

General Catalog



NEW

INDUCTIVE SENSORS

- Full Inox Basic with IO-Link
- Full Inox Weld-Immune, M8
- Full Inox C23, cubic with IO-Link
- High Temperature, 230°C (440°F)

PHOTOELECTRIC SENSORS

- Contrast sensor with IO-Link
- C12: Cubic Subminiature
- C23: Cubic with IO-Link
- C23 Distance: Triangulation
- C55 Distance: TOF

SAFETY

- Type 2 light curtains for hand protection

RFID

- LF + HF R/W modules in ContriNet
- HF tags for 180°C (356°F), embeddable in metal
- HF tags for 250°C (482°F)
- EtherCat interface



A
Swiss
Company

INTRODUCTION

CONTRINEX

Contrinex is a leading manufacturer of sensors for factory automation. The Swiss company, headquartered in Givisiez near Fribourg (CH), has a unique and innovative range of products whose features far surpass those of standard sensors.

Since its foundation in 1972 by Peter Heimlicher, Dipl Ing ETH, Contrinex has grown from a one-man operation to a multinational group with over 500 employees worldwide. More than 15 subsidiaries cover the core markets in Europe, Asia, North and South America.

At a glance

- Technology leading manufacturer of inductive and photoelectric sensors as well as safety and RFID systems
- World market leader for miniature sensors, sensors with long operating distances and devices for particularly demanding operating conditions (all-metal, high-pressure and high-temperature resistant sensors)
- Represented in over 60 countries worldwide, headquarters in Switzerland
- 8000 products

Technology leader for sensor intelligence and industrial RFID

CONTRINEX - SENSE MORE, DO MORE



INTELLIGENT SENSORS FOR THE 4TH INDUSTRIAL REVOLUTION: INDUSTRY 4.0

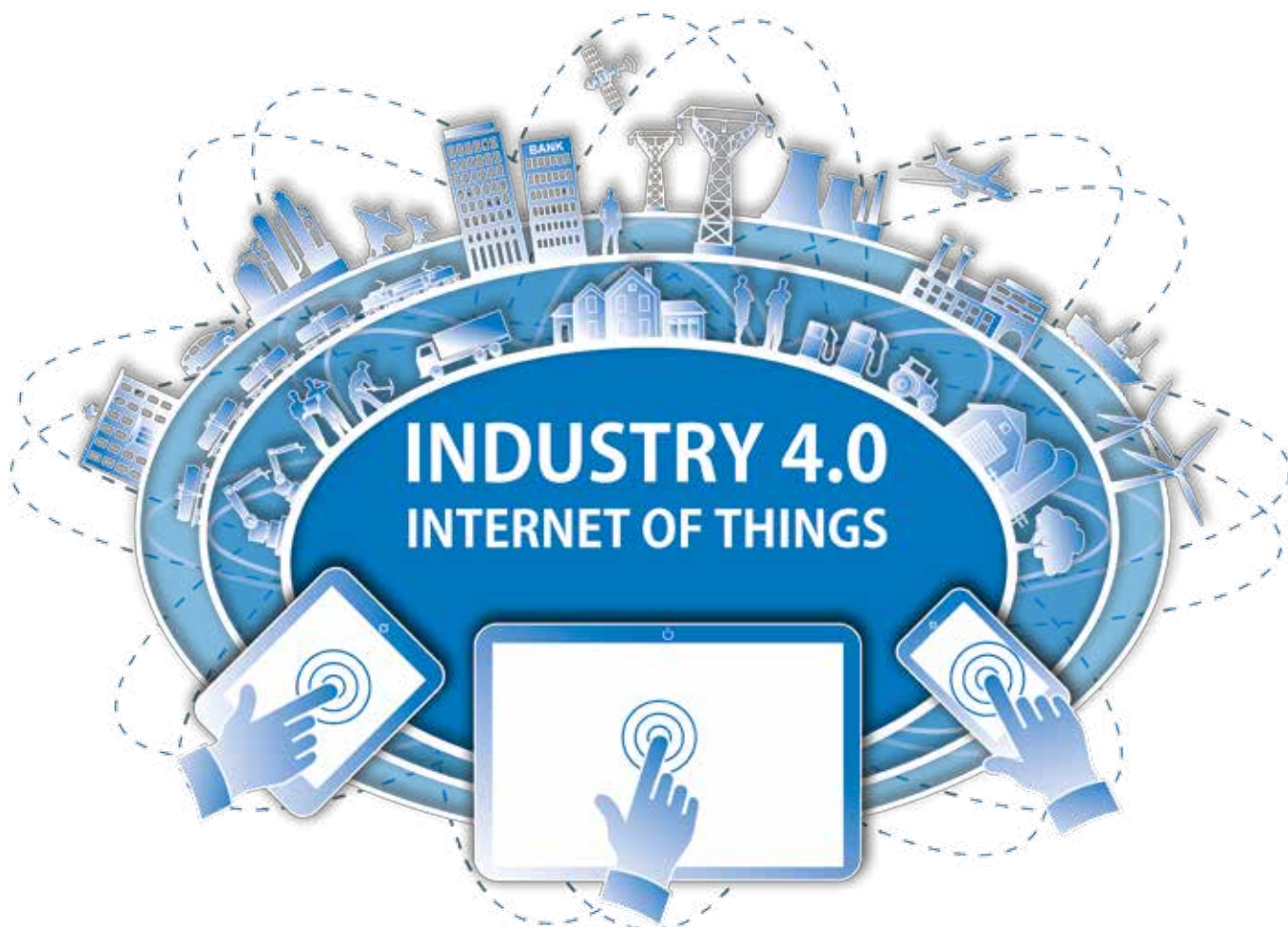
Fit for the future with IO-Link

Intelligent sensors are the fundamental building blocks of modern smart factories. They enable sensor-supported production resources (machines, robots, etc.) to configure, control, manage and optimize themselves. Precise, reliable sensor data is now more essential than ever.

Sensors from Contrinex, the leader in intelligent sensor technology, ensure excellent data quality. To communicate that data, all Contrinex inductive and photoelectric ASIC sensors will be equipped with IO-Link as standard. Customers use either the sensor's binary PNP output or its intelligent IO-Link interface. Both are available in one and the same device.

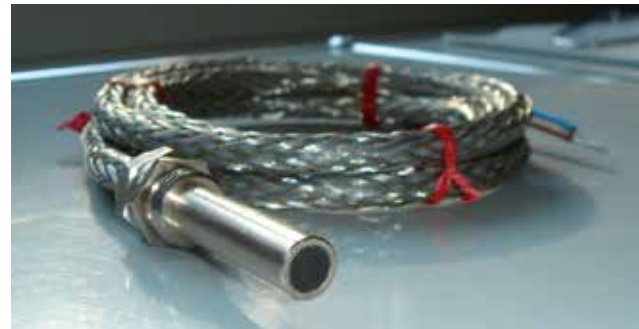
Another advantage is the fact that, with Contrinex sensors, there is no extra charge for IO-Link. This makes them not only quick and simple to install, but also highly economic.

As the first standardized IO technology worldwide (IEC 61131-9) for communication with sensors and actuators, IO-Link is crucial to the 4th Industrial Revolution. By installing Contrinex ASIC sensors with IO-Link, users can make themselves fit for the future.



MARKET-LEADING INNOVATION

- 1979** Sensor business starts with self-contained subminiature inductive sensors: Ø4 mm (instead of M8 before)
- 1982** Launch of inductive sensor with patented Condist® technology – market leadership with operating distances 3x standard
- 1986** Launch of Ø3 mm inductive sensors, now market leader for subminiature inductive sensors
- 1996** Market launch of Ø4 mm subminiature photoelectric sensors
- 1999** Launch of world's first inductive sensor with full-metal housing – thanks to patented Condet® technology
- 2005** Integration of Contrinex's excellent performance for inductive sensors in CMOS-ASIC (Application-Specific Integrated Circuit), a proprietary development
- 2007** Launch of RFID products for closed loop industrial applications. First RFID product range with tags and readers in full-metal housing
- 2008** Launch of Safetinex®, the industrial safety product range
- 2009** The smart sensor is born. Launch of next generation ASIC, a "system on a chip", including IO-Link interface
- 2011** Development starts on Contrinex's first ASIC for photoelectric sensors
- 2014** Launch of photoelectric sensor with new generation Contrinex ASIC and IO-Link



Early inductive sensor produced for own use in 1973 (special version for extreme conditions)



ASIC sensor technology



Safety product range



Subminiature photoelectric sensor



SENSORS

INDUCTIVE

- BASIC
- MINIATURE
- EXTREME
- EXTRA PRESSURE
- HIGH PRESSURE
- EXTRA TEMPERATURE
- HIGH TEMPERATURE
- WASHDOWN
- ANALOG OUTPUT
- 2-WIRE
- WELD-IMMUNE
- SPECIAL

PHOTOELECTRIC

- CYLINDRICAL SUBMINIATURE
- CYLINDRICAL MINIATURE
- CYLINDRICAL SMALL
- CUBIC SUBMINIATURE
- CUBIC MINIATURE
- CUBIC SMALL
- CUBIC COMPACT
- FIBER-OPTIC AMPLIFIERS, FIBERS

ULTRASONIC

- MINIATURE
- SMALL
- COMPACT

CAPACITIVE

- BASIC
- HIGH PERFORMANCE

SAFETY

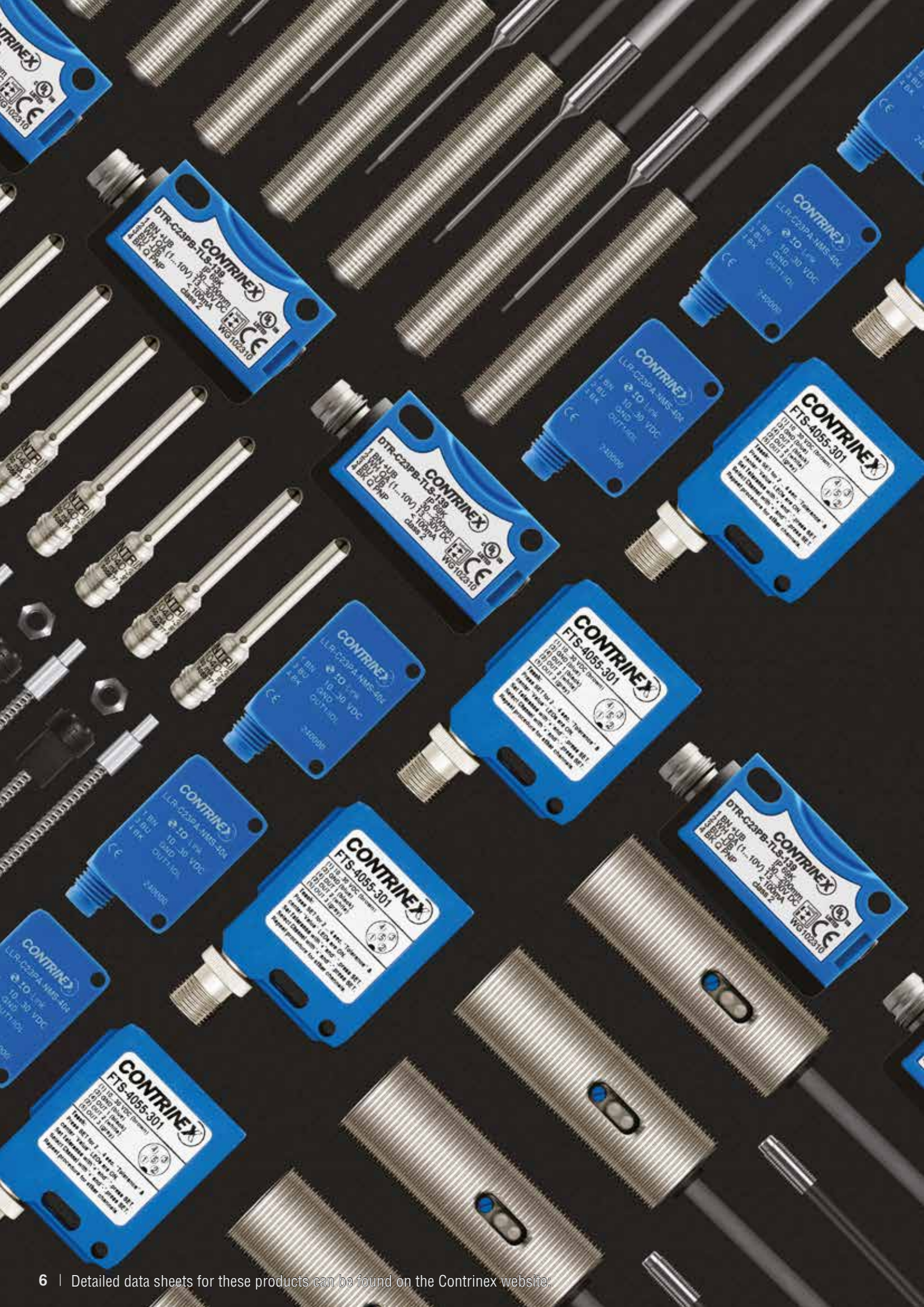
LIGHT CURTAINS

- FINGER PROTECTION type 4
- HAND PROTECTION type 4 and type 2
- SAFETY RELAYS
- ACCESS CONTROL type 4

RFID

LOW AND HIGH FREQUENCY

- TRANSPONDERS
- CONTRINET
- USB READ/WRITE MODULES
- HANDHELD DEVICES
- ACCESSORIES
- SOFTWARE
- STARTER KITS





INDUCTIVE SENSORS

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**PHOTOELECTRIC SENSORS /
OPTICAL FIBERS**

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CAPACITIVE SENSORS

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SAFETY

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SENSOR SELECTOR

	INDUCTIVE	PHOTOELECTRIC
		
SENSING DISTANCE	1 mm - 40 mm	1 mm - 50,000 mm
TARGET MATERIAL	Metal only	Any material that reflects light
SENSING SPEED	0.02 - 10 kHz	1 - 5 kHz
ENVIRONMENT	Versions for normal or harsh and dirty environments, with protection class up to IP 68 / IP 69K	For clean environments without dust or steam, with protection class up to IP 67
PROGRAM OVERVIEW	P. 16 - 19	P. 168 - 171
TASKS	<ul style="list-style-type: none"> ✓ Presence detection of metal objects ✓ Position control of all kinds of metal targets ✓ Counting tasks ✓ Distance control on end positions ✓ Quality control 	<ul style="list-style-type: none"> ✓ Sensing of light reflective objects ✓ Position control of cartons and other objects on conveyors ✓ Detection of small objects over large distances

ULTRASONIC



10 mm - 6000 mm

Any material that reflects sounds

1 - 10 Hz

For industrial environments, with protection class up to IP 67

P. 286 - 287

- ✓ Detection of all objects that reflect ultrasound
- ✓ Monitoring of winding and un-winding processes
- ✓ Liquid level control
- ✓ Loop tension control
- ✓ Position feedback
- ✓ Distance or height control

CAPACITIVE



1 mm - 40 mm

Metals, non-metals, liquids, powders

15 - 500 Hz

For normal or demanding environments, with protection class up to IP 67

P. 312 - 313

- ✓ Level control of fluids, bulk materials and powder
- ✓ Presence detection of almost all materials
- ✓ Counting tasks for non-metallic materials
- ✓ Detection through non-metallic container walls

APPLICATIONS

AUTOMOTIVE MANUFACTURING INDUSTRY

Today, sensors of all types are common in automotive factories around the globe. Highly automated plants with demanding conformity requirements rely heavily on sensor technology to maintain world-class quality standards, particularly where harsh processes such as welding, metal finishing and high-temperature coating are required.

Manufacturing engineers working for automotive manufacturers and for first- and second-tier suppliers expect robust, reliable sensors that deliver accurate, repeatable results with minimal downtime.

Recommended product ranges:

- Inductive - Full Inox - Extreme
- Inductive - Classics - Basic
- Inductive - Full Inox - Weld-Immune
- Inductive - Extra Distance - Basic



PACKAGING MACHINES

On the journey from manufacturer to consumer, packaging protects all types of product, including foods, pharmaceuticals, white goods and cosmetics. Although packaging helps bring competitive products to target markets in the best possible condition, costs are often significant, and automation helps minimize the impact.

The packaging industry is highly innovative, using sensors to identify, select and position packaging of all types. Reducing manufacturing costs and ensuring environmental sustainability are key objectives, and sensors for packaging machines are chosen to maximize efficiency while ensuring reliable, repeatable operation.

Recommended product ranges:

- Photoelectric - Cubic Small
- Photoelectric - Cylindrical Small
- Photoelectric - Cubic Miniature



MACHINE TOOLS

Machine tools impose harsh operating conditions on the sensors needed to control cutting, forming and joining processes that run continuously in many metalworking factories. Common hazards include cutting fluid, cooling sprays, swarf particles and electromagnetic interference, making sensor selection particularly difficult where world-class performance is essential.

Size is another key factor, as modern tool-holders allow only limited space for the sensors needed to identify and position individual tools during rapid tool-changing. The right sensors contribute to efficient production, without interruption or error.

Recommended product ranges:

Inductive - Classics - Miniature
Photoelectric - Cylindrical Subminiature
Inductive - Extra Distance - Basic



LOGISTICS

Whatever the logistics system, choosing the right sensors is crucial to achieving the six “rights” of logistics: ensuring that the right goods, in the right quantities, in the right condition, are delivered to the right place, at the right time, for the right cost.

From large-scale containerized shipping to everyday internal logistics, engineers select the right sensor technology for each container, conveyor, palletizer or robot, ensuring reliable, repeatable detection and identification, together with trouble-free operation.

Recommended product ranges:

Inductive - Extra Distance - Basic
Photoelectric - Cubic Small
Inductive - Classics - Basic
Photoelectric - Cylindrical Small



APPLICATIONS

TEXTILE

Machinery manufacturers supplying the textile, leather and clothing industries rely on sensors for efficiency, reliability and precision. World-class accuracy is essential for production of technical textiles and for making the carbon or chemical fibers used in modern, innovative products, often in highly automated factories.

The high-speed machinery used by textile manufacturers must operate continuously and safely, relying on top-quality sensors for all aspects of access and control. The environmental challenges include industrial cleaning routines that test every sensor to the limit of its capability.

Recommended product ranges:

- Inductive - Classics - Basic
- Inductive - Extra Distance - Basic
- Photoelectric - Cylindrical Small



FILLING MACHINES

Filling machines are widespread in many industries, including solids handling, chemical, food, beverage and pharmaceutical, often operating continuously around the clock. Industrial sensors detect containers, lids, labels and caps, measure fill levels and more, and play a vital role in keeping automated filling equipment running reliably, accurately and with minimal downtime.

When handling bulk solids or aggressive chemicals, or working in environments that may operate harsh clean-in-place routines, choosing robust, high-quality sensors is essential to maximize operational efficiency and minimize total cost of ownership.

Recommended product ranges:

- Photoelectric - Cubic Small
- Capacitive - Cylindrical - Basic
- Photoelectric - Cylindrical Small



GREEN ENERGY AND ENVIRONMENT

The Green Economy relies heavily on technology for its continued advancement, and sensors are a major component of any eco-friendly strategy. Environmental initiatives include wind-, wave- and solar-power generation, industrial and domestic recycling, energy management and development of alternative fuels.

To deliver the green agenda, all of these sectors utilize sensors extensively for reliable detection and identification of materials, accurate measurement of operational parameters and consistent control of processes.

Recommended product ranges:

Inductive - Full Inox - Washdown
Inductive - Classics - Basic
Inductive - Extra Distance - Basic



MOBILE EQUIPMENT

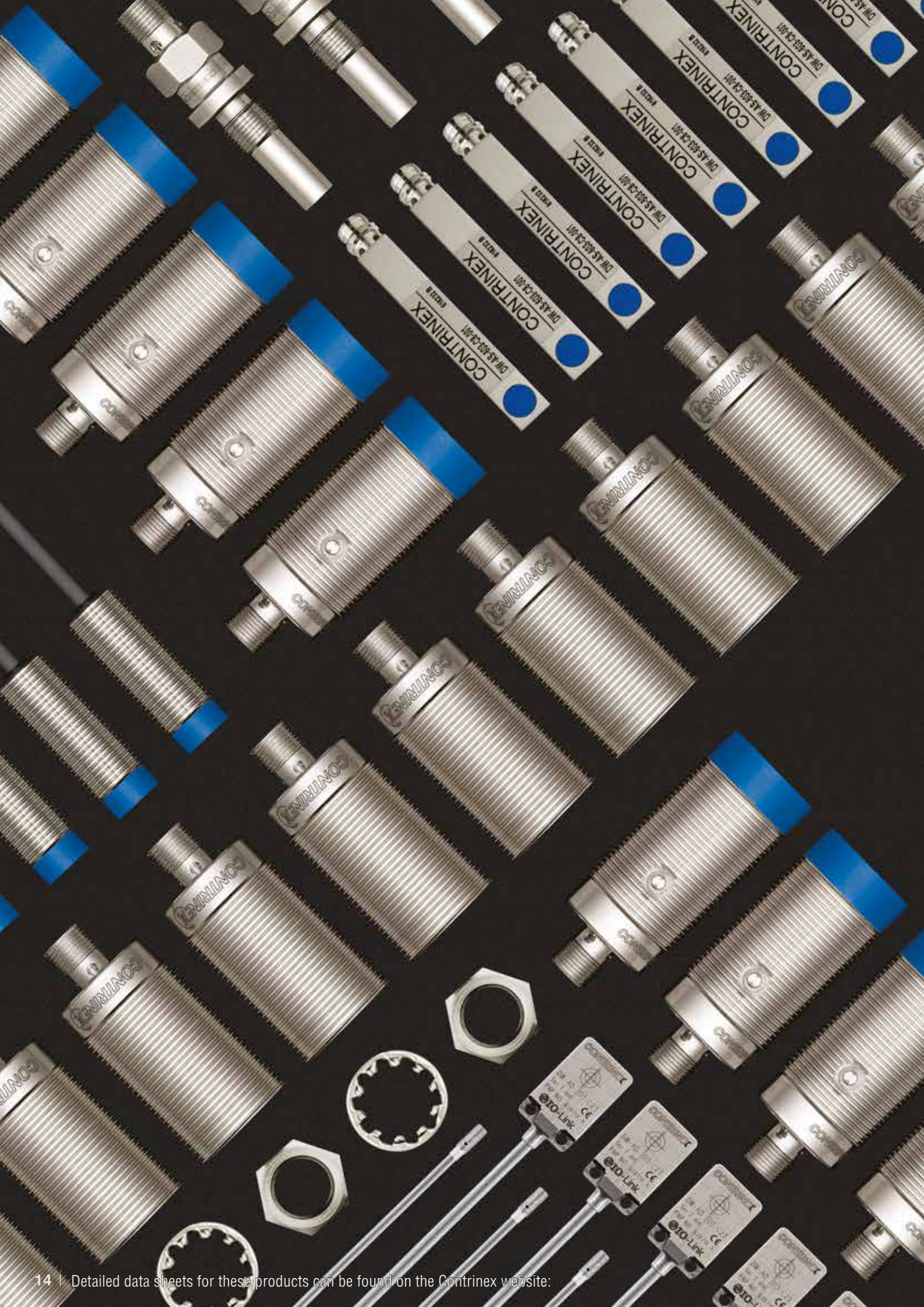
Repairing and servicing equipment on site can be difficult and costly at best, and sometimes impossible. In these circumstances, robust, highly reliable sensors are vital for continuous operation in environments that may be challenging in the extreme. Exposure to dirt and dust, impact, vibration, seawater, corrosive chemicals and extremes of temperature and pressure are all part of a regular day's work.

