Inductive and Photoelectric Proximity Switches



Highlights:

- All-metal housings
- Miniature sizes
- Standard sizes
- Long operating distances
- Extreme environmental conditions
- Analog outputs
- Right-angle optics
- Teach-in

New:

- Small devices with long operating distances
- Inductive devices with 4 x operating distance
- New pressure-resistant executions
- Fiber-optic amplifier with teach-in

CONTRINEX



Top-quality proximity switches

CONTRINEX has manufactured inductive and photoelectric proximity switches since its foundation in 1972. From small beginnings, the company has grown, and now employs over 200 people. Today it specializes exclusively in the development, manufacture and sales of positioning sensors for industrial use.

A proximity switch manufacturer with a difference

Many years ago, CONTRINEX was the first manufacturer to launch the now widespread **miniature inductive devices** with diameters 4 mm and M5 (400 series). In the course of time, many other miniature types followed, such as the 3 mm diameter model (300 series), which is the smallest self-contained inductive proximity switch with built-in amplifier, light-emitting diode, protective circuit, etc. available on the market today.

Already in 1982, CONTRINEX introduced the first inductive devices with **long operating distances** (500 series), which had previously been considered impossible. Today, such devices are available from a number of suppliers, and form an important market segment. However, the new standard for operating distances introduced by CONTRINEX at that time has remained virtually unmatched by any other supplier.

In the meantime, CONTRINEX has launched another series of switches with characteristics far superior to those of current inductive proximity switches: **all-metal housing, long operating distances on steel** as well as on **non-ferrous metals** (series 700).

For less demanding sensing tasks, CONTRINEX offers a comprehensive range of **standard devices** of the highest quality.

In addition, CONTRINEX **photoelectric proximity switches** set new benchmarks for high performance coupled with small dimensions. The latest breakthrough is a new miniature device available in diameter 4 mm and M5 with cylindrical light beam and well-defined operating range.

Quality

If CONTRINEX proximity switches are held in high regard by its worldwide demanding clientele, it is not only because of their technical superiority, but also because of their uncompromising quality and reliability. This is achieved by involving all departments and all management levels in our ISO 9001 certified management system.

The strictest quality standards are applied to the manufacture of every CONTRINEX proximity switch. Nothing is left to chance. Only suppliers who also manufacture to the highest quality standards are qualified to deliver components. Before each component is released into production, it must pass our rigorous incoming inspection. At each production stage, intermediate testing is carried out. And before packing, highly developed automatic systems perform a comprehensive test on every switch, where all the important parameters are checked, documented and statistically analyzed. In addition, the entire manufacturing process is set up for full traceability using the most up-to-date computer technology. The consistently high quality of CONTRINEX proximity switches is certainly not just the result of pure coincidence!

Certified Management System SQS ISO 9001
Reg. N° 11397



SQS

The Swiss Association
for Quality and Management Systems

SQS herewith certifies that the company named below has an appropriate management system which meets the requirements of the international standard for quality management and quality assurance (ISO 9001) and issues the company

Contrinex AG

CH-1762 Givisiez

the

SQS Certificate ISO 9001:1994

on the basis of the audit result

Certified area

Whole Company

Field of activity

Industrial Electronics

CH-3052 Zollikofen, 3 January 2001
This SQS Certificate is valid up to and including 31 December 2003
Scope number 18
Registration number 11397-03

Managing Director SQS — President SQS

T. Zahner — Prof. Dr. H. D. Seghezzi

IQNet

Documentation

Documentation concerning the products in this catalog, detailed data sheets, application details, importable dimensional drawings, cross-reference lists, key to types, presentation of special products and new developments not included in this catalog, additional technical information, information concerning quality, safety and standards, addresses of our representatives, and much more can be found on our website: **www.contrinex.com**, the contents of which are continuously updated and extended.



Worldwide

CONTRINEX products are sold in over 40 countries by experienced agents and well-qualified regional distributors. Well-managed local stocks ensure short delivery times. A list of our representatives is available on request.

Research and development

Nearly all CONTRINEX proximity switches are developed right up to the production stage by ourselves in our modern, well-equipped development laboratories. Amongst others, our facilities include:

- Computer simulators for analog and digital electronic circuits, optical systems, magnetic fields
- Climatic test systems (temperature and humidity)
- EMC test systems (interference generators, measuring instruments, measuring benches)
- Reliability test systems (operating condition simulation, temperature and humidity cycles)

Manufacturing

Most CONTRINEX proximity switches are manufactured in our own factory by highly trained and qualified staff. The key processes are bonding, SMD assembly, trimming, final assembly, and potting.

Quality control

Every device undergoes a complete test cycle, using highly sophisticated automatic test systems, before leaving the factory. In addition, each switch is marked with a reference number, ensuring traceability to historical manufacturing and test information over a period of several years.

Applications

CONTRINEX switches are self-contained, non-contact position sensors. Not only do they not contain parts prone to mechanical wear, but they are also virtually insensitive to environmental influences. They are preferred for applications with exacting requirements, such as reliability, switch-point accuracy, switching frequency, durability, operating speed, etc. According to the physical principle used, a variety of detection possibilities can be realized.

- Inductive proximity switches react only to metal parts, and are thus insensitive to dirt, which is an advantage in many cases.
- Photoelectric proximity switches work with light, which results in long operating distances, and react also to non-conducting materials. Furthermore, these devices are best suited for adapting to specific applications.
- Capacitive sensors are suitable for applications where, for instance, non-conducting, transparent objects have to be detected, or where a clear difference in dielectric properties exclusively distinguishes the target from its background.

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> For further information www.contrinex.com

1 Inductive proximity switches



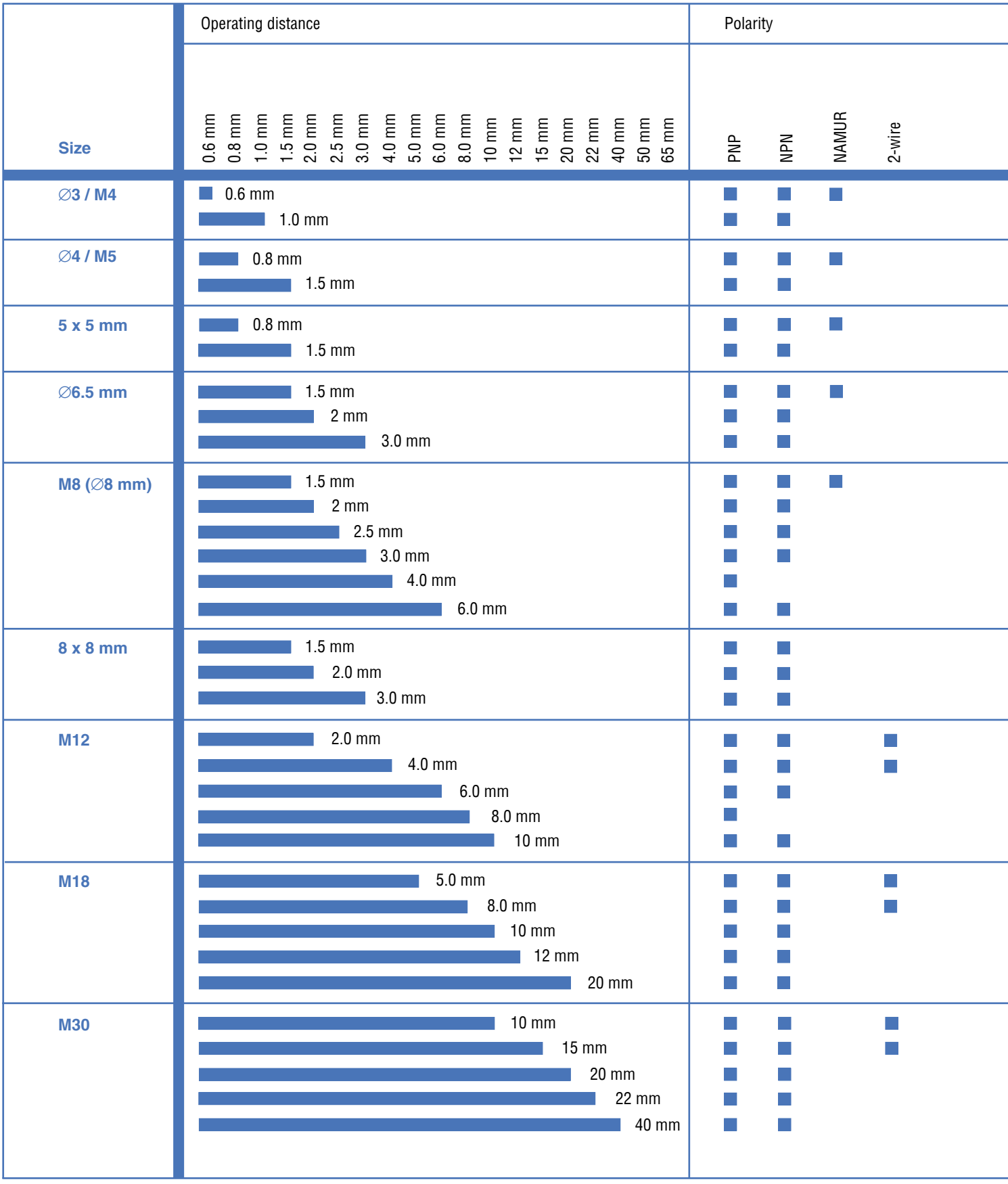
Highlights:

- All-metal housings
- Miniature sizes
- Standard sizes
- Long operating distances
- Extreme environmental conditions
- Analog outputs

New:

- Small devices with long operating distances
- Devices with 4 x operating distance
- New pressure-resistant executions
- New cubic models

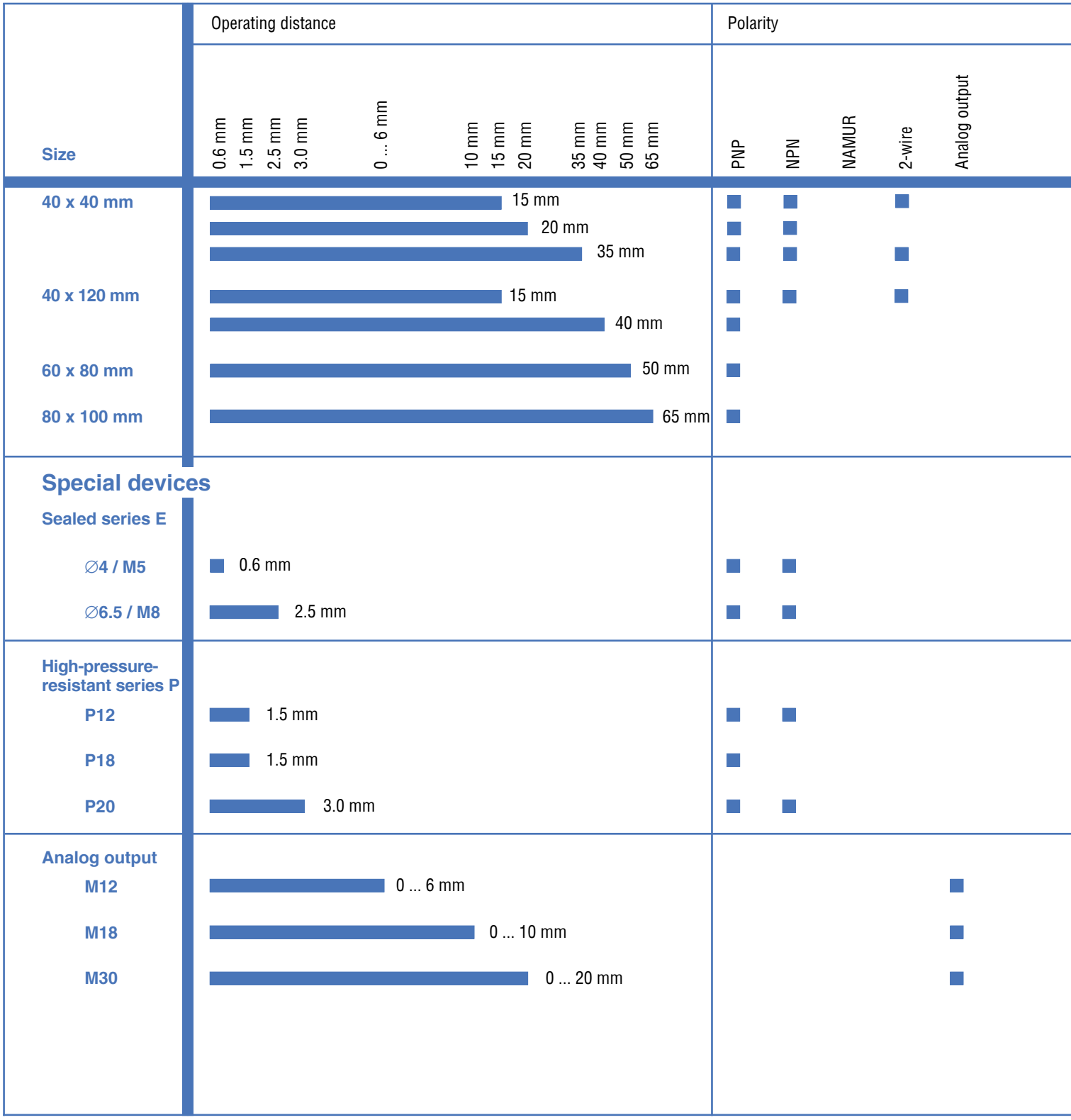
1 Inductive proximity switches



PROGRAM OVERVIEW

Mounting			Supply voltage U_B		Connection					Page
Embeddable	Quasi-embeddable	Non-embeddable	PNP / NPN	NAMUR /2-wire	Connector S08	Connector S12	Cable	Single wires	All-metal housing	
■			10 ... 30 VDC	7.7 ... 9 VDC	■		■			18, 19
■			10 ... 30 VDC		■		■			18, 19
■			10 ... 30 VDC	7.7 ... 9 VDC	■		■	■		19 - 21
■			10 ... 30 VDC		■		■			20, 21
■			10 ... 30 VDC	7.7 ... 9 VDC	■		■			22
■			10 ... 30 VDC		■		■			22, 23
■			10 ... 30 VDC	7.7 ... 9 VDC	■	■	■			23 - 25
■			10 ... 30 VDC		■	■	■			25 - 27
	■		10 ... 30 VDC		■	■	■			28
■			10 ... 30 VDC	7.7 ... 9 VDC	■	■	■			30 - 31 (28)
■			10 ... 30 VDC		■	■	■			32 - 33 (29)
		■	10 ... 30 VDC		■	■	■			34 - 35
	■		10 ... 30 VDC		■	■	■			36
	■		10 ... 30 VDC		■	■	■			36 - 37
		■	10 ... 30 VDC		■	■	■			37
■			10 ... 30 VDC		■		■			38
■			10 ... 30 VDC		■		■			38
	■		10 ... 30 VDC		■		■			39
■			15 ... 34 VDC	20...265 VAC / 20...320 VDC		■	■			40 - 41
■		■	15 ... 34 VDC	20...265 VAC / 20...320 VDC		■	■			41 - 43
■	■		10 ... 30 VDC			■	■		■	43 - 44
	■		10 ... 30 VDC			■	■			45
		■	10 ... 30 VDC			■	■		■	45 - 46
■			15 ... 34 VDC	20...265 VAC / 20...320 VDC		■	■			46 - 47
	■	■	15 ... 34 VDC	20...265 VAC / 20...320 VDC		■	■			48 - 50
■			10 ... 30 VDC			■	■		■	50
	■		10 ... 30 VDC			■	■			51
		■	10 ... 30 VDC			■	■		■	52 - 53
■			15 ... 34 VDC	20...265 VAC / 20...320 VDC		■	■			54 - 55
		■	15 ... 34 VDC	20...265 VAC / 20...320 VDC		■	■			55 - 56
■			10 ... 30 VDC			■	■		■	56 - 57
	■		10 ... 30 VDC			■	■			57
		■	10 ... 30 VDC			■	■		■	58 - 59

1 Inductive proximity switches



PROGRAM OVERVIEW

Mounting			Supply voltage U_B		Connection					Page
Embeddable	Quasi-embeddable	Non-embeddable	PNP / NPN	NAMUR / 2-wire	Connector S08	Connector S12	Cable	Single wires	Screw terminal	
■			15 ... 34 VDC	20...265 VAC / 20...320 VDC		■				60
■			15 ... 34 VDC			■				60
		■	15 ... 34 VDC	20...265 VAC / 20...320 VDC		■				61
■			15 ... 34 VDC	20...265 VAC / 20...320 VDC					■	62
		■	10 ... 65 VDC						■	62
		■	10 ... 65 VDC						■	63
		■	10 ... 65 VDC						■	63
■			10 ... 30 VDC				■			64
■			10 ... 30 VDC				■			64
■			10 ... 30 VDC			■				64 - 65
■			10 ... 30 VDC			■				65
■			10 ... 30 VDC			■	■			65
	■		10 ... 30 VDC			■	■			66
	■		10 ... 30 VDC			■	■			66 - 67
	■		10 ... 30 VDC			■	■			67

1 Inductive proximity switches

Technology

Depending on the type, CONTRINEX inductive devices work according to one of **three different technologies.** All have in common the generation of an alternating magnetic field, which emanates from the sensing face. When a conductive, generally metallic, object enters into this field, the latter is influenced in a way that can be detected and evaluated by the built-in electronics. The three operating principles mentioned are described below.

Operating principles

Classic inductive proximity switches

The coil of a conventional circuit oscillator in the proximity switch generates a high-frequency magnetic field, which emanates from the sensing face. Any metallic object found in this field absorbs some of the energy, which is detected and evaluated by the built-in electronics (Fig. 1).

Ferromagnetic metals (steel, nickel, cobalt) absorb the most energy. The achievable operating distances are therefore greatest with these metals. Good conducting, non-ferromagnetic metals, such as aluminum, absorb less energy. As a result, operating distances are significantly lower (approx. 25...45% of those on steel).

This technology is used in 300, 400, 420, 600 and 620 series devices.

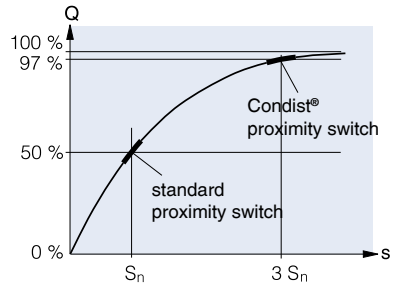


Fig. 3

Proximity switches using Condist® technology

By means of a CONTRINEX patented **Condist® oscillator,** these proximity switches also generate a high-frequency magnetic field, which emanates from the sensing face (Fig. 2). Again, the resulting effect is that any metallic object entering the field absorbs energy from it.

The oscillator and the subsequent signal evaluation circuit are however completely different, with the objective of achieving a significantly **better stability** with respect to environmental influences, in particular, temperature. The most important contribution to this comes from the CONTRINEX patented Condist® oscillator.

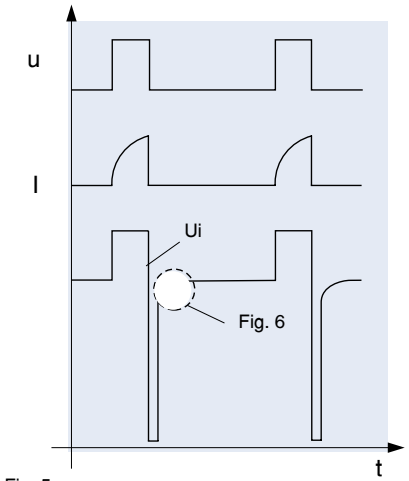


Fig. 5

The improved stability permits the switch point to be further away, leading to **longer operating distances** (Fig. 3). The subsequent assemblies on the other hand are no different from those of proximity switches with standard operating distances. Material dependency is similar to conventional oscillators.

This technology is used in 500 and 520 series devices.

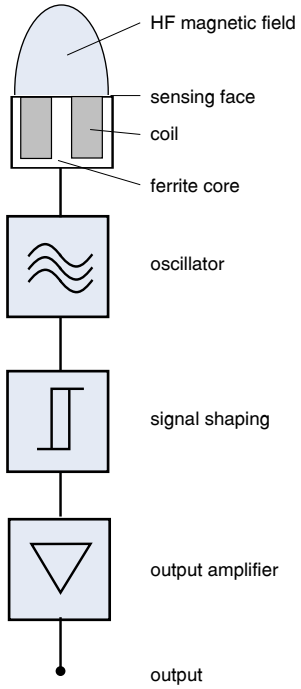


Fig. 1

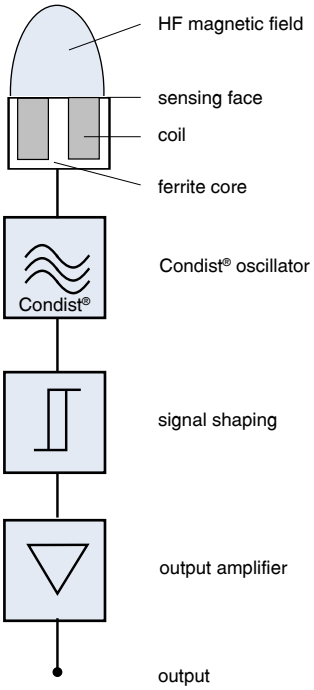


Fig. 2

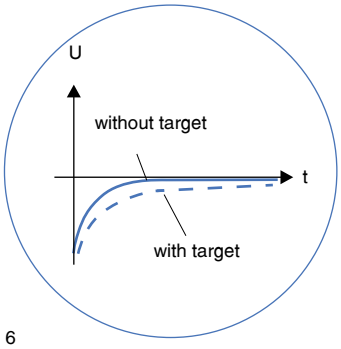


Fig. 6

Proximity switches using Condet® technology

These devices also function according to inductive technology. However, the coil which generates the magnetic field is not part of the oscillator (Fig. 4). Instead, the field is generated by periodic, short **transmitter current pulses**, which flow through the coil (Fig. 5). This field induces a voltage in the target, which, in turn, generates a current flow in it. When the transmitter current pulse is switched off, the current in the object dies away, causing a **voltage to be induced** in the transmitting coil (Fig. 6).

This voltage generates the signal required, and is in principle **independent of the field's energy loss.** Therein lies the fundamental advantage of this technology, since the field energy losses, which are evaluated in conventional proximity switches, are liable to a number of undesirable environmental and material influences.

The coupling between the target and the coil is rather **like a transformer**, and is hence **temperature independent** and only **slightly influenced by the target's material.** Only metals which are non-ferromagnetic and also have poor electrical conductivity give a reduced usable signal.

This technology is used in 700 series devices.

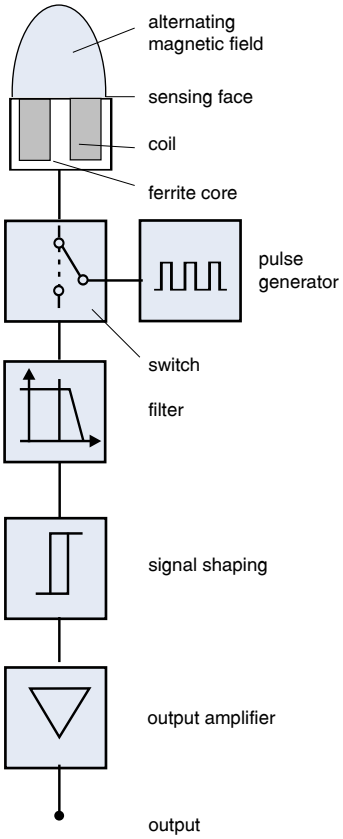


Fig. 4

Small sizes

These small devices operate with conventional technology (Fig. 1). They have been so optimized that a particularly **high switching frequency** can be obtained.

The essential differences compared to larger versions lie in their construction and manufacture. Only sub-components with the smallest dimensions possible can be used. The semiconductors are mounted onto the substrate as chips (without housings), i.e. bonded (COB technique). As substrate, exclusively glass-fiber reinforced epoxy resin is used (**no ceramic,** with its undesirable brittleness). The finished electronic assemblies are subsequently potted, using a special vacuum technique, i.e. without any inclusion of air bubbles. In this way, **optimum long-term reliability,** even under difficult operating conditions, can be guaranteed.



Devices with long operating distances, 500 series

These devices work using Condist® technology (Fig. 2). They are distinguished by their **long operating distances** on ferromagnetic metals, and react particularly well to elongated targets, e.g. rods and wires.



To a great extent, all other properties correspond to those of conventional proximity switches. Special attention has been paid to **meet the relevant standards as much as possible**, so that easy **interchangeability** with conventional devices is guaranteed. Great emphasis has been placed on a very good EMC resistance and on perfect sealing against liquid penetration.

Devices with very long operating distances, 520 series

These devices also work using Condist® technology (Fig. 2). Available in sizes M8 and M12, they are a further development of the series 500 switches, featuring **even longer operating distances** on ferromagnetic metals than the latter.

Standard switches, 600 series

Functioning according to classical technology (Fig. 1), these devices form the backbone of position sensors. They are reliable, undemanding, standardized, low-cost, and therefore suitable for many applications where there are **no special requirements.**

Standard switches with increased operating distances, 620 series

Functioning also according to classical technology (Fig. 1), these devices basically correspond to those of the 300, 400, 420 and 600 series. Switching-wise, they have been optimized in such a way that an **increased operating distance** can be achieved, especially for small sizes. Users will find them interesting, since with a relatively small markup in price, a valuable increase in operating distance can be obtained.

All-metal devices with long operating distances, 700 series

These devices work using Condet® technology (Fig. 4). They are characterized by **long operating distances**, not only on ferromagnetic metals, but also on all other metals having good conductivity, such as **aluminum, copper, brass,** etc. Only metals which are both non-ferromagnetic as well as having poor electrical conductivity result in reduced operating distances. For good results, the target must have a certain surface area, this technology being less suitable for elongated geometries.

A further important characteristic of these devices is the **one-piece stainless steel housing,** sensing face included (Fig. 7). Throughout the whole of their working lives therefore, the 700 series devices are **without reservation impervious** at the sensing face to all liquids and gases which do not corrode stainless steel. The material at the sensing face being relatively thick, the devices are therefore **pressure resistant** to a considerable extent. In addition, thanks to their all-metal housing, they are much **more resistant** to **mechanical stresses** in the area of the sensing face than conventional proximity switches. As a result, important weak spots of conventional proximity switches are eliminated.

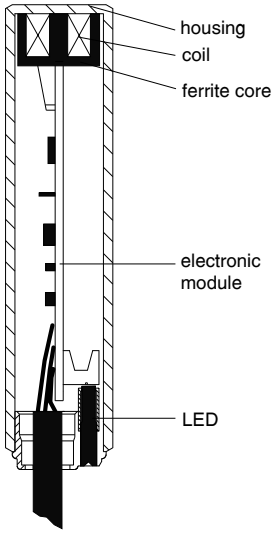


Fig. 7

All other properties correspond to a great extent to those of standard devices found in the market. Special attention has also been paid to **meet the relevant standards as much as possible,** so that easy **interchangeability** with previous devices is guaranteed.

Devices for special applications

Analog series

Within the 500 series, a number of devices are available with analog output. At the moment, executions with non-linear transmission behavior (Fig. 8) are available. Models with linear transmission behavior are in preparation.

These devices use Condist® technology (Fig. 2). They are characterized by a **very large sensing range**, good accuracy, stability, and repeat accuracy, as well as low specimen scattering.

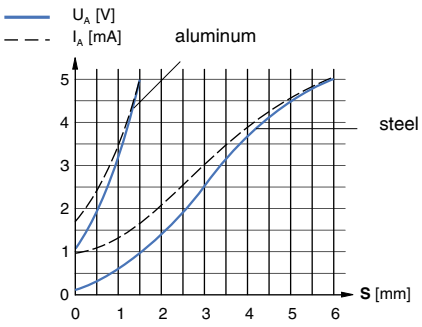


Fig. 8

Sealed series E

The sealed series E is equipped with a **stainless steel** housing, an imperviously bonded **sapphire or ceramic disk** at the sensing face, and polyurethane cable as standard. In order to benefit from optimum impermeability, the LED and connector versions have been dispensed with.



High-pressure-resistant series P

The main problem of any pressure-resistant proximity switch is that, in order to achieve pressure resistance, a thick cover (usually of a ceramic material) on the sensing face is necessary. The thickness of this cover reduces the device's normal operating distance, so that only a small usable operating distance, or even none at all, remains. Because of this, devices are available on the market which have the oscillator coil on the high-pressure side. On top of this, the sensing face is partly made of plastic. As a result, when used in normal operating circumstances (hydraulic oils, high temperature, cyclic pressure stress), reliability problems are unavoidable



with this type of proximity switch. CONTRINEX devices are constructed entirely differently, and such problems do not occur. Using Condist® technology, the electronic modules are inserted into thick-walled stainless steel housings. Thanks to their very long operating distance, it is possible to employ a simple, robust, sufficiently **thick ceramic disk** at the sensing face, without any support construction or other artificial tricks. The whole **electronic unit,** ferrite core and coil included, is thus found on the **no-pressure side**. The remaining usable operating distance is more than sufficient. The assembly is shown in Fig. 9.

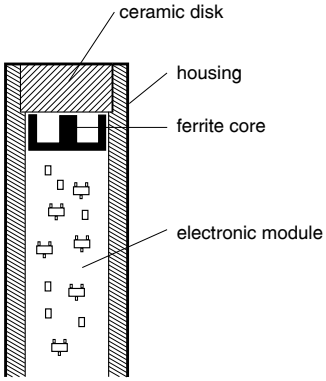


Fig. 9

The housing is heat shrunk onto the ceramic disk. Without any further measures, such as additionally sealing, the union produced by this force fit is mechanically very resistant and **exceptionally impervious.** This technology results in devices which are outstanding for applications where there is **high dynamic pressure stress.**

Product overview

Series 300

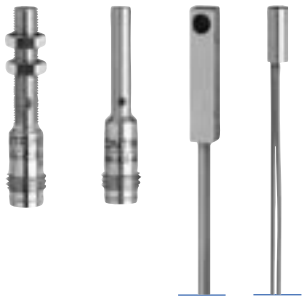
The delivery program includes sizes with diameters 3 mm smooth and M4 in an embeddable execution. These are the **smallest self-contained inductive proximity switches available on the market** with fully integrated evaluation electronics. These sizes, introduced by CONTRINEX, are not yet standardized.



All devices are available in 3-wire DC, NPN and PNP executions. Additionally, the range contains devices with 2 wires according to NAMUR (DIN / EN 19234). All 3-wire models are available in N.O. and N.C. configuration; a LED output state indicator is standard. In addition, all the important protection functions are built in, such as short-circuit and overload protection, full polarity reversal protection, induction protection, EMC protection, power-on reset, etc. (only partially for NAMUR devices). CE conformity is achieved **without** the external protective circuit authorized according to the standard (EN 60947-5-2 / 7.2.3.1).

Series 400

The delivery program includes sizes with diameters 4 mm smooth, M5 threaded, as well as the 5 x 5 x 25 mm cuboid **with through holes** for fixing, all in embeddable execution. A further device with 4 mm diameter is distinguished by its very short length of only 10 mm (only in NAMUR execution). **Also introduced by CONTRINEX, these sizes** are now standardized for the most part.



All devices are available in 3-wire DC, NPN and PNP executions. Additionally, the range contains devices with 2 wires according to NAMUR (DIN / EN 19234). All 3-wire models are available in N.O. and N.C. configuration; a LED output state indicator is standard. In addition, all the important protection functions are built in, such as short-circuit and overload protection, full polarity reversal protection, induction protection, EMC protection, power-on reset, etc. (only partially for NAMUR devices). CE conformity is achieved **without** the external protective circuit authorized according to the standard (EN 60947-5-2 / 7.2.3.1).

Series 420

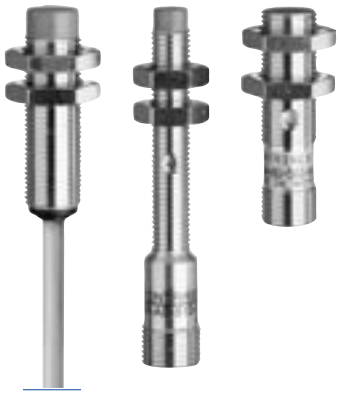
The delivery program includes sizes with diameters 6.5 mm smooth and M8. These devices are distinguished by their **extremely short lengths**. The execution with right-angled cable output permits a **further reduction** in length. Introduced by CONTRINEX, these sizes correspond to all relevant standards, with the exception of their length.



All devices are available in 3-wire DC, NPN and PNP executions. Additionally, the range contains devices with 2 wires according to NAMUR (DIN / EN 19234). All 3-wire models are available in N.O. and N.C. configuration; a LED output state indicator is standard. In addition, all the important protection functions are built in, such as short-circuit and overload protection, full polarity reversal protection, induction protection, EMC protection, power-on reset, etc. (only partially for NAMUR devices). CE conformity is achieved **without** the external protective circuit authorized according to the standard (EN 60947-5-2 / 7.2.3.1).

Series 500

The delivery program includes sizes with diameters from 6.5 mm smooth to M30 in quasi-embeddable and non-embeddable executions. These sizes are standardized. Varying from the standard, the series 500 offers however greater **operating distances** (2.2 ... 3 times the standard values).



All devices are available in 3-wire DC, NPN and PNP executions. All 3-wire models are available in N.O. and N.C. configuration; a LED output state indicator is standard. In addition, all the important protection functions are built in, such as short-circuit and overload protection, full polarity reversal protection, induction protection, EMC protection, power-on reset, etc.

The range additionally includes devices with **analog output**. A voltage output (0 ... 5 V or 0 ... 10 V) and a current output (1 ... 5 mA or 4 ... 20 mA) are simultaneously available. For the moment, quasi-embeddable devices in sizes M12, M18, and M30 are available.

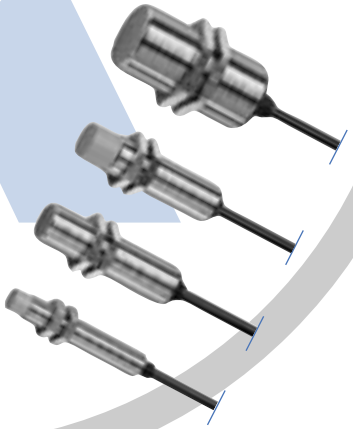
Series 520

The 520 series devices are a further development of the 500 series. In addition to the previously existing properties, they feature even longer operating distances. For the moment, sizes M8 and M12 are available.

Series 600

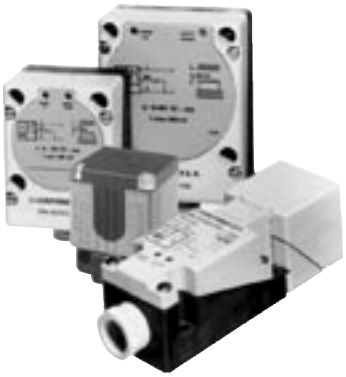
Cylindrical housings

This range of proximity switches comprises all widely used sizes from 6.5 mm smooth to M30, according to the standards IEC 60947-5-2 / EN 60947-5-2 and VDE 0660 part 208. All switches are available in 3-wire DC, PNP and NPN versions, with cables or connectors. Sizes M12, M18 and M30 are also available as 2-wire models (for 20 ... 265 VAC, or 20 ... 320 VDC). All types are available in N.O. and N.C. configuration. A LED output state indicator is standard. In addition, all the important protection functions are built in, such as short-circuit and overload protection (3-wire DC models), full polarity reversal protection, induction protection, EMC protection, power-on reset, etc.



Cuboid housings

In addition to the cylindrical models, series 600 also includes cuboid types in sizes 40 x 40 mm (IEC I1C40 / I2C40), 60 x 40 mm and 80 x 40 mm (IEC I2D80). These are equipped with screw terminals for easy connection. All types are available as 3-wire DC PNP models, and some also as NPN models or as 2-wire UC (AC / DC) versions. New are the cubic models 40 x 40 x 40 mm with connector, available as 4-wire PNP or NPN, as well as 2-wire UC. LED and protection circuitry are as for cylindrical types. High-quality plastic housings (mostly glass-fiber reinforced PBTP) ensure the excellent mechanical stability of these switches.



Series 620

These proximity switches are a further development of the series 300, 400, 420 and 600 models, but having increased operating distances. Sizes 3 mm smooth to M18, including sizes C5 and C8 cuboids, are currently available.

Series 700

At the present time, the delivery program includes sizes M12, M18, and M30 in embeddable and non-embeddable executions. Further sizes are in preparation. These sizes are basically standardized. Varying from the standard, the series 700 offers however **long operating distances**. These operating distances are moreo-

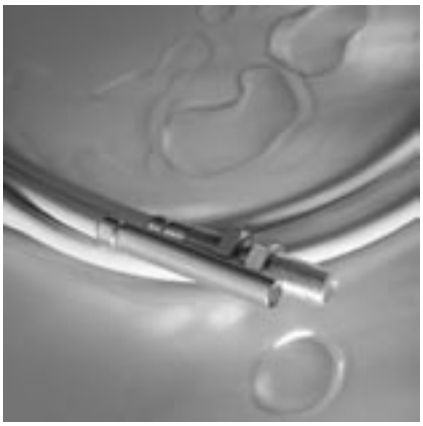


ver also achieved on the most important **non-ferrous metals**. Of further particular interest, is the **one-piece** stainless steel housing, sensing face included.

All devices are available in 3-wire DC NPN and PNP executions. All 3-wire models are available in N.O. and N.C. configuration; a LED output state indicator is standard. In addition, all the important protection functions are built in, such as short-circuit and overload protection, full polarity reversal protection, induction protection, EMC protection, power-on reset, etc.

Sealed series E

At the present time, the delivery program includes sizes with diameters from 4 mm smooth to M8. The devices are intended for **difficult environmental conditions**. They are equipped with a **stainless steel** housing imperviously bonded, by soldering or shrinking, to a **sapphire or ceramic disk** on the sensing face. Connection is by means of a highly flexible cable with a polyurethane sleeve. The electrical properties are equivalent to those of the corresponding series 400 and 500 devices. However, due to the thickness of the disk, the operating distances are somewhat shorter.



High-pressure-resistant series P

The delivery program includes different size devices for operating pressures from **100 ... 500 bars.** Their main applications are in high-pressure hydraulic systems. They have a **stainless steel** housing imperviously shrunk onto a ceramic disk at the sensing face (Fig. 9). Connection is by means of either a highly flexible cable with a polyurethane sleeve, or an integrated connector. The electric properties are equivalent to those of the corresponding series 500 devices.



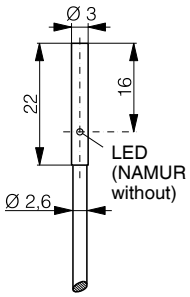
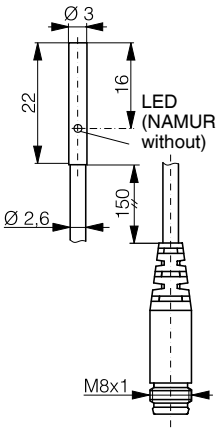
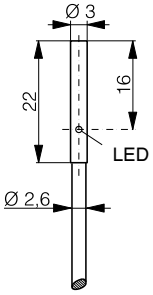
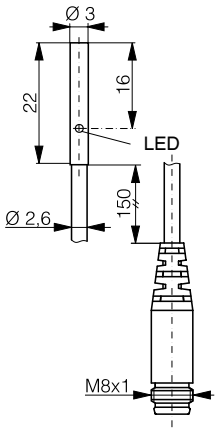
Special executions

In addition to the types described in this catalog, a number of special executions are available, in particular devices with different cable lengths, different cable types (e.g. with oil-resistant, highly flexible PUR insulation, or silicone cables), different housing materials (e.g. stainless steel).

CE mark

The inductive proximity switches in this catalog comply with the requirements of European standards EN 60947-1 and EN 60947-5-2 and therefore correspond to the EMC guideline 89/336/EEC as well as the low-voltage guideline 73/23/EEC.

They are therefore provided throughout with the **CE mark**.

Size	Ø 3				Ø 3	
Operating distance mm	0.6		0.6		1.0	1.0
Housing material	Stainless steel V2A		Stainless steel V2A		Stainless steel V2A	Stainless steel V2A
Connection [1]	PUR cable type 1		PUR cable type 1 / Connec. S8		PUR cable type 1	PUR cable type 1 / Connec. S8
Degree of protection	IP 67		IP 67		IP 67	IP 67
Mounting	Embeddable		Embeddable		Embeddable	Embeddable
Max. switching frequency	5,000 Hz	10,000 Hz	5,000 Hz	10,000 Hz	3,000 Hz	3,000 Hz
Technical data [2]	Table 8	Table 5	Table 8	Table 5	Table 8	Table 8
Wiring [3]	Diagram 1	Diagram 4	Diagram 1	Diagram 4	Diagram 1	Diagram 1
LED	Built-in	---	Built-in	---	Built-in	Built-in
Supply voltage range	10 ... 30 VDC	7.7 ... 9 VDC	10 ... 30 VDC	7.7 ... 9 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 100 mA	≤ 1 / ≥ 2.2 mA*	≤ 100 mA	≤ 1 / ≥ 2.2 mA*	≤ 100 mA	≤ 100 mA
[1] Standard cable length 2 m. Non-standard cable lengths and types on request. [2] see page 68 [3] see page 69 [4] see page 112					 increased distance	 increased distance
Dimensions: Part references: (**bold:** preferred types)						
NPN N.O.	**DW-AD-301-03**		**DW-AS-301-03**		**DW-AD-621-03**	**DW-AS-621-03**
NPN N.C.	DW-AD-302-03		DW-AS-302-03		DW-AD-622-03	DW-AS-622-03
PNP N.O.	**DW-AD-303-03**		**DW-AS-303-03**		**DW-AD-623-03**	**DW-AS-623-03**
PNP N.C.	DW-AD-304-03		DW-AS-304-03		DW-AD-624-03	DW-AS-624-03
NAMUR		**DW-AD-305-03**		DW-AS-305-03		
AC/DC 2-wire N.O.						
AC/DC 2-wire N.C.						
Compatible connectors [4]			A ... D	A, B		A ... D

*damped / non-damped

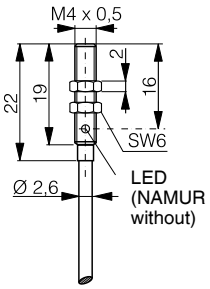
SERIES 300

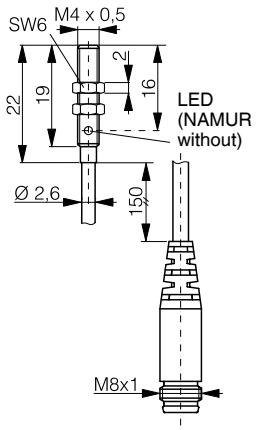
M4

0.6		0.6	
Stainless steel V2A		Stainless steel V2A	
PUR cable type 1		PUR cable type 1 / Connec. S8	
IP 67		IP 67	
Embeddable		Embeddable	
5,000 Hz	10,000 Hz	5,000 Hz	10,000 Hz
Table 8	Table 5	Table 8	Table 5
Diagram 1	Diagram 4	Diagram 1	Diagram 4
Built-in	---	Built-in	---
10 ... 30 VDC	7.7 ... 9 VDC	10 ... 30 VDC	7.7 ... 9 VDC
-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
≤ 100 mA	≤ 1 / ≥ 2.2 mA*	≤ 100 mA	≤ 1 / ≥ 2.2 mA*









DW-AD-301-M4		**DW-AS-301-M4**	
DW-AD-302-M4		DW-AS-302-M4	
DW-AD-303-M4		**DW-AS-303-M4**	
DW-AD-304-M4		DW-AS-304-M4	
	DW-AD-305-M4		DW-AS-305-M4
		A ... D	A, B

*damped / non-damped

SERIES 620

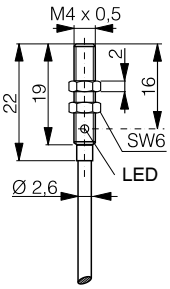
M4

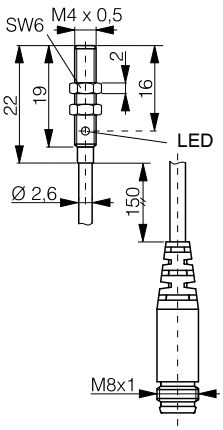
1.0	1.0
Stainless steel V2A	Stainless steel V2A
PUR cable type 1	PUR cable type 1 / Connec. S8
IP 67	IP 67
Embeddable	Embeddable
3,000 Hz	3,000 Hz
Table 8	Table 8
Diagram 1	Diagram 1
Built-in	Built-in
10 ... 30 VDC	10 ... 30 VDC
-25 ... +70 °C	-25 ... +70 °C
≤ 100 mA	≤ 100 mA





increased distance | increased distance





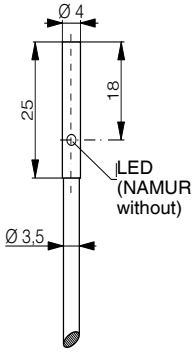
DW-AD-621-M4	**DW-AS-621-M4**
DW-AD-622-M4	DW-AS-622-M4
DW-AD-623-M4	**DW-AS-623-M4**
DW-AD-624-M4	DW-AS-624-M4
	A ... D

SERIES 400

Ø 4

0.8	
Stainless steel V2A	
PVC cable type 2	
IP 67	
Embeddable	
5,000 Hz	10,000 Hz
Table 1	Table 5
Diagram 1	Diagram 4
Built-in	---
10 ... 30 VDC	7.7 ... 9 VDC
-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 1 / ≥ 2.2 mA*





DW-AD-401-04	
DW-AD-402-04	
DW-AD-403-04	
DW-AD-404-04	
	DW-AD-405-04

*damped / non-damped

For all these products, you will find detailed data sheets, application notes, dimensional drawings, cross-reference lists, part references, new items, special executions, extensive additional technical information, specifications concerning quality, safety and standards, as well as the addresses of our agents, and much more besides, on our Internet website at www.contrinex.com. The website contents are constantly up-dated and extended.

Size	Ø 4			Ø 4
Operating distance mm	0.8	0.8	0.8	1.5
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection [1]	PVC cable type 2 / Connec. S8	Connector S8	Single wires	PVC cable type 2
Degree of protection	IP 67	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable	Embeddable
Max. switching frequency	5,000 Hz	5,000 Hz / 10,000 Hz	10,000 Hz	3,000 Hz
Technical data [2]	Table 1	Table 1 / Table 5	Table 5	Table 1
Wiring [3]	Diagram 1	Diagram 1 / Diagram 4	Diagram 4	Diagram 1
LED	Built-in	Built-in / ---	---	Built-in
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC / 7.7 ... 9 VDC	7.7 ... 9 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C / -25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 200 mA	≤ 200 mA / ≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*	≤ 200 mA

[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 68
[3] see page 69
[4] see page 112



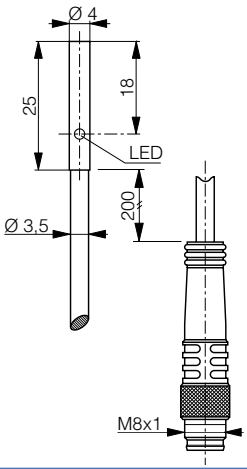


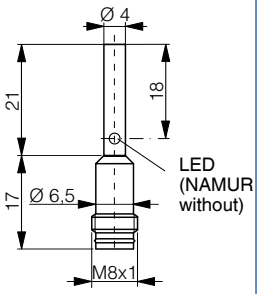


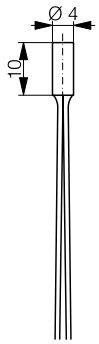


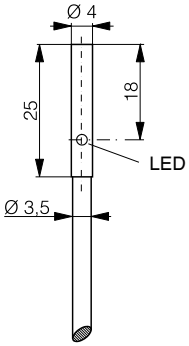
increased distance

Dimensions:





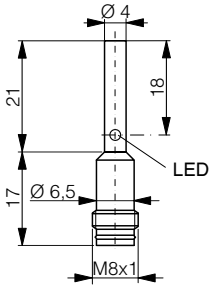
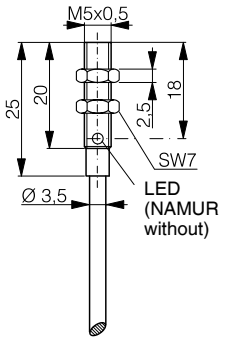
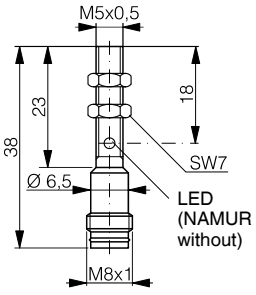
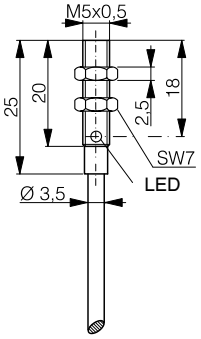
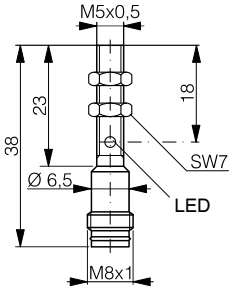




Part references:
(**bold:** preferred types)

NPN N.O.		**DW-AS-401-04**			**DW-AD-621-04**
NPN N.C.		DW-AS-402-04			DW-AD-622-04
PNP N.O.	**DW-AV-403-04-236**	**DW-AS-403-04**			**DW-AD-623-04**
PNP N.C.	DW-AV-404-04-236	DW-AS-404-04			DW-AD-624-04
NAMUR			**DW-AS-405-04**	**DW-AD-405-04K**	
AC/DC 2-wire N.O.					
AC/DC 2-wire N.C.					
Compatible connectors [4]	A ... D	A ... D	A, B		

*damped / non-damped

620	SERIES 400				SERIES 620	
	M5				M5	
1.5	0.8		0.8		1.5	1.5
Stainless steel V2A	Stainless steel V2A		Stainless steel V2A		Stainless steel V2A	Stainless steel V2A
Connector S8	PVC cable type 2		Connector S8		PVC cable type 2	Connector S8
IP 67	IP 67		IP 67		IP 67	IP 67
Embeddable	Embeddable		Embeddable		Embeddable	Embeddable
3,000 Hz	5,000 Hz	10,000 Hz	5,000 Hz	10,000 Hz	3,000 Hz	3,000 Hz
Table 1	Table 1	Table 5	Table 1	Table 5	Table 1	Table 1
Diagram 1	Diagram 1	Diagram 4	Diagram 1	Diagram 4	Diagram 1	Diagram 1
Built-in	Built-in	---	Built-in	---	Built-in	Built-in
10 ... 30 VDC	10 ... 30 VDC	7.7 ... 9 VDC	10 ... 30 VDC	7.7 ... 9 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 200 mA	≤ 1 / ≥ 2.2 mA*	≤ 200 mA	≤ 1 / ≥ 2.2 mA*	≤ 200 mA	≤ 200 mA
						
increased distance					increased distance	increased distance
						
DW-AS-621-04	**DW-AD-401-M5**		**DW-AS-401-M5**		**DW-AD-621-M5**	**DW-AS-621-M5**
DW-AS-622-04	DW-AD-402-M5		DW-AS-402-M5		DW-AD-622-M5	DW-AS-622-M5
DW-AS-623-04	**DW-AD-403-M5**		**DW-AS-403-M5**		**DW-AD-623-M5**	**DW-AS-623-M5**
DW-AS-624-04	DW-AD-404-M5		DW-AS-404-M5		DW-AD-624-M5	DW-AS-624-M5
		DW-AD-405-M5		**DW-AS-405-M5**		
A ... D			A ... D	A, B		A ... D

*damped / non-damped

For all these products, you will find detailed data sheets, application notes, dimensional drawings, cross-reference lists, part references, new items, special executions, extensive additional technical information, specifications concerning quality, safety and standards, as well as the addresses of our agents, and much more besides, on our Internet website at www.contrinex.com. The website contents are constantly up-dated and extended.

