Inductive, Photoelectric and Ultrasonic Proximity Switches

Highlights:

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

New:

- All-metal inductive devices for food industry and sea-water applications
- High-temperature inductive devices
- Miniature inductive devices with long operating distance
- High-pressure-resistant executions
- Fiber-optic amplifiers with teach-in or potentiometer
- M8 inductive devices with analog output
- M8 all-metal inductive devices
- Cylindrical laser through-beam sensors
- Cylindrical and cuboid ultrasonic proximity switches

CONTRINEX

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Top-quality proximity switches

CONTRINEX has been manufacturing inductive and photoelectric proximity switches since its foundation in 1972. From small beginnings, the company has grown, and now employs over 300 people worldwide. 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** diameter 4 mm and M5, now also available with an improved operating distance of 2.5 mm. 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 unmatched by any other supplier.

In the meantime, CONTRINEX has launched another series of switches with characteristics far superior to those of conventional inductive proximity switches: **all-metal housings, long operating distances on steel** as well as **on non-ferrous metals** (series 700). These devices are now also available for the **food and pharmaceutical industries**, as well as for **sea-water applications**.

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

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Worldwide

CONTRINEX products are sold in over 50 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 factories 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 adaption 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.
- Ultrasonic proximity switches are employed wherever distances have to be measured in air. They detect transparent as well as colored targets in the solid, liquid, granular or powder state.

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1 Inductive proximity switches

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- Long operating distances
- Extreme environmental conditions
- Analog outputs

New:

- All-metal devices for food industry and sea-water applications
- High-temperature devices
- Miniature devices with long operating distance
- High-pressure-resistant executions
- M8 with analog output
- M8 with all-metal housings

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1 Inductive proximity switches

Housing size	Operating distance	Polarity				
	0.6 mm, 0.8 mm, 1.0 mm, 1.5 mm, 2.0 mm, 2.5 mm, 3.0 mm, 4.0 mm, 5.0 mm, 6.0 mm, 8.0 mm, 10 mm, 12 mm, 15 mm, 20 mm, 22 mm, 40 mm, 50 mm, 65 mm	PNP	NPN	NAMUR	2-wire DC	2-wire AC/DC
∅3 / M4	0.6 mm 1.0 mm	■ ■	■ ■	■		
∅4 / M5	0.8 mm 1.5 mm 2.5 mm	■ ■ ■	■ ■ ■	■		
5 x 5 mm	0.8 mm 1.5 mm	■ ■	■ ■	■		
∅6.5 mm	1.5 mm 2.0 mm 3.0 mm 4.0 mm	■ ■ ■ ■	■ ■ ■ ■	■		
M8 (∅8 mm)	1.5 mm 2.0 mm 2.5 mm 3.0 mm 4.0 mm 6.0 mm	■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■	■		
8 x 8 mm	1.5 mm 2.0 mm 3.0 mm	■ ■ ■	■ ■ ■			
M12	2.0 mm 4.0 mm 6.0 mm 8.0 mm 10 mm	■ ■ ■ ■ ■	■ ■ ■ ■ ■		■ ■	■ ■
M18	5.0 mm 8.0 mm 10 mm 12 mm 20 mm	■ ■ ■ ■ ■	■ ■ ■ ■ ■		■ ■	■ ■
M30	10 mm 15 mm 20 mm 22 mm 40 mm	■ ■ ■ ■ ■	■ ■ ■ ■ ■		■ ■	■ ■

PROGRAM OVERVIEW

Mounting			Supply voltage U_B			Connection					Page
Embeddable	Quasi-embeddable	Non-embeddable	PNP / NPN	NAMUR / 2-wire DC	2-wire AC/DC	Connector S8	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 - 22
■			10 ... 30 VDC			■		■			21 - 22
■			10 ... 30 VDC	7.7 ... 9 VDC		■		■			23
■			10 ... 30 VDC			■		■			23
■			10 ... 30 VDC	7.7 ... 9 VDC		■	■	■			24 - 26
■			10 ... 30 VDC			■	■	■			26 - 28
	■		10 ... 30 VDC			■	■	■			28 - 29
		■	10 ... 30 VDC			■		■			29
■			10 ... 30 VDC	7.7 ... 9 VDC		■	■	■			30 - 31 (29)
■			10 ... 30 VDC			■	■	■			32 - 33 (29)
		■	10 ... 30 VDC			■	■	■			34 - 35
■	■		10 ... 30 VDC			■	■	■		■	35 - 36
	■	■	10 ... 30 VDC			■	■	■			36 - 37
		■	10 ... 30 VDC			■	■	■		■	37 - 38
■			10 ... 30 VDC			■		■			38 - 39
■			10 ... 30 VDC			■		■			39
	■		10 ... 30 VDC			■		■			39
■			10 ... 30 VDC	10 ... 65 VDC	20...265 VAC / 20...320 VDC		■	■		■*	40 - 41
■		■	10 ... 30 VDC	10 ... 65 VDC	20...265 VAC / 20...320 VDC		■	■		■*	41 - 43
■	■		10 ... 30 VDC				■	■		■	44
	■		10 ... 30 VDC				■	■			45
		■	10 ... 30 VDC				■	■		■	45 - 46
■			10 ... 30 VDC	10 ... 65 VDC	20...265 VAC / 20...320 VDC		■	■		■*	46 - 48
	■	■	10 ... 30 VDC	10 ... 65 VDC	20...265 VAC / 20...320 VDC		■	■		■*	48 - 51
■			10 ... 30 VDC				■	■		■	51
	■		10 ... 30 VDC				■	■			52
		■	10 ... 30 VDC				■	■		■	53
■			10 ... 30 VDC	10 ... 65 VDC	20...265 VAC / 20...320 VDC		■	■		■*	54 - 55
		■	10 ... 30 VDC	10 ... 65 VDC	20...265 VAC / 20...320 VDC		■	■		■*	55 - 57
■			10 ... 30 VDC				■	■		■	57
	■		10 ... 30 VDC				■	■			58
		■	10 ... 30 VDC				■	■		■	58 - 59

*on request

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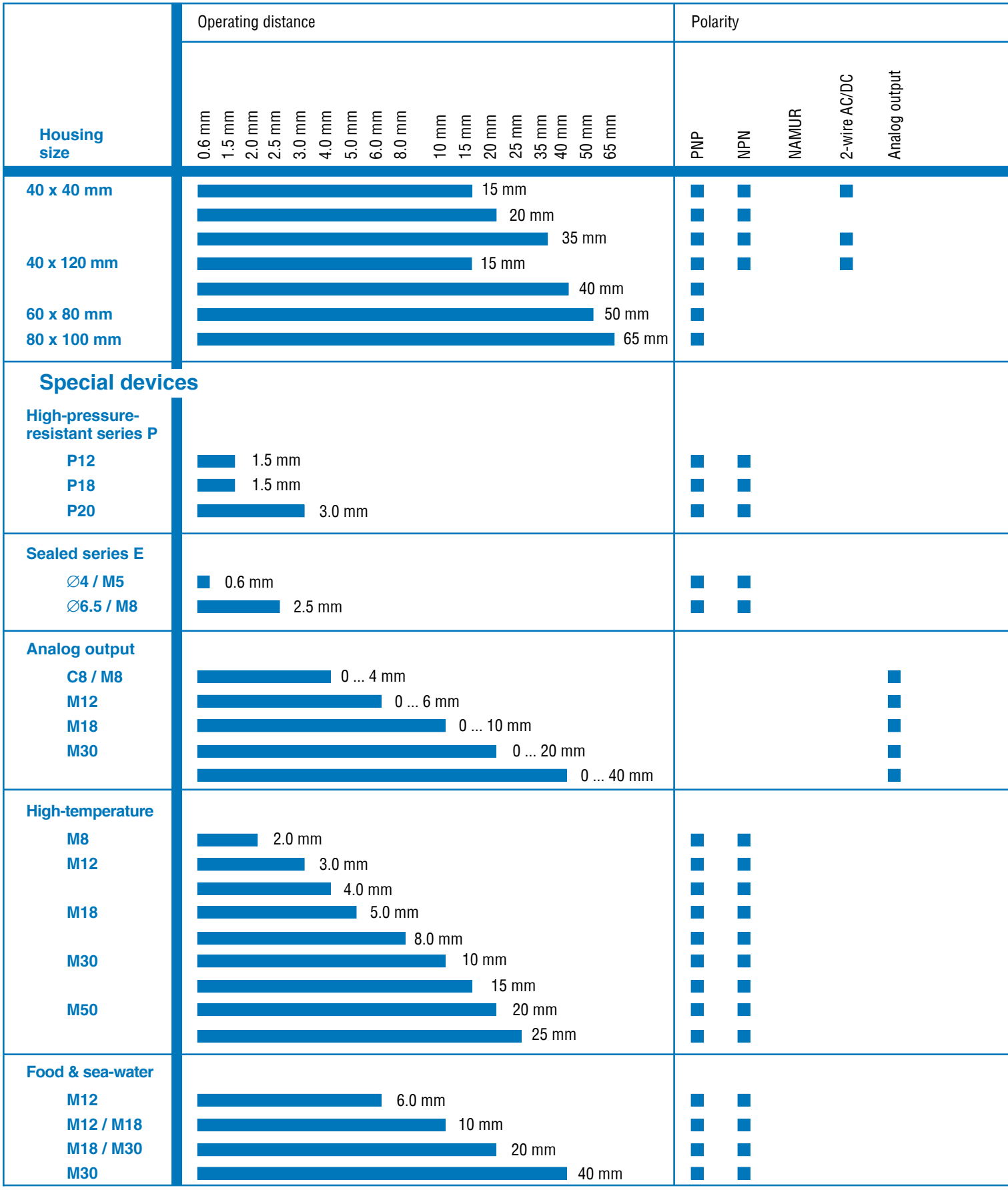
1 Inductive proximity switches



PROGRAM OVERVIEW

Mounting			Supply voltage U_B		Connection					Max. amb. temp.			Page
Embeddable	Quasi-embeddable	Non-embeddable	PNP / NPN	NAMUR / 2-wire	Connector S8	Connector S12	Cable	Screw terminal	All-metal housing	140 / 150 °C	180 °C	230 °C	
■			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				■					61
		■	10 ... 65 VDC					■					62
		■	10 ... 65 VDC					■					62
		■	10 ... 65 VDC					■					62
■			10 ... 30 VDC			■	■						63 - 64
■			10 ... 30 VDC			■							64
■			10 ... 30 VDC			■	■						65
■			10 ... 30 VDC				■						65
■			10 ... 30 VDC				■						65
	■		10/15 ... 30 VDC		■	■	■						66
	■		10/15 ... 30 VDC			■	■						67
	■		10/15 ... 30 VDC			■	■						67 - 68
	■		10/15 ... 30 VDC			■	■						68 - 69
		■	10/15 ... 30 VDC			■	■						69
■			10 ... 30 VDC				■			■			70
■			10 ... 30 VDC				■			■			70
		■	10 ... 30 VDC				■			■			70
■			10 ... 30 VDC				■				■	■	71
		■	10 ... 30 VDC				■				■		71
■			10 ... 30 VDC				■				■	■	72
		■	10 ... 30 VDC				■				■	■	72
	■		10 ... 30 VDC				■				■	■	73
		■	10 ... 30 VDC				■				■	■	73
■			10 ... 30 VDC			■	■		■				74
■		■	10 ... 30 VDC			■	■		■				74
■		■	10 ... 30 VDC			■	■		■				75
		■	10 ... 30 VDC			■	■		■				75

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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.

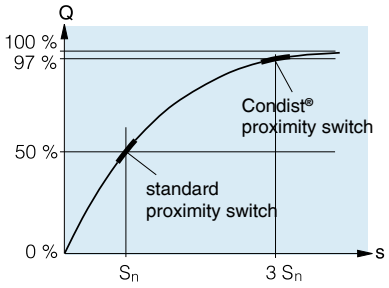

Fig. 3

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.

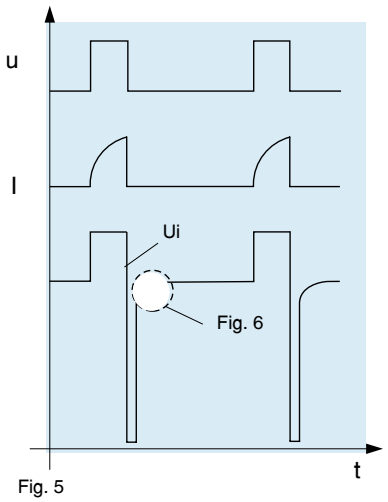

Fig. 5

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.

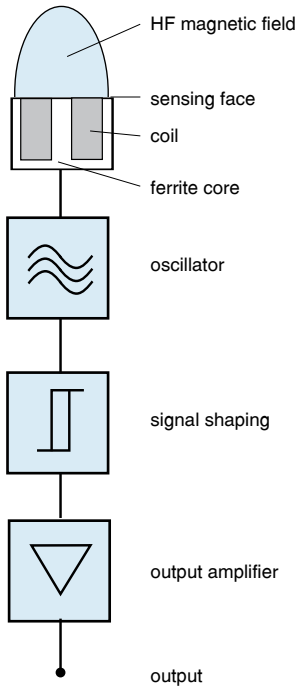

Fig. 1

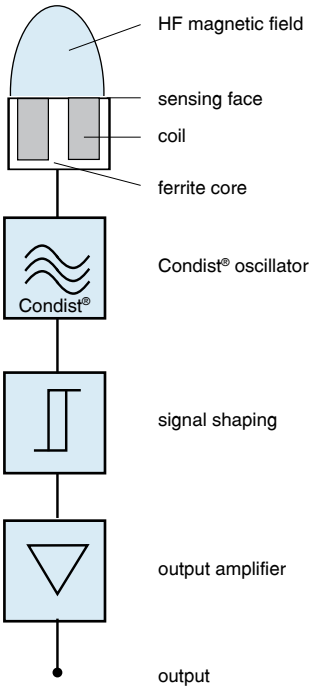

Fig. 2

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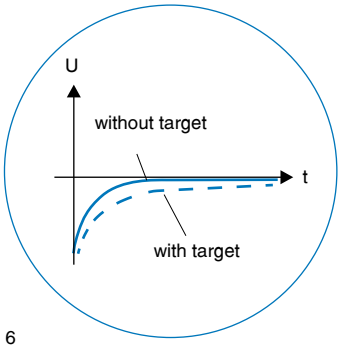

Fig. 6

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.

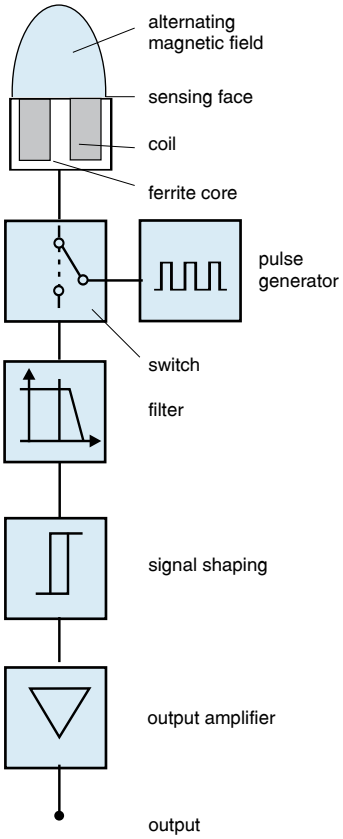

Fig. 4

Small sizes

The small devices operate with conventional (Fig. 1) or Condist® (Fig. 2) technology. 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 amongst 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.

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

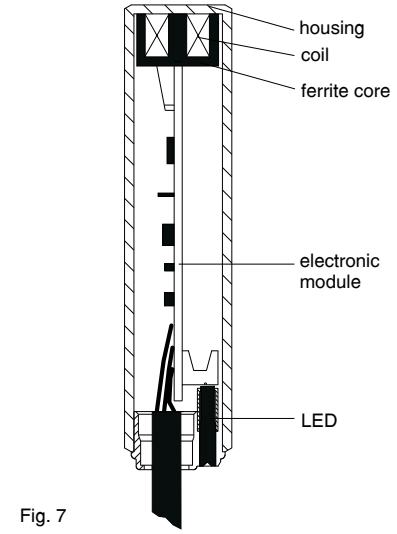

Fig. 7

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.

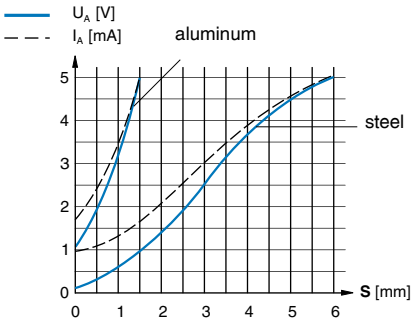

Fig. 8

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 sometimes made of plastic. As a result, when used in normal operating environments (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

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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.

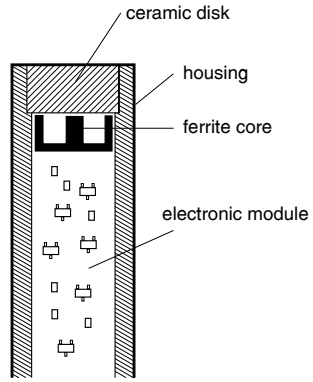


Fig. 9

The housing is heat shrunk onto the ceramic disk. Without any further measures, such as additional 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.**

High-temperature series

These devices are suitable for applications up to 140°C, 150°C, 180°C (built-in amplifier) and 230°C (external amplifier).

All-metal food and sea-water series

These devices work using Condet® technology (Fig. 4) and are a further development of the series 700 all-metal switches. They are **food safe** and **corrosion resistant** (V4A / AISI 316L / DIN 1.4435) and feature **IP 68 + IP 69K**.

Product overview

Series 300

The delivery program includes sizes diameter 3 mm smooth and M4 in 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. configurations; 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 diameter 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. configurations; 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 diameter 6.5 mm smooth and M8. These devices are distinguished by their **extremely short lengths**. The execution with right-angled cable exit 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. configurations; 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 from diameter 4 mm to M30 in quasi-embeddable (Ø 4 mm and M5 recess mountable) 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).

The devices are available in 3-wire DC NPN and PNP executions, in either N.O. or 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**. For most models, 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, devices are available in sizes C8, M8, M12, M18, and M30 quasi-embeddable, as well as M30 non-embeddable.

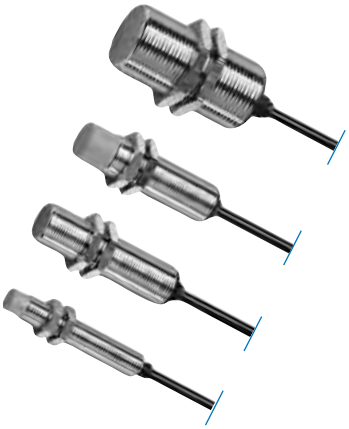
Series 520

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 AC/DC models (for 20 ... 265 VAC, or 20 ... 320 VDC) as well as 2-wire DC execution (for 10 ... 65 VDC). 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 120 mm (IEC I1C40 / I2C40), 60 x 80 mm and 80 x 100 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. In addition, there are 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 C5 and C8 cuboids, are currently available.

Series 700

At the present time, the delivery program includes sizes M8, M12, M18, and M30 in embeddable and non-embeddable executions. Further sizes are in preparation. The available sizes are basically standardized. Varying from the standard, the series 700 offers however **long operating distances**. These operating distances are moreover also achieved on the most important **non-ferrous metals.** Of further particular interest is the **one-piece** stainless steel housing, sensing face included.

The range includes devices of food-safe and corrosion-resistant stainless steel (V4A / AISI 316L / DIN 1.4435), featuring IP 68 + IP 69K degree of protection, for the **food and pharmaceutical industries**, as well as for **sea-water applications**.

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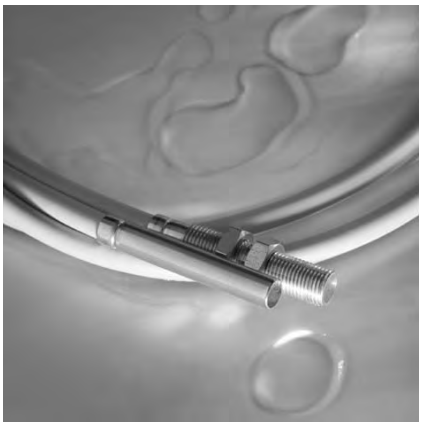
All devices are available in 3-wire DC NPN and PNP executions. All 3-wire models are available in N.O. and N.C. configurations; a LED output state indicator is standard. In addition, all the important protection functions are built in, such as short-circuit and overload protection, full polarity reversal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

Sealed series E

At the present time, the delivery program includes sizes 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 bar.** 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.

High-temperature series

The delivery program includes sizes from M8 to M50 in embeddable and non-embeddable executions. The devices are intended for demanding applications in high-temperature areas, and are respectively suitable for ambient temperatures of up to **140 °C, 150 °C, 180 °C and 230 °C**. Executions up to 180 °C feature built-in amplifiers, and connection by means of a 2 m silicone or Teflon cable is standard. For 230 °C types, the amplifiers are built into an M12 stainless-steel housing, which is connected by means of a standard 3 m Teflon cable, and thus removed from the hot area.

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), or 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.** CE

CONTRINEX

SERIES 300

SERIES 620

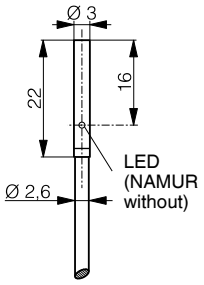
Housing size	Ø 3				Ø 3	
Operating distance mm	0.6		0.6		1.0	1.0
Housing material	Stainless steel V2A		Stainless steel V2A		Stainless steel V2A	Stainless steel V2A
Connection [1]	PUR cable type 1		PUR cable type 1 / Connec. S8		PUR cable type 1	PUR cable type 1 / Connec. S8
Degree of protection	IP 67		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 1	Table 5	Table 1	Table 5	Table 1	Table 1
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

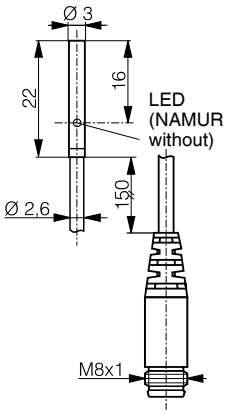
[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 76
[3] see page 77
[4] see page 146

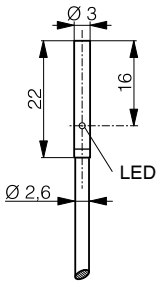
increased distance

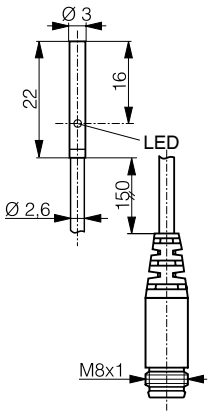
increased distance

Dimensions:









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

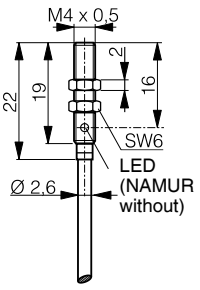
NPN N.O.	**DW-AD-301-03**		**DW-AS-301-03**		**DW-AD-621-03**	**DW-AS-621-03**
NPN N.C.	DW-AD-302-03		DW-AS-302-03		DW-AD-622-03	DW-AS-622-03
PNP N.O.	**DW-AD-303-03**		**DW-AS-303-03**		**DW-AD-623-03**	**DW-AS-623-03**
PNP N.C.	DW-AD-304-03		DW-AS-304-03		DW-AD-624-03	DW-AS-624-03
NAMUR		**DW-AD-305-03**		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

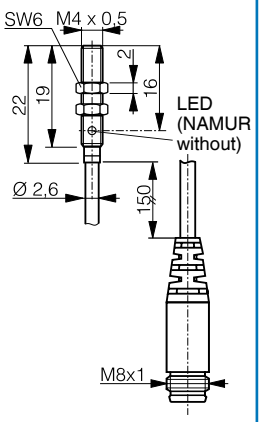
*damped / non-damped

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 1	Table 5	Table 1	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

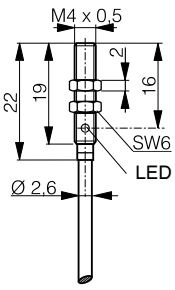
*damped / non-damped

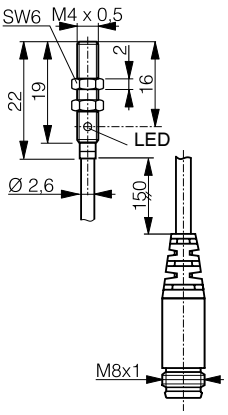
SERIES 620

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 1	Table 1
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



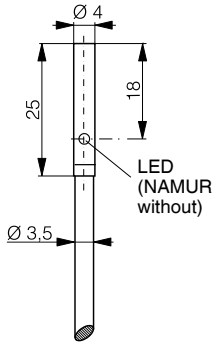


DW-AD-621-M4	**DW-AS-621-M4**
DW-AD-622-M4	DW-AS-622-M4
DW-AD-623-M4	**DW-AS-623-M4**
DW-AD-624-M4	DW-AS-624-M4
	A ... D

S 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.

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CONTRINEX

SERIES 400

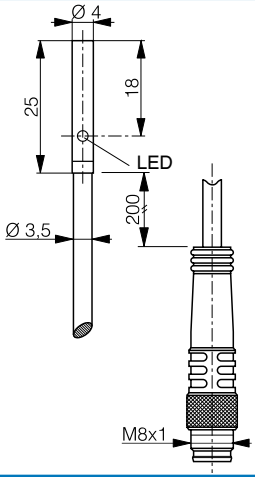
SERIES

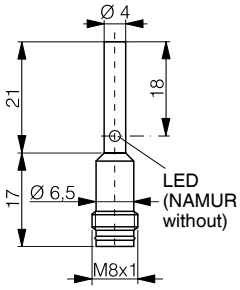
Housing size	Ø 4			Ø 4
Operating distance mm	**0.8**	**0.8**	**0.8**	**1.5**
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection [1]	PVC cable type 2 / Connec. S8	Connector S8	Single wires	PVC cable type 2
Degree of protection	IP 67	IP 67	IP 67	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

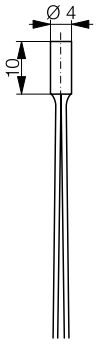
[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 76
[3] see page 77
[4] see page 146

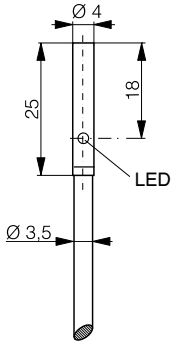
increased distance

Dimensions:





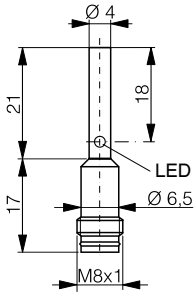
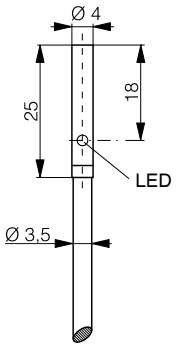
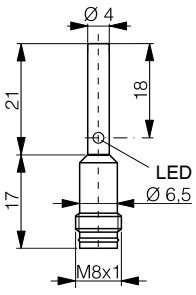
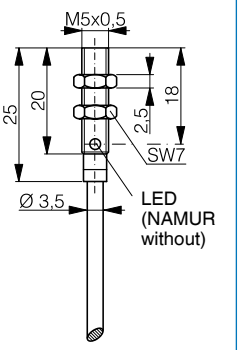
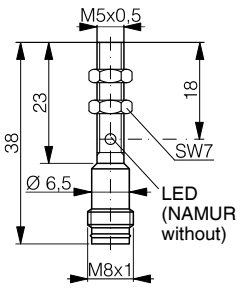




Part references:
(**bold:** preferred types)

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 500		SERIES 400			
	Ø 4		M5			
1.5	2.5	2.5	0.8		0.8	
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	800 Hz	800 Hz	5,000 Hz	10,000 Hz	5,000 Hz	10,000 Hz
Table 1	Table 1	Table 1	Table 1	Table 5	Table 1	Table 5
Diagram 1	Diagram 1	Diagram 1	Diagram 1	Diagram 4	Diagram 1	Diagram 4
Built-in	Built-in	Built-in	Built-in	---	Built-in	---
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	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	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 1 / ≥ 2.2 mA*	≤ 200 mA	≤ 1 / ≥ 2.2 mA*
						
increased distance	long distance	long distance				
						
DW-AS-621-04	**DW-AD-501-04****	**DW-AS-501-04****	**DW-AD-401-M5**		**DW-AS-401-M5**	
DW-AS-622-04	DW-AD-502-04**	DW-AS-502-04**	DW-AD-402-M5		DW-AS-402-M5	
DW-AS-623-04	**DW-AD-503-04**	**DW-AS-503-04****	**DW-AD-403-M5**		**DW-AS-403-M5**	
DW-AS-624-04	DW-AD-504-04**	DW-AS-504-04**	DW-AD-404-M5		DW-AS-404-M5	
				DW-AD-405-M5		**DW-AS-405-M5**
A ... D		A ... D			A ... D	A, B

** Please check availability

*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.

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CONTRINEX

SERIES 620

SERIES 500

Housing size	M5		M5	
Operating distance mm	1.5	1.5	2.5	2.5
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
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	3,000 Hz	3,000 Hz	800 Hz	800 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 76
[3] see page 77
[4] see page 146

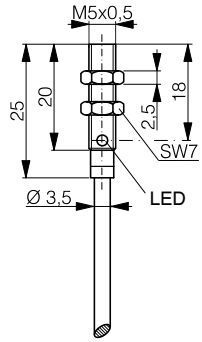
increased distance

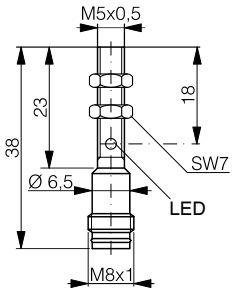
increased distance

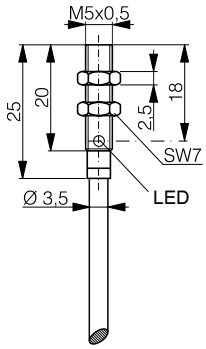
long distance

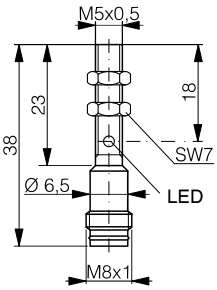
long distance

Dimensions:









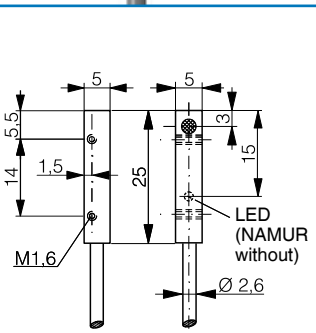
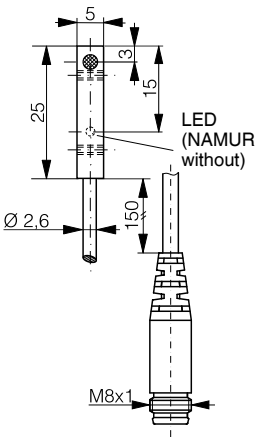
Part references:
(**bold:** preferred types)

NPN N.O.	**DW-AD-621-M5**	**DW-AS-621-M5**	**DW-AD-501-M5****	**DW-AS-501-M5****
NPN N.C.	DW-AD-622-M5	DW-AS-622-M5	DW-AD-502-M5**	DW-AS-502-M5**
PNP N.O.	**DW-AD-623-M5**	**DW-AS-623-M5**	**DW-AD-503-M5**	**DW-AS-503-M5****
PNP N.C.	DW-AD-624-M5	DW-AS-624-M5	DW-AD-504-M5**	DW-AS-504-M5**
NAMUR				
AC/DC 2-wire N.O.				
AC/DC 2-wire N.C.				
Compatible connectors [4]		A ... D		A ... D

** Please check availability

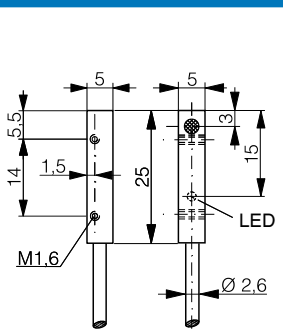
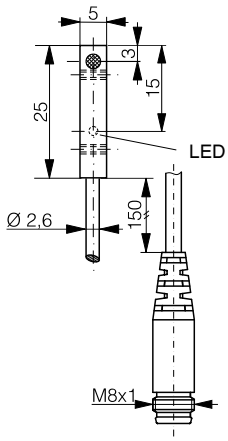
SERIES 400

☐5x5

0.8		0.8	
Nickel-chrome-plated brass		Nickel-chrome-plated brass	
PUR cable type 1		PUR cable type 1 / Connector S8	
IP 67		IP 67	
Embeddable		Embeddable	
5,000 Hz	10,000 Hz	5,000 Hz	10,000 Hz
Table 1	Table 5	Table 1	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
≤ 200 mA	≤ 1 / ≥ 2.2 mA*	≤ 200 mA	≤ 1 / ≥ 2.2 mA*
			
			
DW-AD-401-C5		**DW-AS-401-C5**	
DW-AD-402-C5		DW-AS-402-C5	
DW-AD-403-C5		**DW-AS-403-C5**	
DW-AD-404-C5		DW-AS-404-C5	
	DW-AD-405-C5		DW-AS-405-C5
		A ... D	A, B

SERIES 620

☐5x5

1.5	1.5
Nickel-chrome-plated brass	Nickel-chrome-plated brass
PUR cable type 1	PUR cable type 1 / Connector S8
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-C5	**DW-AS-621-C5**
DW-AD-622-C5	DW-AS-622-C5
DW-AD-623-C5	**DW-AS-623-C5**
DW-AD-624-C5	DW-AS-624-C5
	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.

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CONTRINEX

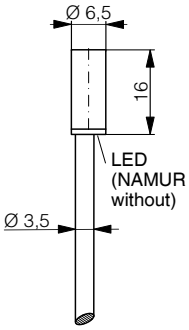
SERIES 420

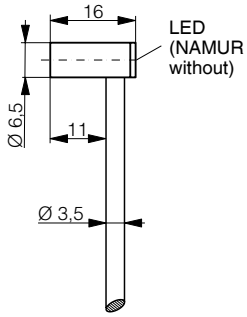
SERIES 600

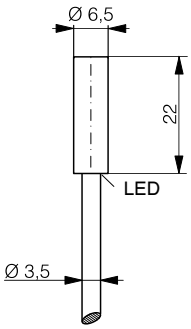
Housing size	Ø 6.5				Ø 6.5
Operating distance mm	1.5		1.5		1.5
Housing material	Stainless steel V2A		Stainless steel V2A		Stainless steel V2A
Connection [1]	PVC cable type 2		PVC cable type 2		PVC cable type 2
Degree of protection	IP 67		IP 67		IP 67
Mounting	Embeddable		Embeddable		Embeddable
Max. switching frequency	5,000 Hz	10,000 Hz	5,000 Hz	10,000 Hz	5,000 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 76
[3] see page 77
[4] see page 146

Dimensions:







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

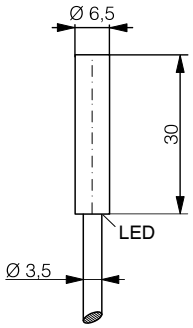
NPN N.O.	**DW-AD-421-065**		**DW-AD-421-065-400**		**DW-AD-601-065-121**
NPN N.C.	DW-AD-422-065		DW-AD-422-065-400		DW-AD-602-065-121
PNP N.O.	**DW-AD-423-065**		**DW-AD-423-065-400**		**DW-AD-603-065-121**
PNP N.C.	DW-AD-424-065		DW-AD-424-065-400		DW-AD-604-065-121
NAMUR		**DW-AD-425-065**		DW-AD-425-065-400	
AC/DC 2-wire N.O.					
AC/DC 2-wire N.C.					
Compatible connectors [4]					

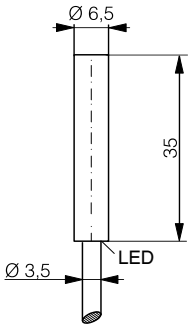
*damped / non-damped

SERIES 600

Ø 6.5

1.5	1.5
Stainless steel V2A	Stainless steel V2A
PVC cable type 2	PVC cable type 2
IP 67	IP 67
Embeddable	Embeddable
5,000 Hz	5,000 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



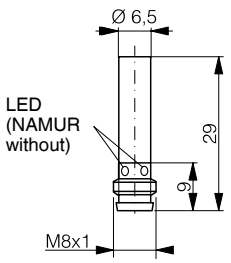


DW-AD-601-065-122	DW-AD-601-065
DW-AD-602-065-122	DW-AD-602-065
DW-AD-603-065-122	DW-AD-603-065
DW-AD-604-065-122	DW-AD-604-065

SERIES 420

Ø 6.5

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*



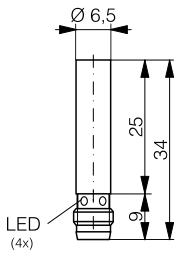
DW-AS-421-065-001	
DW-AS-422-065-001	
DW-AS-423-065-001	
DW-AS-424-065-001	
	DW-AS-425-065-001
A ... D	A, B

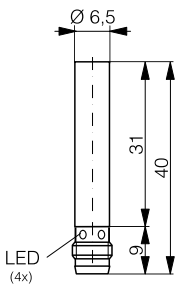
*damped / non-damped

SERIES 600

Ø 6.5

1.5	1.5
Stainless steel V2A	Stainless steel V2A
Connector S8	Connector S8
IP 67	IP 67
Embeddable	Embeddable
5,000 Hz	5,000 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





DW-AS-601-065-123	DW-AS-601-065-124
DW-AS-602-065-123	DW-AS-602-065-124
DW-AS-603-065-123	DW-AS-603-065-124
DW-AS-604-065-123	DW-AS-604-065-124
A ... D	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.

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CONTRINEX SERIES 600 — SERIES 620

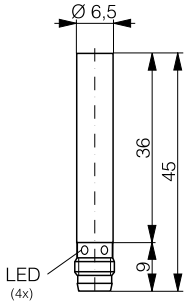
Housing size	Ø 6.5		Ø 6.5	
Operating distance mm	**1.5**	**1.5**	**2**	**2**
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection [1]	Connector S8	Connector S12	PVC cable type 2	PVC cable type 2
Degree of protection	IP 67	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable	Embeddable
Max. switching frequency	5,000 Hz	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 2	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

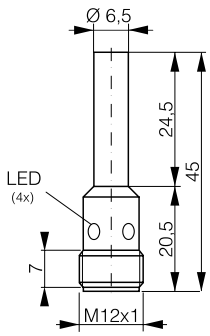
[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 76
[3] see page 77
[4] see page 146

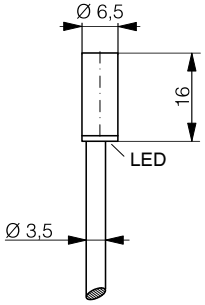
increased distance

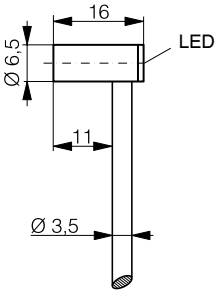
increased distance

Dimensions:





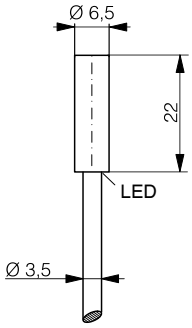
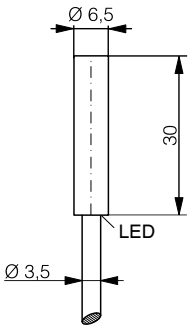
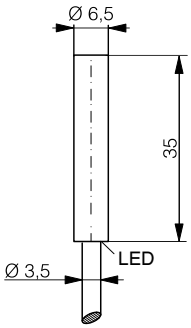
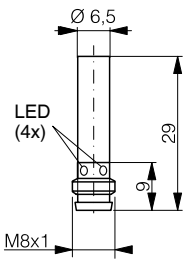
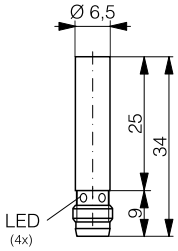




Part references:
(**bold:** preferred types)

NPN N.O.	**DW-AS-601-065-001**	**DW-AS-601-065**	**DW-AD-621-065-120**	**DW-AD-621-065-400**
NPN N.C.	DW-AS-602-065-001	DW-AS-602-065	DW-AD-622-065-120	DW-AD-622-065-400
PNP N.O.	**DW-AS-603-065-001**	**DW-AS-603-065**	**DW-AD-623-065-120**	**DW-AD-623-065-400**
PNP N.C.	DW-AS-604-065-001	DW-AS-604-065	DW-AD-624-065-120	DW-AD-624-065-400
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.)		

Ø 6.5

2	2	2	2	2
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
PVC cable type 2	PVC cable type 2	PVC cable type 2	Connector S8	Connector S8
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 1
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-AD-621-065-121	**DW-AD-621-065-122**	**DW-AD-621-065**	**DW-AS-621-065-129**	**DW-AS-621-065-123**
DW-AD-622-065-121	DW-AD-622-065-122	DW-AD-622-065	DW-AS-622-065-129	DW-AS-622-065-123
DW-AD-623-065-121	**DW-AD-623-065-122**	**DW-AD-623-065**	**DW-AS-623-065-129**	**DW-AS-623-065-123**
DW-AD-624-065-121	DW-AD-624-065-122	DW-AD-624-065	DW-AS-624-065-129	DW-AS-624-065-123
			A ... D	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.