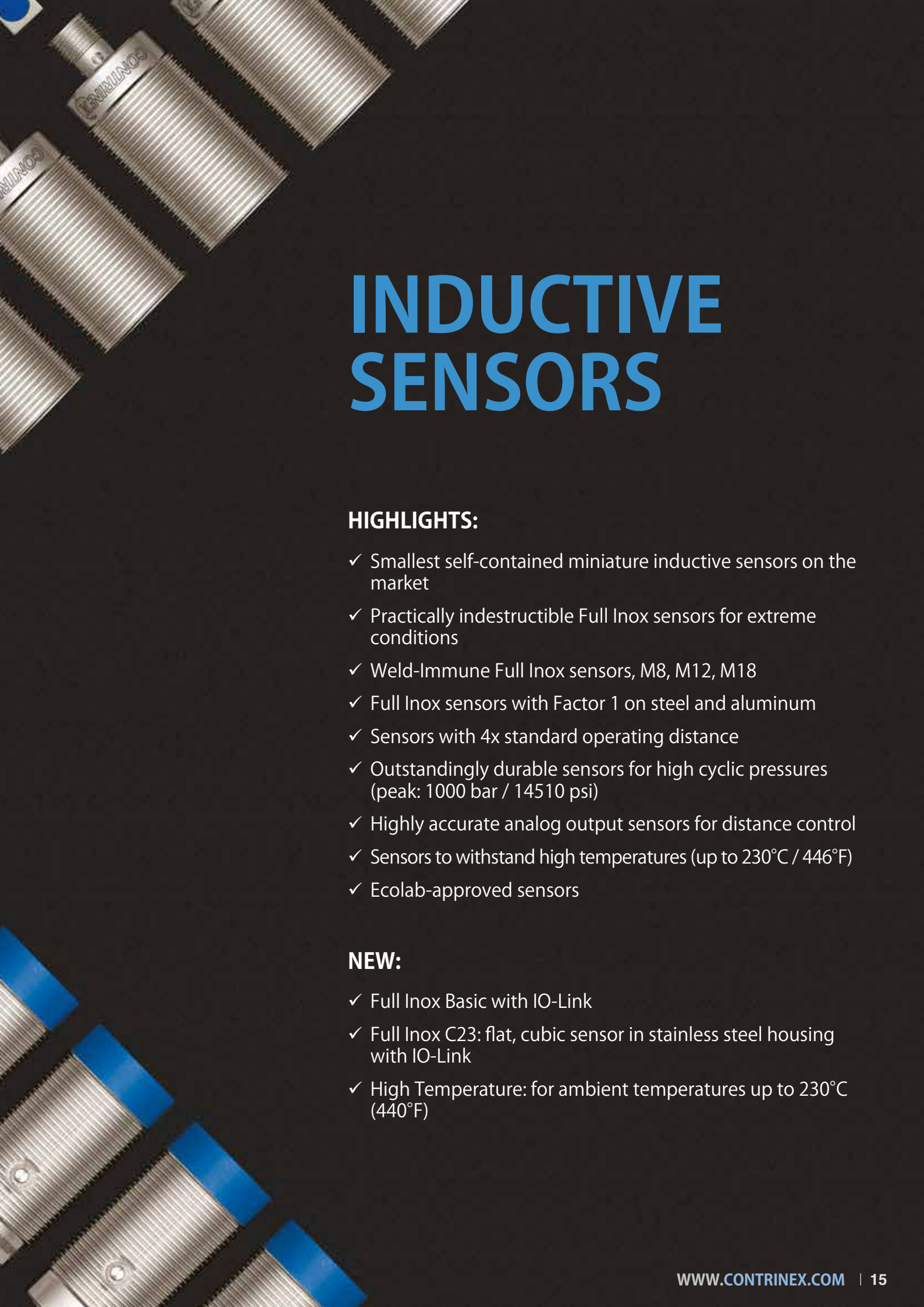
Manufacturers of mobile and portable equipment, including forklifts, agricultural machines, construction plant, aircraft, vehicles and ships, expect exceptional reliability and life-expectancy when selecting fit-and-forget sensors for these demanding applications.

Recommended product ranges:

Inductive - Extra Distance - High pressure
Inductive - Full Inox - Extreme
Inductive - Extra Distance - Basic







INDUCTIVE SENSORS

HIGHLIGHTS:

- ✓ Smallest self-contained miniature inductive sensors on the market
- ✓ Practically indestructible Full Inox sensors for extreme conditions
- ✓ Weld-Immune Full Inox sensors, M8, M12, M18
- ✓ Full Inox sensors with Factor 1 on steel and aluminum
- ✓ Sensors with 4x standard operating distance
- ✓ Outstandingly durable sensors for high cyclic pressures (peak: 1000 bar / 14510 psi)
- ✓ Highly accurate analog output sensors for distance control
- ✓ Sensors to withstand high temperatures (up to 230°C / 446°F)
- ✓ Ecolab-approved sensors

NEW:

- ✓ Full Inox Basic with IO-Link
- ✓ Full Inox C23: flat, cubic sensor in stainless steel housing with IO-Link
- ✓ High Temperature: for ambient temperatures up to 230°C (440°F)

PROGRAM OVERVIEW

FAMILY	HOUSING SIZE	OPERATING DISTANCE	BASIC	MINIATURE	EXTREME	EXTRA PRESSURE up to 100 bar	
 CLASSICS Series 600 1 x S _n / 2 x S _n	∅ 3	0.6 ... 1 mm		p. 71-72		p. 95	
	M4	0.6 ... 1 mm		p. 72-73			
	∅ 4	0.8 ... 1.5 mm		p. 73-75		see online	
	M5	0.8 ... 1.5 mm		p. 76-77		p. 95	
	C5	0.8 ... 1.5 mm		p. 78-79			
	∅ 6.5	1.5 ... 2 mm	p. 31-35				
	M8	1.5 ... 4 mm	p. 35-41, 43-44				
	C8	1.5 ... 2 mm	p. 45-46				
	M12	2 ... 8 mm	p. 47-51				
	M18	5 ... 8 mm	p. 54-57				
	M30	10 ... 15 mm	p. 59-61				
	M50	25 mm					
	40 x 40	15 ... 40 mm	p. 65-66				
EXTRA DISTANCE Series 500 3 x S _n / 4 x S _n	∅ 4	2.5 mm		p. 75			
	M5 / P5	1 ... 2.5 mm		p. 77			
	∅ 6.5	2.5 ... 3 mm	p. 35			p. 95	
	M8 / P8	1.5 ... 6 mm	p. 42-45			see online	
	C8	2 ... 4 mm	p. 46				
	M12 / P12	1.5 ... 10 mm	p. 50-54				
	M18	12 ... 20 mm	p. 57-59				
	M30	20 ... 40 mm	p. 61-64				
	M14 / P20	3 mm					
FULL INOX Series 700 full-metal housing 	∅ 4	3 mm		p. 75			
	M5	3 mm		p. 78			
	∅ 6,5				coming soon		
	M8	2 ... 6 mm	p. 41		p. 83-84		
	M12 / P12	1.5 ... 15 mm	p. 47-48		p. 84-86		
	M18	5 ... 20 mm	p. 55		p. 86-88		
	M30	3 ... 40 mm	p. 60		p. 88-89		
	C23	7 mm			p. 90		

	HIGH PRESSURE up to 1000 bar peak	EXTRA/HIGH TEMPERATURE -40 to +230°C	WASHDOWN	ANALOG OUTPUT	2-WIRE	WELD-IMMUNE	SPECIAL	
					p. 131			Inductive
					p. 131			Photoelectric
					p. 132			
		p. 107			p. 133			Ultrasonic
					p. 133			
					p. 134, 140			
		p. 107, 111			p.134-135,141-143			Capacitive
		p. 107, 111	p. 117		p.135-136,144-149	see online		
		p. 107, 111			p.136-137,149-153	see online		
		p. 111			p.137-138,154-157	see online		
		p. 112						Safety
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PROGRAM OVERVIEW

MINIATURE + BASIC

HOUSING SIZE	OPERATING DISTANCE													PAGE
	5 mm	10 mm	15 mm	20 mm	25 mm	30 mm	35 mm	40 mm	45 mm	50 mm	55 mm	60 mm	65 mm	
∅ 3 mm / M4	0.6 mm													71 - 72
	1 mm													72 - 73
∅ 4 mm / M5	0.8 mm													73-74, 76
	1.5 mm													74, 77
	2.5 mm													75, 77
	3 mm													75, 78
C5	0.8 mm													78
	1.5 mm													79
∅ 6.5 mm	1.5 mm													31 - 33
	2 mm													33 - 35
	3 mm													35
M8	1.5 mm													35 - 37
	2 mm													38 - 41
	2.5 mm													41
	3 mm													42
	4 mm													43 - 44
C8	1.5 mm													44 - 45
	2 mm													45
	3 mm													45 - 46
M12	2 mm													46
	3 - 4 mm													47
	6 mm													47 - 50
	8 mm													50 - 51
M18	10 mm													51 - 53
	5 mm													53 - 54
	8 mm													54 - 55
	12 mm													55 - 57
M30	20 mm													57 - 58
	10 mm													58 - 59
	15 mm													59 - 60
	22 mm													61
C44	40 mm													61 - 62
	10 mm													63 - 64
	15 mm													65
C44	20 mm													65
	30 mm													65
	40 mm													66

OTHER RANGES

HOUSING SIZE	OPERATING DISTANCE													PAGE
	5 mm	10 mm	15 mm	20 mm	25 mm	30 mm	35 mm	40 mm	45 mm	50 mm	55 mm	60 mm	65 mm	
EXTREME														
M8	3 mm												83	
M8 / M12	6 mm												83 - 85	
M18 / C23	5 ... 7 mm												86 - 87, 90	
M12 / M18	10 mm												85 - 87	
M12	15 mm												86	
M18 / M30	20 mm												88 - 89	
M30	40 mm												89	
EXTRA PRESSURE														
∅ 3 / M5	0.6 ... 0.8 mm												95	
∅ 6.5	2.5 mm												95	
HIGH PRESSURE														
M5 / P5	1 mm												99	
M8 / P8 / M12 / P12	1.5 ... 2.5 mm												99 - 101	
M14 / P20	3.0 mm												101 - 102	
EXTRA/HIGH TEMP.														
M5	0.8 mm												107	
M8	2 ... 4 mm												107, 111	
M12	2 ... 4 mm												107, 111	
M18	5 mm												107, 111	
M30	10 mm												111	
M50	25 mm												112	
WASHDOWN														
M12	2 ... 6 mm												117	
M18	10 mm												117 - 118	
M30	20 mm												118	
ANALOG OUTPUT														
C8 / M8	0 ... 4 mm												123 - 124	
M12	0 ... 6 mm												124 - 125	
M18	0 ... 10 mm												125 - 126	
M18 / M30	0 ... 20 mm												126 - 127	
M30	0 ... 40 mm												127	
2-WIRE														
∅ 3/∅ 4/M4/M5/C5	0.6 ... 0.8 mm												131 - 133	
∅ 6.5	1.5 mm												134, 140	
M8	1.5 ... 2.5 mm												134 - 135, 141 - 143	
M12	2 ... 4 mm												135 - 136, 144 - 149	
M18	5 ... 8 mm												136 - 137, 149 - 153	
M30	10 ... 15 mm												137 - 138, 154 - 157	
WELD-IMMUNE														
M8	3 mm												161	
M12	6 mm												161	
M18	10 mm												161	
SPECIAL														
M30	3 ... 5 mm												165	

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

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INTRODUCTION

TECHNOLOGY

Contrinex inductive devices work according to one of **three different technologies**. All involve the generation of an alternating magnetic field that emerges at the sensing face. The presence of a conductive, generally metallic, object influences this field in a way that can be detected and evaluated by built-in electronics. All Contrinex ASIC sensors are IO-Link enabled in PNP NO versions.

TECHNOLOGY FAMILIES

CLASSICS FAMILY:

Conventional technology, engineered by Contrinex

The **Classics** family uses conventional inductive sensor technology, but with the benefit of a Contrinex ASIC (application specific integrated circuit). ASIC technology ensures reliability, stability and ease of commissioning, due to low variation. Sensors in this family achieve operating distances up to 2 x the industry standard. All ASIC sensors in the **Classics** family are IO-Link enabled in PNP NO versions.

Classics sensors have a conventional oscillator and coil generating a high-frequency magnetic field that emerges at the sensing face. Any metallic object found in this field absorbs some of the energy, which is in turn detected and evaluated by built-in electronics (Fig. 1).

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

The **Classics** technology family (series 600) includes devices from the ranges **Basic, Miniature Extra pressure, Extra temperature, High temperature, Wash-down, Weld-immune** and **2-Wire**.

EXTRA DISTANCE FAMILY:

Increased stability for exceptionally long operating distance

The **Extra Distance** family is based on the patented Condist® oscillator developed by Contrinex. Sensors benefit from **up to 4x the standard** operating distance, keeping them out of harm's way in rugged, industrial environments. Sensor lifetime is therefore increased.

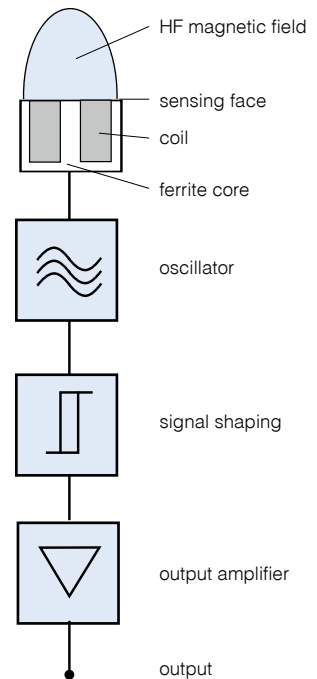


Fig. 1: Conventional inductive sensor technology, as used in the **Classics** family

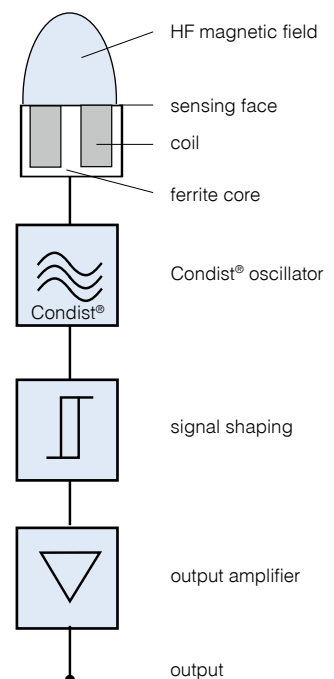


Fig. 2: Contrinex's patented Condist® inductive sensor technology, as used in the **Extra Distance** family

Like **Classics** family sensors, these also generate a high-frequency magnetic field that emerges at the sensing face (Fig. 2). Again, the resulting effect is that any metallic object entering the field absorbs energy from it.

However, the oscillator and the subsequent signal evaluation circuit are 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.

Improved stability permits the switch point to be further away, leading to **long operating distances** on ferromagnetic metals (Fig. 3). Sensors with this technology also react particularly well to **narrow targets**, e.g. small screws, wires and foils.

Apart from the Condist® oscillator, all other assemblies are equivalent to the **Classics** family. Material dependencies and other properties are also the same as for **Classics** family sensors.

Special attention has been paid to **meets the relevant standards as much as possible**, so that easy **interchangeability** with conventional devices is guaranteed. Great emphasis has been placed on very good EMC resistance and on perfect sealing against liquid penetration.

The **Extra Distance** technology family includes devices from the **Basic, Miniature, Extra pressure, High pressure** and **Analog output** ranges. This technology is used in series 500 devices.

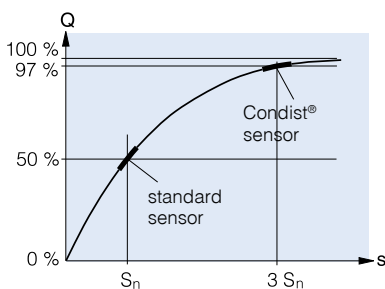


Fig. 3: **Extra Distance** family sensors have a longer operating distance, due to Condist® oscillator technology

FULL INOX FAMILY:

All-round stainless steel protection - practically indestructible

The **Full Inox** family is based on Contrinex's patented Condet® technology. These one-piece stainless steel sensors are not only the most durable on the market, they also offer long operating distances on any conductive metal.

Full Inox sensors 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 sensors, are subject to a number of undesirable environmental and material influences.

Condet® technology allows the sensor, including its face, to be fully encapsulated in a protective, stainless steel housing, with the added security of long operating distances.

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**. Operating distances are therefore identical on steel and aluminum. Only metals which are non-ferromagnetic and also have poor electrical conductivity give a reduced usable signal.

The **Full Inox** technology family includes devices from the **Basic, Miniature, Extreme, High pressure, Washdown, Weld-immune** and **Special** ranges. This technology is used in series 700 devices.

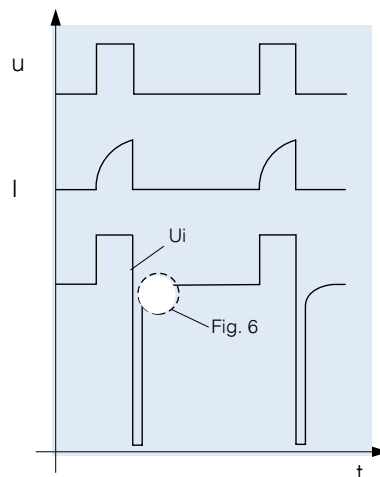


Fig. 5: Evolution of main signals

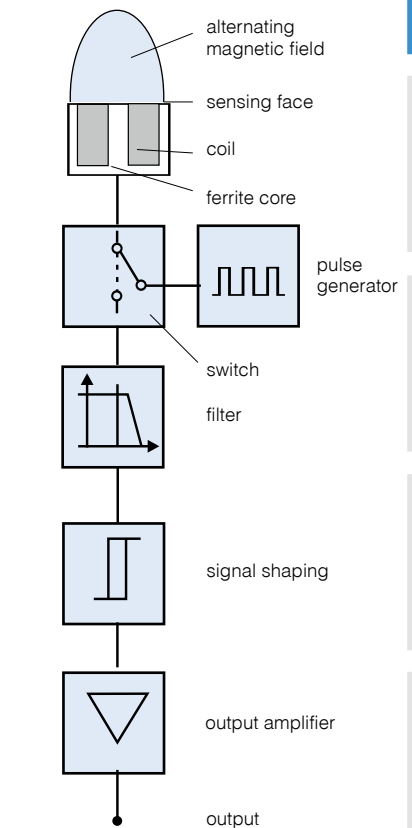


Fig. 4: **Full Inox** family sensors use Condet® pulse generator technology instead of an oscillator

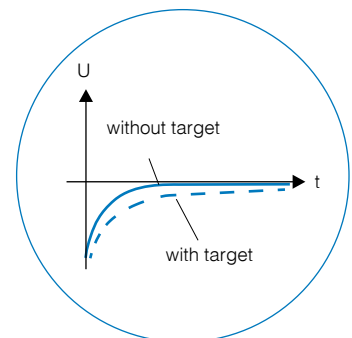


Fig. 6 (detail fig. 5): Effect of a target on the measured signal

INTRODUCTION

PRODUCT RANGES

BASIC

First choice in all environments

Contrinex **Basic** range inductive sensors have a worldwide and well-deserved reputation for uncompromising accuracy and exceptional reliability. With best-in-class sensing distances between **1.5 mm** and **40 mm**, the **Basic** range offers fit-and-forget operation, delivering world-class performance and a highly attractive total cost of ownership.

Available in sizes from M8 to M30 and C44, with optional Ø 6.5 plain and 8 mm square-section models, **Basic** range inductive sensors are ideal for general position-sensing and presence-sensing applications in almost any industry. Embeddable or non-embeddable variants are available, with either hard-wired, hermetically sealed connecting cables or integral metal connectors. **Basic** range devices, whether from the **Classics** (Fig. 1), **Extra Distance** (Fig. 2) or **Full Inox** (Fig. 4) technology families, all utilize Contrinex application-specific integrated circuits (ASICs) that ensure highly repeatable results at operating temperatures between -25°C and +70°C.



MINIATURE

Full functionality, smallest size

Size is often a critical constraint when selecting sensors for position- or presence-sensing. The Contrinex **Miniature** range, which includes the smallest self-contained inductive sensors on the market, meets this constraint without compromising on functionality.

Sensors from this range use either **Classics** (Fig. 1), **Extra Distance** (Fig. 2) or **Full Inox** (Fig. 4) technology. **Classics** and **Full Inox Miniature** sensors are IO-Link enabled in PNP NO versions. Available in plain and threaded sizes from Ø 3 to M5 and as a 5 mm square-section type, **Miniature** range inductive sensors are ideal for applications where space is limited, including tool-selection, robotic position-sensing and control of micro-mechanisms.

Extremely robust, thanks to chip-scale package (CSP) technology, a glass-fiber reinforced substrate and vacuum encapsulation, the Contrinex **Miniature** range delivers long-term reliability and maximum uptime, even in the most demanding environments. The low mass and **high switching frequency** of these sensors makes them particularly suitable for high-dynamic applications where inertia is a major consideration.

These embeddable devices are available in 3-wire DC, NPN and PNP versions with a choice of N.O. or N.C. configurations. An LED output state indicator is standard. All the important protection functions are included, such as short-circuit and overload protection, full polarity reversal protection, induction protection, EMC protection, power-on reset, etc.

With a sensing range up to **3 mm**, Contrinex miniature inductive sensors combine world-class quality with a highly attractive total cost of ownership.



EXTREME

Extreme durability in harsh environments

Only the toughest sensors survive the most extreme environments, and **Extreme** range inductive sensors from the **Full Inox** family are ideally equipped for the job. Thanks to one-piece stainless-steel (V2A/ AISI 303) construction and a hermetically sealed cable entry, **Extreme** sensors are corrosion-resistant, impervious to oil, and pressure-resistant to **80 bar**. Rugged, reliable and highly accurate, the **Extreme** range is at home in the most challenging circumstances.



Developed to withstand the harshest industrial operating conditions, **Extreme** sensors are rated to **IP 68** and **IP 69K**, delivering fit-and-forget performance with minimal downtime. With operating distances up to **40 mm**, the **Extreme** range senses both ferrous and non-ferrous materials with **Factor 1** performance, and is available in sizes from M8 to M30 and C23.

EXTRA PRESSURE

Pressure resistant up to 100 bar

Dependable, accurate presence- and position-sensing at pressures up to **100 bar** requires world-class performance and build quality. The **Extra pressure** range of pressure-resistant inductive sensors delivers exactly that, operating continuously in permanently pressurized conditions. This makes the range especially suitable for offshore installations, the chemical industry, motor lubrication systems and atomic fuel element monitoring. A stainless-steel housing with bonded ceramic or brazed sapphire sensing face and protection class **IP 68** guarantees robustness and exceptional reliability in miniature packages sized from **Ø 3** to **M8**.



The **Extra pressure** range is also ideal for high-vacuum environments and satellite applications, offering fit-and-forget capability and a sealed cable-entry that ensures no loss of service or interruptions to production.

Sensors from this range use either **Classics** (Fig. 1), **Extra Distance** (Fig. 2) or **Full Inox** (Fig. 4) technology and have equivalent electrical properties. For optimum impermeability, LED and connector versions are not available in this range.

Sensors from the **Extra pressure** range detect parts at sensing distances up to **2.5 mm**, and offer a highly attractive total cost of ownership.

HIGH PRESSURE

Resistant to pressure and dynamic stress up to 500 bar (peak 1000 bar)

For reliable, accurate sensing in the most demanding pneumatic and hydraulic applications, Contrinex offers a unique range of **High pressure** sensors with permanent operating pressures of **100 ... 500 bar** and peak pressures up to **1000 bar**.

Suitable for operating temperatures up to 100°C and resistant to more than 1 million pressure cycles, their IP 68 and IP 69K protection and oil impermeability make them the robust, reliable choice for the hydraulic industry. Fit-and-forget operation virtually eliminates sensor replacement costs. Exceptional performance and world-class quality are assured in sizes from M5 to M18.

Contrinex **High pressure** sensors are available in either **Extra Distance** (Fig. 2) or **Full Inox** (Fig 4) versions. Both of these patented technologies ensure durability without compromising on usable operating distance. Sensor construction is simple and robust, with the whole electronic unit, ferrite core and coil included, safely on the **no-pressure side**. Sealed connection is by means of either flexible PU cable or an integral connector.