Size	□ 5x5				□ 5x5
Operating distance mm	0.8		0.8		1.5
Housing material	Nickel-plated brass		Nickel-plated brass		Nickel-plated brass
Connection [1]	PUR cable type 1		PUR cable type 1 / Connector S8		PUR cable type 1
Degree of protection	IP 67		IP 67		IP 67
Mounting	Embeddable		Embeddable		Embeddable
Max. switching frequency	5,000 Hz	10,000 Hz	5,000 Hz	10,000 Hz	3,000 Hz
Technical data [2]	Table 1	Table 5	Table 1	Table 5	Table 1
Wiring [3]	Diagram 1	Diagram 4	Diagram 1	Diagram 4	Diagram 1
LED	Built-in	---	Built-in	---	Built-in
Supply voltage range	10 ... 30 VDC	7.7 ... 9 VDC	10 ... 30 VDC	7.7 ... 9 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 200 mA	≤ 1 / ≥ 2.2 mA*	≤ 200 mA	≤ 1 / ≥ 2.2 mA*	≤ 200 mA

[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 68
[3] see page 69
[4] see page 112

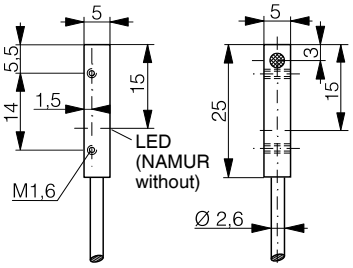


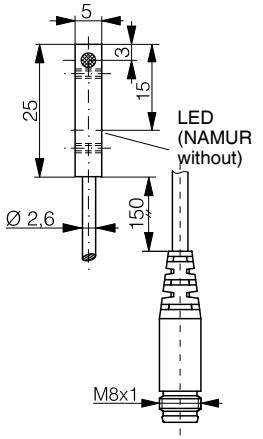


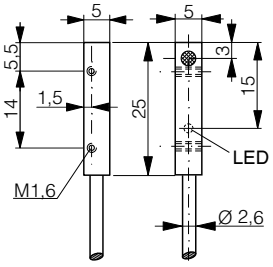


increased distance

Dimensions:



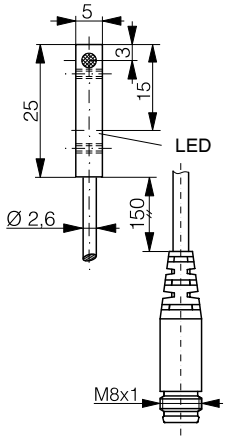
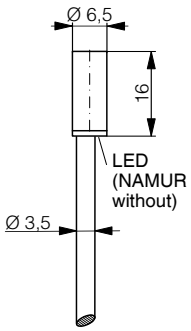
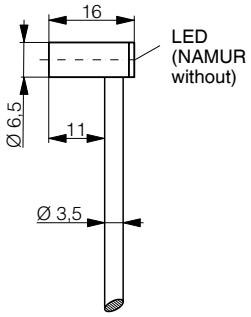
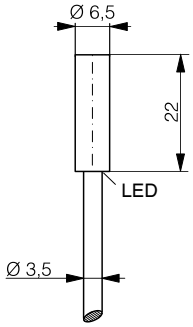




Part references:
(**bold:** preferred types)

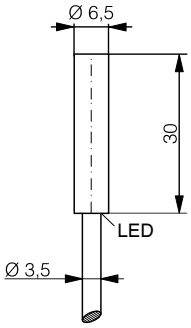
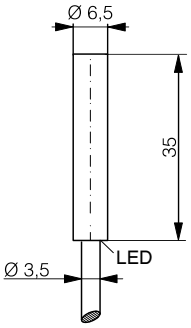
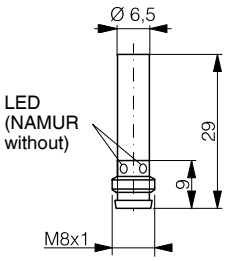
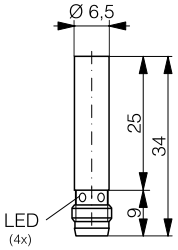
NPN N.O.	**DW-AD-401-C5**		**DW-AS-401-C5**		**DW-AD-621-C5**
NPN N.C.	DW-AD-402-C5		DW-AS-402-C5		DW-AD-622-C5
PNP N.O.	**DW-AD-403-C5**		**DW-AS-403-C5**		**DW-AD-623-C5**
PNP N.C.	DW-AD-404-C5		DW-AS-404-C5		DW-AD-624-C5
NAMUR		DW-AD-405-C5		DW-AS-405-C5	
AC/DC 2-wire N.O.					
AC/DC 2-wire N.C.					
Compatible connectors [4]			A ... D	A, B	

*damped / non-damped

620	SERIES 420				SERIES 600
	Ø 6.5				Ø 6.5
1.5	1.5		1.5		1.5
Nickel-plated brass	Stainless steel V2A		Stainless steel V2A		Stainless steel V2A
PUR cable type 1 / Connector S8	PVC cable type 2		PVC cable type 2		PVC cable type 2
IP 67	IP 67		IP 67		IP 67
Embeddable	Embeddable		Embeddable		Embeddable
3,000 Hz	5,000 Hz	10,000 Hz	5,000 Hz	10,000 Hz	5,000 Hz
Table 1	Table 1	Table 5	Table 1	Table 5	Table 1
Diagram 1	Diagram 1	Diagram 4	Diagram 1	Diagram 4	Diagram 1
Built-in	Built-in	---	Built-in	---	Built-in
10 ... 30 VDC	10 ... 30 VDC	7.7 ... 9 VDC	10 ... 30 VDC	7.7 ... 9 VDC	10 ... 30 VDC
-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 200 mA	≤ 1 / ≥ 2.2 mA*	≤ 200 mA	≤ 1 / ≥ 2.2 mA*	≤ 200 mA
					
increased distance					
					
DW-AS-621-C5	**DW-AD-421-065**		**DW-AD-421-065-400**		**DW-AD-601-065-121**
DW-AS-622-C5	DW-AD-422-065		DW-AD-422-065-400		DW-AD-602-065-121
DW-AS-623-C5	**DW-AD-423-065**		**DW-AD-423-065-400**		**DW-AD-603-065-121**
DW-AS-624-C5	DW-AD-424-065		DW-AD-424-065-400		DW-AD-604-065-121
		DW-AD-425-065		DW-AD-425-065-400	
A ... D					

*damped / non-damped

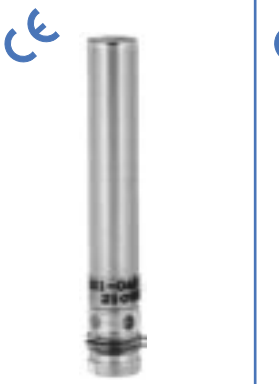
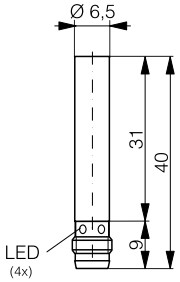
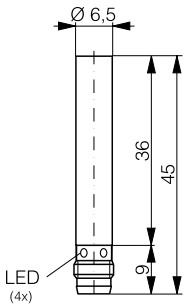
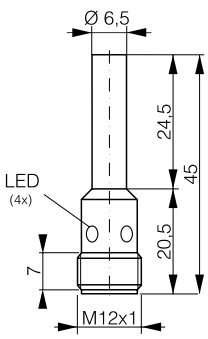
For all these products, you will find detailed data sheets, application notes, dimensional drawings, cross-reference lists, part references, new items, special executions, extensive additional technical information, specifications concerning quality, safety and standards, as well as the addresses of our agents, and much more besides, on our Internet website at www.contrinex.com. The website contents are constantly up-dated and extended.

Size	Ø 6.5		Ø 6.5		
Operating distance mm	1.5	1.5	1.5		1.5
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A		Stainless steel V2A
Connection [1]	PVC cable type 2	PVC cable type 2	Connector S8		Connector S8
Degree of protection	IP 67	IP 67	IP 67		IP 67
Mounting	Embeddable	Embeddable	Embeddable		Embeddable
Max. switching frequency	5,000 Hz	5,000 Hz	5,000 Hz	10,000 Hz	5,000 Hz
Technical data [2]	Table 1	Table 1	Table 1	Table 5	Table 1
Wiring [3]	Diagram 1	Diagram 1	Diagram 1	Diagram 4	Diagram 1
LED	Built-in	Built-in	Built-in	---	Built-in
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	7.7 ... 9 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 1 / ≥ 2.2 mA*	≤ 200 mA
[1] Standard cable length 2 m. Non-standard cable lengths and types on request. [2] see page 68 [3] see page 69 [4] see page 112					
Dimensions: Part references: (**bold:** preferred types)					
NPN N.O.	**DW-AD-601-065-122**	**DW-AD-601-065**	**DW-AS-421-065-001**		**DW-AS-601-065-123**
NPN N.C.	DW-AD-602-065-122	DW-AD-602-065	DW-AS-422-065-001		DW-AS-602-065-123
PNP N.O.	**DW-AD-603-065-122**	**DW-AD-603-065**	**DW-AS-423-065-001**		**DW-AS-603-065-123**
PNP N.C.	DW-AD-604-065-122	DW-AD-604-065	DW-AS-424-065-001		DW-AS-604-065-123
NAMUR				**DW-AS-425-065-001**	
AC/DC 2-wire N.O.					
AC/DC 2-wire N.C.					
Compatible connectors [4]			A ... D	A, B	A ... D

*damped / non-damped

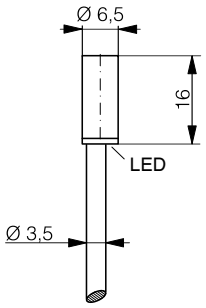
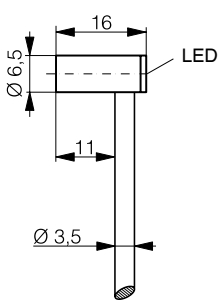
SERIES 600

Ø 6.5

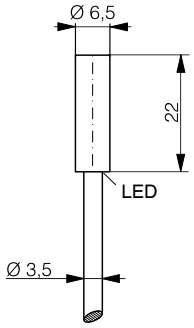
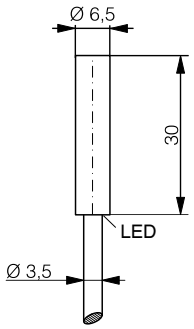
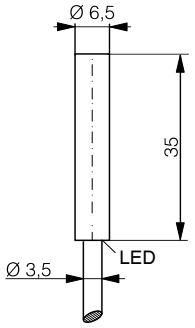
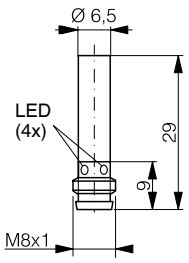
1.5	1.5	1.5
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connector S8	Connector S8	Connector S12
IP 67	IP 67	IP 67
Embeddable	Embeddable	Embeddable
5,000 Hz	5,000 Hz	5,000 Hz
Table 1	Table 1	Table 1
Diagram 1	Diagram 1	Diagram 2
Built-in	Built-in	Built-in
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 200 mA	≤ 200 mA
		
		
DW-AS-601-065-124	**DW-AS-601-065-001**	**DW-AS-601-065**
DW-AS-602-065-124	DW-AS-602-065-001	DW-AS-602-065
DW-AS-603-065-124	**DW-AS-603-065-001**	**DW-AS-603-065**
DW-AS-604-065-124	DW-AS-604-065-001	DW-AS-604-065
A ... D	A ... D	G ... N (N.O.); K ... N (N.C.)

SERIES 620

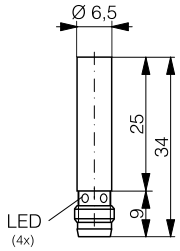
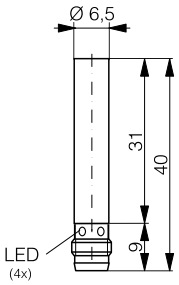
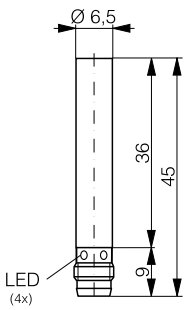
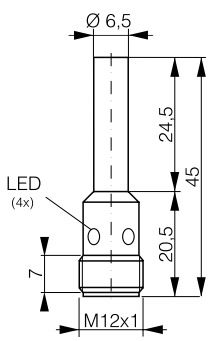
Ø 6.5

2	2
Stainless steel V2A	Stainless V2A
PVC cable type 2	PVC cable type 2
IP 67	IP 67
Embeddable	Embeddable
3,000 Hz	3,000 Hz
Table 1	Table 1
Diagram 1	Diagram 1
Built-in	Built-in
10 ... 30 VDC	10 ... 30 VDC
-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 200 mA
	
increased distance	increased distance
	
DW-AD-621-065-120	**DW-AD-621-065-400**
DW-AD-622-065-120	DW-AD-622-065-400
DW-AD-623-065-120	**DW-AD-623-065-400**
DW-AD-624-065-120	DW-AD-624-065-400

For all these products, you will find detailed data sheets, application notes, dimensional drawings, cross-reference lists, part references, new items, special executions, extensive additional technical information, specifications concerning quality, safety and standards, as well as the addresses of our agents, and much more besides, on our Internet website at www.contrinex.com. The website contents are constantly up-dated and extended.

Size	Ø 6.5			
Operating distance mm	2	2	2	2
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection [1]	PVC cable type 2	PVC cable type 2	PVC cable type 2	Connector S8
Degree of protection	IP 67	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable	Embeddable
Max. switching frequency	3,000 Hz	3,000 Hz	3,000 Hz	3,000 Hz
Technical data [2]	Table 1	Table 1	Table 1	Table 1
Wiring [3]	Diagram 1	Diagram 1	Diagram 1	Diagram 1
LED	Built-in	Built-in	Built-in	Built-in
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
[1] Standard cable length 2 m. Non-standard cable lengths and types on request. [2] see page 68 [3] see page 69 [4] see page 112				
	increased distance	increased distance	increased distance	increased distance
Dimensions: Part references: (**bold:** preferred types)				
NPN N.O.	**DW-AD-621-065-121**	**DW-AD-621-065-122**	**DW-AD-621-065**	**DW-AS-621-065-129**
NPN N.C.	DW-AD-622-065-121	DW-AD-622-065-122	DW-AD-622-065	DW-AS-622-065-129
PNP N.O.	**DW-AD-623-065-121**	**DW-AD-623-065-122**	**DW-AD-623-065**	**DW-AS-623-065-129**
PNP N.C.	DW-AD-624-065-121	DW-AD-624-065-122	DW-AD-624-065	DW-AS-624-065-129
NAMUR				
AC/DC 2-wire N.O.				
AC/DC 2-wire N.C.				
Compatible connectors [4]				A ... D

Ø 6.5

2	2	2	2	
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	
Connector S8	Connector S8	Connector S8	Connector S12	
IP 67	IP 67	IP 67	IP 67	
Embeddable	Embeddable	Embeddable	Embeddable	
3,000 Hz	3,000 Hz	3,000 Hz	3,000 Hz	
Table 1	Table 1	Table 1	Table 1	
Diagram 1	Diagram 1	Diagram 1	Diagram 2	
Built-in	Built-in	Built-in	Built-in	
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	
-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	
				
increased distance	increased distance	increased distance	increased distance	
				
DW-AS-621-065-123	**DW-AS-621-065-124**	**DW-AS-621-065-001**	**DW-AS-621-065**	
DW-AS-622-065-123	DW-AS-622-065-124	DW-AS-622-065-001	DW-AS-622-065	
DW-AS-623-065-123	**DW-AS-623-065-124**	**DW-AS-623-065-001**	**DW-AS-623-065**	
DW-AS-624-065-123	DW-AS-624-065-124	DW-AS-624-065-001	DW-AS-624-065	
A ... D	A ... D	A ... D	G ... N (N.O.); K ... N (N.C.)	

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Size	Ø 6.5			Ø 8
Operating distance mm	3	3	3	1.5
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Stainless steel V2A
Connection [1]	PVC cable type 2	Connector S8	Connector S12	Connector S12
Degree of protection	IP 67	IP 67	IP 67	IP 67
Mounting	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Embeddable
Max. switching frequency	1,000 Hz	1,000 Hz	1,000 Hz	5,000 Hz
Technical data [2]	Table 1	Table 1	Table 1	Table 1
Wiring [3]	Diagram 1	Diagram 1	Diagram 2	Diagram 2
LED	Built-in	Built-in	Built-in	Built-in
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA

[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 68
[3] see page 69
[4] see page 112



long distance



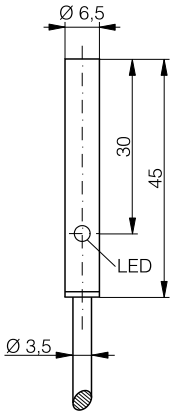
long distance

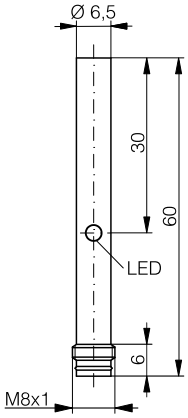


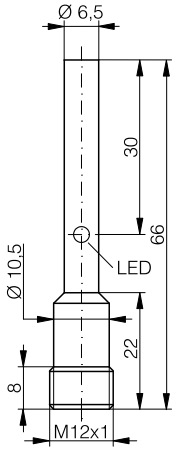
long distance

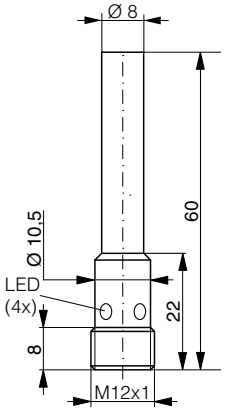


Dimensions:









Part references:
(**bold:** preferred types)

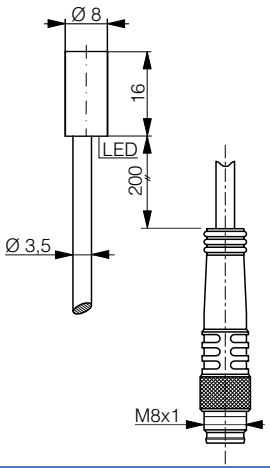
NPN N.O.	**DW-AD-501-065**	**DW-AS-501-065-001**	**DW-AS-501-065**	
NPN N.C.	DW-AD-502-065	DW-AS-502-065-001	DW-AS-502-065	
PNP N.O.	**DW-AD-503-065**	**DW-AS-503-065-001**	**DW-AS-503-065**	**DW-AS-603-080-168**
PNP N.C.	DW-AD-504-065	DW-AS-504-065-001	DW-AS-504-065	
NAMUR				
AC/DC 2-wire N.O.				
AC/DC 2-wire N.C.				
Compatible connectors [4]		A ... D	G ... N (N.O.); K ... N (N.C.)	G ... N

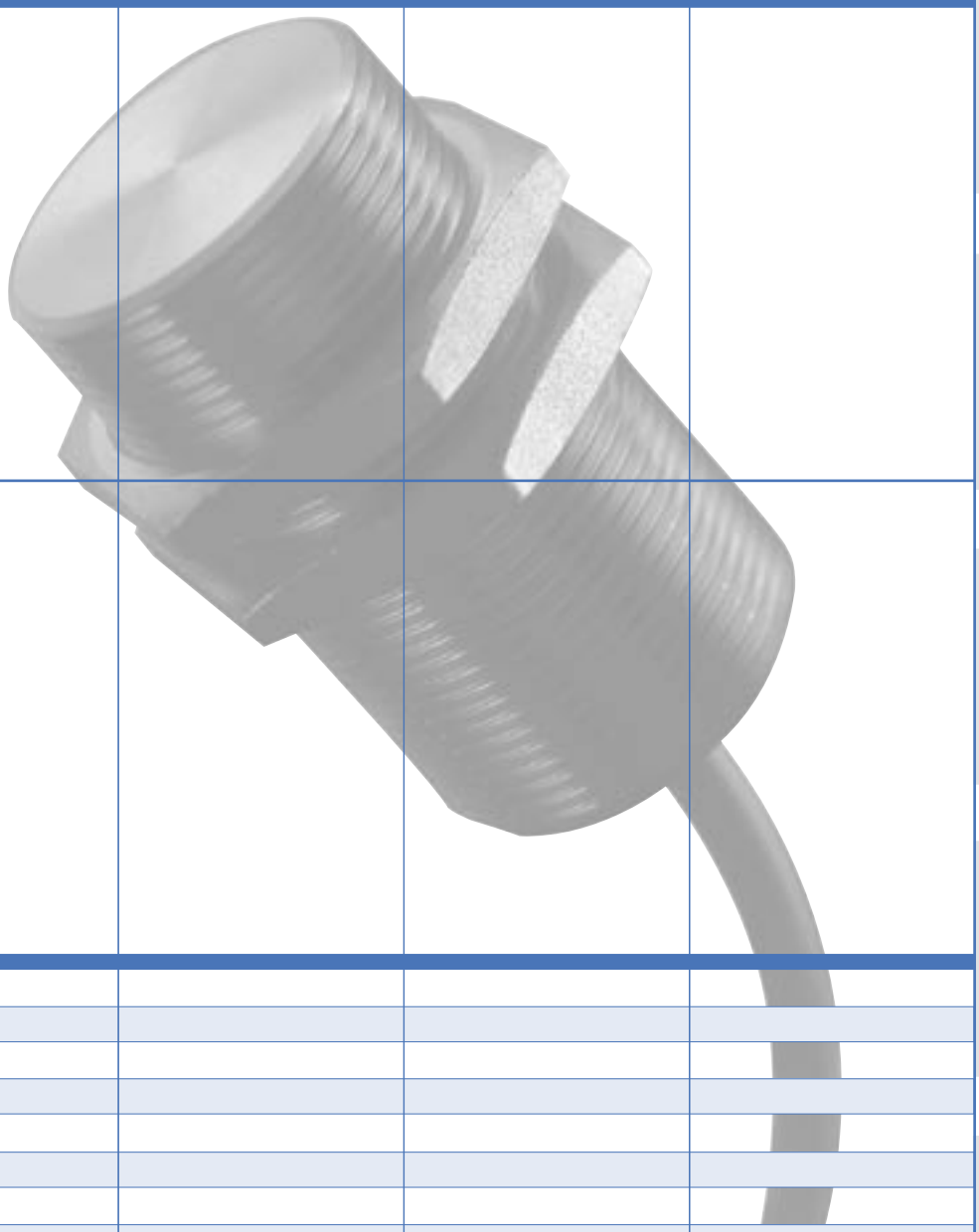
Ø 8

2				
Nickel-plated brass				
PVC cable type 2 / Connector S8				
IP 67				
Embeddable				
3,000 Hz				
Table 1				
Diagram 1				
Built-in				
10 ... 30 VDC				
-25 ... +70 °C				
≤ 200 mA				



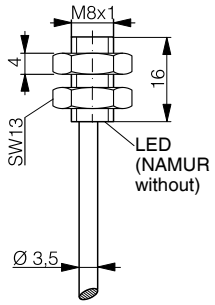
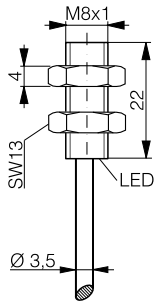
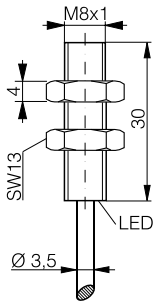
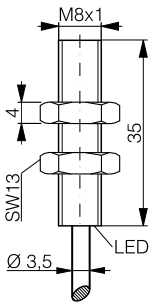
increased distance





DW-AV-623-080-236				
A ... D				

For all these products, you will find detailed data sheets, application notes, dimensional drawings, cross-reference lists, part references, new items, special executions, extensive additional technical information, specifications concerning quality, safety and standards, as well as the addresses of our agents, and much more besides, on our Internet website at www.contrinex.com. The website contents are constantly up-dated and extended.

Size	M8		M8		
Operating distance mm	1.5		1.5	1.5	1.5
Housing material	Stainless steel V2A		Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection [1]	PVC cable type 2		PVC cable type 2	PVC cable type 2	PVC cable type 2
Degree of protection	IP 67		IP 67	IP 67	IP 67
Mounting	Embeddable		Embeddable	Embeddable	Embeddable
Max. switching frequency	5,000 Hz	10,000 Hz	5,000 Hz	5,000 Hz	5,000 Hz
Technical data [2]	Table 1	Table 5	Table 1	Table 1	Table 1
Wiring [3]	Diagram 1	Diagram 4	Diagram 1	Diagram 1	Diagram 1
LED	Built-in	---	Built-in	Built-in	Built-in
Supply voltage range	10 ... 30 VDC	7.7 ... 9 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 200 mA	≤ 1 / ≥ 2.2 mA*	≤ 200 mA	≤ 200 mA	≤ 200 mA
[1] Standard cable length 2 m. Non-standard cable lengths and types on request. [2] see page 68 [3] see page 69 [4] see page 112					
Dimensions: Part references: (**bold:** preferred types)					
NPN N.O.	**DW-AD-421-M8**		**DW-AD-601-M8-121**	**DW-AD-601-M8-122**	**DW-AD-601-M8**
NPN N.C.	DW-AD-422-M8		DW-AD-602-M8-121	DW-AD-602-M8-122	DW-AD-602-M8
PNP N.O.	**DW-AD-423-M8**		**DW-AD-603-M8-121**	**DW-AD-603-M8-122**	**DW-AD-603-M8**
PNP N.C.	DW-AD-424-M8		DW-AD-604-M8-121	DW-AD-604-M8-122	DW-AD-604-M8
NAMUR		**DW-AD-425-M8**			
AC/DC 2-wire N.O.					
AC/DC 2-wire N.C.					
Compatible connectors [4]					

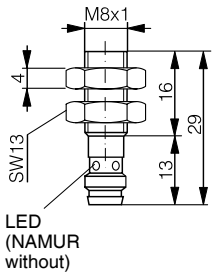
*damped / non-damped

SERIES 420

M8

1.5	
Stainless steel V2A	
Connector S8	
IP 67	
Embeddable	
5,000 Hz	10,000 Hz
Table 1	Table 5
Diagram 1	Diagram 4
Built-in	---
10 ... 30 VDC	7.7 ... 9 VDC
-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 1 / ≥ 2.2 mA*





DW-AS-421-M8-001	
DW-AS-422-M8-001	
DW-AS-423-M8-001	
DW-AS-424-M8-001	
	DW-AS-425-M8-001
A ... D	A, B

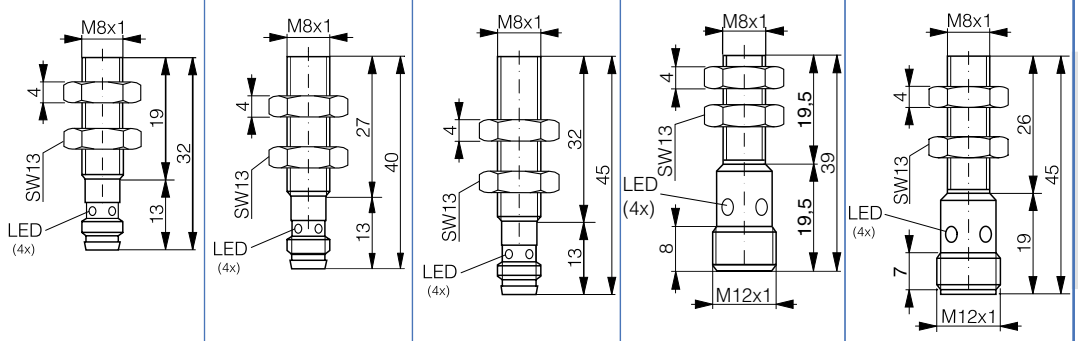
*damped / non-damped

SERIES 600

M8

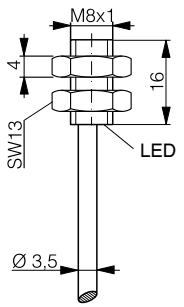
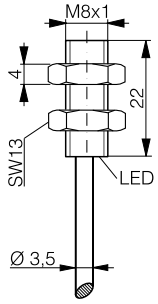
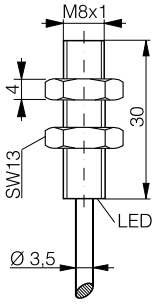
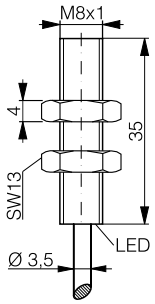
1.5	1.5	1.5	1.5	1.5
Stainless steel V2A	Stainless steel V2A	Nickel-plated brass	Stainless steel V2A	Nickel-plated brass
Connector S8	Connector S8	Connector S8	Connector S12	Connector S12
IP 67	IP 67	IP 67	IP 67	IP 67
Embeddable	Embeddable	Embeddable	Embeddable	Embeddable
5,000 Hz	5,000 Hz	5,000 Hz	5,000 Hz	5,000 Hz
Table 1	Table 1	Table 1	Table 1	Table 1
Diagram 1	Diagram 1	Diagram 1	Diagram 2	Diagram 2
Built-in	Built-in	Built-in	Built-in	Built-in
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA



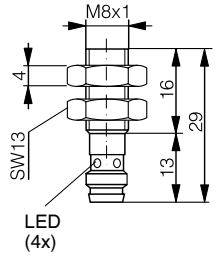
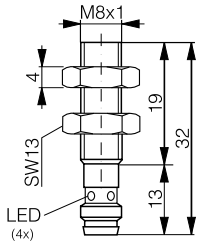
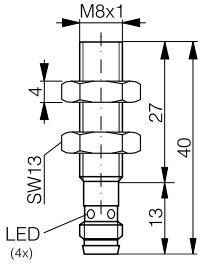
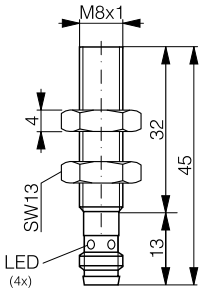
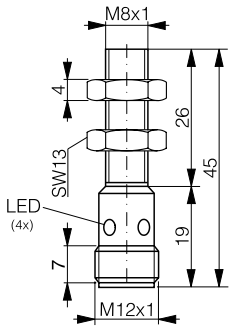


DW-AS-601-M8-123	**DW-AS-601-M8-124**	**DW-AS-601-M8-001**	**DW-AS-601-M8-120**	**DW-AS-601-M8**
DW-AS-602-M8-123	DW-AS-602-M8-124	DW-AS-602-M8-001		DW-AS-602-M8
DW-AS-603-M8-123	**DW-AS-603-M8-124**	**DW-AS-603-M8-001**	**DW-AS-603-M8-120**	**DW-AS-603-M8**
DW-AS-604-M8-123	DW-AS-604-M8-124	DW-AS-604-M8-001		DW-AS-604-M8
A ... D	A ... D	A ... D	G ... N	G ... N (N.O.); K ... N (N.C.)

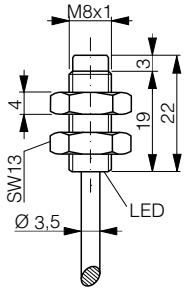
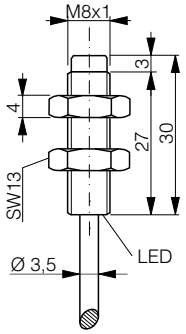
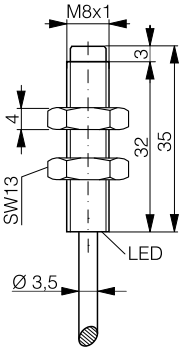
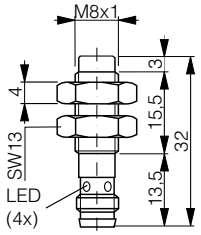
For all these products, you will find detailed data sheets, application notes, dimensional drawings, cross-reference lists, part references, new items, special executions, extensive additional technical information, specifications concerning quality, safety and standards, as well as the addresses of our agents, and much more besides, on our Internet website at www.contrinex.com. The website contents are constantly up-dated and extended.

Size	M8			
Operating distance mm	2	2	2	2
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection [1]	PVC cable type 2	PVC cable type 2	PVC cable type 2	PVC cable type 2
Degree of protection	IP 67	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable	Embeddable
Max. switching frequency	3,000 Hz	3,000 Hz	3,000 Hz	3,000 Hz
Technical data [2]	Table 1	Table 1	Table 1	Table 1
Wiring [3]	Diagram 1	Diagram 1	Diagram 1	Diagram 1
LED	Built-in	Built-in	Built-in	Built-in
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
[1] Standard cable length 2 m. Non-standard cable lengths and types on request. [2] see page 68 [3] see page 69 [4] see page 112				
	increased distance	increased distance	increased distance	increased distance
Dimensions:				
Part references: (**bold:** preferred types)				
NPN N.O.	**DW-AD-621-M8-120**	**DW-AD-621-M8-121**	**DW-AD-621-M8-122**	**DW-AD-621-M8**
NPN N.C.	DW-AD-622-M8-120	DW-AD-622-M8-121	DW-AD-622-M8-122	DW-AD-622-M8
PNP N.O.	**DW-AD-623-M8-120**	**DW-AD-623-M8-121**	**DW-AD-623-M8-122**	**DW-AD-623-M8**
PNP N.C.	DW-AD-624-M8-120	DW-AD-624-M8-121	DW-AD-624-M8-122	DW-AD-624-M8
NAMUR				
AC/DC 2-wire N.O.				
AC/DC 2-wire N.C.				
Compatible connectors [4]				

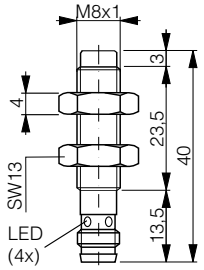
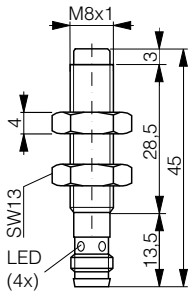
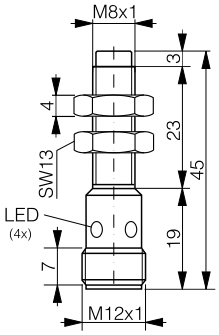
M8

2	2	2	2	2
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connector S8	Connector S8	Connector S8	Connector S8	Connector S12
IP 67	IP 67	IP 67	IP 67	IP 67
Embeddable	Embeddable	Embeddable	Embeddable	Embeddable
3,000 Hz	3,000 Hz	3,000 Hz	3,000 Hz	3,000 Hz
Table 1	Table 1	Table 1	Table 1	Table 1
Diagram 1	Diagram 1	Diagram 1	Diagram 1	Diagram 2
Built-in	Built-in	Built-in	Built-in	Built-in
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
				
increased distance	increased distance	increased distance	increased distance	increased distance
				
DW-AS-621-M8-129	**DW-AS-621-M8-123**	**DW-AS-621-M8-124**	**DW-AS-621-M8-001**	**DW-AS-621-M8**
DW-AS-622-M8-129	DW-AS-622-M8-123	DW-AS-622-M8-124	DW-AS-622-M8-001	DW-AS-622-M8
DW-AS-623-M8-129	**DW-AS-623-M8-123**	**DW-AS-623-M8-124**	**DW-AS-623-M8-001**	**DW-AS-623-M8**
DW-AS-624-M8-129	DW-AS-624-M8-123	DW-AS-624-M8-124	DW-AS-624-M8-001	DW-AS-624-M8
A ... D	A ... D	A ... D	A ... D	G ... N (N.O.); K ... N (N.C.)

For all these products, you will find detailed data sheets, application notes, dimensional drawings, cross-reference lists, part references, new items, special executions, extensive additional technical information, specifications concerning quality, safety and standards, as well as the addresses of our agents, and much more besides, on our Internet website at www.contrinex.com. The website contents are constantly up-dated and extended.

Size	M8			
Operating distance mm	**2.5**	**2.5**	**2.5**	**2.5**
Housing material	Stainless steel V2A	Stainless steel V2A	Nickel-plated brass	Stainless steel V2A
Connection [1]	PVC cable type 2	PVC cable type 2	PVC cable type 2	Connector S8
Degree of protection	IP 67	IP 67	IP 67	IP 67
Mounting	Non-embeddable	Non-embeddable	Non-embeddable	Non-embeddable
Max. switching frequency	3,000 Hz	3,000 Hz	3,000 Hz	3,000 Hz
Technical data [2]	Table 1	Table 1	Table 1	Table 1
Wiring [3]	Diagram 1	Diagram 1	Diagram 1	Diagram 1
LED	Built-in	Built-in	Built-in	Built-in
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
[1] Standard cable length 2 m. Non-standard cable lengths and types on request. [2] see page 68 [3] see page 69 [4] see page 112				
Dimensions: Part references: (**bold:** preferred types)				
NPN N.O.	**DW-AD-611-M8-121**	**DW-AD-611-M8-122**	**DW-AD-611-M8**	**DW-AS-611-M8-123**
NPN N.C.	DW-AD-612-M8-121	DW-AD-612-M8-122	DW-AD-612-M8	DW-AS-612-M8-123
PNP N.O.	**DW-AD-613-M8-121**	**DW-AD-613-M8-122**	**DW-AD-613-M8**	**DW-AS-613-M8-123**
PNP N.C.	DW-AD-614-M8-121	DW-AD-614-M8-122	DW-AD-614-M8	DW-AS-614-M8-123
NAMUR				
AC/DC 2-wire N.O.				
AC/DC 2-wire N.C.				
Compatible connectors [4]				A ... D

M8

2.5	2.5	2.5		
Stainless steel V2A	Nickel-plated brass	Nickel-plated brass		
Connector S8	Connector S8	Connector S12		
IP 67	IP 67	IP 67		
Non-embeddable	Non-embeddable	Non-embeddable		
3,000 Hz	3,000 Hz	3,000 Hz		
Table 1	Table 1	Table 1		
Diagram 1	Diagram 1	Diagram 2		
Built-in	Built-in	Built-in		
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC		
-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C		
≤ 200 mA	≤ 200 mA	≤ 200 mA		
				
				
DW-AS-611-M8-124	**DW-AS-611-M8-001**	**DW-AS-611-M8**		
DW-AS-612-M8-124	DW-AS-612-M8-001	DW-AS-612-M8		
DW-AS-613-M8-124	**DW-AS-613-M8-001**	**DW-AS-613-M8**		
DW-AS-614-M8-124	DW-AS-614-M8-001	DW-AS-614-M8		
A ... D	A ... D	G ... N (N.O.); K ... N (N.C.)		

For all these products, you will find detailed data sheets, application notes, dimensional drawings, cross-reference lists, part references, new items, special executions, extensive additional technical information, specifications concerning quality, safety and standards, as well as the addresses of our agents, and much more besides, on our Internet website at www.contrinex.com. The website contents are constantly up-dated and extended.

Size	M8			
Operating distance mm	3	3	3	4
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connection [1]	PVC cable type 2	Connector S8	Connector S12	PVC cable type 2
Degree of protection	IP 67	IP 67	IP 67	IP 67
Mounting	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable
Max. switching frequency	1,000 Hz	1,000 Hz	1,000 Hz	500 Hz
Technical data [2]	Table 1	Table 1	Table 1	Table 1
Wiring [3]	Diagram 1	Diagram 1	Diagram 2	Diagram 1
LED	Built-in	Built-in	Built-in	Built-in
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA

[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 68
[3] see page 69
[4] see page 112



long distance



long distance

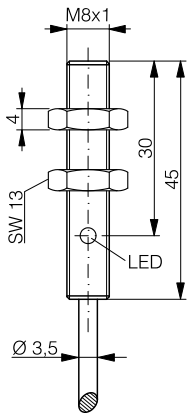


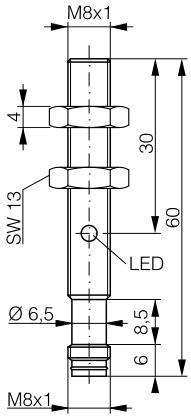
long distance

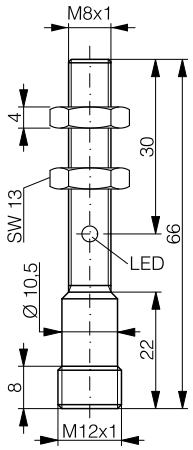


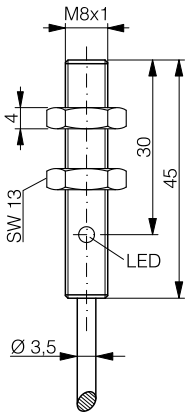
4 x distance

Dimensions:







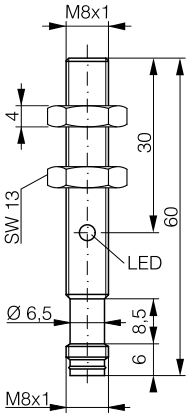
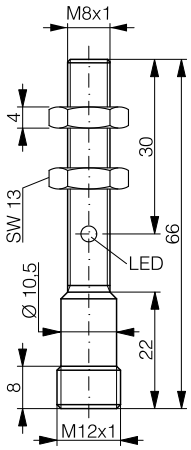


Part references:
(**bold:** preferred types)

NPN N.O.	**DW-AD-501-M8**	**DW-AS-501-M8-001**	**DW-AS-501-M8**	
NPN N.C.	DW-AD-502-M8	DW-AS-502-M8-001	DW-AS-502-M8	
PNP N.O.	**DW-AD-503-M8**	**DW-AS-503-M8-001**	**DW-AS-503-M8**	**DW-AD-523-M8**
PNP N.C.	DW-AD-504-M8	DW-AS-504-M8-001	DW-AS-504-M8	
NAMUR				
AC/DC 2-wire N.O.				
AC/DC 2-wire N.C.				
Compatible connectors [4]		A ... D	G ... N (N.O.); K ... N (N.C.)	

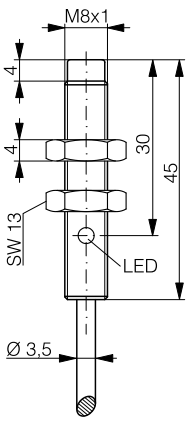
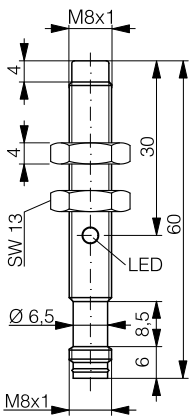
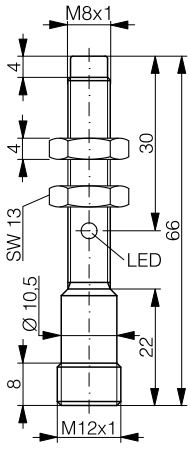
SERIES 520

M8

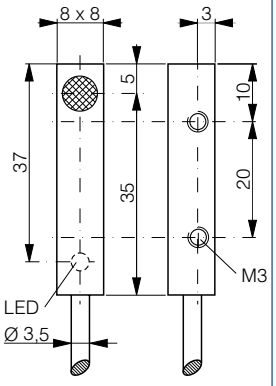
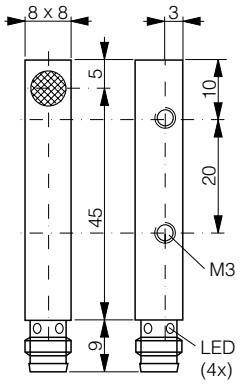
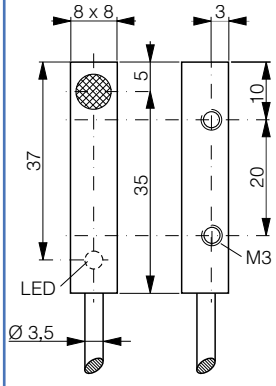
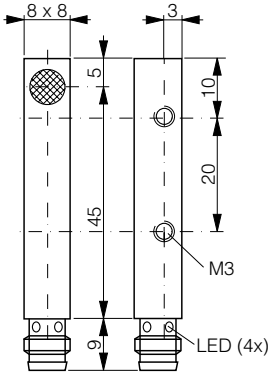
4	4
Chrome-plated brass	Chrome-plated brass
Connector S8	Connector S12
IP 67	IP 67
Quasi-embeddable	Quasi-embeddable
500 Hz	500 Hz
Table 1	Table 1
Diagram 1	Diagram 2
Built-in	Built-in
10 ... 30 VDC	10 ... 30 VDC
-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 200 mA
	
4 x distance	4 x distance
	
DW-AS-523-M8-001	**DW-AS-523-M8**
A ... D	G ... N

SERIES 500

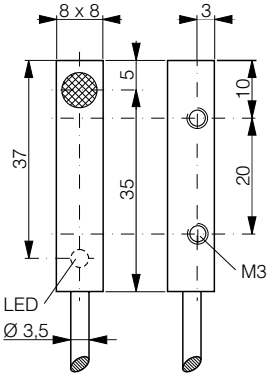
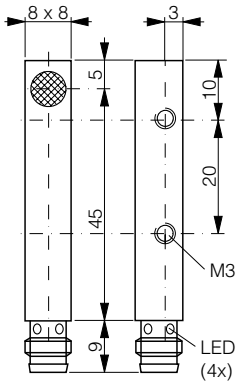
M8

6	6	6
Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
PVC cable type 2	Connector S8	Connector S12
IP 67	IP 67	IP 67
Non-embeddable	Non-embeddable	Non-embeddable
500 Hz	500 Hz	500 Hz
Table 1	Table 1	Table 1
Diagram 1	Diagram 1	Diagram 2
Built-in	Built-in	Built-in
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 200 mA	≤ 200 mA
		
long distance	long distance	long distance
		
DW-AD-511-M8	**DW-AS-511-M8-001**	**DW-AS-511-M8**
DW-AD-512-M8	DW-AS-512-M8-001	DW-AS-512-M8
DW-AD-513-M8	**DW-AS-513-M8-001**	**DW-AS-513-M8**
DW-AD-514-M8	DW-AS-514-M8-001	DW-AS-514-M8
A ... D	A ... D	G ... N (N.O.); K ...N (N.C.)

For all these products, you will find detailed data sheets, application notes, dimensional drawings, cross-reference lists, part references, new items, special executions, extensive additional technical information, specifications concerning quality, safety and standards, as well as the addresses of our agents, and much more besides, on our Internet website at www.contrinex.com. The website contents are constantly up-dated and extended.