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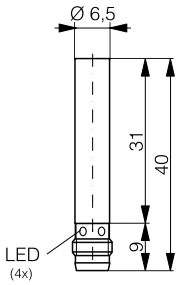
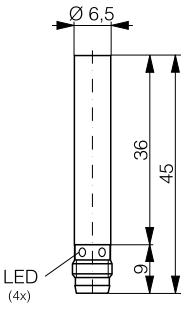
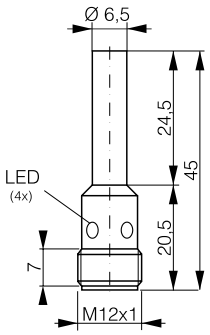
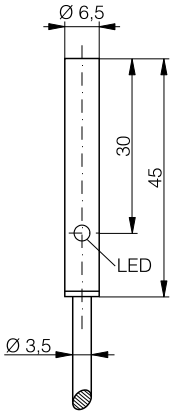
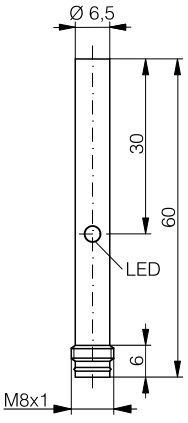
CONTRINEX

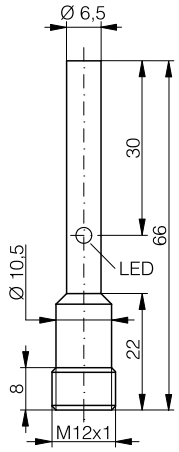
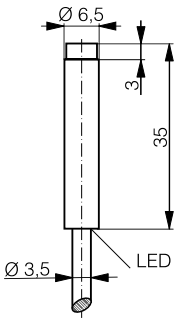
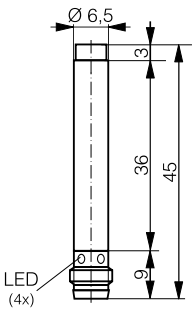
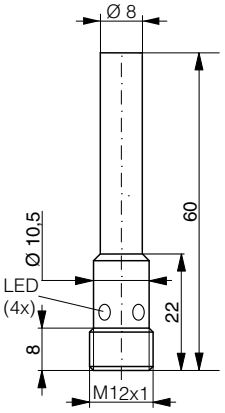
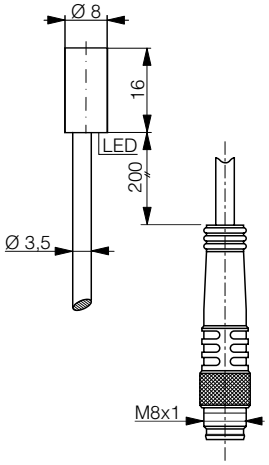
SERIES 620

SERIES

Housing size	Ø 6.5			Ø 6.5	
Operating distance mm	2	2	2	3	3
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Chrome-plated brass	Chrome-plated brass
Connection [1]	Connector S8	Connector S8	Connector S12	PVC cable type 2	Connector S8
Degree of protection	IP 67	IP 67	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable	Quasi-embeddable	Quasi-embeddable
Max. switching frequency	3,000 Hz	3,000 Hz	3,000 Hz	1,000 Hz	1,000 Hz
Technical data [2]	Table 1	Table 1	Table 1	Table 1	Table 1
Wiring [3]	Diagram 1	Diagram 1	Diagram 2	Diagram 1	Diagram 1
LED	Built-in	Built-in	Built-in	Built-in	Built-in
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 ... +70 °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 76
[3] see page 77
[4] see page 146

	increased distance	increased distance	increased distance	long distance	long distance
Dimensions:					
Part references: (**bold:** preferred types)					
NPN N.O.	**DW-AS-621-065-124**	**DW-AS-621-065-001**	**DW-AS-621-065**	**DW-AD-501-065**	**DW-AS-501-065-001**
NPN N.C.	DW-AS-622-065-124	DW-AS-622-065-001	DW-AS-622-065	DW-AD-502-065	DW-AS-502-065-001
PNP N.O.	**DW-AS-623-065-124**	**DW-AS-623-065-001**	**DW-AS-623-065**	**DW-AD-503-065**	**DW-AS-503-065-001**
PNP N.C.	DW-AS-624-065-124	DW-AS-624-065-001	DW-AS-624-065	DW-AD-504-065	DW-AS-504-065-001
NAMUR					
AC/DC 2-wire N.O.					
AC/DC 2-wire N.C.					
Compatible connectors [4]	A ... D	A ... D	G ... N (N.O.); K ... N (N.C.)		A ... D

500	SERIES 620		S 600	S 620
Ø 6.5	Ø 6.5		Ø 8	Ø 8
3	4	4	1.5	2
Chrome-plated brass	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Chrome-plated brass
Connector S12	PVC cable type 2	Connector S8	Connector S12	PVC cable type 2 / S8
IP 67	IP 67	IP 67	IP 67	IP 67
Quasi-embeddable	Non-embeddable	Non-embeddable	Embeddable	Embeddable
1,000 Hz	2,500 Hz	2,500 Hz	5,000 Hz	3,000 Hz
Table 1	Table 1	Table 1	Table 1	Table 1
Diagram 2	Diagram 1	Diagram 1	Diagram 2	Diagram 1
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
				
long distance	increased distance	increased distance		increased distance
				
DW-AS-501-065	**DW-AD-631-065**	**DW-AS-631-065-001**		
DW-AS-502-065	DW-AD-632-065	DW-AS-632-065-001		
DW-AS-503-065	**DW-AD-633-065**	**DW-AS-633-065-001**	**DW-AS-603-080-168**	**DW-AV-623-080-236**
DW-AS-504-065	DW-AD-634-065	DW-AS-634-065-001		
G ... N (N.O.); K ... N (N.C.)		A ... D	G ... N	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.

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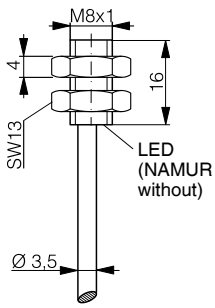
CONTRINEX S420

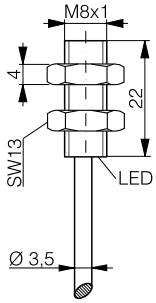
SERIES 600

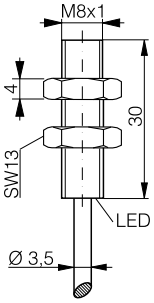
Housing size	M8		M8		
Operating distance mm	1.5		1.5	1.5	1.5
Housing material	Stainless steel V2A		Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection [1]	PVC cable type 2		PVC cable type 2	PVC cable type 2	PVC cable type 2
Degree of protection	IP 67		IP 67	IP 67	IP 67
Mounting	Embeddable		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

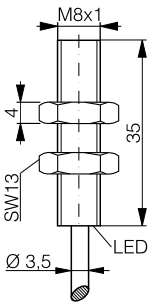
[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 76
[3] see page 77
[4] see page 146

Dimensions:









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

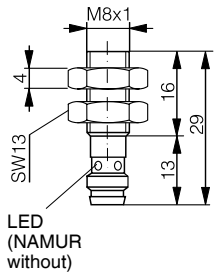
NPN N.O.	**DW-AD-421-M8**		**DW-AD-601-M8-121**	**DW-AD-601-M8-122**	**DW-AD-601-M8**
NPN N.C.	DW-AD-422-M8		DW-AD-602-M8-121	DW-AD-602-M8-122	DW-AD-602-M8
PNP N.O.	**DW-AD-423-M8**		**DW-AD-603-M8-121**	**DW-AD-603-M8-122**	**DW-AD-603-M8**
PNP N.C.	DW-AD-424-M8		DW-AD-604-M8-121	DW-AD-604-M8-122	DW-AD-604-M8
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*

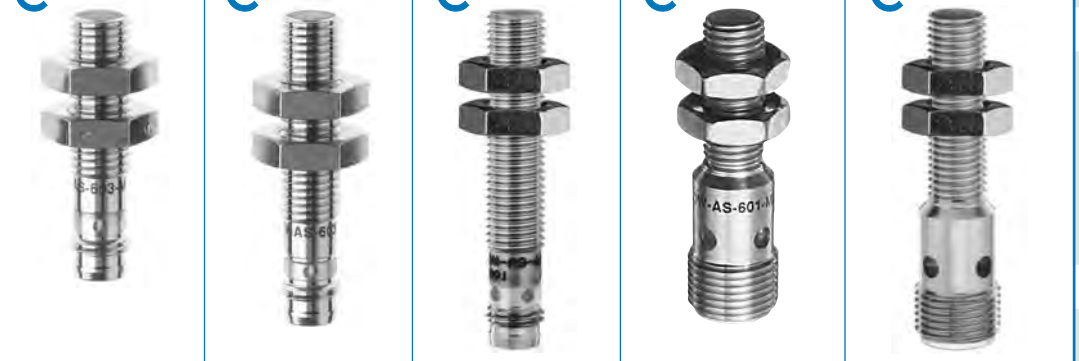


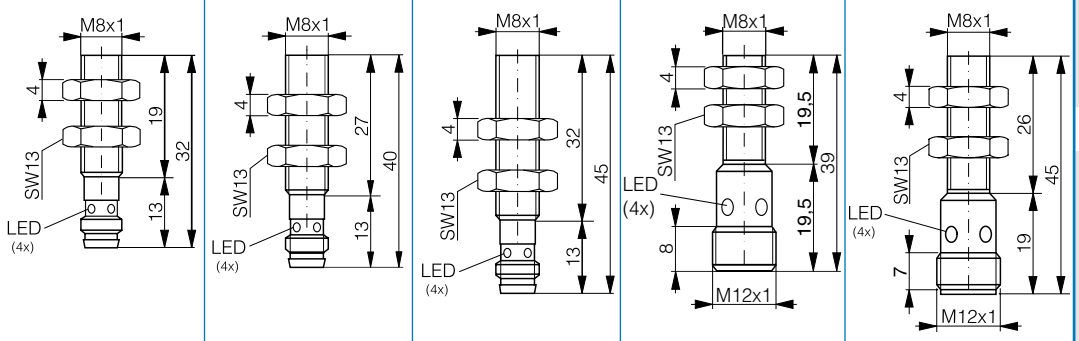
DW-AS-421-M8-001	
DW-AS-422-M8-001	
DW-AS-423-M8-001	
DW-AS-424-M8-001	
	DW-AS-425-M8-001
A ... D	A, B

SERIES 600

M8

1.5	1.5	1.5	1.5	1.5
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
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.)

*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.

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Housing 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 76
[3] see page 77
[4] see page 146

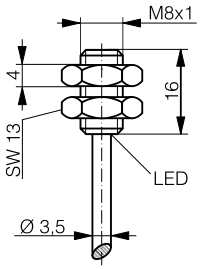
increased distance

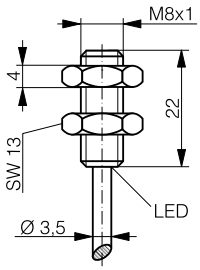
increased distance

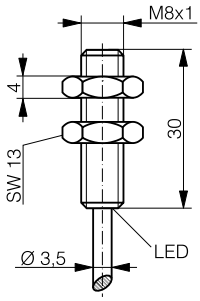
increased distance

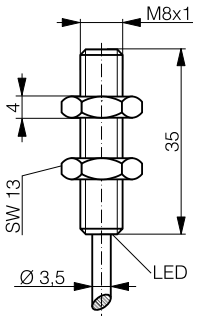
increased distance

Dimensions:





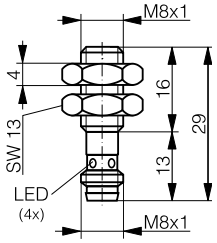
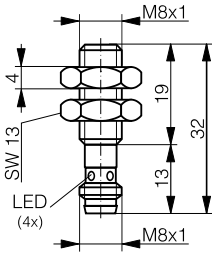
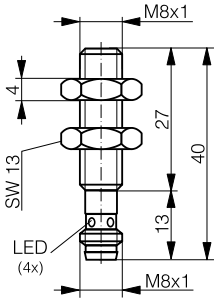
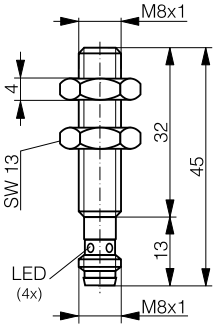
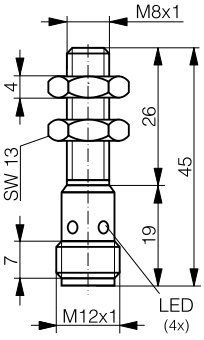
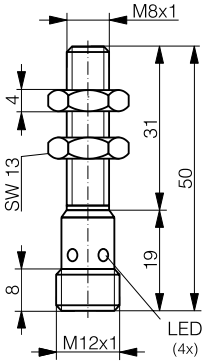




Part references:
(**bold:** preferred types)

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	2
Stainless steel V2A	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	Connector S12
IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
Embeddable	Embeddable	Embeddable	Embeddable	Embeddable	Embeddable
3,000 Hz	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	Table 1
Diagram 1	Diagram 1	Diagram 1	Diagram 1	Diagram 2	Diagram 2
Built-in	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	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	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
					
increased distance	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-621-M8-193**
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-622-M8-193
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-623-M8-193**
DW-AS-624-M8-129	DW-AS-624-M8-123	DW-AS-624-M8-124	DW-AS-624-M8-001	DW-AS-624-M8	DW-AS-624-M8-193
A ... D	A ... D	A ... D	A ... D	G ... N (N.O.); K ... N (N.C.)	G ... N (N.O.); K ... N (N.C.)

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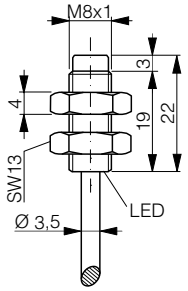
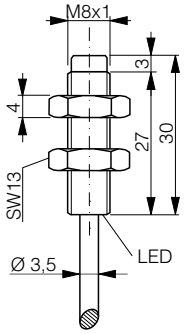
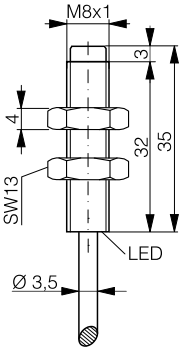
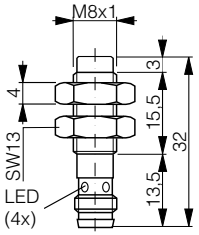
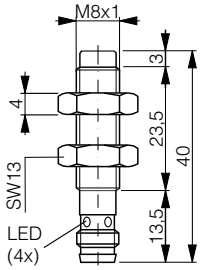
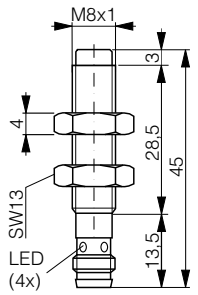
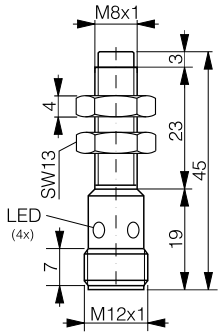
M8

Housing size				
Operating distance mm	**2.5**	**2.5**	**2.5**	**2.5**
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	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 76 [3] see page 77 [4] see page 146				
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

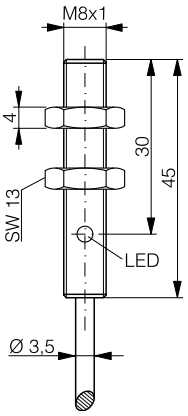
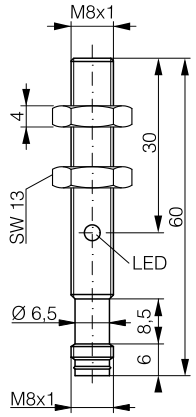
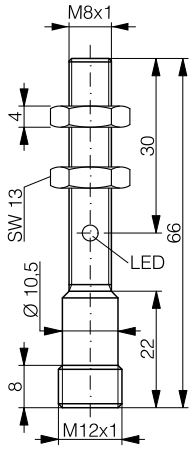
SERIES 600

M8

2.5	2.5	2.5
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
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.)

SERIES 500

M8

3	3	3
Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
PVC cable type 2	Connector S8	Connector S12
IP 67	IP 67	IP 67
Quasi-embeddable	Quasi-embeddable	Quasi-embeddable
1,000 Hz	1,000 Hz	1,000 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
		
long distance	long distance	long distance
		
DW-AD-501-M8	**DW-AS-501-M8-001**	**DW-AS-501-M8**
DW-AD-502-M8	DW-AS-502-M8-001	DW-AS-502-M8
DW-AD-503-M8	**DW-AS-503-M8-001**	**DW-AS-503-M8**
DW-AD-504-M8	DW-AS-504-M8-001	DW-AS-504-M8
	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.

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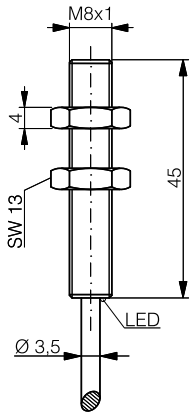
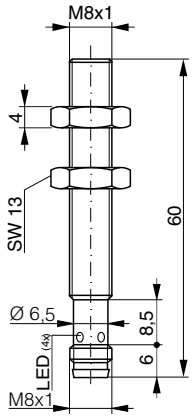
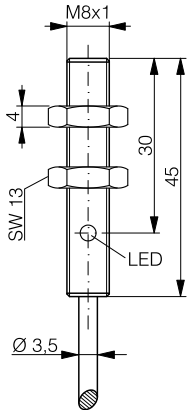
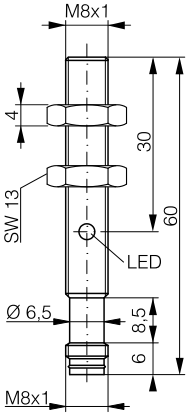
CONTRINEX SERIES 700

SERIES 520

Housing size	M8		M8	
Operating distance mm	3	3	4	4
Housing material	Stainless steel V2A	Stainless steel V2A	Chrome-plated brass	Chrome-plated brass
Connection [1]	PUR cable type 3	Connector S8	PVC cable type 2	Connector S8
Degree of protection	IP 68	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Quasi-embeddable	Quasi-embeddable
Max. switching frequency	800 Hz	800 Hz	500 Hz	500 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

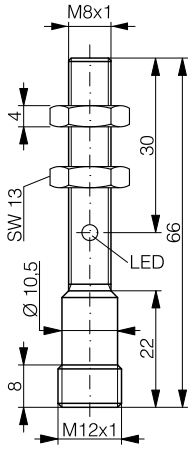
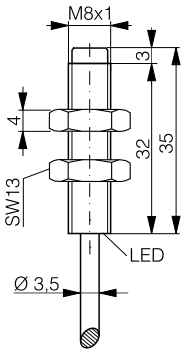
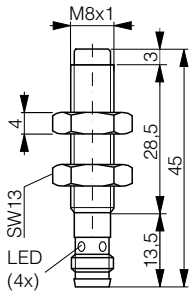
[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 76
[3] see page 77
[4] see page 146

	100 bar	100 bar		
				
	all-metal	all-metal	4 x distance	4 x distance
Dimensions:				
Part references: (**bold:** preferred types)				
NPN N.O.	**DW-AD-701-M8***	**DW-AS-701-M8-001***	**DW-AD-521-M8**	**DW-AS-521-M8-001**
NPN N.C.	DW-AD-702-M8*	DW-AS-702-M8-001*	DW-AD-522-M8	DW-AS-522-M8-001
PNP N.O.	**DW-AD-703-M8**	**DW-AS-703-M8-001**	**DW-AD-523-M8**	**DW-AS-523-M8-001**
PNP N.C.	DW-AD-704-M8*	DW-AS-704-M8-001*	DW-AD-524-M8	DW-AS-524-M8-001
NAMUR				
AC/DC 2-wire N.O.				
AC/DC 2-wire N.C.				
Compatible connectors [4]		A ... D		A ... D

* Please check availability

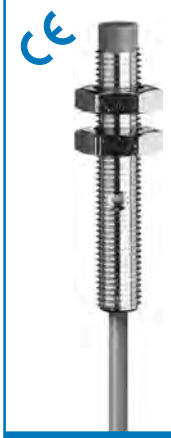
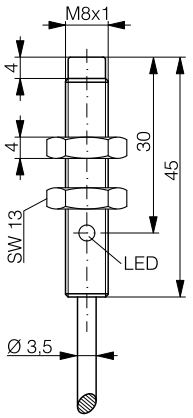
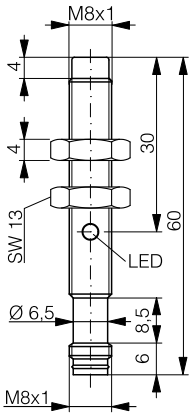
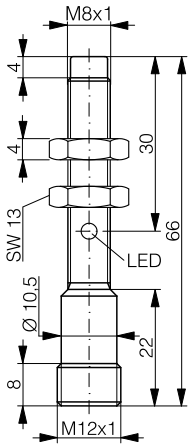
SERIES 620

M8

4	4	4
Chrome-plated brass	Stainless steel V2A	Stainless steel V2A
Connector S12	PVC cable type 2	Connector S8
IP 67	IP 67	IP 67
Quasi-embeddable	Non-embeddable	Non-embeddable
500 Hz	2,500 Hz	2,500 Hz
Table 1	Table 1	Table 1
Diagram 2	Diagram 1	Diagram 1
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
		
4 x distance	**increased distance**	**increased distance**
		
DW-AS-521-M8	**DW-AD-631-M8**	**DW-AS-631-M8-001**
DW-AS-522-M8	DW-AD-632-M8	DW-AS-632-M8-001
DW-AS-523-M8	**DW-AD-633-M8**	**DW-AS-633-M8-001**
DW-AS-524-M8	DW-AD-634-M8	DW-AS-634-M8-001
G ... N (N.O.); K ... N (N.C.)		A ... D

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	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.

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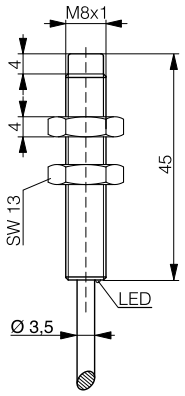
Housing size	M8			□ 8x8
Operating distance mm	6	6		1.5
Housing material	Stainless steel V2A	Stainless steel V2A		Nickel-plated brass
Connection [1]	PUR cable type 3	Connector S8		PVC cable type 2
Degree of protection	IP 68	IP 67		IP 67
Mounting	Non-embeddable	Non-embeddable		Embeddable
Max. switching frequency	700 Hz	700 Hz		5,000 Hz
Technical data [2]	Table 1	Table 1		Table 1
Wiring [3]	Diagram 1	Diagram 1		Diagram 1
LED	Built-in	Built-in		Built-in
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC		10 ... 30 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C		-25 ... +70 °C
Output current	≤ 200 mA	≤ 200 mA		≤ 200 mA

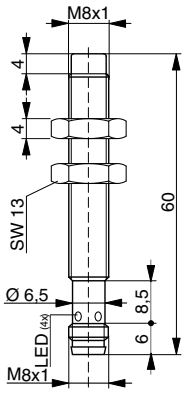
[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 76
[3] see page 77
[4] see page 146

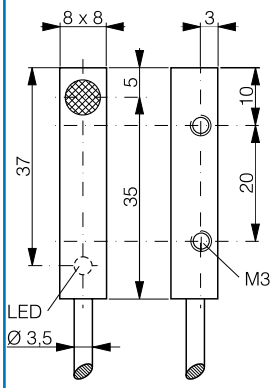
all-metal

all-metal

Dimensions:



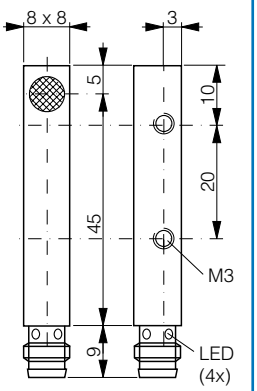
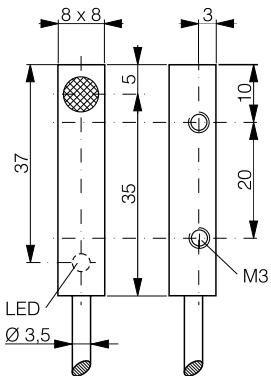
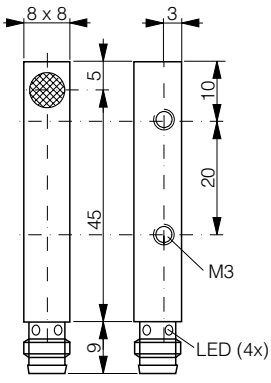
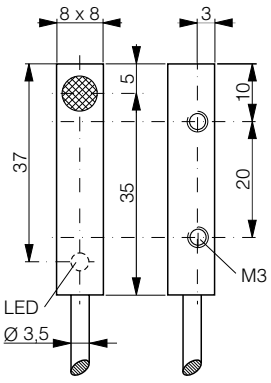
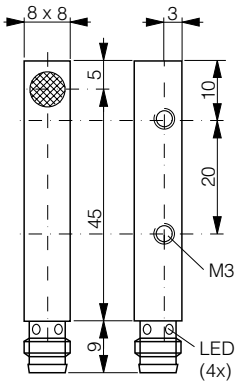




Part references:
(**bold:** preferred types)

NPN N.O.	**DW-AD-711-M8***	**DW-AS-711-M8-001***	**DW-AD-601-C8**
NPN N.C.	DW-AD-712-M8*	DW-AS-712-M8-001*	DW-AD-602-C8
PNP N.O.	**DW-AD-713-M8***	**DW-AS-713-M8-001***	**DW-AD-603-C8**
PNP N.C.	DW-AD-714-M8*	DW-AS-714-M8-001*	DW-AD-604-C8
NAMUR			
AC/DC 2-wire N.O.			
AC/DC 2-wire N.C.			
Compatible connectors [4]		A ... D	

* Please check availability

600	SERIES 620		SERIES 500	
☐8x8	☐8x8		☐8x8	
1.5	2	2	3	3
Nickel-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
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	Quasi-embeddable	Quasi-embeddable
5,000 Hz	3,000 Hz	3,000 Hz	1,000 Hz	1,000 Hz
Table 1	Table 1	Table 1	Table 1	Table 1
Diagram 1	Diagram 1	Diagram 1	Diagram 1	Diagram 1
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	long distance	long distance
				
DW-AS-601-C8-001	**DW-AD-621-C8**	**DW-AS-621-C8-001**	**DW-AD-501-C8**	**DW-AS-501-C8**
DW-AS-602-C8-001	DW-AD-622-C8	DW-AS-622-C8-001	DW-AD-502-C8	DW-AS-502-C8
DW-AS-603-C8-001	**DW-AD-623-C8**	**DW-AS-623-C8-001**	**DW-AD-503-C8**	**DW-AS-503-C8**
DW-AS-604-C8-001	DW-AD-624-C8	DW-AS-624-C8-001	DW-AD-504-C8	DW-AS-504-C8
A ... D		A ... D		A ... D

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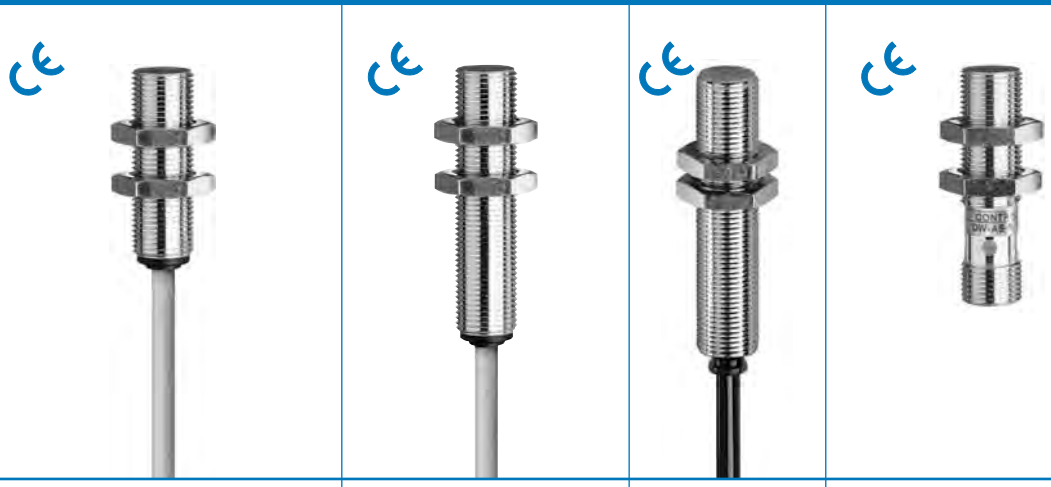
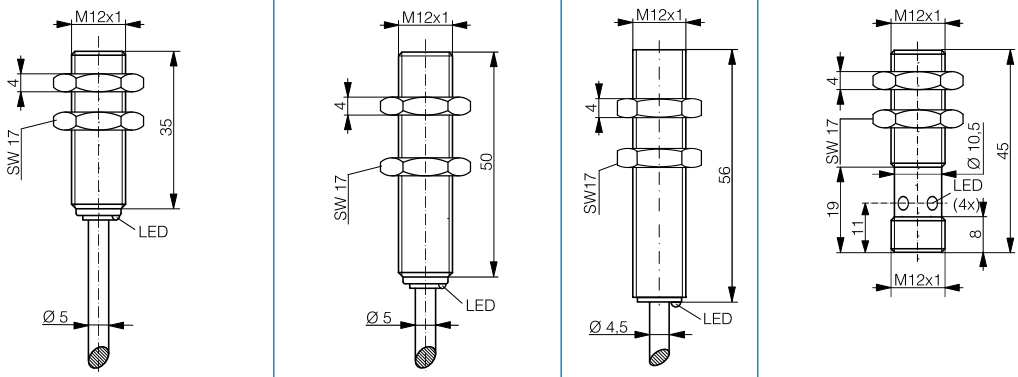
M12

Housing size							
Operating distance mm	2		2		2	2	
Housing material	Chrome-plated brass		Chrome-plated brass		Nickel-plated brass	Chrome-plated brass	
Connection [1]	PVC cable type 8		PVC cable type 8		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	3,000 Hz	3,000 Hz	3,000 Hz	3,000 Hz	25Hz (AC)/1,200Hz (DC)	3,000 Hz	3,000 Hz
Technical data [2]	Table 1	Table 11	Table 1	Table 11	Table 4	Table 1	Table 11
Wiring [3]	Diagram 1	Diagram 7	Diagram 1	Diagram 7	Diagram 3	Diagram 2	Diagram 7
LED	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in
Supply voltage range	10 ... 30 VDC	10 ... 65 VDC	10 ... 30 VDC	10 ... 65 VDC	20...265VAC/20...320VDC	10 ... 30 VDC	10 ... 65 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +85 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 200 mA	≤ 100 mA	≤ 200 mA	≤ 100 mA	≤ 200 mA	≤ 200 mA	≤ 100 mA

[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 76
[3] see page 77
[4] see page 146



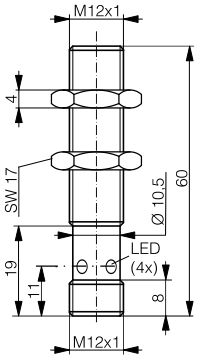
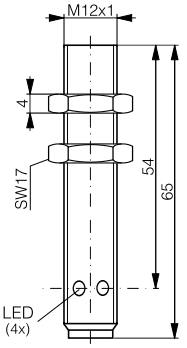
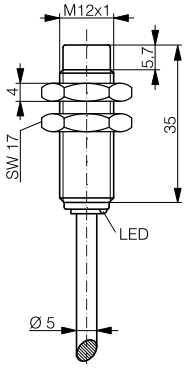
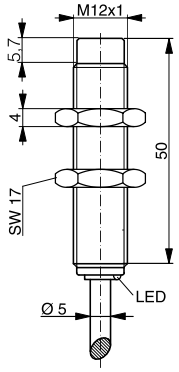
Dimensions:



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	
DC 2-wire N.O.		**DW-DD-605-M12-120**		**DW-DD-605-M12**			**DW-DS-605-M12-120**
DC 2-wire N.C.		DW-DD-606-M12-120		DW-DD-606-M12			DW-DS-606-M12-120
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.)	G...N (N.O.);K...N (N.C.)

M12

2		2	4		4	
Chrome-plated brass		Nickel-plated brass	Chrome-plated brass		Chrome-plated brass	
Connector S12		Connector S12	PVC cable type 8		PVC cable type 8	
IP 67		IP 67	IP 67		IP 67	
Embeddable		Embeddable	Non-embeddable		Non-embeddable	
3,000 Hz	3,000 Hz	25Hz (AC)/1,200Hz (DC)	2,000 Hz	2,500 Hz	2,000 Hz	2,500 Hz
Table 1	Table 11	Table 4	Table 1	Table 11	Table 1	Table 11
Diagram 2	Diagram 7	Diagram 3	Diagram 1	Diagram 7	Diagram 1	Diagram 7
Built-in	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in
10 ... 30 VDC	10 ... 65 VDC	20...265VAC/20...320VDC	10 ... 30 VDC	10 ... 65 VDC	10 ... 30 VDC	10 ... 65 VDC
-25 ... +70 °C	-25 ... +70 °C	-25 ... +85 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 100 mA	≤ 200 mA	≤ 200 mA	≤ 100 mA	≤ 200 mA	≤ 100 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-DS-605-M12			**DW-DD-615-M12-120**		**DW-DD-615-M12**
	DW-DS-606-M12			DW-DD-616-M12-120		DW-DD-616-M12
		DW-AS-607-M12				
		DW-AS-608-M12				
G...N (N.O.); K...N (N.C.)	G...N (N.O.);K...N (N.C.)	M, N				

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.

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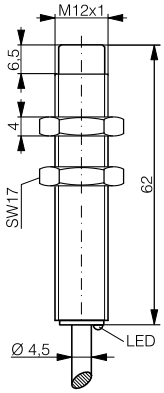
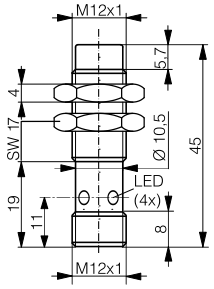
M12

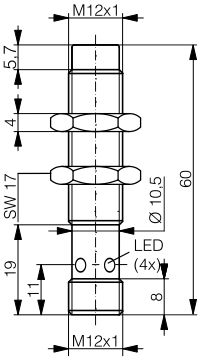
Housing size	M12					
Operating distance mm	4	4		4		4
Housing material	Nickel-plated brass	Chrome-plated brass		Chrome-plated brass		Nickel-plated brass
Connection [1]	PUR cable type 5	Connector S12		Connector S12		Connector S12
Degree of protection	IP 67	IP 67		IP 67		IP 67
Mounting	Non-embeddable	Non-embeddable		Non-embeddable		Non-embeddable
Max. switching frequency	25 Hz (AC) / 900 Hz (DC)	2,000 Hz	2,500 Hz	2,000 Hz	2,500 Hz	25 Hz (AC) / 900 Hz (DC)
Technical data [2]	Table 4	Table 1	Table 11	Table 1	Table 11	Table 4
Wiring [3]	Diagram 3	Diagram 2	Diagram 7	Diagram 2	Diagram 7	Diagram 3
LED	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in
Supply voltage range	20...265 VAC / 20...320 VDC	10 ... 30 VDC	10 ... 65 VDC	10 ... 30 VDC	10 ... 65 VDC	20...265 VAC/20...320 VDC
Ambient temperature range	-25 ... +85 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +85 °C
Output current	≤ 200 mA	≤ 200 mA	≤ 100 mA	≤ 200 mA	≤ 100 mA	≤ 200 mA

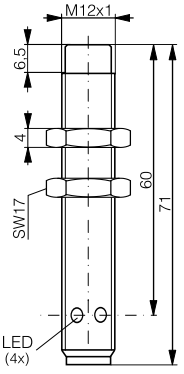
[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 76
[3] see page 77
[4] see page 146

Dimensions:









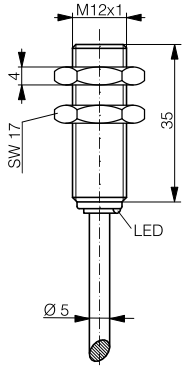
Part references:
(**bold:** preferred types)

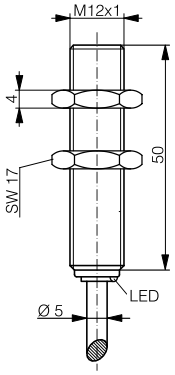
NPN N.O.		**DW-AS-611-M12-120**		**DW-AS-611-M12**		
NPN N.C.		DW-AS-612-M12-120		DW-AS-612-M12		
PNP N.O.		**DW-AS-613-M12-120**		**DW-AS-613-M12**		
PNP N.C.		DW-AS-614-M12-120		DW-AS-614-M12		
DC 2-wire N.O.			**DW-DS-615-M12-120**		**DW-DS-615-M12**	
DC 2-wire N.C.			DW-DS-616-M12-120		DW-DS-616-M12	
AC/DC 2-wire N.O.	**DW-AD-617-M12**					**DW-AS-617-M12**
AC/DC 2-wire N.C.	DW-AD-618-M12					DW-AS-618-M12
Compatible connectors [4]		G...N (N.O.);K...N (N.C.)	G...N (N.O.);K...N (N.C.)	G...N (N.O.);K...N (N.C.)	G...N (N.O.);K...N (N.C.)	M, N

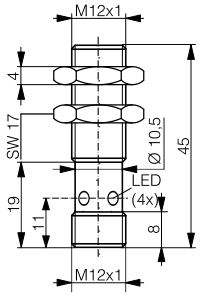
M12

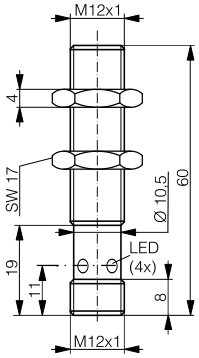
4		4		4		4	
Chrome-plated brass		Chrome-plated brass		Chrome-plated brass		Chrome-plated brass	
PVC cable type 8		PVC cable type 8		Connector S12		Connector S12	
IP 67		IP 67		IP 67		IP 67	
Embeddable		Embeddable		Embeddable		Embeddable	
2,500 Hz	2,000 Hz	2,500 Hz	2,000 Hz	2,500 Hz	2,000 Hz	2,500 Hz	2,000 Hz
Table 1	Table 11	Table 1	Table 11	Table 1	Table 11	Table 1	Table 11
Diagram 1	Diagram 7	Diagram 1	Diagram 7	Diagram 2	Diagram 7	Diagram 2	Diagram 7
Built-in	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in
10 ... 30 VDC	10 ... 65 VDC	10 ... 30 VDC	10 ... 65 VDC	10 ... 30 VDC	10 ... 65 VDC	10 ... 30 VDC	10 ... 65 VDC
-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 100 mA	≤ 200 mA	≤ 100 mA	≤ 200 mA	≤ 100 mA	≤ 200 mA	≤ 100 mA

increased distance | **increased distance** | **increased distance** | **increased distance**









DW-AD-621-M12-120		**DW-AD-621-M12**		**DW-AS-621-M12-120**		**DW-AS-621-M12**	
DW-AD-622-M12-120		DW-AD-622-M12		DW-AS-622-M12-120		DW-AS-622-M12	
DW-AD-623-M12-120		**DW-AD-623-M12**		**DW-AS-623-M12-120**		**DW-AS-623-M12**	
DW-AD-624-M12-120		DW-AD-624-M12		DW-AS-624-M12-120		DW-AS-624-M12	
	DW-DD-625-M12-120		**DW-DD-625-M12**		**DW-DS-625-M12-120**		**DW-DS-625-M12**
	DW-DD-626-M12-120		DW-DD-626-M12		DW-DS-626-M12-120		DW-DS-626-M12
				G...N (N.O.);K...N (N.C.)	G...N (N.O.);K...N (N.C.)	G...N (N.O.);K...N (N.C.)	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.

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CONTRINEX

SERIES 500 | SERIES 700

Housing size	M12				M12	
Operating distance mm	6	6	6	6	6*	6*
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Stainless steel V2A	Stainless steel V2A
Connection [1]	PVC cable type 8	PVC cable type 8	Connector S12	Connector S12	PUR cable type 11	Connector S12
Degree of protection	IP 67	IP 67	IP 67	IP 67	IP 68	IP 67
Mounting	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Embeddable	Embeddable
Max. switching frequency	800 Hz	800 Hz	800 Hz	800 Hz	600 Hz	600 Hz
Technical data [2]	Table 1	Table 1	Table 1	Table 1	Table 1	Table 1
Wiring [3]	Diagram 1	Diagram 1	Diagram 2	Diagram 2	Diagram 1	Diagram 2
LED	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in
Supply voltage range	10 ... 30 VDC	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 ... +70 °C	-25 ... +70 °C
Output current	≤ 200 mA	≤ 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 76
[3] see page 77
[4] see page 146

long distance

long distance

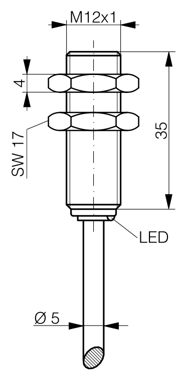
long distance

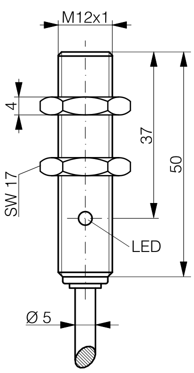
long distance

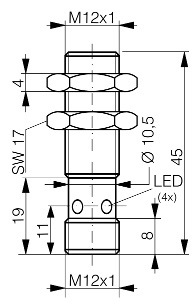
all-metal

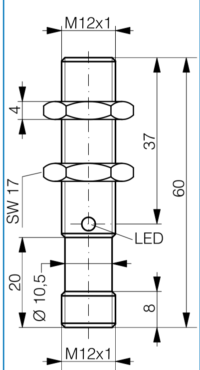
all-metal

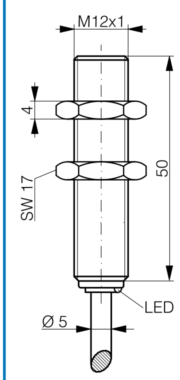
Dimensions:

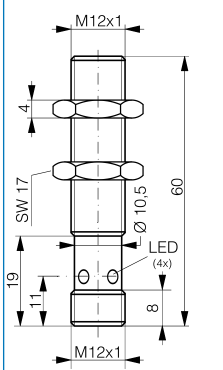












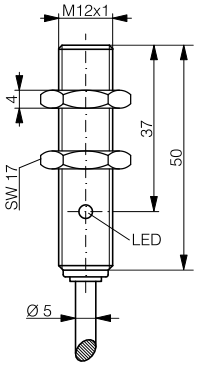
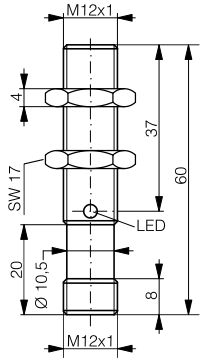
Part references:
(**bold:** preferred types)

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

* versions with 2 mm operating distance on request

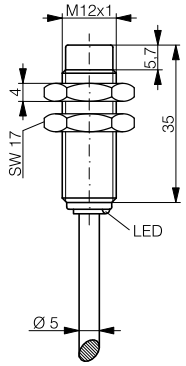
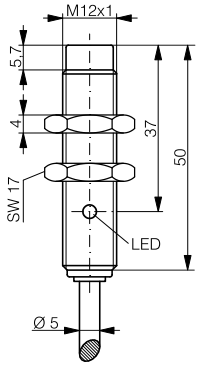
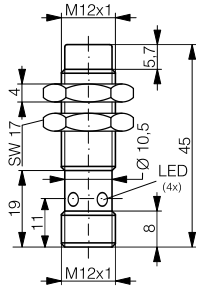
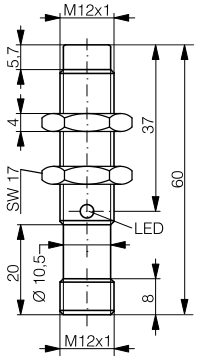
SERIES 520

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-521-M12	**DW-AS-521-M12**
DW-AD-522-M12	DW-AS-522-M12
DW-AD-523-M12	**DW-AS-523-M12**
DW-AD-524-M12	DW-AS-524-M12
	G ... N (N.O.); K ... N (N.C.)

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-M12-120	DW-AD-512-M12	DW-AS-512-M12-120	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-M12-120	DW-AD-514-M12	DW-AS-514-M12-120	DW-AS-514-M12
		G ... N (N.O.); K ... N (N.C.)	G ... N (N.O.); K ... N (N.C.)

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CONTRINEX SERIES 700 — SERIES 600

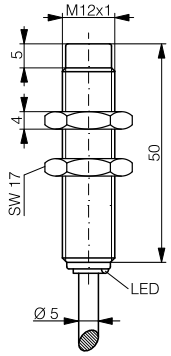
Housing size	M12		M18	
Operating distance mm	10*	10*	5	
Housing material	Stainless steel V2A	Stainless steel V2A	Chrome-plated brass	
Connection [1]	PUR cable type 11	Connector S12	PVC cable type 8	
Degree of protection	IP 68	IP 67	IP 67	
Mounting	Non-embeddable	Non-embeddable	Embeddable	
Max. switching frequency	400 Hz	400 Hz	2,000 Hz	1,500 Hz
Technical data [2]	Table 1	Table 1	Table 1	Table 11
Wiring [3]	Diagram 1	Diagram 2	Diagram 1	Diagram 7
LED	Built-in	Built-in	Built-in	Built-in
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 65 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 100 mA

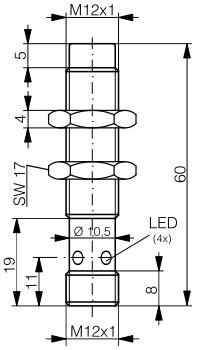
[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 76
[3] see page 77
[4] see page 146

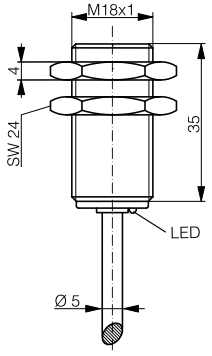
all-metal

all-metal

Dimensions:







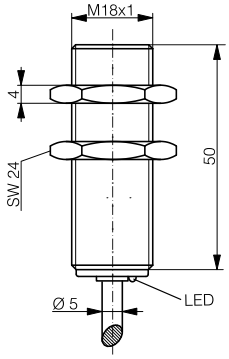
Part references:
(**bold:** preferred types)

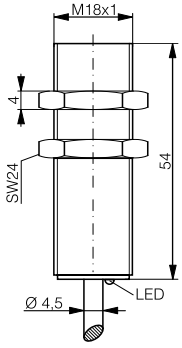
NPN N.O.	**DW-AD-711-M12**	**DW-AS-711-M12**	**DW-AD-601-M18-120**	
NPN N.C.	DW-AD-712-M12	DW-AS-712-M12	DW-AD-602-M18-120	
PNP N.O.	**DW-AD-713-M12**	**DW-AS-713-M12**	**DW-AD-603-M18-120**	
PNP N.C.	DW-AD-714-M12	DW-AS-714-M12	DW-AD-604-M18-120	
DC 2-wire N.O.				**DW-DD-605-M18-120**
DC 2-wire N.C.				DW-DD-606-M18-120
AC/DC 2-wire N.O.				
AC/DC 2-wire N.C.				
Compatible connectors [4]		G ... N (N.O.); K ... N (N.C.)		