Fig. 7 shows an **Extra Distance** version. The stainless steel housing is heat shrunk onto the ceramic disk, making the sensor mechanically resistant, **exceptionally impervious**, and outstanding for applications with **high dynamic pressure stress**, such as piston-control applications. With operating distances of up to 3 mm, they are gas-tight and meet protection class **IP 68**.

Versions from the **Full Inox** family have a practically indestructible pressure- and corrosion-resistant one-piece stainless steel housing (V4A / AISI 316L / DIN 1.4404). They provide excellent detection of all metals with good conductivity, both ferromagnetic and non-ferromagnetic. These corrosion resistant sensors are suitable for the harshest conditions and meet protection classes **IP 68 & IP 69K**.

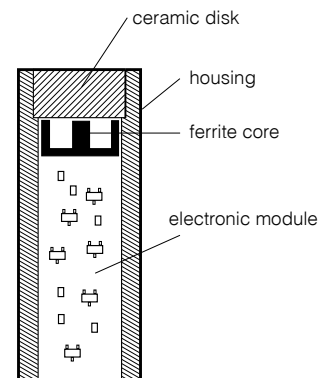


Fig. 7

Conversion of temperature	
Celsius	Fahrenheit
-40	-40
-25	-13
0	+32
+70	+158
+100	+212
+120	+248
+180	+356
+230	+446

Conversion of pressure	
Bar	PSI
1	14.5
80	1160
100	1451
500	7255
1000	14510

INTRODUCTION

EXTRA TEMPERATURE

Temperature resistant up to 120°C

Inductive sensors from the **Extra temperature** range offer the ideal solution for position- and presence-sensing applications at temperatures from as low as minus 40°C up to 120°C. Industrial processes often generate heat, resulting in temperatures that would damage a standard sensor, but the stainless-steel construction and robust electronics of Contrinex **Extra temperature** sensors ensure reliable, accurate operation and minimal downtime, even in the most demanding environments.

Sensors from this range use either conventional **Classics** (Fig. 1) or all-metal **Full Inox** (Fig. 4) technology. Individually compensated for repeatable, highly accurate operation across the full operating temperature range, **Extra temperature** inductive sensors accommodate sensing distances up to 25 mm, minimizing the risk of collision damage.

Available in sizes from M5 to M18, the **Extra temperature** range delivers best-in-class performance at elevated temperatures in the harsh environments of the automotive, molding and metal-processing industries.



HIGH TEMPERATURE

Temperature resistant up to 180°C (230°C with external amplifier)

Contrinex **High temperature** inductive sensors are designed for continuous operation at temperatures from 0°C up to 180°C (up to 230°C with remote electronics). The range is ideal for the harshest environments, including automotive paint shops, metal-treatment plants and glass manufacturing.

High temperature sensors use conventional **Classics** (Fig. 1) technology. Embeddable, non-embeddable and quasi-embeddable versions are available. For temperatures up to 180°C, sensors 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. Stainless steel construction and sensing distances up to 25 mm minimize the risk of mechanical damage during operation, ensuring maximum plant availability and a highly attractive total cost of ownership. Contrinex high-temperature sensors are available in sizes from M8 to M50.



WASHDOWN

Ecolab approved for strictest production hygiene

Washdown inductive sensors are certified to operate continuously and reliably in the harsh conditions of the food, beverage and pharmaceutical industries, ensuring uninterrupted production. With **Ecolab** approval and rated to **IP 68** and **IP 69K**, they are pressure resistant up to **80 bar**, **food safe** and **corrosion resistant**.



Washdown sensors are available in conventional **Classics** (Fig. 1) technology, size M12, or **Full Inox** (Fig. 4) technology, sizes M12, M18 and M30. **Full Inox** types have a totally impervious one-piece housing in stainless-steel (V4A / AISI 316L), including the sensing face. They are therefore highly resistant to the corrosive chemicals used for clean-in-place or wash-down processes. With Factor 1 on steel and aluminum and extended sensing ranges up to 40 mm, **Full Inox** technology minimizes the possibility of impact damage - a common hazard in confined operating spaces.

Washdown sensors meet the increasingly demanding sensing needs of the food, beverage and pharmaceutical industries, delivering best-in-class performance with an attractive total cost of ownership.

ANALOG OUTPUT

Continuous analog output for precision control

Engineers needing a reliable, repeatable, highly accurate means of measuring the position of a target object should look no further than Contrinex **Analog output** inductive sensors. This range of sensors has been developed on the platform of **Extra Distance** (Fig. 2) technology for excellent temperature stability, repeat accuracy, and the best long-range sensing capability on the market. With a measurement range of **zero to 40 mm** and detection accuracy on the micron scale, the **Analog output** sensor range is ideally suited for measuring linear, angular and rotational position (Fig. 8). They offer world-class performance and an attractive total cost of ownership in applications from vibration monitoring and end-position approach regulation, to position monitoring, metal sorting and sheet-metal forming.

Analog output inductive sensors are available in sizes from M8 to M30, with the option of an 8 mm square-section model. Voltage outputs are included for all sizes, while sizes M12 and above feature both voltage and current outputs.

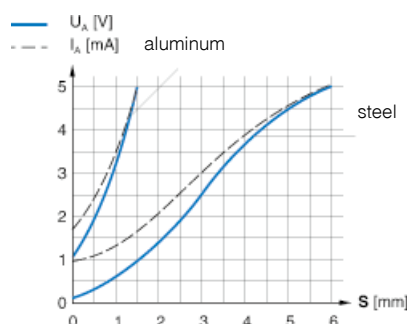


Fig. 8

WELD-IMMUNE

Immune to magnetic fields and resistant to weld spatter

Contrinex **Weld-immune** inductive sensors are ideal for the hostile working environments found in automotive factories and other industrial welding plants. The range includes sensors from two technology platforms: **Classics** (Fig. 1) and **Full Inox** (Fig. 4).

Classics devices, with protection class IP 67, are available either in PTFE-coated cylindrical brass housings or a PBTP 40 x 40 mm cubic form. They resist solder and the strong magnetic fields present during industrial welding processes. They have identical operating distances on steel and non-ferrous metals.

Weld-immune sensors built on the **Full Inox** platform have a long operating distance and Factor 1 on steel and aluminum. One-piece, stainless-steel (V2A / AISI 303) construction makes these sensors the most durable on the market, ensuring minimal down-time. These practically indestructible sensors withstand the welding environment for years, resisting electromagnetic fields, welding spatter, cleaning and impacts.

All **Weld-immune** sensors are embeddable and have an integral S12 connector. Best-in-class sensing ranges of up to **15 mm** eliminate the risk of collision - a frequent hazard when operating in close proximity to moving machine parts.

Developed for extreme accuracy throughout the welding cycle, **Weld-immune** sensors continuously detect part presence and machine position to ensure optimal equipment utilization and prevent errors in production. These sensors provide excellent repeatability at temperatures between -25°C and $+70^{\circ}\text{C}$.



2-WIRE

Easy installation and high switching frequency

The **2-Wire** range of DC, AC/DC and NAMUR sensors is constructed on the Classics (Fig. 1) technology platform and includes sizes from $\text{Ø}3$ to M30, plus a 5 x 5 mm square-section type. Devices are available for embeddable or non-embeddable mounting and connection is by means of cable or connector. With a sensing range up to 15 mm, Contrinex **2-Wire** sensors ensure optimal equipment utilization.

SPECIAL RANGE

Designed to meet special technical requirements

For **double-sheet** detection, sensors from the **Full Inox** (Fig. 4) family are used. Its patented inductive technology enables discrimination between one and two conductive metal sheets of a defined thickness, achieving sensitivity of 0.8 - 1.2 mm per sheet. This discrimination aids in the prevention of double feeds into blanking and forming processes which ultimately saves damage to tooling. The one-piece, stainless-steel construction of these sensors makes them the most durable on the market. They withstand the impacts that are a common hazard in double-sheet detection applications close to moving sheet metal, ensuring minimal down-time.

IO-LINK FUNCTIONALITY* WITH INDUCTIVE SENSORS

Data monitoring:

- 1 Switching state is monitored continuously. This not only monitors the signal itself, but also the state at 80% of the switching distance. One can therefore ensure that the sensor is not working at the limit of its specifications.

Diagnosis:

- 2 The operating state of the sensor is checked. In case of wire break, under-voltage, LC oscillator break or installation of the wrong sensor, information is provided directly through IO-Link to enable fast repair, maintenance and replacement.

NO/NC selection:

- 3 The output switching mode can be selected as NO or NC. A single sensor type is configurable for the various needs of an application. This helps reduce the number of different sensor types required in stock.

Switching timer:

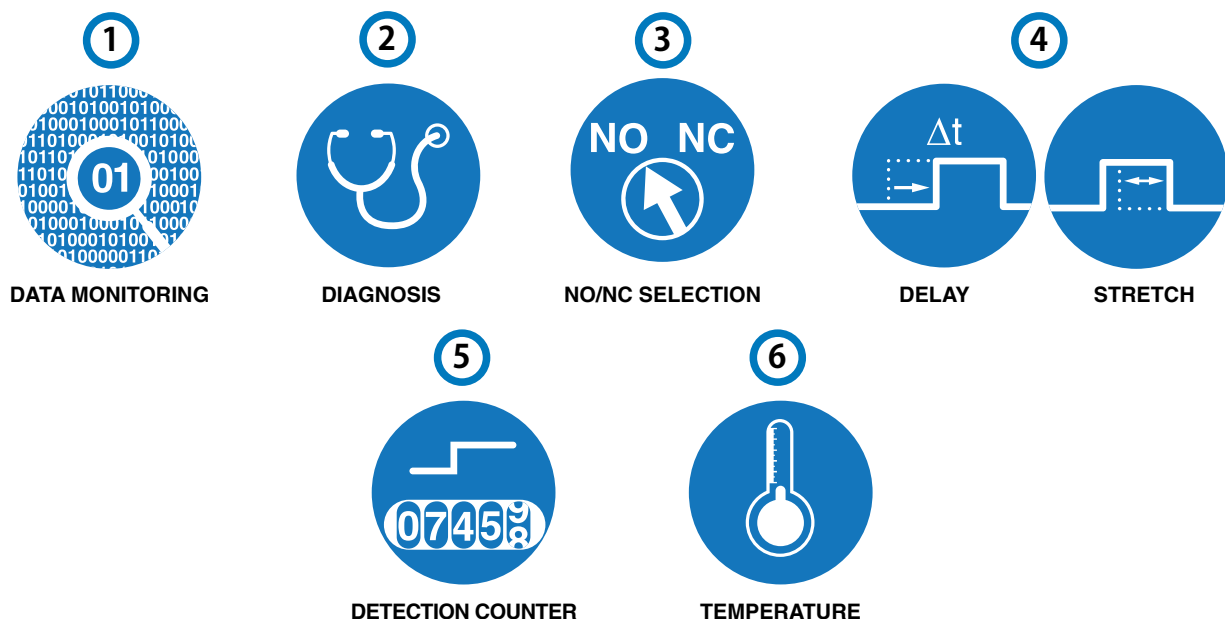
- 4 The timing of output switching can be configured. Depending on the needs of an application, output switching can be delayed or the duration stretched through programming.

Detection counter:

- 5 Detection events are counted. By registering the number of detections, it is possible to calculate the speed or number of parts. The counter can be reset by means of a unique IO-Link message.

Temperature:

- 6 The internal temperature of the sensor is measured continuously, which provides an indication about the ambient temperature in the application. Moreover, the maximum temperature measured is saved for diagnosis and preventive maintenance purposes.



* Functionalities may vary depending on series and sensor type



1 + 1 = 2



FIRST CHOICE IN ALL ENVIRONMENTS

BASIC

INDUCTIVE SENSORS

KEY ADVANTAGES

Classics, Extra Distance and Full Inox

- ✓ High quality ASIC sensors
- ✓ IO-Link (Classics and Full Inox)
- ✓ Exceptional price-performance ratio
- ✓ Excellent accuracy
- ✓ Outstanding temperature compensation
- ✓ Vibration and shock resistant
- ✓ Long operating distance

Full Inox

- ✓ Extremely robust one-piece stainless-steel housing
- ✓ Corrosion resistant
- ✓ IP 68 and IP 69K, sea water resistant
- ✓ Pressure resistant up to 80 bar

RANGE OVERVIEW	Housing size	Classics	Extra Distance	Full Inox
BASIC	∅ 6.5 mm	p. 31-35	p. 35	
	M8	p. 35-41, 43-44	p. 42-45	p. 41
	C8	p. 45-46	p. 46	
	M12	p. 47-51	p. 50-54	p. 47-48
	M18	p. 54-57	p. 57-59	p. 55
	M30	p. 59-61	p. 61-64	p. 60
	C44	p. 65-66		

FAMILY

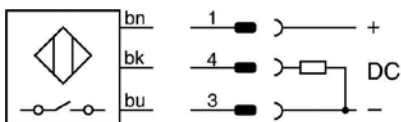
HOUSING SIZE MM

OPERATING DISTANCE MM

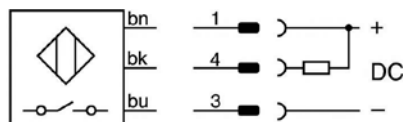
INDUCTIVE

WIRING DIAGRAMS

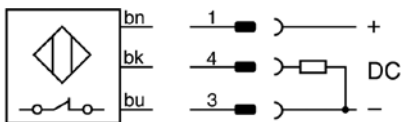
PNP NO



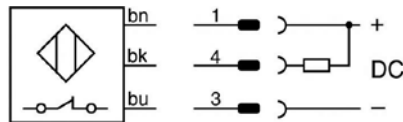
NPN NO



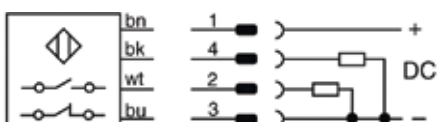
PNP NC



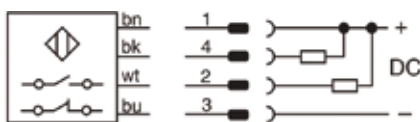
NPN NC



PNP Changeover



NPN Changeover



DATA

Housing material

Connection

Degree of protection

Mounting

Max. switching frequency

Supply voltage range

Ambient temperature range





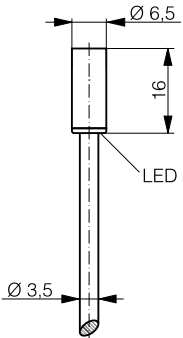
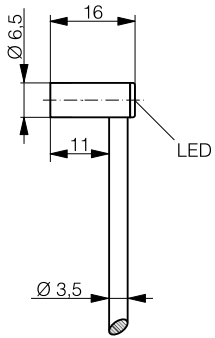
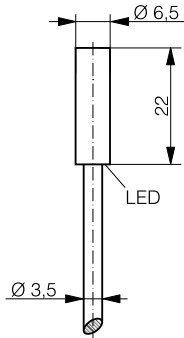
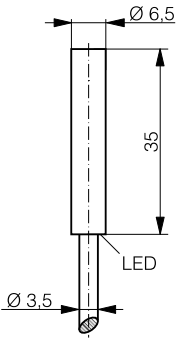
Output current

PNP NO

NPN NO

Other types available

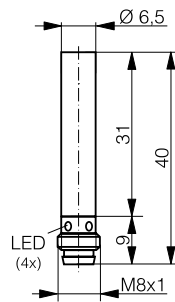
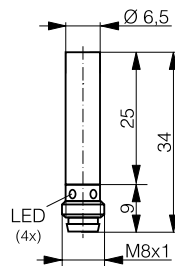
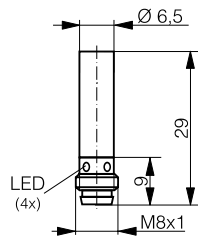
BASIC

CLASSICS	CLASSICS	CLASSICS	CLASSICS	Inductive
Ø 6.5	Ø 6.5	Ø 6.5	Ø 6.5	
1.5	1.5	1.5	1.5	Photoelectric
				
				Capacitive
				RFID
				Accessories
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	
PVC cable	PVC cable	PVC cable	PVC cable	
IP 67	IP 67	IP 67	IP 67	
Embeddable	Embeddable	Embeddable	Embeddable	
5000 Hz	5000 Hz	5000 Hz	5000 Hz	
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	Index
DW-AD-603-065-120	DW-AD-603-065-400	DW-AD-603-065-121	DW-AD-603-065	
DW-AD-601-065-120	DW-AD-601-065-400	DW-AD-601-065-121	DW-AD-601-065	
PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC, length 30 mm	

BASIC





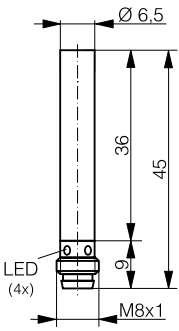
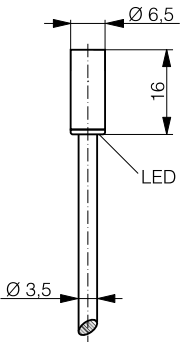
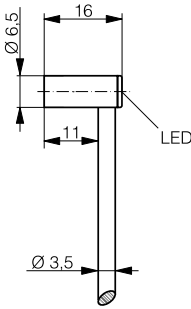
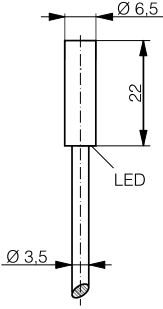
INDUCTIVE

FAMILY	CLASSICS	CLASSICS	CLASSICS
HOUSING SIZE MM	Ø 6.5	Ø 6.5	Ø 6.5
OPERATING DISTANCE MM	1.5	1.5	1.5



DATA			
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection	Connector S8	Connector S8	Connector S8
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable
Max. switching frequency	5000 Hz	5000 Hz	5000 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AS-603-065-129	DW-AS-603-065-123	DW-AS-603-065-124
NPN NO	DW-AS-601-065-129	DW-AS-601-065-123	DW-AS-601-065-124
Other types available	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC

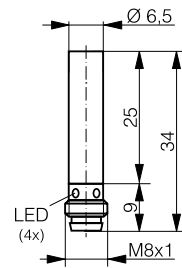
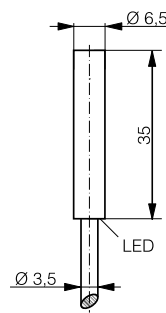
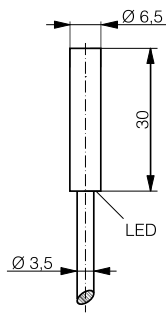
BASIC

CLASSICS	CLASSICS	CLASSICS	CLASSICS	Inductive
Ø 6.5	Ø 6.5	Ø 6.5	Ø 6.5	
1.5	2	2	2	Photoelectric
				
				Capacitive
				Safety
				RFID
				Connectivity
				Accessories
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Glossary
Connector S8	PVC cable	PVC cable	PVC cable	
IP 67	IP 67	IP 67	IP 67	Index
Embeddable	Embeddable	Embeddable	Embeddable	
5000 Hz	5000 Hz	5000 Hz	5000 Hz	
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	
DW-AS-603-065-001	DW-AD-623-065-120	DW-AD-623-065-400	DW-AD-623-065-121	
DW-AS-601-065-001	DW-AD-621-065-120	DW-AD-621-065-400	DW-AD-621-065-121	
PNP NC, NPN NC, S12	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC	

BASIC

INDUCTIVE

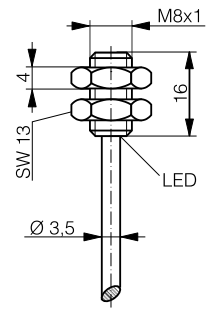
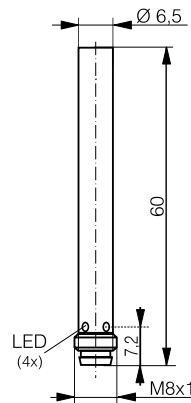
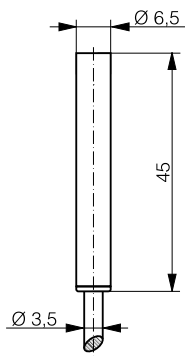
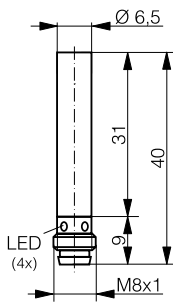
FAMILY	CLASSICS	CLASSICS	CLASSICS
HOUSING SIZE MM	Ø 6.5	Ø 6.5	Ø 6.5
OPERATING DISTANCE MM	2	2	2



DATA			
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection	PVC cable	PVC cable	Connector S8
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable
Max. switching frequency	5000 Hz	5000 Hz	5000 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AD-623-065-122	DW-AD-623-065	DW-AS-623-065-123
NPN NO	DW-AD-621-065-122	DW-AD-621-065	DW-AS-621-065-123
Other types available	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC length 29 mm

BASIC

CLASSICS	EXTRA DISTANCE	EXTRA DISTANCE	CLASSICS	Inductive
Ø 6.5	Ø 6.5	Ø 6.5	M8	
2	3	3	1.5	



Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

Glossary

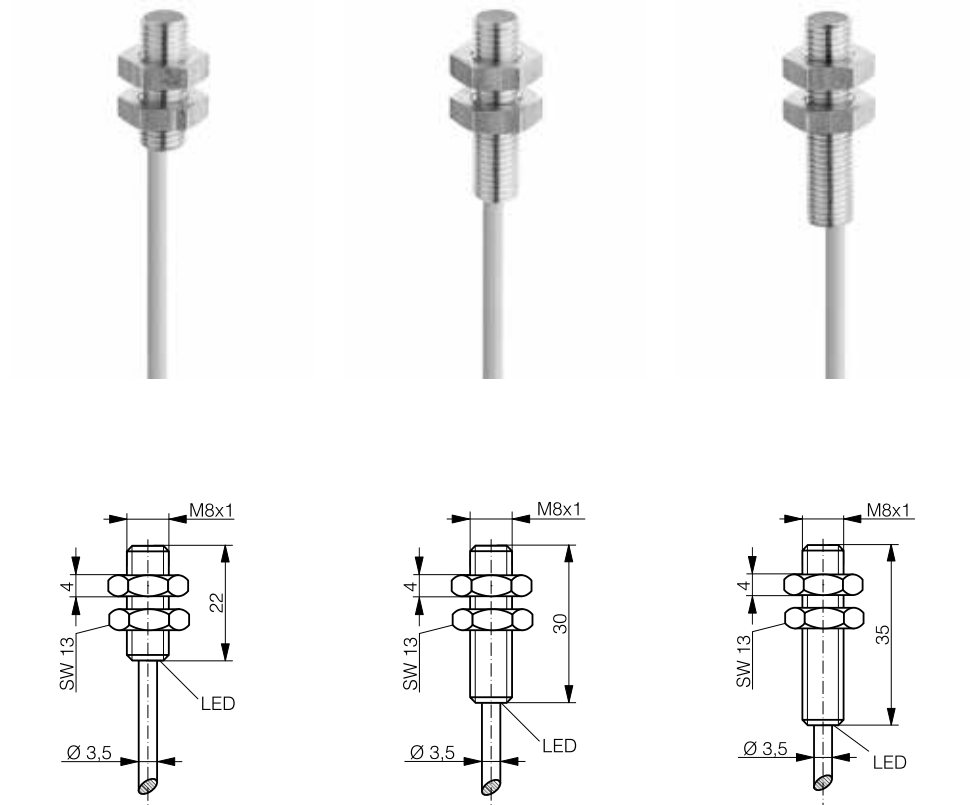
Index

Stainless steel V2A	Chrome-plated brass	Chrome-plated brass	Stainless steel V2A
Connector S8	PVC cable	Connector S8	PVC cable
IP 67	IP 67	IP 67	IP 67
Embeddable	Quasi-embeddable	Quasi-embeddable	Embeddable
5000 Hz	1000 Hz	1000 Hz	5000 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
DW-AS-623-065-124	DW-AD-503-065	DW-AS-503-065-001	DW-AD-603-M8-120
DW-AS-621-065-124	DW-AD-501-065	DW-AS-501-065-001	DW-AD-601-M8-120
PNP NC, NPN NC length 45 mm, S12	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC

