainless steel A4 – M12 x 1 plug connection



| | | | |
|------------------------------|------------------------|------------------------------|--------------------|
| Type | FCS-G1/4A4P-AP8X-H1141 | Sensor quality | AISI 316Ti |
| Operating voltage | 21...26 VDC | Housing quality | PBT |
| Medium | liquids | Mechanical connection | G 1/4" |
| Oil operating range | 3...300 cm/s | Electrical connection | connector, M12 x 1 |
| Operating range water | 1...150 cm/s | Pressure resistance | 100 bar |
| Medium temperature | -20...80 °C | Wiring diagram | w108 |
| Output function | —, PNP | Dimension drawing | d511 |

G1/2" – stainless steel A4 – M12 x 1 plug connection





| | | | |
|------------------------------|------------------------|------------------------------|--------------------|
| Type | FCS-G1/2A4P-AP8X-H1141 | Sensor quality | AISI 316Ti |
| Operating voltage | 21...26 VDC | Housing quality | PBT |
| Medium | liquids | Mechanical connection | G 1/2" |
| Oil operating range | 3...300 cm/s | Electrical connection | connector, M12 x 1 |
| Operating range water | 1...150 cm/s | Pressure resistance | 100 bar |
| Medium temperature | -20...80 °C | Wiring diagram | w108 |
| Output function | —, PNP | Dimension drawing | d512 |

G1/2" – stainless steel A4 – Cable connection




| | | | |
|------------------------------|--------------|------------------------------|---------|
| General data | | Housing quality | PBT |
| Medium | liquids | Mechanical connection | G 1/2" |
| Oil operating range | 3...300 cm/s | Electrical connection | cable |
| Operating range water | 1...150 cm/s | Pressure resistance | 100 bar |
| Medium temperature | -20...80 °C | | |
| Sensor quality | AISI 316Ti | | |

Types and data – selection table

| Type | Operating voltage | Output function | w | d |
|----------------------------|-------------------|---|------|------|
| FCS-G1/2A4P-VRX/24VDC | 19.2...28.8 VDC |  , relay output | w112 | d513 |
| FCS-G1/2A4P-AP8X/D092 1.5M | 21...26 VDC |  , NPN | w110 | d514 |


GL1/2" – stainless steel A4 – M12 x 1 plug connection



| | | | |
|------------------------------|---|------------------------------|--------------------|
| Type | FCS-GL1/2A4P-AP8X-H1141 | Sensor quality | AISI 316Ti |
| Operating voltage | 21...26 VDC | Housing quality | PBT |
| Medium | liquids | Mechanical connection | G 1/2" length |
| Oil operating range | 3...300 cm/s | Electrical connection | connector, M12 x 1 |
| Operating range water | 1...150 cm/s | Pressure resistance | 100 bar |
| Medium temperature | -20...80 °C | Wiring diagram | w108 |
| Output function |  , PNP | Dimension drawing | d515 |

GL1/2" – stainless steel A4 – Cable connection



| | | | |
|------------------------------|--|------------------------------|---------------|
| Type | FCS-GL1/2A4P-VRX/230VAC | Sensor quality | AISI 316Ti |
| Operating voltage | 195...264 VAC | Housing quality | PBT |
| Medium | liquids | Mechanical connection | G 1/2" length |
| Oil operating range | 3...300 cm/s | Electrical connection | cable |
| Operating range water | 1...150 cm/s | Pressure resistance | 100 bar |
| Medium temperature | -20...80 °C | Wiring diagram | w113 |
| Output function |  , relay output | Dimension drawing | d516 |

N1/2" – stainless steel A4 – M12 x 1 plug connection



| | | | |
|------------------------------|------------------------|------------------------------|--------------------|
| Type | FCS-N1/2A4P-AP8X-H1141 | Sensor quality | AISI 316Ti |
| Operating voltage | 21...26 VDC | Housing quality | PBT |
| Medium | liquids | Mechanical connection | NPT 1/2" |
| Oil operating range | 3...300 cm/s | Electrical connection | connector, M12 x 1 |
| Operating range water | 1...150 cm/s | Pressure resistance | 100 bar |
| Medium temperature | -20...80 °C | Wiring diagram | w108 |
| Output function | —, PNP | Dimension drawing | d517 |

Insertion flow sensors for liquid media

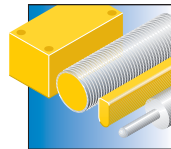


The insertion flow sensors are operated with an external signal processor. They are mounted with a T-piece, a weld-on adapter or with a matching adapter block. The probe is inserted in the pipe and has direct contact with the medium. The integrated LED chain indicates the current flow state. The sensors are available with transistor, relay or analog current output, depending on the signal processor used. They are also available with different mechanical process connections and probe lengths.

Features

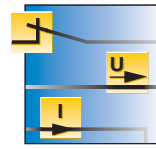
- Insertion flow sensors
- Separate sensor and signal processor
- Values adjusted and displayed at the signal processor
- Ideal for all pipe diameters of DN20 and larger
- Adjustable to flow speeds between 1...300 cm/s
- Switchpoint freely adjustable via potentiometer within the operating range
- Transistor, relay or current output
- High temperature version up to +120 °C
- Chemical resistant materials

Properties



Design

Insertion flow sensors, ideal for pipe diameters of DN20 and larger



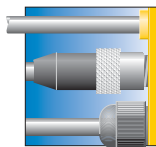
Electrical versions

Transistor, relay or analog current output 4...20 mA



Monitoring range

Adjustable to flow speeds in a range between 1...300 cm/s



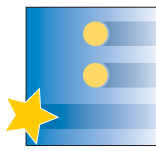
Electrical connections

Via A-coded M12 x 1 plug connection or sensor cable



Materials

Sensor material stainless steel 1.4571 (A4) or teflon (PTFE)



Special features

Pressure-resistant up to 100 bar, high-pressure version up to 500 bar, high-temperature version up to +120 °C

G1/4" – stainless steel A4 – M12 x 1 plug connection



| | | | |
|------------------------------|---------------------|------------------------------|--------------------|
| Type | FCS-G1/4A4-NA-H1141 | Housing quality | V4A (1.4571) |
| Medium | liquids | Mechanical connection | G 1/4" |
| Oil operating range | 3...300 cm/s | Electrical connection | connector, M12 x 1 |
| Operating range water | 1...150 cm/s | Pressure resistance | 100 bar |
| Medium temperature | -20...80 °C | Wiring diagram | w114 |
| Sensor quality | AISI 316Ti | Dimension drawing | d518 |

G1/4" – Teflon – Cable connection



| | | | |
|------------------------------|--------------|------------------------------|-----------|
| Type | FCS-G1/4T-NA | Housing quality | PTFE |
| Medium | liquids | Mechanical connection | G 1/4" |
| Oil operating range | 2...100 cm/s | Electrical connection | FEP cable |
| Operating range water | 1...70 cm/s | Pressure resistance | 5 bar |
| Medium temperature | -10...70 °C | Wiring diagram | w115 |
| Sensor quality | PTFE | Dimension drawing | d519 |

G1/2" – stainless steel A4 – M12 x 1 plug connection



| | | | |
|------------------------------|---------------------|------------------------------|--------------------|
| Type | FCS-G1/2A4-NA-H1141 | Housing quality | V4A (1.4571) |
| Medium | liquids | Mechanical connection | G 1/2" |
| Oil operating range | 3...300 cm/s | Electrical connection | connector, M12 x 1 |
| Operating range water | 1...150 cm/s | Pressure resistance | 100 bar |
| Medium temperature | -20...80 °C | Wiring diagram | w114 |
| Sensor quality | AISI 316Ti | Dimension drawing | d520 |

GL1/2 – stainless steel A4 – M12 x 1 plug connection



| | | | |
|------------------------------|----------------------|------------------------------|--------------------|
| Type | FCS-GL1/2A4-NA-H1141 | Housing quality | V4A (1.4571) |
| Medium | liquids | Mechanical connection | G 1/2" length |
| Oil operating range | 3...300 cm/s | Electrical connection | connector, M12 x 1 |
| Operating range water | 1...150 cm/s | Pressure resistance | 100 bar |
| Medium temperature | -20...80 °C | Wiring diagram | w114 |
| Sensor quality | AISI 316Ti | Dimension drawing | d521 |

GL1/2 – Teflon – Cable connection



| | | | |
|------------------------------|---------------|------------------------------|---------------|
| Type | FCS-GL1/2T-NA | Housing quality | PTFE |
| Medium | liquids | Mechanical connection | G 1/2" length |
| Oil operating range | 2...100 cm/s | Electrical connection | FEP cable |
| Operating range water | 1...70 cm/s | Pressure resistance | 5 bar |
| Medium temperature | -10...70 °C | Wiring diagram | w115 |
| Sensor quality | PTFE | Dimension drawing | d522 |

G3/4" – stainless steel A4 – M12 x 1 plug connection



| | | | |
|------------------------------|---------------------|------------------------------|--------------------|
| Type | FCS-G3/4A4-NA-H1141 | Housing quality | V4A (1.4571) |
| Medium | liquids | Mechanical connection | G 3/4" |
| Oil operating range | 3...300 cm/s | Electrical connection | connector, M12 x 1 |
| Operating range water | 1...150 cm/s | Pressure resistance | 100 bar |
| Medium temperature | -20...80 °C | Wiring diagram | w114 |
| Sensor quality | AISI 316Ti | Dimension drawing | d523 |

N1/2" – stainless steel A4 – Cable connection



| | | | |
|------------------------------|---------------|------------------------------|--------------|
| Type | FCS-N1/2A4-NA | Housing quality | V4A (1.4571) |
| Medium | liquids | Mechanical connection | NPT 1/2" |
| Oil operating range | 3...300 cm/s | Electrical connection | PVC cable |
| Operating range water | 1...150 cm/s | Pressure resistance | 100 bar |
| Medium temperature | -20...80 °C | Wiring diagram | w115 |
| Sensor quality | AISI 316Ti | Dimension drawing | d524 |

N3/4" – stainless steel A4 – M12 x 1 plug connection



| | | | |
|------------------------------|---------------------|------------------------------|--------------------|
| Type | FCS-N3/4A4-NA-H1141 | Housing quality | V4A (1.4571) |
| Medium | liquids | Mechanical connection | NPT 3/4" |
| Oil operating range | 3...300 cm/s | Electrical connection | connector, M12 x 1 |
| Operating range water | 1...150 cm/s | Pressure resistance | 100 bar |
| Medium temperature | -20...80 °C | Wiring diagram | w114 |
| Sensor quality | AISI 316Ti | Dimension drawing | d525 |

DN25 – Dairy screw connection – A4 – Cable connection



| | | | |
|------------------------------|--------------------|------------------------------|---------------------------------------|
| Type | FCS-DN25A4-NA/D100 | Housing quality | V4A (1.4404) |
| Medium | liquids | Mechanical connection | threaded tube connection per DIN11851 |
| Oil operating range | 3...300 cm/s | Electrical connection | FEP cable |
| Operating range water | 1...150 cm/s | Pressure resistance | 10 bar |
| Medium temperature | 10...120 °C | Wiring diagram | w115 |
| Sensor quality | AISI 316L | Dimension drawing | d526 |

1 1/2" TriClamp – stainless steel A4 – Cable connection



| | | | |
|------------------------------|------------------|------------------------------|------------------|
| Type | FCS-50A4-NA/D014 | Housing quality | V4A (1.4404) |
| Medium | liquids | Mechanical connection | Tri-Clamp 1 1/2" |
| Oil operating range | 3...300 cm/s | Electrical connection | FEP cable |
| Operating range water | 1...150 cm/s | Pressure resistance | 10 bar |
| Medium temperature | 10...120 °C | Wiring diagram | w115 |
| Sensor quality | AISI 316L | Dimension drawing | d527 |

Varivent – stainless steel A4 – Cable connection



| | | | |
|------------------------------|------------------|------------------------------|--------------|
| Type | FCS-68A4-NA/D011 | Housing quality | V4A (1.4571) |
| Medium | liquids | Mechanical connection | Varivent |
| Oil operating range | 3...300 cm/s | Electrical connection | PVC cable |
| Operating range water | 1...150 cm/s | Pressure resistance | 10 bar |
| Medium temperature | 10...120 °C | Wiring diagram | w115 |
| Sensor quality | AISI 316Ti | Dimension drawing | d528 |

Compact inline devices for liquid media

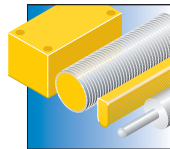


The compact inline devices incorporate sensor and signal processor. They have very fast response times and are suited for simple control tasks, such as monitoring low flow rates. For this purpose they are mounted directly in pipes. The integrated LED chain indicates the current flow state. The sensors are available either with transistor, relay switching or analog current output. They are also available with different mechanical process connections.

Features

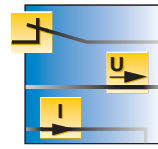
- Inline flow sensor in a plastic housing
- Sensor and signal processor enclosed in the housing
- Ideal for smaller pipe diameters of up to DN20
- Adjustable to flow rates between 0.001...30 l/min
- Switchpoint freely adjustable within the operating range
- LED chain for status indication
- Transistor, relay or analog current output
- No disturbing components, free pipe profile, no pressure loss
- Fast response times within seconds

Properties



Design

Inline flow sensors, ideal for all pipe diameters of up to DN20.



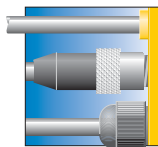
Electrical versions

PNP transistor, relay or analog current output 4...20 mA



Monitoring range

Adjustable to flow rates between 1 ml/min ... 30 l/min.



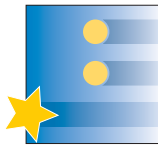
Electrical connections

M12 x 1 plug connection, A-coded



Materials

plastic housing, sensor material stainless steel 1.4571 (A4)



Special features

Switchpoint adjusted via potentiometer, LED chain for status indication

4 mm pipe connection – stainless steel A4 – M12 x 1 plug connection



General data

| | | | |
|-----------------------------|-------------------|------------------------------|--------------------|
| Operating voltage | 21...26 VDC | Housing quality | PBT |
| Medium | liquids | Mechanical connection | tube 4 mm |
| Flow operating range | 0.001...0.2 l/min | Electrical connection | connector, M12 x 1 |
| Medium temperature | 0...60 °C | Pressure resistance | 1 bar |
| Sensor quality | AISI 316Ti | Ambient temperature | 0...60 °C |

Types and data – selection table

| Type | Output function | w | d |
|-------------------------|--------------------------|------|------|
| FCI-TCDO4A4P-AP8X-H1141 | —, PNP | w108 | d529 |
| FCI-TCDO4A4P-LIX-H1141 | 4...20 mA, analog output | w116 | d530 |
| FCI-TCDO4A4P-ARX-H1140 | —, relay output | w109 | d529 |

TriClamp DN 10 – stainless steel A4 – M12 x 1 plug connection



General data

| | | | |
|-----------------------------|---------------|------------------------------|--------------------|
| Operating voltage | 21...26 VDC | Housing quality | PBT |
| Medium | liquids | Mechanical connection | Tri-Clamp DN 10 |
| Flow operating range | 0.1...6 l/min | Electrical connection | connector, M12 x 1 |
| Sensor quality | AISI 316L | Pressure resistance | 20 bar |
| | | Ambient temperature | 0...60 °C |

Types and data – selection table

| Type | Medium temperature | Output function | w | d |
|-------------------------|--------------------|--------------------------|------|------|
| FCI-34D10A4P-ARX-H1140 | -20...80 °C | —, relay output | w109 | d531 |
| FCI-34D10A4P-LIX-H1141 | -20...60 °C | 4...20 mA, analog output | w116 | d532 |
| FCI-34D10A4P-AP8X-H1141 | -20...80 °C | —, PNP | w108 | d531 |

G1/4" – Male – stainless steel A4 – M12 x 1 plug connection



| | | | |
|-----------------------------|--------------------------|------------------------------|--------------------|
| Type | FCI-D04A4P-LIX-H1141 | Housing quality | PBT |
| Operating voltage | 21...26 VDC | Mechanical connection | G 1/4" |
| Medium | liquids | Electrical connection | connector, M12 x 1 |
| Flow operating range | 0.01...1 l/min | Pressure resistance | 20 bar |
| Medium temperature | -20...80 °C | Ambient temperature | 0...60 °C |
| Output function | 4...20 mA, analog output | Wiring diagram | w116 |
| Sensor quality | AISI 316Ti | Dimension drawing | d533 |

G1/4" – Female – Ceramics/Teflon – M12 x 1 plug connection



| | | | |
|-----------------------------|--------------------------------------|------------------------------|----------------------|
| General data | | Housing quality | PBT |
| Operating voltage | 21...26 VDC | Mechanical connection | G 1/4" female thread |
| Medium | liquids | Electrical connection | connector, M12 x 1 |
| Flow operating range | 0.02...3 l/min | Pressure resistance | 5 bar |
| Medium temperature | 0...60 °C | Ambient temperature | 0...60 °C |
| Sensor quality | Al ₂ O ₃ /PTFE | | |

Types and data – selection table

| Type | Output function | w | d |
|-----------------------|--------------------------|------|------|
| FCI-D06CTP-ARX-H1140 | —, relay output | w109 | d534 |
| FCI-D06CTP-LIX-H1141 | 4...20 mA, analog output | w116 | d535 |
| FCI-D06CTP-AP8X-H1141 | —, PNP | w108 | d534 |

G1/4" – Male – stainless steel A4 – M12 x 1 plug connection



| | | | |
|-----------------------------|----------------------|------------------------------|--------------------|
| Type | FCI-D10A4P-ARX-H1140 | Housing quality | PBT |
| Operating voltage | 21...26 VDC | Mechanical connection | G 1/4" |
| Medium | liquids | Electrical connection | connector, M12 x 1 |
| Flow operating range | 0.1...6 l/min | Pressure resistance | 20 bar |
| Medium temperature | -20...80 °C | Ambient temperature | 0...60 °C |
| Output function | —, relay output | Wiring diagram | w109 |
| Sensor quality | AISI 316Ti | Dimension drawing | d536 |

G1/2" – Male – stainless steel A4 – M12 x 1 plug connection



| | | | |
|-----------------------------|-----------------------|------------------------------|--------------------|
| Type | FCI-D15A4P-AP8X-H1141 | Housing quality | PBT |
| Operating voltage | 21...26 VDC | Mechanical connection | G 1/2" |
| Medium | liquids | Electrical connection | connector, M12 x 1 |
| Flow operating range | 3...20 l/min | Pressure resistance | 20 bar |
| Medium temperature | -20...80 °C | Ambient temperature | 0...60 °C |
| Output function | —, PNP | Wiring diagram | w108 |
| Sensor quality | AISI 316Ti | Dimension drawing | d537 |

G3/4" – Male – stainless steel A4 – M12 x 1 plug connection



| | | | |
|-----------------------------|-----------------------|------------------------------|--------------------|
| Type | FCI-D20A4P-AP8X-H1141 | Housing quality | PBT |
| Operating voltage | 21...26 VDC | Mechanical connection | G 3/4" |
| Medium | liquids | Electrical connection | connector, M12 x 1 |
| Flow operating range | 4...30 l/min | Pressure resistance | 20 bar |
| Medium temperature | -20...80 °C | Ambient temperature | 0...60 °C |
| Output function | —, PNP | Wiring diagram | w108 |
| Sensor quality | AISI 316Ti | Dimension drawing | d538 |

Inline flow sensors for liquid media

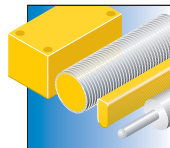


The inline flow sensors are operated with an external signal processor. For this purpose they are mounted directly in pipes. They have very fast response times and are suited for simple control tasks, such as monitoring low flow rates. The integrated LED chain indicates the current flow state. The sensors are available with transistor, relay or analog current output, depending on the signal processor used. They are also available with different mechanical process connections.

Features

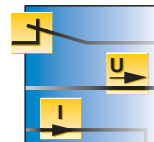
- Inline flow sensors
- Separate sensor and signal processor
- Values adjusted and displayed at the signal processor
- Ideal for small pipe diameters of up to DN10
- Adjustable to flow rates between 5...900 ml/min
- Switchpoint freely adjustable within the operating range
- Transistor, relay or current output
- No disturbing components, free pipe profile, no pressure loss
- Fast response times within seconds

Properties



Design

Inline flow sensors, ideal for all pipe diameters of up to DN10



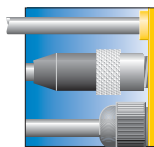
Electrical versions

Transistor, relay or analog current output 4...20 mA



Monitoring range

Adjustable to flow rates between 5 ... 900 ml/min



Electrical connections

M12 x 1 plug connection, A-coded



Materials

Sensor material stainless steel 1.4571 (A4) or Delrin



Special features

Pressure-resistant 5, 10, or 16 bar, temperature range -20...+80 °C

M12x1.5 – Female – stainless steel A4 – M12 x 1 plug connection



| | | | |
|-----------------------------|------------------------|------------------------------|--------------------|
| Type | FCI-D03A4-NA-H1141/M12 | Housing quality | V4A (1.4571) |
| Medium | liquids | Mechanical connection | M12 x 1.5 |
| Oil operating range | 15...300 ml/min | Electrical connection | connector, M12 x 1 |
| Flow operating range | 0.005...0.15 l/min | Pressure resistance | 10 bar |
| Medium temperature | -20...80 °C | Wiring diagram | w114 |
| Sensor quality | AISI 316Ti | Dimension drawing | d539 |

M16x1.5 – Female – stainless steel A4 – M12 x 1 plug connection



| | | | |
|-----------------------------|------------------------|------------------------------|--------------------|
| Type | FCI-D09A4-NA-H1141/M16 | Housing quality | V4A (1.4571) |
| Medium | liquids | Mechanical connection | M16 x 1.5 |
| Oil operating range | 90...1800 ml/min | Electrical connection | connector, M12 x 1 |
| Flow operating range | 0.03...0.9 l/min | Pressure resistance | 16 bar |
| Medium temperature | -20...80 °C | Wiring diagram | w114 |
| Sensor quality | AISI 316Ti | Dimension drawing | d540 |

Compact insertion devices for gaseous media

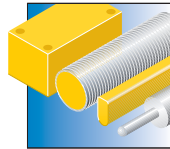


The compact devices incorporate sensor and signal processor. They are mounted with a T-piece, a weld-on adapter or with a matching adapter block. The probe is inserted in the pipe and has direct contact with the medium. The integrated LED chain indicates the current flow state. The sensors are available either with transistor, relay switching or analog current output. They are also available with different mechanical process connections.

Features

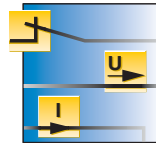
- Insertion flow sensor in a plastic housing
- Sensor and signal processor enclosed in the housing
- Ideal for all pipe diameters of DN20 and larger
- Adjustable to flow speeds between 0.5...30 m/s
- Switchpoint freely adjustable within the operating range
- LED chain for status indication
- Transistor, relay or analog current output
- Pressure-resistant up to 30 bar

Properties



Design

Compact insertion flow sensors, ideal for all pipe diameters of DN20 and larger.



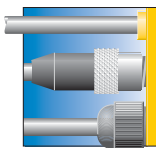
Electrical versions

PNP transistor, relay or current output
4...20 mA



Monitoring range

Adjustable to flow speeds between 0.5 ... 30 m/s



Electrical connections

Via A-coded M12 x 1 plug connection or connection cable



Materials

Sensor material stainless steel 1.4571 (A4)



Special features

Switchpoint adjusted via potentiometer, LED chain for status indication, pressure-resistant up to 30 bar

GL1/2" – stainless steel A2 – M12 x 1 plug connection



General data

| | |
|---------------------|--------------|
| Operating voltage | 21...26 VDC |
| Medium | air |
| Air operating range | 0.5...30 m/s |
| Medium temperature | -20...80 °C |
| Sensor quality | AISI 303 |

| | |
|-----------------------|--------------------|
| Housing quality | PBT |
| Mechanical connection | G 1/2" length |
| Electrical connection | connector, M12 x 1 |
| Pressure resistance | 30 bar |

Types and data – selection table

| Type | Output function | w | d |
|---------------------------|--------------------------|------|------|
| FCS-GL1/2A2P-AP8X-H1141/A | —, PNP | w108 | d541 |
| FCS-GL1/2A2P-LIX-H1141/A | 4...20 mA, analog output | w116 | d541 |

G 1" – Female – Coupling nut – stainless steel A2 – M12 x 1 connector



| | |
|---------------------|-------------------------------|
| Type | FCS-HA2P-VRX/230VAC/ AL115 |
| Operating voltage | 195...264 VAC |
| Medium | air |
| Air operating range | 0.5...30 m/s |
| Medium temperature | -20...80 °C |
| Output function | —, relay output |
| Sensor quality | AISI 303 |

| | |
|-----------------------|------------------------------------|
| Housing quality | PBT-GF30-V0 |
| Mechanical connection | G 1" female thread per DIN 3852 |
| Electrical connection | cable |
| Pressure resistance | 3 bar |
| Wiring diagram | w113 |
| Dimension drawing | d543 |

G 1" – Female – with coupling nut – stainless steel A2 – M12 x 1 plug connection



| | |
|---------------------|--------------------------|
| Type | FCS-HA2P-LIX-H1141/AL115 |
| Operating voltage | 21...26 VDC |
| Medium | air |
| Air operating range | 0.5...30 m/s |
| Medium temperature | -20...80 °C |
| Output function | 4...20 mA, analog output |
| Sensor quality | AISI 303 |

| | |
|-----------------------|------------------------------------|
| Housing quality | PBT |
| Mechanical connection | G 1" female thread per DIN 3852 |
| Electrical connection | connector, M12 x 1 |
| Pressure resistance | 3 bar |
| Wiring diagram | w116 |
| Dimension drawing | d542 |

w Wiring diagrams on page 832 ff

d Dimension drawings on page 842 ff

a Accessories on page 786 ff

Insertion flow sensors for gaseous media

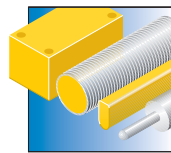


The insertion flow sensors are operated with an external signal processor. They are mounted with a T-piece, a weld-on adapter or with a matching adapter block. The probe is inserted in the pipe and has direct contact with the medium. The integrated LED chain indicates the current flow state. The sensors are available with transistor, relay or analog current output, depending on the signal processor used. They are also available with different mechanical process connections and probe lengths. In addition, we offer sensors for high-temperature applications.

Features

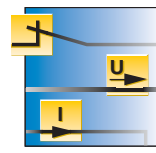
- Insertion flow sensors
- Separate sensor and signal processor
- Values adjusted and displayed at the signal processor
- Ideal for all pipe diameters of up to DN20
- Adjustable to flow speeds between 0.5...30 m/s
- Switchpoint freely adjustable within the operating range
- Transistor, relay or current output
- Pressure-resistant up to 30 bar

Properties



Design

Insertion flow sensors, ideal for all pipe diameters of DN20 and larger.



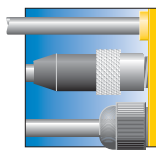
Electrical versions

Transistor, relay or analog current output 4...20 mA



Monitoring range

Adjustable to flow speeds between 0.5 ... 30 m/s



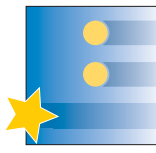
Electrical connections

Via A-coded M12 x 1 plug connection or connection cable



Materials

Sensor material stainless steel 1.4571 (A4)



Special features

High-temperature version up to +120 °C

GL1/2 – stainless steel A2 – M12 x 1 plug connection



| | | | |
|----------------------------|------------------------|------------------------------|--------------------|
| Type | FCS-GL1/2A2-NA-H1141/A | Mechanical connection | G 1/2" length |
| Medium | air | Electrical connection | connector, M12 x 1 |
| Air operating range | 0.5...30 m/s | Pressure resistance | 30 bar |
| Medium temperature | -20...80 °C | Wiring diagram | w114 |
| Sensor quality | AISI 303 | Dimension drawing | d544 |
| Housing quality | V2A (1.4305) | | |

GL1/2 – stainless steel A2 – Cable connection



| | | | |
|----------------------------|-----------------------|------------------------------|---------------|
| Type | FCS-GL1/2A2-NA/A/D100 | Mechanical connection | G 1/2" length |
| Medium | air | Electrical connection | FEP cable |
| Air operating range | 0.5...30 m/s | Pressure resistance | 30 bar |
| Medium temperature | 10...120 °C | Wiring diagram | w115 |
| Sensor quality | AISI 303 | Dimension drawing | d545 |
| Housing quality | V2A (1.4305) | | |

Compact inline device for gaseous media

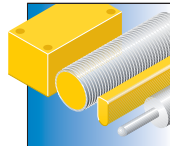


The compact devices incorporate sensor and signal processor. Inline sensors have very fast response times and are suited for simple control tasks, such as monitoring low flow rates. For this purpose they are mounted directly in pipes. The integrated LED chain indicates the current flow state. The sensors are available either with transistor, relay switching or analog current output. They are also available with different mechanical process connections.

Features

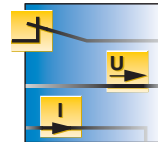
- Inline flow sensor in a plastic housing
- Sensor and signal processor enclosed in the housing
- Ideal for small pipe diameters of up to DN10
- Adjustable to flow speeds between 0.5 ... 40 m/s
- Switchpoint freely adjustable within the operating range
- LED chain for status indication
- Transistor or analog current output
- No disturbing components, free pipe profile, no pressure loss
- Fast response times within seconds

Properties



Design

Inline flow sensors, ideal for all pipe diameters of up to DN10.



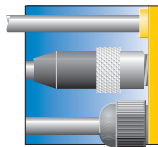
Electrical versions

Transistor or analog current output
4...20 mA



Monitoring range

Adjustable to flow speeds between 0.5 ... 40 m/s



Electrical connections

M12 x 1 plug connection, A-coded



Materials

plastic housing, sensor material stainless steel 1.4571 (A4)



Special features

Switchpoint adjustable via potentiometer, LED chain for status indication

G1/4" – Male – stainless steel A4 – M12 x 1 plug connection



General data

| | |
|----------------------------|--------------|
| Operating voltage | 21...26 VDC |
| Medium | air |
| Air operating range | 0.5...40 m/s |
| Medium temperature | -20...80 °C |
| Sensor quality | AISI 316Ti |

| | |
|------------------------------|--------------------|
| Housing quality | PBT |
| Mechanical connection | G 1/4" |
| Electrical connection | connector, M12 x 1 |
| Pressure resistance | 20 bar |
| Ambient temperature | 0...60 °C |

Types and data – selection table

| Type | Output function | w | d |
|-------------------------|----------------------------|------|------|
| FCI-D10A4P-AP8X-H1141/A | —, PNP | w108 | d536 |
| FCI-D10A4P-LIX-H1141/A | 4 ... 20 mA, analog output | w116 | d536 |

Insertion flow sensors for liquid media – Ex zone 1

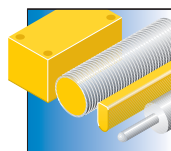


Insertion flow sensors for liquid media are also available for Ex zone 1. The devices are operated with an external Ex signal processor. They are mounted with a T-piece, a weld-on adapter or with a matching adapter block. The probe is inserted in the pipe and has direct contact with the medium. The integrated LED chain indicates the current flow state. The devices are available with transistor or relay output, depending on the type of signal processor used. They are also available with different mechanical process connections and probe lengths.

Features

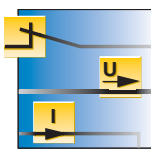
- Insertion flow sensor for Ex zone 1
- Separate sensor and signal processor
- Values adjusted and displayed at the Ex signal processor
- Ideal for all pipe diameters of DN20 and larger
- Adjustable to flow speeds between 1...200 cm/s
- Switchpoint freely adjustable via potentiometer within the operating range
- Transistor or relay output
- Pressure-resistant up to 60 bar
- High temperature version up to +120 °C
- High pressure version up to 500 bar
- Chemical-resistant materials

Properties



Design

Insertion flow sensors, ideal for all pipe diameters of DN20 and larger.



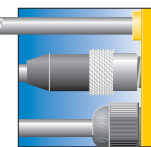
Electrical versions

Transistor or relay output



Monitoring range

Adjustable to flow speeds between 1...200 cm/s



Electrical connections

Via A-coded M12 x 1 plug connection or connection cable



Materials

Sensor material stainless steel 1.4571 (A4)



Special features

For Ex zone 1, high-pressure version 500 bar max., high-temperature version +120 °C max.

G1/4" – stainless steel A4 – M12 x 1 plug connection



| | | | |
|------------------------------|-----------------------|------------------------------|--------------------|
| Type | FCS-G1/4A4-NAEX-H1141 | Housing quality | V4A (1.4571) |
| Protection type | Ex ib IIC | Mechanical connection | G 1/4" |
| Medium | liquids | Electrical connection | connector, M12 x 1 |
| Oil operating range | 3...200 cm/s | Pressure resistance | 60 bar |
| Operating range water | 1...100 cm/s | Wiring diagram | w117 |
| Medium temperature | -20...85 °C | Dimension drawing | d518 |
| Sensor quality | AISI 316Ti | | |

G1/4" – stainless steel A4 – Cable connection



| | | | |
|------------------------------|-----------------|------------------------------|--------------|
| Type | FCS-G1/4A4-NAEX | Housing quality | V4A (1.4571) |
| Protection type | Ex ib IIC | Mechanical connection | G 1/4" |
| Medium | liquids | Electrical connection | PUR cable |
| Oil operating range | 3...200 cm/s | Pressure resistance | 60 bar |
| Operating range water | 1...100 cm/s | Wiring diagram | w118 |
| Medium temperature | -20...85 °C | Dimension drawing | d546 |
| Sensor quality | AISI 316Ti | | |

G1/2" – stainless steel A4 – M12 x 1 plug connection



| | | | |
|------------------------------|-----------------------|------------------------------|--------------------|
| Type | FCS-G1/2A4-NAEX-H1141 | Housing quality | V4A (1.4571) |
| Protection type | Ex ib IIC | Mechanical connection | G 1/2" |
| Medium | liquids | Electrical connection | connector, M12 x 1 |
| Oil operating range | 3...200 cm/s | Pressure resistance | 60 bar |
| Operating range water | 1...100 cm/s | Wiring diagram | w117 |
| Medium temperature | -20...85 °C | Dimension drawing | d520 |
| Sensor quality | AISI 316Ti | | |

GL1/2" – stainless steel A4 – M12 x 1 plug connection



| | | | |
|------------------------------|------------------------|------------------------------|--------------------|
| Type | FCS-GL1/2A4-NAEX-H1141 | Housing quality | V4A (1.4571) |
| Protection type | Ex ib IIC | Mechanical connection | G 1/2" length |
| Medium | liquids | Electrical connection | connector, M12 x 1 |
| Oil operating range | 3...200 cm/s | Pressure resistance | 60 bar |
| Operating range water | 1...100 cm/s | Wiring diagram | w117 |
| Medium temperature | -20...85 °C | Dimension drawing | d521 |
| Sensor quality | AISI 316Ti | | |

N1/2" – stainless steel A4 – M12 x 1 plug connection



| | | | |
|------------------------------|-----------------------|------------------------------|--------------------|
| Type | FCS-N1/2A4-NAEX-H1141 | Housing quality | V4A (1.4571) |
| Protection type | Ex ib IIC | Mechanical connection | NPT 1/2" |
| Medium | liquids | Electrical connection | connector, M12 x 1 |
| Oil operating range | 3...200 cm/s | Pressure resistance | 60 bar |
| Operating range water | 1...100 cm/s | Wiring diagram | w117 |
| Medium temperature | -20...85 °C | Dimension drawing | d547 |
| Sensor quality | AISI 316Ti | | |

Inline flow sensors for liquid media – Ex zone 1

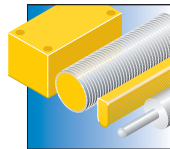


Inline flow sensors for liquid media are also available for Ex zone 1. The devices are operated with an external Ex signal processor. For this purpose they are mounted directly in pipes. They have very fast response times and are suited for simple control tasks, such as monitoring low flow rates. The integrated LED chain indicates the current flow state. A transistor or relay output are available, depending on the type of signal processor used. They are also available with different mechanical process connections.

Features

- Inline flow sensors for Ex zone 1
- Separate sensor and signal processor
- Values adjusted and displayed at the Ex signal processor
- Ideal for small pipe diameters of up to DN10
- Adjustable to flow rates between 10 and 900 ml/min
- Switchpoint freely adjustable within the operating range
- Transistor or relay output
- No disturbing components, free pipe profile, no pressure loss
- Fast response times within seconds
- Pressure-resistant up to 6 bar

Properties



Design

Inline flow sensors, ideal for all pipe diameters of up to DN10.



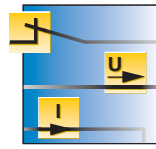
Monitoring range

Adjustable to flow rates between 10 ml/min ... 0.9 l/min



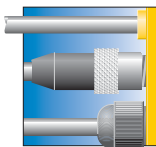
Materials

Sensor material stainless steel 1.4571 (A4)



Electrical versions

Transistor or relay output



Electrical connections

M12 x 1 plug connection, A-coded



Special features

Application in Ex zone 1, pressure resistant up to 6 bar

M12x1.5 – Female – stainless steel A4 – M12 x 1 plug connection



| | | | |
|-----------------------------|------------------------------|------------------------------|--------------------|
| Type | FCI-D03A4-NAEX-H1141/ M12 | Housing quality | V4A (1.4571) |
| Medium | liquids | Mechanical connection | M12 x 1.5 |
| Oil operating range | 25...300 ml/min | Electrical connection | connector, M12 x 1 |
| Flow operating range | 0.01...0.15 l/min. | Pressure resistance | 6 bar |
| Medium temperature | -20...70 °C | Wiring diagram | w117 |
| Sensor quality | AISI 316Ti | Dimension drawing | d539 |

M16x1.5 – Female – stainless steel A4 – M12 x 1 plug connection



| | | | |
|-----------------------------|------------------------------|------------------------------|--------------------|
| Type | FCI-D09A4-NAEX-H1141/ M16 | Housing quality | V4A (1.4571) |
| Medium | liquids | Mechanical connection | M16 x 1.5 |
| Oil operating range | 150...1800 ml/min | Electrical connection | connector, M12 x 1 |
| Flow operating range | 0.05...0.9 l/min. | Pressure resistance | 6 bar |
| Medium temperature | -20...70 °C | Wiring diagram | w117 |
| Sensor quality | AISI 316Ti | Dimension drawing | d540 |

Insertion flow sensors for gaseous media – Ex zone 1

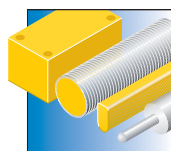


Insertion flow sensors for liquid media are also available for Ex zone 1. The devices are operated with an external Ex signal processor. They are mounted with a T-piece, a weld-on adapter or with a matching adapter block. The probe is inserted in the pipe and has direct contact with the medium. The integrated LED chain indicates the current flow state. A transistor or relay output are available, depending on the type of signal processor used. They are also available with different mechanical process connections and probe lengths.

Features

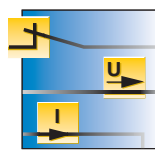
- Insertion flow sensor for Ex zone 1
- Separate sensor and signal processor
- Values adjusted and displayed at the Ex signal processor
- Ideal for all pipe diameters of DN20 and larger
- Adjustable to flow speeds between 2...20 m/s
- Switchpoint freely adjustable within the operating range
- Transistor or relay output
- Pressure-resistant up to 10 bar
- High temperature version up to +120 °C

Properties



Design

Insertion flow sensors, ideal for all pipe diameters of DN20 and larger



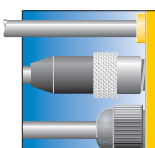
Electrical versions

Transistor or relay output



Monitoring range

Adjustable to flow speeds between 2...20 m/s



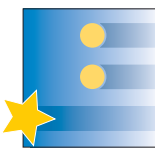
Electrical connections

Via A-coded M12 x 1 plug connection or connection cable



Materials

Sensor material stainless steel 1.4571 (A4)



Special features

Application in Ex zone 1, pressure-resistant up to 10 bar

GL1/2" – stainless steel A4 – Cable connection



| | | | |
|----------------------------|--------------------|------------------------------|---------------|
| Type | FCS-GL1/2A4-NAEX/A | Housing quality | V4A (1.4571) |
| Protection type | Ex ib IIC | Mechanical connection | G 1/2" length |
| Medium | air | Electrical connection | PUR cable |
| Air operating range | 2...20 m/s | Pressure resistance | 10 bar |
| Medium temperature | -20...85 °C | Wiring diagram | w118 |
| Sensor quality | AISI 316Ti | Dimension drawing | d545 |

GL1/2" – stainless steel A4 – M12 x 1 plug connection



| | | | |
|----------------------------|--------------------------|------------------------------|--------------------|
| Type | FCS-GL1/2A4-NAEX-H1141/A | Housing quality | V4A (1.4571) |
| Protection type | Ex ib IIC | Mechanical connection | G 1/2" length |
| Medium | air | Electrical connection | connector, M12 x 1 |
| Air operating range | 2...20 m/s | Pressure resistance | 10 bar |
| Medium temperature | -20...85 °C | Wiring diagram | w117 |
| Sensor quality | AISI 316Ti | Dimension drawing | d544 |

Insertion flow sensors for liquid media – Ex zone 0

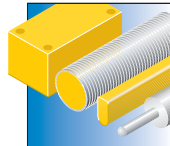


Insertion flow sensors for liquid media are also available for Ex zone 0. The devices are operated with an external Ex signal processor. They are mounted with a T-piece, a weld-on adapter or with a matching adapter block. The probe is inserted in the pipe and has direct contact with the medium. The integrated LED chain indicates the current flow state. A transistor or relay output are available, depending on the type of signal processor used. They are also available with different mechanical process connections and probe lengths.

Features

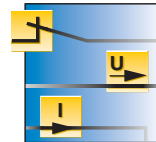
- Insertion flow sensor for Ex zone 0
- Separate sensor and signal processor
- Values adjusted and displayed at the Ex signal processor
- Ideal for all pipe diameters of DN20 and larger
- Adjustable to flow speeds between 1...200 cm/s
- Switchpoint freely adjustable via potentiometer within the operating range
- Transistor or relay output
- Pressure-resistant up to 60 bar
- Chemical resistant materials

Properties



Design

Insertion flow sensors, ideal for all pipe diameters of DN20 and larger.



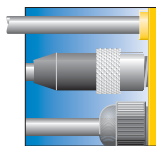
Electrical versions

Transistor or relay output



Monitoring range

Adjustable to flow speeds between 1...200 cm/s



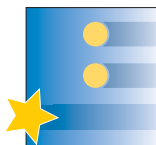
Electrical connections

Via A-coded M12 x 1 plug connection or connection cable



Materials

Sensor material stainless steel 1.4571 (A4)



Special features

Application in Ex zone 0, pressure-resistant up to 60 bar, high-pressure version up to 500 bar, high-temperature version up to +120 °C

G1/4" – stainless steel A4 – Cable connection



| | | | |
|------------------------------|------------------|------------------------------|--------------|
| Type | FCS-G1/4A4-NAEXO | Housing quality | V4A (1.4571) |
| Protection type | Ex ia IIC | Mechanical connection | G 1/4" |
| Medium | liquids | Electrical connection | PUR cable |
| Oil operating range | 3...200 cm/s | Pressure resistance | 60 bar |
| Operating range water | 1...100 cm/s | Wiring diagram | w118 |
| Medium temperature | -20...60 °C | Dimension drawing | d546 |
| Sensor quality | AISI 316Ti | | |

G1/2" – stainless steel A4 – M12 x 1 plug connection



| | | | |
|------------------------------|------------------------|------------------------------|--------------------|
| Type | FCS-G1/2A4-NAEXO-H1141 | Housing quality | V4A (1.4571) |
| Protection type | Ex ia IIC | Mechanical connection | G 1/2" |
| Medium | liquids | Electrical connection | connector, M12 x 1 |
| Oil operating range | 3...200 cm/s | Pressure resistance | 60 bar |
| Operating range water | 1...100 cm/s | Wiring diagram | w117 |
| Medium temperature | -20...60 °C | Dimension drawing | d520 |
| Sensor quality | AISI 316Ti | | |

G1/2" – stainless steel A4 – Cable connection



| | | | |
|------------------------------|------------------|------------------------------|--------------|
| Type | FCS-G1/2A4-NAEXO | Housing quality | V4A (1.4571) |
| Protection type | Ex ia IIC | Mechanical connection | G 1/2" |
| Medium | liquids | Electrical connection | PUR cable |
| Oil operating range | 3...200 cm/s | Pressure resistance | 60 bar |
| Operating range water | 1...100 cm/s | Wiring diagram | w118 |
| Medium temperature | -20...60 °C | Dimension drawing | d548 |
| Sensor quality | AISI 316Ti | | |

G3/4" – stainless steel A4 – Cable connection



| | |
|------------------------------|------------------|
| Type | FCS-G3/4A4-NAEXO |
| Protection type | Ex ia IIC |
| Medium | liquids |
| Oil operating range | 3...200 cm/s |
| Operating range water | 1...100 cm/s |
| Medium temperature | -20...60 °C |
| Sensor quality | AISI 316Ti |

| | |
|------------------------------|--------------|
| Housing quality | V4A (1.4571) |
| Mechanical connection | G 3/4" |
| Electrical connection | PUR cable |
| Pressure resistance | 60 bar |
| Wiring diagram | w118 |
| Dimension drawing | d549 |

Insertion flow sensors for gaseous media – Ex zone 0

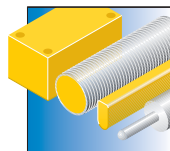


Insertion flow sensors for liquid media are also available for Ex zone 0. The devices are operated with an external Ex signal processor. They are mounted with a T-piece, a weld-on adapter or with a matching adapter block. The probe is inserted in the pipe and has direct contact with the medium. The integrated LED chain indicates the current flow state. The devices are available with transistor or relay output, depending on the type of signal processor used. They are also available with different mechanical process connections and probe lengths.

Features

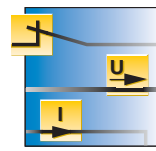
- Insertion flow sensor for Ex zone 0
- Separate sensor and signal processor
- Values adjusted and displayed at the Ex signal processor
- Ideal for all pipe diameters of DN20 and larger
- Adjustable to flow speeds between 2...20 m/s
- Switchpoint freely adjustable within the operating range
- Transistor or relay output
- Pressure-resistant up to 10 bar

Properties



Design

Insertion flow sensors, ideal for all pipe diameters of DN20 and larger.



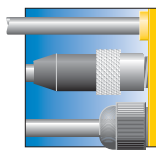
Electrical versions

Transistor or relay output



Monitoring range

Adjustable to flow speeds between 2...20 m/s



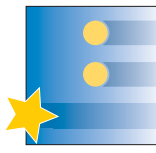
Electrical connections

Via A-coded M12 x 1 plug connection or connection cable



Materials

Sensor material stainless steel 1.4571 (A4)



Special features

Application in Ex zone 0, pressure-resistant up to 10 bar

GL1/2" – stainless steel A4 – M12 x 1 plug connection



| | | | |
|----------------------------|---------------------------|------------------------------|--------------------|
| Type | FCS-GL1/2A4-NAEX0-H1141/A | Housing quality | V4A (1.4571) |
| Protection type | Ex ia IIC | Mechanical connection | G 1/2" length |
| Medium | air | Electrical connection | connector, M12 x 1 |
| Air operating range | 2...20 m/s | Pressure resistance | 10 bar |
| Medium temperature | -20...60 °C | Wiring diagram | w117 |
| Sensor quality | AISI 316Ti | Dimension drawing | d544 |

GL1/2" – stainless steel A4 – Cable connection



| | | | |
|----------------------------|---------------------|------------------------------|---------------|
| Type | FCS-GL1/2A4-NAEX0/A | Housing quality | V4A (1.4571) |
| Protection type | Ex ia IIC | Mechanical connection | G 1/2" length |
| Medium | air | Electrical connection | PUR cable |
| Air operating range | 2...20 m/s | Pressure resistance | 10 bar |
| Medium temperature | -20...60 °C | Wiring diagram | w118 |
| Sensor quality | AISI 316Ti | Dimension drawing | d545 |

Signal processors for flow sensors

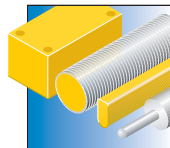


The MK96, MS96 and MC96F are used for power supply and signal processing of flow sensors. The switchpoints resp. operating range are adjusted via 2 potentiometers. The flow state is indicated continuously via a multicolor LED chain. The MS96 features moreover an output for temperature monitoring and an adjustable switch-off delay. The MC96 is designed as a 19" card to fit in 19" module racks. It features an output for temperature monitoring as well as a DIP switch to enable or disable the switch-on/off delay.

Features

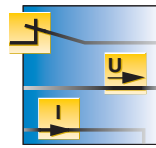
- Signal processors for the connection of insertion and inline flow sensors
- Separate sensor and signal processor
- Compact version with minimal space requirements
- Values adjusted and displayed at the signal processor
- Adjustment via potentiometer, easy handling
- Available types MK96, MS96, MC96
- MS96 and MC96 additionally with temperature monitoring
- Transistor, relay or analog current output

Properties



Design

Modular housing MK96 for flow monitoring; modular housing MS96 and 19" card MC96 for flow and temperature monitoring



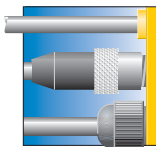
Electrical versions

MK96 with transistor, relay or current output
MS96 and MC96 with relay outputs for flow and temperature monitoring



Monitoring range

Depending on connected flow sensors



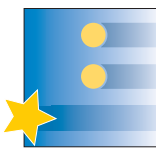
Electrical connections

MK96 and MS96 junction box; MC96 series plug connection 19" card



Materials

plastic housing, polycarbonate (ABS)



Special features

Simple adjustment via potentiometer, MS96 and MC96 additionally with temperature monitoring

MK96 – Modular housing



General data

Operating voltage

19.2...28.8 VDC

Design

terminal chambers

Housing material




Polycarbonate/ABS

Protection class

IP20

Local admissible ambient temperature -20...+60 °C

Types and data – selection table


| Type | Output function | w | d |
|-----------------|--|------|------|
| MK96-LI01 | 4 ... 20 mA, analog output | w119 | d550 |
| MK96-VN01 |  , NPN | w120 | d550 |
| MK96-VP01 |  , PNP | w121 | d550 |
| MK96-11-R/24VDC |  , relay output | w122 | d550 |

MS96 – Modular housing



General data

Output function

, relay output

Design

terminal chambers

Housing material

Polycarbonate/ABS

Protection class

IP20

Local admissible ambient temperature -20...+60 °C

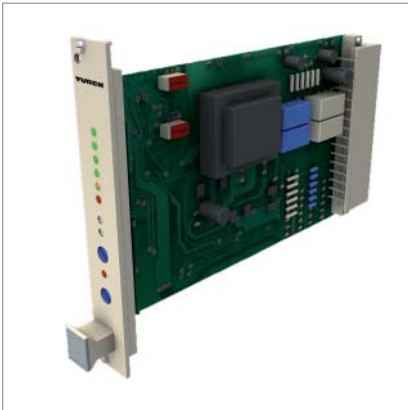
Types and data – selection table

| Type | Operating voltage | w | d |
|-----------------|-------------------|------|------|
| MS96-12R/24VDC | 19...29 VDC | w123 | d551 |
| MS96-12R/115VAC | 92...127 VAC | w124 | d551 |
| MS96-12R/230VAC | 184...265 VAC | w124 | d551 |

Signal processors

Signal processors for insertion and inline flow sensors

MC96 – 19" card



| | | | |
|--------------------------|-----------------|---|--------------|
| Type | MC96-22-R/24VDC | Protection class | IP20 |
| Operating voltage | 19.2...28.8 VDC | Local admissible ambient temperature | -20...+60 °C |
| Output function | —, relay output | Wiring diagram | w125 |
| Design | Eurocard | Dimension drawing | d552 |
| Housing material | metal/plastic | | |

Signal processors for Ex flow sensors

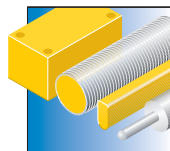


The MK96 and MS96 are used for power supply and signal processing of Ex flow sensors. The switchpoints resp. operating range are adjusted via 2 potentiometers. The flow state is indicated continuously via a multicolor LED chain. The MC96 is designed as a 19" card to fit in 19" module racks. In addition, they feature an output for temperature monitoring as well as an adjustable switch-on or off delay. The MS96 is additionally equipped with an adjustable switch-off delay.

Features

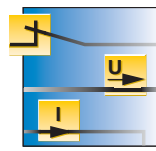
- [Ex ia] signal processors for Ex insertion and inline flow sensors
- Separate sensor and signal processor
- Compact version with minimal space requirements
- Values adjusted and displayed at the signal processor
- Adjustment via potentiometer, easy handling
- Available types MS96 and MC96
- MC96 additionally with temperature monitoring
- Transistor and relay output

Properties



Design

Modular housing MS96 for flow monitoring; 19" card MC96 for flow and temperature monitoring



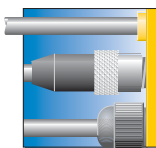
Electrical versions

MS96 with relay output for flow monitoring, and MC96 with relay outputs for flow and temperature monitoring



Monitoring range

Depending on connected flow sensor



Electrical connections

MS96 junction box; MC96 series plug connection 19" card



Materials

plastic housing, polycarbonate (ABS)



Special features

Simple adjustment via potentiometer, MC96 additionally with temperature monitoring

MS96 – Modular housing



General data

Output function

, relay output

Protection class IP20

Design

terminal chambers

Local admissible ambient temperature -20...+60 °C

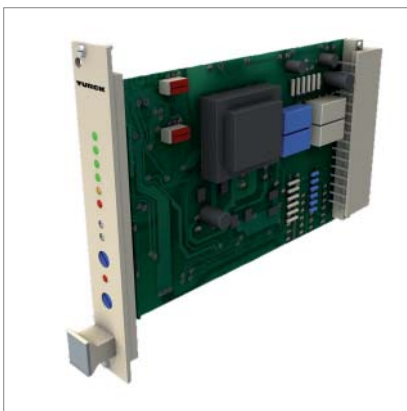
Housing material

Polycarbonate/ABS

Types and data – selection table

| Type | Operating voltage | Protection type | w | d |
|---------------------|-------------------|-----------------|------|------|
| MS96-11EX0-R/24VDC | 21...28 VDC | [Ex ia] IIC | w126 | d551 |
| MS96-11EX0-R/230VAC | 198...242 VAC | [Ex ia] IIC | w127 | d551 |
| MS96-11EX0-R/115VAC | 99...121 VAC | [Ex ia] IIC | w127 | d551 |
| MS96-11EX-R/230VAC | 207...253 VAC | [Ex ib] IIC | w127 | d551 |
| MS96-11EX-R/24VDC | 22...26 VDC | [Ex ib] IIC | w126 | d551 |
| MS96-11EX-R/115VAC | 104...127 VAC | [Ex ib] IIC | w127 | d551 |

MC96 – 19" card



General data

Operating voltage

19.2...28.8 VDC

Housing material

metal/plastic

Output function

, relay output

Protection class

IP20

Design

Eurocard

Types and data – selection table

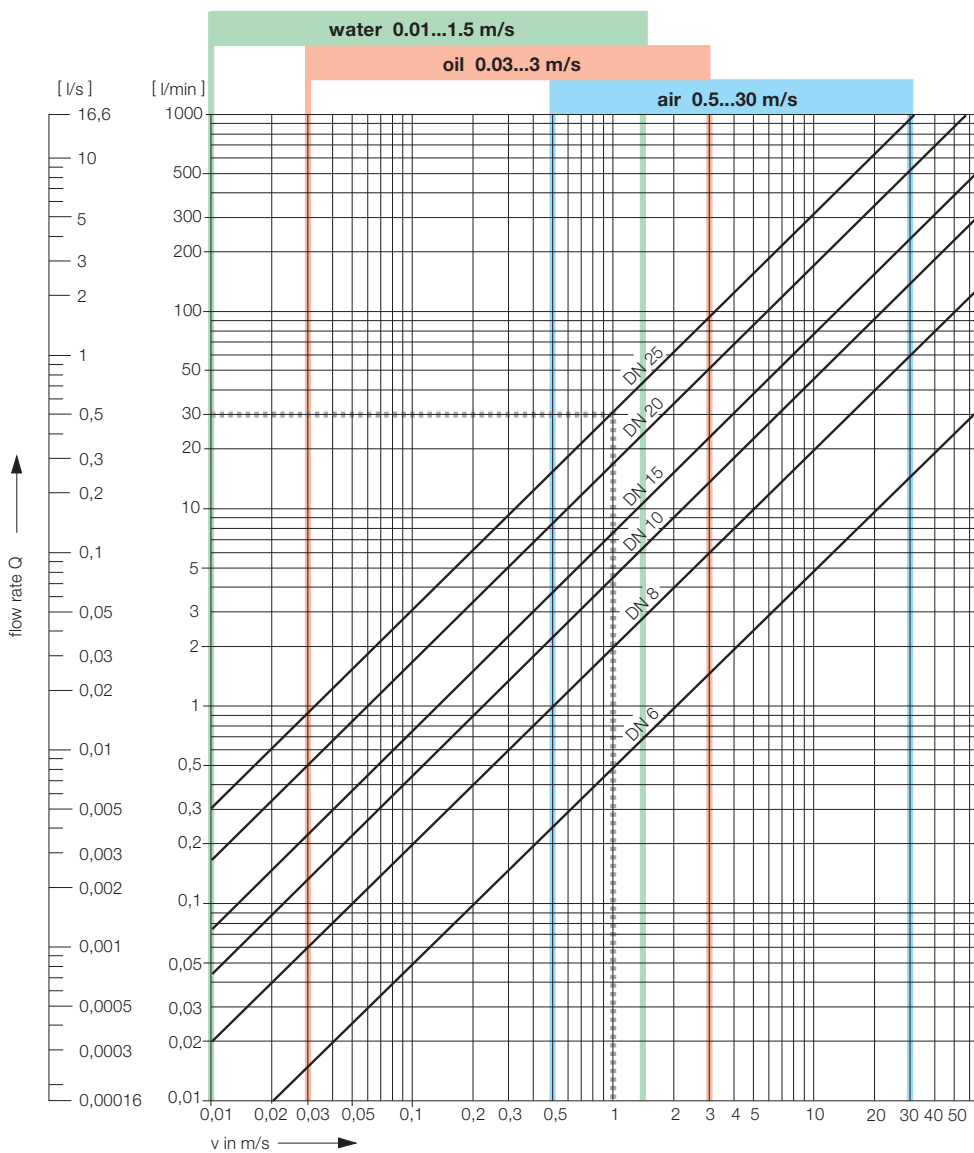
| Type | Local admissible ambient temperature | Protection type | w | d |
|--------------------|--------------------------------------|-----------------|------|------|
| MC96-12EX0-R/24VDC | -20...+60 °C | [Ex ia] IIC | w128 | d552 |
| MC96-12EX-R/24VDC | -20...+40 °C | [Ex ib] IIC | w128 | d552 |

Nomograms

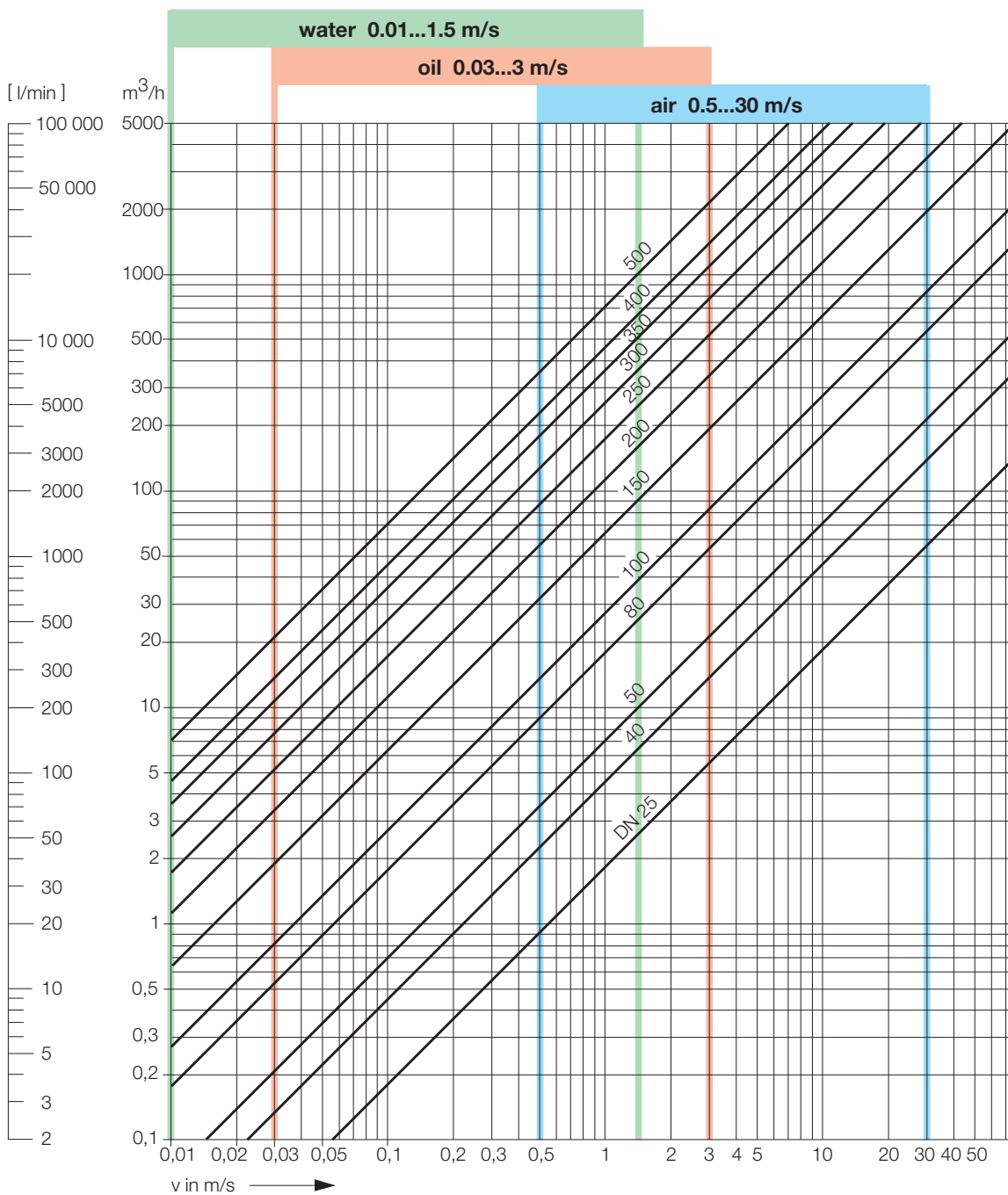
Flow sensors

Nomogram (pipe diameter DN 6...25)

The nomogram is used to convert volume flow rates (l/min) into flow speed (m/s) in relation to the pipe diameter (DN), as shown in the example below. If the flow speed is outside the detection range, the speed can be adjusted through changing the pipe diameter. For example: At a flow rate of 30 l/min and a pipe diameter of DN25, the flow speed is 1 m/s



Nomogram (pipe diameter DN 25...500)

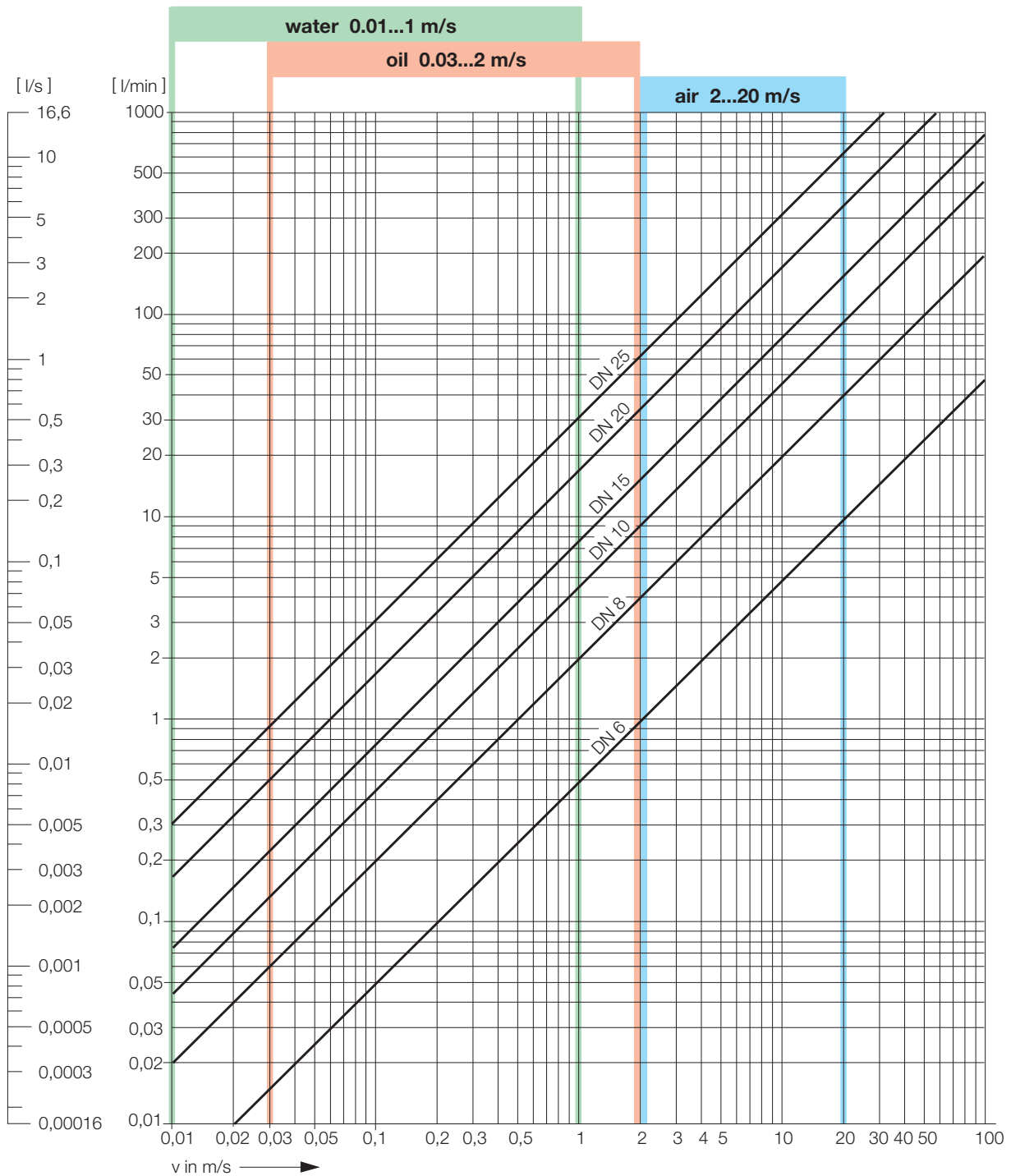


Flow sensors

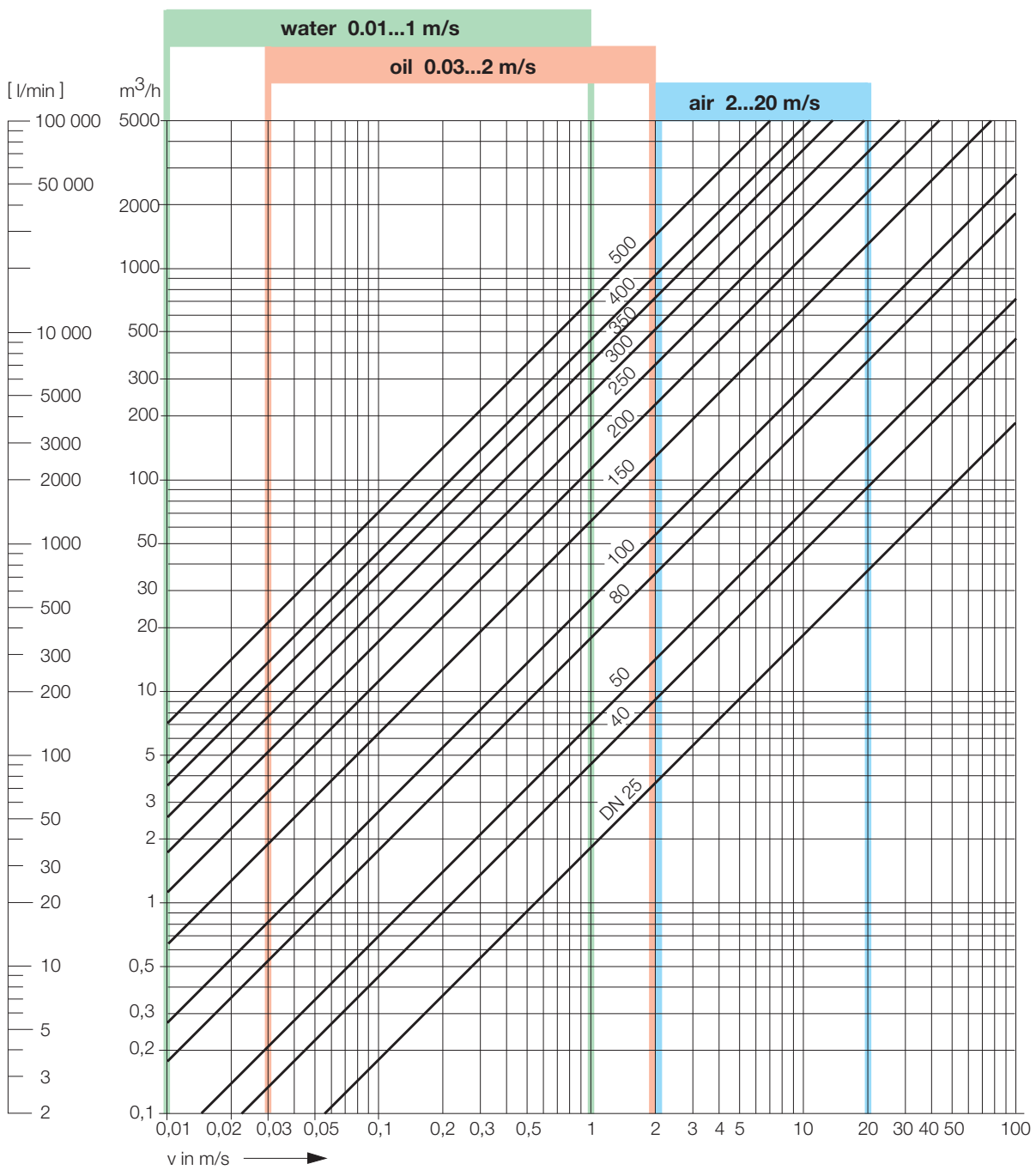
Nomograms

Flow sensors

Nomogram for Ex flow sensor (pipe diameters DN 6...25)



Nomogram for Ex flow sensors (pipe diameters DN 25...500)



At a glance

Flow meters



Flow meters – Continuous and precise measuring of flow rates

In order to guarantee smooth operation and consistent quality, many processes require constant in and outflow of liquid or gaseous media. Flow sensors measure the speed and flow meters measure continuously the volume per time unit relative to the defined pipe cross-section.

Flow measurement requires high repeatability and accuracy. TURCK sensors apply different methods for electronic measurement of flow rates, such as the calorimetric, the magnetic-inductive as well as the Vortex principle.

TURCK flow meters indicate the flow rate via display and via an analog current output. The output signal can either be analog or binary, depending on whether continuous flow or a limit value is to be monitored. The programmable devices are characterized by a long service life and are thus almost maintenance-free.

The FTCl flow meters operate according to the thermodynamic principle. They are favourably priced and work reliably. Due to the different thermal conductivity

of media, the devices are preferably applied in water or water-glycol mixtures. Short response times within seconds and stable values displayed even under the influence of strong temperature fluctuations, make these sensors particularly suited for flow rate monitoring in cooling circuits.

FCMI flow meters operate according to the magnetic-inductive principle. They measure the flow rate of many low-conductive liquids. Blistering and non-abrasive solids content have only little influence on the measurement. The operating range between 0.2 and 80 l/min is ideal for all applications with small to medium flow rates.

FCVI vortex flow meters are insensitive to pressure and temperature changes and are thus suited for applications requiring a high repeatability. Flow rates between 2 and 20 l/min are detected with a repeatability of 2 % f.s. The extremely responsive and temperature-stable flow meter is preferably applied in return and coolant circuits.

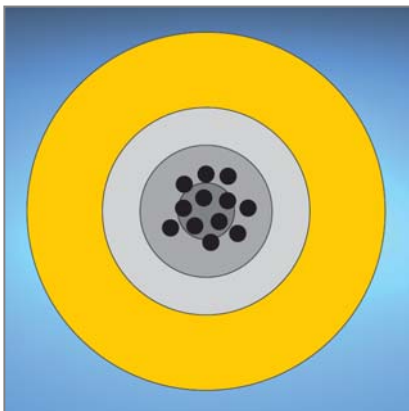
Our strengths...



Measuring and monitoring of flow rates

Flow monitoring of media plays an important role in many applications of factory and process automation. For example, the monitoring of coolant circuits, run-dry protection of pumps or the flow

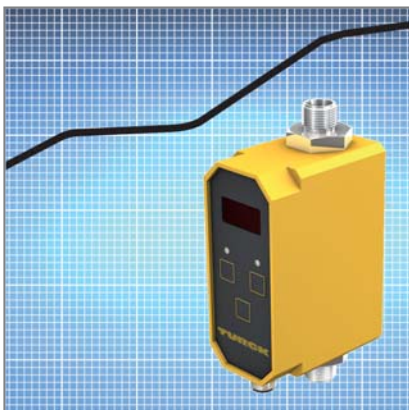
control of exhaust air ducts and air conditioning systems. In order to detect critical changes in flow and to indicate them to a control unit, electronic flow sensors are increasingly applied.



High repeatability

Unvarying processes and smooth operation require a constant inflow of media. Flow rate measuring in such processes thus requires high repeatability. TURCK flow meters indicate the flow rate via dis-

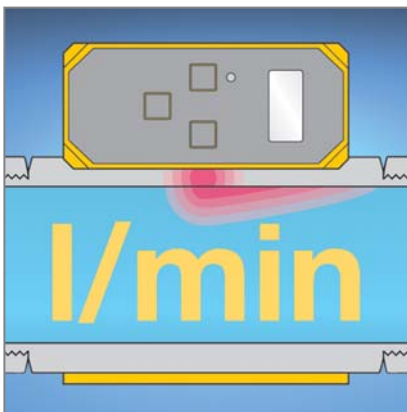
play and analog current output. The output signal can either be analog or binary, depending on whether continuous flow or a limit value is to be monitored.



High performance in a compact design

The combination of a highly precise measuring system and a compact housing is characteristic for inline flow meters made by TURCK. They are easily integrated in existing line configurations and are space saving alternatives for new constructions.

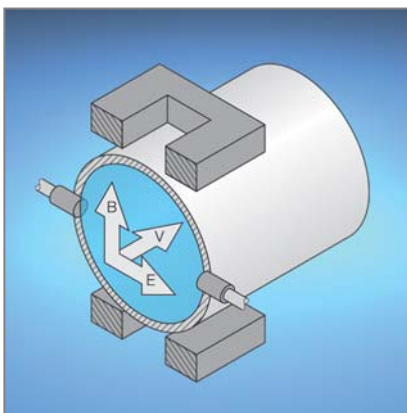
Not only coolant circuits and temperature cycles are precisely monitored but also dosage intervals, like in water purification systems. Limit value monitoring as well as an analog linearized switching output are available for these tasks.



Calorimetric flow meter

The FTCI flow meter working on the calorimetric principle measures and monitors either the media temperature or the flow rate. The FTCI is therefore suited for many different applications. Flow rates between 1 and 40 l/min are detected with

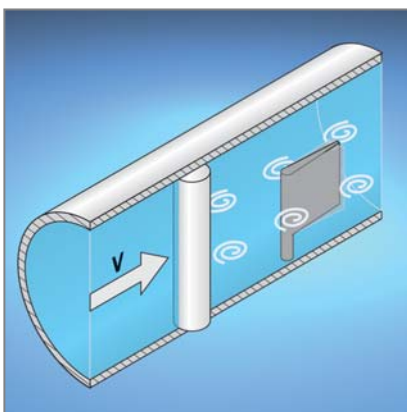
a repeatability of 10 % f.s. Short response times within seconds and stable values displayed even under the influence of strong temperature fluctuations, make these sensors particularly suited for flow rate monitoring in coolant circuits.



Magnetic-inductive flow meter

The magnetic-inductive flow meter FCMI measures flow rates of low-conductive liquids. The FCMI is therefore suited for many different applications. Outstanding features of the magnetic-inductive

flow meter are a high measuring range dynamics and a repeatability of 2 % f.s. The operating range between 0.2 and 80 l/min is ideal for all applications with small to medium flow rates.

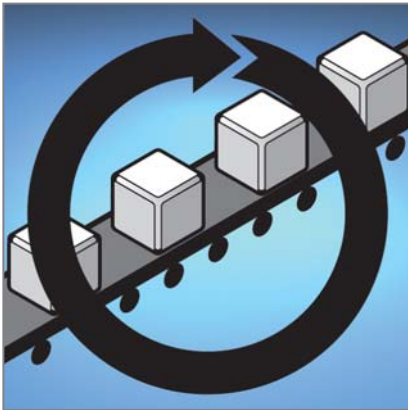


Vortex flow meter

The FCVI vortex flow meter works on the principle of the Karman vortex street. It is thus especially suited for high-precision measurement of water flow rates. Flow rates between 2 and 20 l/min are detected with a measuring accuracy of 2 %

f.s. Short response times within seconds and stable values displayed even under the influence of strong temperature fluctuations, make these sensors particularly suited for flow rate monitoring in return and coolant circuits.

Your advantages...



High system availability

Especially in rough environments of factory and process automation, the inline flow meters proof their outstanding reliability. This is guaranteed through excellent EMC properties as well as protection class IP67. An application-optimized housing, durable mounting aids and a

well readable display are the main features considered in the design. Flow meters thus withstand the special ambient conditions of many applications without any problems. Use these benefits to optimize your production processes.



Maximum planning freedom

Many solutions are implementable with only a few device types, numerous connection possibilities, simple mounting and flexible mounting aids. From polling of single switchpoints, over analog

output signals, to remote readable of displays, profit from the extensive standard product range of TURCK flow meters. They provide more flexibility to your application.



User-friendly operation

The inline flow meters have two front panel buttons to perform adjustments. The menu and flow rates [l/min] are well readable on a 3-digit 7-segment display. Programming functions are only accessible with a code. Without the access code,

only the stored values of the switchpoints and parameters are displayed. Commissioning times are reduced and process safety is improved through a simply structured menu.

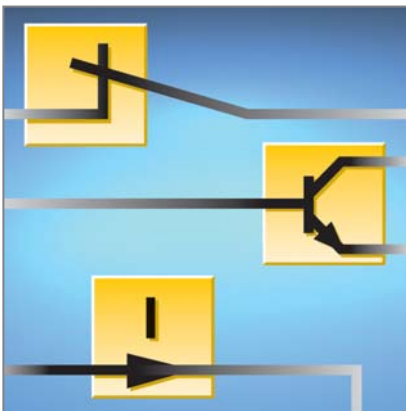
Advantages



Easy mounting

The inline flow meters are built in pipelines. The pipe may be connected directly via cutting ring or adapter. With a threaded bushing at the housing bottom the flow meters can be mounted on a base-

plate. Alternatively, the baseplate can also be mounted on the sensor. In combination with the baseplate the sensor can also be mounted at the front.



Many different output signals

For further processing of output signals via control system, the flow meters provide a standard switching as well as an analog 4...20 mA output signal. Initial and end value are adjusted in the programming mode. Upon error in the measurement system, 2 mA are provided at

the output. If the direction of flow is opposed to the mounting direction, the flow rate is displayed as a negative value and the output current remains stable at 4 mA. The measuring range shown in the display is limited to -9.9 l/min.



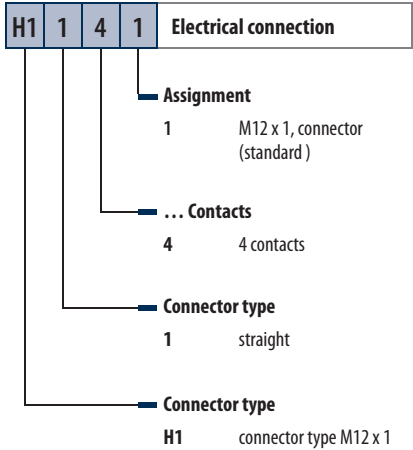
High servicability

Thanks to the many application possibilities, user-friendly operation and adjustment, the well legible 3-digit 7-segment

display and last but not least the excellent repeatability, inline flow meters offer calculable advantages.

Type code

| | | | | | | | | | | | | |
|-------------|---|---|--------------|---|---------------|---|------------|----------|----------|--|---------------------------|---|
| FCMI | Functional principle | - | 10D08 | DYA4P | Design | - | LIU | P | 8 | X | Electrical version | - |
| | <p>Flow meters</p> <p>FTCI calorimetric, inline with temperature monitoring</p> <p>FCMI magnetic-inductive, inline</p> <p>FCVI Vortex, inline</p> | | | <p>Materials</p> <p>A4 stainless steel A4 (1.4404 or 1.4571)</p> <p>DY PVDF (Dyflor)</p> <p>P plastic housing</p> | | | | | | <p>Indication</p> <p>... X number of LEDs or multicolor LED</p> | | |
| | | | | <p>Mechanical connection</p> <p>10D08 compression fittings for smooth barrel, outer Ø 10 mm</p> <p>10D10 compression fittings for smooth barrel, outer Ø 10 mm</p> <p>10R09 compression fittings for smooth barrel, outer Ø 10 mm</p> <p>15D15 compression fittings for smooth barrel, outer Ø 15 mm</p> <p>18D15 compression fittings for smooth barrel, outer Ø 18 mm</p> | | | | | | <p>Voltage range</p> <p>8 19.2...28.8 VDC</p> | | |
| | | | | | | | | | | <p>Output mode</p> <p>P PNP</p> | | |
| | | | | | | | | | | <p>Output function</p> <p>LI analog output (I)</p> <p>LIU NO/NC programmable, analog + current + PNP</p> <p>2U NO/NC programmable, 2 x PNP</p> | | |



Designs and variants

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FTCI-D10

| | |
|------------------------------|---|
| Medium | liquids |
| Mechanical connection | compression ferrule fittings for pipes \varnothing 10 x 1 (EN10305-1) |
| Flow operating range | 1...10 l/min |
| Medium temperature | -10...90 °C |
| Sensor quality | V4A (1.4571) |
| Pressure resistance | 20 bar |
| Housing material | plastic |

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FTCI-D15

| | |
|------------------------------|---|
| Medium | liquids |
| Mechanical connection | compression ferrule fittings for pipes \varnothing 15 x 1.5 (EN10305-1) |
| Flow operating range | 2...20 l/min |
| Medium temperature | -10...90 °C |
| Sensor quality | AISI 316Ti |
| Pressure resistance | 20 bar |
| Housing material | plastic |

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FTCI-D18

| | |
|------------------------------|---|
| Medium | liquids |
| Mechanical connection | compression ferrule fittings for pipes \varnothing 18 x 1.5 (EN10305-1) |
| Flow operating range | 4...40 l/min |
| Medium temperature | -10...90 °C |
| Sensor quality | AISI 316Ti |
| Pressure resistance | 20 bar |
| Housing material | plastic |

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FCMI-D10

| | |
|------------------------------|---|
| Medium | liquids |
| Mechanical connection | compression ferrule fittings for pipes \varnothing 10 x 1 (EN10305-1) |
| Flow operating range | 0...40 l/min |
| Medium temperature | 5...60 °C |
| Sensor quality | V4A (1.4571)/PVDF |
| Pressure resistance | 10 bar |
| Housing material | plastic |

Standard variants

Page 655



FCMI-D15

| | |
|------------------------------|---|
| Medium | liquids |
| Mechanical connection | compression ferrule fittings for pipes \varnothing 15 x 1.5 (EN10305-1) |
| Flow operating range | 0...80 l/min |
| Medium temperature | 5...60 °C |
| Sensor quality | V4A (1.4571)/PVDF |
| Pressure resistance | 10 bar |
| Housing material | plastic |

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FCMI-3/4"

| | |
|------------------------------|-------------------|
| Medium | liquids |
| Mechanical connection | G 3/4" |
| Flow operating range | 0...75 l/min |
| Medium temperature | 5...60 °C |
| Sensor quality | V4A (1.4571)/PVDF |
| Pressure resistance | 10 bar |
| Housing material | plastic |

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FCVI-D10

| | |
|------------------------------|---|
| Medium | liquids |
| Mechanical connection | compression ferrule fittings for pipes \varnothing 10 x 1 (EN10305-1) |
| Flow operating range | 2...20 l/min |
| Medium temperature | 5...60 °C |
| Sensor quality | V4A (1.4571)/PVDF |
| Pressure resistance | 10 bar |
| Housing material | plastic |

Flow meters for water and water-glycol mixtures



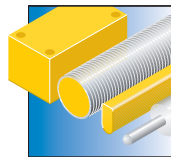
The FTCIs are particularly suited for flow rate monitoring in coolant circuits. Short response times within seconds and stable values displayed even under the influence of strong temperature fluctuations, make these sensors particularly suited for welding applications of the automotive industry. A 3-digit 7-segment display indicates the flow rate and the cooling capacity continuously.

To prevent icing, industrial air conditioning systems use water-glycol mixtures in secondary circuits. In order to provide a reliable indication of flow rate values, the glycol amount is adjusted at the flow meter. The devices are programmable via three pushbuttons at the front. Either the measured value or the sensor parameters are displayed, depending on the adjustment.

Features

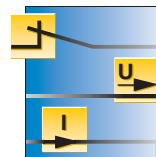
- Measurement of small to medium water flow rates and water-glycol mixtures
- Ideal for small pipe diameters of up to DN20
- Temperature monitoring
- Switchpoint freely adjustable within the operating range
- No disturbing built-ins, free pipe profile, no pressure loss
- Fast response times within seconds
- Adjustable to flow rates between 1...40 l/min
- Repeatability < 10 % f.s.
- Two transistor outputs or one transistor and one analog current output

Properties



Design

Rugged plastic housing with display, ideal for small pipe diameters of up to DN20



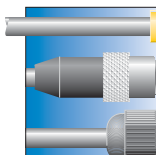
Electrical versions

Two PNP transistor outputs or one PNP transistor and one linear analog current output 4...20 mA



Measuring ranges

Adjustable to flow rates between 1 ... 40 l/min, repeatability < 10 % f.s.



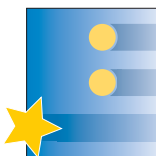
Electrical connections

M12 x 1 plug connection, A-coded



Materials

PBT housing, sensor made of stainless steel 1.4571 and FKM O-ring



Special features

Programmable switchpoint, output, hysteresis, switch ON/OFF delay, glycol amount, flow rate correction, averaging and access code

10 mm cutting ring



General data

Operating voltage 21...26 VDC
Medium liquids

Flow operating range 1...10 l/min
Medium temperature -10...90 °C
Sensor quality AISI 316Ti

Housing quality PBT
Mechanical connection compression ferrule fittings for pipes Ø 10 x 1 (EN10305-1)
Electrical connection connector, M12 x 1
Pressure resistance 20 bar
Ambient temperature 0...60 °C

Types and data – selection table

| Type | Output function | w | d |
|----------------------------|---------------------------------|------|------|
| FTCI-10D10A4P-LIUP8X-H1141 | programmable, PNP/analog output | w129 | d553 |
| FTCI-10D10A4P-2UP8X-H1141 | programmable, 2 x PNP | w130 | d554 |

15 mm cutting ring



General data

Operating voltage 21...26 VDC
Medium liquids

Flow operating range 2...20 l/min
Medium temperature -10...90 °C
Sensor quality AISI 316Ti

Housing quality PBT
Mechanical connection compression ferrule fittings for pipes Ø 15 x 1.5 (EN10305-1)
Electrical connection connector, M12 x 1
Pressure resistance 20 bar
Ambient temperature 0...60 °C

Types and data – selection table

| Type | Output function | w | d |
|----------------------------|---------------------------------|------|------|
| FTCI-15D15A4P-LIUP8X-H1141 | programmable, PNP/analog output | w129 | d555 |
| FTCI-15D15A4P-2UP8X-H1141 | programmable, 2 x PNP | w130 | d556 |

18 mm cutting ring



General data



Operating voltage 21...26 VDC
Medium liquids

Flow operating range 4...40 l/min
Medium temperature -10...90 °C
Sensor quality AISI 316Ti

Housing quality PBT
Mechanical connection compression ferrule fittings for pipes Ø 18 x 1.5 (EN10305-1)

Electrical connection connector, M12 x 1
Pressure resistance 20 bar
Ambient temperature 0...60 °C

Types and data – selection table

| Type | Output function | w | d |
|----------------------------|---|------|------|
| FTCI-18D15A4P-LIUP8X-H1141 |  programmable, PNP/analog output | w129 | d557 |
| FTCI-18D15A4P-2UP8X-H1141 |  programmable, 2 x PNP | w130 | d558 |

Compact devices for electrically conductive media

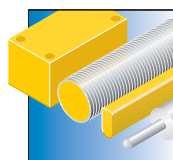


The FCMI's are designed for continuous measurement of many conductive liquids. The operating range covers small to medium flow rates. Operating on the magnetic-inductive principle, they are applied in many different areas to measure quantities and dosages of many different media. The strengths of the magnetic-inductive flow meters include a high measuring range dynamics and excellent repeatability. A 3-digit 7-segment display indicates the flow rate continuously. The devices are programmable via three pushbuttons at the front. Either the measured value or the sensor parameters are displayed, depending on the adjustment.

Features

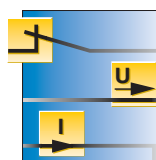
- Measurement of small to medium flow rates of conductive liquids $> 20 \mu\text{S}/\text{cm}$
- Ideal for small pipe diameters of up to DN15
- Switchpoint freely adjustable within the operating range
- No disturbing built-ins, free pipe profile, no pressure loss
- Fast response times within seconds
- Adjustable to flow rates between 1...80 l/min
- Repeatability $< 20\%$ f.s.
- Transistor and analog current output

Properties



Design

Rugged plastic housing with display, ideal for small pipe diameters of up to DN15



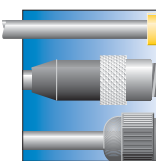
Electrical versions

Configurable PNP transistor output, linear analog current output 4...20 mA



Measuring ranges

Adjustable to flow rates between 1 ... 80 l/min, repeatability $< 2\%$ f.s.



Electrical connections

M12 x 1 plug connection, A-coded



Materials

PBT housing, sensor material PVDF and stainless steel 1.4571





Special features

Programmable switchpoint, output, hysteresis, switch ON/OFF delay, averaging and access code



10 mm cutting ring



| | | | |
|-----------------------------|---|------------------------------|---|
| Type | FCMI-10D08DYA4P-LIUP8X-H1141 | Housing quality | PBT |
| Operating voltage | 21...26 VDC | Mechanical connection | compression ferrule fittings for pipes Ø 10 x 1 (EN10305-1) |
| Medium | liquids | Electrical connection | connector, M12 x 1 |
| Flow operating range | 0...40 l/min | Pressure resistance | 10 bar |
| Medium temperature | 5...60 °C | Ambient temperature | 0...60 °C |
| Output function |  /  programmable, PNP/analog output | Wiring diagram | w129 |
| Sensor quality | V4A (1.4571)/PVDF | Dimension drawing | d553 |



15 mm cutting ring



| | | | |
|-----------------------------|---|------------------------------|---|
| Type | FCMI-15D12DYA4P-LIUP8X-H1141 | Housing quality | PBT |
| Operating voltage | 21...26 VDC | Mechanical connection | compression ferrule fittings for pipes Ø 15 x 1.5 (EN10305-1) |
| Medium | liquids | Electrical connection | connector, M12 x 1 |
| Flow operating range | 0...80 l/min | Pressure resistance | 10 bar |
| Medium temperature | 5...60 °C | Ambient temperature | 0...60 °C |
| Output function |  /  programmable, PNP/analog output | Wiring diagram | w129 |
| Sensor quality | V4A (1.4571)/PVDF | Dimension drawing | d555 |

G 3/4" – Male



| | | | |
|-----------------------------|---|------------------------------|--------------------|
| Type | FCMI-3/4D12DYA4P-LIUP8X-H1141 | Housing quality | PBT |
| Operating voltage | 21...26 VDC | Mechanical connection | G 3/4" |
| Medium | liquids | Electrical connection | connector, M12 x 1 |
| Flow operating range | 0...75 l/min | Pressure resistance | 10 bar |
| Medium temperature | 5...60 °C | Ambient temperature | 0...60 °C |
| Output function |  /  programmable, PNP/analog output | Wiring diagram | w129 |
| Sensor quality | V4A (1.4571)/PVDF | Dimension drawing | d559 |

Flow meters for water applications

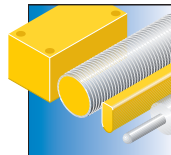


The Vortex flow meter FCVI is especially suited for applications with high demands on linearity and repeatability. The devices detect flow rates between 2 and 20 l/min with a repeatability of 2 % f.s. Short response times within seconds and stable values despite strong temperature fluctuation of the medium, make the FCVI especially suited for flow rate measurements of return and coolant circuits. A 3-digit 7-segment display indicates the flow rate continuously. The devices are programmed via three pushbuttons at the front. Either the measured value or the sensor parameters can be displayed, depending on the adjustment.

Features

- Measurement of small to medium water flow rates
- Ideal for small pipe diameters of up to DN10
- Switchpoint freely adjustable within the operating range
- Fast response times within seconds
- Adjustable to flow rates between 2...20 l/min
- Repeatability < 2 % f.s.
- Transistor and analog current output

Properties



Design

Robust plastic housing with display, ideal for small pipe diameters of up to DN10



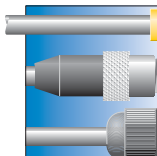
Electrical versions

Configurable PNP transistor output and linear analog current output 4...20 mA



Measuring ranges

Adjustable to flow rates between 2...20 l/min, repeatability < 2 % f.s.



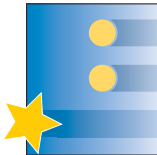
Electrical connections

M12 x 1 plug connection, A-coded



Materials

PBT housing, sensor made of PVDF and stainless steel 1.4571





Special features

Programmable switchpoint, output, hysteresis, switch ON/OFF delay, averaging and access code

10 mm cutting ring



| | | | |
|-----------------------------|---|------------------------------|---|
| Type | FCVI-10R09DYA4P-LIUP8X-H1141 | Housing quality | PBT |
| Operating voltage | 21...26 VDC | Mechanical connection | compression ferrule fittings for pipes Ø 10 x 1 (EN10305-1) |
| Medium | liquids | Electrical connection | connector, M12 x 1 |
| Flow operating range | 2...20 l/min | Pressure resistance | 10 bar |
| Medium temperature | 5...60 °C | Ambient temperature | 0...60 °C |
| Output function |  /  programmable, PNP/analog output | Wiring diagram | w129 |
| Sensor quality | V4A (1.4571)/PVDF | Dimension drawing | d553 |

At a glance

Encoders



Encoders

Encoders measure rotation speed, sense, position, angle and length. For this purpose, they convert mechanical motion in electrical signals.

There are incremental and absolute encoders. Signal periods provided by incremental encoders are used as a measure for rotation speed or position. The dual-channel incremental encoder detects positions bidirectionally as well as the rotation sense of shafts.

With absolute encoders instead, each incremental angle is assigned a code pattern. The position is detected at any time, even in the event of power failure without having to perform a reference run. Single-turn encoders set back the coding to the initial value after each full revolution. Absolute encoders detect angles, positions and inclinations precisely. Tasks that are typically found in robotics, positioning and process technology.

Encoders are available as solid and hollow shaft types. Hollow shaft encoders can be mounted without couplings, brackets or other mounting aids. The hollow shaft encoder is shifted on the drive shaft, then clamped and if necessary fixed with a pin.

TURCK encoders are available in diverse mechanical designs, as versions for incremental or absolute position detection, as hollow or solid shafts and in various sizes with diameters from 24 mm to 102 mm. They fulfill different positioning tasks with a resolution of up to 14 bits (digital

devices) and of up to 36,000 pulses per revolution (incremental types).

If simple length measurements have to be performed such as cutting paper or fabrics to length, encoders with a prefixed measuring wheel are the right choice. They are reasonably priced and operate highly accurate.

Encoders with a prefixed draw-wire mechanism (1 to 40 m long) are the best solution for direct length measurements. Thanks to the excellent repeatability rating of 0.05 mm, they solve position control tasks highly precise in systems in which only complex equipment has been operated successfully until now. Whether applied to control the filling levels, position of pumps in tanks, alignment of elevating platforms or orientation of cranes: Just select an encoder of the right size and with the appropriate output configuration and combine it with a draw-wire mechanism of the right length.

Our strengths - Your advantages



Many different designs

We offer the appropriate encoder for almost any application. Incremental and absolute encoders in different sizes are available as hollow or solid shaft types. From miniature versions, over IP69K rated types, up to encoders for the heavy industry. A broad range of connection possibilities

provide tailor-made solutions for any application. Equally beneficial is the large range of available output types, making the connection to the control system very easy. Many of the devices are UL approved and also available with ATEX approval if desired.



High-precision measurement

Whether optical or magnetic scanning, measured signals produced by TURCK encoders are always highly precise and provide the basis for high-resolution output signals and excellent repeatability. Incremental encoders achieve a maximum resolution of 36000 pulses per revolution, whereas absolute encoders achieve 17

bits per revolution at a maximum of 4096 revolutions.

Integrated temperature compensation ensures a stable signal quality for the entire operating temperature range. TURCK encoders can be applied wherever highest precision is required as a standard.



Aging compensation

Encoders are made of high-quality component. In order to guarantee longterm durability, the devices also feature a so called aging compensation to neutralize

the loss of luminosity of the internal optical scanning. Downtimes produced by faulty encoder signals are thus prevented in the long run.

advantages



Rugged Safety-Lock™ and Safety-Lockplus™ design

The extremely rugged bearing assembly in Safety-Lock™ design provides high stability and protection against vibration and other mechanical strain exerted on the shaft. Blocked bearings, large distances between the bearings and extra strong outer bearings prevent interferences and

downtimes emerging as a result of intense load, to which mechanically complex applications are often exposed. The mechanically protected shaft seal Safety-Lockplus™ is a high-level and durable protection against adverse conditions.



Large product range

NOTE: The product range of TURCK encoders offers nearly all combination possibilities and the largest possible number of variants. The type codes on the following pages provide the best overview over the product range and features.

A detailed description of the entire product range would exceed the scope of this catalog.