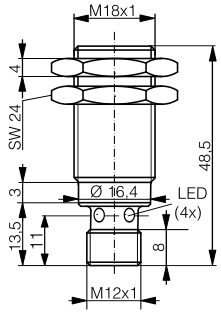
* versions with 4 mm operating distance on request

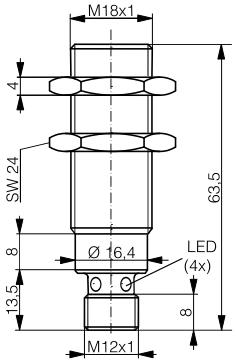
M18

5		5	5		5	
Chrome-plated brass		Nickel-plated brass	Chrome-plated brass		Chrome-plated brass	
PVC cable type 8		PUR cable type 5	Connector S12		Connector S12	
IP 67		IP 67	IP 67		IP 67	
Embeddable		Embeddable	Embeddable		Embeddable	
2,000 Hz	1,500 Hz	25 Hz (AC) / 490 Hz (DC)	2,000 Hz	1,500 Hz	2,000 Hz	1,500 Hz
Table 1	Table 11	Table 4	Table 1	Table 11	Table 1	Table 11
Diagram 1	Diagram 7	Diagram 3	Diagram 2	Diagram 7	Diagram 2	Diagram 7
Built-in	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in
10 ... 30 VDC	10 ... 65 VDC	20 ... 265 VAC / 20 ... 320 VDC	10 ... 30 VDC	10 ... 65 VDC	10 ... 30 VDC	10 ... 65 VDC
-25 ... +70 °C	-25 ... +70 °C	-25 ... +85 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 100 mA	≤ 300 mA	≤ 200 mA	≤ 100 mA	≤ 200 mA	≤ 100 mA









DW-AD-601-M18			**DW-AS-601-M18-120**		**DW-AS-601-M18-002**	
DW-AD-602-M18			DW-AS-602-M18-120		DW-AS-602-M18-002	
DW-AD-603-M18			**DW-AS-603-M18-120**		**DW-AS-603-M18-002**	
DW-AD-604-M18			DW-AS-604-M18-120		DW-AS-604-M18-002	
	DW-DD-605-M18			**DW-DS-605-M18-120**		**DW-DS-605-M18-002**
	DW-DD-606-M18			DW-DS-606-M18-120		DW-DS-606-M18-002
		DW-AD-607-M18				
		DW-AD-608-M18				
			G...N (N.O.); K...N (N.C.)	G...N (N.O.);K...N (N.C.)	G...N (N.O.); K...N (N.C.)	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.

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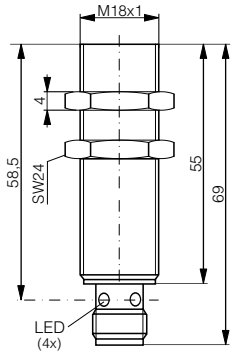
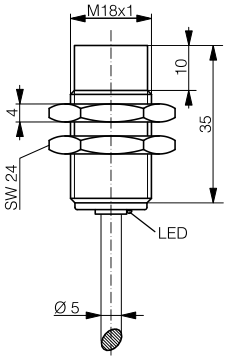
M18

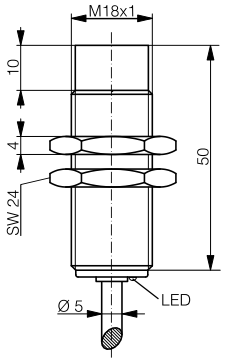
Housing size					
Operating distance mm	5	8		8	
Housing material	Nickel-plated brass	Chrome-plated brass		Chrome-plated brass	
Connection [1]	Connector S12	PVC cable type 8		PVC cable type 8	
Degree of protection	IP 67	IP 67		IP 67	
Mounting	Embeddable	Non-embeddable		Non-embeddable	
Max. switching frequency	25 Hz (AC) / 490 Hz (DC)	1,400 Hz	1,200 Hz	1,400 Hz	1,200 Hz
Technical data [2]	Table 4	Table 1	Table 11	Table 1	Table 11
Wiring [3]	Diagram 3	Diagram 1	Diagram 7	Diagram 1	Diagram 7
LED	Built-in	Built-in	Built-in	Built-in	Built-in
Supply voltage range	20 ... 265 VAC / 20 ... 320 VDC	10 ... 30 VDC	10 ... 65 VDC	10 ... 30 VDC	10 ... 65 VDC
Ambient temperature range	-25 ... +85 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 300 mA	≤ 200 mA	≤ 100 mA	≤ 200 mA	≤ 100 mA

[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 76
[3] see page 77
[4] see page 146

Dimensions:



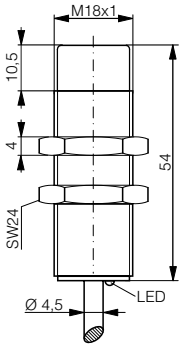
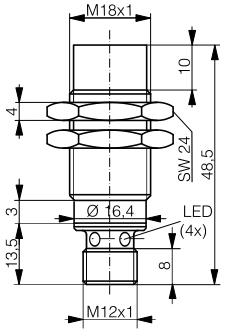
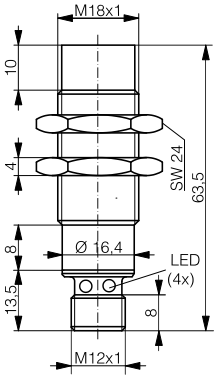




Part references:
(**bold:** preferred types)

NPN N.O.		**DW-AD-611-M18-120**		**DW-AD-611-M18**	
NPN N.C.		DW-AD-612-M18-120		DW-AD-612-M18	
PNP N.O.		**DW-AD-613-M18-120**		**DW-AD-613-M18**	
PNP N.C.		DW-AD-614-M18-120		DW-AD-614-M18	
DC 2-wire N.O.			**DW-DD-615-M18-120**		**DW-DD-615-M18**
DC 2-wire N.C.			DW-DD-616-M18-120		DW-DD-616-M18
AC/DC 2-wire N.O.	**DW-AS-607-M18-002**				
AC/DC 2-wire N.C.	DW-AS-608-M18-002				
Compatible connectors [4]	M, N				

M18

8	8		8	
Nickel-plated brass	Chrome-plated brass		Chrome-plated brass	
PUR cable type 5	Connector S12		Connector S12	
IP 67	IP 67		IP 67	
Non-embeddable	Non-embeddable		Non-embeddable	
25 Hz (AC) / 340 Hz (DC)	1,400 Hz	1,200 Hz	1,400 Hz	1,200 Hz
Table 4	Table 1	Table 11	Table 1	Table 11
Diagram 3	Diagram 2	Diagram 7	Diagram 2	Diagram 7
Built-in	Built-in	Built-in	Built-in	Built-in
20 ... 265 VAC / 20 ... 320 VDC	10 ... 30 VDC	10 ... 65 VDC	10 ... 30 VDC	10 ... 65 VDC
-25 ... +85 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
≤ 300 mA	≤ 200 mA	≤ 100 mA	≤ 200 mA	≤ 100 mA
				
				
	DW-AS-611-M18-120		**DW-AS-611-M18-002**	
	DW-AS-612-M18-120		DW-AS-612-M18-002	
	DW-AS-613-M18-120		**DW-AS-613-M18-002**	
	DW-AS-614-M18-120		DW-AS-614-M18-002	
		DW-DS-615-M18-120		**DW-DS-615-M18-002**
		DW-DS-616-M18-120		DW-DS-616-M18-002
DW-AD-617-M18				
DW-AD-618-M18				
	G ... N (N.O.); K ... N (N.C.)	G...N (N.O.);K...N (N.C.)	G ... N (N.O.); K ... N (N.C.)	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.

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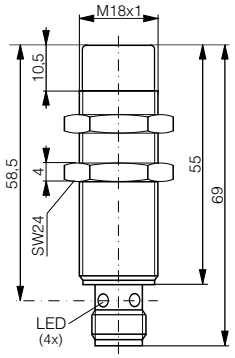
Housing size	M18	M18		M18	
Operating distance mm	8	8		8	
Housing material	Nickel-plated brass	Chrome-plated brass		Chrome-plated brass	
Connection [1]	Connector S12	PVC cable type 8		PVC cable type 8	
Degree of protection	IP 67	IP 67		IP 67	
Mounting	Non-embeddable	Quasi-embeddable		Quasi-embeddable	
Max. switching frequency	25 Hz (AC) / 340 Hz (DC)	1,000 Hz	1,000 Hz	1,000 Hz	1,000 Hz
Technical data [2]	Table 4	Table 1	Table 11	Table 1	Table 11
Wiring [3]	Diagram 3	Diagram 1	Diagram 7	Diagram 1	Diagram 7
LED	Built-in	Built-in	Built-in	Built-in	Built-in
Supply voltage range	20 ... 265 VAC / 20 ... 320 VDC	10 ... 30 VDC	10 ... 65 VDC	10 ... 30 VDC	10 ... 65 VDC
Ambient temperature range	-25 ... +85 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 300 mA	≤ 200 mA	≤ 100 mA	≤ 200 mA	≤ 100 mA

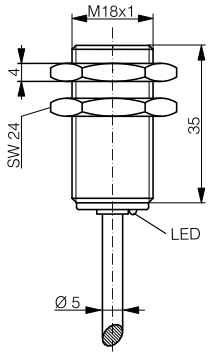
[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 76
[3] see page 77
[4] see page 146

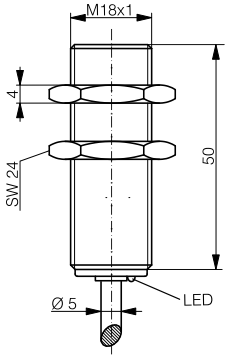
increased distance

increased distance

Dimensions:







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

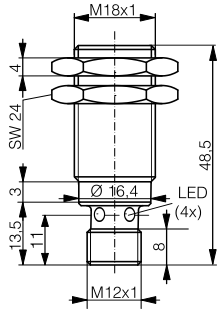
NPN N.O.		**DW-AD-621-M18-120**		**DW-AD-621-M18**	
NPN N.C.		DW-AD-622-M18-120		DW-AD-622-M18	
PNP N.O.		**DW-AD-623-M18-120**		**DW-AD-623-M18**	
PNP N.C.		DW-AD-624-M18-120		DW-AD-624-M18	
DC 2-wire N.O.			**DW-DD-625-M18-120**		**DW-DD-625-M18**
DC 2-wire N.C.			DW-DD-626-M18-120		DW-DD-626-M18
AC/DC 2-wire N.O.	**DW-AS-617-M18-002**				
AC/DC 2-wire N.C.	DW-AS-618-M18-002				
Compatible connectors [4]	M, N				

SERIES 620

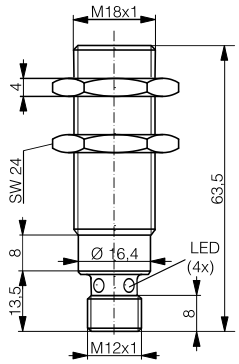
M18

8		8	
Chrome-plated brass		Chrome-plated brass	
Connector S12		Connector S12	
IP 67		IP 67	
Quasi-embeddable		Quasi-embeddable	
1,000 Hz	1,000 Hz	1,000 Hz	1,000 Hz
Table 1	Table 11	Table 1	Table 11
Diagram 2	Diagram 7	Diagram 2	Diagram 7
Built-in	Built-in	Built-in	Built-in
10 ... 30 VDC	10 ... 65 VDC	10 ... 30 VDC	10 ... 65 VDC
-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 100 mA	≤ 200 mA	≤ 100 mA

increased distance



increased distance



DW-AS-621-M18-120		**DW-AS-621-M18-002**	
DW-AS-622-M18-120		DW-AS-622-M18-002	
DW-AS-623-M18-120		**DW-AS-623-M18-002**	
DW-AS-624-M18-120		DW-AS-624-M18-002	
	DW-DS-625-M18-120		**DW-DS-625-M18-002**
	DW-DS-626-M18-120		DW-DS-626-M18-002
G...N (N.O.); K...N (N.C.)	G...N (N.O.);K...N (N.C.)	G...N (N.O.); K...N (N.C.)	G...N (N.O.);K...N (N.C.)

SERIES 700

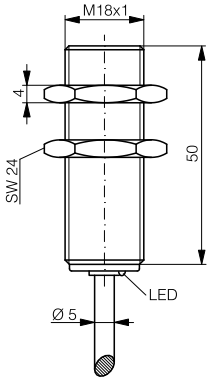
M18

10*	10*
Stainless steel V2A	Stainless steel V2A
PUR cable type 11	Connector S12
IP 68	IP 67
Embeddable	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

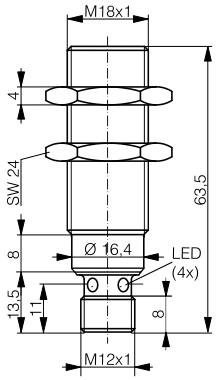
60 bar

60 bar

all-metal



all-metal



DW-AD-701-M18	**DW-AS-701-M18-002**
DW-AD-702-M18	DW-AS-702-M18-002
DW-AD-703-M18	**DW-AS-703-M18-002**
DW-AD-704-M18	DW-AS-704-M18-002
	G ... N (N.O.); K ... N (N.C.)

* versions with 5 mm operating distance 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.

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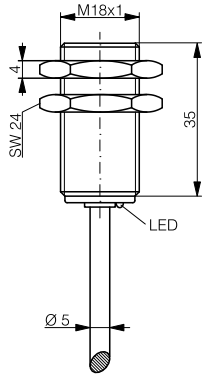
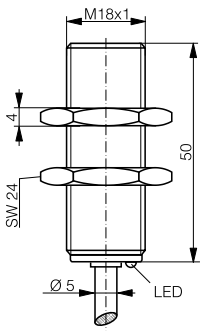
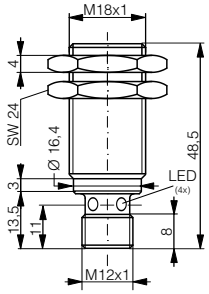
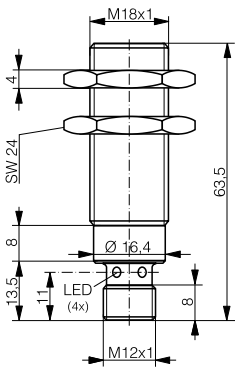
M18

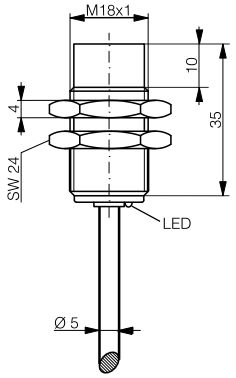
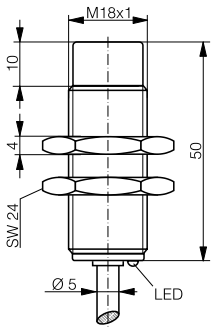
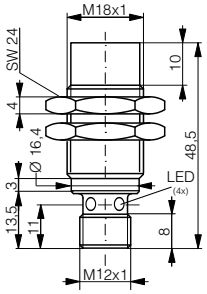
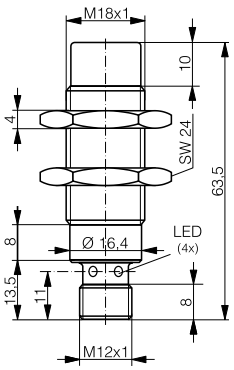
Housing size				
Operating distance mm	12	12	12	12
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connection [1]	PVC cable type 8	PVC cable type 8	Connector S12	Connector S12
Degree of protection	IP 67	IP 67	IP 67	IP 67
Mounting	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable
Max. switching frequency	500 Hz	500 Hz	500 Hz	500 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 76
[3] see page 77
[4] see page 146

	long distance	long distance	long distance	long distance
Dimensions:				
Part references: (**bold:** preferred types)				
NPN N.O.	**DW-AD-501-M18-120**	**DW-AD-501-M18**	**DW-AS-501-M18-120**	**DW-AS-501-M18-002**
NPN N.C.	DW-AD-502-M18-120	DW-AD-502-M18	DW-AS-502-M18-120	DW-AS-502-M18-002
PNP N.O.	**DW-AD-503-M18-120**	**DW-AD-503-M18**	**DW-AS-503-M18-120**	**DW-AS-503-M18-002**
PNP N.C.	DW-AD-504-M18-120	DW-AD-504-M18	DW-AS-504-M18-120	DW-AS-504-M18-002
DC 2-wire N.O.				
DC 2-wire N.C.				
AC/DC 2-wire N.O.				
AC/DC 2-wire N.C.				
Compatible connectors [4]			G ... N (N.O.); K ... N (N.C.)	G ... N (N.O.); K ... N (N.C.)

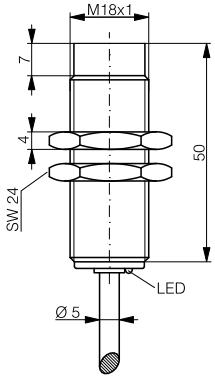
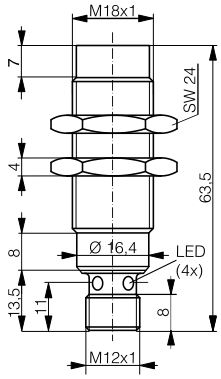
SERIES 500

M18

20	20	20	20
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
200 Hz	200 Hz	200 Hz	200 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-M18-120	**DW-AD-511-M18**	**DW-AS-511-M18-120**	**DW-AS-511-M18-002**
DW-AD-512-M18-120	DW-AD-512-M18	DW-AS-512-M18-120	DW-AS-512-M18-002
DW-AD-513-M18-120	**DW-AD-513-M18**	**DW-AS-513-M18-120**	**DW-AS-513-M18-002**
DW-AD-514-M18-120	DW-AD-514-M18	DW-AS-514-M18-120	DW-AS-514-M18-002
		G ... N (N.O.); K ... N (N.C.)	G ... N (N.O.); K ... N (N.C.)

SERIES 700

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
60 bar 	60 bar 
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.)

* versions with 8 mm operating distance 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.

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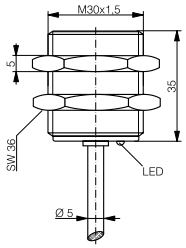
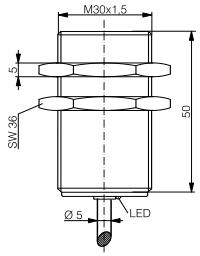
M30

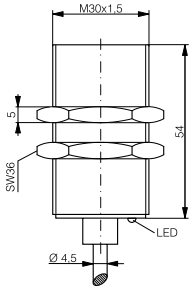
Housing size					
Operating distance mm	10		10		10
Housing material	Chrome-plated brass		Chrome-plated brass		Nickel-plated brass
Connection [1]	PVC cable type 8		PVC cable type 8		PUR cable type 5
Degree of protection	IP 67		IP 67		IP 67
Mounting	Embeddable		Embeddable		Embeddable
Max. switching frequency	850 Hz	600 Hz	850 Hz	600 Hz	25 Hz (AC) / 200 Hz (DC)
Technical data [2]	Table 1	Table 11	Table 1	Table 11	Table 4
Wiring [3]	Diagram 1	Diagram 7	Diagram 1	Diagram 7	Diagram 3
LED	Built-in	Built-in	Built-in	Built-in	Built-in
Supply voltage range	10 ... 30 VDC	10 ... 65 VDC	10 ... 30 VDC	10 ... 65 VDC	20 ... 265 VAC / 20 ... 320 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +85 °C
Output current	≤ 200 mA	≤ 100 mA	≤ 200 mA	≤ 100 mA	≤ 300 mA

[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 76
[3] see page 77
[4] see page 146

Dimensions:





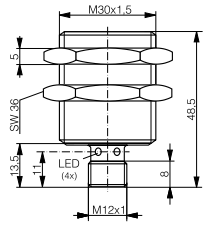


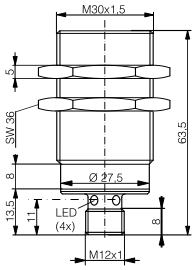
Part references:
(**bold:** preferred types)

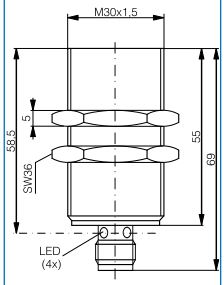
NPN N.O.	**DW-AD-601-M30-120**		**DW-AD-601-M30**		
NPN N.C.	DW-AD-602-M30-120		DW-AD-602-M30		
PNP N.O.	**DW-AD-603-M30-120**		**DW-AD-603-M30**		
PNP N.C.	DW-AD-604-M30-120		DW-AD-604-M30		
DC 2-wire N.O.		**DW-DD-605-M30-120**		**DW-DD-605-M30**	
DC 2-wire N.C.		DW-DD-606-M30-120		DW-DD-606-M30	
AC/DC 2-wire N.O.					**DW-AD-607-M30**
AC/DC 2-wire N.C.					DW-AD-608-M30
Compatible connectors [4]					

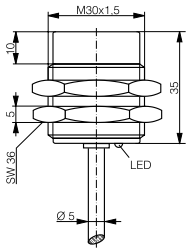
M30

10		10		10	15	
Chrome-plated brass		Chrome-plated brass		Nickel-plated brass	Chrome-plated brass	
Connector S12		Connector S12		Connector S12	PVC cable type 8	
IP 67		IP 67		IP 67	IP 67	
Embeddable		Embeddable		Embeddable	Non-embeddable	
850 Hz	600 Hz	850 Hz	600 Hz	25 Hz (AC) / 200 Hz (DC)	850 Hz	500 Hz
Table 1	Table 11	Table 1	Table 11	Table 4	Table 1	Table 11
Diagram 2	Diagram 7	Diagram 2	Diagram 7	Diagram 3	Diagram 1	Diagram 7
Built-in	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in
10 ... 30 VDC	10 ... 65 VDC	10 ... 30 VDC	10 ... 65 VDC	20...265 VAC/20...320 VDC	10 ... 30 VDC	10 ... 65 VDC
-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +85 °C	-25 ... +70 °C	-25 ... +70 °C
≤ 200 mA	≤ 100 mA	≤ 200 mA	≤ 100 mA	≤ 300 mA	≤ 200 mA	≤ 100 mA









DW-AS-601-M30-120		**DW-AS-601-M30-002**			**DW-AD-611-M30-120**	
DW-AS-602-M30-120		DW-AS-602-M30-002			DW-AD-612-M30-120	
DW-AS-603-M30-120		**DW-AS-603-M30-002**			**DW-AD-613-M30-120**	
DW-AS-604-M30-120		DW-AS-604-M30-002			DW-AD-614-M30-120	
	DW-DS-605-M30-120		**DW-DS-605-M30-002**			**DW-DD-615-M30-120**
	DW-DS-606-M30-120		DW-DS-606-M30-002			DW-DD-616-M30-120
				DW-AS-607-M30-002		
				DW-AS-608-M30-002		
G ... N (N.O.); K ... N (N.C.)	G...N (N.O.);K...N (N.C.)	G ... N (N.O.); K ... N (N.C.)	G...N (N.O.);K...N (N.C.)	M, N		

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.

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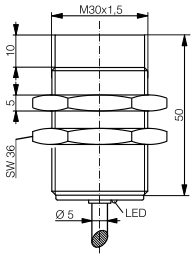
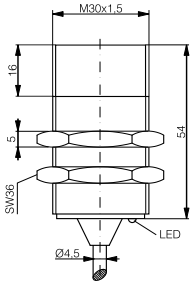
M30

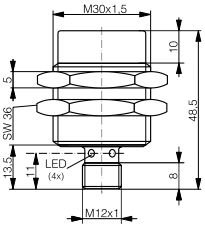
Housing size					
Operating distance mm	15		15	15	
Housing material	Chrome-plated brass		Nickel-plated brass	Chrome-plated brass	
Connection [1]	PVC cable type 8		PUR cable type 5	Connector S12	
Degree of protection	IP 67		IP 67	IP 67	
Mounting	Non-embeddable		Non-embeddable	Non-embeddable	
Max. switching frequency	850 Hz	500 Hz	25 Hz (AC) / 220 Hz (DC)	850 Hz	500 Hz
Technical data [2]	Table 1	Table 11	Table 4	Table 1	Table 11
Wiring [3]	Diagram 1	Diagram 7	Diagram 3	Diagram 2	Diagram 7
LED	Built-in	Built-in	Built-in	Built-in	Built-in
Supply voltage range	10 ... 30 VDC	10 ... 65 VDC	20 ... 265 VAC / 20 ... 320 VDC	10 ... 30 VDC	10 ... 65 VDC
Ambient temperature range	-25 ... +70 °C	-25 ... +70 °C	-25 ... +85 °C	-25 ... +70 °C	-25 ... +70 °C
Output current	≤ 200 mA	≤ 100 mA	≤ 300 mA	≤ 200 mA	≤ 100 mA

[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 76
[3] see page 77
[4] see page 146

Dimensions:





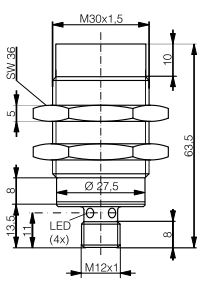
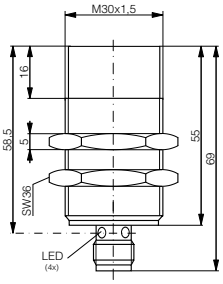


Part references:
(**bold:** preferred types)

NPN N.O.	**DW-AD-611-M30**			**DW-AS-611-M30-120**	
NPN N.C.	DW-AD-612-M30			DW-AS-612-M30-120	
PNP N.O.	**DW-AD-613-M30**			**DW-AS-613-M30-120**	
PNP N.C.	DW-AD-614-M30			DW-AS-614-M30-120	
DC 2-wire N.O.		**DW-DD-615-M30**			**DW-DS-615-M30-120**
DC 2-wire N.C.		DW-DD-616-M30			DW-DS-616-M30-120
AC/DC 2-wire N.O.			**DW-AD-617-M30**		
AC/DC 2-wire N.C.			DW-AD-618-M30		
Compatible connectors [4]				G ... N (N.O.); K ... N (N.C.)	G...N (N.O.);K...N (N.C.)

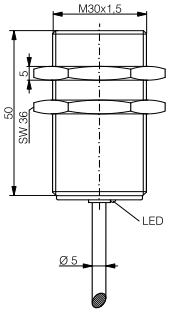
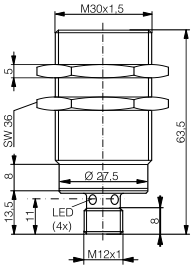
SERIES 600

M30

15		15
Chrome-plated brass		Nickel-plated brass
Connector S12		Connector S12
IP 67		IP 67
Non-embeddable		Non-embeddable
850 Hz	500 Hz	25 Hz (AC) / 220 Hz (DC)
Table 1	Table 11	Table 4
Diagram 2	Diagram 7	Diagram 3
Built-in	Built-in	Built-in
10 ... 30 VDC	10 ... 65 VDC	20...265 VAC / 20...320 VDC
-25 ... +70 °C	-25 ... +70 °C	-25 ... +85 °C
≤ 200 mA	≤ 100 mA	≤ 300 mA
		
		
DW-AS-611-M30-002		
DW-AS-612-M30-002		
DW-AS-613-M30-002		
DW-AS-614-M30-002		
	DW-DS-615-M30-002	
	DW-DS-616-M30-002	
		DW-AS-617-M30-002
		DW-AS-618-M30-002
G ... N (N.O.); K ... N (N.C.)	G...N (N.O.);K...N (N.C.)	M, N

SERIES 700

M30

20*	20*
Stainless steel V2A	Stainless steel V2A
PUR cable type 11	Connector S12
IP 68	IP 67
Embeddable	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
40 bar 	40 bar 
all-metal	all-metal
	
DW-AD-701-M30	**DW-AS-701-M30-002**
DW-AD-702-M30	DW-AS-702-M30-002
DW-AD-703-M30	**DW-AS-703-M30-002**
DW-AD-704-M30	DW-AS-704-M30-002
	G ... N (N.O.); K ... N (N.C.)

* versions with 10 mm operating distance 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.

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M30

Housing size					
Operating distance mm	22	22	22	22	40
Housing material	Chrome-plated brass	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	PVC cable type 8
Degree of protection	IP 67	IP 67	IP 67	IP 67	IP 67
Mounting	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Non-embeddable
Max. switching frequency	200 Hz	200 Hz	200 Hz	200 Hz	100 Hz
Technical data [2]	Table 1	Table 1	Table 1	Table 1	Table 1
Wiring [3]	Diagram 1	Diagram 1	Diagram 2	Diagram 2	Diagram 1
LED	Built-in	Built-in	Built-in	Built-in	Built-in
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 ... +70 °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 76
[3] see page 77
[4] see page 146

long distance

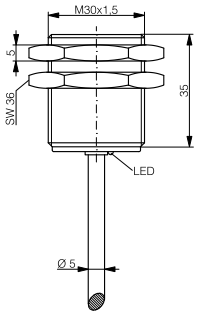
long distance

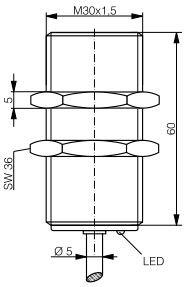
long distance

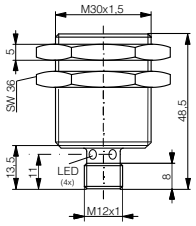
long distance

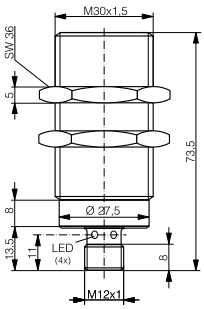
long distance

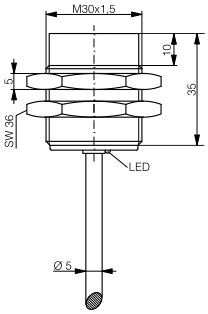
Dimensions:









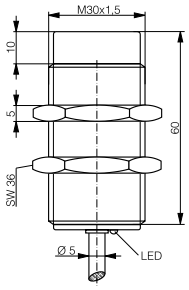
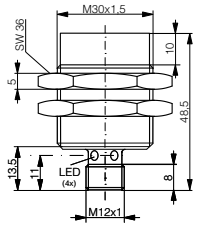
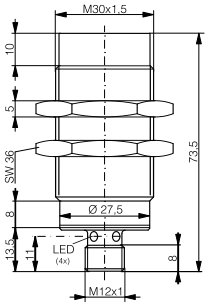


Part references:
(**bold:** preferred types)

NPN N.O.	DW-AD-501-M30-120	**DW-AD-501-M30**	DW-AS-501-M30-120	**DW-AS-501-M30-002**	DW-AD-511-M30-120
NPN N.C.	DW-AD-502-M30-120	DW-AD-502-M30	DW-AS-502-M30-120	DW-AS-502-M30-002	DW-AD-512-M30-120
PNP N.O.	DW-AD-503-M30-120	**DW-AD-503-M30**	DW-AS-503-M30-120	**DW-AS-503-M30-002**	DW-AD-513-M30-120
PNP N.C.	DW-AD-504-M30-120	DW-AD-504-M30	DW-AS-504-M30-120	DW-AS-504-M30-002	DW-AD-514-M30-120
DC 2-wire N.O.					
DC 2-wire N.C.					
AC/DC 2-wire N.O.					
AC/DC 2-wire N.C.					
Compatible connectors [4]			G ... N (N.O.); K ... N (N.C.)	G ... N (N.O.); K ... N (N.C.)	

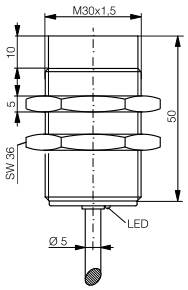
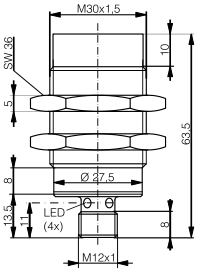
SERIES 500

M30

40	40	40
Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
PVC cable type 8	Connector S12	Connector S12
IP 67	IP 67	IP 67
Non-embeddable	Non-embeddable	Non-embeddable
100 Hz	100 Hz	100 Hz
Table 1	Table 1	Table 1
Diagram 1	Diagram 2	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-M30	DW-AS-511-M30-120	**DW-AS-511-M30-002**
DW-AD-512-M30	DW-AS-512-M30-120	DW-AS-512-M30-002
DW-AD-513-M30	DW-AS-513-M30-120	**DW-AS-513-M30-002**
DW-AD-514-M30	DW-AS-514-M30-120	DW-AS-514-M30-002
	G ... N (N.O.); K ... N (N.C.)	G ... N (N.O.); K ... N (N.C.)

SERIES 700

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
40 bar 	40 bar 
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.)

* versions with 15 mm operating distance on request

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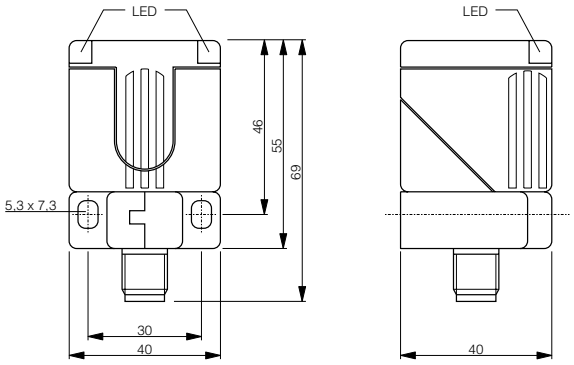
□ 40x40

Housing size			
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 8	Table 9	Table 8
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 76
[3] see page 77
[4] see page 146

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

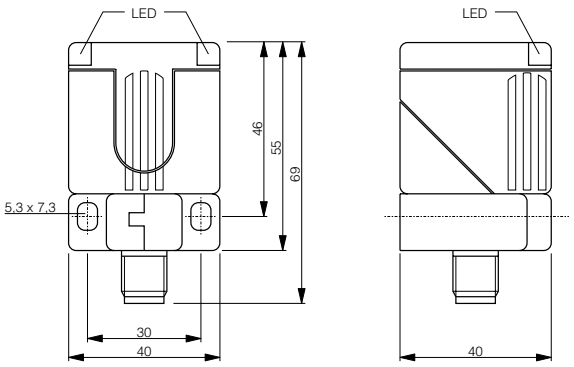
* 50 °C / 85 °C

SERIES 600

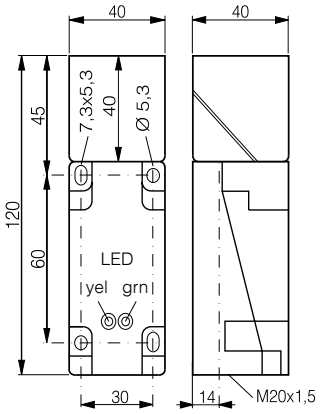
☐ 40x40

☐ 40x120

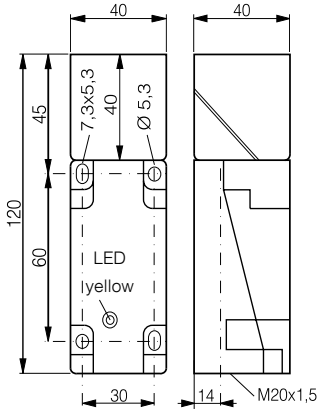
35	35	15	15
PBTP	PBTP	PBTP	PBTP
Connector S12	Connector S12	Screw terminal	Screw terminal
IP 67	IP 67	IP 65	IP 65
Non-embeddable	Non-embeddable	Embeddable	Embeddable
30 Hz	25 Hz (AC) / 30 Hz (DC)	100 Hz	25 Hz (AC) / 150 Hz (DC)
Table 8	Table 9	Table 2	Table 4
Diagram 6	Diagram 3	Diagram 2	Diagram 3
Built-in	Built-in	Built-in	Built-in
15 ... 34 VDC	20...265 VAC / 20...320 VDC	15 ... 34 VDC	20 ... 265 VAC / 20 ... 320 VDC
-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C
≤ 200 mA / ≤ 150 mA*	≤ 300 mA	≤ 200 mA / ≤ 150 mA*	≤ 300 mA



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.

DW-AS-611-C44			
		DW-AD-601-C40	
DW-AS-613-C44			
		DW-AD-603-C40	
	DW-AS-617-C44		**DW-AD-607-C40****
M, N	G ... N		

* 50 °C / 85 °C

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

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.

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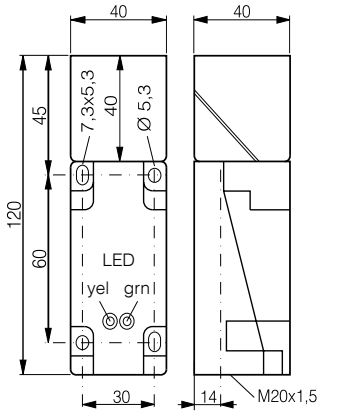
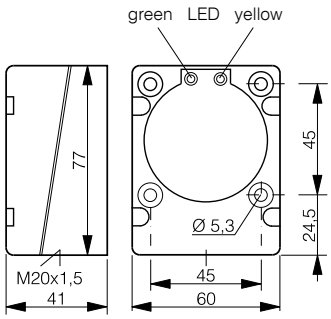
Housing size	☐ 40x120	☐ 60x80	☐ 80x100
Operating distance mm	**40**	**50**	**65**
Housing material	PBTP	PBTP	PBTP
Connection [1]	Screw terminal	Screw terminal	Screw terminal
Degree of protection	IP 65	IP 65	IP 65
Mounting	Non-embeddable	Non-embeddable	Non-embeddable
Max. switching frequency	20 Hz	20 Hz	10 Hz
Technical data [2]	Table 3	Table 3	Table 3
Wiring [3]	Diagram 2	Diagram 2	Diagram 2
LED	Built-in	Built-in	Built-in
Supply voltage range	10 ... 65 VDC	10 ... 65 VDC	10 ... 65 VDC
Ambient temperature range	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C
Output current	≤ 300 mA	≤ 300 mA	≤ 300 mA

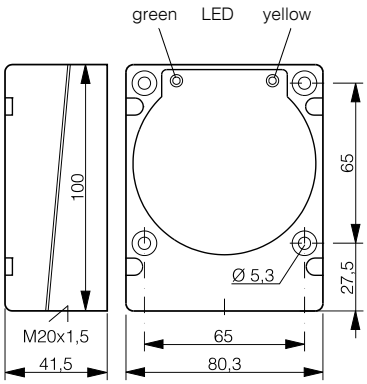
[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 76
[3] see page 77
[4] see page 146

Dimensions:



Sensing face can be rotated to 5 different sides.



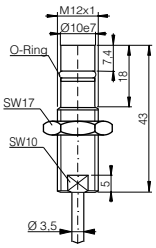
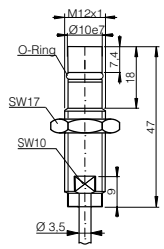
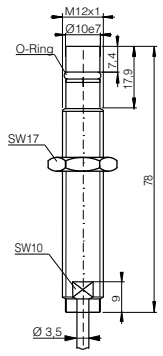
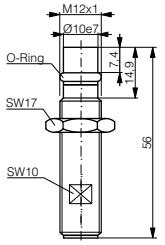
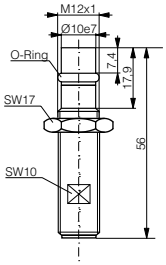
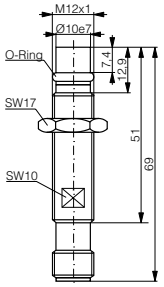


Part references:
(**bold:** preferred types)

NPN N.O.			
NPN N.C.			
PNP N.O.	**DW-AD-613-C40****	**DW-AD-613-C60****	**DW-AD-613-C80****
PNP N.C.			
DC 2-wire N.O.			
AC/DC 2-wire N.O.			
AC/DC 2-wire N.C.			
Compatible connectors [4]			

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

HIGH-PRESSURE-RESISTANT SERIES P

Housing size	P12					
Operating distance mm	1.5	1.5	1.5	1.5	1.5	1.5
Max. operating pressure	500 bar	500 bar	500 bar	500 bar	500 bar	500 bar
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Sensing face	Ceramic ZrO_2	Ceramic ZrO_2	Ceramic ZrO_2	Ceramic ZrO_2	Ceramic ZrO_2	Ceramic ZrO_2
Connection [1]	PUR cable type 3	PUR cable type 3	PUR cable type 3	Connector S12	Connector S12	Connector S12
Degree of protection	IP 68	IP 68	IP 68	IP 68	IP 68	IP 68
Mounting	Embeddable	Embeddable	Embeddable	Embeddable	Embeddable	Embeddable
Max. switching frequency	600 Hz	600 Hz	600 Hz	600 Hz	600 Hz	600 Hz
Technical data [2]	Table 6	Table 6	Table 6	Table 6	Table 6	Table 6
Wiring [3]	Diagram 1	Diagram 1	Diagram 1	Diagram 2	Diagram 2	Diagram 2
LED	---	---	---	---	---	---
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +80 °C	-25 ... +80 °C	-25 ... +80 °C	-25 ... +80 °C	-25 ... +80 °C	-25 ... +80 °C
Output current	≤ 200 mA	≤ 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 76 [3] see page 77 [4] see page 146						
Dimensions:						
Part references: (**bold:** preferred types)						
NPN N.O.	**DW-AD-501-P12-639**	**DW-AD-501-P12-625**	**DW-AD-501-P12-627**	**DW-AS-501-P12-624**	**DW-AS-501-P12-630**	**DW-AS-501-P12**
NPN N.C.						
PNP N.O.	**DW-AD-503-P12-639**	**DW-AD-503-P12-625**	**DW-AD-503-P12-627**	**DW-AS-503-P12-624**	**DW-AS-503-P12-630**	**DW-AS-503-P12**
PNP N.C.						DW-AS-504-P12
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.)

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.