BASIC

INDUCTIVE

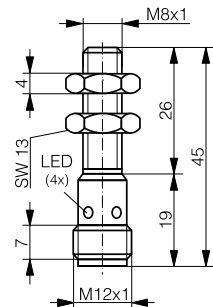
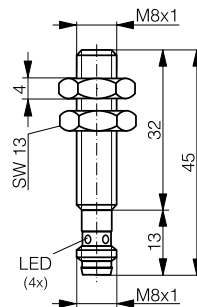
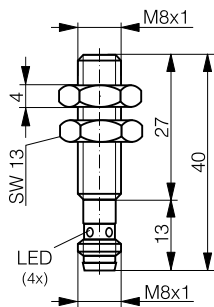
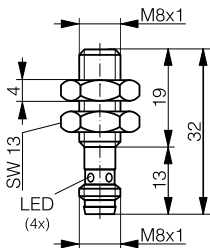
FAMILY	CLASSICS	CLASSICS	CLASSICS
HOUSING SIZE	M8	M8	M8
OPERATING DISTANCE MM	1.5	1.5	1.5



DATA			
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection	PVC cable	PVC cable	PVC cable
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable
Max. switching frequency	5000 Hz	5000 Hz	5000 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AD-603-M8-121	DW-AD-603-M8-122	DW-AD-603-M8
NPN NO	DW-AD-601-M8-121	DW-AD-601-M8-122	DW-AD-601-M8
Other types available	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC

BASIC

CLASSICS	CLASSICS	CLASSICS	CLASSICS	Inductive
M8	M8	M8	M8	
1.5	1.5	1.5	1.5	



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Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connector S8	Connector S8	Connector S8	Connector S12
IP 67	IP 67	IP 67	IP 67
Embeddable	Embeddable	Embeddable	Embeddable
5000 Hz	5000 Hz	5000 Hz	5000 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
DW-AS-603-M8-123	DW-AS-603-M8-124	DW-AS-603-M8-001	DW-AS-603-M8
DW-AS-601-M8-123	DW-AS-601-M8-124	DW-AS-601-M8-001	DW-AS-601-M8
PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC, length 39 mm

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FAMILY

CLASSICS

CLASSICS

CLASSICS

HOUSING SIZE

M8

M8

M8

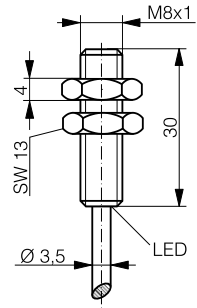
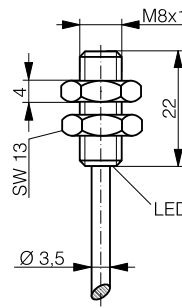
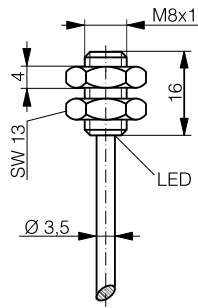
OPERATING DISTANCE MM

2

2

2

INDUCTIVE

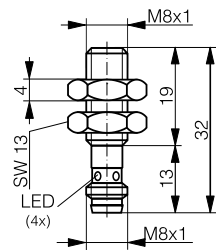
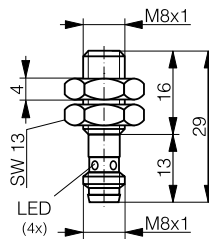
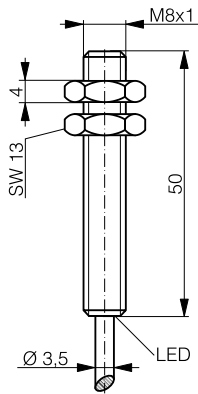
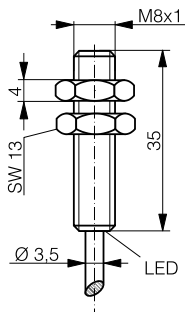


DATA

DATA			
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection	PVC cable	PVC cable	PVC cable
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable
Max. switching frequency	5000 Hz	5000 Hz	5000 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AD-623-M8-120	DW-AD-623-M8-121	DW-AD-623-M8-122
NPN NO	DW-AD-621-M8-120	DW-AD-621-M8-121	DW-AD-621-M8-122
Other types available	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC

BASIC

CLASSICS	CLASSICS	CLASSICS	CLASSICS
M8	M8	M8	M8
2	2	2	2



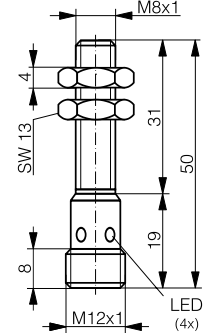
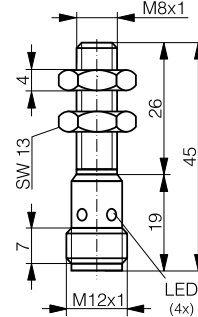
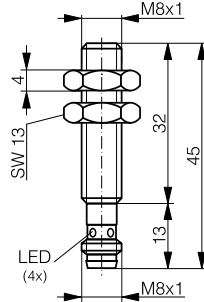
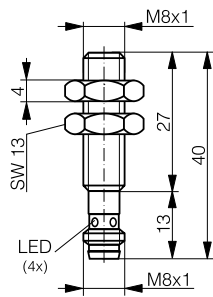
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
PVC cable	PVC cable	Connector S8	Connector S8
IP 67	IP 67	IP 67	IP 67
Embeddable	Embeddable	Embeddable	Embeddable
5000 Hz	5000 Hz	5000 Hz	5000 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
DW-AD-623-M8	DW-AD-623-M8-177	DW-AS-623-M8-129	DW-AS-623-M8-123
DW-AD-621-M8	DW-AD-621-M8-177	DW-AS-621-M8-129	DW-AS-621-M8-123
PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC

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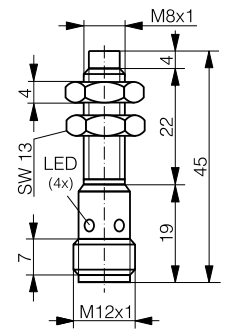
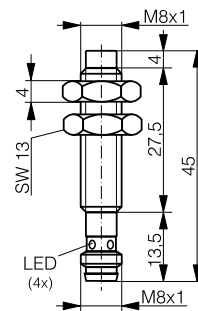
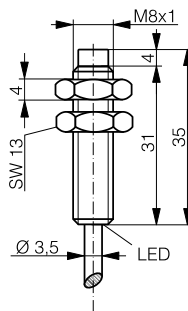
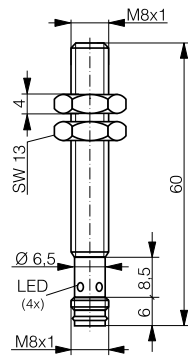
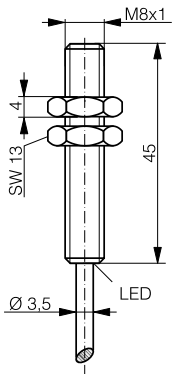
FAMILY	CLASSICS	CLASSICS	CLASSICS	CLASSICS
HOUSING SIZE	M8	M8	M8	M8
OPERATING DISTANCE MM	2	2	2	2



DATA				
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection	Connector S8	Connector S8	Connector S12	Connector S12
Degree of protection	IP 67	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable	Embeddable
Max. switching frequency	5000 Hz	5000 Hz	5000 Hz	5000 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25...+70°C/-13...+158°F	-25...+70°C/-13...+158°F	-25...+70°C/-13...+158°F	-25...+70°C/-13...+158°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AS-623-M8-124	DW-AS-623-M8-001	DW-AS-623-M8	DW-AS-623-M8-193
NPN NO	DW-AS-621-M8-124	DW-AS-621-M8-001	DW-AS-621-M8	DW-AS-621-M8-193
Other types available	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC

BASIC

FULL INOX	FULL INOX	CLASSICS	CLASSICS	CLASSICS
M8	M8	M8	M8	M8
2	2	2.5	2.5	2.5



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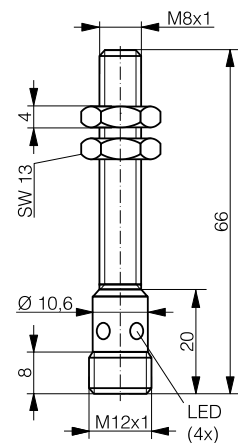
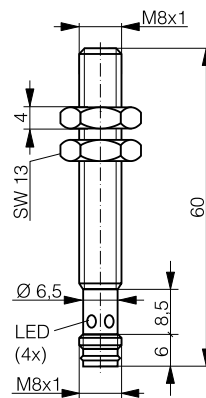
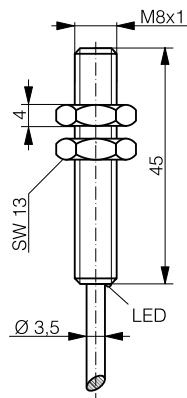
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Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
PUR cable	Connector S8	PVC cable	Connector S8	Connector S12
IP 68	IP 68 / IP 69K	IP 67	IP 67	IP 67
Embeddable	Embeddable	Non-embeddable	Non-embeddable	Non-embeddable
100 Hz	100 Hz	4500 Hz	4500 Hz	4500 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70°C/-13 ... +158°F	-25 ... +70°C/-13 ... +158°F	-25 ... +70°C/-13 ... +158°F	-25 ... +70°C/-13 ... +158°F	-25 ... +70°C/-13 ... +158°F
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
DW-AD-703-M8-BAS	DW-AS-703-M8-001-BAS	DW-AD-613-M8	DW-AS-613-M8-001	DW-AS-613-M8
DW-AD-701-M8-BAS	DW-AS-701-M8-001-BAS	DW-AD-611-M8	DW-AS-611-M8-001	DW-AS-611-M8
		PNP NC, NPN NC, lengths 22 & 30 mm	PNP NC, NPN NC, lengths 32 & 40 mm	PNP NC, NPN NC

BASIC





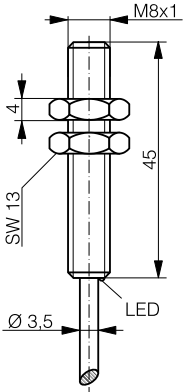
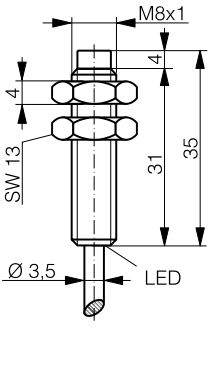
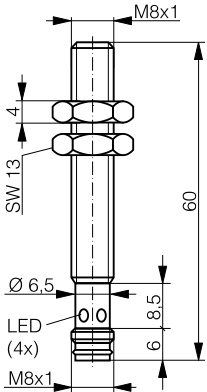
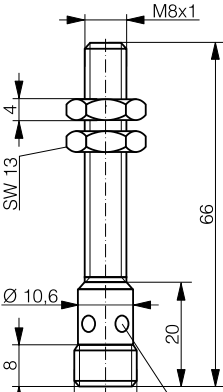
INDUCTIVE

FAMILY	EXTRA DISTANCE	EXTRA DISTANCE	EXTRA DISTANCE
HOUSING SIZE	M8	M8	M8
OPERATING DISTANCE MM	3	3	3



DATA			
Housing material	Chrome-plated nickel silver	Chrome-plated nickel silver	Chrome-plated nickel silver
Connection	PVC cable	Connector S8	Connector S12
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable
Max. switching frequency	1000 Hz	1000 Hz	1000 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AD-503-M8	DW-AS-503-M8-001	DW-AS-503-M8
NPN NO	DW-AD-501-M8	DW-AS-501-M8-001	DW-AS-501-M8
Other types available	PNP NC, NPN NC, length 35 mm	PNP NC, NPN NC	PNP NC, NPN NC

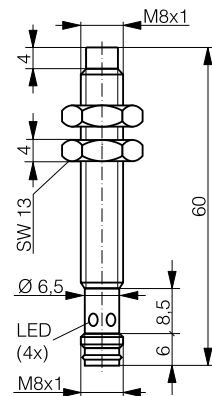
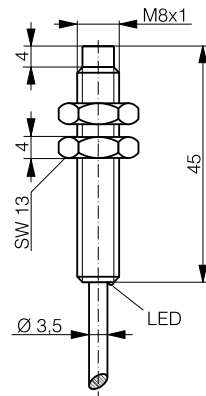
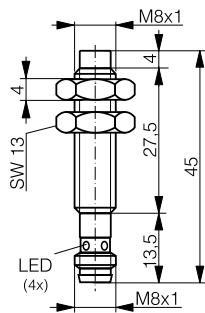
BASIC

EXTRA DISTANCE	CLASSICS	EXTRA DISTANCE	EXTRA DISTANCE	Inductive
M8	M8	M8	M8	
4	4	4	4	
				Photoelectric
				Ultrasonic
				Capacitive
				Safety
				RFID
				Connectivity
				Accessories
Chrome-plated nickel silver	Stainless steel V2A	Chrome-plated nickel silver	Chrome-plated nickel silver	
PVC cable	PVC cable	Connector S8	Connector S12	
IP 67	IP 67	IP 67	IP 67	
Embeddable	Non-embeddable	Embeddable	Embeddable	Glossary
500 Hz	3500 Hz	500 Hz	500 Hz	
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	
DW-AD-523-M8	DW-AD-633-M8	DW-AS-523-M8-001	DW-AS-523-M8	Index
DW-AD-521-M8	DW-AD-631-M8	DW-AS-521-M8-001	DW-AS-521-M8	
PNP NC, NPN NC, length 35 mm	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC	

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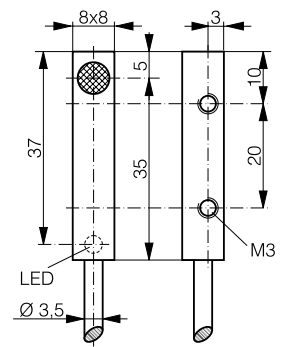
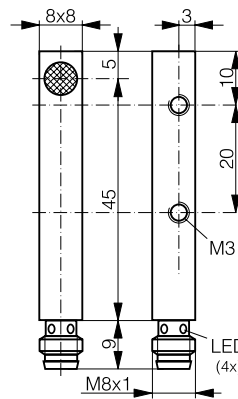
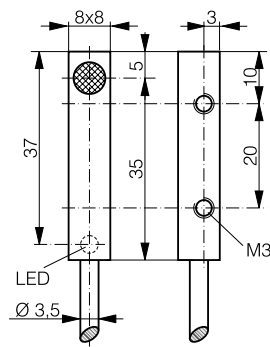
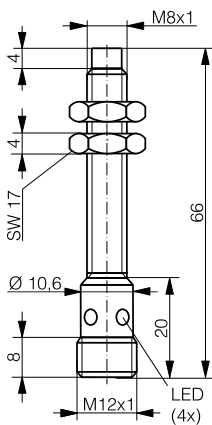
FAMILY	CLASSICS	EXTRA DISTANCE	EXTRA DISTANCE
HOUSING SIZE	M8	M8	M8
OPERATING DISTANCE MM	4	6	6



DATA			
Housing material	Stainless steel V2A	Chrome-plated brass	Chrome-plated brass
Connection	Connector S8	PVC cable	Connector S8
Degree of protection	IP 67	IP 67	IP 67
Mounting	Non-embeddable	Non-embeddable	Non-embeddable
Max. switching frequency	3500 Hz	500 Hz	500 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AS-633-M8-001	DW-AD-513-M8	DW-AS-513-M8-001
NPN NO	DW-AS-631-M8-001	DW-AD-511-M8	DW-AS-511-M8-001
Other types available	PNP NC, NPN NC	PNP NC, NPN NC, length 35 mm	PNP NC, NPN NC

BASIC

EXTRA DISTANCE	CLASSICS	CLASSICS	CLASSICS
M8	□ 8 x 8	□ 8 x 8	□ 8 x 8
6	1.5	1.5	2



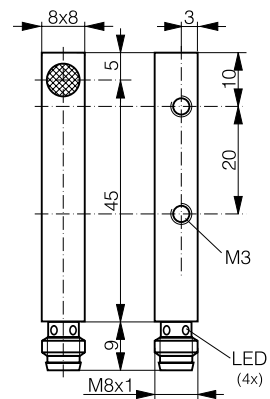
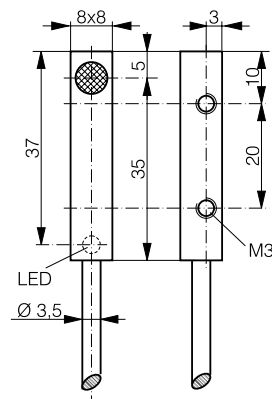
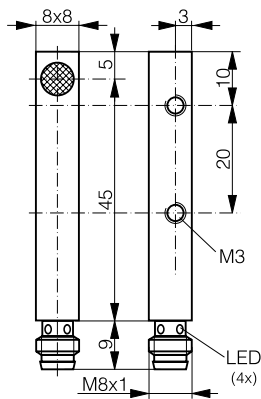
EXTRA DISTANCE	CLASSICS	CLASSICS	CLASSICS
Chrome-plated brass	Zamak	Zamak	Zamak
Connector S12	PVC cable	Connector S8	PVC cable
IP 67	IP 67	IP 67	IP 67
Non-embeddable	Embeddable	Embeddable	Embeddable
500 Hz	3500 Hz	3500 Hz	5000 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
DW-AS-513-M8	DW-AD-603-C8	DW-AS-603-C8-001	DW-AD-623-C8
DW-AS-511-M8	DW-AD-601-C8	DW-AS-601-C8-001	DW-AD-621-C8
PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC

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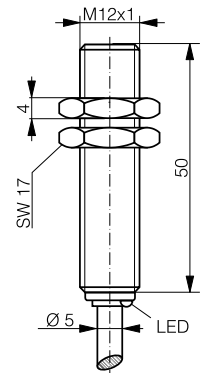
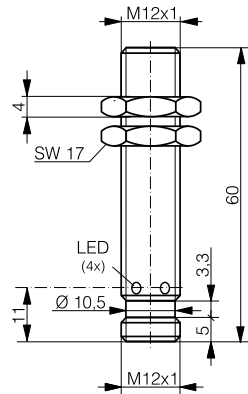
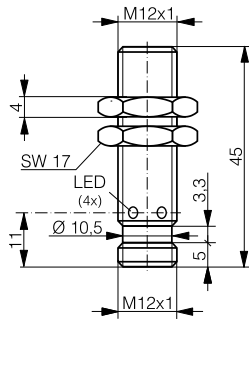
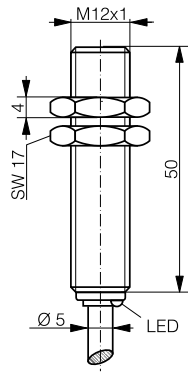
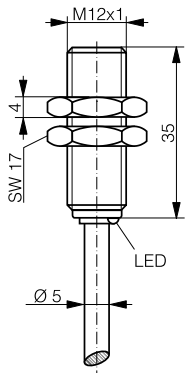
FAMILY	CLASSICS	EXTRA DISTANCE	EXTRA DISTANCE
HOUSING SIZE	□ 8 x 8	□ 8 x 8	□ 8 x 8
OPERATING DISTANCE MM	2	3	3



DATA			
Housing material	Zamak	Zamak	Zamak
Connection	Connector S8	PVC cable	Connector S8
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Quasi-embeddable	Quasi-embeddable
Max. switching frequency	5000 Hz	1000 Hz	1000 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AS-623-C8-001	DW-AD-503-C8	DW-AS-503-C8
NPN NO	DW-AS-621-C8-001	DW-AD-501-C8	DW-AS-501-C8
Other types available	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC

BASIC

CLASSICS	CLASSICS	CLASSICS	CLASSICS	FULL INOX
M12	M12	M12	M12	M12
2	2	2	2	3



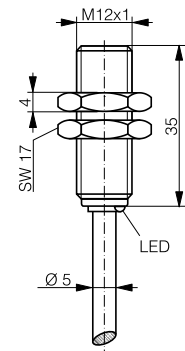
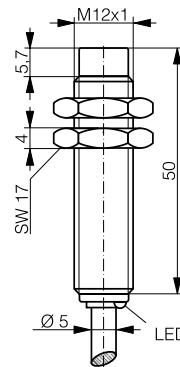
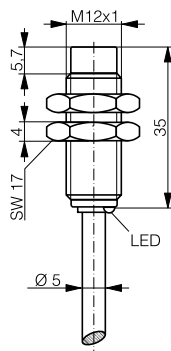
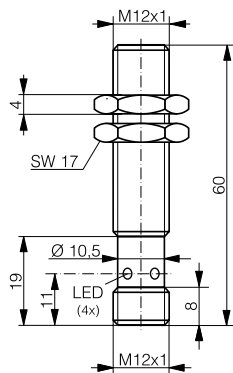
Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Stainless steel V2A
PVC cable	PVC cable	Connector S12	Connector S12	PUR cable
IP 67	IP 67	IP 67	IP 67	IP 68
Embeddable	Embeddable	Embeddable	Embeddable	Embeddable
3000 Hz	3000 Hz	3000 Hz	3000 Hz	100 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70°C/-13 ... +158°F	-25 ... +70°C/-13 ... +158°F	-25 ... +70°C/-13 ... +158°F	-25 ... +70°C/-13 ... +158°F	-25 ... +70°C/-13 ... +158°F
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
DW-AD-603-M12-120	DW-AD-603-M12	DW-AS-603-M12-120	DW-AS-603-M12	DW-AD-703-M12-BAS
DW-AD-601-M12-120	DW-AD-601-M12	DW-AS-601-M12-120	DW-AS-601-M12	DW-AD-701-M12-BAS
PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC	

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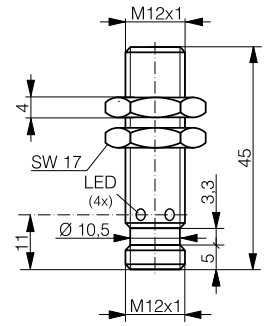
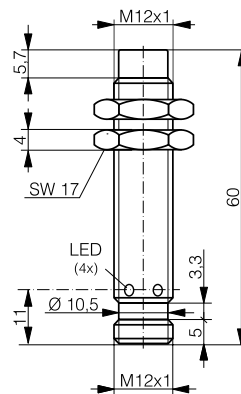
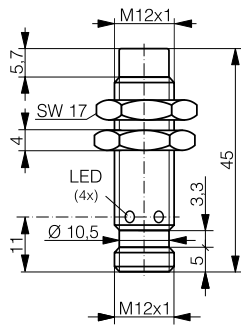
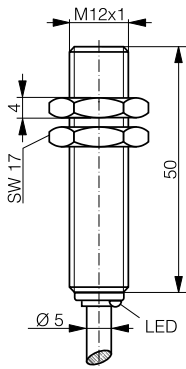
FAMILY	FULL INOX	CLASSICS	CLASSICS	CLASSICS
HOUSING SIZE	M12	M12	M12	M12
OPERATING DISTANCE MM	3	4	4	4



DATA	FULL INOX	CLASSICS	CLASSICS	CLASSICS
Housing material	Stainless steel V2A	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
Connection	Connector S12	PVC cable	PVC cable	PVC cable
Degree of protection	IP 68 & IP 69K	IP 67	IP 67	IP 67
Mounting	Embeddable	Non-embeddable	Non-embeddable	Embeddable
Max. switching frequency	100 Hz	2000 Hz	2000 Hz	2500 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25...+70°C/-13...+158°F	-25...+70°C/-13...+158°F	-25...+70°C/-13...+158°F	-25...+70°C/-13...+158°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AS-703-M12-BAS	DW-AD-613-M12-120	DW-AD-613-M12	DW-AD-623-M12-120
NPN NO	DW-AS-701-M12-BAS	DW-AD-611-M12-120	DW-AD-611-M12	DW-AD-621-M12-120
Other types available		PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC