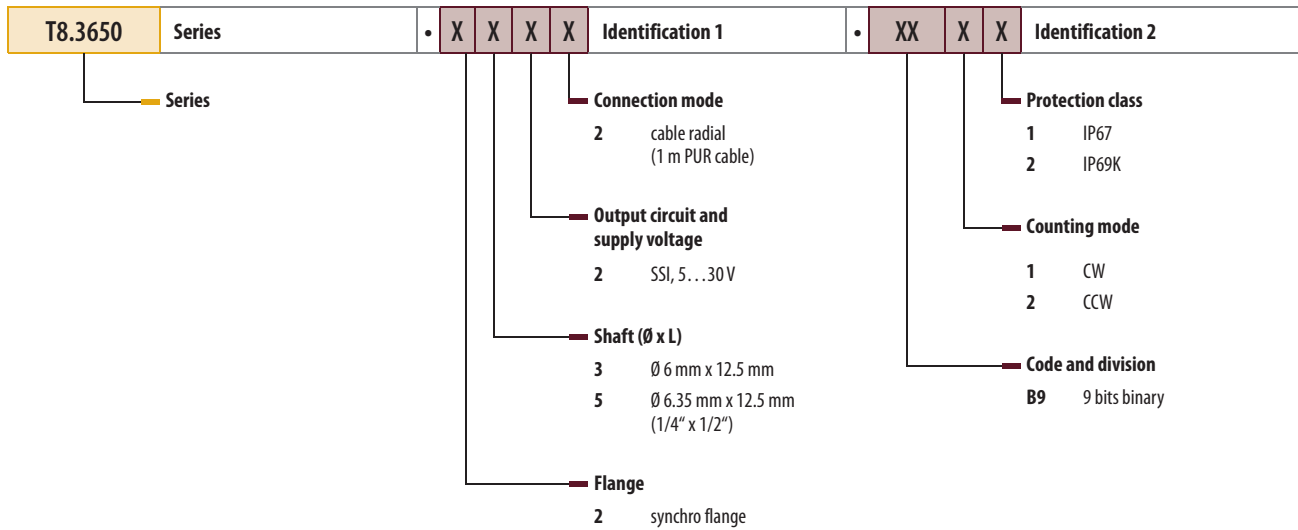
Type code

Type code

Incremental, solid shaft, diameter 50 mm

| | | | | | | | | | | |
|---------|--------|---|---|---|---|---|---|---|---|------------------|
| T8.5000 | Series | • | X | X | X | X | Identification 1 | • | XXXX | Identification 2 |
| | Series | | | | | | Connection mode 1 cable axial (1 m PVC cable) 2 cable radial (1 m PVC cable) 3 8-pole M12 connector axial 4 8-pole M12 connector radial 7 12-pole M23 connector axial 8 12-pole M23 connector radial Y 10-pole mil.- connector radial Output circuit and supply voltage 1 RS422 (with inverting function), power supply 5...30 V 2 push-pull (7272 with inverting function), power supply 5...30 V 4 RS422 (with inverting function), power supply 5 V 5 push-pull (with inverting function), power supply 10...30 V | | Pulse rate/rotation 1, 5, 10, 12, 36, 100, 200, 250, 256, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 2000, 2048, 2500, 3600, 4096, 5000 other pulse rates on request | |
| | | | | | | | Flange 5 synchro flange Ø 50.8 mm, IP67 6 synchro flange Ø 50.8 mm, IP65 7 clamping flange, metric, Ø 58 mm, IP67 8 clamping flange, metric, Ø 58 mm, IP65 A synchro flange Ø 58 mm, IP67 B synchro flange Ø 58 mm, IP65 C square flange 63,5 mm (2.5"), IP67 D square flange 63,5 mm (2.5"), IP65 | | Shaft (Ø x L) 1 Ø 6 mm x 10 mm 2 Ø 1/4" x 5/8" (6.35 mm x 15.86 mm) 3 Ø 10 mm x 20 mm 4 Ø 3/8" x 5/8" (9.52 x 15,86 mm) 5 Ø 12 mm x 20 mm 6 Ø 8 mm x 15 mm | |

Incremental, solid shaft, diameter 36 mm



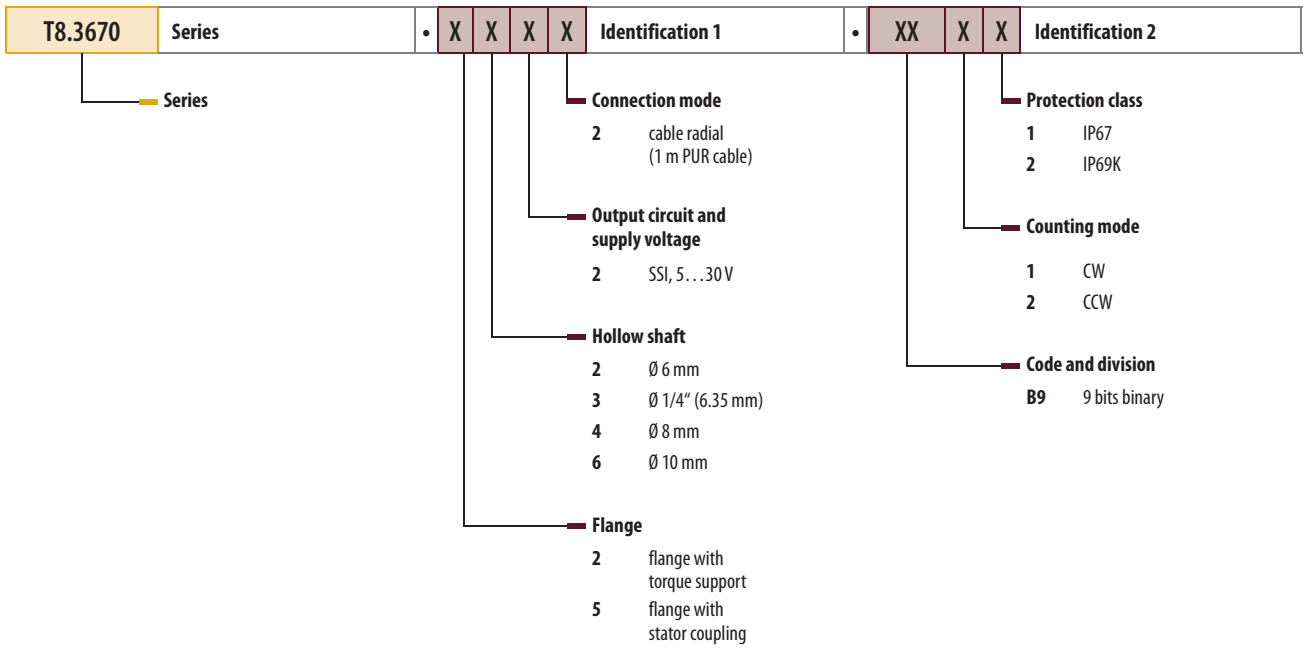
Type code

Type code

Incremental, hollow shaft, diameter 50 mm

| | | | | | | | | | | | | | |
|---------|--------|---|---|---|---|---|---|---|---|---|--|---|------------------|
| T8.5020 | Series | • | X | X | X | X | Identification 1 | • | X | X | X | X | Identification 2 |
| | Series | | | | | | Connection mode 1 cable radial (1 m PVC cable) 2 8-pole M12 connector radial without mating connector 4 12-pole M23 connector radial without mating connector 7 10-pole mil.- connector radial Output circuit and supply voltage 1 RS422 with inverting function power supply 5...30 V 2 push-pull 7272 with invert. function power supply 5...30 V 4 RS422 with inverting function-power supply 5...30 V 5 push-pull with inverting function power supply 10...30 V | | | | | Pulse rate/rotation 1, 5, 10, 12, 36, 100, 200, 250, 256, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 2000, 2048, 2500, 3600, 4096, 5000 other pulse rates on request | |
| | | | | | | | Flange 1 flange with torque support, IP67 2 flange with torque support, IP65 3 flange with mounting bracket, IP67 4 flange with mounting bracket, IP65 7 flange with stator coupling, Ø 65 mm, IP67 8 flange with stator coupling, Ø 65 mm, IP65 C flange with stator coupling, Ø 63 mm, IP67 D flange with stator coupling, Ø 63 mm, IP65 | | | | Hollow shaft 1 Ø 6 mm 2 Ø 1/4" (6.35 mm) 3 Ø 10 mm 4 Ø 3/8" (9.52 mm) 5 Ø 12 mm 6 Ø 1/2" (12.75 mm) 7 Ø 5/8" (15.875 mm) 8 Ø 15 mm 9 Ø 8 mm A Ø 14 mm | | |

Incremental, hollow shaft, diameter 36 mm



Type code

Absolute, solid shaft, diameter 58 mm

| T8.58X3 | Series | . | X | X | X | X | Identification 1 | . | X | X | X | X | Identification 2 |
|---------|---|---|---|---|---|---|--|---|---|---|---|---|--|
| | Series 5 single turn 6 multiturn | | | | | | Connection mode 1 cable axial (1 m PVC cable) 2 cable radial (1 m PVC cable) 3 12-pole M23 connector axial 4 12-pole M23 connector radial 5 8-pole M12 connector axial 6 8-pole M12 connector radial | | | | | | Options (service) 1 no option 2 status LED 3 SET button and status LED I/Os 2 Input SET, DIR additional status output Resolution A 10 bit ST + 12 bit MT 1 11 bit ST + 12 bit MT 2 12 bit ST + 12 bit MT 3 13 bit ST + 12 bit MT 4 14 bit ST + 12 bit MT 7 17 bit ST + 12 bit MT Code B SSI, binary C BiSS, binary G SSI, Gray |
| | Flange 1 clamping flange Ø 58 mm, IP65 2 synchro flange Ø 58 mm, IP65 3 clamping flange Ø 58 mm, IP67 4 synchro flange Ø 58 mm, IP67 5 square flange, 2.5" (63.5 mm), IP65 7 square flange, 2.5" (63.5 mm), IP67 C flange with stator coupling, Ø 63 mm, IP67 D flange with stator coupling, Ø 63 mm, IP65 Solid shaft (Ø x L see table) 1 Ø 6 mm x 10 mm 2 Ø 10 mm x 20 mm 3 Ø 1/4" x 7/8" 5 Ø 3/8" x 7/8" 5 square flange, 2.5" (63.5 mm), IP65 7 square flange, 2.5" (63.5 mm), IP67 C flange with stator coupling, Ø 63 mm, IP67 D flange with stator coupling, Ø 63 mm, IP65 | | | | | | Output circuit and supply voltage 1 SSI or BiSS, 5 VDC 2 SSI or BiSS, 10...30 V 3 SSI or BiSS, and 2048 ppr SinCosSpur, 5 VDC 4 SSI or BiSS, and 2048 ppr SinCos, 10...30 VDC 5 SSI or BiSS, 5 VDC, with sensor output for voltage monitoring at encoder 6 SSI or BiSS and 2048 ppr SinCos, 5 VDC, with sensor output for voltage monitoring at encoder 7 SSI or BiSS and 2048 ppr incremental signals RS422, TTL comp., 5 VDC 8 SSI or BiSS and 2048 ppr incremental signals RS422, TTL comp., 10...30 VDC 9 SSI or BiSS and 2048 ppr incremental signals RS422, TTL comp., 5 VDC, with sensor output for voltage monitoring at encoder | | | | | | |

Absolute, hollow shaft, diameter 58 mm

| | | | | | | | | | | | | | |
|----------------|---|---|----------|----------|----------|----------|--|---|----------|----------|--|----------|-------------------------|
| T8.58X3 | Series | . | X | X | X | X | Identification 1 | . | X | X | X | X | Identification 2 |
| | <p>Series</p> <p>7 single turn</p> <p>8 multiturn</p> <p>Flange</p> <p>1 flange with torque support, IP65</p> <p>2 flange with torque support, IP67</p> <p>3 flange with stator coupling TK65, IP65</p> <p>4 flange with stator coupling TK65, IP67</p> <p>5 flange with stator coupling TK63, IP65</p> <p>6 flange with stator coupling TK63, IP67</p> <p>Hollow shaft</p> <p>3 Ø 10 mm</p> <p>4 Ø 12 mm</p> <p>5 Ø 14 mm</p> <p>6 Ø 15 mm (blind hole, hollow shaft)</p> <p>8 Ø 9.52 mm (3/8")</p> <p>9 Ø 12,7 mm (1/2")</p> | | | | | | <p>Connection mode</p> <p>2 cable radial (1 m PVC cable)</p> <p>4 12-pole M23 connector radial</p> <p>6 8-pole M12 connector radial</p> <p>E tangential cable outlet (1 m PVC cable)</p> <p>Output circuit and supply voltage</p> <p>1 SSI or BiSS, 5 VDC</p> <p>2 SSI or BiSS, 10...30 V</p> <p>3 SSI or BiSS and 2048 ppr SinCosSpur, 5 VDC</p> <p>4 SSI or BiSS and 2048 ppr SinCos, 10...30 VDC</p> <p>5 SSI or BiSS, 5 VDC, with sensor output for voltage monitoring at encoder</p> <p>6 SSI or BiSS and 2048 ppr SinCos, 5 VDC, with sensor output for voltage monitoring at encoder</p> <p>7 SSI or BiSS and 2048 ppr incremental signals RS422, TTL comp., 5 VDC</p> <p>8 SSI or BiSS and 2048 ppr incremental signals RS422, TTL comp., 10...30 VDC</p> <p>9 SSI or BiSS and 2048 ppr incremental signals RS422, TTL comp., 5 VDC, with sensor output for voltage monitoring at encoder</p> | | | | <p>Options (service)</p> <p>1 no option</p> <p>2 status LED</p> <p>3 SET button and status LED</p> <p>I/Os</p> <p>2 input SET, DIR additional status output</p> <p>Resolution</p> <p>A 10 bit ST + 12 bit MT</p> <p>1 11 bit ST + 12 bit MT</p> <p>2 12 bit ST + 12 bit MT</p> <p>3 13 bit ST + 12 bit MT</p> <p>4 14 bit ST + 12 bit MT</p> <p>7 17 bit ST + 12 bit MT</p> <p>Code</p> <p>B SSI, binary</p> <p>C BiSS, binary</p> <p>G SSI, Gray</p> | | |

At a glance

Inclinometers



Inclinometers – Solutions for many applications

No matter if applied in harvesters, agricultural and construction machinery, in vehicles and airplanes or in machines, robots and solar plants: Sensors for measuring and monitoring inclination are universally applicable and help to improve the safety and efficiency of operations.

Inclination is defined as the relative angular tilt to the horizon or perpendicular. Inclinometers use the local gravity respectively acceleration of gravity as a reference to measure angular tilt. The measuring principle is similar to that of perpendicular drop, whereby the mass is directly related to the gravitational field. Following this principle, inclinometers use mechanical pendulums, bending beams or liquids like in water-levels.

TURCK inclinometers incorporate a micro-mechanical pendulum based on MEMS technology (Mikro Elektro Mechanic Systems). The core piece is a capacitive sensor element consisting of two parallel arranged plate electrodes with a dielectric in the middle.

The dielectric of this differential capacitor is designed as a resilient pendulum. If the position of the sensor changes, the dielectric in the middle moves, causing the capacitance ratio between both electrodes to change. This change in capacitance is exactly measured and processed to detect the angular tilt.

The extremely rugged TURCK inclinometers are also suited for fast production sequences and withstand impacts. The standard product portfolio comprises rectangular shaped, biaxially operating inclinometers Q20L60, with angular ranges of $\pm 10^\circ$, $\pm 45^\circ$ and $\pm 60^\circ$. It also includes devices with analog voltage, current or ratiometric output as well as 20 mm uniaxial versions with freely adjustable measuring range $0^\circ \dots 360^\circ$ and analog or digital output.

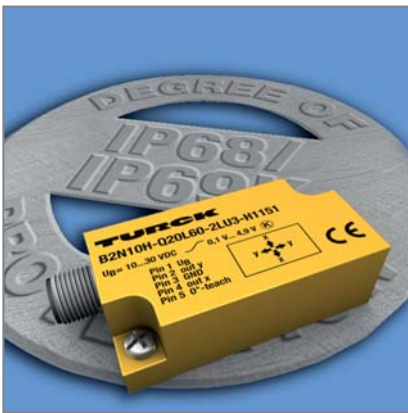
The Q42 complementing the product range, features a standard CANopen interface (CiA DS-301). These sensors provide baud rates of 10 kbps up to 1Mbps, high sampling rates and bandwidths as well as parameterizable vibrostability.

Our strenghts - Your advantages



High repeatability

The Q20L60 series is the right solution for high-precision applications, operating with a repeatability of 0.1% f.s. Q20L60 and Q42 inclinometers both feature a resolution of up to 0.04°.



High protection rating

The sensors are IP68 and IP69K protected, fulfilling high requirements such as:

- 24 hrs. continuous storage at +70 °C
- 24 hrs. continuous storage at -25 °C
- 7 days submersed, depth 1m
- 10 thermal shock changes from +70 °C to -25 °C, dwell cycle per temperature 1 hour
- Suited for high pressure steam-jet cleaning acc. to DIN 40050-9, following EN 60529



360° freely selectable range

The uniaxial inclinometers operate over the full angular range of 360°. The required measuring range is set via teach adapter. Select the start value and press the teach adapter VB2-SP3 for 1 sec. Then select the end value and press the teach adapter for 3 seconds.

advantages



Compact CANopen interface

The inclinometers with CANopen interface (CIA DS-301) provide baud rates of 10 kbps up to 1Mbps, high sampling rates and bandwidths as well as parameterizable vibrostability.



Easy setting of zero point

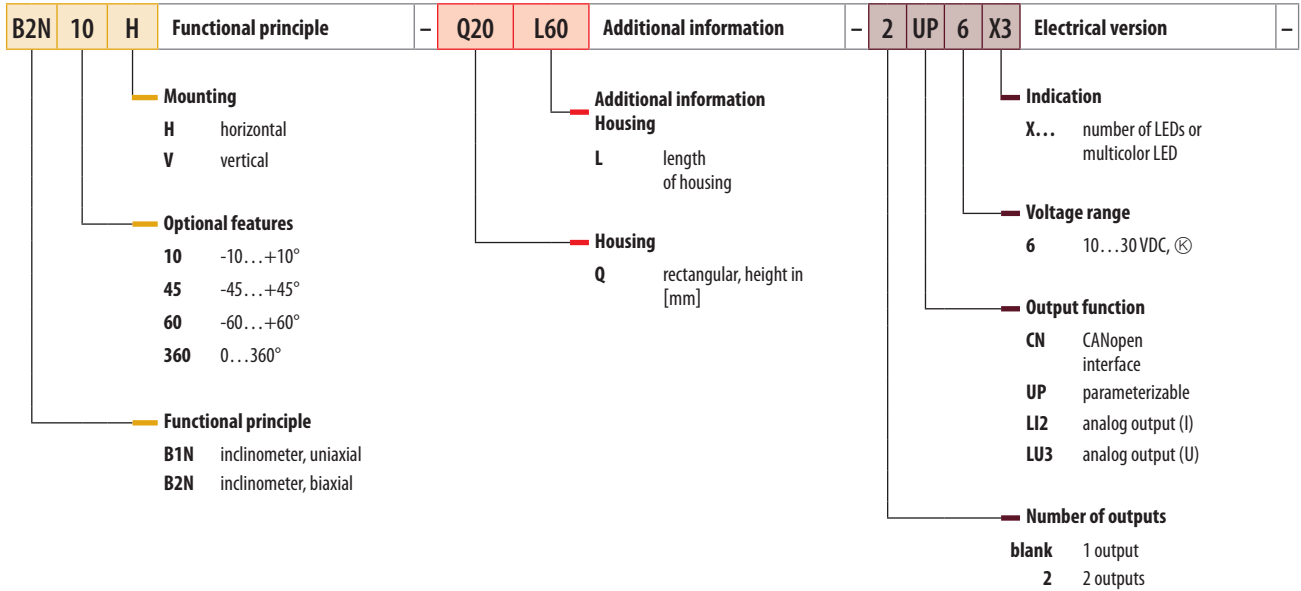
The home position (zero point) is easily set with the teach adapter VB2-SP3. Move the sensor in the wanted position, press the teach adapter for just 1 second and the sensor is calibrated!

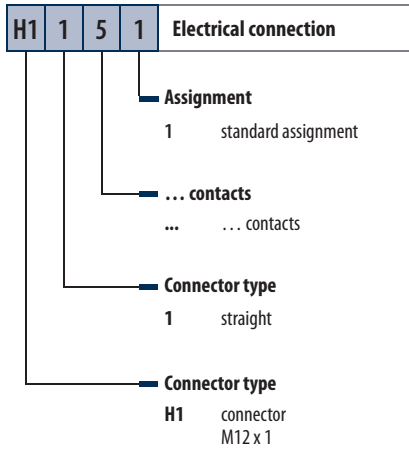


Programmable switchpoints

The inclinometer with digital output features two programmable switchpoints that can be set with the teach adapter TX1-Q20L60. Different positions at cranes and utility vehicles are thus detected and monitored for example.

Type code





Inclinometers for all applications



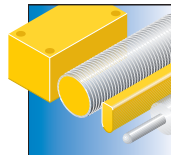
The standard product portfolio comprises rectangular shaped, biaxially operating inclinometers Q20L60, with angular ranges of $\pm 10^\circ$, $\pm 45^\circ$ and $\pm 60^\circ$. It also includes devices with analog voltage, current or ratiometric output as well as 20 mm uniaxial versions with freely adjustable measuring range $0^\circ \dots 360^\circ$ and analog or digital output.

The Q42 complementing the product range, features a standard CANopen interface (CiA DS-301). These sensors provide baud rates of 10 kbps up to 1 Mbps, high sampling rates and bandwidths as well as a parameterizable vibro-stability.

Features

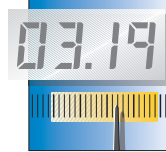
- Compact rectangular design
- High-speed measurement
- Sensitive and precise
- Long-term stable and reliable
- Zero-offset compensation
- High protection classes IP68 and IP69K
- Extremely robust
- Simple alignment
- Adjustable measuring range
- Adjustable switchpoints

Properties



Design

Compact housing, 20 x 42 mm



Measuring ranges

Angular ranges $\pm 10^\circ$, $\pm 45^\circ$, $\pm 60^\circ$, $\pm 85^\circ$ and 360°



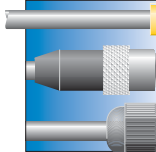
Materials

Rugged plastic housings, fully encapsulated, chemical-resistant



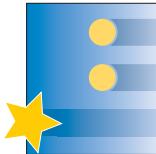
Electrical versions

Digital as well as analog current and voltage outputs



Electrical connections

M12 x 1 plug connection for simple installation



Special features

Zero point setting

Q20L60 – Voltage output 0.1...4.9 V



| | | | |
|--------------------------|-----------------|----------------------------|--------------|
| General data | | | |
| Dimensions | 30 x 20 x 60 mm | Ambient temperature | -30...+70 °C |
| Voltage output | 0.1...4.9 V | Protection class | IP68 / IP69K |
| Operating voltage | 10...30 VDC | Material housing | PC |

Types and data – selection table

| Type | Measuring range | Absolute accuracy (at 25 °C) | Temperature coef- ficient typical | Resolution | w | d |
|--------------------------|-----------------|---------------------------------|--------------------------------------|------------|------|------|
| B2N10H-Q20L60-2LU3-H1151 | -10...10° | 0.3 ° | 0.01 °/K | 0.04 ° | w133 | d562 |
| B2N45H-Q20L60-2LU3-H1151 | -45...45° | 0.5 ° | 0.03 °/K | 0.1 ° | w133 | d562 |
| B2N60H-Q20L60-2LU3-H1151 | -60...60° | 0.5 ° | 0.03 °/K | 0.14 ° | w133 | d562 |
| B2N85H-Q20L60-2LU3-H1151 | -85...85° | 0.5 | 0.03 °/K | 0.14 ° | w133 | d562 |

Q20L60 – Current output 4...20 mA



| | | | |
|--------------------------|-----------------|----------------------------|--------------|
| General data | | | |
| Dimensions | 30 x 20 x 60 mm | Ambient temperature | -30...+70 °C |
| Current output | 4...20 mA | Protection class | IP68 / IP69K |
| Operating voltage | 10...30 VDC | Material housing | PC |

Types and data – selection table

| Type | Measuring range | Absolute accuracy (at 25 °C) | Temperature coef- ficient typical | Resolution | w | d |
|--------------------------|-----------------|---------------------------------|--------------------------------------|------------|------|------|
| B2N10H-Q20L60-2LI2-H1151 | -10...10° | 0.3 ° | 0.01 °/K | 0.04 ° | w134 | d562 |
| B2N45H-Q20L60-2LI2-H1151 | -45...45° | 0.5 ° | 0.03 °/K | 0.1 ° | w134 | d562 |
| B2N60H-Q20L60-2LI2-H1151 | -60...60° | 0.5 ° | 0.03 °/K | 0.14 ° | w134 | d562 |
| B2N85H-Q20L60-2LI2-H1151 | -85...85° | 0.5 ° | 0.03 °/K | 0.14 ° | w134 | d562 |

Q20L60 – Ratiometric voltage output



| | | | |
|-----------------------------------|-------------------------|----------------------------|--------------|
| General data | | | |
| Dimensions | 30 x 20 x 60 mm | Ambient temperature | -30...+70 °C |
| Ratiometric output voltage | 2...98 % U _b | Protection class | IP68 / IP69K |
| Operating voltage | 4.75...5.25 VDC | Material housing | PC |

Types and data – selection table

| Type | Measuring range | Absolute accuracy (at 25 °C) | Temperature coefficient typical | Resolution | w | d |
|--------------------------|-----------------|------------------------------|---------------------------------|------------|------|------|
| B2N60H-Q20L60-2LU5-H1151 | -60...60° | 0.5 ° | 0.03 °/K | 0.14 ° | w133 | d562 |
| B2N10H-Q20L60-2LU5-H1151 | -10...10° | 0.3 ° | 0.01 °/K | 0.04 ° | w133 | d562 |
| B2N45H-Q20L60-2LU5-H1151 | -45...45° | 0.5 ° | 0.03 °/K | 0.1 ° | w133 | d562 |
| B2N85H-Q20L60-2LU5-H1151 | -85...85° | 0.5 ° | 0.03 °/K | 0.14 ° | w133 | d562 |

Q20L60 – Adjustable measuring range



| | | | |
|--|-----------------|----------------------------|--------------|
| General data | | | |
| Dimensions | 30 x 20 x 60 mm | Operating voltage | 10...30 VDC |
| Measuring range | 0...360° | Ambient temperature | -30...+70 °C |
| Absolute accuracy (at 25 °C) | 0.5 ° | Protection class | IP68 / IP69K |
| Temperature coefficient typical | 0.03 °/K | Material housing | PC |
| Resolution | 0.14 ° | | |

Types and data – selection table

| Type | Current output | Voltage output | w | d |
|--------------------------|----------------|----------------|------|------|
| B1N360V-Q20L60-LI2-H1151 | 4...20 mA | - | w135 | d563 |
| B1N360V-Q20L60-LU3-H1151 | - | 0.1...4.9V | w136 | d563 |

Q20L60 – Two programmable switchpoints



| | | | |
|------------------------------------|-----------------------------|----------------------------|--------------|
| Type | B1N360V-Q20L60-2UP6X3-H1151 | Operating voltage | 10...30 VDC |
| Dimensions | 30 x 20 x 60 mm | Ambient temperature | -30...+70 °C |
| Measuring range | 0...360° | Protection class | IP68 / IP69K |
| Output | programmable, 2 x PNP | Material housing | PC |
| Absolute accuracy (at 25°C) | 0.5° | Wiring diagram | w137 |
| Resolution | 0.14° | Dimension drawing | d564 |

Q42 – CANopen interface



| | | | |
|--|-----------------|----------------------------|--------------|
| General data | | | |
| Dimensions | 52 x 42 x 68 mm | Ambient temperature | -40...+80 °C |
| Absolute accuracy (at 25°C) | 0.1° | Protection class | IP68 / IP69K |
| Temperature coefficient typical | 0.008 °/K | Material housing | PA |
| Operating voltage | 10...30 VDC | | |

Types and data – selection table

| Type | Resolution | Measuring range | w | d |
|------------------------|------------|-----------------|------|------|
| B2N10H-Q42-CNX2-2H1150 | 0.05° | -10...+10° | w138 | d565 |
| B2N45H-Q42-CNX2-2H1150 | 0.1° | -45...+45° | w138 | d565 |
| B2N60H-Q42-CNX2-2H1150 | 0.1° | -60...+60° | w138 | d565 |

At a glance

Connecting and Mounting accessories



Connection technology

TURCK connectors fulfill many different requirements of the automation industry. The standard and universally applicable product series help to minimize installation efforts and storage space.

M8/M12 x 1 female or male outputs are available, straight and angled, 3 and 4-pole. The M12 is also available as 5-pole version. The entire product family is IP67 rated.



Mounting accessories

TURCK offers the appropriate accessories for quick mounting, optimal operation and protection of the sensors. Accessories for:

- Proximity sensors
- Dual sensors for rotary actuators
- Magnetic field sensors

- Pressure sensors
- Temperature sensors
- Flow sensors
- Ultrasonic sensors

More accessories for photoelectric and inspection sensors are listed at the end.

Plug connections



The product range features flit plugs with injection-moulded cables, connection cables and field attachable plugs. You find a short overview of the standard flit plugs with stripped cable end further below in this chapter.

Please visit our website for more details on our entire product range.

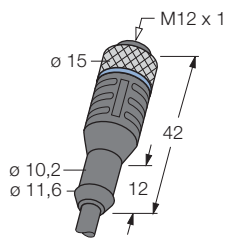
Automation-Line plug connections

- Trailing capability
- Free from halogen, silicone and PVC
- UL approved
- Resistant to weld splatter, chemicals and oils
- Resistant to microbes and hydrolysis
- Flame-retardant

FB+ plug connections

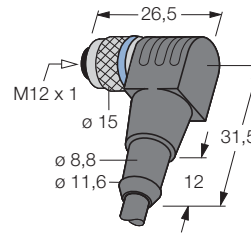
- IP68/IP69K rated
- Resistant to cleaning agents
- Stainless steel coupling nut

Plug connections



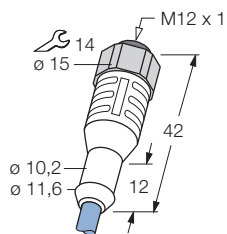
Female
M12 x 1 straight
Cable length 2 m

3-pole AL-WAK3-2/S370
4-pole AL-WAK4-2/S370
5-pole AL-WAK4.5-2/S370



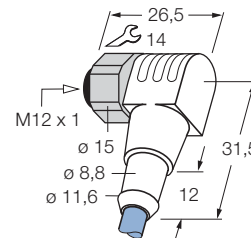
Female
M12 x 1 angled
Cable length 2 m,
Food industry

3-pole AL-WWAK3-2/S370
4-pole AL-WWAK4-2/S370
5-pole AL-WWAK4.5-2/S370



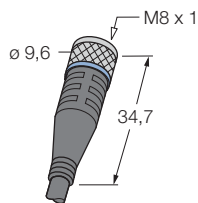
Female
M12 x 1 straight
Cable length 2 m
Food industry

4-pole FB-WAK4-2/S2300



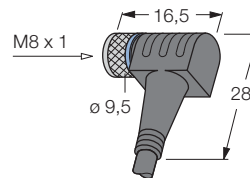
Female
M12 x 1 angled
Cable length 2 m,
Food industry

4-pole FB-WWAK4-2/S2300



Female
M8 x 1 straight
Cable length 2 m

3-pole AL-SKP3-2/S370
4-pole AL-SKP4-2/S370



Female
M8 x 1 angled
Cable length 2 m

3-pole AL-SWKP3-2/S370
4-pole AL-SWKP4-2/S370

For other cable lengths see www.turck.com

Accessories for proximity sensors



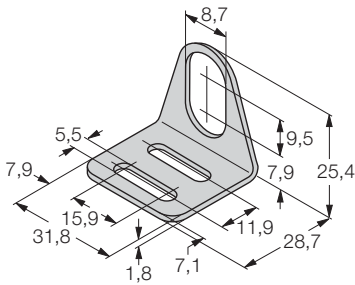
Our scope of delivery comprises accessories for operating, mounting and protection of proximity sensors. We offer function supporting accessories and actuating elements, accessories for easy and safe mounting as well as protective aids to hold up mechanical damage.

Features

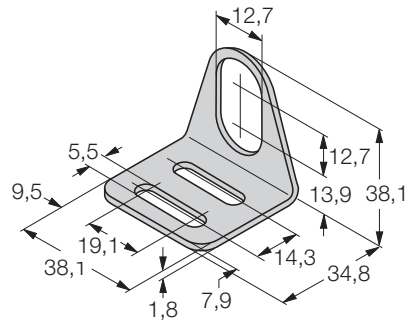
- Protective housing and mounting rails for CP40 sensors
- Fixing clamps for smooth and threaded barrel sensors
- Teflon caps for M12, M18 and M30 threads protect against weld splatter
- Test box to check the functionality of sensors
- Universal signal transducer for sensors with M12 connector
- Brackets provide highest mounting flexibility

Mounting brackets

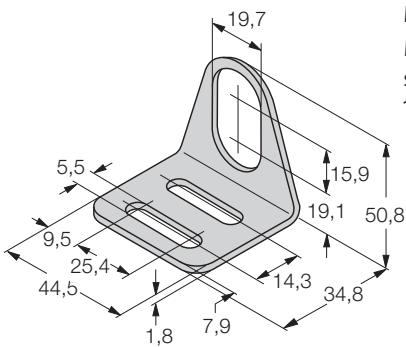
MW-08
Mounting bracket;
stainless steel A2
1.4301 (AISI 304)



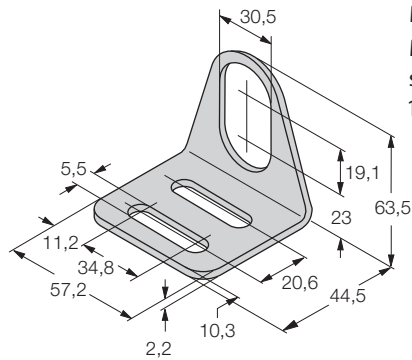
MW-12
Mounting bracket;
stainless steel A2
1.4301 (AISI 304)



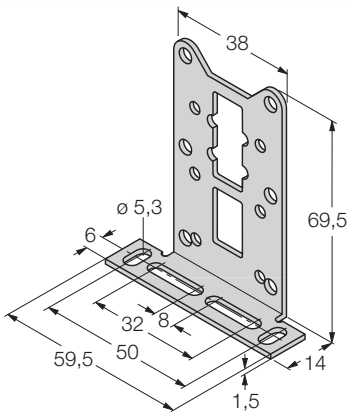
MW-18
Mounting bracket;
stainless steel A2
1.4301 (AISI 304)



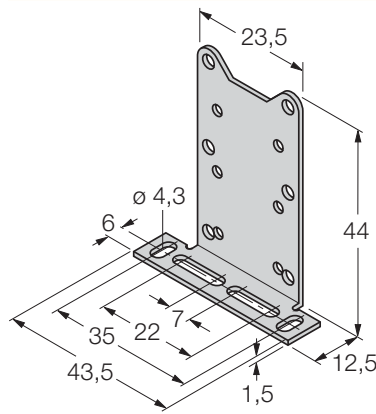
MW-30
Mounting bracket;
stainless steel A2
1.4301 (AISI 304)



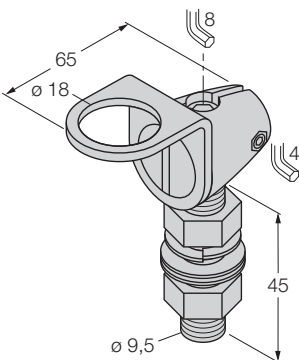
MW-Q14/Q20
Mounting bracket;
VA 1.4301



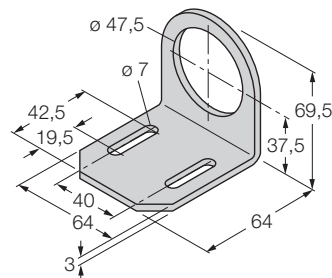
MW-Q08/Q10
Mounting bracket;
VA 1.4301



SMB18FA
Mounting bracket;
VA 1.4401

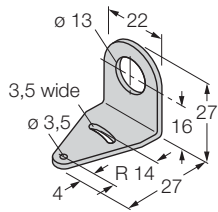


MW 47
Mounting bracket;
steel plate, zinc-plated



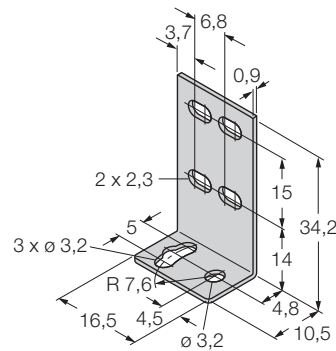
SMBQS12PD

Mounting bracket;
VA 1.4401, for Q12
series



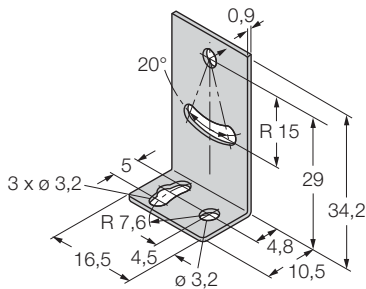
SMBQ12T

Mounting bracket;
VA 1.4401, for photo-
electric sensor, Q12
series



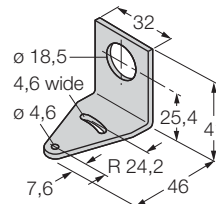
SMBQ12A

Mounting bracket;
VA 1.4401, for photo-
electric sensor, Q12
series



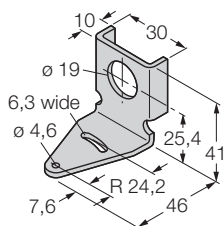
SMB18A

Mounting bracket for
threaded barrels,
stainless steel



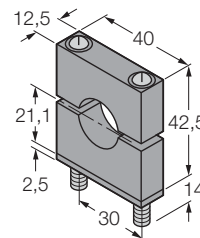
SMB18Q

Mounting bracket for
threaded barrels,
stainless steel



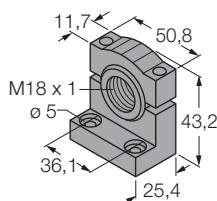
SMB18C

Mounting bracket,
PBT black; 2 screws
M5 x 0.8



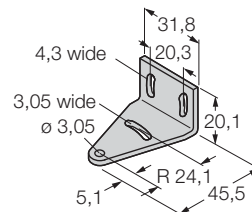
SMB18SF

Mounting bracket,
PBT black



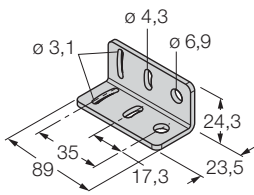
SMB312S

Mounting bracket for
threaded barrels,
stainless steel



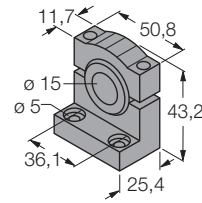
SMB312B

Mounting bracket for threaded barrels, stainless steel



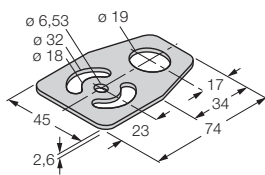
SMB1815SF

Mounting bracket, PBT black



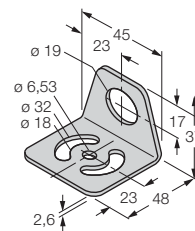
SMBAMS18P

Backplane, stainless steel



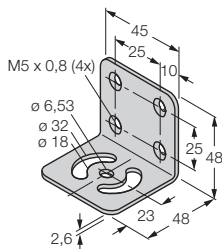
SMBAMS18RA

Mounting bracket, stainless steel



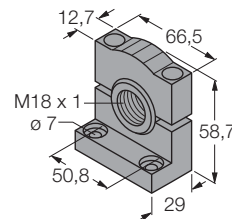
SMBAMSBRA

Mounting bracket, stainless steel



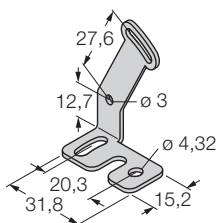
SMB3018SC

Mounting bracket, PBT black



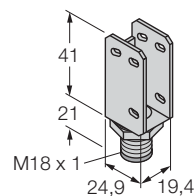
SMBQS18AF

Mounting bracket, stainless steel, for QS18AF series



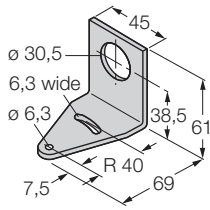
SMBQS18A

Mounting bracket, stainless steel, for QS18 series



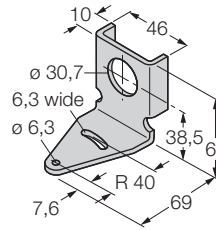
SMB30A

Mounting bracket for threaded barrels, stainless steel



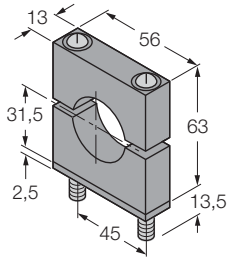
SMB30Q

Mounting bracket for threaded barrels, stainless steel



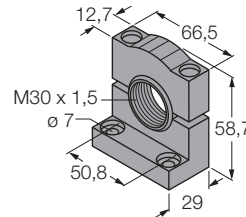
SMB30C

Mounting bracket, PBT black; 2 screws M5 x 0.8



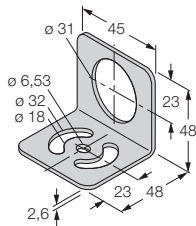
SMB30SC

Mounting bracket, PBT black; 4 screws M5 x 0.8



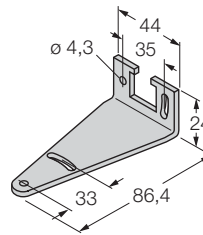
SMBAMS30RA

Mounting bracket, stainless steel



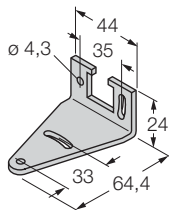
SMBQS30LT

Mounting bracket, stainless steel, for QS30 series



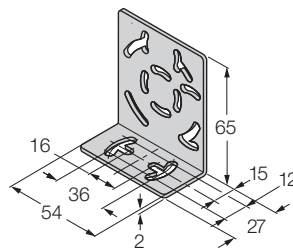
SMBQS30L

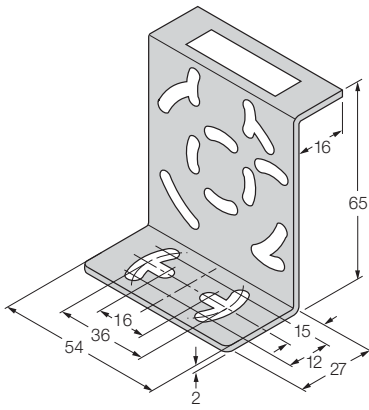
Mounting bracket, stainless steel, for QS30 series



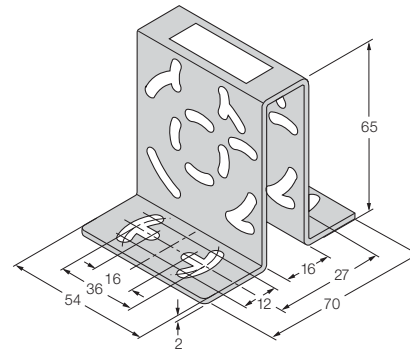
SMB46L

Mounting bracket for threaded barrels, stainless steel

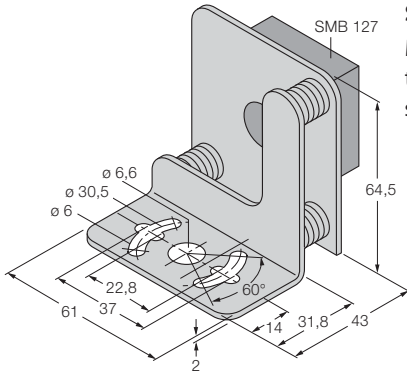




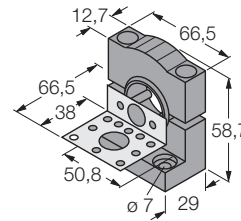
SMB46S
Mounting bracket for
threaded barrels,
stainless steel



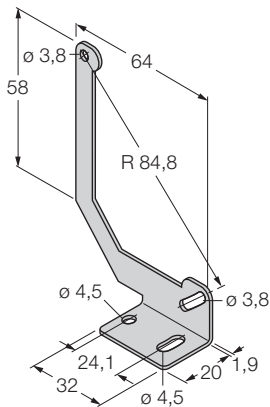
SMB46U
Mounting bracket for
threaded barrels,
stainless steel



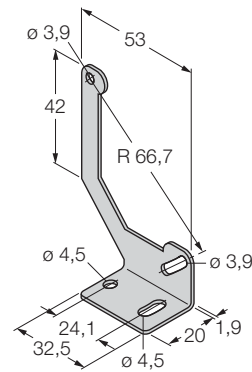
SMB46A
Mounting bracket for
threaded barrels,
stainless steel



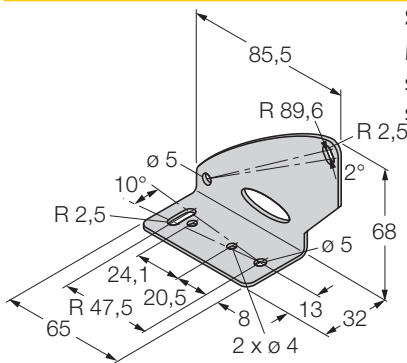
SMB30SK
Mounting bracket,
PBT black



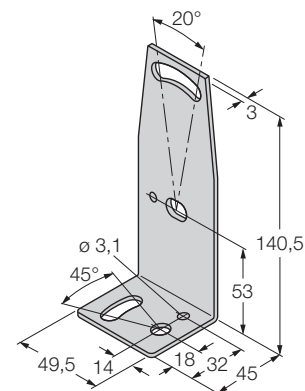
SMBQ50
Mounting bracket,
stainless steel, for Q50
series



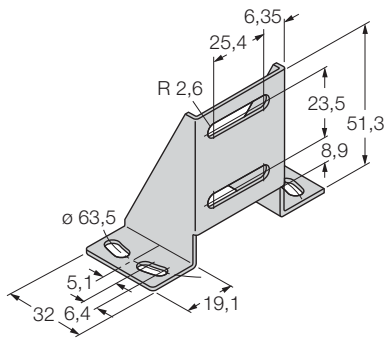
SMBQ60
Mounting bracket,
stainless steel, for Q60
series



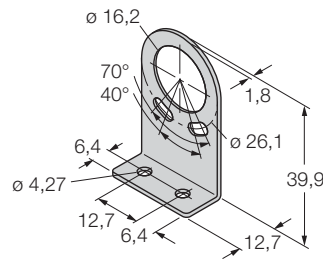
SMBLT31
Mounting bracket,
stainless steel, for LT3
series



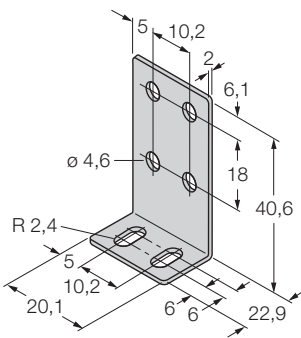
Mounting bracket,
stainless steel, for LT3
series



SMLXR
Foot, for LX series

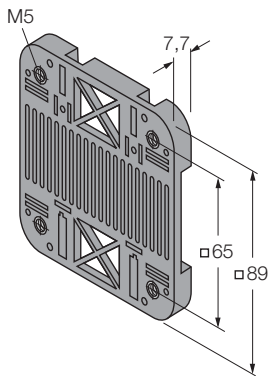


SMLX
Mounting bracket,
stainless steel, LX
series

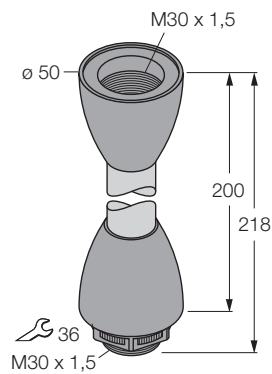


SMBPVA1
Mounting bracket,
stainless steel, for PVA
series

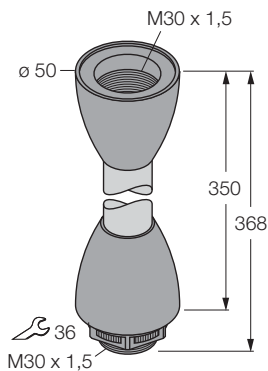
Mounting aids



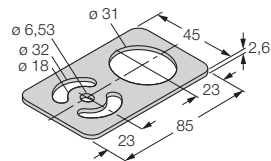
SMBDX80DIN
Backplane for DIN rail,
suited for CP80, DX80,
K80, Q80



SOK-K50L-150SS
Foot for signal light
K50L, stainless-steel
round bar, adapter
made of Acetal



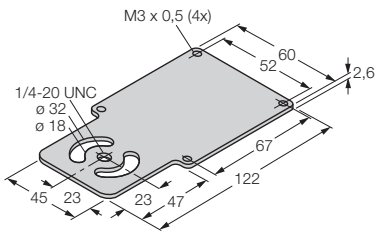
SOK-K50L-300SS
Foot for signal light
K50L, stainless-steel
round bar, adapter
made of Acetal



SMBAMS30P
Backplane, stainless
steel

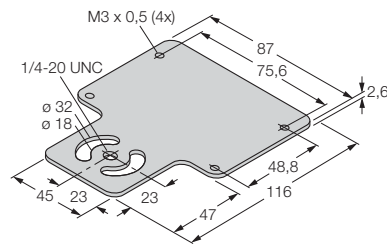
SMBAMSQ60P

Backplane, stainless steel, for Q60 series



SMBAMSLT3P

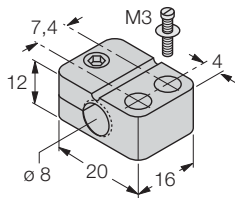
Backplane, stainless steel, for LT3 series



Fixing clamps

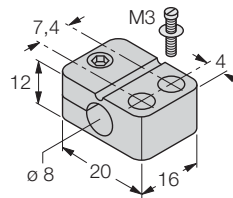
BST-08B

Fixing clamp with dead-stop; PA6



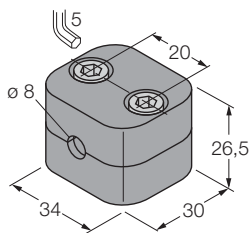
BST-08N

Quick-mount fixing clamp without dead-stop; PA6



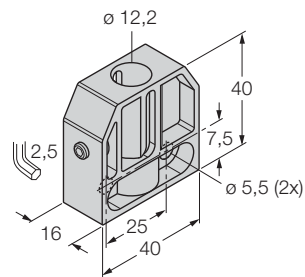
BSS-08

Fixing clamp; polypropylene



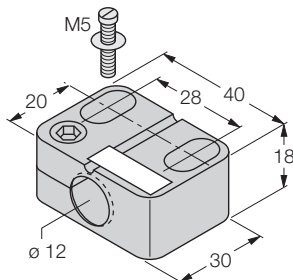
BS 12

Fixing clamp; PBT-GF20



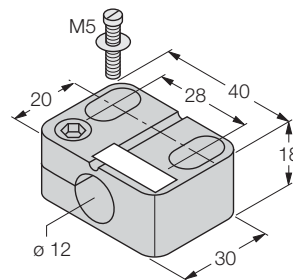
BST-12B

Fixing clamp with dead-stop; PA6

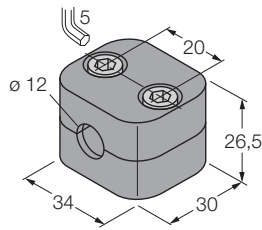


BST-12N

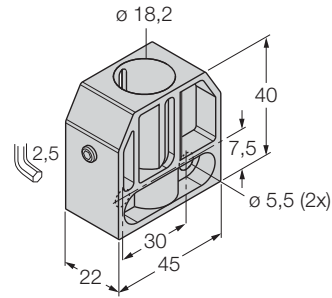
Quick-mount fixing clamp without dead-stop; PA6



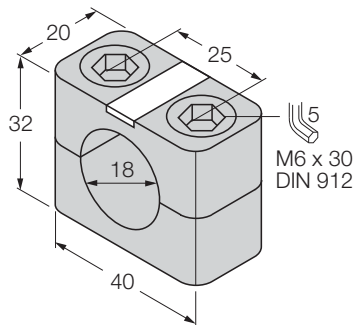
BSS-12
Fixing clamp;
polypropylene



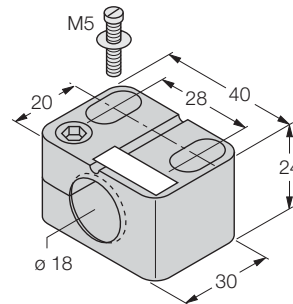
BS 18
Fixing clamp; PA66-GF



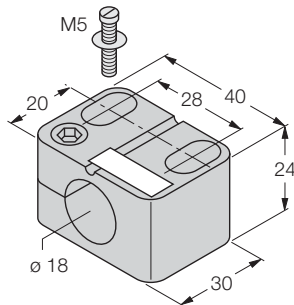
BSN 18
Fixing clamp; PA66-GF



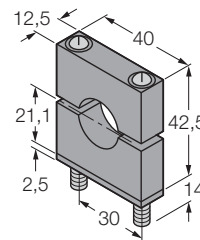
BST-18B
Fixing clamp with
dead-stop; PA6



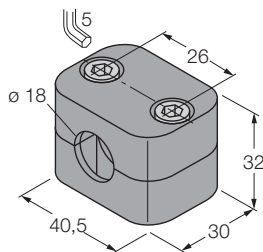
BST-18N
Quick-mount fixing
clamp without dead-
stop; PA6



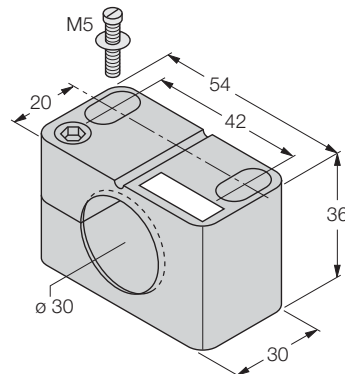
SMB18C
Mounting bracket,
PBT black; 2 screws
M5 x 0.8

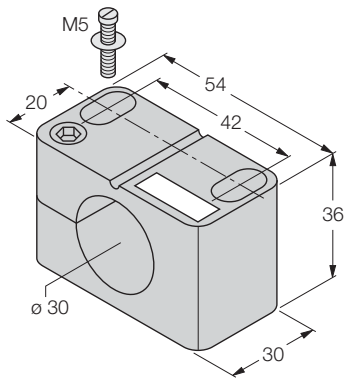


BSS-18
Fixing clamp;
polypropylene



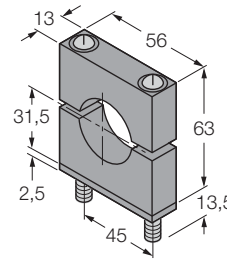
BST-30B
Fixing clamp with
dead-stop; PA6





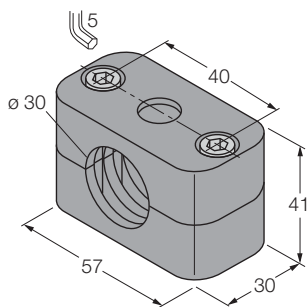
BST-30N

Quick-mount fixing clamp without dead-stop; PA6



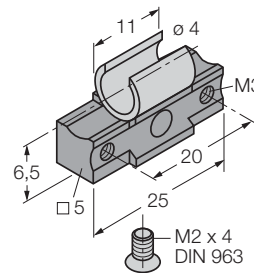
SMB30C

Mounting bracket, PBT black; 2 screws M5 x 0.8



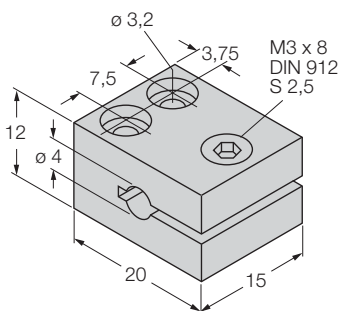
BSS-30

Fixing clamp; polypropylene



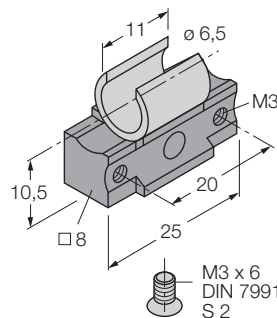
BS 540

Fixing clamp; mounting block made (anodized aluminium); clamp sleeve (steel)



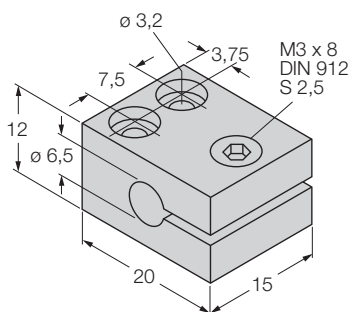
MBS40

Fixing clamp; mounting block (anodized aluminium)



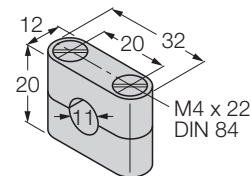
BS 865

Fixing clamp; mounting block (anodized aluminium); clamp sleeve (steel)



MBS65

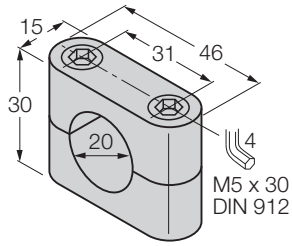
Fixing clamp; mounting block (anodized aluminium)



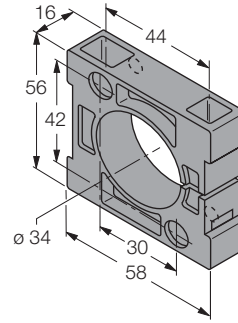
BS 11

Fixing clamp; mounting block: PBT

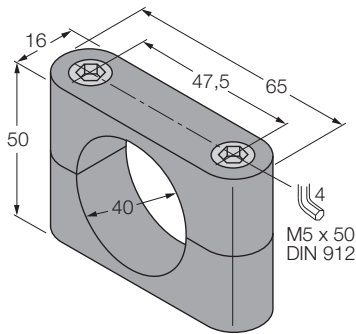
BS 20
Fixing clamp;
mounting block PBT



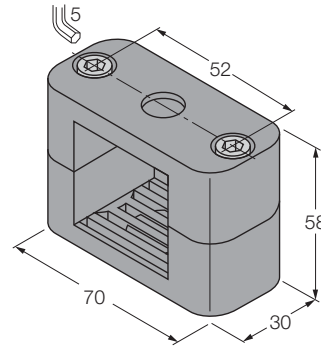
BS34.1
Fixing clamp; mount-
ing block (PBT-GF20-
V0); dimensions
(58 mm x 56 mm x
16 mm), included in
delivery (2 M5 screws
for base mounting)



BS 40
Fixing clamp;
mounting block PBT

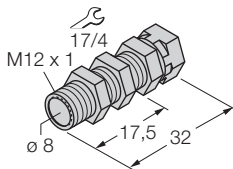


BSS-CP40
Fixing clamp,
polypropylene

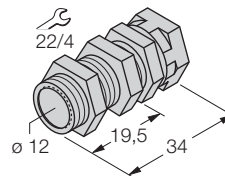


Quick-mount brackets

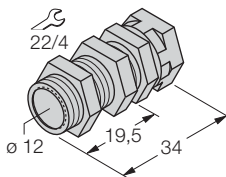
QM-08
Quick-mount bracket
with dead-stop;
chrome-plated brass
male thread M12 x 1.
Note: The switching
distance of proxim-
ity switches may be
reduced by the use of
quick-mount brackets.



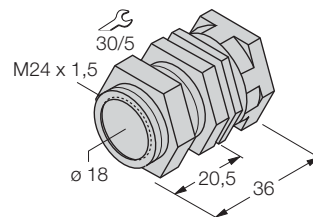
QM-12
Quick-mount bracket
with dead-stop;
chrome-plated brass
male thread M16 x 1.
Note: The switching
distance of proxim-
ity switches may be
reduced by the use of
quick-mount brackets.

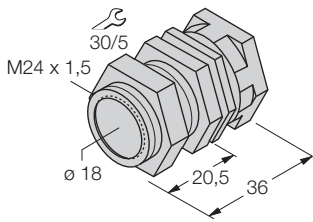


QMT-12
Quick-mount bracket
with dead-stop;
teflon-coated brass
male thread M16 x 1.
Note: The switching
distance of proxim-
ity switches may be
reduced by the use of
quick-mount brackets.



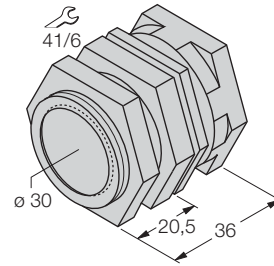
QM-18
Quick-mount bracket
with dead-stop;
chrome-plated brass
male thread M24 x 1.5.
Note: The switching
distance of proxim-
ity switches may be
reduced by the use of
quick-mount brackets.





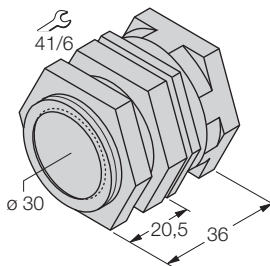
QMT-18

Quick-mount bracket with dead-stop; teflon-coated brass male thread M24 x 1.5. Note: The switching distance of proximity switches may be reduced by the use of quick-mount brackets.



QM-30

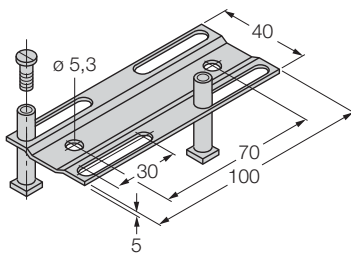
Quick-mount bracket with dead-stop; chrome-plated brass male thread M36 x 1.5. Note: The switching distance of proximity switches may be reduced by the use of quick-mount brackets.



QMT-30

Quick-mount bracket with dead-stop; teflon-coated brass male thread M36 x 1.5. Note: The switching distance of proximity switches may be reduced by the use of quick-mount brackets.

Mounting rail



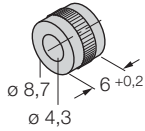
JS 025/037

Mounting rail;
VA 1.4301

Spacer rollers

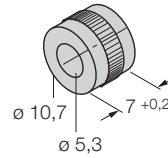
MH-Q14

Mounted with active face downwards, for Q14



MH-Q20

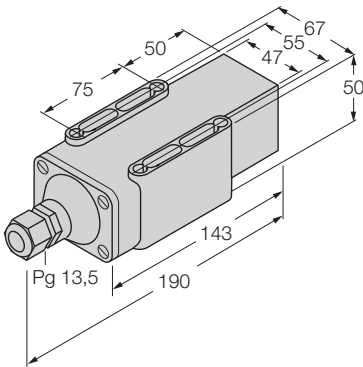
Mounted with active face downwards, for Q20



Protective housings

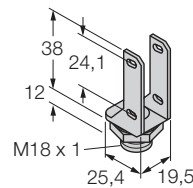
SG40/2 (ULTEM)

Protective housing; housing/cover material: ULTEM; temperature resistant up to +170 °C, especially UV and ozone resistant; protection class IP 68, 5 m wh.



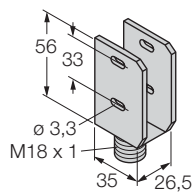
SMBQS18Y

Protective housing, stainless steel, for QS18 series



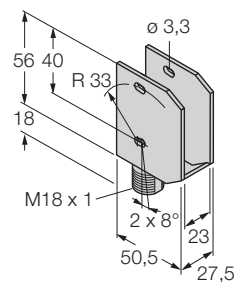
SMBQS30Y

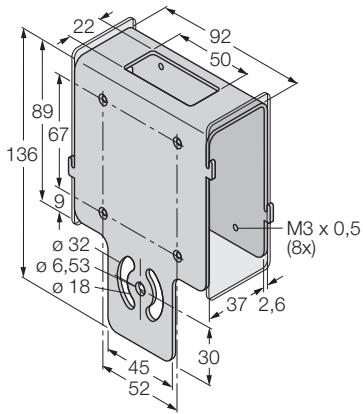
Protective housing, stainless steel, for QS30 series



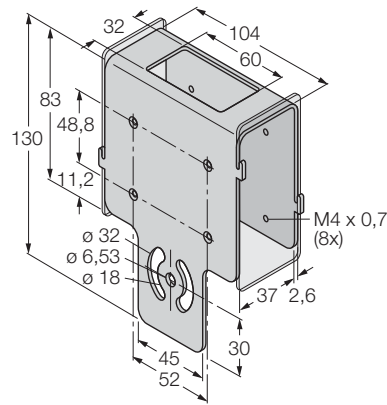
SMBQS30YL

Protective housing with safety glass panel, stainless steel, for QS30 series

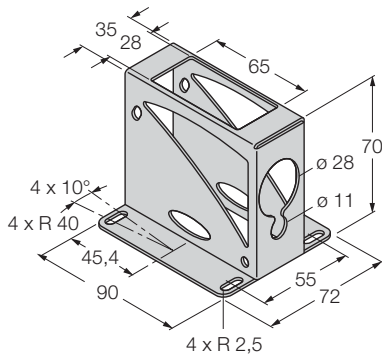




SMBAMSQ60IP
Protective housing
with safety glass
panel, stainless steel,
for Q60

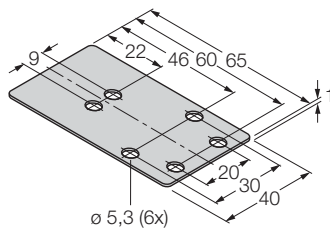


SMBAMSLT3IP
Protective housing
with safety glass
panel, for LT3 series

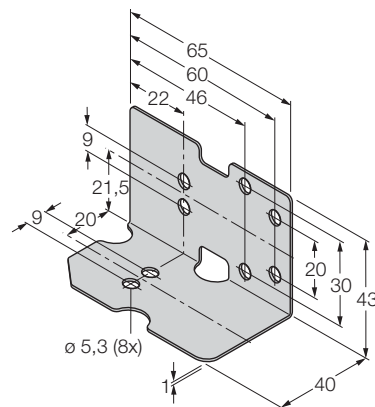


SMBLT32
Protective housing,
stainless steel, for
LT3 series

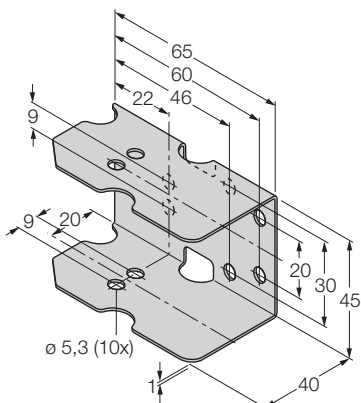
Protective frames



MF-CK40-1S
Protective frame
(I-profile)

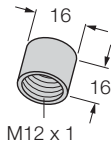


MF-CK40-2S
Protective frame
(L-profile)

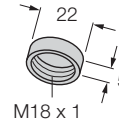


MF-CK40-3S
Protective frame
(U-profile)

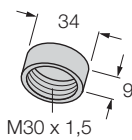
Protective caps



SKN/M12
Protective teflon cap;
PTFE; for use in
welding systems and
grinding machinery
exposed to strong
sparking

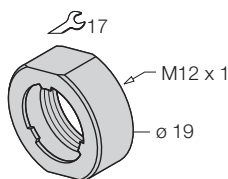


SKN/M18
Protective teflon cap;
PTFE; for use in
welding systems and
grinding machinery
exposed to strong
sparking

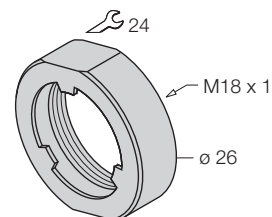


SKN/M30
Protective teflon cap;
material PTFE; for use
in welding systems
and grinding machin-
ery exposed to strong
sparking

Screw caps



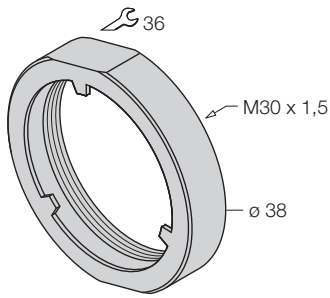
PN-M12
Screw cap;
stainless steel A2
1.4305 (AISI 303)



PN-M18
Screw cap; stainless
steel A2 1.4305 (AISI
303)

PN-M30

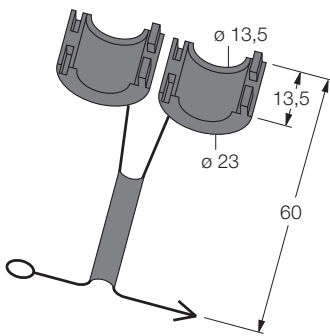
Screw cap; stainless steel A2 1.4305 (AISI 303)



Safety clips

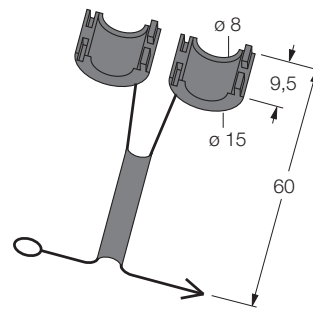
SC-M12/3GD

Safety clip for sensors with M12 x 1 plug connection and approval according to ATEX II 3 G or II 3 D



SC-M8/3GD

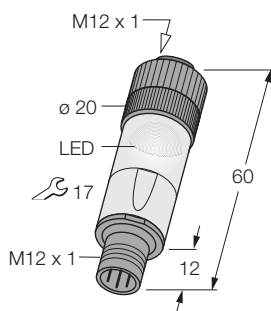
Safety clip for sensors with M8 x 1 plug connection and approval according to ATEX II 3 G or II 3 D



Adapters

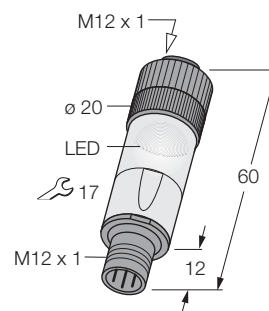
SPF1-AP6X

Adapter for rotation speed monitor

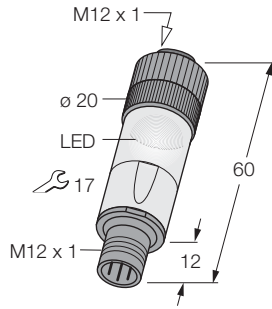


SPN1-AP6-ARN6X

Adapter for PNP/NPN switching function

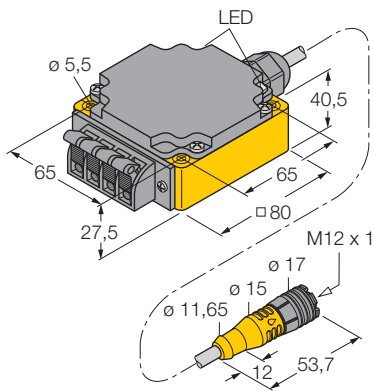


SPT1-AP6X
Adapter with switch-
ON/OFF delay

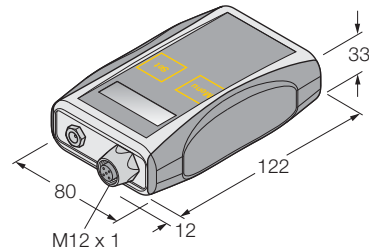


Test boxes

TB3-CP80
Universal test box for
PNP, NPN and NAMUR
sensors



TB4
Universal test and
configuration box
for analog and binary
sensors.



Accessories for dual sensors

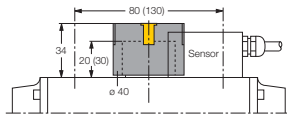


TURCK offers a comprehensive range of sensors and matching accessories for position feedback. This allows cost-effective planning, commissioning and operation of systems. Different actuating elements can be applied for clockwise and counterclockwise rotating actuators and changing switchpoints.

Features

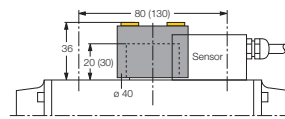
- Broad range of actuating elements and accessories
- Highly resistant to chemicals and cleaning agents
- For all standard actuators
- Rugged design

Dual sensors DSU35



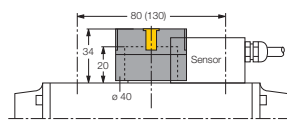
BTS-DSU35-EB1

Actuation kit (puck); end position damped; hole pattern on flange surface 80 x 30 mm and 130 x 30 mm; interconnecting shaft (shaft extension) height 20 (30) mm / Ø max. 30 mm



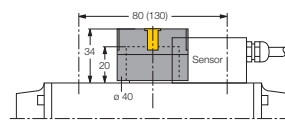
BTS-DSU35-EU2

Actuation kit (puck); end position damped for clockwise or counter-clockwise drives; hole pattern on flange surface 80 x 30 mm and 130 x 30 mm; interconnecting shaft (shaft extension) height 20 (30) mm / Ø max. 30 mm



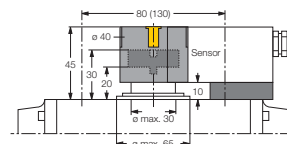
BTS-DSU35-EBE1

Actuation kit (puck), end position damped and switchpoint adjustable; hole pattern on flange surface 80 x 30 mm (130 x 30 mm); interconnecting shaft (shaft extension) height 20 / Ø max. 30 mm



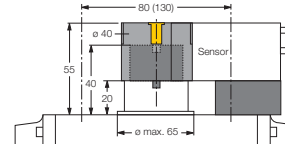
BTS-DSU35-EBE3

Actuation kit (puck), end position damped; „open“ and „closed“ switch-point infinitely adjustable; hole pattern on flange surface 80 x 30 mm and 130 x 30 mm; interconnecting shaft (shaft extension) height 20 / Ø max. 30 mm



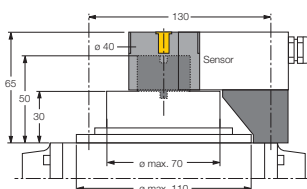
BTS-DSU35-Z01

Mounting kit for larger rotary actuators: Ø disc and snap ring max. 65 mm; hole pattern on flange surface 30 x 80 mm (30 x 130 mm); interconnecting shaft (shaft extension) height 30 mm / Ø max. 30 mm



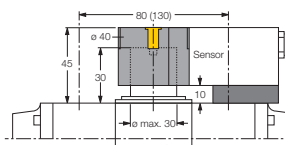
BTS-DSU35-Z02

Mounting kit for larger rotary actuators: Ø disc and snap ring max. 65 mm; hole pattern on flange surface 30 x 80 mm (30 x 130 mm); interconnecting shaft (shaft extension) height 20 (30) mm / Ø max. 40 mm



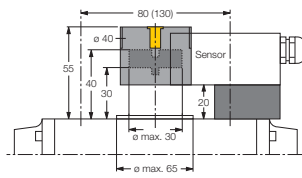
BTS-DSU35-Z03

Mounting kit for larger rotary actuators: Ø disc and snap ring max. 110 mm; hole pattern on flange surface 30 x 130 mm; interconnecting shaft (shaft extension) height 30 mm / Ø max. 70 mm

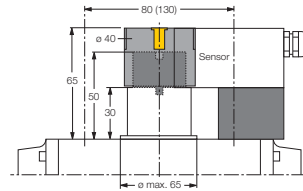


BTS-DSU35-Z04

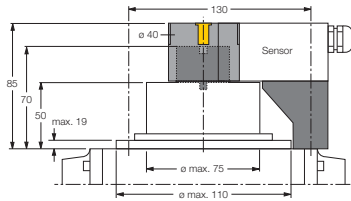
Mounting kit for larger rotary actuators: Ø disc and snap ring max. 65 mm; hole pattern on flange surface 30 x 80 mm (30 x 130 mm); interconnecting shaft (shaft extension) height 30 mm / Ø max. 30 mm



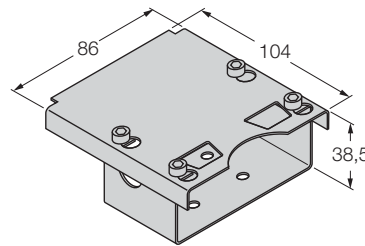
BTS-DSU35-Z05
 Mounting kit for larger rotary actuators: Ø disc and snap ring max. 65 mm; hole pattern on flange surface 30 x 80 mm (30 x 130 mm); interconnecting shaft (shaft extension) height 30 mm / Ø max. 30 mm



BTS-DSU35-Z06
 Mounting kit for larger rotary actuators: Ø disc and snap ring max. 65 mm; hole pattern on flange surface 30 x 80 mm (30 x 130 mm); interconnecting shaft (shaft extension) height 30 mm / Ø max. 40 mm

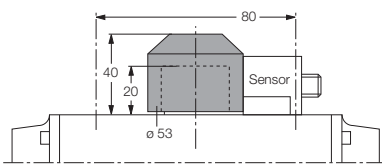


BTS-DSU35-Z07
 Mounting kit for larger rotary actuators: Ø disc and snap ring max. 110 mm; hole pattern on flange surface 30 x 130 mm; interconnecting shaft (shaft extension) height 30 mm / Ø max. 75 mm

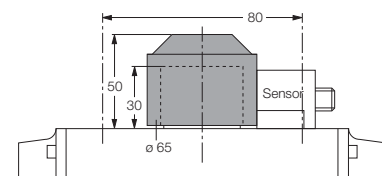


SG-DSU35TC
 Protective housing for dual sensors, series DSU35, for mechanically protected installation in the explosion hazardous area

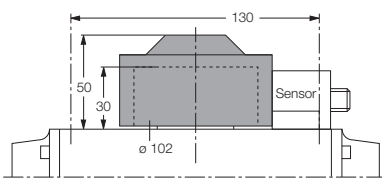
Dual sensors DSC26



BTS-DSC26-EB1
 Actuation kit (puck); end position damped; hole pattern on flange surface 80 x 30 mm and 130 x 30 mm; interconnecting shaft (shaft extension) height 20 mm / Ø max. 35 mm



BTS-DSC26-EB2
 Actuation kit (puck); end position damped; hole pattern on flange surface 80 x 30 mm and 130 x 30 mm; interconnecting shaft (shaft extension) height 30 mm / Ø max. 50 mm



BTS-DSC26-EB3
 Actuation kit (puck); end position damped; hole pattern on flange surface 30 x 130 mm; interconnecting shaft (shaft extension) height 30 mm / Ø max. 85 mm

Accessories for magnetic field sensors

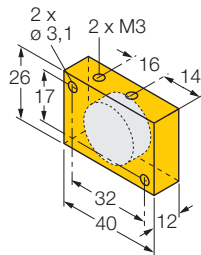


The permanent magnets are used as actuating elements for magnetic inductive proximity sensors or as positioning elements for magnetic inductive linear-position sensors. Despite the small size, they achieve larger switching distances compared to inductive sensors. They fit in narrow spaces and are ideal for difficult sensing conditions, such as hangar doors with poor guiding control.

Features

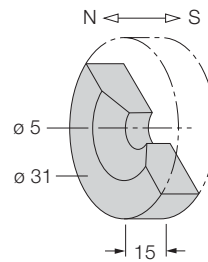
- Strontium ferrite magnets, rugged and resistant to chemicals
- Block-shaped polyamide magnet
- Switching distance up to 90 mm on BIM-(E)M12 sensors
- Switching distance up to 78 mm on BIM-EG08 sensors
- Recommended distance between magnet and WIM-Q25L positioning sensor: 3 to 5 mm

Actuating magnets



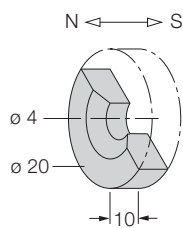
DM-Q12

Actuating magnet; block-shaped, plastic; sensing range 58 mm on BIM-(E)M12 sensors resp. 49 mm on BIM-EG08 sensors; in combination with Q25: Recommended distance between sensor and magnet: 3 ... 5 mm



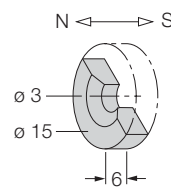
DMR31-15-5

Actuating magnet, Ø 31 mm (Ø 5 mm), h: 15 mm; sensing range 90 mm on BIM-(E)M12 sensors resp. 78 mm on BIM-EG08 sensors; in combination with Q25L: Recommended distance between sensor and magnet: 3 ... 5 mm



DMR20-10-4

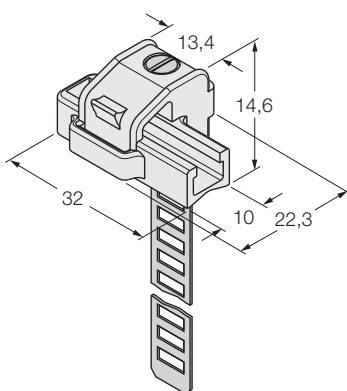
Actuating magnet; Ø 20 mm (Ø 4 mm), height 10 mm; sensing range 59 mm on BIM-(E)M12 sensors resp. 50 mm on BIM-EG08 sensors; in combination with Q25L: Recommended distance between sensor and magnet: 3 ... 4 mm



DMR15-6-3

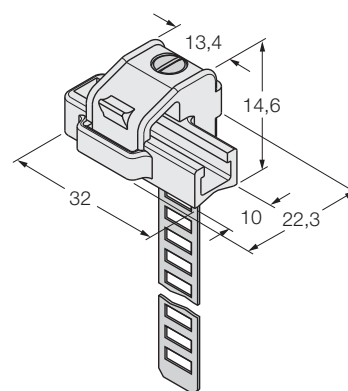
Actuating magnet, Ø 15 mm (Ø 3 mm), height 6 mm; sensing range 36 mm on BIM-(E)M12 sensors resp. 32 mm on BIM-EG08 sensors; in combination with Q25L: Recommended distance between sensor and magnet: 3 ... 4 mm

Accessories for UNT



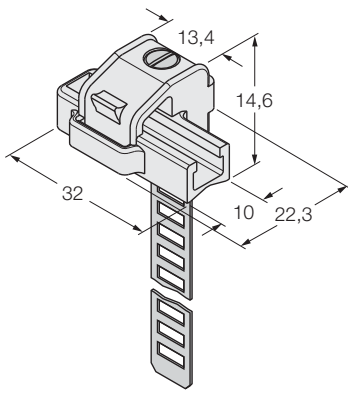
KLRC-UNT1

Mounting aid for
○ cylinders;
Ø 8...25 mm;
PA 6I/6T / nickel silver;
fire-hazard classifica-
tion acc. to UL94 - V2



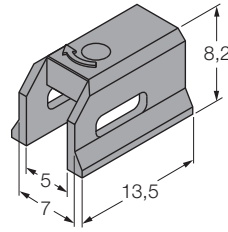
KLRC-UNT2

Mounting aid for
○ cylinders;
Ø 25...63 mm;
PA 6I/6T / nickel silver;
fire-hazard classifica-
tion acc. to UL94 - V2



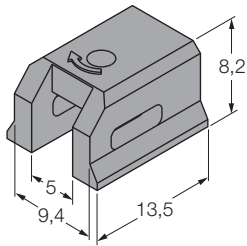
KLRC-UNT3

Mounting aid for
 ○ cylinders;
 Ø 63...130 mm;
 PA 6I/6T / nickel silver;
 fire-hazard classifica-
 tion acc. to UL94 - V2



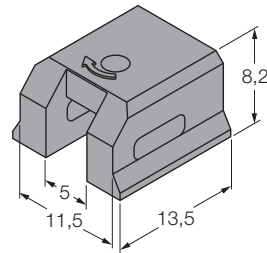
KLDT-UNT2

Mounting aid for
 □ dovetail groove
 cylinders; groove
 width 7 mm; PPS



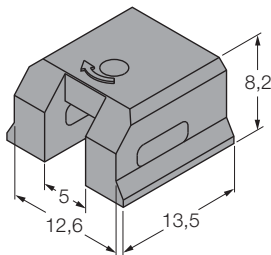
KLDT-UNT3

Mounting aid for
 □ dovetail groove
 cylinders; groove
 width 9.4 mm; PPS



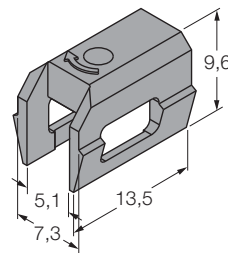
KLDT-UNT4

Mounting aid for
 □ dovetail groove
 cylinders; groove
 width 11.5 mm; PPS



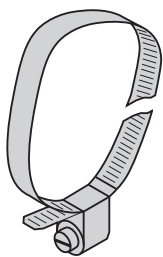
KLDT-UNT5

Mounting aid for
 □ dovetail groove
 cylinders; groove
 width 12.6 mm; PPS



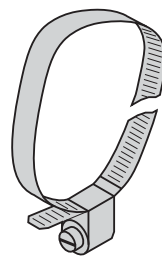
KLDT-UNT6

Mounting aid for
 □ dovetail groove
 cylinders; groove
 width 7.35 mm; PPS



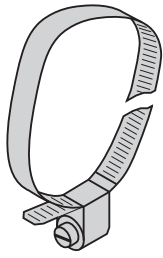
ASB-1

Clip collar to mount
 BIM-UNT in combina-
 tion with KLDT-UNT2
 on round cylinders Ø
 7...11 mm.

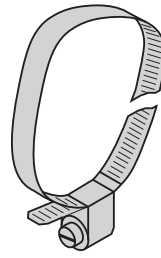


ASB-2

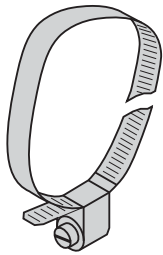
Clip collar to mount
 BIM-UNT in combina-
 tion with KLDT-UNT2
 on round cylinders Ø
 11...19 mm.



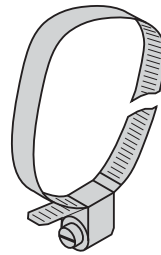
ASB-3
Clip collar to mount BIM-UNT in combination with KLDT-UNT2 on round cylinders \varnothing 18...29 mm.



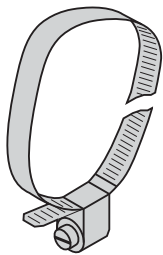
ASB-4
Clip collar to mount BIM-UNT in combination with KLDT-UNT2 on round cylinders \varnothing 28...39 mm.



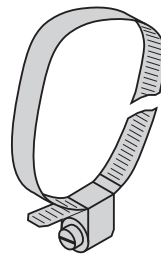
ASB-5
Clip collar to mount BIM-UNT in combination with KLDT-UNT2 on round cylinders \varnothing 38...49 mm.



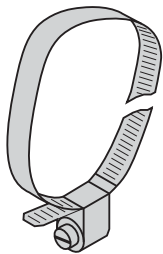
ASB-6
Clip collar to mount BIM-UNT in combination with KLDT-UNT2 on round cylinders \varnothing 48...59 mm.



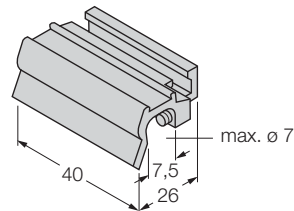
ASB-7
Clip collar to mount BIM-UNT in combination with KLDT-UNT2 on round cylinders \varnothing 58...69 mm.



ASB-8
Clip collar to mount BIM-UNT in combination with KLDT-UNT2 on round cylinders \varnothing 68...79 mm.



ASB-9
Clip collar to mount BIM-UNT in combination with KLDT-UNT2 on round cylinders \varnothing 78...89 mm.



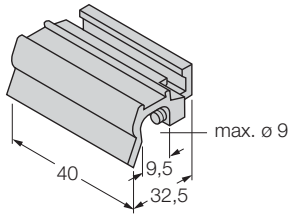
KLZ1-INT
Mounting aid for \bigcirc tie-rod cylinder \varnothing 32...40 mm; aluminium; further mounting accessories for other cylinder diameters on request

Accessories

Magnetic field sensors

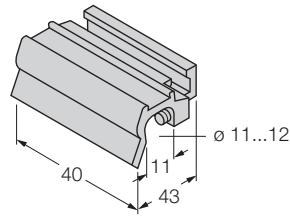
KLZ2-INT

Mounting aid for
○ tie-rod cylinder
Ø 50...63 mm;
aluminium; further
mounting accessories
for other cylinder
diameters on request



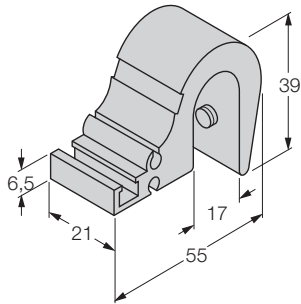
KLZ3-INT

Mounting aid for
○ tie-rod cylinder;
Ø 80...100 mm;
aluminium; further
mounting accessories
for other cylinder
diameters on request



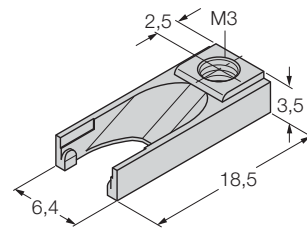
KLZ5-INT

Mounting aid for
○ tie-rod cylinder;
Ø 160...200 mm;
aluminium; further
mounting accessories
for other cylinder
diameters on request



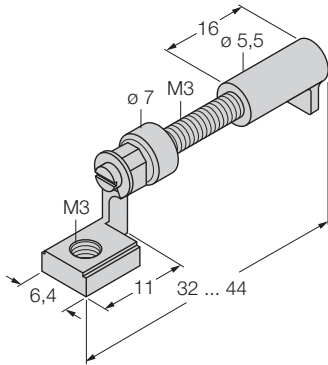
UNT-Stopper

Mounting aid for
fine-tuning of switch-
point on □ T-groove
cylinders; snap-lock
mounting in the
sensor fixture; suited
for multiple use;
plastic



UNT-Justage

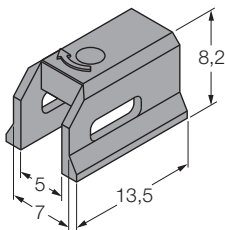
Mounting aid for
fine-tuning of switch-
point on □ T-groove
cylinders; snap-lock
mounting in the sen-
sor fixture; suited for
multiple use;
metal/plastic



Accessories for WIM

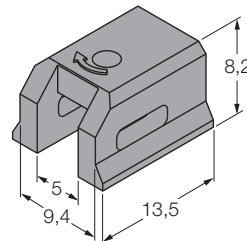
KLDT-UNT2

Mounting aid for
□ dovetail groove
cylinders; groove
width: 7 mm; PPS




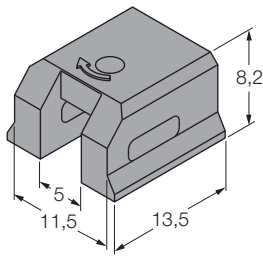
KLDT-UNT3

Mounting aid for
□ dovetail groove
cylinders; groove
width: 9.4 mm; PPS




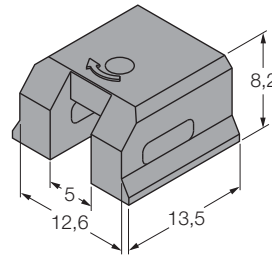
KLDT-UNT4

Mounting aid for
 dovetail groove
 cylinders; groove
 width: 11.5 mm; PPS




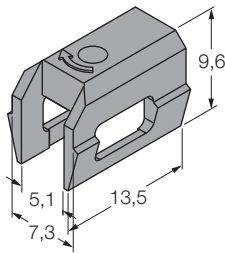
KLDT-UNT5

Mounting aid for
 dovetail groove
 cylinders; groove
 width: 12.6 mm; PPS



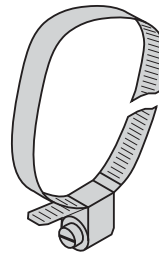
KLDT-UNT6

Mounting aid for
 dovetail groove
 cylinders; groove
 width: 7.35 mm; PPS



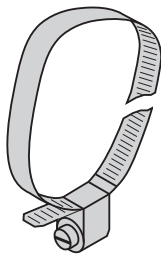
ASB-1

Clip collar to mount
 BIM-UNT in combina-
 tion with KLDT-UNT2
 on round cylinders
 Ø 7...11 mm.



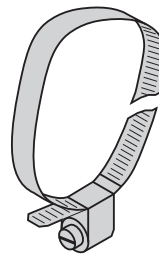
ASB-2

Clip collar to mount
 BIM-UNT in combina-
 tion with KLDT-UNT2
 on round cylinders
 Ø 11...19 mm.



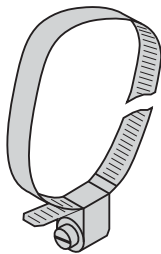
ASB-3

Clip collar to mount
 BIM-UNT in combina-
 tion with KLDT-UNT2
 on round cylinders
 Ø 18...29 mm.



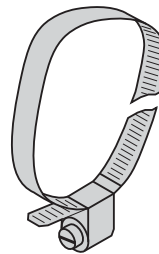
ASB-4

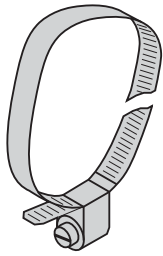
Clip collar to mount
 BIM-UNT in combina-
 tion with KLDT-UNT2
 on round cylinders
 with diameters of
 28...39 mm.



ASB-5

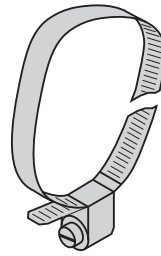
Clip collar to mount
 BIM-UNT in combina-
 tion with KLDT-UNT2
 on round cylinders
 with diameters of
 38...49 mm.





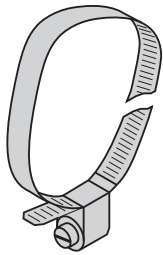
ASB-6

Clip collar to mount BIM-UNT in combination with KLDT-UNT2 on round cylinders Ø 48...59 mm.



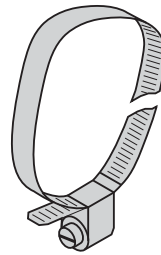
ASB-7

Clip collar to mount BIM-UNT in combination with KLDT-UNT2 on round cylinders Ø 58...69 mm.



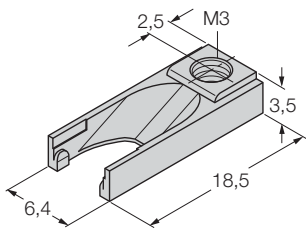
ASB-8

Clip collar to mount BIM-UNT in combination with KLDT-UNT2 on round cylinders Ø 68...79 mm.



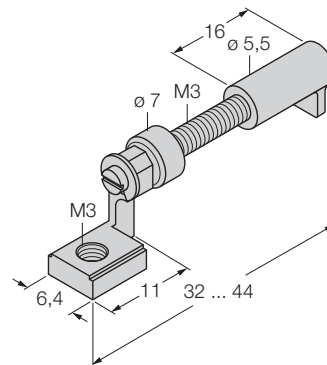
ASB-9

Clip collar to mount BIM-UNT in combination with KLDT-UNT2 on round cylinders Ø 78...89 mm.



UNT-stopper

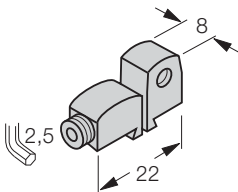
Mounting aid for fine-tuning of switch-point on T-groove cylinders; snap-lock mounting in the sensor fixture; suited for multiple use; plastic



UNT-fine adjustment

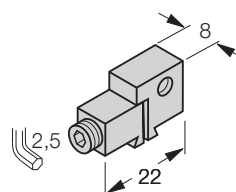
Mounting aid for fine-tuning of switch-point on T-groove cylinders; snap-lock mounting in the sensor fixture; suited for multiple use; metal/plastic

Accessories for NST



KLN 1


Clamping piece for dovetail groove cylinders or T-groove cylinders; clamping width 5.2...13.5 mm; anodized aluminium

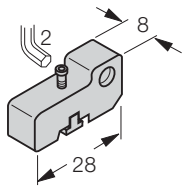


KLN 3


Clamping piece for dovetail groove cylinders or T-groove cylinders; clamping width 5.2...13.5 mm; anodized aluminium

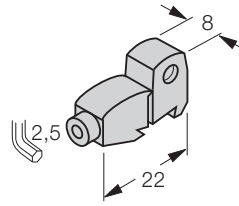
KLN-SMC

Clamping piece for
 SMC cylinders;
 clamping width 4 mm;
 anodized aluminium




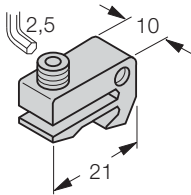
KLF 1

Clamping piece for
 external dove-
 tail grooves; for all
 cylinder diameters,
 material: Anodized
 aluminium




KLF 2

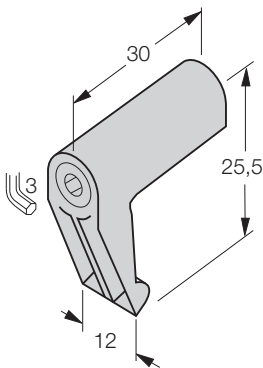
Clamping piece for
 external dovetail
 grooves (IMI Norgrem)
 or all cylinder
 diameters, anodized
 aluminium




Accessories for IKT

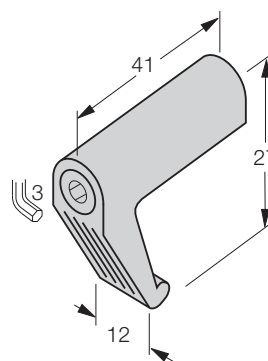
KLI 1

Clamping piece for
 tie-rod cylinders;
 Ø 32...100 mm;
 die-cast zinc




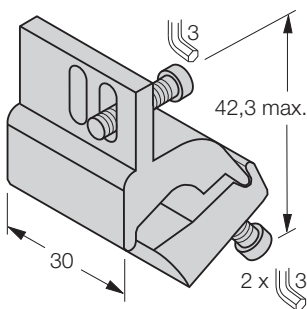
KLI 3

Clamping piece for
 tie-rod cylinders;
 Ø 63...160 mm;
 die-cast zinc




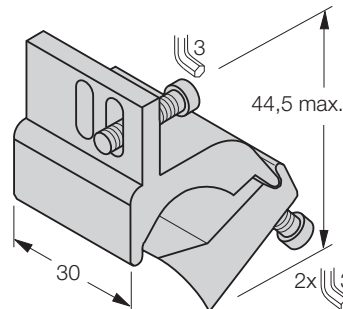
KLI 5Z

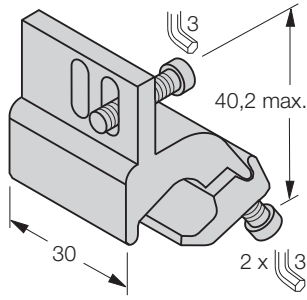
Clamping piece for
 tie-rod cylinders;
 Ø 32...63 mm;
 aluminium



KLI 6Z

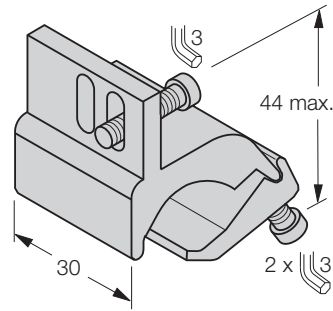
Clamping piece for
 tie-rod cylinders;
 Ø 50...125 mm;
 aluminium





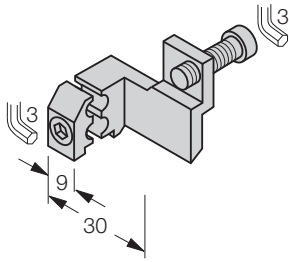
KLI 5

Clamping piece for
□ profile cylinder;
Ø 32...50 mm;
aluminium



KLI 6

Clamping piece for
□ profile cylinder;
Ø 50...100 mm;
aluminium



KLI 7

Clamping piece for
□ profile cylinder
with external dovetail
grooves; Ø 32...200
mm; aluminium

Accessories for linear position sensors

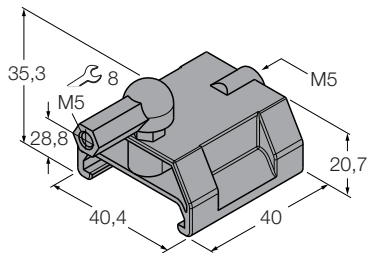


The range of accessories includes guided and floating positioning elements as well as different mounting aids for linear position sensors. The measuring range is set via pushbutton at the teach adapter. The sensors are thus easily adjusted to the correspondent application. The programmed measuring range is tested with the analog test box.