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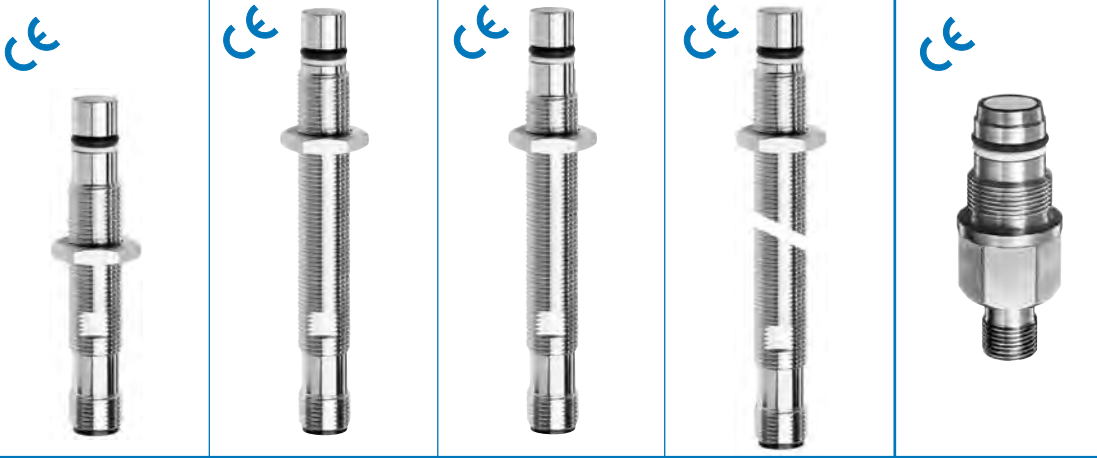
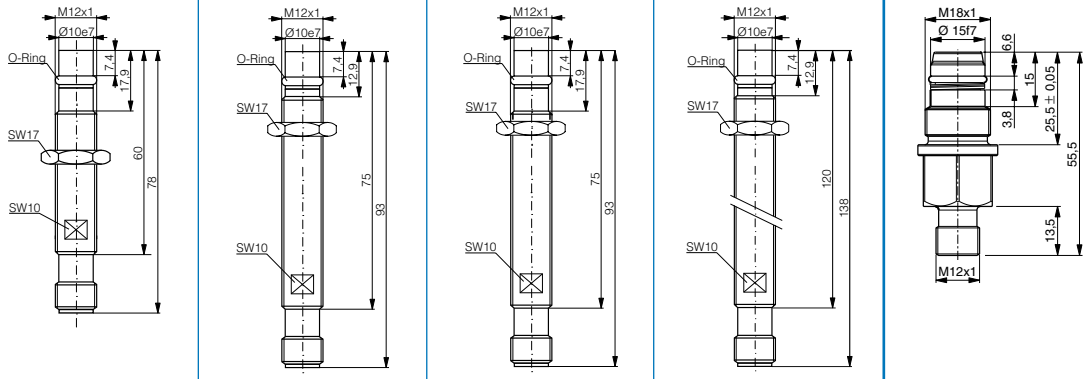
CONTRINEX HIGH-PRESSURE-RESISTANT

Housing size	P12				P18
Operating distance mm	1.5	1.5	1.5	1.5	1.5
Max. operating pressure	500 bar	500 bar	500 bar	500 bar	500 bar
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Sensing face	Ceramic ZrO_2	Ceramic ZrO_2	Ceramic ZrO_2	Ceramic ZrO_2	Ceramic ZrO_2
Connection [1]	Connector S12	Connector S12	Connector S12	Connector S12	Connector S12
Degree of protection	IP 68	IP 68	IP 68	IP 68	IP 68
Mounting	Embeddable	Embeddable	Embeddable	Embeddable	Embeddable
Max. switching frequency	600 Hz	600 Hz	600 Hz	600 Hz	800 Hz
Technical data [2]	Table 6	Table 6	Table 6	Table 6	Table 6
Wiring [3]	Diagram 2	Diagram 2	Diagram 2	Diagram 2	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 ... +80 °C	-25 ... +80 °C	-25 ... +80 °C	-25 ... +80 °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 76
[3] see page 77
[4] see page 146



Dimensions:

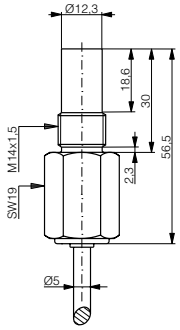
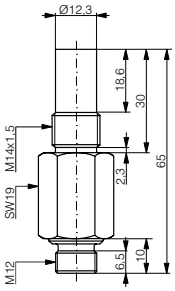


Part references:
(**bold:** preferred types)

NPN N.O.	**DW-AS-501-P12-627**	**DW-AS-501-P12-621**	**DW-AS-501-P12-635**	**DW-AS-501-P12-622**	**DW-AS-501-P18**
NPN N.C.					
PNP N.O.	**DW-AS-503-P12-627**	**DW-AS-503-P12-621**	**DW-AS-503-P12-635**	**DW-AS-503-P12-622**	**DW-AS-503-P18**
PNP N.C.					
NAMUR					
AC/DC 2-wire N.O.					
AC/DC 2-wire N.C.					
Compatible connectors [4]	G ... N	G ... N	G ... N	G ... N	G ... N

SERIES P

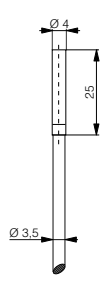
P20

3	3
500 bar	500 bar
Stainless steel V4A	Stainless steel V4A
Ceramic ZrO_2	Ceramic ZrO_2
PUR cable type 11	Connector S12
IP 68	IP 68
Embeddable	Embeddable
500 Hz	500 Hz
Table 6	Table 6
Diagram 1	Diagram 2
---	---
10 ... 30 VDC	10 ... 30 VDC
-25 ... +80 °C	-25 ... +80 °C
≤ 200 mA	≤ 200 mA
	
	
DW-AD-501-P20	**DW-AS-501-P20**
DW-AD-503-P20	**DW-AS-503-P20**
	DW-AS-504-P20
	G...N (N.O.); K...N (N.C.)

SEALED SERIES E

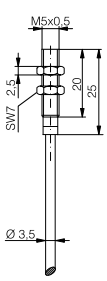
Ø 4

0.6
20 bar
Stainless steel V2A
Sapphire
PUR cable type 3
IP 68
Embeddable
5,000 Hz
Table 1
Diagram 1
---
10 ... 30 VDC
-25 ... +70 °C
≤ 200 mA


DW-AD-401-04E
DW-AD-403-04E

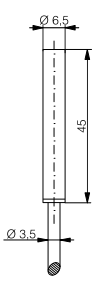
M5

0.6
20 bar
Stainless steel V2A
Sapphire
PUR cable type 3
IP 68
Embeddable
5,000 Hz
Table 1
Diagram 1
---
10 ... 30 VDC
-25 ... +70 °C
≤ 200 mA


DW-AD-401-M5E
DW-AD-403-M5E

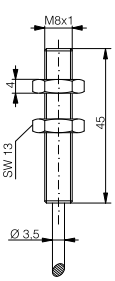
Ø 6.5

2.5
20 bar
Stainless steel V2A
Ceramic ZrO_2
PUR cable type 3
IP 68
Embeddable
1,000 Hz
Table 1
Diagram 1
---
10 ... 30 VDC
-25 ... +70 °C
≤ 200 mA


DW-AD-501-065E
DW-AD-503-065E

M8

2.5
20 bar
Stainless steel V2A
Ceramic ZrO_2
PUR cable type 3
IP 68
Embeddable
1,000 Hz
Table 1
Diagram 1
---
10 ... 30 VDC
-25 ... +70 °C
≤ 200 mA


DW-AD-501-M8E
DW-AD-503-M8E

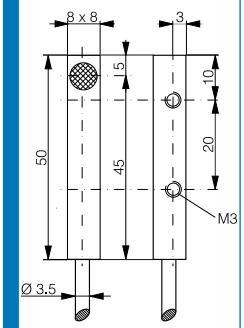
For all these products, you will find detailed data sheets, application notes, dimensional drawings, cross-reference lists, part references, new items, special executions, extensive additional technical information, specifications concerning quality, safety and standards, as well as the addresses of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

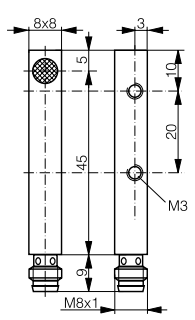
Housing size	C8		M8		
Sensing range mm	0 ... 4	0 ... 4	0 ... 4	0 ... 4	0 ... 4
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connection [1]	PUR cable type 3	Connecteur S8	PUR cable type 3	Connector S8	Connector S12
Degree of protection	IP 67	IP 67	IP 67	IP 67	IP 67
Bandwidth (-3 dB)	1,600 Hz (at s = 2mm)	1,600 Hz (at s = 2mm)	1,600 Hz (at s = 2mm)	1,600 Hz (at s = 2mm)	1,600 Hz (at s = 2mm)
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 ... 10 V	0 ... 10 V	0 ... 5 V / 0 ... 10 V	0 ... 5 V / 0 ... 10 V	0 ... 5 V / 0 ... 10 V
Current output	---	---	---	---	---
Wiring [3]	Diagram 5	Diagram 5	Diagram 5	Diagram 5	Diagram 5
Supply voltage range	15 ... 30 VDC	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

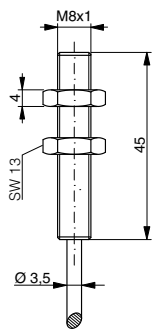
[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 76
[3] see page 77
[4] see page 146

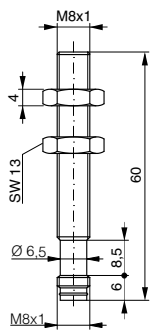


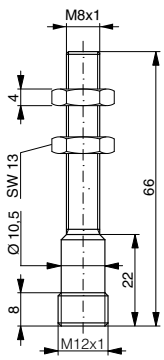

Dimensions:









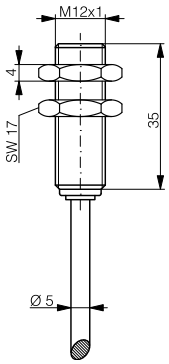
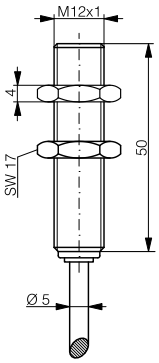
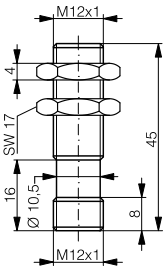
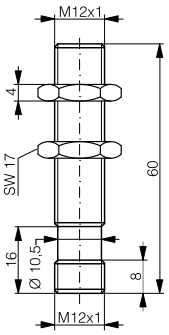
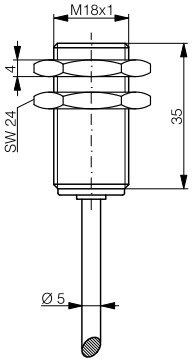
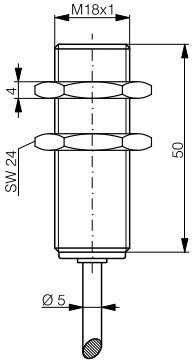


Part references:
(**bold:** preferred types)

Non-linearized:					
Outputs 0...5 V / 1...5 mA			**DW-AD-509-M8*****	**DW-AS-509-M8-001*****	**DW-AS-509-M8*****
Outputs 0...10 V / 4...20 mA	**DW-AD-509-C8-390*****	**DW-AS-509-C8-390*****	**DW-AD-509-M8-390*****	**DW-AS-509-M8-390*****	**DW-AS-509-M8-393*****
Compatible connectors [4]				A ... D	G ... N

* DW-A#-509-M##-320/39# ** Depending on operating conditions, limited temperature range for DW-A#-509-M##-320/390 (see data sheets) *** without current output

ANALOG SERIES

M12				M18	
0 ... 6	0 ... 6	0 ... 6	0 ... 6	0 ...10	0 ...10
Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
PUR cable type 7	PUR cable type 7	Connector S12	Connector S12	PUR cable type 7	PUR cable type 7
IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
1,000 Hz (at s = 3mm)	1,000 Hz (at s = 3mm)	1,000 Hz (at s = 3mm)	1,000 Hz (at s = 3mm)	500 Hz (at s = 5mm)	500 Hz (at s = 5mm)
Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable
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
1 ... 5 mA	1...5 mA / 4...20 mA	1 ... 5 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
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**
					
					
DW-AD-509-M12-120	**DW-AD-509-M12**	**DW-AS-509-M12-120**	**DW-AS-509-M12**	**DW-AD-509-M18-120**	**DW-AD-509-M18**
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**	**DW-AD-509-M18-390**
		M, N	M, N		

* DW-A#-509-M##-320/39# ** Depending on operating conditions, limited temperature range for DW-A#-509-M##-320/390 (see data sheets) *** without current output

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.

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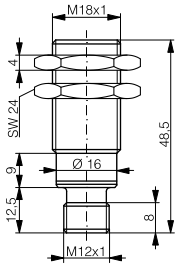
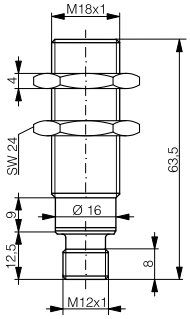
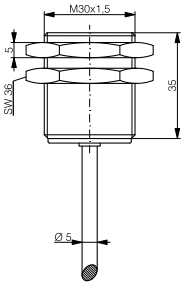
Housing size	M18		M30		
Sensing range mm	0 ...10	0 ...10	0 ... 20	0 ... 20	0 ... 20
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connection [1]	Connector S12	Connector S12	PUR cable type 7	PUR cable type 7	Connector S12
Degree of protection	IP 67	IP 67	IP 67	IP 67	IP 67
Bandwidth (-3 dB)	500 Hz (at s = 5mm)	500 Hz (at s = 5mm)	200 Hz (at s = 10mm)	200 Hz (at s = 10mm)	200 Hz (at s = 10mm)
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 / 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
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**

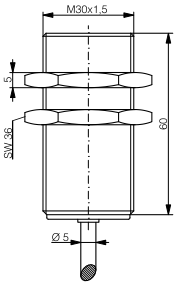
[1] Standard cable length 2 m. Non-standard cable lengths and types on request.
[2] see page 76
[3] see page 77
[4] see page 146

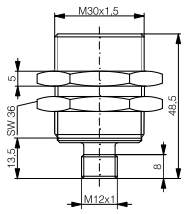
Dimensions:







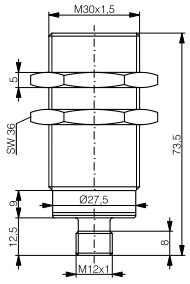
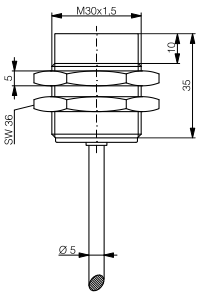
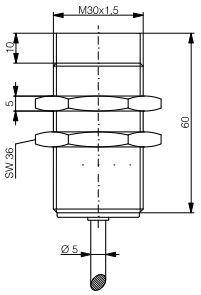
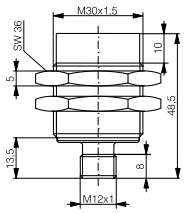
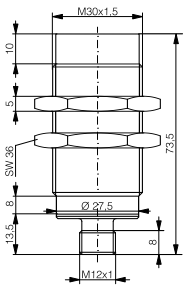




Part references:
(**bold:** preferred types)

Non-linearized:					
Outputs 0...5 V / 1...5 mA	**DW-AS-509-M18-120**	**DW-AS-509-M18-002**	DW-AD-509-M30-120	**DW-AD-509-M30**	DW-AS-509-M30-120
Outputs 0...10 V / 4...20 mA	**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
Compatible connectors [4]	M, N	M, N			M, N

* DW-A#-5#9-M##-320/390 ** Depending on operating conditions, limited temperature range for DW-A#-5#9-M##-320/390 (see data sheets)

M30	M30			
0 ... 20	**0 ... 40**	**0 ... 40**	**0 ... 40**	**0 ... 40**
Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connector S12	PUR cable type 7	PUR cable type 7	Connector S12	Connector S12
IP 67	IP 67	IP 67	IP 67	IP 67
200 Hz (at s = 10mm)	100 Hz (at s = 20mm)	100 Hz (at s = 20mm)	100 Hz (at s = 20mm)	100 Hz (at s = 20mm)
Quasi-embeddable	Non-embeddable	Non-embeddable	Non-embeddable	Non-embeddable
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
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
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**
				
				
DW-AS-509-M30-002	DW-AD-519-M30-120	**DW-AD-519-M30**	DW-AS-519-M30-120	**DW-AS-519-M30-002**
DW-AS-509-M30-390	DW-AD-519-M30-320	**DW-AD-519-M30-390**	DW-AS-519-M30-320	**DW-AS-519-M30-390**
M, N			M, N	M, N

* DW-A#-5#9-M##-320/390 ** Depending on operating conditions, limited temperature range for DW-A#-5#9-M##-320/390 (see data sheets)

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CONTRINEX HIGH-TEMPERATURE SERIES

Housing size	M8	M12	
Operating distance mm	2	3	4
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection [1]	Silicone cable 2 m*	Silicone cable 2 m*	Silicone cable 2 m*
Amplifier	Built-in	Built-in	Built-in
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Non-embeddable
Max. switching frequency	600 Hz	500 Hz	500 Hz
Technical data [2]	Table 10	Table 10	Table 10
Wiring [3]	Diagram 1	Diagram 1	Diagram 1
LED	---	---	---
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +140 °C	-25 ... +150 °C	-25 ... +150 °C
Output current	120mA (≤100°C) / 80mA (>100°C)	120mA (≤100°C) / 70mA (>100°C)	120mA (≤100°C) / 70mA (>100°C)

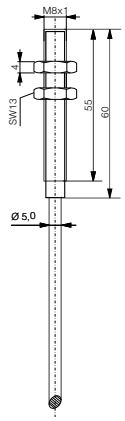
[1] Non-standard cable lengths and types on request.
[2] see page 76
[3] see page 77
[4] see page 146

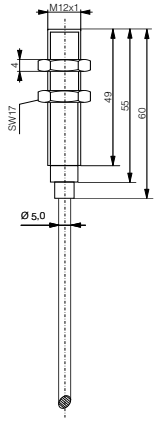
-25 ... +140 °C

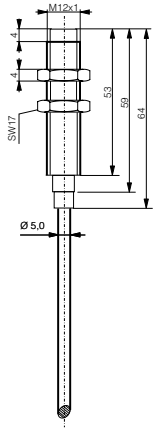
-25 ... +150 °C

-25 ... +150 °C

Dimensions:







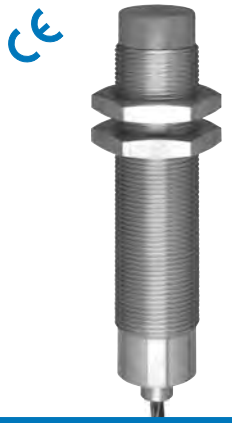
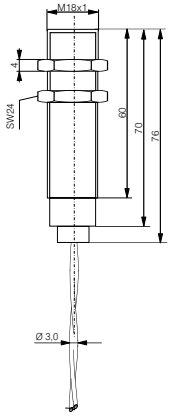
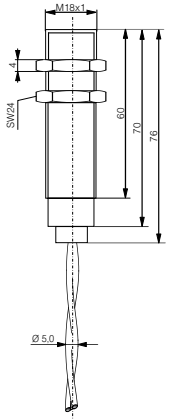
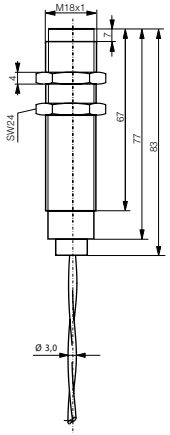
Part references:
(**bold:** preferred types)

NPN N.O.	**DW-HD-621-M8-100**	**DW-HD-601-M12-200**	**DW-HD-611-M12-200**
NPN N.C.			
PNP N.O.	**DW-HD-623-M8-100**	**DW-HD-603-M12-200**	**DW-HD-613-M12-200**
PNP N.C.			
NAMUR			
AC/DC 2-wire N.O.			
AC/DC 2-wire N.C.			
Compatible connectors [4]			

* Teflon cable on request

HIGH-TEMPERATURE SERIES

M18

5	5	8	
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	
Teflon cable 2 m	Teflon cable 3 m + PUR 2 m	Teflon cable 2 m	
Built-in	In cable	Built-in	
IP 67	IP 67	IP 67	
Embeddable	Embeddable	Non-embeddable	
400 Hz	300 Hz	400 Hz	
Table 10	Table 10	Table 10	
Diagram 1	Diagram 1	Diagram 1	
---	Yellow (amplifier)	---	
10 ... 30 VDC	10 ... 30 VDC (amplifier)	10 ... 30 VDC	
-25 ... +180 °C	-25 ... +230 °C	-25 ... +180 °C	
≤ 150 mA	≤ 200 mA (amplifier)	≤ 150 mA	
			
-25 ... +180 °C	**-25 ... +230 °C**	**-25 ... +180 °C**	
			
DW-HD-601-M18-310	**DW-HD-601-M18-411**	**DW-HD-611-M18-310**	
DW-HD-603-M18-310	**DW-HD-603-M18-411**	**DW-HD-613-M18-310**	

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Housing size	M30			
Operating distance mm	10	10	15	15
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection [1]	Teflon cable 2 m	Teflon cable 3 m + PUR 2 m	Teflon cable 2 m	Teflon cable 3 m + PUR 2 m
Amplifier	Built-in	In cable	Built-in	In cable
Degree of protection	IP 67	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Non-embeddable	Non-embeddable
Max. switching frequency	200 Hz	200 Hz	200 Hz	150 Hz
Technical data [2]	Table 10	Table 10	Table 10	Table 10
Wiring [3]	Diagram 1	Diagram 1	Diagram 1	Diagram 1
LED	---	Yellow (amplifier)	---	Yellow (amplifier)
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC (amplifier)	10 ... 30 VDC	10 ... 30 VDC (amplifier)
Ambient temperature range	-25 ... +180 °C	-25 ... +230 °C	-25 ... +180 °C	-25 ... +230 °C
Output current	≤ 150 mA	≤ 200 mA (amplifier)	≤ 150 mA	≤ 200 mA (amplifier)

[1] Non-standard cable lengths and types on request.
[2] see page 76
[3] see page 77
[4] see page 146

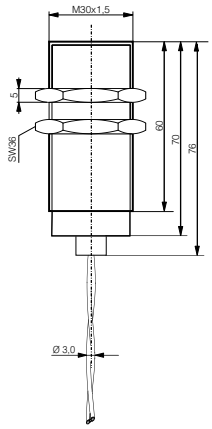
-25 ... +180 °C

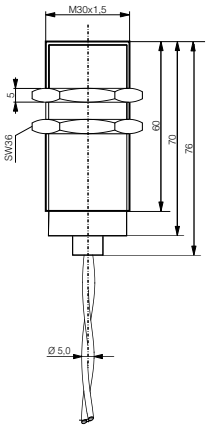
-25 ... +230 °C

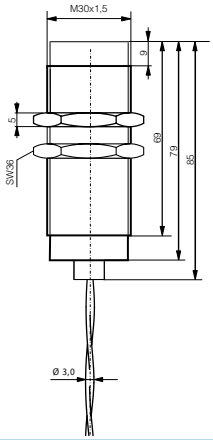
-25 ... +180 °C

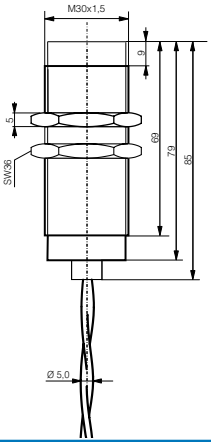
-25 ... +230 °C

Dimensions:





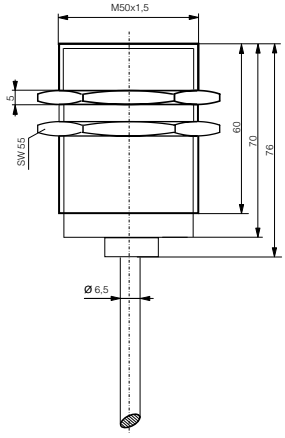
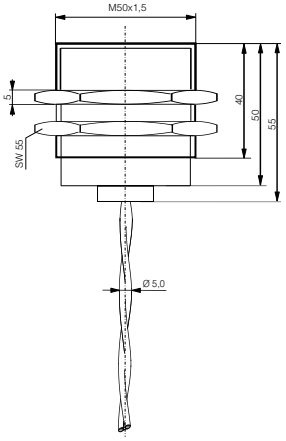
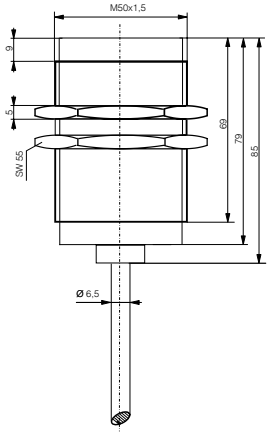
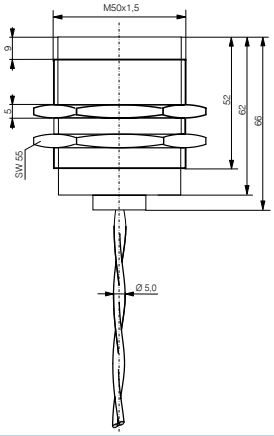




Part references:
(**bold:** preferred types)

NPN N.O.	**DW-HD-601-M30-310**	**DW-HD-601-M30-411**	**DW-HD-611-M30-310**	**DW-HD-611-M30-411**
NPN N.C.				
PNP N.O.	**DW-HD-603-M30-310**	**DW-HD-603-M30-411**	**DW-HD-613-M30-310**	**DW-HD-613-M30-411**
PNP N.C.				
NAMUR				
AC/DC 2-wire N.O.				
AC/DC 2-wire N.C.				
Compatible connectors [4]				

M50

20	20	25	25
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Silicone cable 2 m*	Teflon cable 3 m + PUR 2 m	Silicone cable 2 m*	Teflon cable 3 m + PUR 2 m
Built-in	In cable	Built-in	In cable
IP 67	IP 67	IP 67	IP 67
Quasi-embeddable	Quasi-embeddable	Non-embeddable	Non-embeddable
100 Hz	150 Hz	100 Hz	150 Hz
Table 10	Table 10	Table 10	Table 10
Diagram 1	Diagram 1	Diagram 1	Diagram 1
---	Yellow (amplifier)	---	Yellow (amplifier)
10 ... 30 VDC	10 ... 30 VDC (amplifier)	10 ... 30 VDC	10 ... 30 VDC (amplifier)
-25 ... +180 °C	-25 ... +230 °C	-25 ... +180 °C	-25 ... +230 °C
≤ 150 mA	≤ 200 mA (amplifier)	≤ 150 mA	≤ 200 mA (amplifier)
			
-25 ... +180 °C	-25 ... +230 °C	-25 ... +180 °C	-25 ... +230 °C
			
DW-HD-601-M50-300	**DW-HD-601-M50-411**	**DW-HD-611-M50-300**	**DW-HD-611-M50-411**
DW-HD-603-M50-300	**DW-HD-603-M50-411**	**DW-HD-613-M50-300**	**DW-HD-613-M50-411**

* Teflon cable 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.

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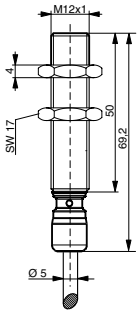
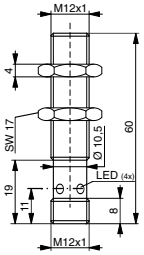
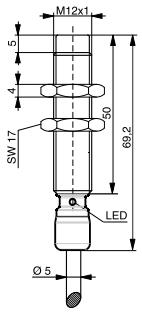
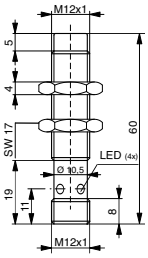
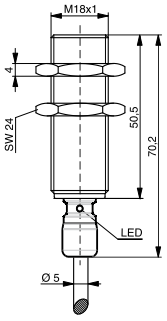
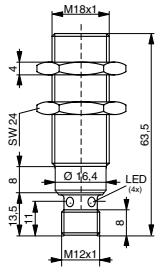
CONTRINEX 700 FOOD & SEA-WATER SERIES

Housing size	M12				M18	
Operating distance mm	6	6	10	10	10	10
Housing material	Stainless steel V4A*	Stainless steel V4A*	Stainless steel V4A*	Stainless steel V4A*	Stainless steel V4A*	Stainless steel V4A*
Connection [1]	TPE-S cable type 13	Connector S12	TPE-S cable type 13	Connector S12	TPE-S cable type 13	Connector S12
Degree of protection	IP 68 + IP 69K	IP 68 + IP 69K	IP 68 + IP 69K	IP 68 + IP 69K	IP 68 + IP 69K	IP 68 + IP 69K
Mounting	Embeddable	Embeddable	Non-embeddable	Non-embeddable	Embeddable	Embeddable
Max. switching frequency	600 Hz	600 Hz	400 Hz	400 Hz	300 Hz	300 Hz
Technical data [2]	Table 1	Table 1	Table 1	Table 1	Table 1	Table 1
Wiring [3]	Diagram 1	Diagram 2	Diagram 1	Diagram 2	Diagram 1	Diagram 2
LED	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C
Output current	≤ 200 mA	≤ 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 76
[3] see page 77
[4] see page 146

	80 bar	80 bar	80 bar	80 bar	60 bar	60 bar
						
	all-metal food-safe & corrosion-resistant / IP 68 + IP 69K					
Dimensions:						
Part references: (**bold:** preferred types)						
NPN N.O.	**DW-LD-701-M12**	**DW-LS-701-M12**	**DW-LD-711-M12**	**DW-LS-711-M12**	**DW-LD-701-M18**	**DW-LS-701-M18-002**
NPN N.C.	DW-LD-702-M12	DW-LS-702-M12	DW-LD-712-M12	DW-LS-712-M12	DW-LD-702-M18	DW-LS-702-M18-002
PNP N.O.	**DW-LD-703-M12**	**DW-LS-703-M12**	**DW-LD-713-M12**	**DW-LS-713-M12**	**DW-LD-703-M18**	**DW-LS-703-M18-002**
PNP N.C.	DW-LD-704-M12	DW-LS-704-M12	DW-LD-714-M12	DW-LS-714-M12	DW-LD-704-M18	DW-LS-704-M18-002
NAMUR						
AC/DC 2-wire N.O.						
AC/DC 2-wire N.C.						
Compatible connectors [4]						

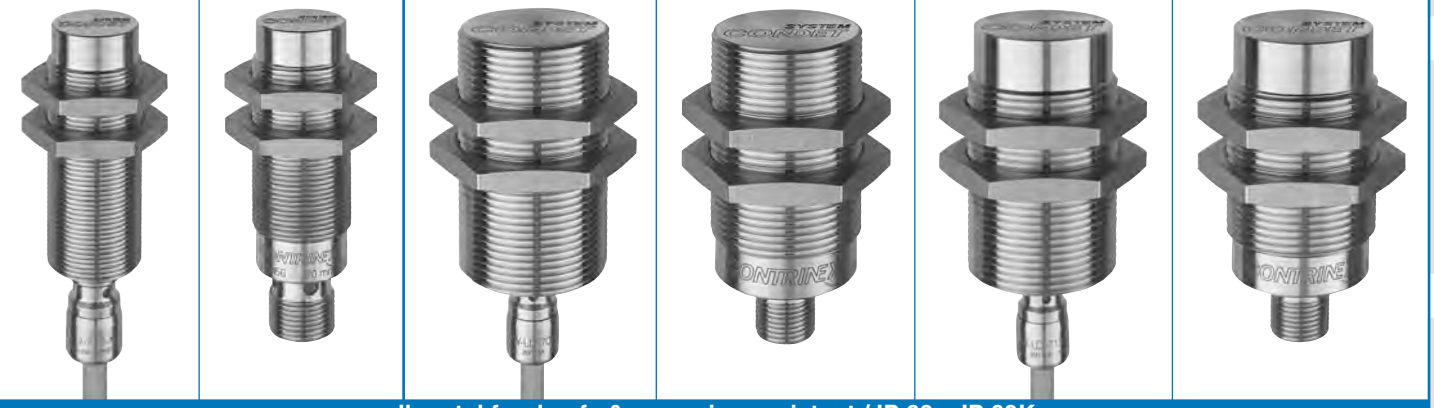
* AISI 316L / DIN 1.4435 (food-safe)

700 FOOD & SEA-WATER SERIES

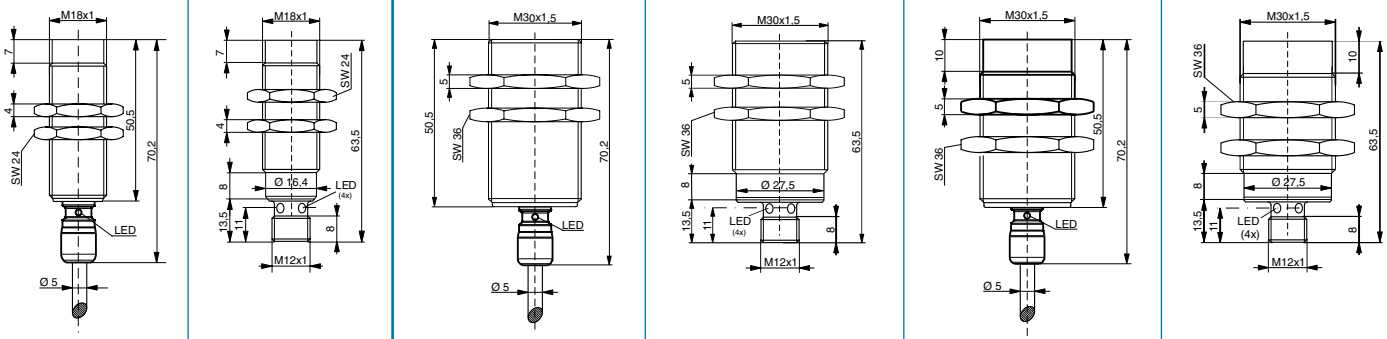
M18

M30

20	20	20	20	40	40
Stainless steel V4A*	Stainless steel V4A*	Stainless steel V4A*	Stainless steel V4A*	Stainless steel V4A*	Stainless steel V4A*
TPE-S cable type 13	Connector S12	TPE-S cable type 13	Connector S12	TPE-S cable type 13	Connector S12
IP 68 + IP 69K	IP 68 + IP 69K	IP 68 + IP 69K	IP 68 + IP 69K	IP 68 + IP 69K	IP 68 + IP 69K
Non-embeddable	Non-embeddable	Embeddable	Embeddable	Non-embeddable	Non-embeddable
200 Hz	200 Hz	120 Hz	120 Hz	100 Hz	100 Hz
Table 1	Table 1	Table 1	Table 1	Table 1	Table 1
Diagram 1	Diagram 2	Diagram 1	Diagram 2	Diagram 1	Diagram 2
Built-in	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	10 ... 30 VDC
-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C	-25 ... +85 °C
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
60 bar	60 bar	40 bar	40 bar	40 bar	40 bar



all-metal food-safe & corrosion-resistant / IP 68 + IP 69K



DW-LD-711-M18	**DW-LS-711-M18-002**	**DW-LD-701-M30**	**DW-LS-701-M30-002**	**DW-LD-711-M30**	**DW-LS-711-M30-002**
DW-LD-712-M18	DW-LS-712-M18-002	DW-LD-702-M30	DW-LS-702-M30-002	DW-LD-712-M30	DW-LS-712-M30-002
DW-LD-713-M18	**DW-LS-713-M18-002**	**DW-LD-703-M30**	**DW-LS-703-M30-002**	**DW-LD-713-M30**	**DW-LS-713-M30-002**
DW-LD-714-M18	DW-LS-714-M18-002	DW-LD-704-M30	DW-LS-704-M30-002	DW-LD-714-M30	DW-LS-714-M30-002

* AISI 316L / DIN 1.4435 (food-safe)

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.

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Technical data

	Table 1	Table 2	Table 3	Table 4	Table 5	Table 6
Permissible ripple content	≤ 20 %	≤ 20 %	≤ 20 %	---	≤ 20 %	≤ 20 %
No-load supply current	≤ 10 mA	≤ 17 mA (24 V)	≤ 20 mA	≤ 1.5 mA	---	≤ 10 mA
		≤ 30 mA (34 V)				
Leakage current at output	≤ 0.1 mA	≤ 0.1 mA	≤ 0.1 mA	---	---	≤ 0.1 mA
Voltage drop, switched state	≤ 2.0 V	≤ 2.5 V	≤ 2.5 V	≤ 8 V	---	≤ 2.0 V
Temperature drift % s_r	≤ 10 %	≤ 10 %	≤ 10 %	≤ 10 %	≤ 10 %	≤ 10 %
Hysteresis % s_r	1 ... 15% (10% typ.)	≤ 20 %	≤ 20 %	≤ 20 %	---	1 ... 15% (10% typ.)
Repeat accuracy	≤ 5 % s_r	≤ 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	built-in
Polarity reversal protection	built-in	built-in	built-in	built-in	---	built-in
Power-on reset	built-in	built-in	built-in	built-in	---	built-in

	Table 7	Table 8	Table 9	Table 10	Table 11
Permissible ripple content	≤ 20 %	≤ 10 %	---	≤ 15 % / ≤ 20 %**	≤ 20 %
No-load supply current	≤ 10 mA	30 mA (24 VDC)	typ. 1.5 mA (24 V)	≤ 10 mA / ≤ 5 mA**	≤ 0.6 mA
		40 mA (34 VDC)	≤ 2.0 mA (U_{max})		
Output voltage, damped	0 VDC	---	---	---	---
Output voltage, non-damped	5 VDC / 10 VDC*	---	---	---	---
Leakage current at output	---	0.01 mA	< 2.0 mA	≤ 0.1 mA	---
Voltage drop, switched state	---	≤ 2.5 V	≤ 8 V	≤ 2.0 V	≤ 5.0 V
Temperature drift % s_r	≤ 5 % (0...+70 °C)	≤ 10 %	≤ 10 %	≤ 15 %	≤ 10 %
	≤ 10 % (-25...0 °C)				
Hysteresis % s_r	---	1 ... 15 %	1 ... 15 %	3...15 % / 2...20 %***	1 ... 15 % (10% typ.)
Repeat accuracy	---	≤ 5 % s_r	≤ 5 % s_r	≤ 0.02 mm	≤ 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	---****
Power-on reset	built-in	built-in	built-in	---	built-in

* DW-A#-5#9-M##-320/39# ** amplifier *** see data sheets **** non-polarized devices

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.

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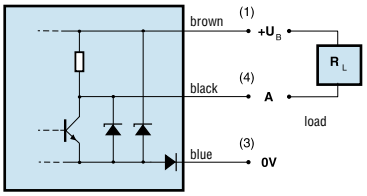
Wiring diagrams

Diagram 1

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



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

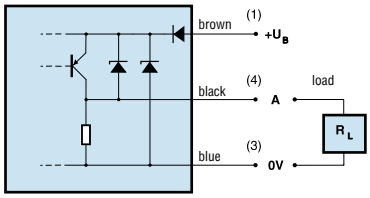
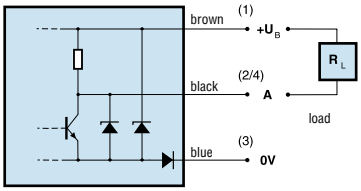


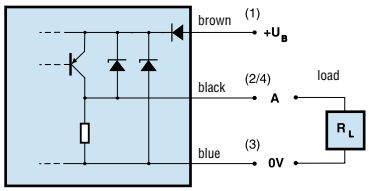
Diagram 2

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



2 N.C. / 4 N.O.

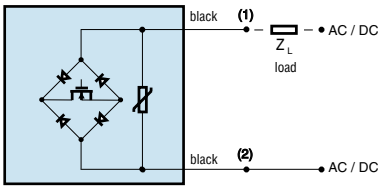
PNP normally open (N.O.) / normally closed (N.C.)



2 N.C. / 4 N.O.

Diagram 3

2-wire UC normally closed (N.C.)



2-wire UC normally open (N.O.)

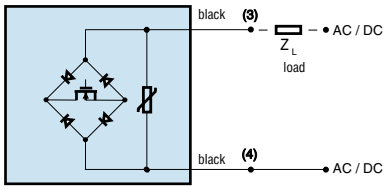


Diagram 4

2-wire NAMUR

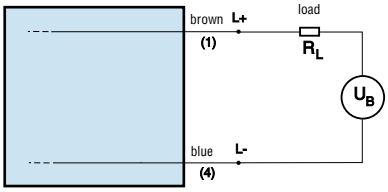
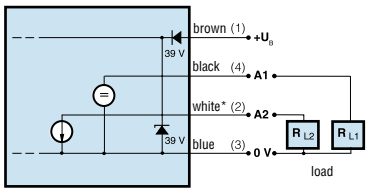


Diagram 5

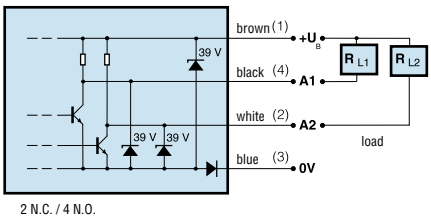
Analog output



* only for models with current output

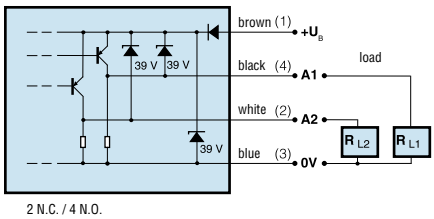
Diagram 6

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



2 N.C. / 4 N.O.

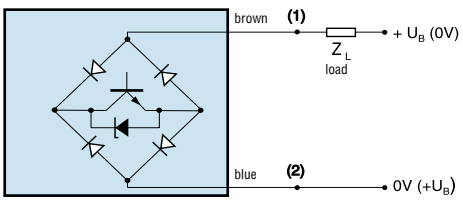
PNP normally open (N.O.) + normally closed (N.C.)



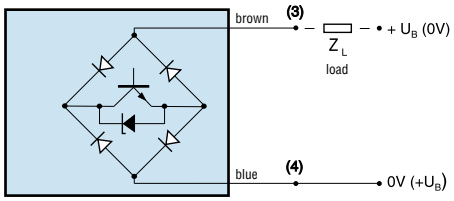
2 N.C. / 4 N.O.

Diagram 7

2-wire DC normally closed (N.C.)



2-wire DC normally open (N.O.)



2 Photoelectric proximity switches

Highlights:

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

New:

- Fiber-optic amplifiers with teach-in or potentiometer
- Cylindrical laser through-beam sensors

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2 Photoelectric proximity switches

	Housing size	Operating distance	Output	
		50/60 mm, 100 mm, 120 mm, 140/150 mm, 200 mm, 250 mm, 300 mm, 600 mm, 1000 mm, 1200 mm, 1500 mm, 2000 mm, 4000 mm, 6000 mm, 10000 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 (DC)	2000 mm	■	■
	65 x 83 mm (UC)	2000 mm	■	■
Diffuse sensors with background suppression	M18 (M18W)	10 ... 120 mm	■	■
	30 x 30 mm	15 ... 150 mm	■	■
	65 x 83 mm (DC)	50 ... 1000 mm	■	■
	65 x 83 mm (UC)	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 (DC)	6000 mm	■	■
	65 x 83 mm (UC)	6000 mm	■	■
Through-beam sensors	∅4 / M5	250 mm	■	■
	M12	10000 mm	■	■
	M12 ⚠	50000 mm	■	■
	M18 (M18W)	20000 mm	■	■
	M18 ⚠	50000 mm	■	■
	30 x 30 mm	6000 mm	■	■
	30 x 30 mm	12000 mm	■	■
	40 x 40 mm	15000 mm	■	■
	65 x 83 mm (DC)	50000 mm	■	■
	65 x 83 mm (UC)		■	■
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	100 mm	■	■
	31 x 60 mm	140 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	Blue light	High switching frequency	Supply voltage range U_B	Connector S8	Connector S12	Cable	Screw terminal	PBTP	Metal	Page
■										10 ... 30 VDC	■		■			■	88, 89
■										10 ... 30 VDC	■		■			■	89
■										10 ... 30 VDC	■		■			■	86, 87
■										10 ... 36 VDC		■	■			■	90
■										10 ... 36 VDC		■	■			■	94 (98)
■										10 ... 36 VDC	■		■		■		102
■			■	■						10 ... 36 VDC	■		■		■		100
■			■	■						10 ... 36 VDC	■		■		■		104
■	■	■		■		■				10 ... 36 VDC		■		■	■		110
■		■		■	■	■				20...265 VAC/20...320 VDC		■		■	■		110
■										10 ... 36 VDC		■	■			■	95 (99)
■			■	■						10 ... 36 VDC	■		■		■		101, 103
■	■	■		■		■				10 ... 36 VDC		■		■	■		111
■		■		■	■	■				20...265 VAC/20...320 VDC		■		■	■		111
	■									10 ... 36 VDC		■	■			■	91
	■									10 ... 36 VDC		■	■			■	95 (99)
	■									10 ... 36 VDC	■		■		■		103
■			■	■						10 ... 36 VDC	■		■		■		101
■			■	■						10 ... 36 VDC	■		■		■		105
■	■	■		■		■				10 ... 36 VDC		■		■	■		111
■		■		■	■	■				20...265 VAC/20...320 VDC		■		■	■		111
	■									10 ... 36 VDC	■		■			■	87
■	■									10 ... 36 VDC		■	■			■	91
■	■									10 ... 36 VDC		■	■			■	93
■			■	■						10 ... 36 VDC		■	■			■	95 (99)
■			■	■						10 ... 36 VDC		■	■			■	97
	■									10 ... 36 VDC	■		■		■		103
■			■	■						10 ... 36 VDC	■		■		■		101
■			■	■						10 ... 36 VDC	■		■		■		105
■	■	■		■		■				10 ... 36 VDC		■		■	■		111
■		■		■	■	■				20...265 VAC/20...320 VDC		■		■	■		111
■	■		■	■						10 ... 36 VDC	■		■		■		103
■			■	■						10 ... 36 VDC	■		■		■		101
■			■	■						10 ... 36 VDC	■		■		■		105
		■		■		■	■	■		10 ... 30 VDC	■		■		■		107, 109
		■		■		■	■		■	10 ... 30 VDC	■		■		■		107, 109
		■		■		■	■			10 ... 30 VDC	■		■		■		106, 108

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 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.