BASIC

CLASSICS	CLASSICS	CLASSICS	CLASSICS
M12	M12	M12	M12
4	4	4	4



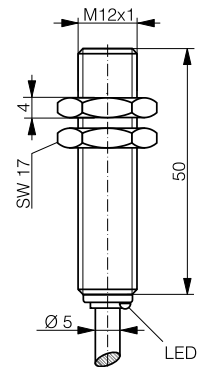
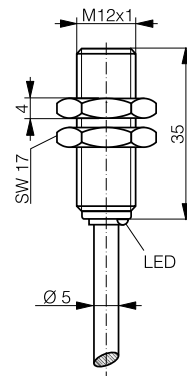
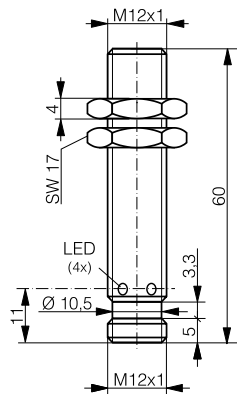
Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
PVC cable	Connector S12	Connector S12	Connector S12
IP 67	IP 67	IP 67	IP 67
Embeddable	Non-embeddable	Non-embeddable	Embeddable
2500 Hz	2000 Hz	2000 Hz	2500 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
DW-AD-623-M12	DW-AS-613-M12-120	DW-AS-613-M12	DW-AS-623-M12-120
DW-AD-621-M12	DW-AS-611-M12-120	DW-AS-611-M12	DW-AS-621-M12-120
PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC

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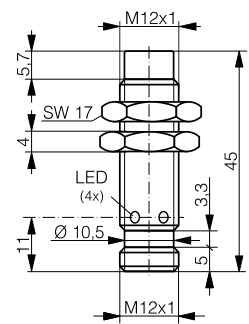
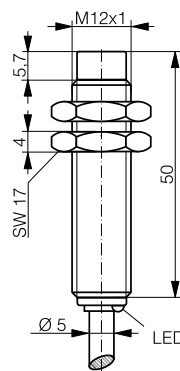
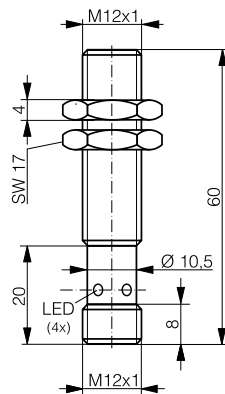
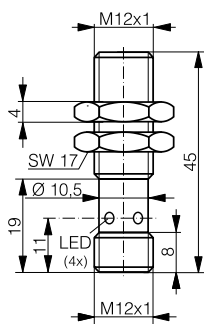
FAMILY	CLASSICS	EXTRA DISTANCE	EXTRA DISTANCE
HOUSING SIZE	M12	M12	M12
OPERATING DISTANCE MM	4	6	6



DATA			
Housing material	Nickel-plated brass	Chrome-plated brass	Chrome-plated brass
Connection	Connector S12	PVC cable	PVC cable
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Quasi-embeddable	Quasi-embeddable
Max. switching frequency	2500 Hz	800 Hz	800 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AS-623-M12	DW-AD-503-M12-120	DW-AD-503-M12
NPN NO	DW-AS-621-M12	DW-AD-501-M12-120	DW-AD-501-M12
PNP NC	DW-AS-624-M12		
Other types available	NPN NC	PNP NC, NPN NC	PNP NC, NPN NC

BASIC

EXTRA DISTANCE	EXTRA DISTANCE	CLASSICS	CLASSICS	Inductive
M12	M12	M12	M12	
6	6	8	8	



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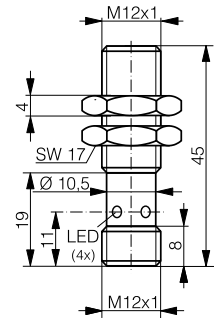
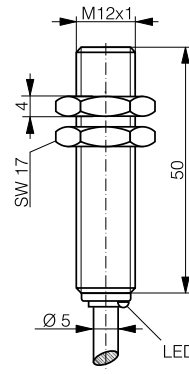
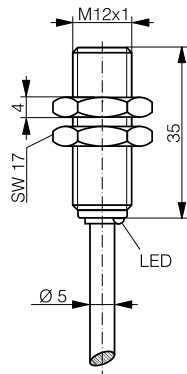
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Chrome-plated brass	Chrome-plated brass	Nickel-plated brass	Nickel-plated brass
Connector S12	Connector S12	PVC cable	Connector S12
IP 67	IP 67	IP 67	IP 67
Quasi-embeddable	Quasi-embeddable	Non-embeddable	Non-embeddable
800 Hz	800 Hz	1400 Hz	1400 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
DW-AS-503-M12-120	DW-AS-503-M12	DW-AD-633-M12	DW-AS-633-M12-120
DW-AS-501-M12-120	DW-AS-501-M12	DW-AD-631-M12	DW-AS-631-M12-120
	DW-AS-504-M12	DW-AD-634-M12	DW-AS-634-M12-120
PNP NC, NPN NC	NPN NC	NPN NC, length 35 mm	NPN NC, length 60 mm

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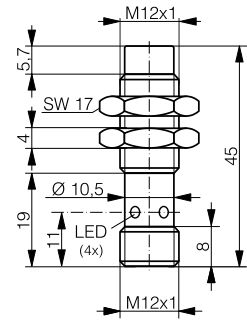
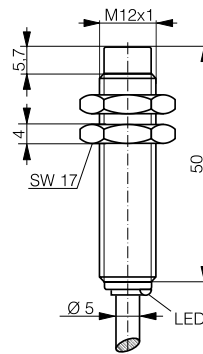
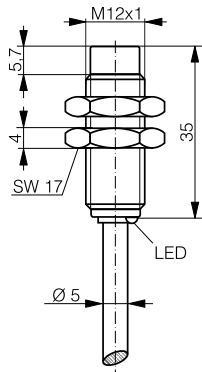
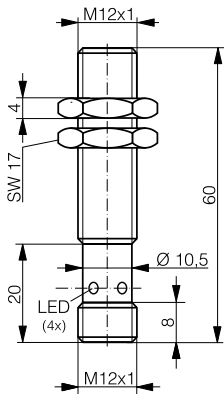
FAMILY	EXTRA DISTANCE	EXTRA DISTANCE	EXTRA DISTANCE
HOUSING SIZE	M12	M12	M12
OPERATING DISTANCE MM	8	8	8



DATA			
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connection	PVC cable	PVC cable	Connector S12
Degree of protection	IP 67	IP 67	IP 67
Mounting	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable
Max. switching frequency	400 Hz	400 Hz	400 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AD-523-M12-120	DW-AD-523-M12	DW-AS-523-M12-120
NPN NO	DW-AD-521-M12-120	DW-AD-521-M12	DW-AS-521-M12-120
Other types available	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC

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EXTRA DISTANCE	EXTRA DISTANCE	EXTRA DISTANCE	EXTRA DISTANCE	Inductive
M12	M12	M12	M12	
8	10	10	10	



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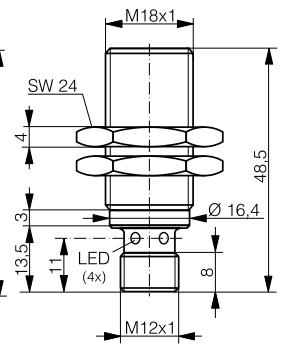
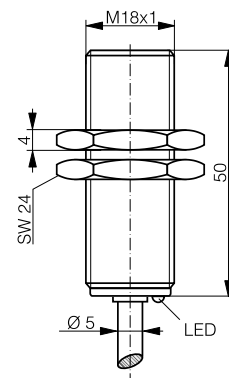
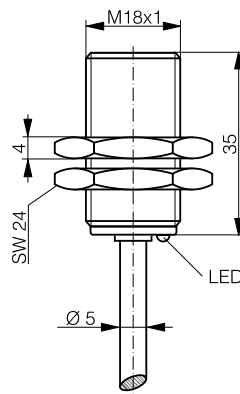
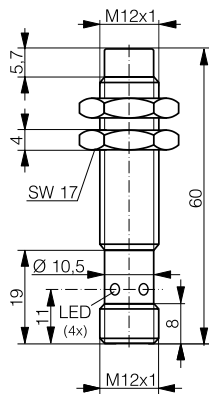
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Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connector S12	PVC cable	PVC cable	Connector S12
IP 67	IP 67	IP 67	IP 67
Quasi-embeddable	Non-embeddable	Non-embeddable	Non-embeddable
400 Hz	400 Hz	400 Hz	400 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
DW-AS-523-M12	DW-AD-513-M12-120	DW-AD-513-M12	DW-AS-513-M12-120
DW-AS-521-M12	DW-AD-511-M12-120	DW-AD-511-M12	DW-AS-511-M12-120
PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC

BASIC

INDUCTIVE

FAMILY	EXTRA DISTANCE	CLASSICS	CLASSICS	CLASSICS
HOUSING SIZE	M12	M18	M18	M18
OPERATING DISTANCE MM	10	5	5	5



DATA				
Housing material	Chrome-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
Connection	Connector S12	PVC cable	PVC cable	Connector S12
Degree of protection	IP 67	IP 67	IP 67	IP 67
Mounting	Non-embeddable	Embeddable	Embeddable	Embeddable
Max. switching frequency	400 Hz	2000 Hz	2000 Hz	2000 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25...+70°C/-13...+158°F	-25...+70°C/-13...+158°F	-25...+70°C/-13...+158°F	-25...+70°C/-13...+158°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AS-513-M12	DW-AD-603-M18-120	DW-AD-603-M18	DW-AS-603-M18-120
NPN NO	DW-AS-511-M12	DW-AD-601-M18-120	DW-AD-601-M18	DW-AS-601-M18-120
PNP NC	DW-AS-514-M12		DW-AD-604-M18	
Other types available	NPN NC	PNP NC, NPN NC	NPN NC	PNP NC, NPN NC

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CLASSICS	FULL INOX	FULL INOX	CLASSICS	CLASSICS
M18	M18	M18	M18	M18
5	5	5	8	8



Inductive

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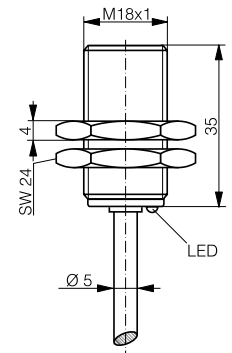
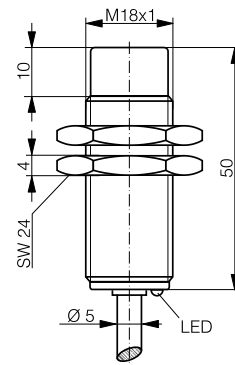
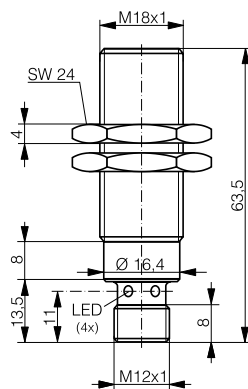
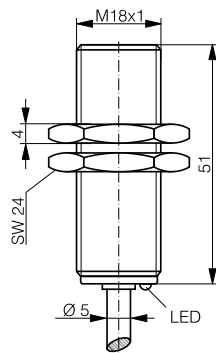
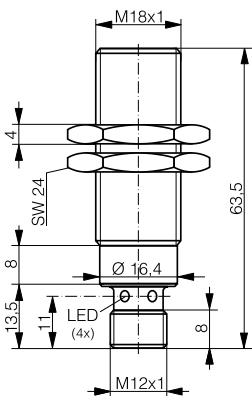
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Nickel-plated brass	Stainless steel V2A	Stainless steel V2A	Nickel-plated brass	Nickel-plated brass
Connector S12	PUR cable	Connector S12	PVC cable	PVC cable
IP 67	IP 68	IP 68 & IP 69K	IP 67	IP 67
Embeddable	Embeddable	Embeddable	Non-embeddable	Quasi-embeddable
2000 Hz	100 Hz	100 Hz	2000 Hz	1500 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70°C/-13 ... +158°F	-25 ... +70°C/-13 ... +158°F	-25 ... +70°C/-13 ... +158°F	-25 ... +70°C/-13 ... +158°F	-25 ... +70°C/-13 ... +158°F
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
DW-AS-603-M18-002	DW-AD-703-M18-BAS	DW-AS-703-M18-BAS	DW-AD-613-M18	DW-AD-623-M18-120
DW-AS-601-M18-002	DW-AD-701-M18-BAS	DW-AS-701-M18-BAS	DW-AD-611-M18	DW-AD-621-M18-120
DW-AS-604-M18-002				
NPN NC			PNP NC, NPN NC	PNP NC, NPN NC

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FAMILY

CLASSICS

CLASSICS

CLASSICS

HOUSING SIZE

M18

M18

M18

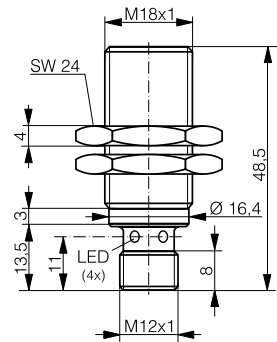
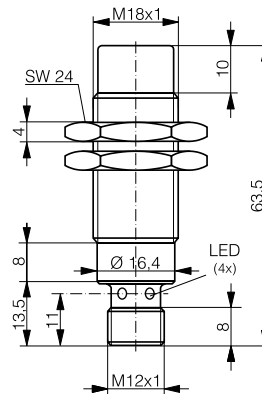
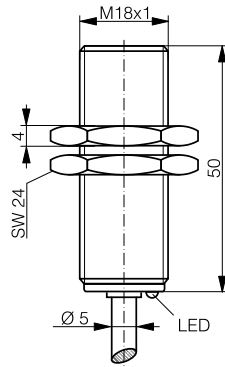
OPERATING DISTANCE MM

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8

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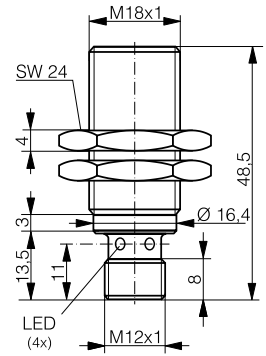
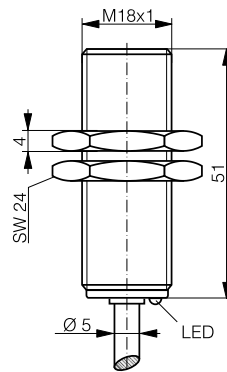
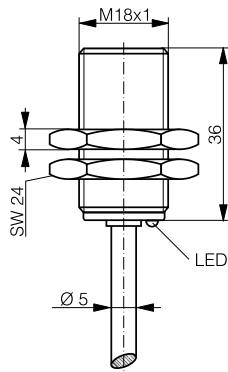
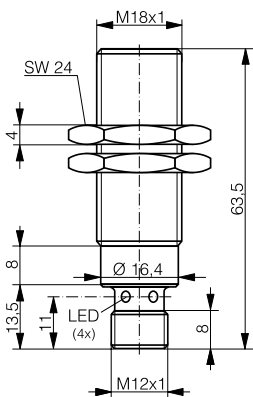


DATA

DATA			
Housing material	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
Connection	PVC cable	Connector S12	Connector S12
Degree of protection	IP 67	IP 67	IP 67
Mounting	Quasi-embeddable	Non-embeddable	Embeddable
Max. switching frequency	1500 Hz	2000 Hz	1500 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AD-623-M18	DW-AS-613-M18-002	DW-AS-623-M18-120
NPN NO	DW-AD-621-M18	DW-AS-611-M18-002	DW-AS-621-M18-120
PNP NC		DW-AS-614-M18-002	
Other types available	PNP NC, NPN NC	NPN NC	PNP NC, NPN NC

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CLASSICS	EXTRA DISTANCE	EXTRA DISTANCE	EXTRA DISTANCE
M18	M18	M18	M18
8	12	12	12



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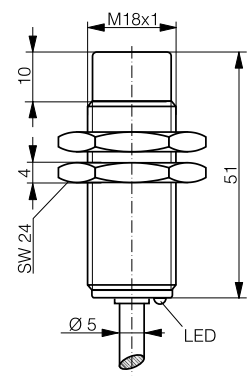
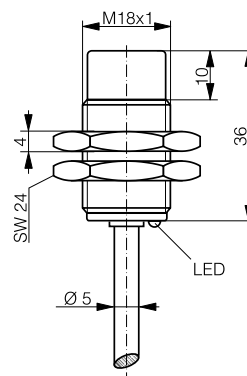
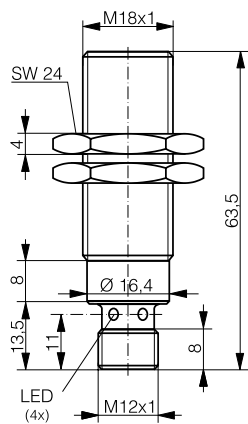
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Nickel-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connector S12	PVC cable	PVC cable	Connector S12
IP 67	IP 67	IP 67	IP 67
Embeddable	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable
1500 Hz	500 Hz	500 Hz	500 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
DW-AS-623-M18-002	DW-AD-503-M18-120	DW-AD-503-M18	DW-AS-503-M18-120
DW-AS-621-M18-002	DW-AD-501-M18-120	DW-AD-501-M18	DW-AS-501-M18-120
DW-AS-624-M18-002			
NPN NC	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC

BASIC

INDUCTIVE

FAMILY	EXTRA DISTANCE	EXTRA DISTANCE	EXTRA DISTANCE
HOUSING SIZE	M18	M18	M18
OPERATING DISTANCE MM	12	20	20



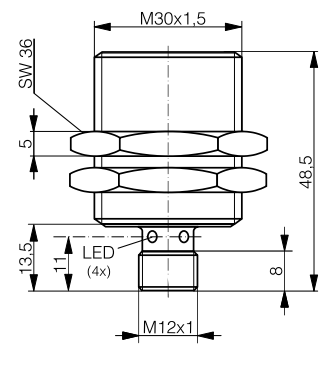
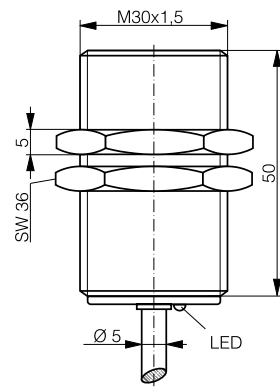
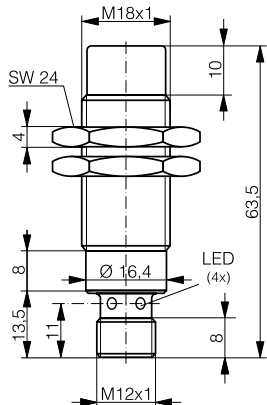
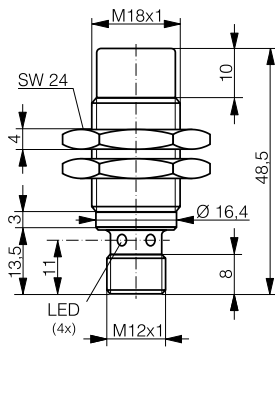
DATA			
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connection	Connector S12	PVC cable	PVC cable
Degree of protection	IP 67	IP 67	IP 67
Mounting	Quasi-embeddable	Non-embeddable	Non-embeddable
Max. switching frequency	500 Hz	200 Hz	200 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AS-503-M18-002	DW-AD-513-M18-120	DW-AD-513-M18
NPN NO	DW-AS-501-M18-002	DW-AD-511-M18-120	DW-AD-511-M18
PNP NC	DW-AS-504-M18-002		DW-AD-514-M18
Other types available	NPN NC	PNP NC, NPN NC	NPN NC

BASIC

EXTRA DISTANCE	EXTRA DISTANCE	CLASSICS	CLASSICS	Inductive
M18	M18	M30	M30	
20	20	10	10	



Photoelectric
Ultrasonic
Capacitive



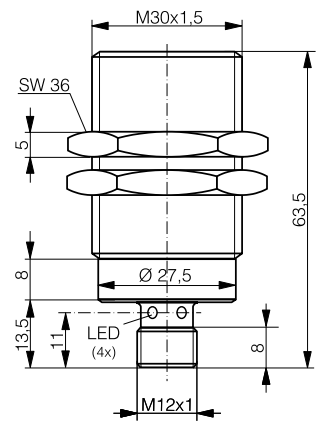
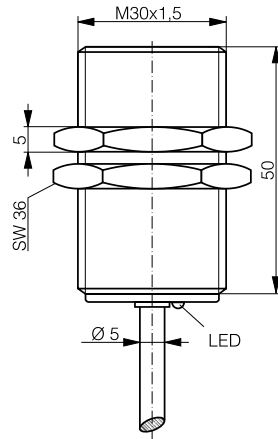
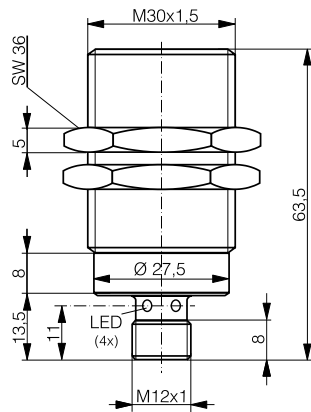
Safety
RFID

EXTRA DISTANCE	EXTRA DISTANCE	CLASSICS	CLASSICS	Connectivity
Chrome-plated brass	Chrome-plated brass	Nickel-plated brass	Nickel-plated brass	
Connector S12	Connector S12	PVC cable	Connector S12	
IP 67	IP 67	IP 67	IP 67	Accessories
Non-embeddable	Non-embeddable	Embeddable	Embeddable	
200 Hz	200 Hz	1200 Hz	1200 Hz	
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	Glossary
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	
DW-AS-513-M18-120	DW-AS-513-M18-002	DW-AD-603-M30	DW-AS-603-M30-120	Index
DW-AS-511-M18-120	DW-AS-511-M18-002	DW-AD-601-M30	DW-AS-601-M30-120	
	DW-AS-514-M18-002			
PNP NC, NPN NC	NPN NC	PNP NC, NPN NC	PNP NC, NPN NC	

BASIC

INDUCTIVE

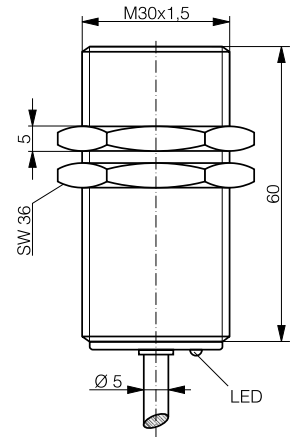
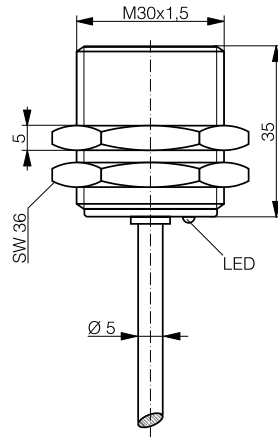
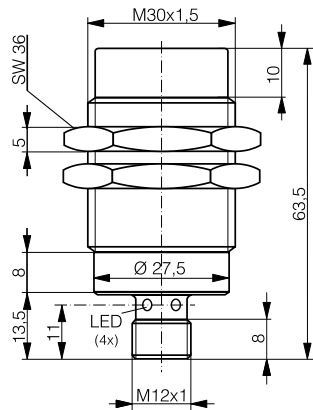
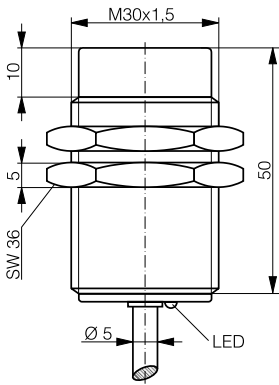
FAMILY	CLASSICS	FULL INOX	FULL INOX
HOUSING SIZE	M30	M30	M30
OPERATING DISTANCE MM	10	10	10



DATA			
Housing material	Nickel-plated brass	Stainless steel V2A	Stainless steel V2A
Connection	Connector S12	PUR cable	Connector S12
Degree of protection	IP 67	IP 68	IP 68 & IP 69K
Mounting	Embeddable	Embeddable	Embeddable
Max. switching frequency	1200 Hz	50 Hz	50 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AS-603-M30-002	DW-AS-703-M30-BAS	DW-AD-703-M30-BAS
NPN NO	DW-AS-601-M30-002	DW-AS-701-M30-BAS	DW-AD-701-M30-BAS
PNP NC			
Other types available	PNP NC, NPN NC		