Features

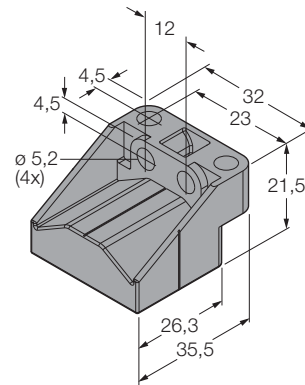
- Broad range of positioning elements and mounting accessories
- Highest mounting flexibility
- Guided and floating positioning elements

Li-Q25L



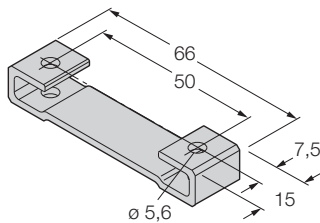
P1-Li-Q25L

Guided positioning element. The positioning magnet is inserted in the sensor guide.



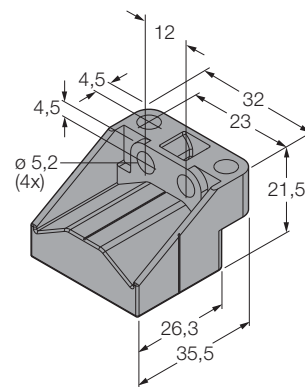
P2-Li-Q25L

Floating positioning element



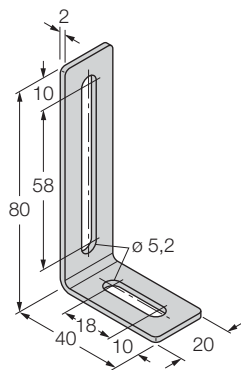
M1-Q25L

Mounting foot for linear position sensor Q25L; aluminium; 2 pcs. per bag



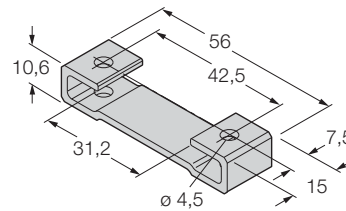
P3-Li-Q25L

Floating positioning element, right-angle mounting



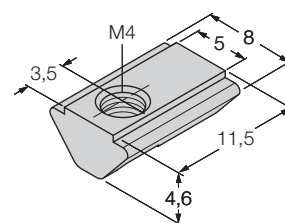
M4-Q25L

Mounting bracket for linear position sensor Q25L; material Stainless steel; 2 pcs. per bag



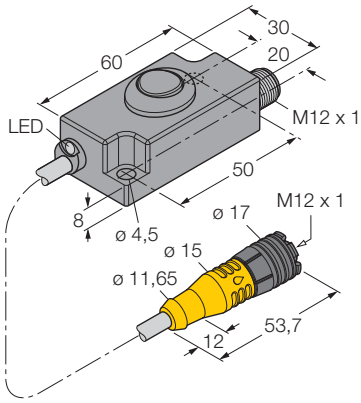
M2-Q25L

Mounting foot for linear position sensor Q25L; aluminium; 2 pcs. per bag

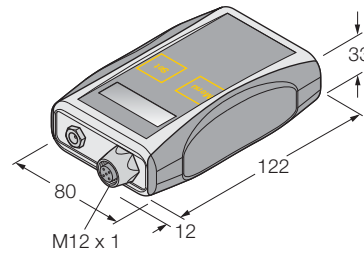


MN-M4-Q25

Sliding block with M4 thread with the backside profile of the Q25L; material Brass; 10 pcs. per bag

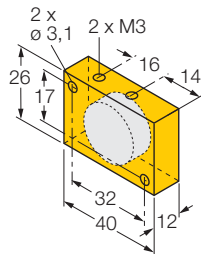


TX1-Q20L60
Teach adapter:

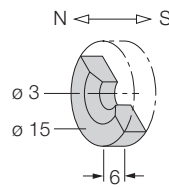


TB4
Universal test and configuration box for analog and binary sensors.

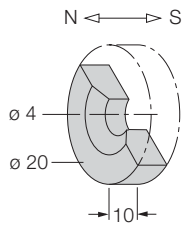
WIM-Q25L



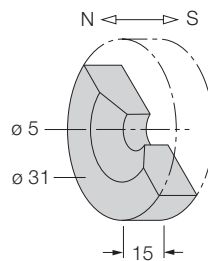
DM-Q12
Actuation magnet; block-shaped, plastic; sensing range 58 mm on BIM-(E)M12 sensors resp. 49 mm on BIM-EG08 sensors; recommended distance between sensor and magnet 3...5 mm when used with Q25L



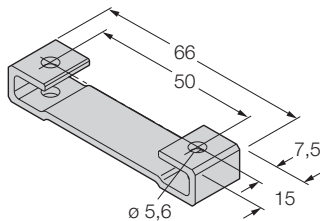
DMR15-6-3
Actuation magnet, Ø 15 mm (Ø 3 mm), height 6 mm; sensing range 36 mm on BIM-(E)M12 sensors resp. 32 mm on BIM-EG08 sensors; recommended distance between sensor and magnet 3...4 mm when used with Q25L



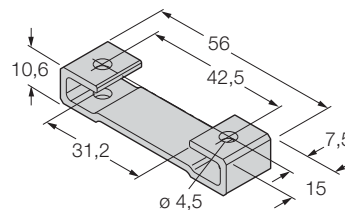
DMR20-10-4
Actuation magnet; Ø 20 mm (Ø 4 mm), height 10 mm; sensing range 59 mm on BIM-(E)M12 sensors resp. 50 mm on BIM-EG08 sensors; recommended distance between sensor and magnet 3...4 mm when used with Q25L



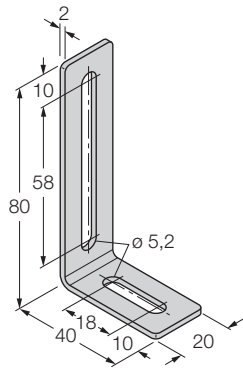
DMR31-15-5
Actuation magnet, Ø 31 mm (Ø 5 mm), height 15 mm; sensing range 90 mm on BIM-(E)M12 sensors resp. 78 mm on BIM-EG08 sensors; recommended distance between sensor and magnet 3...5 mm when used with Q25L



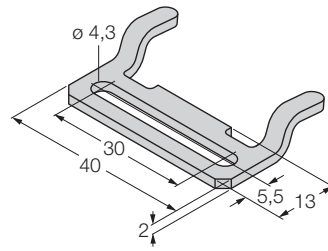
M1-Q25L
Mounting foot for linear position sensor Q25L; aluminium; 2 pcs. per bag



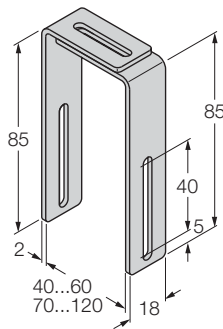
M2-Q25L
Mounting foot for linear position sensor Q25L; aluminium; 2 pcs. per bag



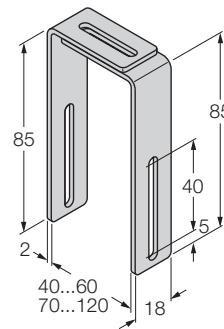
M4-Q25L
Mounting bracket for
linear position sensor
Q25L; stainless steel;
2 pcs. per bag



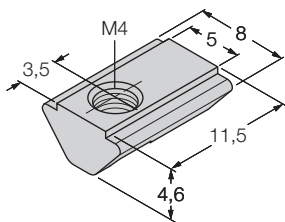
MB1-Q25
Mounting clip for
linear position sensor
Q25L; stainless steel;
2 pcs. per bag



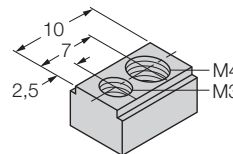
MB2.1-Q25
Mounting bracket for
linear position sensors
Q25L; mounting on
pneumatic cylinders
(40...60mm); stainless
steel; 4 pcs. per bag



MB2.2-Q25
Mounting bracket for
linear position sensors
Q25L; mounting on
pneumatic cylinders
(70...120mm); stain-
less steel; 4 pcs. per
bag



MN-M4-Q25
Sliding block with M4
thread for backside
profile of the Q25L;
brass; 10 pcs. per bag



MN-C1
Sliding block for T-
groove cylinder, 2 pcs.
per bag

Accessories for pressure sensors



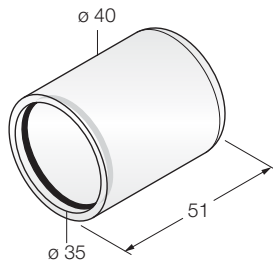
The range of accessories comprises aids for mounting, operating and protecting pressure sensors of the PK and PS series. It also includes a heat sink to reduce high ambient temperatures.

Features

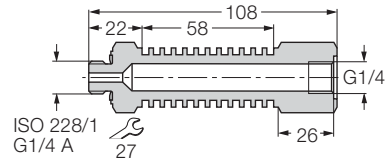
- Protective cap for the PS series
- Reduction of temperature for the PS and PT series
- Mounting accessories for the PK series

PS series

PTS-Cover
Protective cap

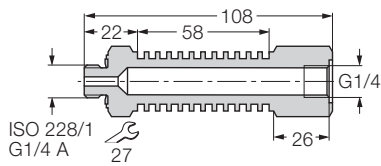


PCS-G1/4A4
Heat sink



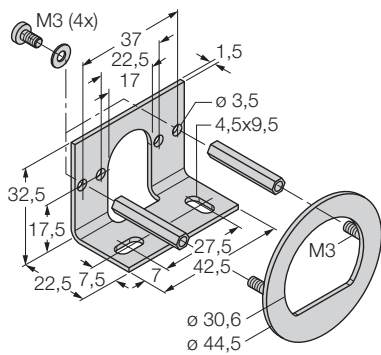
PT series

PCS-G1/4A4
Heat sink

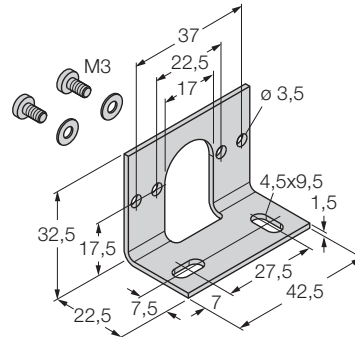


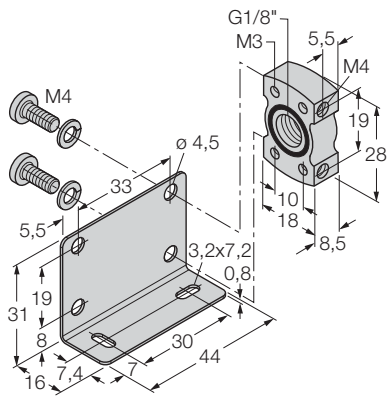
PK series

PK-N-MZ-001
Mounting kit PK-N

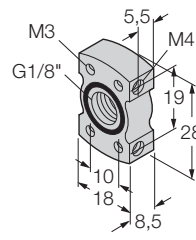


PK-N-MZ-002
Mounting kit PK-N





PK-P-MZ-001
Mounting kit PK-P



PK-P-MZ-002
Flange connection
PK-P

Accessories for temperature sensors



We offer a large range of function supporting accessories such as compression and cutting ring fittings for easy and safe mounting, as well as protective aids such as thermowells and caps. They are tailored to the correspondent sensor types and protect them against mechanical stresses.

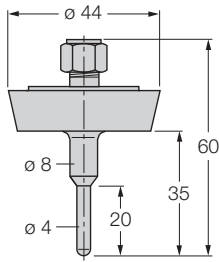
Features

- Compression fittings for temperature probes with different process connections
- Thermowells

THW-3 – Thermowells for 3 mm probes

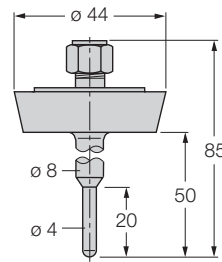
THW-3-DN25K-L035

Thermowell for
temperature probes



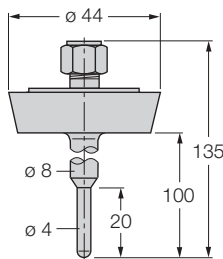
THW-3-DN25K-A4-L050

Thermowell for
temperature probes



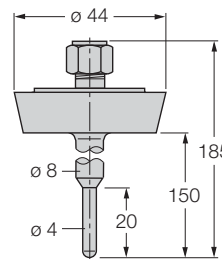
THW-3-DN25K-A4-L100

Thermowell for
temperature probes



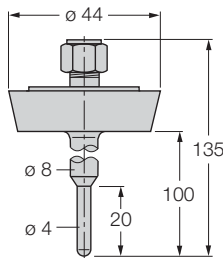
THW-3-DN25K-A4-L150

Thermowell for
temperature probes



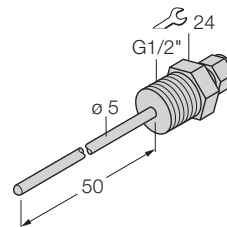
THW-3-DN25K-A4-L250

Thermowell for
temperature probes



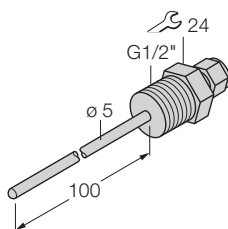
THW-3-G1/2-A4-L050

Thermowell for
temperature probes



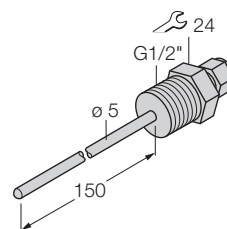
THW-3-G1/2-A4-L100

Thermowell for
temperature probes



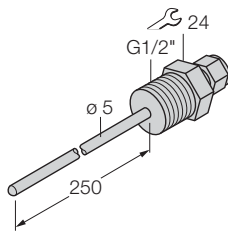
THW-3-G1/2-A4-L150

Thermowell for
temperature probes



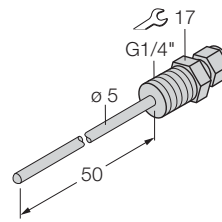
**THW-3-G1/2-
A4-L250**

Thermowell for
temperature probes



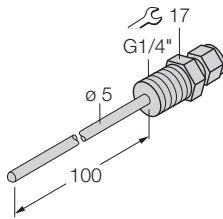
**THW-3-G1/4-
A4-L050**

Thermowell for
temperature probes



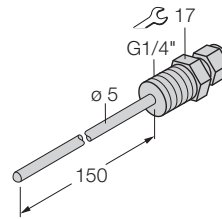
**THW-3-G1/4-
A4-L100**

Thermowell for
temperature probes



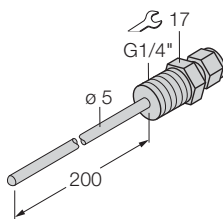
**THW-3-G1/4-
A4-L150**

Thermowell for
temperature probes



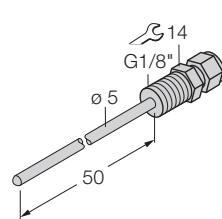
**THW-3-G1/4-
A4-L200**

Thermowell for
temperature probes



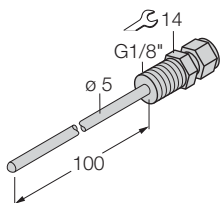
**THW-3-G1/8-
A4-L050**

Thermowell for
temperature probes



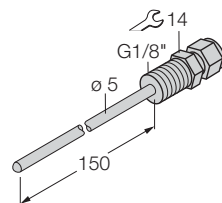
**THW-3-G1/8-
A4-L100**

Thermowell for
temperature probes



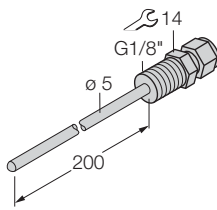
**THW-3-G1/8-
A4-L150**

Thermowell for
temperature probes



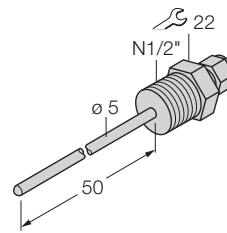
THW-3-G1/8-A4-L200

Thermowell for temperature probes



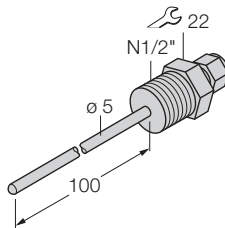
THW-3-N1/2-A4-L050

Thermowell for temperature probes



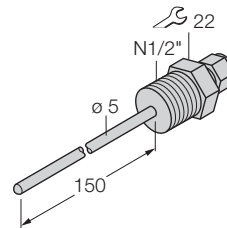
THW-3-N1/2-A4-L100

Thermowell for temperature probes



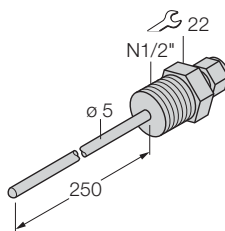
THW-3-N1/2-A4-L150

Thermowell for temperature probes



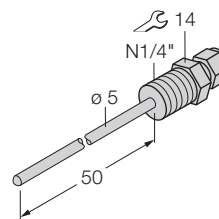
THW-3-N1/2-A4-L250

Thermowell for temperature probes



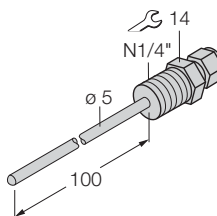
THW-3-N1/4-A4-L050

Thermowell for temperature probes



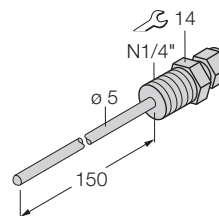
THW-3-N1/4-A4-L100

Thermowell for temperature probes

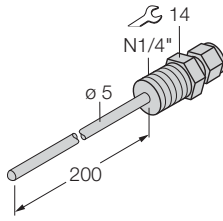


THW-3-N1/4-A4-L150

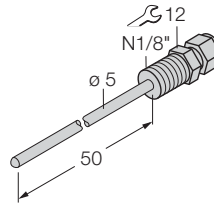
Thermowell for temperature probes



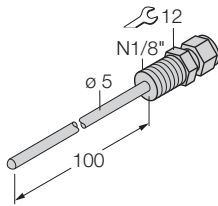
THW-3-N1/4-A4-L200
Thermowell for temperature probes



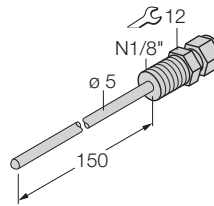
THW-3-N1/8-A4-L050
Thermowell for temperature probes



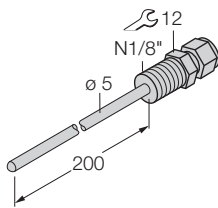
THW-3-N1/8-A4-L100
Thermowell for temperature probes



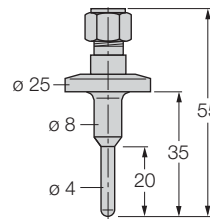
THW-3-N1/8-A4-L150
Thermowell for temperature probes



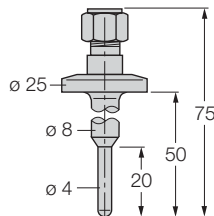
THW-3-N1/8-A4-L200
Thermowell for temperature probes



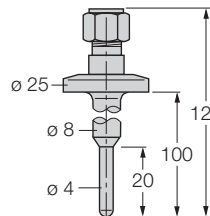
THW-3-TRI3/4-A4-L035
Thermowell for temperature probes

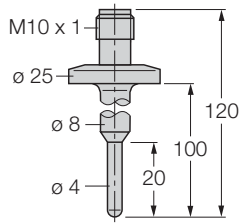


THW-3-TRI3/4-A4-L050
Thermowell for temperature probes

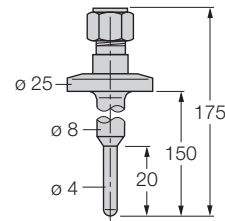


THW-3-TRI3/4-A4-L100
Thermowell for temperature probes

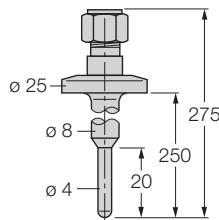




THW-3-TRI3/4-A4-L100
Thermowell for temperature probes

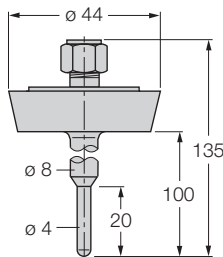


THW-3-TRI3/4-A4-L150
Thermowell for temperature probes

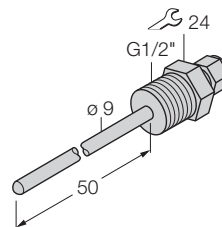


THW-3-TRI3/4-A4-L250
Thermowell for temperature probes

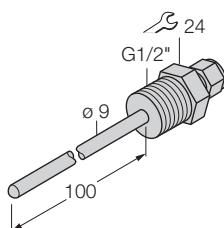
THW-6 – Thermowells for 6 mm probes



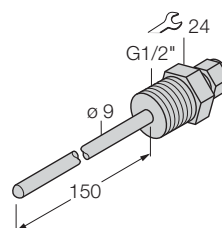
THW-6-DN25K-A4-L100
Thermowell for temperature probes



THW-6-G1/2-A4-L050
Thermowell for temperature probes



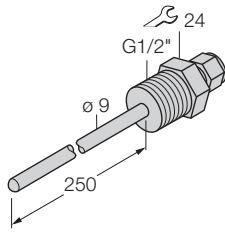
THW-6-G1/2-A4-L100
Thermowell for temperature probes



THW-6-G1/2-A4-L150
Thermowell for temperature probes

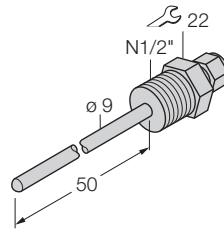
THW-6-G1/2-A4-L250

Thermowell for temperature probes



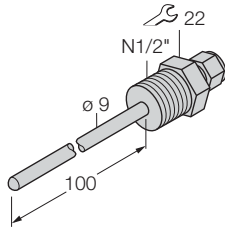
THW-6-N1/2-A4-L050

Thermowell for temperature probes



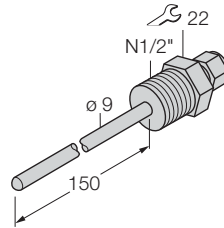
THW-6-N1/2-A4-L100

Thermowell for temperature probes



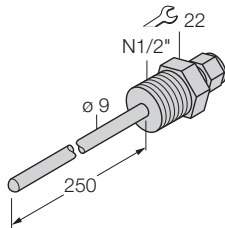
THW-6-N1/2-A4-L150

Thermowell for temperature probes



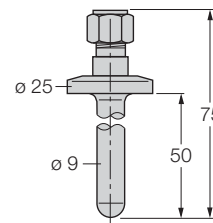
THW-6-N1/2-A4-L250

Thermowell for temperature probes



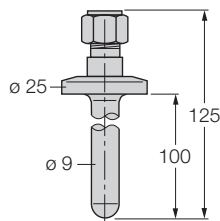
THW-6-TRI3/4-A4-L050

Thermowell for temperature probes



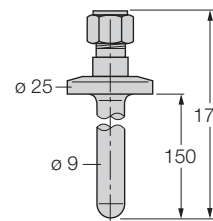
THW-6-TRI3/4-A4-L100

Thermowell for temperature probes



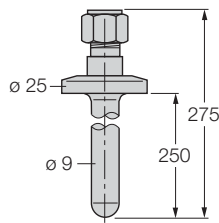
THW-6-TRI3/4-A4-L150

Thermowell for temperature probes



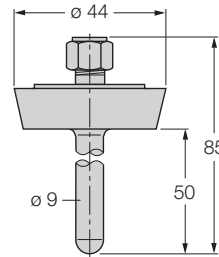
THW-6-TRI3/4-A4-L250

Thermowell for temperature probes



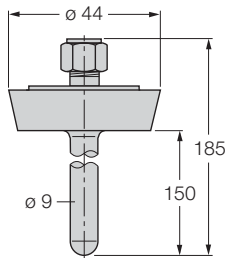
THW-6-DN25K-A4-L050

Thermowell for temperature probes



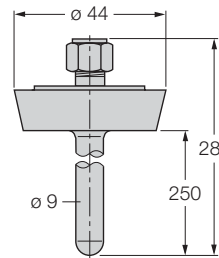
THW-6-DN25K-A4-L150

Thermowell for temperature probes



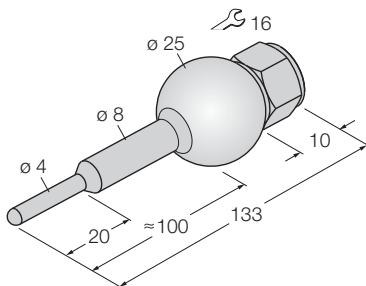
THW-6-DN25K-A4-L250

Thermowell for temperature probes



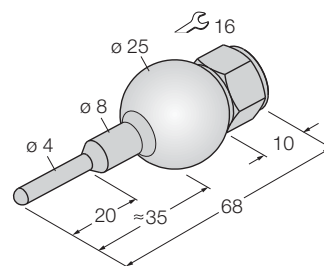
THW-3-UNI25-A4-L100

Thermowell for temperature probes



THW-3-UNI25-A4-L035

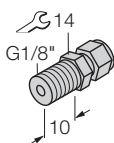
Thermowell for temperature probes



CF-3 – Compression fittings for 3 mm probes

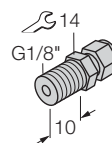
CF-M-3-G1/8-A4

Compression fitting for temperature probes



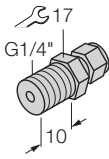
CF-M-3-N1/8-A4

Compression fitting for temperature probes



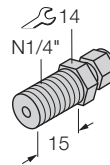
CF-M-3-G1/4-A4

Compression fitting for direct mounting of temperature probes



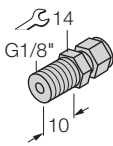
CF-M-3-N1/4-A4

Compression fitting for direct mounting of temperature probes



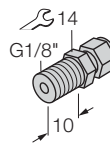
CF-P-3-G1/8-A4

Compression fitting for direct mounting of temperature probes



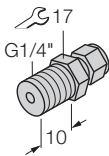
CF-P-3-N1/8-A4

Compression fitting for direct mounting of temperature probes



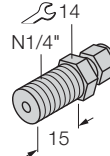
CF-P-3-G1/4-A4

Compression fitting for direct mounting of temperature probes



CF-P-3-N1/4-A4

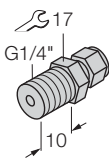
Compression fitting for direct mounting of temperature probes



CF-6 – Compression fittings for 6 mm probes

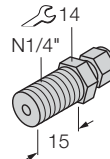
CF-M-6-G1/4-A4

Compression fitting for direct mounting of temperature probes



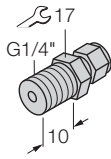
CF-M-6-N1/4-A4

Compression fitting for direct mounting of temperature probes



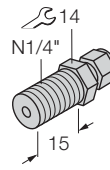
CF-P-6-G1/4-A4

Compression fitting
for direct mounting of
temperature probes



CF-P-6-N1/4-A4

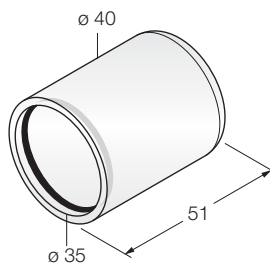
Compression fitting
for direct mounting of
temperature probes



Accessories

PTS-Cover

Protective cap



Accessories for flow sensors / flow meters



We offer a large range of function supporting accessories for easy and safe mounting, different adapters and mounting kits as well as protective aids to hold up mechanical stress.

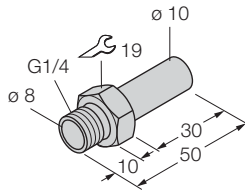
Features

- Adapters for flow meters, D18, D15, D10 on G1/2
- Other connection types on request
- Mounting aids for FTCL, FCVI and FCMI flow meters

Adapters and mounting kits

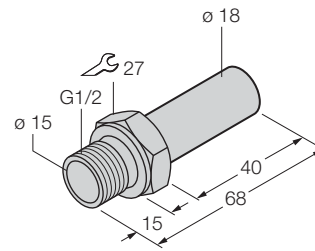
FTCI-G1/4A4-D10/ L050

Adapter for G1/4
thread; stainless steel
A4 (1.4571/AISI 316Ti)



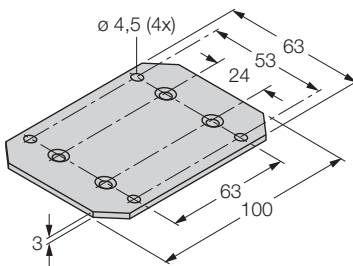
FTCI-G1/2A4-D18/ L068

Adapter for G1/2
thread, stainless steel
A4 (1.4571/AISI 316Ti)



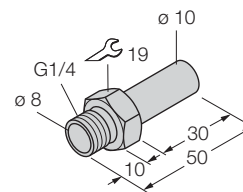
FTCI-MP01AL

Aluminium mounting
panel for front mount-
ing



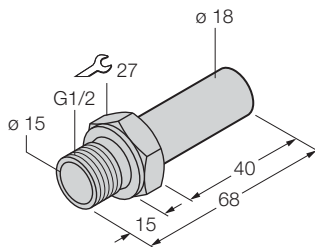
FTCI-G1/4A4-D10/ L050

Adapter for G1/4
thread, stainless steel
A4 (1.4571/AISI 316Ti)



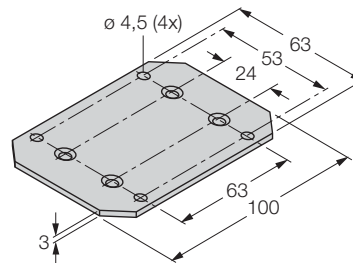
FTCI-G1/2A4-D18/ L068

Adapter for G1/2
thread, stainless steel
A4 (1.4571/AISI 316Ti)



FTCI-MP01AL

Aluminium mounting
panel for
front mounting



Reflectors



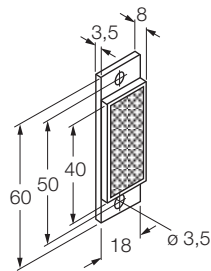
The use of reflectors and reflective foils requires sufficient excess gain (excess radiated power). „Excess gain 1“ means, the sensor operates without excess of radiancy. If dust, fume or mist is expected to contaminate the lens or the beam path, excess gain of the system has to be enlarged (> 1.5) compared to a clean environments (1.5).

Unless otherwise indicated, the ranges of the retroreflective sensors stated are based on the use of a BRT-3 reflector with a diameter of 75 mm.

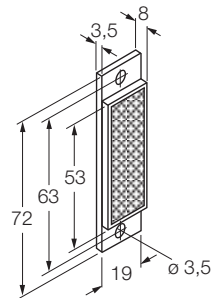
Features

- Reflectors and reflective foils are available in different sizes and with different mounting arrangements.
- Reflectors for rough environments and high temperatures

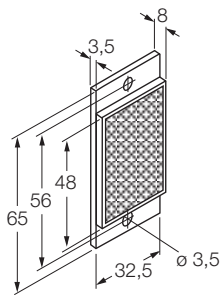
Rectangular reflectors



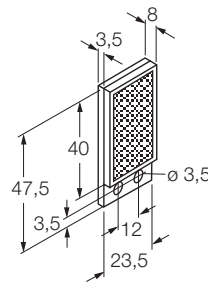
BRT-40X18A
Rectangular reflector,
reflection coefficient
1.0, acrylic, ambient
temperatures
-20 ... +60 °C



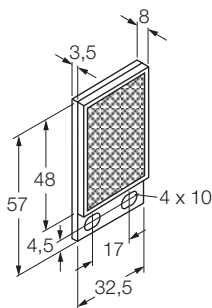
BRT-53X19A
Rectangular reflector,
reflection coefficient
1.4, acrylic, ambient
temperatures max.
+50 °C



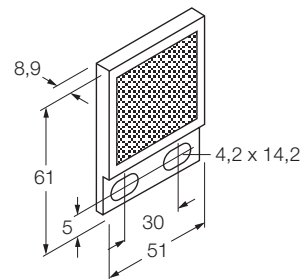
BRT-48X32A
Rectangular reflector,
reflection coefficient
1.0, acrylic, ambient
temperatures
max. +50 °C



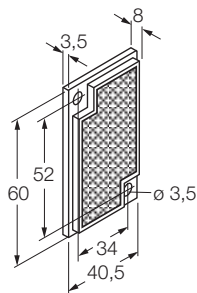
BRT-40X23B
Rectangular reflector,
reflection coefficient
1.4, acrylic, ambient
temperatures
max. +50 °C



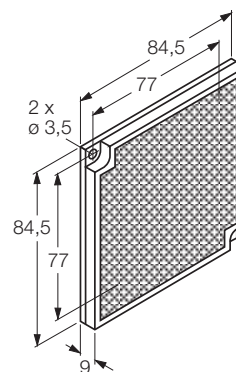
BRT-48X32B
Rectangular reflector,
reflection coefficient
1.0, acrylic, ambient
temperatures
-20 °C ... +60 °C



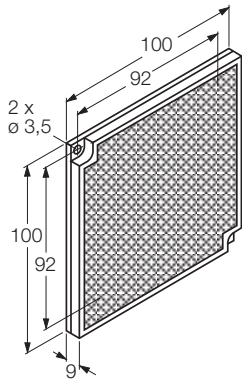
BRT-46
Rectangular reflector,
reflection coefficient
1.8, acrylic, ambient
temperatures
max. +50 °C



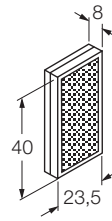
BRT-60X40C
Rectangular reflector,
reflection coefficient
1.48, acrylic, ambient
temperatures
max. +50 °C



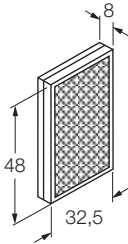
BRT-77X77C
Rectangular reflector,
reflection coefficient
2.0, acrylic, ambient
temperatures
-20 °C ... +60 °C



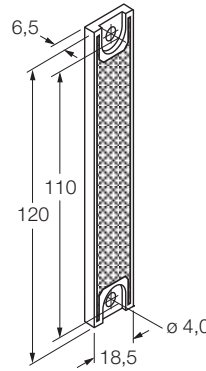
BRT-92 x92C
 Rectangular reflector,
 reflection coefficient
 3.0, acrylic, ambient
 temperatures
 -20 °C... +60 °C



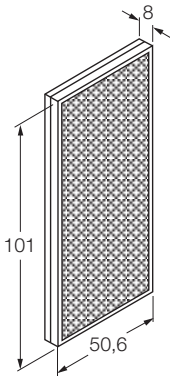
BRT-40X23
 Rectangular reflector,
 reflection coefficient
 1.4, acrylic, ambient
 temperatures
 -20 °C... +60 °C



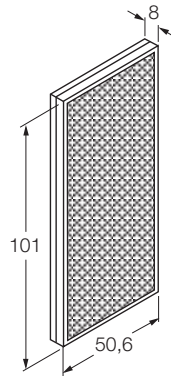
BRT-48X32
 Rectangular reflector,
 reflection coefficient
 1.0, acrylic, ambient
 temperatures
 -20 °C... +60 °C



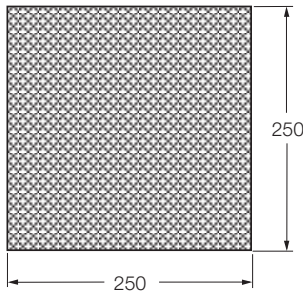
BRT-100X18A
 Rectangular reflector,
 reflection coefficient
 1.4, acrylic, ambient
 temperatures
 -20 °C... +60 °C



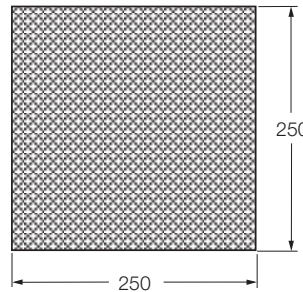
BRT-100X50
 Rectangular reflector,
 reflection coefficient
 1.4, acrylic, ambient
 temperatures
 -20 °C... +60 °C



BRT-100X55A
 Rectangular reflector,
 reflection coefficient
 1.4, acrylic, ambient
 temperatures
 -20 °C... +60 °C



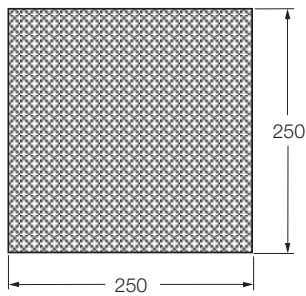
BRT-250
 Special rectangular
 reflector for LT7PLVQ
 sensor, aluminium,
 ambient temperatures
 -20 °C... +50 °C



BRT-4HT
 Rectangular reflector,
 reflection coefficient
 0.15, aluminium,
 ambient temperatures
 max. +480 °C

BRT-50X60H

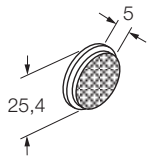
Rectangular reflector,
reflection coefficient
1.4, acrylic, ambient
temperatures
max. +110 °C



Round reflectors

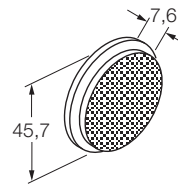
BRT-25

Round reflector,
reflection coefficient
1.0, acrylic, ambient
temperatures
max. +65 °C



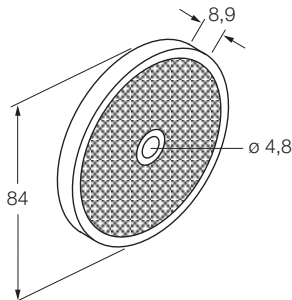
BRT-40

Round reflector,
reflection coefficient
1.0, acrylic, ambient
temperatures
max. +65 °C



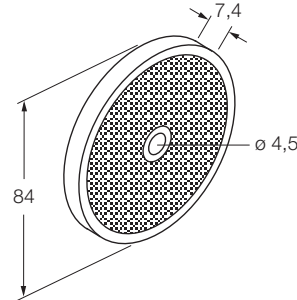
BRT-75

Round reflector,
reflection coefficient
1.0, acrylic, ambient
temperatures
max. +65 °C



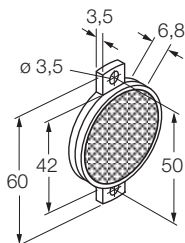
BRT-84

Round reflector,
reflection coefficient
1.4, acrylic, ambient
temperatures
-20 °C... +60 °C



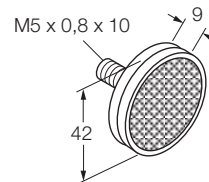
BRT-42A

Round reflector,
reflection coefficient
1.0, acrylic, ambient
temperatures
-20 °C... +60 °C



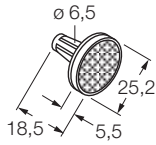
BRT-42D

Round reflector,
reflection coefficient
1.0, acrylic, ambient
temperatures
-20 °C... +60 °C



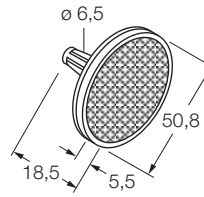
BRT-25R

Round reflector,
reflection coefficient
1.0, acrylic, ambient
temperatures
-20 °C... +60 °C



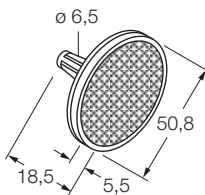
BRT-50R

Round reflector,
reflection coefficient
1.0, acrylic, ambient
temperatures
max. +50 °C



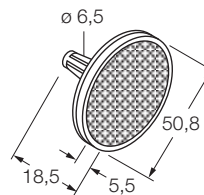
BRT-2A

Round reflector,
reflection coefficient
1.0, acrylic, ambient
temperatures
max. +65 °C



BRT-41AHT

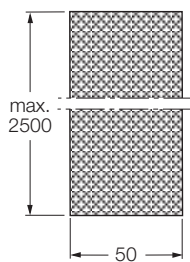
Round reflector,
reflection coefficient
1.0, acrylic, ambient
temperatures
-20 °C... +200 °C



Reflective foils

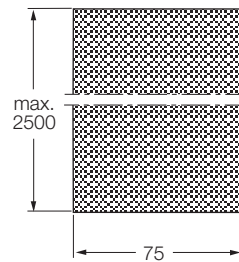
BRF50H (1M)

Self-adhesive
reflective foil made
of epoxy resin;
length 1 m, reflection
coefficient 0.7,
ambient temperature
max. +60 °C



BRF75H (1M)

Self-adhesive
reflective foil made
of epoxy resin;
length 1 m, reflection
coefficient 0.7,
ambient temperature
max. +60 °C



Glass fibers



In many applications objects can only be detected through the use of fiber optics. If light beams have to be piped through very hot, humid or chemically aggressive ambients, glass or plastic fibers are the ideal solution.

Glass fibers are available in different sizes, lengths and qualities, as monofilaments for opposed mode sensors and as bifurcated or double bifurcated fibers for diffuse mode sensors.

Unlike plastic fibers, glass fibers have a bigger inner bending radius and are not suited for frequent bending.

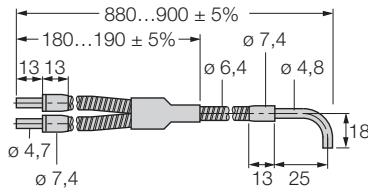
Features

- Standard and special types for demanding application conditions
- High chemical resistance
- Broad temperature range: -140 °C...+480 °C
- Immune to moisture
- Resistant to impacts and vibration
- High interference immunity
- Robust design, for application in vacuum chambers
- Mounted with brackets

Glass fibers – diffuse mode

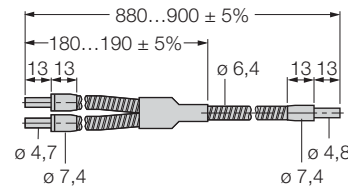
BA23S

Glass fiber, diffuse mode, angled head (90°), flexible stainless steel sheath, ambient temperatures -140 °C ... +250 °C



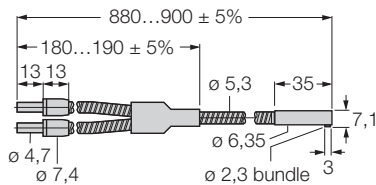
BF23S

Glass fiber, diffuse mode, flexible stainless steel sheath, ambient temperatures -140 °C ... +250 °C



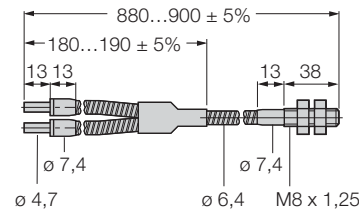
BA1.53SMTA

Glass fiber, diffuse mode, head 1.5 mm angled (90°), flexible stainless steel sheath, ambient temperatures -140 °C ... +250 °C



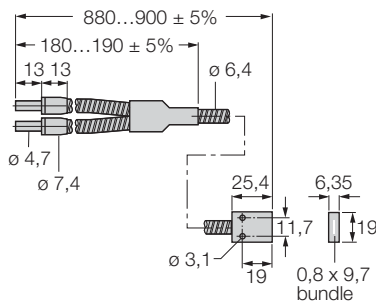
BT23SM8

Glass fiber, diffuse mode, threaded brass bushing M8 x 1.25, bundle diameter 3.2 mm, flexible stainless steel sheath, ambient temperatures -140 °C ... +250 °C



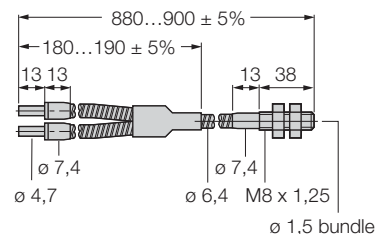
BR23S

Glass fiber, diffuse mode, rectangular beam, flexible stainless steel sheath, ambient temperatures -140 °C ... +250 °C



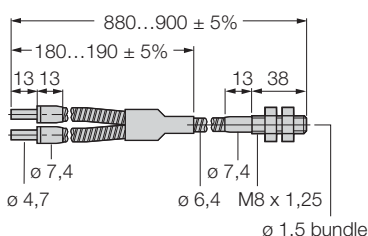
BT13SM8

Glass fiber, diffuse mode, threaded brass bushing M8 x 1.25, bundle diameter 1.6 mm, flexible stainless steel sheath, ambient temperatures -140 °C ... +250 °C



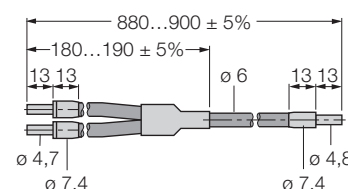
BP13P

Glass fiber, diffuse mode, bendable tip, galvanized PVC jacket, ambient temperatures -140 °C ... +250 °C



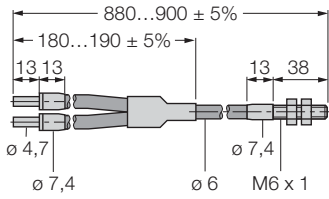
BF23P

Glass fiber, sensing mode: Diffuse mode sensor, galvanized PVC jacket; ambient temperatures -40 °C ... +105 °C



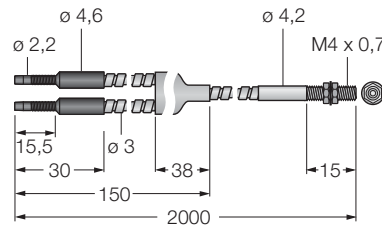
BT23PM6

Glass fiber, diffuse mode, PVC cable; ambient temperatures -40 °C...+105 °C



BMT16.6S-HT

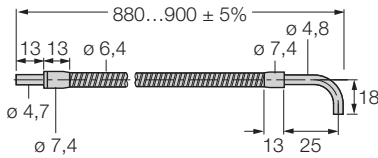
Glass fiber, diffuse mode, compact head, high temperature proof up to +315 °C, threaded brass bushing M4 x 0.7, flexible stainless steel sheath



Glass fibers – opposed mode

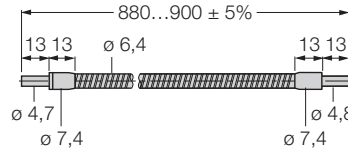
IA23S

Glass fiber, opposed mode, angled head 90°, flexible stainless steel sheath, ambient temperatures -140 °C ...+250 °C



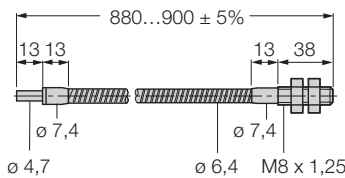
IF23S

Glass fiber, opposed mode, flexible stainless steel sheath, ambient temperatures -140 °C...+250 °C



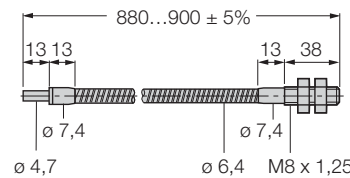
IT23SM8

Glass fiber, opposed mode, threaded brass bushing M8 x 1.25, bundle diameter 3.2 mm, flexible stainless steel sheath, ambient temperatures -140 °C ...+250 °C



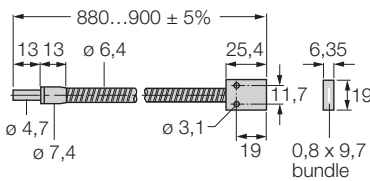
IR2.53S

Glass fiber, opposed mode, rectangular beam, bundle diameter 4 mm, flexible stainless steel sheath, ambient temperatures -140 °C...+250 °C



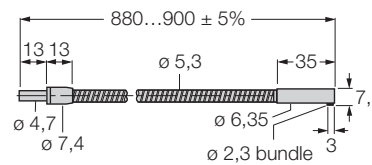
IR23S

Glass fiber, opposed mode, rectangular beam, bundle diameter 3.2 mm, flexible stainless steel sheath, ambient temperatures -140 °C ...+250 °C



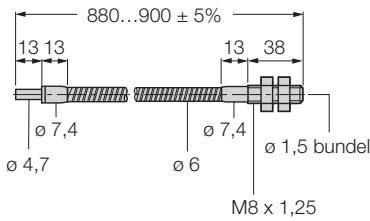
IA1.53SMTA

Glass fiber, opposed mode, compact head 1.5 mm, angled 90°, flexible stainless steel sheath, ambient temperatures -140 °C ...+250 °C



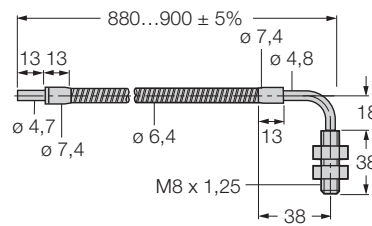
IT13SM8

Glass fiber, opposed mode, threaded brass bushing M8 x 1.25, bundle diameter 1.6 mm, flexible stainless steel sheath, ambient temperatures -140 °C ... +250 °C



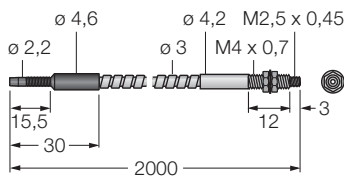
IAT23SM8

Glass fiber, opposed mode, angled head 90°, threaded brass bushing M8 x 1.25, flexible stainless steel sheath, ambient temperatures -140 °C ... +250 °C



IMT.756.6S-HT

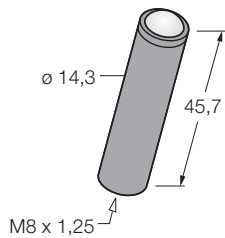
Glass fiber, opposed mode, compact head, temperature proof up to +315 °C, threaded brass bushing M4 x 0.7, flexible stainless steel sheath



Glass fibers – lenses

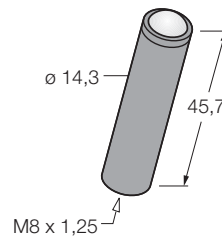
L9M8

Glass lens in a blue galvanized aluminium sheath, for glass fibers, range extension of opposed mode sensing, ambient temperatures up to +315 °C



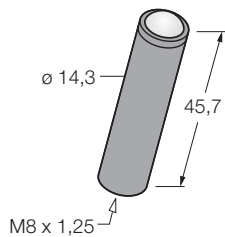
L10M8

Convergent glass lens in a red galvanized aluminium sheath to focus the light of bifurcated fiber optic sensors, e.g. for print/color mark detection, focal distance 5 mm ± 1 mm, ambient temperatures up to +315 °C



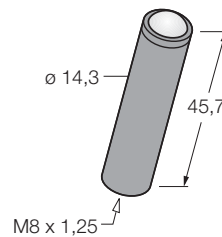
L16FM8

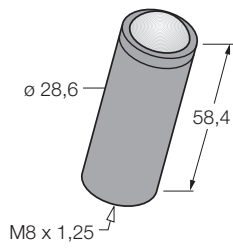
Glass lens in plastic jacket for glass fibers; range extension of opposed mode sensing, ambient temperatures up to +105 °C



L16FALM8

Glass lens in a galvanized aluminium sheath; for glass fibers, range extension of opposed and retro-reflective sensing mode, long range, ambient temperatures up to +315 °C

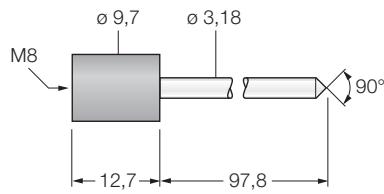




L16FSSM8

Glass lens in a stainless steel sheath; for glass fiber optics, range extension of opposed and retro-reflective mode sensing, long range, ambient temperatures up to +480 °C

Glass fibers – monitoring of filling levels



TGRM8 mm

Monitoring of filling levels with bifurcated glass fibers, M8 thread (types „B...M8“), end tip screwed on the fiber, chemical-resistant glass tip, ambient temperatures -140 °C...+250 °C

Plastic fibers



The very flexible plastic fibers are a well-priced solution for applications with poorly accessible spaces.

Plastic fibers can be cut to the required length. They are freely bendable and fit in the respective space. For applications in which the fibers need to be bended in all directions, TURCK offers extremely flexible coiled version with the following diameters: 0.25, 0.5, 0.75, 1 and 1.5 mm. They are sold in pairs.

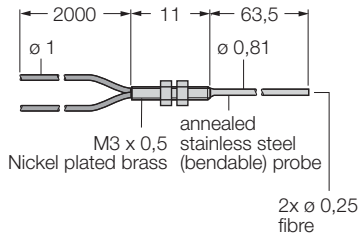
Features

- Well-priced solution for confined spaces
- Easy fitting
- Coiled plastic fibers, freely bendable
- Highly flexible
- Cut to fit
- Extremely small bending radii, more than 1,000,000 bending cycles
- Ambient temperatures: -30...+70 °C
- Mounting brackets are available

Plastic fibers – diffuse mode

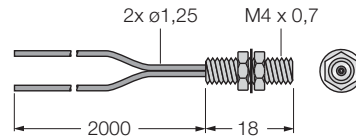
PBP16U

Plastic fiber, diffuse mode, bendable tip, preassembled wire without end tip, polyethylene jacket, ambient temperatures -30 °C...+70 °C



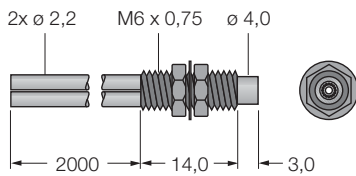
PBCT26U

Plastic fiber, diffuse mode, coaxial, threaded bushing M4 x 0.7 mm, preassembled wire without end tip, polyethylene jacket, ambient temperatures -30 °C...+70 °C



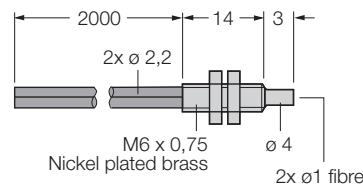
PBCT46U

Plastic fiber, diffuse mode, coaxial, threaded bushing M6 x 0.75 mm, preassembled wire without end tip, polyethylene jacket, ambient temperatures -30 °C...+70 °C



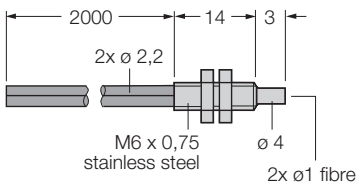
PBT46UHF

Plastic fiber, diffuse mode, threaded bushing M6 x 0.75 mm, highly bendable DURA-BEND™ multicore fiber, preassembled wire without end tip, polyethylene jacket, ambient temperatures -30 °C...+70 °C



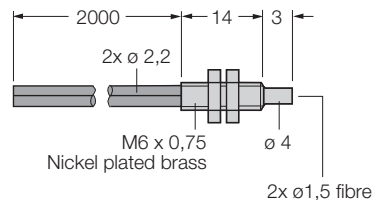
PBT46UHT1

Plastic fiber, diffuse mode, threaded bushing M6 x 0.75 mm, preassembled wire without end tip, polyethylene jacket, ambient temperatures up to +125 °C



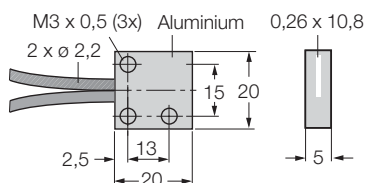
PBT66U

Plastic fiber, diffuse mode, threaded bushing M6 x 0.75 mm, preassembled wire without end tip, polyethylene jacket, ambient temperatures -30 °C...+70 °C



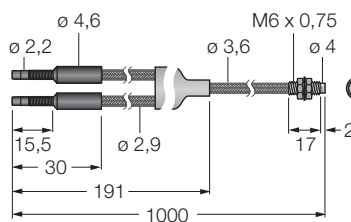
PBR1X326U

Plastic fiber, diffuse mode, rectangular beam, preassembled wire without end tip, polyethylene jacket, ambient temperatures -30 °C...+70 °C



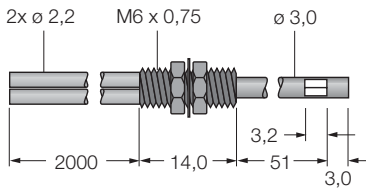
PBT43TMB5

Plastic fiber, diffuse mode, threaded bushing M6 x 0.75 mm, plug-gable end tip (for D12 sensor), polyethylene jacket, ambient temperatures -30 °C...+70 °C



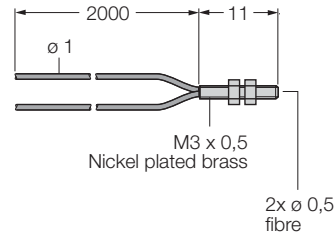
PBPS46UMT

Plastic fiber, diffuse mode, lateral beam, head with bendable tip, threaded bushing M6 x 0.75 mm, pre-assembled wire without end tip, polyethylene jacket, ambient temperatures -30 °C...+70 °C



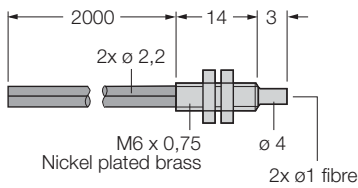
PBT26U

Plastic fiber, diffuse mode, threaded bushing M3 x 0.75 mm, pre-assembled wire without end tip, polyethylene jacket, ambient temperatures -30 °C...+70 °C



PBT46U

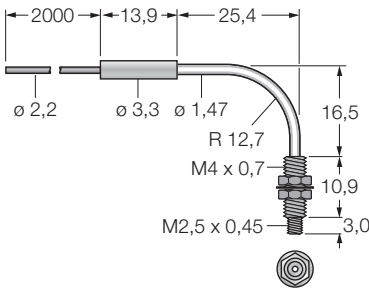
Plastic fiber, diffuse mode, polyethylene cable; ambient temperatures -30 °C...+70 °C



Plastic fibers – opposed mode

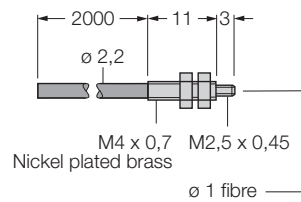
PIAT46U

Plastic fiber, opposed mode, angled head 90°, threaded bushing M2.5 x 0.45 mm, preassembled wire without end tip, polyethylene jacket, ambient temperatures -30 °C...+70 °C



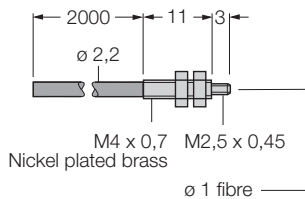
PIT46UHF

Plastic fiber, opposed mode, threaded bushing M2.5 x 0.45 mm, highly bendable DURA-BEND™ multicore fiber, pre-assembled wire without end tip, polyethylene jacket, ambient temperatures -30 °C...+70 °C



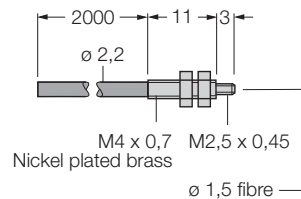
PIT46UHT1

Plastic fiber, opposed mode, threaded bushing M2.5 x 0.45 mm, preassembled wire without end tip, polyethylene jacket, ambient temperatures up to +125 °C



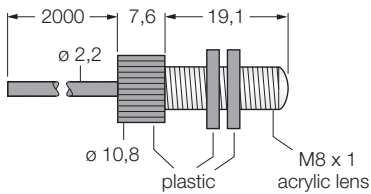
PIT66U

Plastic fiber, opposed mode, bundle diameter Ø 1.5 mm, threaded bushing M2.5 x 0.45 mm, preassembled wire without end tip, polyethylene jacket, ambient temperatures -30 °C...+70 °C



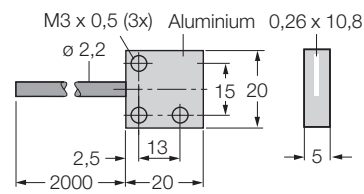
PIL46U

Plastic fiber, opposed mode, with acrylic lens, threaded bushing M8 x 1, preassembled wire without end tip, polyethylene jacket, ambient temperatures -30 °C...+70 °C



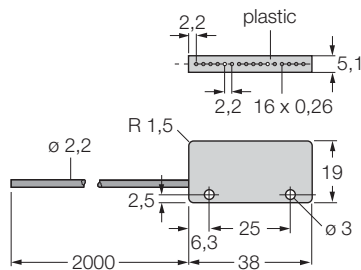
PIR1X166U

Plastic fiber, opposed mode, compact head, rectangular/straight beam, preassembled wire without end tip, polyethylene jacket, ambient temperatures -30 °C...+70 °C



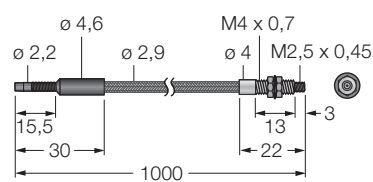
PIRS1X166UMPMAL

Plastic fiber, opposed mode, rectangular beam, side emission, preassembled wire without end tip, polyethylene jacket, ambient temperatures -30 °C...+70 °C



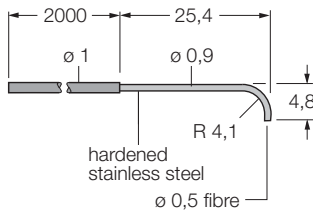
PIT43TMB5

Plastic fiber, opposed mode, threaded bushing M2.5 x 0.45 mm, plug-gable end tip (for D12 sensor), polyethylene jacket, ambient temperatures -30 °C...+70 °C



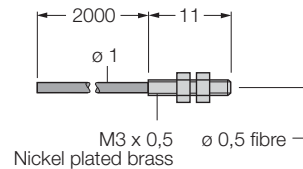
PIA26U

Plastic fiber, opposed mode, angled head 90°, polyethylene jacket, ambient temperatures -30 °C...+70 °C



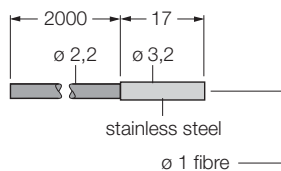
PIT26U

Plastic fiber, opposed mode, threaded bushing M3 x 0.5 mm, preassembled wire without end tip, polyethylene jacket, ambient temperatures -30 °C...+70 °C



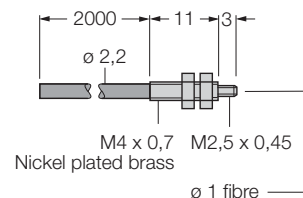
PIF46U

Plastic fiber, opposed mode, smooth bushing Ø 3.2, preassembled wire without end tip, polyethylene jacket, ambient temperatures -30 °C...+70 °C

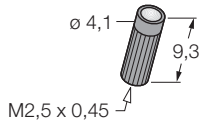


PIT46U

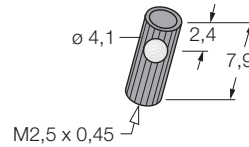
Plastic fiber, opposed mode, polyethylene cable; ambient temperatures -30 °C...+70 °C



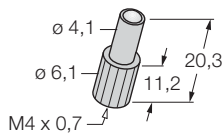
Plastic fibers – Lenses



L2
Glass lens in nickel-plated brass jacket, for range extension, ambient temperatures -60 ...+350 °C

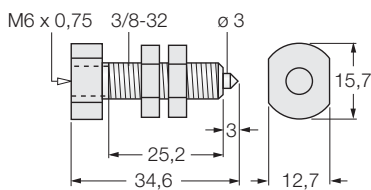


L2RA
Glass lens (prism) in nickel-plated brass jacket, lateral beam emission, for range extension, ambient temperatures -60 ...+300 °C



L4C6
Accessory lens in anodized aluminium jacket to focus the light, range 6 mm \pm 1 mm, spot size \varnothing 2.5 mm, ambient temperatures -40 ...+70 °C

Plastic fibers – Monitoring of filling levels



TGR3/8MPFMQ
Monitoring of filling levels with bifurcated plastic fiber PBT46U and PBT26UM6M.1, polypropylene jacket, quartz glass tip, ambient temperatures -30 °C...+70 °C.

Accessories for ultrasonic sensors



TURCK offers a large selection of accessories for operating, mounting and protection of ultrasonic sensors. .

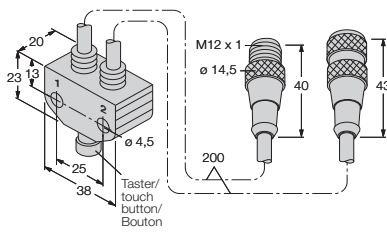
Features

- Teach adapter
- Programming device
- Ultrasonic adapter

Ultrasonic sensors

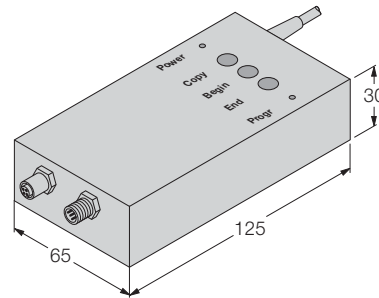
VB2-SP2

Teach adapter for ultrasonic sensors, types RUN and RUR



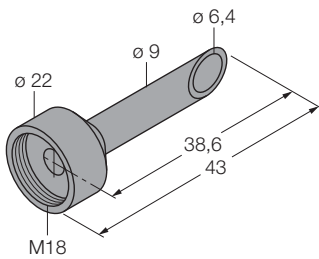
RU-PDI

Programming device for configuration of ultrasonic sensors types RU...-M18 and RUC...-M30



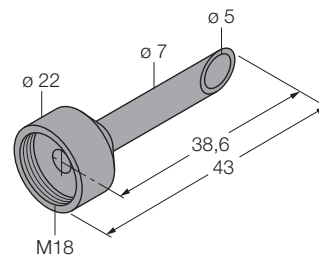
UWG18-6.4

Ultrasonic focussing-adapter for QS18U and S18U, internal diameter 6.4 mm



UWG18-5.0

Ultrasonic focussing-adapter for QS18U and S18U, internal diameter 5.0 mm

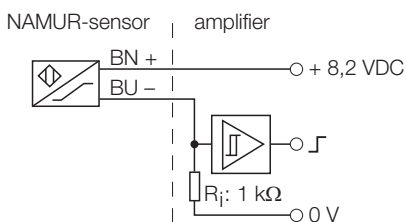


General information

Electrical versions

NAMUR

NAMUR sensors according to EN 60947-5-6 are polarized 2-wire sensors which change their internal resistance depending on the damping (constant distance/current characteristic). They are designed for connection to external switching amplifiers which convert the current change into a binary output signal.



Advantages of NAMUR sensors

Applicable in explosion hazardous areas in conjunction with an approved switching amplifier.

Permanent wire-break and short-circuit protection via switching amplifier.

Sensors with NAMUR output are suited for detection of fast movements and high rotation speed. NAMUR sensors have the same housing style but feature a higher switching frequency.

Nominal operating values

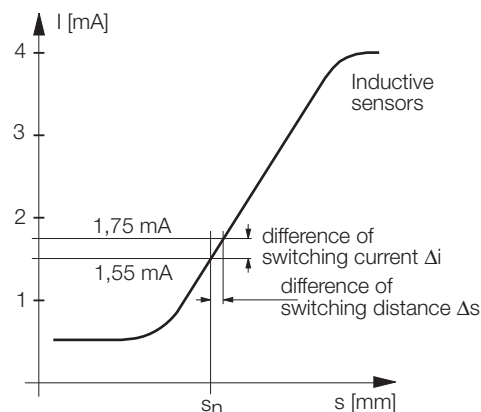
The nominal values according to EN 60947-5-6:

- $U_0 = 8,2 \text{ VDC}$
- $R_i = 1000 \ \Omega$
- $I_{\text{activated}} \leq 1.2 \text{ mA}$
- $I_{\text{non-activated}} \geq 2.1 \text{ mA}$
- Please note that capacitive magnetic field sensors feature an inverted characteristic due to their functional principle.

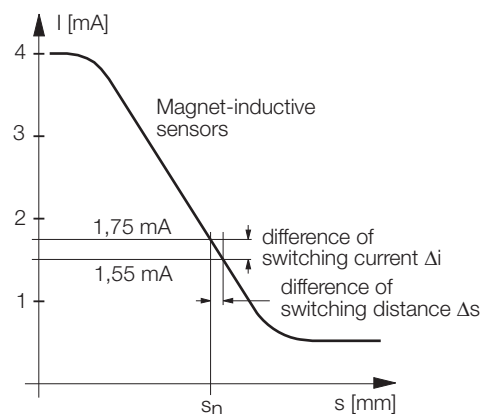
TURCK-NAMUR sensors are adjusted at 1.55 mA for s_n and 1.75 mA for $s_n + \Delta s$, precisely in the middle of the "NAMUR-window" (see characteristics).

- Reverse polarity protected
- Hysteresis H: 1...10 %
- Temperature drift $< \pm 10 \%$ (nominal temperature range -20...+70 °C) $< \pm 20 \%$ (extended temperature range -40/-25...+100/120 °C)
- Repeatability R: $< 2 \%$

NAMUR characteristic, inductive sensors



NAMUR characteristic, capacitive and magnetic field sensors



Status display (LED)

Based on the special functional principle, inductive sensors with NAMUR output feature an inverted LED function: The LED lights up in undamped and not in damped state. This is so, because in damped state only a weak current flow is produced (see NAMUR-characteristics). This is not enough to drive an LED. In undamped state instead enough current is provided for an LED signal.

Information

Ambient conditions

Protection rating (IEC 60529/EN 60529) IP67
Pollution degree 3
Shock resistance 30 x g (11 ms)
Vibration resistance 55 Hz (1 mm)

Use in explosion hazardous areas

If applied in explosion hazardous areas, NAMUR sensors must be connected to approved switching amplifiers with intrinsically safe control circuits. TURCK offers a wide range of approved switching amplifiers.

- Supply and output via approved external switching amplifiers Coding: ...-Y1.
- Class Ex ia IIC T4...T6 (approved for use in explosion hazardous areas; EC type examination certificate according to EN 60079-0 and EN 61214-0; approval according to directive 94/9/EG, KEMA 02 ATEX 1090 X).
- Avoid static charging when using sensor types CA40, CK40, CP40, CP80, DSU26, DSU35, K40, K90, MP, Q80.
- Mounting conditions according to certificate and instruction manual.

Use in safety-related applications IEC 61508

Nearly all NAMUR sensors of the TURCK product portfolio are suited for the application in safety systems (inclusive of SIL2 according to IEC 61508). This has been certified by an independent test body (TÜV). The certificate is valid for all TURCK sensors with standard NAMUR output. These sensors are 100 % compatible with all standard NAMUR signal processors i.e. SPS systems with NAMUR inputs.

Failure probability (PFD_{avg})

- 7.00×10^{-6} test interval 1 year
- 3.50×10^{-6} test interval 5 years
- Safe failure fraction (SFF): 0.9

Series or parallel connection of NAMUR sensors

Not permitted with TURCK switching amplifiers.

Maximum cable length

In order to determine the maximum cable length, two conditions have to be considered:

Condition 1:

A maximum cable resistance of 50 Ω is predefined by the EN 60947-5-6 standard. The maximum cable length can be calculated taking this value in relation to the core diameter:

$$l = R \times Q / \delta$$

l = max. core length, m

R = max. resistance, Ω

Q = core diameter, mm^2

δ = specific resistance of the core materials (0.0175 for copper), $\Omega \times \text{mm}^2 \times \text{m}$

Example for copper core with a core diameter of $Q = 0.34 \text{ mm}^2$:

$$l = 50 \times 0.34 / 0.0175 = 971 \text{ m}$$

As NAMUR sensors are operated with two cores, the determined value has to be divided by two. Concerning our example, the calculated maximum cable length would be:

$$971 / 2 = 485.5 \text{ m}$$

Note: Additional resistances, like corrosion or transfer resistance of connection terminals are not included in this calculation!

Condition 2:

If the sensor is operated in explosion hazardous areas, the maximum inductivity and capacity has to be considered. The correspondent values are listed on the data sheets of NAMUR sensors and isolating switching amplifiers.

Example:

– Isolating switching amplifier IM1-22Ex-R:
 $C_{\text{max}} 830 \text{ nF}$; $L_{\text{max}} 5 \text{ mH}$ (for EEx ia IIC)

– Sensor Bi5-EG18SK-Y1X:
 $C_i = 150 \text{ nF}$; $L_i = 150 \mu\text{H}$

If the values of isolating switching amplifiers and sensors are subtracted, the following values result:
 $C = 680 \text{ nF}$; $L = 4.85 \text{ mH}$.

Values for inductivity and capacity per meter are usually indicated by the cable vendor. 110 nF/km and 1 mH/km are index values for inductivity and capacity of the cables. The following maximum cable lengths can be calculated on the basis of these standard values:

max. cable length based on 110 nF/km:

$$680 \text{ nF} / 110 \text{ nF} = 6.18 \text{ km}$$

max. cable length based on 1 mH/km:

$$4.85 \text{ mH} / 1 \text{ mH} = 4.85 \text{ km}$$

The maximally allowed cable length is the smallest value which was calculated on the basis of the two conditions.

This example lead to the following results:

- Condition 1: Cable resistance: 485.5 m
- Condition 2:
 - a) Cable inductivity: 6.18 km
 - b) Cable capacity: 4.85 km

Considering both conditions, the maximum cable length in this example is 485.5 m.

Sensors with transistor output 3/4-wire DC

Advantages

- Very low leakage current
- Easy connection to relays or PLCs
- Series or parallel connection possible

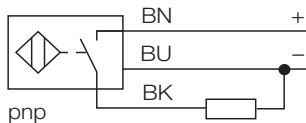
Power supply

- Operating voltage: U_B : 10...30 VDC, 10...55 VDC or 10...65 VDC
- Ripple W_{ss} : 10 %

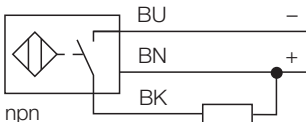
Switching output

- Normally open (NO) or normally closed (NC) with 3-wire sensors
- Exclusive OR (XOR) with 4-wire sensors
- Cyclic short circuit protection
- Wire-break protection
- Reverse polarity protection
- Usage category 13
- Rated insulation voltage $U_i = 0.5$ kV
- Rated conditional short-circuit current 100 A

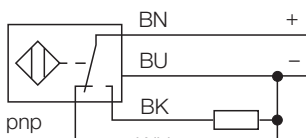
3-wire DC (PNP)



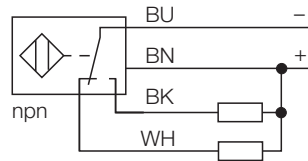
3-wire DC (NPN)



4-wire DC (PNP)



4-wire DC (NPN)



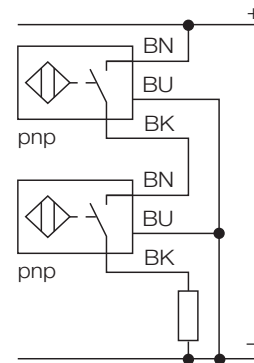
Ambient conditions

- Protection rating (IEC 60529/EN 60529) IP67/IP68/IP69K (depending on sensor type)
- Pollution degree 3
- Shock resistance 30 x g (11 ms)
- Vibration resistance 55 Hz (1 mm)

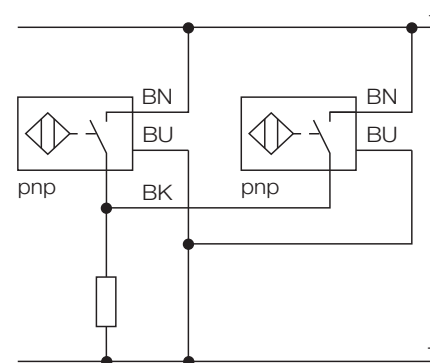
Series or parallel connection

When sensors are series connected, voltage drops and readiness delays of the individual sensors add up.

3-wire DC series connection



3-wire DC parallel connection



Sensors with transistor output 2-wire DC

Advantages

- Only two wires
- Short-circuit proof

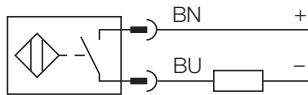
Power supply

- Operating voltage U_B : 10...30 VDC or 10...65 VDC (see type code)
- Ripple W_{ss} : 10 %

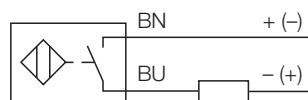
Switching behaviour

- Normally open (NO)
- Cyclic short-circuit protection (overload trip point $> I_e + 20 \text{ mA}$)
- Reverse polarity protection
- Off-state current I_r : $\leq 0.6 \text{ mA}$
- Voltage drop U_d : non-polarized version (AD) $< 5 \text{ V}$, polarized version (AG) $< 4.2 \text{ V}$
- Usage category 13

2-wire DC (polarized)



2-wire DC (non-polarized)



Ambient conditions

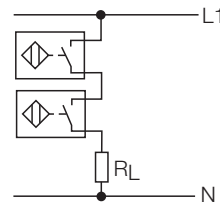
- Protection rating, minimum IP65
- Pollution degree 3
- Shock resistance: 30 x g (11 ms)
- Vibration resistance: 55 Hz (1 mm)

Series connection of 2-wire sensors

- Normally open (NO): AND logic
- Normally closed (NC): NOR logic

When sensors are series connected, voltage drops of the individual sensors add up. This reduces the usable voltage at the load. Care must be taken not to underrange the minimum admissible supply voltage.

Series connection of 2-wire sensors



2-wire AC/DC sensors

Advantages

- Only two wires
- AC/DC connection
- Short-circuit proof (types: ADZ, RDZ, FDZ)

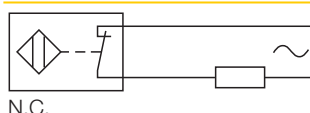
Power supply

- Operating voltage of inductive and capacitive sensors U_B : 20...250 VAC oder 10...300 VDC
- Except for sensors with selective functions (NF) and sensors with extended temperature range up to +120 °C

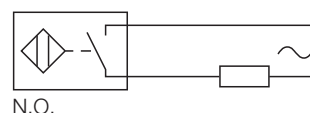
Switching behaviour

- Normally open (NO), coding: ...ADZ/AZ
- Normally closed (NC), coding: ...RDZ/RZ
- Normally open (NO) and normally closed (NC) programmable connection, coding: ...FDZ/FZ
- Off-state current: $I_s \leq 1.7$ mA (AC), $I_s \leq 1.5$ mA (DC)
- Latching short-circuit protection, types ADZ, RDZ, FDZ; surge current ≤ 8 A (≤ 5 ms, max. 5 Hz); overload trip point > 500 mA
- Voltage drop $U_d < 6 V_{eff}$
- Hysteresis H: 3...15 %
- Temperature drift $< \pm 10$ % (default temperature range -25...+70 °C), $< \pm 20$ % (extended temperature range -40/-25...+100/120 °C)
- Repeatability R: < 2 %
- Usage category: AC 140/DC 13
- Rated insulation voltage $U_i = 1.5$ kV
- Rated conditional short-circuit 100 A
- Should the ambient temperature exceed + 40 °C the rated operating current is limited.

2-wire AC/DC, NC



2-wire AC/DC, NO



Ambient conditions

- Protection rating (IEC 60529/EN 60529): IP67
- Pollution degree: 3
- Shock resistance: 30 x g (11 ms)
- Vibration resistance: 55 Hz (1 mm)

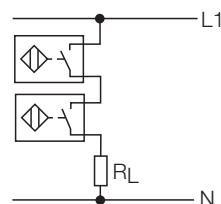
Series connection of 2-wire AC/DC sensors

- Normally closed (NO): AND logic
- Normally open (NC): NOR logic

When sensors are series connected, voltage drops of the individual sensors add up. This reduces the usable voltage at the

load. Care must be taken not to underrange the minimum admissible supply voltage.

Series connection of 2-wire AC/DC sensors



Mechanical switches and AC/DC sensors connected in series

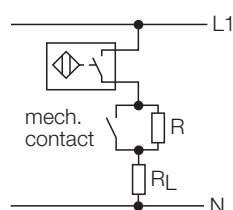
The open contact interrupts the supply voltage of the sensor. If the sensor is damped while the mechanical contact closes, a short time delay will occur. The readiness delay before availability ($t \leq 80$ ms) prevents immediate switching

Solution: A resistor connected in series with the contact ensures the minimum voltage supply to the sensor. Thus, the time delay before availability after opening of the mechanical contact is avoided

Formular to calculate the resistance value:

$$R = 10V / I_{Load} P = I_{Load}^2 \times R$$

Series connection with mechanical switches



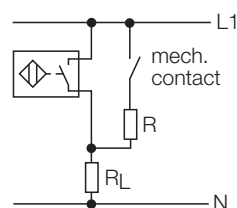
Mechanical switches and AC/DC sensors connected in parallel

The closed contact interrupts the supply voltage of the sensor. The sensor is ready for operation after opening the contact and following time delay ($t = 80$ ms)

Solution: A resistor connected in parallel to the mechanical contact supplies the sensor in open contact state, so that the time delay before availability effect is avoided. For 230 VAC the resistance value is approx. 91 k Ω /1 W.

Approximate resistance value 400 Ω /V

Parallel connection with mechanical switches



Sensors with analog output

Advantages

- Linear characteristic (except SiU)
- Miniature design with extended sensing range and non-linearized output (SiU)
- Variable outputs: Current, voltage, frequency, adjustable switching output.

Power supply

- Operating voltage U_B : 15...30 VDC
- Ripple W_{ss} : 10 %

Ambient conditions

- Protection rating, minimum IP65
- Pollution degree 3
- Shock resistance: 30 x g (11 ms)
- Vibration resistance: 55 Hz (1 mm)

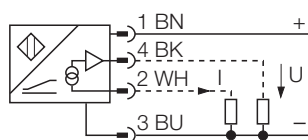
Standard data

- Repeatability R: < 1 %; R < 0.5 % after warm-up time 30 min.
- Temperature drift: $\leq 0.06\% / ^\circ\text{C}$
- Usage category: 13
- Rated insulation voltage: $U_i = 0.5\text{ kV}$

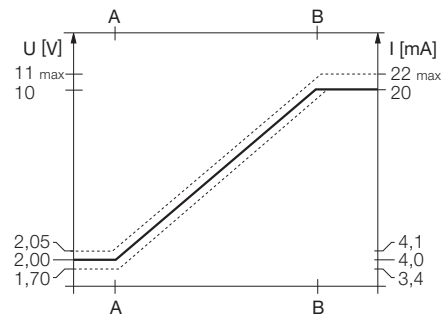
Load resistance

- Current output: < 0.4 k Ω
- Voltage output: $\geq 4.7\text{ k}\Omega$
- Frequency output: < 1 k Ω

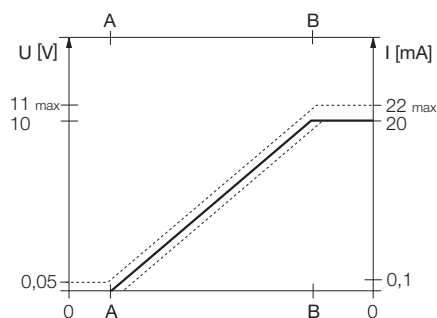
Wiring diagram of sensors with voltage and current output (example)



Output characteristic of sensors with 2...10 V/4...20 mA output (example)



Output characteristic of sensors with 0...10 V/0...20 mA output (example)



Standards and directives (if applicable)

Standards

EN 60947-5-2

Low voltage switchgear and control-gear, part 5: Control units and switching elements, main section 2: Proximity switches

EN 60079-0

Electrical apparatus for use in explosion hazardous locations, General requirements

EN 60079-11

Electrical apparatus for use in explosion hazardous locations Intrinsic safety „i“

EN 60079-15

Electrical apparatus for use in explosion hazardous locations type of protection „n“

EN 61241-0

General requirements for electrical equipment applied in areas exposed to flammable dust

EN 61241-1

Electrical equipment for application in dust exposed areas, protected by housing

EN 61000-6-4

Electromagnetic compatibility (EMC), generic emission standard

EN 61000-6-2

Electromagnetic compatibility (EMC), generic immunity standard

EN 60529/IEC 60529/DIN VDE 0470-1

Protection ratings (IP code) of the housings indicating the degree of protection against the ingress of dust and humidity.

EN 60947-5-6 (NAMUR)

Control units and switching elements/proximity switches, DC interface for proximity sensors and switching amplifiers (NAMUR)

IEC 61508 (SIL)

Functional safety of safety related, electronic and programmable electronic systems

information

Directives

2006/95/EG

Low voltage directive

2004/108/EG

Electromagnetic compatibility;
CE marking

94/9/EG

Explosion protection (ATEX)

CE

The CE-symbol is neither a seal of quality nor a test mark but serves for free trade within the European Community. Manufacturers assure that the protective aims of the applicable directives are fulfilled by CE-labeled products.

General information

Housing materials

Housing materials – abbreviations and explanations

ABS

Acrylnitril-Butadien-Styrol
impact resistant, rigid

AL

Aluminium
low specific weight, good oxidation resistance

CuZn-Cr

Chrome-plated brass
standard housing material

CuZn-OP

Optaloy-coated brass
standard housing material

CuZn-T

Teflon-coated brass
protection against weld splatter

DURO

Duroplast
excellent mechanical strength and temperature resistance

EPTR

Thermoplastic rubber
good mechanical strength, temperature and chemical-resistant

FEP

Fluoropolymer
high temperature resistance, high abrasion resistance, resistant to acids, alcalis, solvents, lacquer, benzine and oils

GD-Al

Die-cast aluminium
low specific weight, excellent tightness and durability

GD-Zn

Die-cast, zinc
excellent tightness and durability

LCP

Liquid crystal copolyester
excellent stability, low thermal expansion, excellent chemical resistance and flame retardant properties (UL94-V0)

PA

Polyamide
good mechanical strength, temperature resistance, PA6/12 approved for the food industry

PA-T

Teflon-coated polyamide
protection against weld splatter

PA-X

Irradiated polyamide
excellent mechanical strength, high temperature resistance, PA6/12 approved for the food industry

PBT

Polybutylenterephthalate
excellent mechanical strength and temperature resistance, good resistance against chemicals, flame retardant and self-extinguishing (UL94-V0), transparent and UV-resistant

PC

Polycarbonate
highly impact-resistant

PEEK

Polyethertetherketone
good mechanical properties at high temperatures, high dimensional stability and chemical resistance



POM

Polyoxymethylene
high impact resistance, good mechanical and chemical resistance

PP

Polypropylene
excellent chemical resistance, even against acids, alkalis and solvents. High temperature and mechanical resistance.

PTFE

Teflon
excellent resistance to high temperatures and chemicals

PUR

Polyurethane
elastic, abrasion-proof, impact resistant; oil, grease and solvent resistant

PVC

Polyvinylchlorid
good mechanical strength, impact and chemical resistance

PVDF

Polyvinylidenfluorid
high temperature resistance, good chemical resistance (similar to PTFE), high mechanical strength

SrFe

Strontium-Ferrite
properties are similar to ceramic material with respect to rigidity and brittleness, good resistance to corrosion and chemicals

Trogamid

Polyamide
transparent, hard, rigid, good chemical resistance

ULTEM (PEI)

Polyetherimide
excellent mechanical strength and temperature resistance, good chemical resistance, (PEI) flame retardant and self-extinguishing (UL94-V0), transparent and UV-resistant

V4A

Top-quality stainless steel
Excellent corrosion resistance, specified for high requirements, especially for the food industry

VA

Stainless steel
excellent corrosion resistance, specified for high requirements of the food industry

VA-T

Teflon-coated stainless steel
protection against weld splatter

VES

Vestamid (PA)
good mechanical strength and excellent temperature resistance

Sensor cables

PVC cable jacket with PVC wire insulation

Standard quality, fine-wire litz construction, highly flexible (Li-fYY)

PUR cable jacket with PVC wire insulation

Resistant to all industrial oils and lubricants. Fine-wire litz construction. Resistant to vibration and bending stress; small bending radius

Identification: .../S90

Silicone cable jacket with silicone Adernisolation

For use at high or low ambient temperatures (-50...+180 °C) moderate mechanical strength, average resistance to alkalis, acids, oils and solvents

Identification:

.../S140 or .../S120 (+120 °C)

SiHSi, 2 x 0.5 mm², 16 x 0.2

SiHSi, 3 x 0.5 mm², 16 x 0.2

SiHSi, 3 x 0.25 mm², 14 x 0.15

PTFE cable jacket with PTFE wire insulation

Optimum resistance to high temperatures and chemicals

Identification:

.../S120 (+120 °C)

.../S907 (+160 °C)

.../S200 (+200 °C)

FEP cable jacket FEP wire insulation

Suited for low temperature applications

Temperature range -100...+180 °C

Identification: .../S939 (-60 °C)

Ölflex PUR cable jacket with PVC wire insulation

Good resistance to oils, extremely abrasion and friction-resistant, firm, antiseptic and hydrolysis resistant, temperature range -5...+70 °C

Identification: .../S396 (underwater)

TPE cable jacket with TPE wire insulation

Good temperature and chemical resistance (-40...+130 °C)

Identification: ...EG08.../S100

Glossary

Terms and definitions

Active face

The point where the high-frequency magnetic field leaves the sensor. Regarding threaded barrel sensors, the active face is at the front. Concerning rectangular plastic sensors, the zone of the active face is marked with a target.

AID alignment indicating device (photoelectric sensors)

The AID emits pulses at a rate proportional to the quantity of received light. The higher the pulse frequency, the higher the amount of light. A pulse rate of 1 Hz indicates that the sensor receives just the right amount of light it needs to switch. Slight contamination may cause malfunctioning. A pulse rate of 3 Hz or more ensures reliable operation of the sensor.

Air pressure (ultrasonic sensors)

Normal atmospheric changes of $\pm 5\%$ (for a local reference point) can lead to a deviation of the sensing range of about $\pm 0.6\%$.

Air streams (ultrasonic sensors)

Air streams influence the echo time, however, air flow speeds of up to 10 m/s are insignificant. In conditions where turbulences prevail, e.g. above glowing metal, the use of ultrasonic sensors is not recommended, because the echo of distorted sound waves is difficult to evaluate.

Air temperature and humidity (ultrasonic sensors)

Both air temperature and air humidity influence the sonic pulse duration. An increase of temperature by 20 °C causes a change of the sensing distance of max. 8%. An increase of humidity results in an increase of sound speed of max. 2%. The distance to the object seemingly decreases with a higher sound speed.

Alarm output

The alarm output indicates low excess gain or overload. Many sensors mentioned in this catalog feature an alarm output.

Ambient conditions (photoelectric sensors)

The ambient conditions determine the sensor's reliability. Working at its maximum range in demanding ambients, the sensor will soon perform less efficiently and finally be inoperable due to dirt covering the lens. If the same sensor works at half its distance in the same environment, the good performance may be kept stable for a longer time. The optimal range for each sensor and the individual ambient conditions is determined with the excess gain curve.

Analog output signal

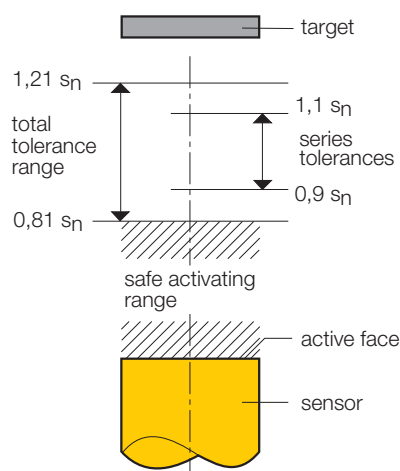
The analog output signal is provided at the output either at 4...20 mA, 0...10 V or a similar power rate.

Assured switching distance (s_a) inductive sensors

"Distance at which the sensor securely switches". Correlation to rated switching distance s_n : $s_a < 0.81 \times s_n$

Assured switching distance (s_a) capacitive sensors

- Distance at which the sensor securely switches
- Correlation to rated switching distance s_n : $s_a < 0.72 \times s_n$



Background suppression (photoelectric sensors)

Normal diffuse mode sensors switch on when the level of light reflected back to the receiver exceeds the sensor's threshold. A dark object that is close and a bright object that is further away reflect the same quantity of light. It is recommended that, in order to have an acceptable contrast, any object that has to be ignored, should be at least four times further away than the actual target to be detected. Background suppression sensors not only detect the amount of energy returned to the sensor but also determine the distance to the object reflecting the light. A background suppression sensor detects objects reliably up to a set distance (the cutoff point) while ignoring other objects that are slightly further away regardless of their surface reflectivity.

Blind zone (ultrasonic and linear position sensors)

Diffuse mode ultrasonic sensors are not capable of detecting targets located directly in front of the sonic transducer. The area between the sonic transducer surface and the beginning of the detection range is called blind zone and must always be kept free. With regard to linear position sensors, the blind zone marks the area in which the positioning element can not be detected

Burst pressure (pressure sensors)

The minimum pressure a sensor must withstand without damage. If the minimum pressure is exceeded, the sensor may leak or be destroyed..

Close-up range suppression (capacitive sensors)

Dirt deposits and humidity are blanked out through integrated self-compensation.

Color effects (photoelectric sensors)

Colored objects may affect the measurement accuracy of photoelectric sensors. White, red, yellow and orange objects reflect more light than green, blue or black ones. All values indicated in this catalog are related to the official white Kodak test card.

Contrast (photoelectric sensors)

The most important factor for reliable operation of photoelectric sensors is the contrast. Contrast is the degree of difference between two sensing conditions, light and dark. For example, a thick cardboard box breaks a retroreflective beam. The contrast is determined through adjusting first the light condition. For this purpose the sensitivity is reduced to the minimum level (counter clockwise rotation of button). Subsequently the level of sensitivity is increased until the status LED lights up. Next the dark condition is established when the sensor switches off. Subsequently the sensitivity is increased until the status LED lights up again. The best contrast is achieved if the difference between both switching states covers more than a third of the adjustable range. Sensors without sensitivity adjustment are not suited for low contrast applications.

Convergent mode sensors (photoelectric sensors)

Convergent mode sensors use a lens system that focuses the emitted light to an exact point in front of the sensor and focuses the receiver element at the same point. They operate like diffuse mode sensors, detecting an object through its reflectivity. Small objects, edges and transparent materials are reliably detected. It is important though that the objects are within the near-field depth. The near-field depth is defined as the area in front and behind the focal point in which objects are detected. The higher the reflectivity of an object the deeper the field. Through bundling light in the focal point, convergent mode sensors are capable of detecting objects with low reflectivity. They detect transparent materials easily, such as glass bottles on conveyor belts. Convergent mode sensors working with visible light are suited for the detection of color marks.

Correction factors

see Reduction factors

Crosstalk (ultrasonic sensors)

Crosstalk occurs when ultrasonic sensors are mounted side by side. It can either be avoided through minimum distances kept between the sensors, alternate operation or synchronization (see multiplexing).

Degree of pollution

§ 6.1.3.2 of IEC 60947-1 defines 4 pollution degrees: TURCK proximity sensors belong to category 3 as per IEC 60947-1 conductive or dry, non-conductive dirt that becomes conductive due to condensation.

Designs and beam angle (ultrasonic sensors)

TURCK ultrasonic sensors are available as threaded barrels M18/ M30 or rectangular Q30 devices with a narrow beam angle of 6°. They detect very small objects with pinpoint accuracy up to a distance of 8 m. Q45U and T30U types feature beam angles of 12° to 15° and achieve longer ranges. CP40 types with a beam angle of 60° monitor large areas and are immune to tilt when detecting objects with smooth and even surfaces.

Diffuse mode sensors (photoelectric sensors)

Like retroreflective sensors, diffuse mode sensors host emitter and receiver circuitry in the same housing. In this sensing mode, an object is not detected through the interruption of a light beam but through the reflectivity of an object. An object is detected when sufficient light is reflected back to the emitter. The switching distance of diffuse mode sensors depends largely on the reflectivity of the object.

Diffuse mode sensors with background suppression (photoelectric sensors)

Diffuse mode sensors with background suppression operate with an emitter and several receivers. They not only detect the amount of light returned but also the distance to the object and figure out if the object is within or outside the sensing range. They are available either with fixed or adjustable field

Digital output

Digital output signals are ON/OFF signals which are produced when continuous measurement reaches a given value. They are usually produced with PNP/NPN transistors or an electromagnetic relay.

Distance measuring gauge (inductive sensors)

Square metal plate to determine the measuring range s_n :

- Material: St37
- Thickness: 1 mm
- Edge length $3 \times s_n$, if $3 \times s_n$ is greater than the diameter of the active face, otherwise just the diameter of the active face.

Dynamic output

Sensors with dynamic output respond highly sensitive and create a short pulse upon damping.

EMC (electromagnetic capability)

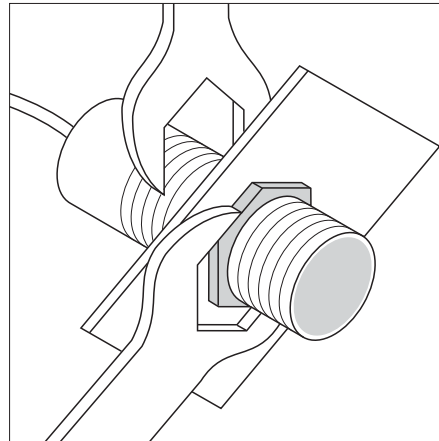
The ability of an electrical device to operate failure-free and without negative influence on the operating environment.

Excess gain (photoelectric sensors)

Excess gain indicates how much light a sensor receives under certain conditions. This value is compared to the amount of light the sensor needs to switch. Excess gain 1 indicates that the sensor receives a minimum quantity of light, just enough to work. Excess gain 50 indicates that the sensor receives fifty times more light than needed for proper operation. In a clean environment, excess gain 1.5 is sufficient to ensure proper operation of the sensor in case of offset or gradual consumption of the LED. If dust, fume or mist is expected to contaminate the lens, excess gain should be higher than 1.5. All values for the sensing ranges stated in this catalog refer to excess gain 1.

Fixing torque

Concerning threaded barrel sensors, the maximum moment of force to be observed in order to avoid torsional stress. You find the corresponding values on the data sheets. If exposed to strong vibrations, use liquid threaded fastener on anaerobic base (e.g. Loctite 242).



Flush and non-flush mounting (inductive and capacitive sensors)

Flush mountable sensors can be mounted in metal up to the active face. Non-flush mountable sensors have to protrude the metal, they have larger sensing ranges.

Non-flush mountable *uprox*[®]+ sensors with integrated self-compensation can be embedded partially (see technical data). Flush mountable *uprox*[®]+ with integrated self-compensation can be recessed (see technical data).

Hysteresis function (pressure sensors)

This function is used to establish a stable switching state, independent of system-related pressure fluctuations near the adjusted set point. The switching range is limited by a switchpoint (SP) and a release point (RP) adjusted by the user.

Linearity deviation

Indicated by sensors with analog output. Admissible deviation of the output signal from an ideal linear curve, indicated in % f.s. of the output signal.

Magnetic field immune

Magnetic-field immune sensors with ferrite core are insensitive to magnetic fields occurring in welding systems for example. All *uprox*[®]+ and *uprox*[®] sensors are immune to magnetic DC or AC fields.

Measurement accuracy

The closeness of the measured value to the nominal value. See also Measurement deviation

Measurement deviation

Deviation of a measured value from a nominal value according to DIN 1319-1:1995.

Measurement error

see Measurement deviation

Measuring range

Indicated by sensors with analog output.
The range within which the output signal is changed.

Media temperature (flow sensors)

The temperature range in which the sensor operates according to its measurement properties.

Minimum operating current (I_m)

Minimum current in ON state to maintain the functionality. Indicated for 2-wire sensors only.

Multiplexing (ultrasonic sensors)

Mutual influence is impossible with alternately operating ultrasonic sensors. The more sensors are operated alternately, the lower the switching frequency. The X1-line of the sensor series RUC-M30, RU-Q30 and RU-M18 can also be used as an enable input for multiplexing. If the X1-line is connected to +24 V, the sensor is enabled; if the X1-line is connected to 0 V, the sensor is disabled. Multiplexing via the X1-line has the advantage that for each enable-operation only the response time and not the time-delay before availability has to be considered. Once connected to the X1 line, most sensors can be programmed with the RU-PDI to multiplex automatically.

Noise suppression (ultrasonic sensors)

Noise such as metal clink or roaring pressure have no influence on the evaluation of signals thanks to the optimally adjustable frequency range and the patented noise suppression circuitry.