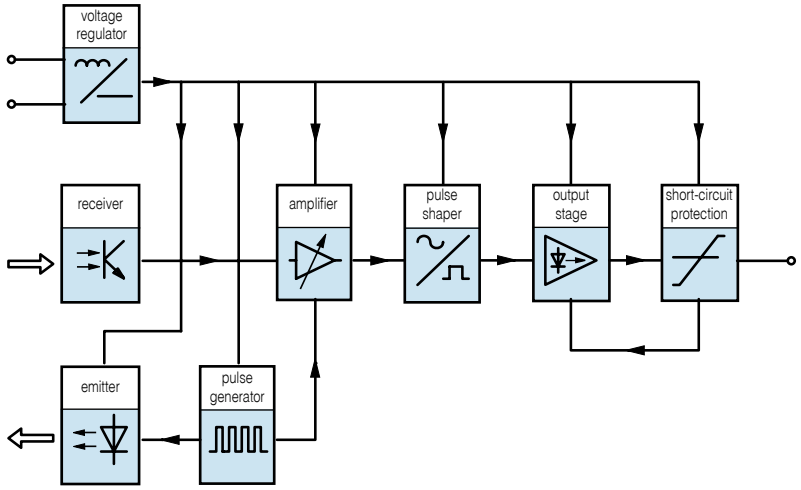

Fig. 10

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.

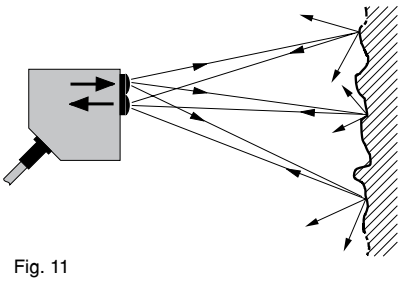

Fig. 11

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

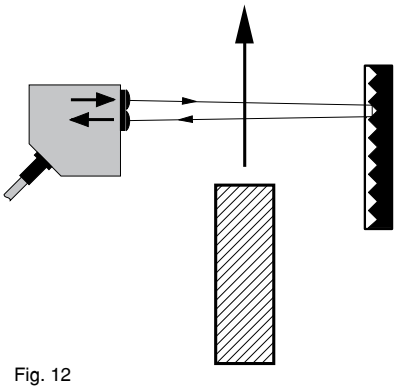

Fig. 12

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.

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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

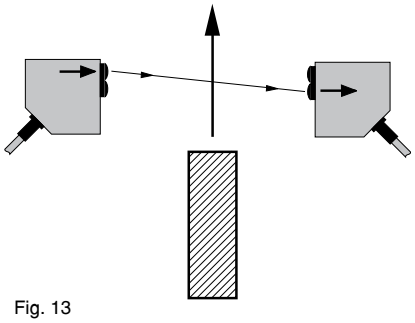


Fig. 13

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).

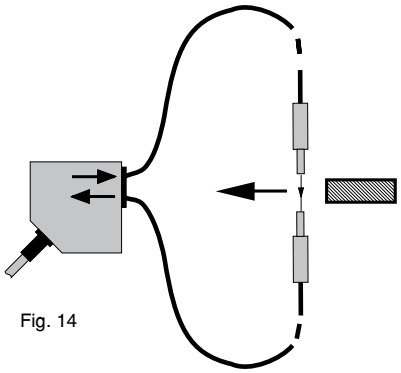


Fig. 14

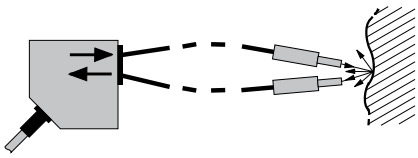


Fig. 15

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).

CONTRINEX

Product overview

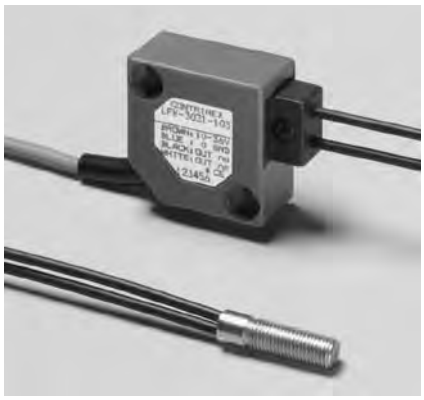
Series 1000

This series features a great variety of sizes and functions in widely used standardized cylindrical housings (smooth and threaded types). The program includes devices in sizes diameter 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.

The series 1000 now also includes laser devices in sizes M12 and M18, which compared to conventional LED through-beam sensors, are distinguished by a narrowly collimated red laser beam. The latter allows for the detection of very small objects across a large distance.

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 / 3065

The new fiber-optic amplifiers for DIN-rail mounting (DIN/EN 50022) feature large sensing ranges, outstanding detection properties for both long and very short operating distances, high temperature stability and durability, thanks to stabilized light power (teach-in model only), and high switching frequency. For the teach-in versions, built-in adjustable pulse delay and stretching are standard. The housing width of only 10 mm allows for optimum stacking 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 potentiometer and teach-in; the latter 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. The devices are available as blue and red-light, as well as high-frequency models, in cable and connector executions.

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Glass optical fibers

A large range of glass optical fibers is available for the 4040 series, and partially for the 3030 / 3031 and 3060 / 3065 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

For 3030 / 3031 and 3060 / 3065 series switches, this catalog includes 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.

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 connector or screw terminal. All variations can be delivered with a timer.

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.

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 max.
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 60947-5-2	1 kV
IEC 61000-4-2	Level 2
IEC 61000-4-3	Level 3
IEC 61000-4-4	Level 2

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.

LED

The LED (yellow) lights up when the 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 146.

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

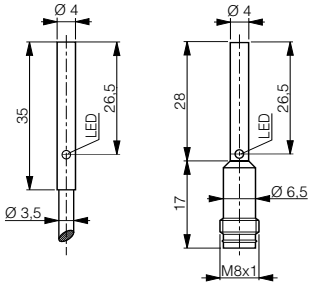
Photoelectric proximity switch, 2 fixing nuts (for size M5), instructions.

Ø 4

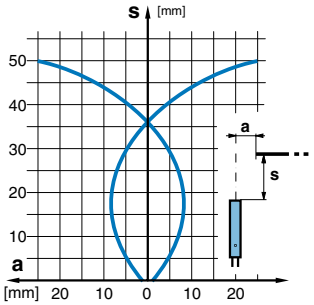
Diffuse sensor, energetic

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 146)	A, B
Wiring (pages 114 - 115)	Diagram 1

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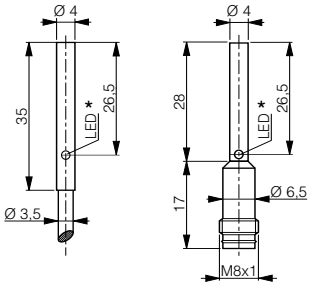
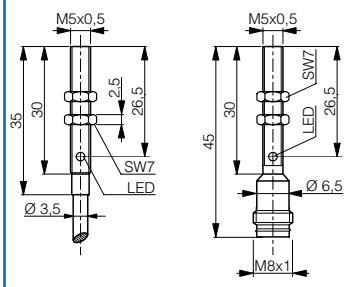
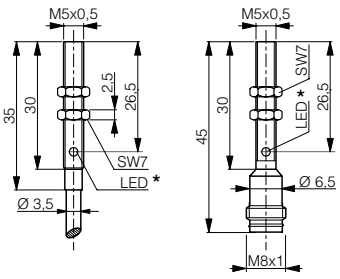
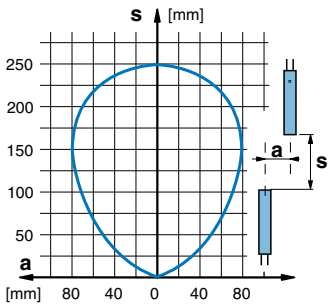
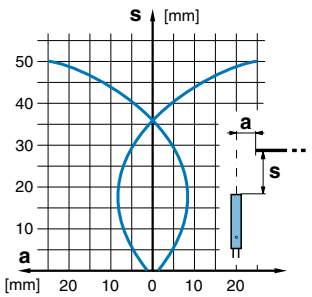
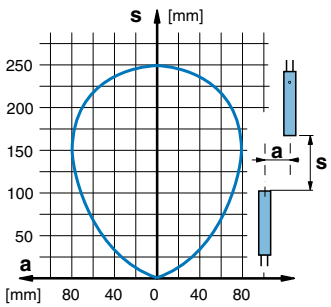
SERIES 1040 / 1050

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	
66 / 6 g (R and E)	35 / 4 g	68 / 8 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.

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 max.
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 60947-5-2	1 kV
IEC 61000-4-2	Level 2
IEC 61000-4-3	Level 3
IEC 61000-4-4	Level 2

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.

LED

The LED (yellow) lights up when the 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 146.

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

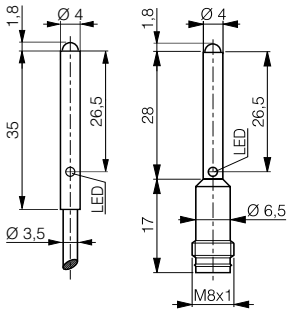
Photoelectric proximity switch, 2 fixing nuts (for size M5), instructions.

Ø 4

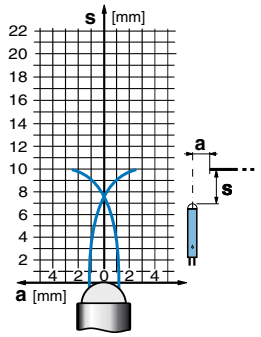
Diffuse sensor, energetic

10 mm

Dimensions:

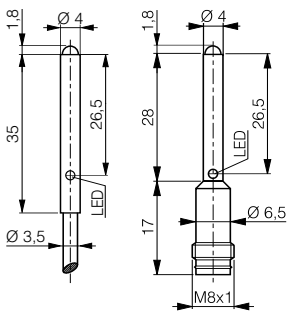
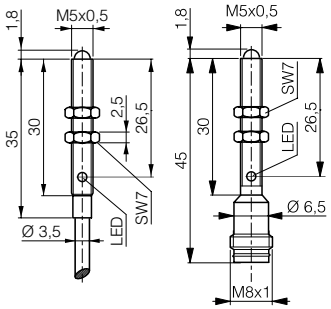
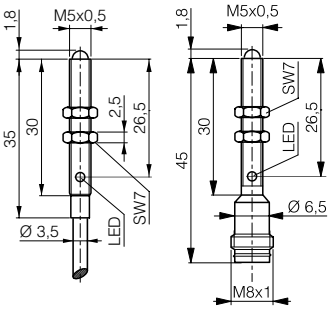
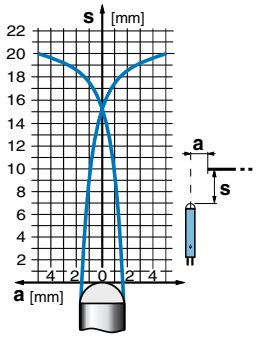
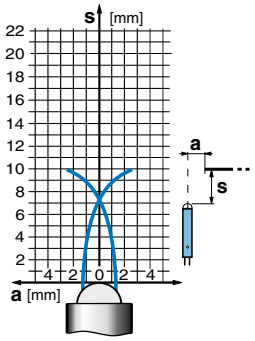
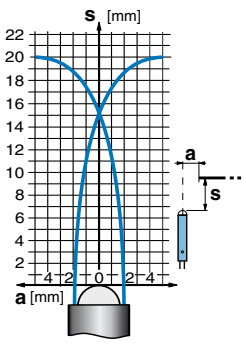


Response curve:



Operating distance	10 mm
Standard target	100 x 100 mm white
No-load supply current	15 mA typ.
Emitter	IR LED 880 nm
Weight (cable / connector model)	28 g / 3 g
Part ref.: (**bold:** preferred types)	
NPN light-ON / cable	**LTK-1040-301-505**
NPN dark-ON / cable	-
NPN light-ON / connector S8	**LTS-1040-301-505**
NPN dark-ON / connector S8	-
PNP light-ON / cable	**LTK-1040-303-505**
PNP dark-ON / cable	-
PNP light-ON / connector S8	**LTS-1040-303-505**
PNP dark-ON / connector S8	-
Suitable connecting cables (page 146)	A, B
Wiring (pages 114 - 115)	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 / 3 g	30 g / 5 g	30 g / 5 g	
LTK-1040-301-506	**LTK-1050-301-505**	**LTK-1050-301-506**	
-	-	-	
LTS-1040-301-506	**LTS-1050-301-505**	**LTS-1050-301-506**	
-	-	-	
LTK-1040-303-506	**LTK-1050-303-505**	**LTK-1050-303-506**	
-	-	-	
LTS-1040-303-506	**LTS-1050-303-505**	**LTS-1050-303-506**	
-	-	-	
A, B	A, B	A, B	
Diagram 1	Diagram 1	Diagram 1	

At a glance:

- Short: housing length 50 mm (cable model) / 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 chrome-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 max.
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 60947-5-2	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. 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 0.34mm^2 (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 146.

Reflectors

A range of suitable reflectors for the reflex sensors is listed on page 113.

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

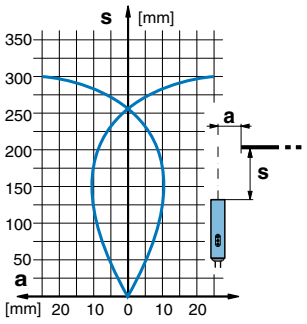
Photoelectric proximity switch, 2 fixing nuts, screwdriver, instructions.

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 146)	G, H, K, L
Wiring (pages 114 - 115)	Diagram 1

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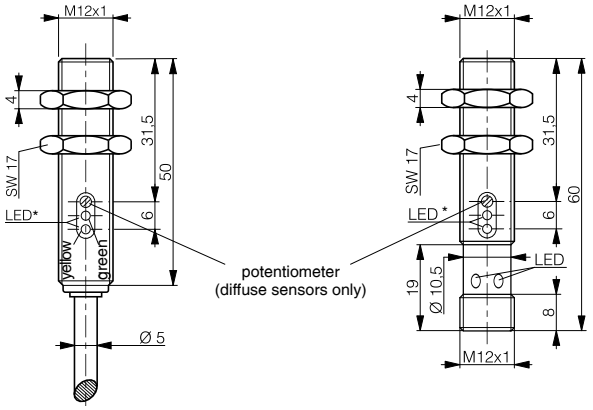
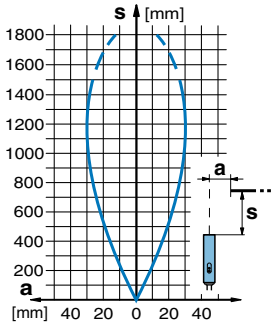
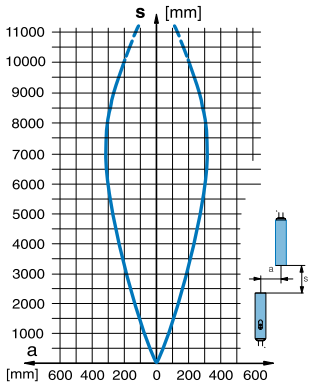
	M12 Reflex sensor 1,500 mm		M12 Through-beam sensor 10,000 mm
	 		
			* receiver only 
	1,500 mm		10,000 mm
	Reflector type 3		-
	15 mA typ.		15 mA typ.
	LED red polarized 660 nm		LED red 660 nm
	100 / 20 g		200 / 65 g (R and E)
			(R) receiver / **(E)** emitter
	-		LLK-1120-201 (R) / **LLK-1120-200 (E)**
	LRK-1120-302		**LLK-1120-202 (R) / LLK-1120-200 (E)**
	-		LLS-1120-201 (R) / **LLS-1120-200 (E)**
	LRS-1120-302		**LLS-1120-202 (R) / LLS-1120-200 (E)**
	-		LLK-1120-203 (R) / **LLK-1120-200 (E)**
	LRK-1120-304		**LLK-1120-204 (R) / LLK-1120-200 (E)**
	-		LLS-1120-203 (R) / **LLS-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) / 4 (E)

At a glance:

- Precise laser beam for the detection of very small objects
- Short: housing length 50 mm (cable model) / 60 mm (connector model)
- Long operating distance: 50 m
- High switching frequency: 5,000 Hz
- Visible red laser light 660 nm
- Glass lens and 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
- High degree of protection: IP 67

Construction

The devices are built into stainless-steel housings (V2A), 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. Turning clockwise increases the sensitivity.

Technical data:

(according to IEC 60947-5-2)	
Supply voltage range U_B	10 ... 36 VDC
Max. ripple content	20 %
Output current	200 mA max.
Output voltage drop	2.0 V max. at 200 mA
Max. switching frequency	5,000 Hz
Switching time (↑ and ↓)	0.1 msec
Max. ambient light:	
halogen	5,000 Lux
sun	10,000 Lux
Ambient temperature range	-10 ... +50 °C
Degree of protection	IP 67
Laser protection degree	2
EMC protection:	
IEC 60947-5-2	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. 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 0.34 mm² (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 146.

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

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

Operating distance	
Standard target	
No-load supply current	
Emitter	
Weight (cable / connector model)	
Part ref.: (**bold:** preferred types)	
NPN light-ON / cable	
NPN dark-ON / cable	
NPN light-ON / connector S12	
NPN dark-ON / connector S12	
PNP light-ON / cable	
PNP dark-ON / cable	
PNP light-ON / connector S12	
PNP dark-ON / connector S12	
Suitable connecting cables (page 146)	
Wiring (pages 114 - 115)	

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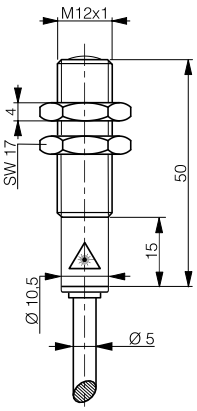
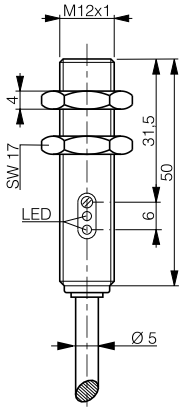
M12

Through-beam sensor

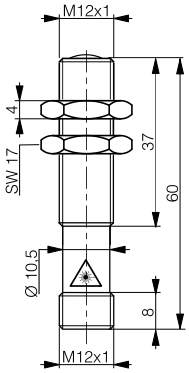
50,000 mm



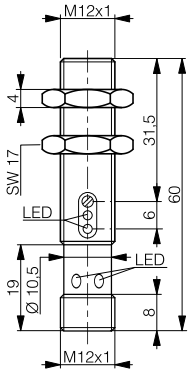
Emitter



Receiver



Emitter



Receiver

50,000 mm	
-	
10 mA typ.	
Laser red pulsed 660 nm	
180 / 50 g (R and E)	
(R) receiver / **(E)** emitter	
LLK-1121L-201 (R) / **LLK-1121L-200 (E)**	
LLK-1121L-202 (R) / LLK-1121L-200 (E)	
LLS-1121L-201 (R) / **LLS-1121L-200 (E)**	
LLS-1121L-202 (R) / LLS-1121L-200 (E)	
LLK-1121L-203 (R) / **LLK-1121L-200 (E)**	
LLK-1121L-204 (R) / LLK-1121L-200 (E)	
LLS-1121L-203 (R) / **LLS-1121L-200 (E)**	
LLS-1121L-204 (R) / LLS-1121L-200 (E)	
G, H, K, L	
Diagram 1 (R) / 4 (E)	

At a glance:

- Short: housing length 50 mm (cable model) / 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 chrome-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 of the energetic diffuse sensors can be adjusted from 40 ... 600 mm by means of the built-in potentiometer (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 max.
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 60947-5-2	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 of the diffuse sensors with background suppression can be adjusted from 10 ... 120 mm by means of the built-in potentiometer. 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. 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 energetic diffuse sensors and the receiver of 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 146.

Reflectors

A range of suitable reflectors for the reflex sensors is listed on page 113.

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

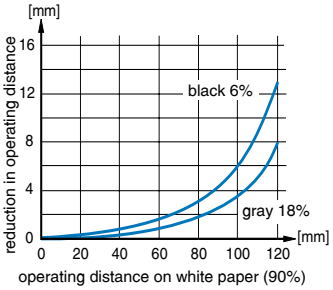
Proximity switch, 2 fixing nuts, instructions.

M18

Diffuse sensor with background suppression

120 mm

Response curve:



Operating distance (setting range)	120 mm (10 ... 120 mm)
Standard target	100 x 100 mm white
No-load supply current	25 mA typ.
Emitter	LED red 660 nm
Weight (cable / connector model)	121 / 53 g
Part ref.: (**bold:** preferred types)	
NPN light-ON / cable	**LHK-1180-301**
NPN dark-ON / cable	-
NPN light-ON / connector S12	**LHS-1180-301**
NPN dark-ON / connector S12	-
PNP light-ON / cable	**LHK-1180-303**
PNP dark-ON / cable	-
PNP light-ON / connector S12	**LHS-1180-303**
PNP dark-ON / connector S12	-
Suitable connecting cables (page 146)	G, H, K, L
Wiring (pages 114 - 115)	Diagram 1

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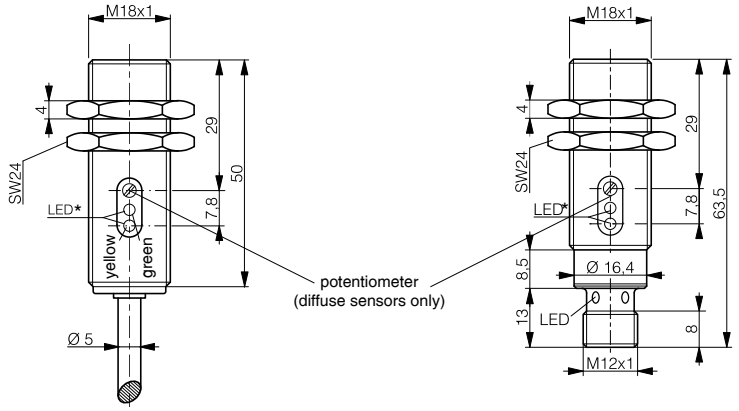
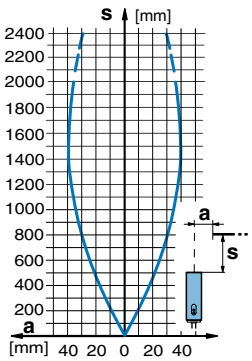
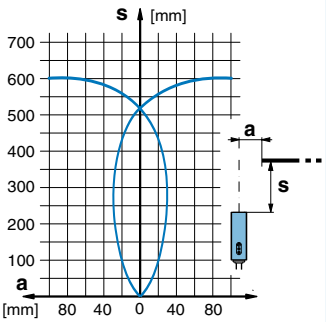
SERIES 1180

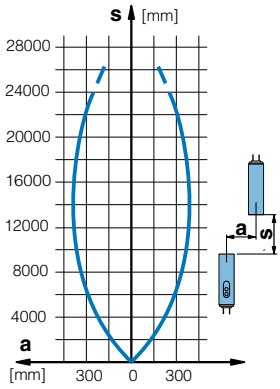
M18		M18	M18
Reflex sensor		**Diffuse sensor, energetic**	**Through-beam sensor**
2,000 mm		**600 mm**	**20,000 mm**



* receiver only







2,000 mm	Operating distance (setting range)	600 mm (40 ... 600 mm)	20,000 mm
Reflector type 3	Standard target	200 x 200 mm white	-
15 mA typ.	No-load supply current	20 mA typ.	10 mA typ. (R) / 15 mA typ. (E)
LED red polarized 660 nm	Emitter	LED red 660 nm	LED red 660 nm
121 / 53 g	Weight (cable / connector model)	121 / 53 g	230 / 80 g (R and E)
	Part ref.: (**bold:** preferred types)		**(R)** receiver / **(E)** emitter
-	NPN changeover outputs / cable	**LTK-1180-101**	**LLK-1180-001 (R) / LLK-1180-000 (E)**
LRK-1180-302	NPN light-ON + excess light / cable	LTK-1180-102	LLK-1180-002 (R) / **LLK-1180-000 (E)**
-	NPN changeover outputs / conn. S12	**LTS-1180-101**	**LLS-1180-001 (R) / LLS-1180-000 (E)**
LRS-1180-302	NPN light-ON + excess light / conn. S12	LTS-1180-102	LLS-1180-002 (R) / **LLS-1180-000 (E)**
-	PNP changeover outputs / cable	**LTK-1180-103**	**LLK-1180-003 (R) / LLK-1180-000 (E)**
LRK-1180-304	PNP light-ON + excess light / cable	LTK-1180-104	**LLK-1180-004 (R) / LLK-1180-000 (E)**
-	PNP changeover outputs / conn. S12	**LTS-1180-103**	**LLS-1180-003 (R) / LLS-1180-000 (E)**
LRS-1180-304	PNP light-ON + excess light / conn. S12	LTS-1180-104	**LLS-1180-004 (R) / LLS-1180-000 (E)**
G, H, K, L	Suitable connecting cables (page 146)	M, N	M, N
Diagram 1	Wiring (pages 114 - 115)	Diagram 2	Diagram 2 (R) / 4 (E)

At a glance:

- Precise laser beam for the detection of very small objects
- Short: housing length 50 mm (cable model) / 63.5 mm (connector model)
- Long operating distance: 50 m
- High switching frequency: 5,000 Hz
- Visible red laser light 660 nm
- Glass lens and 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
- High degree of protection: IP 67

Construction

The devices are built into stainless-steel housings (V2A), 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. Turning clockwise increases the sensitivity.

Technical data:

(according to IEC 60947-5-2)	
Supply voltage range U_B	10 ... 36 VDC
Max. ripple content	20 %
Output current (total of both outputs)	200 mA max.
Output voltage drop	2.0 V max. at 200 mA
Max. switching frequency	5,000 Hz
Switching time (↑ and ↓)	0.1 msec
Max. ambient light:	
halogen	5,000 Lux
sun	10,000 Lux
Ambient temperature range	-10 ... +50 °C
Degree of protection	IP 67
Laser protection degree	2
EMC protection:	
IEC 60947-5-2	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. 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 0.34 mm² (type 8) for the sender and 4 x 0.25 mm² (type 12) for the receiver, or 4-pole S12 connector are standard. Other cable types or lengths are available on request. Suitable connecting cables are listed on page 146.

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

Photoelectric proximity switch, 2 fixing nuts, instructions.

Operating distance	
Standard target	
No-load supply current	
Emitter	
Weight (cable / connector model)	
Part ref.: (**bold:** preferred types)	
NPN changeover outputs / cable	
NPN light-ON + excess light / cable	
NPN changeover outputs / conn. S12	
NPN light-ON + excess light / conn. S12	
PNP changeover outputs / cable	
PNP light-ON + excess light / cable	
PNP changeover outputs / conn. S12	
PNP light-ON + excess light / conn. S12	
Suitable connecting cables (page 146)	
Wiring (pages 114 - 115)	

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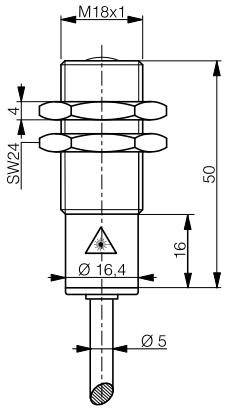
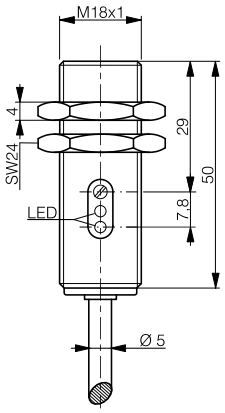
M18

Through-beam sensor

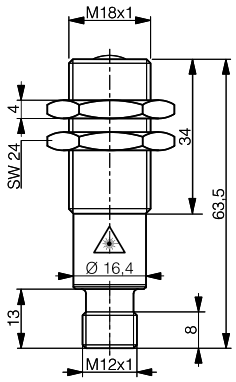
50,000 mm



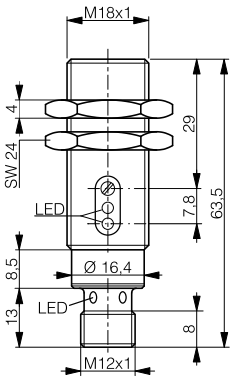
Emitter



Receiver



Emitter



Receiver

		50,000 mm	
		-	
		10 mA typ.	
		Laser red pulsed 660 nm	
		215 / 85 g (R and E)	
		(R) receiver / **(E)** emitter	
		LLK-1181L-001 (R) / LLK-1181L-000 (E)	
		LLK-1181L-002 (R) / **LLK-1181L-000 (E)**	
		LLS-1181L-001 (R) / LLS-1181L-000 (E)	
		LLS-1181L-002 (R) **/ LLS-1181L-000 (E)**	
		LLK-1181L-003 (R) / LLK-1181L-000 (E)	
		LLK-1181L-004 (R) / LLK-1181L-000 (E)	
		LLS-1181L-003 (R) / LLS-1181L-000 (E)	
		LLS-1181L-004 (R) / LLS-1181L-000 (E)	
		M, N	
		Diagram 2 (R) / 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 chrome-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 of the energetic diffuse sensors can be adjusted from 40 ... 600 mm by means of the built-in potentiometer (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 max.
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 60947-5-2	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 of the diffuse sensors with background suppression can be adjusted from 10 ... 120 mm by means of the built-in potentiometer. 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. 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 energetic diffuse sensors and the receiver of 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 146.

Reflectors

A range of suitable reflectors for the reflex sensors is listed on page 113.

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

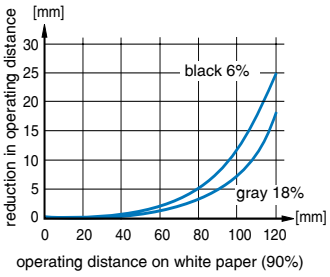
Proximity switch, 2 fixing nuts, instructions.

M18W

Diffuse sensor with background suppression

120 mm

Response curve:



Operating distance (setting range)	120 mm (10 ... 120 mm)
Standard target	100 x 100 mm white
No-load supply current	25 mA typ.
Emitter	LED red 660 nm
Weight (cable / connector model)	124 / 57 g
Part ref.: (**bold:** preferred types)	
NPN light-ON / cable	**LHK-1180W-301**
NPN dark-ON / cable	-
NPN light-ON / connector S12	**LHS-1180W-301**
NPN dark-ON / connector S12	-
PNP light-ON / cable	**LHK-1180W-303**
PNP dark-ON / cable	-
PNP light-ON / connector S12	**LHS-1180W-303**
PNP dark-ON / connector S12	-
Suitable connecting cables (page 146)	G, H, K, L
Wiring (pages 114 - 115)	Diagram 1

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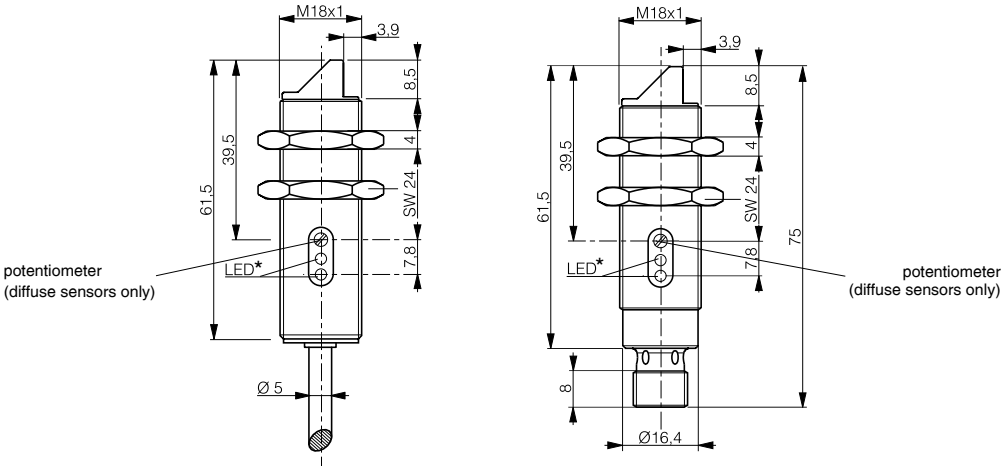
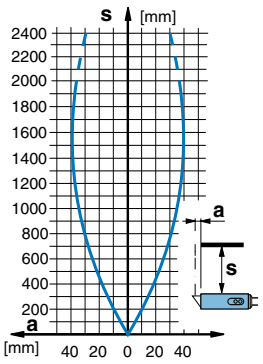
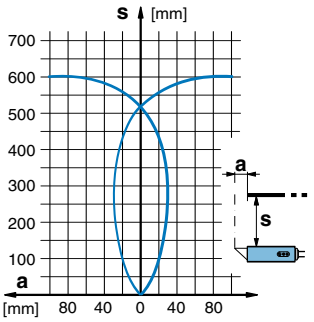
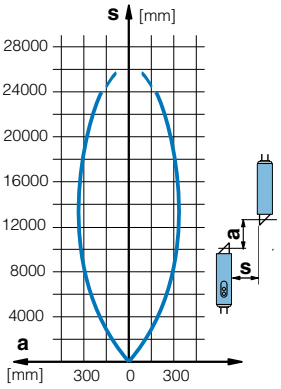
M18W		M18W	M18W
Reflex sensor		**Diffuse sensor, energetic**	**Through-beam sensor**
2,000 mm		**600 mm**	**20,000 mm**







* receiver only



2,000 mm	Operating distance (setting range)	600 mm (40 ... 600 mm)	20,000 mm
Reflector type 3	Standard target	200 x 200 mm white	-
15 mA typ.	No-load supply current	20 mA typ.	10 mA typ. (R) / 15 mA typ. (E)
LED red polarized 660 nm	Emitter	LED red 660 nm	LED red 660 nm
125 / 56 g	Weight (cable / connector model)	123 / 56 g	248 / 114 g (R and E)
	Part ref.: (**bold:** preferred types)		**(R)** receiver / **(E)** emitter
-	NPN changeover outputs / cable	**LTK-1180W-101**	**LLK-1180W-001 (R)/LLK-1180W-000 (E)**
LRK-1180W-302	NPN light-ON + excess light / cable	LTK-1180W-102	LLK-1180W-002 (R)/**LLK-1180W-000 (E)**
-	NPN changeover outputs / conn. S12	**LTS-1180W-101**	**LLS-1180W-001 (R)/LLS-1180W-000 (E)**
LRS-1180W-302	NPN light-ON + excess light / conn. S12	LTS-1180W-102	LLS-1180W-002 (R)/**LLS-1180W-000 (E)**
-	PNP changeover outputs / cable	**LTK-1180W-103**	**LLK-1180W-003 (R)/LLK-1180W-000 (E)**
LRK-1180W-304	PNP light-ON + excess light / cable	LTK-1180W-104	**LLK-1180W-004 (R)/LLK-1180W-000 (E)**
-	PNP changeover outputs / conn. S12	**LTS-1180W-103**	**LLS-1180W-003 (R)/LLS-1180W-000 (E)**
LRS-1180W-304	PNP light-ON + excess light / conn. S12	LTS-1180W-104	**LLS-1180W-004 (R)/LLS-1180W-000 (E)**
G, H, K, L	Suitable connecting cables (page 146)	M, N	M, N
Diagram 1	Wiring (pages 114 - 115)	Diagram 2	Diagram 2 (R) / 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 max.
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 60947-5-2	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 146.

Reflectors

A range of suitable reflectors for the reflex sensors is listed on page 113.

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 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 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

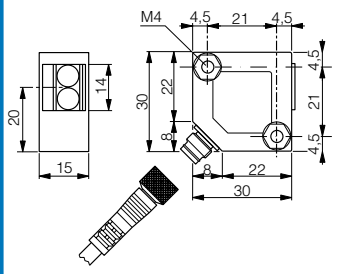
Proximity switch, mounting bracket, screws, washers and nuts, screwdriver, instructions.

□ 30x30

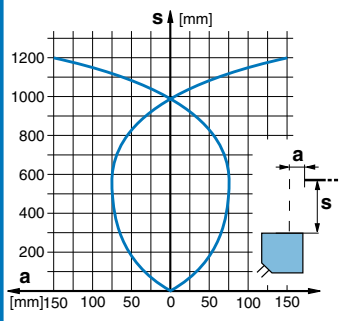
Diffuse sensor, energetic

1,200 mm

Dimensions:



Response curve:



Operating distance	1,200 mm
Standard target	200 x 200 mm white
No-load supply current	20 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 light-ON + excess light / cable	LTK-3030-102
NPN changeover outputs / conn. S8	**LTS-3030-101**
NPN light-ON + excess light / conn. S8	LTS-3030-102
PNP changeover outputs / cable	**LTK-3030-103**
PNP light-ON + excess light / cable	**LTK-3030-104**
PNP changeover outputs / conn. S8	**LTS-3030-103**
PNP light-ON + excess light / conn. S8	**LTS-3030-104**
Suitable connecting cables (page 146)	E, F
Wiring (pages 114 - 115)	Diagram 2

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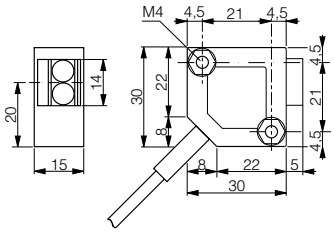
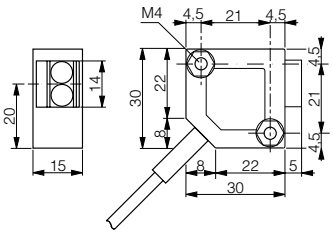
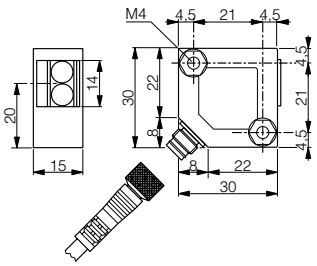
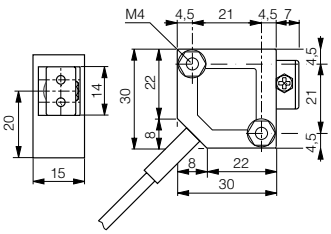
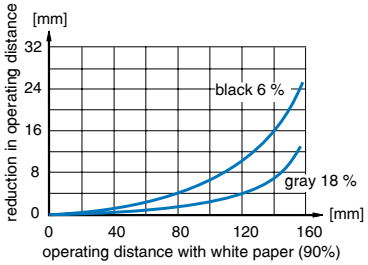
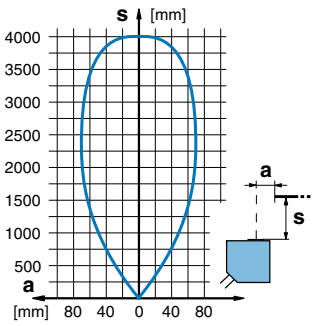
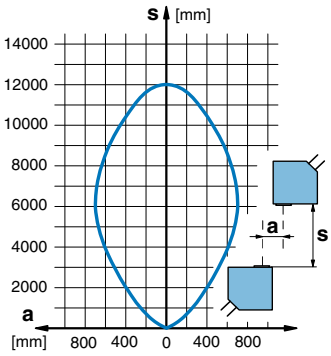
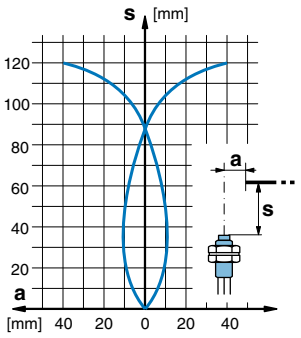
SERIES 3030

☐ 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 white	Reflector type 3	-	100 x 100 mm white
25 mA typ.	20 mA typ.	10 mA typ. (R) / 15 mA typ. (E)	20 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	150 / 34 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) / 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 max.
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 65
EMC protection:	
IEC 60947-5-2	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 146.

Reflectors

A range of suitable reflectors for the reflex sensors is listed on page 113.

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 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 mounting 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

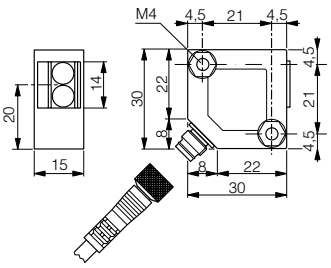
Proximity switch, instructions.

□ 30x30

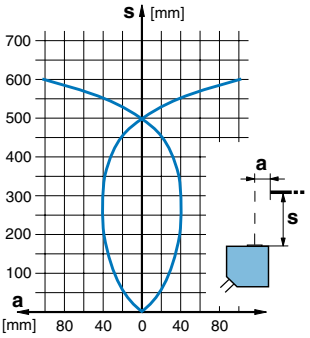
Diffuse sensor, energetic

600 mm

Dimensions:



Response curve:



Operating distance	600 mm
Standard target	200 x 200 mm white
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 146)	A, B
Wiring (pages 114 - 115)	Diagram 1

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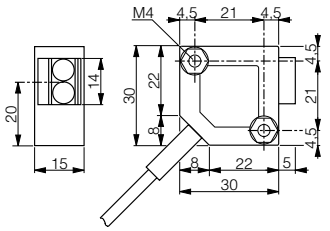
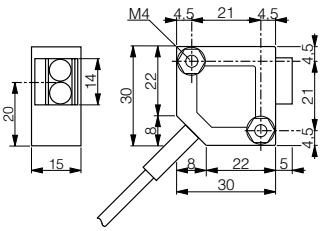
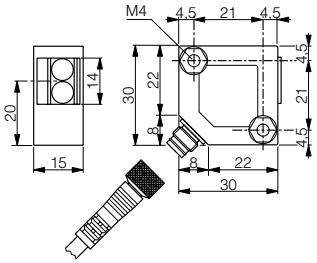
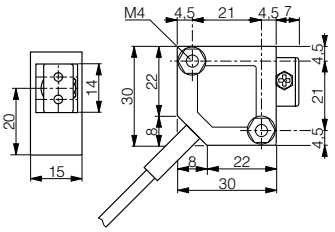
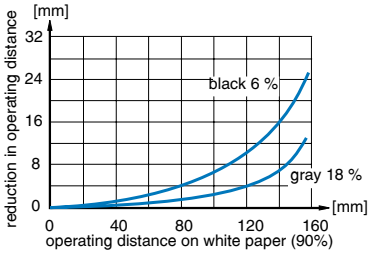
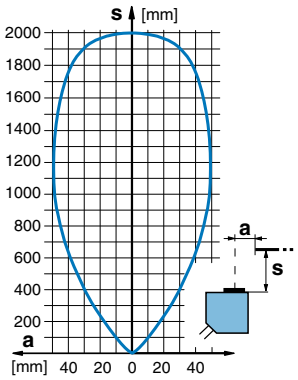
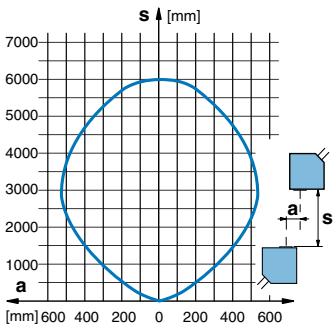
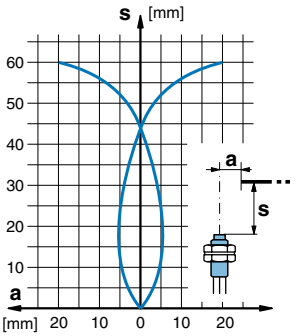
☐ 30x30	☐ 30x30	☐ 30x30	☐ 30x30
Diffuse sensor with background suppression	**Reflex sensor**	**Through-beam sensor**	**Fiber-optic amplifier**
15 ... 150 mm	**2,000 mm**	**6,000 mm**	**60 mm**
			
			
			
15 ... 150 mm	2,000 mm	6,000 mm	60 mm (with LFP-1002-020)
100 x 100 mm white	Reflector type 3	-	100 x 100 mm white
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	150 / 34 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) / 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/polybutylene-terephthalate (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.