BASIC

CLASSICS	CLASSICS	EXTRA DISTANCE	EXTRA DISTANCE	Inductive
M30	M30	M30	M30	
15	15	22	22	



Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

Glossary

Index

Nickel-plated brass	Nickel-plated brass	Chrome-plated brass	Chrome-plated brass	
PVC cable	Connector S12	PVC cable	PVC cable	
IP 67	IP 67	IP 67	IP 67	
Non-embeddable	Non-embeddable	Quasi-embeddable	Quasi-embeddable	
700 Hz	700 Hz	200 Hz	200 Hz	
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	
DW-AD-613-M30	DW-AS-613-M30-002	DW-AD-503-M30-120	DW-AD-503-M30	
DW-AD-611-M30	DW-AS-611-M30-002	DW-AD-501-M30-120	DW-AD-501-M30	
			DW-AD-504-M30	
PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC	NPN NC	

BASIC

FAMILY

EXTRA DISTANCE

EXTRA DISTANCE

HOUSING SIZE

M30

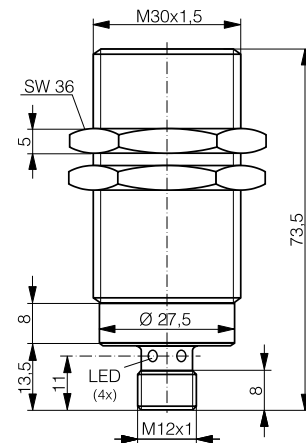
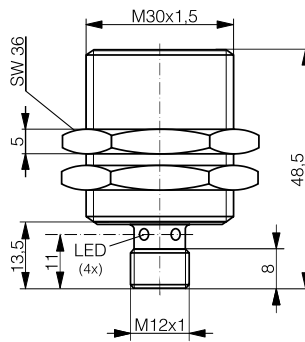
M30

OPERATING DISTANCE MM

22

22

INDUCTIVE



DATA

Housing material

Chrome-plated brass

Chrome-plated brass

Connection

Connector S12

Connector S12

Degree of protection

IP 67

IP 67

Mounting

Quasi-embeddable

Quasi-embeddable

Max. switching frequency

200 Hz

200 Hz

Supply voltage range

10 ... 30 VDC

10 ... 30 VDC

Ambient temperature range

-25 ... +70°C / -13 ... +158°F

-25 ... +70°C / -13 ... +158°F

Output current

≤ 200 mA

≤ 200 mA

PNP NO

DW-AS-503-M30-120

DW-AS-503-M30-002

NPN NO

DW-AS-501-M30-120

DW-AS-501-M30-002

PNP NC

DW-AS-504-M30-002

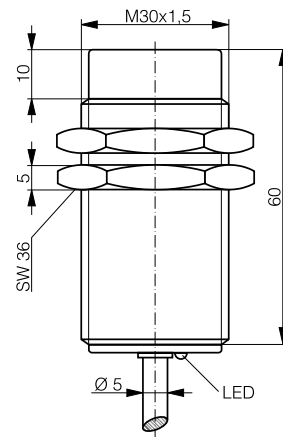
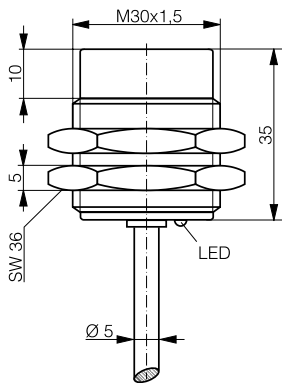
Other types available

PNP NC, NPN NC

NPN NC

BASIC

EXTRA DISTANCE	EXTRA DISTANCE
M30	M30
40	40



Inductive
Photoelectric
Ultrasonic
Capacitive
Safety
RFID
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Index

Chrome-plated brass
PVC cable
IP 67
Non-embeddable
100 Hz
10 ... 30 VDC
-25 ... +70°C / -13 ... +158°F
≤ 200 mA
DW-AD-513-M30-120
DW-AD-511-M30-120
PNP NC, NPN NC

Chrome-plated brass
PVC cable
IP 67
Non-embeddable
100 Hz
10 ... 30 VDC
-25 ... +70°C / -13 ... +158°F
≤ 200 mA
DW-AD-513-M30
DW-AD-511-M30
PNP NC, NPN NC

BASIC

FAMILY

EXTRA DISTANCE

EXTRA DISTANCE

HOUSING SIZE MM

M30

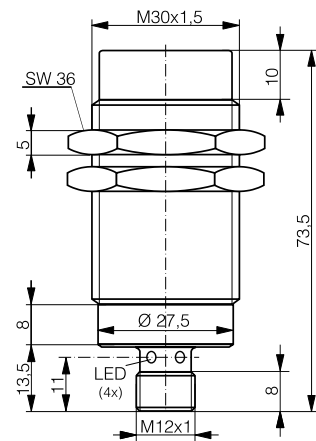
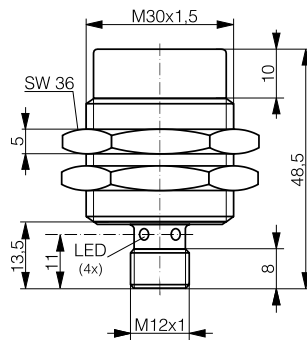
M30

OPERATING DISTANCE MM

40

40

INDUCTIVE



DATA

Housing material

Chrome-plated brass

Chrome-plated brass

Connection

Connector S12

Connector S12

Degree of protection

IP 67

IP 67

Mounting

Non-embeddable

Non-embeddable

Max. switching frequency

100 Hz

100 Hz

Supply voltage range

10 ... 30 VDC

10 ... 30 VDC

Ambient temperature range

-25 ... +70°C / -13 ... +158°F

-25 ... +70°C / -13 ... +158°F

Output current

≤ 200 mA

≤ 200 mA

PNP NO

DW-AS-513-M30-120

DW-AS-513-M30-002

NPN NO

DW-AS-511-M30-120

DW-AS-511-M30-002

PNP NC

DW-AS-514-M30-002

PNP NO + NC

NPN NO + NC

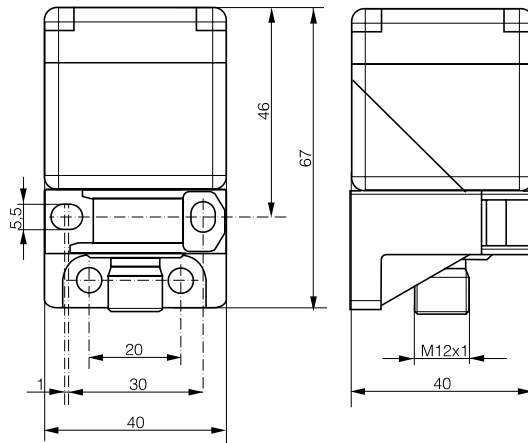
Other types available

PNP NC, NPN NC

NPN NC

BASIC

CLASSICS	CLASSICS	CLASSICS
□ 40 x 40	□ 40 x 40	□ 40 x 40
15	20	30



PA GF	PA GF	PA GF
Connector S12	Connector S12	Connector S12
IP 68 / IP 69K	IP 68 / IP 69K	IP 68 / IP 69K
Embeddable	Embeddable	Non-embeddable
100 Hz	100 Hz	100 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +85°C / -13 ... +185°F	-25 ... +85°C / -13 ... +185°F	-25 ... +85°C / -13 ... +185°F
≤ 200 mA	≤ 200 mA	≤ 200 mA
DW-AS-60A-C44	DW-AS-62A-C44	DW-AS-61A-C44
DW-AS-60B-C44	DW-AS-62B-C44	DW-AS-61B-C44

- Inductive
- Photoelectric
- Ultrasonic
- Capacitive
- Safety
- RFID
- Connectivity
- Accessories
- Glossary
- Index

BASIC

FAMILY

CLASSICS

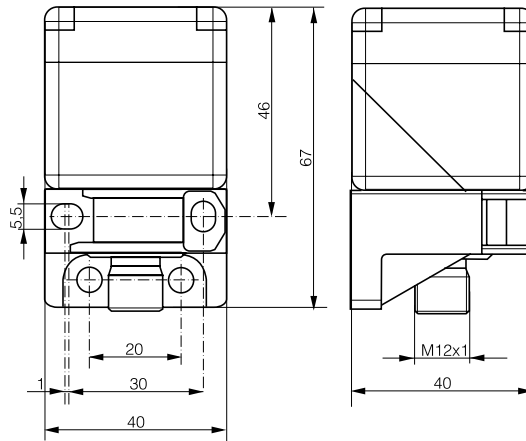
HOUSING SIZE MM

□ 40 x 40

OPERATING DISTANCE MM

40

INDUCTIVE



DATA

Housing material	PA GF
Connection	Connector S12
Degree of protection	IP 68 / IP 69K
Mounting	Non-embeddable
Max. switching frequency	100 Hz
Supply voltage range	10 ... 30 VDC
Ambient temperature range	-25 ... +85°C / -13 ... +185°F
Output current	≤ 200 mA
PNP NO + NC	DW-AS-63A-C44
NPN NO + NC	DW-AS-63B-C44
Other types available	





FULL FUNCTIONALITY, SMALLEST SIZE

MINIATURE INDUCTIVE SENSORS

KEY ADVANTAGES

Classics, Extra Distance and Full Inox

- ✓ High quality ASIC sensors with IO-Link interface
- ✓ Smallest self-contained inductive sensors on the market
- ✓ Outstanding temperature stability from -25°C (-13°F) to +70°C (+158°F)
- ✓ High switching frequency up to 5000 Hz
- ✓ Electronics vacuum potted for optimum long-term reliability under high stress

Full Inox

- ✓ Extremely robust one-piece stainless-steel housing
- ✓ Corrosion resistant
- ✓ IP 68 and IP 69K, sea water resistant
- ✓ Pressure resistant up to 80 bar

RANGE OVERVIEW	Housing size	Classics	Extra Distance	Full Inox
MINIATURE	∅ 3 mm	p. 71-72		
	M4	p. 72-73		
	∅ 4 mm	p. 73-75	p. 75	p. 75
	M5	p. 76-77	p. 77	p. 78
	C5	p. 78-79		

FAMILY

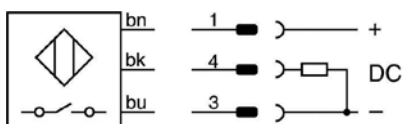
HOUSING SIZE MM

OPERATING DISTANCE MM

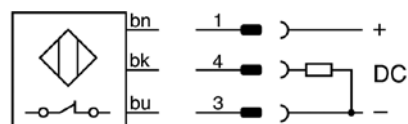
INDUCTIVE

WIRING DIAGRAMS

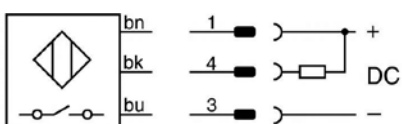
PNP NO



PNP NC



NPN NO



DATA

Housing material

Connection

Degree of protection

Mounting

Max. switching frequency

Supply voltage range

Ambient temperature range

Output current

PNP NO

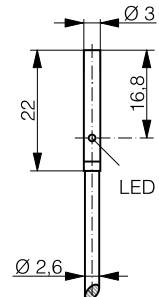
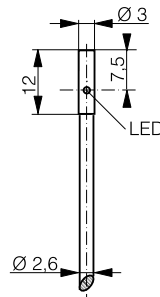
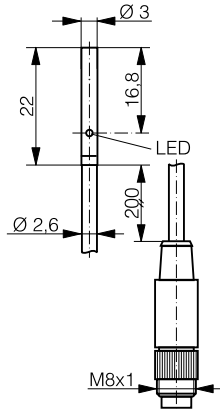
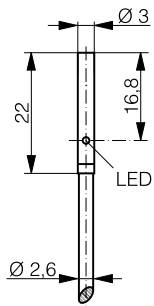
NPN NO

PNP NC

Other types available

MINIATURE

CLASSICS	CLASSICS	CLASSICS	CLASSICS
Ø 3	Ø 3	Ø 3	Ø 3
0.6	0.6	1	1



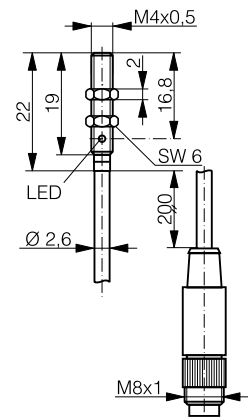
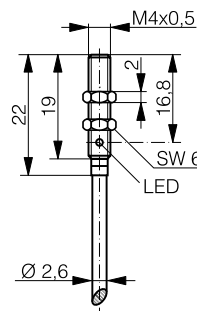
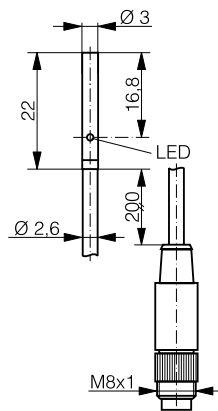
Inductive
Photoelectric
Ultrasonic
Capacitive
Safety
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Accessories
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Index

Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
PUR cable	PUR cable / Connector S8	PUR cable	PUR cable
IP 67	IP 67	IP 67	IP 67
Embeddable	Embeddable	Embeddable	Embeddable
5000 Hz	5000 Hz	8000 Hz	3000 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 100 mA	≤ 100 mA	≤ 100 mA	≤ 100 mA
DW-AD-603-03	DW-AV-603-03-276	DW-AD-623-03-960	DW-AD-623-03
DW-AD-601-03	DW-AV-601-03-276	DW-AD-621-03-960	DW-AD-621-03
DW-AD-604-03			
NPN NC	PNP NC, NPN NC		PNP NC, NPN NC

MINIATURE

INDUCTIVE

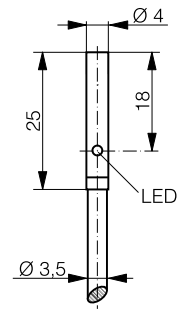
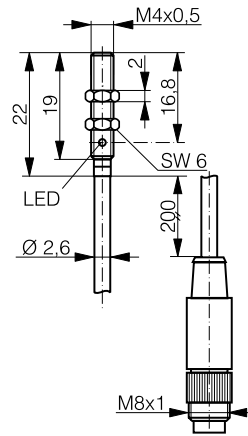
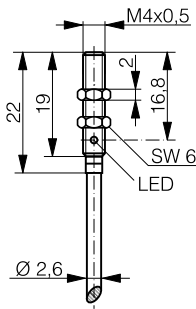
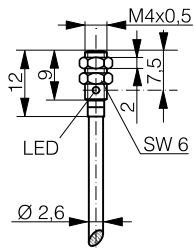
FAMILY	CLASSICS	CLASSICS	CLASSICS
HOUSING SIZE MM	Ø 3	M4	M4
OPERATING DISTANCE MM	1	0.6	0.6



DATA			
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection	PUR cable / Connector S8	PUR cable	PUR cable / Connector S8
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable
Max. switching frequency	3000 Hz	5000 Hz	5000 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 100 mA	≤ 100 mA	≤ 100 mA
PNP NO	DW-AV-623-03-276	DW-AD-603-M4	DW-AV-603-M4-276
NPN NO	DW-AV-621-03-276	DW-AD-601-M4	DW-AV-601-M4-276
PNP NC		DW-AD-604-M4	
Other types available	PNP NC, NPN NC	NPN NC	PNP NC, NPN NC

MINIATURE

CLASSICS	CLASSICS	CLASSICS	CLASSICS
M4	M4	M4	Ø 4
1	1	1	0.8



Inductive
Photoelectric
Ultrasonic
Capacitive
Safety
RFID
Connectivity
Accessories
Glossary
Index

Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
PUR cable	PUR cable	PUR cable / Connector S8	PVC cable
IP 67	IP 67	IP 67	IP 67
Embeddable	Embeddable	Embeddable	Embeddable
8000 Hz	3000 Hz	3000 Hz	5000 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 100 mA	≤ 100 mA	≤ 100 mA	≤ 200 mA
DW-AD-623-M4-960	DW-AD-623-M4	DW-AV-623-M4-276	DW-AD-603-04
DW-AD-621-M4-960	DW-AD-621-M4	DW-AV-621-M4-276	DW-AD-601-04
			DW-AD-604-04
	PNP NC, NPN NC	PNP NC, NPN NC	NPN NC

MINIATURE

FAMILY

CLASSICS

CLASSICS

CLASSICS

HOUSING SIZE MM

Ø 4

Ø 4

Ø 4

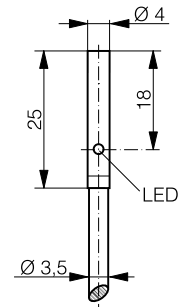
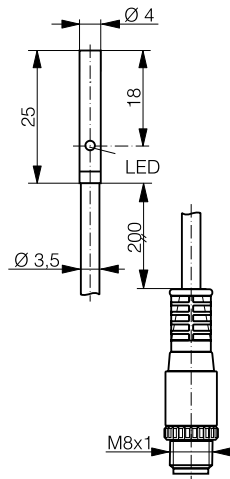
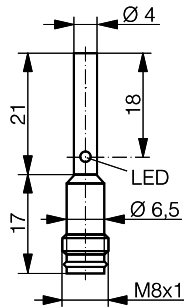
OPERATING DISTANCE MM

0.8

0.8

1.5

INDUCTIVE

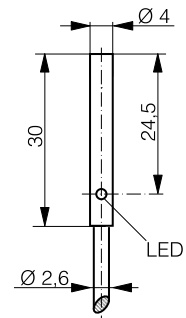
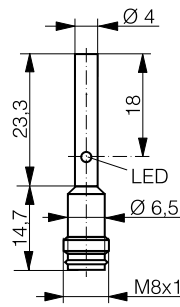
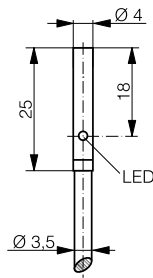
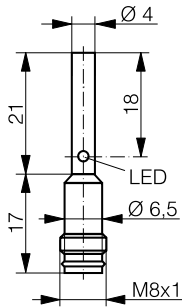


DATA

DATA			
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection	Connector S8	PVC cable / Connector S8	PVC cable
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable
Max. switching frequency	5000 Hz	5000 Hz	3000 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AS-603-04	DW-AV-603-04-236	DW-AD-623-04
NPN NO	DW-AS-601-04	DW-AV-601-04-236	DW-AD-621-04
PNP NC			DW-AD-624-04
Other types available	PNP NC, NPN NC	PNP NC, NPN NC	NPN NC

MINIATURE

CLASSICS	EXTRA DISTANCE	EXTRA DISTANCE	FULL INOX	Inductive
Ø 4	Ø 4	Ø 4	Ø 4	
1.5	2.5	2.5	3	



Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

Glossary

Index

CLASSICS	EXTRA DISTANCE	EXTRA DISTANCE	FULL INOX
Stainless steel V2A	Nickel silver	Nickel silver	Stainless steel V2A
Connector S8	PVC cable	Connector S8	PVC cable
IP 67	IP 67	IP 67	IP 67
Embeddable	Embeddable	Embeddable	Non-embeddable
3000 Hz	800 Hz	800 Hz	1200 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
DW-AS-623-04	DW-AD-503-04	DW-AS-503-04	DW-AD-713-04
DW-AS-621-04	DW-AD-501-04	DW-AS-501-04	DW-AD-711-04
		DW-AS-504-04	
PNP NC, NPN NC	PNP NC, NPN NC	NPN NC	

MINIATURE

FAMILY

CLASSICS

CLASSICS

CLASSICS

HOUSING SIZE MM

M5

M5

M5

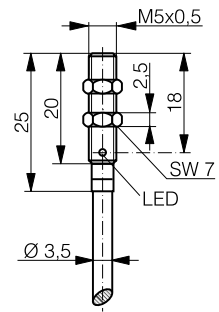
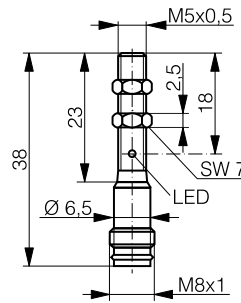
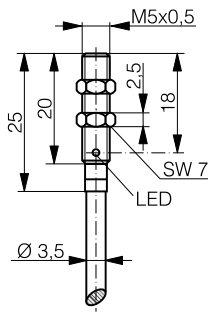
OPERATING DISTANCE MM

0.8

0.8

1.5

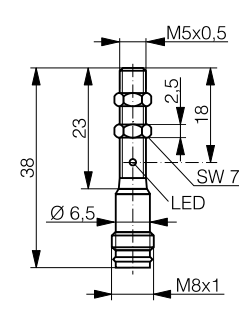
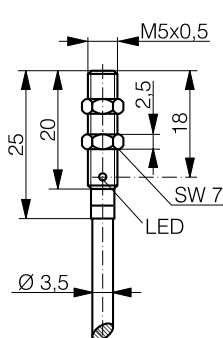
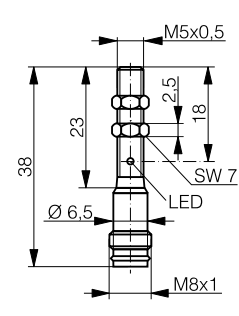
INDUCTIVE



DATA

Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection	PVC cable	Connector S8	PVC cable
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable
Max. switching frequency	5000 Hz	5000 Hz	3000 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AD-603-M5	DW-AS-603-M5	DW-AD-623-M5
NPN NO	DW-AD-601-M5	DW-AS-601-M5	DW-AD-621-M5
PNP NC	DW-AD-604-M5	DW-AS-604-M5	DW-AD-624-M5
Other types available	NPN NC	NPN NC	NPN NC

CLASSICS	EXTRA DISTANCE	EXTRA DISTANCE	Inductive
M5	M5	M5	
1.5	2.5	2.5	



Photoelectric
Ultrasonic
Capacitive
Safety
RFID
Connectivity

CLASSICS	EXTRA DISTANCE	EXTRA DISTANCE	Accessories
Stainless steel V2A	Nickel silver	Nickel silver	Connector S8
Connector S8	PVC cable	Connector S8	IP 67
IP 67	IP 67	IP 67	Embeddable
Embeddable	Embeddable	Embeddable	3000 Hz
3000 Hz	800 Hz	800 Hz	10 ... 30 VDC
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	-25 ... +70°C / -13 ... +158°F
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	≤ 200 mA
≤ 200 mA	≤ 200 mA	≤ 200 mA	Index
DW-AS-623-M5	DW-AD-503-M5	DW-AS-503-M5	
DW-AS-621-M5	DW-AD-501-M5	DW-AS-501-M5	
DW-AS-624-M5	DW-AD-504-M5	DW-AS-504-M5	
NPN NC	NPN NC	NPN NC	

MINIATURE

FAMILY

FULL INOX

CLASSICS

HOUSING SIZE MM

M5

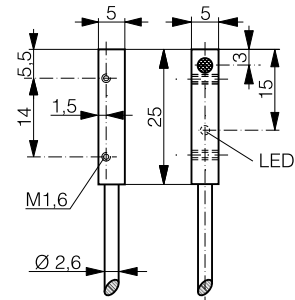
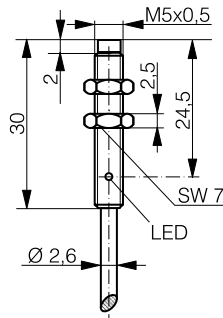
□ 5 x 5

OPERATING DISTANCE MM

3

0.8

INDUCTIVE



DATA

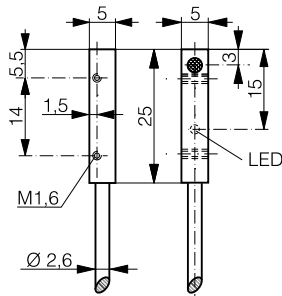
Housing material	Stainless steel V2A	Chrome-plated brass
Connection	PVC cable	PUR cable
Degree of protection	IP 67	IP 67
Mounting	Non-embeddable	Embeddable
Max. switching frequency	1200 Hz	5000 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 200 mA	≤ 200 mA
PNP NO	DW-AD-713-M5	DW-AD-603-C5
NPN NO	DW-AD-711-M5	DW-AD-601-C5
PNP NC		DW-AD-604-C5
Other types available		NPN NC