No-load current (I_o)

Current flow between supply voltage and 0 V. Indicated for 3 and 4-wire sensors only.

Object color (photoelectric sensors)

The color as well as the transparency of objects has no influence on the sensing range. Glass or perspex are reliably detected.

Object surface (photoelectric sensors)

Sometimes the surface quality of an object helps to choose the right sensor. Photoelectric sensors are usually not the right choice for mirror-like surfaces. Measuring errors are likely to occur even with semi-transparent and porous surfaces such as plastic or foam.

Operating range (flow sensors)

The operating ranges vary from one type of fluid to the other. They are proportional to the speed of the fluid that the sensor can detect. At the same flow rate compared to water, air can only conduct away a fraction of the heat from the heating element. Therefore different operating ranges apply for water, oil or air.

Operating range (pressure sensors)

Is the tolerance, in which deviation of pressure is permitted.

Operating range (temperature sensors)

Is the tolerance in which deviation of temperature is permitted.

Operating modes (ultrasonic and photoelectric sensors)

Ultrasonic sensors are mainly used in the diffuse mode. An object in front of the sensor is detected by the partly reflected sound wave. They are also used in opposed and retroreflective mode. An ultrasonic opposed mode sensor consists of an emitter and a receiver which listen to each other permanently. The ultrasonic sound is interrupted by an object between emitter and receiver, causing the sensor to switch. Photoelectric sensors operate according to the same principles using light instead of sound

Opposed mode sensors (photoelectric sensors)

Opposed mode sensors consist of emitter and receiver mounted in separate housings. They are installed directly opposite each other in such a way that the light from the emitter is aimed directly at the receiver. When an object interrupts or weakens the light beam, the sensor switches. Opposed mode sensors are the most reliable photoelectric sensors for detection of opaque targets.

Optical fibers

Optical fibers are suited for many applications:

- Detection of small objects
- Fit in confined spaces
- High-temperature resistant
- Immune to strong magnetic fields
- Vibration proof
- Resistant to aggressive gases
- Suited for explosion hazardous areas

Optical fibers made of glass or plastic are used to pipe light from the sensor to the object and back. They are passive components of a photoelectric system. Because of their passiveness and the absence of moving parts, light can be piped in hazardous areas. They are also immune to electromagnetic interference. The strands are incased in a cladding that reflects light to the core. The cladding has a lower refractive index than the core. The law of total internal reflection defines, when a light beam hits the medium boundary between two media with different refractive index, it is totally reflected, provided the angle of incidence does not exceed a determined critical angle.

Output function

NAMUR: Standard output signal according to EN 60947-5-6

Normally open (NO): The output is open when the sensor is non-activated and closed when the sensor is activated.
Normally closed (NC): The output is closed when the sensor is non-activated and open when the sensor is activated.

Antivalent: One of the two outputs is closed when the sensor is non-activated and the other one when the sensor is activated.

Analog output: The signal provided at the output is either 4...20 mA or 0...10 V.

SSI output: Digital output transmitting measured values directly to the control unit or via remote I/O fieldbus station.

Overpressure (pressure sensors)

The maximum pressure load exerted on the sensor occasionally without impeding its functionality, yet allowing the tolerances to be exceeded.

Precipitation and humidity (ultrasonic sensors)

Normal concentrations of rain or snow do not affect the sensor's operability. The CP40 transducers are not protected against humidity (protection class IP40). All other types are not damaged by water but correct functionality may be impaired. Ultrasonic transducers should generally be protected against direct wetting.

Predamping protection

Self-compensation inhibits predamping of non-flush mountable sensors and enables partial embedding of the same with reduced switching distances.

Pressure range (pressure sensors)

The operating range in which deviation of pressure is permitted.

Principle of photoelectric sensing

Photoelectric sensors operate on the principle of emitting and receiving light. All sensors in this catalog are compact devices having optics, amplifier and switching output in the same housing. A diode emits a light beam which is either cut off (opposed mode) or reflected by an object (retroreflective/diffuse mode). The sensor detects a change in light intensity causing the output to switch. Photoelectric sensors operate with modulated light in order to blank out unwanted influence of ambient light.

Polarizing filter (photoelectric sensors)

If strong reflecting objects have to be detected with retroreflective sensors a polarizing filter is required. A tripel reflector redirects the light beam by 90°, maintaining the polarization of the light reflected by the object's surface. The polarizing filter enables the sensor to distinguish between light thrown back from the object or from the reflector.

Power consumption

The power needed to operate a sensor. For sensors with switching output the power consumption is indicated without load

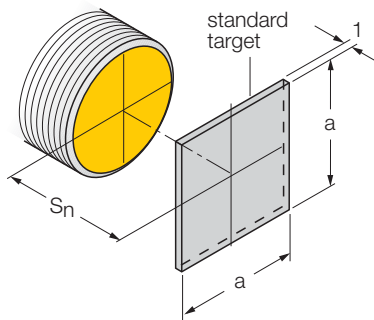
Protection rating

Protection against contact with and ingress of foreign bodies and water:

- IP65: Full protection against dust and hose water
- IP67: Full protection against dust and water. Watertight at a depth of 1 m, for a period of 30 min. and constant ambient temperature.
- IP68: Sensors for higher demands; 24 hrs. continuous storage at +70 °C; 24 hrs. continuous storage at -25 °C; 7 days submerged at a depth of 1 m; 10 temperature cycles + 70 °C...-25 °C, dwell cycle per temperature 1hrs.
- IP69K: Suited for high pressure cleaning acc. to DIN 40050-9 following EN 60529

Rated operating distance (sn)

The rated operating distance is measured through the axial approach of a standard target. Manufacturing tolerances and external influences such as temperature and voltage are not considered. The tables only indicate the rated operating distances.



Readiness delay

Sensors feature a readiness delay of < 80 ms to suppress failure pulses occurring in the period between power-on and operational readiness.

Real switching distance (Sr)

Real switching distance (s_r)

- Switching distance under fixed temperature and supply conditions
- Factory set tolerances are taken into account
- Correlation to rated operating distance $0.9 s_n < s_r < 1.1 s_n$.

Reduction factor

The switching distance of inductive ferrite core sensors depends on the material of the actuating element. The maximum switching distance is attained with mild steel St37, whereas with other metals only smaller switching distances are achieved.

The reduction factor indicates to which fraction the switching distance is reduced by using other metals than St37.

Typical reduction factor values : Mild steel (St37): 1; brass: 0.35 - 0.5; copper: 0.25 - 0.45; aluminium: 0.35 - 0.50; stainless steel: 0.6 - 1

uprox[®] and *uprox*⁺ sensors have the same switching distance for all metals. The reduction factor is always 1.

Reflectivity of surfaces (photoelectric sensors)

An object has to reflect sufficient light in order to be detected by a diffuse or a convergent mode sensor. The amount of light received, depends on the emitting power of the sensor and the reflectivity of the object. A dark object reflects less light than a bright one (see Excess gain). A smooth, mirror-like surface has to be aligned perpendicular to the sensor's axis. Otherwise, the light is not reflected back.

Reflectors and filters (photoelectric sensors)

All sensing ranges of photoelectric sensors and excess gain curves of retroreflective sensors mentioned in this catalog were determined with the BRT75 reflector. Retroreflectors are designed in such a way that light is reflected back in the same direction. The amount of light reflected back to the sensor depends on two factors:

1. The size of the reflecting surface
2. The reflector's reflectivity.

Short distances require a reflector with \varnothing 25 mm which is capable of reflecting the light as good as a \varnothing 75 mm reflector. A \varnothing 75 mm reflector reflects up to nine times more light than a \varnothing 25 mm and is suited for longer distances..

Refreshing rate

The period a value takes to be formed in an application in device A, to be sent on line to a device B and made available to the application there. The refreshing rate should not be confused with the response time, which is slower in most cases. A floating average value can be formed for a data volume of 10 ms and given out every 1 ms. In this case the refreshing rate is 1/1 ms resp. 1 kHz, while the response time is 6 ms.

Release point (pressure sensors)

In hysteresis mode, the output switches at the release point (rP) when system pressure decreases. In window mode, the output switches at the rP independent of whether system pressure increases or decreases.

Repeatability

Repeatability is defined as the deviation of the switchpoint after often repeated switching, under identical conditions and with the same digital sensor.

For example, a laser sensor is programmed to switch at 100 mm. The actual distance is measured twenty times with a micro-meter. The standard deviation measured is 0.01 mm.; the two sigma repeatability is 0.02 mm.

Repeatability

Sensors with switching output (digital):

Deviation of the switchpoint after often repeated switching, under identical conditions and with the same sensor. Sensors with analog output: Change of the output value under the same conditions and with the same sensor. Value of the measured range indicated in percentage.

Residual current (Ir)

2-wire sensors: The current which flows in non-active condition.

3 and 4-wire sensors: The current which flows in non-active condition between the output and 0 V (PNP output), resp. between output and supply voltage (NPN output).

Glossary

Terms and definitions

Resolution

Analog signals converted to digital signals by a DA converter. Each digital signal is individually resolved. The resolution indicates the increment of the signal, meaning the smallest possible change of the analog output signal.

Response time (flow sensors)

Is the time a sensor takes to react to a given change of an input signal.

Example: A temperature sensor working at 0 °C is instantly immersed in 100 °C hot water. After 4 seconds, the sensor indicates 63 °C. The response time is thus 4 seconds.

Retroreflective sensors (photoelectric sensors)

Retroreflective sensors host both emitter and receiver circuitry in the same housing. A light beam is established between the emitter, reflector and receiver. An object is sensed when it interrupts the beam. Retroreflective sensors share some advantages with opposed mode sensors such as good contrast and high excess gain. Moreover, only one device has to be installed and wired. A retroreflective target is an optical device that reflects the light back in the direction of the light source. Retroreflective sensing mode allows reliable detection over a relatively long distance without the need to wire up two electrical devices.

Reverse polarity protection

Protection against false connection.

Ripple

Residual AC voltage superimposed on the DC supply voltage. Usually 10 % ripple (peak to peak) of the applied supply voltage is tolerable.

Sensing conditions (ultrasonic sensors)

The ultrasonic transducers are especially optimized for the medium „air“. They can also be used for other gaseous media. In this case the sensitivity and the range need to be adjusted.

Standby time (flow sensors)

The time a flow sensor needs to achieve a stable state after it has been turned on.

Static output (ring sensors)

Sensors with a static output produce a constant pulse as long as they are damped. In principle, all proximity sensors feature a static output. The term is used in connection with ring sensors (see also dynamic output).

Storage temperature

The storage temperature may range from -30...+85 °C.

Surface roughness (ultrasonic sensors)

Ultrasonic sensors detect objects with a surface roughness exceeding 0.15 mm. On the one hand, the surface need not be aligned exactly towards the sensor but on the other hand the sensing range has to be reduced.

Surge current

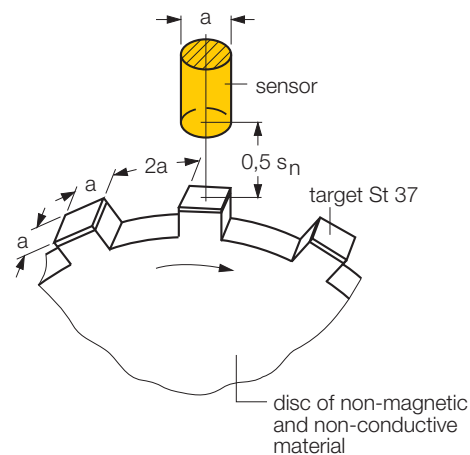
Inrush current transiently flowing through the output.

Switching distance (s)

Distance at which a change of signal is produced with axial approach of the object.

Switching frequency

The switching frequency indicates the number of status changes per second. The higher the switching frequency the more often switching can be repeated per second resp. the faster the switching operation. Concerning proximity switches, the switching frequency indicates the maximum number of changes between damped and undamped state per second (Hz). Maximum switching frequency at an operating distance $s = S_N/2$, measured with a gauge wheel.



Short-circuit protection

Protection against overload.

Switching frequency (max.)

The maximum switching frequency indicates how many status changes per second are possible.

Switch element function

see Output function

Switch-off time (flow sensors)

Time the flow sensor needs to measure and display the drop in flow speed.

Switchpoint (pressure and temperature sensors)

In hysteresis mode, the output switches at the switchpoint (sP) when system pressure or temperature increases. In window mode, the output switches at the sP independent of whether system pressure or temperature increases or decreases.

Switchpoint accuracy (pressure and temperature sensors)

The switchpoint accuracy defines the maximum admissible deviation of an adjusted value from the actual switchpoint value.

Switching delay

Is the period between attaining a switchpoint and resulting change of status at the output.

Switch-on time (flow sensors)

Time the flow sensor needs to measure and display the increase in flow speed.

Synchronization (ultrasonic sensors)

Crosstalk can be avoided through synchronization. Most sensors of the RUC-M30, RU-M18 and RU-Q30 series synchronize themselves by simply connecting the synchronization line. They emit sonic pulses simultaneously, performing like a single sensor with extended angle of detection.

System pressure (pressure sensors)

The media pressure exerted on the pressure sensor.

Temperature drift

Temperature-dependent change of switchpoint or output value.

Temperature gradient (flow sensors)

The temperature gradient defines the max. temperature rise that a flow sensor can adapt to without damage. The sensors have the ability to compensate temperature jumps within specified tolerances. Excess of these tolerances may lead to malfunction. In this case, the sensor has to be adjusted to the new temperature range to ensure correct detection of flow.
Unit of measure: °C/min. or K/min.

Transparent objects (photoelectric sensors)

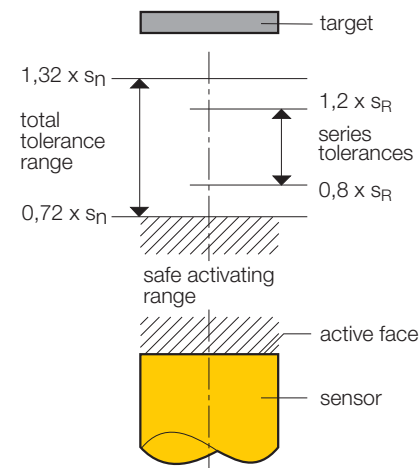
Transparent objects are hardly detected by opposed mode sensors as they reflect the light beam only partially. Retroreflective sensors are better suited for this task because the light beam passes the object twice. This improves the contrast considerably. Anyhow, the switchpoint has to be adjusted precisely which is only possible with sensors featuring sensitivity adjustment. Diffuse mode or convergent mode sensors are best suited for this job.

Usable operating distance (Su) (capacitive sensors)

Operating distance which is guaranteed within the permitted temperature and voltage range.

Correlation to rated operating distance:

- $0.8 \times s_r < s_u < 1.2 \times s_r$
- $0.72 \times s_n < s_u < 1.32 \times s_n$

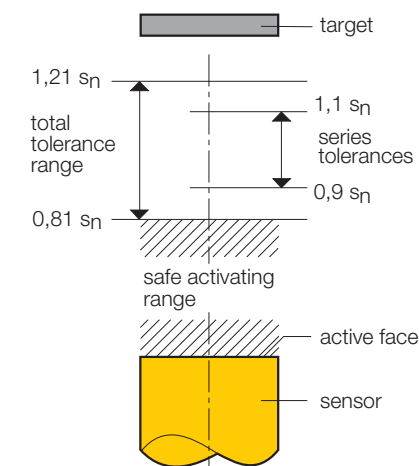


Usable operating distance (Su) (inductive sensors)

Operating distance which is guaranteed within the permitted temperature and voltage range

Correlation to rated operating distance

- $0.9 \times s_r < s_u < 1.1 \times s_r$
- $0.81 \times s_n < s_u < 1.21 \times s_n$



Glossary

Terms and definitions

Utilization categorie

The utilization category indicates the area in which sensors can be operated. Category IEC 60947-5-2 is defined in relation to the correspondent rated current, rated voltage and the load current.

Inductive sensors by TURCK fulfill the following categories:

DC-13: Control of electromagnets

AC-140: Control of smaller electromagnetic loads with holding current > 0.2 A

Voltage drop (Ud)

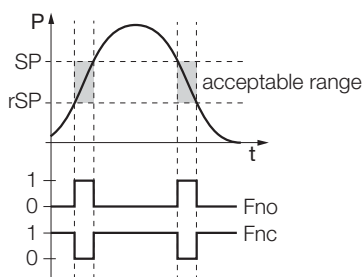
Voltage drop is the reduction in voltage of a connected output.

Weld-proof

Weld-resistant sensors can be applied in welding systems. They incorporate a special ferrite core which makes them immune to magnetic AC and DC fields (see Magnetic field immune).

Window function

An adjustable range, in which the sensor operates in a defined switching state. The window (switching range) is limited by an upper and lower value set by the operator.



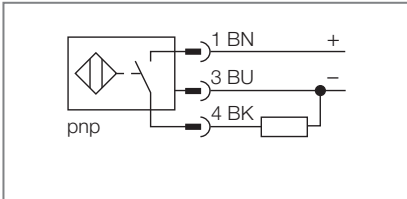
Wire-break protection

If the supply cable is cut, the output stays off (no failure).

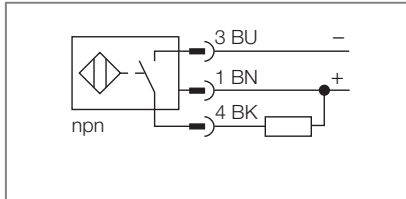
Wiring diagrams

Wiring diagrams

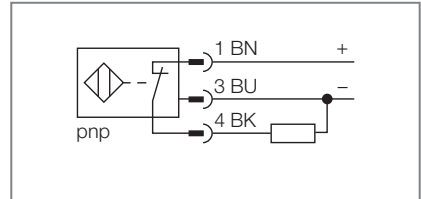
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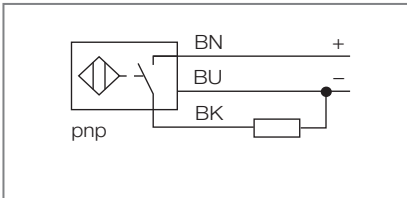
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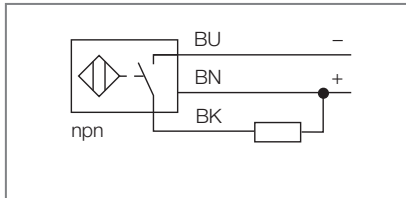
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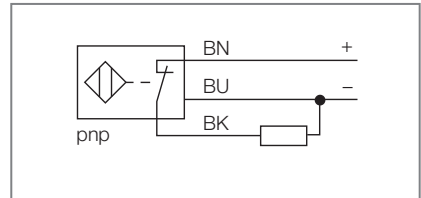
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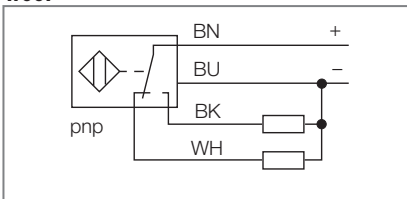
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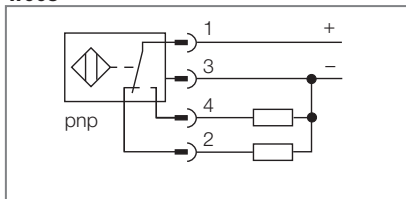
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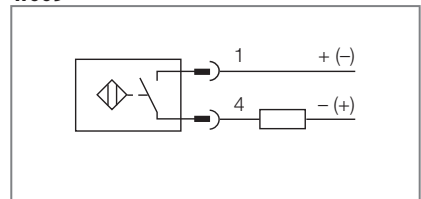
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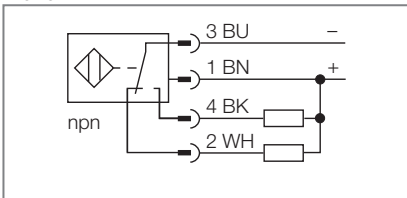
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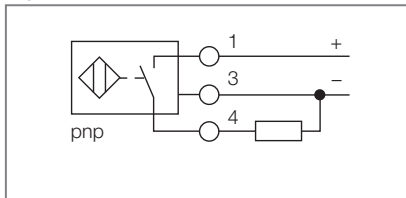
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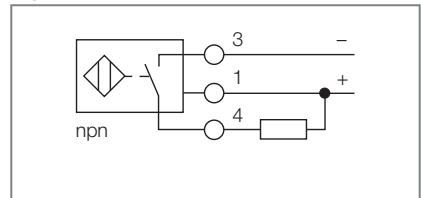
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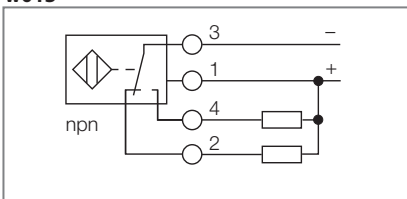
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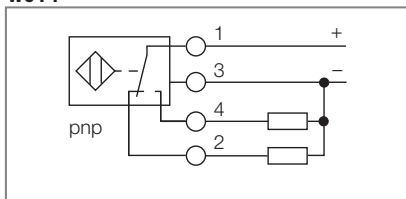
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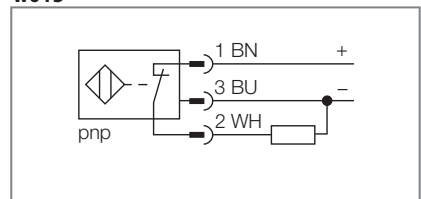
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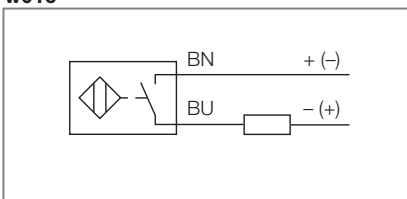
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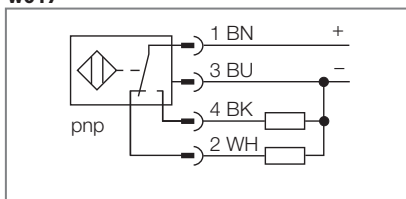
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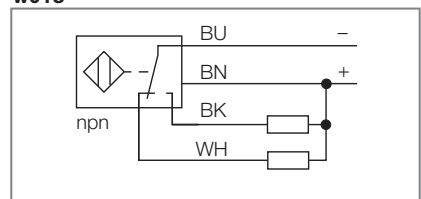
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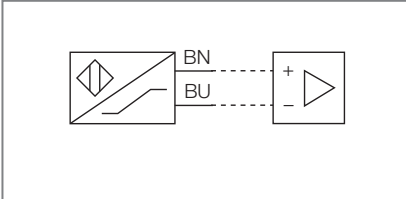
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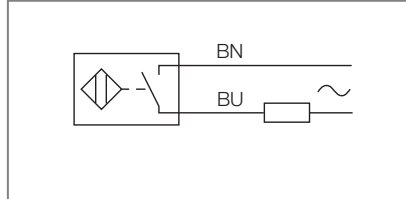
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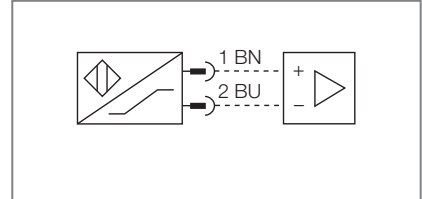
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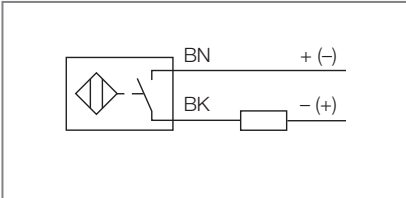
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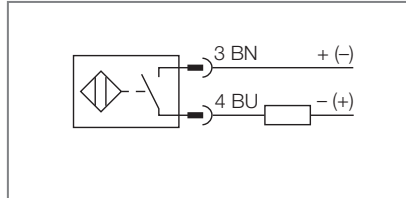
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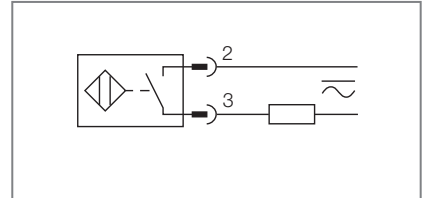
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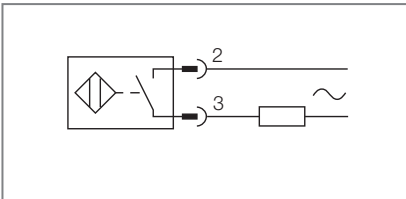
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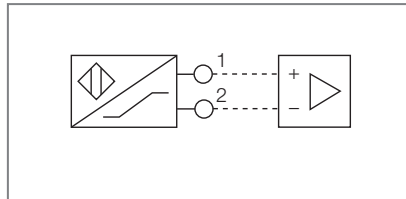
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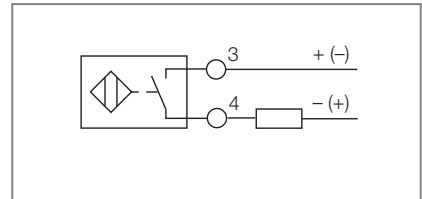
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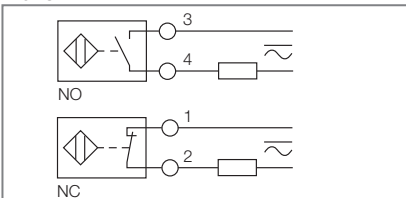
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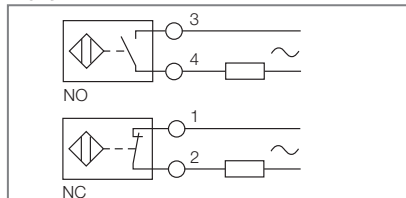
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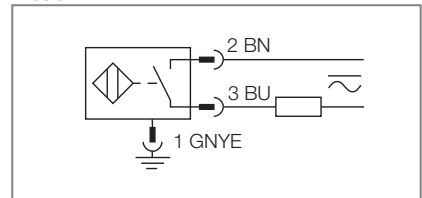
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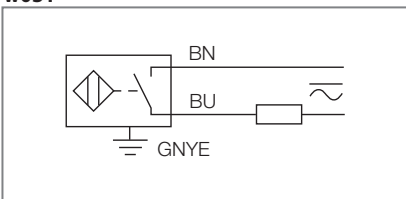
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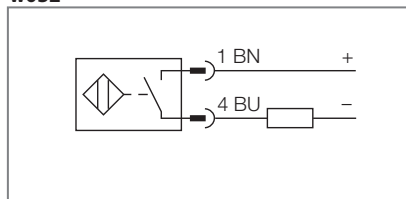
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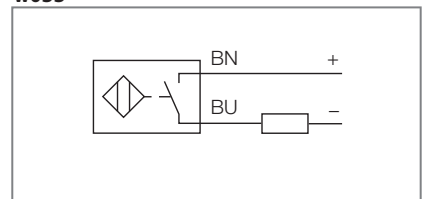
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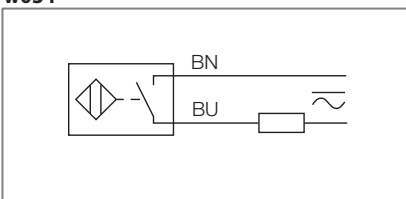
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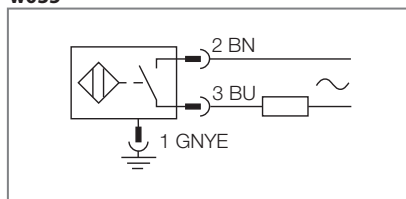
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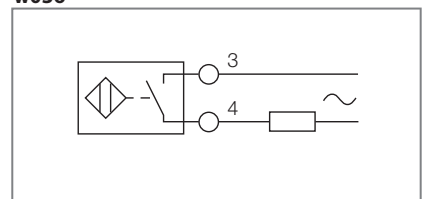
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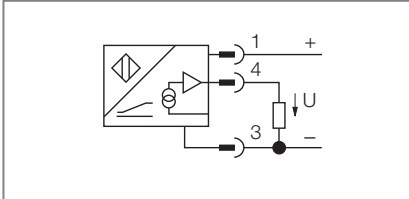
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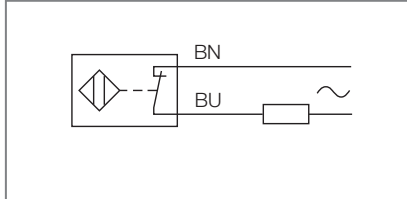
Wiring diagrams

Wiring diagrams

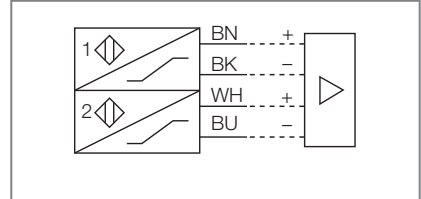
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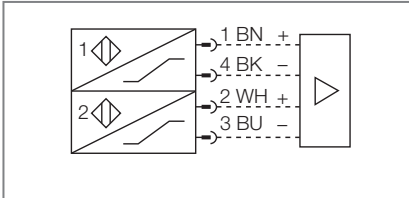
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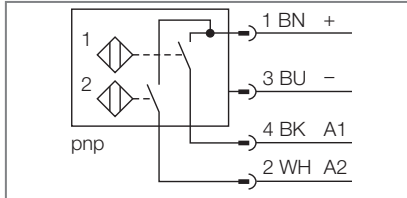
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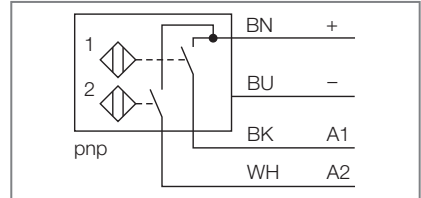
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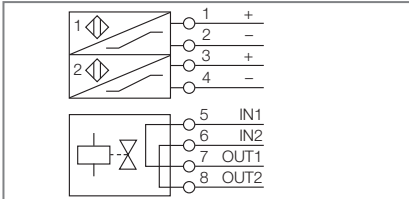
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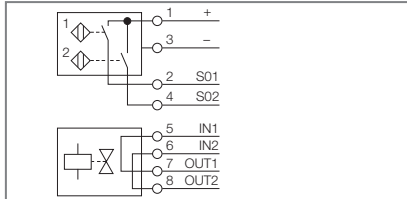
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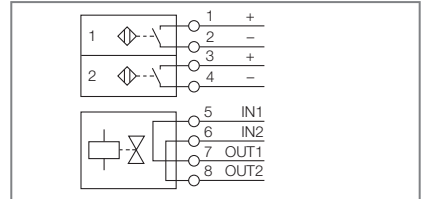
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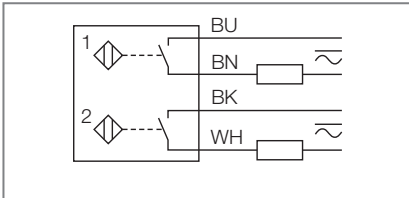
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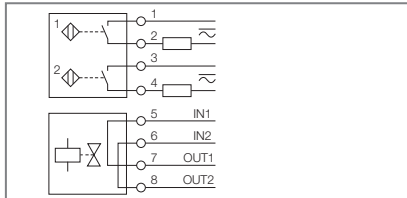
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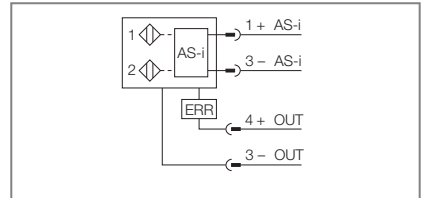
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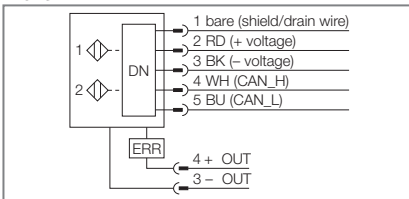
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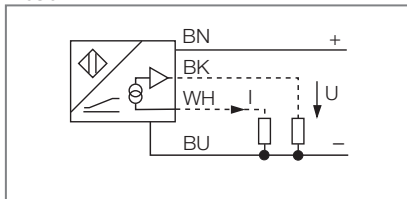
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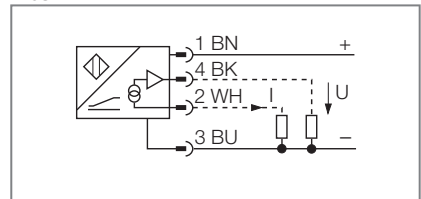
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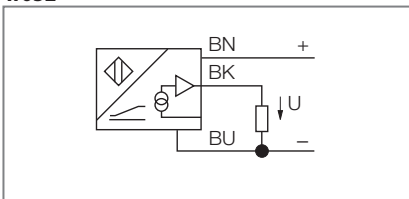
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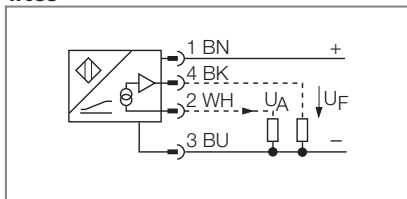
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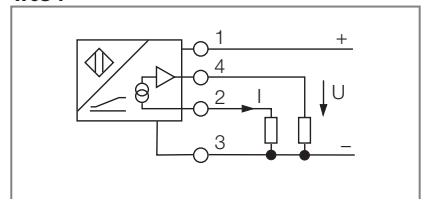
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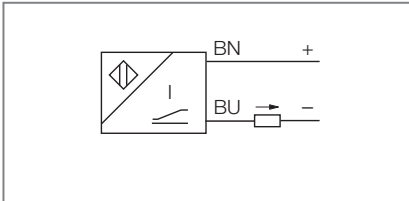
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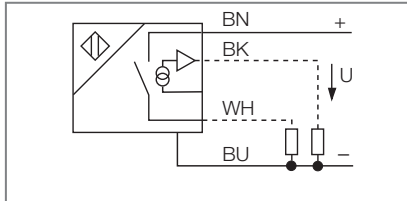
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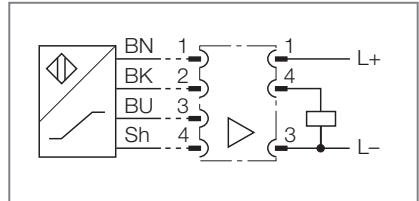
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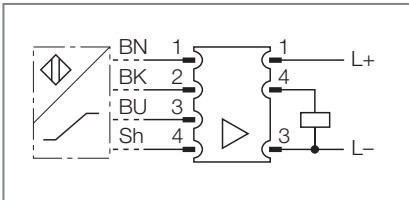
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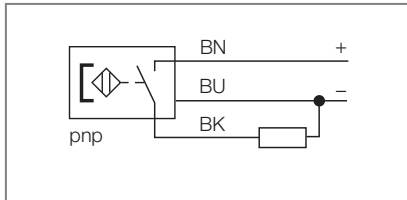
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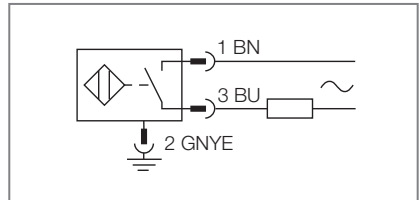
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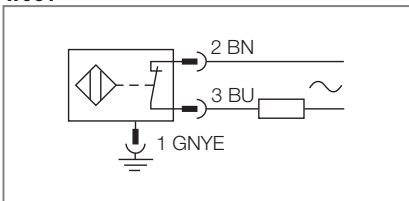
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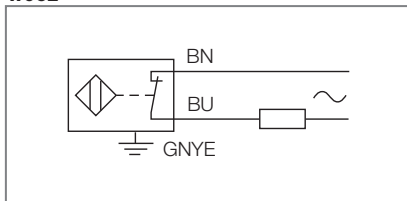
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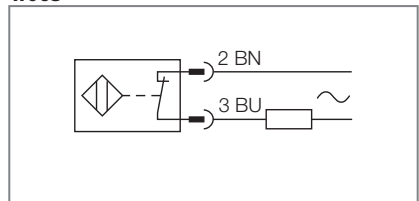
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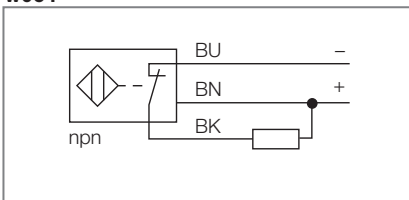
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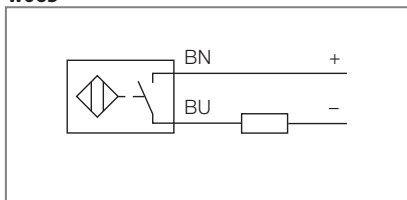
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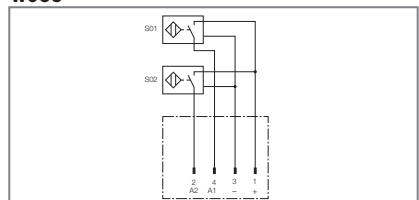
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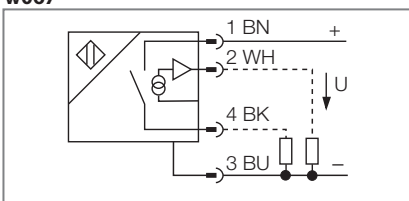
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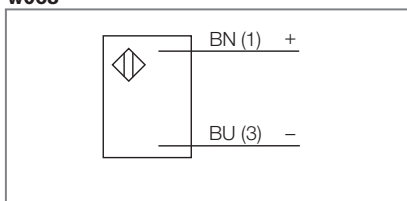
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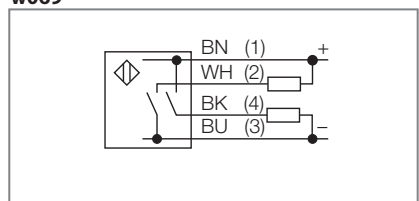
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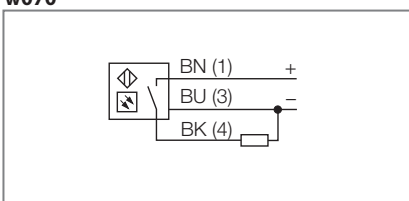
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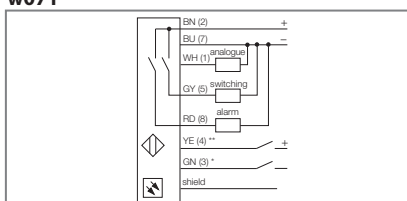
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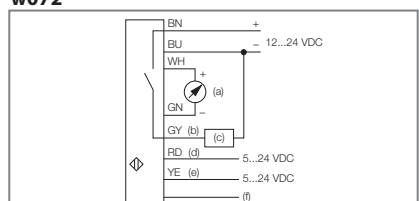
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w071



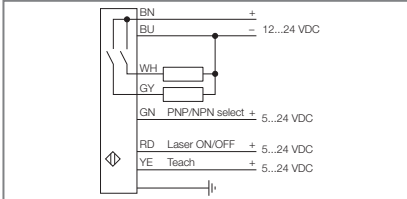
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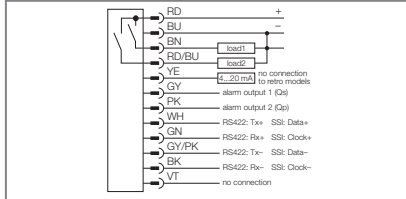
Wiring diagrams

Wiring diagrams

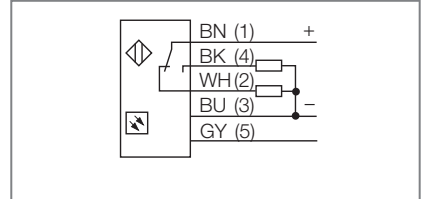
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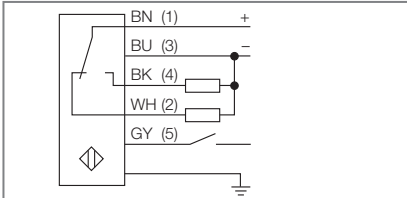
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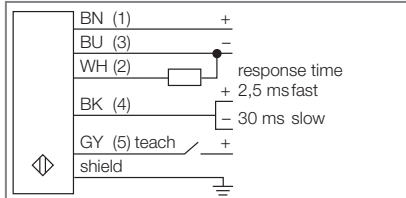
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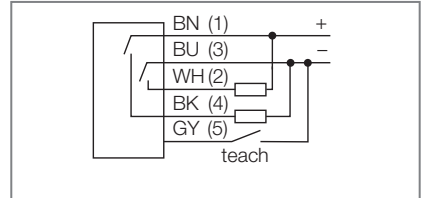
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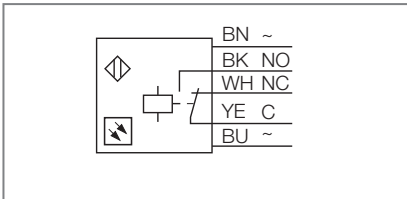
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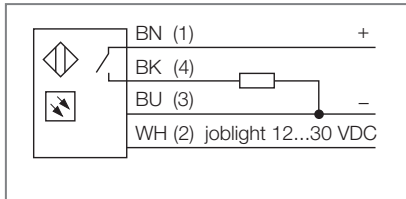
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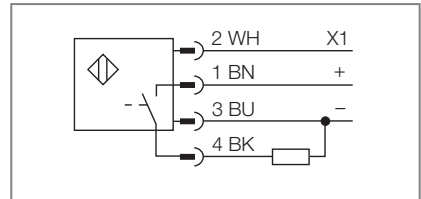
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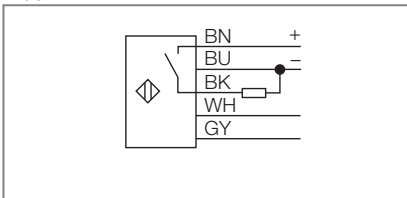
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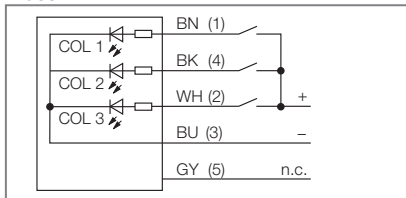
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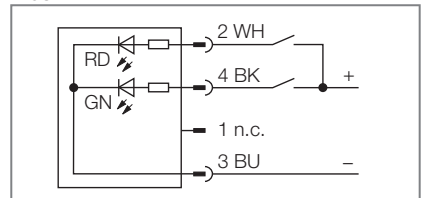
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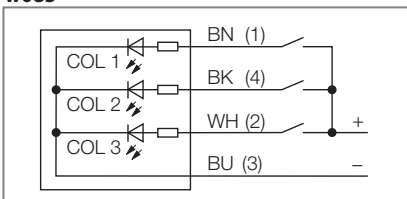
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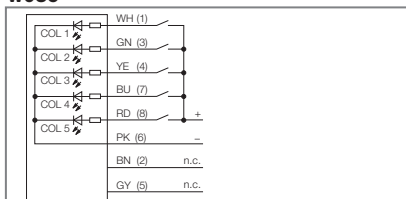
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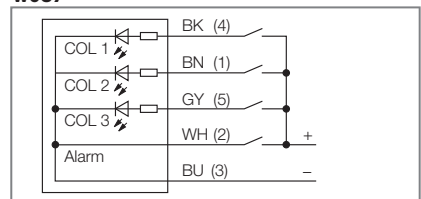
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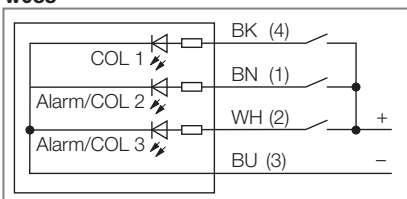
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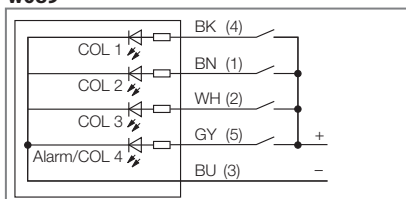
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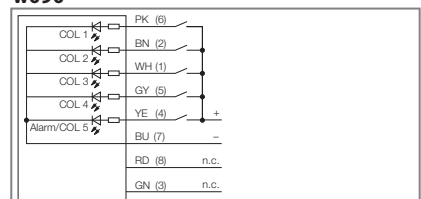
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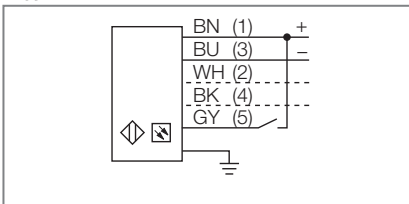
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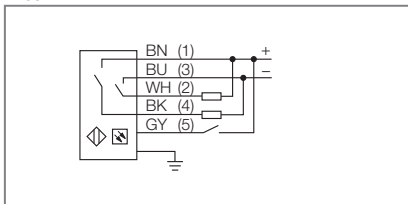
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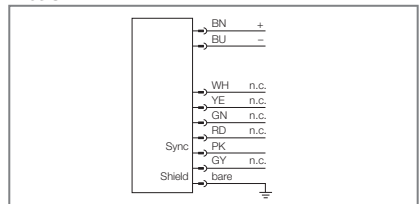
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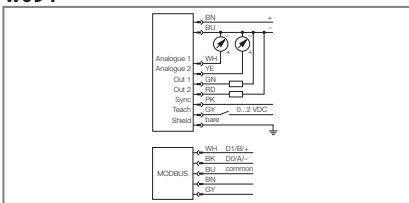
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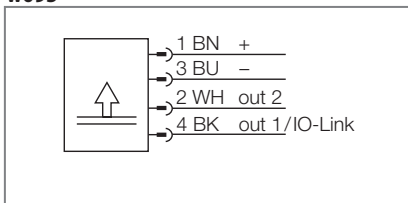
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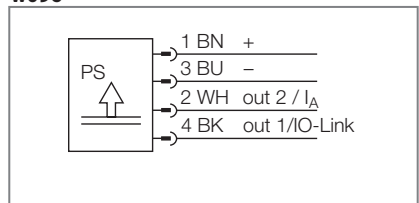
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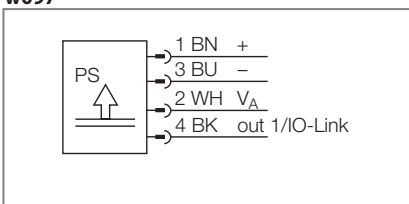
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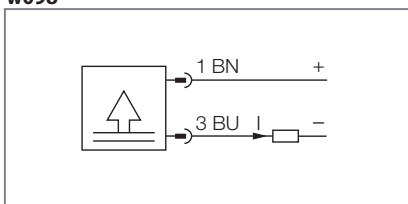
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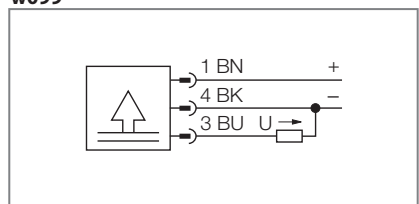
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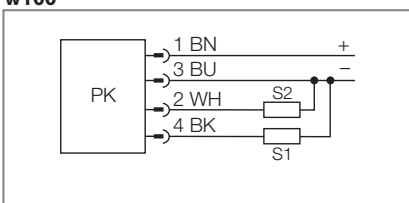
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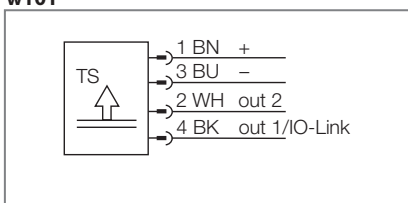
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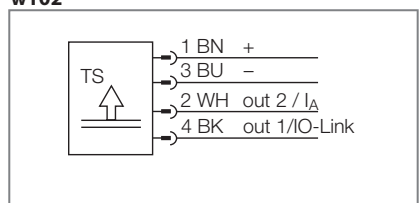
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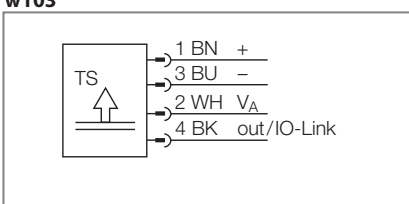
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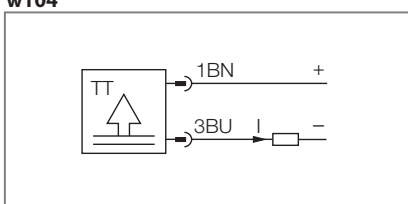
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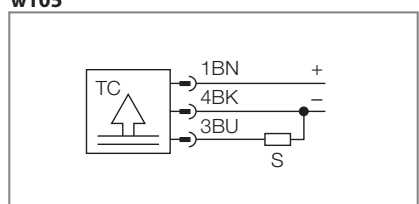
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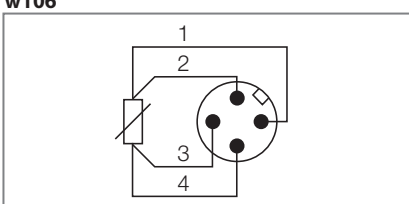
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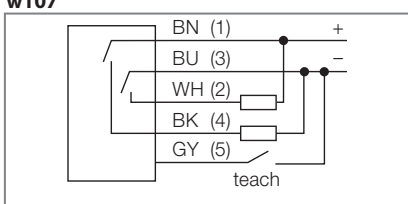
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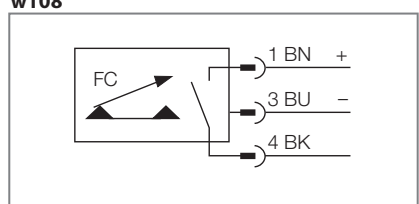
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w107



w108

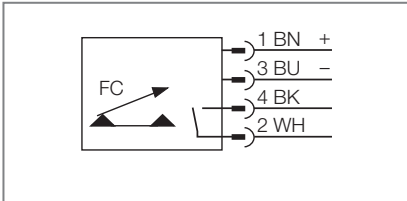


Wiring diagrams

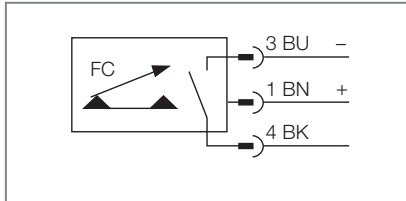
Wiring diagrams

Wiring diagrams

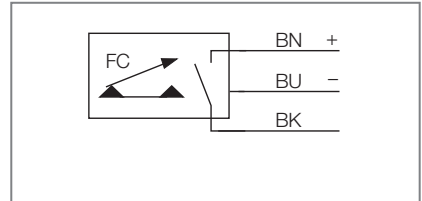
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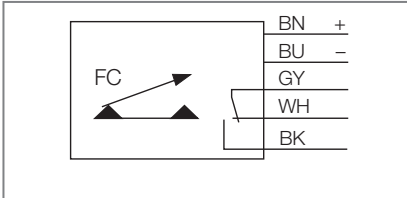
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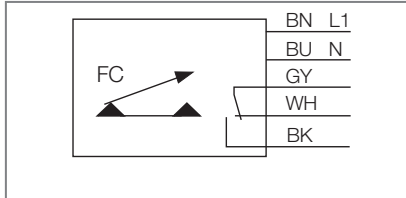
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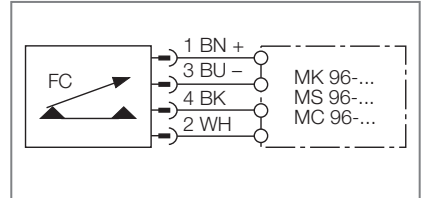
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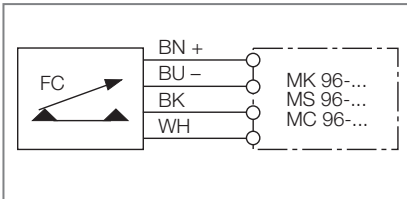
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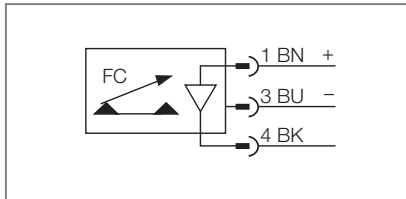
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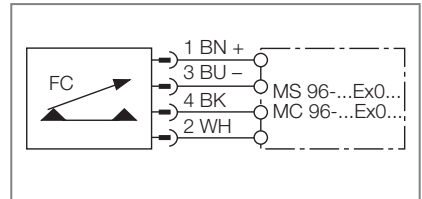
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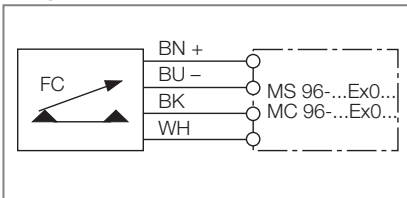
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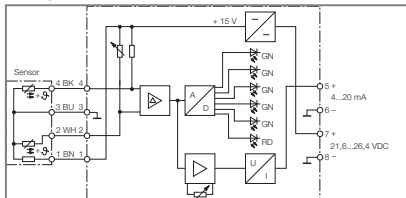
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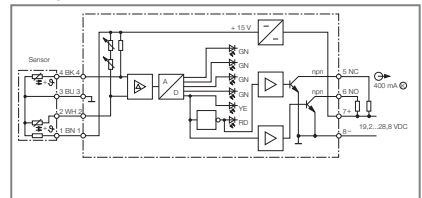
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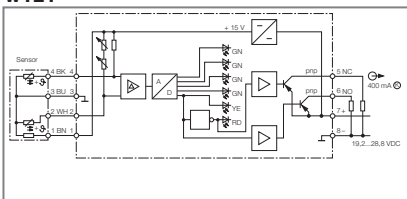
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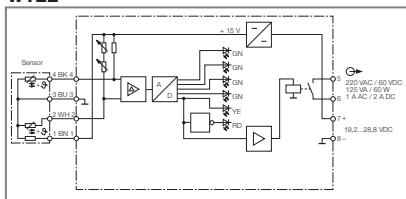
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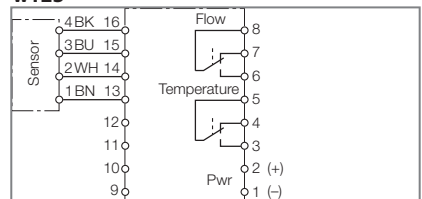
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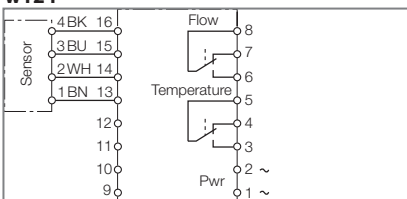
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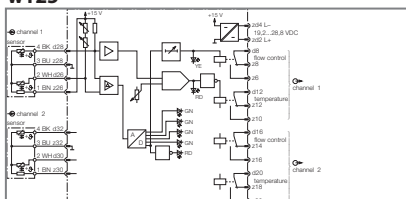
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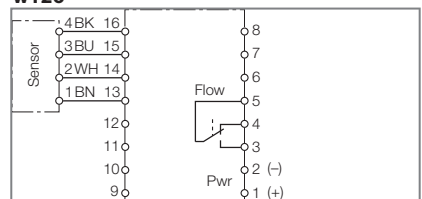
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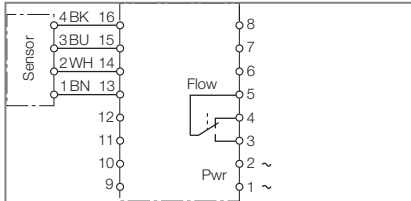
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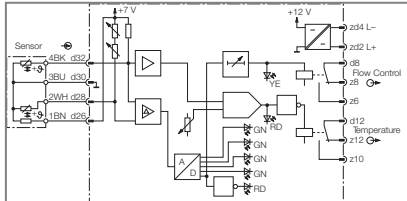
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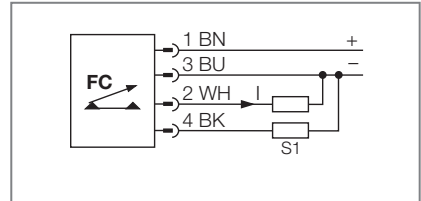
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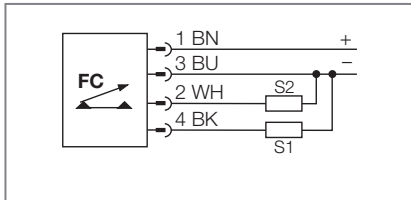
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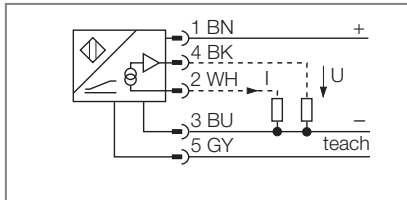
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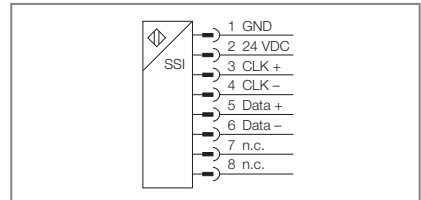
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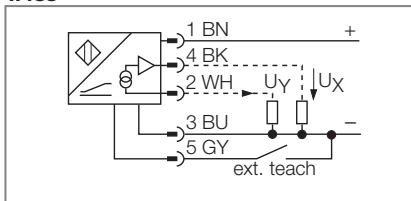
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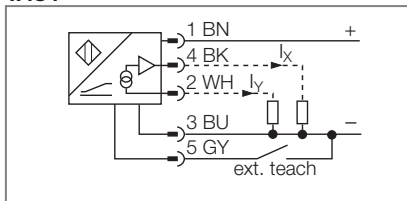
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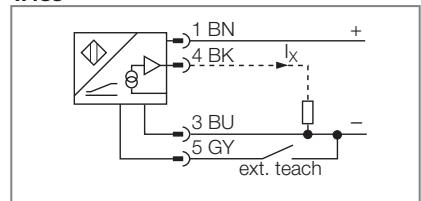
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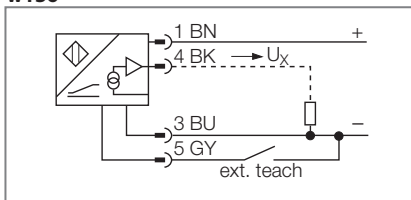
w134



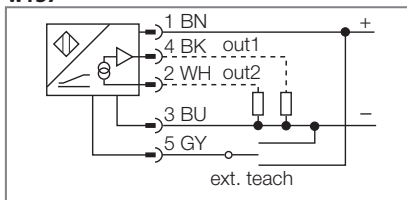
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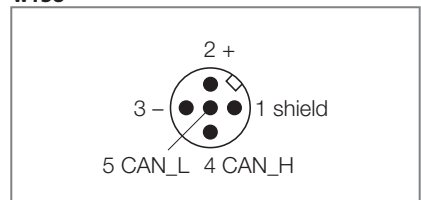
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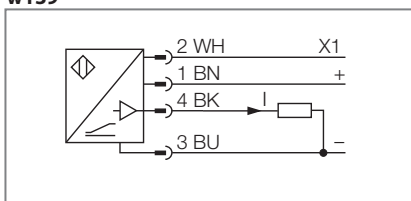
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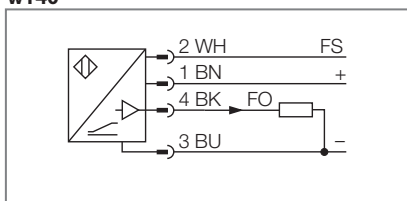
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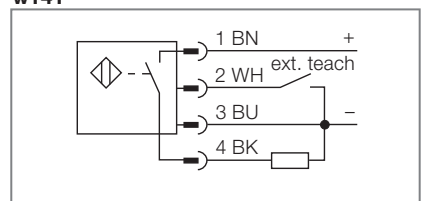
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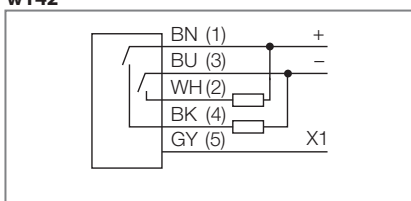
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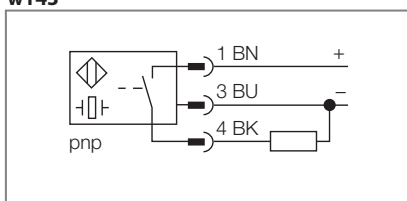
w141



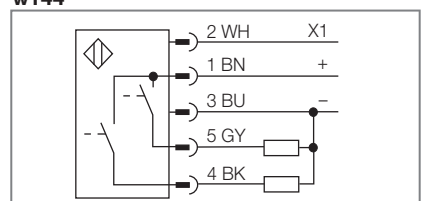
w142



w143



w144

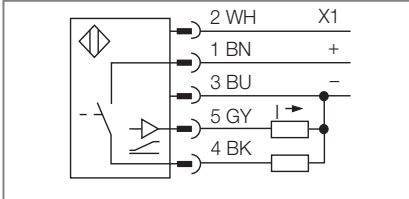


Wiring diagrams

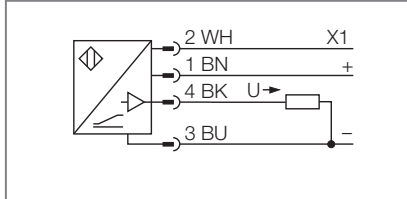
Wiring diagrams

Wiring diagrams

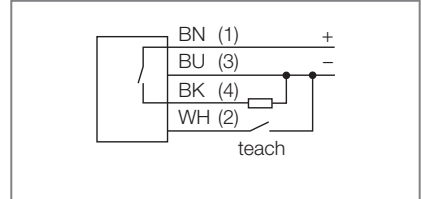
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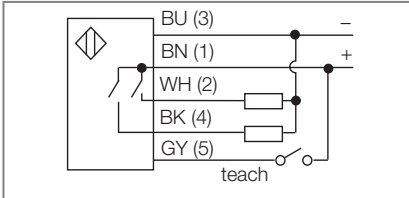
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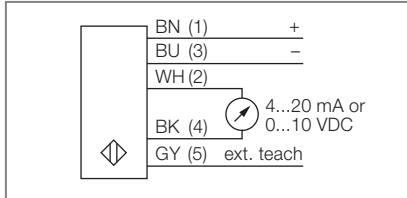
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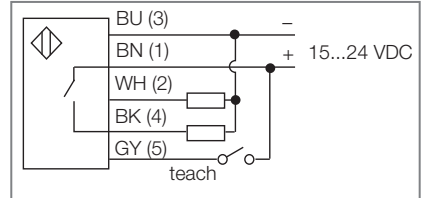
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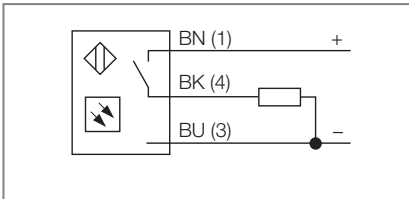
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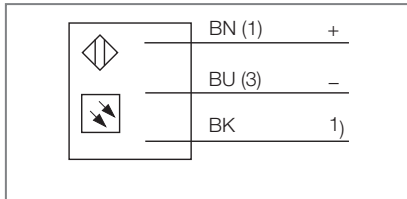
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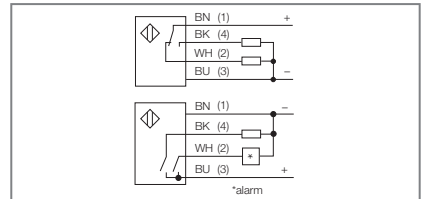
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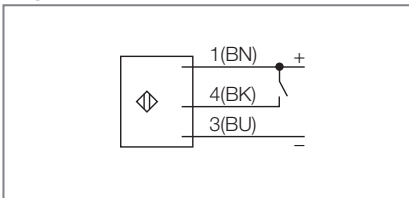
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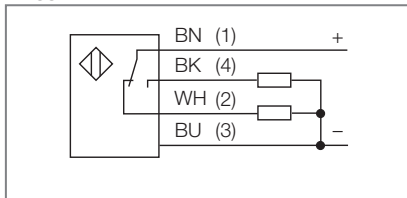
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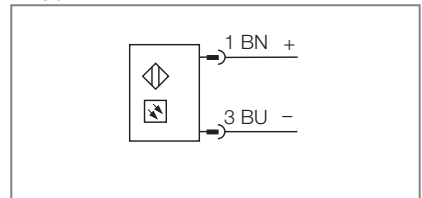
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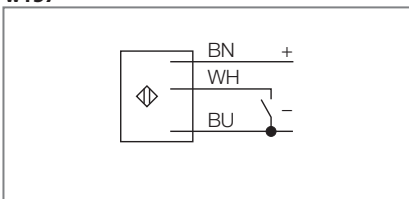
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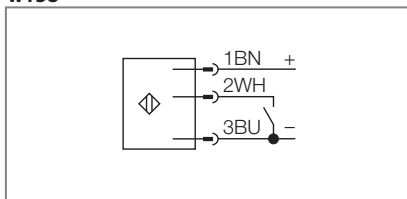
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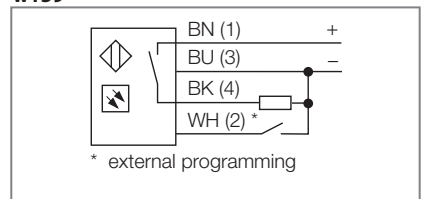
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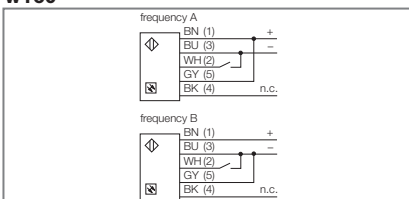
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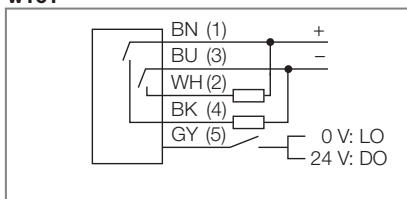
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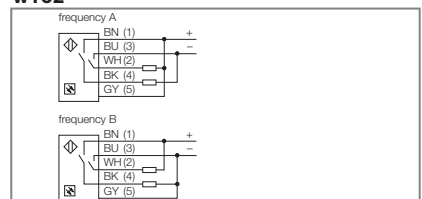
w160



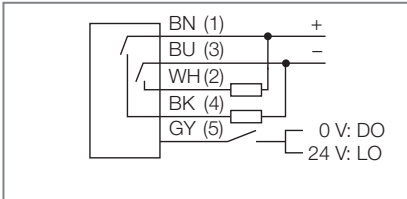
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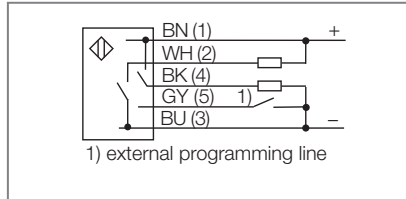
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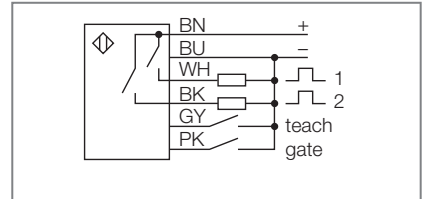
w163



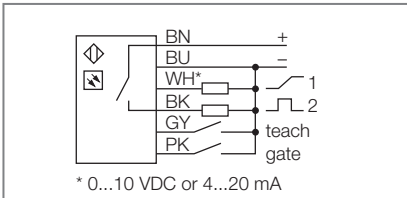
w164



w165

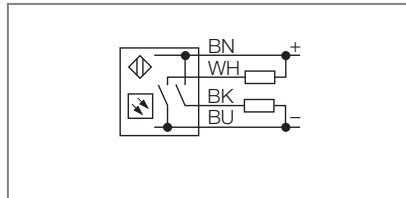


w166

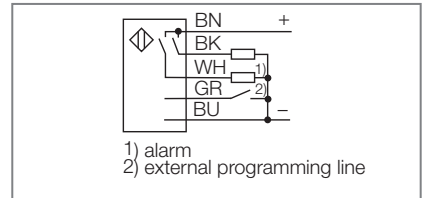


* 0...10 VDC or 4...20 mA

w167



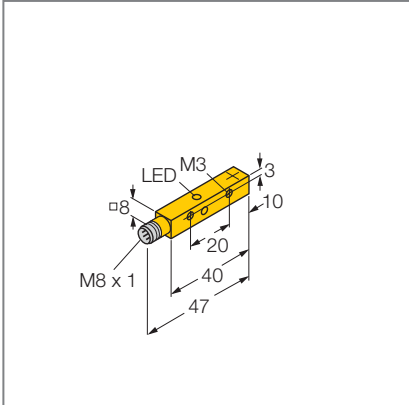
w168



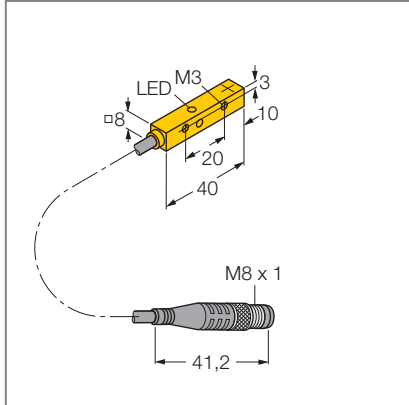
1) alarm
2) external programming line

Dimension drawings

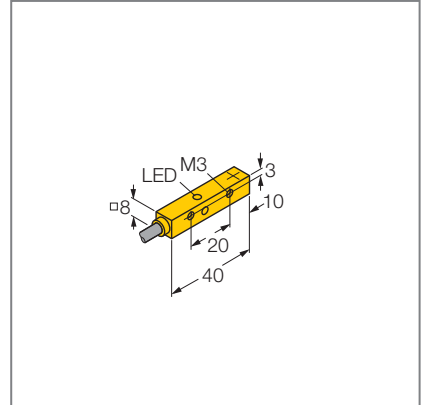
d001



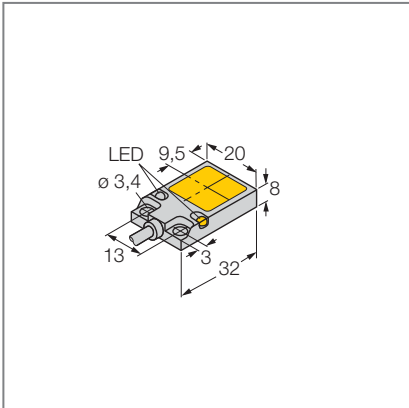
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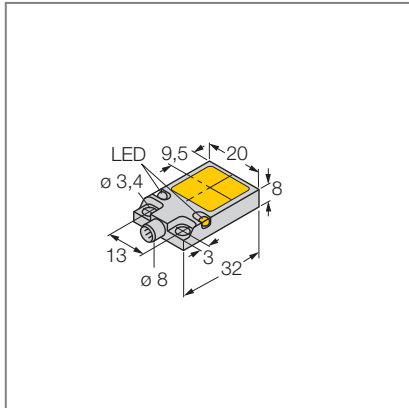
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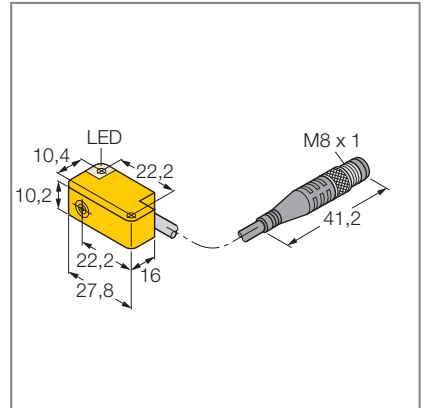
d004



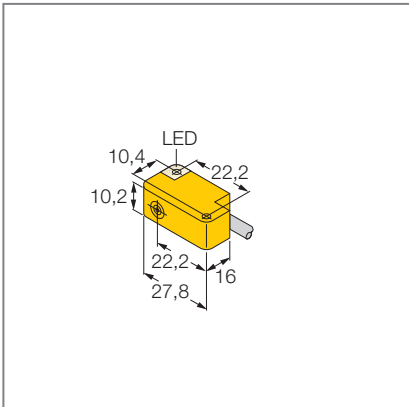
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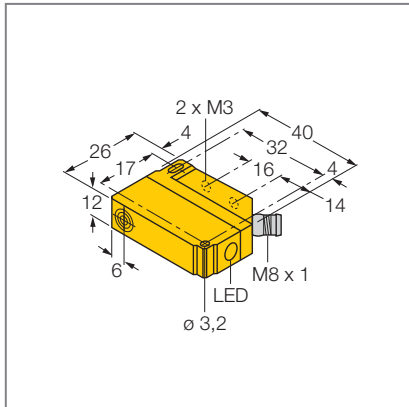
d006



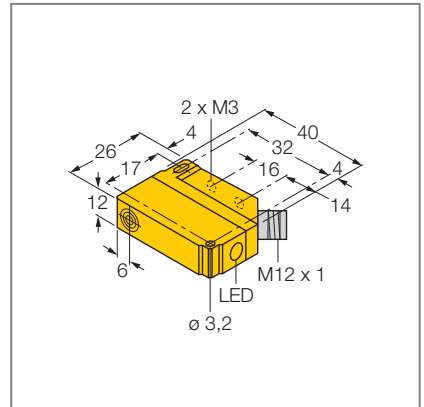
d007



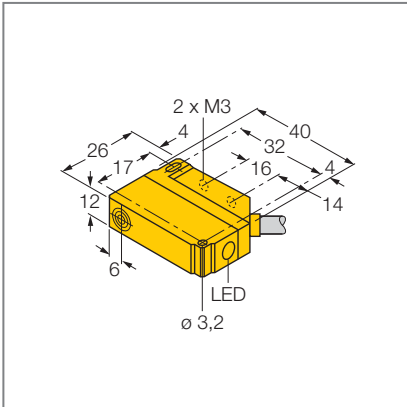
d008



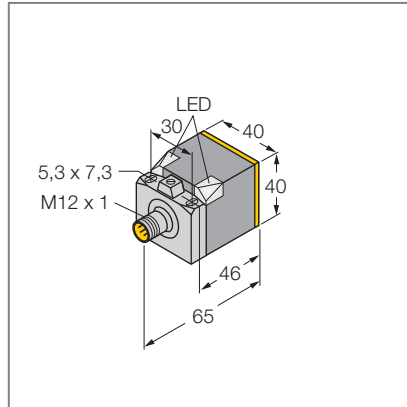
d009



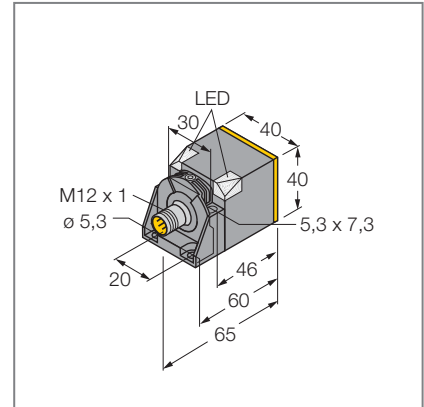
d010



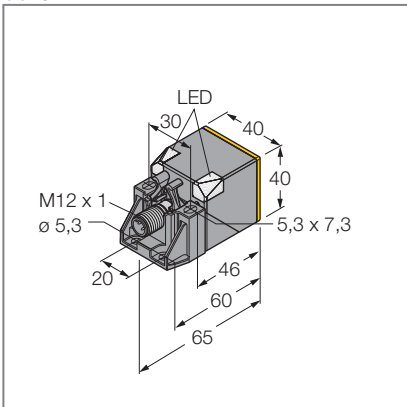
d011



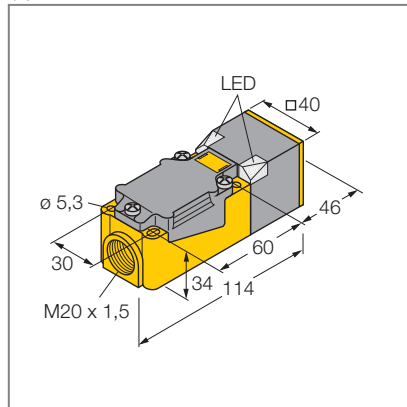
d012



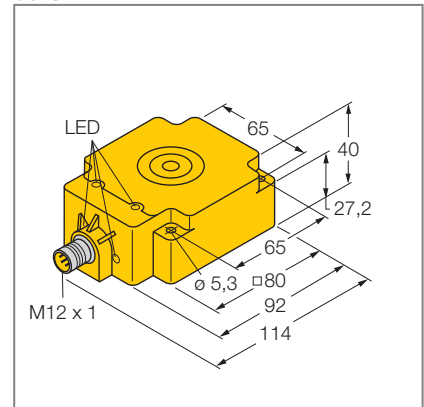
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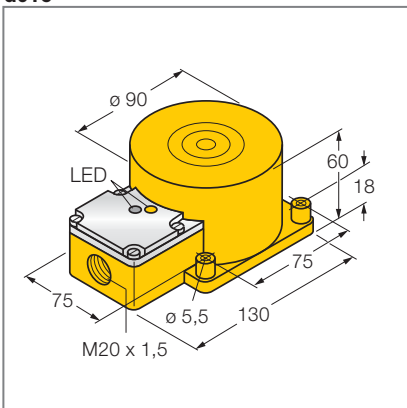
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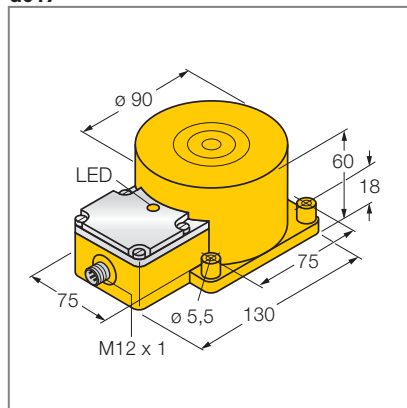
d015



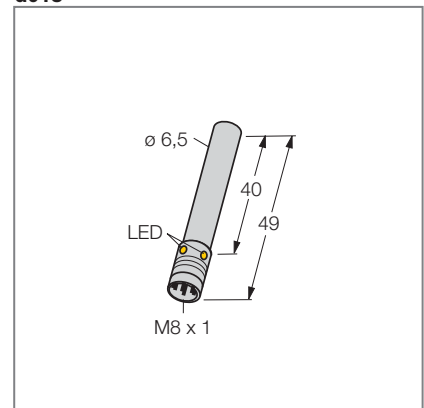
d016



d017

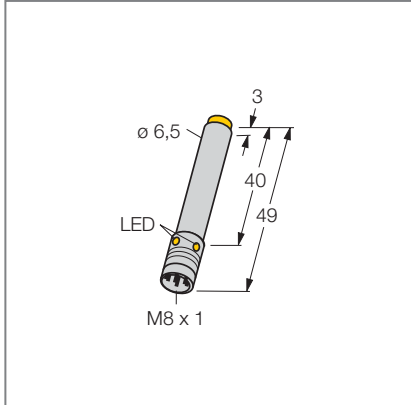


d018

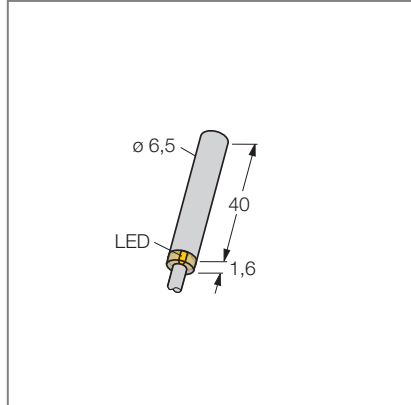


Dimension drawings

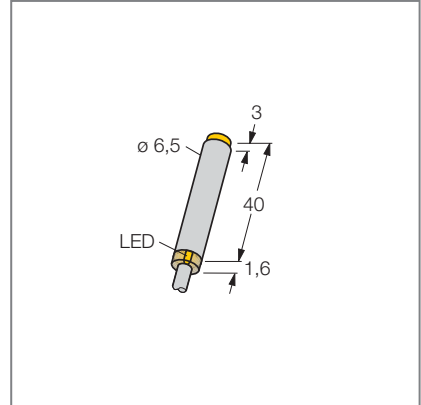
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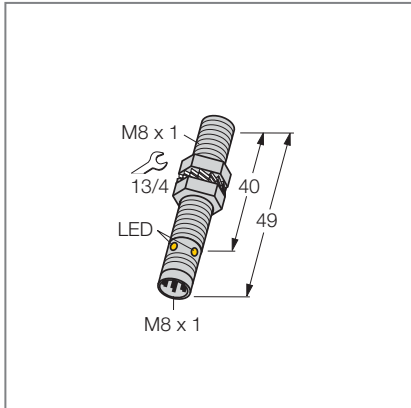
d020



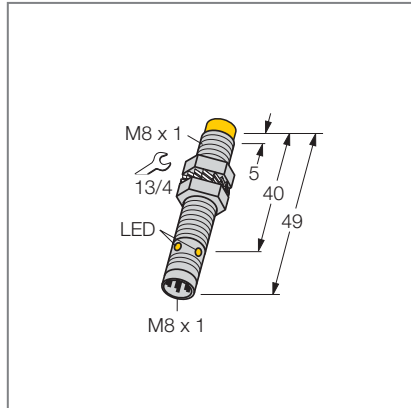
d021



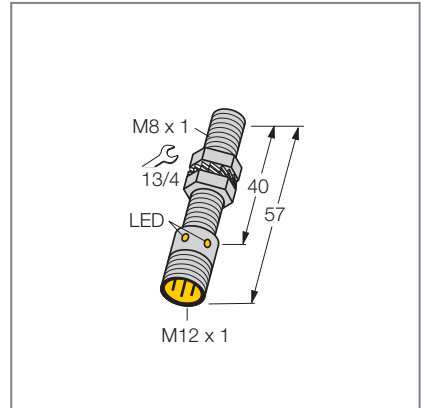
d022



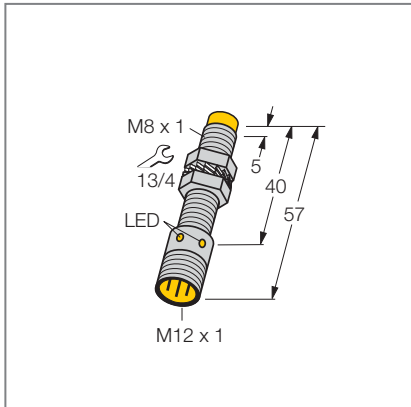
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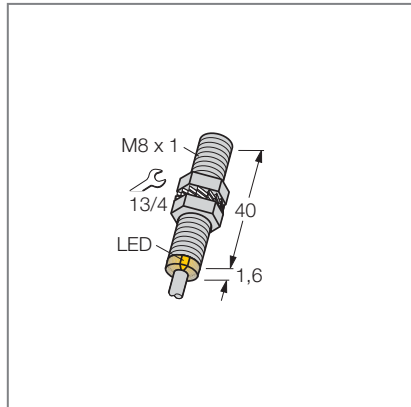
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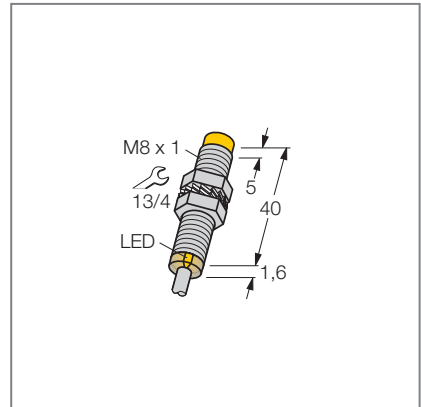
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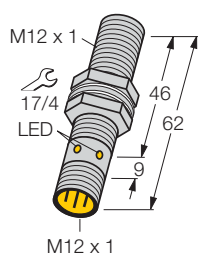
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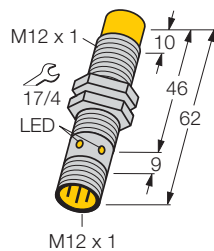
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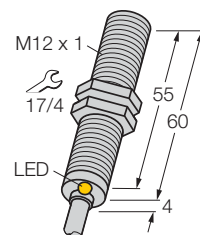
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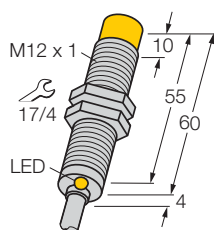
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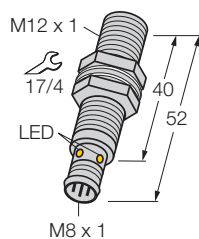
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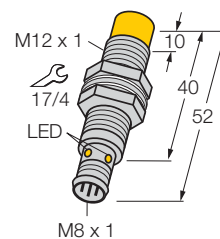
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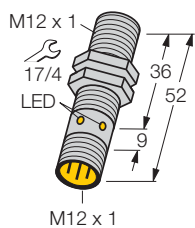
d032



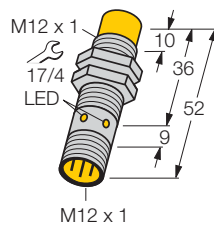
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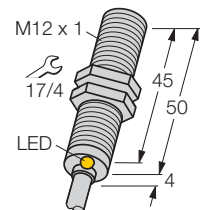
d034



d035

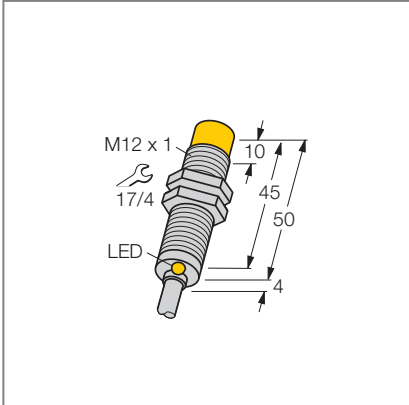


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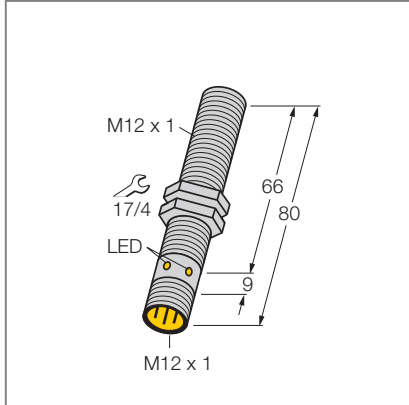


Dimension drawings

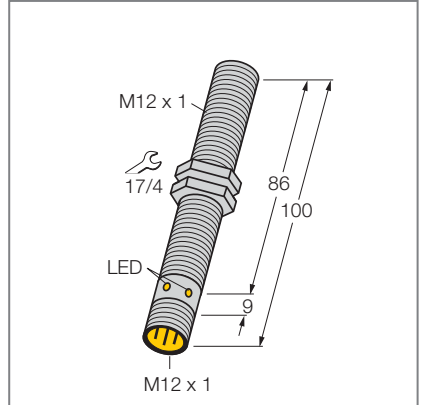
d037



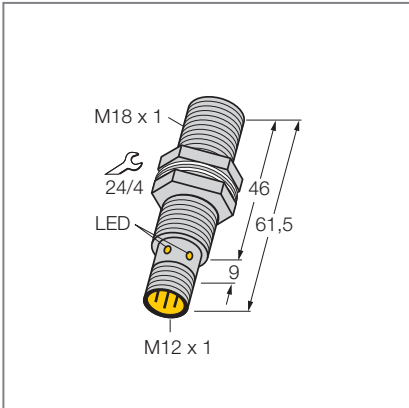
d038



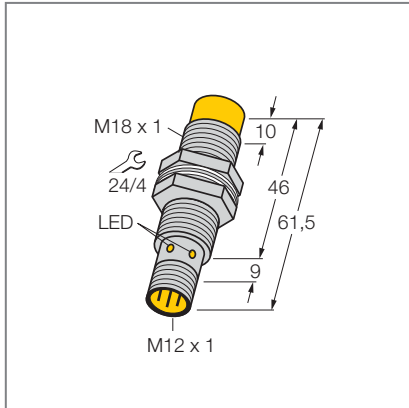
d039



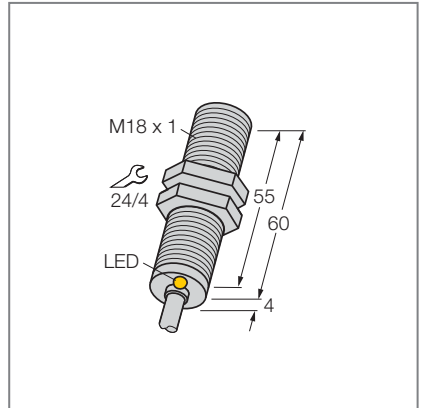
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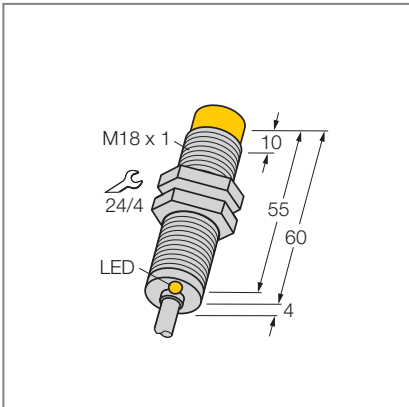
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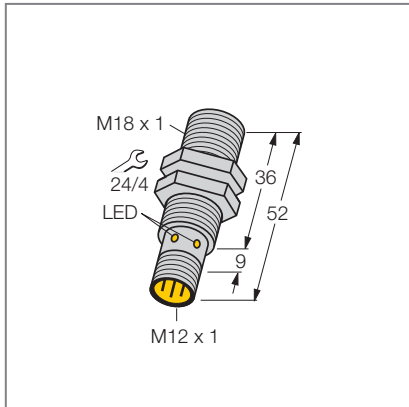
d042



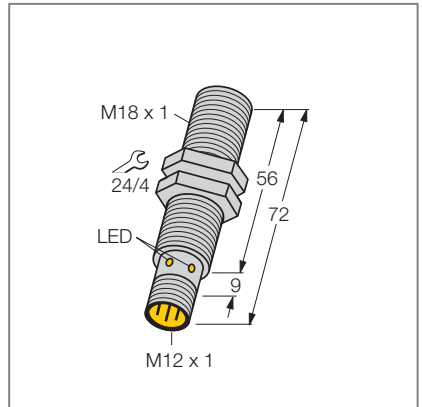
d043



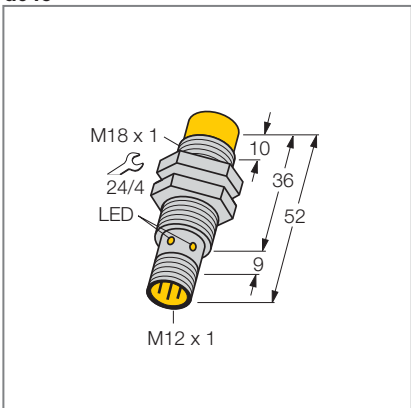
d044



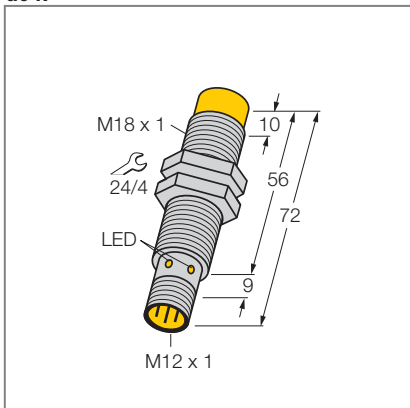
d045



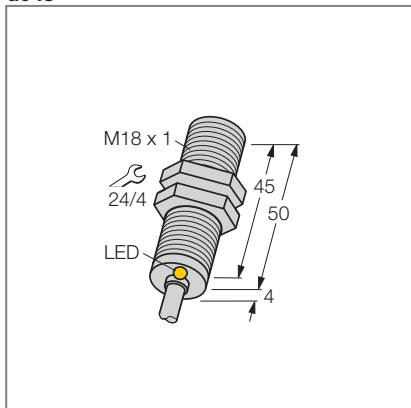
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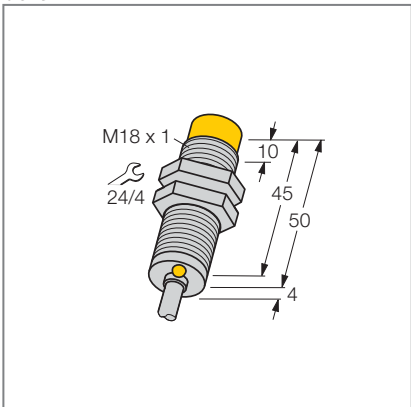
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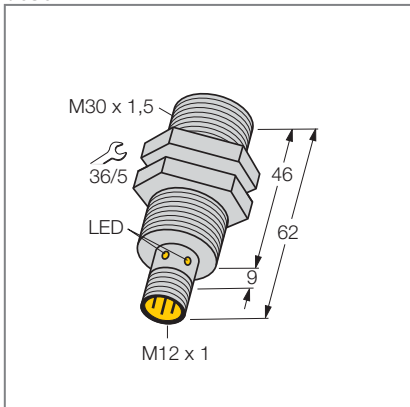
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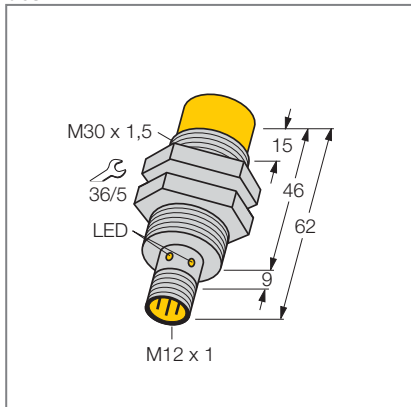
d049



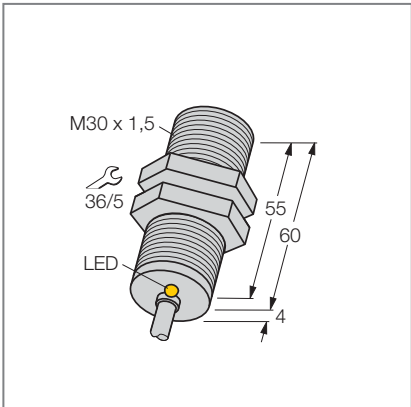
d050



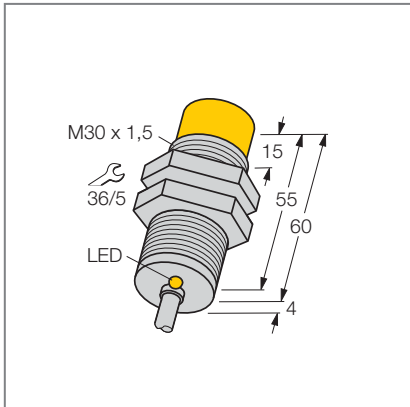
d051



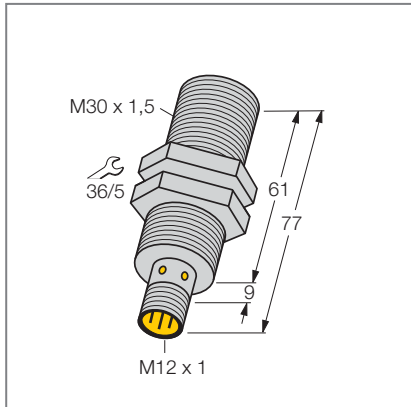
d052



d053



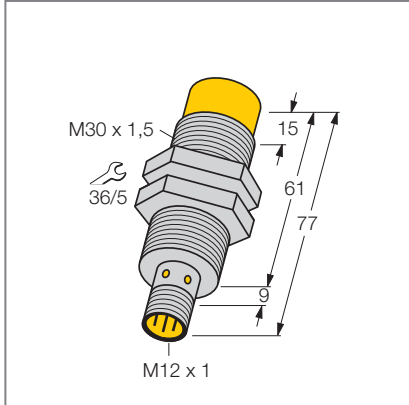
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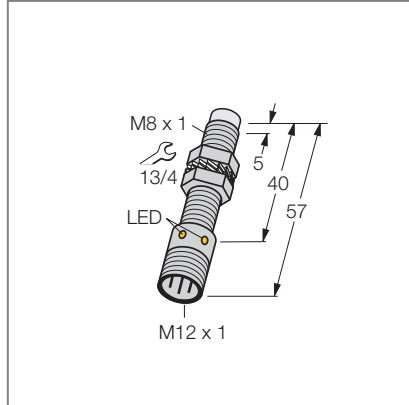
Dimension drawings