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 max.
Output voltage drop	2.0 V max. at 200 mA
Max. switching frequency	1,000 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 60947-5-2	1 kV
IEC 61000-4-2	Level 2
IEC 61000-4-3	Level 3
IEC 61000-4-4	Level 3

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.

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 146.

Reflectors

A range of suitable reflectors for the reflex sensors is listed on page 113.

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 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

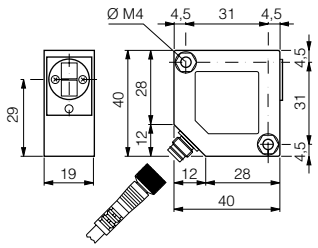
Proximity switch, mounting bracket, screws, washers and nuts, screwdriver, instructions.

□ 40x40

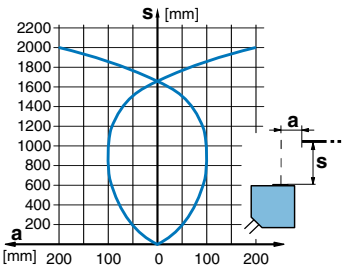
Diffuse sensor, energetic

2,000 mm

Dimensions:



Response curve:



Operating distance	2,000 mm
Standard target	400 x 400 mm white
No-load supply current	25 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 light-ON + excess light / cable	LTK-4040-102
NPN changeover outputs / conn. S8	**LTS-4040-101**
NPN light-ON + excess light / conn. S8	LTS-4040-102
PNP changeover outputs / cable	**LTK-4040-103**
PNP light-ON + excess light / cable	LTK-4040-104
PNP changeover outputs / conn. S8	**LTS-4040-103**
PNP light-ON + excess light / conn. S8	LTS-4040-104
Suitable connecting cables (page 146)	E, F
Wiring (pages 114 - 115)	Diagram 2

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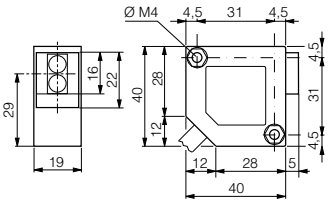
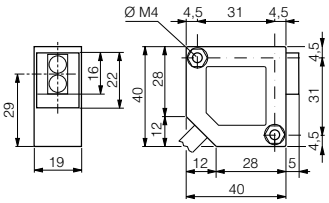
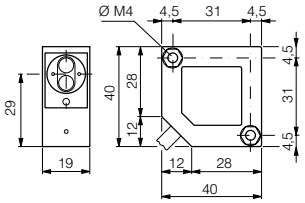
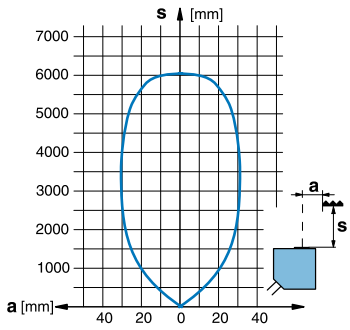
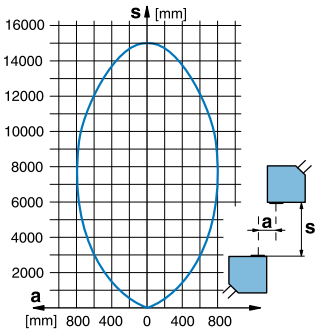
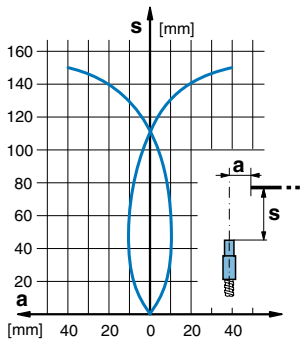
SERIES 4040

	□ 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 white
	20 mA typ.	10 mA typ. (R) / 15 mA typ. (E)	20 mA typ.
	LED red polarized 660 nm	IR LED 880 nm	IR LED 880 nm
	90 / 35 g	190 / 70 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) / 4 (E)	Diagram 2

At a glance:

- Fiber-optic amplifiers for DIN-rail mounting (DIN/EN 50022)
- Excellent detection properties across a wide sensing range of 0 ... 200 mm for red-light / 0 ... 100 mm for blue-light executions and 0 ... 140 mm for executions with high switching frequency
- No blind zone
- Large setting range of 20 ... 200 mm for red-light / 20 .. 100 mm for blue-light executions and 20 ... 140 mm for executions with high switching frequency
- Distance setting by means of a 12-turn potentiometer with illuminated calibration scale
- Switch selectable light-ON / dark-ON output, as well as excess-light output
- 10 mm housing width

Construction

The devices are built into a housing of glass-fiber reinforced PBTP/polybutylene-terephthalate (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 max.
Output voltage drop	2.0 V max. at 200 mA
Max. switching frequency	1,500 Hz / 5,000 Hz*
Switching time (↑ and ↓)	330 µsec / 100 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 60947-5-2	5 kV
IEC 61000-4-2	Level 2
IEC 61000-4-3	Level 3
IEC 61000-4-4	Level 2

* Executions with high switching frequency

Operating distance adjustment

The operating distance is adjusted by means of a 12-turn potentiometer (setting range 20 ... 200 mm for red-light / 20 ... 100 mm for blue-light executions and 20 ... 140 mm for executions with high switching frequency).

Light-ON / dark-ON

The output function is switch selectable light-ON / dark-ON 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

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

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 146.

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

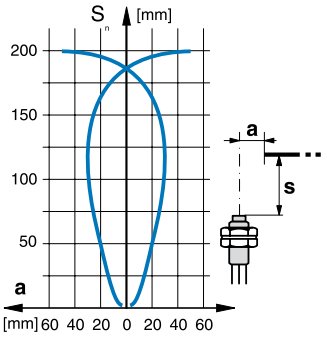
Device, instructions.

☐ 31x60

Fiber-optic amplifier with potentiometer

200 mm

Response curve:



Operating distance	200 mm (with LFP-1002-020)
Standard target	100 x 100 mm white
No-load supply current (at U_B=24V)	15 mA typ.
Emitter	LED red 680 nm
Weight (cable / connector model)	69 g / 18 g
Part ref.: (**bold:** preferred types)	
NPN potentiometer / cable	**LFK-3060-101**
NPN potentiometer / connector S8	**LFS-3060-101**
PNP potentiometer / cable	**LFK-3060-103**
PNP potentiometer / connector S8	**LFS-3060-103**
Suitable connecting cables (page 146)	E, F
Wiring (pages 114 - 115)	Diagram 2

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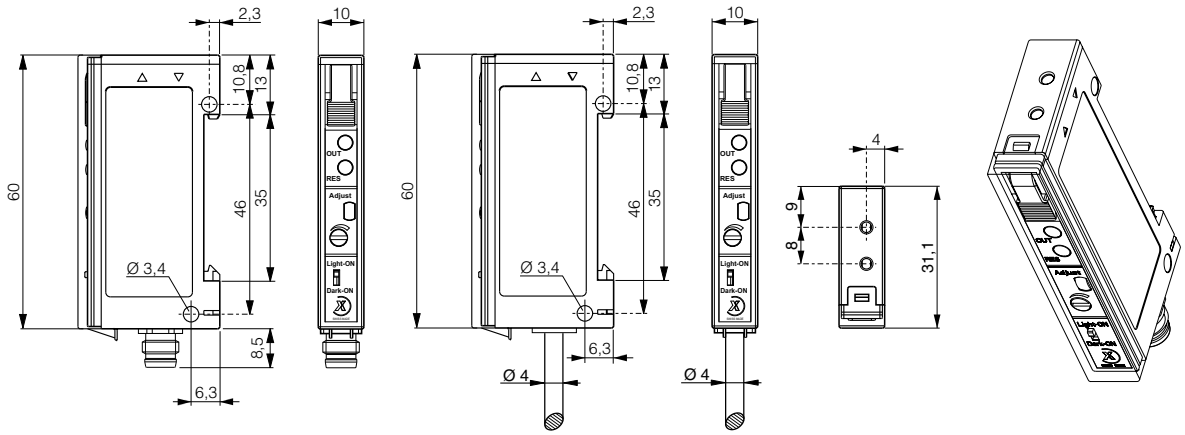
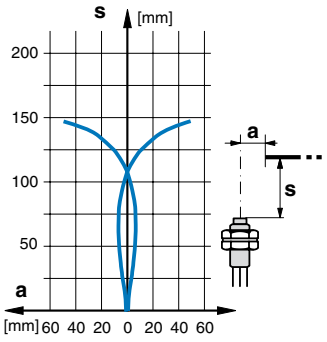
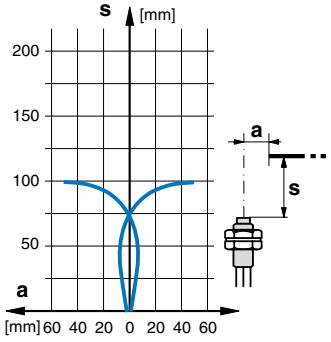
☐ 31x60	☐ 31x60	
Fiber-optic amplifier with potentiometer, high switching frequency	**Blue-light fiber-optic amplifier with potentiometer**	
140 mm	**100 mm**	

Dimensions:







140 mm (with LFP-1002-020)	100 mm (with LFP-1002-020)	
100 x 100 mm white	100 x 100 mm white	
15 mA typ.	15 mA typ.	
LED red 680 nm	LED blue 465 nm	
69 g / 18 g	69 g / 18 g	
LFK-3260-101	**LFK-3360-101**	
LFS-3260-101	**LFS-3360-101**	
LFK-3260-103	**LFK-3360-103**	
LFS-3260-103	**LFS-3360-103**	
E, F	E, F	
Diagram 2	Diagram 2	

CONTRINEX SERIES 3065 WITH TEACH-IN

At a glance:

- Fiber-optic amplifiers for DIN-rail mounting (DIN/EN 50022)
- Excellent detection properties across a wide sensing range of 0 ... 200 mm for red-light / 0 ... 100 mm for blue-light executions and 0 ... 140 mm for executions with high switching frequency
- No blind zone
- Large setting range of 20 ... 200 mm for red-light / 20 ... 100 mm for blue-light executions and 20 ... 140 mm for executions with high switching frequency
- 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/polybutylene-terephthalate (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 max.
Output voltage drop	2.0 V max. at 200 mA
Max. switching frequency	1,500 Hz / 5,000 Hz*
Switching time (↑ and ↓)	330 µsec / 100 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 60947-5-2	5 kV
IEC 61000-4-2	Level 2
IEC 61000-4-3	Level 3
IEC 61000-4-4	Level 2

* Executions with high switching frequency

Operating distance adjustment

The operating distance is adjusted by means of teach-in (setting range 20 ... 200 mm for red-light / 20 ... 100 mm for blue-light executions and 20 ... 140 mm for executions with high switching frequency). Depending on the application, either Teach 1 (only for background), or Teach 2 (for 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 146.

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

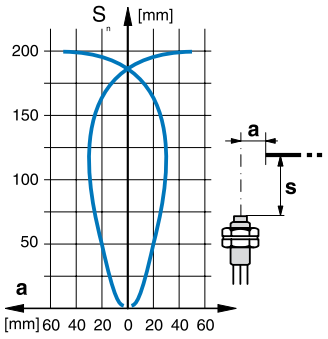
Device, instructions.

☐ 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 white
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 146)	E, F
Wiring (pages 114 - 115)	Diagram 6

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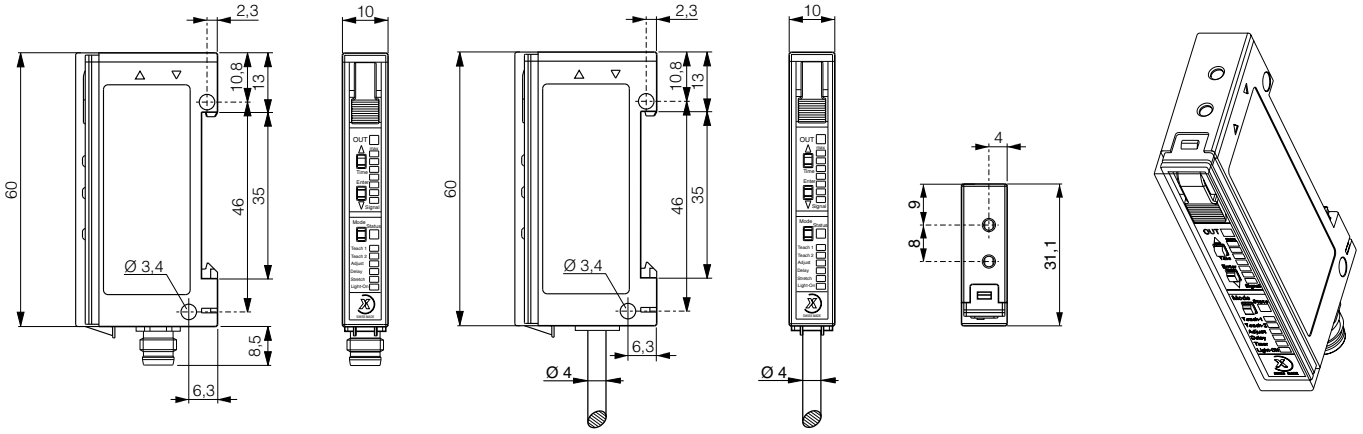
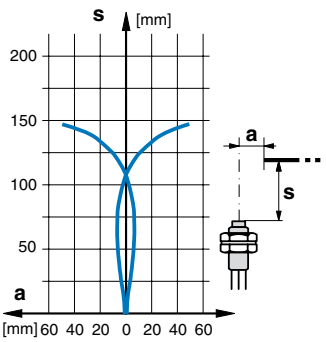
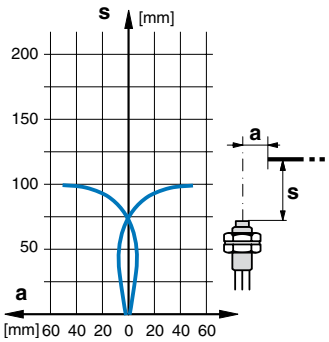
☐ 31x60	☐ 31x60	
Fiber-optic amplifier with teach-in, high switching frequency	**Blue-light fiber-optic amplifier with teach-in**	
140 mm	**100 mm**	

Dimensions:







140 mm (with LFP-1002-020)	100 mm (with LFP-1002-020)	
100 x 100 mm white	100 x 100 mm white	
25 mA typ.	25 mA typ.	
LED red 680 nm	LED blue 465 nm	
68 g / 17 g	68 g / 17 g	
LFK-3265-101	**LFK-3365-101**	
LFS-3265-101	**LFS-3365-101**	
LFK-3265-103	**LFK-3365-103**	
LFS-3265-103	**LFS-3365-103**	
E, F	E, F	
Diagram 7	Diagram 6	

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 max.
Output voltage drop**	2.0 V max. at 200 mA
Max. switching frequency**	1,000 Hz / 250 Hz*
Switching time** (↑ and ↓)	0.5 msec / 2 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 60947-5-2	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 146.

Reflectors

A range of suitable reflectors for the reflex sensors is listed on page 113.

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

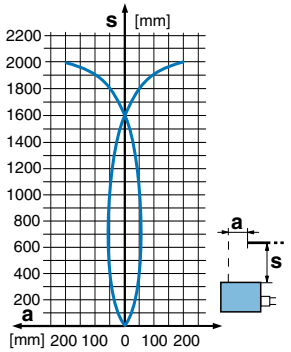
Proximity switch, instructions.

□ 65x83

Diffuse sensor, energetic

2,000 mm

Response curve:



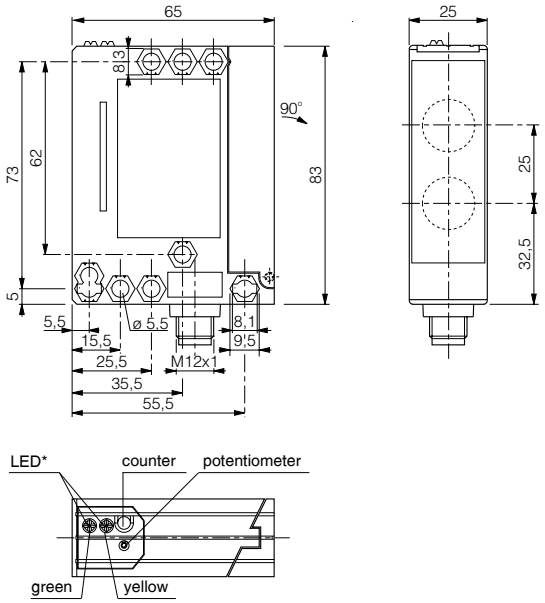
Operating distance	2,000 mm
Standard target	400 x 400 mm white
No-load supply current DC / voltage UC	20 mA / 2 VA typ.
Emitter	IR LED 880 nm
Weight	100 g
Part ref.: (**bold:** preferred types)	
DC NPN / connector S12	**LTS-6080-101***
DC NPN / screw terminal	**LTT-6080-101**
DC NPN timer*** / connector 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 146)	M, N (**with test input: O, P)
Wiring (pages 114 - 115)	2 (LTS-...*) / 3 (LTS/LTT-...) / 5 (UC)

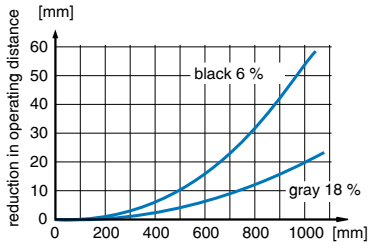
*** light-ON/dark-ON switchable

☐ 65x83

Diffuse sensor with background suppression

50 ... 1,000 mm



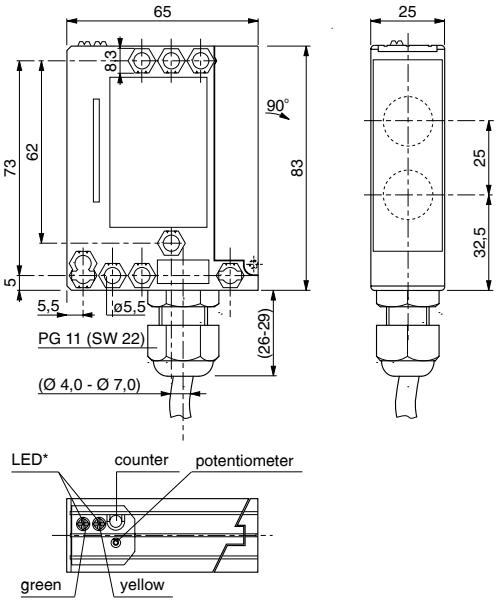


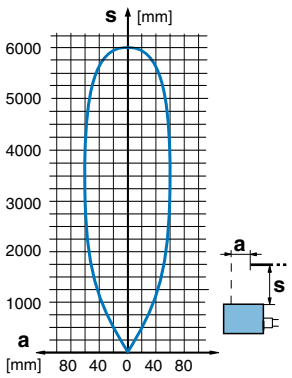
50 ... 1,000 mm
200 x 200 mm white
50 mA / 2 VA typ.
IR LED 880 nm
100 g
LHS-6080-101*
LHT-6080-101
LHS-6080-151**
LHT-6080-151
LHS-6080-103*
LHT-6080-103
LHS-6080-153**
LHT-6080-153
LHS-6080-115
LHT-6080-115
LHS-6080-165
LHT-6080-165
M, N (**with test input: O, P)
2 (LHS-...*) / 3 (LHS/LHT-...) / 5 (UC)

☐ 65x83

Reflex sensor

6,000 mm





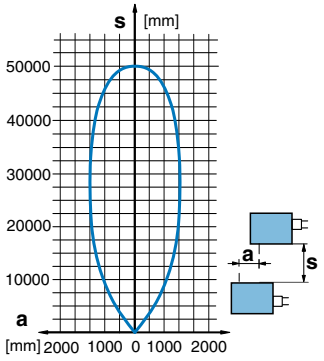
6,000 mm
Reflector type 3
30 mA / 2 VA typ.
LED red polarized 660 nm
100 g
LRS-6080-102*
LRT-6080-102
LRS-6080-152**
LRT-6080-152
LRS-6080-104*
LRT-6080-104
LRS-6080-154**
LRT-6080-154
LRS-6080-115
LRT-6080-115
LRS-6080-165
LRT-6080-165
M, N (**with test input: O, P)
2 (LRS-...*) / 3 (LRS/LRT-...) / 5 (UC)

☐ 65x83

Through-beam sensor

50,000 mm

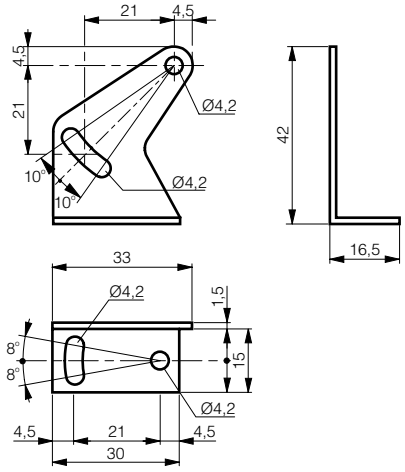
* receiver only



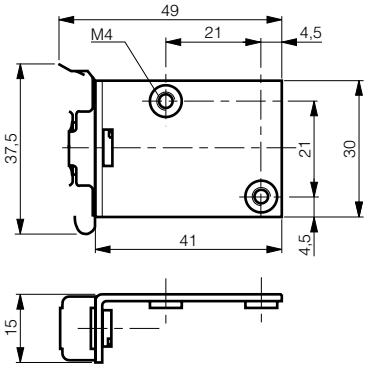
50,000 mm
-
30 mA / 2 VA typ.
IR LED 880 nm
200 g (R and E)
(R) receiver / **(E)** emitter
LLS-6080-002 (R) / LLS-6080-000 (E)
LLT-6080-002 (R) / LLT-6080-000 (E)
LLS-6080-052 (R) / LLS-6080-000 (E)
LLT-6080-052 (R) / LLT-6080-000 (E)
LLS-6080-004 (R) / LLS-6080-000 (E)
LLT-6080-004 (R) / LLT-6080-000 (E)
LLS-6080-054 (R) / LLS-6080-000 (E)
LLT-6080-054 (R) / LLT-6080-000 (E)
LLS-6080-015 (R) / LLS-6080-010 (E)
LLT-6080-015 (R) / LLT-6080-010 (E)
LLS-6080-065 (R) / **LLS-6080-010 (E)**
LLT-6080-065 (R) / **LLT-6080-010 (E)**
M, N
2 (LLS/LLT-...) / 4 (E) / 5 (UC)

Photoelectric accessories

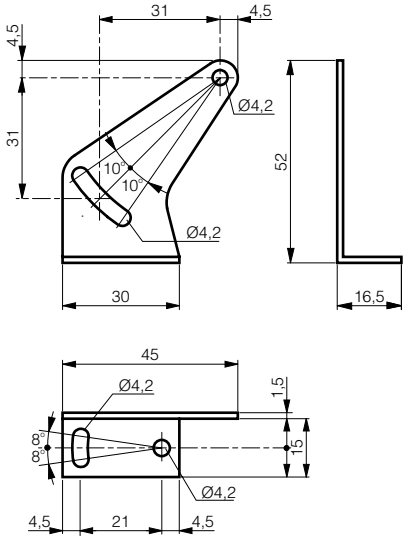
Universal mounting bracket
For 3030 and 3031 series
Material: stainless steel V2A
Part reference: ***LXW-3030-000***



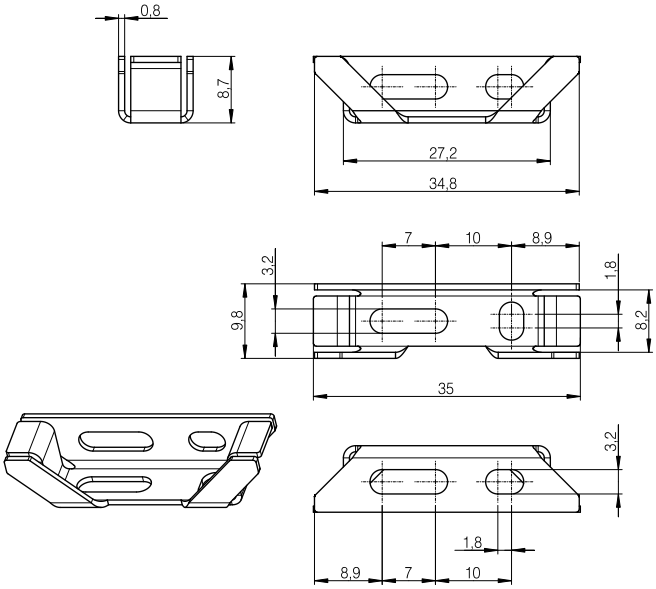
DIN-rail mounting bracket
For 3030 and 3031 series
Material: stainless steel V2A
Part reference: ***LXW-3030-001***



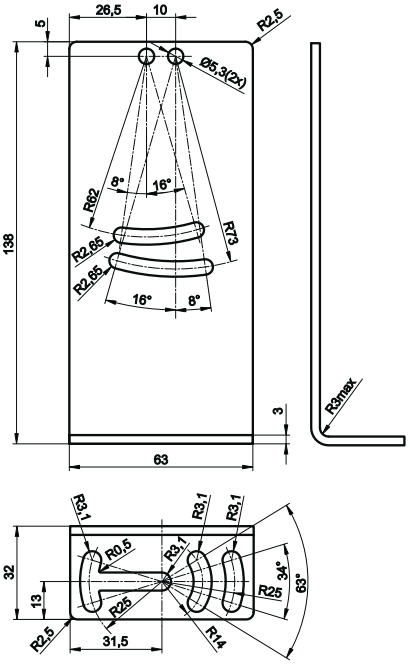
Universal mounting bracket
For 4040 series
Material: stainless steel V2A
Part reference: ***LXW-4040-000***



Universal mounting bracket
For 3060 and 3065 series
Material: stainless steel V2A
Part reference: ***LXW-3060-000***

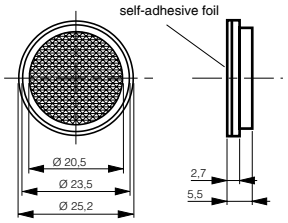


Universal mounting bracket
For 6080 series
Material: stainless steel V2A
Part reference: ***LXW-6080-000***



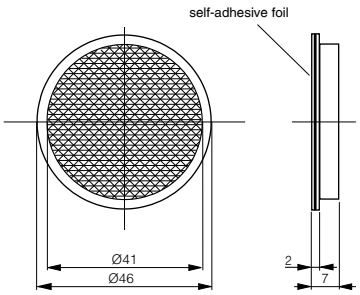
Reflector type 1
Range approx. 50% of type 3

Part reference: LXR-0000-025



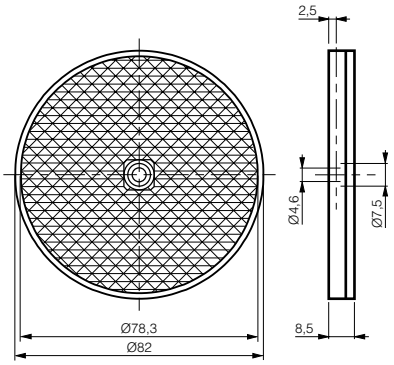
Reflector type 2
Range approx. 60% of type 3

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



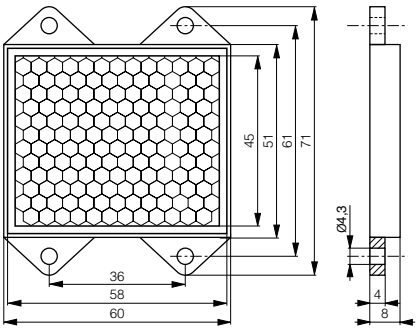
Reflector type 3
Reference reflector for all reflex sensors

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



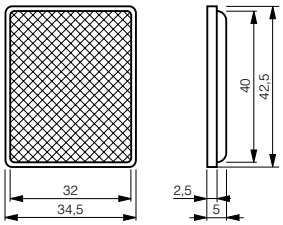
Reflector type 12
Range approx. 80% of type 3

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



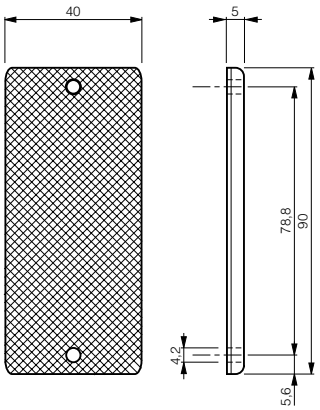
Reflector type 13
Range approx. 40% of type 3

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



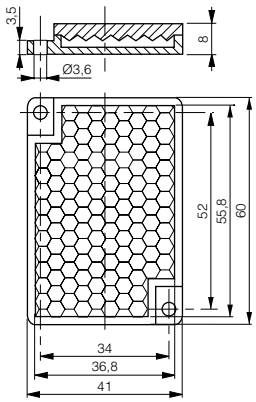
Reflector type 14
Range approx. 50% of type 3

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



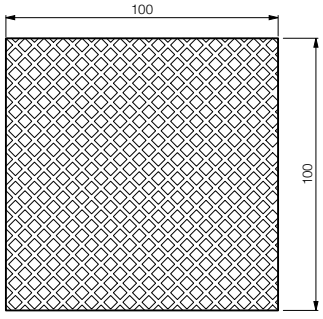
Reflector type 15
Range approx. 100% of type 3

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



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

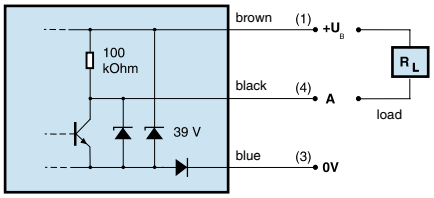
Part reference: ***LXR-0000-000***



Wiring diagrams

Diagram 1

NPN light-ON / dark-ON output



PNP light-ON / dark-ON output

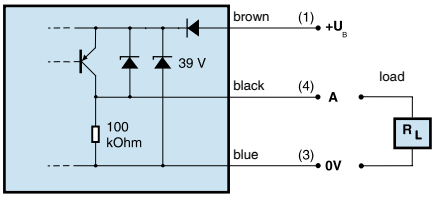
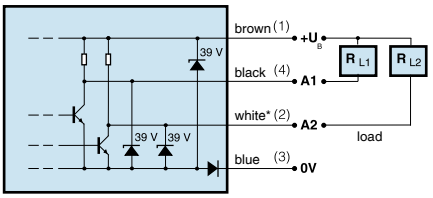


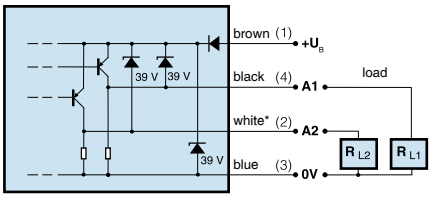
Diagram 2

NPN changeover outputs
NPN light-ON (/dark-ON) + excess-light outputs



* pink for LFK-3#60-10#

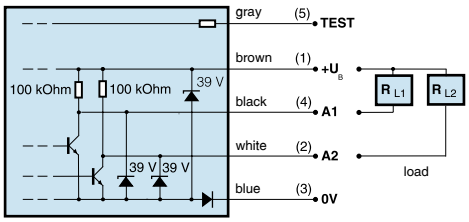
PNP changeover outputs
PNP light-ON (/dark-ON) + excess-light outputs



* pink for LFK-3#60-10#

Diagram 3

NPN with test input



PNP with test input

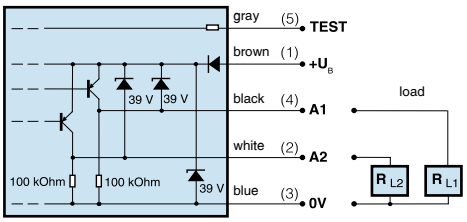


Diagram 4

Emitter of through-beam sensor

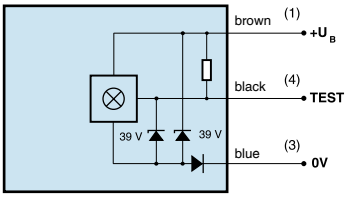
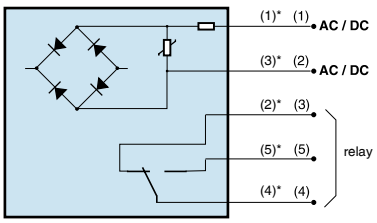


Diagram 5

UC with relay output



* for connector models

UC with relay output / emitter of through-beam sensor

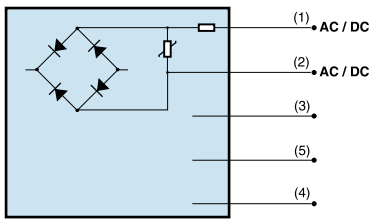
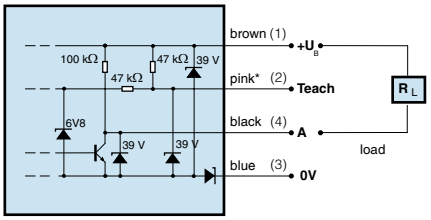


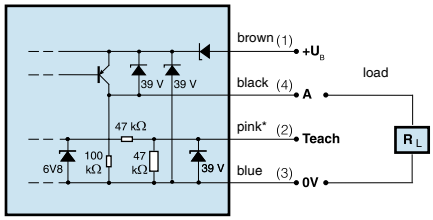
Diagram 6

NPN light-ON/dark-ON output with teach-in



* white for LFS-3#65-10#

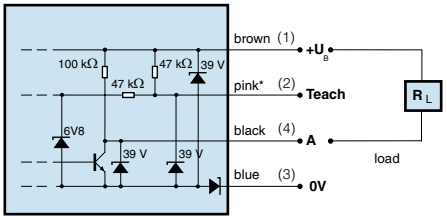
PNP light-ON/dark-ON output with teach-in



* white for LFS-3#65-10#

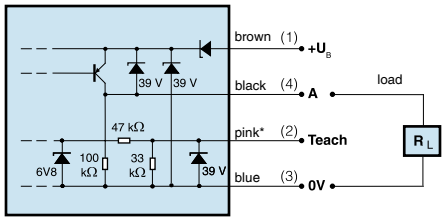
Diagram 7

NPN light-ON/dark-ON output with teach-in



* white for LFS-3265-10#

PNP light-ON/dark-ON output with teach-in



* white for LFS-3265-10#

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 sensing head: IP 67
- Cost efficient
- For difficult environments, glass fibers are available for the 3030/3031 and 3060/3065 series switches (LFG-1022-050 and LFG-3022-050, page 125)

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 sensing head	IP 67
Standard length	2 m ± 0.1 m
Fiber bending radii:	
miniature	15 mm
standard / coaxial	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
Sensing head material	Nickel-plated brass/stainless steel*/PBTP**
Sensing head light-outlet tube material	Stainless steel
Optical attenuation:	
miniature / flexible	0.6 dB / m max. at 660 nm
standard / luminous / coaxial	0.4 dB / m max. at 660 nm
Angle of incidence	See data sheets
Tightening torque:	
M3	0.6 Nm
M4	1.0 Nm
M5	1.5 Nm
M6	2.0 Nm

* LFP-1006/1007-020

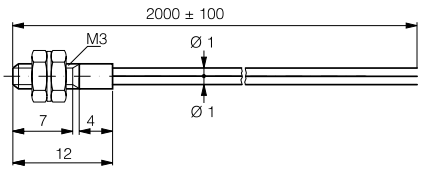
** LFP-1108/1109-020

Diffuse sensors

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

Housing size | *Part ref. / max. operating distance* | *Characteristics*

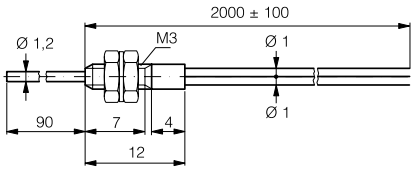
M3



Miniature

LFP-1001-020
40 mm

- Operating distance:
  - with series 3030 40 mm
  - with series 3031 20 mm
  - with series 3060/65 70 mm
- 1 separable double fiber, outside diameter 1 mm
- Fine inner fiber Ø 0.5 mm for highest resolution
- Can be cut



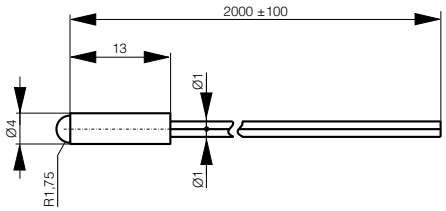
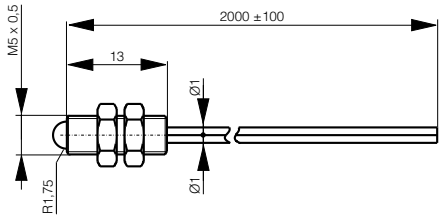
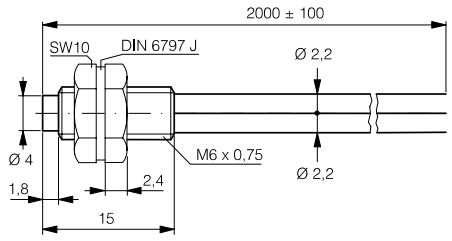
Miniature

LFP-1004-020
40 mm

- Operating distance:
  - with series 3030 40 mm
  - with series 3031 20 mm
  - with series 3060/65 70 mm
- 1 separable double fiber, outside diameter 1 mm
- Sensing head with bendable light-outlet tube for ease of positioning
- Fine inner fiber Ø 0.5 mm for highest resolution
- Can be cut

Clearwater Tech - Phone: 800.894.0412 - Fax: 208.368.0415 - Web: www.clrwtr.com - Email: info@clrwtr.com

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

Housing 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 3060/65 140 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 3060/65 140 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 3060/65 200 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 3060/65 150 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 3060/65 260 mm – 1 separable double fiber, outside diameter 2.2 mm – Inner fiber Ø 1.5 mm – Longest operating distance – Can be cut

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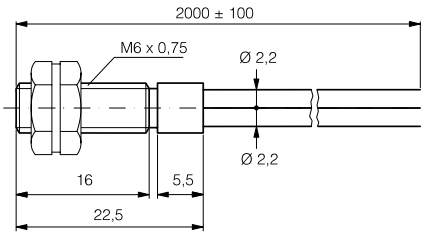
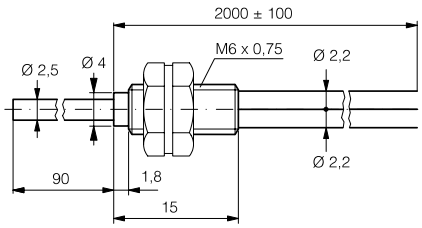
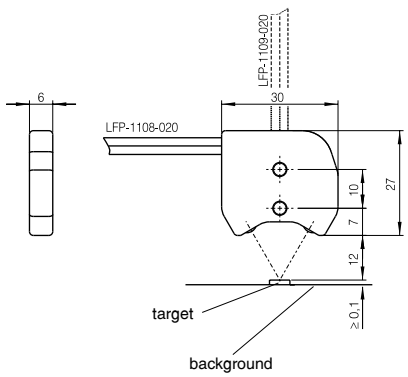
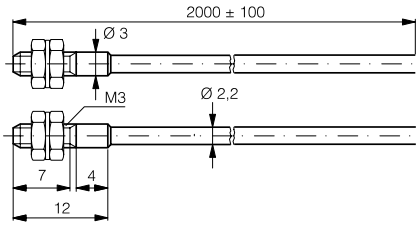
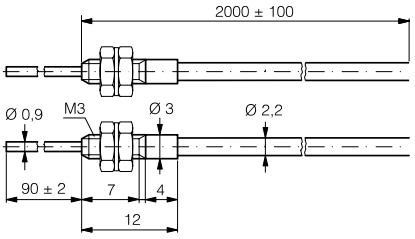
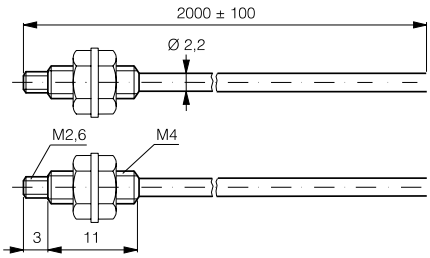
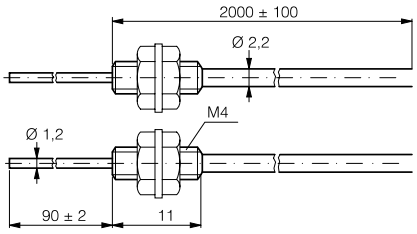
*Part references (**bold** = preferred types)*

Housing size	*Part ref. / max. operating distance*	*Characteristics*
M6	**Coaxial**	– Operating distance: – with series 3030 120 mm – with series 3031 60 mm – with series 3060/65 200 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 3060/65 200 mm – 1 separable double fiber, outside diameter 2.2 mm – Inner fiber Ø 1.0 mm – Sensing 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 3060/65 150 mm – 1 separable double fiber, outside diameter 2.2 mm – Extremely fine inner fibers 151 x Ø 75 µm – Sensing head with bendable light-outlet tube for ease of positioning – Very small bending radius – Can be cut
27x30	**Flexible / background suppression / 90°**	– Operating distance: – fixed 12 mm – 2 separate fibers, outside diameter 2.2 mm (for lateral sensing) – Extremely fine inner fibers 151 x Ø 75 µm – Very small bending radius – Recognition of position and thickness differences down to 0.1 mm – Sensing head of glass-fiber reinforced PBTP – Can be cut
	LFP-1108-020 **12 mm**	
	Flexible / background suppression LFP-1109-020 **12 mm**	– Operating distance: – fixed 12 mm – 2 separate fibers, outside diameter 2.2 mm (for axial sensing) – Extremely fine inner fibers 151 x Ø 75 µm – Very small bending radius – Recognition of position and thickness differences down to 0.1 mm – Sensing head of glass-fiber reinforced PBTP – Can be cut

Through-beam sensors

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

Housing size	*Part ref. / max. operating distance*	*Characteristics*
M3	**Standard**	– Operating distance: – with series 3030 120 mm – with series 3031 60 mm – with series 3060/65 200 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 3060/65 200 mm – 2 individual fibers, outside diameter 2.2 mm – Sensing head with bendable light-outlet tube for ease of positioning – Fine inner fiber Ø 0.5 mm for highest resolution – Can be cut
M4	**Standard**	– Operating distance: – with series 3030 400 mm – with series 3031 200 mm – with series 3060/65 700 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 3060/65 550 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 3060/65 900 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