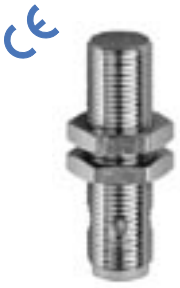
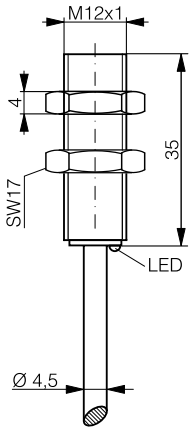
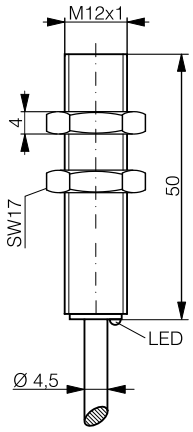
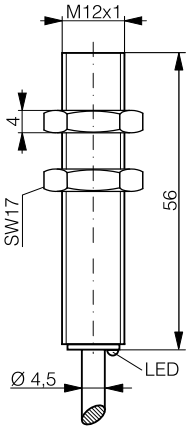
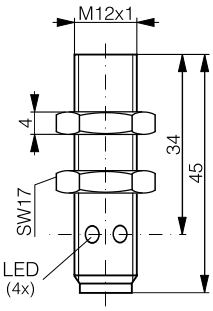
Size	☐ 8x8		☐ 8x8	
Operating distance mm	1.5	1.5	2	2
Housing material	Nickel-plated brass	Nickel-plated brass	Chrome-plated brass	Chrome-plated brass
Connection [1]	PVC cable type 2	Connector S8	PVC cable type 2	Connector S8
Degree of protection	IP 67	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable	Embeddable
Max. switching frequency	5,000 Hz	5,000 Hz	3,000 Hz	3,000 Hz
Technical data [2]	Table 1	Table 1	Table 1	Table 1
Wiring [3]	Diagram 1	Diagram 1	Diagram 1	Diagram 1
LED	Built-in	Built-in	Built-in	Built-in
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
[1] Standard cable length 2 m. Non-standard cable lengths and types on request. [2] see page 68 [3] see page 69 [4] see page 112			 increased distance	 increased distance
Dimensions: Part references: (**bold:** preferred types)				
NPN N.O.	**DW-AD-601-C8**	**DW-AS-601-C8-001**	**DW-AD-621-C8**	**DW-AS-621-C8-001**
NPN N.C.	DW-AD-602-C8	DW-AS-602-C8-001	DW-AD-622-C8	DW-AS-622-C8-001
PNP N.O.	**DW-AD-603-C8**	**DW-AS-603-C8-001**	**DW-AD-623-C8**	**DW-AS-623-C8-001**
PNP N.C.	DW-AD-604-C8	DW-AS-604-C8-001	DW-AD-624-C8	DW-AS-624-C8-001
NAMUR				
AC/DC 2-wire N.O.				
AC/DC 2-wire N.C.				
Compatible connectors [4]		A ... D		A ... D

☐8x8

3	3
Chrome-plated brass	Chrome-plated brass
PVC cable type 2	Connector S8
IP 67	IP 67
Quasi-embeddable	Quasi-embeddable
1,000 Hz	1,000 Hz
Table 1	Table 1
Diagram 1	Diagram 1
Built-in	Built-in
10 ... 30 VDC	10 ... 30 VDC
-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 200 mA
	
long distance	long distance
	
DW-AD-501-C8	**DW-AS-501-C8**
DW-AD-502-C8	DW-AS-502-C8
DW-AD-503-C8	**DW-AS-503-C8**
DW-AD-504-C8	DW-AS-504-C8
	A ... D

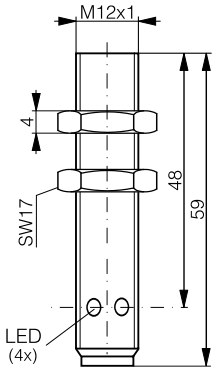
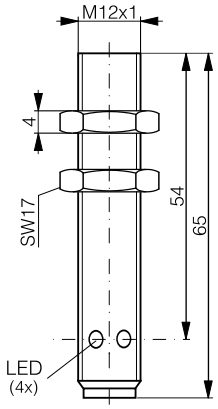
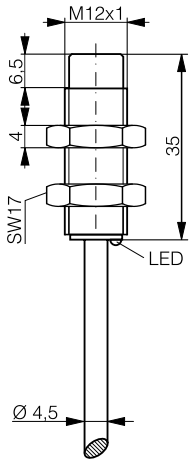
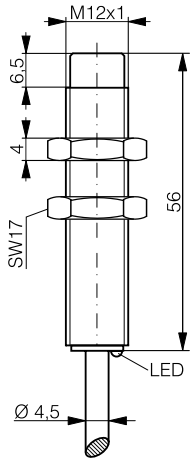
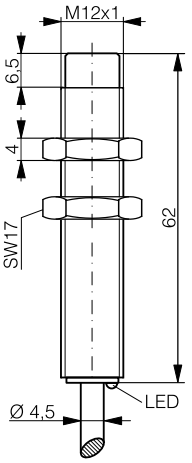
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M12

Size				
Operating distance mm	2	2	2	2
Housing material	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
Connection [1]	PUR cable type 5	PUR cable type 5	PUR cable type 5	Connector S12
Degree of protection	IP 67	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable	Embeddable
Max. switching frequency	1,200 Hz	1,200 Hz	25 Hz (AC) / 1,200 Hz (DC)	1,200 Hz
Technical data [2]	Table 2	Table 2	Table 4	Table 2
Wiring [3]	Diagram 2	Diagram 2	Diagram 3	Diagram 2
LED	Built-in	Built-in	Built-in	Built-in
Supply voltage range	15 ... 34 VDC	15 ... 34 VDC	20 ... 265 VAC / 20 ... 320 VDC	15 ... 34 VDC
Ambient temperature range	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C
Output current	≤ 200 mA / ≤ 150 mA*	≤ 200 mA / ≤ 150 mA*	≤ 200 mA	≤ 200 mA / ≤ 150 mA*
[1] Standard cable length 2 m. Non-standard cable lengths and types on request. [2] see page 68 [3] see page 69 [4] see page 112				
Dimensions: Part references: (**bold:** preferred types)				
NPN N.O.	**DW-AD-601-M12-120**	**DW-AD-601-M12**		**DW-AS-601-M12-120**
NPN N.C.	DW-AD-602-M12-120	DW-AD-602-M12		DW-AS-602-M12-120
PNP N.O.	**DW-AD-603-M12-120**	**DW-AD-603-M12**		**DW-AS-603-M12-120**
PNP N.C.	DW-AD-604-M12-120	DW-AD-604-M12		DW-AS-604-M12-120
NAMUR				
AC/DC 2-wire N.O.			**DW-AD-607-M12**	
AC/DC 2-wire N.C.			DW-AD-608-M12	
Compatible connectors [4]				G ... N (N.O.); K ... N (N.C.)

*50 °C / 85 °C

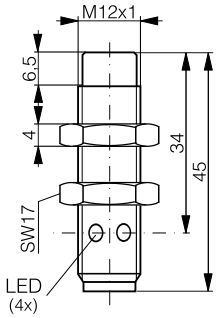
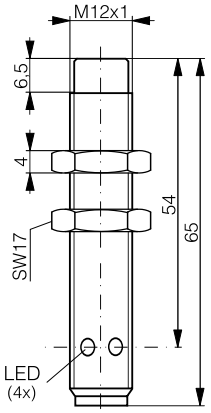
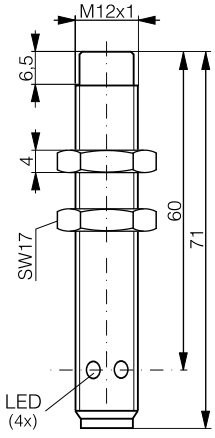
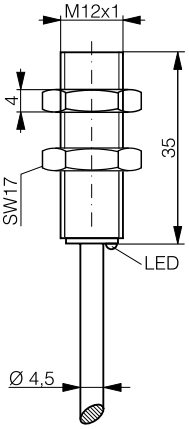
M12

2	2	4	4	4
Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
Connector S12	Connector S12	PUR cable type 5	PUR cable type 5	PUR cable type 5
IP 67	IP 67	IP 67	IP 67	IP 67
Embeddable	Embeddable	Non-embeddable	Non-embeddable	Non-embeddable
1,200 Hz	25 Hz (AC) / 1,200 Hz (DC)	800 Hz	800 Hz	25 Hz (AC) / 900 Hz (DC)
Table 2	Table 4	Table 2	Table 2	Table 4
Diagram 2	Diagram 3	Diagram 2	Diagram 2	Diagram 3
Built-in	Built-in	Built-in	Built-in	Built-in
15 ... 34 VDC	20 ... 265 VAC / 20 ... 320 VDC	15 ... 34 VDC	15 ... 34 VDC	20 ... 265 VAC / 20 ... 320 VDC
-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C
≤ 200 mA / ≤ 150 mA*	≤ 200 mA	≤ 200 mA / ≤ 150 mA*	≤ 200 mA / ≤ 150 mA*	≤ 200 mA
				
				
DW-AS-601-M12		**DW-AD-611-M12-120**	**DW-AD-611-M12**	
DW-AS-602-M12		DW-AD-612-M12-120	DW-AD-612-M12	
DW-AS-603-M12		**DW-AD-613-M12-120**	**DW-AD-613-M12**	
DW-AS-604-M12		DW-AD-614-M12-120	DW-AD-614-M12	
	DW-AS-607-M12			**DW-AD-617-M12**
	DW-AS-608-M12			DW-AD-618-M12
G ... N (N.O.); K ... N (N.C.)	M, N			

*50 °C / 85 °C

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M12

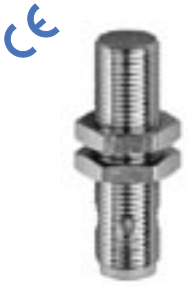
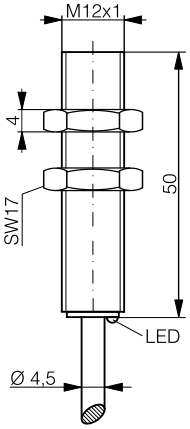
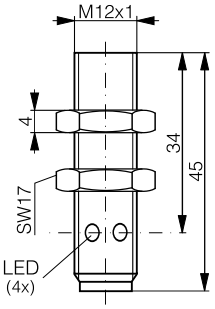
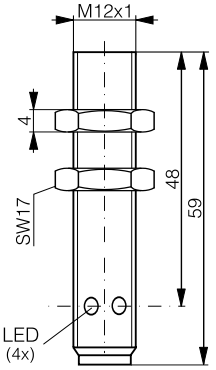
Size	M12			
Operating distance mm	4	4	4	4
Housing material	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
Connection [1]	Connector S12	Connector S12	Connector S12	PUR cable type 5
Degree of protection	IP 67	IP 67	IP 67	IP 67
Mounting	Non-embeddable	Non-embeddable	Non-embeddable	Embeddable
Max. switching frequency	800 Hz	800 Hz	25 Hz (AC) / 900 Hz (DC)	800 Hz
Technical data [2]	Table 2	Table 2	Table 4	Table 2
Wiring [3]	Diagram 2	Diagram 2	Diagram 3	Diagram 2
LED	Built-in	Built-in	Built-in	Built-in
Supply voltage range	15 ... 34 VDC	15 ... 34 VDC	20 ... 265 VAC / 20 ... 320 VDC	15 ... 34 VDC
Ambient temperature range	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C
Output current	≤ 200 mA / ≤ 150 mA*	≤ 200 mA / ≤ 150 mA*	≤ 200 mA	≤ 200 mA / ≤ 150 mA*
[1] Standard cable length 2 m. Non-standard cable lengths and types on request. [2] see page 68 [3] see page 69 [4] see page 112				 increased distance
Dimensions: Part references: (**bold:** preferred types)				
NPN N.O.	**DW-AS-611-M12-120**	**DW-AS-611-M12**		**
NPN N.C.	DW-AS-612-M12-120	DW-AS-612-M12		**
PNP N.O.	**DW-AS-613-M12-120**	**DW-AS-613-M12**		**DW-AD-623-M12-120**
PNP N.C.	DW-AS-614-M12-120	DW-AS-614-M12		**
NAMUR				
AC/DC 2-wire N.O.			**DW-AS-617-M12**	
AC/DC 2-wire N.C.			DW-AS-618-M12	
Compatible connectors [4]	G ... N (N.O.); K ... N (N.C.)	G ... N (N.O.); K ... N (N.C.)	M, N	

*50 °C / 85 °C

** on request

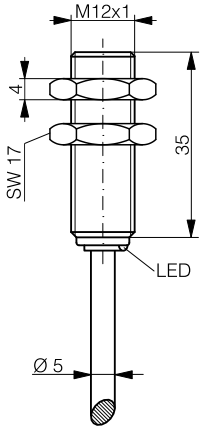
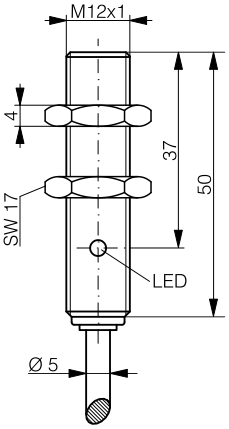
SERIES 620

M12

4	4	4
Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
PUR cable type 5	Connector S12	Connector S12
IP 67	IP 67	IP 67
Embeddable	Embeddable	Embeddable
800 Hz	800 Hz	800 Hz
Table 2	Table 2	Table 2
Diagram 2	Diagram 2	Diagram 2
Built-in	Built-in	Built-in
15 ... 34 VDC	15 ... 34 VDC	15 ... 34 VDC
-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C
≤ 200 mA / ≤ 150 mA*	≤ 200 mA / ≤ 150 mA*	≤ 200 mA / ≤ 150 mA*
		
increased distance	increased distance	increased distance
		
**	**	**
**	**	**
DW-AD-623-M12	**DW-AS-623-M12-120**	**DW-AS-623-M12**
**	**	**
	G ...N	G ...N

SERIES 500

M12

6	6
Chrome-plated brass	Chrome-plated brass
PVC cable type 8	PVC cable type 8
IP 67	IP 67
Quasi-embeddable	Quasi-embeddable
800 Hz	800 Hz
Table 1	Table 1
Diagram 1	Diagram 1
Built-in	Built-in
10 ... 30 VDC	10 ... 30 VDC
-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 200 mA
	
long distance	long distance
	
DW-AD-501-M12-120	**DW-AD-501-M12**
DW-AD-502-M12-120	DW-AD-502-M12
DW-AD-503-M12-120	**DW-AD-503-M12**
DW-AD-504-M12-120	DW-AD-504-M12

*50 °C / 85 °C

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Size	M12		M12	
Operating distance mm	6	6	6	6
Housing material	Chrome-plated brass	Chrome-plated brass	Stainless steel V2A	Stainless steel V2A
Connection [1]	Connector S12	Connector S12	PUR cable type 11	Connector S12
Degree of protection	IP 67	IP 67	IP 68	IP 67
Mounting	Quasi-embeddable	Quasi-embeddable	Embeddable	Embeddable
Max. switching frequency	800 Hz	800 Hz	400 Hz	400 Hz
Technical data [2]	Table 1	Table 1	Table 1	Table 1
Wiring [3]	Diagram 2	Diagram 2	Diagram 1	Diagram 2
LED	Built-in	Built-in	Built-in	Built-in
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA

[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 68
[3] see page 69
[4] see page 112



long distance



long distance

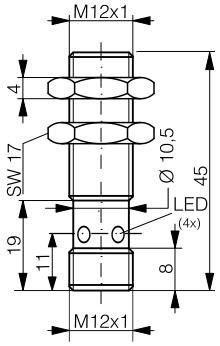


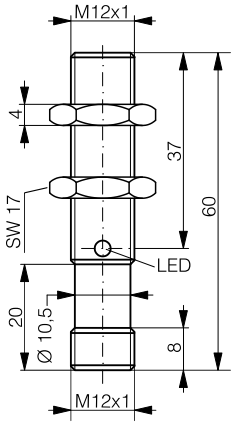
all-metal

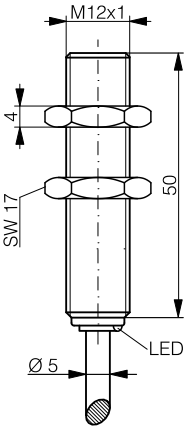


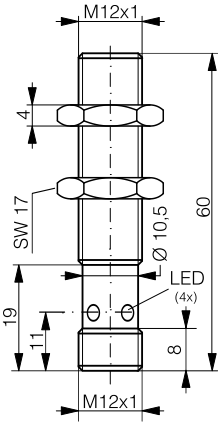
all-metal

Dimensions:







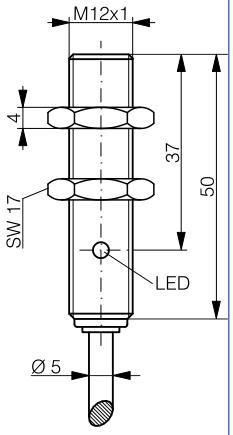
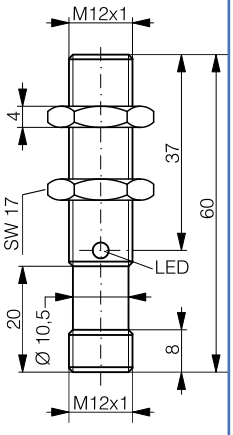


Part references:
(**bold:** preferred types)

NPN N.O.	**DW-AS-501-M12-120**	**DW-AS-501-M12**	**DW-AD-701-M12**	**DW-AS-701-M12**
NPN N.C.		DW-AS-502-M12	DW-AD-702-M12	DW-AS-702-M12
PNP N.O.	**DW-AS-503-M12-120**	**DW-AS-503-M12**	**DW-AD-703-M12**	**DW-AS-703-M12**
PNP N.C.		DW-AS-504-M12	DW-AD-704-M12	DW-AS-704-M12
NAMUR				
AC/DC 2-wire N.O.				
AC/DC 2-wire N.C.				
Compatible connectors [4]	G ... N	G ... N (N.O.); K ... N (N.C.)		G ... N (N.O.); K ... N (N.C.)

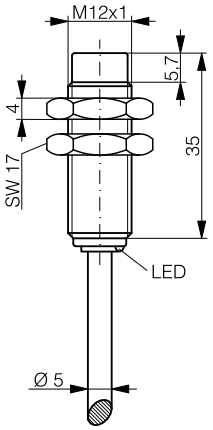
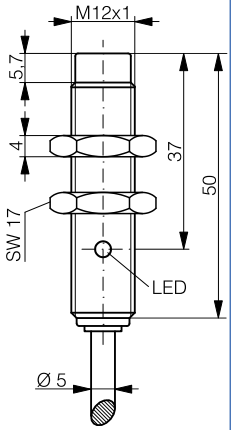
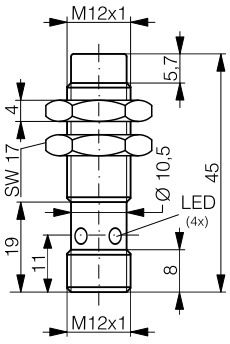
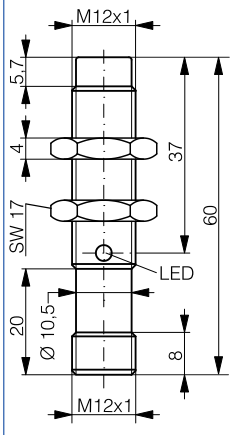
SERIES 520

M12

8	8
Chrome-plated brass	Chrome-plated brass
PVC cable type 8	Connector S12
IP 67	IP 67
Quasi-embeddable	Quasi-embeddable
400 Hz	400 Hz
Table 1	Table 1
Diagram 1	Diagram 2
Built-in	Built-in
10 ... 30 VDC	10 ... 30 VDC
-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 200 mA
	
4 x distance	4 x distance
	
DW-AD-523-M12	**DW-AS-523-M12**
	G ... N

SERIES 500

M12

10	10	10	10
Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
PVC cable type 8	PVC cable type 8	Connector S12	Connector S12
IP 67	IP 67	IP 67	IP 67
Non-embeddable	Non-embeddable	Non-embeddable	Non-embeddable
400 Hz	400 Hz	400 Hz	400 Hz
Table 1	Table 1	Table 1	Table 1
Diagram 1	Diagram 1	Diagram 2	Diagram 2
Built-in	Built-in	Built-in	Built-in
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
			
long distance	long distance	long distance	long distance
			
DW-AD-511-M12-120	**DW-AD-511-M12**	**DW-AS-511-M12-120**	**DW-AS-511-M12**
	DW-AD-512-M12		DW-AS-512-M12
DW-AD-513-M12-120	**DW-AD-513-M12**	**DW-AS-513-M12-120**	**DW-AS-513-M12**
	DW-AD-514-M12		DW-AS-514-M12
		G ... N	G ... N (N.O.); K ... N (N.C.)

For all these products, you will find detailed data sheets, application notes, dimensional drawings, cross-reference lists, part references, new items, special executions, extensive additional technical information, specifications concerning quality, safety and standards, as well as the addresses of our agents, and much more besides, on our Internet website at www.contrinex.com. The website contents are constantly up-dated and extended.

Size	M12		M18	
Operating distance mm	10	10	5	5
Housing material	Stainless steel V2A	Stainless steel V2A	Nickel-plated brass	Nickel-plated brass
Connection [1]	PUR cable type 11	Connector S12	PUR cable type 5	PUR cable type 5
Degree of protection	IP 68	IP 67	IP 67	IP 67
Mounting	Non-embeddable	Non-embeddable	Embeddable	Embeddable
Max. switching frequency	400 Hz	400 Hz	800 Hz	800 Hz
Technical data [2]	Table 1	Table 1	Table 2	Table 2
Wiring [3]	Diagram 1	Diagram 2	Diagram 2	Diagram 2
LED	Built-in	Built-in	Built-in	Built-in
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	15 ... 34 VDC	15 ... 34 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C	-25 ... +85 °C	-25 ... +85 °C
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA / ≤ 150 mA*	≤ 200 mA / ≤ 150 mA*

[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 68
[3] see page 69
[4] see page 112



all-metal

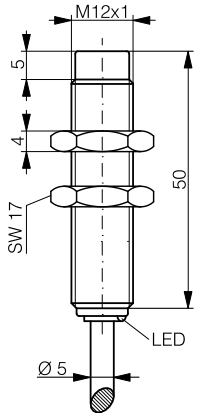


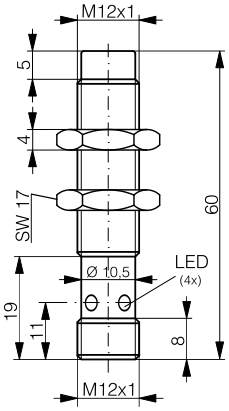
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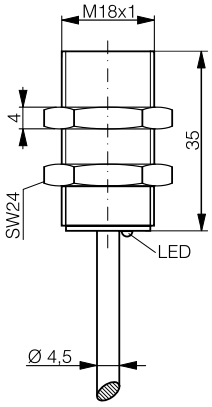


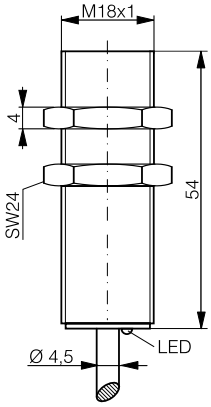


Dimensions:







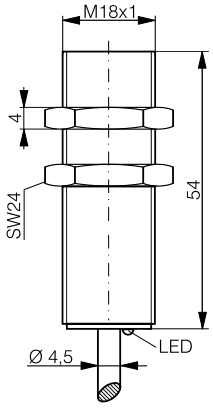
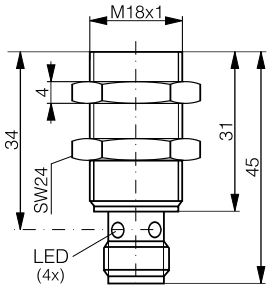
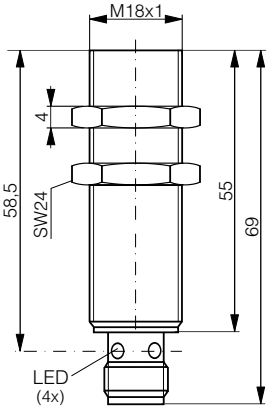
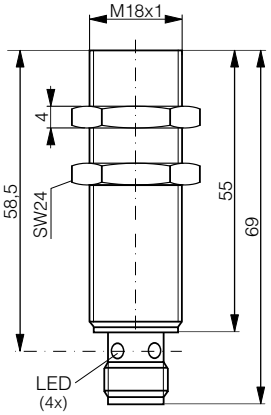


Part references:
(**bold:** preferred types)

NPN N.O.	**DW-AD-711-M12**	**DW-AS-711-M12**	**DW-AD-601-M18-120**	**DW-AD-601-M18**
NPN N.C.	DW-AD-712-M12	DW-AS-712-M12	DW-AD-602-M18-120	DW-AD-602-M18
PNP N.O.	**DW-AD-713-M12**	**DW-AS-713-M12**	**DW-AD-603-M18-120**	**DW-AD-603-M18**
PNP N.C.	DW-AD-714-M12	DW-AS-714-M12	DW-AD-604-M18-120	DW-AD-604-M18
NAMUR				
AC/DC 2-wire N.O.				
AC/DC 2-wire N.C.				
Compatible connectors [4]		G ... N (N.O.); K ... N (N.C.)		

*50 °C / 85 °C

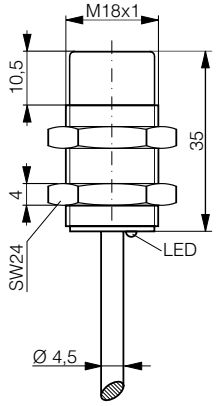
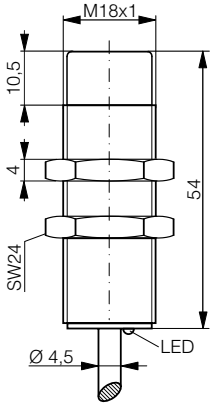
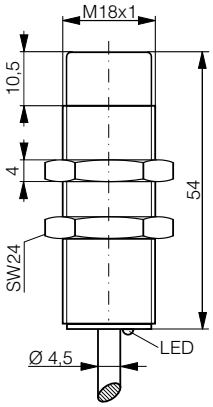
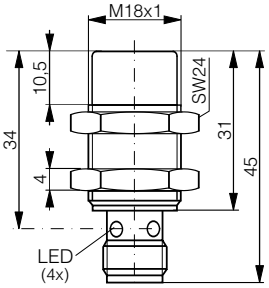
M18

5	5	5	5	
Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	
PUR cable type 5	Connector S12	Connector S12	Connector S12	
IP 67	IP 67	IP 67	IP 67	
Embeddable	Embeddable	Embeddable	Embeddable	
25 Hz (AC) / 490 Hz (DC)	800 Hz	800 Hz	25 Hz (AC) / 490 Hz (DC)	
Table 4	Table 2	Table 2	Table 4	
Diagram 3	Diagram 2	Diagram 2	Diagram 3	
Built-in	Built-in	Built-in	Built-in	
20 ... 265 VAC / 20 ... 320 VDC	15 ... 34 VDC	15 ... 34 VDC	20 ... 265 VAC / 20 ... 320 VDC	
-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C	
≤ 300 mA	≤ 200 mA / ≤ 150 mA*	≤ 200 mA / ≤ 150 mA*	≤ 300 mA	
				
				
	DW-AS-601-M18-120	**DW-AS-601-M18-002**		
	DW-AS-602-M18-120	DW-AS-602-M18-002		
	DW-AS-603-M18-120	**DW-AS-603-M18-002**		
	DW-AS-604-M18-120	DW-AS-604-M18-002		
DW-AD-607-M18			**DW-AS-607-M18-002**	
DW-AD-608-M18			DW-AS-608-M18-002	
	G ... N (N.O.); K ... N (N.C.)	G ... N (N.O.); K ... N (N.C.)	M, N	

*50 °C / 85 °C

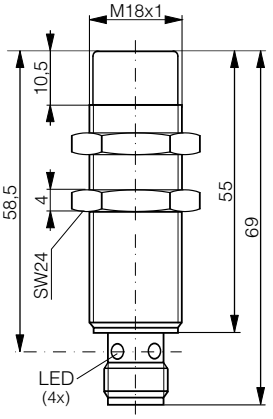
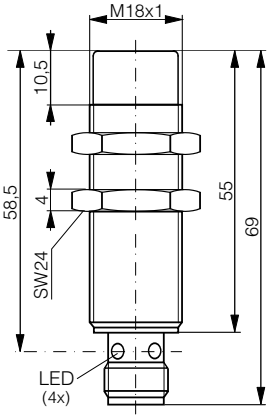
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M18

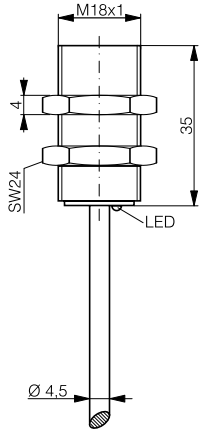
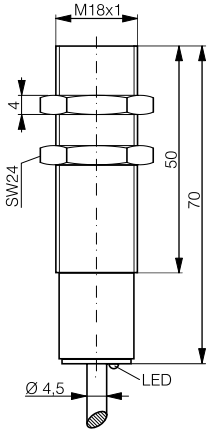
Size	M18			
Operating distance mm	8	8	8	8
Housing material	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
Connection [1]	PUR cable type 5	PUR cable type 5	PUR cable type 5	Connector S12
Degree of protection	IP 67	IP 67	IP 67	IP 67
Mounting	Non-embeddable	Non-embeddable	Non-embeddable	Non-embeddable
Max. switching frequency	500 Hz	500 Hz	25 Hz (AC) / 340 Hz (DC)	500 Hz
Technical data [2]	Table 2	Table 2	Table 4	Table 2
Wiring [3]	Diagram 2	Diagram 2	Diagram 3	Diagram 2
LED	Built-in	Built-in	Built-in	Built-in
Supply voltage range	15 ... 34 VDC	15 ... 34 VDC	20 ... 265 VAC / 20 ... 320 VDC	15 ... 34 VDC
Ambient temperature range	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C
Output current	≤ 200 mA / ≤ 150 mA*	≤ 200 mA / ≤ 150 mA*	≤ 300 mA	≤ 200 mA / ≤ 150 mA*
[1] Standard cable length 2 m. Non-standard cable lengths and types on request. [2] see page 68 [3] see page 69 [4] see page 112				
Dimensions:				
Part references: (**bold:** preferred types)				
NPN N.O.	**DW-AD-611-M18-120**	**DW-AD-611-M18**		**DW-AS-611-M18-120**
NPN N.C.	DW-AD-612-M18-120	DW-AD-612-M18		DW-AS-612-M18-120
PNP N.O.	**DW-AD-613-M18-120**	**DW-AD-613-M18**		**DW-AS-613-M18-120**
PNP N.C.	DW-AD-614-M18-120	DW-AD-614-M18		DW-AS-614-M18-120
NAMUR				
AC/DC 2-wire N.O.			**DW-AD-617-M18**	
AC/DC 2-wire N.C.			DW-AD-618-M18	
Compatible connectors [4]				G ... N (N.O.); K ... N (N.C.)

*50 °C / 85 °C

M18

8	8
Nickel-plated brass	Nickel-plated brass
Connector S12	Connector S12
IP 67	IP 67
Non-embeddable	Non-embeddable
500 Hz	25 Hz (AC) / 340 Hz (DC)
Table 2	Table 4
Diagram 2	Diagram 3
Built-in	Built-in
15 ... 34 VDC	20 ... 265 VAC / 20 ... 320 VDC
-25 ... +85 °C	-25 ... +85 °C
≤ 200 mA / ≤ 150 mA*	≤ 300 mA
	
	
DW-AS-611-M18-002	
DW-AS-612-M18-002	
DW-AS-613-M18-002	
DW-AS-614-M18-002	
	DW-AS-617-M18-002
	DW-AS-618-M18-002
G ... N (N.O.); K ... N (N.C.)	M, N

M18

8	8
Nickel-plated brass	Nickel-plated brass
PUR cable type 5	PUR cable type 5
IP 67	IP 67
Quasi-embeddable	Quasi-embeddable
500 Hz	500 Hz
Table 2	Table 2
Diagram 2	Diagram 2
Built-in	Built-in
15 ... 34 VDC	15 ... 34 VDC
-25 ... +85 °C	-25 ... +85 °C
≤ 200 mA / ≤ 150 mA*	≤ 200 mA / ≤ 150 mA*
	
increased distance	increased distance
	
**	**
**	**
DW-AD-623-M18-120	**DW-AD-623-M18**
**	**

*50 °C / 85 °C

** on request

For all these products, you will find detailed data sheets, application notes, dimensional drawings, cross-reference lists, part references, new items, special executions, extensive additional technical information, specifications concerning quality, safety and standards, as well as the addresses of our agents, and much more besides, on our Internet website at www.contrinex.com. The website contents are constantly up-dated and extended.

Size	M18		M18	
Operating distance mm	8	8	10	10
Housing material	Nickel-plated brass	Nickel-plated brass	Stainless steel V2A	Stainless steel V2A
Connection [1]	Connector S12	Connector S12	PUR cable type 11	Connector S12
Degree of protection	IP 67	IP 67	IP 68	IP 67
Mounting	Quasi-embeddable	Quasi-embeddable	Embeddable	Embeddable
Max. switching frequency	500 Hz	500 Hz	200 Hz	200 Hz
Technical data [2]	Table 2	Table 2	Table 1	Table 1
Wiring [3]	Diagram 2	Diagram 2	Diagram 1	Diagram 2
LED	Built-in	Built-in	Built-in	Built-in
Supply voltage range	15 ... 34 VDC	15 ... 34 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +85 °C	-25 ... +85 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 200 mA / ≤ 150 mA*	≤ 200 mA / ≤ 150 mA*	≤ 200 mA	≤ 200 mA

[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 68
[3] see page 69
[4] see page 112



increased distance



increased distance

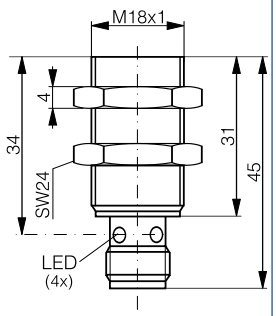


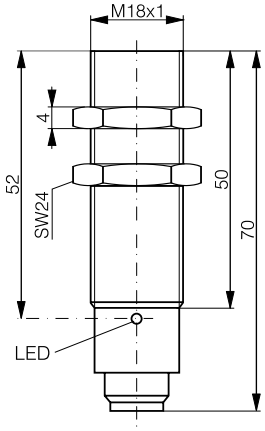
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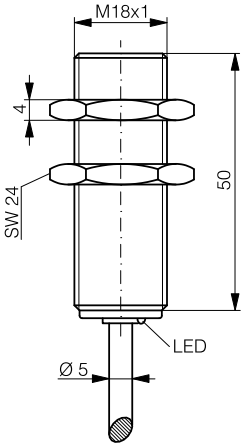


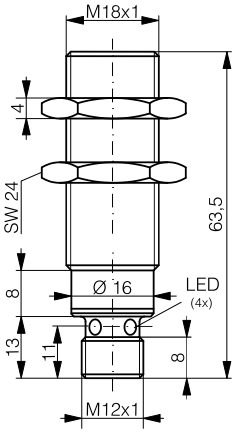
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Dimensions:







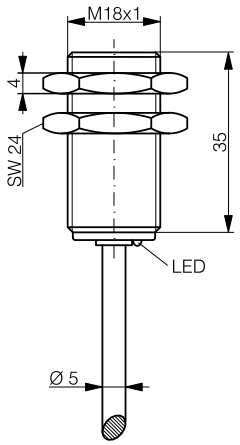
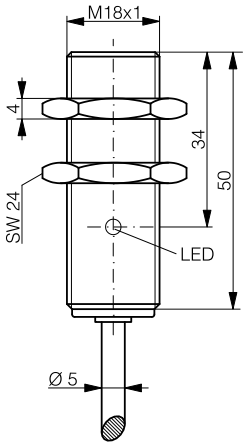
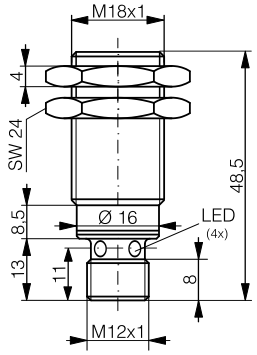
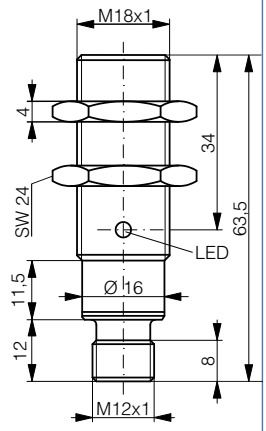


Part references:
(**bold:** preferred types)

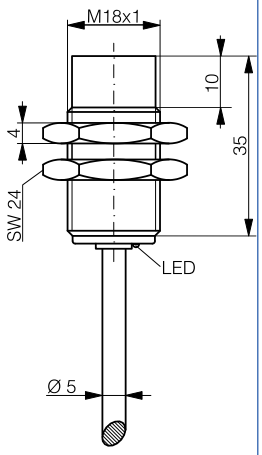
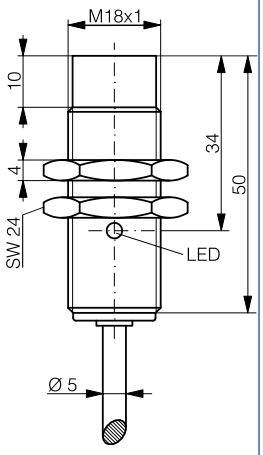
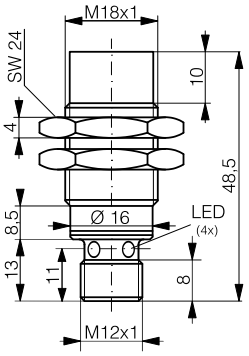
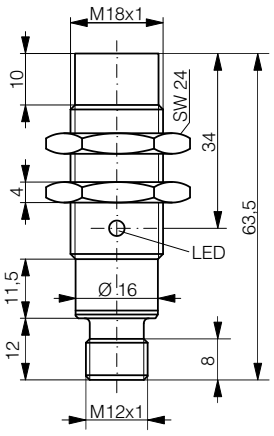
NPN N.O.	**	**	**DW-AD-701-M18**	**DW-AS-701-M18-002**
NPN N.C.	**	**	DW-AD-702-M18	DW-AS-702-M18-002
PNP N.O.	**DW-AS-623-M18-120**	**DW-AS-623-M18-002**	**DW-AD-703-M18**	**DW-AS-703-M18-002**
PNP N.C.	**	**	DW-AD-704-M18	DW-AS-704-M18-002
NAMUR				
AC/DC 2-wire N.O.				
AC/DC 2-wire N.C.				
Compatible connectors [4]	G ... N	G ... N		G ... N (N.O.); K ... N (N.C.)

*50 °C / 85 °C
** on request

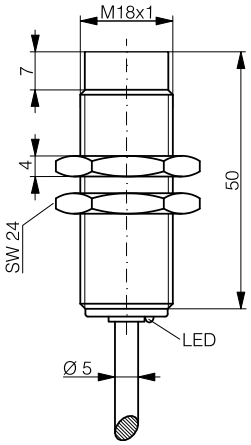
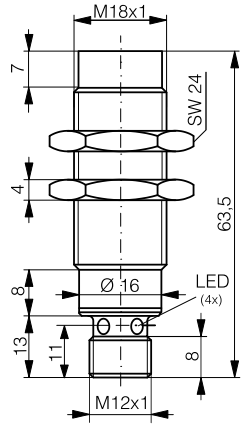
M18

12	12	12	12	
Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	
PVC cable type 8	PVC cable type 8	Connector S12	Connector S12	
IP 67	IP 67	IP 67	IP 67	
Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	
500 Hz	500 Hz	500 Hz	500 Hz	
Table 1	Table 1	Table 1	Table 1	
Diagram 1	Diagram 1	Diagram 2	Diagram 2	
Built-in	Built-in	Built-in	Built-in	
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	
-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	
				
long distance	long distance	long distance	long distance	
				
DW-AD-501-M18-120	**DW-AD-501-M18**	**DW-AS-501-M18-120**	**DW-AS-501-M18-002**	
	DW-AD-502-M18		DW-AS-502-M18-002	
DW-AD-503-M18-120	**DW-AD-503-M18**	**DW-AS-503-M18-120**	**DW-AS-503-M18-002**	
	DW-AD-504-M18		DW-AS-504-M18-002	
		G ... N	G ... N (N.O.); K ... N (N.C.)	

For all these products, you will find detailed data sheets, application notes, dimensional drawings, cross-reference lists, part references, new items, special executions, extensive additional technical information, specifications concerning quality, safety and standards, as well as the addresses of our agents, and much more besides, on our Internet website at www.contrinex.com. The website contents are constantly up-dated and extended.

Size	M18			
Operating distance mm	20	20	20	20
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connection [1]	PVC cable type 8	PVC cable type 8	Connector S12	Connector S12
Degree of protection	IP 67	IP 67	IP 67	IP 67
Mounting	Non-embeddable	Non-embeddable	Non-embeddable	Non-embeddable
Max. switching frequency	200 Hz	200 Hz	200 Hz	200 Hz
Technical data [2]	Table 1	Table 1	Table 1	Table 1
Wiring [3]	Diagram 1	Diagram 1	Diagram 2	Diagram 2
LED	Built-in	Built-in	Built-in	Built-in
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
[1] Standard cable length 2 m. Non-standard cable lengths and types on request. [2] see page 68 [3] see page 69 [4] see page 112				
	long distance	long distance	long distance	long distance
Dimensions:				
Part references: (**bold:** preferred types)				
NPN N.O.	**DW-AD-511-M18-120**	**DW-AD-511-M18**	**DW-AS-511-M18-120**	**DW-AS-511-M18-002**
NPN N.C.		DW-AD-512-M18		DW-AS-512-M18-002
PNP N.O.	**DW-AD-513-M18-120**	**DW-AD-513-M18**	**DW-AS-513-M18-120**	**DW-AS-513-M18-002**
PNP N.C.		DW-AD-514-M18		DW-AS-514-M18-002
NAMUR				
AC/DC 2-wire N.O.				
AC/DC 2-wire N.C.				
Compatible connectors [4]			G ... N	G ... N (N.O.); K ... N (N.C.)

M18

20	20			
Stainless steel V2A	Stainless steel V2A			
PUR cable type 11	Connector S12			
IP 68	IP 67			
Non-embeddable	Non-embeddable			
200 Hz	200 Hz			
Table 1	Table 1			
Diagram 1	Diagram 2			
Built-in	Built-in			
10 ... 30 VDC	10 ... 30 VDC			
-25 ... +70 °C	-25 ... +70 °C			
≤ 200 mA	≤ 200 mA			
				
all-metal	all-metal			
				
DW-AD-711-M18	**DW-AS-711-M18-002**			
DW-AD-712-M18	DW-AS-712-M18-002			
DW-AD-713-M18	**DW-AS-713-M18-002**			
DW-AD-714-M18	DW-AS-714-M18-002			
	G ... N (N.O.); K ... N (N.C.)			

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M30

Size				
Operating distance mm	**10**	**10**	**10**	**10**
Housing material	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
Connection [1]	PUR cable type 5	PUR cable type 5	PUR cable type 5	Connector S12
Degree of protection	IP 67	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable	Embeddable
Max. switching frequency	300 Hz	300 Hz	25 Hz (AC) / 200 Hz (DC)	300 Hz
Technical data [2]	Table 2	Table 2	Table 4	Table 2
Wiring [3]	Diagram 2	Diagram 2	Diagram 3	Diagram 2
LED	Built-in	Built-in	Built-in	Built-in
Supply voltage range	15 ... 34 VDC	15 ... 34 VDC	20 ... 265 VAC / 20 ... 320 VDC	15 ... 34 VDC
Ambient temperature range	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C
Output current	≤ 200 mA / ≤ 150 mA*	≤ 200 mA / ≤ 150 mA*	≤ 300 mA	≤ 200 mA / ≤ 150 mA*

[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 68
[3] see page 69
[4] see page 112

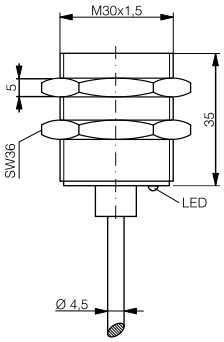


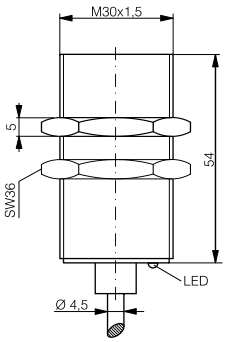


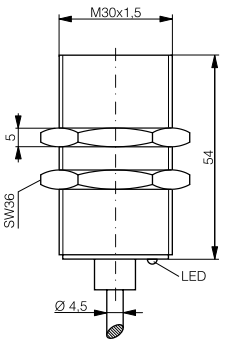


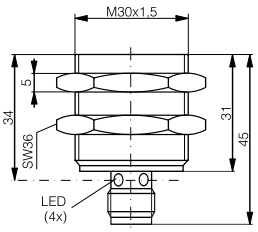


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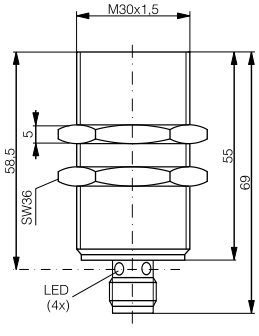
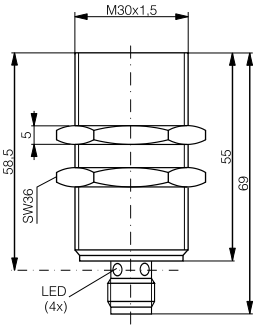
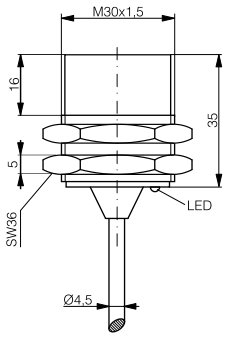
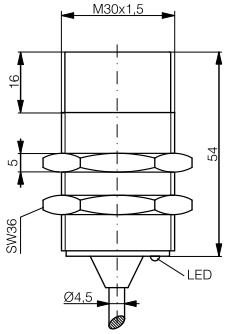
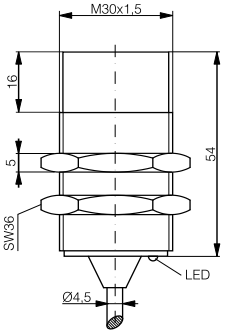


Part references:
(**bold:** preferred types)

NPN N.O.	**DW-AD-601-M30-120**	**DW-AD-601-M30**		**DW-AS-601-M30-120**
NPN N.C.	DW-AD-602-M30-120	DW-AD-602-M30		DW-AS-602-M30-120
PNP N.O.	**DW-AD-603-M30-120**	**DW-AD-603-M30**		**DW-AS-603-M30-120**
PNP N.C.	DW-AD-604-M30-120	DW-AD-604-M30		DW-AS-604-M30-120
NAMUR				
AC/DC 2-wire N.O.			**DW-AD-607-M30**	
AC/DC 2-wire N.C.			DW-AD-608-M30	
Compatible connectors [4]				G ... N (N.O.); K ... N (N.C.)