Dimension drawings

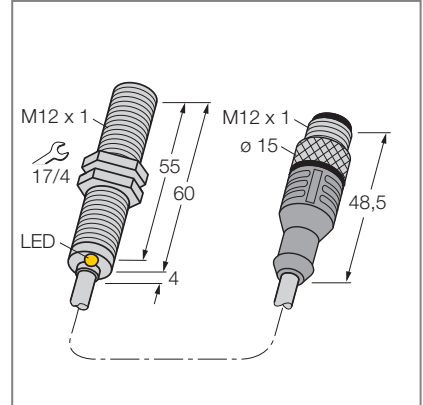
d055



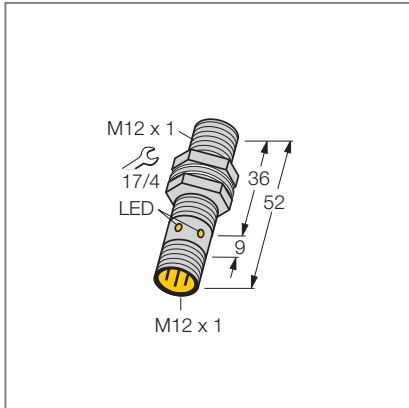
d056



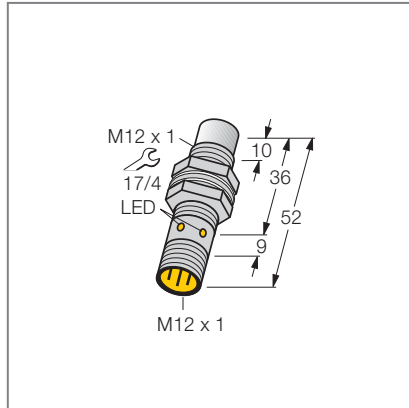
d057



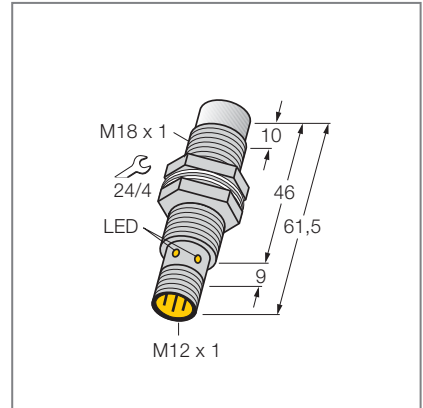
d058



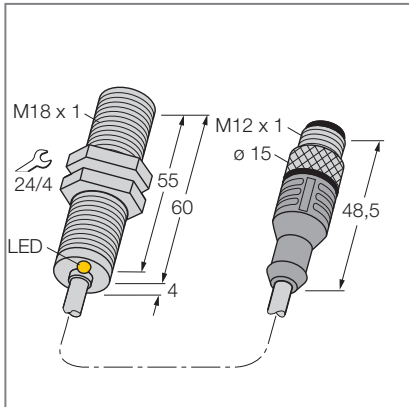
d059



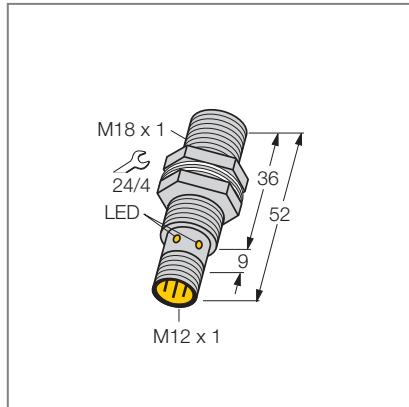
d060



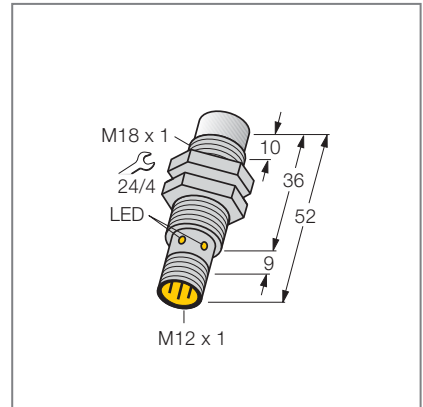
d061



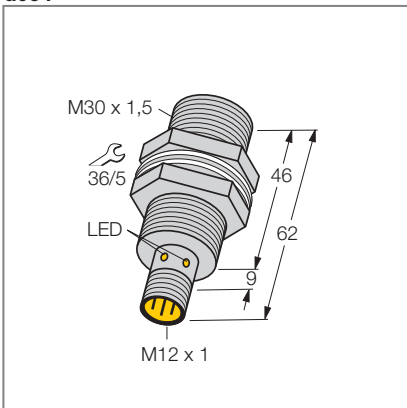
d062



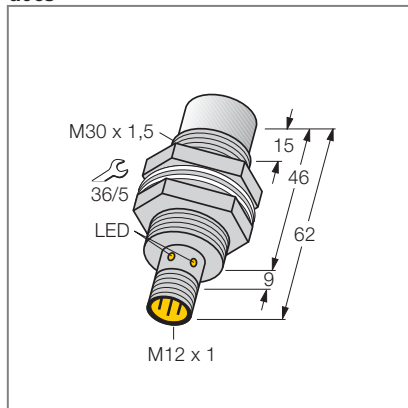
d063



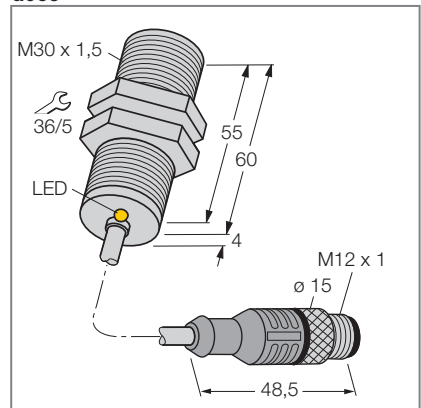
d064



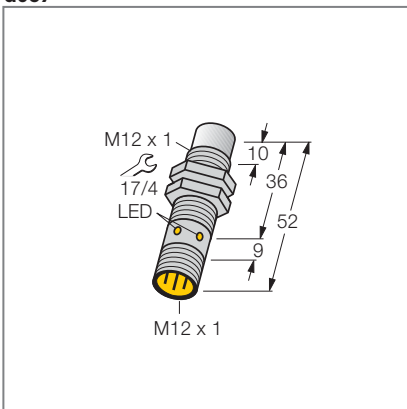
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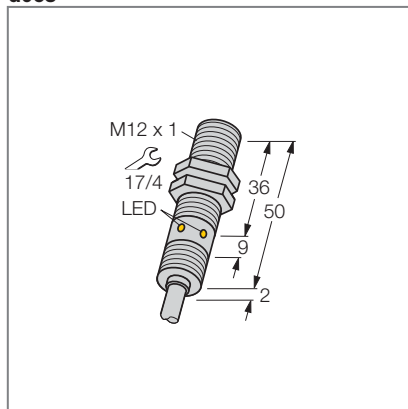
d066



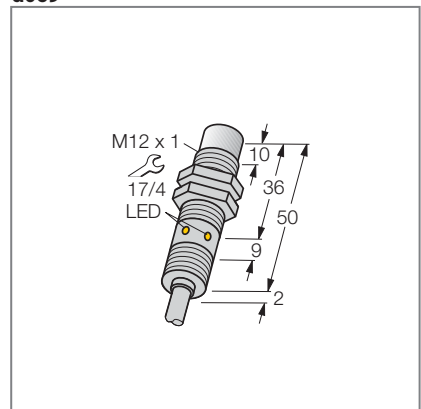
d067



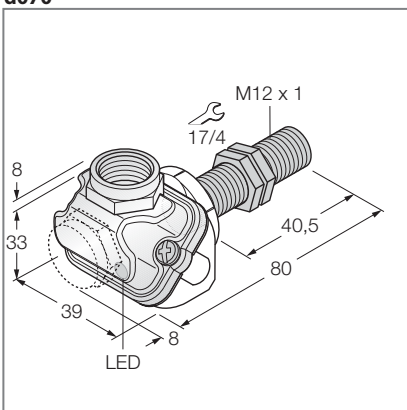
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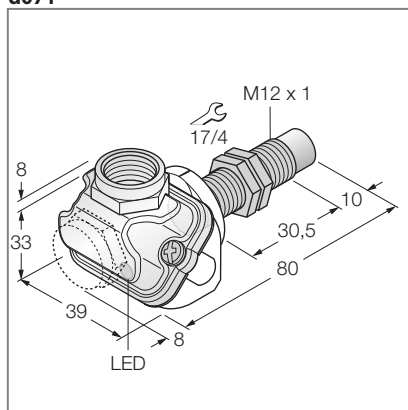
d069



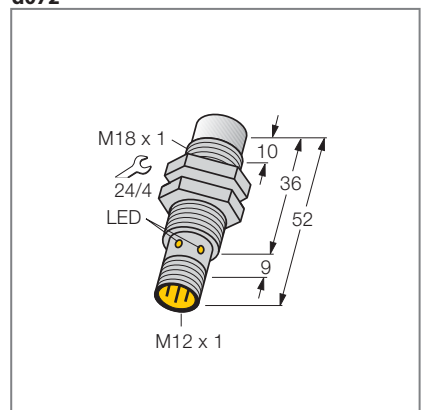
d070



d071



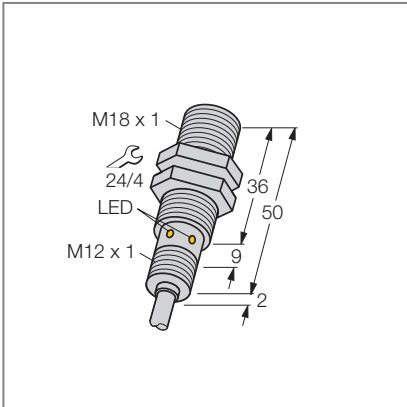
d072



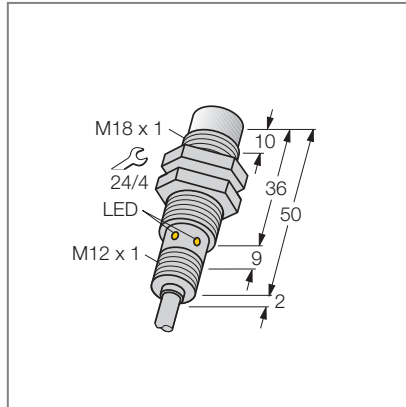
Dimension drawings

Dimension drawings

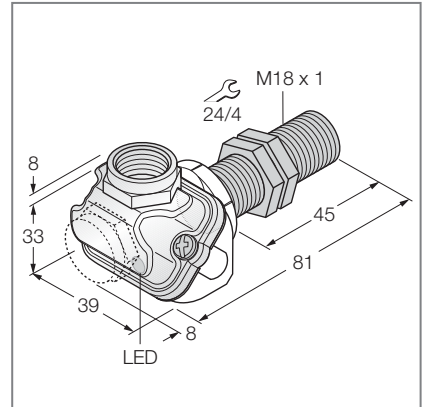
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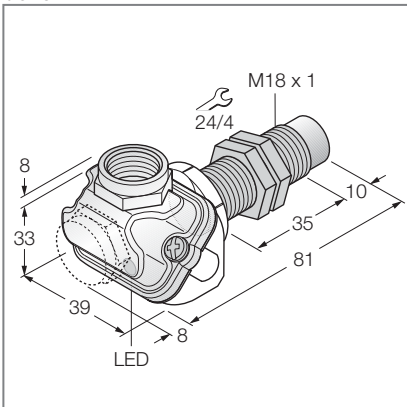
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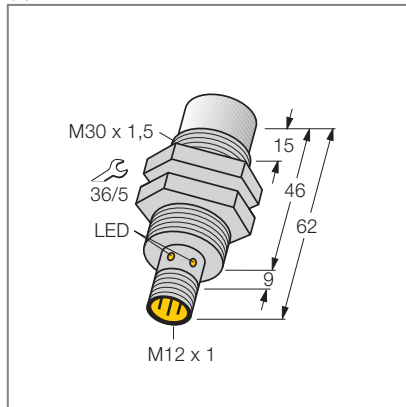
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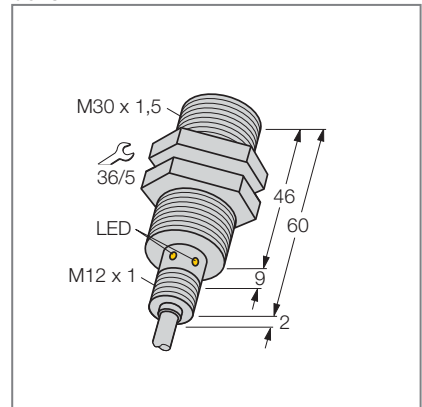
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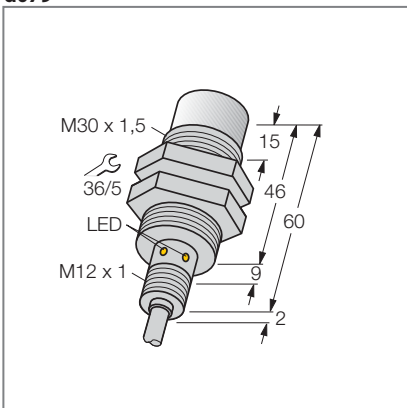
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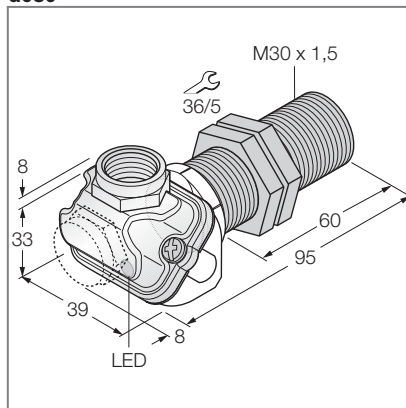
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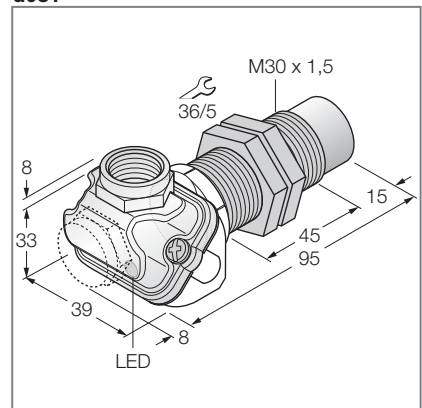
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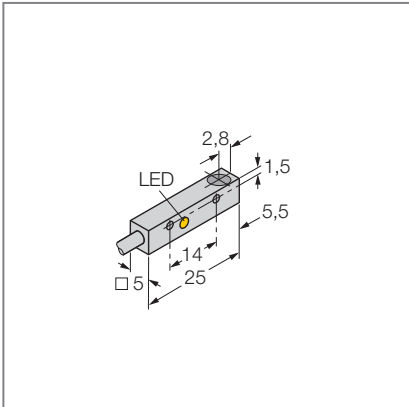
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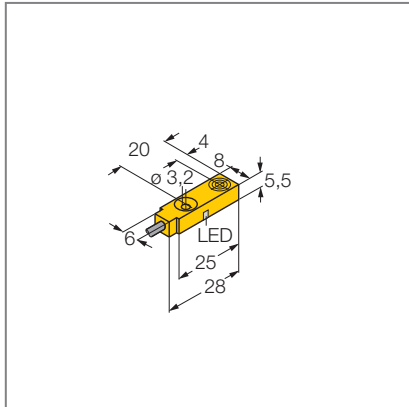
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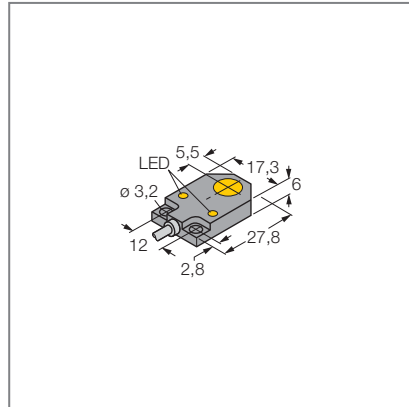
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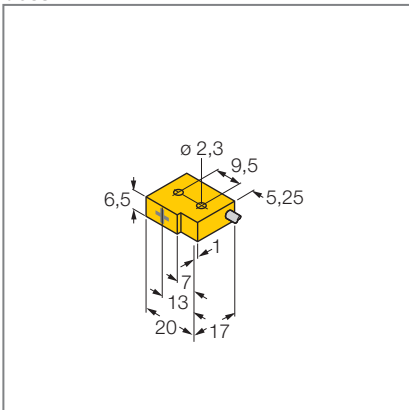
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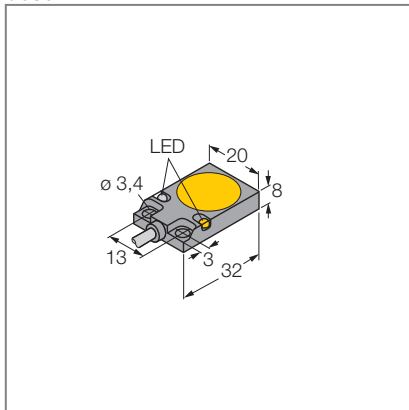
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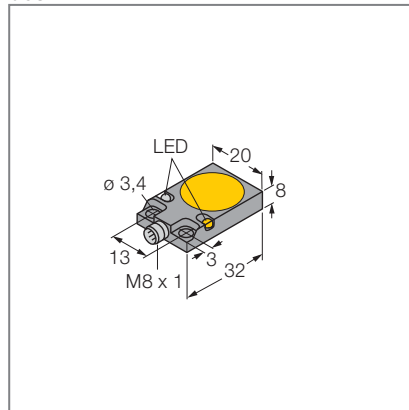
d085



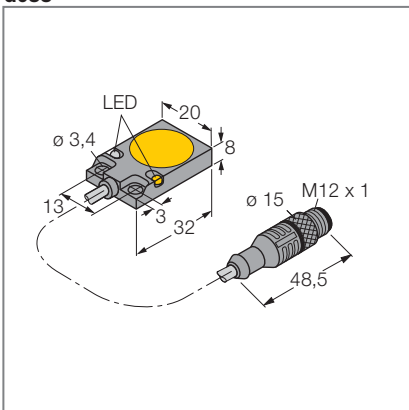
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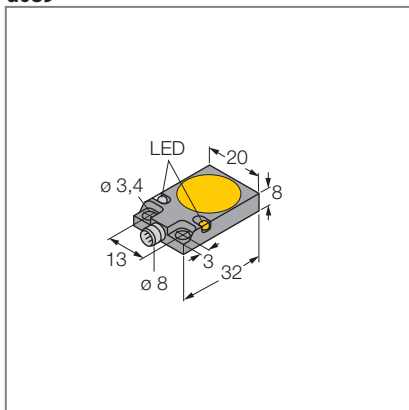
d087



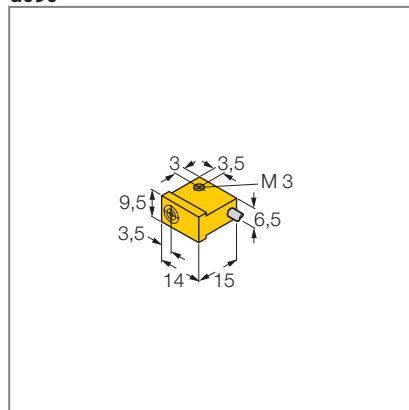
d088



d089



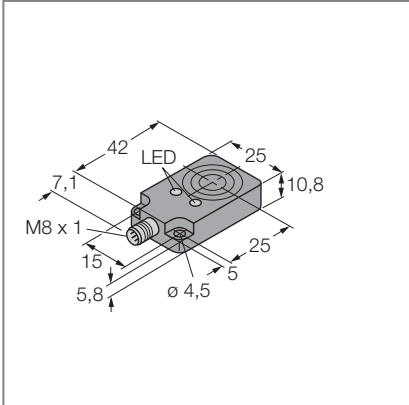
d090



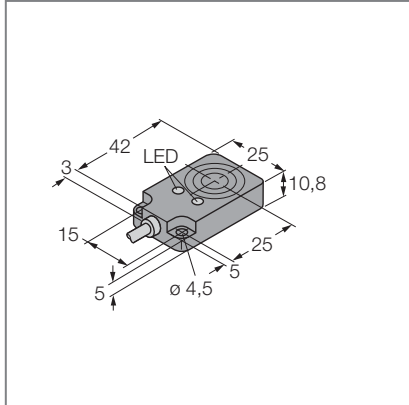
Dimension drawings

Dimension drawings

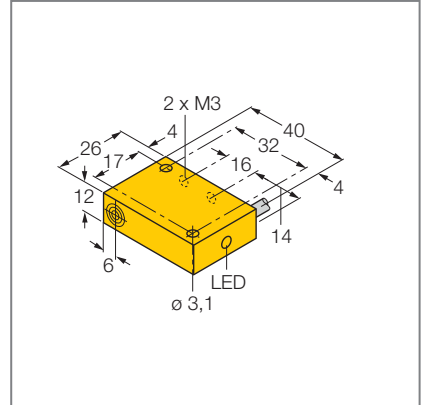
d091



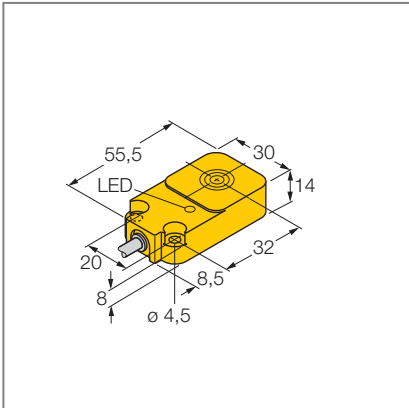
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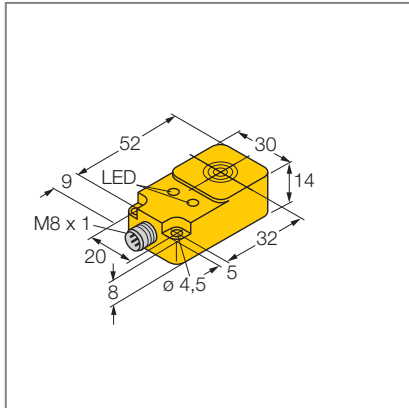
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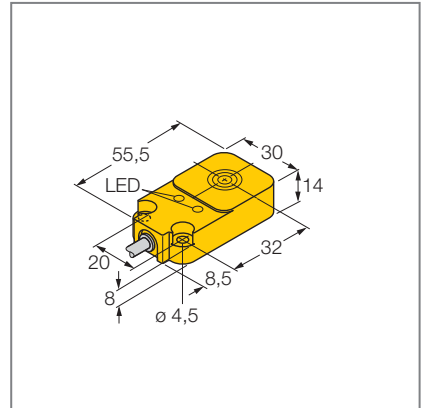
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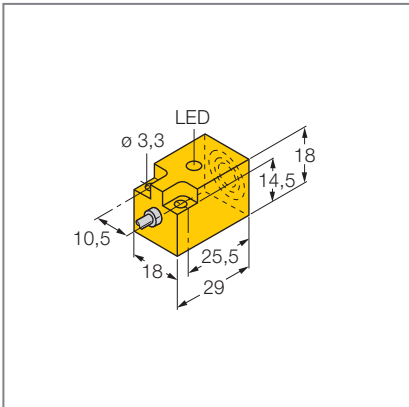
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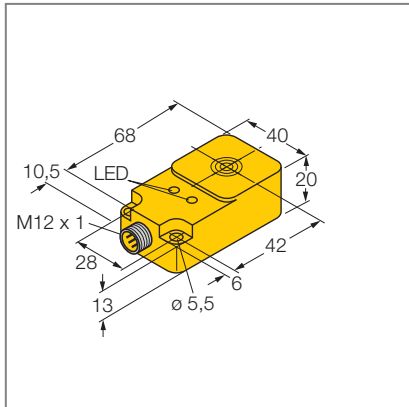
d096



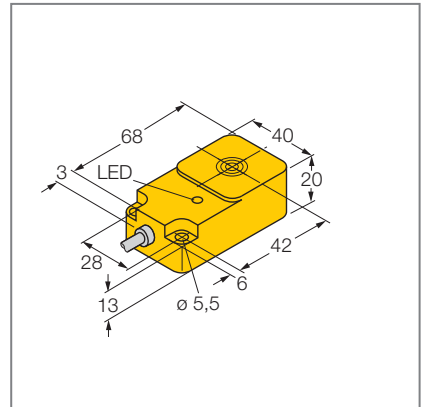
d097



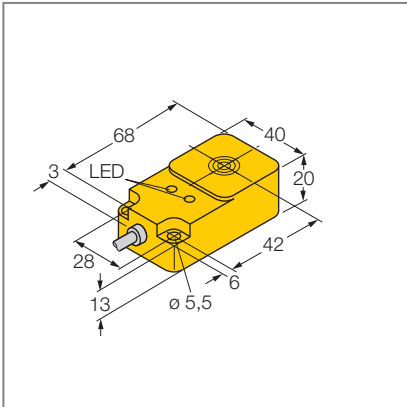
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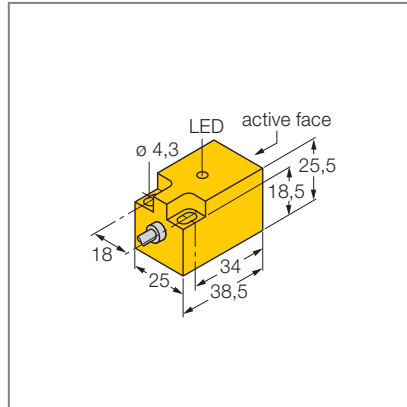
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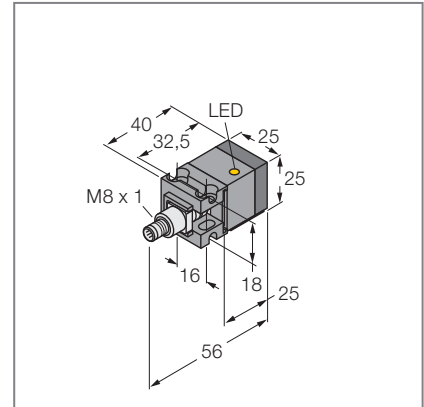
d100



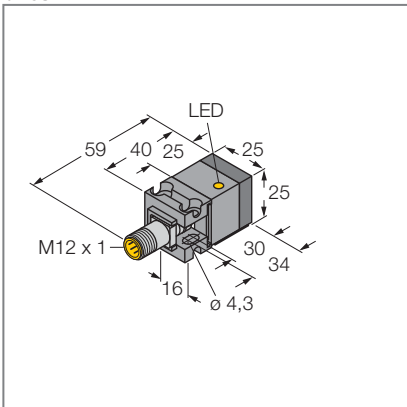
d101



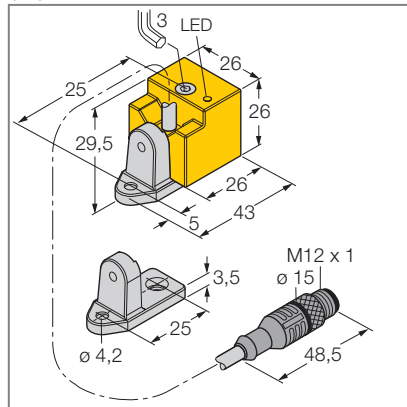
d102



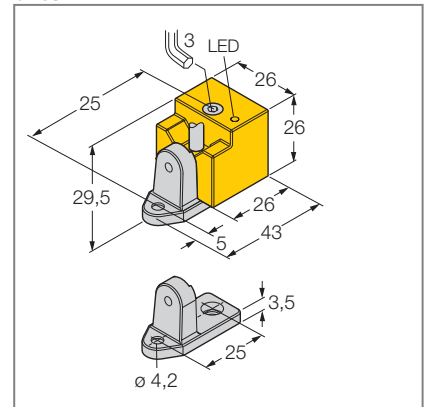
d103



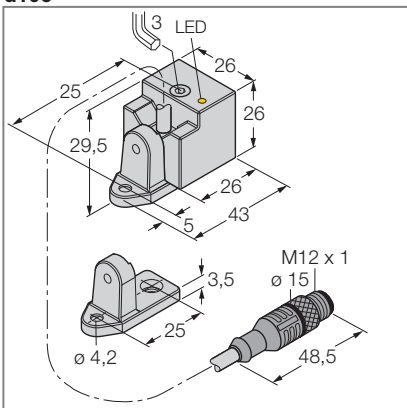
d104



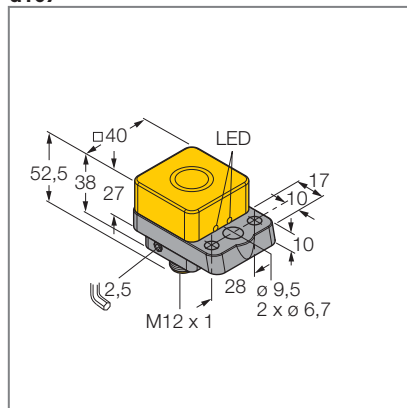
d105



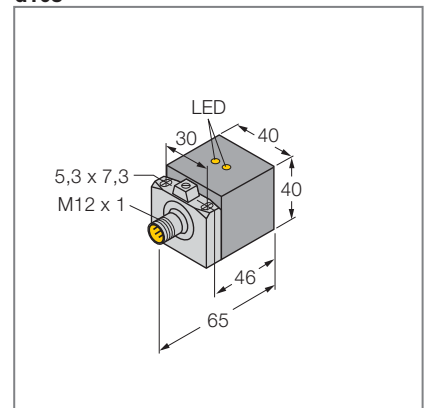
d106



d107

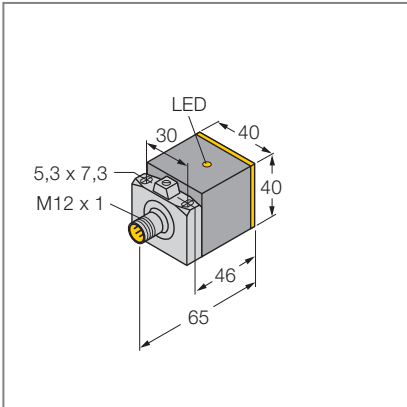


d108

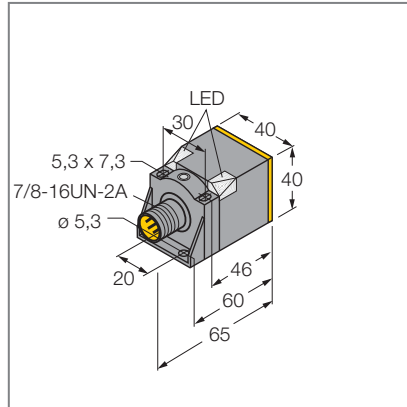


Dimension drawings

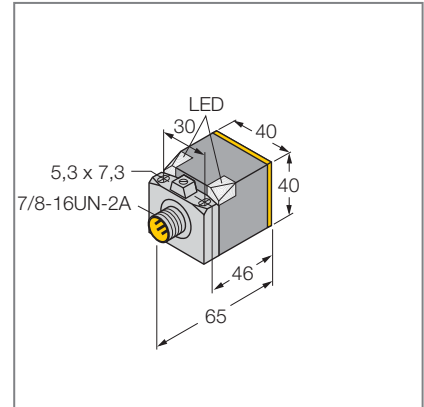
d109



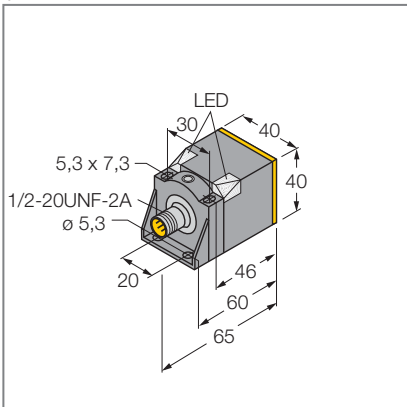
d110



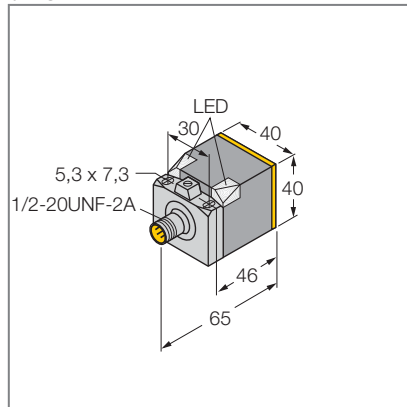
d111



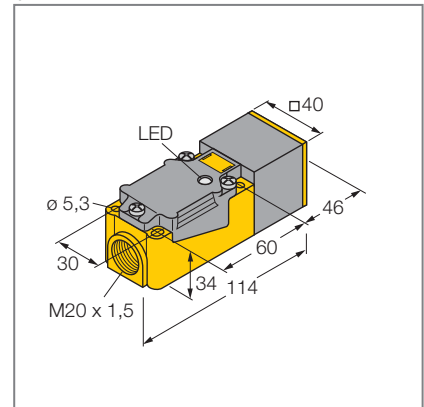
d112



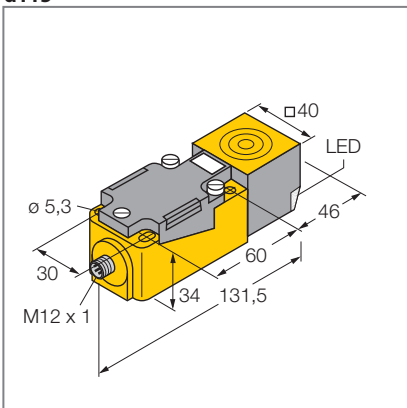
d113



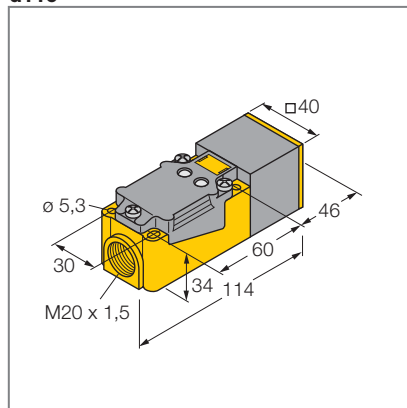
d114



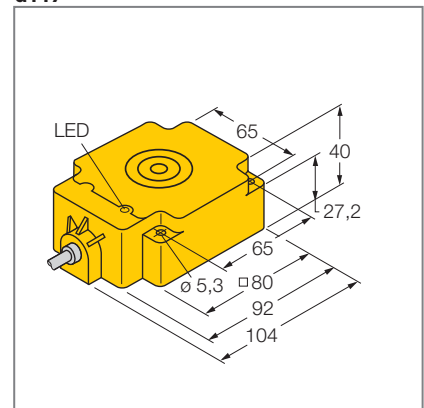
d115



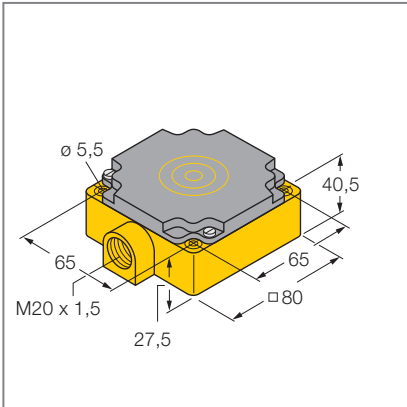
d116



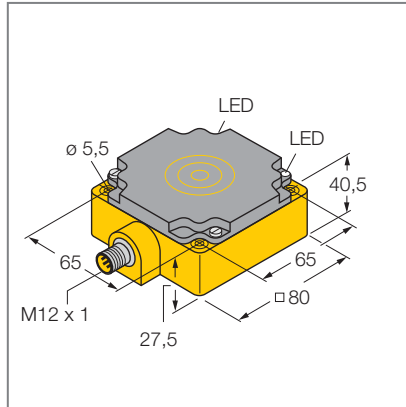
d117



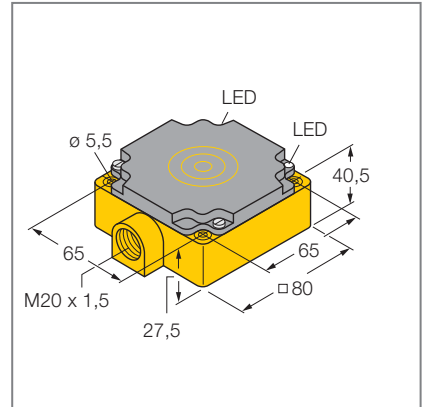
d118



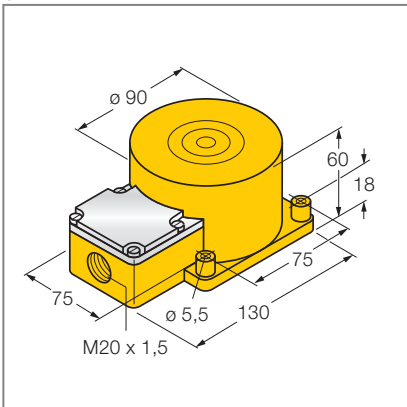
d119



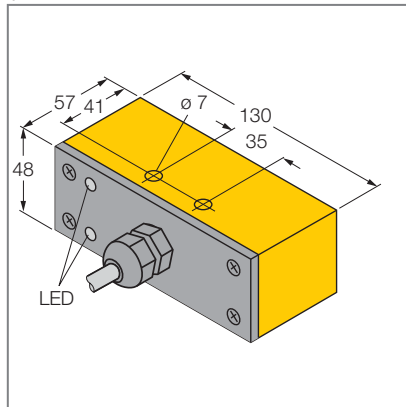
d120



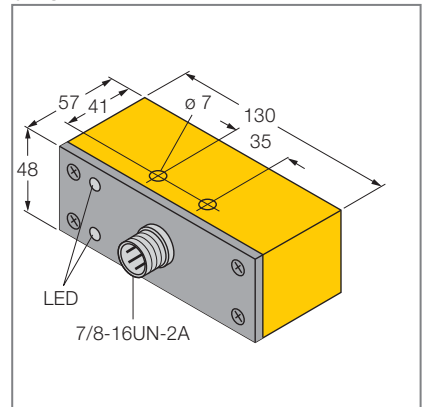
d121



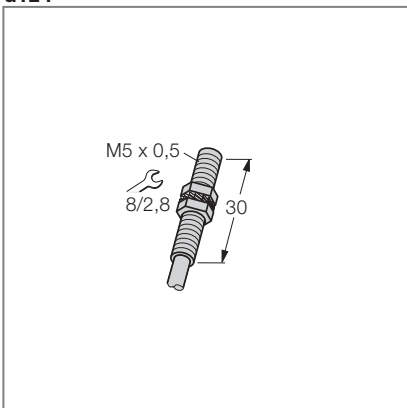
d122



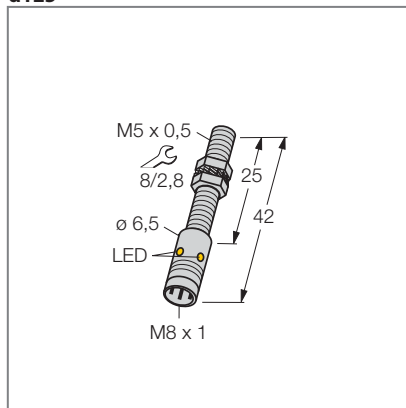
d123



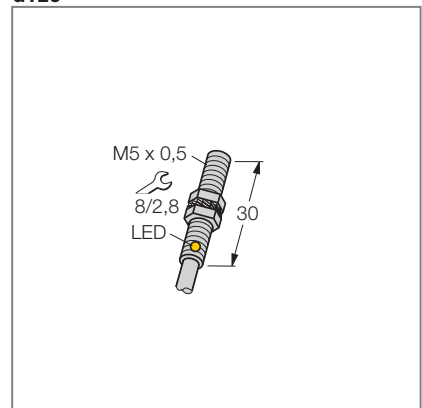
d124



d125

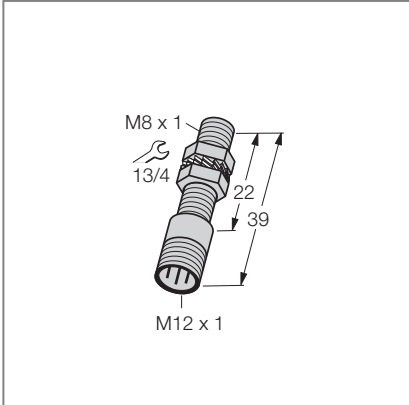


d126

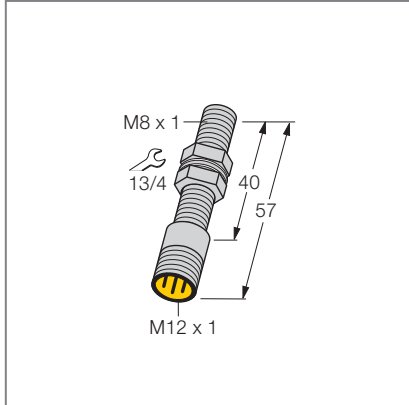


Dimension drawings

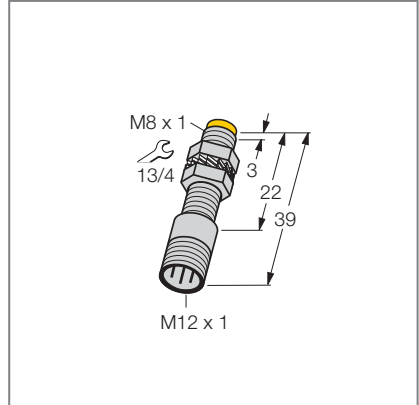
d127



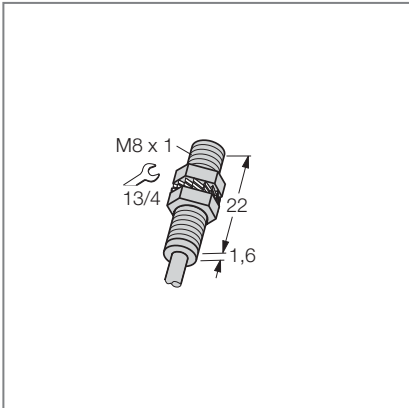
d128



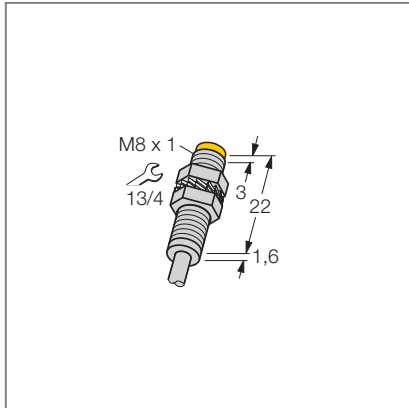
d129



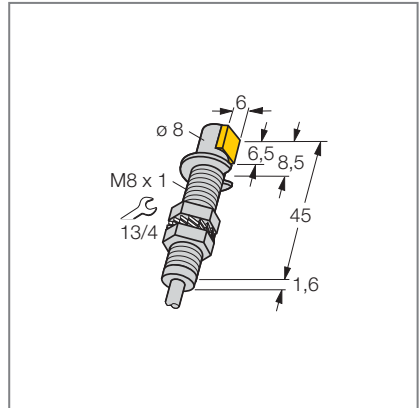
d130



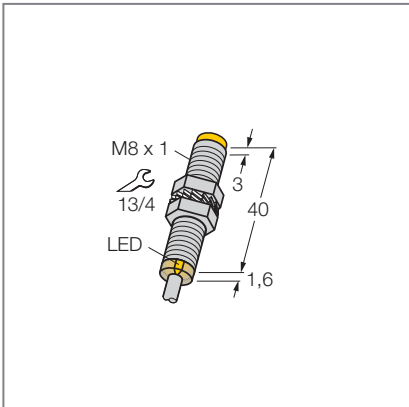
d131



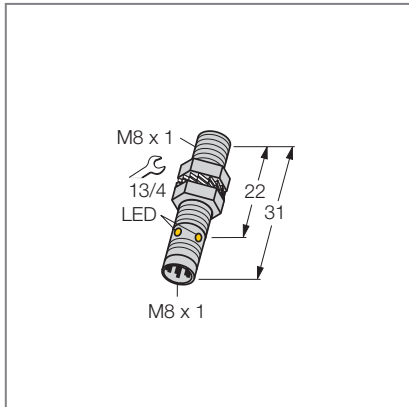
d132



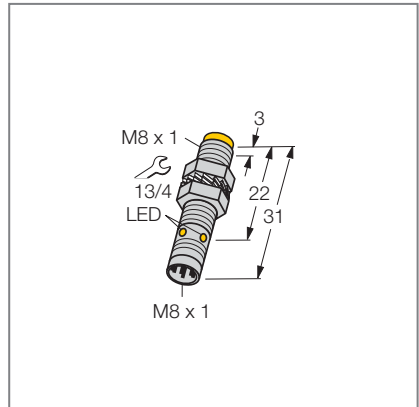
d133



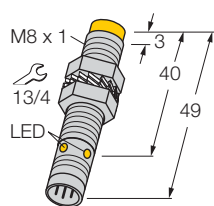
d134



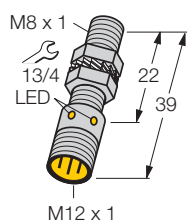
d135



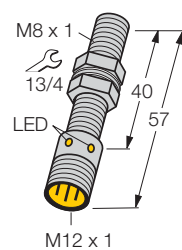
d136



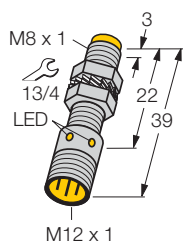
d137



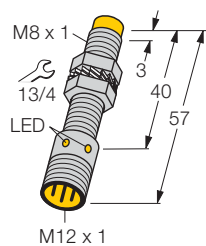
d138



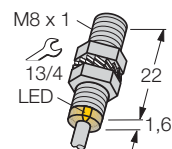
d139



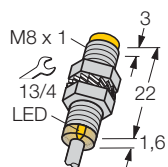
d140



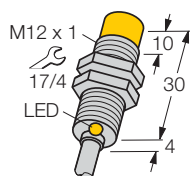
d141



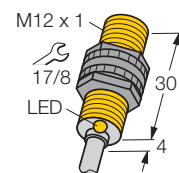
d142



d143

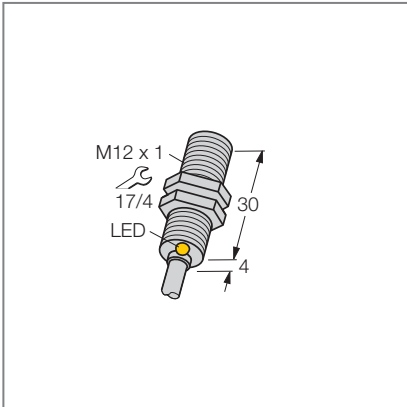


d144

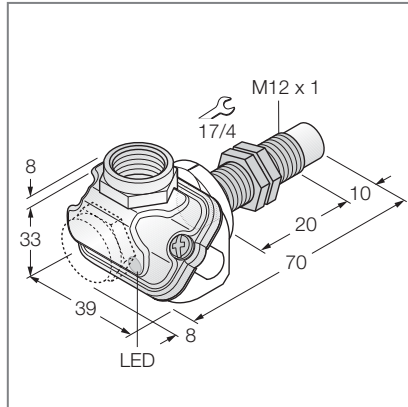


Dimension drawings

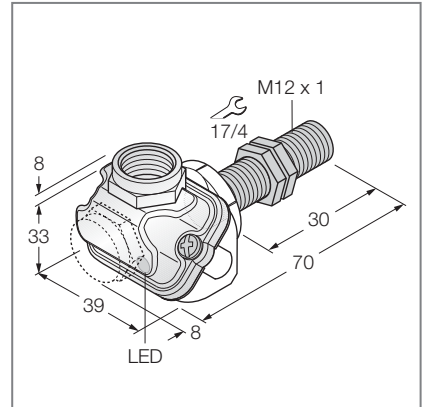
d145



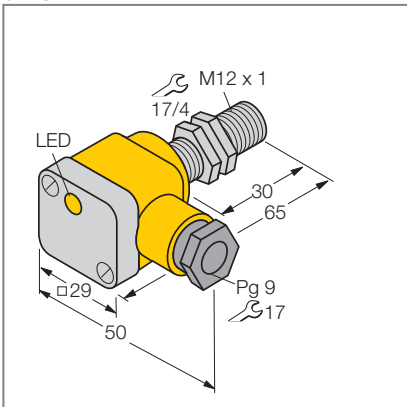
d146



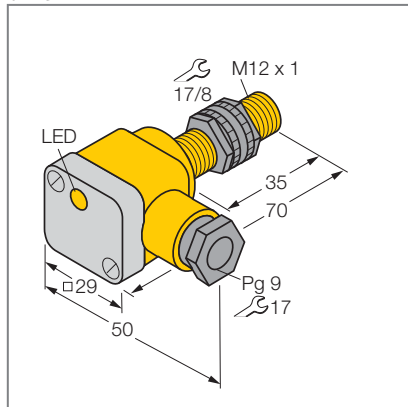
d147



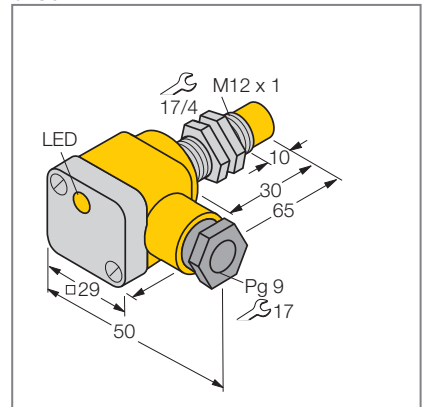
d148



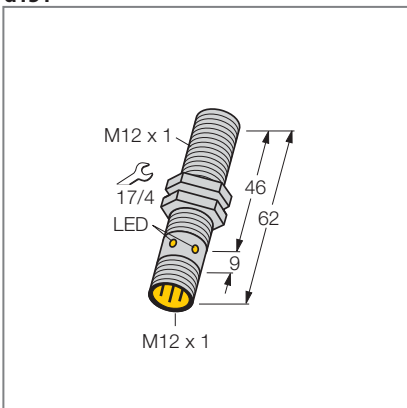
d149



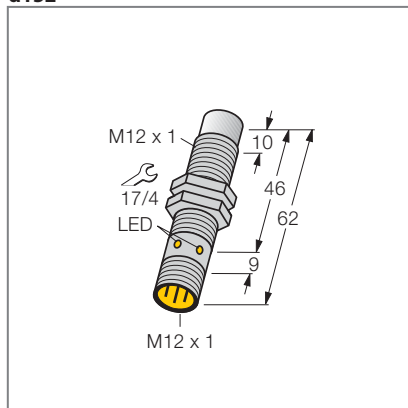
d150



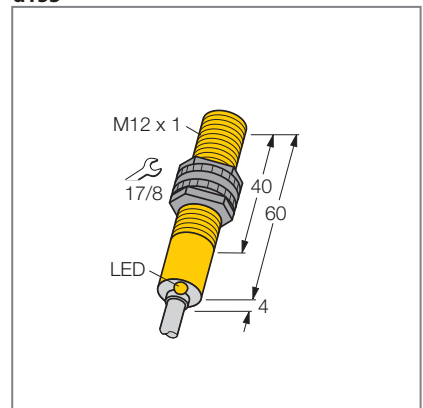
d151



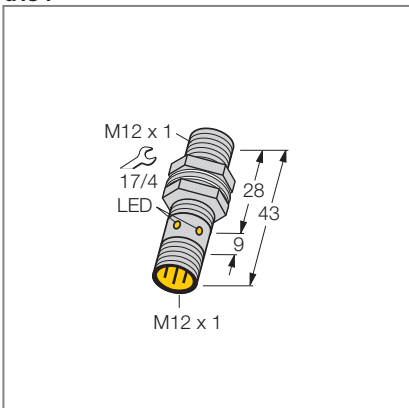
d152



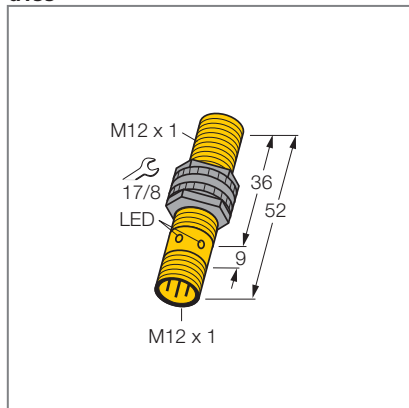
d153



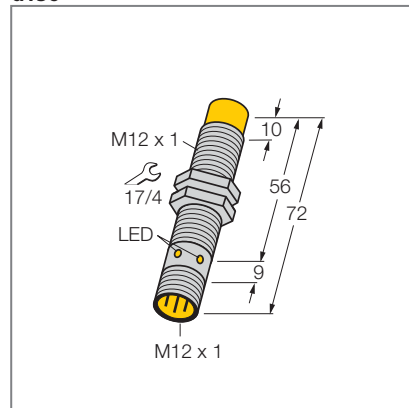
d154



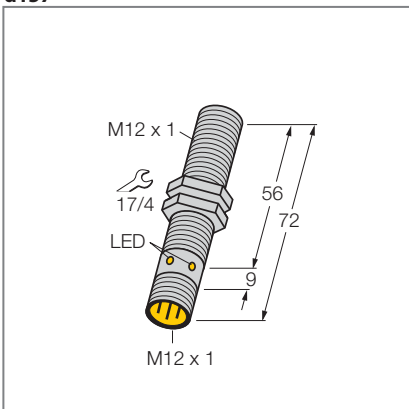
d155



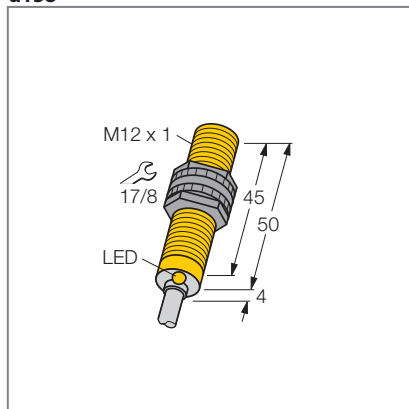
d156



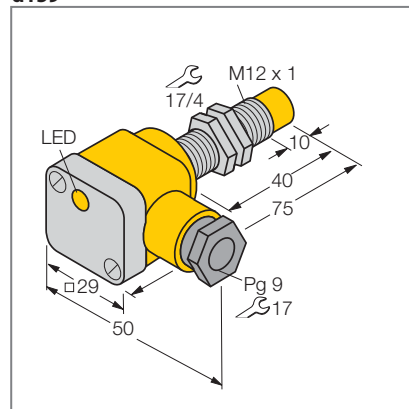
d157



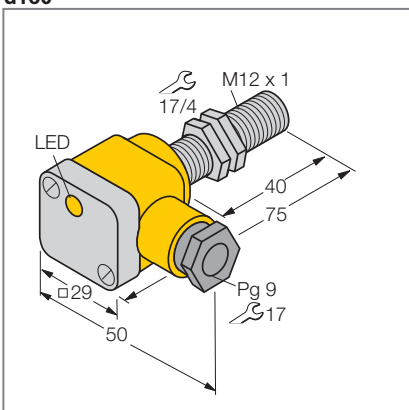
d158



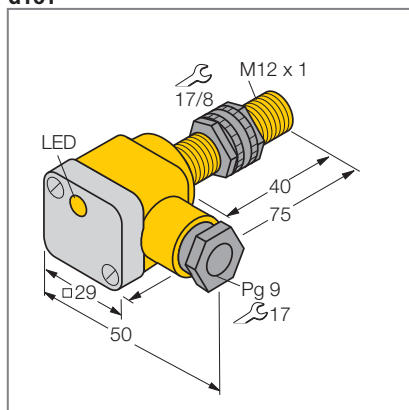
d159



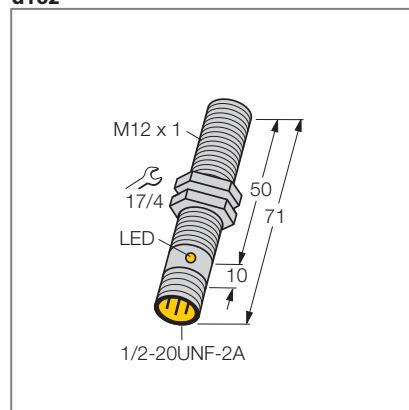
d160



d161



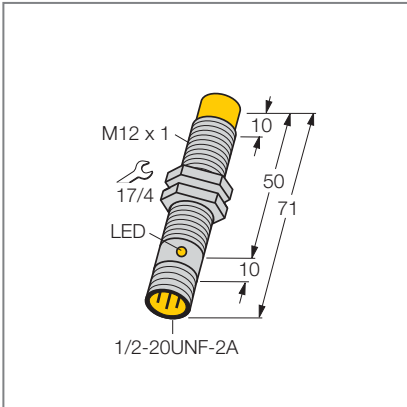
d162



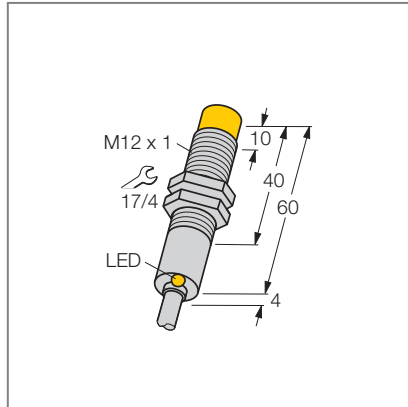
Dimension drawings

Dimension drawings

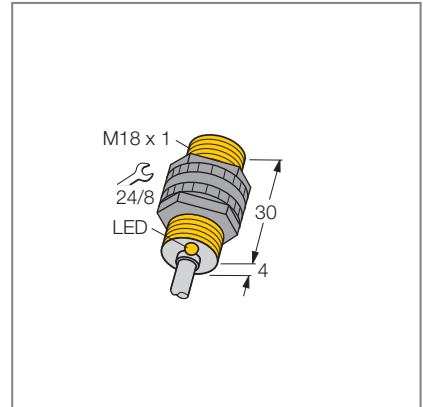
d163



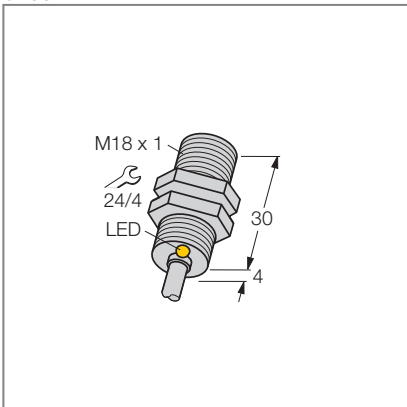
d164



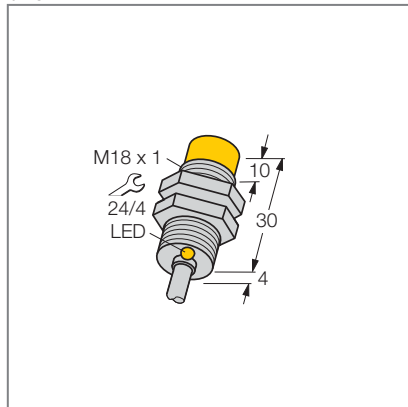
d165



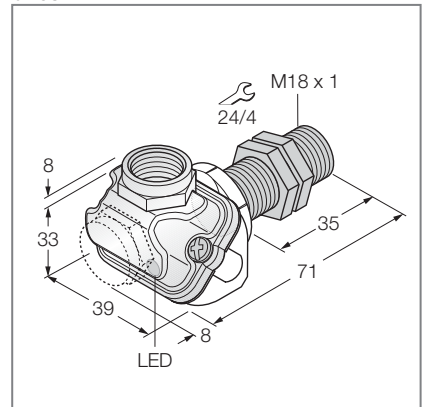
d166



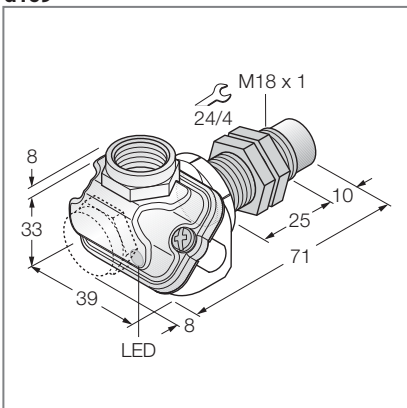
d167



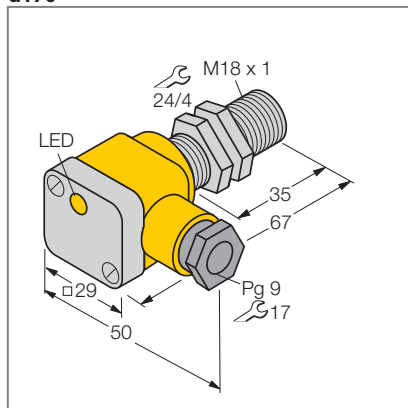
d168



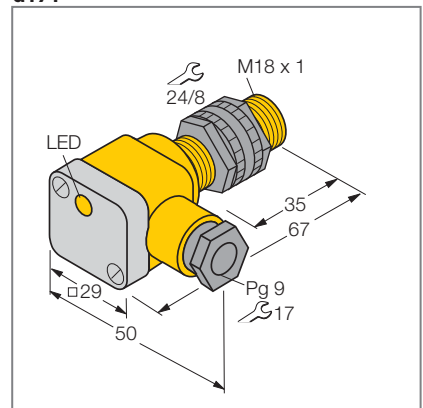
d169



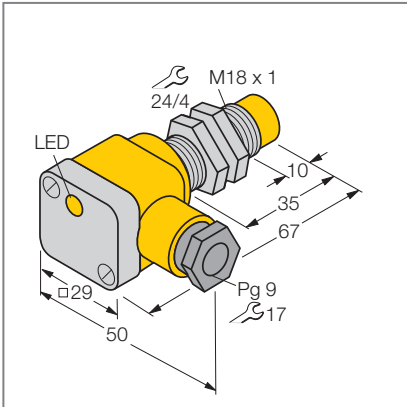
d170



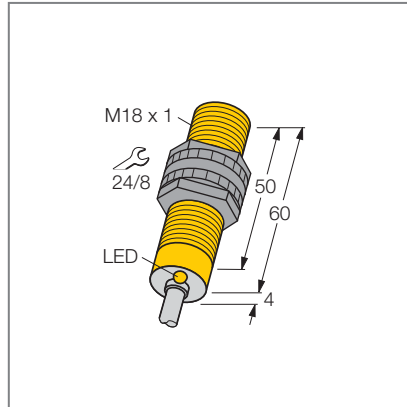
d171



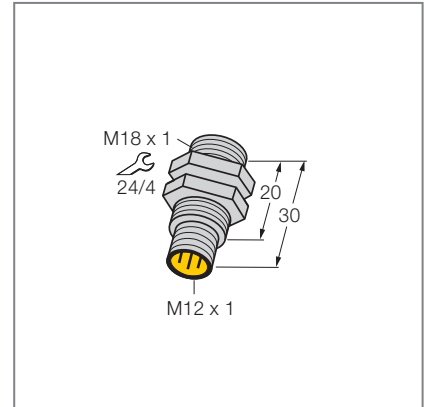
d172



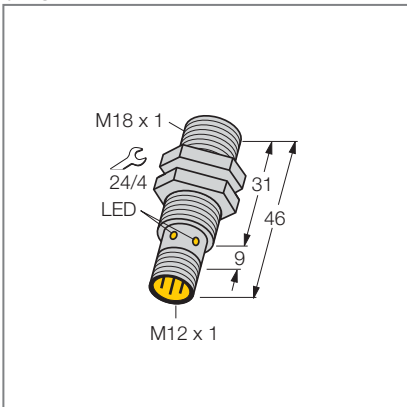
d173



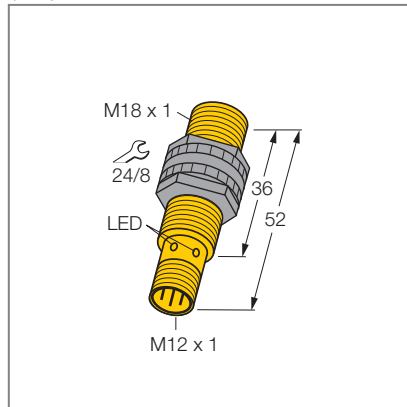
d174



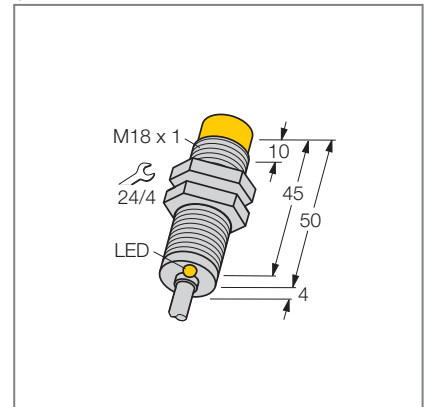
d175



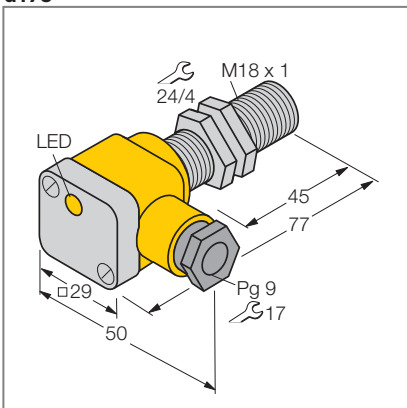
d176



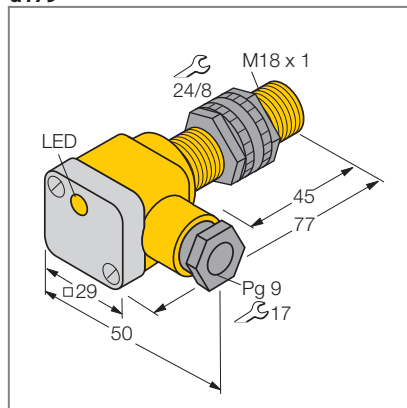
d177



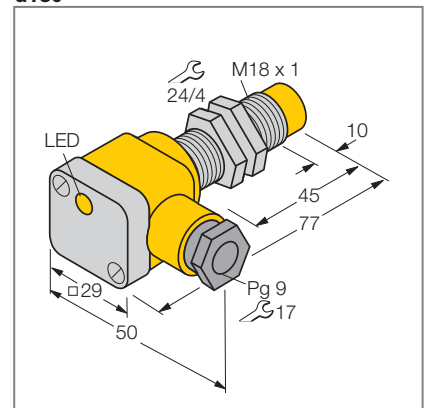
d178



d179

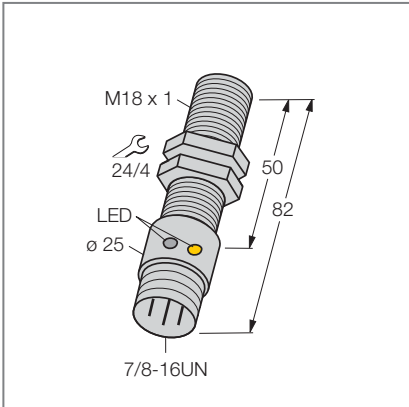


d180

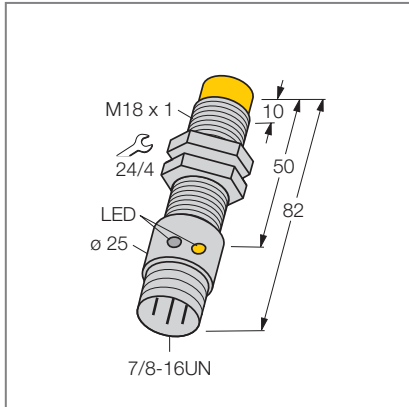


Dimension drawings

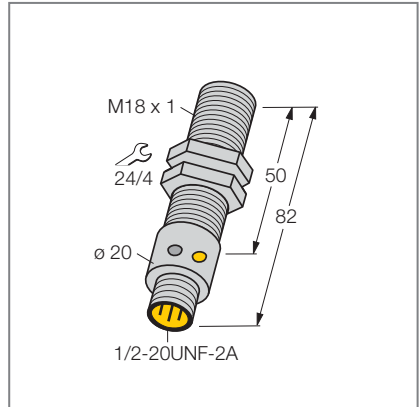
d181



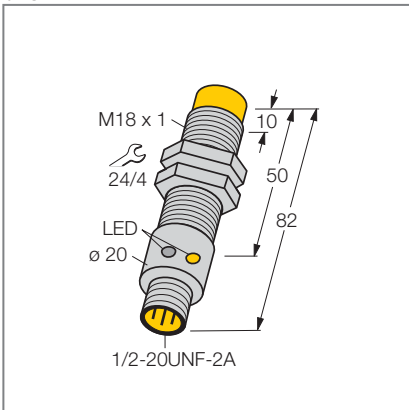
d182



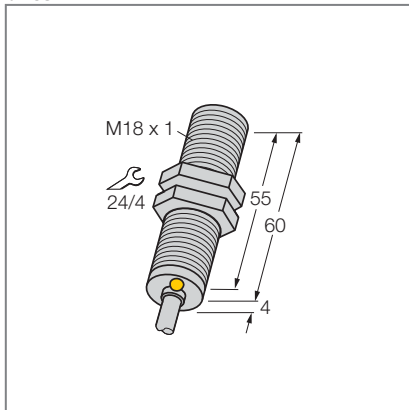
d183



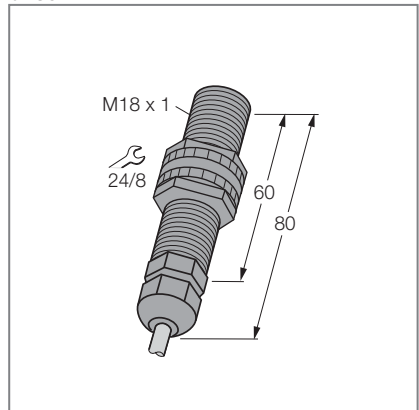
d184



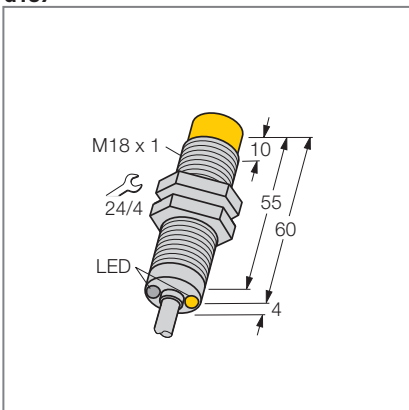
d185



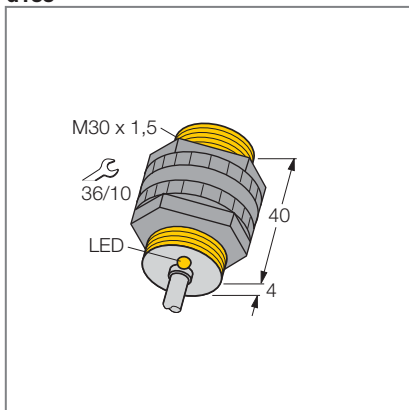
d186



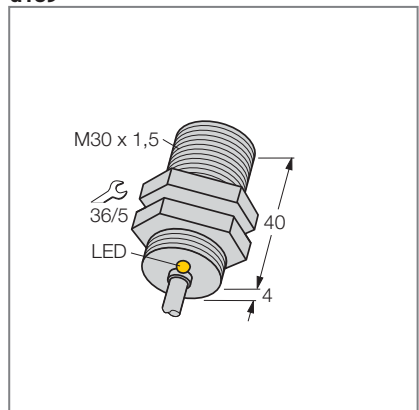
d187



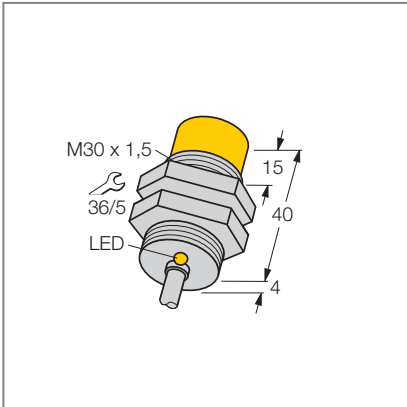
d188



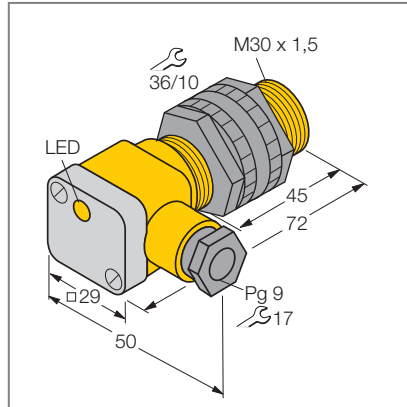
d189



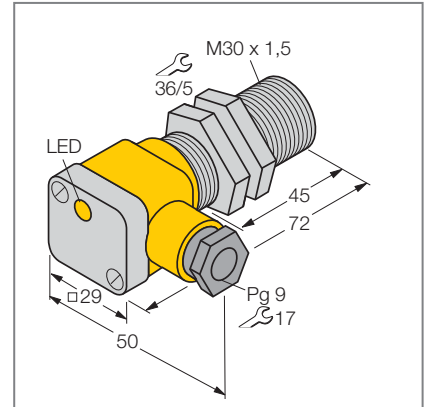
d190



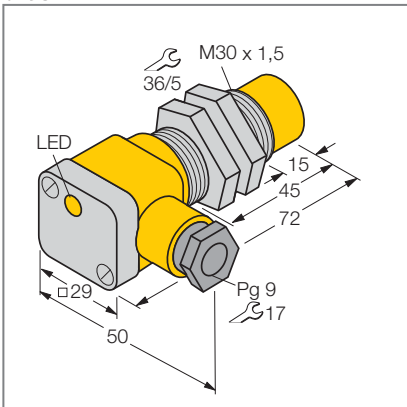
d191



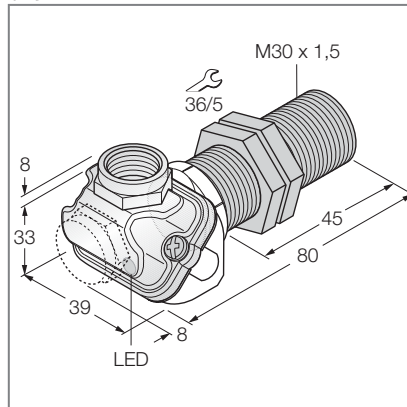
d192



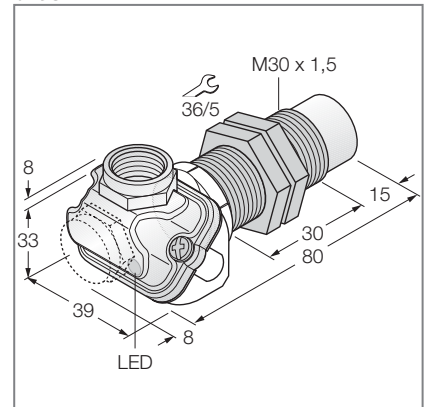
d193



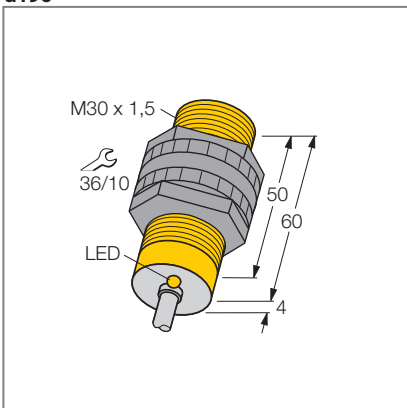
d194



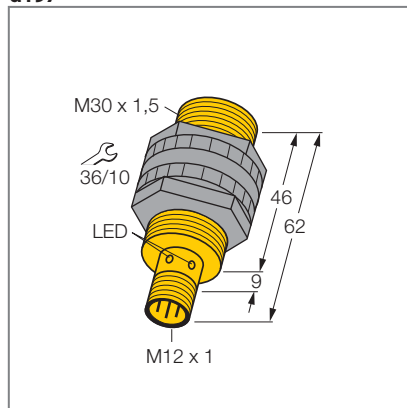
d195



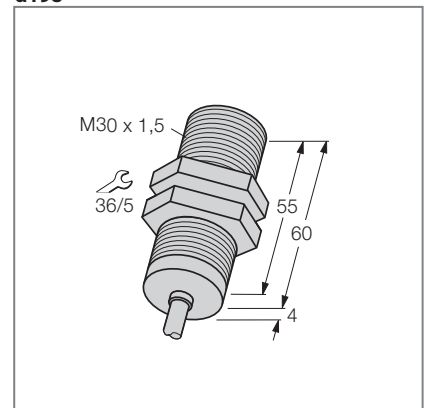
d196



d197

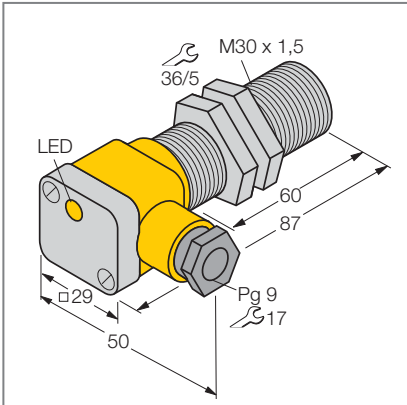


d198

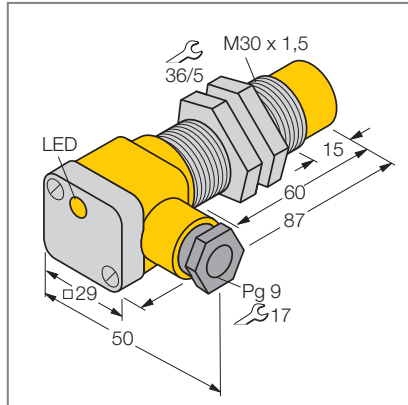


Dimension drawings

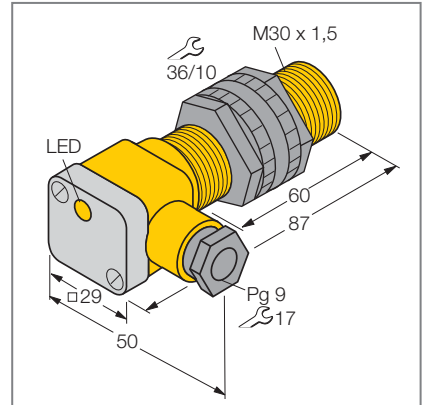
d199



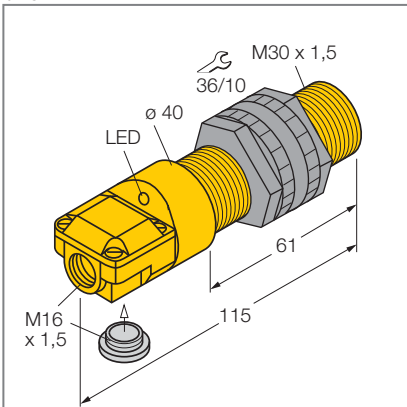
d200



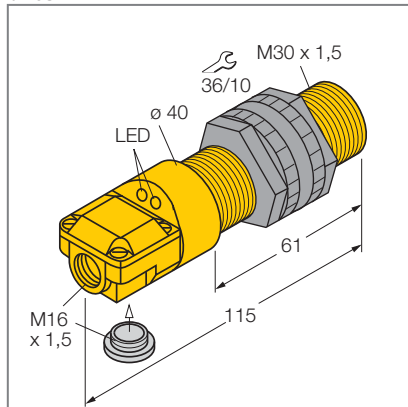
d201



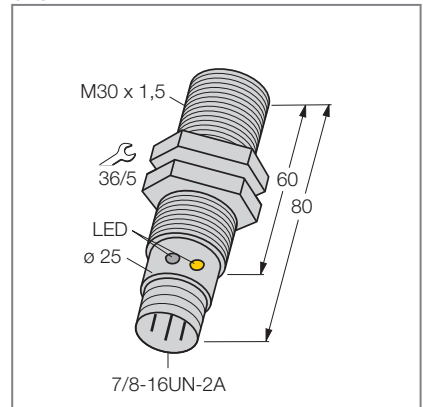
d202



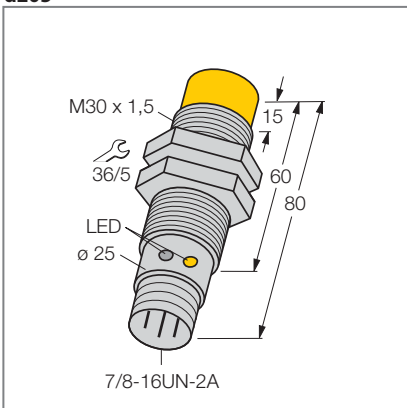
d203



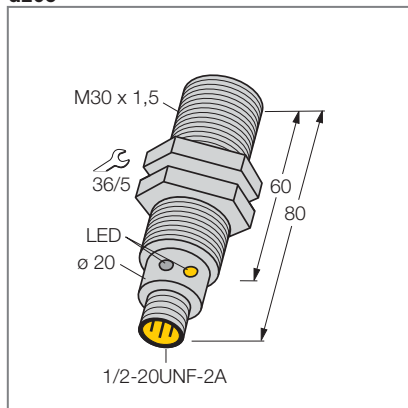
d204



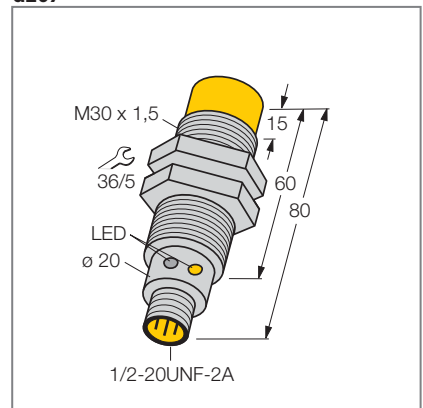
d205



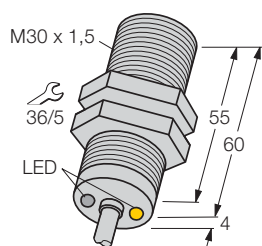
d206



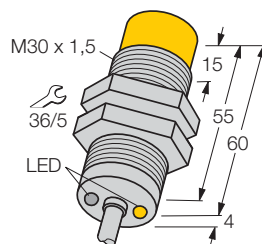
d207



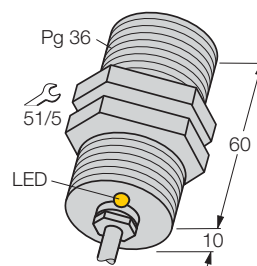
d208



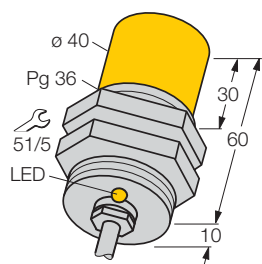
d209



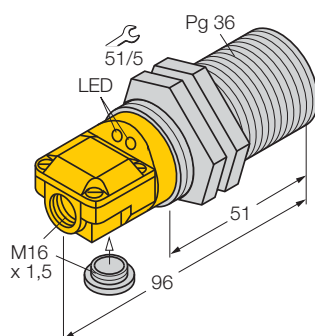
d210



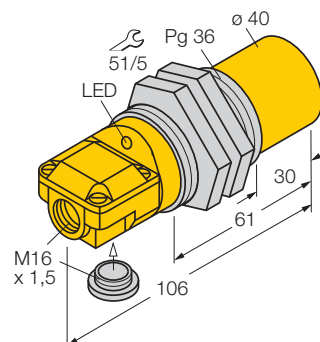
d211



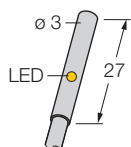
d212



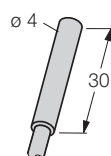
d213



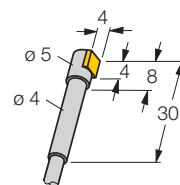
d214



d215

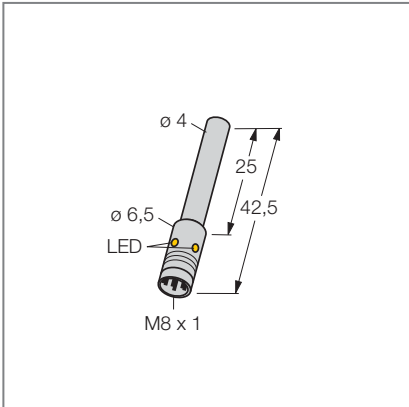


d216

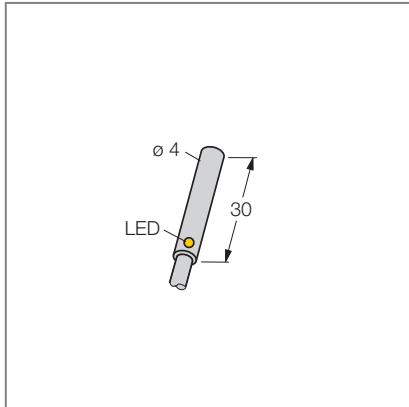


Dimension drawings

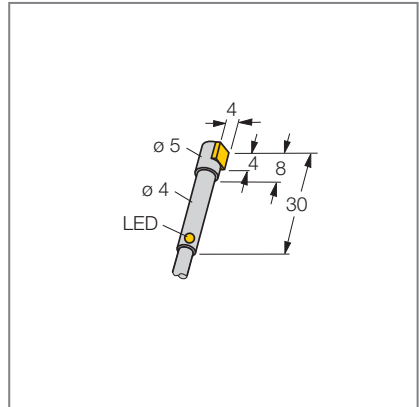
d217



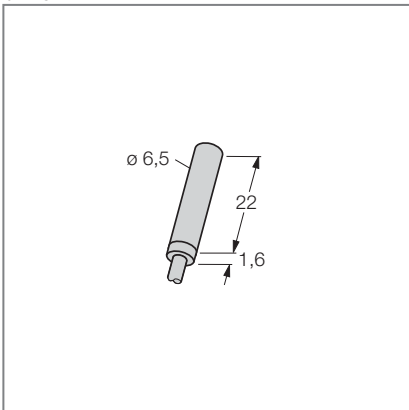
d218



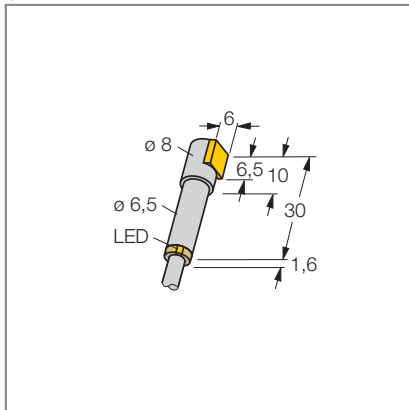
d219



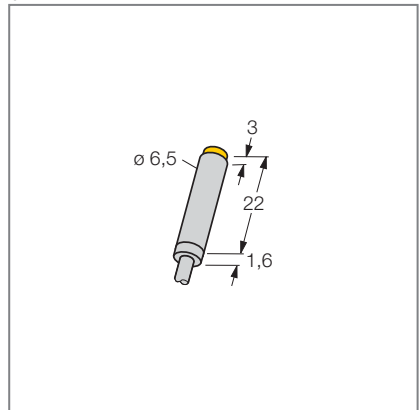
d220



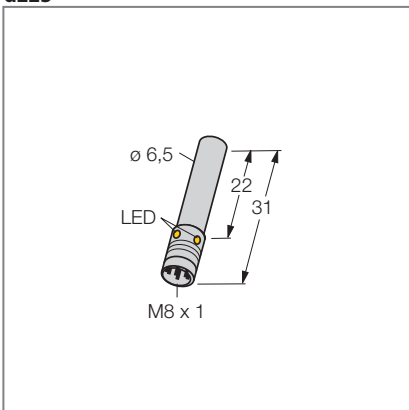
d221



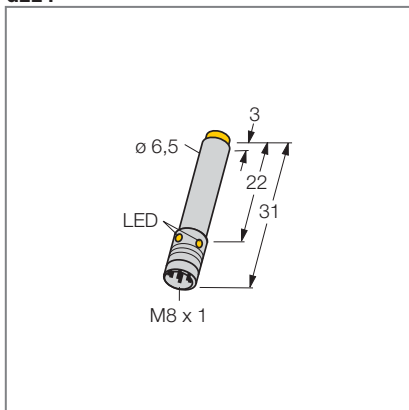
d222



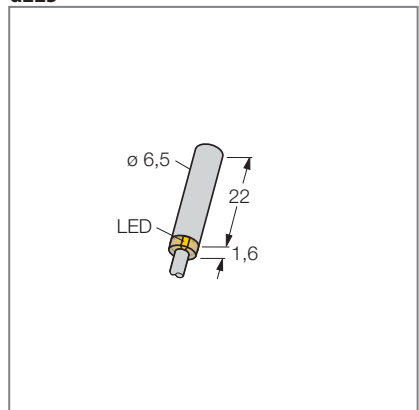
d223



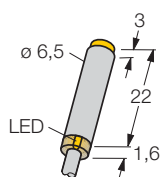
d224



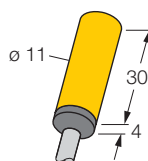
d225



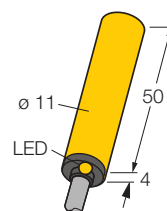
d226



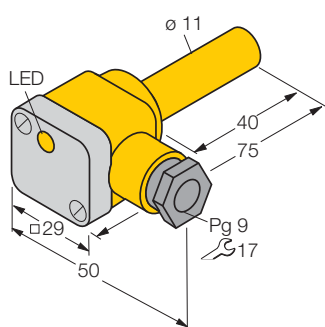
d227



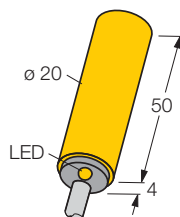
d228



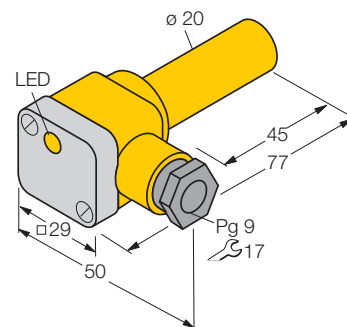
d229



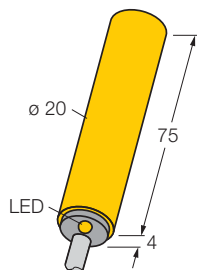
d230



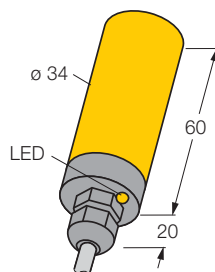
d231



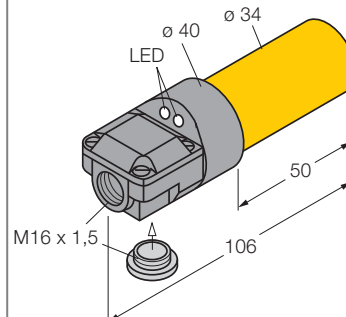
d232



d233

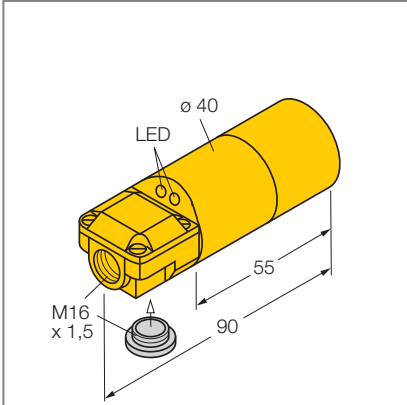


d234

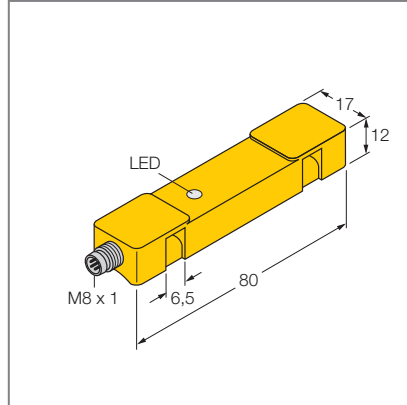


Dimension drawings

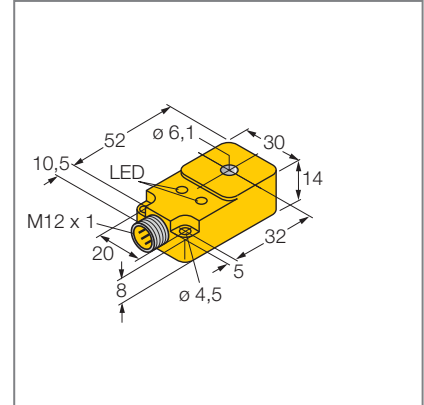
d235



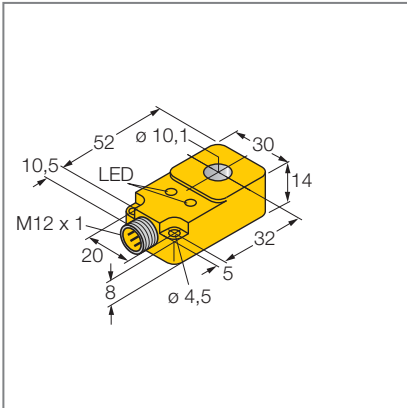
d236



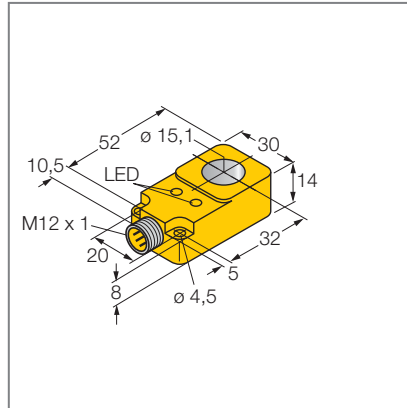
d237



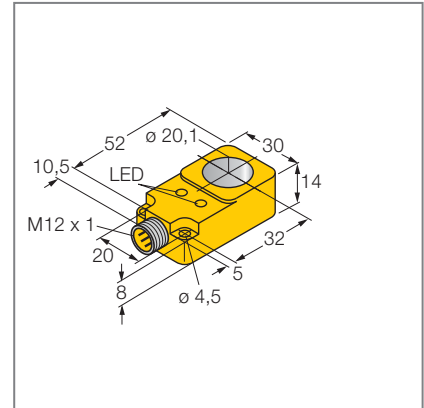
d238



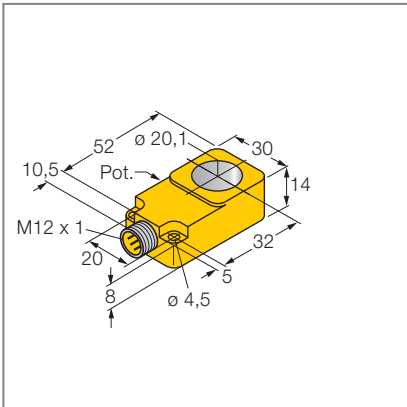
d239



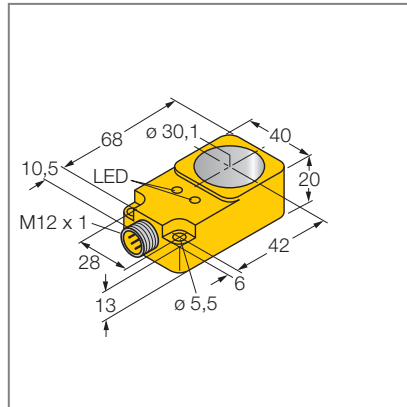
d240



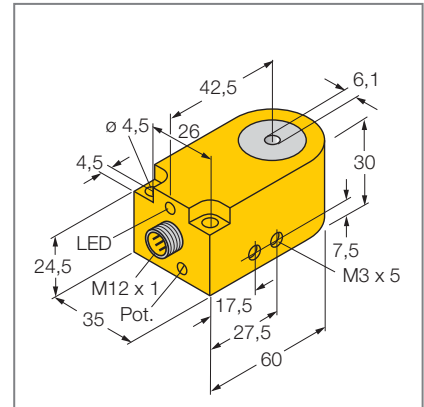
d241



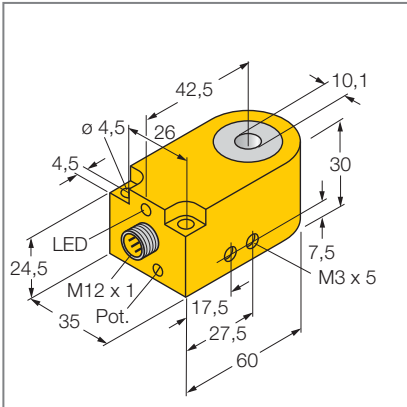
d242



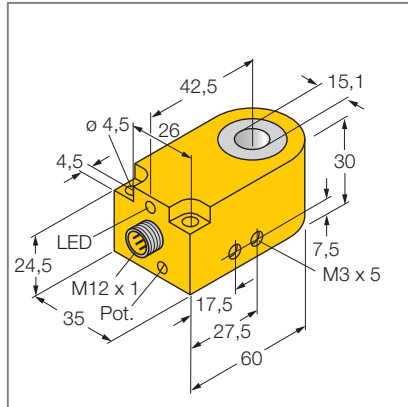
d243



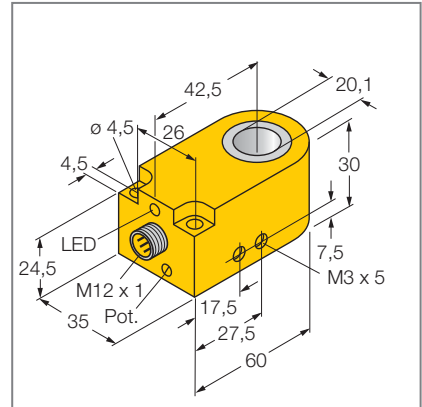
d244



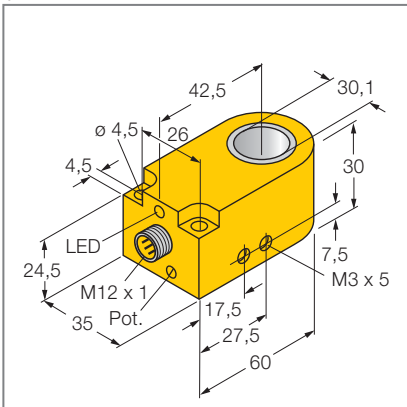
d245



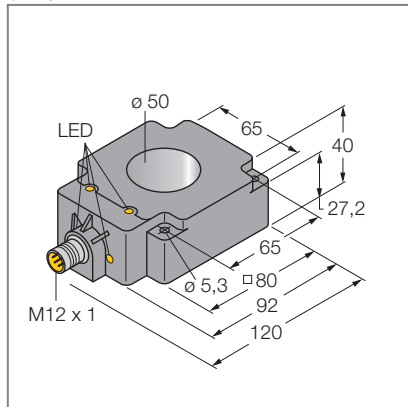
d246



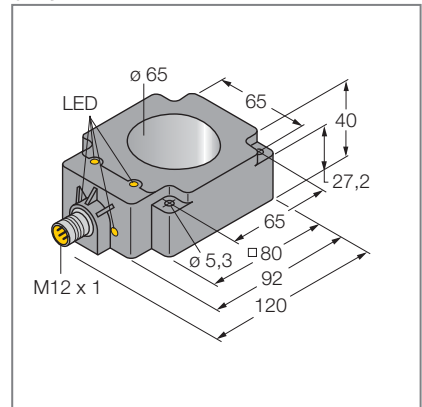
d247



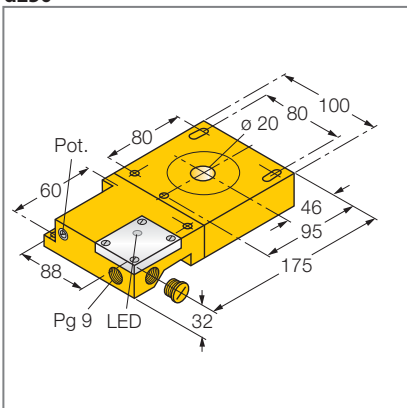
d248



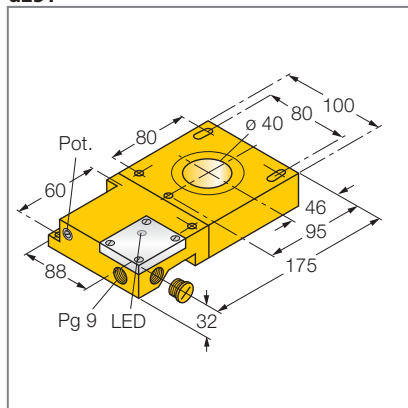
d249



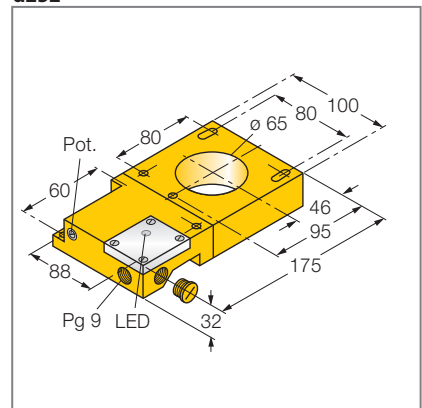
d250



d251

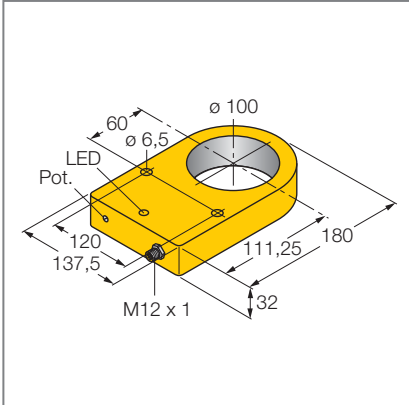


d252

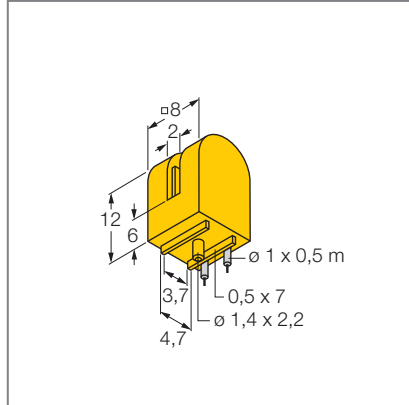


Dimension drawings

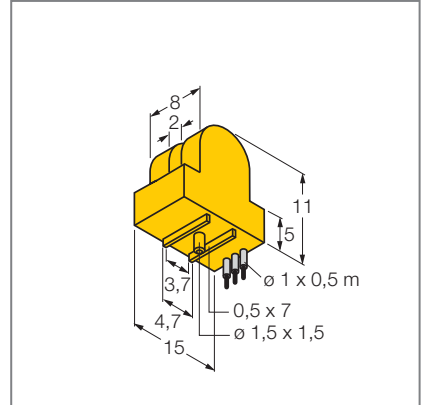
d253



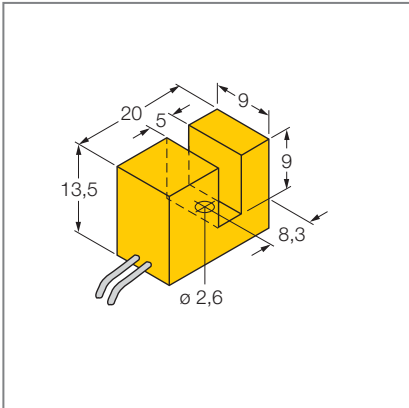
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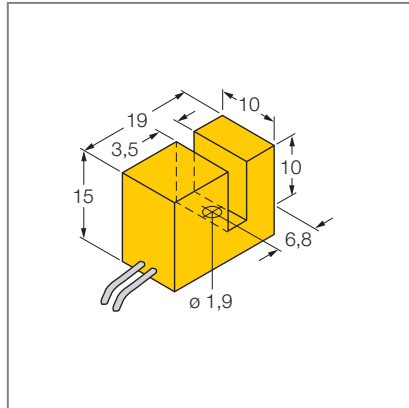
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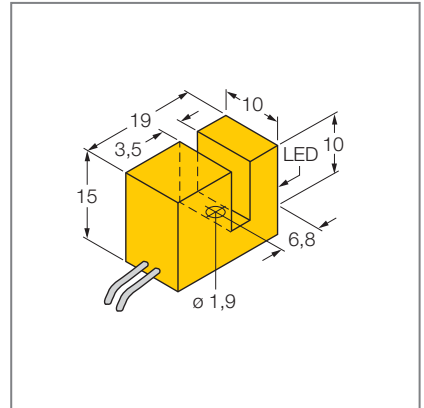
d256