LFP-2004-020
400 mm

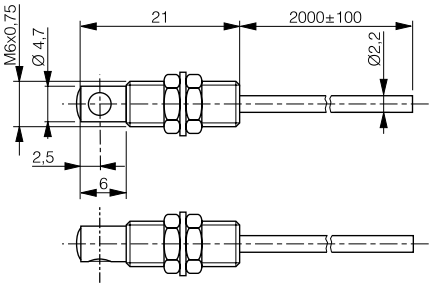
- Operating distance:
  - with series 3030 400 mm
  - with series 3031 200 mm
  - with series 3060/65 700 mm
- 2 individual fibers, outside diameter 2.2 mm
- Inner fiber Ø 1.0 mm
- Sensing head with bendable light-outlet tube for ease of positioning
- Long operating distance
- Can be cut

Flexible

LFP-2104-020
300 mm

- Operating distance:
  - with series 3030 300 mm
  - with series 3031 150 mm
  - with series 3060/65 500 mm
- 2 individual fibers, outside diameter 2.2 mm
- Extremely fine inner fibers 151 x Ø 75 µm
- Sensing head with bendable light-outlet tube for ease of positioning
- Very small bending radius
- Can be cut

M6



Standard 90°

LFP-2005-020
1100 mm

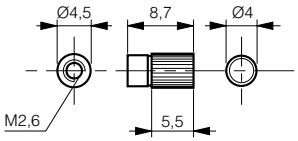
- Operating distance:
  - with series 3030 1100 mm
  - with series 3031 550 mm
  - with series 3060/65 1800 mm
- 2 individual fibers, outside diameter 2.2 mm
- Inner fiber Ø 1.0 mm
- Sensing head for lateral sensing
- Long operating distance
- Can be cut

Accessories for synthetic optical fibers

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

Dimensions | *Part ref. / max. operating distance* | *Characteristics*

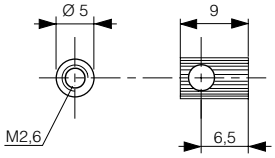
For M4



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 3060/65 5000 mm (with 5 m fiber)



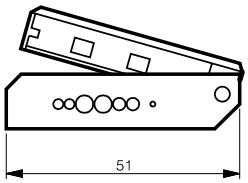
90° front lens

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 3060/65 1700 mm

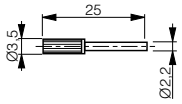
For all synthetic optical fibers
Cutting tool

LXF-0000-000



For fine synthetic optical fibers
Adaptor

LFP-0003-000



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 sensing 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 sensing 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	
Sensing head material	Aluminum	
Sensing head light-outlet tube material	Stainless steel	
Optical attenuation	10 dB / km max. at 880 nm	
Angle of incidence	See data sheets	

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

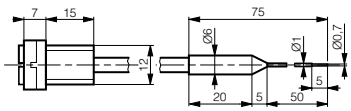
A broad range of special executions is available in small quantities and with short delivery times, e.g.:

- Higher protection degree of the sensing head (on request).
- Special sensing 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**)*

Housing 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

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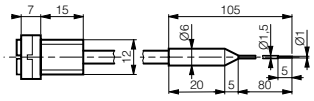
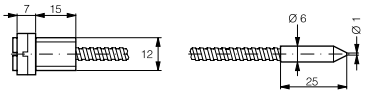
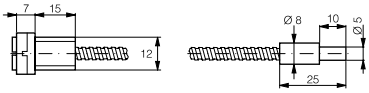
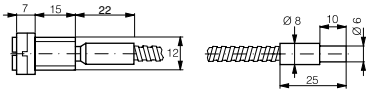
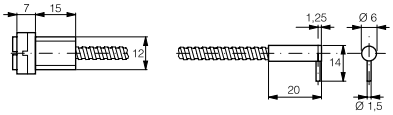
length of glass fiber in cm, standard lengths -025 (250 mm) / -050 (500 mm) / -100 (1000 mm)
***bold** = preferred types (-### **only 500 mm length**)*

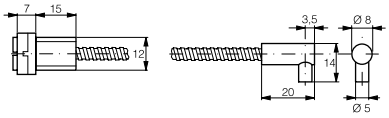
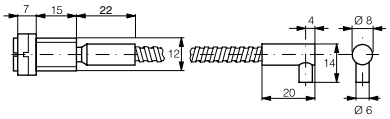
Housing size	*Part ref. / max. operating distance*	*Characteristics*
∅6 	**LFG-1015-###** **15 mm**	– Operating distance: – with series 4040 15 mm – With bendable light-outlet tube – For places difficult to access – Silicone sleeve Ø 4.7 mm – Min. bending radius 20 mm – Min. bending radius of light-outlet 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**)*

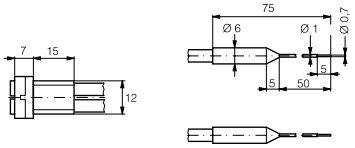
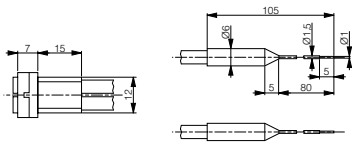
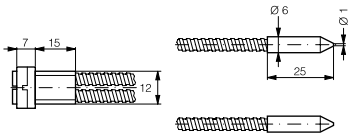
Housing size	*Part ref. / max. operating distance*	*Characteristics*
∅6 	**LFG-2010-###** **15 mm**	– Operating distance: – with series 4040 15 mm – For the detection of smallest objects in places difficult to access – Leg length 14 mm – Wound sleeve of chrome-plated brass Ø 4.7 mm – Min. bending radius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

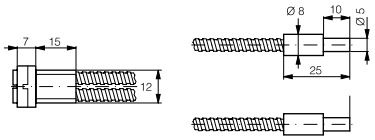
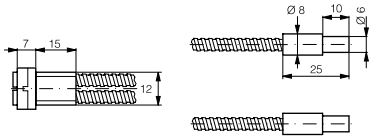
Housing size	*Part ref. / max. operating distance*	*Characteristics*
∅8 	**LFG-2020-###** **30 mm**	– Operating distance: – with series 4040 30 mm – Multi-purpose medium-range model – Leg length 14 mm – Wound sleeve of chrome-plated brass Ø 4.7 mm – Min. bending radius 25 mm – Max. tensile load 50 N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

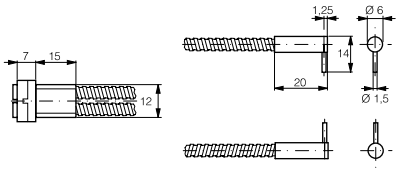
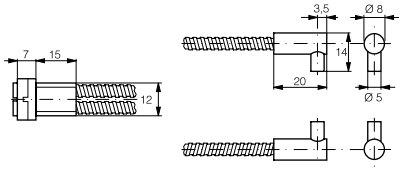
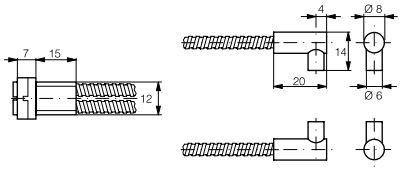
Housing size	*Part ref. / max. operating distance*	*Characteristics*
∅6 	**LFG-3005-###** **50 mm**	– Operating distance: – with series 4040 50 mm – With bendable light-outlet tube – For the detection of smallest objects – Silicone sleeve Ø 4.7 mm – Min. bending radius 20 mm – Min. bending radius of 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**)*

Housing 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**)*

Housing 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, 3060 and 3065 switches (connection as with synthetic fibers)

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

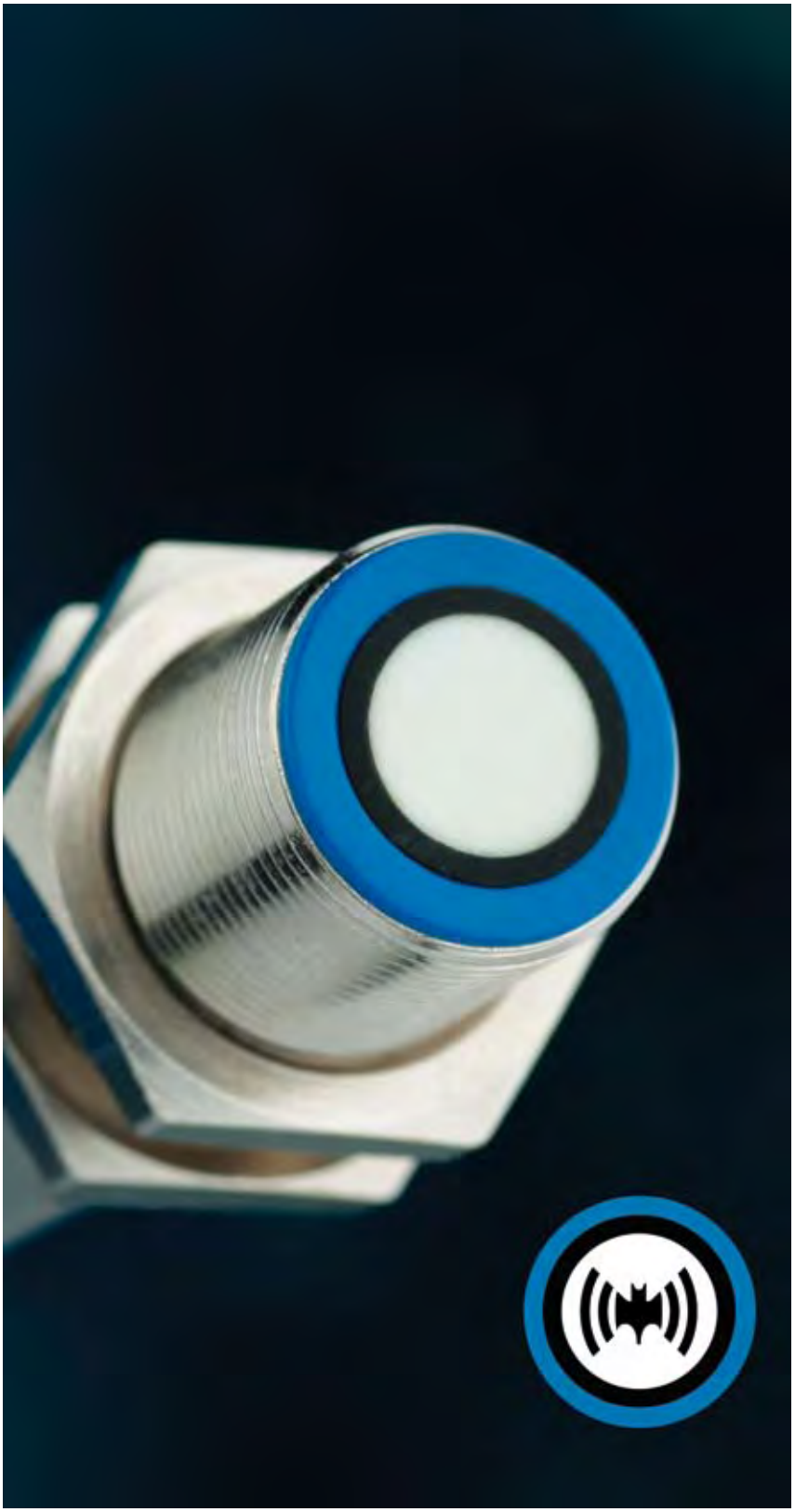
Housing size	*Part ref. / max. operating distance*	*Characteristics*
M6	**Diffuse sensor** **LFG-1022-050** **120 mm**	– Operating distance: – with series 3030 120 mm – with series 3031 60 mm – with series 3060/65 200 mm – For difficult environmental conditions – Wound sleeve of chrome-plated brass Ø 4.6 mm – Min. bending radius 25 mm – Max. tensile load 20 N
M4	**Through-beam sensor** **LFG-3022-050** **500 mm**	– Operating distance: – with series 3030 500 mm – with series 3031 250 mm – with series 3060/65 800 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

Accessories for glass optical fibers

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

Dimensions	*Part reference*	*Characteristics*
For ∅ 6 mm heads	**Fiber mounting clamp** LXG-0000-060	Mounting clamp 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-###
For ∅ 8 mm heads	**Fiber mounting clamp** LXG-0000-080	Mounting clamp 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-###

4 Ultrasonic proximity switches



Highlights:

- Ready-to-connect compact devices
- Short housing lengths
- Adjustment by means of teach-in, potentiometer and/ or interface with PC software
- Devices with digital and/or analog outputs

New:

- Cuboid through-beam models
- Interface cable with teach-in button

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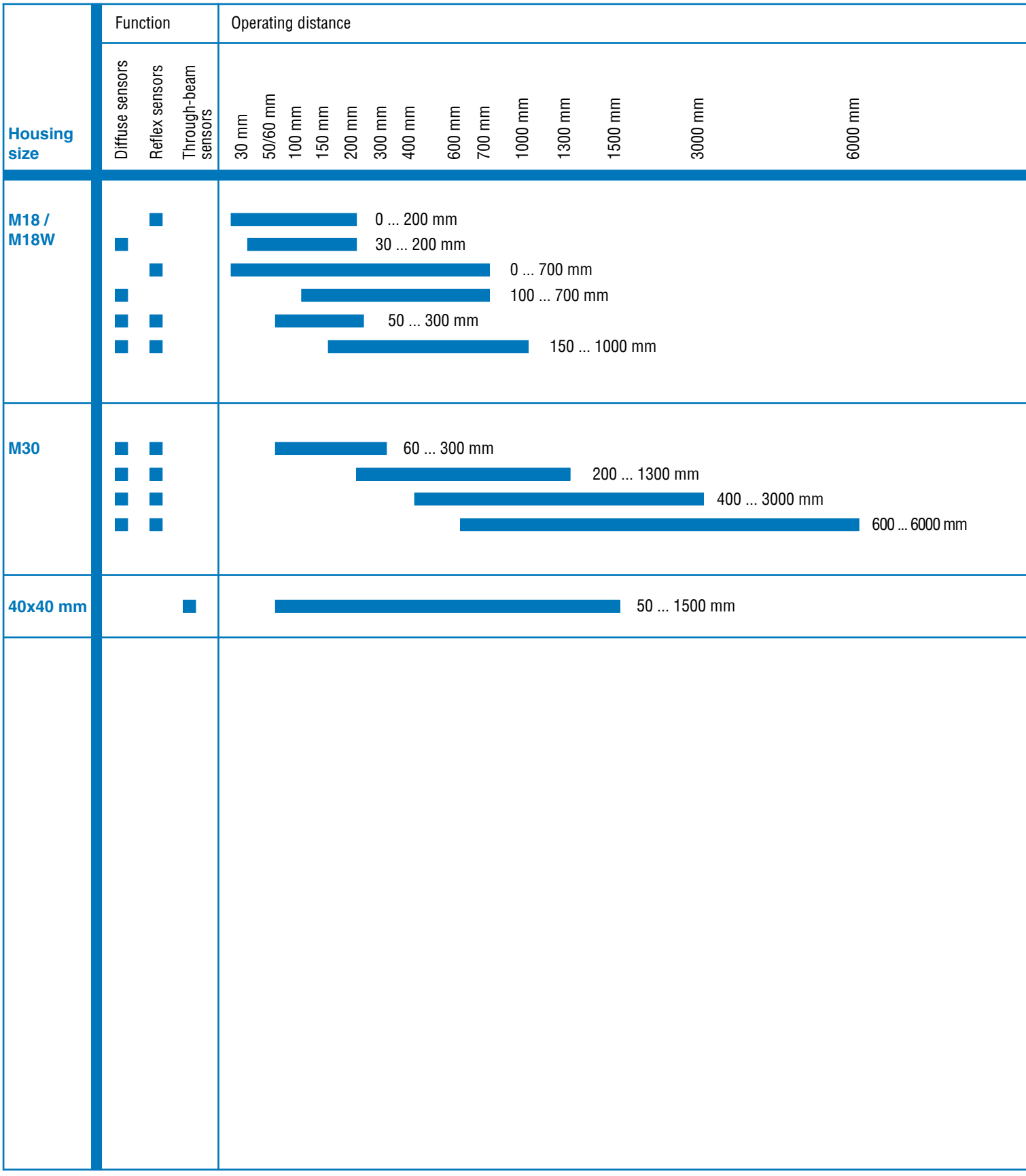
4 Ultrasonic proximity switches



PROGRAM OVERVIEW

Output					Sensitivity setting				Supply voltage range U_B	Connection			Housing		Page
1 x PNP	2 x PNP	NPN	Analog	Analog + PNP	Teach-in	Potentiometer	Interface	Pin 2		Connector S8	Connector S12	Cable	Metal	PBTP	
■					■				20 ... 30 VDC		■		■		133, 135
■					■				20 ... 30 VDC		■		■		132, 134
■					■				20 ... 30 VDC		■		■		133, 135
■					■				20 ... 30 VDC		■		■		133, 135
■			■			■	■		12 ... 30 VDC*		■		■		136, 137
■			■			■	■		12 ... 30 VDC*		■		■		137
■	■			■		■	■		12 ... 30 VDC*		■		■		138, 140
■	■			■		■	■		12 ... 30 VDC*		■		■		139, 141
■	■			■		■	■		12 ... 30 VDC*		■		■		139, 141
■	■			■		■	■		12 ... 30 VDC*		■		■		139, 141
■								■	12 ... 30 VDC*	■	■	■		■	142 - 143

* At 12 ... 20 V, approx. 20 % reduced sensing range.

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4 Ultrasonic proximity switches

Operating principle

Ultrasonic proximity switches can be used as contact-free sensors in many areas of automation. They are employed wherever distances have to be measured in air, since they not only detect objects, but they can also indicate and evaluate the absolute distance between themselves and the target. Changing atmospheric conditions, (e.g. temperature variations) are compensated during evaluation of the measurement.

Ultrasonic proximity switches working as diffuse or reflex sensors send out ultrasonic impulses in cyclical intervals. If these are reflected by an object, the resulting echo is received and converted into an electrical signal. Detection of the received echo is dependent on its intensity, itself dependent on the distance of the object from the sensor. The devices function according to the echo-delay principle, i.e. the time delay between the emitter and echo impulses is evaluated.

With ultrasonic proximity switches working as through-beam sensors, on the other hand, the emitter sends out a narrowly focused permanent sound towards the receiver. The latter evaluates the ultrasonic signal and switches the output as soon as the sound is interrupted by an object.

Sensing range

Due to the sensor construction, the ultrasound is radiated in a lobar shape. Only reflecting objects within this sound beam are detected. Echoes in the blind zone between the sensor face and the sensing range cannot be evaluated.

Targets

The targets to be detected can be in the solid, liquid, granular or powder state. The material may be transparent or colored, of any shape, and with a polished or matt surface. All even or flat surfaces up to an angular deviation of approximately 3° from perpendicular to the sound beam can be detected with certainty, even at the maximum operating distance. Depending on surface roughness, the angular deviation may even be greater. In principle, targets can enter the sound beam from any direction.

Temperature compensation

The ultrasonic proximity switches are equipped with temperature sensors and a compensation circuit, in order to be able to compensate for changes in operating distance caused by temperature fluctuations.

Environmental conditions

Normal atmospheric variations at any given location have a negligible influence on the speed of sound. The propagation of ultrasonic waves in a vacuum is not possible.

Hot objects (e.g. red-hot metals) cause air turbulence, dispersing or diverting the ultrasound. In such surroundings, no analyzable echo is produced.

Ultrasonic proximity switches are designed for use under normal atmospheric conditions, i.e. in air. Operation in other gases (e.g. carbon dioxide) can give rise to serious error measurements or even functional failure, due to differing sound speed and damping values.

Normal rain or snowfall does not impair the functioning of ultrasonic proximity switches. The transducer surface should, however, not become moistened, although dew is permissible.

Ambient noise is distinguished from the system's own sound echoes and, as a rule, does not lead to functional errors.

Safety

The use of ultrasonic proximity switches in applications where the safety of people is dependent on their functioning is not permitted.

Available models

Ultrasonic proximity switches from CONTRINEX are available as diffuse, reflex and through-beam types.

Diffuse sensors

With diffuse sensors, the target functions as a reflector. As soon as an object enters the preset sensing area, its echo causes the device to switch.

Reflex sensors

In the case of reflex sensors, a fixed reflector (e.g. a small metal plate) is mounted facing the device. The switching range is set to this reflector. If an object comes between the ultrasonic proximity switch and the reflector, the sensor no longer recognizes the latter, which causes the output to switch.

Through-beam sensors

Through-beam sensors consist of an emitter and a receiver placed opposite each other. If an object comes between them, the sound is interrupted, causing the output to switch.

Synchronization

Devices of series 1180/1181 and 1300...1303 can be synchronized with each other by simply connecting their synchronization outputs (pin 2 for N.O., pin 4 for N.C.). In this way, up to 10 sensors can be synchronized. In many cases, it is thus possible to mount the sensors very close to one another without mutual interference.

The fourth connection can be used as an external release input. Thus, ultrasonic proximity switches can be activated or deactivated with an external control,

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without switching the supply voltage on and off. An external multiplex operation can be achieved by switching the ultrasonic proximity switches on and off one after the other via the release input. In this case, assurance is always given that the ultrasonic proximity switches do not influence one another. As opposed to internal synchronization, here more than 10 switches can be operated.

Programming

For optimum adaptation to the application conditions, devices of series 1180/1181 and 1300...1303 can be programmed with the PC interface device APE-0000-001 (see Ultrasonic accessories, p. 144).

The series 1180/1181C and 1180/1181W devices are adjustable by teach-in via the device connection.

The sensitivity of series 4040 devices can be adjusted via pin 2 or the white cable wire of the receiver.

Mounting

Ultrasonic proximity switches can be operated in any installation position. However, positions in which materials can be deposited on the transducer surface should be avoided.

In order to obtain the best reflection results, the ultrasonic proximity switch should be oriented in such a way that the sound waves strike the target at as close to 90° as possible. If this is not possible (e.g. with bulk materials), the maximum possible range has to be determined experimentally, and is dependent on the material, surface and orientation of the objects.

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M18

Diffuse sensor with background suppr.

30 ... 200 mm

At a glance:

- Ready-to-connect compact devices
- Short cylindrical housings of 63.5 mm (connector models)
- High excess gain, therefore insensitive to dirt and ambient noise
- Detection independent of target's color, shape, material and surface structure
- Reduced blind zone
- Low current drain
- Adjustment by means of external teach-in
- Diffuse sensors feature background suppression
- High degree of protection: IP 67

Construction

The devices are built into nickel-plated brass housings, and fully potted. The transducer surface is of epoxy resin and its enclosure of glass-fiber reinforced PBTP / polybutylene-terephthalate (Crastin).

Technical data:

(according to IEC 60947-5-2)

Supply voltage range U_B	20 ... 30 VDC
Max. ripple content	10 %
Output current	150 mA max.
Output voltage drop	2.0 V max. at 150 mA
Ambient temp. range	-25 ... +70 °C
Degree of protection	IP 67
EMC protection:	
IEC 61000-4-2	4 kV
IEC 61000-4-3	10 V/m
IEC 61000-4-4	2 kV
IEC 61000-4-6	10 V
EN 55011	Class B

Sensitivity setting

Sensitivity can be adjusted by means of teach-in via the device connection. The lack of a potentiometer prevents the adjustment from being willfully changed.

Protection

The switches are protected against overloads, short-circuits and wire reversals. Furthermore, protection against temporary overvoltages of the power supply is built-in.

LED

The yellow LED lights up when the output is switched. In teach mode, the LED flashes.

Connection

Devices with 4-pole S12 connector are standard.

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. All devices shown here feature power-ON reset.

Data sheets

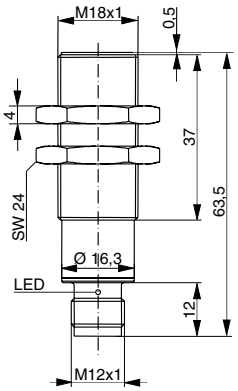
Detailed data sheets with additional technical information are available for all models. These may be retrieved from the CONTRINEX website (www.contrinex.com), or ordered cost-free from our sales offices.

Drawings

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

Delivery package

Ultrasonic proximity switch, 2 fixing nuts, instructions.



Sensing range	30 ... 200 mm
Setting range	50 ... 200 mm
Tolerance width	---
Standard target	20 x 20 mm
Hysteresis	10 mm
No-load supply current	max. 20 mA
Rated ultrasonic frequency	400 kHz
Switching frequency	10 Hz
Time delay before availability	20 msec
Response time	50 msec
Weight	30 g
Part ref.: (**bold**: preferred types)	
PNP N.O. / connector S12	**UTS-1180C-303**
Suitable connecting cables (page 146)	M, N
Wiring (page 145)	Diagram 1

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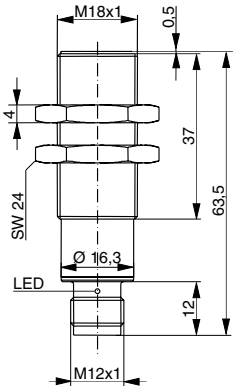
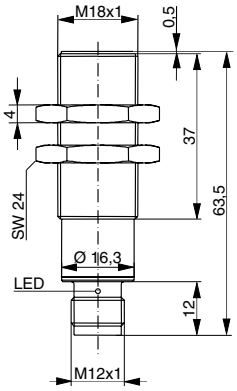
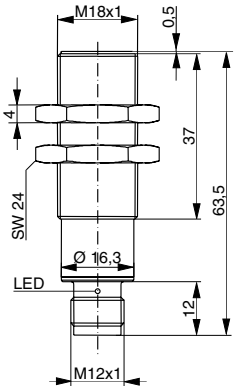
SERIES 1180/1181C WITH TEACH-IN

M18	M18	M18	
Reflex sensor 0 ... 200 mm	Diffuse sensor with background suppression 100 ... 700 mm	Reflex sensor 0 ... 700 mm	
			
			
0 ... 200 mm	100 ... 700 mm	0 ... 700 mm	
120 ... 220 mm	150 ... 700 mm	350 ... 750 mm	
20 mm	---	50 mm	
20 x 20 mm	20 x 20 mm	20 x 20 mm	
2 mm	10 mm	3 mm	
max. 20 mA	max. 20 mA	max. 20 mA	
400 kHz	200 kHz	200 kHz	
10 Hz	5 Hz	5 Hz	
20 msec	20 msec	20 msec	
50 msec	100 msec	100 msec	
30 g	30 g	30 g	
URS-1180C-303	**UTS-1181C-303**	**URS-1181C-303**	
M, N	M, N	M, N	
Diagram 1	Diagram 1	Diagram 1	

At a glance:

- Ready-to-connect compact devices
- Right-angle sensing
- Robust and fully integrated sensing head
- High excess gain, therefore insensitive to dirt and ambient noise
- Detection independent of target's color, shape, material and surface structure
- Reduced blind zone
- Low current drain
- Adjustment by means of external teach-in
- Diffuse sensors feature background suppression
- High degree of protection: IP 67

Construction

The devices are built into nickel-plated brass housings, and fully potted. The transducer surface is of epoxy resin and its enclosure of glass-fiber reinforced PBTP / polybutylene-terephthalate (Crastin).

Sensitivity setting

Sensitivity can be adjusted by means of teach-in via the device connection. The lack of a potentiometer prevents the adjustment from being willfully changed.

Technical data:

(according to IEC 60947-5-2)

Supply voltage range U_B	20 ... 30 VDC
Max. ripple content	10 %
Output current	150 mA max.
Output voltage drop	2.0 V max. at 150 mA
Ambient temp. range	-25 ... +70 °C
Degree of protection	IP 67
EMC protection:	
IEC 61000-4-2	4 kV
IEC 61000-4-3	10 V/m
IEC 61000-4-4	2 kV
IEC 61000-4-6	10 V
EN 55011	Class B

Protection

The switches are protected against overloads, short-circuits and wire reversals. Furthermore, protection against temporary overvoltages of the power supply is built-in.

LED

The yellow LED lights up when the output is switched. In teach mode, the LED flashes.

Connection

Devices with 4-pole S12 connector are standard.

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. All devices shown here feature power-ON reset.

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.

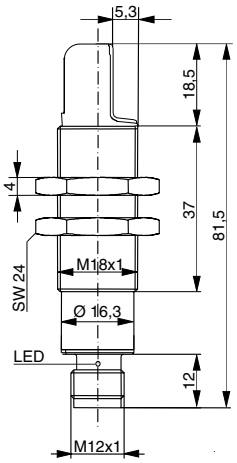
Delivery package

Ultrasonic proximity switch, 2 fixing nuts, instructions.

M18

Diffuse sensor with background suppr.

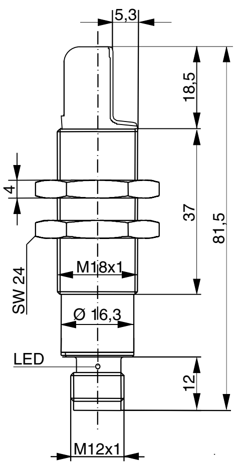
30 ... 200 mm

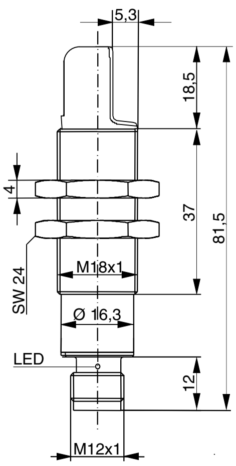


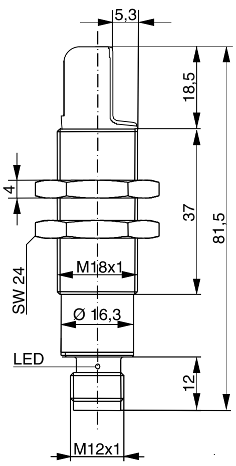
Sensing range	30 ... 200 mm
Setting range	50 ... 200 mm
Tolerance width	---
Standard target	20 x 20 mm
Hysteresis	10 mm
No-load supply current	max. 20 mA
Rated ultrasonic frequency	400 kHz
Switching frequency	10 Hz
Time delay before availability	20 msec
Response time	50 msec
Weight	30 g
Part ref.: (**bold**: preferred types)	
PNP N.O. / connector S12	**UTS-1180W-303**
Suitable connecting cables (page 146)	M, N
Wiring (page 145)	Diagram 1

SERIES 1180/1181W WITH TEACH-IN

M18	M18	M18
Reflex sensor	**Diffuse sensor with background suppression**	**Reflex sensor**
0 ... 200 mm	**100 ... 700 mm**	**0 ... 700 mm**







0 ... 200 mm	100 ... 700 mm	0 ... 700 mm
120 ... 220 mm	150 ... 700 mm	350 ... 750 mm
20 mm	---	50 mm
20 x 20 mm	20 x 20 mm	20 x 20 mm
2 mm	10 mm	3 mm
max. 20 mA	max. 20 mA	max. 20 mA
400 kHz	200 kHz	200 kHz
10 Hz	5 Hz	5 Hz
20 msec	20 msec	20 msec
50 msec	100 msec	100 msec
30 g	30 g	30 g
URS-1180W-303	**UTS-1181W-303**	**URS-1181W-303**
M, N	M, N	M, N
Diagram 1	Diagram 1	Diagram 1

At a glance:

- Ready-to-connect compact devices
- Can be operated as diffuse or reflex sensors (with interface)
- High excess gain, therefore insensitive to dirt and ambient noise
- Detection independent of target's color, shape, material and surface structure
- Reduced blind zone
- Low current drain
- Adjustment by means of potentiometer (only devices with switching output) and interface device APE-0000-001
- Switching or analog output
- Fore- and background suppression
- Diffuse sensors with window function
- High degree of protection: IP 67

Construction

The devices are built into nickel-plated brass housings, and fully potted. The transducer surface is of epoxy resin and its enclosure of glass-fiber reinforced PBTP / polybutyleneterephthalate (Crastin).

Sensitivity setting

Sensitivity is adjusted by means of an interface device (see Ultrasonic accessories, p. 144) or potentiometer (only devices with switching output).

Technical data:

(according to IEC 60947-5-2)

Supply voltage range U_B	12 ... 30 VDC*
Max. ripple content	10 %
Output current	150 mA max.
Output voltage drop	3.0 V max. at 150 mA
Ambient temp. range	-25 ... +70 °C
Degree of protection	IP 67
EMC protection:	
IEC 61000-4-2	4 kV
IEC 61000-4-3	10 V/m
IEC 61000-4-4	2 kV
IEC 61000-4-6	10 V
EN 55011	Class B

* At 12 ... 20 V, approx. 20 % reduced sensing range.

Protection

The switches are protected against overloads, short-circuits and wire reversals. Furthermore, protection against temporary overvoltages of the power supply is built-in.

LED

The yellow LED lights up when the output is switched. Flashing LED indicates misadjustment.

Connection

Devices with 4-pole S12 connector are standard.

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. All devices shown here feature power-ON reset.

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.

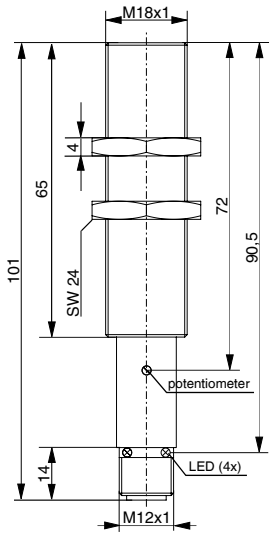
Delivery package

Ultrasonic proximity switch, 2 fixing nuts, instructions.

M18

Diffuse and reflex sensor

50 ... 300 mm



Sensing range	50 ... 300 mm
Setting range	70 ... 300 mm
Standard target	10 x 10 mm
Hysteresis	10 mm
No-load supply current	max. 50 mA
Rated ultrasonic frequency	400 kHz
Switching frequency	5 Hz
Time delay before availability	280 msec
Response time	100 msec
Weight	50 g
Part ref.: (**bold**: preferred types)	
PNP N.O. / connector S12	**UTS-1180-303**
Analog 4 ... 20 mA / connector S12	
Suitable connecting cables (page 146)	M, N
Wiring (page 145)	Diagram 2

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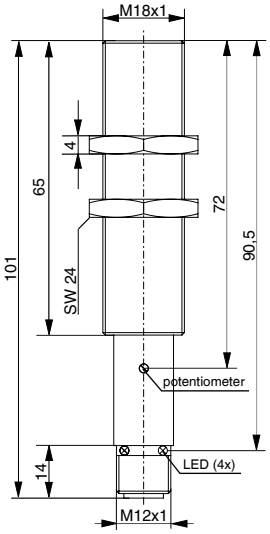
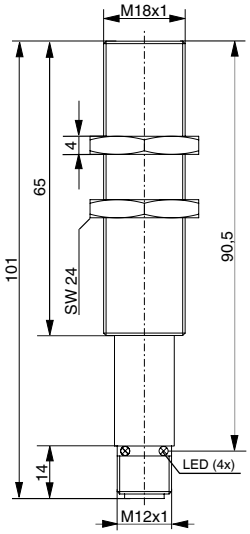
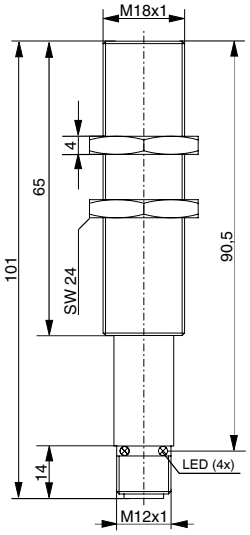
M18	M18	M18	
Diffuse and reflex sensor	**Diffuse and reflex sensor**	**Diffuse and reflex sensor**	
150 ... 1,000 mm	**50 ... 300 mm**	**150 ... 1,000 mm**	
			
			
150 ... 1,000 mm	50 ... 300 mm	150 ... 1,000 mm	
170 ... 1,000 mm	70 ... 300 mm	170 ... 1,000 mm	
20 x 20 mm	10 x 10 mm	20 x 20 mm	
10 mm	10 mm	10 mm	
max. 50 mA	max. 50 mA	max. 50 mA	
200 kHz	400 kHz	200 kHz	
4 Hz	---	---	
280 msec	280 msec	280 msec	
120 msec	100 msec	120 msec	
50 g	50 g	50 g	
UTS-1181-303			
	UTS-1180-329	**UTS-1181-329**	
M, N	M, N	M, N	
Diagram 2	Diagram 2	Diagram 2	

At a glance:

- Ready-to-connect compact devices
- Can be operated as diffuse or reflex sensors
- High excess gain, therefore insensitive to dirt and ambient noise
- Detection independent of target's color, shape, material and surface structure
- Reduced blind zone
- Low current drain
- Adjustment by means of potentiometers and interface device APE-0000-001
- 1 or 2 switching outputs
- Fore- and background suppression
- Diffuse sensors with window function
- High degree of protection: IP 65

Construction

The devices are built into nickel-plated brass housings, and fully potted. The transducer surface is of epoxy resin and its enclosure of glass-fiber reinforced PBTP / polybutyleneterephthalate (Crastin).

Sensitivity setting

Sensitivity is adjusted by means of an interface device (see Ultrasonic accessories, p. 144) or potentiometers.

Technical data:

(according to IEC 60947-5-2)

Supply voltage range U_B	12 ... 30 VDC*
Max. ripple content	10 %
Output current	300 mA max.
Output voltage drop	3.0 V max. at 300 mA
Ambient temp. range	-25 ... +70 °C
Degree of protection	IP 65
EMC protection:	
IEC 61000-4-2	4 kV
IEC 61000-4-3	10 V/m
IEC 61000-4-4	2 kV
IEC 61000-4-6	10 V
EN 55011	Class B

* At 12 ... 20 V, approx. 20 % reduced sensing range.

Protection

The switches are protected against overloads, short-circuits and wire reversals. Furthermore, protection against temporary overvoltages of the power supply is built-in.

LED

The yellow LED lights up when the output is switched. Flashing LED indicates misadjustment.

Connection

Devices with 4-pole (UTS-130#-303) or 5-pole (UTS-130#-107) S12 connector are standard.

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. All devices shown here feature power-ON reset.

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.

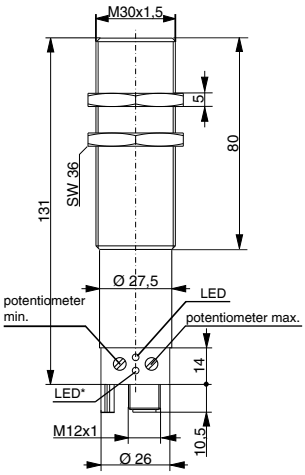
Delivery package

Ultrasonic proximity switch, 2 fixing nuts, instructions.

M30

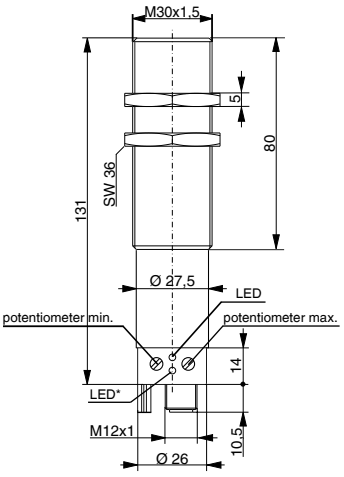
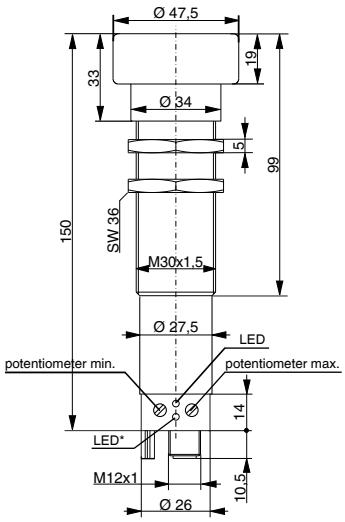
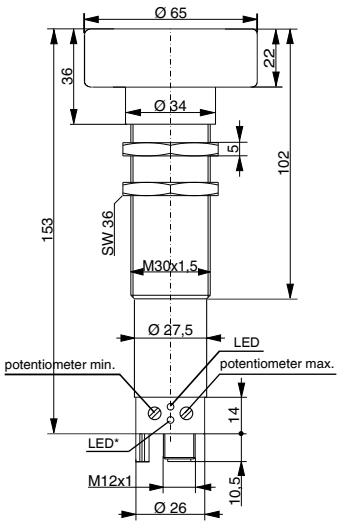
Diffuse and reflex sensor

60 ... 300 mm



* UTS-130#-107 only

Sensing range	60 ... 300 mm
Setting range	80 ... 300 mm
Standard target	10 x 10 mm
Hysteresis	10 mm
No-load supply current	max. 50 mA
Rated ultrasonic frequency	400 kHz
Switching frequency	8 Hz
Time delay before availability	280 msec
Response time	80 msec
Weight	210 g
Part ref.: (**bold**: preferred types)	
1 output: PNP N.O. / connector S12	**UTS-1300-303**
2 outputs: PNP N.O. / connector S12	**UTS-1300-107**
Suitable connecting cables (page 146)	M, N (...-303) / O, P (...-107)
Wiring (page 145)	Diagram 2 (...-303) / 3 (...-107)

M30	M30	M30	
Diffuse and reflex sensor	**Diffuse and reflex sensor**	**Diffuse and reflex sensor**	
200 ... 1,300 mm	**400 ... 3,000 mm**	**600 ... 6,000 mm**	
			
			
* UTS-130#-107 only	* UTS-130#-107 only	* UTS-130#-107 only	
200 ... 1,300 mm	400 ... 3,000 mm	600 ... 6,000 mm	
220 ... 1,300 mm	420 ... 3,000 mm	640 ... 6,000 mm	
20 x 20 mm	50 x 50 mm	100 x 100 mm	
10 mm	20 mm	60 mm	
max. 50 mA	max. 50 mA	max. 50 mA	
200 kHz	120 kHz	80 kHz	
4 Hz	2 Hz	1 Hz	
280 msec	280 msec	280 msec	
110 msec	200 msec	400 msec	
210 g	340 g	380 g	
UTS-1301-303	**UTS-1302-303**	**UTS-1303-303**	
UTS-1301-107	**UTS-1302-107**	**UTS-1303-107**	
M, N (...-303) / O, P (...-107)	M, N (...-303) / O, P (...-107)	M, N (...-303) / O, P (...-107)	
Diagram 2 (...-303) / 3 (...-107)	Diagram 2 (...-303) / 3 (...-107)	Diagram 2 (...-303) / 3 (...-107)	

M30

Diffuse and reflex sensor

60 ... 300 mm

At a glance:

- Ready-to-connect compact devices
- Can be operated as diffuse or reflex sensors
- High excess gain, therefore insensitive to dirt and ambient noise
- Detection independent of target's color, shape, material and surface structure
- Reduced blind zone
- Low current drain
- Adjustment by means of potentiometers and interface device APE-0000-001
- Switching and analog outputs
- Fore- and background suppression
- Diffuse sensors with window function
- High degree of protection: IP 65

Construction

The devices are built into nickel-plated brass housings, and fully potted. The transducer surface is of epoxy resin and its enclosure of glass-fiber reinforced PBTP / polybutylene-terephthalate (Crastin).

Sensitivity setting

Sensitivity is adjusted by means of an interface device (see Ultrasonic accessories, p. 144) or potentiometers.

Technical data:

(according to IEC 60947-5-2)

Supply voltage range U_B	12 ... 30 VDC*
Max. ripple content	10 %
Output current	300 mA max.
Output voltage drop	3.0 V max. at 300 mA
Ambient temp. range	-25 ... +70 °C
Degree of protection	IP 65
EMC protection:	
IEC 61000-4-2	4 kV
IEC 61000-4-3	10 V/m
IEC 61000-4-4	2 kV
IEC 61000-4-6	10 V
EN 55011	Class B

* At 12 ... 20 V, approx. 20 % reduced sensing range.

Protection

The switches are protected against overloads, short-circuits and wire reversals. Furthermore, protection against temporary overvoltages of the power supply is built-in.

LED

The yellow LED lights up when the output is switched. Flashing LED indicates misadjustment.

Connection

Devices with 5-pole S12 connector are standard.

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. All devices shown here feature power-ON reset.