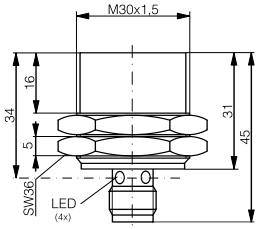
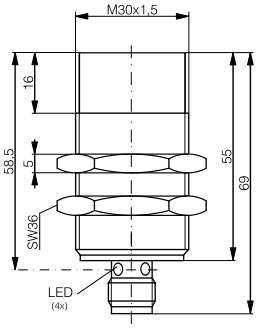
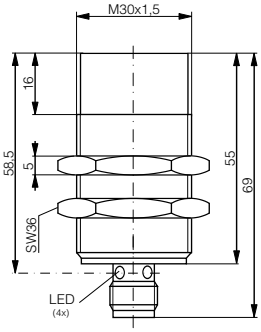
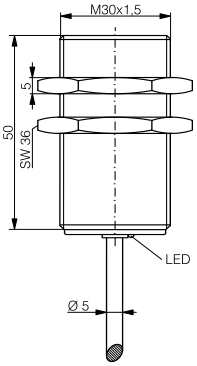
*50 °C / 85 °C

M30

10	10	15	15	15
Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
Connector S12	Connector S12	PUR cable type 5	PUR cable type 5	PUR cable type 5
IP 67	IP 67	IP 67	IP 67	IP 67
Embeddable	Embeddable	Non-embeddable	Non-embeddable	Non-embeddable
300 Hz	25 Hz (AC) / 200 Hz (DC)	300 Hz	300 Hz	25 Hz (AC) / 220 Hz (DC)
Table 2	Table 4	Table 2	Table 2	Table 4
Diagram 2	Diagram 3	Diagram 2	Diagram 2	Diagram 3
Built-in	Built-in	Built-in	Built-in	Built-in
15 ... 34 VDC	20 ... 265 VAC / 20 ... 320 VDC	15 ... 34 VDC	15 ... 34 VDC	20 ... 265 VAC / 20 ... 320 VDC
-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C
≤ 200 mA / ≤ 150 mA*	≤ 300 mA	≤ 200 mA / ≤ 150 mA*	≤ 200 mA / ≤ 150 mA*	≤ 300 mA
				
				
DW-AS-601-M30-002		**DW-AD-611-M30-120**	**DW-AD-611-M30**	
DW-AS-602-M30-002		DW-AD-612-M30-120	DW-AD-612-M30	
DW-AS-603-M30-002		**DW-AD-613-M30-120**	**DW-AD-613-M30**	
DW-AS-604-M30-002		DW-AD-614-M30-120	DW-AD-614-M30	
	DW-AS-607-M30-002			**DW-AD-617-M30**
	DW-AS-608-M30-002			DW-AD-618-M30
G ... N (N.O.); K ... N (N.C.)	M, N			

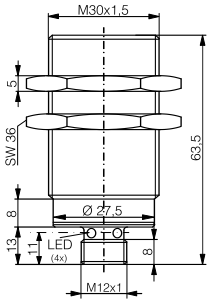
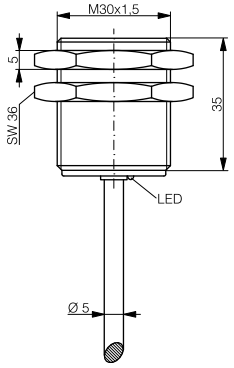
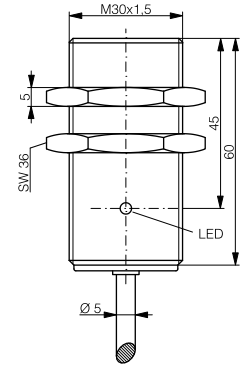
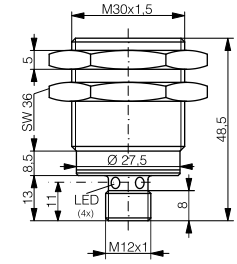
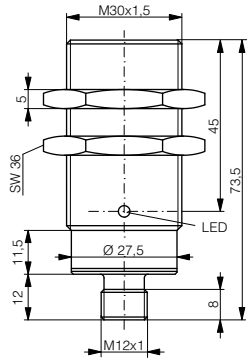
*50 °C / 85 °C

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Size	M30			M30
Operating distance mm	15	15	15	20
Housing material	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Stainless steel V2A
Connection [1]	Connector S12	Connector S12	Connector S12	PUR cable type 11
Degree of protection	IP 67	IP 67	IP 67	IP 68
Mounting	Non-embeddable	Non-embeddable	Non-embeddable	Embeddable
Max. switching frequency	300 Hz	300 Hz	25 Hz (AC) / 220 Hz (DC)	100 Hz
Technical data [2]	Table 2	Table 2	Table 4	Table 1
Wiring [3]	Diagram 2	Diagram 2	Diagram 3	Diagram 1
LED	Built-in	Built-in	Built-in	Built-in
Supply voltage range	15 ... 34 VDC	15 ... 34 VDC	20 ... 265 VAC / 20 ... 320 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C	-25 ... +70 °C
Output current	≤ 200 mA / ≤ 150 mA*	≤ 200 mA / ≤ 150 mA*	≤ 300 mA	≤ 200 mA
[1] Standard cable length 2 m. Non-standard cable lengths and types on request. [2] see page 68 [3] see page 69 [4] see page 112				 all-metal
Dimensions:				
Part references: (**bold:** preferred types)				
NPN N.O.	**DW-AS-611-M30-120**	**DW-AS-611-M30-002**		**DW-AD-701-M30**
NPN N.C.	DW-AS-612-M30-120	DW-AS-612-M30-002		DW-AD-702-M30
PNP N.O.	**DW-AS-613-M30-120**	**DW-AS-613-M30-002**		**DW-AD-703-M30**
PNP N.C.	DW-AS-614-M30-120	DW-AS-614-M30-002		DW-AD-704-M30
NAMUR				
AC/DC 2-wire N.O.			**DW-AS-617-M30-002**	
AC/DC 2-wire N.C.			DW-AS-618-M30-002	
Compatible connectors [4]	G ... N (N.O.); K ... N (N.C.)	G ... N (N.O.); K ... N (N.C.)	M, N	

*50 °C / 85 °C

M30

20	22	22	22	22
Stainless steel V2A	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connector S12	PVC cable type 8	PVC cable type 8	Connector S12	Connector S12
IP 67	IP 67	IP 67	IP 67	IP 67
Embeddable	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable
100 Hz	200 Hz	200 Hz	200 Hz	200 Hz
Table 1	Table 1	Table 1	Table 1	Table 1
Diagram 2	Diagram 1	Diagram 1	Diagram 2	Diagram 2
Built-in	Built-in	Built-in	Built-in	Built-in
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
				
all-metal	**long distance**	**long distance**	**long distance**	**long distance**
				
DW-AS-701-M30-002	DW-AD-501-M30-120	**DW-AD-501-M30**	DW-AS-501-M30-120	**DW-AS-501-M30-002**
DW-AS-702-M30-002		DW-AD-502-M30		DW-AS-502-M30-002
DW-AS-703-M30-002	DW-AD-503-M30-120	**DW-AD-503-M30**	DW-AS-503-M30-120	**DW-AS-503-M30-002**
DW-AS-704-M30-002		DW-AD-504-M30		DW-AS-504-M30-002
G ... N (N.O.); K ... N (N.C.)			G ... N	G ... N (N.O.); K ... N (N.C.)

For all these products, you will find detailed data sheets, application notes, dimensional drawings, cross-reference lists, part references, new items, special executions, extensive additional technical information, specifications concerning quality, safety and standards, as well as the addresses of our agents, and much more besides, on our Internet website at www.contrinex.com. The website contents are constantly up-dated and extended.

Size	M30			
Operating distance mm	40	40	40	40
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connection [1]	PVC cable type 8	PVC cable type 8	Connector S12	Connector S12
Degree of protection	IP 67	IP 67	IP 67	IP 67
Mounting	Non-embeddable	Non-embeddable	Non-embeddable	Non-embeddable
Max. switching frequency	100 Hz	100 Hz	100 Hz	100 Hz
Technical data [2]	Table 1	Table 1	Table 1	Table 1
Wiring [3]	Diagram 1	Diagram 1	Diagram 2	Diagram 2
LED	Built-in	Built-in	Built-in	Built-in
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA

[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 68
[3] see page 69
[4] see page 112



long distance



long distance

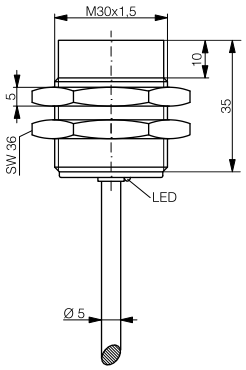


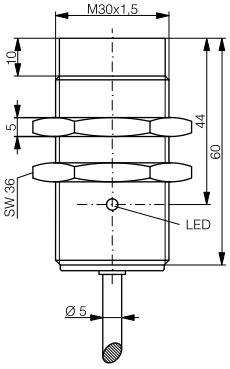
long distance

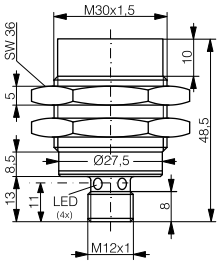


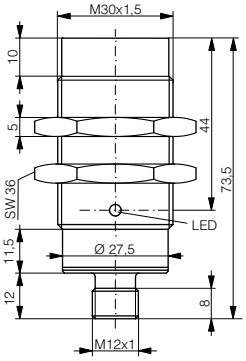
long distance

Dimensions:





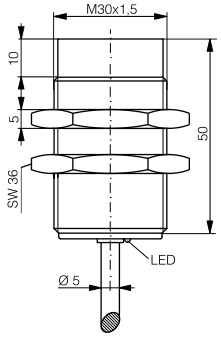
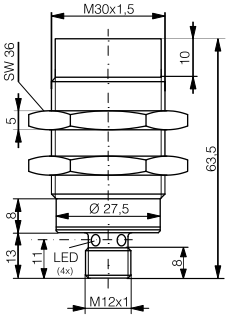




Part references:
(**bold:** preferred types)

NPN N.O.	DW-AD-511-M30-120	**DW-AD-511-M30**	DW-AS-511-M30-120	**DW-AS-511-M30-002**
NPN N.C.		DW-AD-512-M30		DW-AS-512-M30-002
PNP N.O.	DW-AD-513-M30-120	**DW-AD-513-M30**	DW-AS-513-M30-120	**DW-AS-513-M30-002**
PNP N.C.		DW-AD-514-M30		DW-AS-514-M30-002
NAMUR				
AC/DC 2-wire N.O.				
AC/DC 2-wire N.C.				
Compatible connectors [4]			G ... N	G ... N (N.O.); K ... N (N.C.)

M30

40	40			
Stainless steel V2A	Stainless steel V2A			
PUR cable type 11	Connector S12			
IP 68	IP 67			
Non-embeddable	Non-embeddable			
100 Hz	100 Hz			
Table 1	Table 1			
Diagram 1	Diagram 2			
Built-in	Built-in			
10 ... 30 VDC	10 ... 30 VDC			
-25 ... +70 °C	-25 ... +70 °C			
≤ 200 mA	≤ 200 mA			
				
all-metal	all-metal			
				
DW-AD-711-M30	**DW-AS-711-M30-002**			
DW-AD-712-M30	DW-AS-712-M30-002			
DW-AD-713-M30	**DW-AS-713-M30-002**			
DW-AD-714-M30	DW-AS-714-M30-002			
	G ... N (N.O.); K ... N (N.C.)			

For all these products, you will find detailed data sheets, application notes, dimensional drawings, cross-reference lists, part references, new items, special executions, extensive additional technical information, specifications concerning quality, safety and standards, as well as the addresses of our agents, and much more besides, on our Internet website at www.contrinex.com. The website contents are constantly up-dated and extended.

Size □ 40x40

Operating distance mm	15	15	20
Housing material	PBTP	PBTP	PBTP
Connection [1]	Connector S12	Connector S12	Connector S12
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable
Max. switching frequency	50 Hz	25 Hz (AC) / 50 Hz (DC)	30 Hz
Technical data [2]	Table 9	Table 10	Table 9
Wiring [3]	Diagram 6	Diagram 3	Diagram 6
LED	Built-in	Built-in	Built-in
Supply voltage range	15 ... 34 VDC	20 ... 265 VAC / 20 ... 320 VDC	15 ... 34 VDC
Ambient temperature range	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C
Output current	≤ 200 mA / ≤ 150 mA*	≤ 300 mA	≤ 200 mA / ≤ 150 mA*

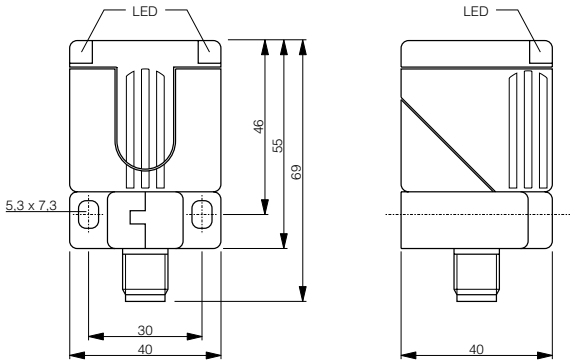
[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 68
[3] see page 69
[4] see page 112







Dimensions:



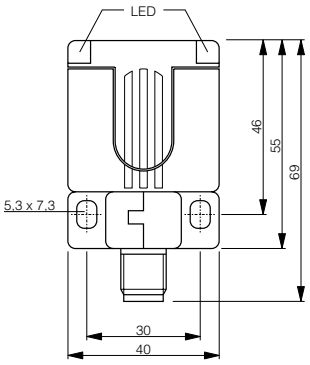
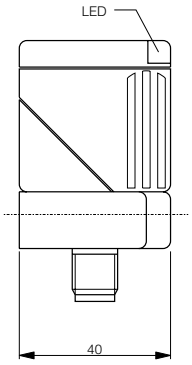
Sensing face can be rotated to 5 different sides.

Part references:
(**bold:** preferred types)

NPN N.O. + N.C.	**DW-AS-601-C44**		**DW-AS-601-C44-304**
PNP N.O. + N.C.	**DW-AS-603-C44**		**DW-AS-603-C44-304**
NAMUR			
AC/DC 2-wire N.O.		**DW-AS-607-C44**	
AC/DC 2-wire N.C.			
Compatible connectors [4]	M, N	M, N	M, N

*50 °C / 85 °C

☐ 40x40

35	35		
PBTP	PBTP		
Connector S12	Connector S12		
IP 67	IP 67		
Non-embeddable	Non-embeddable		
30 Hz	25 Hz (AC) / 30 Hz (DC)		
Table 9	Table 10		
Diagram 6	Diagram 3		
Built-in	Built-in		
15 ... 34 VDC	20 ... 265 VAC / 20 ... 320 VDC		
-25 ... +85 °C	-25 ... +85 °C		
≤ 200 mA / ≤ 150 mA*	≤ 300 mA		
			
  Sensing face can be rotated to 5 different sides.			
DW-AS-611-C44			
DW-AS-613-C44			
	DW-AS-617-C44		
M, N	M, N		

*50 °C / 85 °C

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Size □ 40x120

Operating distance mm	15	15	40
Housing material	PBTP	PBTP	PBTP
Connection [1]	Screw terminal	Screw terminal	Screw terminal
Degree of protection	IP 65	IP 65	IP 65
Mounting	Embeddable	Embeddable	Non-embeddable
Max. switching frequency	100 Hz	25 Hz (AC) / 150 Hz (DC)	20 Hz
Technical data [2]	Table 2	Table 4	Table 3
Wiring [3]	Diagram 2	Diagram 3	Diagram 2
LED	Built-in	Built-in	Built-in
Supply voltage range	15 ... 34 VDC	20 ... 265 VAC / 20 ... 320 VDC	10 ... 65 VDC
Ambient temperature range	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C
Output current	≤ 200 mA / ≤ 150 mA*	≤ 300 mA	≤ 300 mA

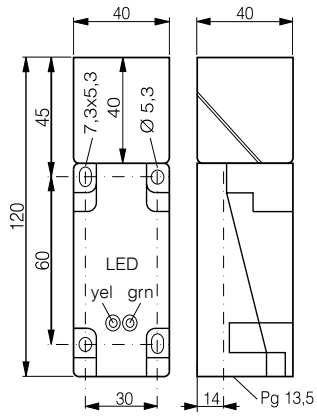
[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 68
[3] see page 69
[4] see page 112



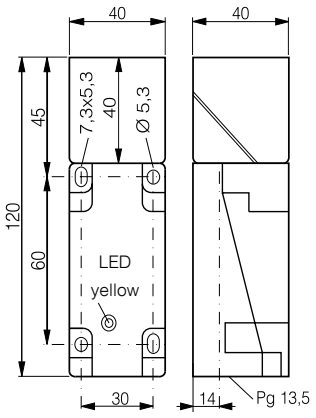




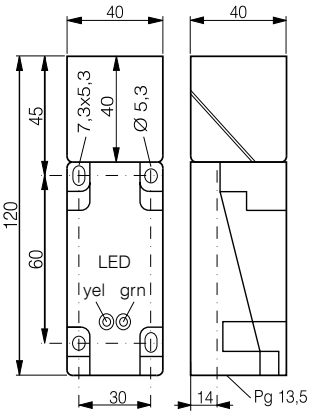
Dimensions:



Sensing face can be rotated to 5 different sides.



Sensing face can be rotated to 5 different sides.



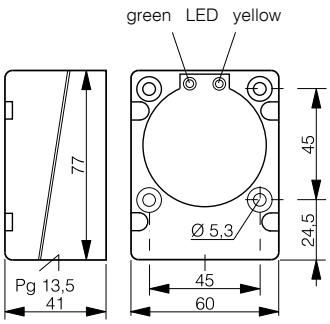
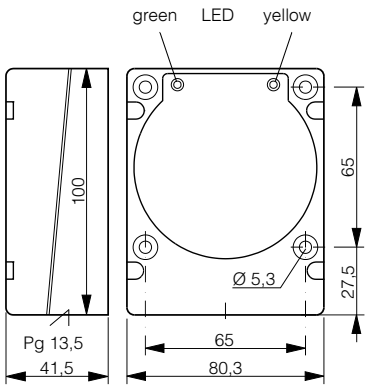
Sensing face can be rotated to 5 different sides.

Part references:
(**bold:** preferred types)

NPN N.O.	DW-AD-601-C40		
NPN N.C.			
PNP N.O.	**DW-AD-603-C40**		**DW-AD-613-C40 ****
PNP N.C.			
NAMUR			
AC/DC 2-wire N.O.		**DW-AD-607-C40 ****	
AC/DC 2-wire N.C.			
Compatible connectors [4]			

*50 °C / 85 °C

** N.O. / N.C. switchable

☐ 60x80	☐ 80x100	
50	**65**	
PBTP	PBTP	
Screw terminal	Screw terminal	
IP 65	IP 65	
Non-embeddable	Non-embeddable	
20 Hz	10 Hz	
Table 3	Table 3	
Diagram 2	Diagram 2	
Built-in	Built-in	
10 ... 65 VDC	10 ... 65 VDC	
-25 ... +85 °C	-25 ... +85 °C	
≤ 300 mA	≤ 300 mA	
		
		
DW-AD-613-C60 **	**DW-AD-613-C80 ****	

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Size	Ø 4	M5	Ø 6.5	M8	
Operating distance mm	0.6	0.6	2.5	2.5	1.5
Max. operating pressure	20 bars	20 bars	20 bars	20 bars	500 bars
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Sensing face	Sapphire	Sapphire	Ceramic ZrO_2	Ceramic ZrO_2	Ceramic ZrO_2
Connection [1]	PUR cable type 3	PUR cable type 3	PUR cable type 3	PUR cable type 3	Connector S12
Degree of protection	IP 68	IP 68	IP 68	IP 68	IP 68
Mounting	Embeddable	Embeddable	Embeddable	Embeddable	Embeddable
Max. switching frequency	5,000 Hz	5,000 Hz	1,000 Hz	1,000 Hz	2,000 Hz
Technical data [2]	Table 1	Table 1	Table 1	Table 1	Table 6
Wiring [3]	Diagram 1	Diagram 1	Diagram 1	Diagram 1	Diagram 2
LED	---	---	---	---	---
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +80 °C
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA

[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 68
[3] see page 69
[4] see page 112



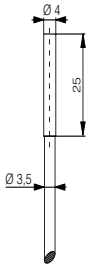


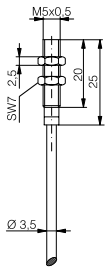


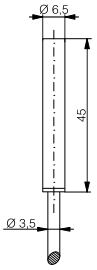


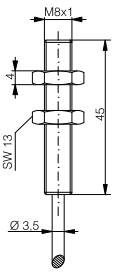


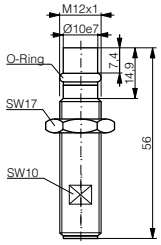
Dimensions:







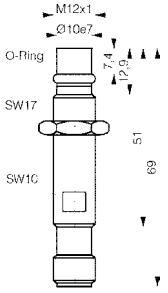
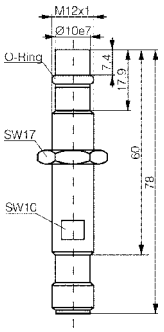
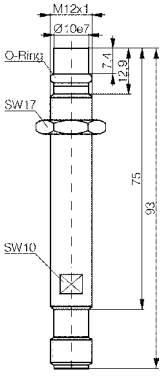
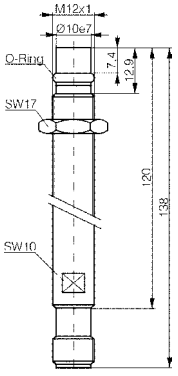
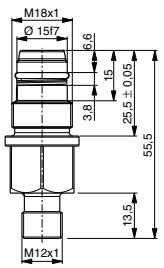
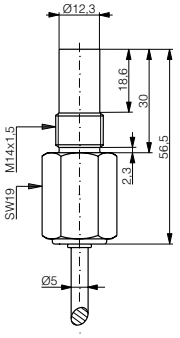
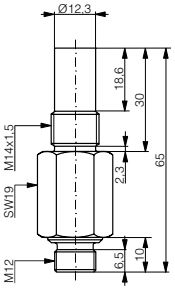




Part references:
(**bold:** preferred types)

NPN N.O.	**DW-AD-401-04E**	**DW-AD-401-M5E**	**DW-AD-501-065E**	**DW-AD-501-M8E**	**DW-AS-501-P12-624**
NPN N.C.					
PNP N.O.	**DW-AD-403-04E**	**DW-AD-403-M5E**	**DW-AD-503-065E**	**DW-AD-503-M8E**	**DW-AS-503-P12-624**
PNP N.C.					
NAMUR					
AC/DC 2-wire N.O.					
AC/DC 2-wire N.C.					
Compatible connectors [4]					G ... N

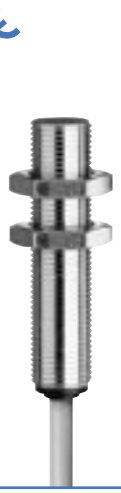
HIGH-PRESSURE-RESISTANT SERIES P

P12				P18	P20	
1.5	1.5	1.5	1.5	1.5	3	3
500 bars	500 bars	500 bars	500 bars	500 bars	500 bars	500 bars
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V4A	Stainless steel V4A
Ceramic ZrO_2	Ceramic ZrO_2	Ceramic ZrO_2	Ceramic ZrO_2	Ceramic ZrO_2	Ceramic ZrO_2	Ceramic ZrO_2
Connector S12	Connector S12	Connector S12	Connector S12	Connector S12	PUR cable type 11	Connector S12
IP 68	IP 68	IP 68	IP 68	IP 68	IP 68	IP 68
Embeddable	Embeddable	Embeddable	Embeddable	Embeddable	Embeddable	Embeddable
2,000 Hz	2,000 Hz	2,000 Hz	2,000 Hz	2,000 Hz	500 Hz	500 Hz
Table 6	Table 6	Table 6	Table 6	Table 6	Table 6	Table 6
Diagram 2	Diagram 2	Diagram 2	Diagram 2	Diagram 2	Diagram 1	Diagram 2
---	---	---	---	---	---	---
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +80 °C	-25 ... +80 °C	-25 ... +80 °C	-25 ... +80 °C	-25 ... +80 °C	-25 ... +80 °C	-25 ... +80 °C
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
						
						
DW-AS-501-P12	**DW-AS-501-P12-627**	**DW-AS-501-P12-621**	**DW-AS-501-P12-622**	in preparation	**DW-AD-501-P20**	**DW-AS-501-P20**
DW-AS-503-P12	**DW-AS-503-P12-627**	**DW-AS-503-P12-621**	**DW-AS-503-P12-622**	**DW-AS-503-P18**	**DW-AD-503-P20**	**DW-AS-503-P20**
G ... N	G ... N	G ... N	G ... N	G ... N		G ... N

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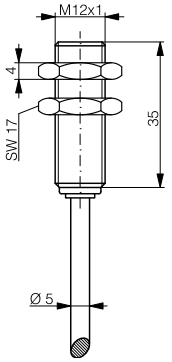
Size	M12				M18
Sensing range mm	0 ... 6	0 ... 6	0 ... 6	0 ... 6	0 ...10
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connection [1]	PUR cable type 7	PUR cable type 7	Connector S12	Connector S12	PUR cable type 7
Degree of protection	IP 67	IP 67	IP 67	IP 67	IP 67
Cut-off frequency -3dB	1,000 Hz	1,000 Hz	1,000 Hz	1,000 Hz	500 Hz
Mounting	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable
Technical data [2]	Table 7	Table 7	Table 7	Table 7	Table 7
Voltage output	0 ... 5 V / 0 ... 10 V	0 ... 5 V / 0 ... 10 V	0 ... 5 V / 0 ... 10 V	0 ... 5 V / 0 ... 10 V	0 ... 5 V /0 ... 10 V
Current output	1 ... 5 mA	1 ... 5 mA / 4 ... 20 mA	1 ... 5 mA	1 ... 5 mA / 4 ... 20 mA	1 ... 5 mA / 4 ... 20 mA
Wiring [3]	Diagram 5	Diagram 5	Diagram 5	Diagram 5	Diagram 5
Supply voltage range	10 ... 30 / 15 ... 30 VDC*	10 ... 30 / 15 ... 30 VDC*	10 ... 30 / 15 ... 30 VDC*	10 ... 30 / 15 ... 30 VDC*	10 ... 30 / 15 ... 30 VDC*
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C**	-25 ... +70 °C	-25 ... +70 °C**	-25 ... +70 °C**

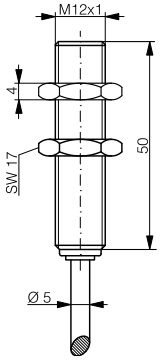
[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 68
[3] see page 69
[4] see page 112

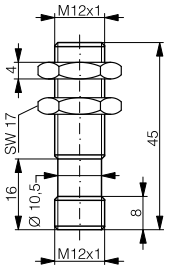



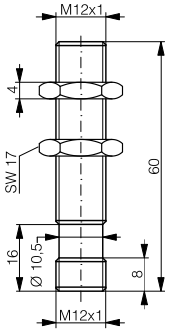


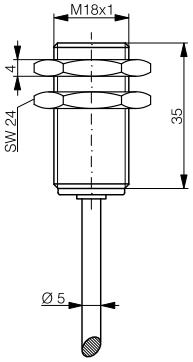

Dimensions:







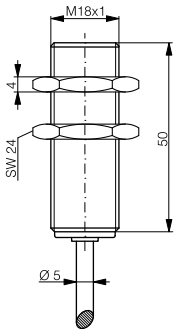
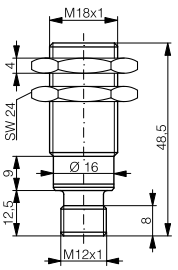
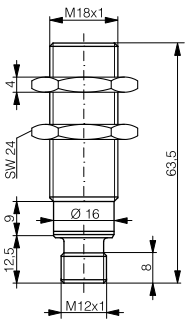
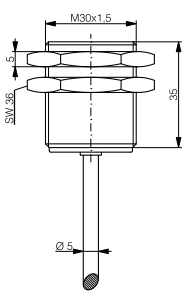
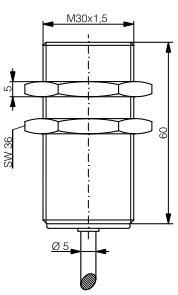
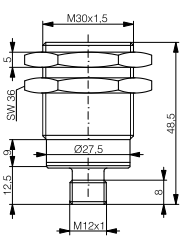
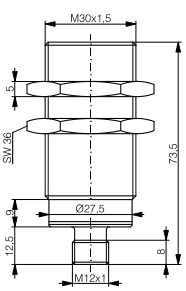




Part references:
(**bold:** preferred types)

Non-linearized:					
Outputs 0...5 V / 1...5 mA	**DW-AD-509-M12-120**	**DW-AD-509-M12**	**DW-AS-509-M12-120**	**DW-AS-509-M12**	**DW-AD-509-M18 -120**
Outputs 0...10 V / 4...20 mA	**DW-AD-509-M12-320*****	**DW-AD-509-M12-390**	**DW-AS-509-M12-320*****	**DW-AS-509-M12-390**	**DW-AD-509-M18 -320**
Compatible connectors [4]			M, N	M, N	

* DW-A#-509-M##-320/390
** Depending on operating conditions, limited temperature range for types DW-A#-509-M##-320/390 (see data sheets)
*** without current output

M18			M30			
0 ...10	0 ...10	0 ...10	0 ... 20	0 ... 20	0 ... 20	0 ... 20
Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
PUR cable type 7	Connector S12	Connector S12	PUR cable type 7	PUR cable type 7	Connector S12	Connector S12
IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
500 Hz	500 Hz	500 Hz	200 Hz	200 Hz	200 Hz	200 Hz
Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable
Table 7	Table 7	Table 7	Table 7	Table 7	Table 7	Table 7
0 ... 5 V / 0 ... 10 V	0 ... 5 V / 0 ... 10 V	0 ... 5 V / 0 ... 10 V	0 ... 5 V / 0 ... 10 V	0 ... 5 V / 0 ... 10 V	0 ... 5 V / 0 ... 10 V	0 ... 5 V / 0 ... 10 V
1 ... 5 mA / 4 ... 20 mA	1 ... 5 mA / 4 ... 20 mA	1 ... 5 mA / 4 ... 20 mA	1 ... 5 mA / 4 ... 20 mA	1 ... 5 mA / 4 ... 20 mA	1 ... 5 mA / 4 ... 20 mA	1 ... 5 mA / 4 ... 20 mA
Diagram 5	Diagram 5	Diagram 5	Diagram 5	Diagram 5	Diagram 5	Diagram 5
10 ... 30 / 15 ... 30 VDC*	10 ... 30 / 15 ... 30 VDC*	10 ... 30 / 15 ... 30 VDC*	10 ... 30 / 15 ... 30 VDC*	10 ... 30 / 15 ... 30 VDC*	10 ... 30 / 15 ... 30 VDC*	10 ... 30 / 15 ... 30 VDC*
-25 ... +70 °C**	-25 ... +70 °C**	-25 ... +70 °C**	-25 ... +70 °C**	-25 ... +70 °C**	-25 ... +70 °C**	-25 ... +70 °C**
						
						
DW-AD-509-M18	**DW-AS-509-M18-120**	**DW-AS-509-M18-002**	DW-AD-509-M30-120	**DW-AD-509-M30**	DW-AS-509-M30-120	**DW-AS-509-M30-002**
DW-AD-509-M18-390	**DW-AS-509-M18-320**	**DW-AS-509-M18-390**	DW-AD-509-M30-320	**DW-AD-509-M30-390**	DW-AS-509-M30-320	**DW-AS-509-M30-390**
	M, N	M, N			M, N	M, N

* DW-A#-509-M##-320/390 **Depending on operating conditions, limited temperature range for DW-A#-509-M##-320/390 (see data sheets)

For all these products, you will find detailed data sheets, application notes, dimensional drawings, cross-reference lists, part references, new items, special executions, extensive additional technical information, specifications concerning quality, safety and standards, as well as the addresses of our agents, and much more besides, on our Internet website at www.contrinex.com. The website contents are constantly up-dated and extended.

Technical data

	Table 1	Table 2	Table 3	Table 4	Table 5
Permissible ripple content	≤ 20%	≤ 20%	≤ 20%	---	≤ 20%
No-load supply current	≤ 10 mA	≤ 17 mA (24 V) /	≤ 20 mA	≤ 1.5 mA	---
		≤ 30 mA (34 V)			
Leakage current at output	≤ 0.1 mA	≤ 0.1 mA	≤ 0.1 mA	---	---
Voltage drop, switched state	≤ 2.0 V	≤ 2.5 V	≤ 2.5 V	≤ 8 V	---
Temperature drift % s_r	≤ 10 %	≤ 10 %	≤ 10 %	≤ 10 %	≤ 10 %
Hysteresis % s_r	1 ... 15% (5% typ.)	≤ 20 %	≤ 20 %	≤ 20 %	---
Repeat accuracy	≤ 5% s_r	≤ 5% s_r	≤ 5% s_r	≤ 5% s_r	≤ 5% s_r
(according to IEC 60947-5-2)					
Short-circuit protection	built-in	built-in	built-in	---	built-in
Polarity reversal protection	built-in	built-in	built-in	built-in	---
Power-on reset	built-in	built-in	built-in	built-in	---

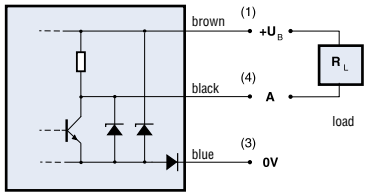
	Table 6	Table 7	Table 8	Table 9	Table 10
Permissible ripple content	≤ 20%	≤ 20%	≤ 20%	≤ 10%	---
No-load supply current	≤ 10 mA	≤ 10 mA	≤ 10 mA	30 mA (24 VDC)	typ 1.5 mA (24 V)
				40 mA (34 VDC)	≤ 2.0 mA (U_{max})
Output voltage, damped	---	0 VDC	---	---	---
Output voltage, non-damped	---	5 VDC	---	---	---
Leakage current at output	≤ 0.1 mA	---	≤ 0.1 mA	0.01 mA	< 2.0 mA
Voltage drop, switched state	≤ 2.0 V	---	≤ 2.0 V	≤ 2.5 V	≤ 8 V
Temperature drift % s_r	≤ 10 %	≤ 5 % (0...+70 °C) /	≤ 10 %	≤ 10 %	≤ 10 %
		≤ 10 % (-25...0 °C)			
Hysteresis % s_r	1 ... 15% (5% typ.)	---	1 ... 15% (5% typ.)	1 ... 15%	1 ... 15%
Repeat accuracy	≤ 5% s_r	---	≤ 5% s_r	≤ 5% s_r	≤ 5% s_r
(according to IEC 60947-5-2)					
Short-circuit protection	built-in	built-in	built-in	built-in	---
Polarity reversal protection	built-in	built-in	built-in	built-in	---
Power-on reset	built-in	built-in	built-in	built-in	built-in

Further data can be obtained from individual data sheets, which may be retrieved from the CONTRINEX website (www.contrinex.com), or ordered from our sales offices.

Wiring diagrams

Diagram 1

NPN normally open (N.O.) / normally closed (N.C.)



PNP normally open (N.O.) / normally closed (N.C.)

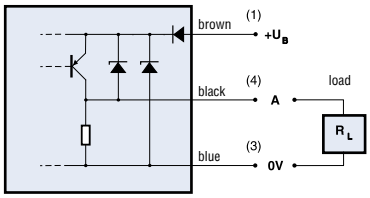
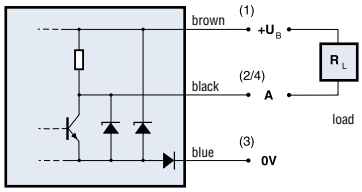


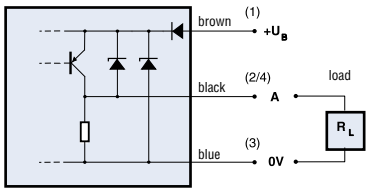
Diagram 2

NPN normally open (N.O.) / normally closed (N.C.)



2 N.C. / 4 N.O.

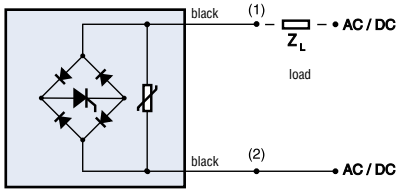
PNP normally open (N.O.) / normally closed (N.C.)



2 N.C. / 4 N.O.

Diagram 3

Normally closed (N.C.)



Normally open (N.O.)

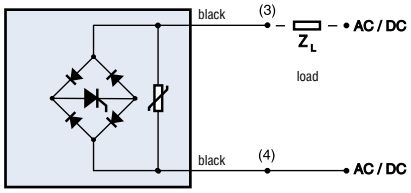


Diagram 4

NAMUR / 2-wire

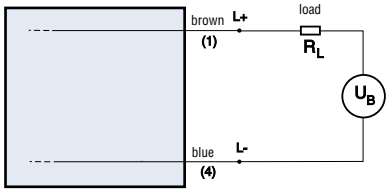


Diagram 5

Analog output

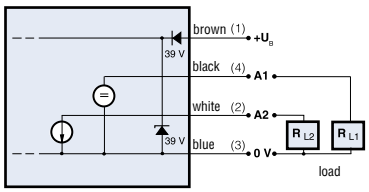
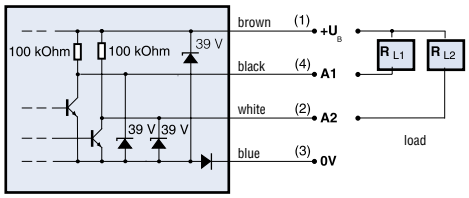


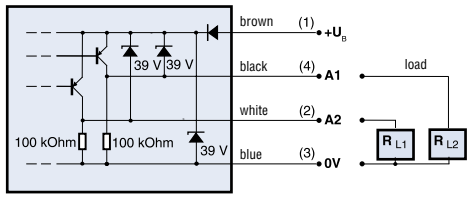
Diagram 6

NPN normally open (N.O.) + normally closed (N.C.)



2 N.C. / 4 N.O.

PNP normally open (N.O.) + normally closed (N.C.)



2 N.C. / 4 N.O.

CONTRINEX

> For further information www.contrinex.com

2 Photoelectric proximity switches



Highlights:

- Miniature sizes
- Long operating distances
- Right-angle optics
- Spherical optics
- Teach-in

New:

- Miniature devices with cylindrical light beam
- Fiber-optic amplifier with teach-in

2 Photoelectric proximity switches

	Size	Operating distance	Output	
		50 mm 60 mm 120 mm 150 mm 200 mm 250 mm 300 mm 600 mm 1000 mm 1200 mm 1500 mm 2000 mm 4000 mm 6000 mm 12000 mm 15000 mm 20000 mm 50000 mm	PNP	NPN
Diffuse sensors, energetic	∅4 / M5	10 mm	■	■
	∅4 / M5	20 mm	■	■
	∅4 / M5	50 mm	■	■
	M12	300 mm	■	■
	M18 (M18W)	600 mm	■	■
	30 x 30 mm	600 mm	■	■
	30 x 30 mm	1200 mm	■	■
	40 x 40 mm	2000 mm	■	■
	65 x 83 mm	2000 mm	■	■
Diffuse sensors with background suppression	M18 (M18W)	10 ... 120 mm	■	■
	30 x 30 mm	15 ... 150 mm	■	■
	65 x 83 mm	50 ... 1000 mm	■	■
Reflex sensors	M12	1500 mm	■	■
	M18 (M18W)	2000 mm	■	■
	30 x 30 mm	2000 mm	■	■
	30 x 30 mm	4000 mm	■	■
	40 x 40 mm	6000 mm	■	■
	65 x 83 mm	6000 mm	■	■
Through-beam sensors	∅4 / M5	250 mm	■	■
	M12	4000 mm	■	■
	M18 (M18W)	20000 mm	■	■
	30 x 30 mm	6000 mm	■	■
	30 x 30 mm	12000 mm	■	■
	40 x 40 mm	15000 mm	■	■
	65 x 83 mm	50000 mm	■	■
Fiber-optic amplifiers	30 x 30 mm	60 mm	■	■
	30 x 30 mm	120 mm	■	■
	40 x 40 mm	150 mm	■	■
	31 x 60 mm	200 mm	■	■

PROGRAM OVERVIEW

Light-ON	Dark-ON	Light-/dark-ON switchable	Changeover outputs	Excess light output	Relay	Timer	Teach-in	Supply voltage range U_B	Connector S08	Connector S12	Cable	Screw terminal	PBTP	Metal	Page
■								10 ... 30 VDC			■			■	80, 81
■								10 ... 30 VDC			■			■	81
■								10 ... 30 VDC	■		■			■	78, 79
■								10 ... 36 VDC		■	■			■	82
■								10 ... 36 VDC		■	■			■	84 (86)
■								10 ... 36 VDC	■		■		■		90
■			■	■				10 ... 36 VDC	■		■		■		88
■			■	■				10 ... 36 VDC	■		■		■		92
■	■	■		■		■		10 ... 36 VDC		■		■	■		96
					■	■		20...265 VAC/20...320 VDC		■		■	■		96
■								10 ... 36 VDC		■	■			■	85 (87)
■			■	■				10 ... 36 VDC	■		■		■		89, 91
■	■	■				■		10 ... 36 VDC		■		■	■		97
					■	■		20...265 VAC/20...320 VDC		■		■	■		97
	■							10 ... 36 VDC		■	■			■	83
	■							10 ... 36 VDC		■	■			■	85 (87)
	■							10 ... 36 VDC	■		■		■		91
■			■	■				10 ... 36 VDC	■		■		■		89
■			■	■				10 ... 36 VDC	■		■		■		93
■	■	■		■		■		10 ... 36 VDC		■		■	■		97
					■	■		20...265 VAC/20...320 VDC		■		■	■		97
	■							10 ... 30 VDC	■		■			■	79
	■							10 ... 36 VDC		■	■			■	83
■			■	■				10 ... 36 VDC		■	■			■	85 (87)
	■							10 ... 36 VDC	■		■		■		91
■			■	■				10 ... 36 VDC	■		■		■		89
■			■	■				10 ... 36 VDC	■		■		■		93
■	■	■		■		■		10 ... 36 VDC		■		■	■		97
					■	■		20...265 VAC/20...320 VDC		■		■	■		97
■	■							10 ... 36 VDC	■		■		■		91
■			■	■				10 ... 36 VDC	■		■		■		89
■			■	■				10 ... 36 VDC	■		■		■		93
		■				■	■	10 ... 30 VDC	■		■		■		94

2 Photoelectric proximity switches

Operating principle

The light-emitting diode (LED) emits a beam of modulated light towards the target. This beam is interrupted by the target, causing partial reflection. A small part of the reflected light reaches the sensing face of the receiver. Depending on the operating principle, either the interrupted beam or the reflected light is used for further processing.

Fig. 10 shows the essential functional blocks of a photoelectric proximity switch.

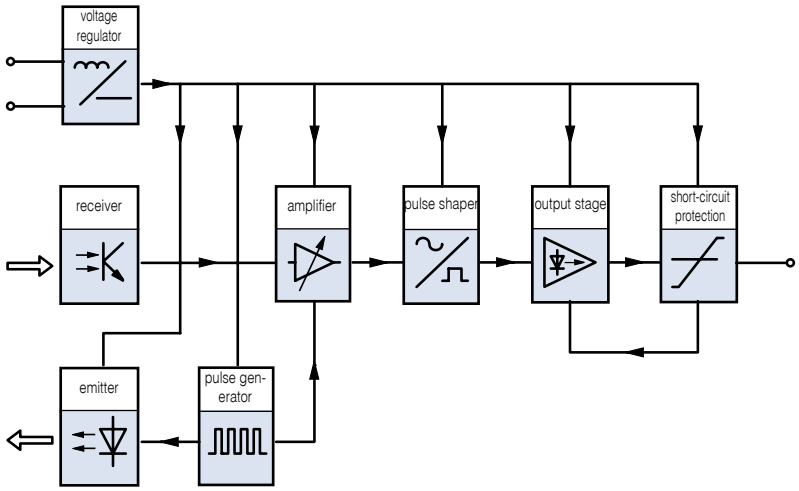


Fig.10

Available models

The CONTRINEX photoelectric program includes energetic diffuse sensors, diffuse sensors with background suppression, reflex sensors, through-beam sensors and fiber-optic amplifiers.

Diffuse sensors, energetic

The pulsed light from the emitting diode falls on an object of any shape or color. It is reflected in a diffuse manner, and part of it reaches the light receiver located in the same unit (Fig. 11). If the intensity of the received light is sufficient, the output is switched. The attainable operating distance depends on the target size and color, as well as its surface structure, and can be adjusted within a wide range by means of the built-in potentiometer.

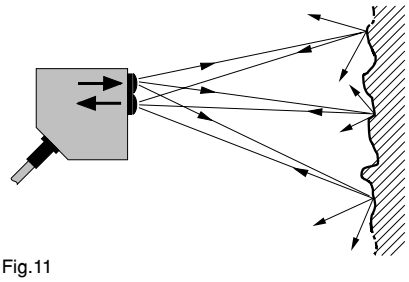


Fig.11

Diffuse sensors with background suppression

These devices basically function in an identical manner to energetic diffuse sensors, but using the angle of incidence, rather than the amount, of reflected light. For this reason, the operating distance depends to only a slight extent on target size, color, or surface structure. The target can therefore be accurately recognized, even on a light background.

Reflex sensors

The pulsed light from the emitting diode is focused by means of a lens, and directed via a polarization filter at a reflector (principle of a 3-way mirror - Fig. 12). Part of the reflected light passes through a further polarization filter, before reaching the receiver. The

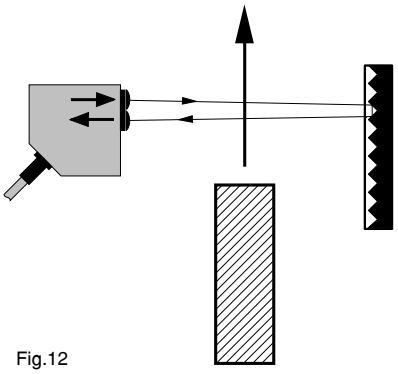


Fig.12

filters are selected and adjusted in such a way that only light returning from the reflector reaches the receiver. This ensures reliable detection results, even with bright and shiny targets, which otherwise would not be detected, due to a strong direct reflection. Furthermore, thanks to the optics used, the operating distance is increased considerably.

An object interrupting the light beam which passes from the emitter via the reflector to the receiver causes the output to switch. For reliable operation, the target size should be at least equal to the diameter of the reflector.

Through-beam sensors

These devices consist of an emitter and a receiver in separate housings. The emitter is aligned so that the greatest possible amount of pulsed light from its diode reaches the receiver (Fig. 13). The

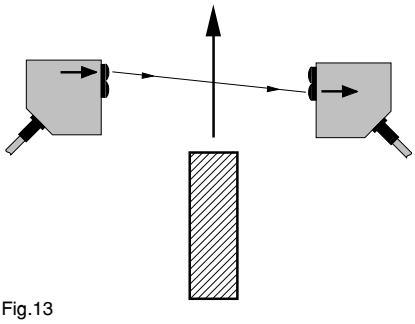


Fig.13

receiver processes the incoming light in such a way that it is clearly separated from ambient and other light sources. Any interruption of the light beam between emitter and receiver causes the output to be switched. For reliable operation, the target must be completely opaque, and its size should be at least equal to the diameter of the receiver's aperture.

Fiber-optic amplifiers

Optical fibers are fitted in front of the emitter and receiver (the basic operation is identical for both glass and synthetic optical fibers). These fibers work as the extended "eye" of the photo sensor. As optical fiber conductors are very small and flexible, they provide a truly practical solution to the problem of sensing in highly inaccessible places. Furthermore, they do not carry any electrical potential, and sensing operations are therefore possible without special safety measures, even in areas where there is an explosion risk, or in the presence of strong electrical and magnetic fields (high-voltage equipment, electrical welding equipment). Even the tiniest objects can be detected by using appropriately thin fibers. Optical fibers can act as both through-beam (Fig. 14) and diffuse sensors (Fig. 15).

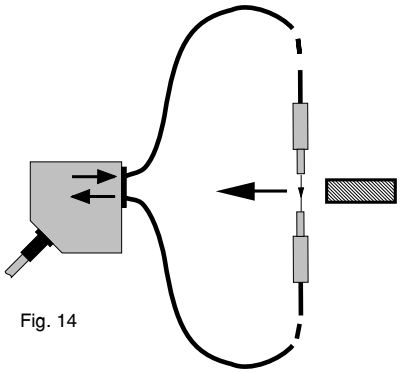


Fig. 14

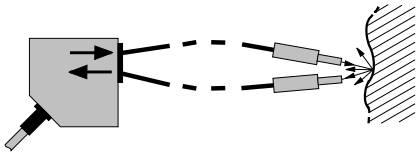


Fig.15

Special executions

In addition to the types described in this catalog, a number of special executions are available, in particular devices with different cable lengths, different cable types (e.g. with oil-resistant, highly flexible PUR insulation), and different housing materials (e.g. stainless steel).



Product overview

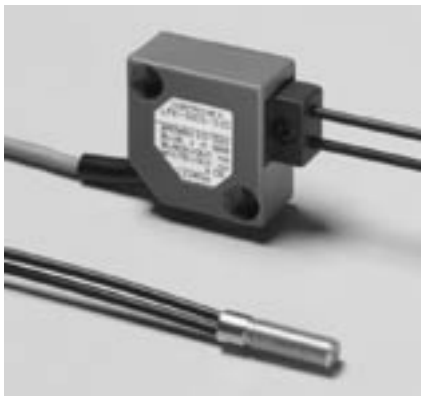
Series 1000

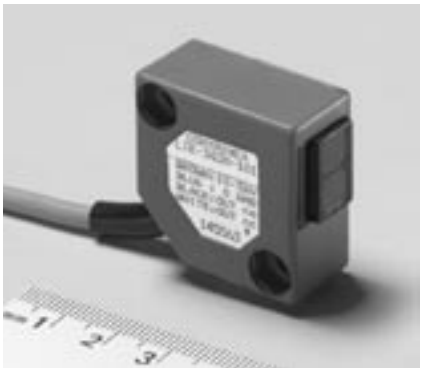
This series features a great variety of sizes and functions in widely used standardized cylindrical housings (smooth and threaded types). The program includes devices with diameters 4 mm, M5, M12, M18 and M18W for right-angle sensing. The ∅ 4 mm and M5 devices are the smallest self-contained photoelectric proximity switches on the market, and are now also available with cylindrical light beam and well-defined operating range. They replace larger models in case of space problems, and optical fibers if the latter do not prove satisfactory. In addition, they can also be used instead of inductive switches of equal size if their operating distances are insufficient.