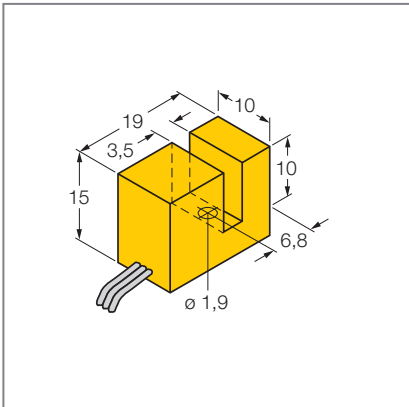
d257



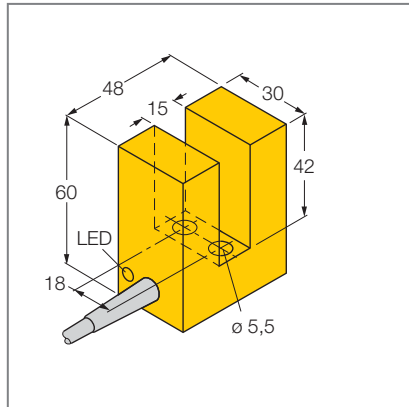
d258



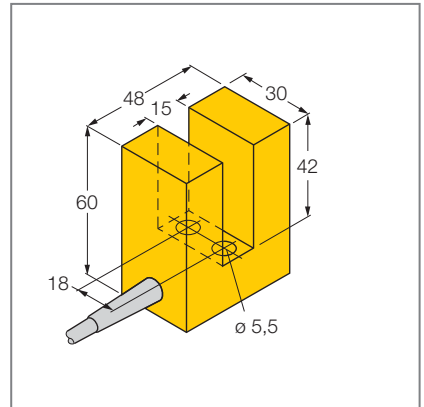
d259



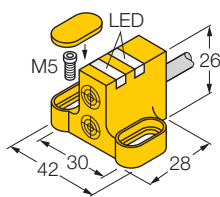
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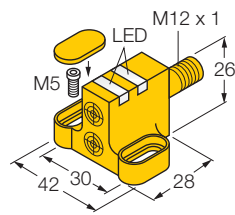
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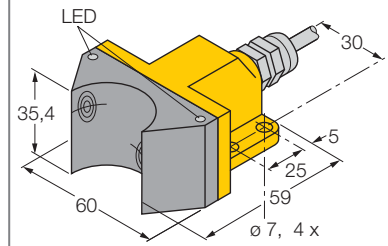
d262



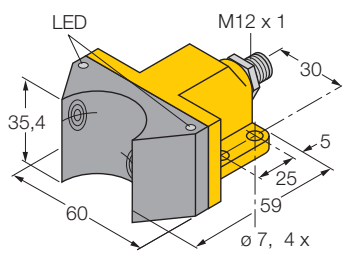
d263



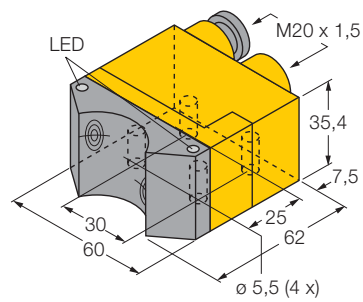
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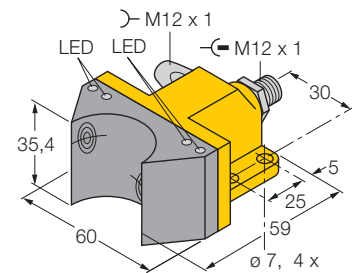
d265



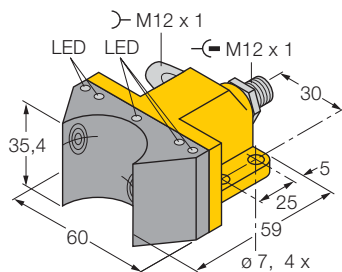
d266



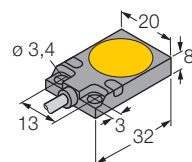
d267



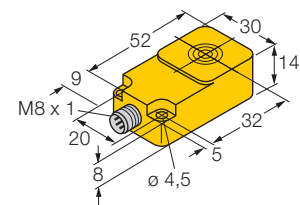
d268



d269

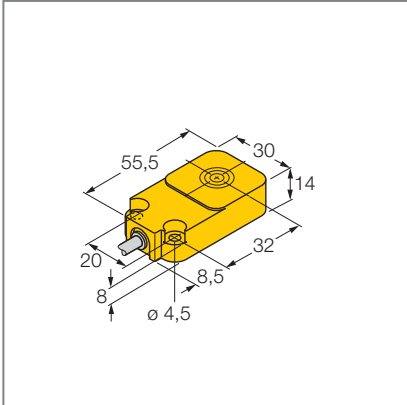


d270

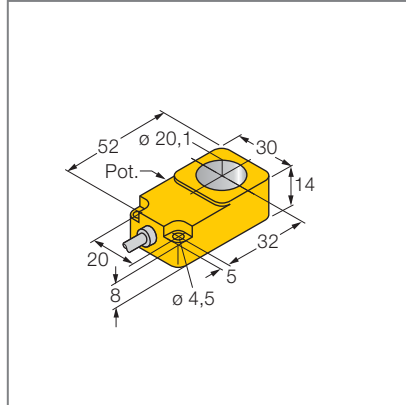


Dimension drawings

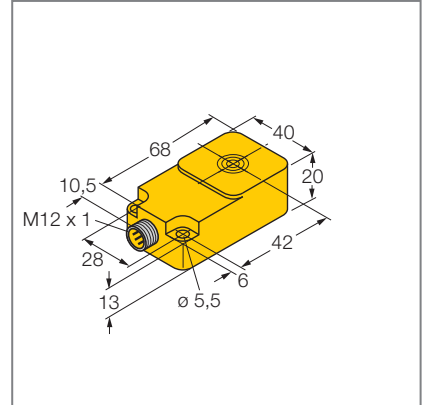
d271



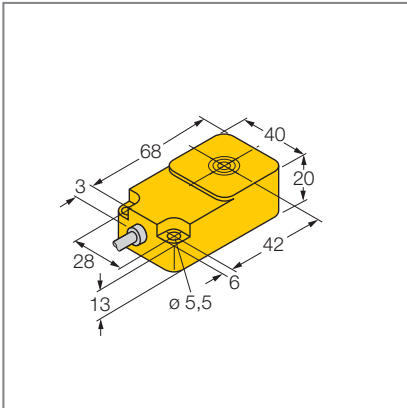
d272



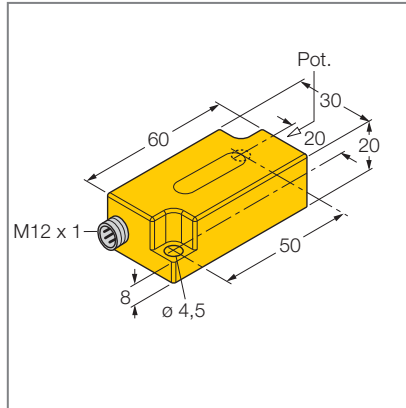
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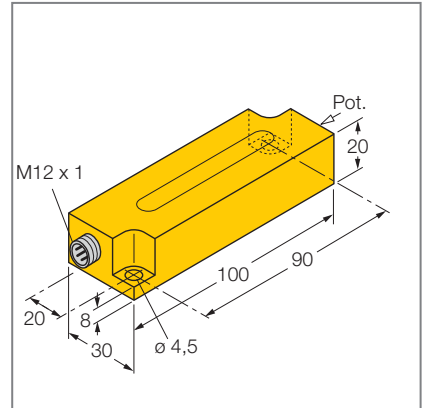
d274



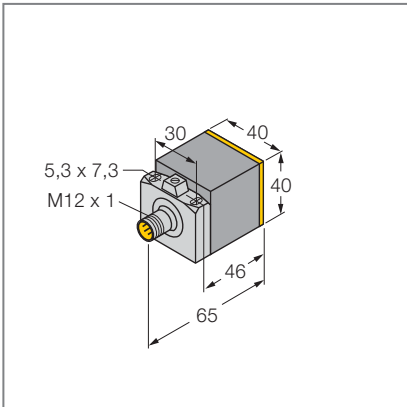
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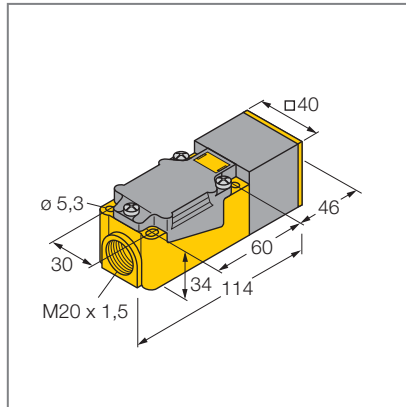
d276



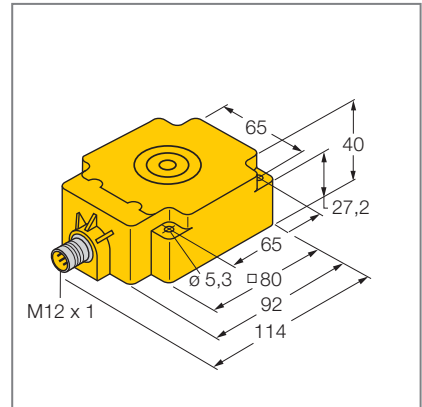
d277



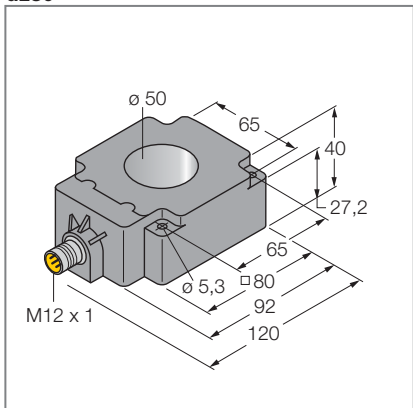
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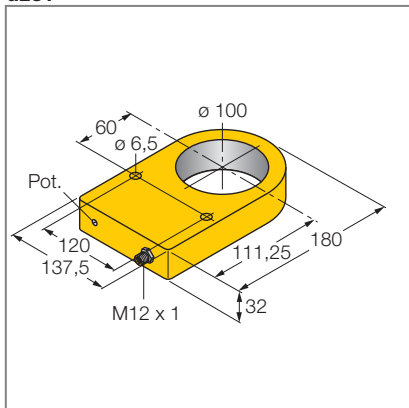
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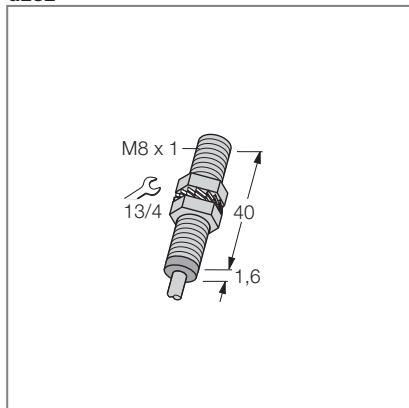
d280



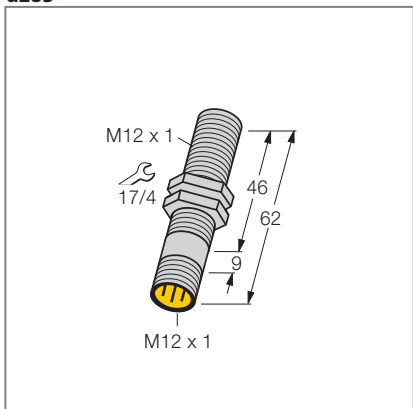
d281



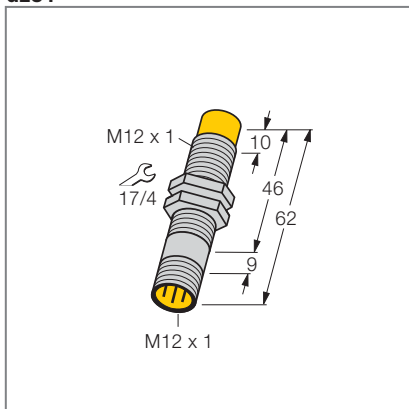
d282



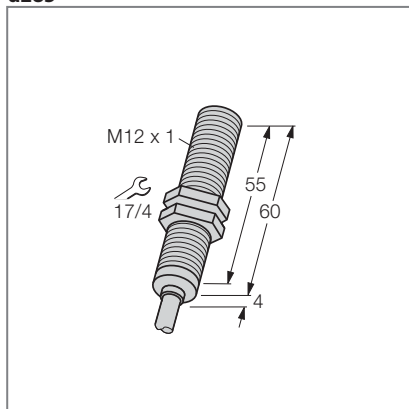
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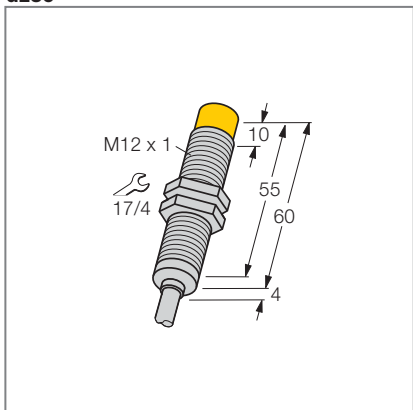
d284



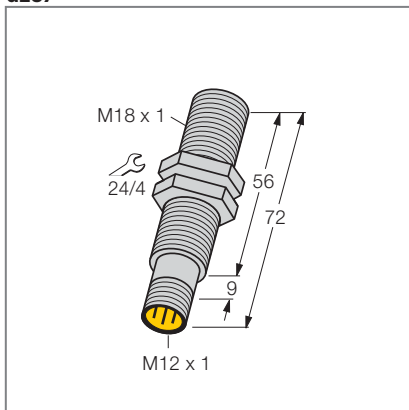
d285



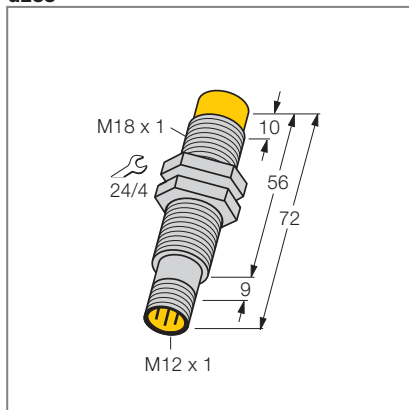
d286



d287

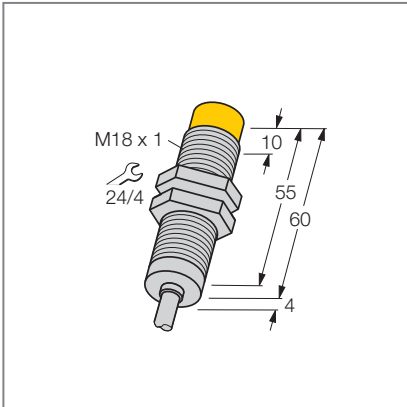


d288

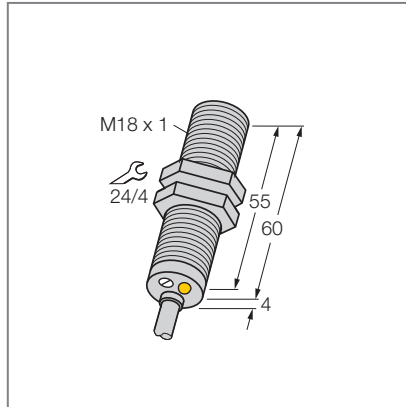


Dimension drawings

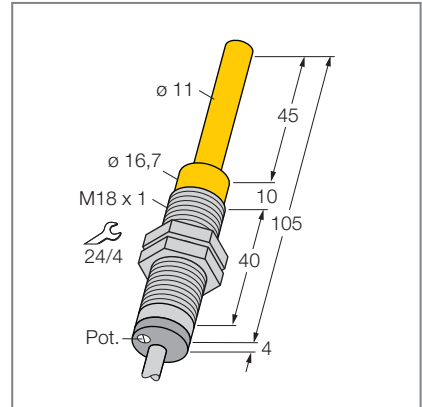
d289



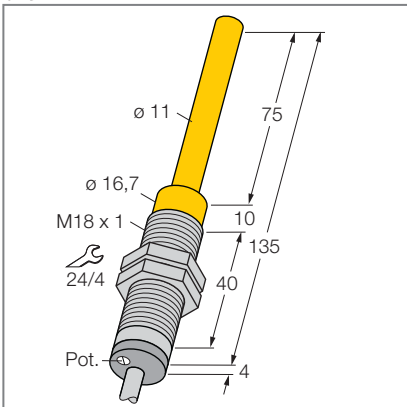
d290



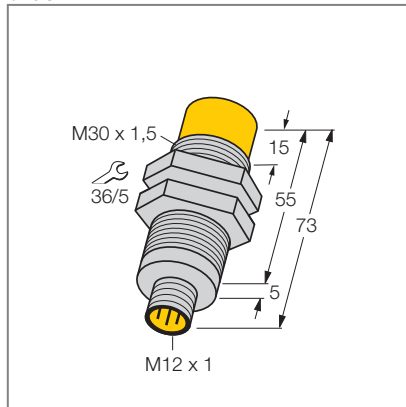
d291



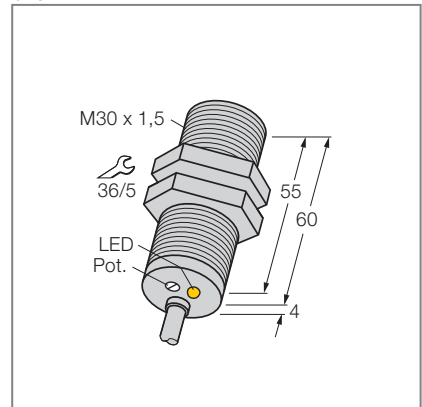
d292



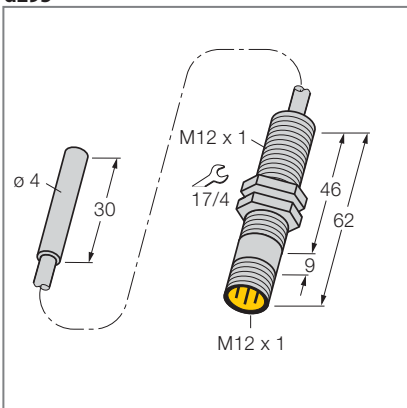
d293



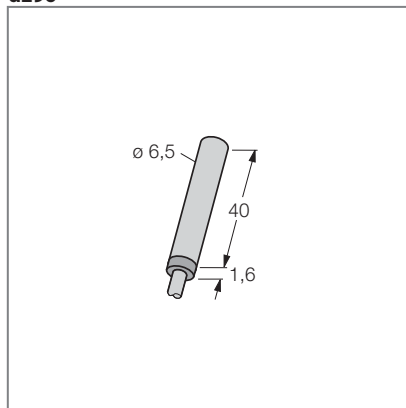
d294



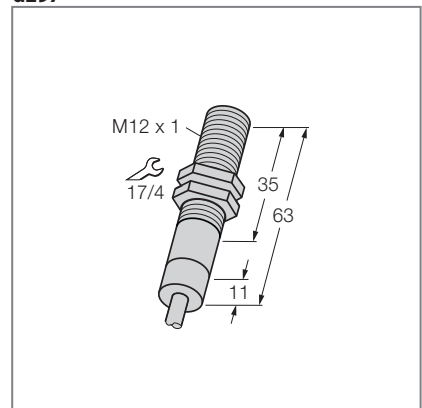
d295



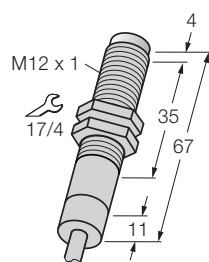
d296



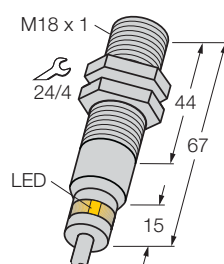
d297



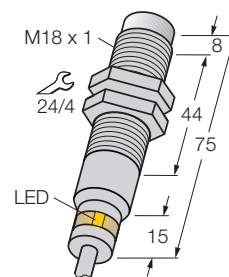
d298



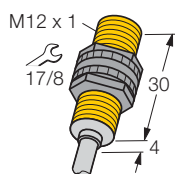
d299



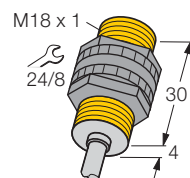
d300



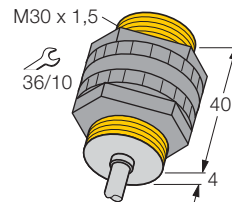
d301



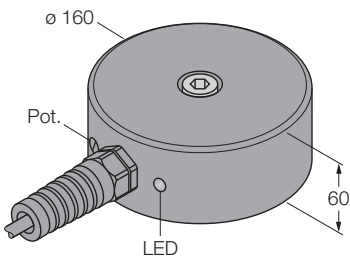
d302



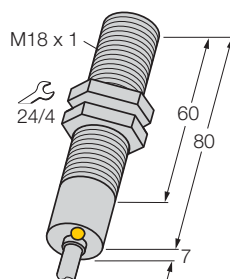
d303



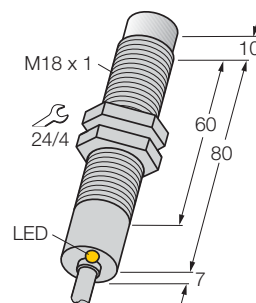
d304



d305

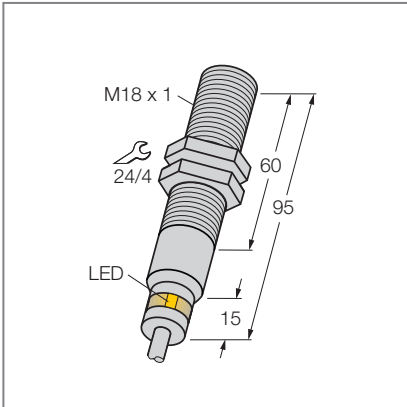


d306

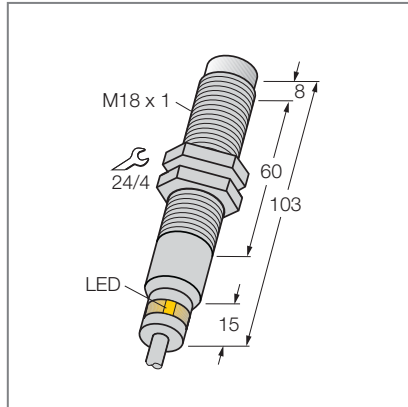


Dimension drawings

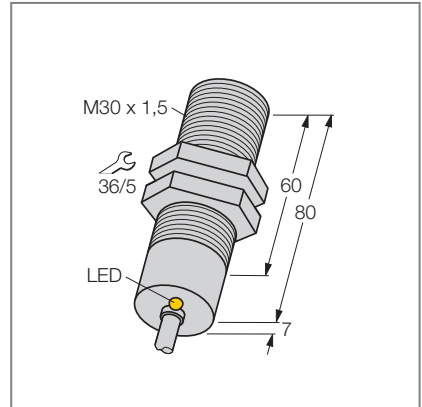
d307



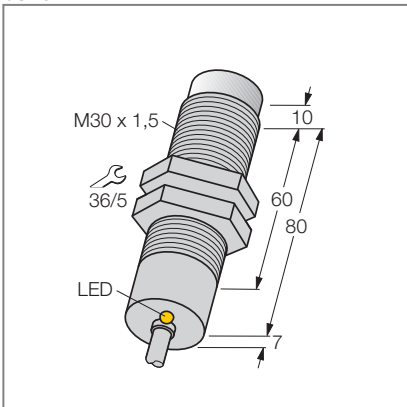
d308



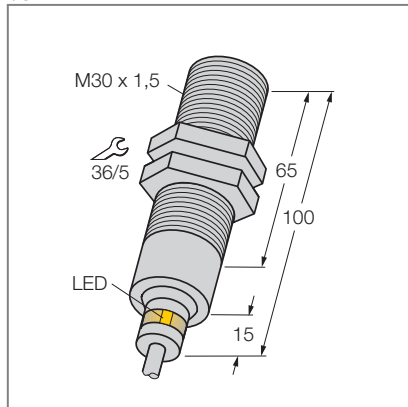
d309



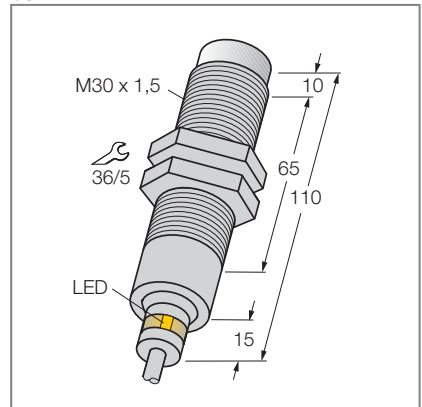
d310



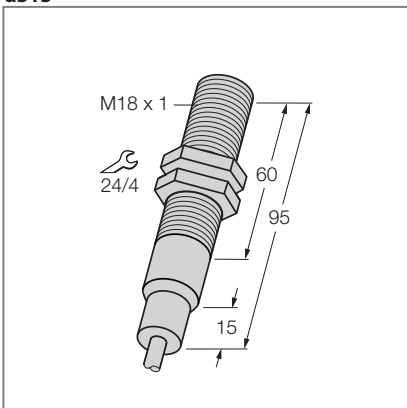
d311



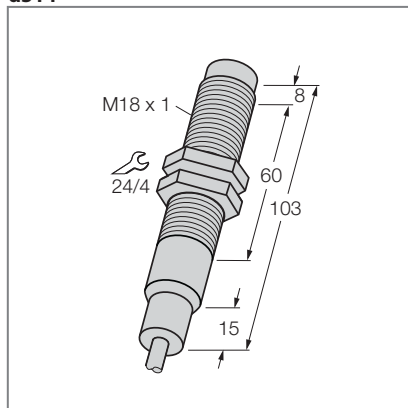
d312



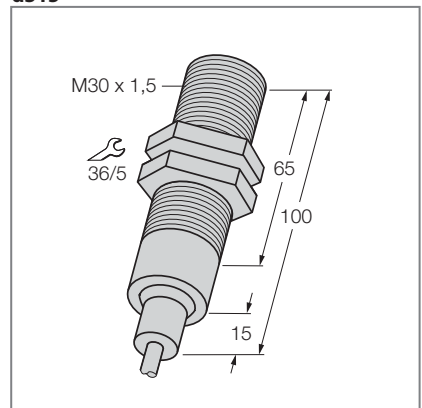
d313



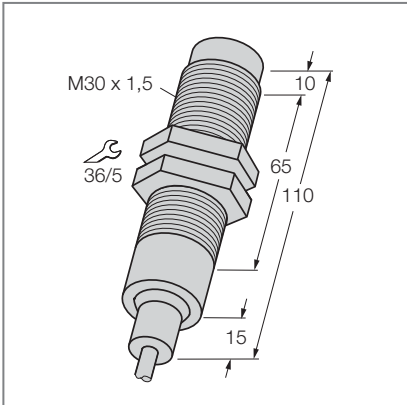
d314



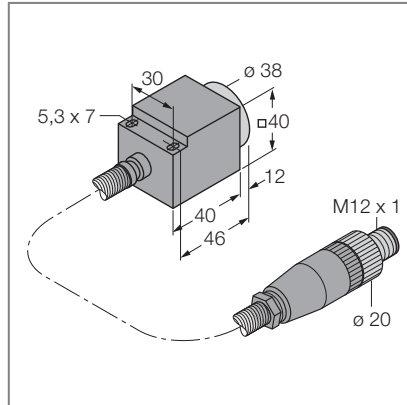
d315



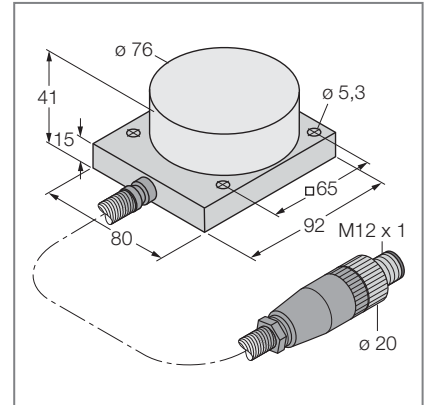
d316



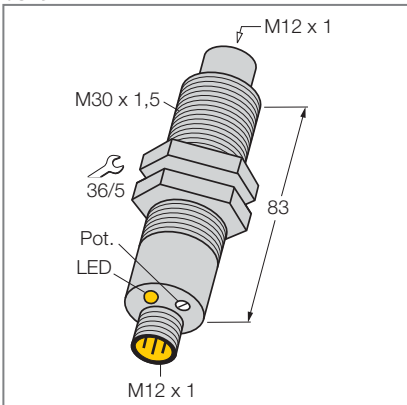
d317



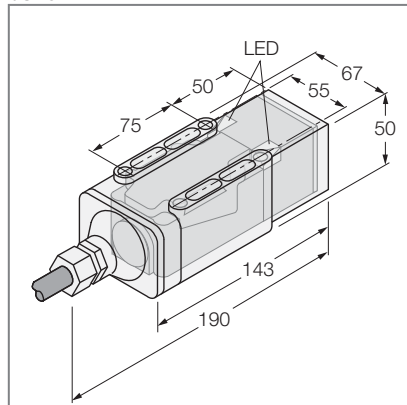
d318



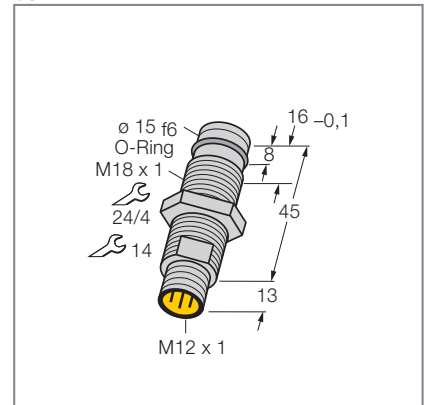
d319



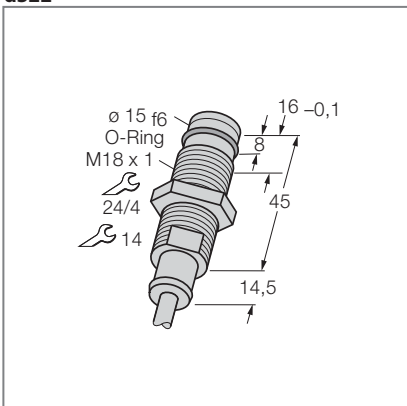
d320



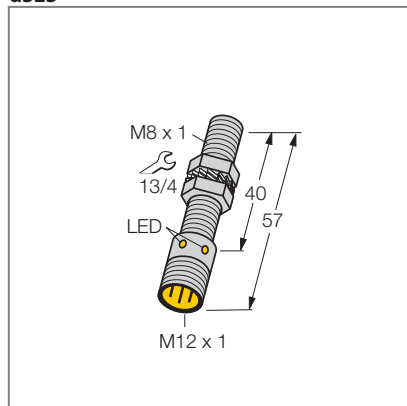
d321



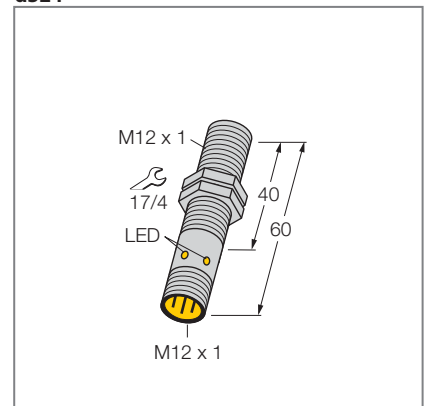
d322



d323

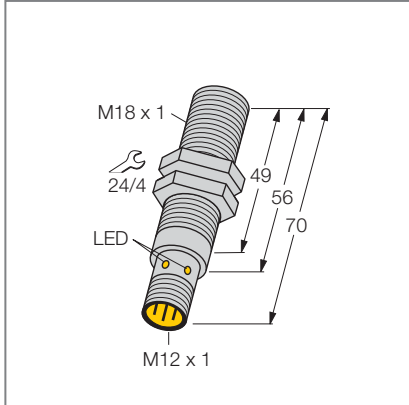


d324

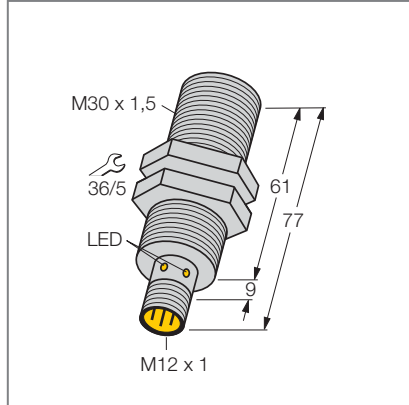


Dimension drawings

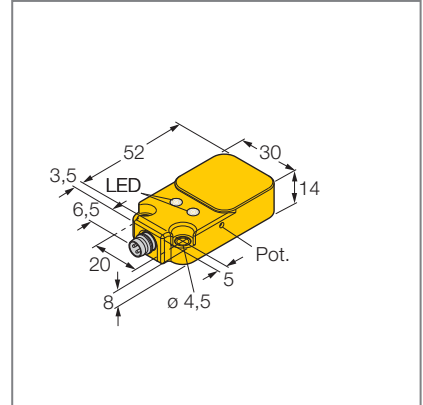
d325



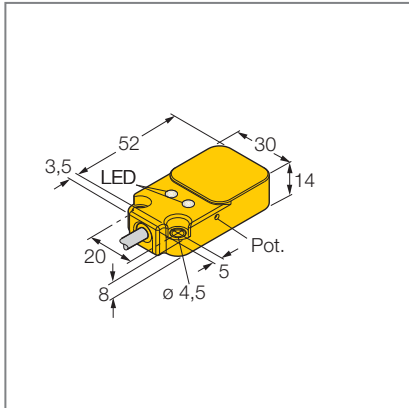
d326



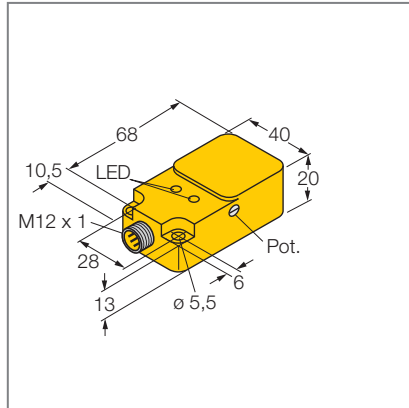
d327



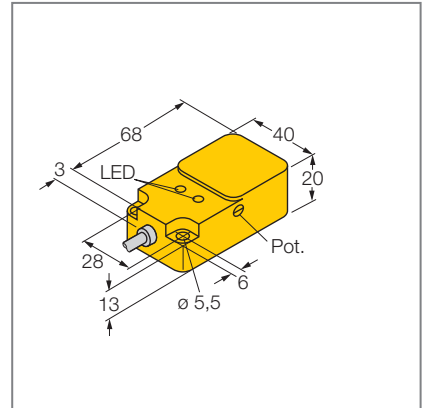
d328



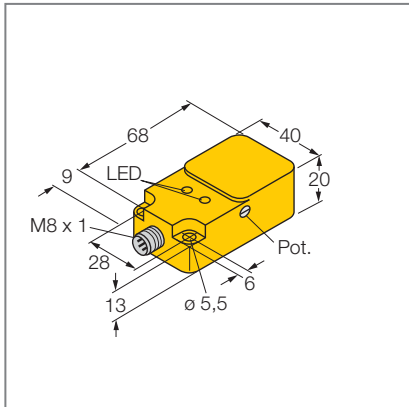
d329



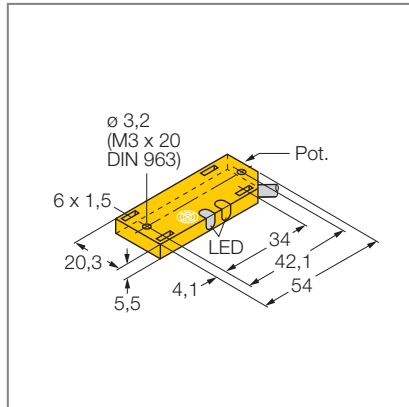
d330



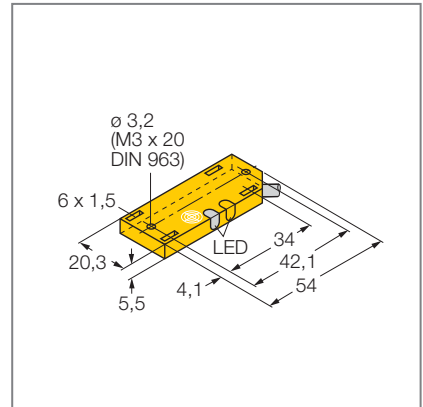
d331



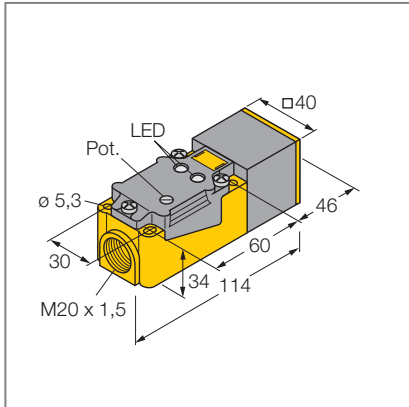
d332



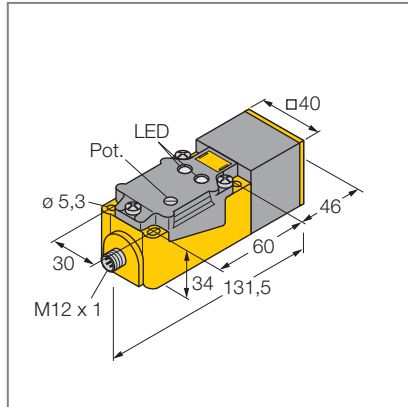
d333



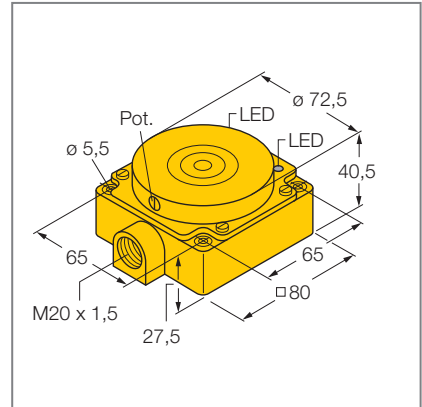
d334



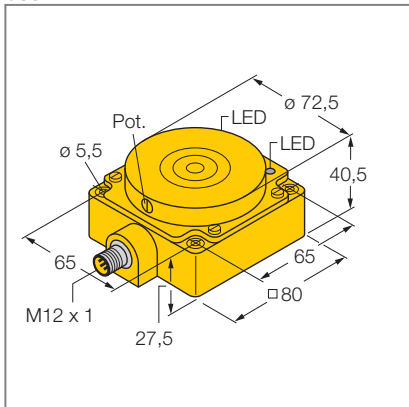
d335



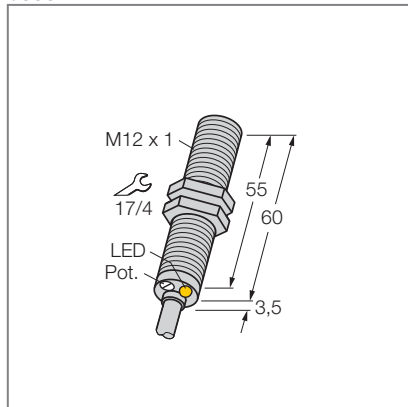
d336



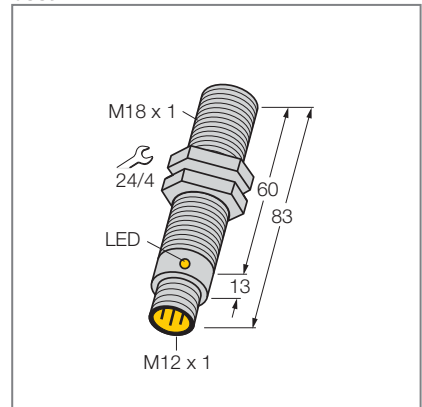
d337



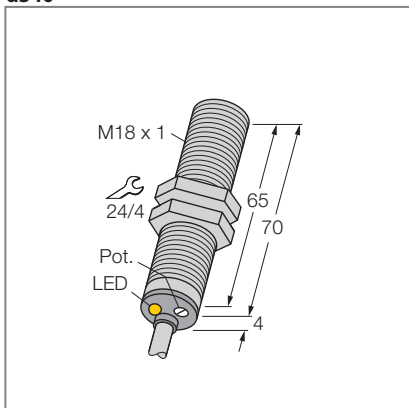
d338



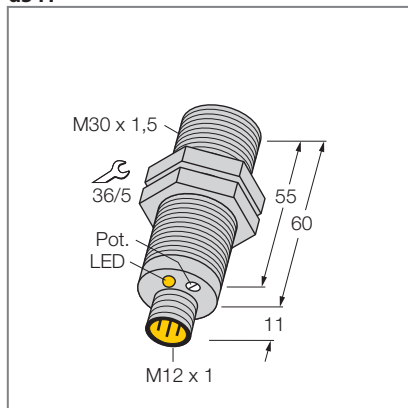
d339



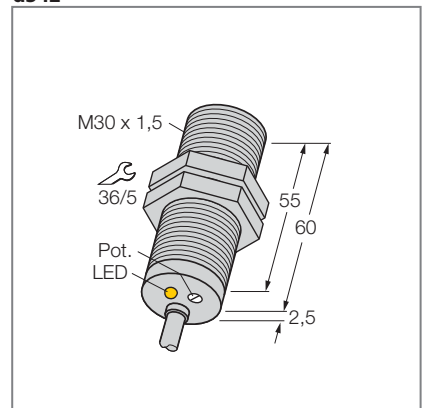
d340



d341

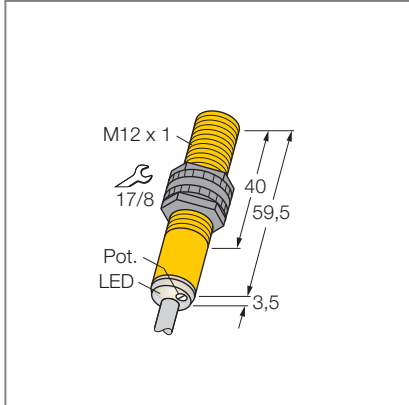


d342

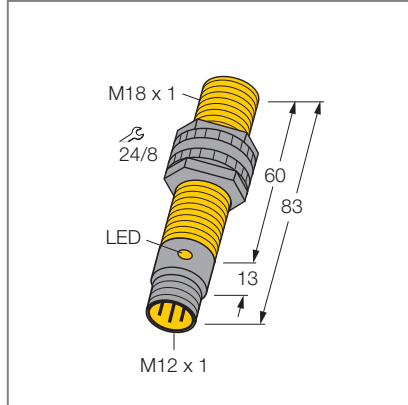


Dimension drawings

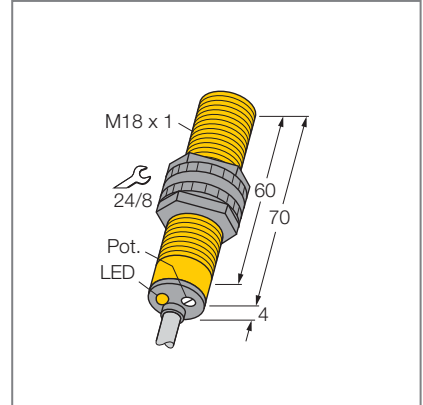
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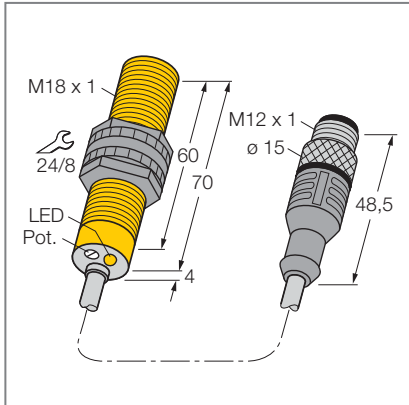
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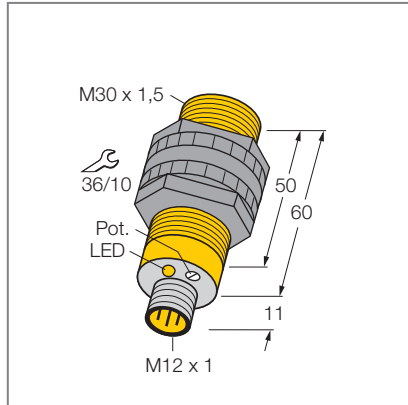
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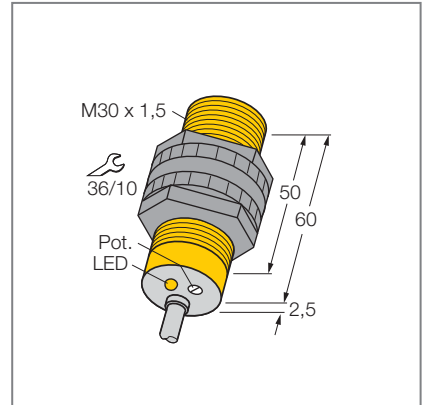
d346



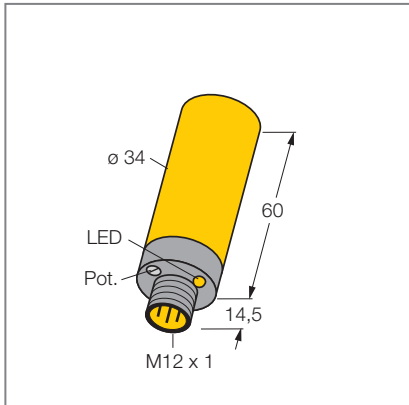
d347



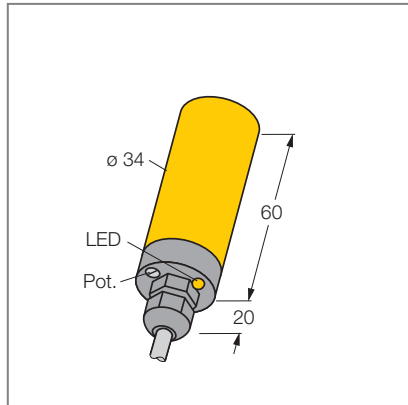
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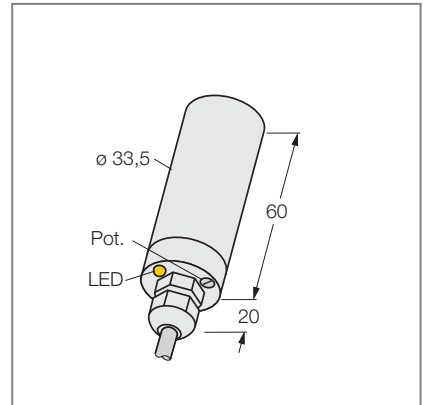
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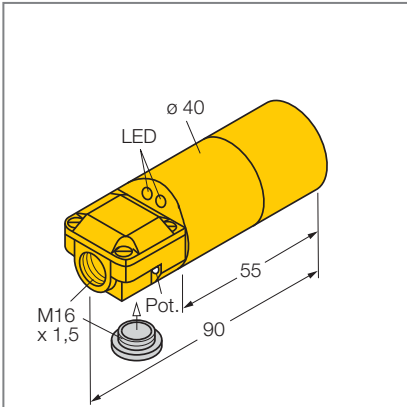
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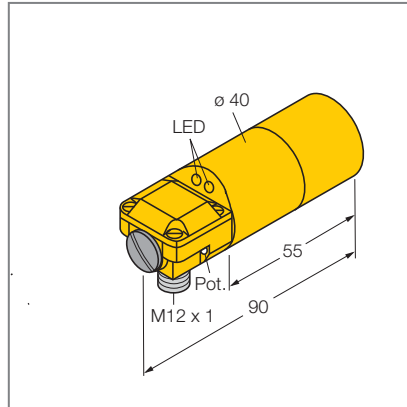
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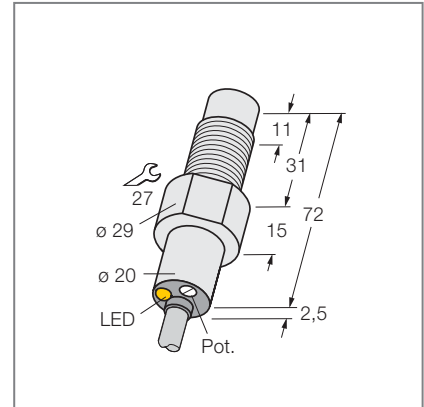
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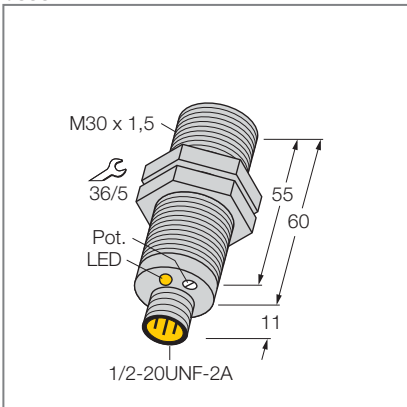
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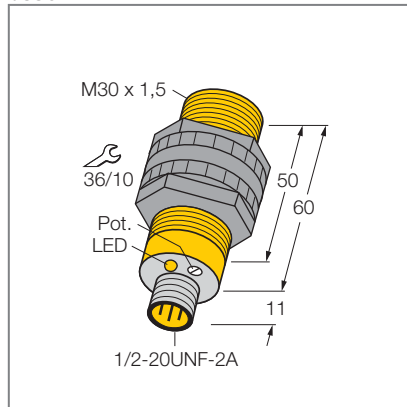
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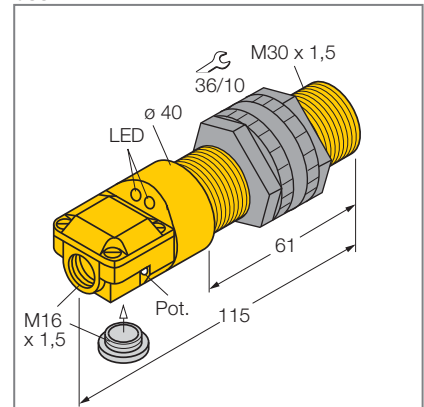
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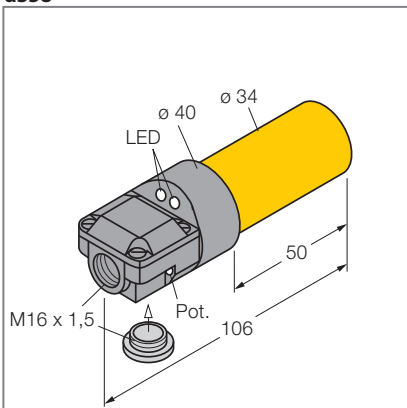
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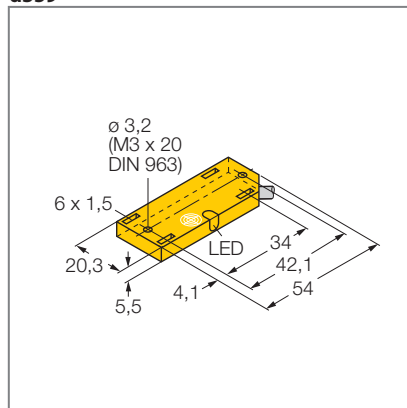
d357



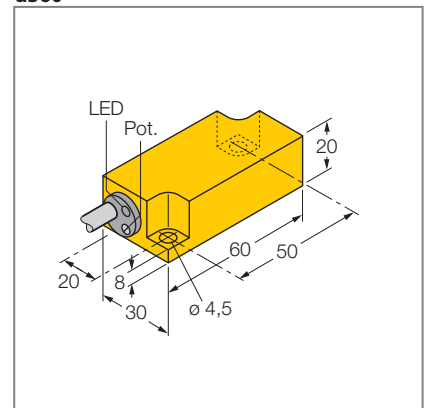
d358



d359

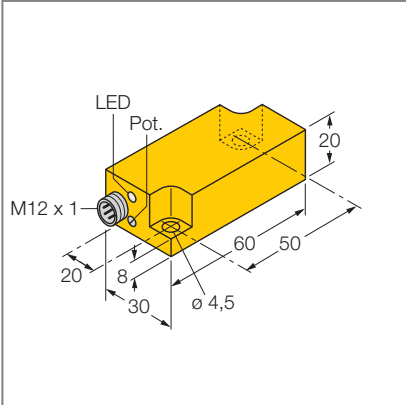


d360

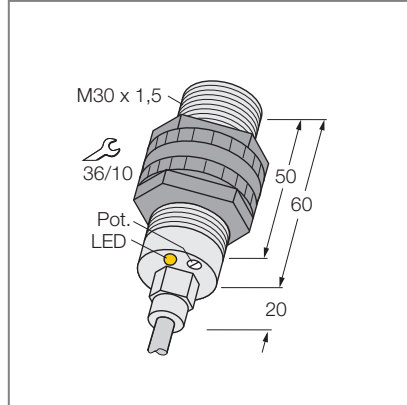


Dimension drawings

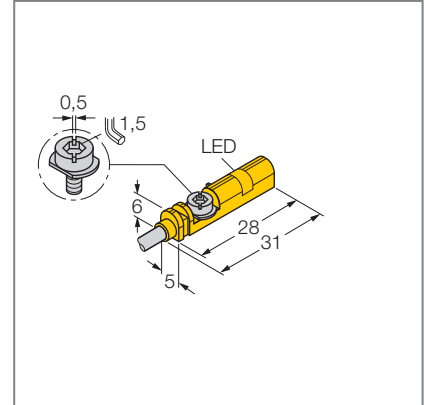
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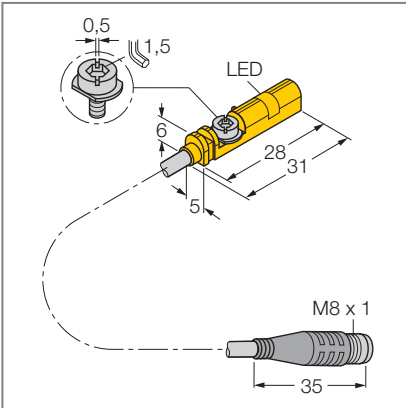
d362



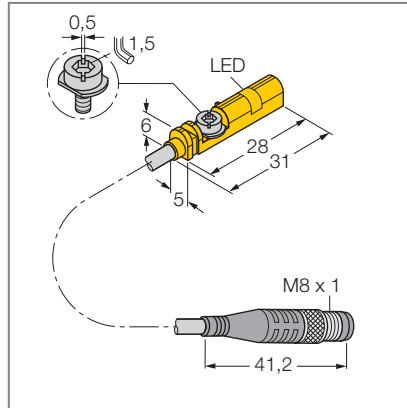
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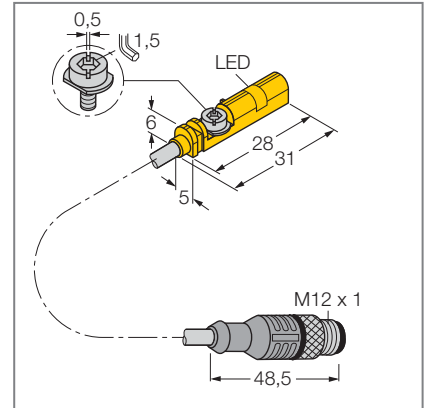
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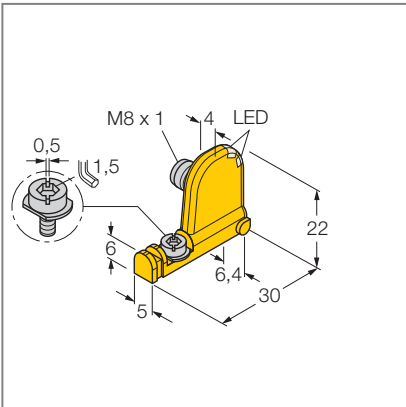
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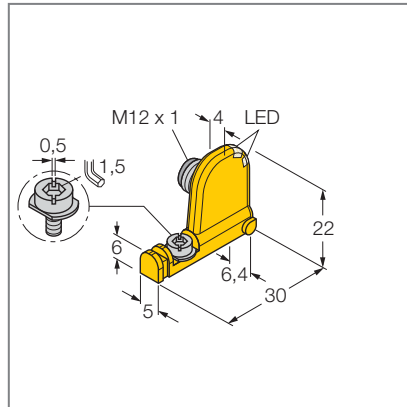
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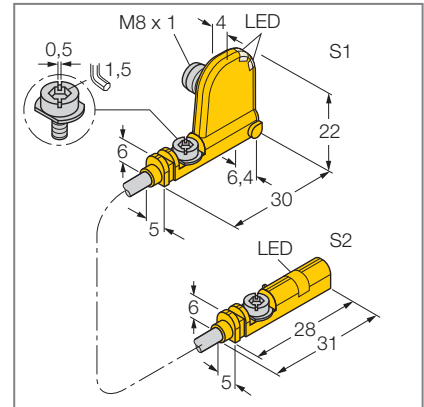
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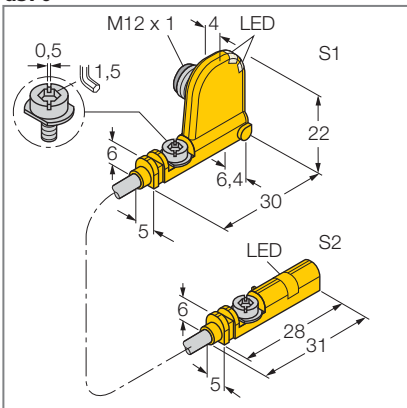
d368



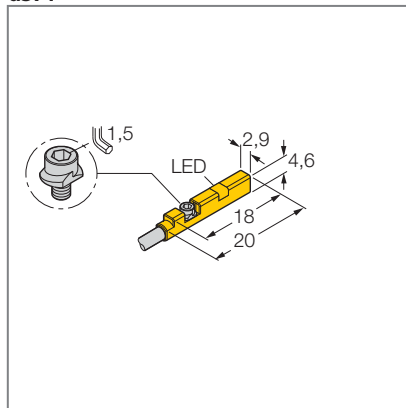
d369



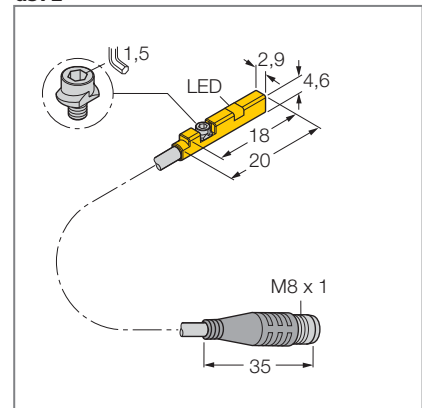
d370



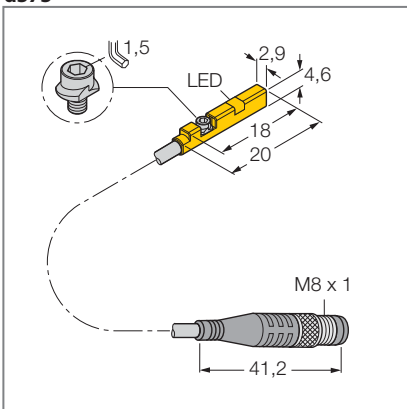
d371



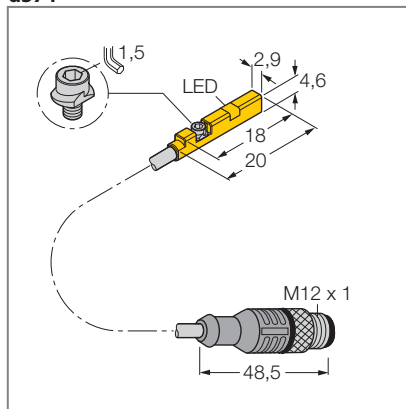
d372



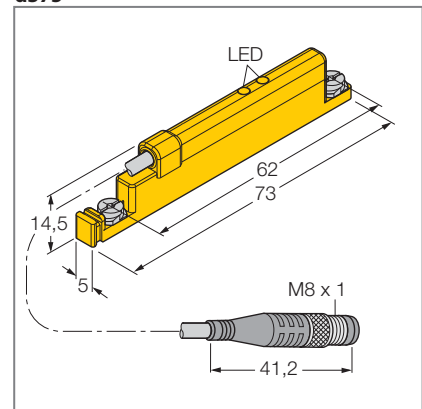
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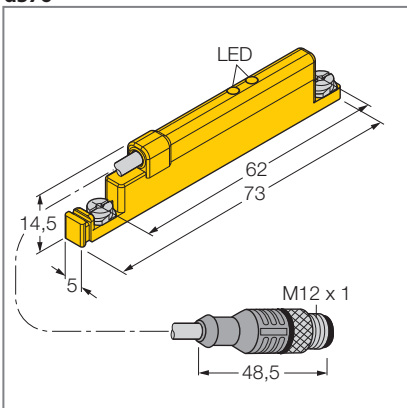
d374



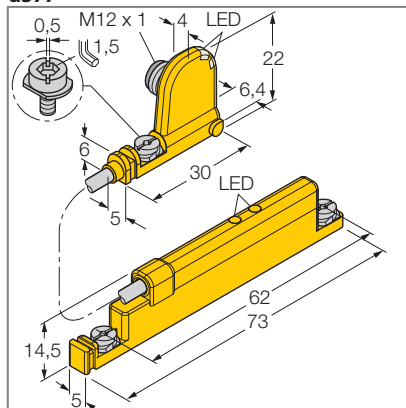
d375



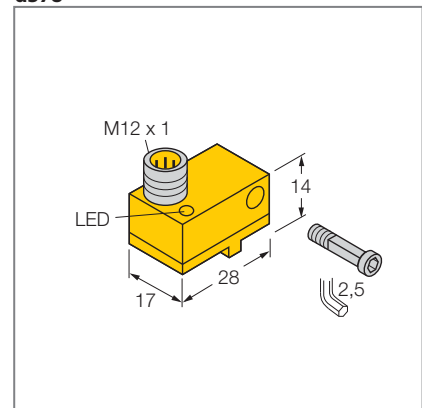
d376



d377

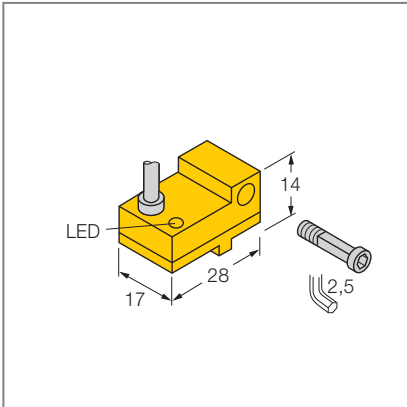


d378

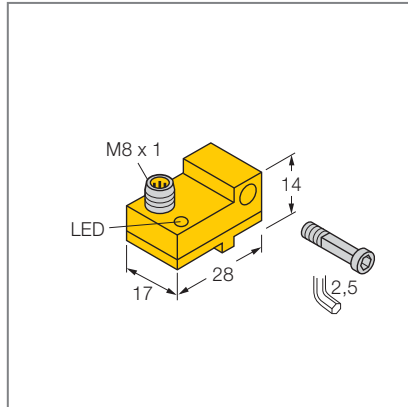


Dimension drawings

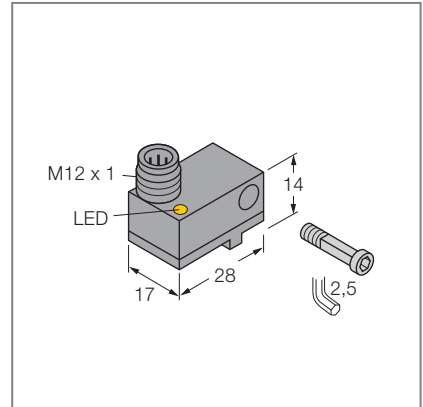
d379



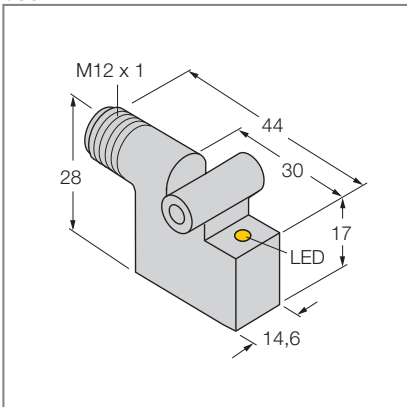
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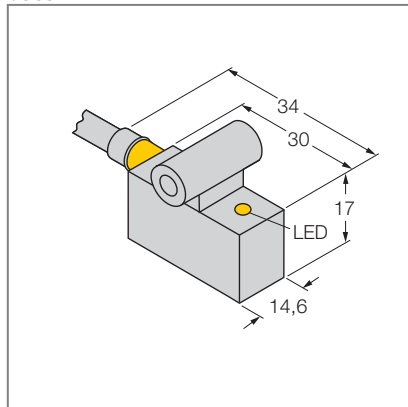
d381



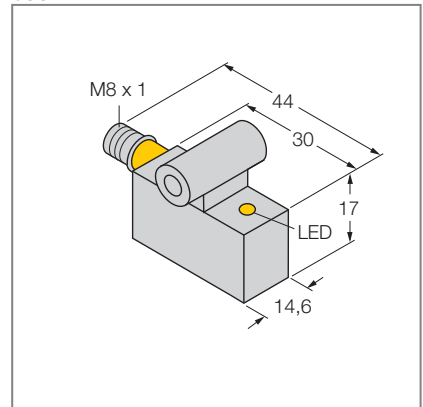
d382



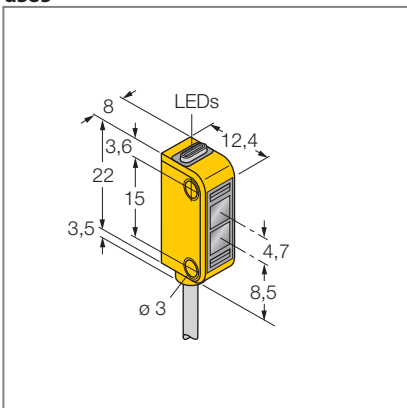
d383



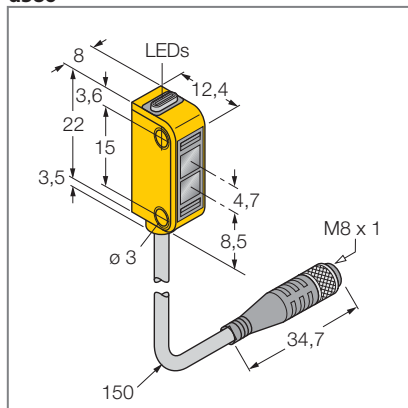
d384



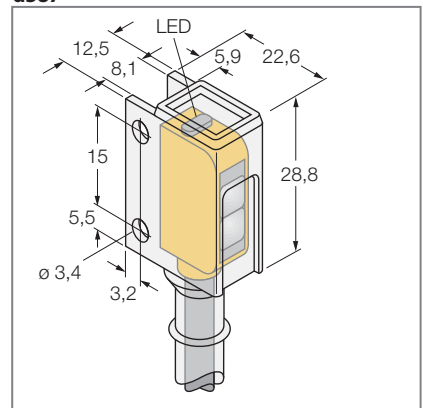
d385



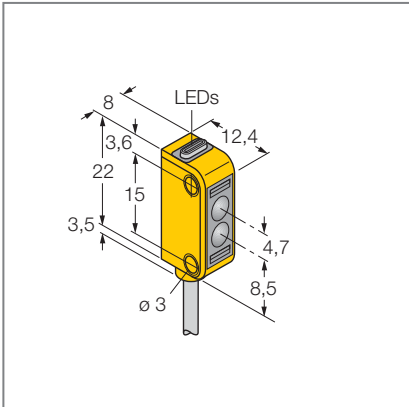
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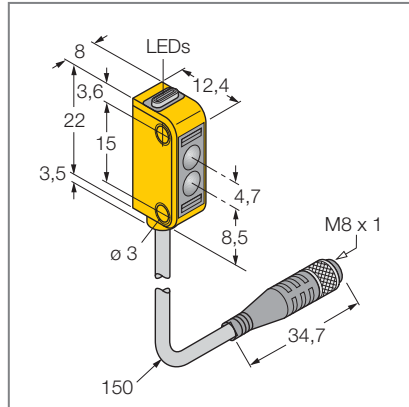
d387



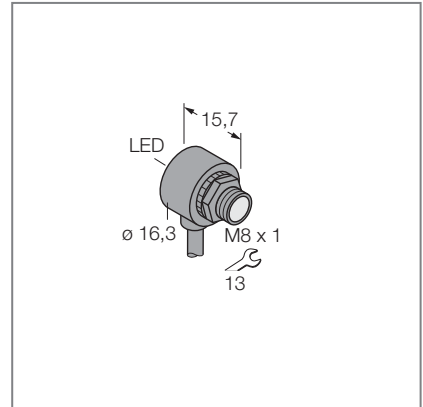
d388



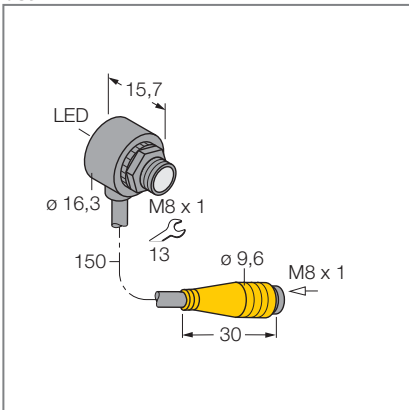
d389



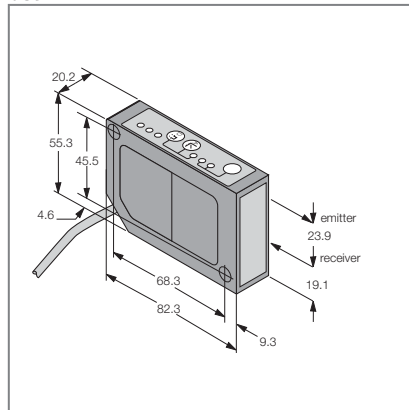
d390



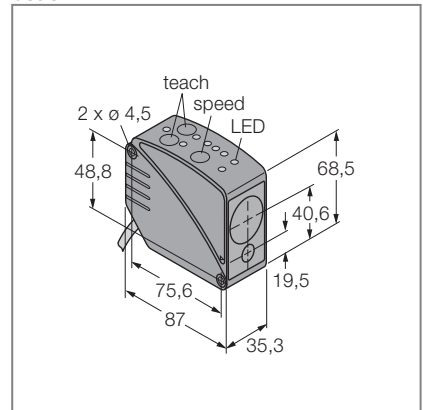
d391



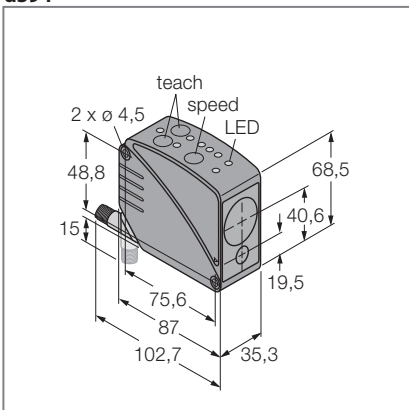
d392



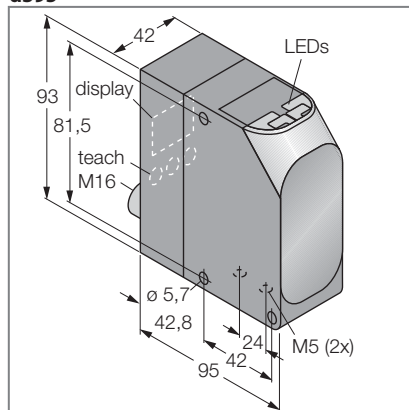
d393



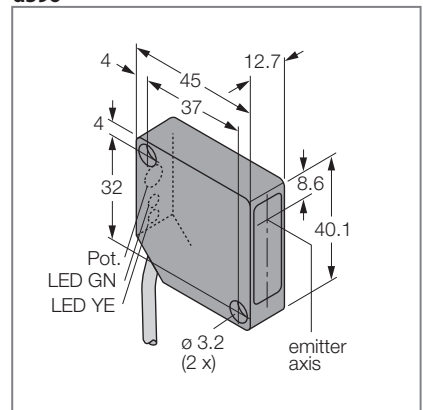
d394



d395

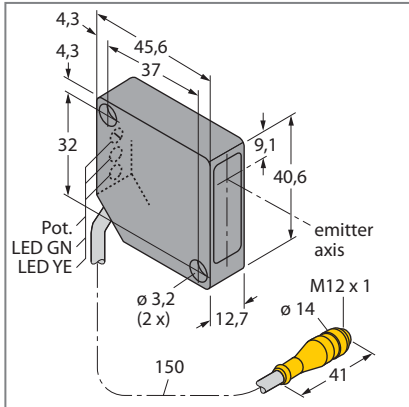


d396

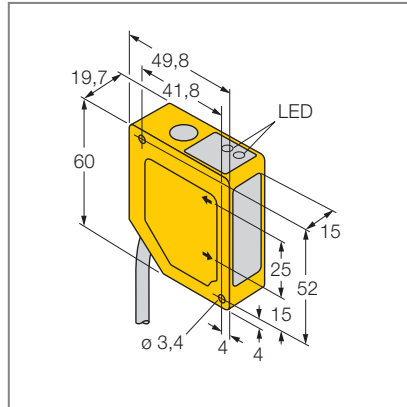


Dimension drawings

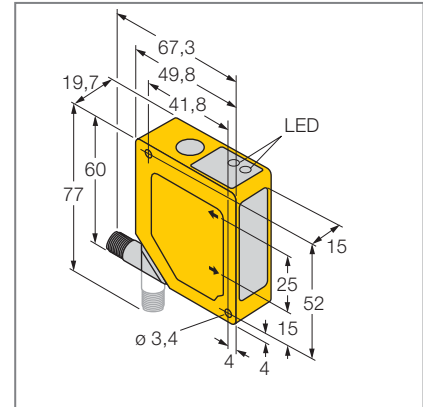
d397



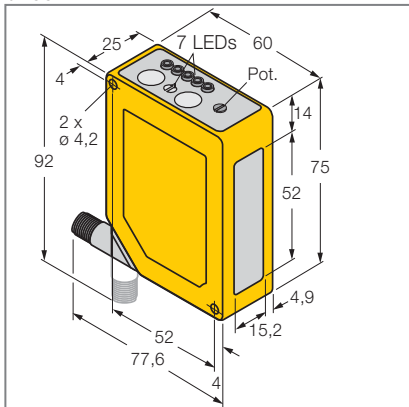
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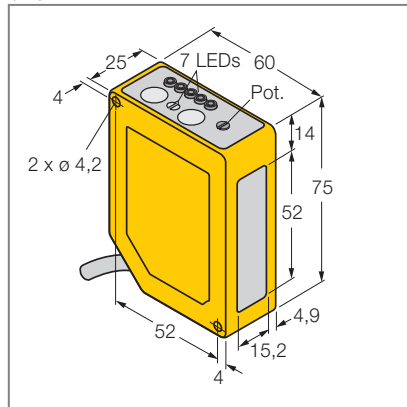
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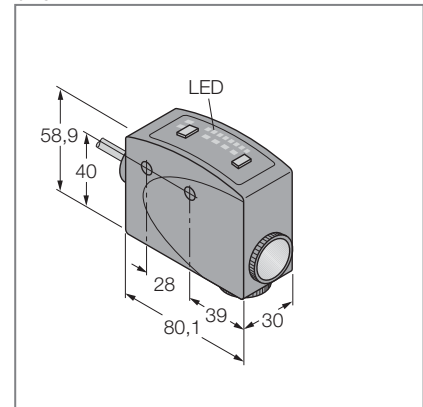
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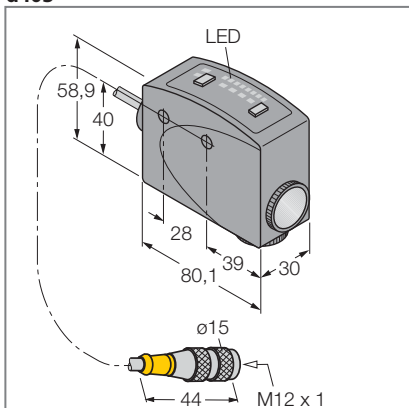
d401



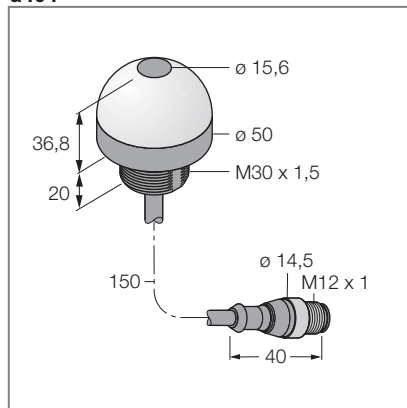
d402



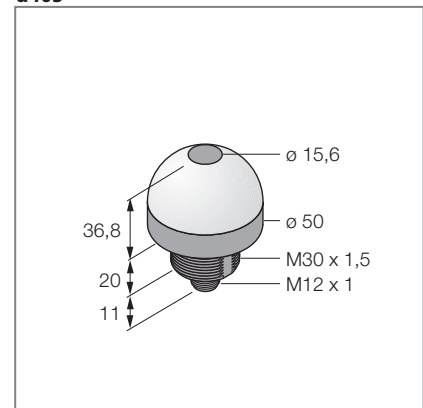
d403



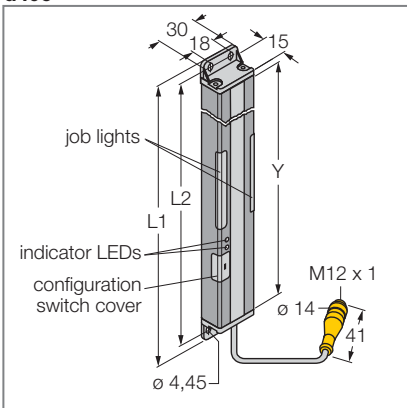
d404



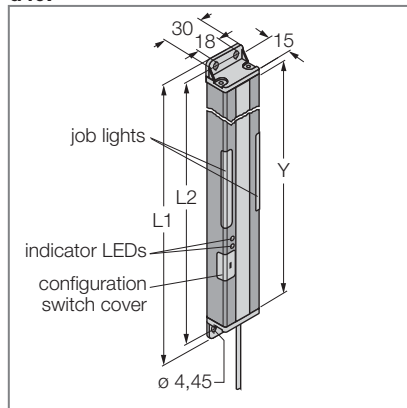
d405



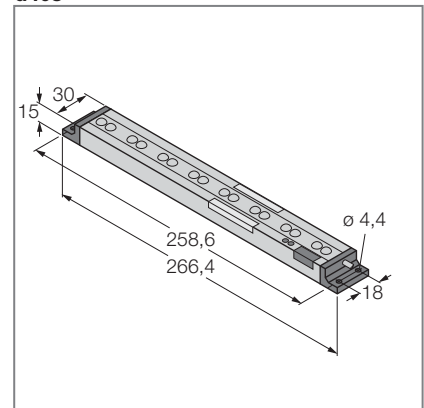
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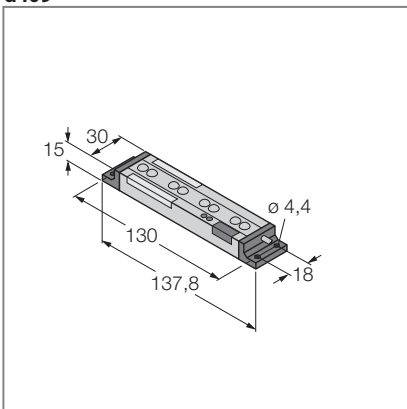
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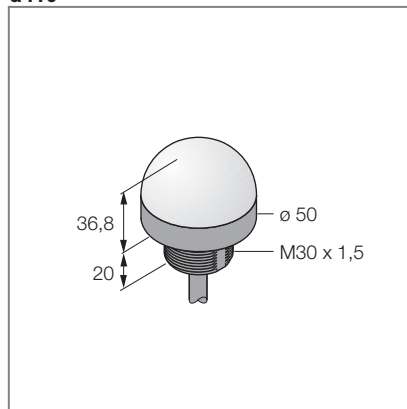
d408



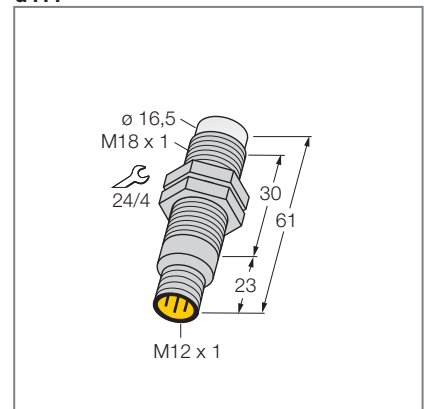
d409



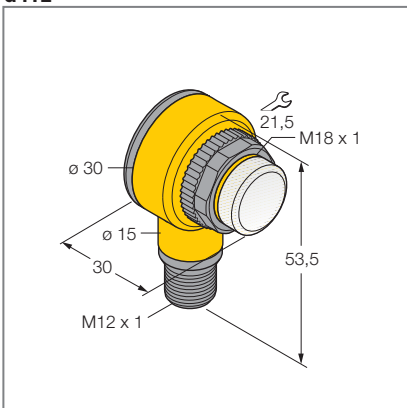
d410



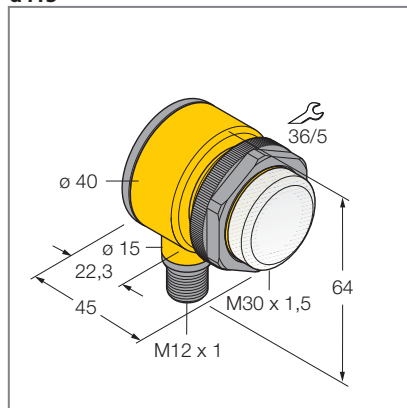
d411



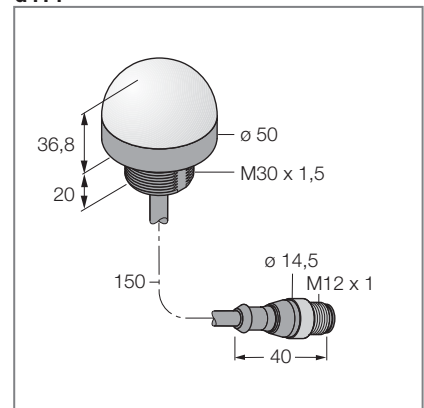
d412



d413

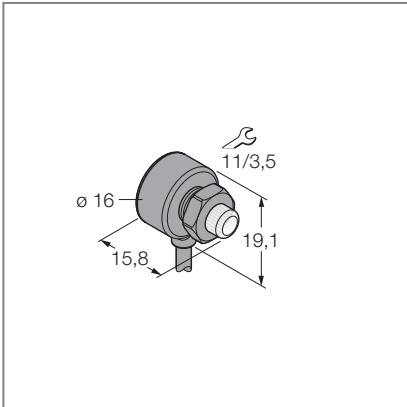


d414

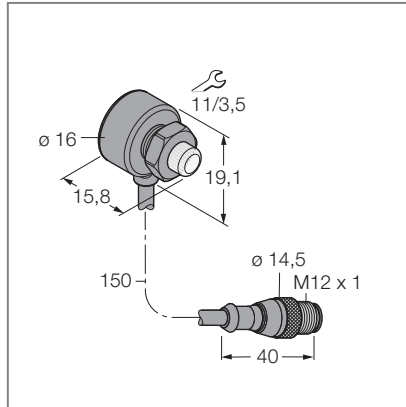


Dimension drawings

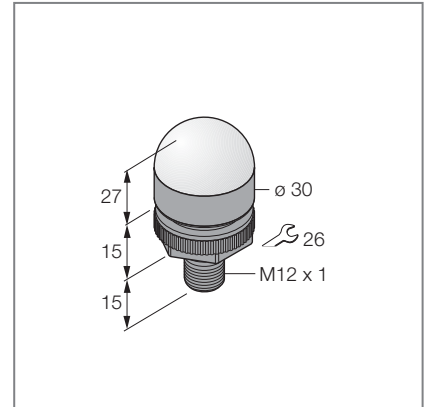
d415



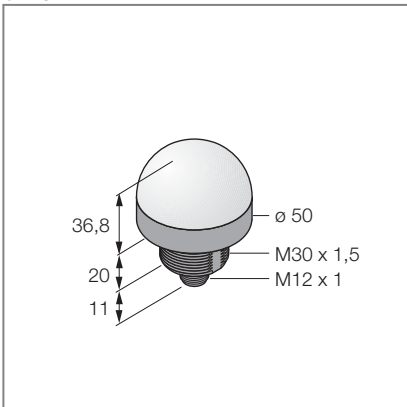
d416



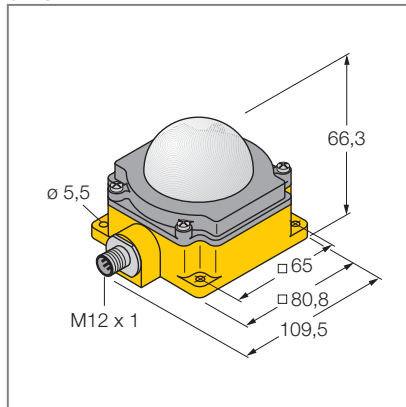
d417



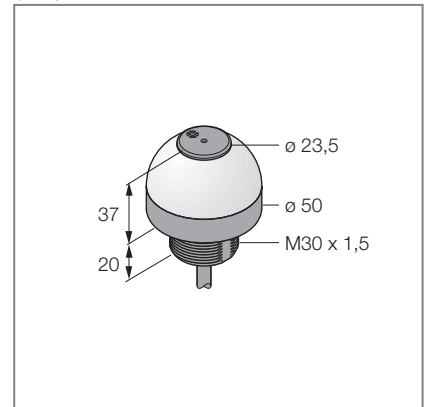
d418



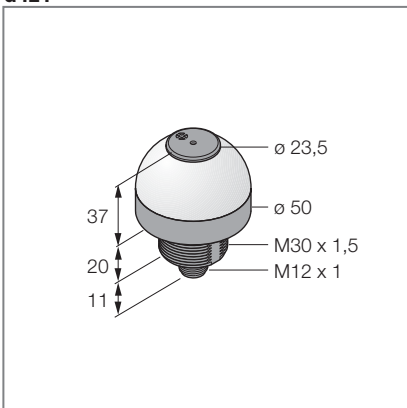
d419



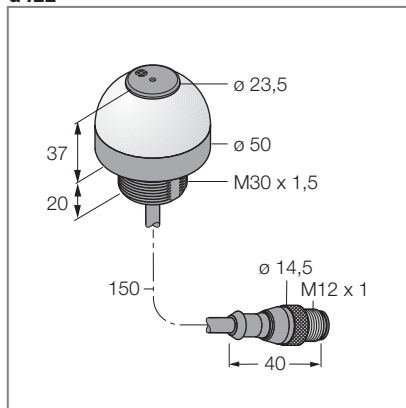
d420



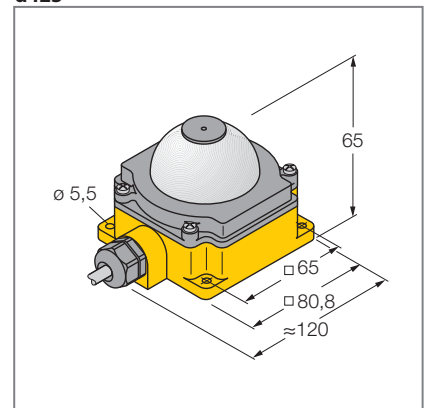
d421



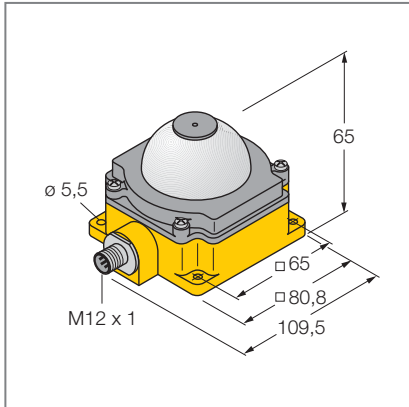
d422



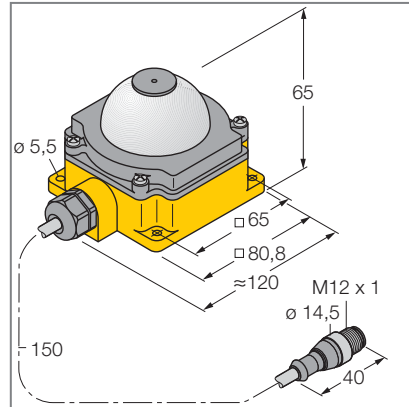
d423



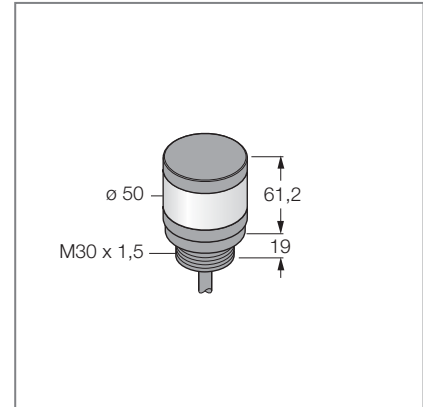
d424



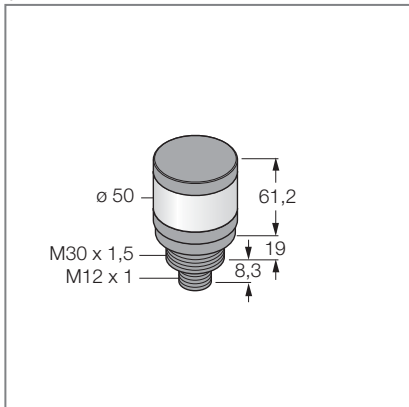
d425



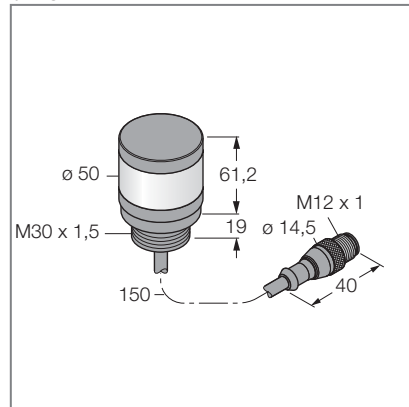
d426



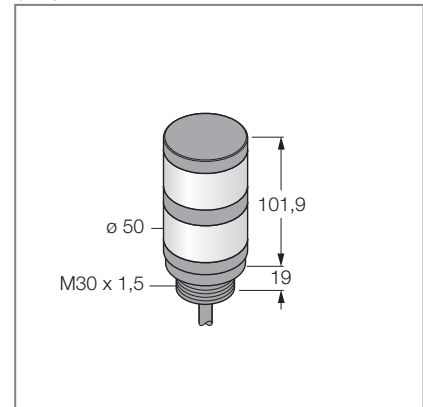
d427



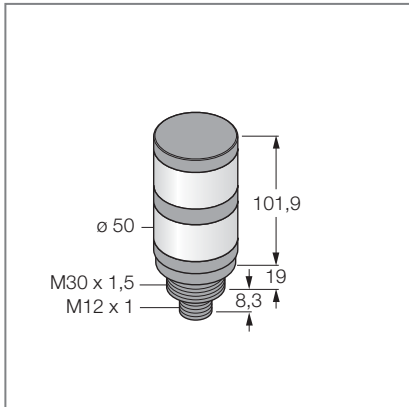
d428



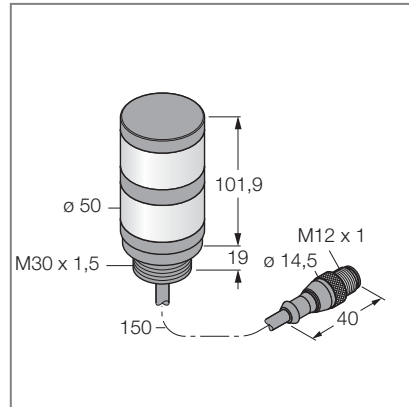
d429



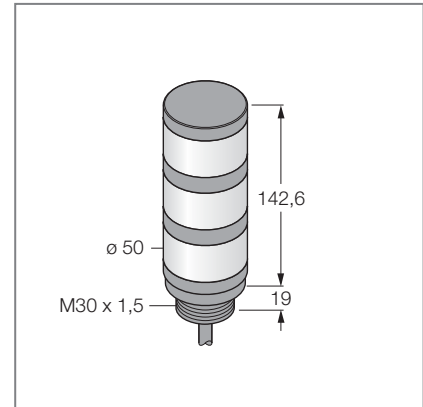
d430



d431

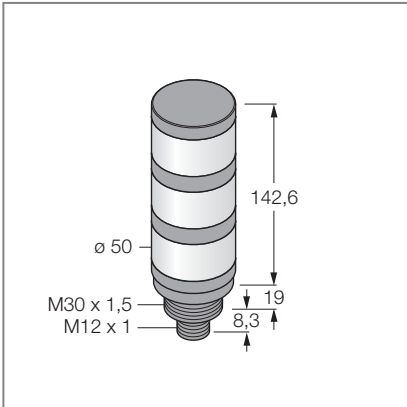


d432

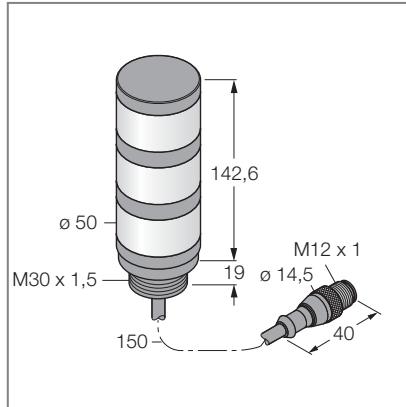


Dimension drawings

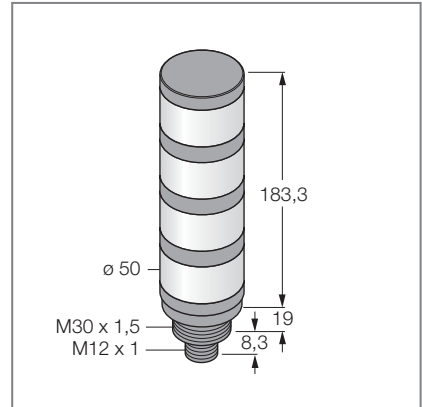
d433



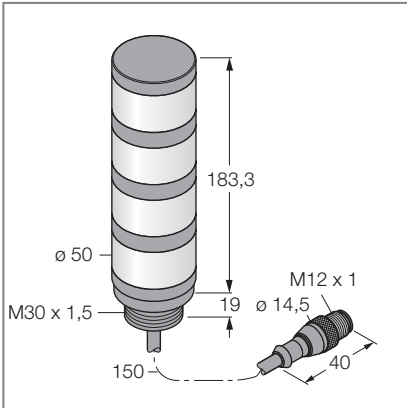
d434



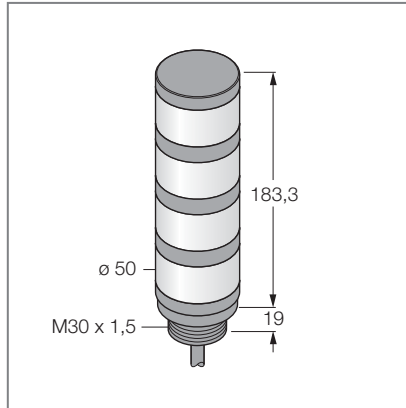
d435



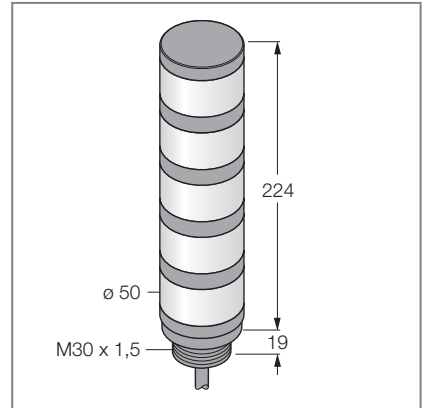
d436



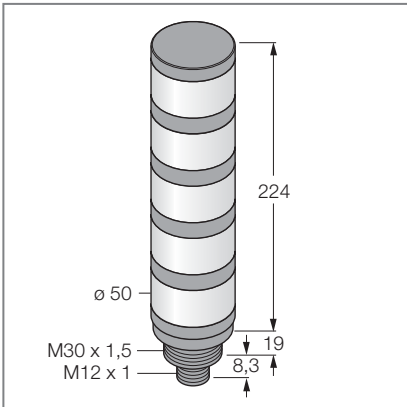
d437



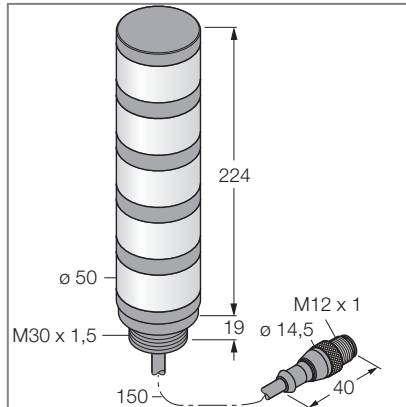
d438



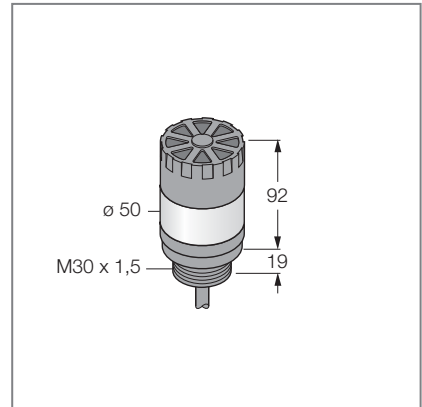
d439



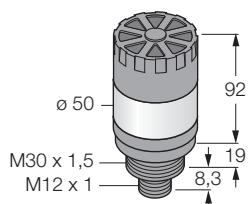
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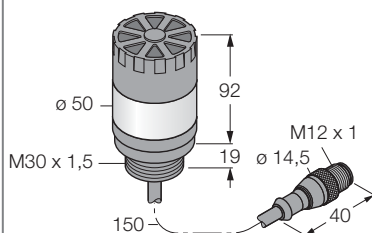
d441