Data sheets

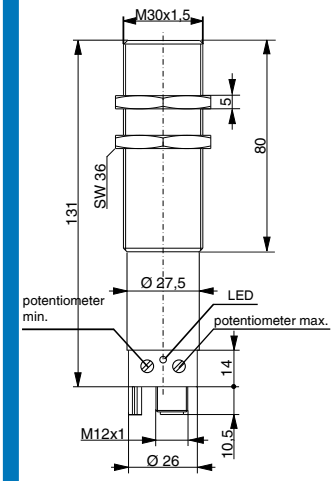
Detailed data sheets with additional technical information are available for all models. These may be retrieved from the CONTRINEX website (www.contrinex.com), or ordered cost-free from our sales offices.

Drawings

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

Delivery package

Ultrasonic proximity switch, 2 fixing nuts, instructions.



Sensing range	60 ... 300 mm
Setting range	80 ... 300 mm
Standard target	10 x 10 mm
Hysteresis	10 mm
No-load supply current	max. 60 mA
Rated ultrasonic frequency	400 kHz
Switching frequency	5 Hz
Time delay before availability	280 msec
Response time	100 msec
Weight	210 g
Part ref.: (**bold**: preferred types)	
Analog 4 ... 20 mA + PNP N.O. / S12	**UTS-1300-123**
Analog 0 ... 10 V + PNP N.O. / S12	**UTS-1300-113**
Suitable connecting cables (page 146)	O, P
Wiring (page 145)	Diagram 4 (...-123) / 5 (...-113)

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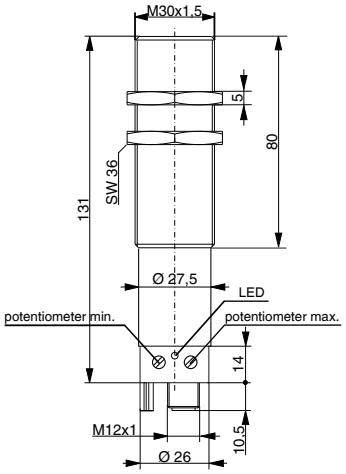
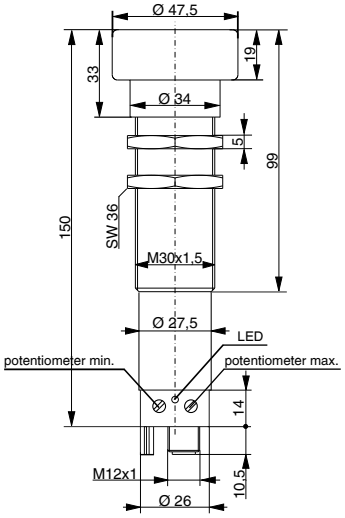
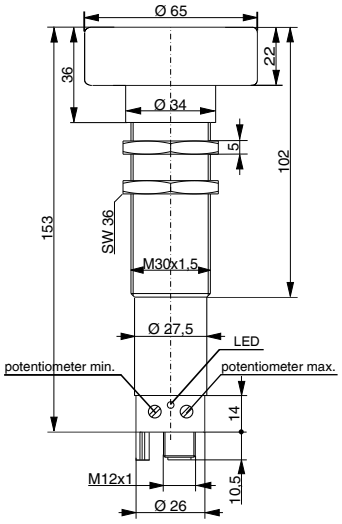
SERIES 1300 ... 1303 WITH ANALOG OUTPUT

M30	M30	M30	
Diffuse and reflex sensor	**Diffuse and reflex sensor**	**Diffuse and reflex sensor**	
200 ... 1,300 mm	**400 ... 3,000 mm**	**600 ... 6,000 mm**	
			
			
200 ... 1,300 mm	400 ... 3,000 mm	600 ... 6,000 mm	
220 ... 1,300 mm	420 ... 3,000 mm	640 ... 6,000 mm	
20 x 20 mm	50 x 50 mm	100 x 100 mm	
10 mm	20 mm	60 mm	
max. 60 mA	max. 60 mA	max. 60 mA	
200 kHz	120 kHz	80 kHz	
4 Hz	2 Hz	1 Hz	
280 msec	280 msec	280 msec	
120 msec	200 msec	400 msec	
210 g	340 g	380 g	
UTS-1301-123	**UTS-1302-123**	**UTS-1303-123**	
UTS-1301-113	**UTS-1302-113**	**UTS-1303-113**	
O, P	O, P	O, P	
Diagram 4 (...-123) / 5 (...-113)	Diagram 4 (...-123) / 5 (...-113)	Diagram 4 (...-123) / 5 (...-113)	

At a glance:

- Ready-to-connect compact devices
- High excess gain, therefore insensitive to dirt and ambient noise
- Detection independent of target's color, shape, material and surface structure
- High switching frequency
- Narrowly focused permanent sound emission
- No blind zone
- Low current drain
- Sensitivity adjustment via pin 2 or white cable wire of receiver
- High degree of protection: IP 67

Construction

The devices are built into a housing of glass-fiber reinforced PBTP / polybutylene-terephthalate (Crastin) and fully potted. The transducer surface is of epoxy resin.

Sensitivity setting

Sensitivity is adjusted via pin 2 or the white cable wire of the receiver.

Protection

The switches are protected against overloads, short-circuits and wire reversals.

Technical data:

(according to IEC 60947-5-2)

Supply voltage range U_B	12 ... 30 VDC*
Max. ripple content	10 %
Output current	100 mA max.
Output voltage drop	2.0 V max. at 100 mA
Ambient temp. range	0 ... +70 °C
Degree of protection	IP 67
EMC protection:	
IEC 60947-5-2	1 kV
IEC 61000-4-2	4 kV / 8 kV
IEC 61000-4-3	10 V/m
IEC 61000-4-4	2 kV
IEC 61000-4-6	7 V

* At 12 ... 20 V, approx. 20 % reduced sensitivity

LED

The yellow LED lights up when the output is switched, the green LED lights up as soon as the sensor is connected.

Connection

Devices with 4-pole S12 or S8 connector, or 3 m PUR cable are standard.

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.

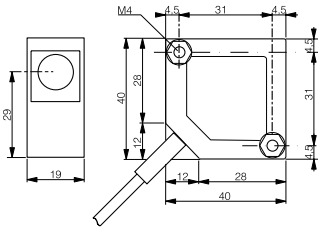
Delivery package

Ultrasonic proximity switch, instructions.

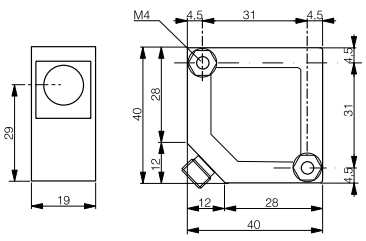
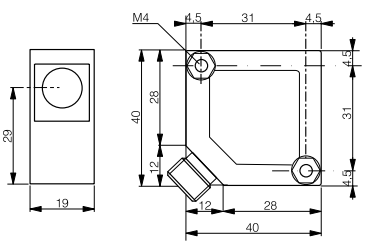
□ 40x40

Through-beam sensor

50 ... 1,500 mm



Sensing range (E)	50 ... 1,500 mm
Standard target	20x20 mm < 400 mm > 10x10 mm
No-load supply current	max. 30 mA (E) / max. 20 mA (R)
Rated ultrasonic frequency (E)	200 kHz
Switching frequency	200 Hz (< 400 mm) / 150 Hz
	(< 800 mm) / 100 Hz (< 1500 mm)
Time delay before availability (R)	40 msec
Response time (R)	2 msec (< 400 mm) / 1.5 msec
	(< 800 mm) / 1 msec (< 1500 mm)
Connection	PUR cable 3 m
Weight (R + E)	220 g
Part ref.: (**bold**: preferred types)	**(R)** receiver / **(E)** emitter
PNP N.O. (receiver)	**ULK-4040-003**
Emitter	**ULK-4040-000**
Suitable connecting cables (page 146)	---
Wiring (page 145)	Diagram 2 (R) / 6 (E)

☐ 40x40	☐ 40x40	
Through-beam sensor	**Through-beam sensor**	
50 ... 1,500 mm	**50 ... 1,500 mm**	
		
		
50 ... 1,500 mm	50 ... 1,500 mm	
20x20 mm < 400 mm > 10x10 mm	20x20 mm < 400 mm > 10x10 mm	
max. 30 mA (E) / max. 20 mA (R)	max. 30 mA (E) / max. 20 mA (R)	
200 kHz	200 kHz	
200 Hz (< 400 mm) / 150 Hz	200 Hz (< 400 mm) / 150 Hz	
(< 800 mm) / 100 Hz (< 1500 mm)	(< 800 mm) / 100 Hz (< 1500 mm)	
40 msec	40 msec	
2 msec (< 400 mm) / 1.5 msec	2 msec (< 400 mm) / 1.5 msec	
(< 800 mm) / 1 msec (< 1500 mm)	(< 800 mm) / 1 msec (< 1500 mm)	
Connector S8	Connector S12	
70 g	80 g	
(R) receiver / **(E)** emitter	**(R)** receiver / **(E)** emitter	
ULS-4040-003	**ULS-4040-003-305**	
ULS-4040-000	**ULS-4040-000-305**	
E, F	M, N	
Diagram 2 (R) / 6 (E)	Diagram 2 (R) / 6 (E)	

Ultrasonic accessories

CONPROG PC interface

For optimum adaptation to the application conditions, the parameters of all the devices in this catalog (excepting series 1180/1181C, 1180/1181W and 4040) can be programmed, visualized, checked and changed with the PC interface device APE-0000-001 and its software CONPROG. Amongst others, the following parameters can be set:

- Beginning and end of operating range
- Hysteresis
- End of sensing range
- Switching function (N.O. or N.C.)
- Beginning and end of analog characteristic curve (devices with analog output)
- Direction of analog characteristic curve (rising or falling)
- End of blind zone
- Mean value generation
- Temperature compensation
- Multiplex function
- Function as diffuse or reflex sensor
- Switching frequency
- Damping (sensitivity)

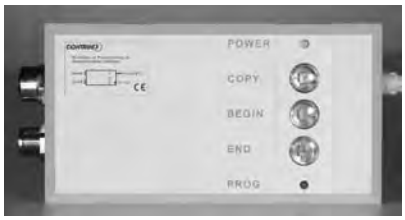
The programmed values can be stored and printed, thus simplifying the maintenance and documentation of the installation. In case several sensors need to be parametrized identically, the stored setting values can be transferred rapidly to the other sensors by means of the interface device (e.g. when connecting switches in series, or when exchanging them).

The interface device is delivered with a RS232 cable (for serial interface), a mains transformer plug, a sensor connecting cable and CONPROG PC software for Windows. Updates to the latest software version can be downloaded from the CONTRINEX website (www.contrinex.com).

Interface device

suitable for all the devices in this catalog, excepting series 1180/1181C, 1180/1181W and 4040.

Part reference: **APE-0000-001**



S12 interface cable with teach-in button

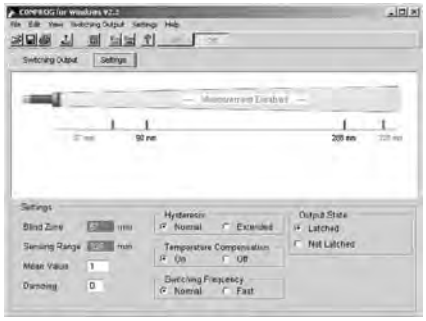
suitable for teach-in of 1180/1181C and 1180/1181W devices.

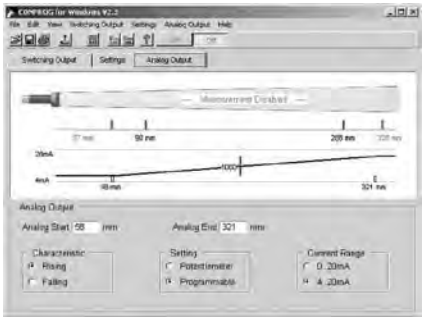
Part reference: **APE-0000-003**

CONPROG PC software

for Windows.

Included with APE-0000-001 interface device.

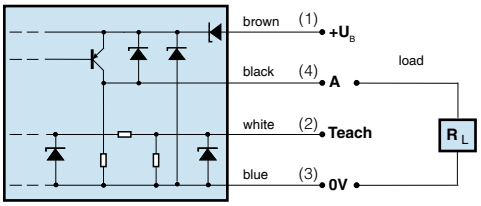




Wiring diagrams

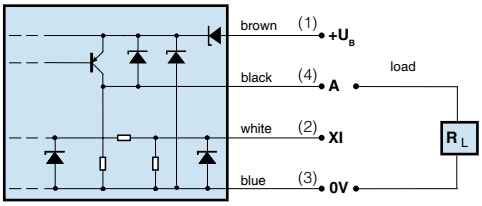
PNP N.O. output with teach-in

Diagram 1



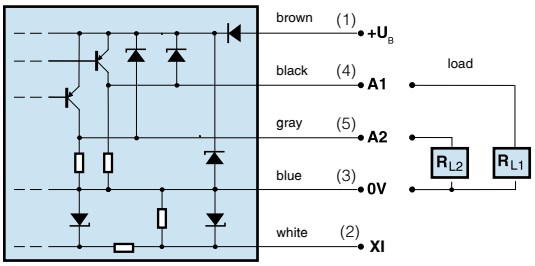
PNP N.O. output / Analog output (current)

Diagram 2



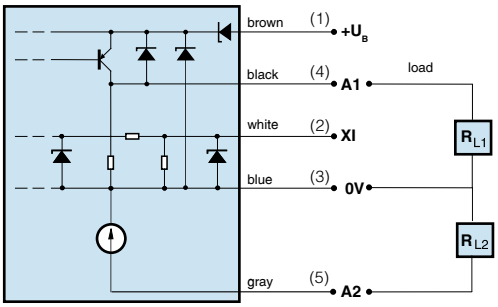
PNP 2 N.O. outputs

Diagram 3



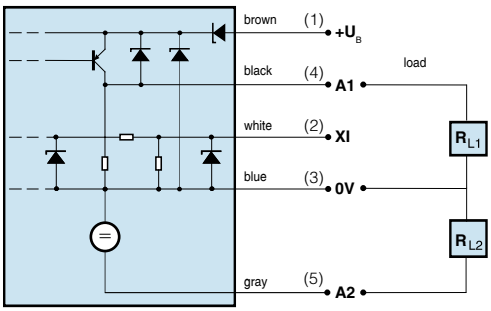
PNP N.O. + analog outputs (current)

Diagram 4



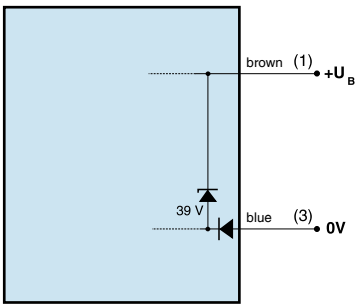
PNP N.O. + analog outputs (voltage)

Diagram 5



Emitter of through-beam sensor

Diagram 6



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5 Connecting cables

Part reference [1]	Size	Number of poles	For N.O. / N.C.	Type / Cable	Output	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 14 / 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 14 / 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 14 / 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 14 / 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

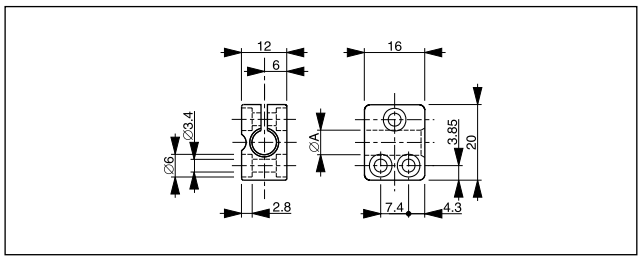
Specifications

	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 0.10 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
Type 13	0.34 mm²	180 x 0.05 mm Ø	TPE-S	TPE-S
Type 14	0.25 mm²	32 x 0.10 mm Ø	PUR	PVC

6 Accessories

Sensor mounting clamps

Ø3, Ø4, Ø5, Ø6.5, Ø8

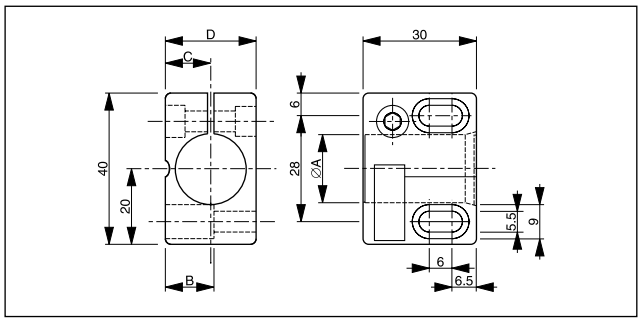


Technical data

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

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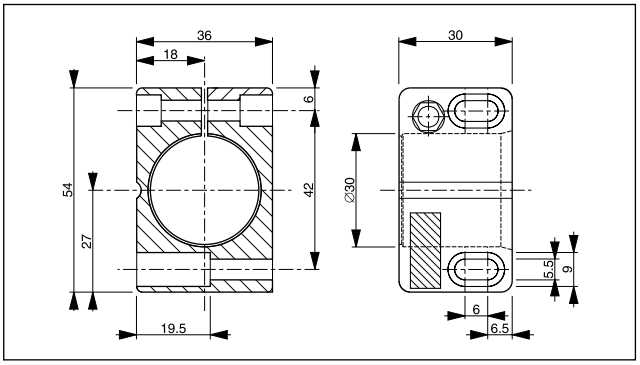
Ø30

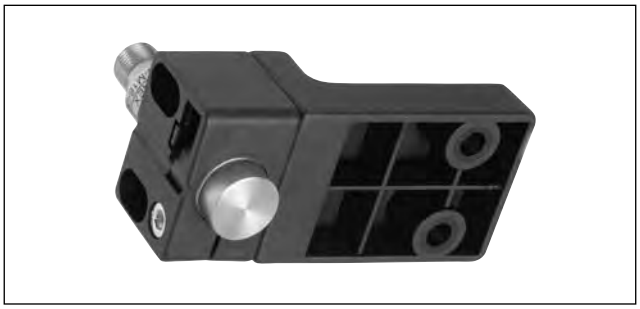


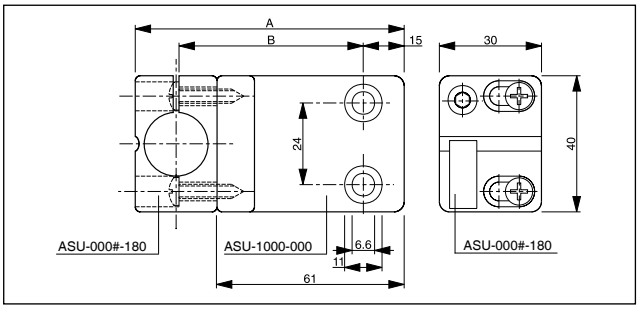
Technical data

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 mounting clamps 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
Screws: DIN 7981, Ø 4.2 zinc-plated

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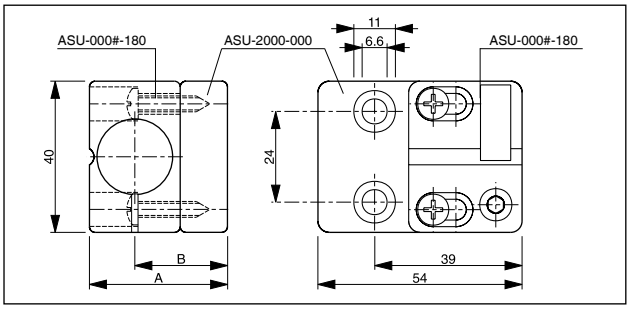


Technical data

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
Screws: DIN 7981, Ø 4.2 zinc-plated

Sensor tester

ATE-0000-002

For fast field checks of various sensor types (inductive, capacitive, photoelectric and ultrasonic) 10 ... 30 V.

- Suitable for PNP and NPN devices, N.O. and N.C. versions
- Automatic PNP/NPN recognition
- LED and acoustic indicators
- Built-in steel target (non-standardized) for checking inductive sensors
- Power supply from a single 9 V battery (type IEC 6LR61)
- LED battery-state indication
- Built-in step-up voltage converter
- Automatic switch off after approx. 30 sec. of non-use

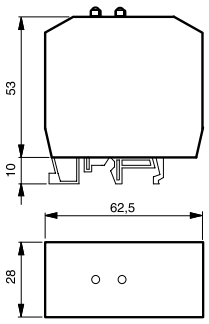
Chargers and rechargeable battery for sensor tester

ATE-0000-012 EU
ATE-0000-022 US + JP
ATE-0000-032 UK

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):

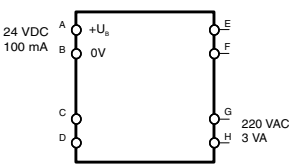


Power supply unit

DW-AZ-100-24

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

Wiring diagram:



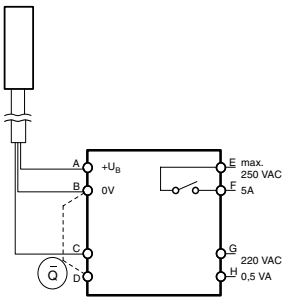
Amplifiers for 3-wire proximity switches

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:

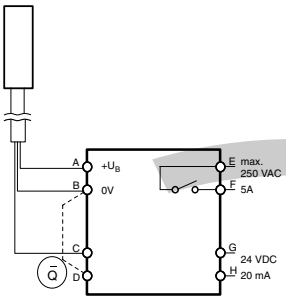


DW-AZ-100-D3

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

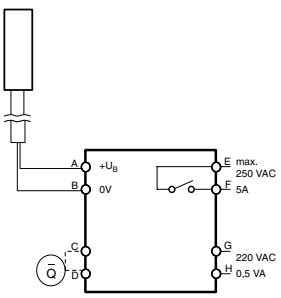
DW-AZ-100-AN

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:



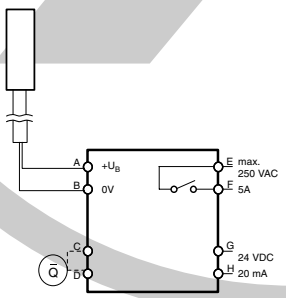
DW-AZ-100-DN

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:



7 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, 1180W, 3030, 3031, 3060, 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. For most models, 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.

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Inductive proximity switches

Photoelectric proximity switches

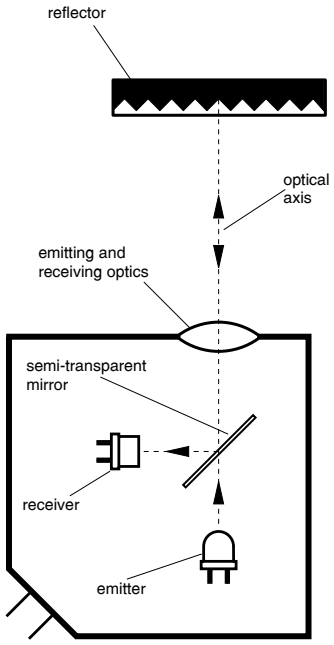

Fig. 16

B

BACKGROUND SUPPRESSION

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

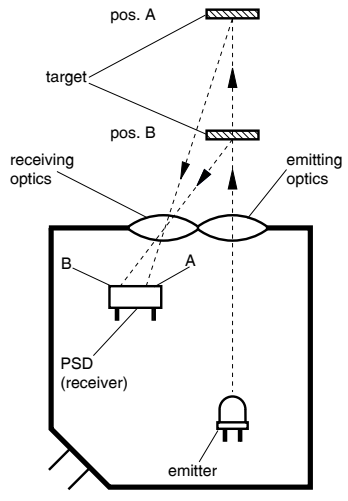

Fig. 17

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).

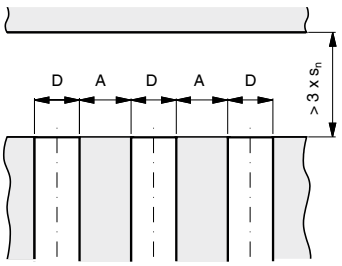

Fig. 18

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CONTRINEX

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 / *12	16
M18	14 / *22	32
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 4	6 (embeddable)	---
M5	5 (embeddable)	---
Ø 6.5	9.5	---
M8	8/*16	20
C8	8	---
M12	18/*34	30
M18	26	60
M30	50	120

Series 700

Size **D**	embeddable **A** (mm)	non-emb. **A** (mm)
M8	12	52
M12	28	68
M18	34	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 1040/50...505	15
Series 1040/50...506	30
Series 1120	150
Series 1180/1180W	500
Series 3030	500
Series 3031	250
Series 4040	750
Series 6080	500

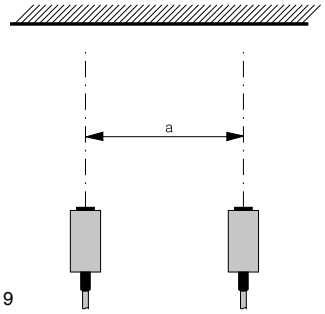

Fig. 19

Diffuse sensors with background suppression

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

Reflex sensors (Fig. 20)

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

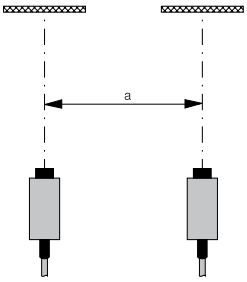

Fig. 20

Through-beam sensors (Fig. 21)

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

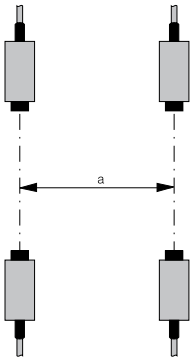

Fig. 21

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).

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Inductive proximity switches

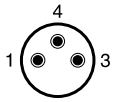
Photoelectric proximity switches

CONDIST® TECHNOLOGY

Developed and patented by CONTRINEX, this technology makes use of a 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

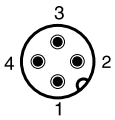
Namur

L+	pin 1	brown
L-	pin 4	blue

Analog output

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

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 DC

N.O. function

L-	pin 3	brown
L+	pin 4	blue

2-wire DC

N.C. function

L-	pin 1	brown
L+	pin 2	blue

Analog output

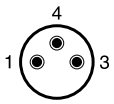
$+U_B$	pin 1	brown
0V	pin 3	blue
voltage output	pin 4	black
current output	pin 2	white

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

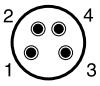
$+U_B$	pin 1	brown
0V	pin 3	blue
output	pin 4	black



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

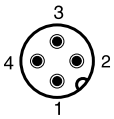
Pin assignment size S12 3 pole:

N.O. function

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

N.C. function

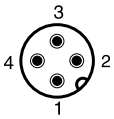
$+U_B$	pin 1	brown
0V	pin 3	blue
output	pin 2	white



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



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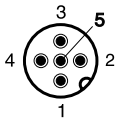
Inductive proximity switches Photoelectric proximity switches

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

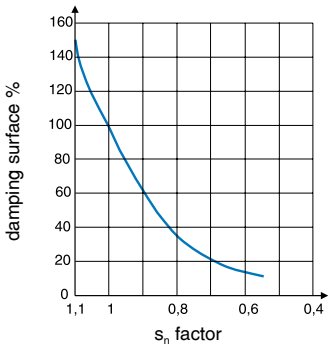
The specified operating distance **s** of inductive proximity switches refers to exactly defined measuring conditions (see **OPERATING DISTANCE**). Other arrangements generally result in a reduction of the operating distance. The following data are to be considered as **guidelines** only; according to 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:



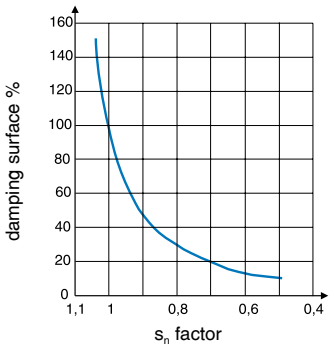
When using foils, an increase in the usable operating distance can be expected.

Series 500 / 520*

Material influence:

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

Geometrical influence:



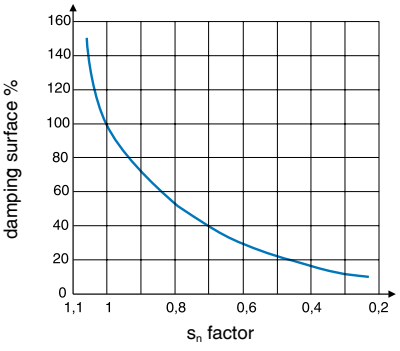
When using foils, an increase in the usable operating distance can be expected.

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
Stainless steel (1 mm thick)	s_n x 0.5
Stainless steel (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 matt 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, matt	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.

9K Protection against water, which directed against the housing from any direction and under considerably increased pressure, must have no harmful effect.

Test conditions: sensor mounted on table turning at 5 ± 1 rpm; spraying with flat nozzle; delivery rate 14 - 16 l/min; distance 100 - 150 mm; angles 0°, 30°, 60° and 90°; temperature 80 ± 5 °C; pressure 8,000 - 10,000 kPa (80 - 100 bar); duration 30 sec per position.

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 60947-5-2	5 kV

Series 600 / 620

– IEC 61000-4-2	level 3
– IEC 61000-4-3	level 3
– IEC 61000-4-4	level 3
– IEC 60947-5-2	1 kV / 5 kV (M12 - C80)

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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.

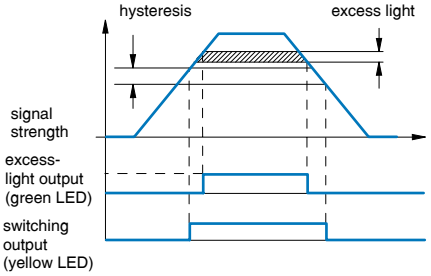

Fig. 22

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.

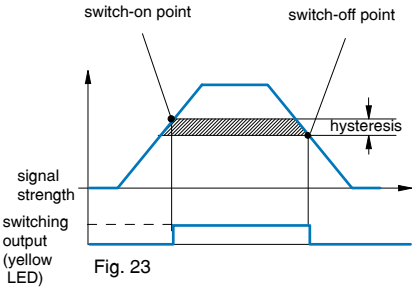

Fig. 23

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.

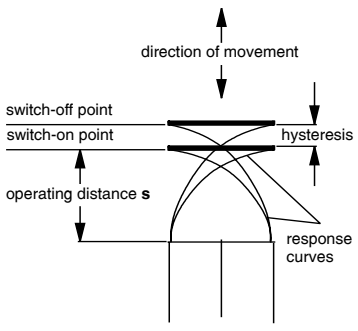

Fig. 24

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 the 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 >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 / IP 69K

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.

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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 146) 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 ohm; at 15 V, it is 75 ohm.

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 of inductive proximity switches, 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 can-

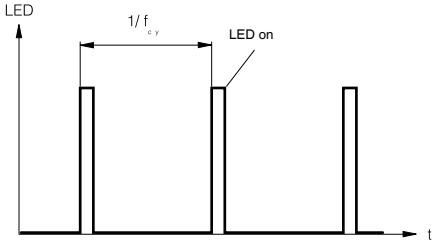

Fig. 25

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Inductive proximity switches Photoelectric proximity switches

not be solved by suitable alignment of the units or by shielding, switches with different modulation frequencies can be supplied as an option.

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.

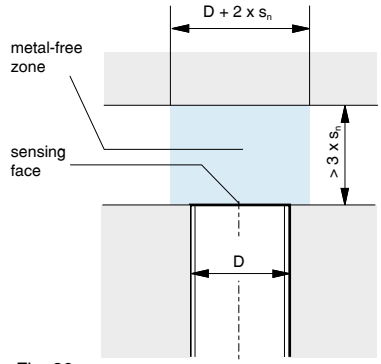

Fig. 26

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.

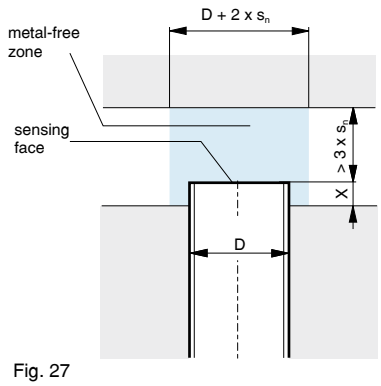

Fig. 27

Mounting in steel and in non-ferrous metals:

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

Mounting in stainless steel:

Housing 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.

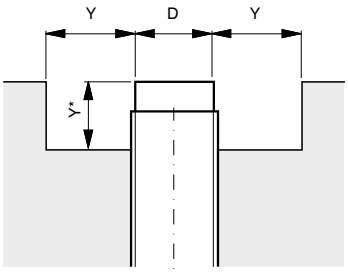

Fig. 28

Housing 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.

NON-EMBEDDABLE MOUNTING

See **MOUNTING**.

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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).

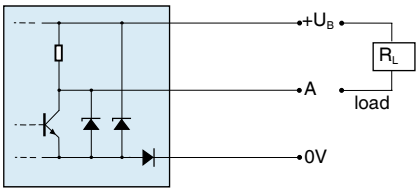

Fig. 29

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.

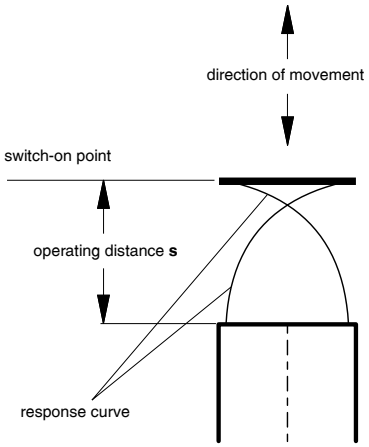

Fig. 30

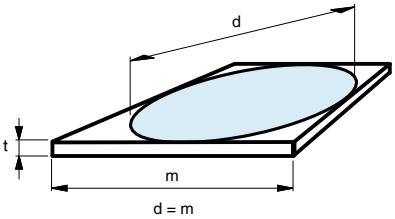

Fig. 31

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.

$$0.9\ s_n \leq s_r \leq 1.1\ s_n$$

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

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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.

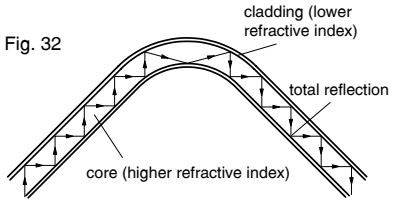

Fig. 32

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 60947-5-2.

P

PARALLEL CONNECTION

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

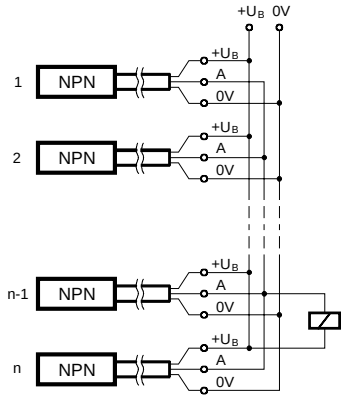

Fig. 33

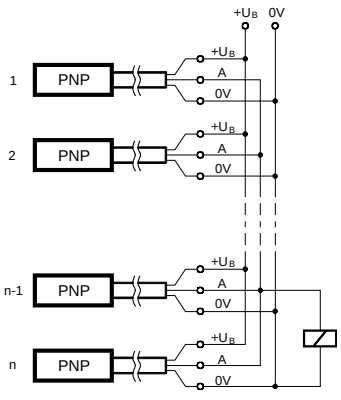

Fig. 34

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.

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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 0V (Fig. 35).

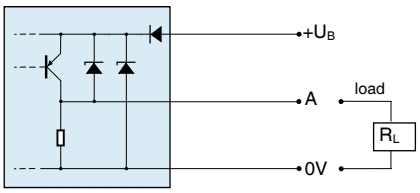

Fig. 35

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 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 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.

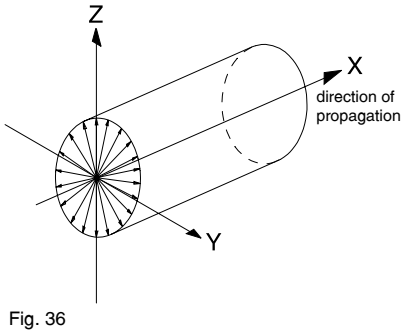

Fig. 36

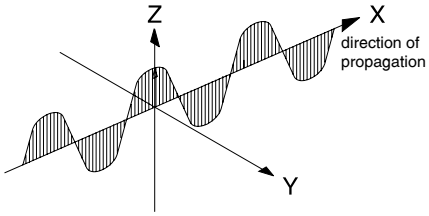

Fig. 37

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.

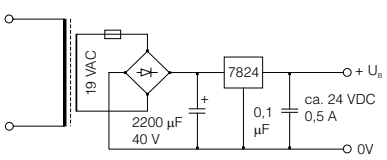

Fig. 38

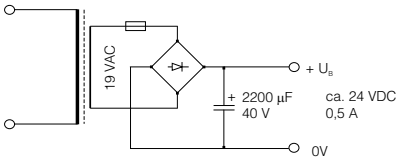

Fig. 39

The CONTRINEX accessory program also includes a suitable power supply unit (page 150).

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°).

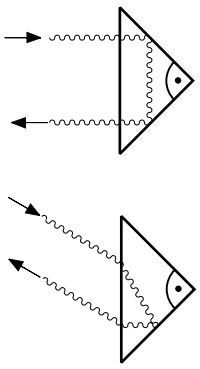

Fig. 40

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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):

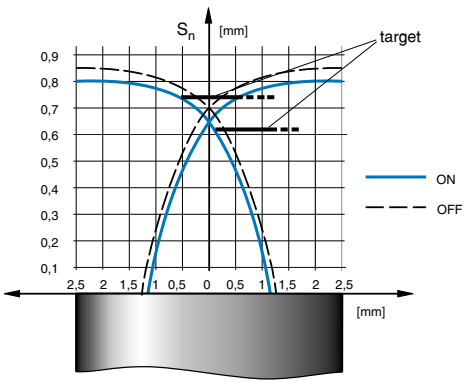

Fig. 41 DW-AD-403-M5

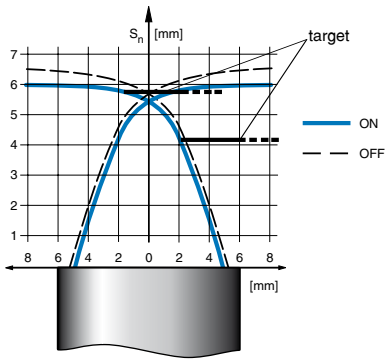

Fig. 42 DW-AD-503-M12

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.

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

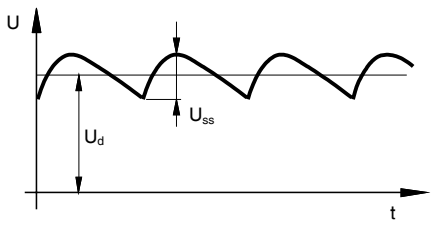

Fig. 43

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 LT#-1040/1050-30#-50# switches (see pages 88 and 89). For the

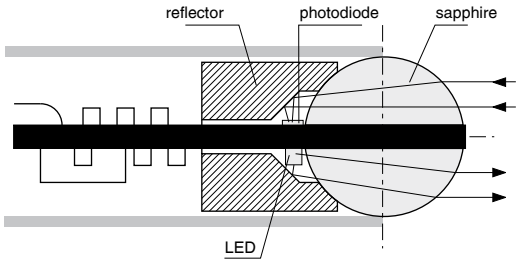

Fig. 44

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 60947-5-2
- 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 60947-5-2. 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).

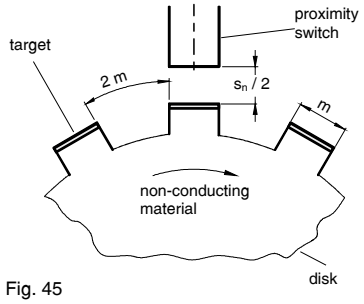

Fig. 45

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 triggered, 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

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the microcontroller in a non-volatile 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 triggered 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.

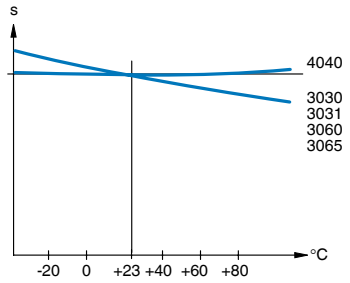

Fig. 46

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.

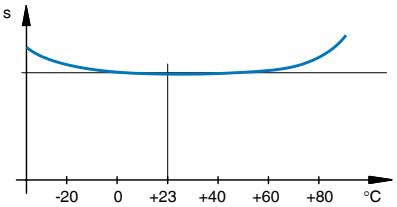

Fig. 47

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**

Housing size **D**	**M** (Nm)
M4	0.8
M5	1.5
C5	0.2
M8	10 / *4
C8	1
M12	10
M18	25 / **20
M30	70 / **40

Series 700

Housing size **D**	**M** (Nm)
M8	6
M12	20
M18	50
M30	150

Series 1040/50, 1120, 1180, 1180W

Housing size **D**	**M** (Nm)
M5	1.5
M12	10
M18 / M18W	20

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.

Inductive proximity switches

Photoelectric proximity switches

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.

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Inductive proximity switches

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

Inductive device	DW

Device type

Conventional	A
2-wire DC (NAMUR excepted)	D
High-temperature	H
Food and sea-water	L

Connection

Cable	D
Connector	S
Cable with moulded connector	V

Series

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

Embeddable/quasi-embeddable	0
Non-embeddable	1
Increased operating distance, (quasi-)embeddable	2
Increased operating distance, non-embeddable	3

Output

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

Short / special executions

Housing size

Threaded

4	M4
5	M5
8	M8
12	M12
18	M18
30	M30
50	M50

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

Output

2-wire DC

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

*2-wire UC**

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

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

Inductive proximity switches

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Inductive proximity switches

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Inductive proximity switches

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Inductive proximity switches

Inductive proximity switches

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Photoelectric proximity switches

LTS-1180-303 (-XXX)

Photoelectric device	**L**

Device type

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

Device with cable	**K**
Device with connector	**S**
Device with screw terminal	**T**
Device with moulded connector	**V**
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**
M12 laser	**112#L**
M18	**1180**
M18 laser	**118#L**
M18 lateral light emission	**1180W**
Cuboid devices	
30x30 mm (high-perform.)	**3030**
30x30 mm (standard)	**3031**
31x60 mm (standard)	**3#60**
31x60 mm (teach-in)	**3#65**
31x60 mm (high switch. frequ.)	**326#**
31x60 mm (blue light)	**336#**
40x40 mm	**4040**
65x83 mm	**6080**
Synthetic optical fibers	
Diffuse sensor	**1###**
Through-beam sensor	**2###**
Miniature / standard / coaxial	**#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 3060 / 3065 series	**3060**
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 sensor (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 25.2 mm
046 reflector Ø 46 mm
084 reflector Ø 82 mm

Photoelectric proximity switches

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Photoelectric proximity switches

Optical fibers

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CONTRINEX

Ultrasonic proximity switches

UTS-1180C-303 (-XXX)

Ultrasonic device	**U**

Device type

Reflex sensor	**R**
Diffuse sensor / diffuse and reflex sensor	**T**
Through-beam sensor	**L**

Connection

Connector	**S**
Cable	**K**

Housing type

Cylindrical device	**1**
Cuboid device	**4**

Housing size

Cylindrical devices	
M18	**18**
M30	**30**
Cuboid devices	
40 x 40 mm	**04**

Special executions

Polarity

3	PNP N.O. (+ analog)
7	2 switching outputs
9	analog output

Output

0	switching output
1	analog (voltage)
2	analog (current)

0	through-beam sensor
1	5-wire (2 outputs), diffuse/ reflex sensor
3	4-wire (1 output), diffuse/ reflex sensor

Housing

C	short
W	for lateral sensing

Operating distance

0	shortest operating distance
1	increased operating distance
2	long operating distance
3	very long operating distance

Connecting cables

S08-3FVW-020 (-XXX)

Connecting cable	**S**

Connector size

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

Number of poles

3-pole	**3**
4-pole	**4**
5-pole	**5**

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