Series 3030

This series combines high performance with miniature size (30 x 30 x 15 mm housing). Available types include energetic diffuse sensors, diffuse sensors with background suppression, reflex sensors, through-beam sensors and fiber-optic amplifiers for synthetic and glass fibers. Despite their small size, they feature all the usual protection functions, are robust and can be used for demanding industrial applications.





Series 3031

This series combines good performance with moderate cost. It is intended for general use, particularly where small size is required (miniature housing 30 x 30 x 15 mm). The program includes energetic diffuse sensors, diffuse sensors with background suppression, reflex sensors, through-beam sensors and fiber-optic amplifiers for synthetic and glass fibers. These robust devices are suitable for industrial use, and feature all the usual protection functions.

Series 4040

Maximum performance in a 40 x 40 x 19 mm housing. These devices are ideally suited for demanding applications, thanks to operating distances of 2 m (diffuse sensor) and 6 m (reflex sensor). As a result of a built-in power saving module, these distances are attained using very little energy. Available types include diffuse sensors, reflex sensors, through-beam sensors and fiber-optic amplifiers for glass fibers.



Series 3060

The new fiber-optic amplifiers for DIN-rail mounting (DIN/EN 50022) feature a large sensing range, outstanding detection properties for both long and very short operating distances, high temperature stability and durability thanks to stabilized light power, and high switching frequency. Built-in adjustable pulse delay and stretching are standard. The housing width of only 10 mm allows for optimum alignment of even a large number of switches. In addition, the devices are optimized for simple and easily understandable operation. Presently, the series offers distance setting by means of teach-in, with additional manual fine adjustment. According to choice, Teach 1 (only on background), or Teach 2 (first on target, then on background) may be used. The teach process can be launched from a distance via a separate input. All devices are available in cable and connector executions.



Series 6080

This series is suitable for conveyors and other applications where extremely robust devices in large housings are required. It offers an extensive functional program contained in a 65 x 83 x 25 mm housing. Available models include energetic diffuse sensors, diffuse sensors with background suppression, reflex sensors, and through-beam sensors.

All models are available in DC or combined AC/DC (20…265 VAC, 20…320 VDC) execution with relay output. Connection is via connectors or screw terminals. All variations can be delivered with a timer.



Glass optical fibers

A large range of glass optical fibers is available for the 4040 series, and partially for the 3030 / 3031 and 3060 series. The program includes types suitable for the most difficult operating conditions and the widest range of sensing applications. Moreover, custom-made models are available at a low extra cost, even for small order quantities.





Synthetic optical fibers

The 3030, 3031 and 3060 series include a comprehensive range of synthetic optical fibers for the detection of smallest objects, and for use in highly inaccessible areas. The fibers can be cut on site to the length required for a specific application.

At a glance:

- Smallest fully self-contained photoelectric proximity switch on the market
- Long operating distances
- Standardized sizes: Ø 4 mm smooth and M5 threaded
- Glass window, therefore scratch resistant and easy to clean
- Excellent resistance to environmental influences thanks to fully vacuum-potted electronics and optical parts
- High degree of protection: IP 67

Construction

The devices are built into stainless-steel housings, and fully potted under vacuum. The optical part works with parabolic mirrors (no lenses), which allows for full potting without degradation of the optical characteristics, thus providing the best long-term reliability in difficult environments. The electronic module uses chip-on-board technology on a ceramic-free substrate, and is therefore insensitive to shock and deformation.

Sensitivity setting

The sensitivity is factory adjusted, and cannot be modified by the user.

Protection

The switches are protected against overloads, short-circuits and all possible wire reversals. Furthermore, protection against overvoltages caused by inductive loads on the output and against voltage spikes on the power supply lines are built in. Malfunctions or destruction caused by electrostatic discharges, fast transients, or HF fields, are prevented by appropriate technology.

Technical data:

(according to IEC 60947-5-2)

Hysteresis	10 % typ.
Supply voltage range U_B	10 ... 30 VDC
Max. ripple content	20 %
Output current	100 mA
Output voltage drop	2.0 V max. at 100 mA
Max. switching frequency	250 Hz
Switching time (↑ and ↓)	2.5 msec
Max. ambient light:	
halogen	5,000 Lux
sun	10,000 Lux
Ambient temperature range	0 ... +55 °C
Degree of protection	IP 67
EMC protection:	
IEC 60255-5	1 kV
IEC 61000-4-2	Level 2
IEC 61000-4-3	Level 3
IEC 61000-4-4	Level 2

LED

The LED (yellow) lights up if a sufficient quantity of light falls on the receiver; at the same time, the light-ON output is switched. The LED flashes if the receiver does not receive enough light (excess light) for reliable operation.

Connection

Switches with 2 m PVC cable 3 x 0.14 mm² (type 2) or 3-pole S8 connector are standard. Other cable types or lengths are available on request. Suitable connecting cables are listed on page 112.

Test input

The additional test input built into the emitters of through-beam models provides the possibility of an extra system control.

Excess light control

If the switch is detecting an object, but not enough light (excess light) is available at the receiver's sensing face, the LED flashes. As a result, alignment is made much easier. Moreover, eventual dirt on the sensing face is indicated early. Cleaning is therefore possible before proper operation is impaired, thus increasing system viability.

Power-ON reset

Operation of the output is inhibited until the power supply requirements are met. This prevents unwanted switching of the output during power-ON.

Data sheets

Detailed data sheets with additional technical information are available for all models. These may be retrieved from the CONTRINEX website (www.contrinex.com), or ordered cost-free from our sales offices.

Drawings

The mechanical drawings may be downloaded as data files from the CONTRINEX website, and imported directly into construction drawings.

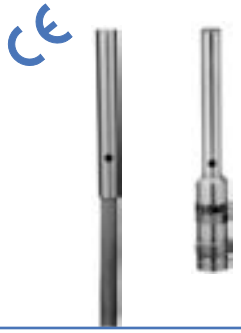
Delivery package

Photoelectric proximity switch, 2 fixing nuts (for size M5), instructions.

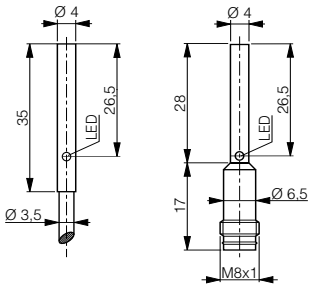
Ø 4

Diffuse sensor, energetic

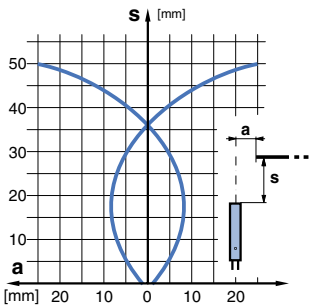
50 mm



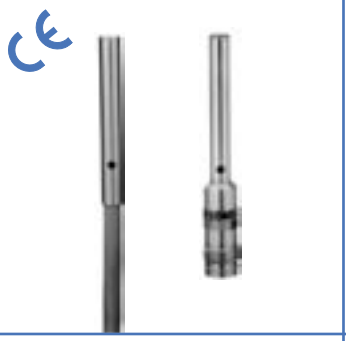
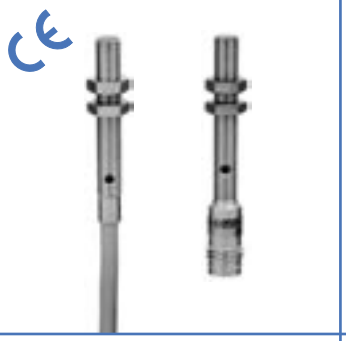
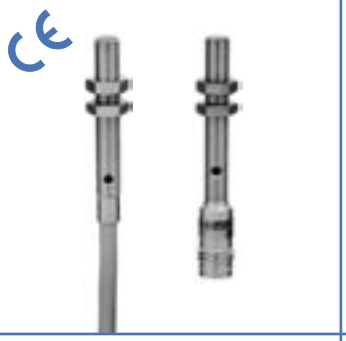
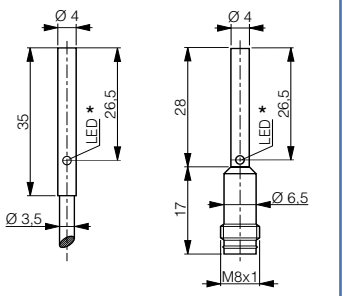
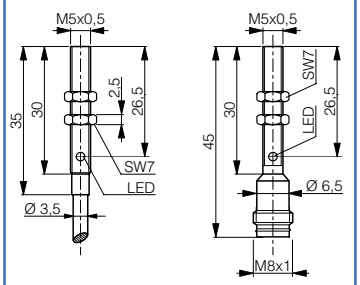
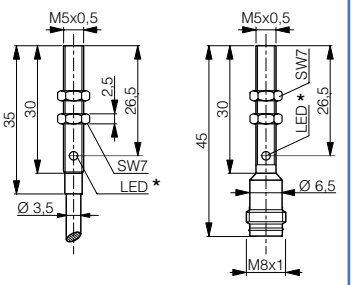
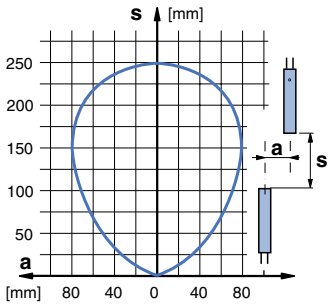
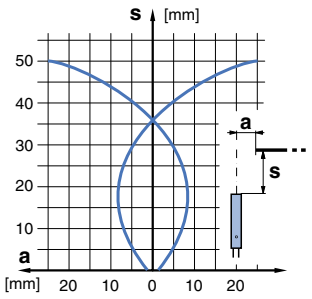
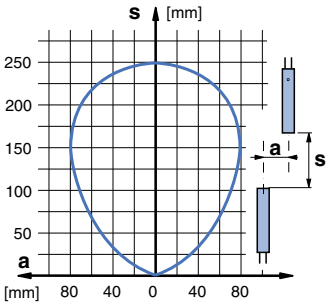
Dimensions:



Response curve:



Operating distance	50 mm
Standard target	100 x 100 mm white
No-load supply current	15 mA typ.
Emitter	IR LED 880 nm
Weight (cable / connector model)	35 / 3 g
Part ref.: (**bold:** preferred types)	
NPN light-ON / cable	**LTK-1040-301**
NPN dark-ON / cable	-
NPN light-ON / connector S8	**LTS-1040-301**
NPN dark-ON / connector S8	-
PNP light-ON / cable	**LTK-1040-303**
PNP dark-ON / cable	-
PNP light-ON / connector S8	**LTS-1040-303**
PNP dark-ON / connector S8	-
Suitable connecting cables (page 112)	A, B
Wiring (pages 100 - 101)	Diagram 1

Ø 4	M5	M5	
Through-beam sensor	Diffuse sensor, energetic	Through-beam sensor	
250 mm	50 mm	250 mm	
			
 *receiver only		 *receiver only	
			
250 mm	50 mm	250 mm	
-	100 x 100 mm white	-	
5 mA typ. (R) / 10 mA typ. (E)	15 mA typ.	5 mA typ. (R) / 10 mA typ. (E)	
IR LED 880 nm	IR LED 880 nm	IR LED 880 nm	
35 / 3 g (R and E)	35 / 4 g	35 / 4 g (R and E)	
(R) receiver / **(E)** emitter		**(R)** receiver / **(E)** emitter	
-	**LTK-1050-301**	-	
LLK-1040-202 (R) / LLK-1040-200 (E)	-	**LLK-1050-202 (R) / LLK-1050-200 (E)**	
-	**LTS-1050-301**	-	
LLS-1040-202 (R) / LLS-1040-200 (E)	-	**LLS-1050-202 (R) / LLS-1050-200 (E)**	
-	**LTK-1050-303**	-	
LLK-1040-204 (R) / LLK-1040-200 (E)	-	**LLK-1050-204 (R) / LLK-1050-200 (E)**	
-	**LTS-1050-303**	-	
LLS-1040-204 (R) / LLS-1040-200 (E)	-	**LLS-1050-204 (R) / LLS-1050-200 (E)**	
A, B	A, B	A, B	
Diagram 1 (R) / 4 (E)	Diagram 1	Diagram 1 (R) / 4 (E)	

At a glance:

- Smallest fully self-contained photoelectric proximity switches on the market
- Cylindrical light beam
- Well-defined operating range
- Standardized sizes: Ø 4 mm smooth and M5 threaded
- Sapphire window, therefore scratch resistant and easy to clean
- Excellent resistance to environmental influences thanks to fully vacuum-potted electronics and optical parts
- High degree of protection: IP 67

Construction

The devices are built into stainless-steel housings, and fully potted under vacuum. The optical part combines reflectors with spherical lenses, which allows for full potting without degradation of the optical characteristics, thus providing the best long-term reliability in difficult environments. The electronic module uses chip-on-board technology on a ceramic-free substrate, and is therefore insensitive to shock and deformation.

Sensitivity setting

The sensitivity is factory adjusted and cannot be modified by the user.

Protection

The switches are protected against overloads, short-circuits and all possible wire reversals. Furthermore, protection against overvoltages caused by inductive loads on the output and against voltage spikes on the power supply lines are built in. Malfunctions or destruction caused by electrostatic discharges, fast transients, or HF fields, are prevented by appropriate technology.

Technical data:

(according to IEC 60947-5-2)	
Hysteresis	10 % typ.
Supply voltage range U_B	10 ... 30 VDC
Max. ripple content	20 %
Output current	100 mA
Output voltage drop	2.0 V max. at 100 mA
Max. switching frequency	250 Hz
Switching time (↑ and ↓)	2.5 msec
Max. ambient light:	
halogen	5,000 Lux
sun	10,000 Lux
Ambient temperature range	0 ... +55 °C
Degree of protection	IP 67
EMC protection:	
IEC 60255-5	1 kV
IEC 61000-4-2	Level 2
IEC 61000-4-3	Level 3
IEC 61000-4-4	Level 2

LED

The LED (yellow) lights up if a sufficient quantity of light falls on the receiver; at the same time, the light-ON output is switched. The LED flashes if the receiver does not receive enough light (excess light) for reliable operation.

Connection

Switches with 2 m PVC cable 3 x 0.14 mm² (type 2) are standard. Other cable types or lengths are available on request.

Excess light control

If the switch is detecting an object, but not enough light (excess light) is available at the receiver's sensing face, the LED flashes. As a result, alignment is made much easier. Moreover, eventual dirt on the sensing face is indicated early. Cleaning is therefore possible before proper operation is impaired, thus increasing system viability.

Power-ON reset

Operation of the output is inhibited until the power supply requirements are met. This prevents unwanted switching of the output during power-ON.

Data sheets

Detailed data sheets with additional technical information are available for all models. These may be retrieved from the CONTRINEX website (www.contrinex.com), or ordered cost-free from our sales offices.

Drawings

The mechanical drawings may be downloaded as data files from the CONTRINEX website, and imported directly into construction drawings.

Delivery package

Photoelectric proximity switch, 2 fixing nuts (for size M5), instructions.

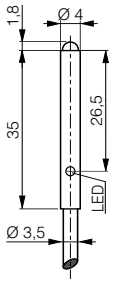
Ø 4

Diffuse sensor, energetic

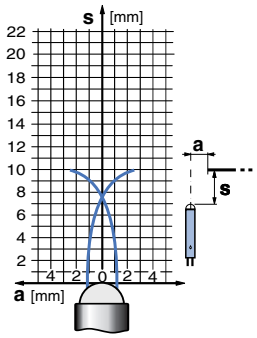
10 mm



Dimensions:

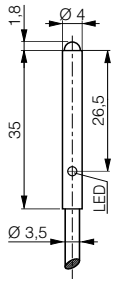
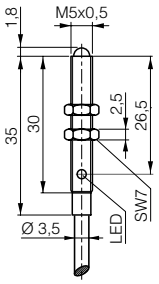
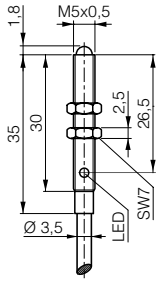
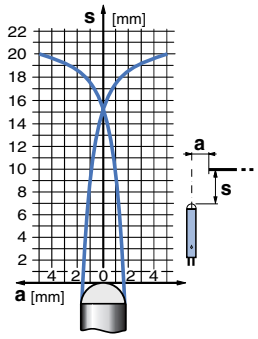
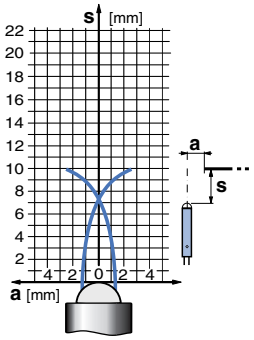
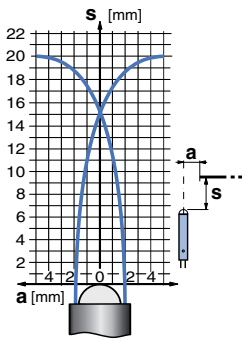


Response curve:



Operating distance	10 mm
Standard target	100 x 100 mm white
No-load supply current	15 mA typ.
Emitter	IR LED 880 nm
Weight	28 g
Part ref.: (**bold:** preferred types)	
NPN light-ON / cable	**LTK-1040-301-505**
NPN dark-ON / cable	-
NPN light-ON / connector S8	-
NPN dark-ON / connector S8	-
PNP light-ON / cable	**LTK-1040-303-505**
PNP dark-ON / cable	-
PNP light-ON / connector S8	-
PNP dark-ON / connector S8	-
Suitable connecting cables (page 112)	-
Wiring (pages 100 - 101)	Diagram 1

WITH CYLINDRICAL LIGHT BEAM

Ø 4	M5	M5	
Diffuse sensor, energetic	Diffuse sensor, energetic	Diffuse sensor, energetic	
20 mm	10 mm	20 mm	
			
			
			
20 mm	10 mm	20 mm	
100 x 100 mm white	100 x 100 mm white	100 x 100 mm white	
15 mA typ.	15 mA typ.	15 mA typ.	
IR LED 880 nm	IR LED 880 nm	IR LED 880 nm	
28 g	30 g	30 g	
LTK-1040-301-506	**LTK-1050-301-505**	**LTK-1050-301-506**	
-	-	-	
-	-	-	
-	-	-	
LTK-1040-303-506	**LTK-1050-303-505**	**LTK-1050-303-506**	
-	-	-	
-	-	-	
-	-	-	
-	-	-	
Diagram 1	Diagram 1	Diagram 1	

At a glance:

- Short: housing length 50 mm (cable connection) / 60 mm (connector model)
- Long operating distances
- High switching frequency: 1000 Hz
- All devices with visible red light
- Glass window, therefore scratch resistant and easy to clean
- Excellent resistance to environmental influences thanks to polyurethane potting of the electronic module
- Convenient sensitivity adjustment by means of the built-in potentiometer (diffuse sensor; optional for other models)
- High degree of protection: IP 67

Construction

The devices are built into nickel-plated brass housings, and encapsulated in polyurethane. The electronic module is constructed using SMD technology on a ceramic-free epoxy substrate, and is therefore insensitive to shock.

Sensitivity setting

The sensitivity can be adjusted by means of the built-in potentiometer (diffuse sensor; optional for other models). Turning clockwise increases the sensitivity.

Technical data:

(according to IEC 60947-5-2)

Hysteresis	10 % typ.
Supply voltage range U_B	10 ... 36 VDC
Max. ripple content	20 %
Output current	200 mA
Output voltage drop	2.0 V max. at 200 mA
Max. switching frequency	1000 Hz
Switching time (↑ and ↓)	0.5 msec
Max. ambient light:	
halogen	5,000 Lux
sun	10,000 Lux
Ambient temperature range	-25 ... +55 °C
Degree of protection	IP 67
EMC protection:	
IEC 60255-5	1 kV
IEC 61000-4-2	Level 2
IEC 61000-4-3	Level 3
IEC 61000-4-4	Level 3

Protection

The switches are protected against overloads, short-circuits and all possible wire reversals. Furthermore, protection against overvoltages caused by inductive loads on the output and against voltage spikes on the power supply lines are built in. Malfunctions or destruction caused by electrostatic discharges, fast transients, or HF fields, are prevented by appropriate technology.

LED

The yellow LED lights up when the output is switched on. The green LED lights up when sufficient light is available for reliable operation (approx. 80% of the maximum operating distance).

Connection

Switches with 2 m PVC cable 3 x 0.34mm² (type 8) or 4-pole S12 connector are standard. Other cable types or lengths are available on request. Suitable connecting cables are listed on page 112.

Reflectors

A range of suitable reflectors for the reflex sensors is listed on page 99.

Test input

The additional test input built into the emitters of the through-beam models provides the possibility of an extra system control.

Excess light control

The built-in excess light circuit simplifies alignment and adjustment of the sensors. Any eventual dirt on the sensing faces is recognized in time, and can be removed easily.

Power-ON reset

Operation of the output is inhibited until the power supply requirements are met. This prevents unwanted switching of the output during power-ON.

Data sheets

Detailed data sheets with additional technical information are available for all models. These may be retrieved from the CONTRINEX website (www.contrinex.com), or ordered cost-free from our sales offices.

Drawings

The mechanical drawings may be downloaded as data files from the CONTRINEX website, and imported directly into construction drawings.

Delivery package

Photoelectic proximity switch, 2 fixing nuts, screwdriver, instructions.

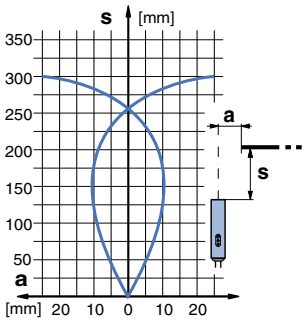
M12

Diffuse sensor, energetic

300 mm



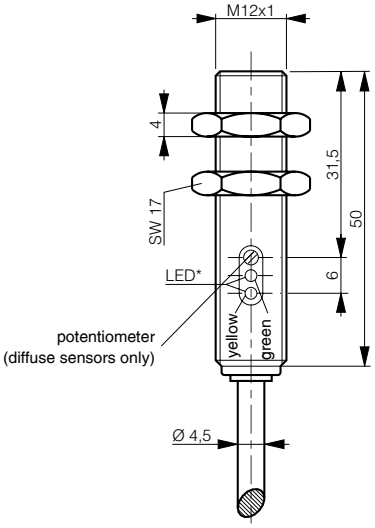
Response curve:

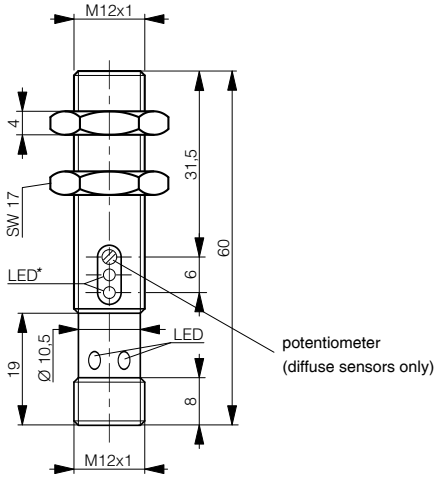


Operating distance	300 mm
Standard target	100 x 100 mm white
No-load supply current	15 mA typ.
Emitter	LED red 660 nm
Weight (cable / connector model)	100 / 20 g
Part ref.: (**bold:** preferred types)	
NPN light-ON / cable	**LTK-1120-301**
NPN dark-ON / cable	-
NPN light-ON / connector S12	**LTS-1120-301**
NPN dark-ON / connector S12	-
PNP light-ON / cable	**LTK-1120-303**
PNP dark-ON / cable	-
PNP light-ON / connector S12	**LTS-1120-303**
PNP dark-ON / connector S12	-
Suitable connecting cables (page 112)	G, H, K, L
Wiring (pages 100 - 101)	Diagram 1

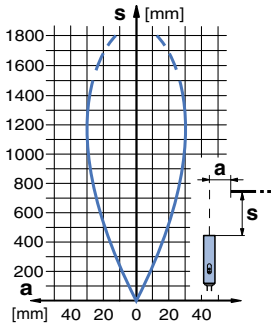
	M12	M12	
	Reflex sensor	Through-beam sensor	
	1,500 mm	4,000 mm	

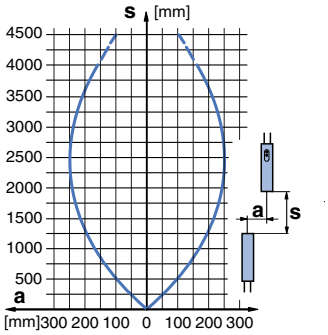






*receiver only





	1,500 mm	4,000 mm	
	Reflector type 3	-	
	15 mA typ.	15 mA typ.	
	LED red polarized 660 nm	LED red 660 nm	
	100 / 20 g	100 / 20 g (R and E)	
		(R) receiver / **(E)** emitter	
	-	-	
	LRK-1120-302	**LLK-1120-202 (R) / LLK-1120-200 (E)**	
	-	-	
	LRS-1120-302	**LLS-1120-202 (R) / LLS-1120-200 (E)**	
	-	-	
	LRK-1120-304	**LLK-1120-204 (R) / LLK-1120-200 (E)**	
	-	-	
	LRS-1120-304	**LLS-1120-204 (R) / LLS-1120-200 (E)**	
	G, H, K, L	G, H, K, L	
	Diagram 1	Diagram 1 (R) / Diagram 4 (E)	

At a glance:

- Short: housing length 50 mm (cable connection) / 63.5 mm (connector model)
- Long operating distances
- High switching frequency: 1000 Hz / 500 Hz*
- Glass window, therefore scratch resistant and easy to clean
- Excellent resistance to environmental influences thanks to polyurethane potting of the electronic module
- Convenient sensitivity adjustment by means of the built-in potentiometer (diffuse sensors; optional for other models)
- High degree of protection: IP 67

Construction

The devices are built into chromed-plated brass housings, and encapsulated in polyurethane. The electronic module is constructed using SMD technology on a ceramic-free epoxy substrate, and is therefore insensitive to shock.

Sensitivity setting

The sensitivity can be adjusted by means of the built-in potentiometer (energetic diffuse sensors; optional for other models). Turning clockwise increases the sensitivity.

Technical data:

(according to IEC 60947-5-2)

Hysteresis	10 % typ.
Supply voltage range U_B	10 ... 36 VDC
Max. ripple content	20 %
Output current	200 mA
Output voltage drop	2.0 V max. at 200 mA
Max. switching frequency	1,000 Hz / 500 Hz*
Switching time (↑ and ↓)	0.5 msec / 1 msec*
Max. ambient light:	
halogen	5,000 Lux
sun	10,000 Lux
Ambient temperature range	-25 ... +55 °C
Degree of protection	IP 67
EMC protection:	
IEC 60255-5	1 kV
IEC 61000-4-2	Level 2
IEC 61000-4-3	Level 3
IEC 61000-4-4	Level 3

* Diffuse sensor with background suppression

Operating distance adjustment

The operating distance can be adjusted by means of the built-in potentiometer (diffuse sensors with background suppression). Turning clockwise increases the operating distance.

Protection

The switches are protected against overloads, short-circuits and all possible wire reversals. Furthermore, protection against overvoltages caused by inductive loads on the output and against voltage spikes on the power supply lines are built in. Malfunctions or destruction caused by electrostatic discharges, fast transients, or HF fields, are prevented by appropriate technology.

LED

The yellow LED lights up when the output is switched on. The green LED lights up when sufficient light is available for reliable operation (approx. 80% of the maximum operating distance).

Connection

Switches with 2 m PVC cable 3 x 0.34mm² (type 8) or 4 x 0.25 mm² (type 12) for through-beam sensors, or 4-pole S12 connector are standard. Other cable types or lengths are available on request. Suitable connecting cables are listed on page 112.

Reflectors

A range of suitable reflectors for the reflex sensors is listed on page 99.

Test input

The additional test input built into the emitters of the through-beam models provides the possibility of an extra system control.

Excess light control

The built-in excess light circuit simplifies alignment and adjustment of the sensors. Any eventual dirt on the sensing faces is recognized in time, and can be removed easily.

Power-ON reset

Operation of the output is inhibited until the power supply requirements are met. This prevents unwanted switching of the output during power-ON.

Background suppression

The diffuse sensor with background suppression uses electronic distance setting. A PSD (**P**osition-**S**ensitive **D**evice) serves as the light receiver. Operating distance adjustment is carried out by means of a potentiometer, using visible red light as the source. The visible light spot (approx. 3 mm ∅) permits simple alignment. The device contains no moving optical parts, and is therefore insensitive to vibration.

Data sheets

Detailed data sheets with additional technical information are available for all models. These may be retrieved from the CONTRINEX website (www.contrinex.com), or ordered cost-free from our sales offices.

Drawings

The mechanical drawings may be downloaded as data files from the CONTRINEX website, and imported directly into construction drawings.

Delivery package

Proximity switch, 2 fixing nuts, instructions.

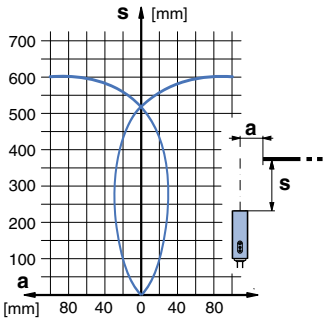
M18

Diffuse sensor, energetic

600 mm

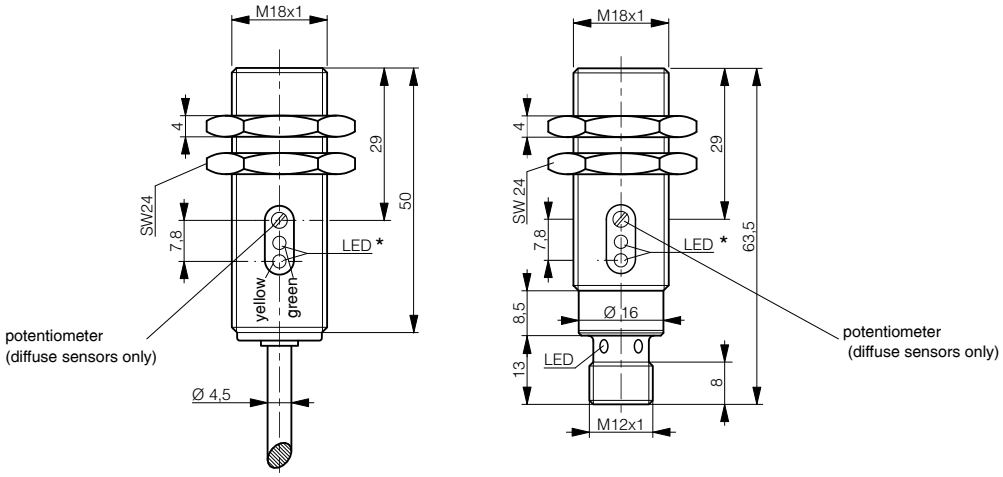


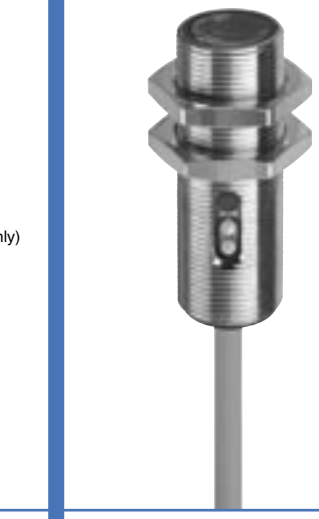
Response curve:

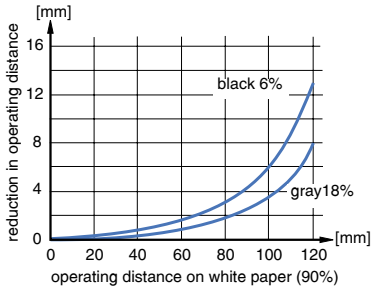


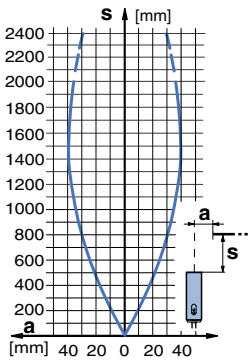
Operating distance	600 mm
Standard target	200 x 200 mm white
No-load supply current	15 mA typ.
Emitter	LED red 660 nm
Weight (cable / connector model)	115 / 40 g
Part ref.: (**bold:** preferred types)	
NPN light-ON / cable	**LTK-1180-301**
NPN dark-ON / cable	-
NPN light-ON / connector S12	**LTS-1180-301**
NPN dark-ON / connector S12	-
PNP light-ON / cable	**LTK-1180-303**
PNP dark-ON / cable	-
PNP light-ON / connector S12	**LTS-1180-303**
PNP dark-ON / connector S12	-
Suitable connecting cables (page 112)	G, H, K, L
Wiring (pages 100 - 101)	Diagram 1

M18	M18		M18
Diffuse sensor with background suppression	**Reflex sensor**		**Through-beam sensor**
10 ... 120 mm	**2,000 mm**		**20,000 mm**

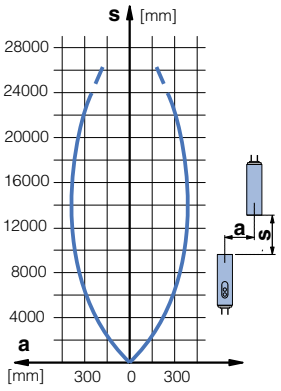








* receiver only



10 ... 120 mm	2,000 mm	Operating distance	20,000 mm
100 x 100 mm white	Reflector type 3	Standard target	-
25 mA typ.	15 mA typ.	No-load supply current	10 mA typ. (R) / 15 mA typ. (E)
LED red 660 nm	LED red polarized 660 nm	Emitter	LED red 660 nm
115 / 40 g	115 / 40 g	Weight (cable / connector model)	115 / 40 g (R and E)
		Part ref.: (**bold:** preferred types)	**(R)** receiver / **(E)** emitter
LHK-1180-301	-	NPN changeover outputs / cable	**LLK-1180-001 (R) / LLK-1180-000 (E)**
-	**LRK-1180-302**	NPN excess light output / cable	LLK-1180-002 (R) / **LLK-1180-000 (E)**
LHS-1180-301	-	NPN changeover outputs / conn. S12	**LLS-1180-001 (R) / LLS-1180-000 (E)**
-	**LRS-1180-302**	NPN excess light output / conn. S12	LLS-1180-002 (R) / **LLS-1180-000 (E)**
LHK-1180-303	-	PNP changeover outputs / cable	**LLK-1180-003 (R) / LLK-1180-000 (E)**
-	**LRK-1180-304**	PNP excess light output / cable	**LLK-1180-004 (R) / LLK-1180-000 (E)**
LHS-1180-303	-	PNP changeover outputs / conn. S12	**LLS-1180-003 (R) / LLS-1180-000 (E)**
-	**LRS-1180-304**	PNP excess light output / conn. S12	**LLS-1180-004 (R) / LLS-1180-000 (E)**
G, H, K, L	G, H, K, L	Suitable connecting cables (page 112)	M, N
Diagram 1	Diagram 1	Wiring (pages 100 - 101)	Diagram 2 (R) / Diagram 4 (E)

At a glance:

- Right-angle sensing
- Compact, robust and fully integrated sensing head
- Easy installation: Fixing nuts can be mounted from both ends
- Technical data identical to corresponding devices with axial light emission
- Excellent resistance to environmental influences thanks to polyurethane potting of the electronic module
- Glass window, therefore scratch resistant and easy to clean
- High degree of protection: IP 67

Construction

The devices are built into chromed-plated brass housings, and encapsulated in polyurethane. The electronic module is constructed using SMD technology on a ceramic-free epoxy substrate, and is therefore insensitive to shock.

Sensibility setting

The sensitivity can be adjusted by means of the built-in potentiometer (diffuse sensors; optional for other models). Turning clockwise increases the sensitivity.

Technical data:

(according to IEC 60947-5-2)

Hysteresis	10 % typ.
Supply voltage range U_B	10 ... 36 VDC
Max. ripple content	20 %
Output current	200 mA
Output voltage drop	2.0 V max. at 200 mA
Max. switching frequency	1,000 Hz / 500 Hz*
Switching time (↑ and ↓)	0.5 msec / 1 msec*
Max. ambient light:	
halogen	5,000 Lux
sun	10,000 Lux
Ambient temperature range	-25 ... +55 °C
Degree of protection	IP 67
EMC protection:	
IEC 60255-5	1 kV
IEC 61000-4-2	Level 2
IEC 61000-4-3	Level 3
IEC 61000-4-4	Level 3

* Diffuse sensor with background suppression

Operating distance adjustment

The operating distance can be adjusted by means of the built-in potentiometer (diffuse sensors with background suppression). Turning clockwise increases the operating distance.

Protection

The switches are protected against overloads, short-circuits and all possible wire reversals. Furthermore, protection against overvoltages caused by inductive loads on the output and against voltage spikes on the power supply lines are built in. Malfunctions or destruction caused by electrostatic discharges, fast transients, or HF fields, are prevented by appropriate technology.

LED

The yellow LED lights up when the output is switched on. The green LED lights up when sufficient light is available for reliable operation (approx. 80% of the maximum operating distance).

Connection

Switches with 2 m PVC cable 3 x 0.34mm² (type 8) or 4 x 0.25 mm² (type 12) for through-beam sensors, or 4-pole S12 connector are standard. Other cable types or lengths are available on request. Suitable connecting cables are listed on page 112.

Reflectors

A range of suitable reflectors for the reflex sensors is listed on page 99.

Test input

The additional test input built into the emitters of the through-beam models provides the possibility of an extra system control.

Excess light control

The built-in excess light circuit simplifies alignment and adjustment of the sensors. Any eventual dirt on the sensing faces is recognized in time, and can be removed easily.

Power-ON reset

Operation of the output is inhibited until the power supply requirements are met. This prevents unwanted switching of the output during power-ON.

Background suppression

The diffuse sensor with background suppression uses electronic distance setting. A PSD (**P**osition-**S**ensitive **D**evice) serves as the light receiver. Operating distance adjustment is carried out by means of a potentiometer, using visible red light as the source. The visible light spot (approx. 3 mm ∅) permits simple alignment. The device contains no moving optical parts, and is therefore insensitive to vibration.

Data sheets

Detailed data sheets with additional technical information are available for all models. These may be retrieved from the CONTRINEX website (www.contrinex.com), or ordered cost-free from our sales offices.

Drawings

The mechanical drawings may be downloaded as data files from the CONTRINEX website, and imported directly into construction drawings.

Delivery package

Proximity switch, 2 fixing nuts, instructions.

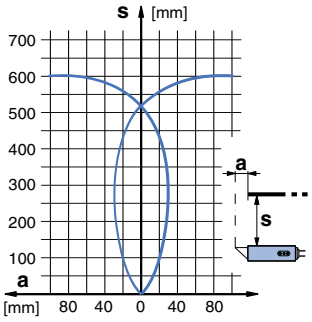
M18W

Diffuse sensor, energetic

600 mm

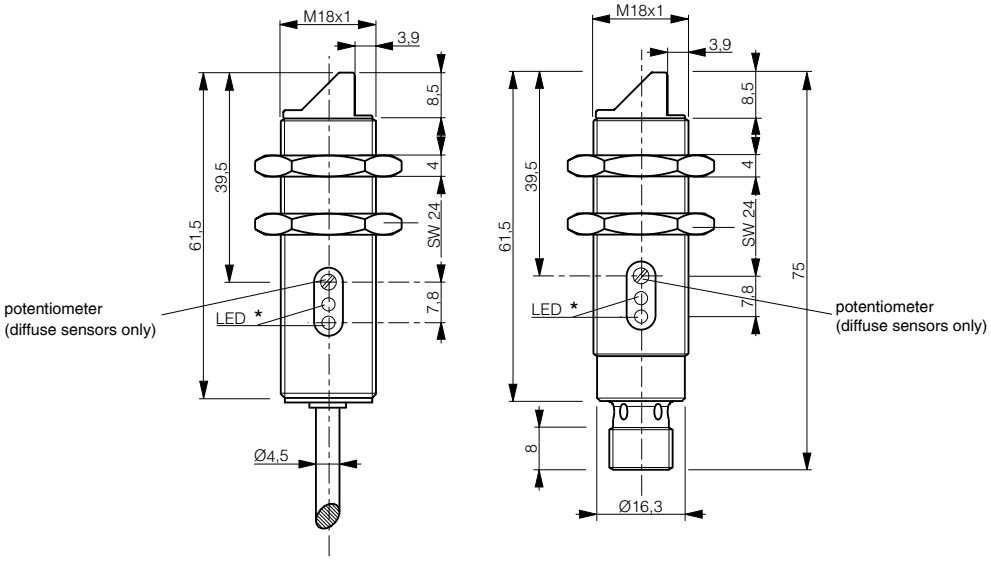


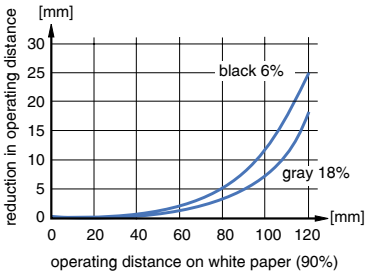
Response curve:

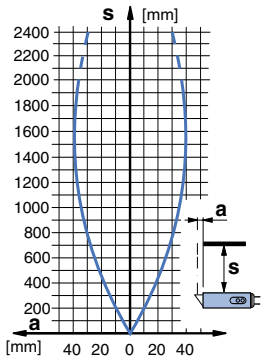


Operating distance	600 mm
Standard target	200 x 200 mm white
No-load supply current	15 mA typ.
Emitter	LED red 660 nm
Weight (cable / connector model)	123 / 56 g
Part ref.: (**bold:** preferred types)	
NPN light-ON / cable	**LTK-1180W-301**
NPN dark-ON / cable	-
NPN light-ON / connector S12	**LTS-1180W-301**
NPN dark-ON / connector S12	-
PNP light-ON / cable	**LTK-1180W-303**
PNP dark-ON / cable	-
PNP light-ON / connector S12	**LTS-1180W-303**
PNP dark-ON / connector S12	-
Suitable connecting cables (page 112)	G, H, K, L
Wiring (pages 100 - 101)	Diagram 1

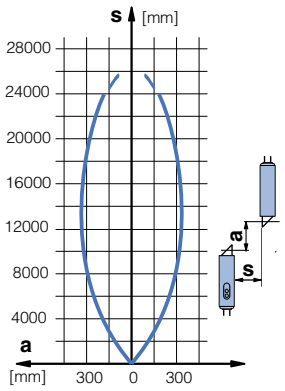
M18W	M18W		M18W
Diffuse sensor with background suppression	Reflex sensor		Through-beam sensor
10 ... 120 mm	2,000 mm		20,000 mm







* receiver only



10 ... 120 mm	2,000 mm	Operating distance	20,000 mm
100 x 100 mm white	Reflector type 3	Standard target	-
25 mA typ.	15 mA typ.	No-load supply current	10 mA typ. (R) / 15 mA typ. (E)
LED red 660 nm	LED red polarized 660 nm	Emitter	LED red 660 nm
124 / 57 g	125 / 56 g	Weight (cable / connector model)	124 / 57 g (R and E)
		Part ref.: (**bold:** preferred types)	**(R)** receiver / **(E)** emitter
LHK-1180W-301	-	NPN changeover outputs / cable	**LLK-1180W-001 (R)/LLK-1180W-000 (E)**
-	**LRK-1180W-302**	NPN excess light output / cable	LLK-1180W-002 (R)/**LLK-1180W-000 (E)**
LHS-1180W-301	-	NPN changeover outputs / conn. S12	**LLS-1180W-001 (R)/LLS-1180W-000 (E)**
-	**LRS-1180W-302**	NPN excess light output / conn. S12	LLS-1180W-002 (R)/**LLS-1180W-000 (E)**
LHK-1180W-303	-	PNP changeover outputs / cable	**LLK-1180W-003 (R)/LLK-1180W-000 (E)**
-	**LRK-1180W-304**	PNP excess light output / cable	**LLK-1180W-004 (R)/LLK-1180W-000 (E)**
LHS-1180W-303	-	PNP changeover outputs / conn. S12	**LLS-1180W-003 (R)/LLS-1180W-000 (E)**
-	**LRS-1180W-304**	PNP excess light output / conn. S12	**LLS-1180W-004 (R)/LLS-1180W-000 (E)**
G, H, K, L	G, H, K, L	Suitable connecting cables (page 112)	M, N
Diagram 1	Diagram 1	Wiring (pages 100 - 101)	Diagram 2 (R) / Diagram 4 (E)

At a glance:

- Small, but robust
- Long operating distances
- High switching frequency: 1000 Hz / 500 Hz*
- Glass window, therefore scratch resistant and easy to clean
- Excellent resistance to environmental influences thanks to polyurethane potting of the electronic module
- Convenient sensitivity adjustment by means of the built-in 12-turn potentiometer
- High degree of protection: IP 67

Construction

The devices are built into a housing of glass-fiber reinforced PBTP/polybutyleneterephthalate (Crastin), and fully potted with polyurethane resin. The covers are ultrasonically welded. Two mounting holes are provided for the use of M4 fastening screws. A universal mounting bracket as well as screws are included with every switch.

Sensitivity setting

The sensitivity can be very finely adjusted by means of the built-in 12-turn potentiometer. The potentiometer cannot be turned too far. Turning clockwise increases the sensitivity.

Technical data:

(according to IEC 60947-5-2)	
Hysteresis	10 % typ.
Supply voltage range U_B	10 ... 36 VDC
Max. ripple content	20 %
Output current (total of both outputs)	200 mA
Output voltage drop	2.0 V max. at 200 mA
Max. switching frequency	1000 Hz / 500 Hz*
Switching time (↑ and ↓)	0.5 msec / 1 msec*
Max. ambient light:	
halogen	5,000 Lux
sun	10,000 Lux
Ambient temperature range	-25 ... +55 °C
Degree of protection	IP 67
EMC protection:	
IEC 60255-5	1 kV
IEC 61000-4-2	Level 2
IEC 61000-4-3	Level 3
IEC 61000-4-4	Level 3

* Diffuse sensor with background suppression

Protection

The switches are protected against overloads, short-circuits and all possible wire reversals. Furthermore, protection against overvoltages caused by inductive loads on the output and against voltage spikes on the power supply lines are built in. Appropriate technology prevents malfunctions or destruction caused by electrostatic discharges, fast transients, or HF fields.

LED

The yellow LED lights up when the light-ON output is switched. The green LED lights up if the receiver gets enough light (excess light) for reliable operation. At the same time the corresponding output (types -102 and -104 only) is switched.

Connection

Switches with 3 m PVC cable 4 x 0.14 mm² (type 2) or 4-pole S8 connector are standard. Other cable types or lengths are available on request. Suitable connecting cables are listed on page 112.

Reflectors

A range of suitable reflectors for the reflex sensors is listed on page 99.

Test input

The additional test input built into the emitters of the through-beam models provides the possibility of an extra system control.

Excess light control

The built-in excess light circuit (separate output for types -102 and -104) simplifies alignment and adjustment of the sensors. Any dirt is recognized in time, and can be removed easily.

Power-ON reset

Operation of the output is inhibited until the power supply requirements are met. This prevents unwanted switching of the output during power-ON.

Background suppression

The diffuse sensor with background suppression uses electronic distance setting. A PSD (**P**osition-**S**ensitive **D**evice) serves as the light receiver. Operating distance adjustment is carried out by means of a potentiometer, using visible red light as the source. The visible light spot (approx. 3 mm ∅) permits simple alignment. The device contains no moving optical parts, and is therefore insensitive to vibration.

Data sheets

Detailed data sheets with additional technical information are available for all models. These may be retrieved from the CONTRINEX website (www.contrinex.com), or ordered cost-free from our sales offices.

Drawings

The mechanical drawings may be downloaded as data files from the CONTRINEX website, and imported directly into construction drawings.

Delivery package

Proximity switch, mounting bracket, screws, washers and nuts, screwdriver, instructions.