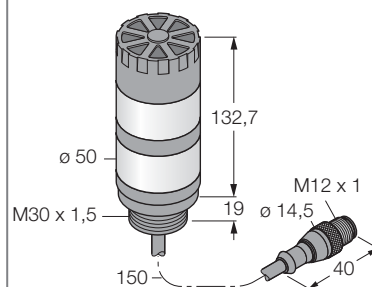
d442



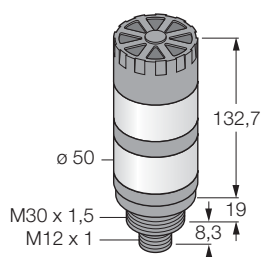
d443



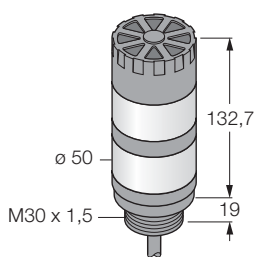
d444



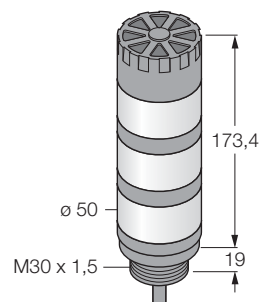
d445



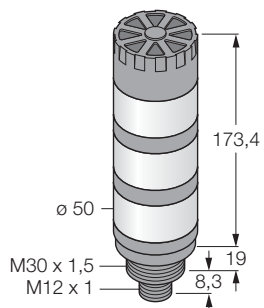
d446



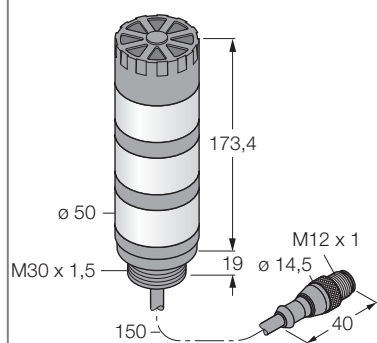
d447



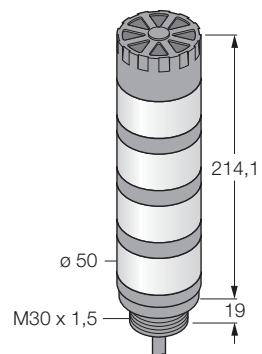
d448



d449

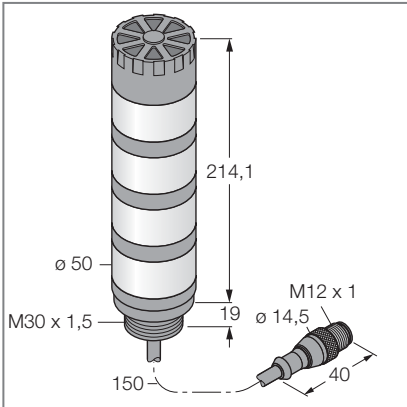


d450

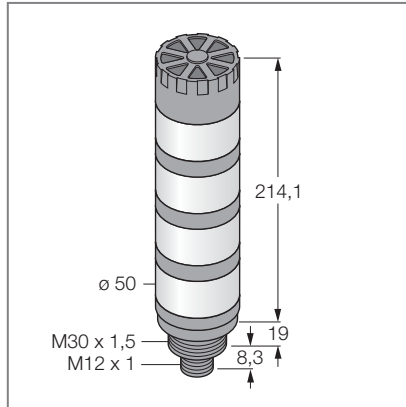


Dimension drawings

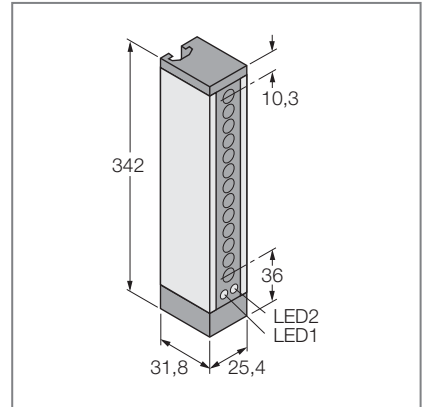
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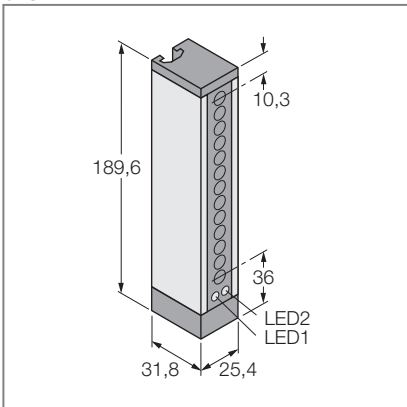
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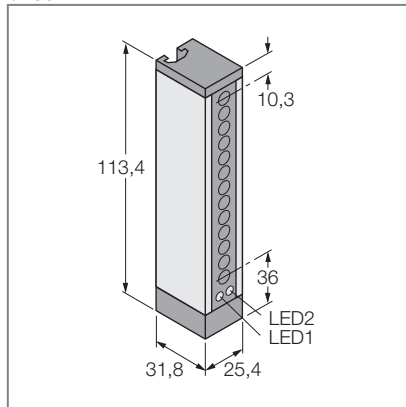
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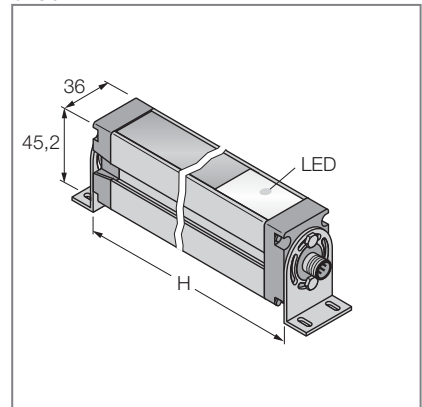
d454



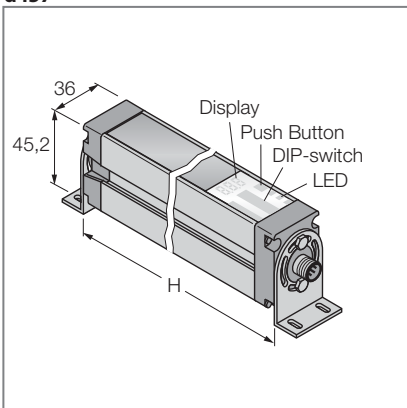
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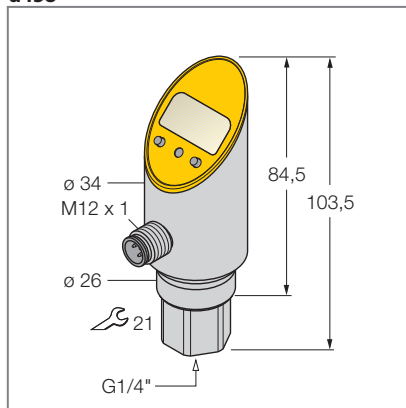
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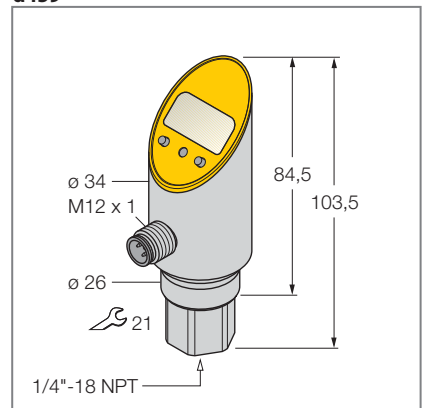
d457



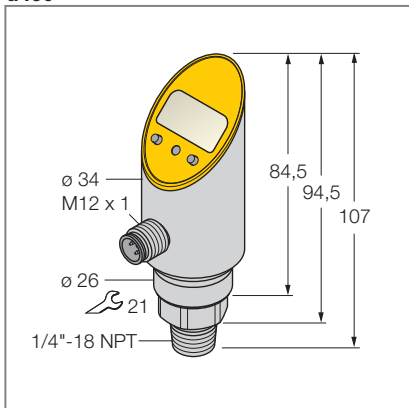
d458



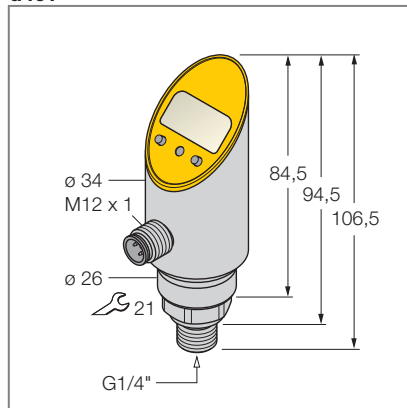
d459



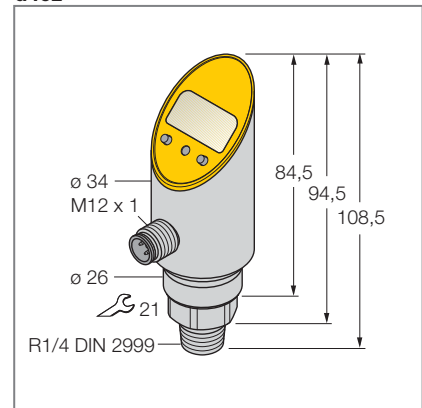
d460



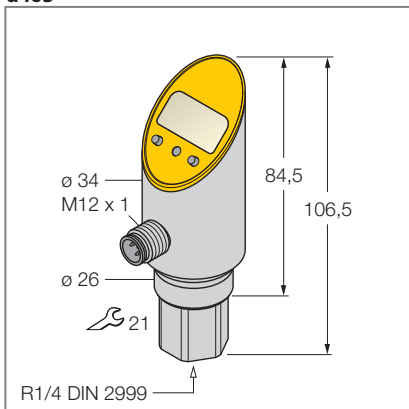
d461



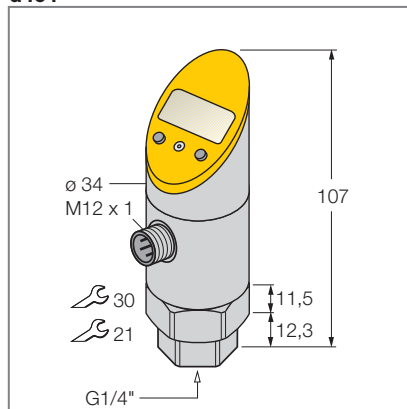
d462



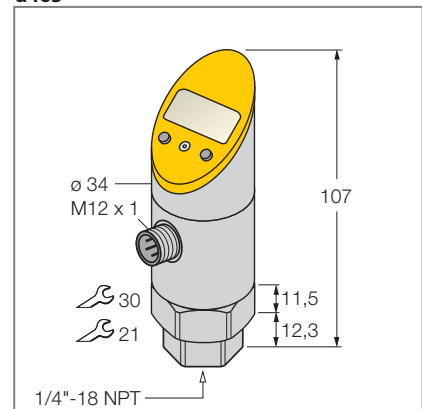
d463



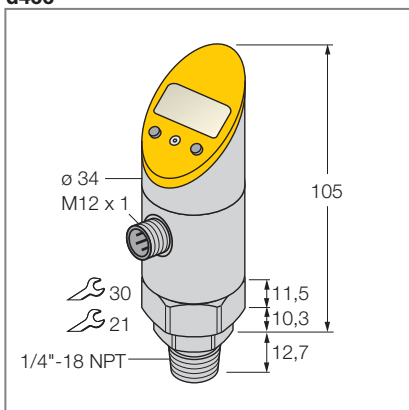
d464



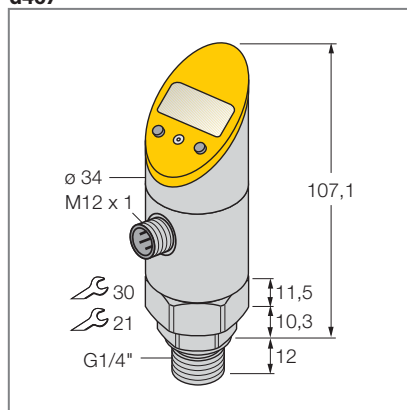
d465



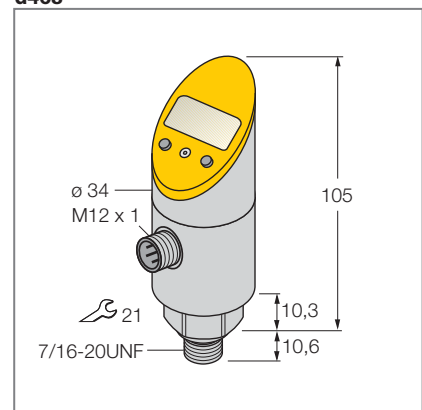
d466



d467

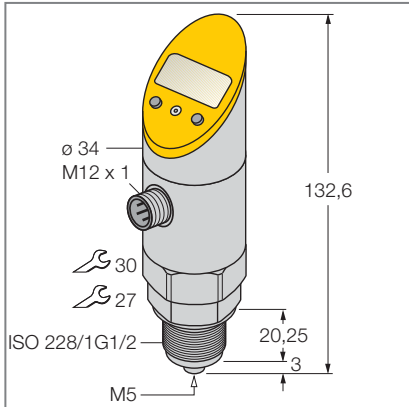


d468

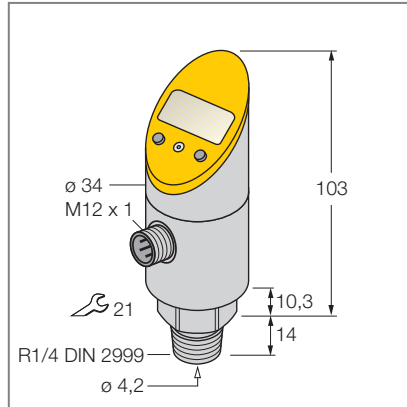


Dimension drawings

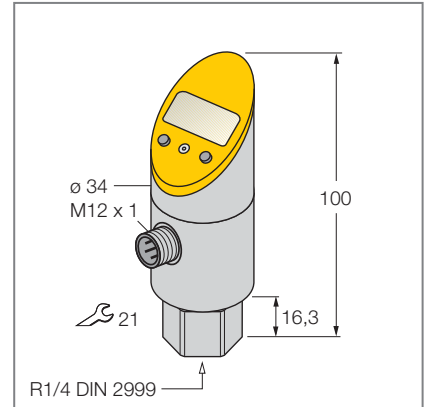
d469



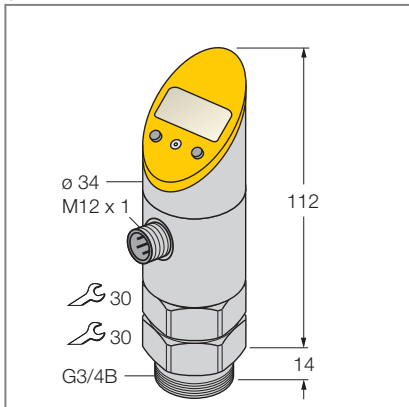
d470



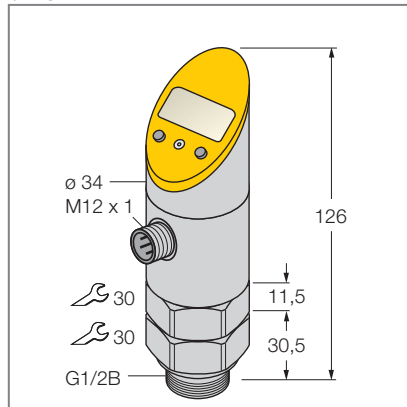
d471



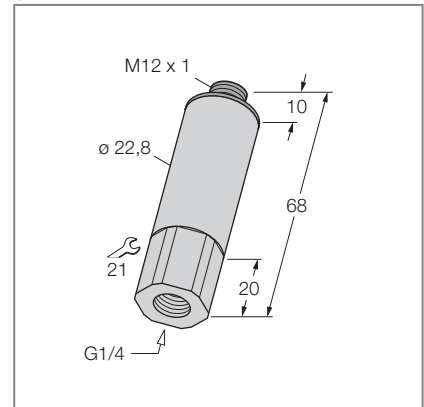
d472



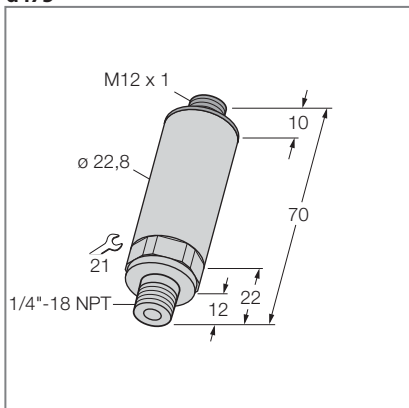
d473



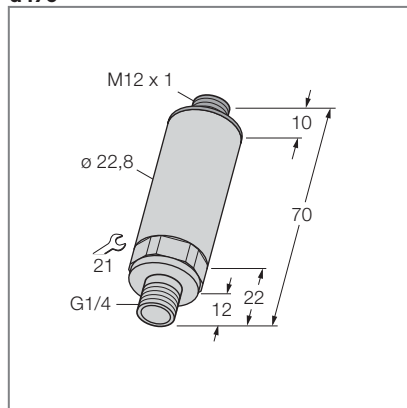
d474



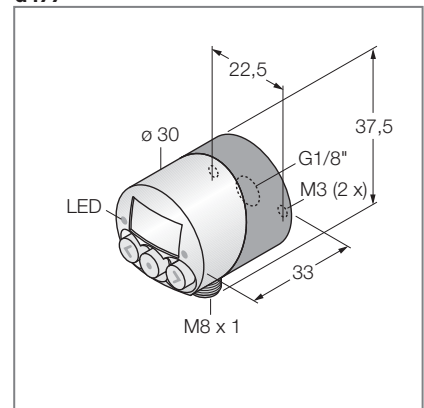
d475



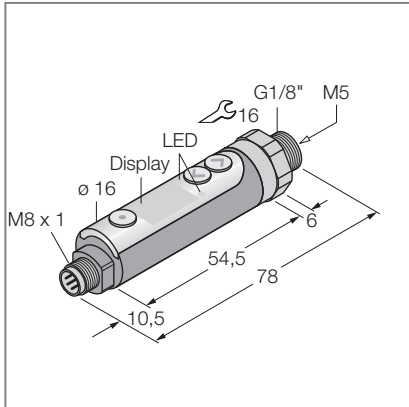
d476



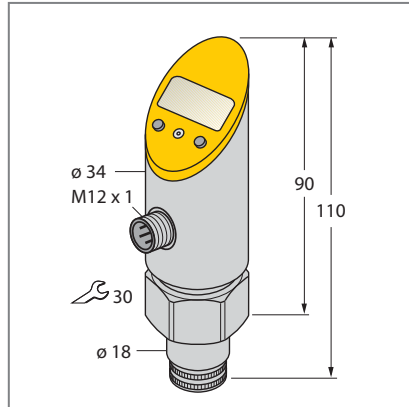
d477



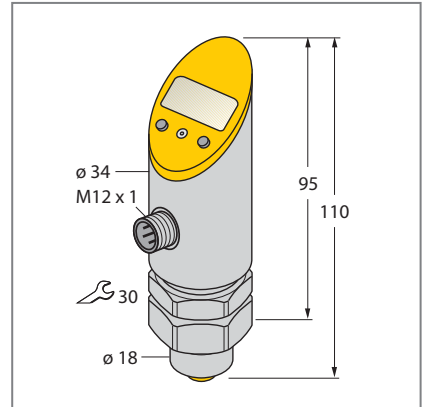
d478



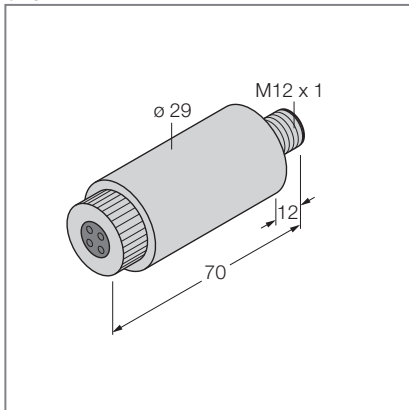
d479



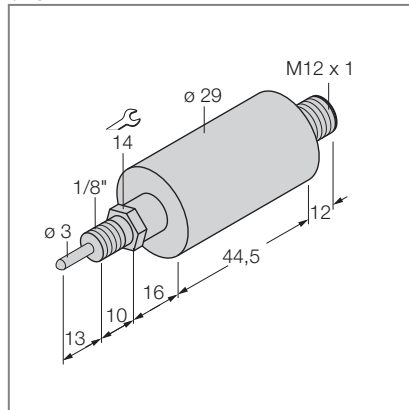
d480



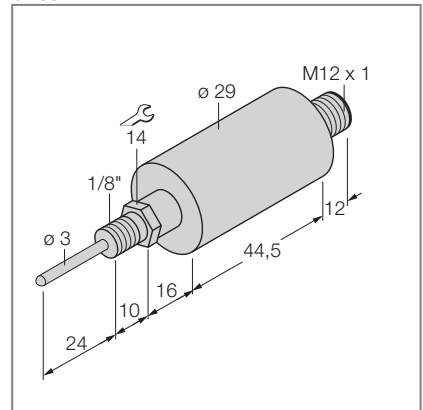
d481



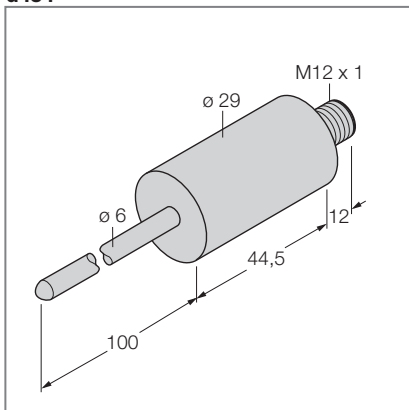
d482



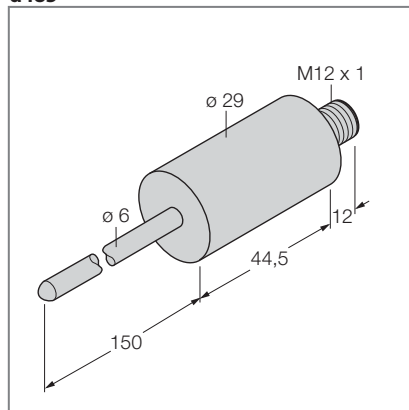
d483



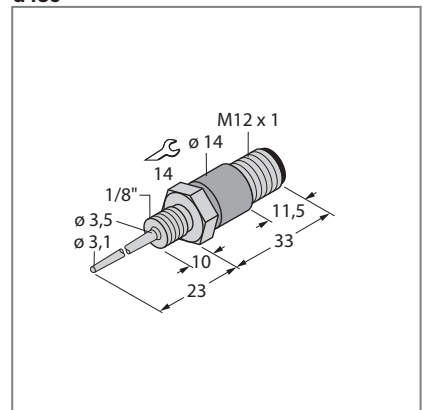
d484



d485

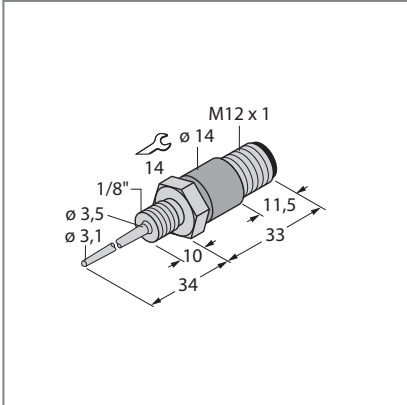


d486

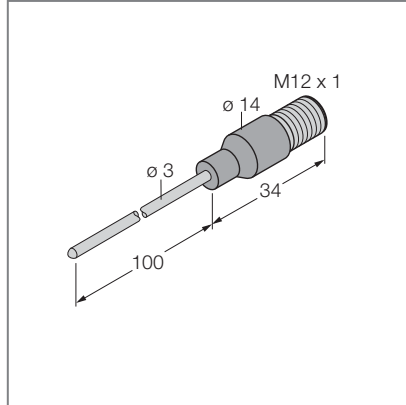


Dimension drawings

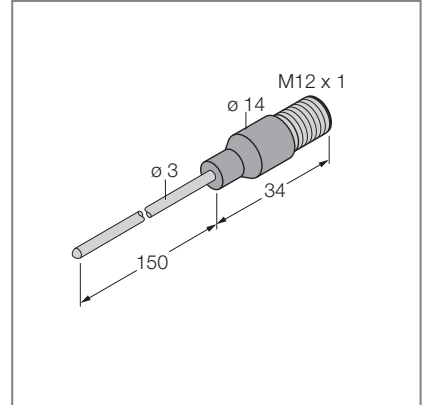
d487



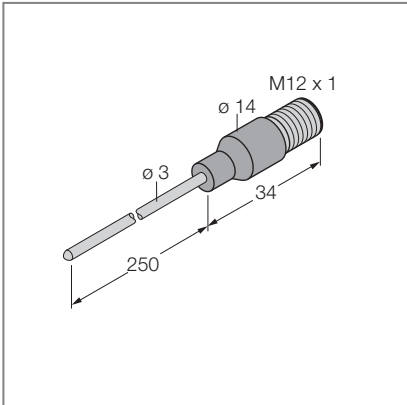
d488



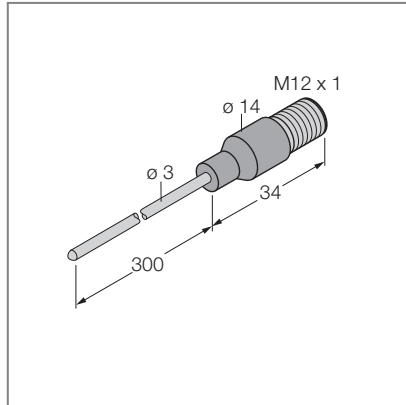
d489



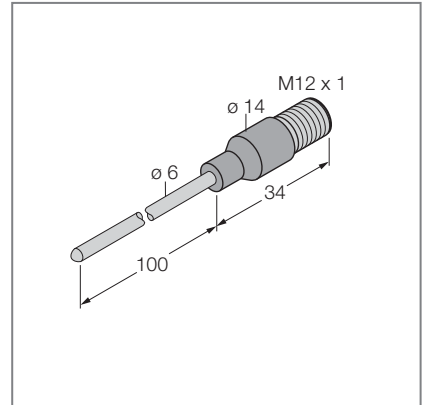
d490



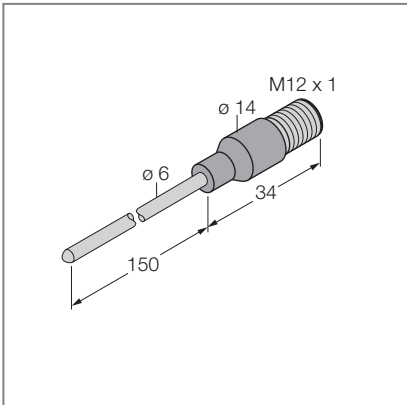
d491



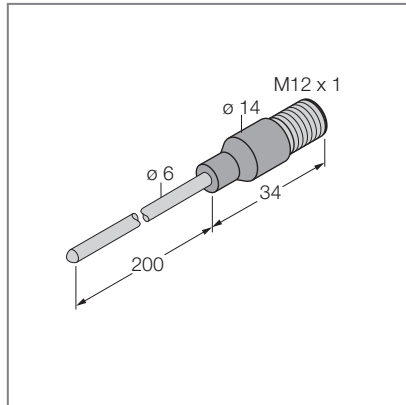
d492



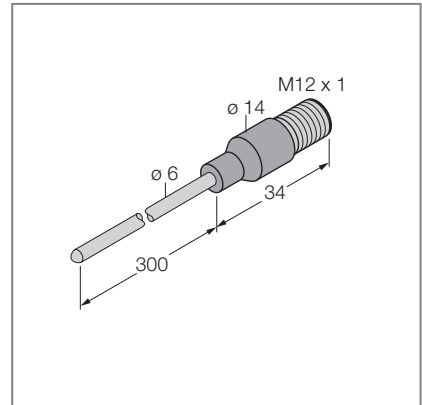
d493



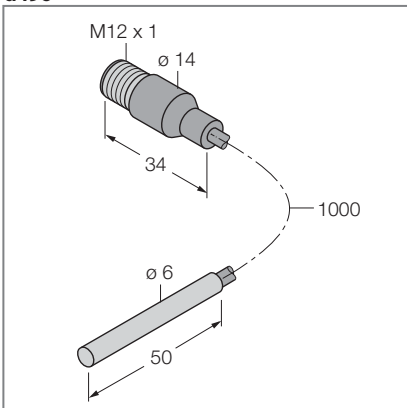
d494



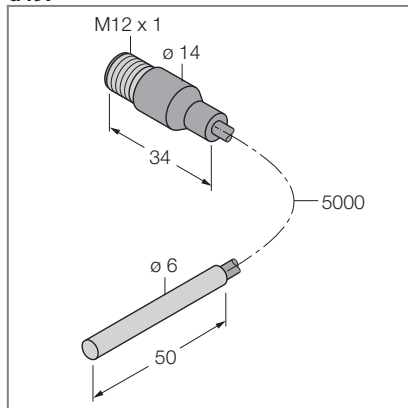
d495



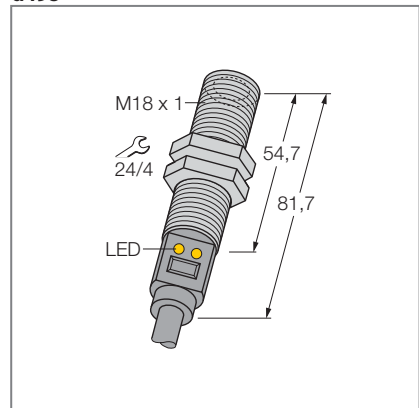
d496



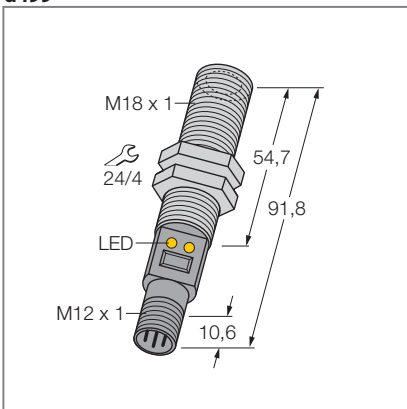
d497



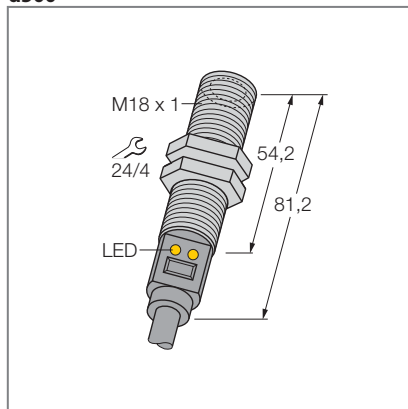
d498



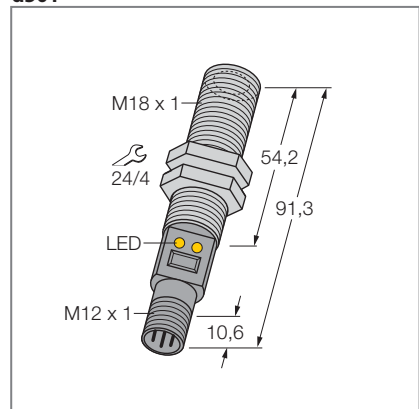
d499



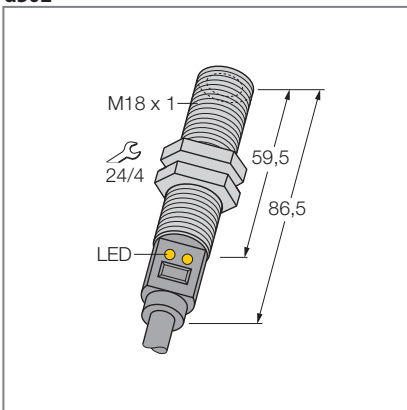
d500



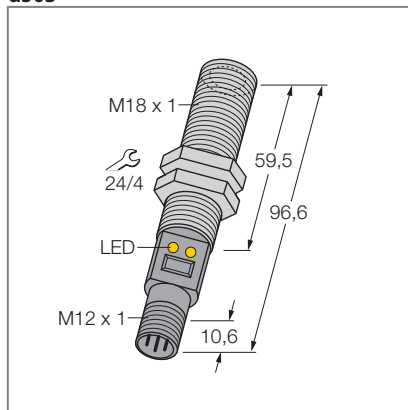
d501



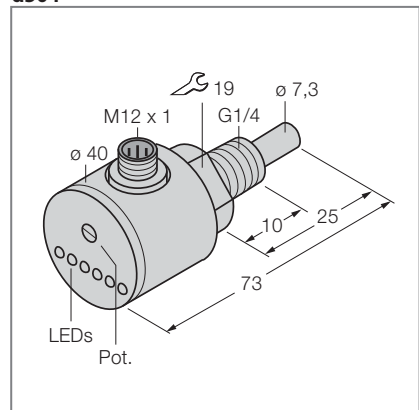
d502



d503

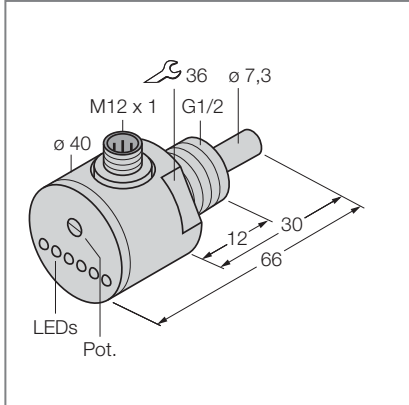


d504

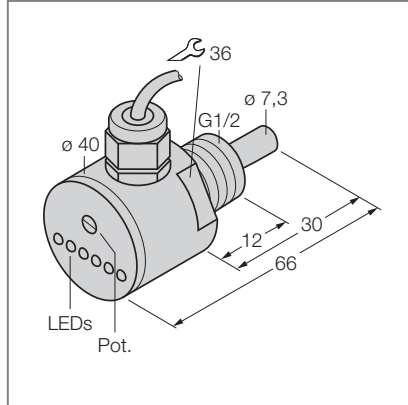


Dimension drawings

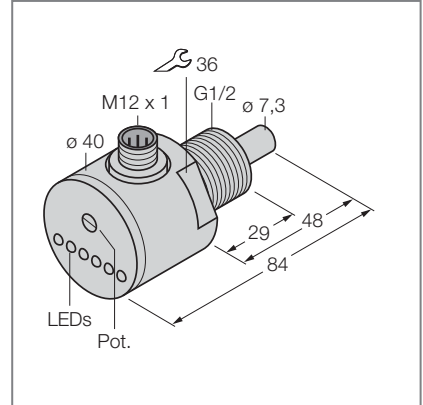
d505



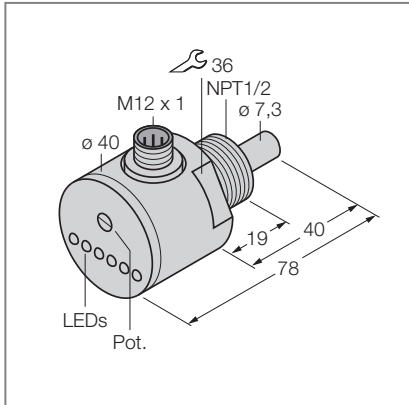
d506



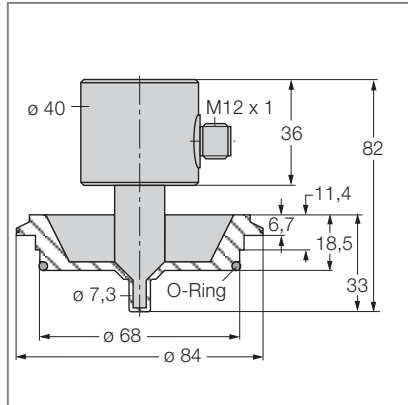
d507



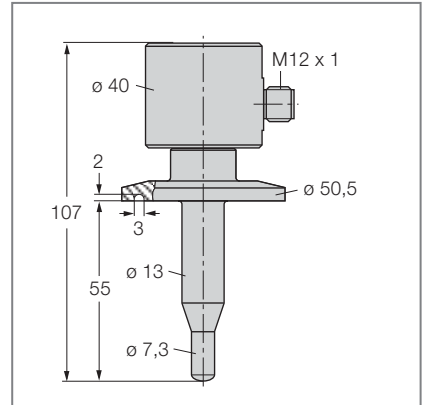
d508



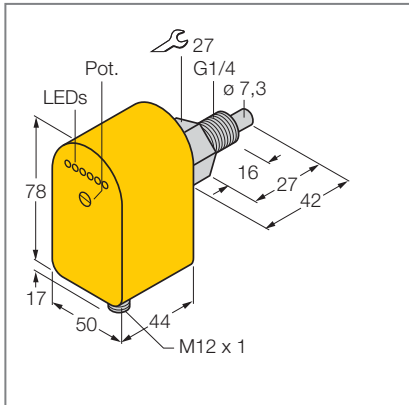
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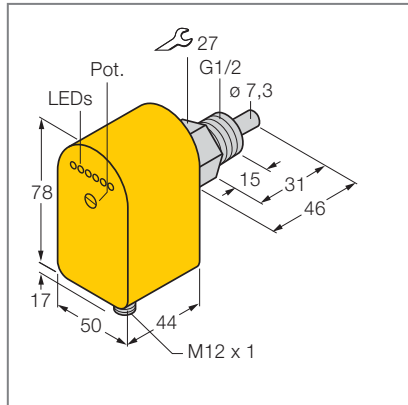
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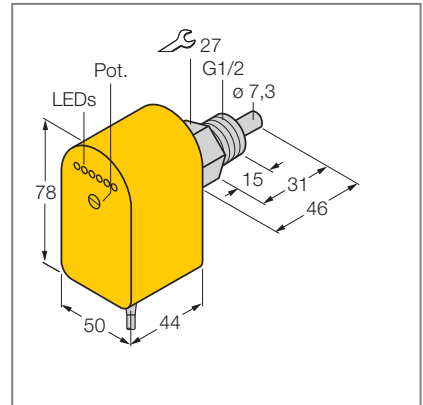
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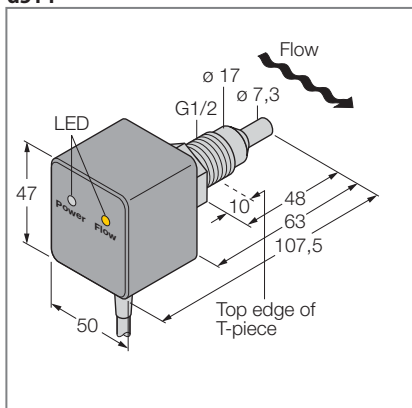
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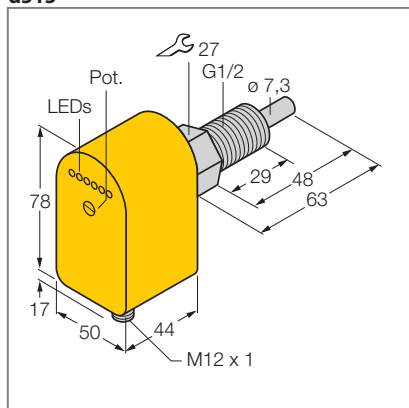
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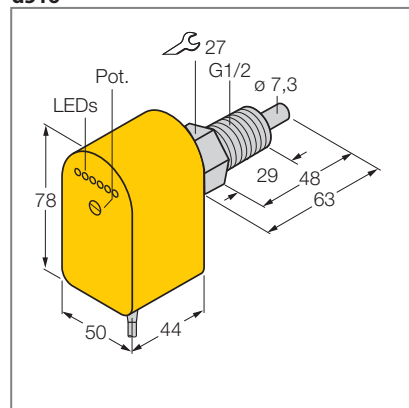
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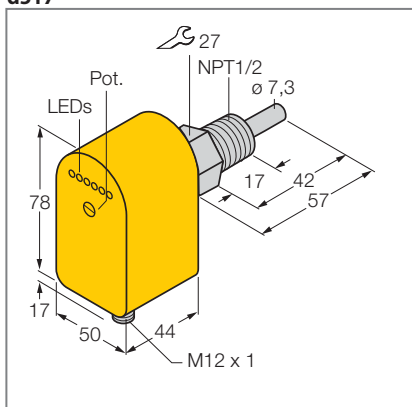
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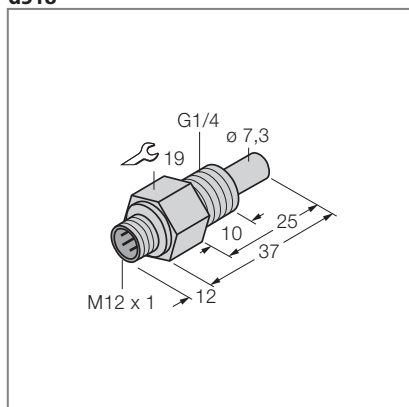
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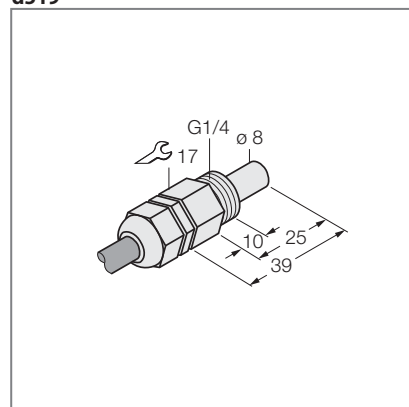
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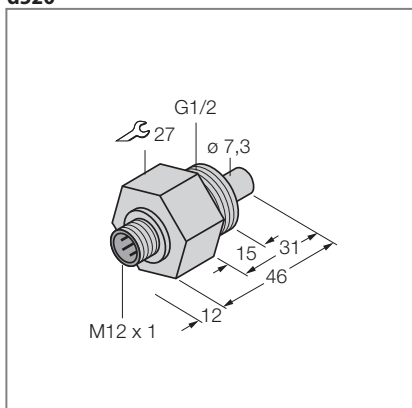
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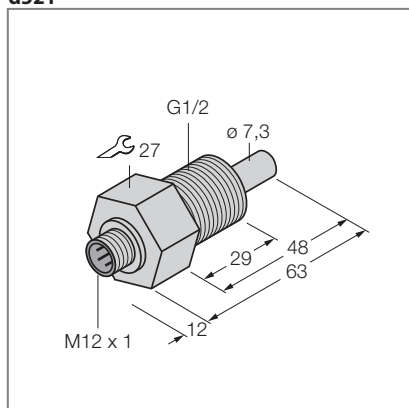
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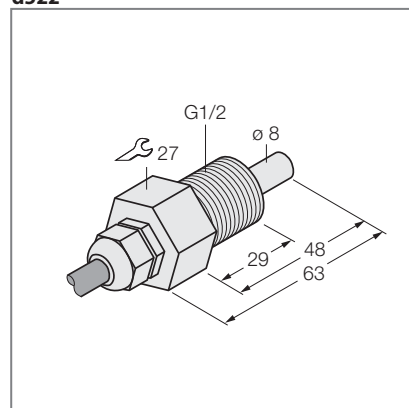
d520



d521

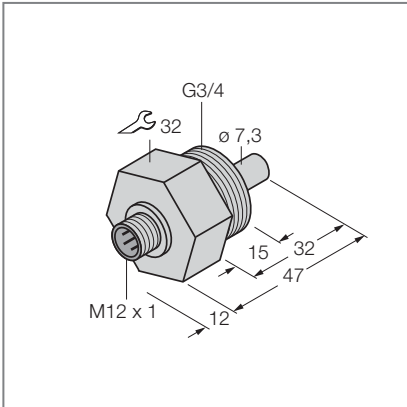


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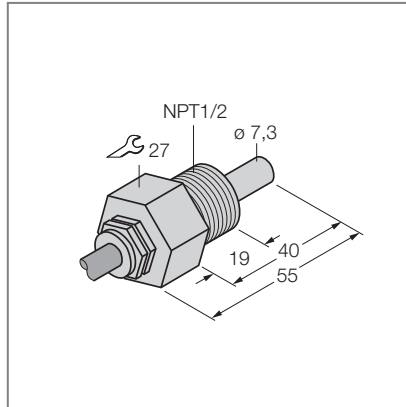


Dimension drawings

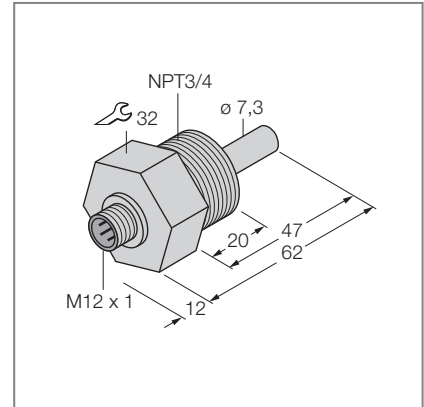
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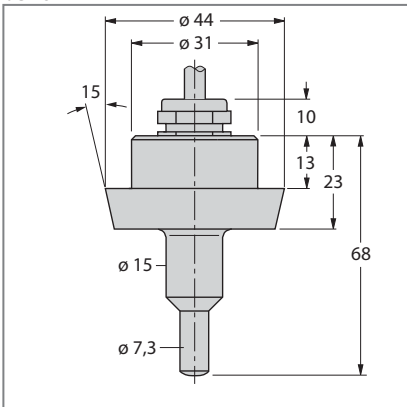
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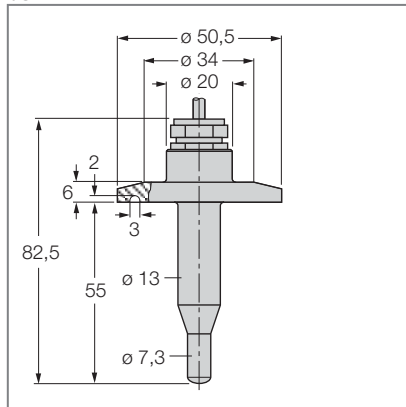
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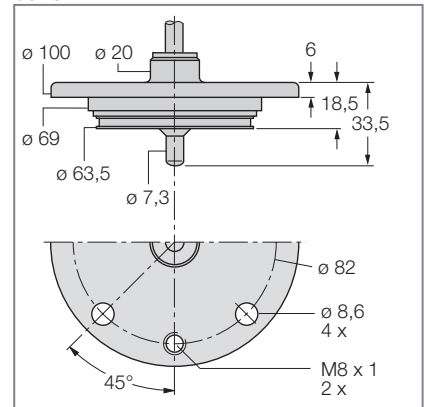
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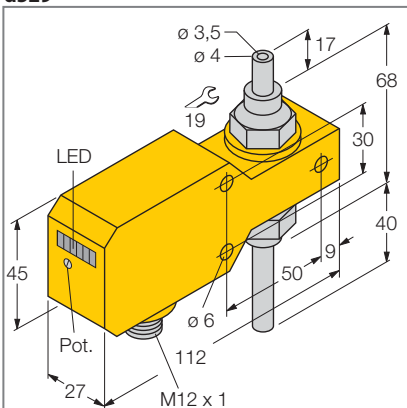
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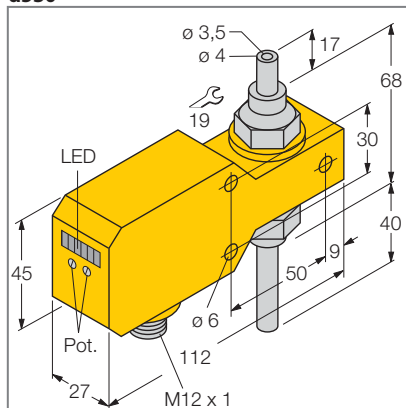
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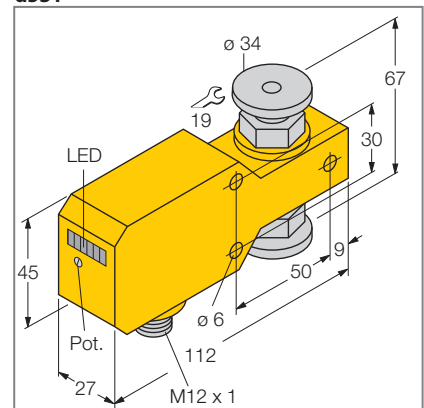
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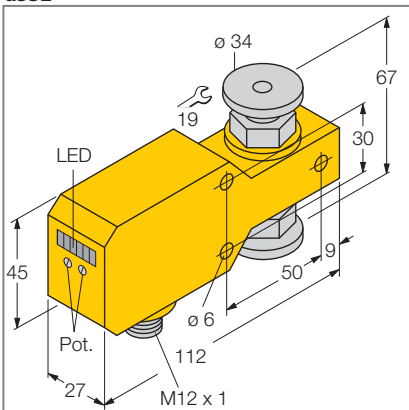
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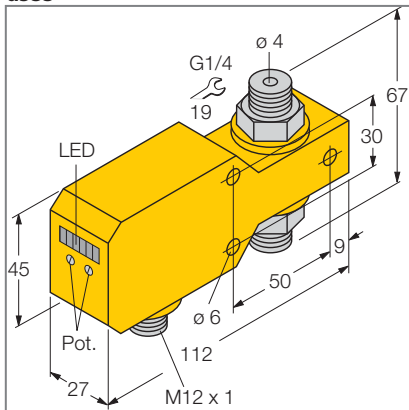
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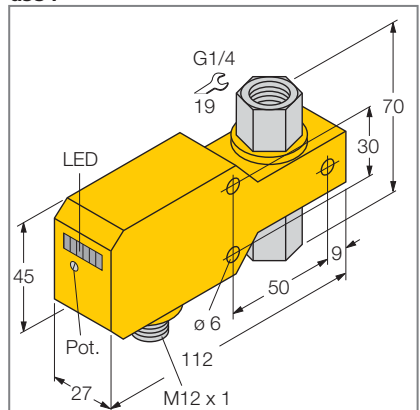
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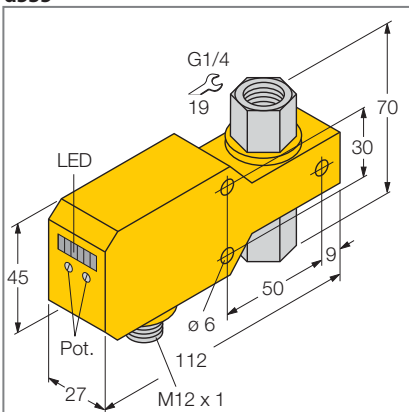
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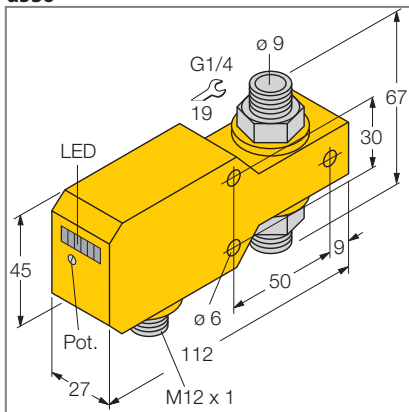
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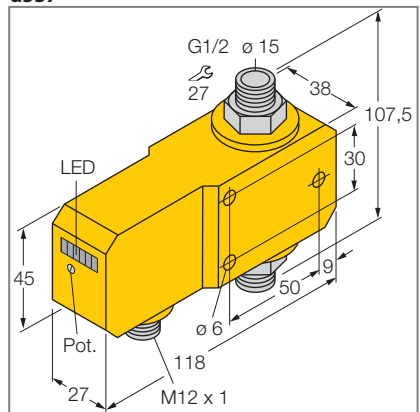
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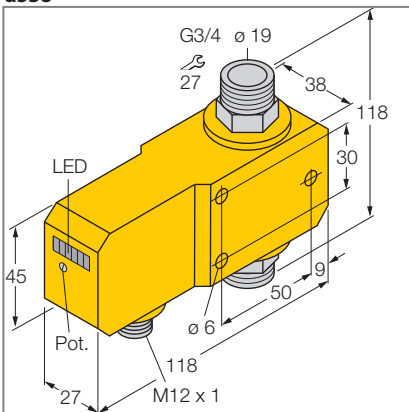
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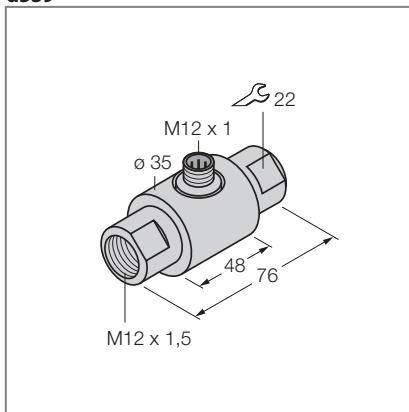
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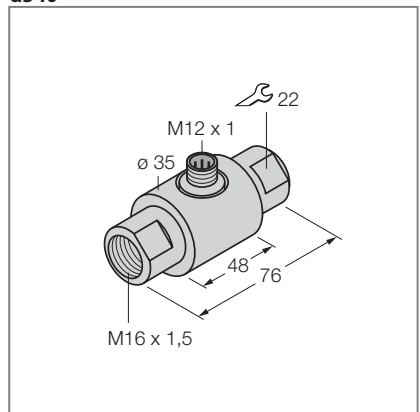
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d539

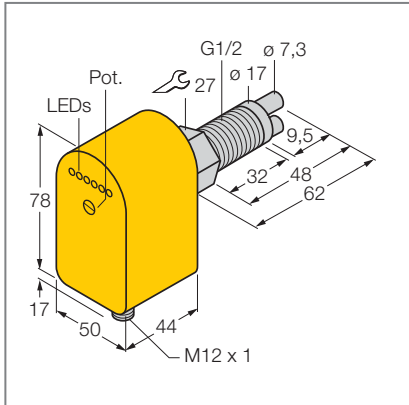


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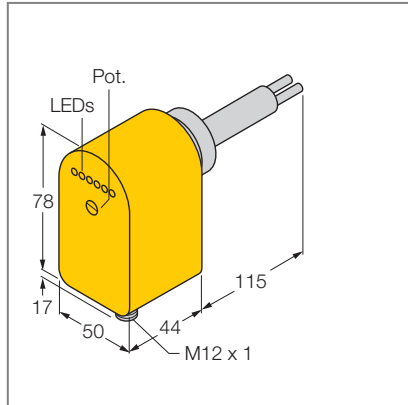


Dimension drawings

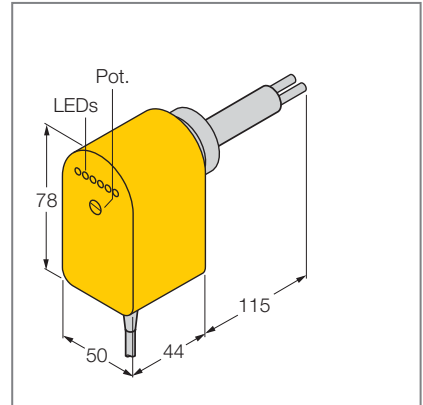
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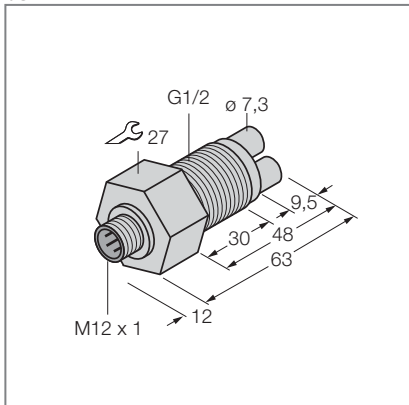
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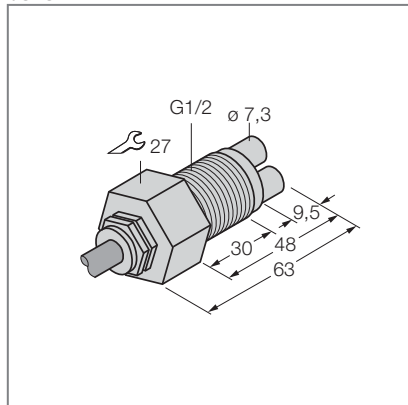
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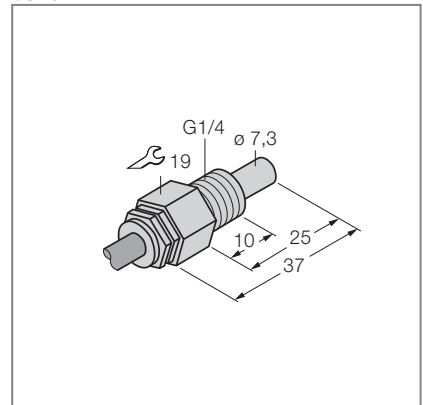
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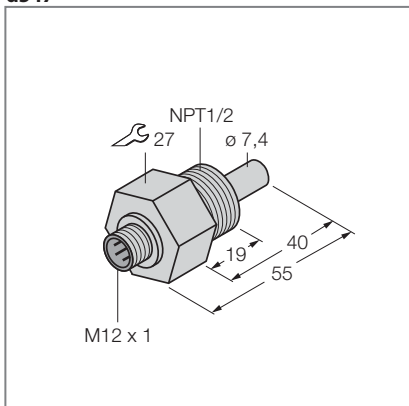
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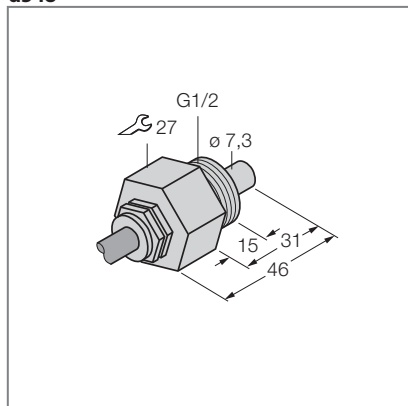
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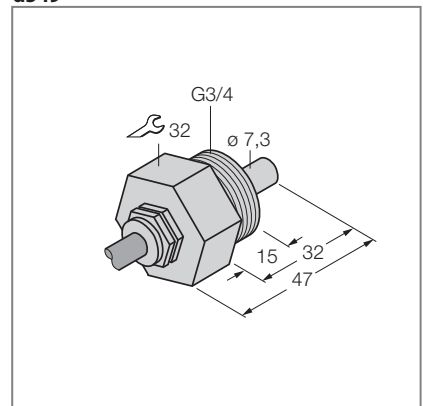
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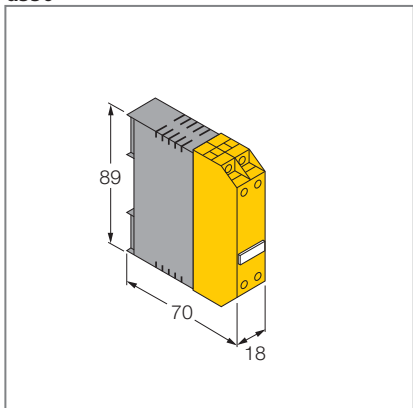
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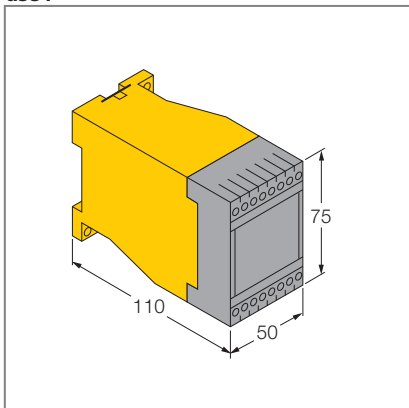
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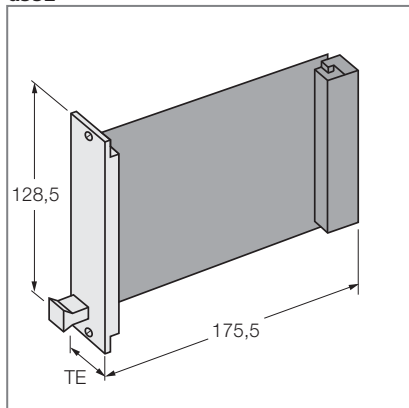
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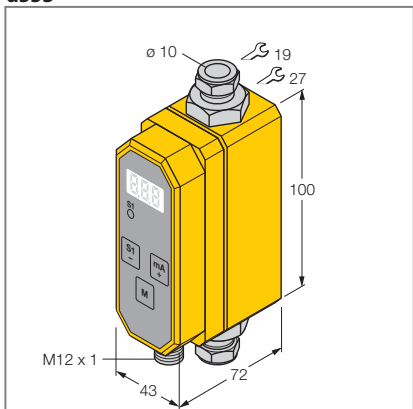
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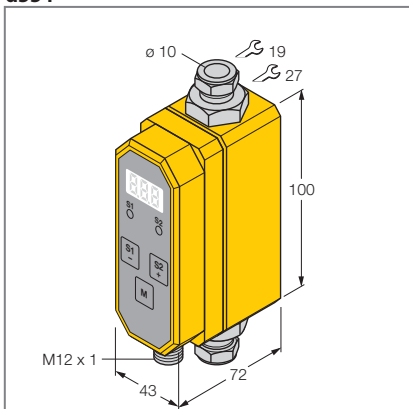
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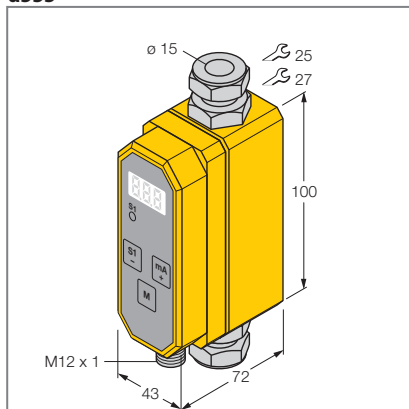
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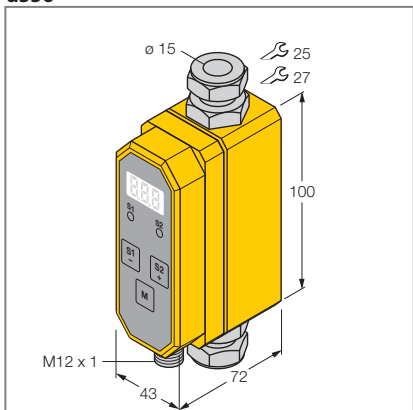
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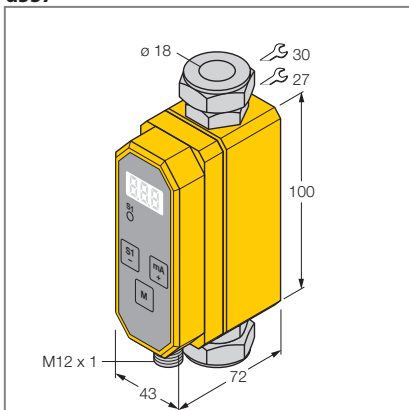
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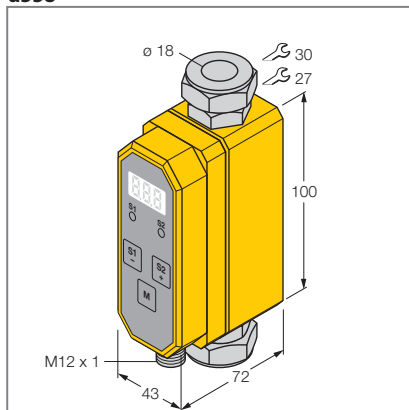
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d557



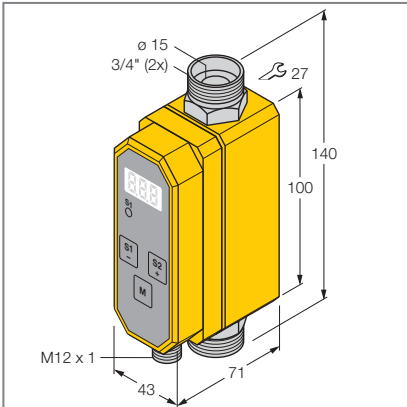
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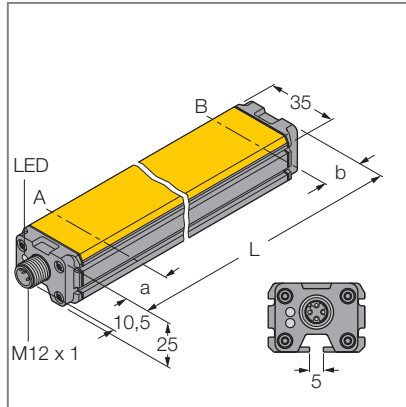
Dimension drawings

Dimension drawings

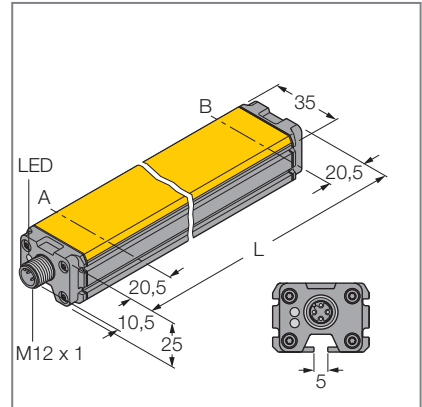
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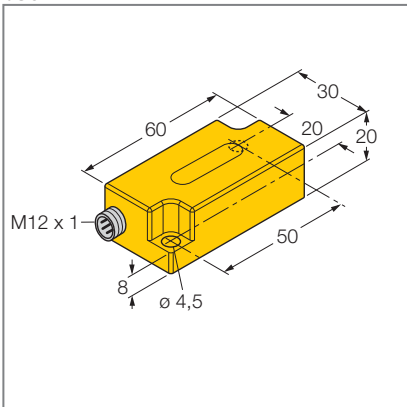
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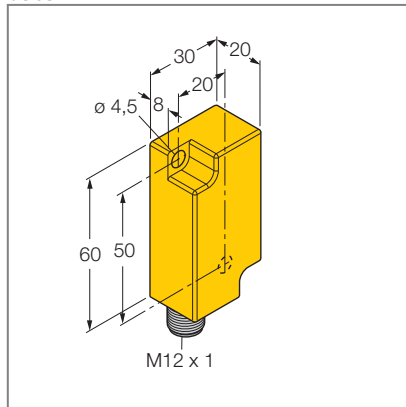
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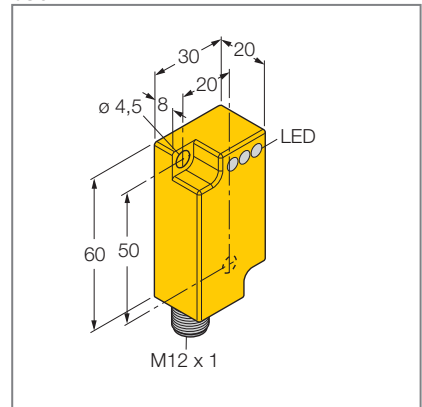
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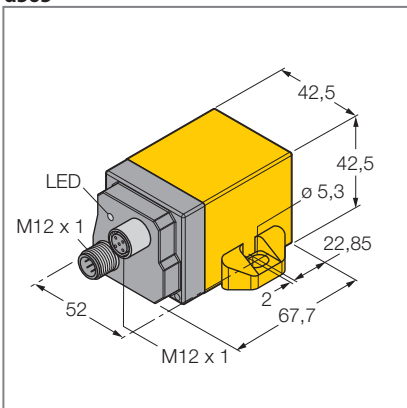
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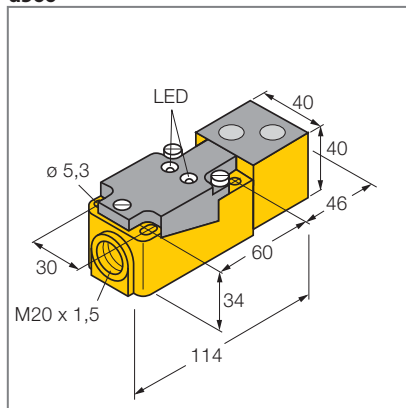
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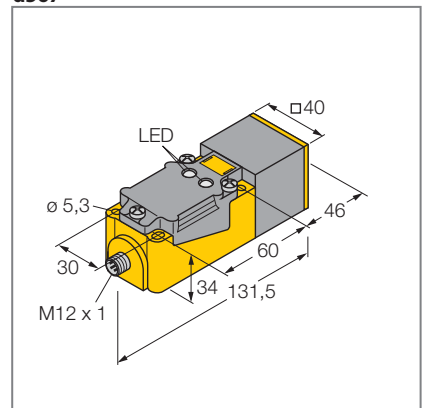
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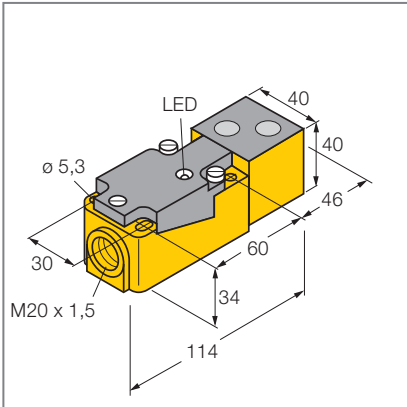
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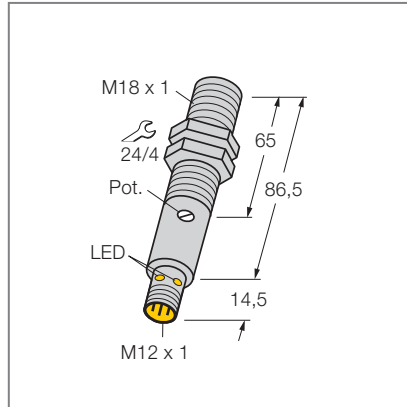
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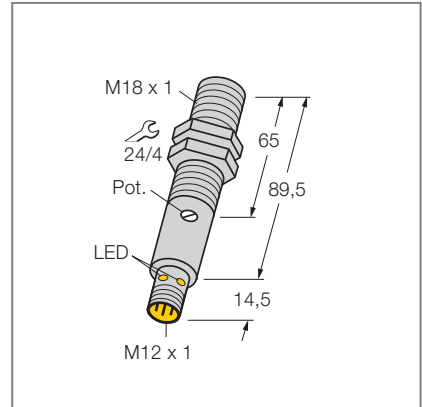
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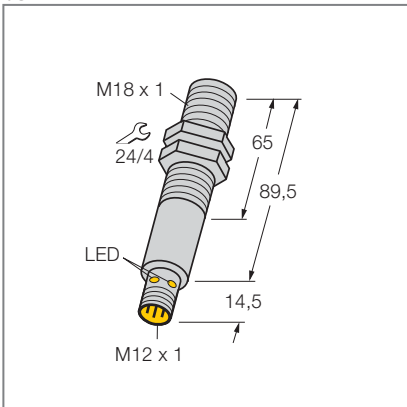
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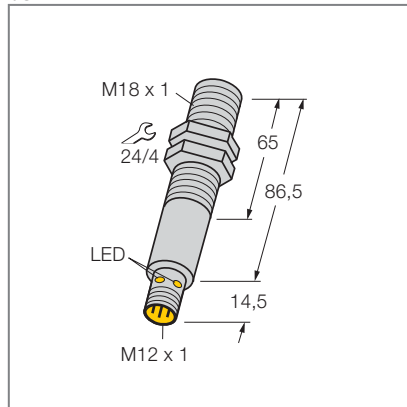
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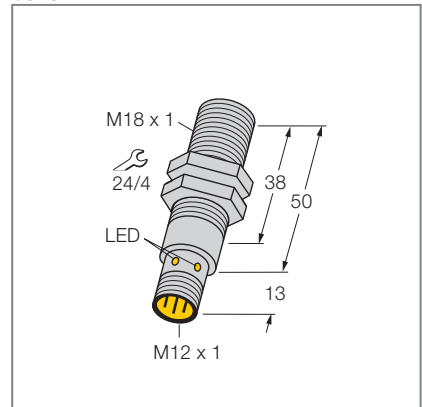
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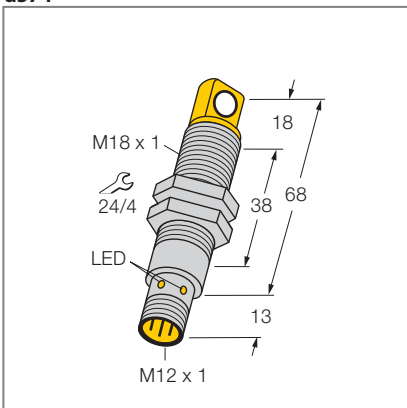
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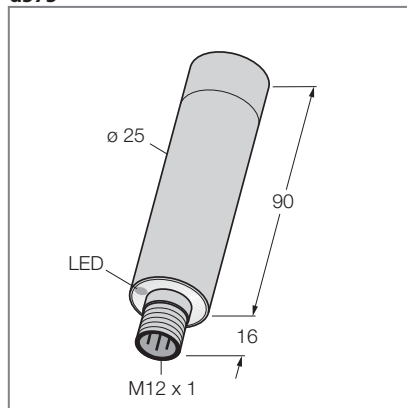
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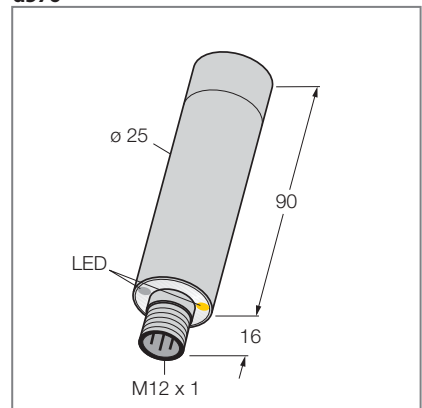
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d575



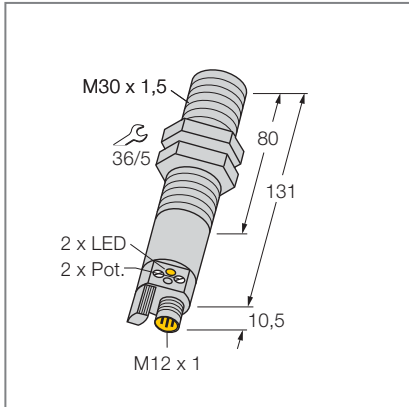
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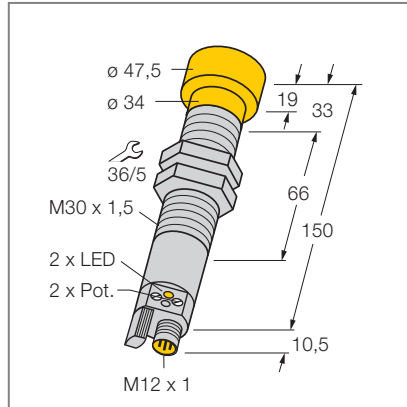
Dimension drawings

Dimension drawings

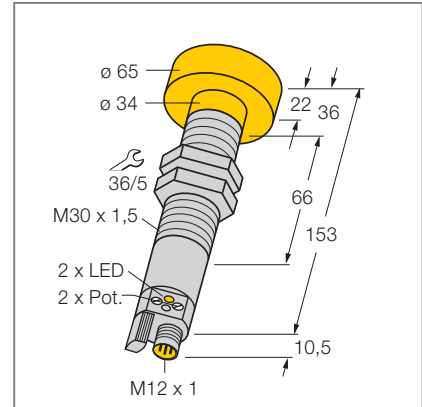
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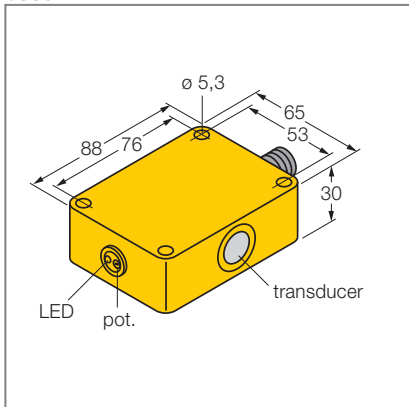
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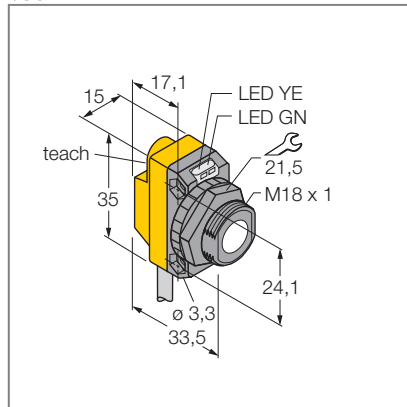
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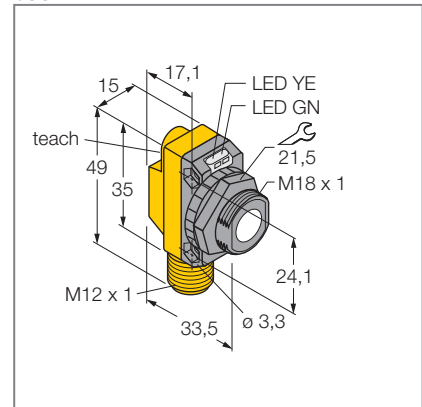
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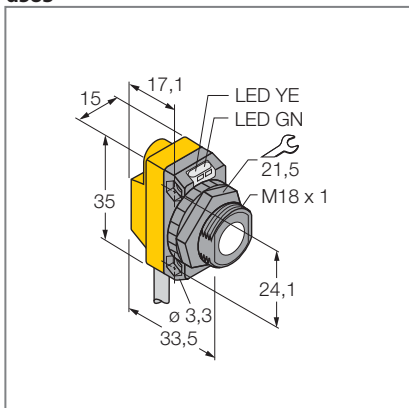
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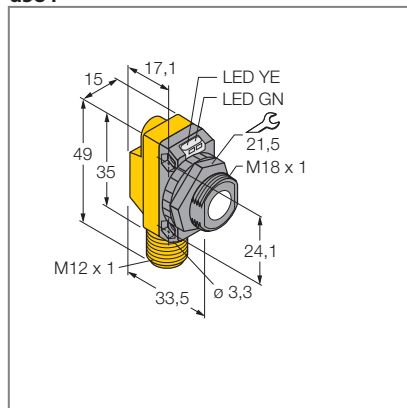
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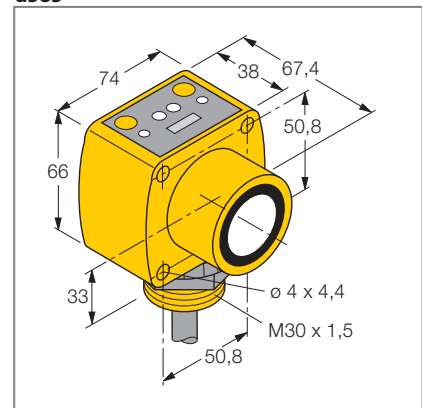
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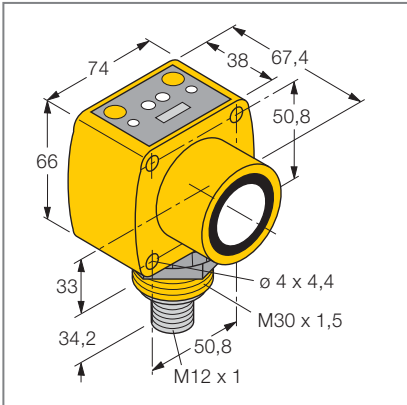
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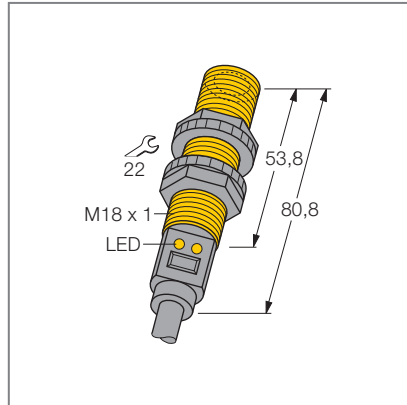
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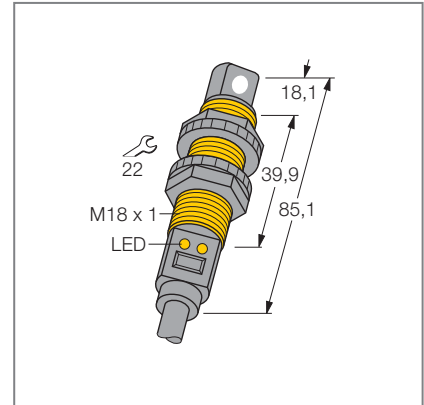
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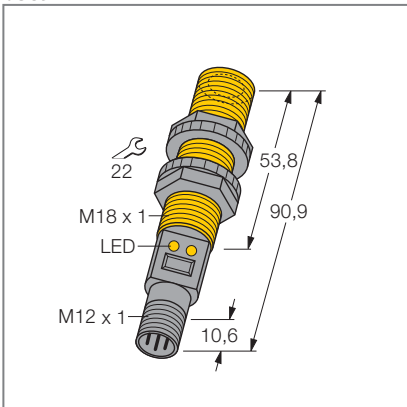
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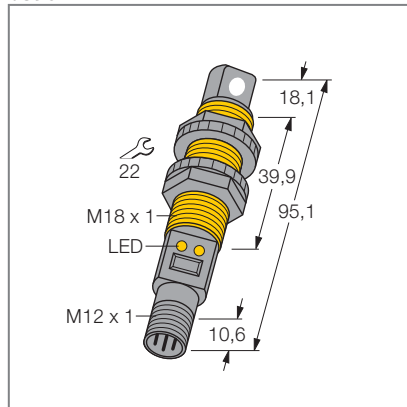
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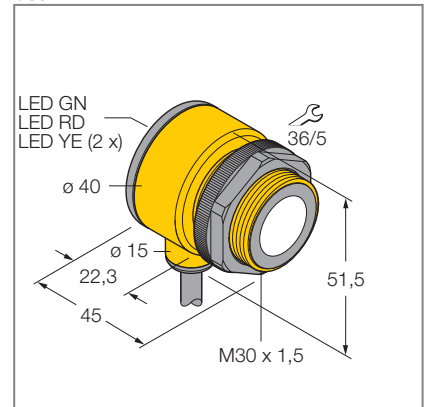
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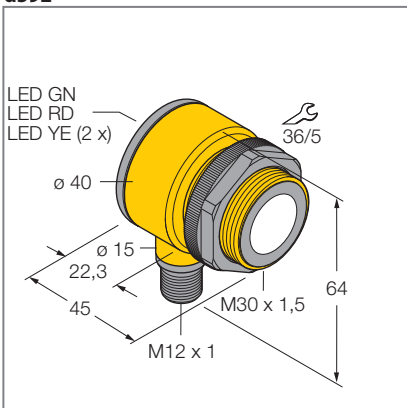
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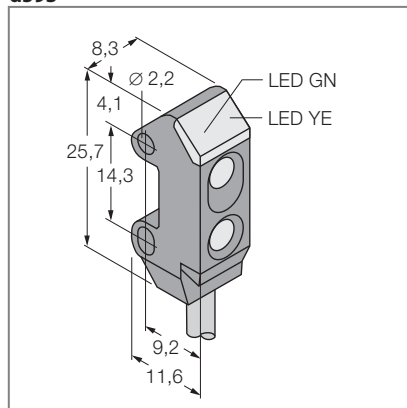
d591



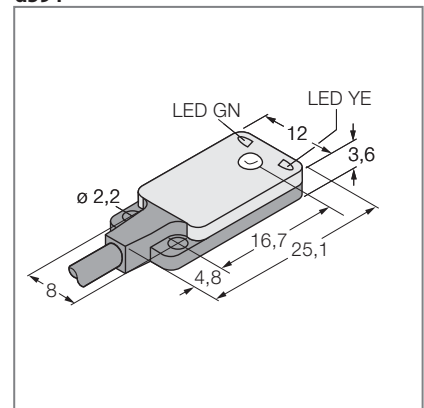
d592



d593

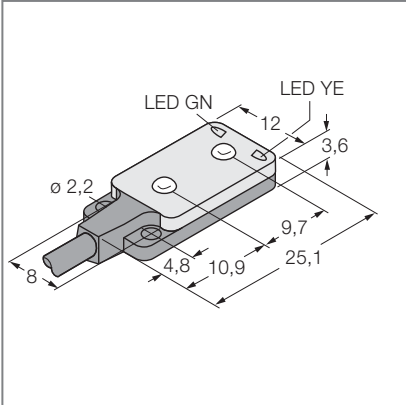


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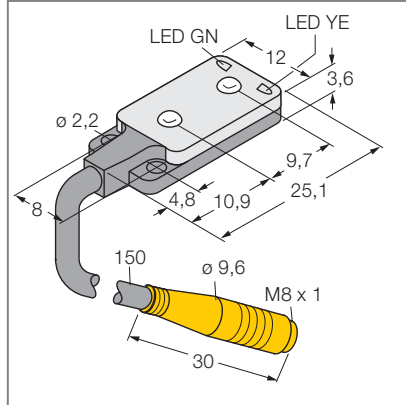


Dimension drawings

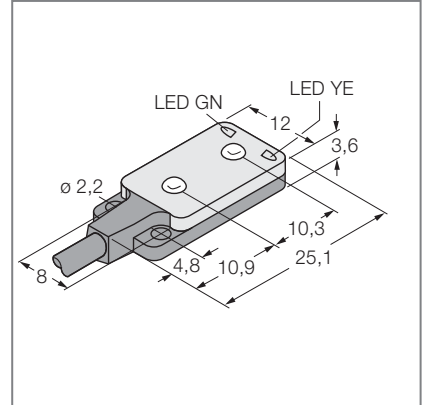
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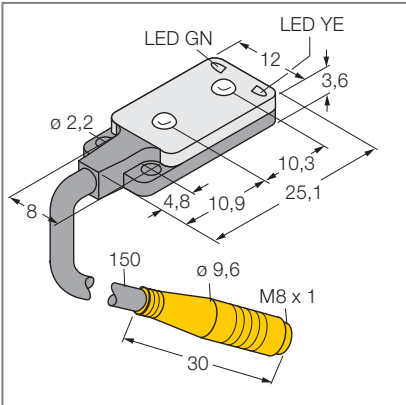
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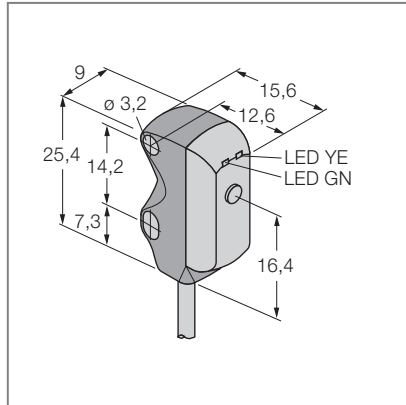
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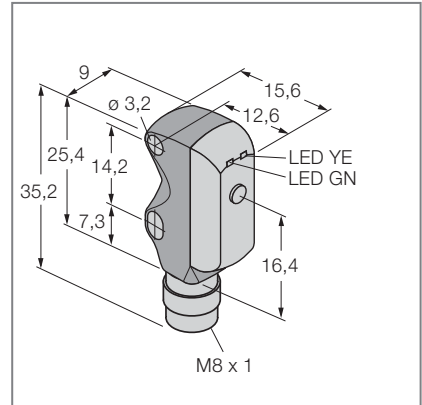
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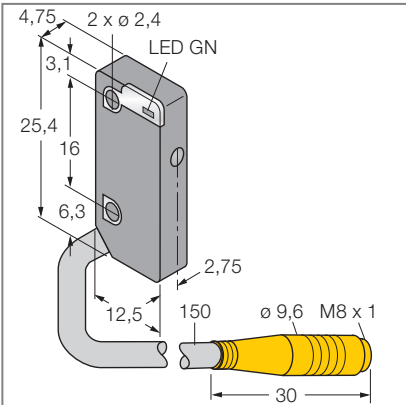
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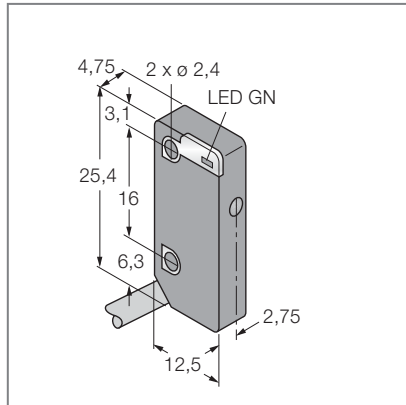
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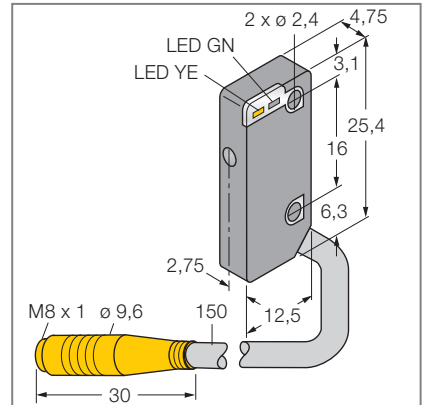
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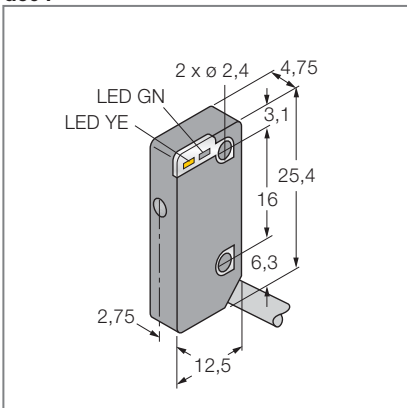
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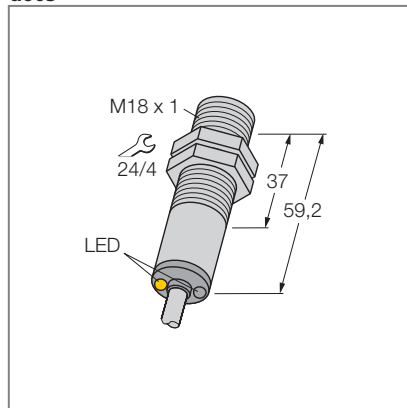
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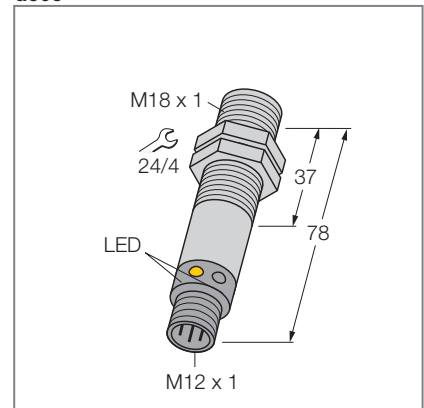
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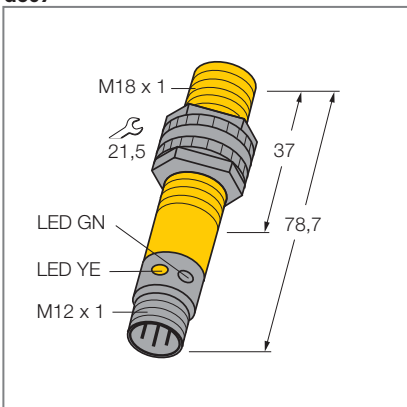
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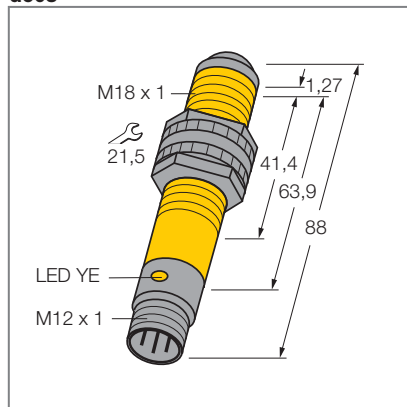
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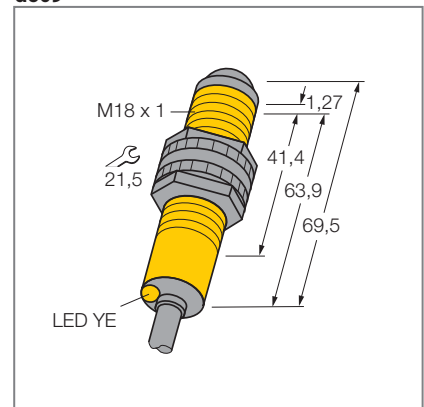
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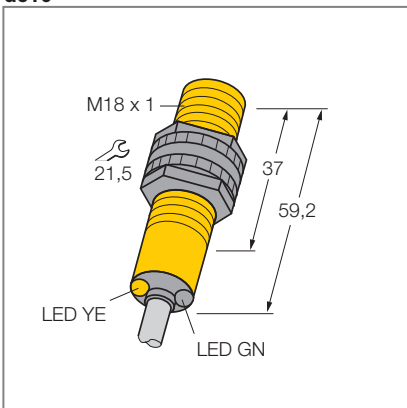
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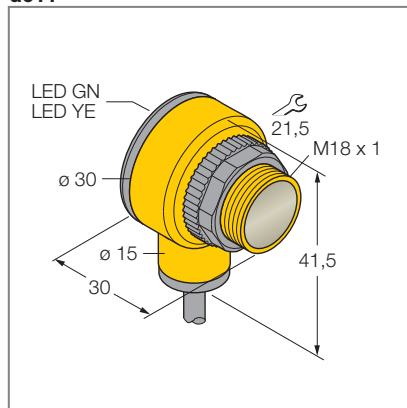
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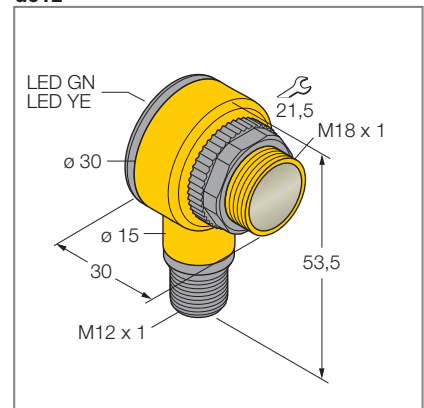
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d611

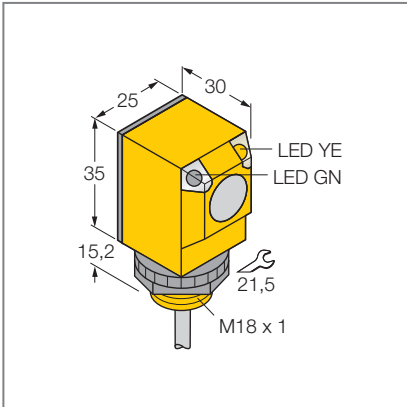


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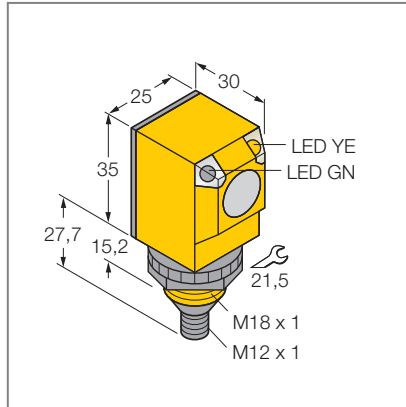