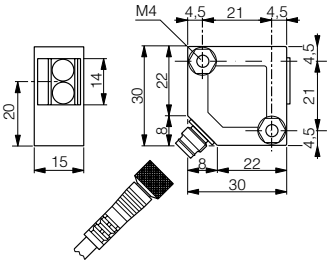
☐ 30x30

Diffuse sensor, energetic

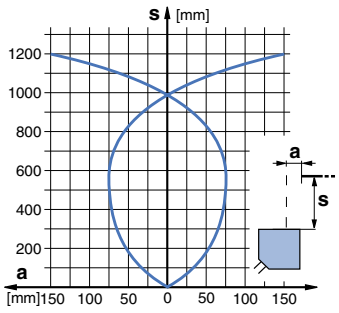
1,200 mm



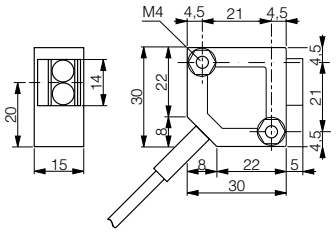
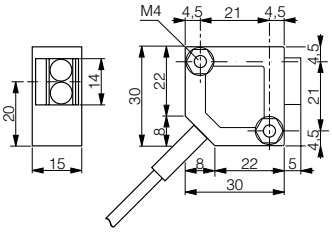
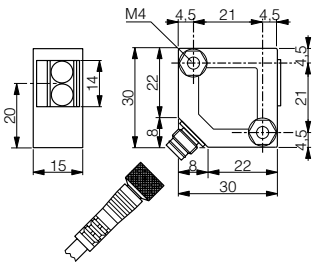
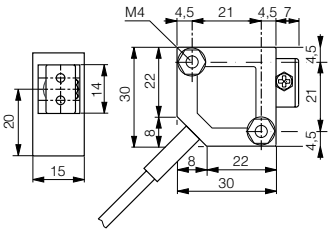
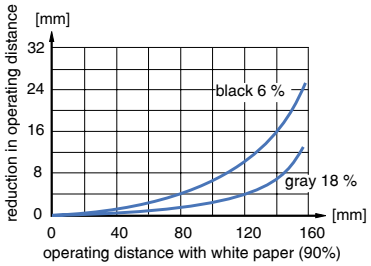
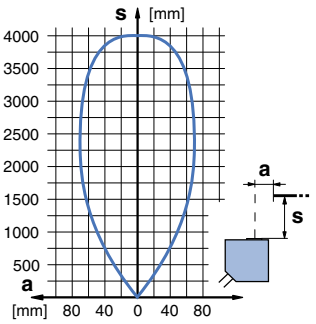
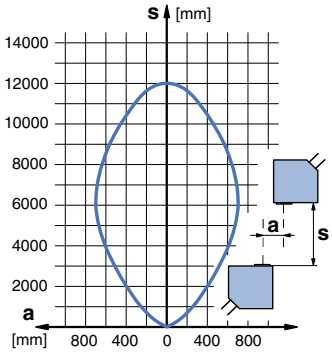
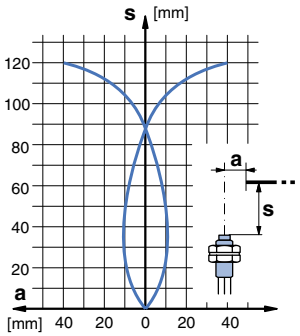
Dimensions:



Response curve:



Operating distance	1,200 mm
Standard target	200 x 200 mm
No-load supply current	15 mA typ.
Emitter	IR LED 880 nm
Weight (cable / connector model)	75 / 17 g
Part ref.: (**bold:** preferred types)	
NPN changeover outputs / cable	**LTK-3030-101**
NPN excess light output / cable	LTK-3030-102
NPN changeover outputs / conn. S8	**LTS-3030-101**
NPN excess light output / conn.S8	LTS-3030-102
PNP changeover outputs / cable	**LTK-3030-103**
PNP excess light output / cable	**LTK-3030-104**
PNP changeover outputs / conn. S8	**LTS-3030-103**
PNP excess light output / conn. S8	**LTS-3030-104**
Suitable connecting cables (page 112)	E, F
Wiring (pages 100 - 101)	Diagram 2

☐ 30x30	☐ 30x30	☐ 30x30	☐ 30x30
Diffuse sensor with background suppression	**Reflex sensor**	**Through-beam sensor**	**Fiber-optic amplifier**
15 ... 150 mm	**4,000 mm**	**12,000 mm**	**120 mm**
			
			
			
15 ... 150 mm	4,000 mm	12,000 mm	120 mm (with LFP-1002-020)
100 x 100 mm	Reflector type 3	-	100 x 100 mm
25 mA typ.	15 mA typ.	10 mA typ. (R) / 15 mA typ. (E)	15 mA typ.
LED red 660 nm	LED red polarized 660 nm	IR LED 880 nm	LED red 660 nm
75 / 17 g	80 / 18 g	75 / 17 g (R and E)	78 / 18 g
		(R) receiver / **(E)** emitter	
LHK-3030-101	**LRK-3030-101**	**LLK-3030-001 (R) / LLK-3030-000 (E)**	**LFK-3030-101**
LHK-3030-102	LRK-3030-102	LLK-3030-002 (R) / **LLK-3030-000 (E)**	LFK-3030-102
LHS-3030-101	**LRS-3030-101**	**LLS-3030-001 (R) / LLS-3030-000 (E)**	**LFS-3030-101**
LHS-3030-102	LRS-3030-102	LLS-3030-002 (R) / **LLS-3030-000 (E)**	LFS-3030-102
LHK-3030-103	**LRK-3030-103**	**LLK-3030-003 (R) / LLK-3030-000 (E)**	**LFK-3030-103**
LHK-3030-104	**LRK-3030-104**	**LLK-3030-004 (R) / LLK-3030-000 (E)**	LFK-3030-104
LHS-3030-103	**LRS-3030-103**	**LLS-3030-003 (R) / LLS-3030-000 (E)**	**LFS-3030-103**
LHS-3030-104	**LRS-3030-104**	**LLS-3030-004 (R) / LLS-3030-000 (E)**	LFS-3030-104
E, F	E, F	E, F	E, F
Diagram 2	Diagram 2	Diagram 2 (R) / Diagram 4 (E)	Diagram 2

At a glance:

- Small, but robust
- Low cost
- High switching frequency: 1000 Hz / 500 Hz*
- Glass window, therefore scratch resistant and easy to clean
- Excellent resistance to environmental influences thanks to polyurethane potting of the electronic module
- Convenient sensitivity adjustment by means of the built-in 12-turn potentiometer
- High degree of protection: IP 65

Construction

The devices are built into a housing of glass-fiber reinforced PBTP/polybutyleneterephthalate (Crastin), and fully potted with polyurethane resin. The covers are ultrasonically welded. Two mounting holes are provided for the use of M4 fastening screws.

Sensitivity setting

The sensitivity can be very finely adjusted by means of the built-in 12-turn potentiometer. The potentiometer cannot be turned too far. Turning clockwise increases the sensitivity.

Technical data:

(according to IEC 60947-5-2)

Hysteresis	10 % typ.
Supply voltage range U_B	10 ... 36 VDC
Max. ripple content	20 %
Output current	200 mA
Output voltage drop	2.0 V max. at 200 mA
Max. switching frequency:	1000 Hz / 500 Hz*
Switching time (↑ and ↓)	0.5 msec / 1 msec*
Max. ambient light:	
halogen	5,000 Lux
sun	10,000 Lux
Ambient temperature range	-25 ... +55 °C
Degree of protection	IP 65
EMC protection:	
IEC 60255-5	1 kV
IEC 61000-4-2	Level 3
IEC 61000-4-3	Level 3
IEC 61000-4-4	Level 3

* Diffuse sensor with background suppression

Protection

The switches are protected against overloads, short-circuits and all possible wire reversals. Furthermore, protection against overvoltages caused by inductive loads on the output and against voltage spikes on the power supply lines are built in. Appropriate technology prevents malfunctions or destruction caused by electrostatic discharges, fast transients, or HF fields.

LED

The yellow LED lights up when the output is switched. The green LED lights up when sufficient light (excess light) is available for reliable operation (approx. 80% of the maximum operating distance).

Connection

Switches with 2 m PVC cable 3 x 0.14 mm² (type 2) or 3-pole S8 connector are standard. Other cable types or lengths are available on request. Suitable connecting cables are listed on page 112.

Reflectors

A range of suitable reflectors for the reflex sensors is listed on page 99.

Test input

The additional test input built into the emitters of the through-beam models provides the possibility of an extra system control.

Excess light control

The built-in excess light circuit simplifies alignment and adjustment of the sensors. Any dirt is recognized in time, and can be removed easily.

Power-ON reset

Operation of the output is inhibited until the power supply requirements are met. This prevents unwanted switching of the output during power-ON.

Background suppression

The diffuse sensor with background suppression uses electronic distance setting. A PSD (**P**osition-**S**ensitive **D**evice) serves as the light receiver. Operating distance adjustment is carried out by means of a potentiometer, using visible red light as the source. The visible light spot (approx. 3 mm ∅) permits simple alignment. The device contains no moving optical parts, and is therefore insensitive to vibration.

Fixing

For fixation purposes, CONTRINEX offers a mounting set (order reference LXW-3030-003), consisting of a universal fixing bracket, screws, and a screwdriver suitable for adjusting the potentiometer.

Data sheets

Detailed data sheets with additional technical information are available for all models. These may be retrieved from the CONTRINEX website (www.contrinex.com), or ordered cost-free from our sales offices.

Drawings

The mechanical drawings may be downloaded as data files from the CONTRINEX website, and imported directly into construction drawings.

Delivery package

Proximity switch, instructions.

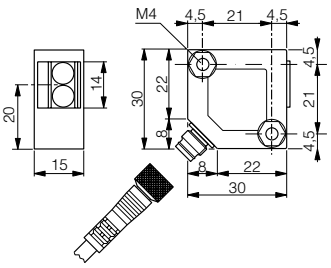
□ 30x30

DIffuse sensor, energetic

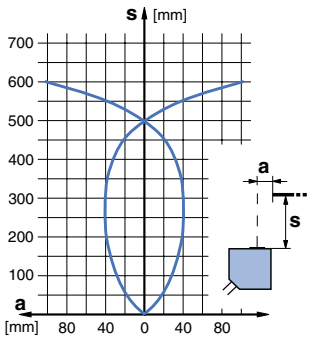
600 mm



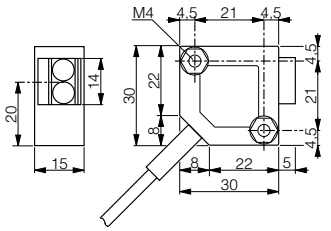
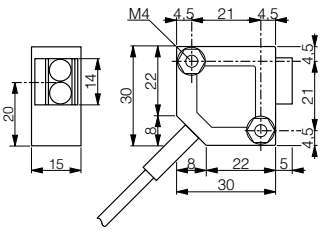
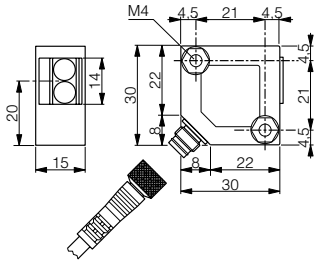
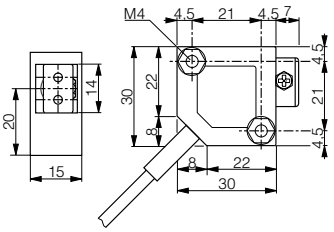
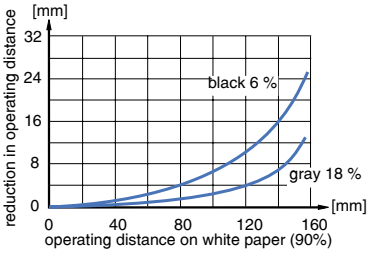
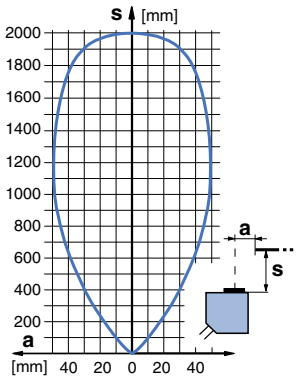
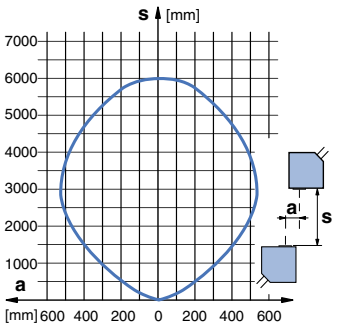
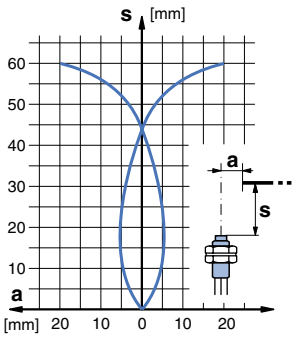
Dimensions:



Response curve:



Operating distance	600 mm
Standard target	200 x 200 mm
No-load supply current	15 mA typ.
Emitter	IR LED 880 nm
Weight (cable / connector model)	75 / 17 g
Part ref.: (**bold:** preferred types)	
NPN light-ON / cable	**LTK-3031-301**
NPN dark-ON / cable	**-**
NPN light-ON / connector S8	**LTS-3031-301**
NPN dark-ON / connector S8	**-**
PNP light-ON / cable	**LTK-3031-303**
PNP dark-ON / cable	**-**
PNP light-ON / connector S8	**LTS-3031-303**
PNP dark-ON / connector S8	-
Suitable connecting cables (page 112)	A, B
Wiring (pages 100 - 101)	Diagram 1

☐ 30x30	☐ 30x30	☐ 30x30	☐ 30x30
Diffuse sensor with background suppression	**Reflex sensor**	**Through-beam sensor**	**Fiber-optic amplifier**
15 ... 150 mm	**2,000 mm**	**6,000 mm**	**60 mm**
			
			
			
15 ... 150 mm	2,000 mm	6,000 mm	60 mm (with LFP-1002-020)
100 x 100 mm	Reflector type 3	-	100 x 100 mm
25 mA typ.	15 mA typ.	10 mA typ. (R) / 15 mA typ. (E)	15 mA typ.
LED red 660 nm	LED red polarized 660 nm	IR LED 880 nm	LED red 660 nm
75 / 17 g	80 / 18 g	75 / 17 g (R and E)	78 / 17 g
		(R) receiver / **(E)** emitter	
LHK-3031-301	-	-	**LFK-3031-301**
-	**LRK-3031-302**	**LLK-3031-202 (R) / LLK-3031-200 (E)**	**LFK-3031-302**
LHS-3031-301	-	-	**LFS-3031-301**
-	**LRS-3031-302**	**LLS-3031-202 (R) / LLS-3031-200 (E)**	**LFS-3031-302**
LHK-3031-303	-	-	**LFK-3031-303**
-	**LRK-3031-304**	**LLK-3031-204 (R) / LLK-3031-200 (E)**	**LFK-3031-304**
LHS-3031-303	-	-	**LFS-3031-303**
-	**LRS-3031-304**	**LLS-3031-204 (R) / LLS-3031-200 (E)**	**LFS-3031-304**
A, B	A, B	A, B	A, B
Diagram 1	Diagram 1	Diagram 1 (R) / Diagram 4 (E)	Diagram 1

At a glance:

- Small, but robust
- Very long operating distances
- High switching frequency: 1000 Hz
- Glass window, therefore scratch resistant and easy to clean
- Excellent resistance to environmental influences thanks to polyurethane potting of the electronic module
- Convenient sensitivity adjustment by means of the built-in 20-turn potentiometer
- High degree of protection: IP 67

Construction

The devices are built into a housing of glass-fiber reinforced PBTP/polybutylenterephthalate (Crastin), and fully potted with polyurethane resin. The covers are ultrasonically welded. Two mounting holes are provided for the use of M4 fastening screws. A universal mounting bracket as well as screws are delivered with every switch.

Sensitivity setting

The sensitivity can be very finely adjusted by means of the built-in 20-turn potentiometer. The potentiometer cannot be turned too far. Turning clockwise increases the sensitivity.

Technical data:

(according to IEC 60947-5-2)

Hysteresis	10 % typ.
Supply voltage range U_B	10 ... 36 VDC
Max. ripple content	20 %
Output current (total of both outputs)	200 mA
Output voltage drop	2.0 V max. at 200 mA
Max. switching frequency	1000 Hz
Switching time (↑ and ↓)	0.5 msec
Max. ambient light:	
halogen	5,000 Lux
sun	10,000 Lux
Ambient temperature range	-25 ... +55 °C
Degree of protection	IP 67
EMC protection:	
IEC 60255-5	1 kV
IEC 61000-4-2	Level 2
IEC 61000-4-3	Level 3
IEC 61000-4-4	Level 3

Protection

The switches are protected against overloads, short-circuits and all possible wire reversals. Furthermore, protection against overvoltages caused by inductive loads on the output and against voltage spikes on the power supply lines are built in. Appropriate technology prevents malfunctions or destruction caused by electrostatic discharges, fast transients, or HF fields.

LED

The yellow LED lights up when the light-ON output is switched. The green LED lights up if the receiver gets enough light (excess light) for reliable operation (approx. 80 % of the maximum operating distance). At the same time, the corresponding output (types -102 and -104 only) is switched.

Connection

Switches with 3 m PVC cable 4 x 0.14 mm² (type 2) or 4-pole S8 connector are standard. Other cable types or lengths are available on request. Suitable connecting cables are listed on page 112.

Reflectors

A range of suitable reflectors for the reflex sensors is listed on page 99.

Test input

The additional test input built into the emitters of the through-beam models provides the possibility of an extra system control.

Excess light control

The built-in excess light circuit simplifies alignment and adjustment of the sensors. Eventual dirt is recognized in time, and can be removed easily.

Power-ON reset

Operation of the output is inhibited until the power supply requirements are met. This prevents unwanted switching of the output during power-ON.

Data sheets

Detailed data sheets with additional technical information are available for all models. These may be retrieved from the CONTRINEX website (www.contrinex.com), or ordered cost-free from our sales offices.

Drawings

The mechanical drawings may be downloaded as data files from the CONTRINEX website, and imported directly into construction drawings.

Delivery package

Proximity switch, mounting bracket, screws, washers and nuts, screwdriver, instructions.

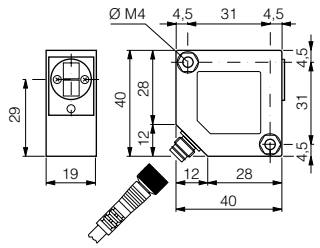
□ 40x40

Diffuse sensor, energetic

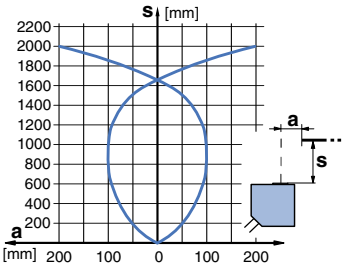
2,000 mm



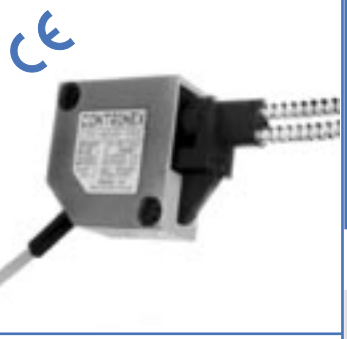
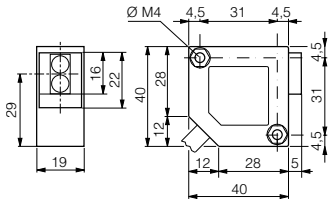
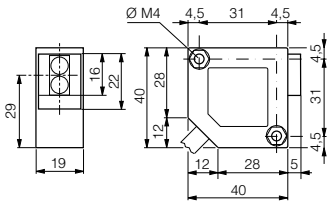
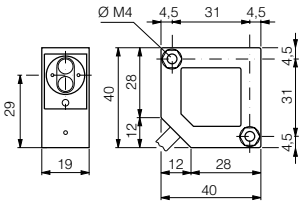
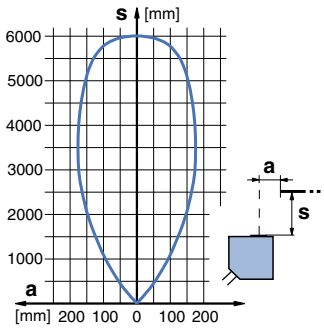
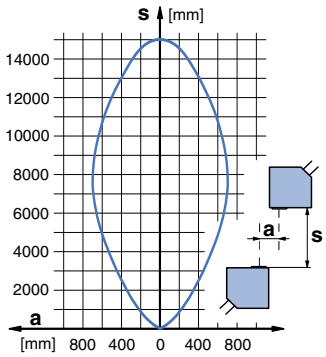
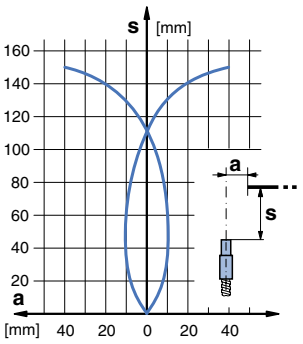
Dimensions:



Response curve:



Operating distance	2,000 mm
Standard target	400 x 400 mm
No-load supply current	15 mA typ.
Emitter	IR LED 880 nm
Weight (cable / connector model)	90 / 35 g
Part ref.: (**bold:** preferred types)	
NPN changeover outputs / cable	**LTK-4040-101**
NPN excess light output / cable	LTK-4040-102
NPN changeover outputs / conn. S8	**LTS-4040-101**
NPN excess light output / conn. S8	LTS-4040-102
PNP changeover outputs / cable	**LTK-4040-103**
PNP excess light output / cable	LTK-4040-104
PNP changeover outputs / conn. S8	**LTS-4040-103**
PNP excess light output / conn. S8	LTS-4040-104
Suitable connecting cables (page 112)	E, F
Wiring (pages 100 - 101)	Diagram 2

	☐ 40x40	☐ 40x40	☐ 40x40
	Reflex sensor	**Through-beam sensor**	**Fiber-optic amplifier**
	6,000 mm	**15,000 mm**	**150 mm**
			
			
			
	6,000 mm	15,000 mm	150 mm (with LFG-1030-050)
	Reflector type 3	-	100 x 100 mm
	15 mA typ.	10 mA typ. (R) / 15 mA typ. (E)	15 mA typ.
	LED red polarized 660 nm	IR LED 880 nm	IR LED 880 nm
	90 / 35 g	95 / 35 g (R and E)	95 / 35 g
		(R) receiver / **(E)** emitter	
	LRK-4040-101	**LLK-4040-001 (R) / LLK-4040-000 (E)**	**LFK-4040-101**
	LRK-4040-102	LLK-4040-002 (R) / **LLK-4040-000 (E)**	LFK-4040-102
	LRS-4040-101	**LLS-4040-001 (R) / LLS-4040-000 (E)**	**LFS-4040-101**
	LRS-4040-102	LLS-4040-002 (R) / **LLS-4040-000 (E)**	LFS-4040-102
	LRK-4040-103	**LLK-4040-003 (R) / LLK-4040-000 (E)**	**LFK-4040-103**
	LRK-4040-104	LLK-4040-004 (R) / **LLK-4040-000 (E)**	LFK-4040-104
	LRS-4040-103	**LLS-4040-003 (R) / LLS-4040-000 (E)**	**LFS-4040-103**
	LRS-4040-104	LLS-4040-004 (R) / **LLS-4040-000 (E)**	LFS-4040-104
	E, F	E, F	E, F
	Diagram 2	Diagram 2 (R) / Diagram 4 (E)	Diagram 2

At a glance:

- Fiber-optic amplifier for DIN-rail mounting (DIN/EN 50022)
- Excellent detection properties across a wide sensing range (20 ... 200 mm)
- No blind zone
- Regulated emitter light power
- Distance setting by means of teach-in with additional manual fine adjustment
- Signal strength and excess light indication by means of a bargraph
- 10 mm housing width

Construction

The devices are built into a housing of glass-fiber reinforced PBTP/polybutyleneterephthalate (Crastin). The housing width is only 10 mm, thus minimizing the space required for stacking. The optical fibers (Ø 2.2 mm) are connected by quick-locking, which protects them from detaching accidentally. The operating and display elements are protected by a clip-on transparent cover. The devices can be snapped onto DIN rails (DIN/EN 50022).

Technical data:

(according to IEC 60947-5-2)

Hysteresis	10 % typ.
Supply voltage range U_B	10 ... 30 VDC
Max. ripple content	20 %
Output current	200 mA
Output voltage drop	2.0 V max. at 200 mA
Max. switching frequency	1,500 Hz
Switching time (↑ and ↓)	330 µsec
Max. ambient light:	
halogen	5,000 Lux
sun	10,000 Lux
Ambient temperature range	-25 ... +55 °C
Degree of protection	IP 64
EMC protection:	
IEC 60255-5	5 kV
IEC 61000-4-2	Level 2
IEC 61000-4-3	Level 3
IEC 61000-4-4	Level 2

Operating distance adjustment

The operating distance is adjusted by means of teach-in (setting range 20 ... 200 mm). Depending on the application, either Teach 1 (only on background), or Teach 2 (on target and background) may be used. The additional manual fine adjustment allows for optimum regulation. The teach process can be triggered remotely.

Regulated light power

The emitter light power is regulated automatically, which results in a very small temperature and aging drift of the operating distance, as well as reducing the spread of the latter between individual devices.

Timers

If needed, the built-in timers for pulse delay and stretching can be activated. The factory-adjusted 10 msec setting can be increased by increments of 10 msec.

Light-ON / dark-ON

The output function can be selected directly on the device (default setting: light-ON).

Protection

The switches are protected against overloads, short-circuits and all possible wire reversals. Furthermore, protection against overvoltages caused by inductive loads on the output and against voltage spikes on the power supply lines are built in. Appropriate technology prevents malfunctions or destruction caused by electrostatic discharges, fast transients, or HF fields. Thanks to optimum sealing, the devices are resistant to environmental influences (degree of protection IP 64).

LED

A yellow LED indicates the switching state. Signal strength and excess light indication by means of a bargraph allow for optimum alignment of the optical fibers. The status LED shows the output state of the device during the teach process, and 8 green LEDs indicate the activated functions.

Connection

Devices with 2 m PVC cable 4 x 0.25 mm² (type 12) or 4-pole S8 connector are standard. Other cable types or lengths are available on request. Suitable connecting cables are listed on page 112.

Power-ON reset

Operation of the output is inhibited until the power supply requirements are met. This prevents unwanted switching of the output during power-ON.

Simple operation

The operating and display elements are clearly structured and largely self-explanatory. Additional operating information can be found on the device labels, and detailed operating instructions are delivered with every switch.

Data sheets

Detailed data sheets with additional technical information are available for all models. These may be retrieved from the CONTRINEX website (www.contrinex.com), or ordered cost-free from our sales offices.

Drawings

The mechanical drawings may be downloaded as data files from the CONTRINEX website, and imported directly into construction drawings.

Delivery package

Device, instructions.

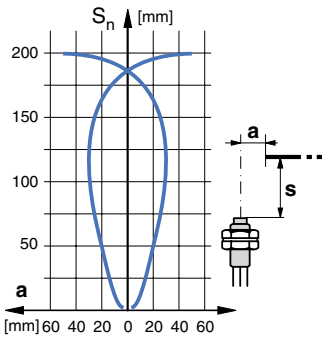
□ 31x60

Fiber-optic amplifier with teach-in

200 mm

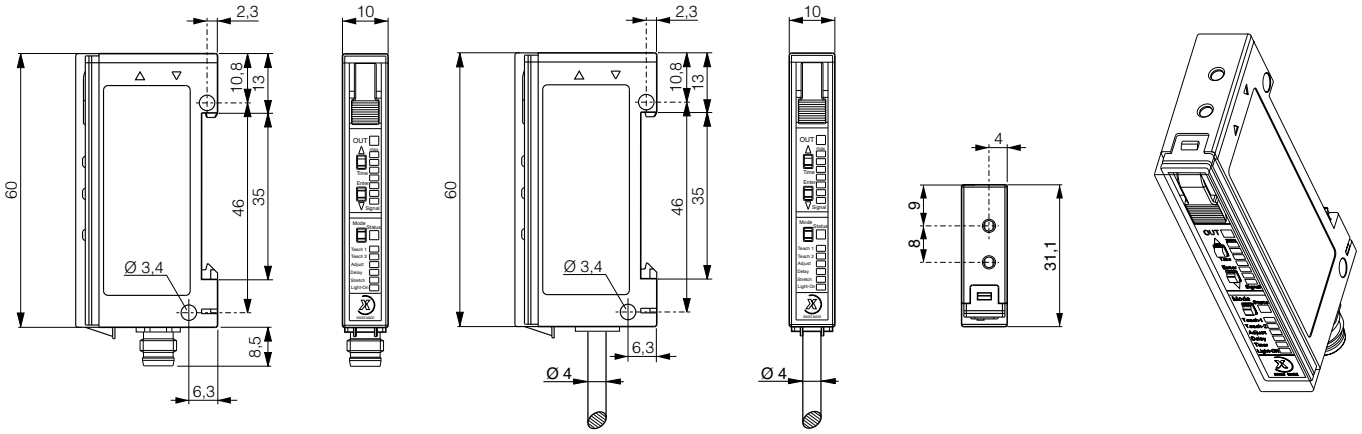


Response curve:



Operating distance	200 mm (with LFP-1002-020)
Standard target	100 x 100 mm
No-load supply current (at U_B=24V)	25 mA typ.
Emitter	LED red 680 nm
Weight (cable / connector model)	68 g / 17 g
Part ref.: (**bold:** preferred types)	
NPN teach-in / cable	**LFK-3065-101**
NPN teach-in / connector S8	**LFS-3065-101**
PNP teach-in / cable	**LFK-3065-103**
PNP teach-in / connector S8	**LFS-3065-103**
Suitable connecting cables (page 112)	E, F
Wiring (pages 100 - 101)	Diagram 6

Dimensions:



At a glance:

- Robust universal devices
- Long operating distances
- High switching frequency: 1000 Hz / 250 Hz*
- Reflex sensors using autocollimation principle
- Glass window, therefore scratch resistant and easy to clean
- The PBTP (Crastin) housing provides exceptional resistance to environmental influences
- Sensitivity adjustment by means of a built-in potentiometer with calibration scale and reduction gearbox
- High degree of protection: IP 67

Construction

The devices are built into a housing of glass-fiber reinforced PBTP/polybutyleneterephthalate (Crastin). For fixing purposes, a number of through holes suitable for M5 screws are provided. The distance between the holes has been chosen for maximum compatibility with the most commonly available sensors on the market.

Sensitivity setting

The sensitivity can be very finely adjusted by means of the built-in potentiometer with calibration scale and reduction gearbox. The potentiometer cannot be turned too far. Turning clockwise increases the sensitivity.

Technical data:

(according to IEC 60947-5-2)

Hysteresis	10 % typ.
DC supply voltage range U_B	10 ... 36 VDC
UC supply voltage range U_B	20 ... 265 VAC 20 ... 320 VDC
Max. ripple content**	20 %
Output current**	200 mA
Output voltage drop**	2.0 V max. at 200 mA
Max. switching frequency**	1000 Hz / 250 Hz*
Switching time** (↑ and ↓)	0.5 msec / 1 msec*
Max. ambient light:	
halogen	5,000 Lux
sun	10,000 Lux
Ambient temperature range	-5 ... +55 °C
Degree of protection	IP 67
EMC protection:	
IEC 60255-5	1 kV
IEC 61000-4-2	Level 3
IEC 61000-4-3	Level 3
IEC 61000-4-4	Level 3

* Diffuse sensor with background suppression

** DC models (UC see data sheet)

Protection

The switches are protected against overloads, short-circuits and all possible wire reversals. Furthermore, protection against overvoltages caused by inductive loads on the output and against voltage spikes on the power supply lines are built in. Appropriate technology prevents malfunctions or destruction caused by electrostatic discharges, fast transients, or HF fields.

LED

The yellow LED lights up when the light-ON output is switched. The green LED indicates that sufficient light is available for reliable operation (approx. 80% of the maximum operating distance); at the same time, the corresponding output (if available) is switched.

Connection

As standard, the devices are delivered with 4-pole or 5-pole S12 connector, or screw terminal. Suitable connecting cables are listed on page 112.

Reflectors

A range of suitable reflectors for the reflex sensors is listed on page 99.

Test input

The built-in test input (optional for some models) provides the possibility of an extra system control.

Excess light control

The built-in excess light circuit simplifies alignment and adjustment of the sensors. Eventual dirt is recognized in time, and can be removed easily.

Power-ON reset

Operation of the output is inhibited until the power supply requirements are met. This prevents unwanted switching of the output during power-ON.

Background suppression

The diffuse sensor with background suppression uses electronic distance setting. A PSD (**P**osition-**S**ensitive **D**evice) serves as the light receiver. Operating distance adjustment is carried out by means of a potentiometer, using infra-red light as the source. At a distance of 1 m, the light spot has a diameter of approx. 30 mm.

Timer

The timer (optional) allows selection of switch-on delay, switch-off delay, or pulses; adjustable from 0.01 ... 1 s (UC models 0.1 ... 10 s).

Data sheets

Detailed data sheets with additional technical information are available for all models. These may be retrieved from the CONTRINEX website (www.contrinex.com), or ordered cost-free from our sales offices.

Drawings

The mechanical drawings may be downloaded as data files from the CONTRINEX website, and imported directly into construction drawings.

Delivery package

Proximity switch, instructions.

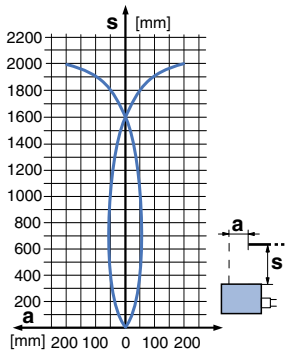
☐ 65x83

Diffuse sensor, energetic

2,000 mm

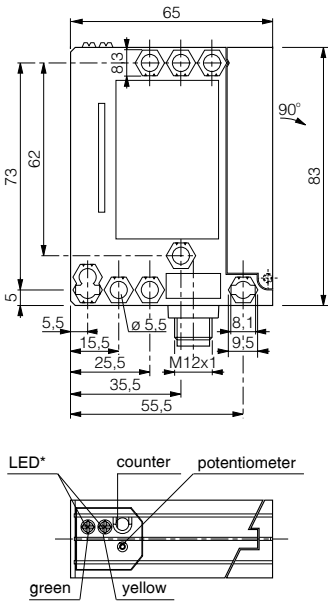
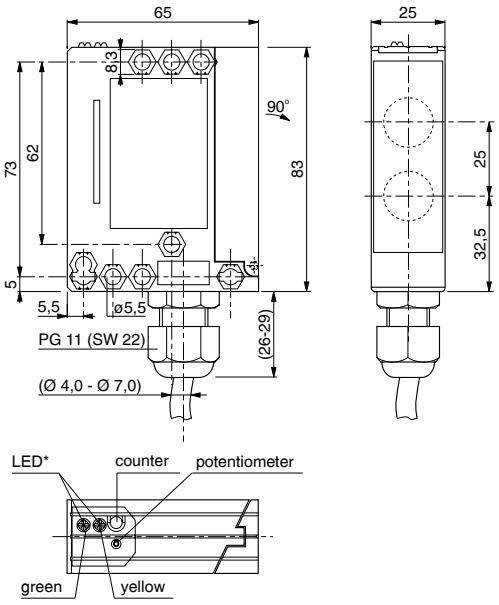
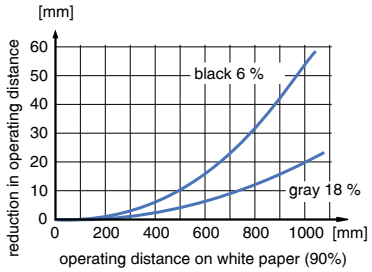
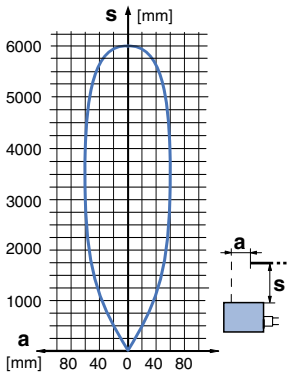
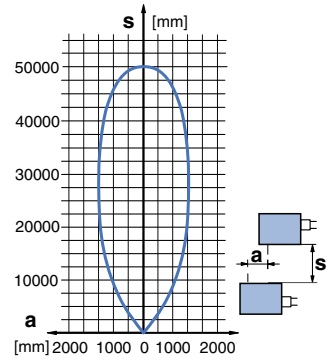


Response curve:



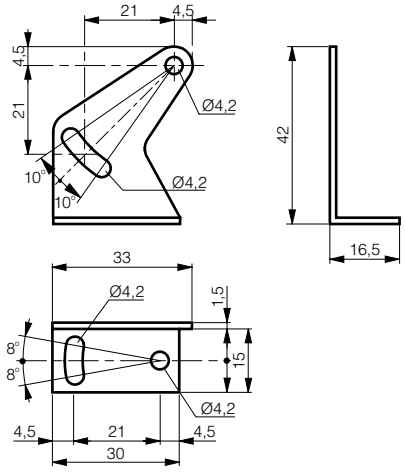
Operating distance	2,000 mm
Standard target	400 x 400 mm white
No-load supply current DC / UC	20 mA / 2 VA typ.
Emitter	IR LED 880 nm
Weight	100 g
Part ref.: (**bold:** preferred types)	
DC NPN / connector S12	**LTS-6080-101***
DC NPN / screw terminal	**LTT-6080-101**
DC NPN timer*** / connector S12	**LTS-6080-151****
DC NPN timer*** / screw terminal	**LTT-6080-151**
DC PNP / connector S12	**LTS-6080-103***
DC PNP / screw terminal	**LTT-6080-103**
DC PNP timer*** / connector S12	**LTS-6080-153****
DC PNP timer*** / screw terminal	**LTT-6080-153**
UC relay / connector S12	**LTS-6080-115**
UC relay / screw terminal	**LTT-6080-115**
UC relay / timer***/ connector S12	LTS-6080-165
UC relay / timer***/ screw terminal	LTT-6080-165
Suitable connecting cables (page 112)	M, N (**with test input: O, P)
Wiring (pages 100 - 101)	2 (LTS-...*) / 3 (LTS/LTT-...) / 5 (UC)

*** light-ON/dark-ON switchable

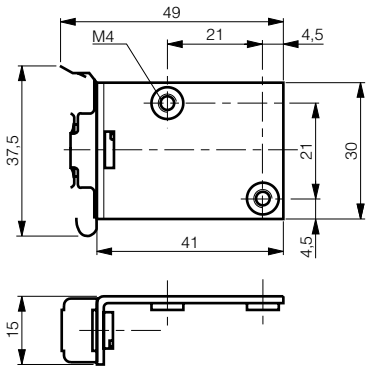
☐ 65x83		☐ 65x83	☐ 65x83
Diffuse sensor with background suppression		**Reflex sensor**	**Through-beam sensor**
50 ... 1,000 mm		**6,000 mm**	**50,000 mm**
			
			* receiver only 
50 ... 1,000 mm		6,000 mm	50,000 mm
200 x 200 mm white		Reflector type 3	-
50 mA / 3 VA typ.		20 mA / 2 VA typ.	20 mA / 2 VA typ. (R and E)
IR LED 880 nm		LED red polarized 660 nm	IR LED 880 nm
100 g		100 g	100 g (R and E)
			(R) receiver / **(E)** emitter
LHS-6080-101*		LRS-6080-102*	**LLS-6080-002 (R) / LLS-6080-000 (E)**
LHT-6080-101		**LRT-6080-102**	**LLT-6080-002 (R) / LLT-6080-000 (E)**
LHS-6080-151**		**LRS-6080-152****	**LLS-6080-052 (R) / LLS-6080-000 (E)**
LHT-6080-151		**LRT-6080-152**	**LLT-6080-052 (R) / LLT-6080-000 (E)**
LHS-6080-103*		**LRS-6080-104***	**LLS-6080-004 (R) / LLS-6080-000 (E)**
LHT-6080-103		**LRT-6080-104**	**LLT-6080-004 (R) / LLT-6080-000 (E)**
LHS-6080-153**		**LRS-6080-154****	**LLS-6080-054 (R) / LLS-6080-000 (E)**
LHT-6080-153		**LRT-6080-154**	**LLT-6080-054 (R) / LLT-6080-000 (E)**
LHS-6080-115		**LRS-6080-115**	**LLS-6080-015 (R) / LLS-6080-010 (E)**
LHT-6080-115		**LRT-6080-115**	**LLT-6080-015 (R) / LLT-6080-010 (E)**
LHS-6080-165		LRS-6080-165	LLS-6080-065 (R) / **LLS-6080-010 (E)**
LHT-6080-165		LRT-6080-165	LLT-6080-065 (R) / **LLT-6080-010 (E)**
M, N (**with test input: O, P)		M, N (**with test input: O, P)	M, N
2 (LHS-...*) / 3 (LHS/LHT-...) / 5 (UC)		2 (LRS-...*) / 3 (LRS/LRT-...) / 5 (UC)	2 (LLS/LLT-...) / 4 (E) / 5 (UC)

Photoelectric accessories

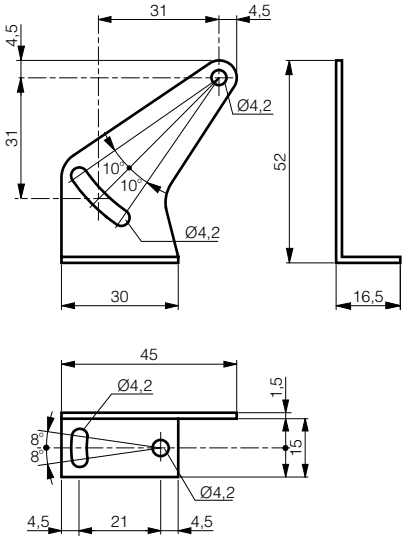
Universal mounting bracket
For 3030 and 3031 series
Material: zinc-plated passivated steel
Part reference: ***LXW-3030-000***



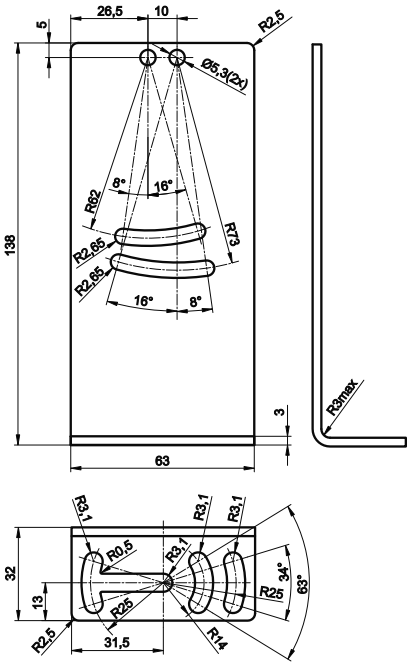
DIN-rail mounting bracket
For 3030 and 3031 series
Material: zinc-plated passivated steel
Part reference: ***LXW-3030-001***



Universal mounting bracket
For 4040 series
Material: zinc-plated passivated steel
Part reference: ***LXW-4040-000***

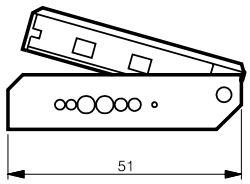


Universal mounting bracket
For 6080 series
Material: zinc-plated passivated steel
Part reference: ***LXW-6080-000***

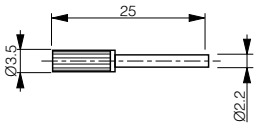




Cutting tool
For synthetic optical fibers
Part reference: ***LXF-0000-000***

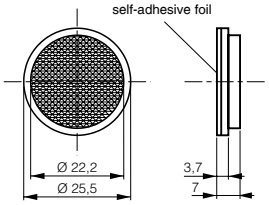


Adaptor
For fine synthetic optical fibers
Part reference: ***LFP-0003-000***



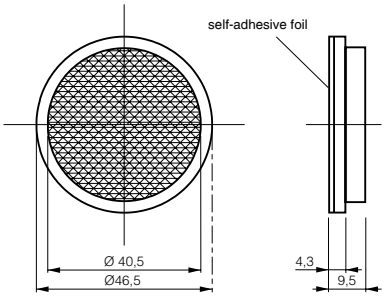
Reflector type 1
Range approx. 40% of type 3

Part reference: LXR-0000-025



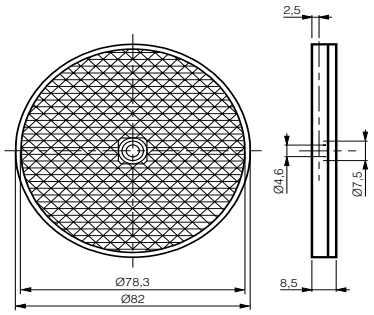
Reflector type 2
Range approx. 60% of type 3

*Part reference: **LXR-0000-046***



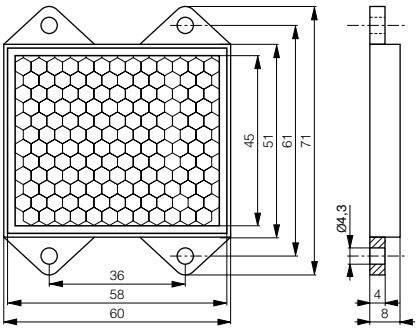
Reflector type 3
Reference reflector for all reflex sensors

*Part reference: **LXR-0000-084***



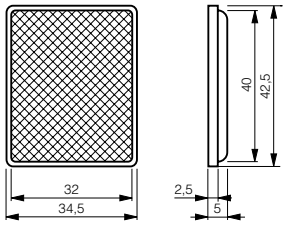
Reflector type 12
Range approx. 80% of type 3

*Part reference: **LXR-0000-012***



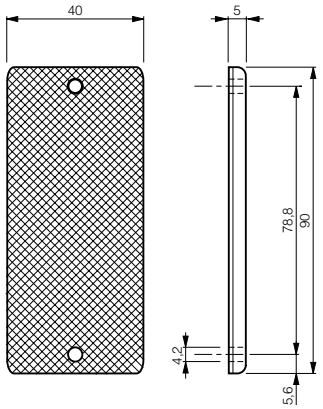
Reflector type 13
Range approx. 40% of type 3

*Part reference: **LXR-0000-013***



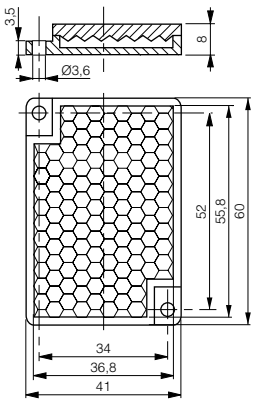
Reflector type 14
Range approx. 50% of type 3

*Part reference: **LXR-0000-014***



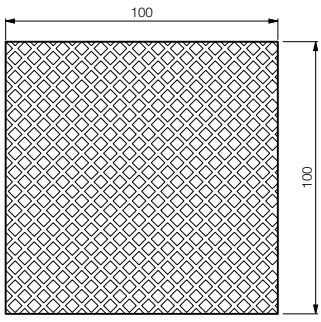
Reflector type 15
Range approx. 100% of type 3

*Part reference: **LXR-0000-015***



Reflective foil (self-adhesive)
For all reflex sensors (IMOS IRF 6000)

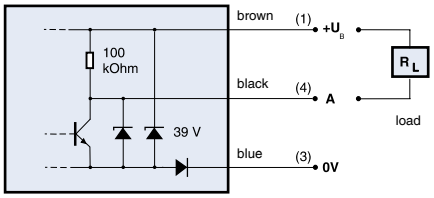
*Part reference: **LXR-0000-000***



Wiring diagrams

Diagram 1

NPN light-ON / dark-ON output



PNP light-ON / dark-ON output

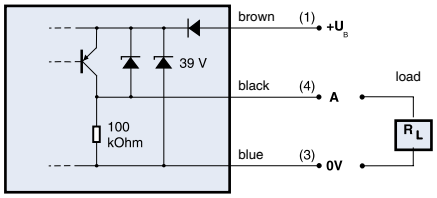
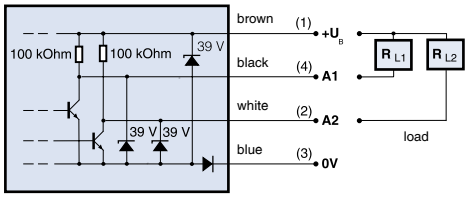


Diagram 2

NPN changeover outputs / excess light output



PNP changeover outputs / excess light output

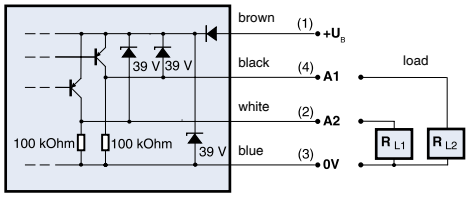
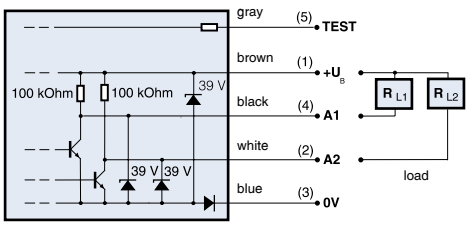


Diagram 3

NPN with test input



PNP with test input

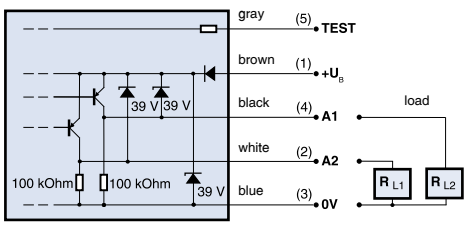




Diagram 4

Emitter of through-beam sensor

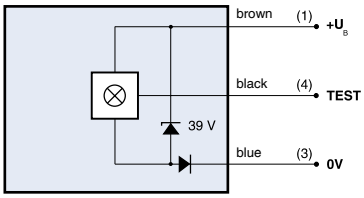
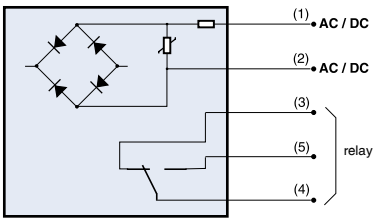


Diagram 5

UC with relay output



UC with relay output / emitter of through-beam sensor

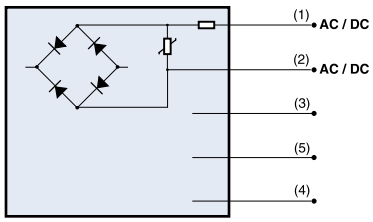
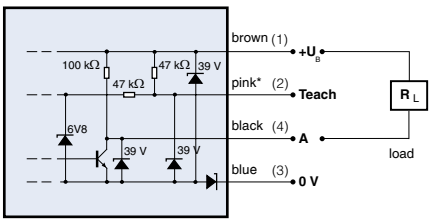


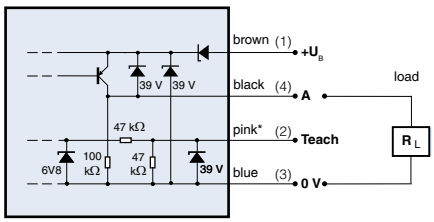
Diagram 6

NPN with teach-in



* white for LFS-3065-10#

PNP with teach-in



* white for LFS-3065-10#

CONTRINEX

3 Optical fibers

Synthetic optical fibers

At a glance:

- Very small dimensions
- Long operating distances
- Low bending radii
- Can be cut on site
- Visible light, hence easy alignment
- Wide range of types
- High degree of protection of the sensor head: IP 67
- Cost efficient
- For difficult environments, glass fibers are available for the 3030/3031 and 3060 series switches (LFG-1022-050 and LFG-3022-050, page 111)

Data sheets

Detailed data sheets with additional technical information are available for all models. These may be retrieved from the CONTRINEX website (www.contrinex.com), or ordered cost-free from our sales offices.