Dimension drawings

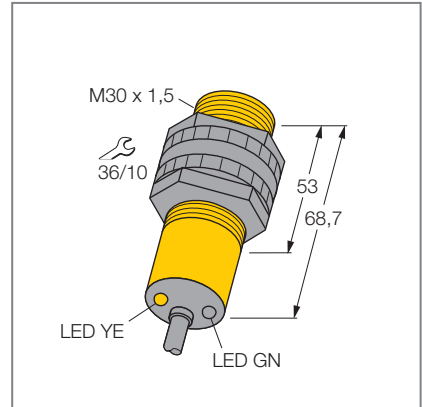
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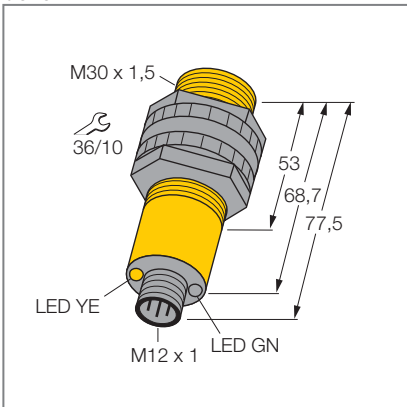
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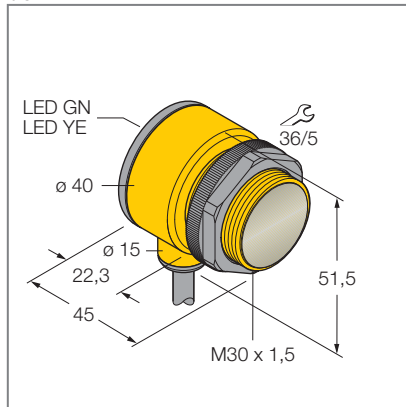
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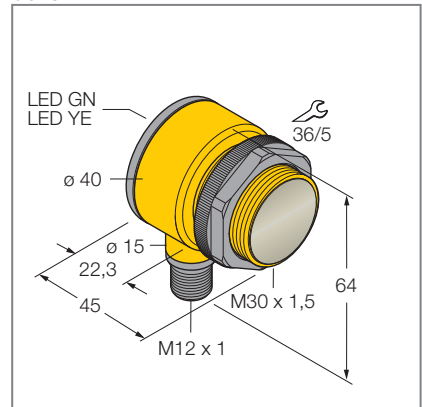
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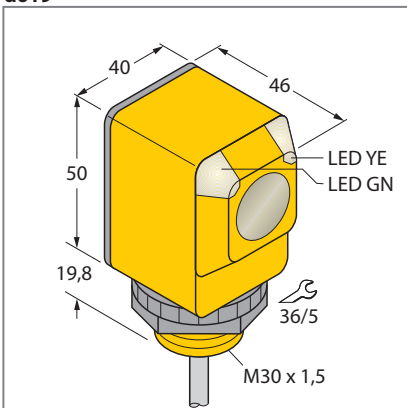
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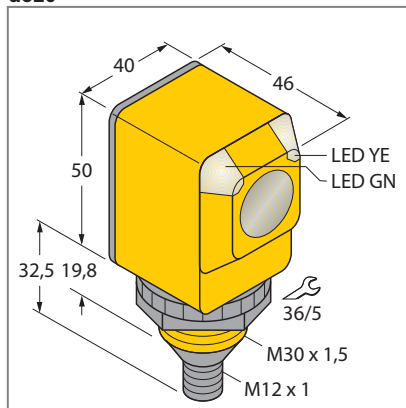
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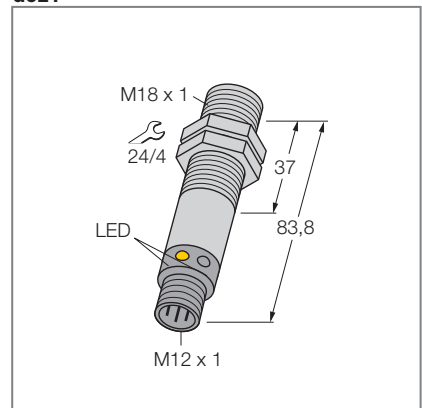
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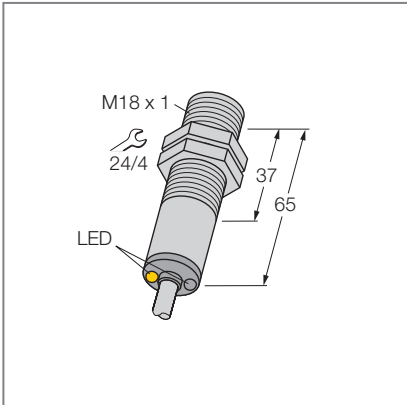
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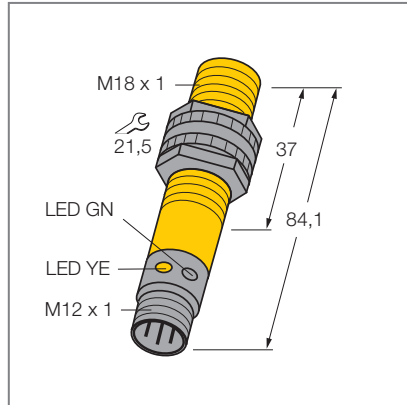
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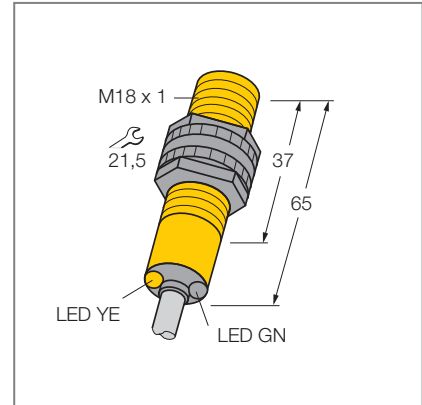
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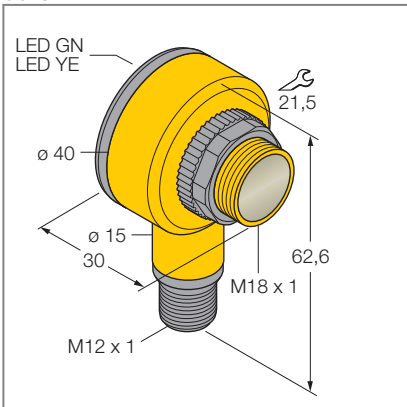
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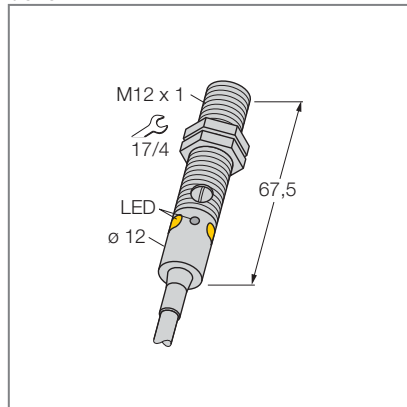
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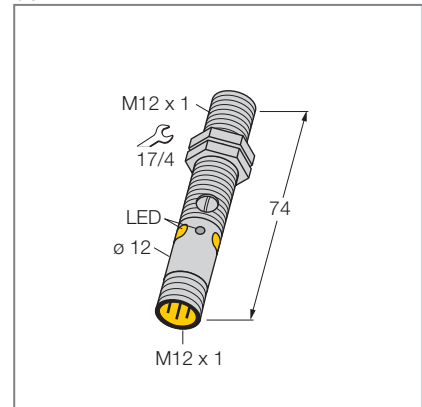
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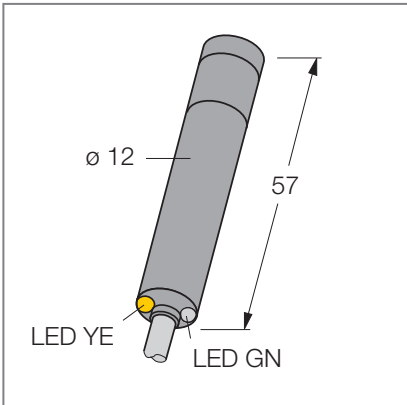
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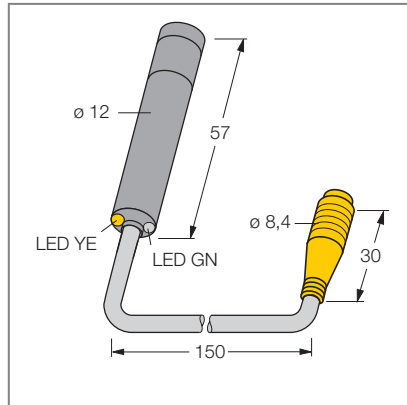
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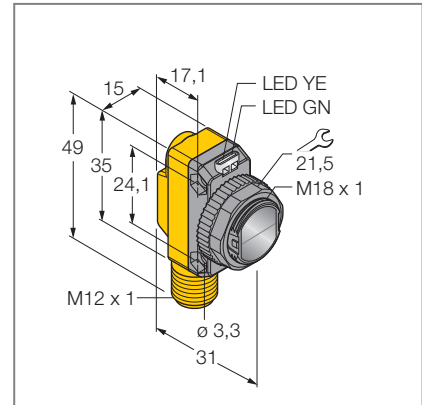
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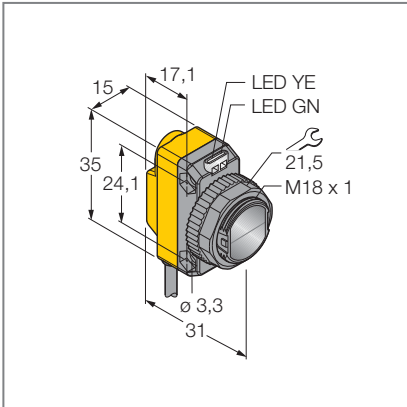
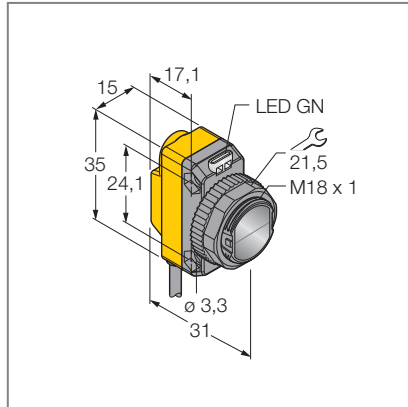
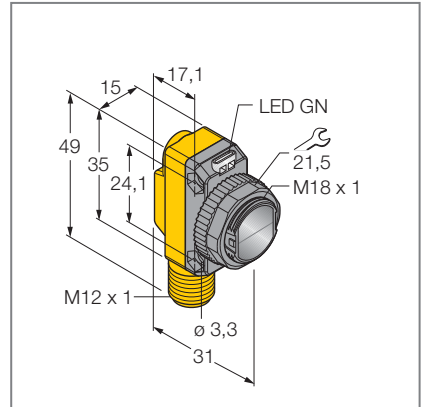
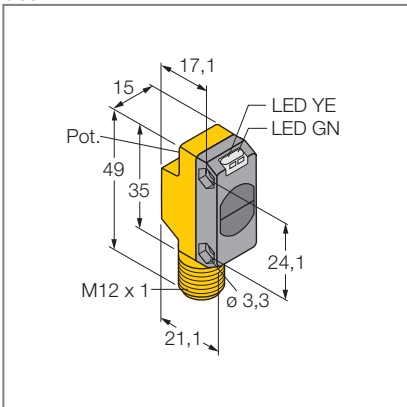
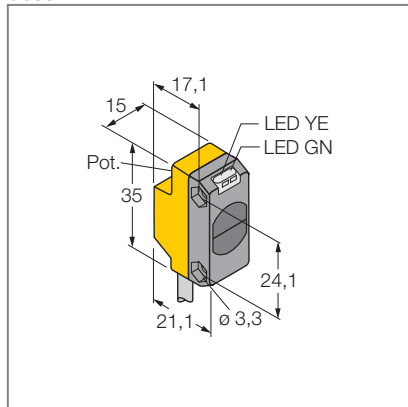
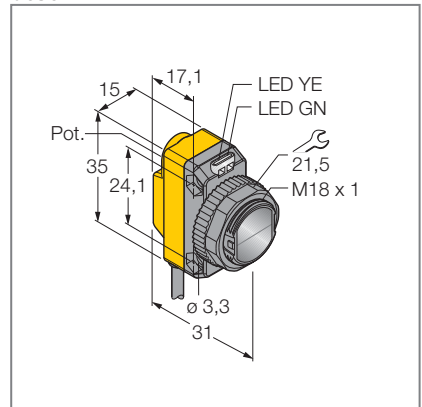
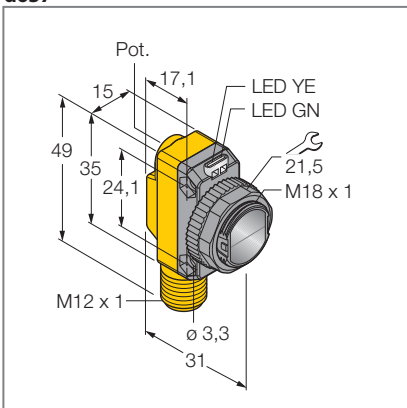
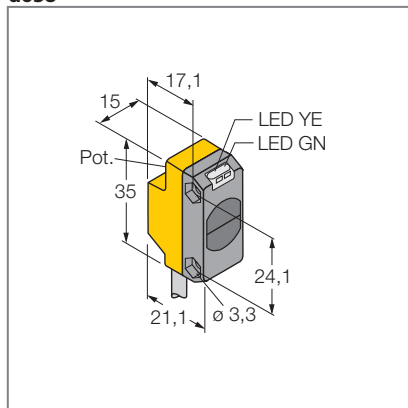
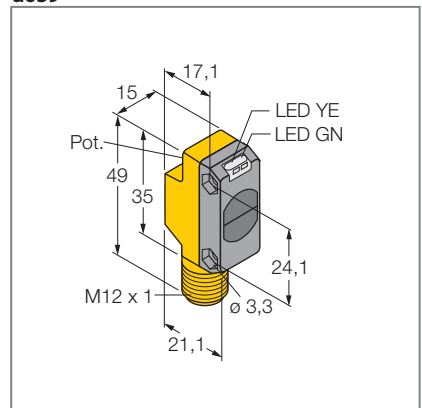
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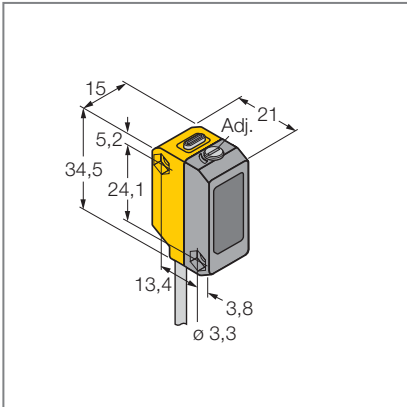
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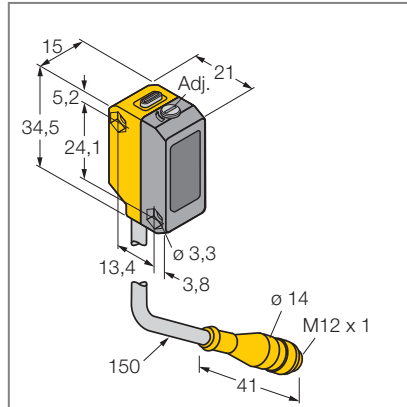
Dimension drawings

d631**d632****d633****d634****d635****d636****d637****d638****d639**

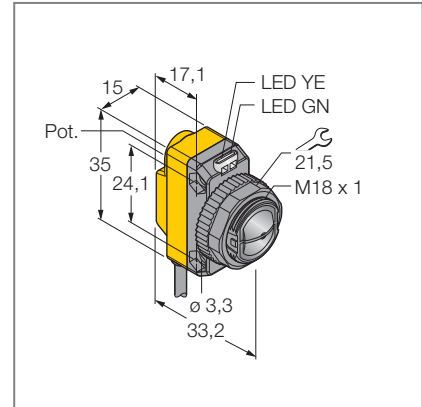
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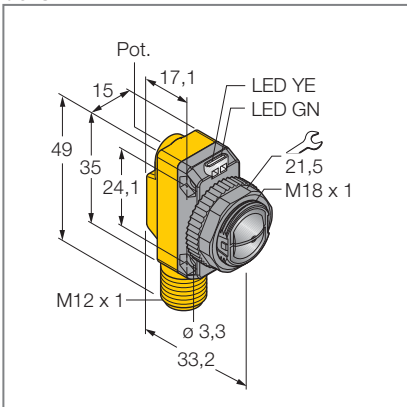
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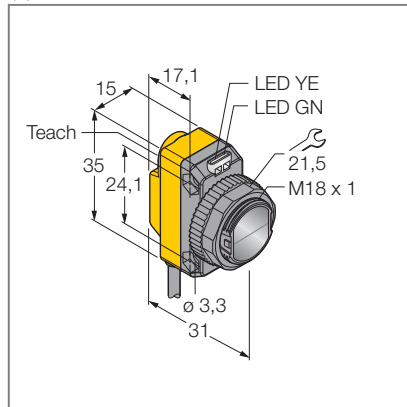
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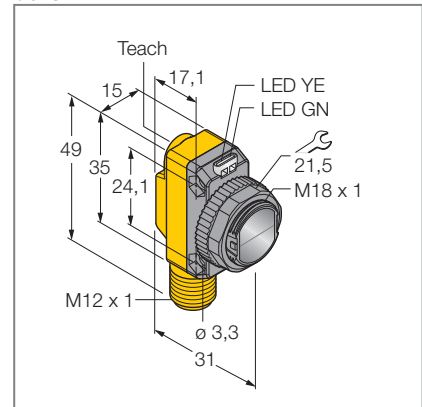
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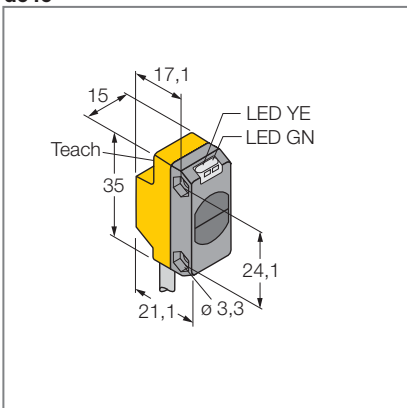
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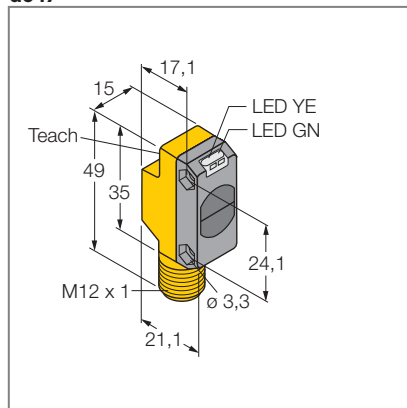
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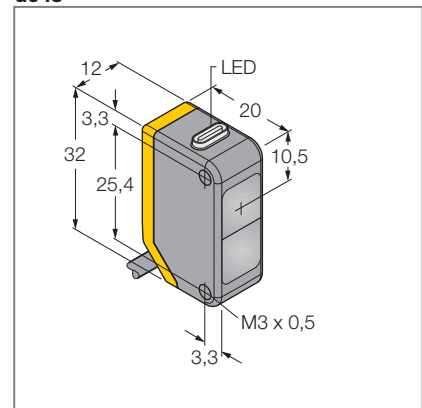
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d647

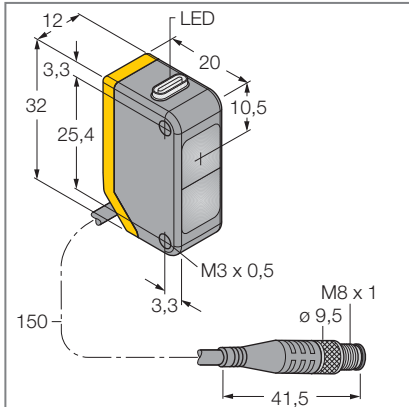


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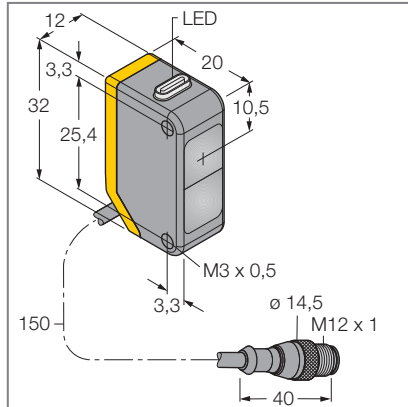


Dimension drawings

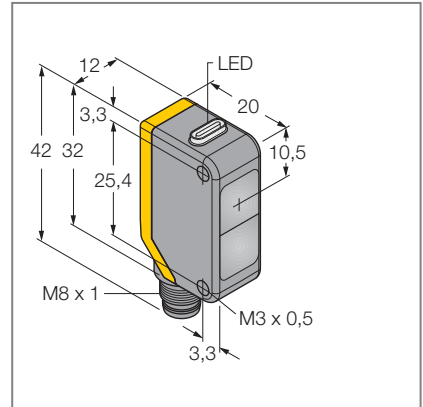
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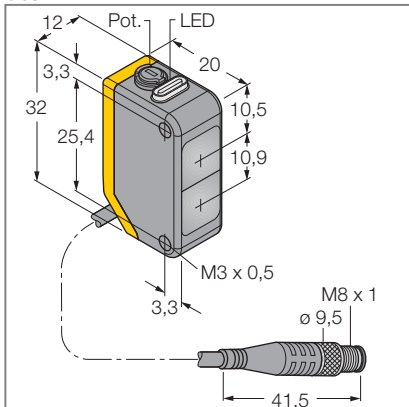
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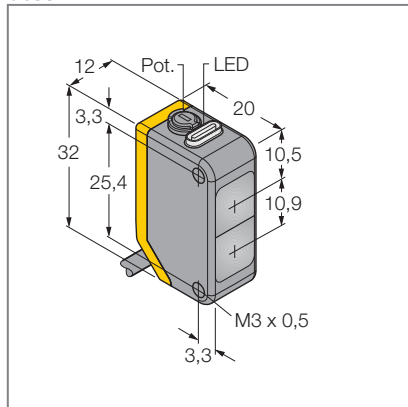
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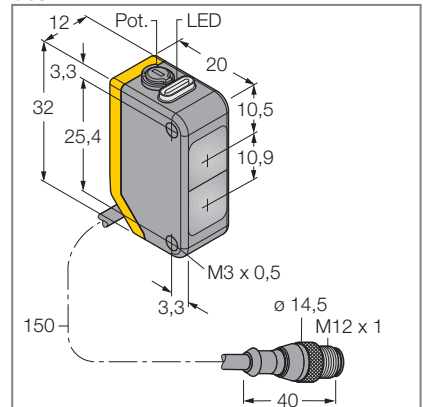
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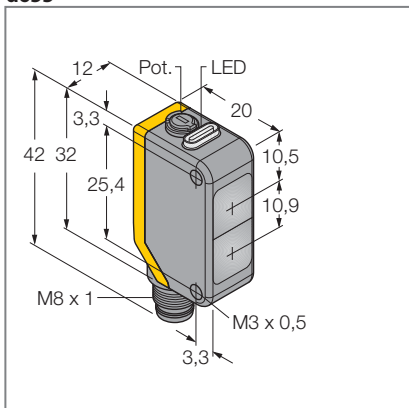
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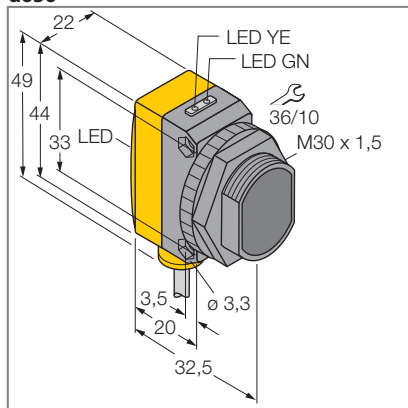
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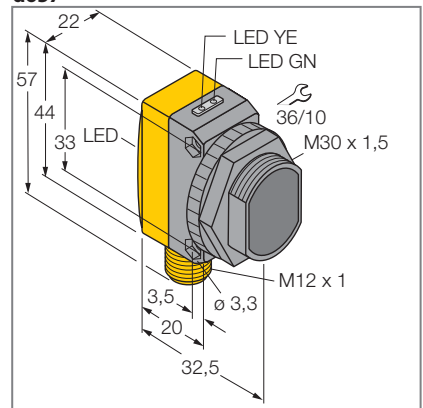
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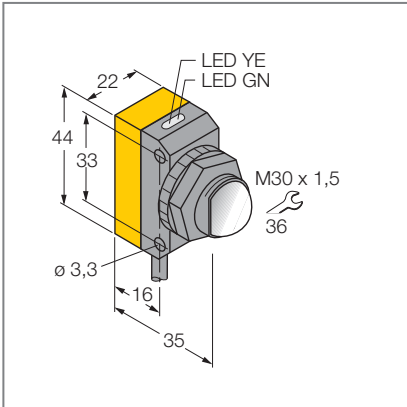
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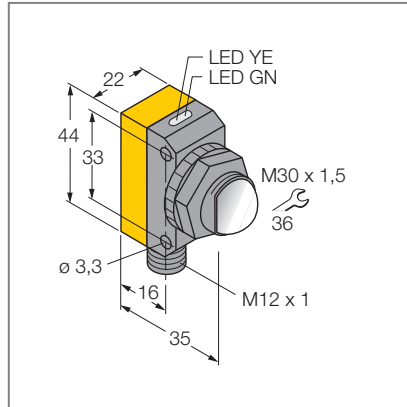
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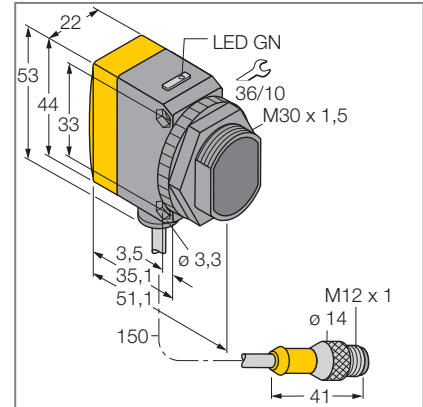
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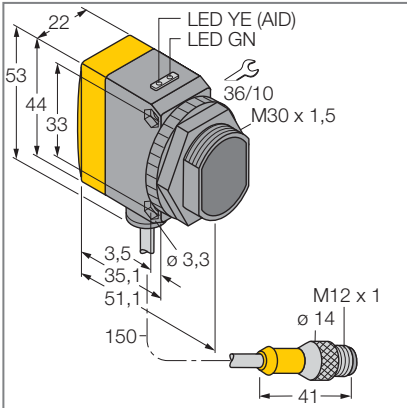
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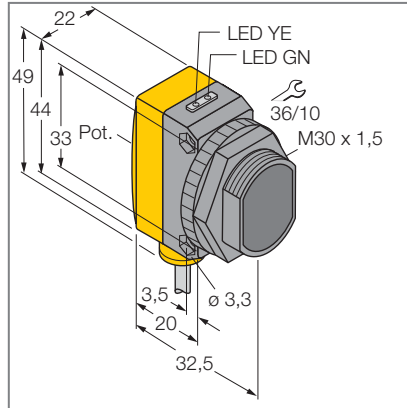
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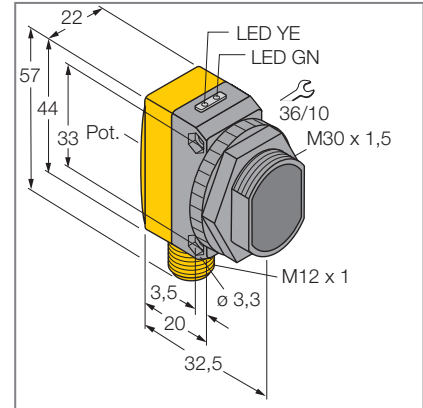
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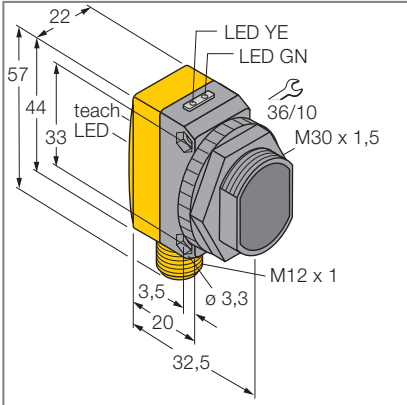
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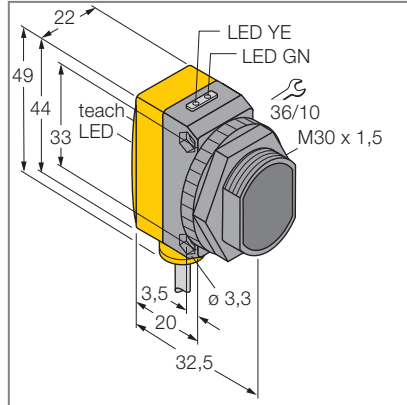
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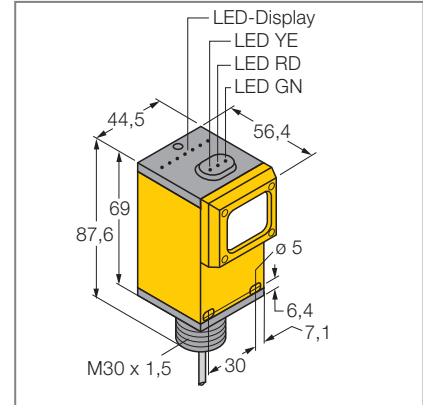
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d665

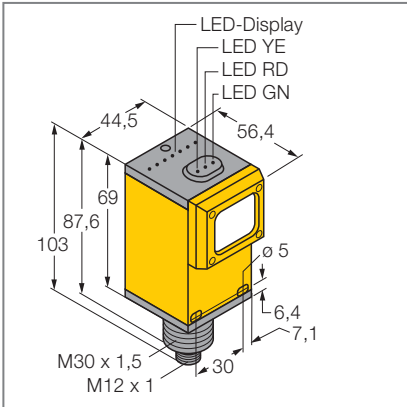


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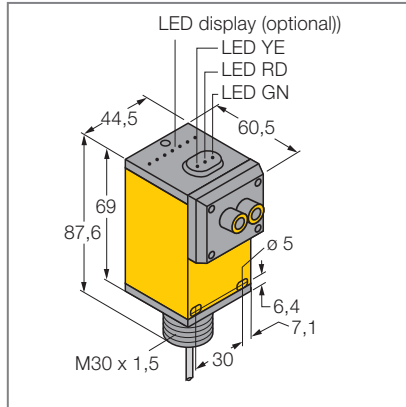


Dimension drawings

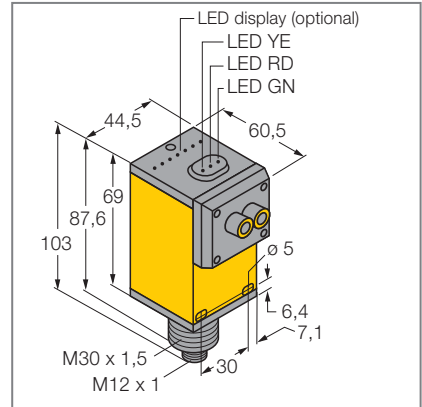
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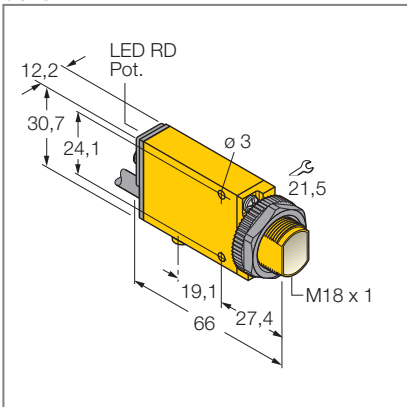
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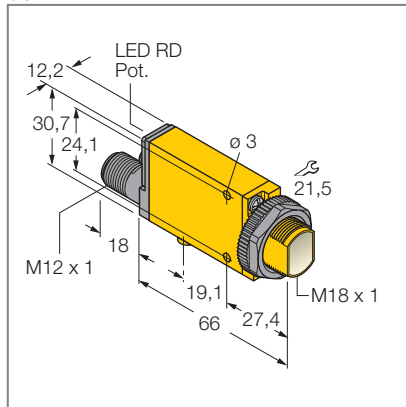
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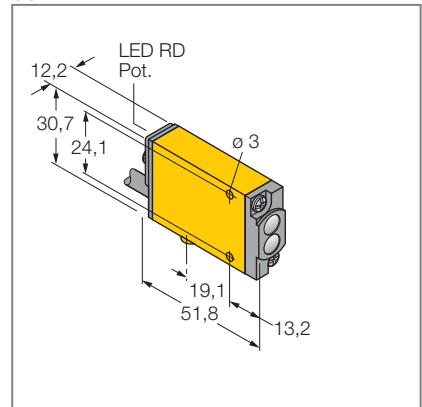
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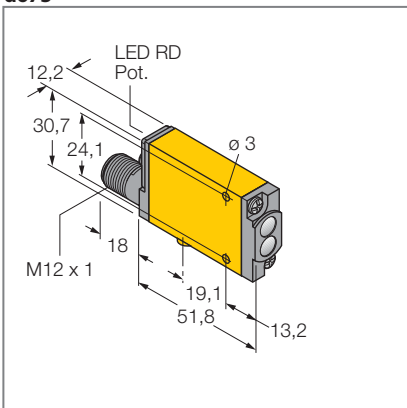
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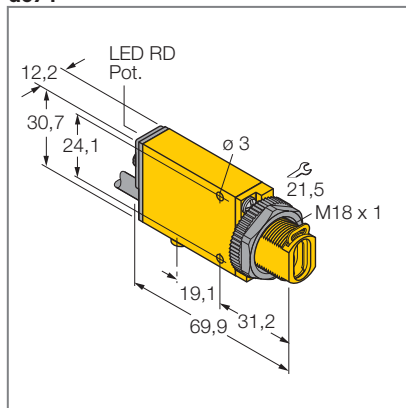
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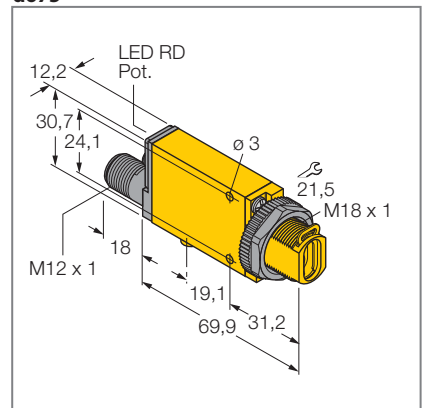
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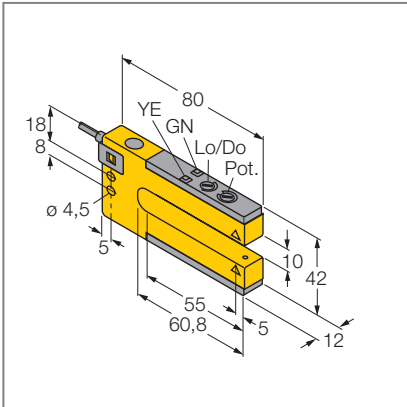
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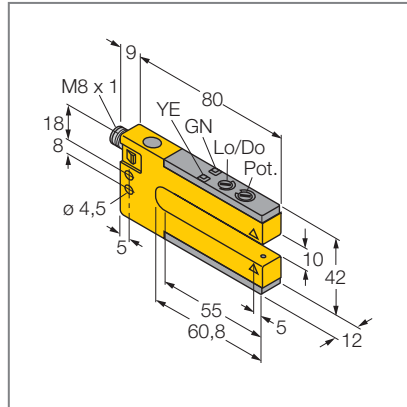
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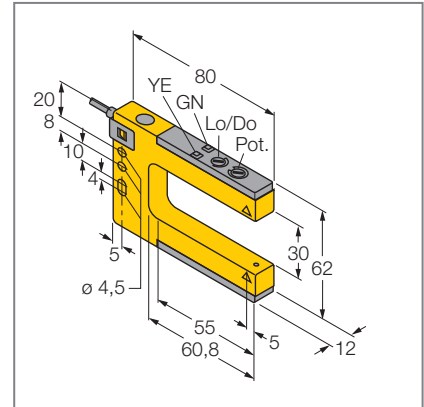
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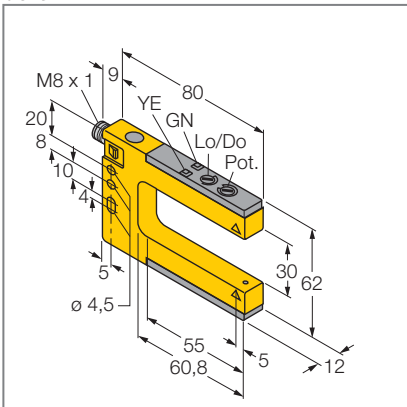
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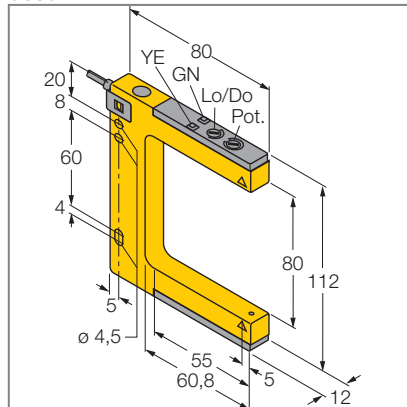
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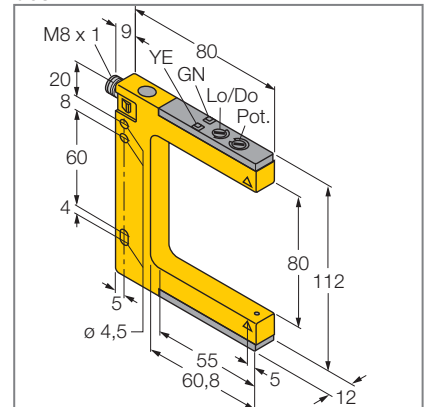
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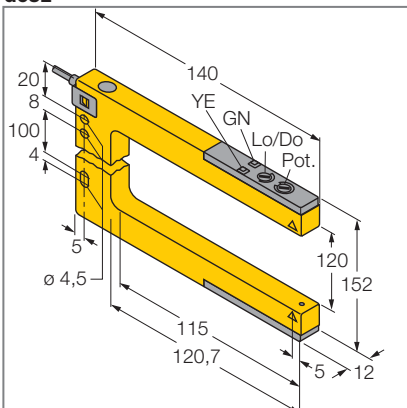
d680



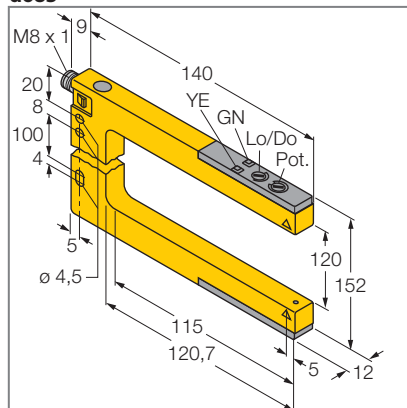
d681



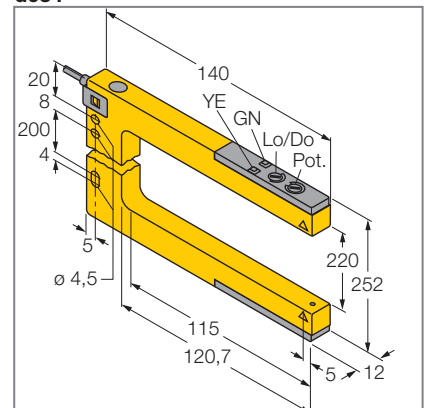
d682



d683

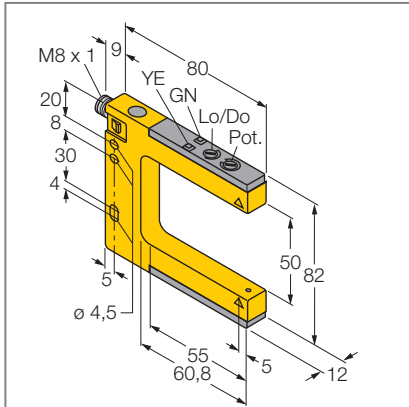


d684

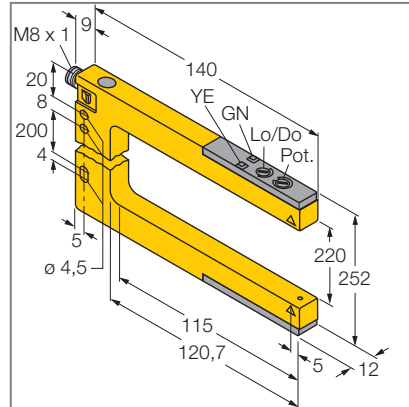


Dimension drawings

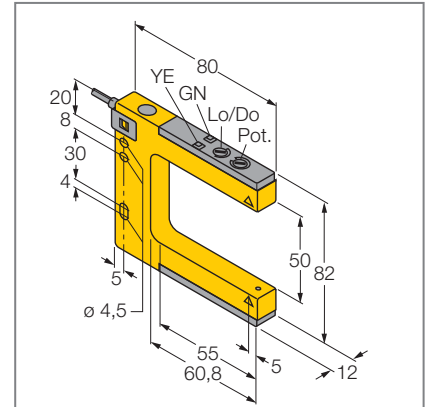
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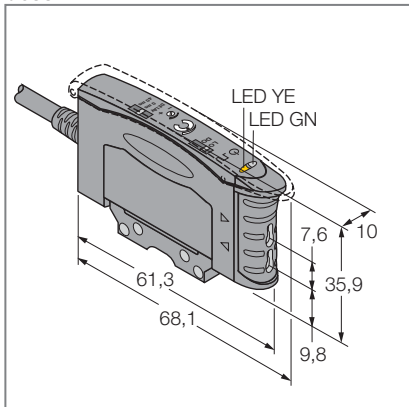
d686



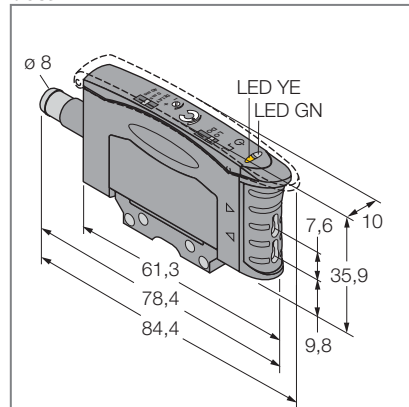
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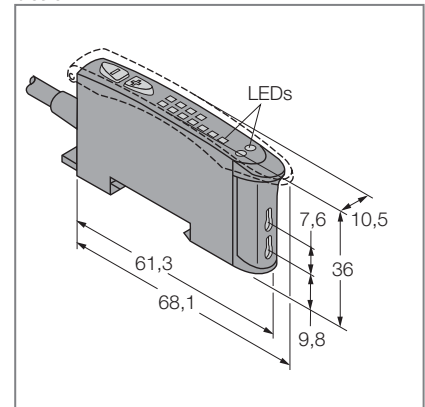
d688



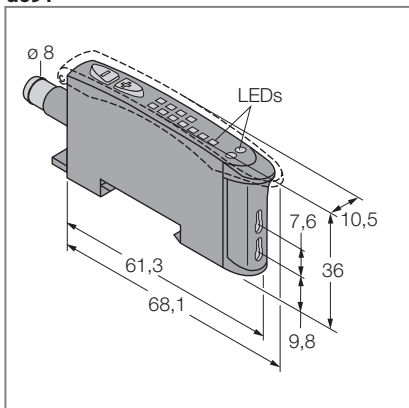
d689



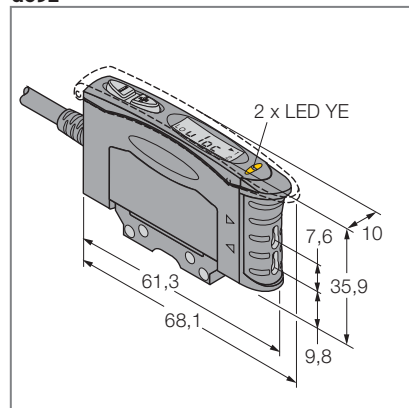
d690



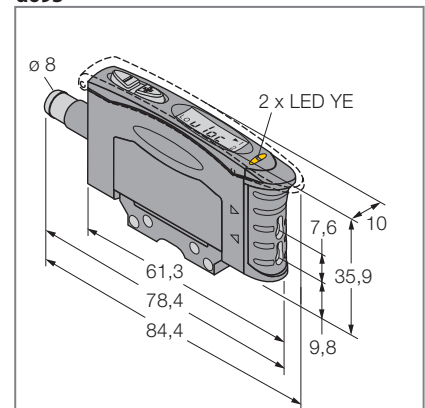
d691



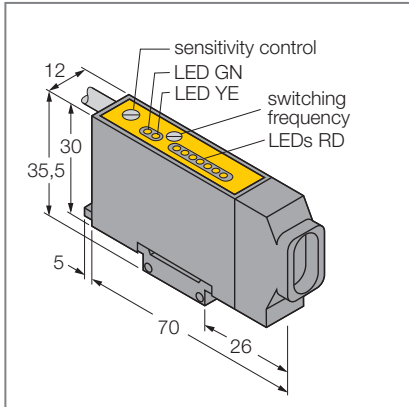
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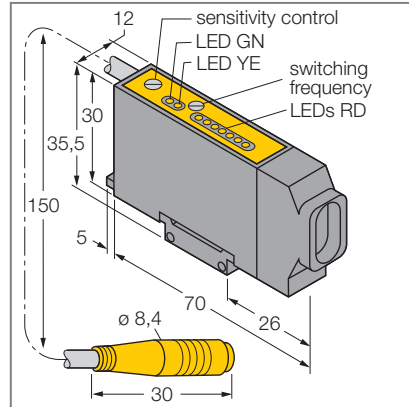
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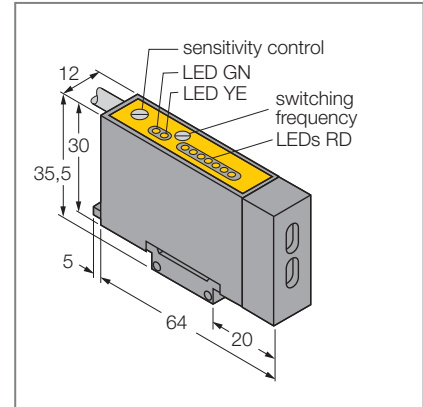
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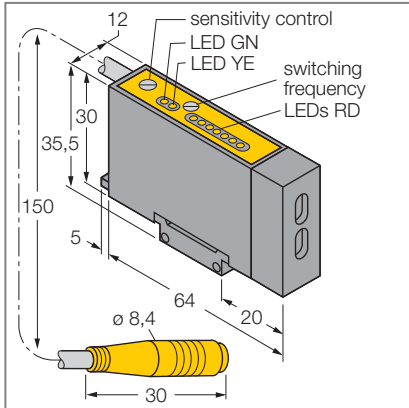
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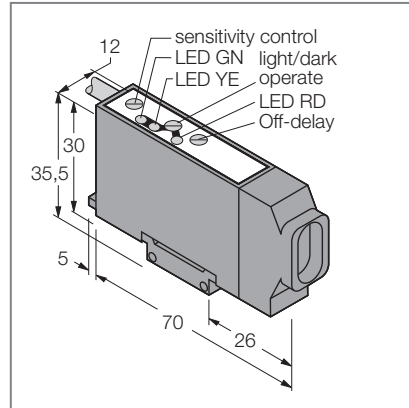
d696



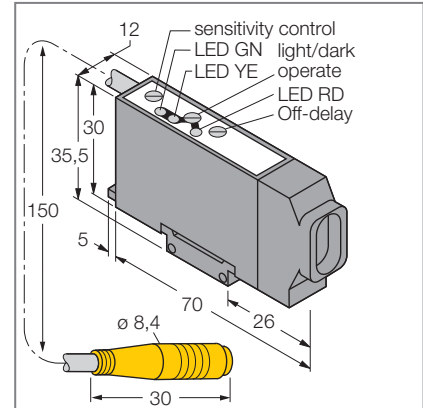
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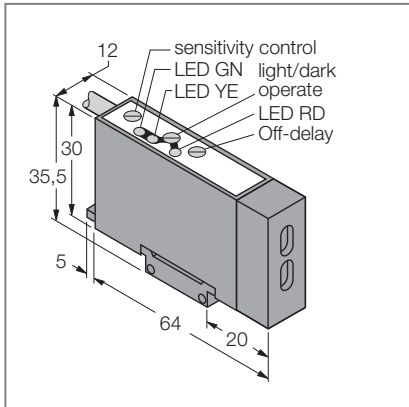
d698



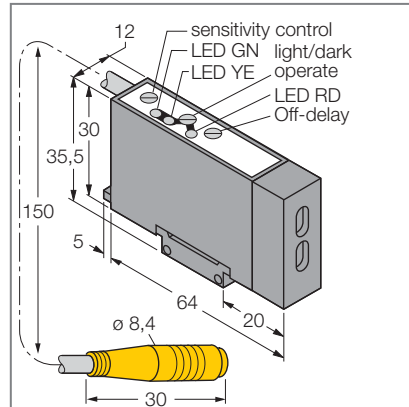
d699



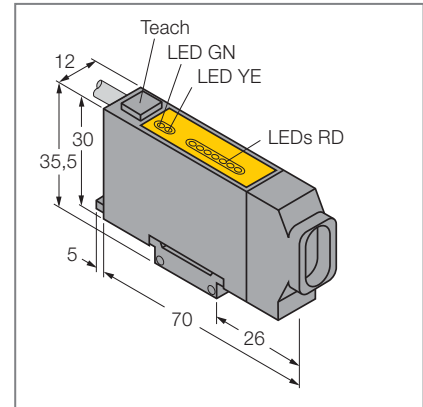
d700



d701

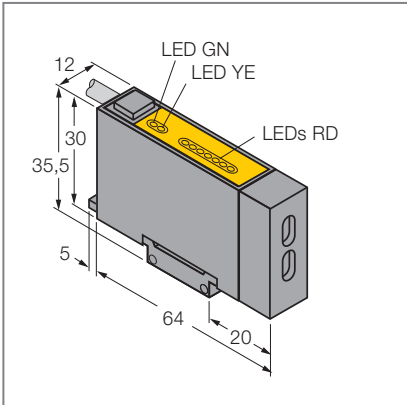


d702

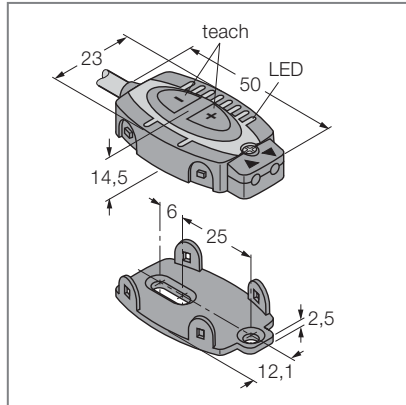


Dimension drawings

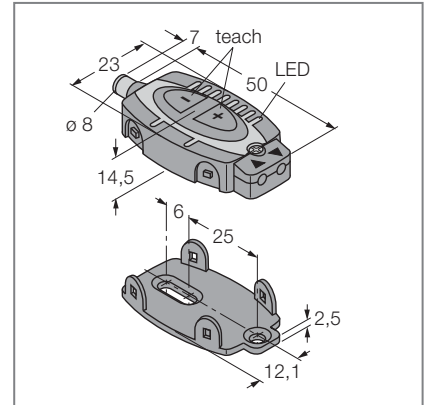
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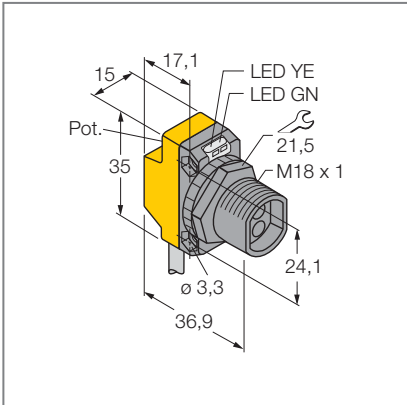
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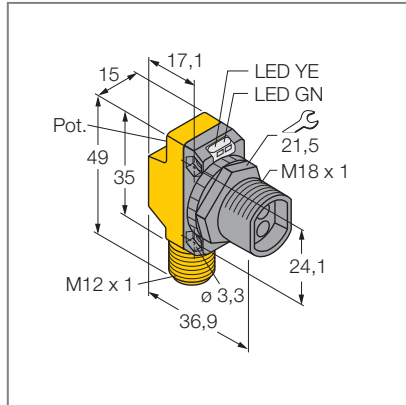
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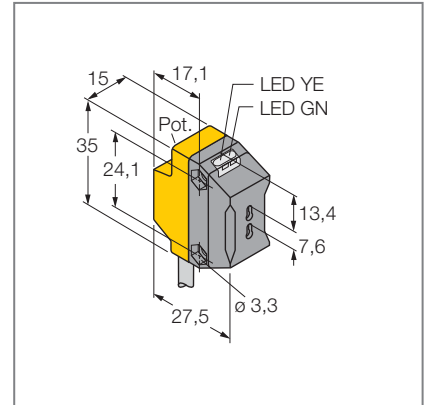
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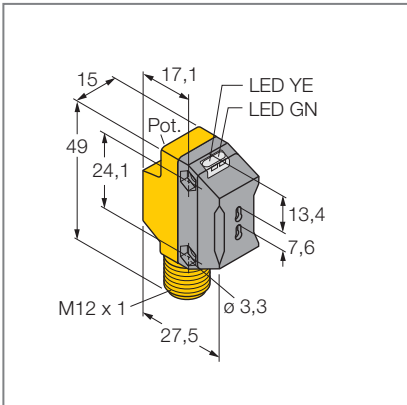
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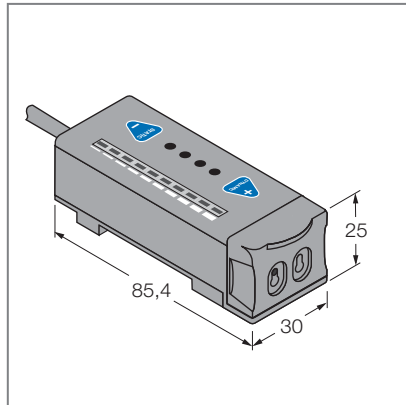
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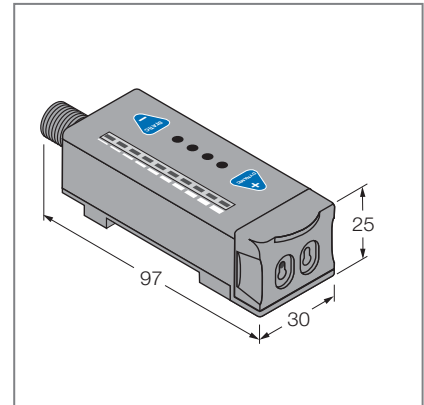
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d710



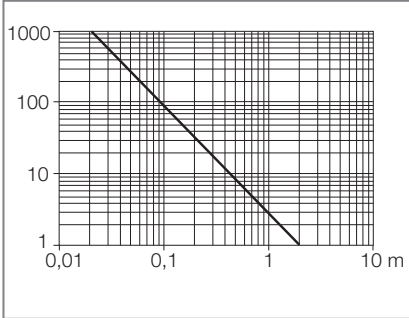
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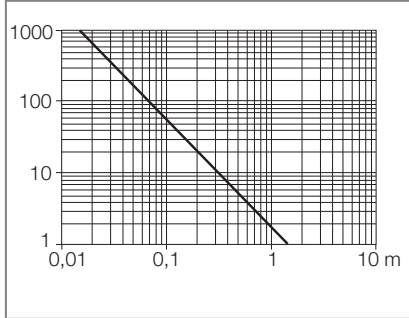
Dimension drawings

Excess gain curves

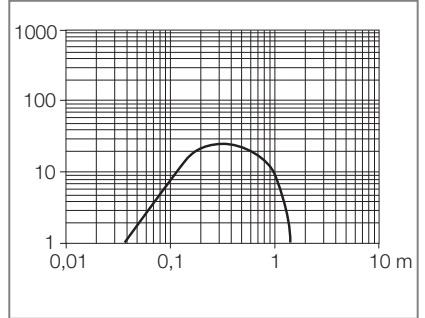
e001



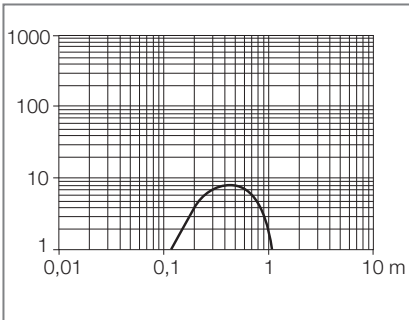
e002



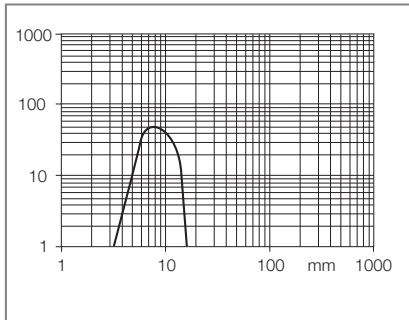
e003



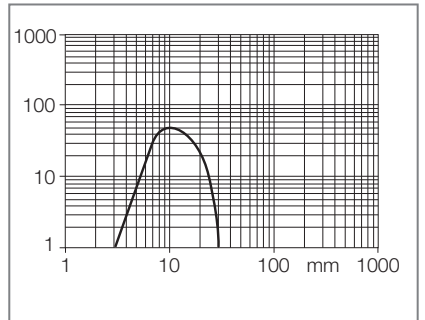
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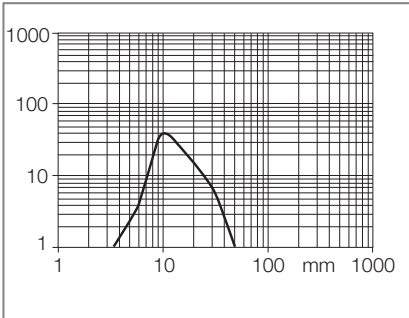
e005



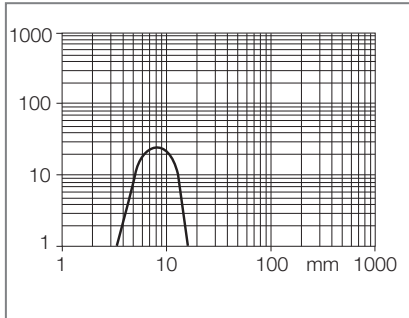
e006



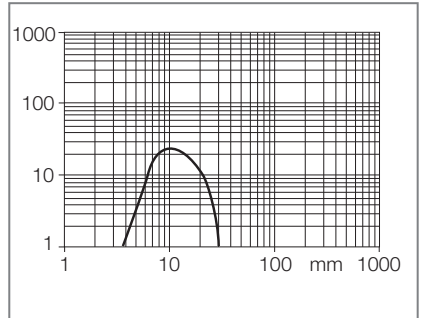
e007



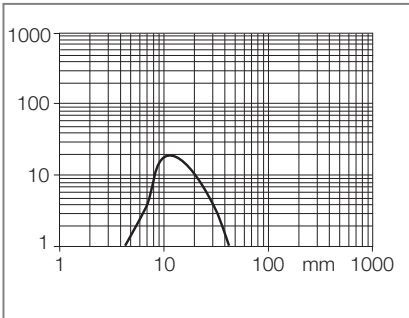
e008



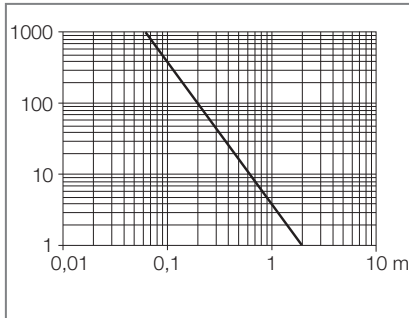
e009



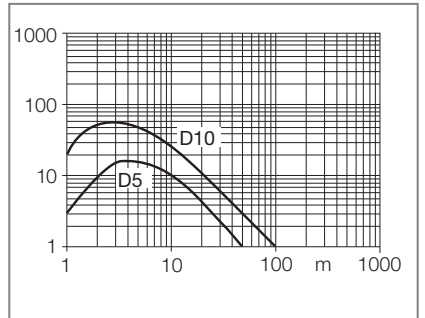
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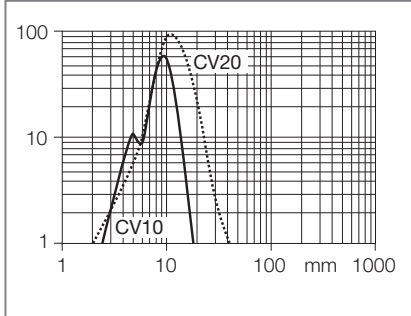
e011



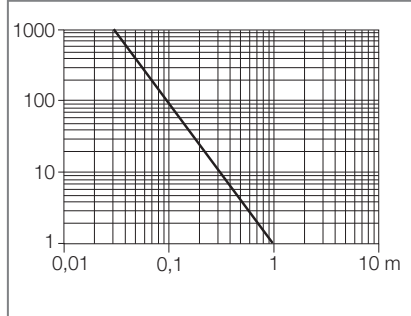
e012



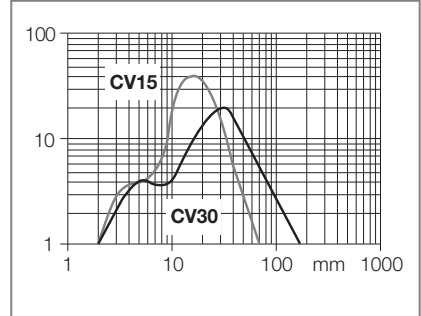
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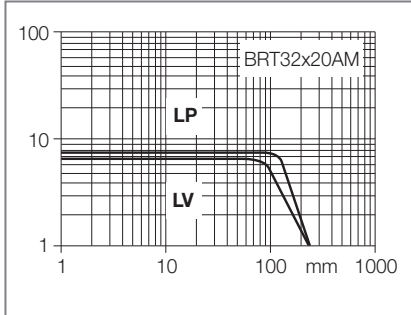
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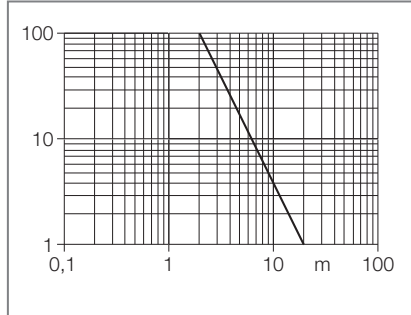
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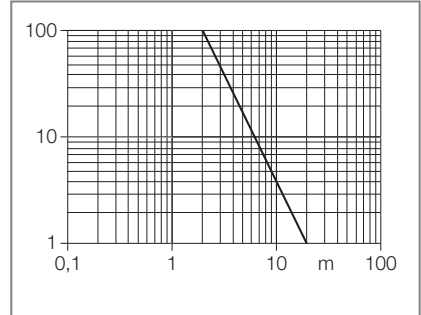
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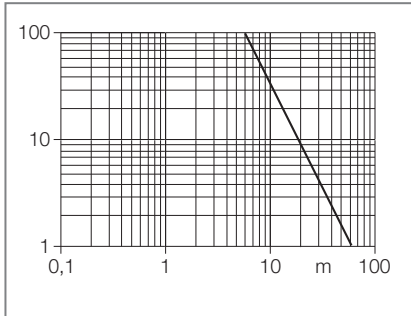
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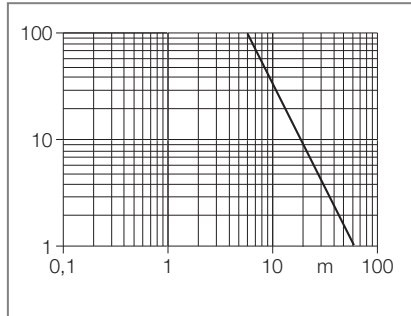
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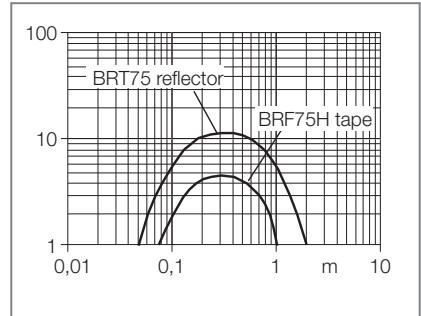
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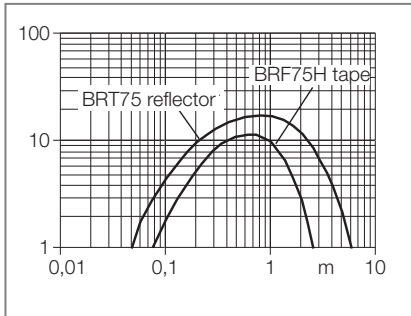
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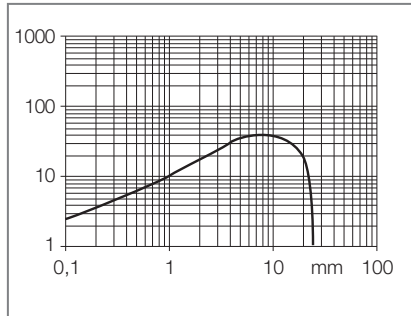
e021



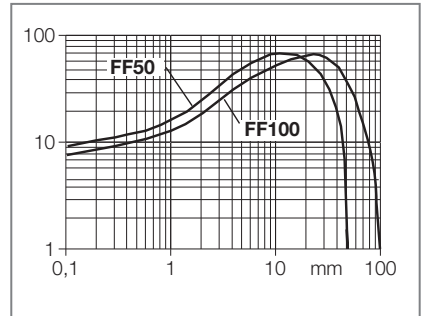
e022



e023

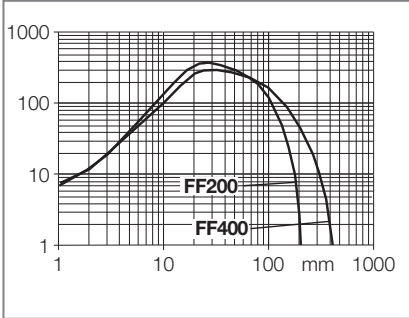


e024

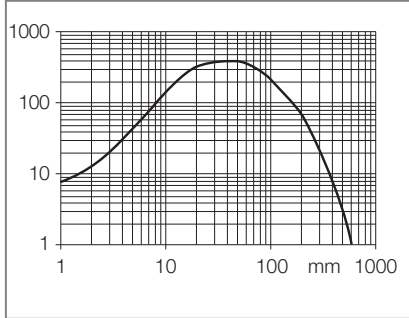


Excess gain curves

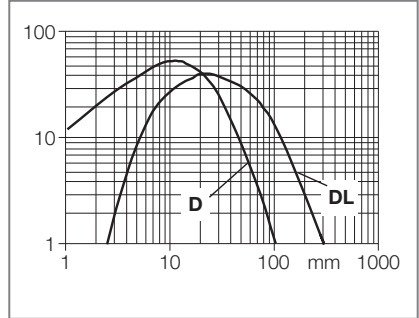
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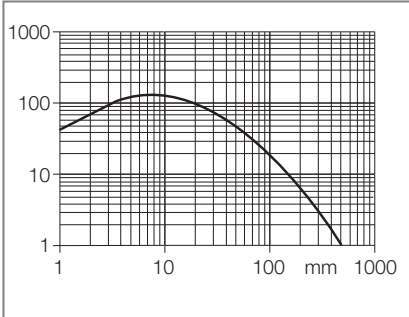
e026



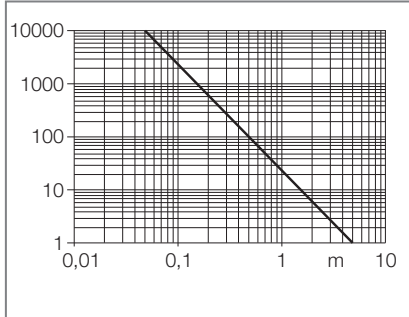
e027



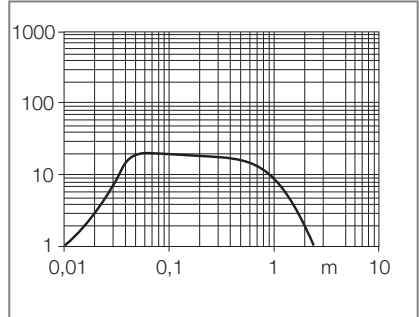
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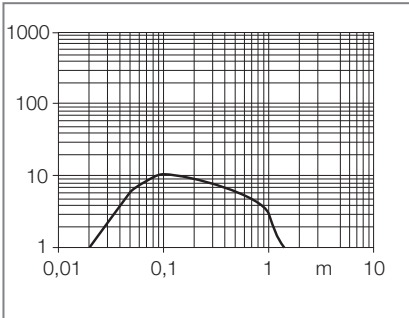
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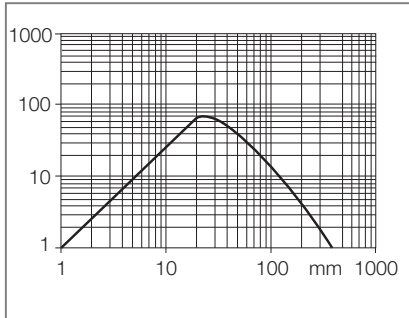
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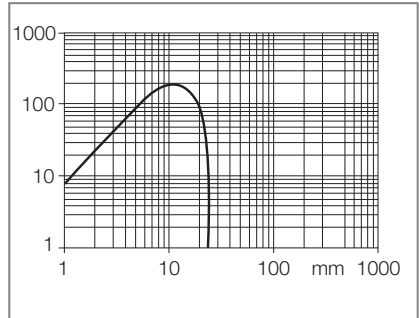
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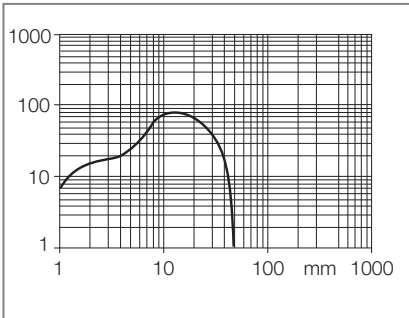
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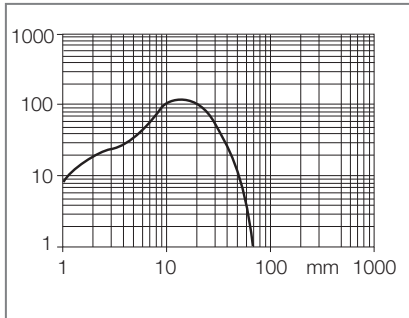
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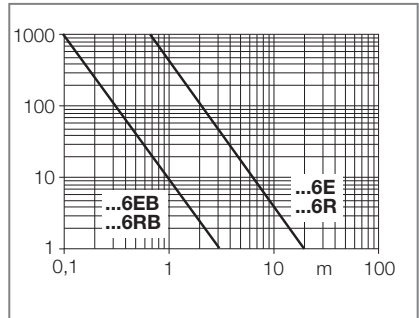
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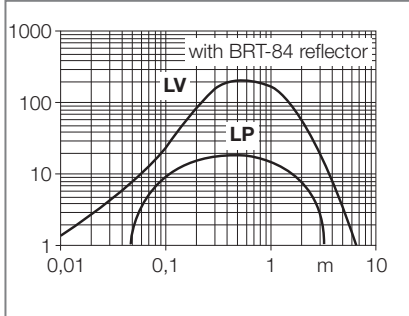
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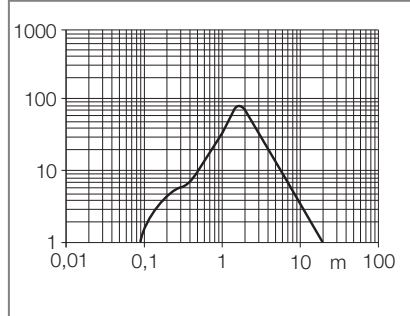
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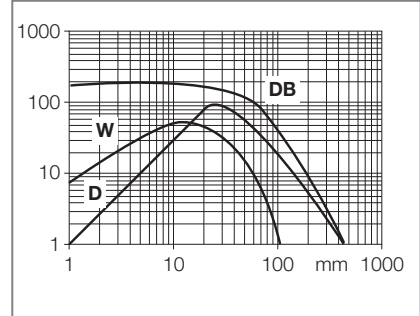
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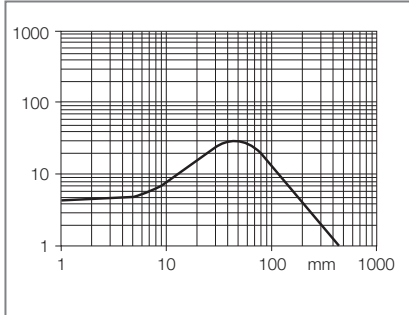
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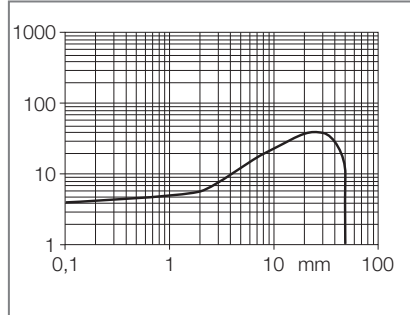
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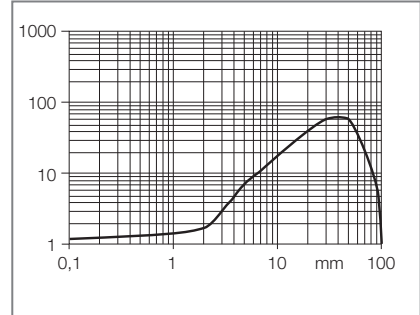
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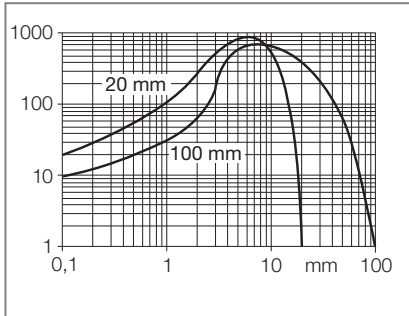
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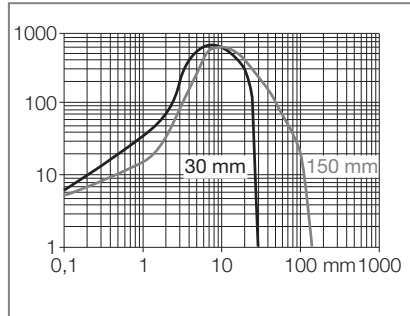
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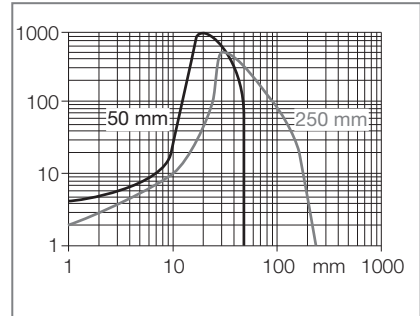
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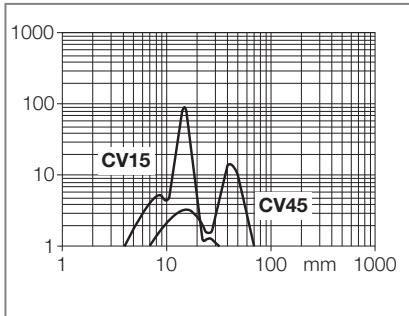
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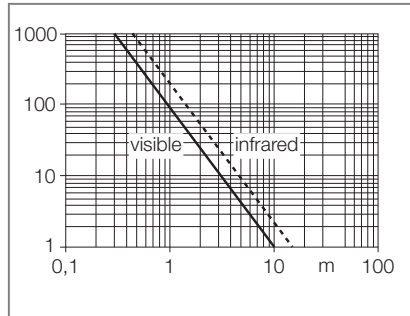
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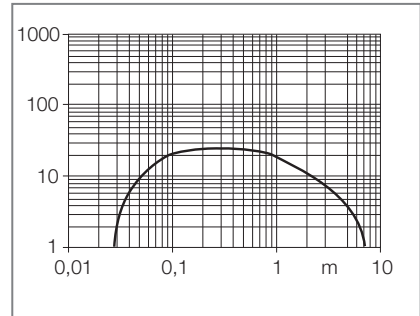
e046



e047

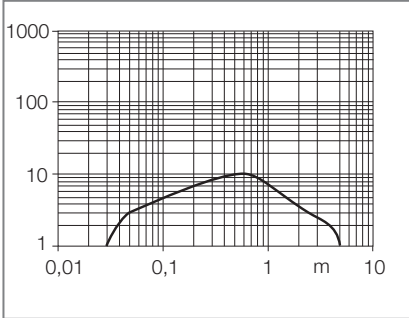


e048

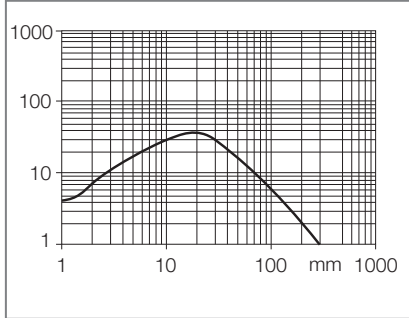


Excess gain curves

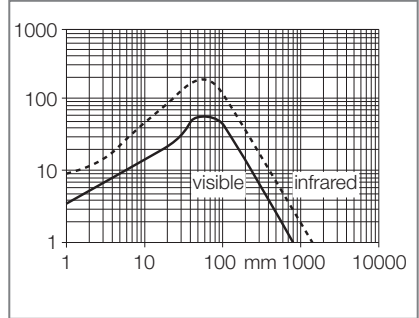
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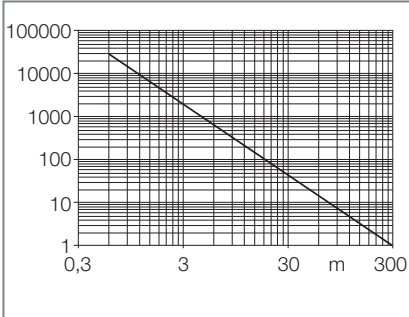
e050



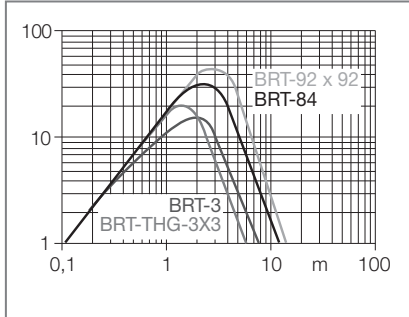
e051



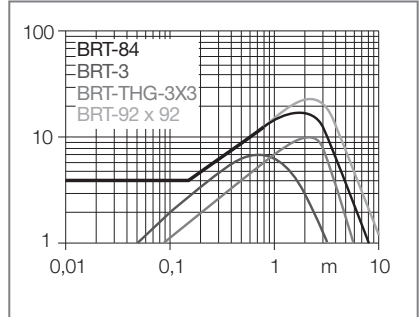
e052



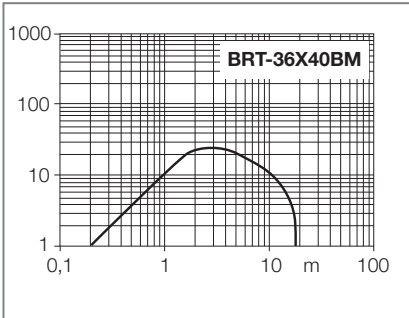
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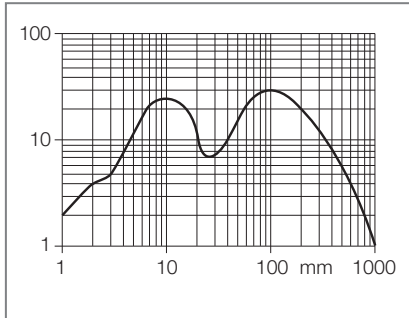
e054



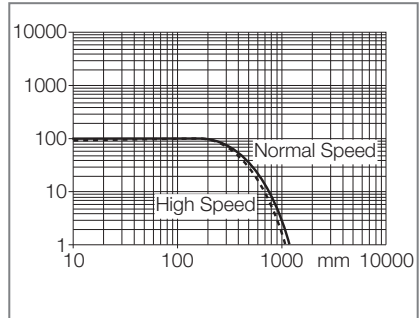
e055



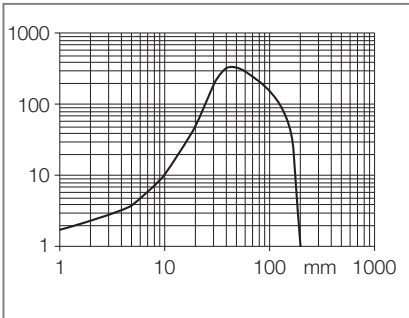
e056



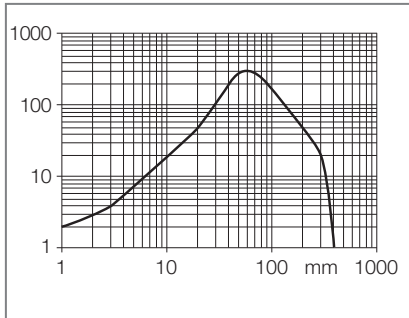
e057



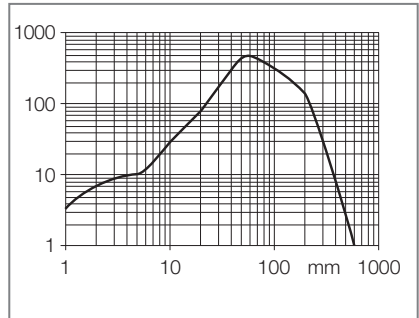
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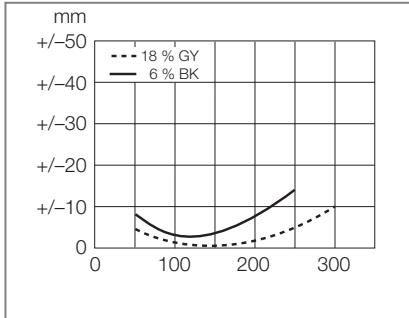
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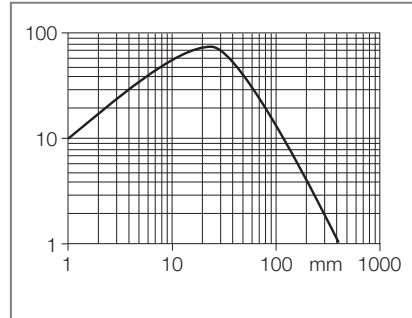
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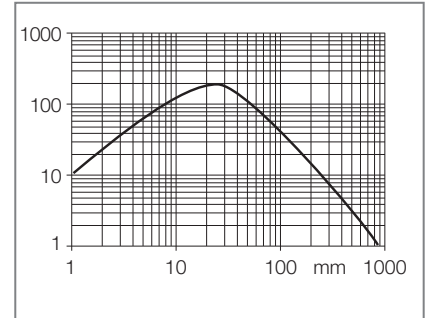
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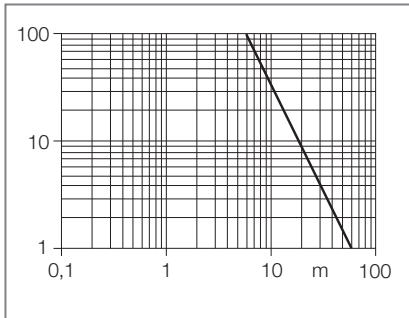
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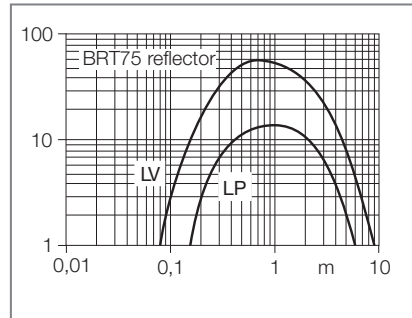
e063



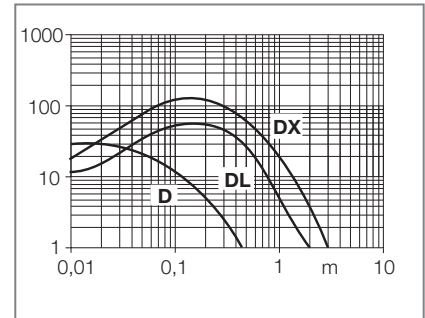
e064



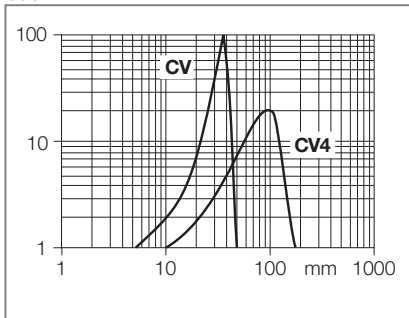
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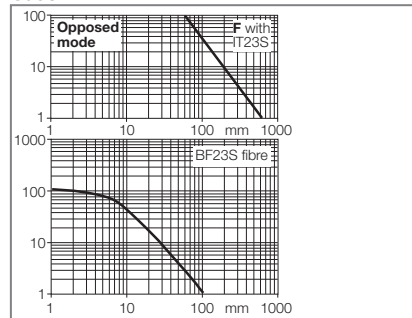
e066



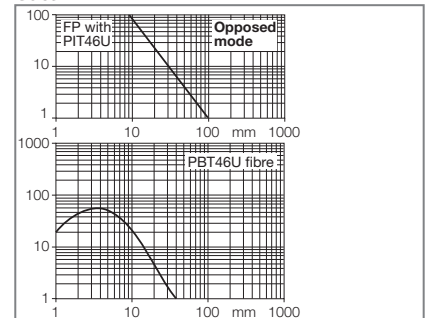
e067



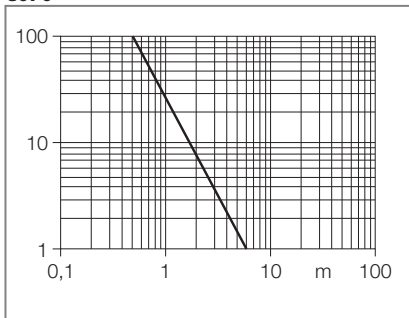
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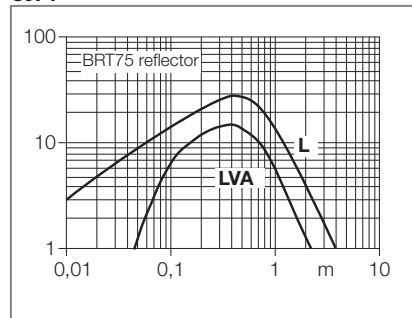
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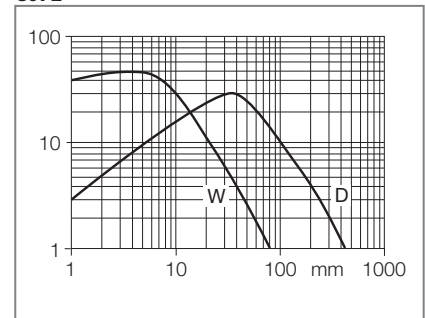
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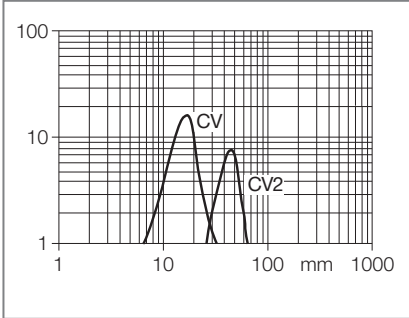


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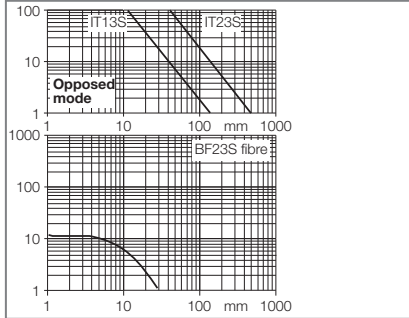


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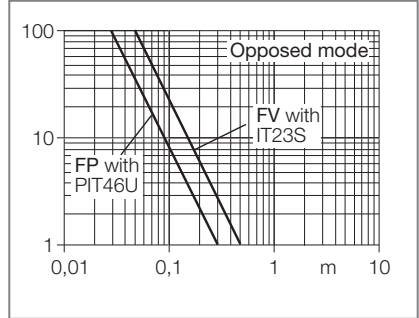
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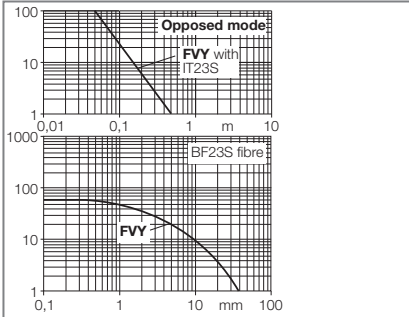
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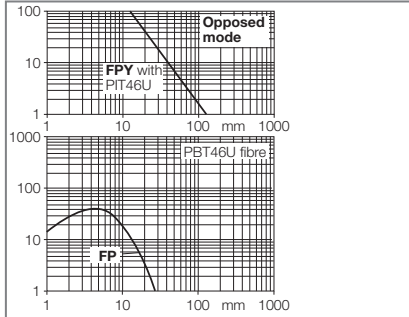
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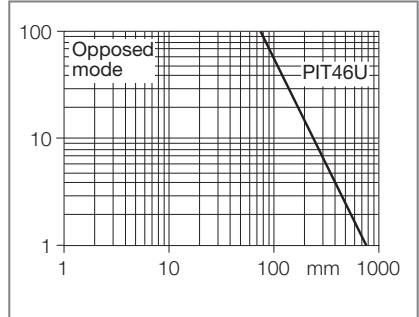
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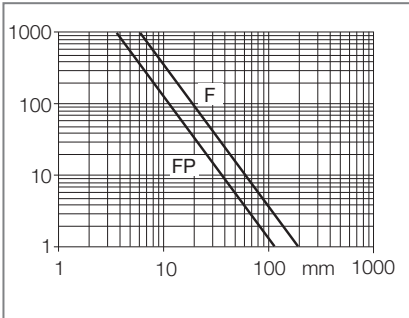
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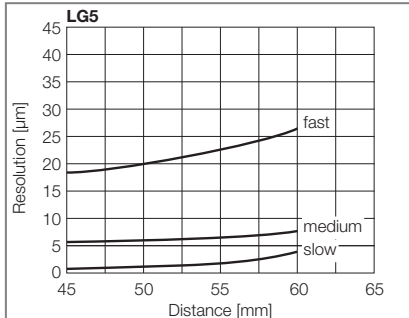
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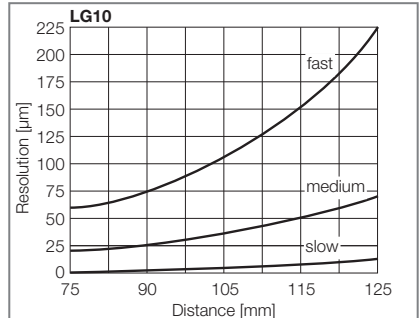
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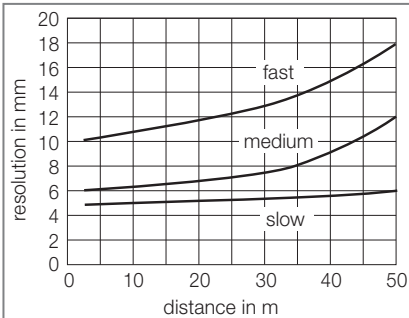
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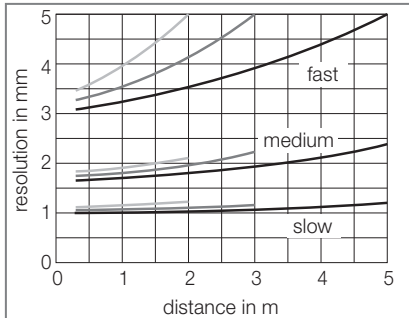
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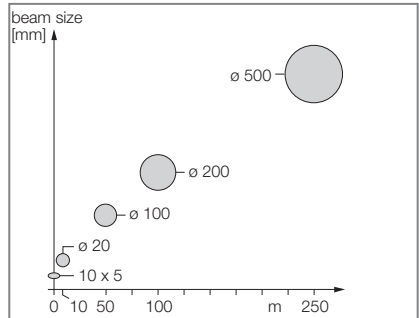
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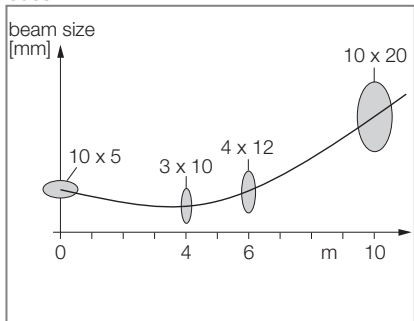
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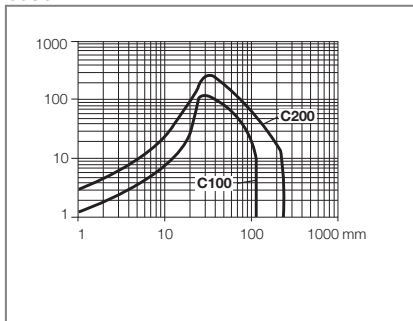
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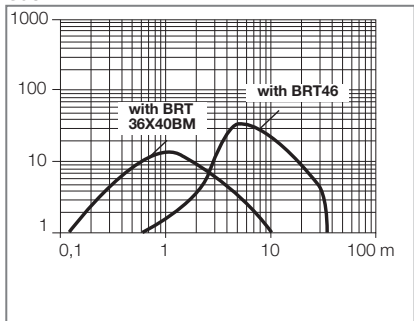
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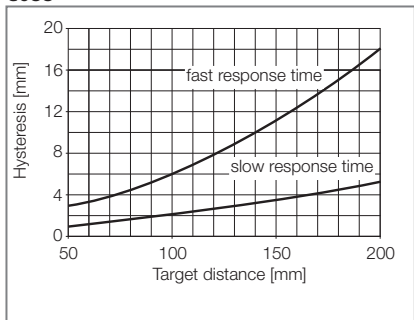
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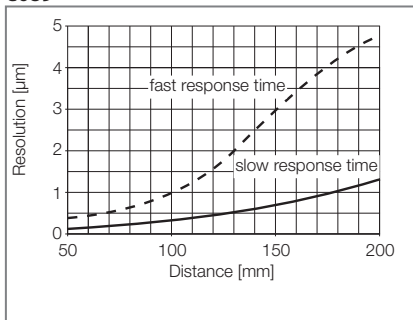
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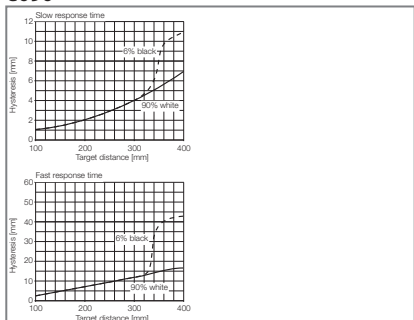
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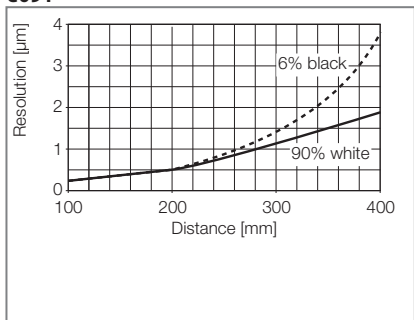
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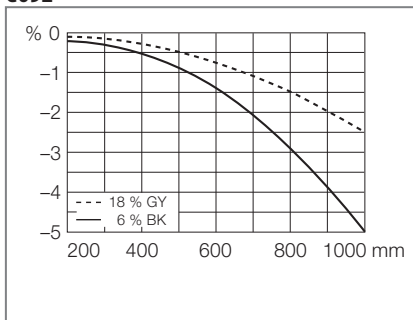
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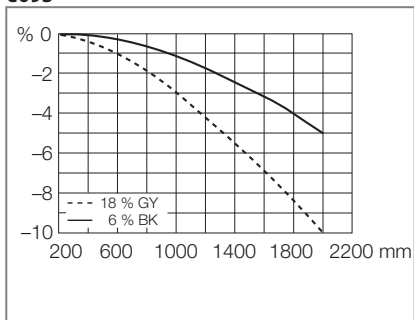
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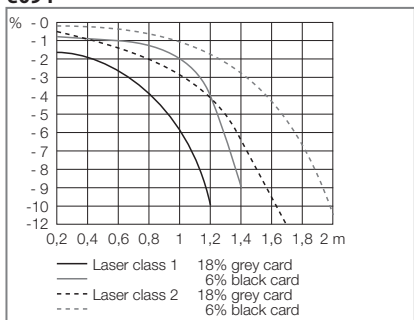
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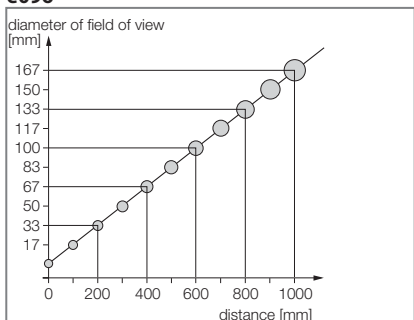
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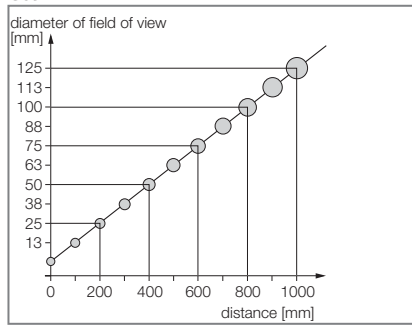
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| YE | — | | + | - |
| YE | - - - | + | + | - |
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| RD-GN-YE | + | + | + | - |

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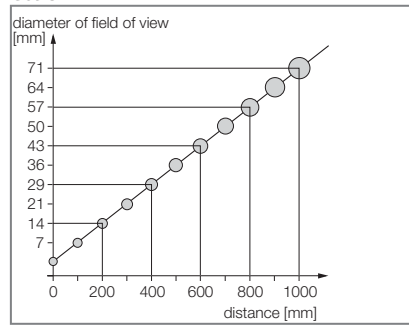


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gain curves

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types

TURCK WORLD-WIDE HEADQUARTERS

GERMANY

Hans Turck GmbH & Co. KG
Witzlebenstraße 7
45472 Mülheim an der Ruhr
P. O. Box 45466 Mülheim an der Ruhr
Tel. +49 (0) 208 4952-0
Fax +49 (0) 208 4952-264
E-Mail more@turck.com

AUSTRALIA

TURCK Australia Pty. Ltd.
unit 5, 6-7 Gilda Court Mulgrave
Victoria 3170
Tel. +61 395609066
Fax +61 395601620
E-Mail australia@turck.com

Austria

TURCK GmbH
Josef-Moser-Gasse 1
1170 Wien
Tel. +43 14 86 15 87 0
Fax +43 14 86 15 87 23
E-Mail austria@turck.com

BAHRAIN

TURCK Middle East S.P.C.
Flat# 23, bldg# 2748
Road# 3649, Block# 436
Seef Area
Manama - Kingdom of Bahrain
Tel. +973 13 638288
Fax +973 13 648288
E-Mail turckmiddleeast@turck.com

BELGIUM

Multiprox N. V.
P. B. 71
Lion d'Orweg 12
9300 Aalst
Tel. +32 53 76 65 66
Fax +32 53 78 39 77
E-Mail mail@multiprox.be

CZECH REPUBLIC

TURCK s.r.o.
Hradecká 1151
500 03 Hradec Králové 3
Tel. +420 495 518 766
Fax +420 495 518 767
E-Mail czechrepublic@turck.com

PR OF CHINA

TURCK (Tianjin) Sensor Co. Ltd.
18,4th Xinghuazhi Road
Xiqing Economic
Development Area
300381 Tianjin
Tel. +86 22 83988-188
83988-199
Fax +86 22 83988-111
E-Mail china@turck.com

FRANCE

TURCK BANNER S.A.S
3, Rue de Courtalin
Magny-Le-Hongre
77703 Marne-La-Vallée Cedex
Tel. +33 1 60 43-60 70
Fax +33 1 60 43-10 18
E-Mail info@turckbanner.fr

GREAT BRITAIN

TURCK BANNER LIMITED
Blenheim House
Hurricane Way
Wickford, Essex SS11 8YT
Tel. +44 1268 578888
Fax +44 1268 763648
E-Mail info@turckbanner.co.uk

HUNGARY

TURCK Hungary kft.
Könyves Kalman Krt.76
1087 Budapest
Tel. +36 14 77 07 40
Fax +36 14 77 07 41
E-Mail hungary@turck.com

INDIA

TURCK India Automation Pvt Ltd.
603/604, 6th Floor, A-wing
ICC Trade Towers
Senapati Bapat Road
Pune - 411016,
Maharashtra - India
Tel. +91 20 25630039
25630040
Fax +91 2 25630040
E-Mail india@turck.com

ITALY

TURCK BANNER S. R. L.
Via S. Domenico, 5
20010 Bareggio (MI)
Tel. +39 02 90 36 42 91
Fax +39 02 90 36 48 38
E-Mail info@turckbanner.it

JAPAN

TURCK Japan Corporation
#202 MBD Bldg. 2F, 3-3-23
Minami-Aoyama,
Minato-ku, 107-0062, Tokyo
Japan
Tel. +81 3 5772 2820
Fax +81 3 3408 2571
E-Mail japan@turck.com

KOREA

Turck Korea Co. Ltd.
Korea Republik (Süd)
Room No. 412, Gyeonggi
Technopark 1271-11,
Sa 1-Dong, Sangnok-Gu, Ansan
ROK426-901 Gyeonggi-Do
Tel. +82 31 500 4555
Fax +82 31 500 4558
E-Mail korea@turck.com

MEXICO

TURCK Mexico S. DE R.L. DE C.V.
Carr. Saltillo-Zacatecas km 4.5 s/n
Parque Industrial "La Angostura"
Saltillo, COAH. 25070
Tel. +52 844 411 6650/46
Fax +52 844 482 6926
E-Mail mexico@turck.com

THE NETHERLANDS

TURCK B. V.
Postbus 297
8000 AG Zwolle
Tel. +31 38 4 22 77 50
Fax +31 38 4 22 74 51
E-Mail netherlands@turck.com

POLAND

TURCK sp.z o.o
ul. Wroclawska 115
45-836 Opole
Tel. +48 77 443 4800
Fax +48 77 443 4801
E-Mail poland@turck.com

ROMANIA

TURCK Automation Romania SRL
Str. Sirlului nr. 6-8, Sector 1
014354 Bucharest
Tel. +40 21 230 02 79
Fax +40 21 231 40 87
E-Mail romania@turck.com

RUSSIA

TURCK Rus O.O.O.
Altufyevskoe shosse, 1/7
127106 Moskau
Tel. +7 495 234 2661
Fax +7 495 234 2665
E-Mail russia@turck.com

SINGAPORE

TURCK Singapore Pte. Ltd.
25 International Business Park
#03-22/23 German Centre
609916 Singapore
Tel. +65 6562 8716
Fax +65 6562 8719
E-Mail singapore@turck.com

TURKEY

Turck Consulting Office
Inonu mah. Kayisdagi c.
Yesil Konak Evleri No:
178, A Blok D:4
34755 Kadikoy/Istanbul
Tel: +90 0 216 572 21 77
Fax: +90 0 216 57 221 23
E-Mail:turkey@turck.com

USA

TURCK Inc.
3000 Campus Drive
Minneapolis, MN 55441-2656
Tel. +1 763 553 9224
553 7300
Fax +1 763 553 0708
E-Mail usa@turck.com



www.turck.com