Drawings

The mechanical drawings may be downloaded as data files from the CONTRINEX website, and imported directly into construction drawings.

Technical data

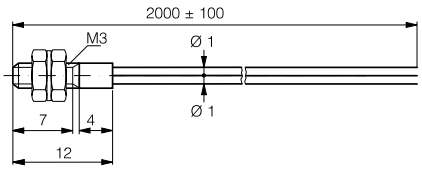
Ambient temperature range	-25 ... +70 °C
Protection degree of sensor head	IP 67
Standard length	2 m ± 0.1 m
Fiber bending radii:	
miniature	15 mm
standard	25 mm
flexible	2 mm
luminous	40 mm
Bending radius of light-outlet tube	25 mm
Tensile load	30 N max.
Fiber material	PMMA
Sleeve material	Polyethylene
Sensor head material	Nickel-plated brass / stainless steel*
Sensor head light-outlet tube material	Stainless steel
Optical attenuation:	
miniature / flexible	0.6 dB / m max. at 660 nm
standard / luminous	0.4 dB / m max. at 660 nm
Angle of incidence	± 28° / ± 5°*

* LFP-1006/1007-020

Diffuse sensors

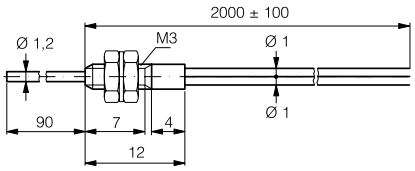
*Part references (**bold** = preferred types)*

Size	*Part ref. / max. operating distance*	*Characteristics*
M3	**Miniature**	– Operating distance: – with series 3030 40 mm – with series 3031 20 mm – with series 3060 70 mm – 1 separable double fiber, outside diameter 1 mm – Fine inner fiber Ø 0.5 mm for highest resolution – Can be cut



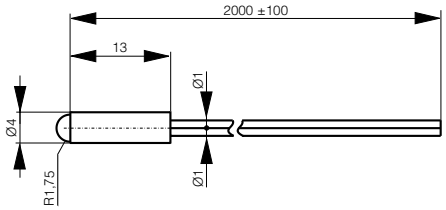
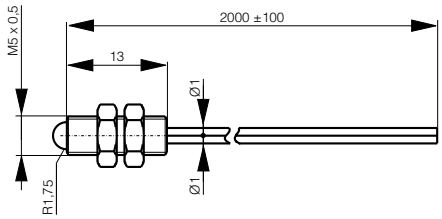
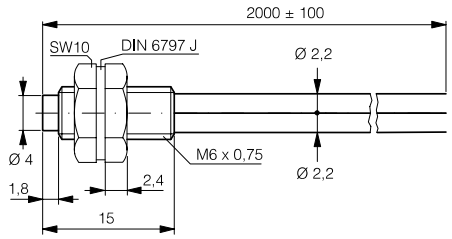
LFP-1001-020
40 mm

	Miniature	– Operating distance: – with series 3030 40 mm – with series 3031 20 mm – with series 3060 70 mm – 1 separable double fiber, outside diameter 1 mm – Sensor head with bendable light-outlet tube for ease of positioning – Fine inner fiber Ø 0.5 mm for highest resolution – Can be cut

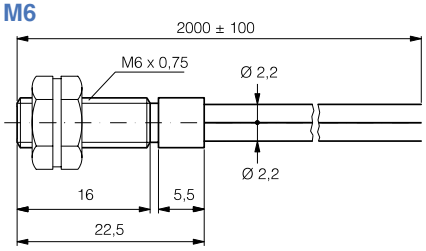
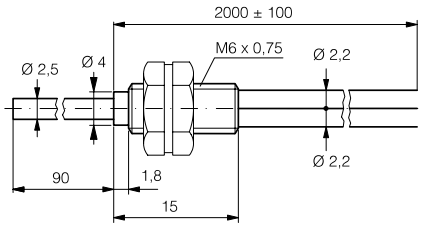


LFP-1004-020
40 mm

*Part references (**bold** = preferred types)*

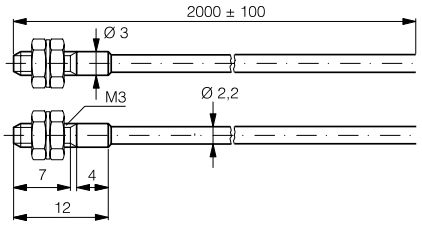
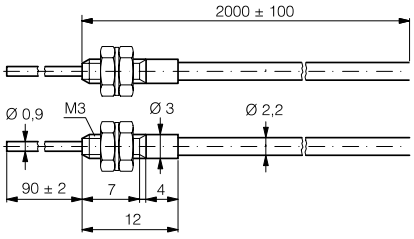
Size	*Part ref. / max. operating distance*	*Characteristics*
∅4 	**Miniature / spherical optics** **LFP-1006-020** **100 mm**	– Operating distance: – with series 3030 100 mm – with series 3031 60 mm – with series 3060 140 mm – 1 separable double fiber, outside diameter 1 mm – Fine inner fiber Ø 0.5 mm for highest resolution – Spherical optics for cylindrical light beam – Can be cut
M5 	**Miniature / spherical optics** **LFP-1007-020** **100 mm**	– Operating distance: – with series 3030 100 mm – with series 3031 60 mm – with series 3060 140 mm – 1 separable double fiber, outside diameter 1 mm – Fine inner fiber Ø 0.5 mm for highest resolution – Spherical optics for cylindrical light beam – Can be cut
M6 	**Standard** **LFP-1002-020** **120 mm**	– Operating distance: – with series 3030 120 mm – with series 3031 60 mm – with series 3060 200 mm – 1 separable double fiber, outside diameter 2.2 mm – Inner fiber Ø 1.0 mm – Long operating distance – Can be cut
	Flexible LFP-1102-020 **90 mm**	– Operating distance: – with series 3030 90 mm – with series 3031 45 mm – with series 3060 150 mm – 1 separable double fiber, outside diameter 2.2 mm – Extremely fine inner fibers 151 x Ø 75 µm – Very small bending radius – Can be cut
	Luminous LFP-1202-020 **160 mm**	– Operating distance: – with series 3030 160 mm – with series 3031 80 mm – with series 3060 260 mm – 1 separable double fiber, outside diameter 2.2 mm – Inner fiber Ø 1.5 mm – Longest operating distance – Can be cut

*Part references (**bold** = preferred types)*

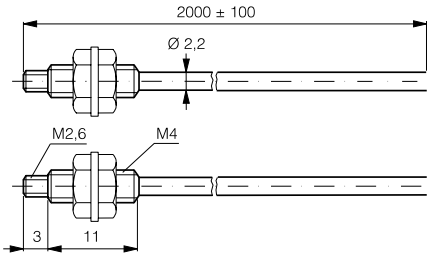
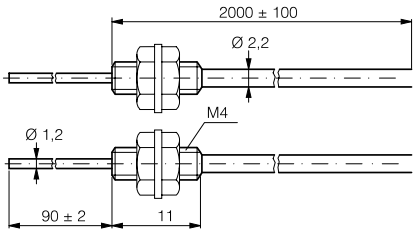
Size	*Part ref. / max. operating distance*	*Characteristics*
M6	**Standard**	– Operating distance: – with series 3030 120 mm – with series 3031 60 mm – with series 3060 200 mm – 1 separable double fiber, outside diameter 2.2 mm – Inner fiber Ø 1.0 mm – Coaxial arrangement of fibers, thus axially symmetric beam – Can be cut
	LFP-1003-020 **120 mm**	
	**Standard** **LFP-1005-020** **120 mm**	– Operating distance: – with series 3030 120 mm – with series 3031 60 mm – with series 3060 200 mm – 1 separable double fiber, outside diameter 2.2 mm – Inner fiber Ø 1.0 mm – Sensor head with bendable light-outlet tube for ease of positioning – Long operating distance – Can be cut
	Flexible LFP-1105-020 **90 mm**	– Operating distance: – with series 3030 90 mm – with series 3031 45 mm – with series 3060 150 mm – 1 separable double fiber, outside diameter 2.2 mm – Extremely fine inner fibers 151 x Ø 75 µm – Sensor head with bendable light-outlet tube for ease of positioning – Very small bending radius – Can be cut

Through-beam sensors

*Part references (**bold** = preferred types)*

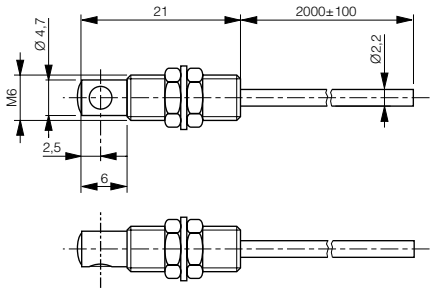
Size	*Part ref. / max. operating distance*	*Characteristics*
M3	**Standard**	– Operating distance: – with series 3030 120 mm – with series 3031 60 mm – with series 3060 200 mm – 2 individual fibers, outside diameter 2.2 mm – Fine inner fiber Ø 0.5 mm for highest resolution – Can be cut
	**LFP-2001-020** **120 mm**	
	**Standard** **LFP-2003-020** **120 mm**	– Operating distance: – with series 3030 120 mm – with series 3031 60 mm – with series 3060 200 mm – 2 individual fibers, outside diameter 2.2 mm – Sensor head with bendable light-outlet tube for ease of positioning – Fine inner fiber Ø 0.5 mm for highest resolution – Can be cut

*Part references (**bold** = preferred types)*

Size	*Part ref. / max. operating distance*	*Characteristics*
M4	**Standard**	– Operating distance: – with series 3030 400 mm – with series 3031 200 mm – with series 3060 700 mm – 2 individual fibers, outside diameter 2.2 mm – Inner fiber Ø 1.0 mm – Long operating distance – Can be cut
	**LFP-2002-020** **400 mm**	
	Flexible	– Operating distance: – with series 3030 300 mm – with series 3031 150 mm – with series 3060 550 mm – 2 individual fibers, outside diameter 2.2 mm – Extremely fine inner fibers 151 x Ø 75 µm – Very small bending radius – Can be cut
	LFP-2102-020 **300 mm**	
	Luminous	– Operating distance: – with series 3030 500 mm – with series 3031 250 mm – with series 3060 900 mm – 2 individual fibers, outside diameter 2.2 mm – Inner fiber Ø 1.5 mm – Longest operating distance – Can be cut
	LFP-2202-020 **500 mm**	
	**Standard**	– Operating distance: – with series 3030 400 mm – with series 3031 200 mm – with series 3060 700 mm – 2 individual fibers, outside diameter 2.2 mm – Inner fiber Ø 1.0 mm – Sensor head with bendable light-outlet tube for ease of positioning – Long operating distance – Can be cut
	LFP-2004-020 **400 mm**	
	Flexible	– Operating distance: – with series 3030 300 mm – with series 3031 150 mm – with series 3060 500 mm – 2 individual fibers, outside diameter 2.2 mm – Extremely fine inner fibers 151 x Ø 75 µm – Sensor head with bendable light-outlet tube for ease of positioning – Very small bending radius – Can be cut
	LFP-2104-020 **300 mm**	

*Part references (**bold** = preferred types)*

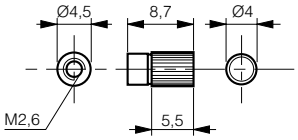
Size	*Part ref. / max. operating distance*	*Characteristics*
M6	**Standard 90°**	– Operating distance: – with series 3030 1100 mm – with series 3031 550 mm – with series 3060 1800 mm – 2 individual fibers, outside diameter 2.2 mm – Inner fiber Ø 1.0 mm – Sensor head for right-angle light emission – Long operating distance – Can be cut

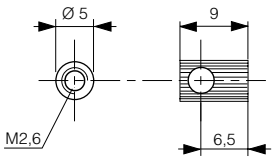


Accessories

*Part references (**bold** = preferred types)*

Size	*Part ref. / max. operating distance*	*Characteristics*
For M4	**Axial front lens** **LFP-0001-000** **3000 mm**	– Can be used with LFP-2#02-020 and LFG-3022-050 fibers – Delivery includes 1 pair – Operating distance: – with series 3030 3000 mm – with series 3031 1500 mm – with series 3060 5000 mm (with 5 m fiber)
	90° front lens **LFP-0002-000** **1000 mm**	– Can be used with LFP-2#02-020 and LFG-3022-050 fibers – Delivery includes 1 pair – Operating distance: – with series 3030 1000 mm – with series 3031 500 mm – with series 3060 1700 mm





Glass optical fibers

At a glance:

- For high ambient temperatures (models with chrome-plated brass and silicone sleeves)
- Executions for extreme environmental conditions
- Small dimensions
- Long operating distances
- Suitable for the detection of smallest objects
- Wide range of types

Characteristics

Depending on the type involved, glass optical fibers consist of 200 to 5,000 individual fibers with diameters of 30 to 50 µm. The fiber bundle is surrounded by a sleeve, which can be selected according to the application:

- PVC sleeve: the economical solution if no special stresses are to be expected.
- Wound sleeve of chrome-plated brass: for permanent operating temperatures of up to 250 °C, and maximum protection against crushing.
- Silicone sleeve with stainless steel braiding for strain relief: for use in corrosive media, at temperatures of up to +150 °C, and where mechanical strain relief is required.

The sensor heads are available with straight or right-angle light outlets. The range comprises models for use as diffuse sensors (emitting and receiving fiber bundles in the same sleeve) and as through-beam sensors (the fiber bundles are in separate sleeves). In order to cover various application needs, a number of different bundle cross-sections are available: large cross-sections for long operating distances, small cross-sections for short distances, high resolutions, and detection of small objects.

Technical data

Ambient temperature range	PVC sleeve	0 ... +70 °C
	Wound brass sleeve	-25 ... +250 °C
	Silicone sleeve	-25 ... +150 °C
Protection degree of sensor head	IP 65 (optional up to IP 68)	
Protection degree of optical fiber	PVC sleeve	IP 67
	Wound brass sleeve	IP 54
	Silicone sleeve	IP 67
Standard lengths	250 mm, 500 mm, 1000 mm	
Sensor head material	Aluminum	
Sensor head light-outlet tube material	Stainless steel	
Optical attenuation	10 dB / km max. at 880 nm	
Angle of incidence	± 18°	

Data sheets

Detailed data sheets with additional technical information are available for all models. These may be retrieved from the CONTRINEX website (www.contrinex.com), or ordered cost-free from our sales offices.

Drawings

The mechanical drawings may be downloaded as data files from the CONTRINEX website, and imported directly into construction drawings.

Special executions

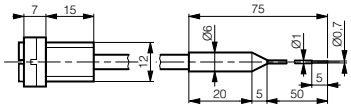
A broad range of special executions are available in small quantities and with short delivery times, e.g.:

- Higher degree of protection of the sensor head (on request).
- Special sensor heads (on request).
- Non-standard fiber lengths; maximum length is 10 m.
- Non-standard sleeves (chrome-plated brass, silicone, PVC) on request.

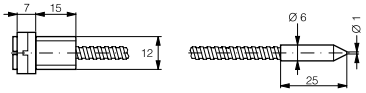
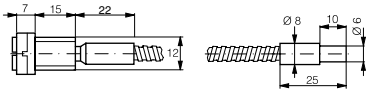
Axial diffuse sensors

length of glass fiber in cm, standard lengths -025 (250 mm) / -050 (500 mm) / -100 (1000 mm)

***bold** = preferred types (-### **only 500 mm length**)*

Size	*Part ref. / max. operating distance*	*Characteristics*
∅6 	**LFG-1005-###** **5 mm**	– Operating distance: - with series 4040 5 mm – With bendable light-outlet tube – For the detection of smallest objects – Silicone sleeve Ø 4.7 mm – Min. bending radius 20 mm – Min. bending radius of light-outlet tube 5 mm (do not bend the inner and outer 10 mm) – Max. tensile load 10 N

length of glass fiber in cm, standard lengths -025 (250 mm) / -050 (500 mm) / -100 (1000 mm)
***bold**= preferred types (-### **only 500 mm length**)*

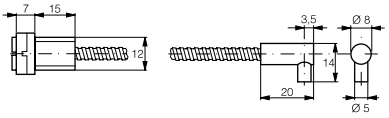
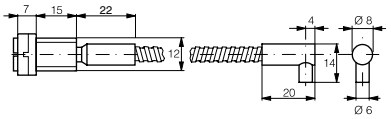
Size	*Part ref. / max. operating distance*	*Characteristics*
∅6	**LFG-1015-###** **15 mm**	– Operating distance: - with series 4040 15 mm – With bendable light-outlet tube – For places difficult to access – Silicone sleeve Ø 4.7 mm – Min. bending radius 20 mm – Min. bending radius of light-outlet tube 5 mm (do not bend the inner and outer 10 mm) – Max. tensile load 10 N
	**LFG-1010-###** **15 mm**	– Operating distance: – with series 4040 15 mm – For the detection of smallest objects in places difficult to access – Wound sleeve of chrome-plated brass Ø 4.7 mm – Min. bending radius 23 mm – Max. tensile load 20 N
∅8	**LFG-1020-###** **50 mm**	– Operating distance: – with series 4040 50 mm – Multi-purpose medium-range model – Wound sleeve of chrome-plated brass Ø 4.7 mm – Min. bending radius 25 mm – Max. tensile load 50 N
	**LFG-1030-###** **150 mm**	– Operating distance: – with series 4040 150 mm – For long operating distance – Wound sleeve of chrome-plated brass Ø 6.7 mm – Min. bending radius 25 mm – Max. tensile load 50 N

Radial diffuse sensors

length of glass fiber in cm, standard lengths -025 (250 mm) / -050 (500 mm) / -100 (1000 mm)
***bold**= preferred types (-### **only 500 mm length**)*

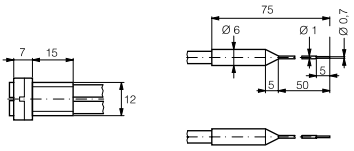
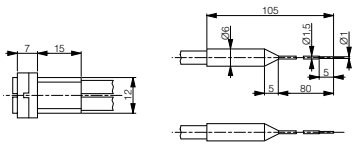
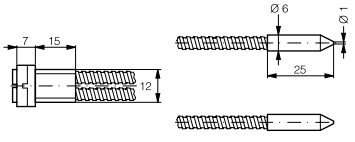
Size	*Part ref. / max. operating distance*	*Characteristics*
∅6	**LFG-2010-###** **15 mm**	– Operating distance: – with series 4040 15 mm – For the detection of smallest objects in places difficult to access – Leg length 14 mm – Wound sleeve of chrome-plated brass Ø 4.7 mm – Min. bending radius 23 mm – Max. tensile load 20 N

length of glass fiber in cm, standard lengths -025 (250 mm) / -050 (500 mm) / -100 (1000 mm)
***bold**= preferred types (-### **only 500 mm length**)*

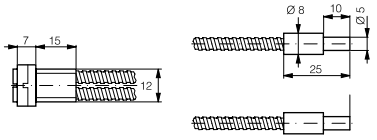
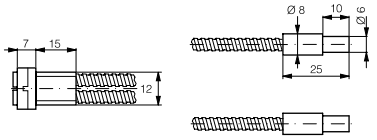
Size	*Part ref. / max. operating distance*	*Characteristics*
∅8 	**LFG-2020-###** **30 mm**	– Operating distance: – with series 4040 30 mm – Multi-purpose medium-range model – Leg length 14 mm – Wound sleeve of chrome-plated brass Ø 4.7 mm – Min. bending radius 25 mm – Max. tensile load 50 N
	**LFG-2030-###** **150 mm**	– Operating distance: – with series 4040 150 mm – For long operating distance – Leg length 14 mm – Wound sleeve of chrome-plated brass Ø 6.7 mm – Min. bending radius 25 mm – Max. tensile load 50 N

Axial through-beam sensors

length of glass fiber in cm, standard lengths -025 (250 mm) / -050 (500 mm) / -100 (1000 mm)
***bold**= preferred types (-### **only 500 mm length**)*

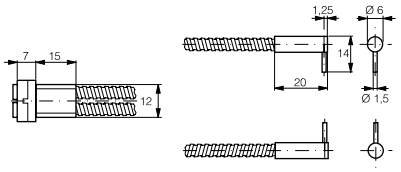
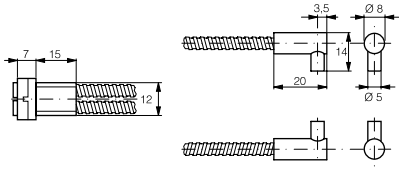
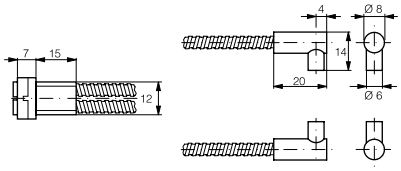
Size	*Part ref. / max. operating distance*	*Characteristics*
∅6 	**LFG-3005-###** **50 mm**	– Operating distance: – with series 4040 50 mm – With bendable light-outlet tube – For the detection of smallest objects – Silicone sleeve Ø 4.7 mm – Min. bending radius 20 mm – Min. bending radius of light-outlet tube 5 mm (do not bend the inner and outer 10 mm) – Max. tensile load 10 N
	**LFG-3015-###** **200 mm**	– Operating distance: – with series 4040 200 mm – With bendable light-outlet tube – For places difficult to access – Silicone sleeve Ø 4.7 mm – Min. bending radius 20 mm – Min. bending radius of light-outlet tube 5 mm (do not bend the inner and outer 10 mm) – Max. tensile load 10 N
	**LFG-3010-###** **200 mm**	– Operating distance: – with series 4040 200 mm – For the detection of smallest objects in places difficult to access – Wound sleeve of chrome-plated brass Ø 4.7 mm – Min. bending radius 23 mm – Max. tensile load 20 N

length of glass fiber in cm, standard lengths -025 (250 mm) / -050 (500 mm) / -100 (1000 mm)
***bold** = preferred types (-### **only 500 mm length**)*

Size	*Part ref. / max. operating distance*	*Characteristics*
∅8 	**LFG-3020-###** **800 mm**	– Operating distance: – with series 4040 800 mm – Multi-purpose medium-range model – Wound sleeve of chrome-plated brass Ø 4.7 mm – Min. bending radius 25 mm – Max. tensile load 50 N
	**LFG-3030-###** **1500 mm**	– Operating distance: – with series 4040 1500 mm – For long operating distance – Wound sleeve of chrome-plated brass Ø 4.7 mm – Min. bending radius 25 mm – Max. tensile load 50 N

Radial through-beam sensors

length of glass fiber in cm, standard lengths -025 (250 mm) / -050 (500 mm) / -100 (1000 mm)
***bold**= preferred types (-### **only 500 mm length**)*

Size	*Part ref. / max. operating distance*	*Characteristics*
∅6 	**LFG-4010-###** **200 mm**	– Operating distance: – with series 4040 200 mm – For the detection of smallest objects in places difficult to access – Leg length 14 mm – Wound sleeve of chrome-plated brass Ø 4.7 mm – Min. bending radius 23 mm – Max. tensile load 20 N
∅8 	**LFG-4020-###** **800 mm**	– Operating distance: – with series 4040 800 mm – Multi-purpose medium-range model – Leg length 14 mm – Wound sleeve of chrome-plated brass Ø 4.7 mm – Min. bending radius 25 mm – Max. tensile load 50 N
	**LFG-4030-###** **1500 mm**	– Operating distance: – with series 4040 1500 mm – For long operating distance – Leg length 14 mm – Wound sleeve of chrome-plated brass Ø 4.7 mm – Min. bending radius 25 mm – Max. tensile load 50 N

Glass optical fibers for series 3030, 3031 and 3060 switches (connection as with synthetic fibers)

*Part reference (**bold** = preferred types)*

Size	*Part ref. / max. operating distance*	*Characteristics*
M6	**Diffuse sensor**	– Operating distance: – with series 3030 120 mm – with series 3031 60 mm – with series 3060 200 mm – For difficult environmental conditions – Wound sleeve of chrome-plated brass Ø 4.6 mm – Min. bending radius 25 mm – Max. tensile load 20 N
	LFG-1022-050 **120 mm**	
M4	**Through-beam sensor**	– Operating distance: – with series 3030 500 mm – with series 3031 250 mm – with series 3060 800 mm – For difficult environmental conditions – Wound sleeve of chrome-plated brass Ø 4.6 mm – Min. bending radius 25 mm – Max. tensile load 20 N
	LFG-3022-050 **500 mm**	

Accessories for glass optical fibers

*Part reference (**bold** = preferred types)*

Size	*Part reference*	*Characteristics*
For Ø 6 mm heads	**Fiber mounting clamp**	Mounting clamps for axial and radial light-outlet tubes. Material: nickel-plated brass. Suitable for the following fibers: – LFG-1005-### / LFG-1015-### – LFG-1010-### / LFG-2010-### – LFG-3005-### / LFG-3015-### – LFG-3010-### / LFG-4010-###
	LXG-0000-060	
For Ø 8 mm heads	**Fiber mounting clamp**	Mounting clamps for axial and radial light-outlet tubes. Material: nickel-plated brass. Suitable for the following fibers: – LFG-1020-### / LFG-1030-### – LFG-2020-### / LFG-2030-### – LFG-3020-### / LFG-3030-### – LFG-4020-### / LFG-4030-###
	LXG-0000-080	

4 Connecting cables

Part reference [1]	Size	Number of poles	For N.O. / N.C.	Type / Cable	Polarity	LED [2]	Execution	
S08-3FVG-020	S8	3	N.O. / N.C.	type 4 / PVC 2 m	-	-	A	
S08-3FUG-020	S8	3	N.O. / N.C.	type 7 / PUR 2 m	-	-	A	
S08-3FVW-020	S8	3	N.O. / N.C.	type 4 / PVC 2 m	-	-	B	
S08-3FUW-020	S8	3	N.O. / N.C.	type 7 / PUR 2 m	-	-	B	
S08-3FUW-020-904	S8	3	N.O. / N.C.	type 6 / PUR 2 m	NPN	yellow / green	C	
S08-3FUW-020-905	S8	3	N.O. / N.C.	type 6 / PUR 2 m	PNP	yellow / green	D	
S08-4FVG-020	S8	4	N.O. / N.C.	type 4 / PVC 2 m	-	-	E	
S08-4FUG-020	S8	4	N.O. / N.C.	type 7 / PUR 2 m	-	-	E	
S08-4FVW-020	S8	4	N.O. / N.C.	type 4 / PVC 2 m	-	-	F	
S08-4FUW-020	S8	4	N.O. / N.C.	type 7 / PUR 2 m	-	-	F	
S12-3FVG-020	S12	3	N.O.	type 9 / PVC 2 m	-	-	G	
S12-3FUG-020	S12	3	N.O.	type 11 / PUR 2 m	-	-	G	
S12-3FVW-020	S12	3	N.O.	type 9 / PVC 2 m	-	-	H	
S12-3FUW-020	S12	3	N.O.	type 11 / PUR 2 m	-	-	H	
S12-3FUW-020-904	S12	3	N.O.	type 10 / PUR 2 m	NPN	yellow / green	I	
S12-3FUW-020-905	S12	3	N.O.	type 10 / PUR 2 m	PNP	yellow / green	J	
S12-3FVG-020-015	S12	3	N.O. / N.C.	type 8 / PVC 2 m	-	-	K	
S12-3FUG-020-015	S12	3	N.O. / N.C.	type 11 / PUR 2 m	-	-	K	
S12-3FVW-020-015	S12	3	N.O. / N.C.	type 8 / PVC 2 m	-	-	L	
S12-3FUW-020-015	S12	3	N.O. / N.C.	type 11 / PUR 2 m	-	-	L	
S12-4FVG-020	S12	4	N.O. / N.C.	type 9 / PVC 2 m	-	-	M	
S12-4FUG-020	S12	4	N.O. / N.C.	type 11 / PUR 2 m	-	-	M	
S12-4FVW-020	S12	4	N.O. / N.C.	type 9 / PVC 2 m	-	-	N	
S12-4FUW-020	S12	4	N.O. / N.C.	type 11 / PUR 2 m	-	-	N	
S12-5FVG-020	S12	5	N.O. / N.C.	type 4 / PVC 2 m	-	-	O	
S12-5FUG-020	S12	5	N.O. / N.C.	type 7 / PUR 2 m	-	-	O	
S12-5FVW-020	S12	5	N.O. / N.C.	type 4 / PVC 2 m	-	-	P	
S12-5FUW-020	S12	5	N.O. / N.C.	type 7 / PUR 2 m	-	-	P	

[1] **bold:** preferred types

[2] LED yellow: switching state / green: supply voltage

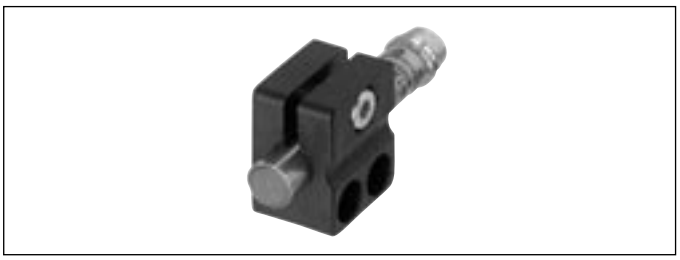
Specifications

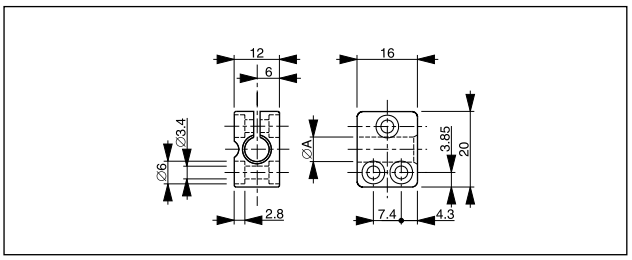
	Section	Conductor	Sleeve material	Wire insulation
Type 1	0.055 mm²	30 x 0.05 mm Ø	PUR	PVC
Type 2	0.14 mm²	18 x 0.1 mm Ø	PVC	PVC
Type 3	0.14 mm²	72 x 0.05 mm Ø	PUR	PVC
Type 4	0.25 mm²	32 x 0.10 mm Ø	PVC	PVC
Type 5	0.25 mm²	19 x 0.13 mm Ø	PUR	PVC
Type 6	0.25 mm²	67 x 0.07 mm Ø	PUR	PVC
Type 7	0.25 mm²	128 x 0.05 mm Ø	PUR	PVC
Type 8	0.34 mm²	7 x 0.25 mm Ø	PVC	PVC
Type 9	0.34 mm²	42 x 0.10 mm Ø	PVC	PVC
Type 10	0.34 mm²	88 x 0.07 mm Ø	PUR	PVC
Type 11	0.34 mm²	180 x 0.05 mm Ø	PUR	PVC
Type 12	0.25 mm²	128 x 0.05 mm Ø	PVC	PVC

5 Accessories

Sensor mounting clamps

Ø3, Ø4, Ø5, Ø6.5, Ø8





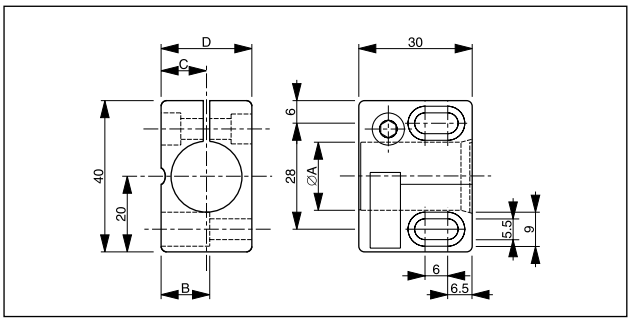
Technical data

Part reference	Type	A
ASU-0001-030	without limit stop	Ø 3 mm
ASU-0001-040	without limit stop	Ø 4 mm
ASU-0001-050	without limit stop	Ø 5 mm
ASU-0001-065	without limit stop	Ø 6.5 mm
ASU-0001-080	without limit stop	Ø 8 mm
ASU-0002-080	with limit stop	Ø 8 mm

Material: PA 6 black
Screw: DIN 912, M3 zinc-plated
Nut: DIN 934, M3 zinc-plated

Ø12, Ø18



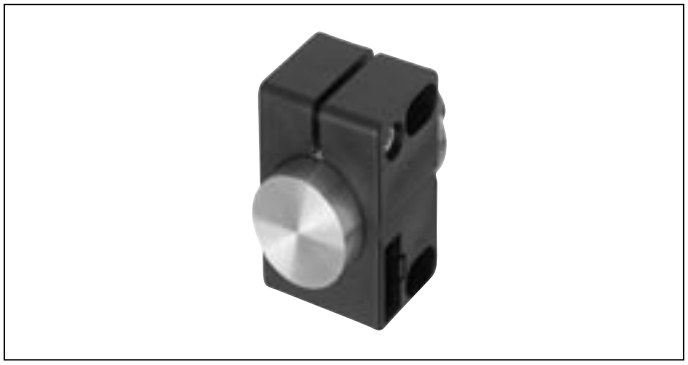


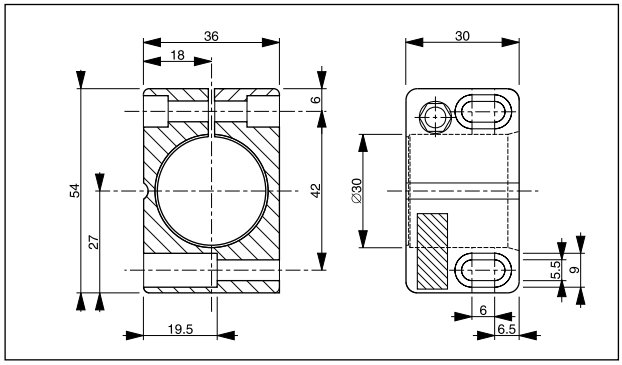
Technical data

Part reference	Type	A	B	C	D
ASU-0001-120	without limit stop	Ø 12 mm	9.75 mm	9 mm	18 mm
ASU-0002-120	with limit stop	Ø 12 mm	9.75 mm	9 mm	18 mm
ASU-0001-180	without limit stop	Ø 18 mm	12.85 mm	12 mm	24 mm
ASU-0002-180	with limit stop	Ø 18 mm	12.85 mm	12 mm	24 mm

Material: PA 6 GK (Ø 18 mm), PA 6 (Ø 12 mm) black
Screw: DIN 912, M5 zinc-plated
Nut: DIN 934, M5 zinc-plated

Ø30



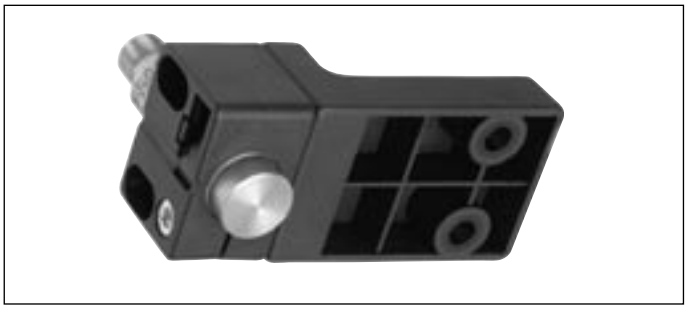


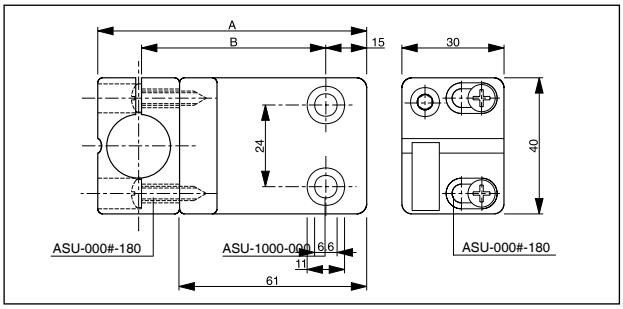
Technical data

Part reference	Type	
ASU-0001-300	without limit stop	Ø 30 mm
ASU-0002-300	with limit stop	Ø 30 mm

Material: PA 6 GK black
Screw: DIN 912, M5 x 25 zinc-plated
Nut: DIN 934, M5 zinc-plated

Bases for Ø12, Ø18



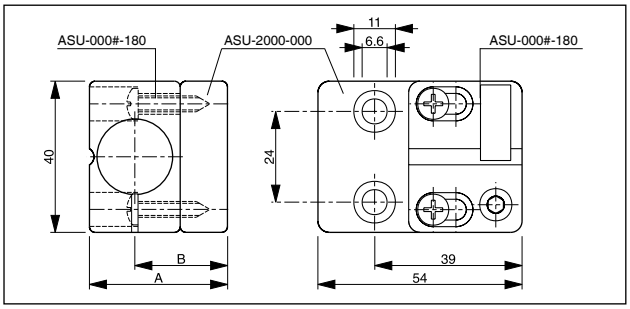


Technical data

Part reference	Type	A with Ø12 / Ø18	B with Ø12 / Ø18
ASU-1000-000	horizontal	79 mm / 85 mm	55 mm / 58 mm

Material: PA 6 black
Screw: DIN 7981, Ø 4.2 zinc-plated





Technical data

Part reference	Type	A with Ø12 / Ø18	B with Ø12 / Ø18
ASU-2000-000	vertical	30.5 mm / 36.5 mm	21.5 mm / 24.5 mm

Material: PA 6 black
Screw: DIN 7981, Ø 4.2 zinc-plated

Sensor tester

ATE-0000-001

These devices are suitable for testing various sensor types: inductive, capacitative, photoelectric.

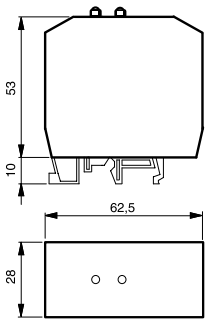


- Connection possibilities for PNP, NPN, Namur, and 2-wire DC devices, N.C. and N.O.
- LED and buzzer indicators
- Current supply from a single 9 V battery
- Built-in voltage transformer
- Built-in automatic time switch (switches off after approx. 60 secs)

Power supply unit, amplifiers

These devices are built into user-friendly clamping frames that can be snapped onto various standard rails, thanks to their universal foot.

Dimensions (all types):

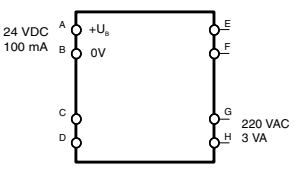


Power supply unit

DW-AZ-100-24

Supply voltage	220 VAC
Power drain	3 VA
Output voltage	24 VDC
Output current	100 mA max.

Wiring diagram:



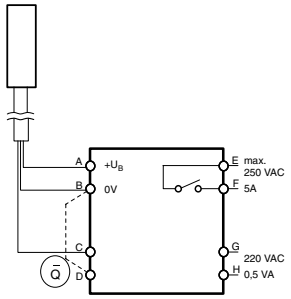
Amplifiers for 3-wire proximity switches

DW-AZ-100-A3

These devices are suitable for NPN and PNP N.O. proximity switches. Operating the switch activates the relay, and the contact closes. A wire bridge between B and D inverts this function.

Supply voltage	220 VAC
Power drain	0.5 VA
Output voltage	18.5 VDC
Output current	20 mA max.

Wiring diagram:

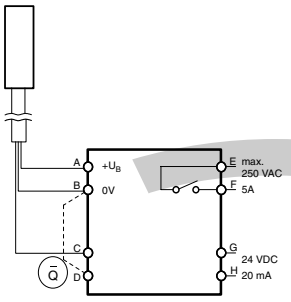


DW-AZ-100-D3

These devices are suitable for NPN and PNP N.O. proximity switches. Operating the switch activates the relay, and the contact closes. A wire bridge between B and D inverts this function.

Supply voltage	24 VDC
No-load supply current	20 mA max.
Output voltage	18.5 VDC
Output current	20 mA max.

Wiring diagram:



Amplifiers for NAMUR proximity switches

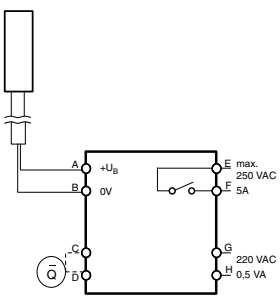
DW-AZ-100-AN

These devices are suitable for NAMUR proximity switches. Operating the switch activates the relay, and the contact closes. A wire bridge between C and D inverts this function.

Supply voltage	220 VAC
Power drain	0.5 VA

Output current and impedance correspond to NAMUR standard (DIN 19234).

Wiring diagram:



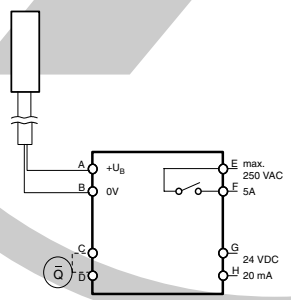
DW-AZ-100-DN

These devices are suitable for NAMUR proximity switches. Operating the switch activates the relay, and the contact closes. A wire bridge between C and D inverts this function.

Supply voltage	24 VDC
No-load supply current	20 mA max.

Output current and impedance correspond to NAMUR standard (DIN 19234).

Wiring diagram:



6 Glossary

Inductive proximity switches Photoelectric proximity switches

A

ADJUSTMENT (potentiometer)

The sensitivity is adjusted by means of the built-in single or multi-turn potentiometer (if provided). Turning it clockwise increases the sensitivity. Multi-turn potentiometers cannot be turned over their end position (no stops).

Through-beam sensors / reflex sensors

The potentiometer is normally set to the maximum sensitivity (turned clockwise). This provides the maximum excess light signal. A reduction in sensitivity may only be necessary to detect transparent objects.

Diffuse sensors, energetic

Set the sensitivity so that the target is reliably detected; for reliable operation, the green LED should light up, or the yellow LED should not flash (series 1040/50). On removing the object, if the output remains ON (detection of the background), the sensitivity must be reduced slightly.

Diffuse sensors with background suppression

The setup must ensure that the target is clearly identified, and any background excluded. The target should first be positioned at the maximum foreseen distance from the emitter, and the potentiometer adjusted so that the output just switches. The target is then removed and the potentiometer adjusted so that the background just causes the output to switch. Finally, the potentiometer is set to half way between the two previous readings. Where there is no background, the potentiometer should be set to the maximum distance.

ALIGNMENT

Through-beam sensors

First place the receiver and fix it in its final position. Then align the emitter accurately onto the receiver.

Reflex sensors

First place the reflector as required, and fix it firmly in place. Cover the reflector all around with adhesive tape so that only the center (approx. 25% of the surface area) remains free. Fit the reflex sensor with the optical axis aligned on the reflector so that it switches reliably. Finally, remove the adhesive tape from the reflector.

Diffuse sensors, energetic

Align the unit's optical axis with the target so that switching occurs reliably. Check that enough excess light is available, i.e. the green LED must light up (series 1120, 1180, 3030, 3031, 4040, 6080), and with the series 1040/50, the yellow LED should not flash. Finally, fix the device firmly.

Diffuse sensors with background suppression

Line up the beam on the center of the target, before fixing the device firmly.

AMBIENT LIGHT LIMIT

Ambient light is that which is produced by external light sources. The illumination intensity is measured on the light incidence surface. The sensors are basically insensitive to ambient light due to the use of modulated light. There is nevertheless an upper limit for the intensity of any external light and this is referred to as the ambient light limit. It is given for sunlight (unmodulated light) and halogen lamps (light modulated at twice the mains frequency). Reliable operation of the units is no longer possible at light intensities above the relevant ambient light limit.

AMBIENT TEMPERATURE

The specified ambient temperature range **must not be exceeded** in order to avoid damaging the proximity switch and rendering its performance unreliable.

ANALOG OUTPUT

Devices with analog output deliver an analog output signal approximately proportional to the target distance. Voltage and current outputs are available **simultaneously**.

AUTOCOLLIMATION

Photoelectric proximity switches using the autocollimation principle are characterized by the fact that the optical axes of the emitting and receiving channels are identical. This is possible with light from one of the channels being deflected by means of a semi-transparent mirror (Fig. 16). This principle completely eliminates the interfering blind zone often found in the proximity of the sensor, which is of special advantage when using reflex sensors. Reflex sensors with autocollimation are especially suitable for foil reflectors.

Inductive proximity switches Photoelectric proximity switches

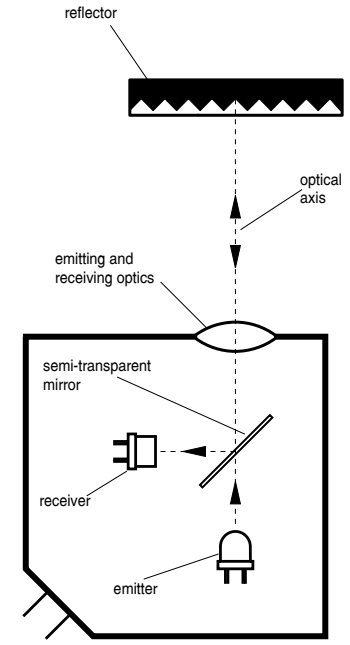


Fig. 16

B

BACKGROUND SUPPRESSION

The light pulse from the emitting diode leaves the optical system as a focused, almost parallel, light beam.

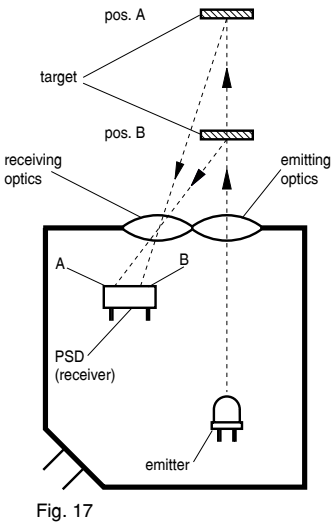


Fig. 17

On meeting an object in its path, part of the beam is diffusely reflected, and in turn, part of this reflected light falls on the PSD (**P**osition-**S**ensitive **D**evice) housed in the same sensor (Fig. 17). Depending on the distance of the target from the device, the light falls on a particular spot of the PSD, and a corresponding reception signal is emitted, indicating that an object is present at a certain distance from the device. The analyzing circuit compares the signal received with the preset operating distance (adjusted by means of the built-in potentiometer), and, if the distance of the object is less than, or equal to, the preset operating distance, the output is switched. Contrary to an energetic diffuse sensor, the operating distance depends only to a very small extent on the target's size or color, or on the nature of its surface. The object can therefore be easily discerned, even against a light background. These devices are not suitable for objects having shiny surfaces.

C

CAPACITANCE

The maximum switchable capacitance is the greatest permissible total capacitance at the device's output so that **reliable switching** is still guaranteed. Contributing to this total capacitance in particular are the lead capacitance (approx. 100 ... 200 pF per m) and the load's input capacitance. The value is given in the individual data sheets. These can be found on the CONTRINEX website (www.contrinex.com), or ordered from our sales offices.

CE MARK

All proximity switches in this catalog meet the requirements of European standards EN 60947-1 and EN 60947-5-2, and therefore correspond to EMC directive 89/336/EEC, as well as low-tension directive 73/23/EEC. Consequently, they are labeled with the CE mark.

However, this mark is **neither a quality seal, nor an official test label** certified by any authority. By applying the CE mark, the manufacturer confirms (under his own responsibility) that the protective requirements for the product meet the applicable EU directives, and consequently that the corresponding EU standards have been complied with. The CE mark enables the free importation of goods into the EU, as well as their free circulation within the EU.

CHANGEOVER

Devices with changeover outputs provide one output for the light-ON and another for the dark-ON signal. Both functions are available simultaneously for maximum connection flexibility to the control unit. Moreover, logical connections may be implemented without using series connection. Connecting both outputs to the control unit allows for additional security monitoring.

CLEARANCE

Inductive proximity switches must not mutually influence each other. For this reason, a minimum distance **A** between devices of diameter **D** must be observed (Fig. 18).

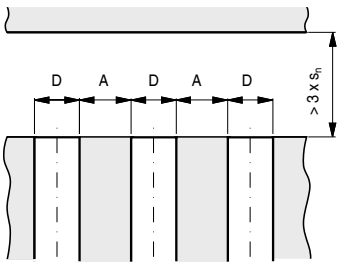


Fig. 18

Inductive proximity switches Photoelectric proximity switches

Series 300, 400, 420, 600, 620*

Size **D**	embeddable **A** (mm)	non-emb. **A** (mm)
Ø 3	0	---
M4	0	---
Ø 4	0	---
M5	0	---
C5	0	---
Ø 6.5	3 / *4	---
M8	2 / *3	8
C8	2 / *3	---
M12	6 / *10	12
M18	12 / *20	30
M30	30	60
C44	40	120
C40	50	140
C60	---	180
C80	---	240

Series 500, 520

Size **D**	quasi-embed. **A** (mm)	non-emb. **A** (mm)
Ø 6.5	10	---
M8	8	20
C8	8	---
M12	18	30
M18	26	60
M30	50	120

Series 700

Size **D**	embeddable **A** (mm)	non-emb. **A** (mm)
M12	28	68
M18	42	132
M30	60	220

Photoelectric proximity switches must not mutually influence each other. For this reason, a minimum distance **"a"** between them has to be respected, which depends strongly on the model used and the actual sensitivity setting. The following values should therefore be considered as rough guidelines only. The values given are for maximum sensitivity.

Diffuse sensors, energetic (Fig. 19)

	distance **a** (mm)
Series 1040/50	50
Series 1120	150
Series 1180	500
Series 3030	500
Series 3031	250
Series 4040	750
Series 6080	500

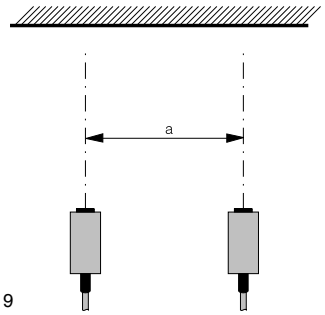


Fig. 19

Diffuse sensors with background suppression

	distance **a** (mm)
Series 1180	50
Series 3030	50
Series 3031	50
Series 6080	150

Reflex sensors (Fig. 20)

	distance **a** (mm)
Series 1120	150
Series 1180	250
Series 3030	500
Series 3031	250
Series 4040	750
Series 6080	500

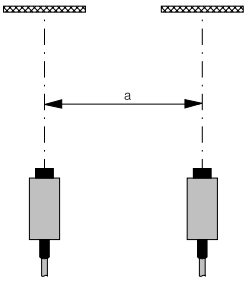


Fig. 20

Through-beam sensors (Fig. 21)

	distance **a** (mm)
Series 1040 /50	50
Series 1120	150
Series 1180	250
Series 3030	500
Series 3031	250
Series 4040	750
Series 6080	500

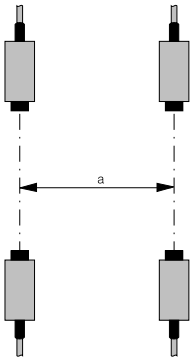


Fig. 21

Fiber-optic amplifiers

The value **"a"** depends strongly on the specific type of fiber used. General recommendations are therefore not possible.

CONDET® TECHNOLOGY

A new technology for producing inductive proximity switches. Contrary to conventional technology, in which a high-frequency magnetic field is generated in front of the sensing face, here the coil is triggered by an alternating polarity **pulsed current**. This technology is used in the 700 series (see also page 13). It permits:

– generally long operating distances;

– long operating distances also on non-ferrous metals, such as aluminum, brass, copper, etc.;

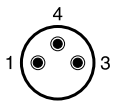
– **one-piece** stainless steel housing (sensing face included).

CONDIST® TECHNOLOGY

Developed and patented by CONTRINEX, a completely new high-performance oscillator for inductive proximity switches. Operating distances from **2.2 to 4 times** the standard values are possible thanks to excellent temperature and voltage stability. Devices of the 500 and 520 series work with such an oscillator (see also page 12).

CONNECTORS

Pin assignment size S8:



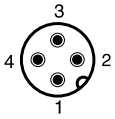
N.O. and N.C. functions

$+U_B$	pin 1	brown
0V	pin 3	blue
output	pin 4	black

Namur

L+	pin 1	brown
L-	pin 4	blue

Pin assignment size S12:



N.O. function

$+U_B$	pin 1	brown
0V	pin 3	blue
output	pin 4	black

N.C. function

$+U_B$	pin 1	brown
0V	pin 3	blue
output	pin 2	white

2-wire AC/DC

L1	pin 3	blue
L2	pin 4	black

Analog output

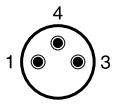
$+U_B$	pin 1	brown
0V	pin 3	blue
voltage output	pin 4	black
current output	pin 2	white

Connector cable types K and L are equipped with screw terminals so that a suitable alternative cable can be connected by the customer if required.

Pin assignment size S8 3 pole:

N.O. and N.C. functions

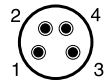
$+U_B$	pin 1	brown
0V	pin 3	blue
output	pin 4	black



Pin assignment size S8 4 pole:

N.O. and N.C. functions

$+U_B$	pin 1	brown
output 2	pin 2	white
0V	pin 3	blue
output 1	pin 4	black



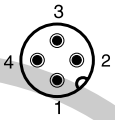
Teach function

$+U_B$	pin 1	brown
output 2	pin 2	white
0V	pin 3	blue
output 1	pin 4	black

Pin assignment size S12 3 pole:

N.O. function

$+U_B$	pin 1	brown
0V	pin 3	blue
output	pin 4	black



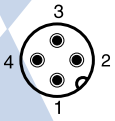
N.C. function

$+U_B$	pin 1	brown
0V	pin 3	blue
output	pin 2	white

Pin assignment size S12 4 pole:

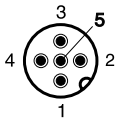
N.O. and N.C. functions

$+U_B$	pin 1	brown
output 2	pin 2	white
0V	pin 3	blue
output 1	pin 4	black



Inductive proximity switches Photoelectric proximity switches

Pin assignment size S12 5 pole:



N.O. and N.C. functions

$+U_B$	pin 1	brown
output 2	pin 2	white
0V	pin 3	blue
output 1	pin 4	black
test	pin 5	gray

Connector cable types K and L are equipped with screw terminals so that a suitable alternative cable can be connected by the customer if required.

CORRECTION FACTORS

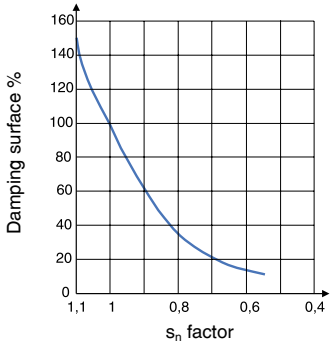
The specified operating distance **s** of inductive proximity switches refers to exactly defined measuring conditions (see **OPERATING DISTANCE**). Other arrangements generally result in a reduction of the operating distance. The following data are to be considered as **guidelines** only; according to size and version, there can be wide variations. Exact values are given in the individual data sheets. These can be found on the CONTRINEX website (www.contrinex.com), or ordered directly from our sales offices.

Series 300 / 400 / 420 / 600 / 620

Material influence:

Target material	Operating distance
Steel type FE 360	s_n x 1.00
Aluminum	s_n x 0.55
Brass	s_n x 0.64
Copper	s_n x 0.51
Stainless steel (V2A)	s_n x 0.85

Geometrical influence:



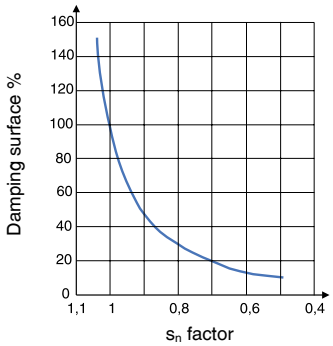
When using foils, an increase in the usable operating distance can be expected.

Series 500 / 520*

Material influence:

Target material	Operating distance
Steel type FE 360	s_n x 1.00
Brass	s_n x 0.44 / *0.37
Aluminum	s_n x 0.36 / *0.28
Copper	s_n x 0.32 / *0.24
Stainless steel (V2A)	s_n x 0.69

Geometrical influence:



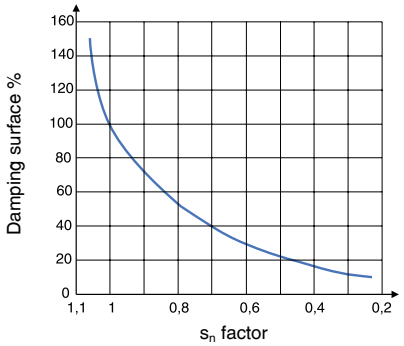
When using foils, an increase in the usable operating distance can be expected.

Series 700

Material influence:

Target material	Operating distance
Steel type FE 360	s_n x 1.0
Aluminum	s_n x 1.0
Brass	s_n x 1.3
Copper	s_n x 0.8
SS (1 mm thick)	s_n x 0.5
SS (2 mm thick)	s_n x 0.9

Geometrical influence:



When using foils, a **decrease** in the usable operating distance can be expected.

The specified operating distances of energetic diffuse sensors are achieved using standard mat white paper of the specified dimensions as the target surface. For other target surface materials, the correction factors given below apply (these are guideline values only).

Test card	100%
(Kodak paper, white)	
Paper, white	80%
PVC, gray	57%
Newspaper, printed	60%
Wood, lightly colored	73%
Cork	65%
Plastic, white	70%
Plastic, black	22%
Neoprene, black	20%
Automobile tires	15%
Aluminum sheet, untreated	200%
Aluminum sheet, black	150%
anodized	
Aluminum sheet, mat	120%
(brushed finish)	
Stainless steel, polished	230%

D

DARK-ON

The "dark-ON" function means that the relevant output is switched (carrying current) when **no** light is reaching the receiver.

DEGREES OF PROTECTION

The IP degrees of protection are defined in DIN 40050 / IEC 60529. The meaning of the **first numeral** is:

6 The housing provides complete protection against contact with electrically conducting or moving parts, and full protection against dust penetration.

and the **second numeral**:

4 Protection against water splashes: water splashed against the housing from any direction must have no harmful effect.

Test conditions: spraying with oscillating tube or spray nozzle, water pressure 1 bar, delivery rate 10 l/min ± 5%, duration 5 minutes.

5 Protection against water jets: water projected by a nozzle from any direction under specified conditions must have no harmful effect.

Test conditions: nozzle with 6.3 mm diameter, delivery rate 12.5 l/min ± 5%, distance 3 m, duration 3 minutes.

7 Protection against water when device is immersed in water under specified pressure and time conditions. Water must not penetrate in damaging quantities.

Test conditions: immersion depth in water 1 m, duration 30 minutes.

8 Protection against water when device is immersed in water indefinitely under specified pressure conditions. Water must not penetrate in damaging quantities.

Test conditions used by CONTRINEX: immersion depth in water 5 m, duration ≥ 1 month.

Devices with degree of protection IP 67 are thus **not intended for prolonged operation in water**, or in prolonged humid conditions. Tolerance to liquids other than water must be examined from case to case.

E

EMBEDDABLE MOUNTING

See **MOUNTING**.

EMC

The EMC (**E**lectro**m**agnetic **C**ompatibility) resistance of the devices satisfies the highest demands. For inductive proximity switches, the following requirements are met:

Series 300 / 400 / 420 / 500 / 520 / 700

- IEC 61000-4-2 level 2
- IEC 61000-4-3 level 3
- IEC 61000-4-4 level 2
- IEC 60255-5 5 kV

Series 600 / 620

- IEC 61000-4-2 level 3
- IEC 61000-4-3 level 3
- IEC 61000-4-4 level 3
- IEC 60255-5 1 kV / 5 kV (M12 - C80)

Inductive proximity switches Photoelectric proximity switches

For photoelectric proximity switches, see “technical data”.

All devices comply with the EU directive no. 89/336/EEC. In addition, they undergo severe field testing.

EXCESS LIGHT INDICATION

The excess light indication circuit detects the excess radiation power which falls on the light incidence surface and is processed by the light receiver. The excess light can decrease in time due to dirt, a change in the target’s reflection factor, and aging of the emitter diode, so that reliable operation can no longer be guaranteed. Some devices are therefore equipped with a second LED (green), which lights up when less than approximately 80% of the available operating distance is used. In others, the yellow LED flashes when the available excess light is insufficient. Models with an excess light output make the excess light signal available to the user for further processing. Thus, operating conditions which are no longer reliable can be recognized in time.

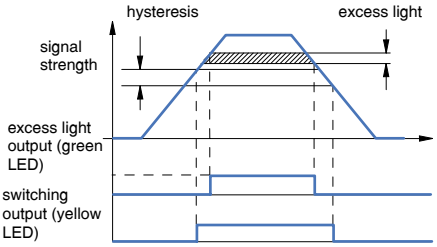


Fig. 22

H

HYSTERESIS

Hysteresis (differential travel) causes a defined switching behavior of the device (Fig. 23). The operating distance always refers to the switch-on point.

Distance hysteresis is only useful for the diffuse sensor model and its related fiber version.

Hysteresis (differential travel) causes a defined switching behavior of the device (Fig. 24). The operating distance always refers to the switch-on point. Namur devices and those with analog output have continuous transmission behavior, i.e. there is no hysteresis.

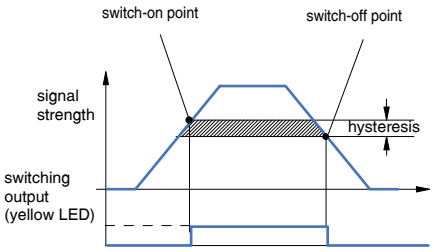


Fig. 23

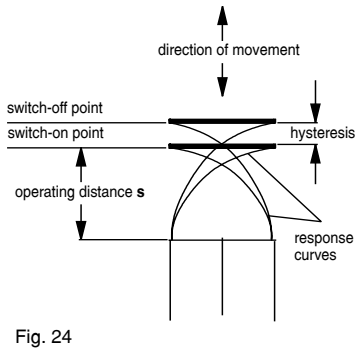


Fig. 24

I

INDUCTION PROTECTION

When inductive loads are switched off, the output voltage, without a protective circuit, would increase to a high value, which could destroy he output transistor. CONTRINEX proximity switches therefore contain a **Zener diode** at the output to limit the switch-off voltage to a safe value (3-wire types). When connecting an inductive load with a current of >100 mA and simultaneously a switching frequency >10 Hz, the mounting of a **roller diode** directly to the load is recommended (due to the leakage power in the built-in Zener diode).

INSTALLATION

Photoelectric proximity switches can be easily and reliably installed in any position, using the mounting accessories supplied with most devices. The installation position should preferably protect the units against dirt and other contamination.

For inductive proximity switches, see **MOUNTING**.

INSULATION VOLTAGE

The devices in this catalog are designed for an insulation voltage (between connecting leads and housing) of **500 VAC** (supply voltage up to 50 VAC / 75 VDC), or **1500 VAC** (supply voltage over 50 VAC / 75 VDC).

IP 64 / IP 65 / IP 67 / IP 68

Refer to **DEGREES OF PROTECTION**.

IR LIGHT

IR is the abbreviation of “**I**nfra-**R**ed”. This refers to any electromagnetic radiation with a wavelength exceeding that of normal visible light, which is approx. 380 to 780 nm. Wavelengths of approx. 780 to 1500 nm are typically used. IR light cannot be used with synthetic fibers, due to high attenuation. Instead, visible red light is used. As the usual polarization filters cannot be used in the IR range, visible red light is also used for reflex sensors.

L

LEAD LENGTHS

For the proximity switch, long leads mean

- a capacitive load at the output (see **CAPACITANCE**);
- increased influence of interference signals.

Even under favorable conditions, lead lengths should not exceed **300 m.**

LEADS

The standard built-in leads are **not** suitable for **repeated bending stresses**. In such cases, high-flexibility PUR cables (special executions) or connectors with corresponding connecting cables (see page 112) must be used.

LEAKAGE CURRENT

Leakage current is the current that flows through the output transistor and thereby through the load when the output is OFF (to be taken into account particularly where switches are connected in parallel).

LED

Most of the inductive devices in this catalog are equipped with a built-in yellow light-emitting diode (LED). It indicates the switching state: **output activated = yellow LED on**. In case of a short-circuit, the LED remains off.

All photoelectric sensors have one or two **L**ight **E**mitting **D**iodes (LEDs) built in. The yellow LED lights up when the output is switched (for switches with 2 outputs: the light-ON output). During a short-circuit or overload, the yellow LED does not operate. The green LED (if provided) lights up when enough excess light for reliable operation is available, i.e. when an object is present in the reliable sensing area (diffuse sensors), or when enough light from the uninterrupted beam reaches the receiver (reflex and through-beam sensors). Switches without a green LED have the yellow LED flashing if the available excess light is insufficient.

LIGHT-ON

Light-ON means that the relevant output is switched (carrying current) when light is reaching the receiver.

LOAD RESISTANCE

From the selected supply voltage U_B and the specified maximum output current of the proximity switch, the lowest permissible load resistance for trouble-free operation can be calculated.

Example: With a voltage of 24 V and a specified maximum permissible output current of 200 mA, the minimum load resistance is 120 ohms; at 15 V, it is 75 ohms.

M

MAGNETIC FIELDS

Permanent and low-frequency alternating magnetic fields do not normally influence the operation of proximity switches.

Strong fields, on the other hand, can saturate the ferrite core, thereby increasing the operating distance, or even provoking through-connection. However, no lasting damage is caused. **High-frequency fields** of several kHz (700 series), or several hundred kHz (other series), may seriously interfere with the switch functioning, since the oscillator frequency of the devices lies in this range. If difficulties with interfering magnetic fields are encountered, shielding is recommended.

MODULATED LIGHT

The photoelectric switches listed in this catalog operate with modulated light, i.e. the light emitter is switched on only for a short period and remains switched off for much longer (ratio approx. 1:25). In diffuse and reflex sensors, the receiver is only active during the light pulse, and is disabled during the pulse gap. Operation with modulated light provides the following advantages:

- The devices are largely insensitive to ambient light.
- Longer operating distances are possible.
- Heat generation is reduced, which prolongs the operating life of the emitting diodes.

MODULATION FREQUENCY

The photoelectric devices in this catalog are operated with modulated light, which makes them largely insensitive to ambient light. The modulation frequency f_{cy} is in the range of several kHz. If a switch is operated in the proximity of another device with the same modulation frequency, interference can occur. If the problem cannot be solved by suitable alignment of the units or by shielding, switches with different modulation frequencies can be supplied as an option.

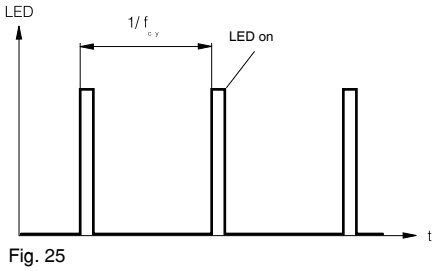


Fig. 25

Inductive proximity switches Photoelectric proximity switches

MOUNTING

Embeddable proximity switches

Embeddable proximity switches may be flush mounted in all metals. For trouble-free operation, a free zone according to Fig. 26 should be observed.

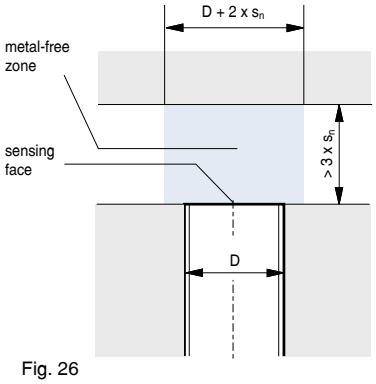


Fig. 26

Quasi-embeddable proximity switches

When installing quasi-embeddable series 500 and 520 proximity switches in conductive materials (metals), the devices must **protrude** by a distance **X**, according to Fig. 27. Further, a free zone of 3 x s_n must be observed. Flush mounting in non-conducting materials is permitted.

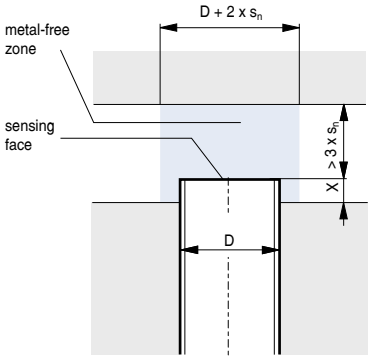


Fig. 27

Mounting in steel and in non-ferrous metals:

Size **D**	**X** (mm)
Ø 6.5	1
M8	1
C8	1
M12	2
M18	4
M30	6

Mounting in stainless steel:

Size **D**	**X** (mm)
Ø 6.5	0.0
M8	0.0
C8	0.0
M12	1.0
M18	1.5
M30	2.0

Non-embeddable proximity switches

When mounting non-embeddable proximity switches in conducting materials (metals), minimum distances to the conducting material must be maintained according to Fig. 28. Flush mounting in non-conducting materials is permitted.

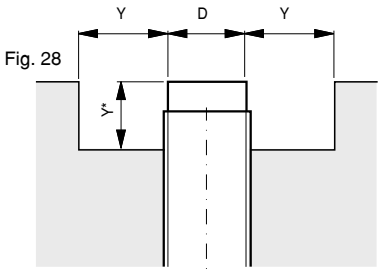


Fig. 28

Size **D**	**Y** (mm)
M8	8
M12	12
M18	22
M30	40
C44	60 / *40
C40	70 / *40
C60	60 / *40
C80	110 / *40

N

N.C. FUNCTION

The output is closed when the switch is not activated. It is open when the switch is activated.

N.O. FUNCTION

The output is open when the switch is not activated. It is closed when the switch is activated.

NO-LOAD SUPPLY CURRENT

No-load supply current is understood as the inherent consumption of the proximity switch for operating the LED, amplifier, etc., in the non-activated state. It does not include the current flowing through the load.

Inductive proximity switches Photoelectric proximity switches

NON-EMBEDDABLE MOUNTING

See **MOUNTING**.

NPN CONFIGURATION

The output device contains an NPN transistor, which switches the load towards zero voltage. The load is connected between the output terminal and the positive supply voltage $+U_B$. (Fig. 29).

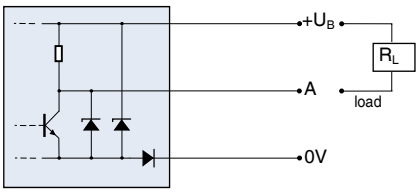


Fig. 29

OIL RESISTANCE

Long-term contact with any oils may affect plastics and weaken their resistance. However, inductive series 700 proximity switches, as well as the sealed (series E) and high-pressure-resistant (series P) types can be used in **oily environments** without restriction. For all other types, this is not necessarily the case.

Thus, please observe the following:

Lubricating oils:

Generally cause no problems. Use versions with oil-resistant PUR cable (special executions).

Hydraulic oils, cutting oils:

These attack most plastics. In particular, PVC cables discolor and become brittle. Measures:

- Wherever possible, avoid contact with these liquids, particularly at the sensing face.
- Use versions with oil-resistant PUR cable.

For photoelectric proximity switches, housing, optical unit, and cable should be considered separately:

Housing

The PBTP / polybutyleneterephthalate (Crastin) used for the housing is highly resistant to all conventional types of oil, in particular, to cutting and hydraulic oils, as well as drilling emulsions.

Optics

The windows are of glass, and are therefore not affected. However, oil on the light in- and outputs changes their optical properties. The effects should be examined from case to case.

Cable

The PVC cable used as standard is not resistant to most types of oils, and becomes brittle in long-term use. The optional PUR cable should therefore be used in oily environments.

OPERATING DISTANCE

The operating distance of inductive proximity switches is the distance at which a target approaching the sensing face triggers a signal change. The operating distance is measured according to IEC 60947-5-2 / EN 60947-5-2, using a **standard square target** moving **axially** (Fig. 30). This target is made of steel, e.g. type FE 360 in accordance with ISO 630, with a smooth surface, square shape, and thickness of 1 mm (Fig. 31). The sides equal the **diameter** of the inscribed circle of the sensing face or **three times the rated operating distance s_n** of the proximity switch, whichever is the greater.

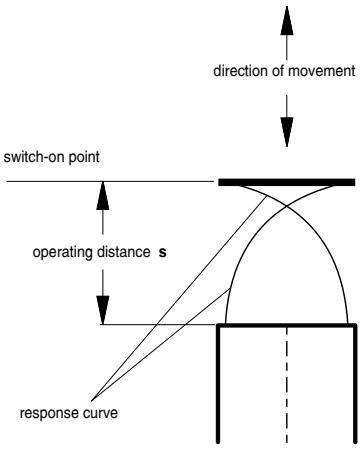


Fig. 30

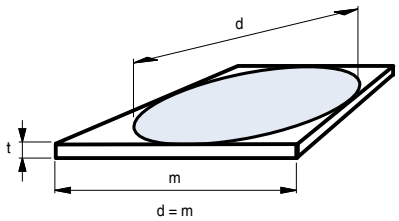


Fig. 31

Rated operating distance s_n

This is the operating distance for which the proximity switch is designed. It can be found under “technical data”.

Effective operating distance s_r

The measured operating distance for a given switch according to IEC 60947-5-2 / EN 60947-5-2.

$$0.9\ s_n \le s_r \le 1.1\ s_n$$

This means that the manufacturing tolerance must not exceed ± 10%.

Inductive proximity switches Photoelectric proximity switches

Usable operating distance s_u

This distance takes into account expected additional deviations caused by temperature and supply voltage fluctuations within the specified range.

$$0.9\ s_r \leq s_u \leq 1.1\ s_r$$

The temperature and supply voltage ranges can be found under “technical data”.

Assured operating distance s_a

$$0 \leq s_a \leq 0.81\ s_n$$

This operating distance is guaranteed by the manufacturer for all specified operating conditions. It is the **basis for a safe design**.

The specified operating distance of photoelectric proximity switches is the maximum usable distance between the switch and the standard target (energetic diffuse sensors); between the switch and the reference reflector (reflex sensors), and between the emitter and the receiver (through-beam sensors). The potentiometer must be set for maximum sensitivity, or for diffuse sensors with background suppression, for maximum operating distance. Moreover, the specified reflector (reflex sensors) or standard target (diffuse sensors) must be used.

OPTICAL FIBERS

An optical fiber can consist of a bundle of glass fibers, or one or more synthetic fibers. It is used to conduct light from one place to another, even around bends and curves. This is possible thanks to the phenomenon of total reflection. Total reflection always occurs when light coming from a material with a higher refractive index falls on an interface with a medium having a lower refractive index, in such a way that the critical angle required for total reflection is never reached.

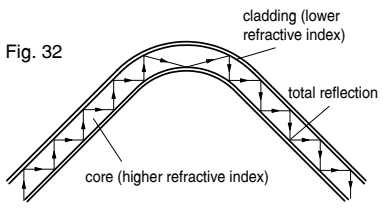


Fig. 32

The fibers consist of a core (with a higher refractive index) and a cladding (with a lower refractive index). Due to total reflection, the light is reflected backwards and forwards in the core, and can thus go round bends and curves.

OUTPUT CURRENT

The devices are designed for a given maximum output current. If this current is exceeded, even for only a short time, the **overload protection** trips. Incandescent lamps, capacitors, and other heavily capacitative loads (e.g. long leads) have a similar effect to overload (see also **CAPACITANCE**).

OUTPUT RESISTANCE

In order that the output voltage, even without external load, follows the switching state, CONTRINEX proximity switches contain a built-in output resistance (pull-up resistor). For operation at high switching frequencies, an additional external load resistor must be added (to reduce the electrical time constant).

OVERVOLTAGE PROTECTION

For maximum operating reliability and ease of use, CONTRINEX proximity switches feature a built-in protection circuit against very short, non-periodic supply voltage peaks, which complies with the requirements of IEC 60255-5.

P

PARALLEL CONNECTION

Connecting proximity switches in parallel, in order to perform logic functions, is possible without any problem (Figs. 33 and 34).

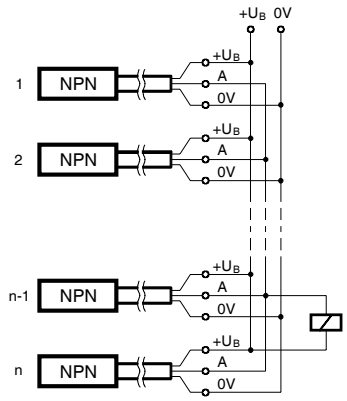


Fig. 33

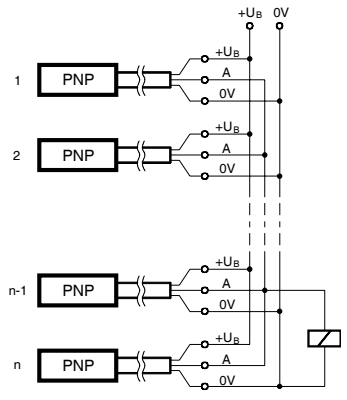


Fig. 34

Please note:

- The no-load supply current increases.
- Leakage currents add up, so that, even when closed, an inadmissible voltage drop can occur at the output.

PNP CONFIGURATION

The output device contains a PNP transistor, which switches the load towards the positive supply voltage $+U_B$. The load is connected between the output terminal and the negative supply voltage 0 V (Fig. 35).

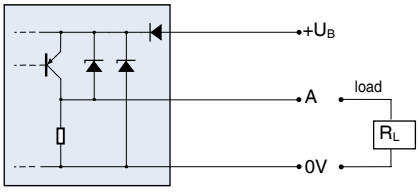


Fig. 35

POLARITY REVERSAL PROTECTION

Virtually all proximity switches in this catalog are protected against **any polarity reversal** at all terminals.

POLARIZATION FILTER

Natural light (including the light from the emitter diodes) is not polarized (Fig. 36). When light has passed

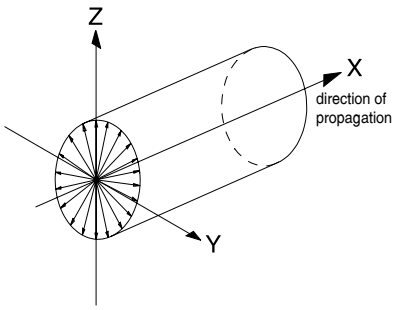


Fig. 36

through a polarizing filter however, only that part of the original light which oscillates in the filter polarization direction is still present (Fig. 37). Polarization is retained after reflection by mirrored surfaces, only the direction of polarization

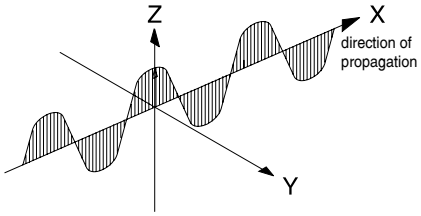


Fig. 37

may be altered. Diffuse reflection, on the other hand, destroys polarization. This difference can be used to suppress the disruptive effects caused by mirrored surfaces, by means of selection and configuration of suitable filters.

POWER-ON RESET

When switched on, the proximity switch output is activated for a short time due to physical reasons, even without the presence of a target in front of the sensing face. Proximity switches with power-on reset therefore include an additional circuit that closes the output for a short time during the switching-on phase, so suppressing an error signal (this function is also known as “switch-on pulse suppression”).

POWER SUPPLY UNITS

Circuit recommendations for suitable power supply units are shown in Figs. 38 and 39.

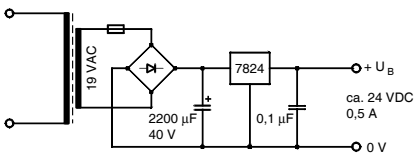


Fig. 38

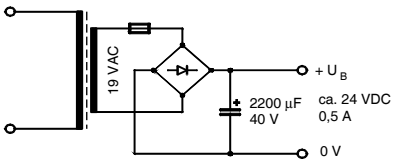


Fig. 39

The CONTRINEX accessory program also includes a suitable power supply unit (page 116).

Please observe:

- Unsuitable power supply units are the most frequent reason for proximity switch problems!
- A transformer and rectifier are not sufficient; at least a smoothing capacitor is essential (due to the ripple content).
- Transformers with a 24 V output, rear-position rectifier and smoothing capacitor deliver a no-load voltage of well above 30 V. Consequently, devices with a maximum supply voltage of 30 V can be damaged.

REFLECTORS

By means of built-in polarization filters, reflex sensors are designed so that they respond only to the light reflected from special reflectors. These operate according to the principle of the 3-way mirror (Fig. 40). The choice of the correct reflector for a specific application is determined by the required operating distance and installation possibilities. The reflector must be installed perpendicularly to the optical axis (tolerance ± 15°).

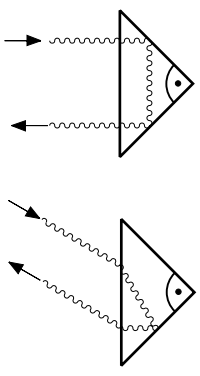


Fig. 40

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REPEAT ACCURACY

Repeat accuracy (according to IEC 60947-5-2 / EN 60947-5-2) is understood to be the repeat accuracy of the effective operating distance $\mathbf{s_r}$ over an 8-hour period at an ambient temperature of (23 ± 5) °C and with a specified supply voltage U_B. The specified repeat accuracy refers to this definition. Successive measurements made immediately one after the other generally lead to much better repeat accuracy.

RESPONSE DIAGRAM

The specified values for the operating distance refer to an **axial** approach of the target. For staggered or lateral movements, type-specific response curves are valid. Two typical examples are shown below (Fig. 41 and Fig. 42):

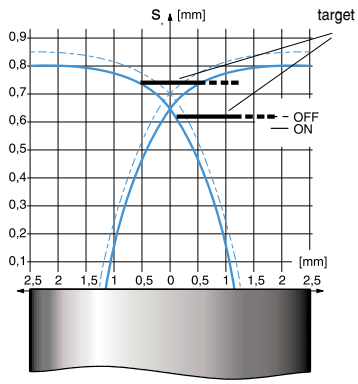


Fig. 41 DW-AD-403-M5

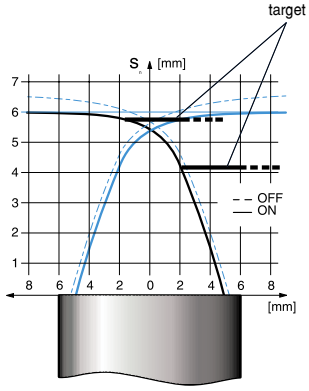


Fig. 42 DW-AD-503-M12

Depending on series, size, and mounting type (embeddable or non-embeddable), the response diagrams differ. Response diagrams for switch types not shown here are readily available from the corresponding individual data sheets. These can be found on the CONTRINEX website (www.contrinex.com), or ordered from our sales offices.

RIPPLE CONTENT (Fig. 43)

Too much ripple content causes undefined switching behavior. To remedy this, use a larger smoothing capacitor, or a stabilized power supply unit. The specified maximum supply voltage U_B must not be exceeded, not even during U_{SS} peaks.

$$W = \frac{U_{ss}}{U_d} \times 100\ (\%)$$

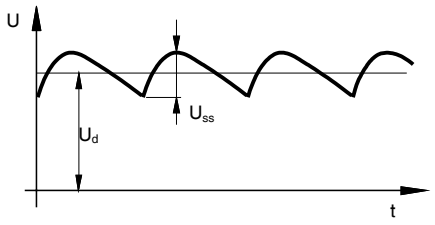


Fig. 43

S

SAFETY

The devices in this catalog **must not be used** in applications where the **safety of people** is dependent on their functioning.

SENSING RANGE

See OPERATING DISTANCE.

SERIES CONNECTION

The connection of switches in series in order to achieve logic functions is possible, but not recommended. The same effect can be achieved by the **parallel connection** of switches with **N.C. function** (instead of the series connection of switches with N.O. function), or vice versa. However, please note that, as a result, the output signal is inverted.

SHOCK RESISTANCE

The proximity switches in this catalog are tested for resistance to a shock of 30 g (30 times gravitational acceleration) for a period of 11 ms, according to IEC 60068-2-27.

SHORT-CIRCUIT PROTECTION

All DC devices feature built-in pulse protection against short-circuits and overloads, which alternately closes and opens the output when the maximum output current is exceeded, until the short-circuit is eliminated. Short-circuits between the output and the supply voltage terminals do not damage the switch, and are allowed **in permanence**. The same applies to overloads. During short-circuits, the LEDs do not function.

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SPHERICAL OPTICS

Spherical lenses are special cases of double convex lenses. They feature a short focal length and a good light incidence area. They are known for their use in the optical coupling of optical fibers, where the mentioned characteristics can be used to their advantage. New, however, is the use of such optics in coupling the light produced or received by a semiconductor chip (LED or photodiode) into (LED), or out of (photodiode) an optical space. Fig. 44 shows such a design, as it is used in the LTK-1040/1050-30#-50# switches (see pages 80 and 81). For

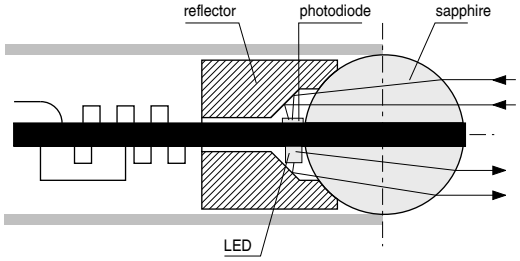


Fig. 44

the diffuse sensor, the sphere is cut in two, in order to separate the reception from the emission channel. The emitter and receiver semiconductor chips are mounted as closely as possible to the surface of the sphere. As can be seen in Fig. 44, the chips are positioned slightly off the optical axis. In optics, this is usually a disadvantage, but not in this case: The emitted beam and the sensing range of the receiver section “squint” somewhat, i.e. they cross at a specific distance from the device. Consequently, the operating distance is relatively short, but the sensing range is virtually cylindrical. This is unusual for photoelectric proximity switches, and allows for interesting new application possibilities, such as, for instance, the detection of targets through narrow holes or gaps.

STANDARDS

The proximity switches in this catalog comply, either completely or to a great extent, with the following standards:

- IEC 60947-5-1, **IEC 60947-5-2**, EN 60947-5-1, **EN 60947-5-2**
- IEC 60255-5
- IEC 61000-4-1, 61000-4-2, 61000-4-3, 61000-4-4, DIN EN 55011, DIN EN 55081-2, DIN EN 50140
- IEC 60529 / DIN 40050
- IEC 60947-1 / EN 60947-1 / DIN VDE 0660, part 100, part 100 A3, part 200, part 208
- DIN EN 50008, 50010, 50025, 50026, 50032, 50036, 50037, 50038, 50040, 50044

SUPPLY VOLTAGE U_B

The specified maximum supply voltages must **not be exceeded**. For maximum operating reliability and ease of use, CONTRINEX proximity switches contain a built-in protection circuit against very short, non-periodic, supply voltage peaks, which complies with the requirements of IEC 60255-5. Operating voltages below the lower specified limit, even for short periods, do not damage the switches, but impede their operation.

SWITCHING FREQUENCY

The maximum switching frequency of inductive proximity switches indicates the highest permissible number of pulses per second for a constant pulse/pause ratio of 1 : 2 at **half the rated operating distance s_n**. Measurement is according to IEC 60947-5-2 / EN 60947-5-2 (Fig. 45).

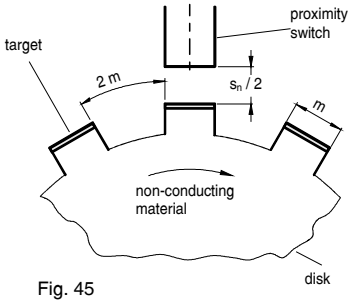


Fig. 45

The maximum switching frequency of photoelectric proximity switches is determined with the aid of a rotating sector disk. Designed so that a light to dark ratio of 1:1 results, it is placed in the path of the beam. The maximum switching frequency is reached just at the point where no output signal pulses are lost.

T

TEACH-IN

In the majority of applications, each sensor has to be adjusted according to the specific conditions. The adjustment usually concerns the operating distance, and is effected by turning a potentiometer screw. However, an alternative is offered by the teach-in process. Before starting the distance setting by teach-in, the target and/or the eventual background are positioned. Then, by pressing a button on the device, or remotely by means of an electrical signal, the teach process is launched, in which a built-in microcontroller, starting from the minimum value, increases the switching threshold until the output switches. This switching threshold is digitally stored by the microcontroller in a non-volatile

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memory (EEPROM), and determines the sensor's subsequent switching behavior. The microcontroller then adapts the switching threshold thus found to the respective application. Depending on the device, or the selected mode, the teach function is applied to the target, the background, or first to the one, and then the other. With newer devices, the teach process can also be remotely launched by means of a PLC via a control lead.

TEMPERATURE DRIFT

The set operating distances are subject to slight temperature influences. Due to built-in temperature compensation, this effect is much less important for devices of the 4040 series (approx. 0.1 %/°C) than for the other switches (approx. 0.3 %/°C). The operating distance, as a function of ambient temperature follows approximately the curves shown in Fig. 46.

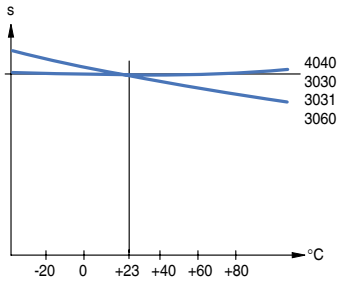


Fig. 46

The specified operating distances refer to a nominal ambient temperature of 23 °C. The operating distance, as a function of ambient temperature, follows approximately the curve shown in Fig. 47.

The temperature of the target itself has practically no influence on the operating distance. Within the permitted temperature range of, as a rule, -25 °C to +70 °C, the operating distance varies by a maximum of ±10% compared to its value at 23 °C.

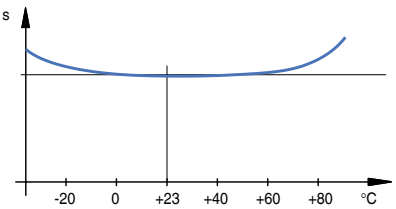


Fig. 47

TEST INPUT

The emitters of through-beam sensors, as well as a number of series 6080 types, are provided with a test input. Light emission can be switched on and off by means of this input, which, together with the corresponding evaluation of the receiver reaction, permits very efficient sensor monitoring.

TIGHTENING TORQUE

Over-tightening of the nuts can mechanically damage cylindrical proximity switches. The specified maximum permissible tightening torques must therefore not be exceeded.

Series 300, 400, 420, 500, 520, 600*, 620*

Size **D**	**M** (Nm)
M4	0.8
M5	1.5
M8	4
M12	10
M18	25 / *20
M30	70 / *40

Series 700

Size **D**	**M** (Nm)
M12	10
M18	50
M30	150

Series 1040/50, 1120, 1180

M5	1.5 Nm
M12	10 Nm
M18	20 Nm

TIME DELAY BEFORE AVAILABILITY

The time delay before availability is the maximum time the proximity switch requires for **operating readiness** after the supply voltage has been switched on.

V

VIBRATION RESISTANCE

The proximity switches in this catalog are tested for resistance to vibrations of 1 mm amplitude at 55 Hz, according to IEC 60068-2-6.

VOLTAGE DROP

In the switched-through condition, a (current dependent) voltage drop develops across the output transistor; the output voltage, therefore, does not entirely reach the corresponding supply voltage (to be particularly taken into account with series connection and electronic inputs).

W

WIRE-BREAK PROTECTION

All proximity switches in this catalog are equipped with wire-break protection. If a voltage supply lead breaks, the output is disabled, thus avoiding an error signal.

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WIRING

  Proximity switch cables must not be laid in parallel in the same cable runs as cables connected to **inductive loads** (i.e. protection solenoids, magnetic rectifiers, motors, etc.), or which conduct currents from **electronic motor drives**. Leads should be kept as short as possible; however, with suitable wiring (low coupling capacitance, small interference voltages), they can be up to 300 m long.

To reduce electromagnetic interference, apply the following measures:

- maintain the distance to interfering cables > 100 mm;
- use shields;
- install inductances (contactors, magnetic rectifiers, relays) with RC networks or varistors.

CONTRINEX

> For further information www.contrinex.com

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DW-AD-503-M12 (-12X/-XXX)

Inductive device	**DW**

Conventional inductive switch	**A**

Connection

Cable connection	**D**
Protective sleeve connection	**R**
Connector	**S**
Cable with moulded connector	**V**

Series

300 (ultraminiature)	**3**
400/420 (miniature)	**4**
500/520 (long operating dist.)	**5**
600/620 (standard)	**6**
700 (all-metal)	**7**

Embeddable	**0**
Non-embeddable	**1**
Increased operating distance	**2**

Polarity

NPN N.O.	**1**
NPN N.C.	**2**
PNP N.O.	**3**
PNP N.C.	**4**

Short / special executions

Size

Threaded

4	M4
5	M5
8	M8
12	M12
18	M18
30	M30

Smooth

3	Ø 3 mm
4	Ø 4 mm
65	Ø 6.5 mm
80	Ø 8 mm
5	5x5 mm
8	8x8 mm
44	40x40 mm
40	40x120 mm
60	60x80 mm
80	80x100 mm

Housing

M	threaded cylindrical housing
C	cuboid housing
0	smooth cylindrical housing
P	pressure-resistant

Polarity

2-wire DC

5	N.C. / Namur
6	N.O.

*2-wire UC**

7	N.O.
8	N.C.
9	with analog output

*UC: 20 ... 265 VAC / 20 ... 320 VDC

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CONTRINEX

Photoelectric proximity switches

LTS-1180-303 (-XXX)

Photoelectric device	**L**

Device type

For fiber / fiber	**F**
With background suppression	**H**
Through-beam sensor	**L**
Reflex sensor	**R**
Diffuse sensor	**T**
Accessory	**X**

Device with cable connection	**K**
Device with connector	**S**
Device with screw terminal	**T**
Synthetic optical fiber	**P**
Glass optical fiber	**G**
Reflector	**R**
Cutting tool	**F**
Mounting bracket	**W**

Series

Cylindrical devices	
Ø 4 mm	**1040**
M5	**1050**
M12	**1120**
M18	**1180**
M18 lateral light emission	**1180W**
Cuboid devices	
30x30 mm (high-performance)	**3030**
30x30 mm (standard)	**3031**
31x60 mm (teach-in)	**3065**
40x40 mm	**4040**
65x83 mm	**6080**
Synthetic optical fibers	
Diffuse sensor	**1###**
Through-beam sensor	**2###**
Miniature / standard	**#0##**
Flexible	**#1##**
Luminous	**#2##**
Glass optical fibers	
Axial diffuse sensor	**1###**
Radial diffuse sensor	**2###**
Axial through-beam sensor	**3###**
Radial through-beam sensor	**4###**
Accessories	**0###**
Universal mounting brackets	
For 3030 / 3031 series	**3030**
For 4040 series	**4040**
For 6080 series	**6080**

0	4-wire through-beam sensor
1	4-wire basic device
2	3-wire through-beam sensor
3	3-wire basic device

Special executions

Execution

00 3- or 4-wire through-beam sensor (emitter)

*4-wire device **NPN** execution, output:*
01 changeover or switchable
02 light-ON and excess light

*4-wire device **PNP** execution, output:*
03 changeover or switchable
04 light-ON and excess light

UC device*
10 through-beam (emitter)
15 with relay output
65 with relay output and timer

*3-wire device **NPN** execution, output:*
01 light-ON
02 dark-ON

*3-wire device **PNP** execution, output:*
03 light-ON
04 dark-ON

+50 with built-in timer

*UC: 20 ... 265 VAC / 20 ... 320 VDC

Dimensions

Synthetic optical fibers
020 length in dm (2 m)

Glass optical fibers
025 length in cm (0.25 m)
050 length in cm (0.50 m)
100 length in cm (1 m)

Accessories
000-001 general
012 reflector type 12
013 reflector type 13
014 reflector type 14
015 reflector type 15
025 reflector Ø 25.5 mm
046 reflector Ø 46.5 mm
084 reflector Ø 84 mm

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Connecting cables

S08-3FVW-020 (-XXX)

Connecting cable	**S**

Size

Connector M8	**08**
Connector M12	**12**
Connector M18	**18**

Number of poles

3-pole	**3**
4-pole	**4**

Type

Female	**F**

015	3-pole, N.O. & N.C.
904	NPN, LEDs
905	PNP, LEDs
921	100 pieces

Cable length

020	2 m (standard)
050	5 m
100	10 m

Cable exit

G	straight
W	right-angle

Cable type

U	PUR cable
V	PVC cable

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S08-3FUW-020	4/112
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S08-3FUW-020-905	4/112
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S08-3FVW-020	4/112
S08-4FUG-020	4/112
S08-4FUW-020	4/112
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