MINIATURE

CLASSICS

□ 5 x 5

1.5



Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

Glossary

Index

Chrome-plated brass

PUR cable

IP 67

Embeddable

3000 Hz

10 ... 30 VDC

-25 ... +70°C / -13 ... +158°F

≤ 200 mA

DW-AD-623-C5

DW-AD-621-C5

DW-AD-624-C5

NPN NC



EXTREME DURABILITY IN HARSH ENVIRONMENTS

EXTREME

INDUCTIVE SENSORS

KEY ADVANTAGES

- ✓ Mechanically and chemically extremely robust
- ✓ Corrosion resistant
- ✓ IP 68 and IP 69K, sea water resistant
- ✓ Pressure resistant up to 80 bar (1160 psi)

RANGE OVERVIEW

Housing size

Full Inox

EXTREME

M8

p. 83-84

M12

p. 84-86

M18

p. 86-88

M30

p. 88-89

C23

p. 90

FAMILY

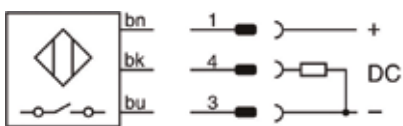
HOUSING SIZE

OPERATING DISTANCE MM

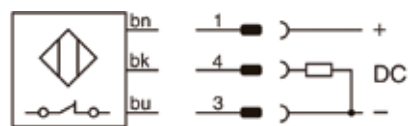
INDUCTIVE

WIRING DIAGRAMS

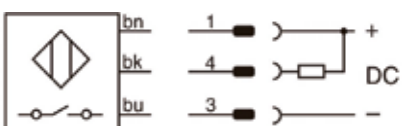
PNP NO



PNP NC



NPN NO



DATA

Sensing face material

Housing material

Connection

Degree of protection

Mounting

Max. switching frequency

Supply voltage range

Ambient temperature range

Output current

PNP NO

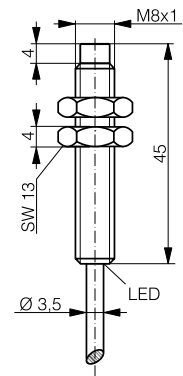
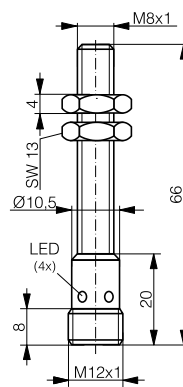
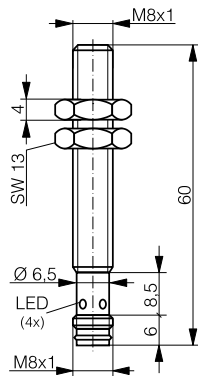
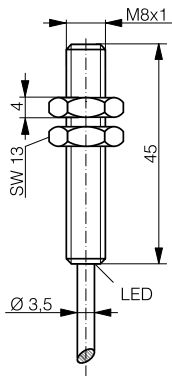
NPN NO

PNP NC

Other types available

EXTREME

FULL INOX	FULL INOX	FULL INOX	FULL INOX	Inductive
M8	M8	M8	M8	
3	3	3	6	



- Photoelectric
- Ultrasonic
- Capacitive
- Safety
- RFID

				Connectivity
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Accessories
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	
PUR cable	Connector S8	Connector S12	PUR cable	
IP 68	IP 67	IP 67	IP 68	Glossary
Embeddable	Embeddable	Embeddable	Non-embeddable	
1000 Hz	1000 Hz	1000 Hz	700 Hz	
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	Index
DW-AD-703-M8	DW-AS-703-M8-001	DW-AS-703-M8	DW-AD-713-M8	
DW-AD-701-M8	DW-AS-701-M8-001	DW-AS-701-M8	DW-AD-711-M8	
DW-AD-704-M8			DW-AD-714-M8	
NPN NC	PNP NC, NPN NC	PNP NC, NPN NC	NPN NC	

EXTREME

FAMILY

FULL INOX

FULL INOX

FULL INOX

HOUSING SIZE

M8

M8

M12

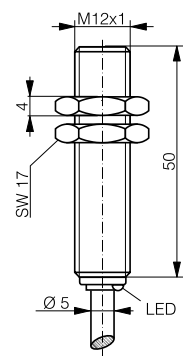
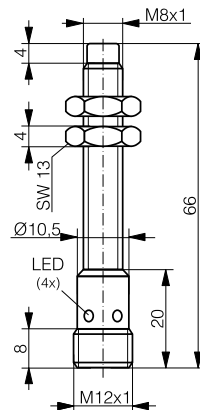
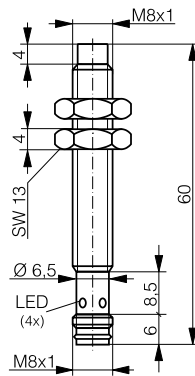
OPERATING DISTANCE MM

6

6

2

INDUCTIVE



DATA

Sensing face material

Stainless steel V2A

Stainless steel V2A

Stainless steel V2A

Housing material

Stainless steel V2A

Stainless steel V2A

Stainless steel V2A

Connection

Connector S8

Connector S12

PUR cable

Degree of protection

IP 67

IP 67

IP 68 / IP 69K

Mounting

Non-embeddable

Non-embeddable

Embeddable

Max. switching frequency

700 Hz

700 Hz

850 Hz

Supply voltage range

10 ... 30 VDC

10 ... 30 VDC

10 ... 30 VDC

Ambient temperature range

-25 ... +70°C / -13 ... +158°F

-25 ... +70°C / -13 ... +158°F

-25 ... +70°C / -13 ... +158°F

Output current

≤ 200 mA

≤ 200 mA

≤ 200 mA

PNP NO

DW-AS-713-M8-001

DW-AS-713-M8

DW-AD-703-M12-303

NPN NO

DW-AS-711-M8-001

DW-AS-711-M8

DW-AD-701-M12-303

PNP NC

Other types available

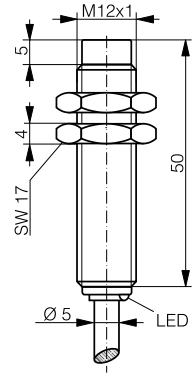
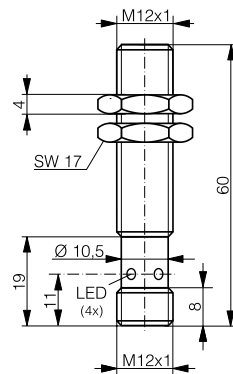
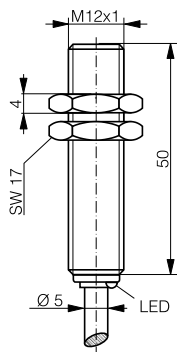
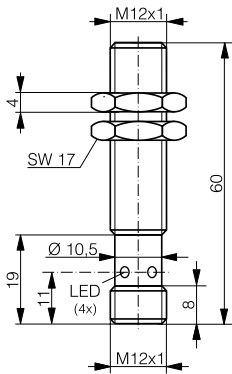
PNP NC, NPN NC

PNP NC, NPN NC

PNP NC, NPN NC

EXTREME

FULL INOX	FULL INOX	FULL INOX	FULL INOX
M12	M12	M12	M12
2	6	6	10



Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connector S12	PUR cable	Connector S12	PUR cable
IP 68 / IP 69K	IP 68 / IP 69K	IP 68 / IP 69K	IP 68 / IP 69K
Embeddable	Embeddable	Embeddable	Non-embeddable
850 Hz	600 Hz	600 Hz	400 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
DW-AS-703-M12-303	DW-AD-703-M12	DW-AS-703-M12	DW-AD-713-M12
DW-AS-701-M12-303	DW-AD-701-M12	DW-AS-701-M12	DW-AD-711-M12
		DW-AS-704-M12	
PNP NC, NPN NC	PNP NC, NPN NC	NPN NC	PNP NC, NPN NC

Inductive
Photoelectric
Ultrasonic
Capacitive
Safety
RFID
Connectivity
Accessories
Glossary
Index

EXTREME

FAMILY

FULL INOX

FULL INOX

FULL INOX

HOUSING SIZE

M12

M12

M18

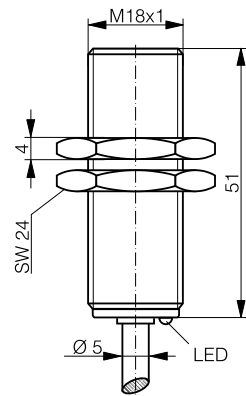
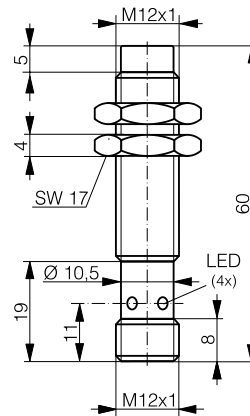
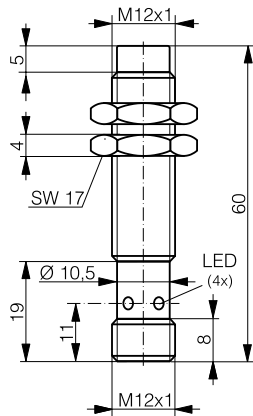
OPERATING DISTANCE MM

10

15

5

INDUCTIVE



DATA

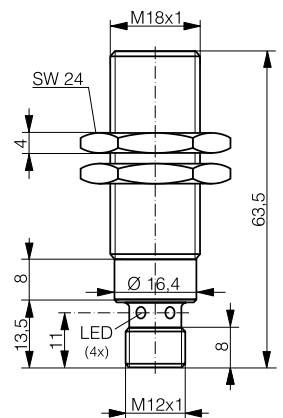
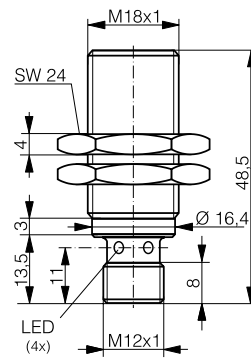
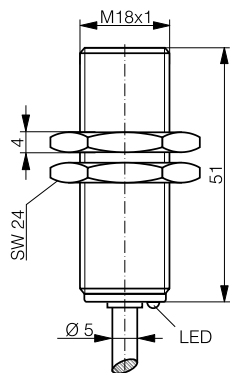
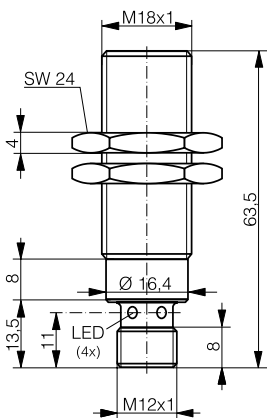
Sensing face material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection	Connector S12	Connector S12	PUR cable
Degree of protection	IP 68 / IP 69K	IP 68 / IP 69K	IP 68 / IP 69K
Mounting	Non-embeddable	Non-embeddable	Embeddable
Max. switching frequency	400 Hz	220 Hz	500 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AS-713-M12	DW-AS-733-M12	DW-AD-703-M18-303
NPN NO	DW-AS-711-M12	DW-AS-731-M12	DW-AD-701-M18-303
PNP NC			
Other types available	PNP NC, NPN NC		PNP NC, NPN NC

EXTREME

FULL INOX	FULL INOX	FULL INOX	FULL INOX	Inductive
M18	M18	M18	M18	
5	10	10	10	



Photoelectric
Ultrasonic
Capacitive



Safety
RFID

				Connectivity
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Accessories
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	
Connector S12	PUR cable	Connector S12	Connector S12	Glossary
IP 68 / IP 69K	IP 68 / IP 69K	IP 68 / IP 69K	IP 68 / IP 69K	
Embeddable	Embeddable	Embeddable	Embeddable	Index
500 Hz	200 Hz	200 Hz	200 Hz	
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	
DW-AS-703-M18-303	DW-AD-703-M18	DW-AS-703-M18-120	DW-AS-703-M18-002	
DW-AS-701-M18-303	DW-AD-701-M18	DW-AS-701-M18-120	DW-AS-701-M18-002	
	DW-AD-704-M18		DW-AS-704-M18-002	
PNP NC, NPN NC	NPN NC	PNP NC, NPN NC	NPN NC	

EXTREME

FAMILY

FULL INOX

FULL INOX

FULL INOX

HOUSING SIZE

M18

M18

M30

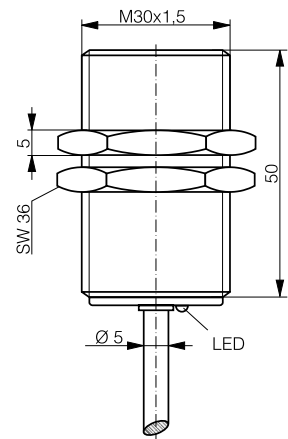
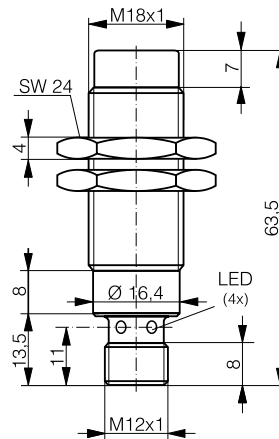
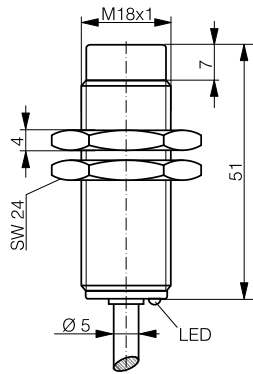
OPERATING DISTANCE MM

20

20

20

INDUCTIVE

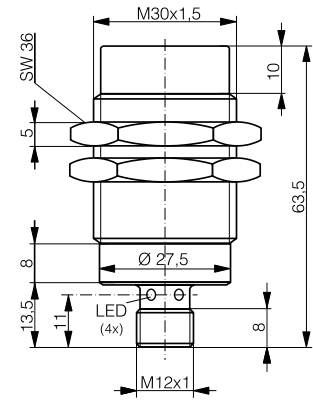
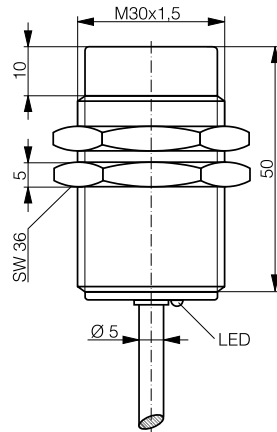
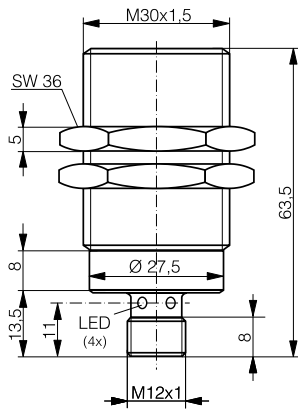


DATA

Sensing face material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection	PUR cable	Connector S12	PUR cable
Degree of protection	IP 68 / IP 69K	IP 68 / IP 69K	IP 68 / IP 69K
Mounting	Non-embeddable	Non-embeddable	Embeddable
Max. switching frequency	200 Hz	200 Hz	100 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AD-713-M18	DW-AS-713-M18-002	DW-AD-703-M30
NPN NO	DW-AD-711-M18	DW-AS-711-M18-002	DW-AD-701-M30
PNP NC			DW-AD-704-M30
Other types available	PNP NC, NPN NC	PNP NC, NPN NC	NPN NC

EXTREME

FULL INOX	FULL INOX	FULL INOX
M30	M30	M30
20	40	40



Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

Glossary

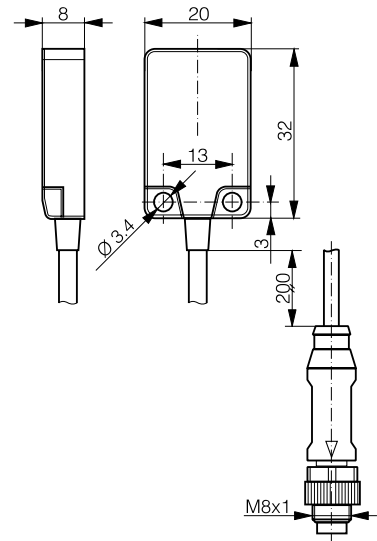
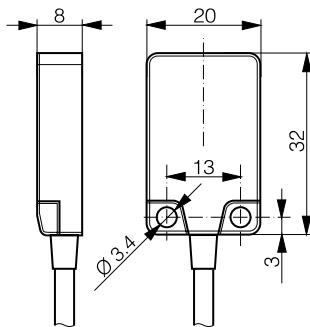
Index

Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connector S12	PUR cable	Connector S12
IP 68 / IP 69K	IP 68 / IP 69K	IP 68 / IP 69K
Embeddable	Non-embeddable	Non-embeddable
100 Hz	90 Hz	90 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 200 mA	≤ 200 mA	≤ 200 mA
DW-AS-703-M30-002	DW-AD-713-M30	DW-AS-713-M30-002
DW-AS-701-M30-002	DW-AD-711-M30	DW-AS-711-M30-002
PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC

EXTREME

INDUCTIVE

FAMILY	FULL INOX	FULL INOX
HOUSING SIZE	C23	C23
OPERATING DISTANCE MM	7	7



DATA		
Housing material	Stainless steel V2A	Stainless steel V2A
Connection	PUR cable	Pigtail
Degree of protection	IP 68 & IP 69K	IP 68 & IP 69K
Mounting	Embeddable	Embeddable
Max. switching frequency	180 Hz	180 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +85°C / -13 ... +185°F	-25 ... +85°C / -13 ... +185°F
Output current	≤ 200 mA	≤ 200 mA
PNP NO	DW-AD-703-C23	DW-AV-703-C23-276
NPN NO	DW-AD-701-C23	DW-AV-701-C23-276
Other types available		



PRESSURE



PRESSURE RESISTANT UP TO 100 BAR (1451 PSI)

EXTRA PRESSURE

INDUCTIVE SENSORS

KEY ADVANTAGES

- ✓ Pressure resistant up to 100 bar (1451 psi)
- ✓ Mechanically and chemically rugged
- ✓ Impervious: IP 68
- ✓ Gas-tight sensing face
- ✓ Miniature devices

RANGE OVERVIEW	Housing size	Classics	Extra Distance
EXTRA PRESSURE	∅ 3 mm	p. 95	
	M5	p. 95	
	∅ 6.5 mm		p. 95

FAMILY

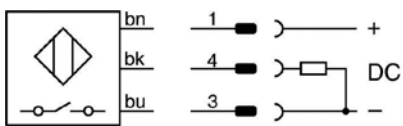
HOUSING SIZE MM

OPERATING DISTANCE MM

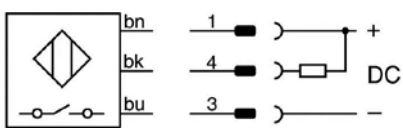
INDUCTIVE

WIRING DIAGRAMS

PNP NO



NPN NO



DATA

Sensing face material

Operating pressure

Housing material

Connection

Degree of protection

Mounting

Max. switching frequency

Supply voltage range

Ambient temperature range

Output current

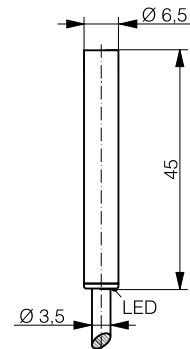
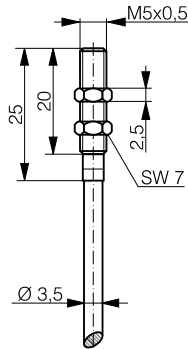
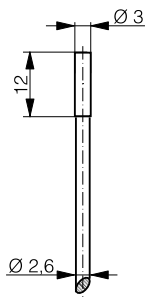
PNP NO

NPN NO

Other types available

EXTRA PRESSURE

CLASSICS	CLASSICS	EXTRA DISTANCE
Ø 3	M5	Ø 6.5
0.8	0.6	2.5



Ceramic ZrO ₂	Sapphire	Ceramic ZrO ₂
200 bar	20 bar	20 bar
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
PUR cable	PUR cable	PUR cable
IP 68	IP 68	IP 68
Embeddable	Embeddable	Embeddable
8000 Hz	5000 Hz	1000 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 100 mA	≤ 200 mA	≤ 200 mA
DW-AD-623-03E-961	DW-AD-603-M5E	DW-AD-503-065E
DW-AD-621-03E-961	DW-AD-601-M5E	DW-AD-501-065E
PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

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PRESSURE RESISTANT UP TO 500 BAR (7255 PSI)

HIGH PRESSURE INDUCTIVE SENSORS

KEY ADVANTAGES

- ✓ Highest operating (500 bar / 7255 psi) and peak pressure (1000 bar / 14510 psi) on the market
- ✓ Resistant to pressure cycles - 50 times longer lifetime under pressure than the market standard
- ✓ Gas-tight sensing face
- ✓ Large temperature range -25°C (-13°F) ... +100°C (+212°F)

RANGE OVERVIEW	Housing size	Extra Distance	Full Inox
HIGH PRESSURE	M5 / P5	p. 99	
	M8 / P8	p. 99	
	M12 / P12	p. 99-101	p. 101
	M14 / P20	p. 101-102	

FAMILY

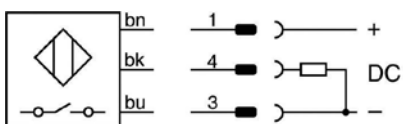
HOUSING SIZE

OPERATING DISTANCE MM

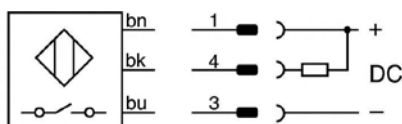
INDUCTIVE

WIRING DIAGRAMS

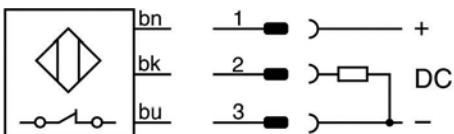
PNP NO



NPN NO



PNP NC



DATA

Sensing face material

Operating pressure

Peak pressure

Housing material

Connection

Degree of protection

Mounting

Max. switching frequency

Supply voltage range

Ambient temperature range

Output current

PNP NO

NPN NO

PNP NO ($S_n = 1.5 \text{ mm}$)

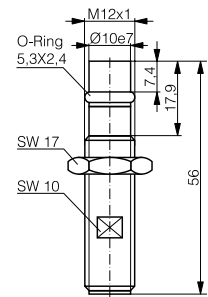
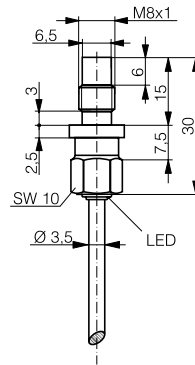
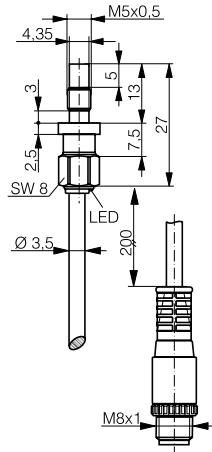
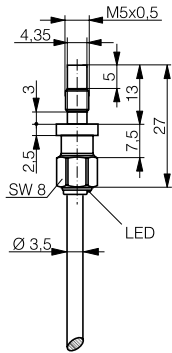
PNP NC ($S_n = 1.5 \text{ mm}$)

PNP NO ($S_n = 2.5 \text{ mm}$)

Other types available

HIGH PRESSURE

EXTRA DISTANCE	EXTRA DISTANCE	EXTRA DISTANCE	EXTRA DISTANCE	Inductive
M5 (P5)	M5 (P5)	M8 (P8)	M12 (P12)	
1	1	1.5	1.5 / 2.5	



Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

Glossary

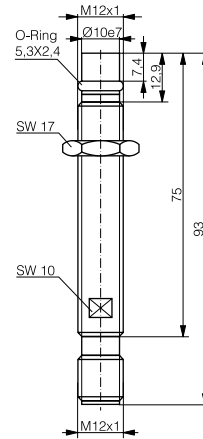
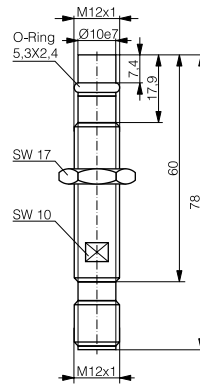
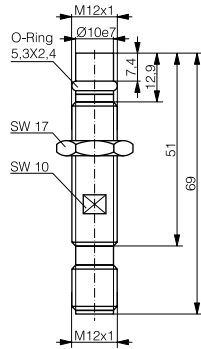
Index

Ceramic ZrO ₂	Ceramic ZrO ₂	Ceramic ZrO ₂	Ceramic ZrO ₂	
500 bar	500 bar	500 bar	500 bar	
1000 bar	1000 bar	1000 bar	1000 bar	
Stainless steel V4A / AISI 316L	Stainless steel V4A / AISI 316L	Stainless steel V4A / AISI 316L	Stainless steel V2A	
PUR cable	PUR cable / Connector S8	PUR cable	Connector S12	
IP 68	IP 68	IP 68	IP 68	
Embeddable	Embeddable	Embeddable	Embeddable	
1000 Hz	1000 Hz	800 Hz	600 Hz	
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	
-25 ... +100°C / -13 ... +212°F	-25 ... +100°C / -13 ... +212°F	-25 ... +100°C / -13 ... +212°F	-25 ... +80°C / -13 ... +176°F	
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	
DW-AD-503-P5	DW-AV-503-P5-276	DW-AD-503-P8		
DW-AD-501-P5	DW-AV-501-P5-276	DW-AD-501-P8		
			DW-AS-503-P12-630	
			DW-AS-504-P12-630	
			DW-AS-523-P12-630	
PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC	NPN NO, NPN NC	

HIGH PRESSURE

INDUCTIVE

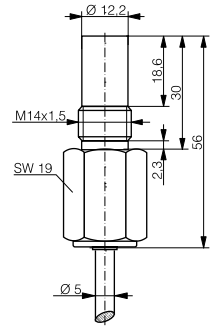
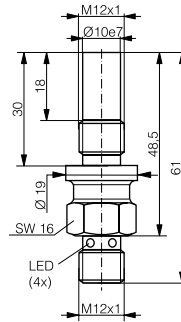
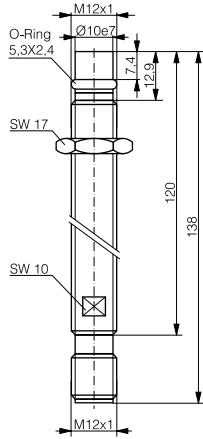
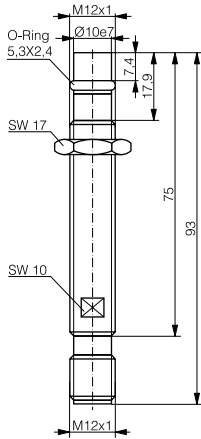
FAMILY	EXTRA DISTANCE	EXTRA DISTANCE	EXTRA DISTANCE
HOUSING SIZE	M12 (P12)	M12 (P12)	M12 (P12)
OPERATING DISTANCE MM	1.5	1.5	1.5



DATA			
Sensing face material	Ceramic ZrO ₂	Ceramic ZrO ₂	Ceramic ZrO ₂
Operating pressure	500 bar	500 bar	500 bar
Peak pressure	1000 bar	1000 bar	1000 bar
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection	Connector S12	Connector S12	Connector S12
Degree of protection	IP 68	IP 68	IP 68
Mounting	Embeddable	Embeddable	Embeddable
Max. switching frequency	600 Hz	600 Hz	600 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +80°C / -13 ... +176°F	-25 ... +80°C / -13 ... +176°F	-25 ... +80°C / -13 ... +176°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-AS-503-P12	DW-AS-503-P12-627	DW-AS-503-P12-621
NPN NO	DW-AS-501-P12	DW-AS-501-P12-627	DW-AS-501-P12-621
Other types available	PNP NC, NPN NC, 2.5 mm operating distance	PNP NC, NPN NC, 2.5 mm operating distance	PNP NC, NPN NC, 2.5 mm operating distance

HIGH PRESSURE

EXTRA DISTANCE	EXTRA DISTANCE	FULL INOX	EXTRA DISTANCE
M12 (P12)	M12 (P12)	M12 (P12)	M14 (P20)
1.5	1.5	1.5	3



Ceramic ZrO ₂	Ceramic ZrO ₂	Stainless steel V4A / AISI 316L	Ceramic ZrO ₂
500 bar	500 bar	500 bar	500 bar
1000 bar	1000 bar	800 bar	1000 bar
Stainless steel V2A	Stainless steel V2A	Stainless steel V4A / AISI 316L	Stainless steel V4A / AISI 316L
Connector S12	Connector S12	Connector S12	PUR cable
IP 68	IP 68	IP 68 / IP 69K	IP 68
Embeddable	Embeddable	Embeddable	Embeddable
600 Hz	600 Hz	850 Hz	500 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +80°C / -13 ... +176°F	-25 ... +80°C / -13 ... +176°F	-25 ... +85°C / -13 ... +185°F	-25 ... +80°C / -13 ... +176°F
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
DW-AS-503-P12-635	DW-AS-503-P12-622	DW-LS-703-P12G	DW-AD-503-P20
DW-AS-501-P12-635	DW-AS-501-P12-622	DW-LS-701-P12G	DW-AD-501-P20
PNP NC, NPN NC, 2.5 mm operating distance	PNP NC, NPN NC, 2.5 mm operating distance	PNP NC, NPN NC	PNP NC, NPN NC

Inductive
Photoelectric
Ultrasonic
Capacitive
Safety
RFID
Connectivity
Accessories
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HIGH PRESSURE

FAMILY

EXTRA DISTANCE

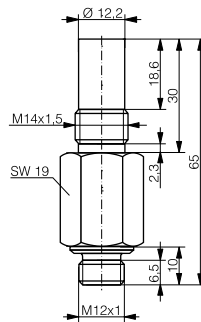
HOUSING SIZE

M14 (P20)

OPERATING DISTANCE MM

3

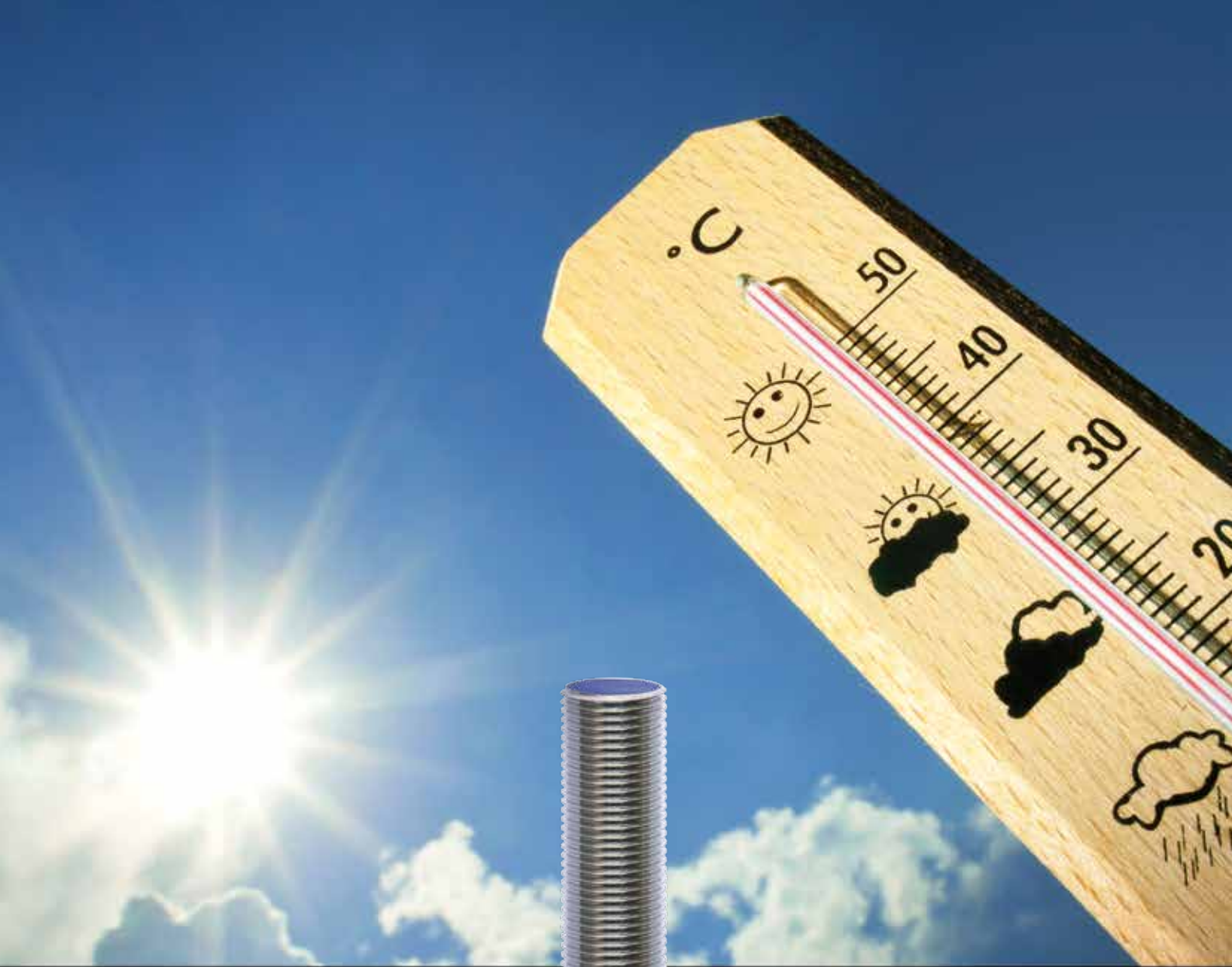
INDUCTIVE



DATA

Sensing face material	Ceramic ZrO ₂
Operating pressure	500 bar
Peak pressure	1000 bar
Housing material	Stainless steel V4A / AISI 316L
Connection	Connector S12
Degree of protection	IP 68
Mounting	Embeddable
Max. switching frequency	500 Hz
Supply voltage range	10 ... 30 VDC
Ambient temperature range	-25 ... +80°C / -13 ... +176°F
Output current	≤ 200 mA
PNP NO	DW-AS-503-P20
NPN NO	DW-AS-501-P20
Other types available	PNP NC, NPN NC





TEMPERATURE RESISTANT UP TO +120°C (+248°F)

EXTRA TEMPERATURE INDUCTIVE SENSORS

KEY ADVANTAGES

- ✓ Temperature resistant up to +120°C (+248°F)
- ✓ Excellent long term reliability
- ✓ Outstanding accuracy

RANGE OVERVIEW	Housing size	Classics
EXTRA TEMPERATURE	M5	p. 107
	M8	p. 107
	M12	p. 107
	M18	p. 107

FAMILY

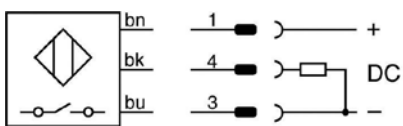
HOUSING SIZE

OPERATING DISTANCE MM

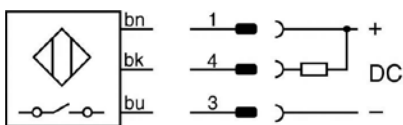
INDUCTIVE

WIRING DIAGRAMS

PNP NO



NPN NO



DATA

Housing material

Connection

Degree of protection

Mounting

Max. switching frequency

Supply voltage range

Ambient temperature range

Output current

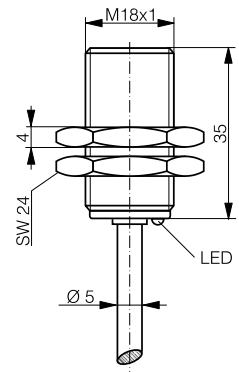
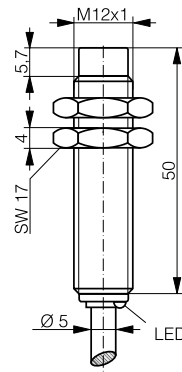
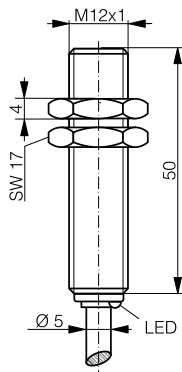
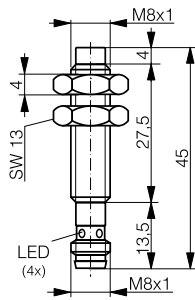
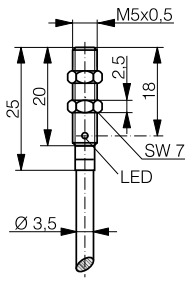
PNP NO

NPN NO

Other types available

EXTRA TEMPERATURE

CLASSICS	CLASSICS	CLASSICS	CLASSICS	CLASSICS
M5	M8	M12	M12	M18
0.8	4	2	4	5



Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

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Stainless steel V2A	Stainless steel V2A	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
Silicone cable 2 m	Connector S8	PVC cable 6 m	PVC cable 5 m	PUR cable 2 m
IP 67	IP 67	IP 67	IP 67	IP 67
Embeddable	Non-embeddable	Embeddable	Non-embeddable	Embeddable
5000 Hz	3500 Hz	3000 Hz	2000 Hz	2000 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25...+120°C / -13...+248°F	0...+85°C / +32 ...+185°F	-25...+100°C / -13...+212°F	-25...+100°C / -13...+212°F	-40...+100°C / -40...+212°F
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
DW-AD-603-M5-735	DW-AS-633-M8-732	DW-AD-603-M12-734	DW-AD-613-M12-733	DW-AD-603-M18-718
DW-AD-601-M5-735				



TEMPERATURE RESISTANT UP TO +230°C (+446°F)



HIGH TEMPERATURE INDUCTIVE SENSORS

KEY ADVANTAGES

- ✓ Models with external electronics for temperatures of up to +230°C (+446°F)
- ✓ Models with integrated electronics for temperatures of up to +180°C (+356°F)
- ✓ Excellent long term reliability

RANGE OVERVIEW

Housing size

Classics

HIGH TEMPERATURE

M8	p. 111
M12	p. 111
M18	p. 111
M30	p. 111
M50	p. 112

FAMILY

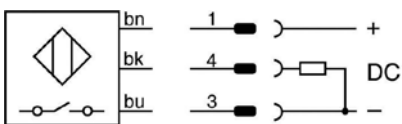
HOUSING SIZE

OPERATING DISTANCE MM

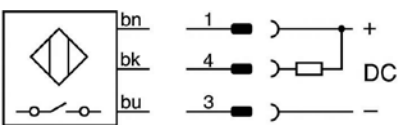
INDUCTIVE

WIRING DIAGRAMS

PNP NO



NPN NO



DATA

Amplifier

Housing material

Connection

Degree of protection

Mounting

Max. switching frequency

Supply voltage range

Ambient temperature range

Output current

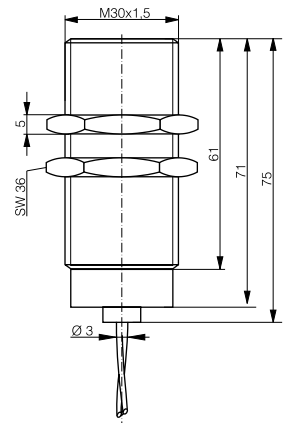
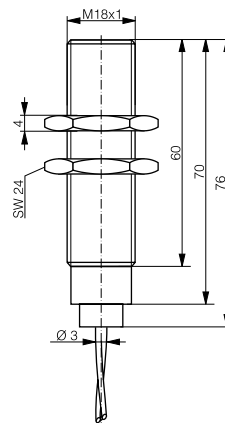
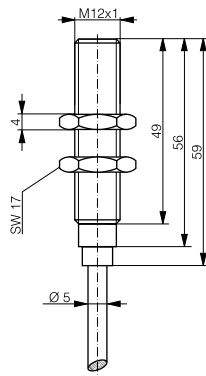
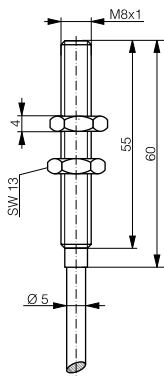
PNP NO

NPN NO

Other types available

HIGH TEMPERATURE

CLASSICS	CLASSICS	CLASSICS	CLASSICS
M8	M12	M18	M30
2	3	5	10



Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

Glossary

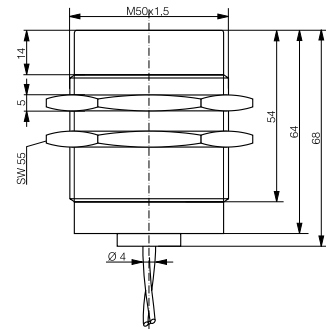
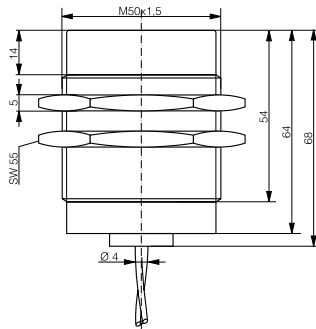
Index

Built-in	Built-in	Built-in	Built-in
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Silicone cable 2 m	Silicone cable 2 m	Teflon cable 2 m	Teflon cable 2 m
IP 67	IP 67	IP 67	IP 67
Embeddable	Embeddable	Embeddable	Embeddable
600 Hz	500 Hz	400 Hz	200 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
0 ... +140°C / +32 ... +280°F	0 ... +150°C / +32 ... +300°F	0 ... +180°C / +32 ... +350°F	0 ... +180°C / +32 ... +350°F
120 mA (≤ 100°C) / 80 mA (> 100°C)	120 mA (≤ 100°C) / 70 mA (> 100°C)	≤ 150 mA	≤ 150 mA
DW-HD-623-M8-100	DW-HD-603-M12-200	DW-HD-603-M18-310	DW-HD-603-M30-310
DW-HD-621-M8-100	DW-HD-601-M12-200	DW-HD-601-M18-310	DW-HD-601-M30-310
PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC	PNP NC, NPN NC

HIGH TEMPERATURE

INDUCTIVE

FAMILY	CLASSICS	CLASSICS
HOUSING SIZE	M50	M50
OPERATING DISTANCE MM	25	25



DATA		
Amplifier	External	External
Housing material	Stainless steel V2A	Stainless steel V2A
Connection	Teflon cable 5 m	Teflon cable 20 m
Degree of protection	IP 67	IP 67
Mounting	Non-embeddable	Non-embeddable
Max. switching frequency	150 Hz	150 Hz
Supply voltage range	10 ... 30 VDC (amplifier)	10 ... 30 VDC (amplifier)
Ambient temperature range	-40 ... +230°C / -40 ... +440°F	0 ... +230°C / + 32 ... +440°F
Output current	≤ 200 mA (amplifier)	≤ 200 mA (amplifier)
PNP NO	DW-HD-613-M50-511	DW-HD-613-M50-503
Other types available	For other cable lengths please ask	For other cable lengths please ask





ECOLAB APPROVED FOR HARSHTEST CLEANING PROCESSES

WASHDOWN

INDUCTIVE SENSORS

KEY ADVANTAGES

- ✓ Corrosion resistant
- ✓ Food safe
- ✓ IP 68 / IP 69K protection
- ✓ IO-Link interface
- ✓ Extremely rugged Full Inox types:
one-piece stainless-steel housing, factor 1 on steel and
aluminum, Ecolab approved

RANGE OVERVIEW	Housing size	Classics	Full Inox
WASHDOWN	M12	p. 117	p. 117
	M18		p. 117-118
	M30		p. 118

FAMILY

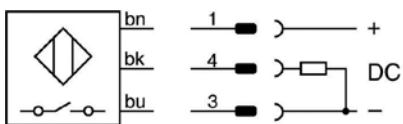
HOUSING SIZE

OPERATING DISTANCE MM

INDUCTIVE

WIRING DIAGRAM

PNP NO



DATA

Operating pressure

Housing material

Connection

Degree of protection

Mounting

Max. switching frequency

Supply voltage range

Ambient temperature range

Output current

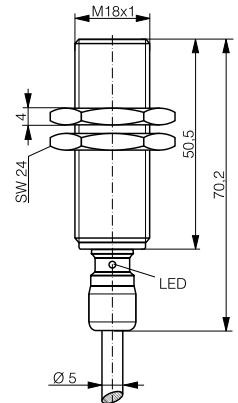
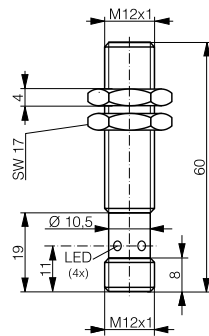
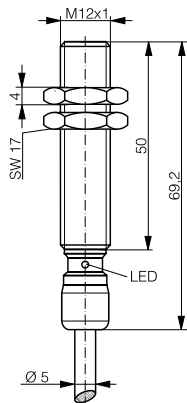
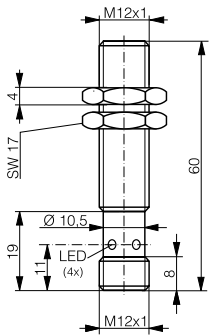
PNP NO

Other types available

WASHDOWN

CLASSICS	FULL INOX	FULL INOX	FULL INOX
M12	M12	M12	M18
2	6	6	10

Inductive
Photoelectric
Ultrasonic
Capacitive
Safety
RFID
Connectivity
Accessories
Glossary
Index

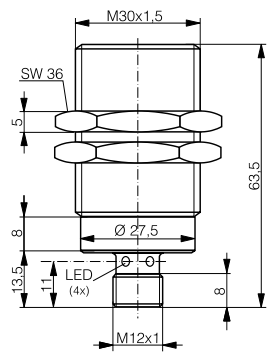
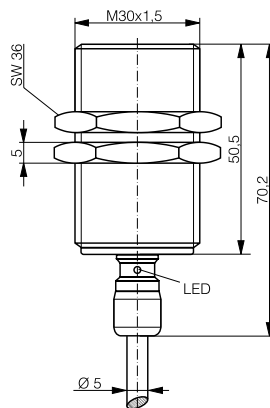
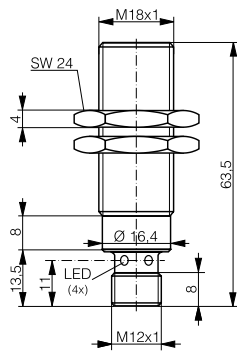


-	80 bar	80 bar	60 bar
PPS/Stainless steel V4A	Stainless steel V4A/AISI 316L	Stainless steel V4A/AISI 316L	Stainless steel V4A/AISI 316L
Connector S12	TPE-S cable	Connector S12	TPE-S cable
IP 68 / IP 69K	IP 68 / IP 69K	IP 68 / IP 69K	IP 68 / IP 69K
Embeddable	Embeddable	Embeddable	Embeddable
1700 Hz	600 Hz	600 Hz	300 Hz
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-40 ... +120°C / -40 ... +248°F	-25 ... +85°C / -13 ... +185°F	-25 ... +85°C / -13 ... +185°F	-25 ... +85°C / -13 ... +185°F
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
DW-LS-603-M12	DW-LD-703-M12	DW-LS-703-M12	DW-LD-703-M18
	NPN NO, PNP NC, NPN NC, non-embeddable	NPN NO, PNP NC, NPN NC, non-embeddable	NPN NO, PNP NC, NPN NC, non-embeddable

WASHDOWN

INDUCTIVE

FAMILY	FULL INOX	FULL INOX	FULL INOX
HOUSING SIZE	M18	M30	M30
OPERATING DISTANCE MM	10	20	20



DATA			
Operating pressure	60 bar	40 bar	40 bar
Housing material	Stainless steel V4A/AISI 316L	Stainless steel V4A/AISI 316L	Stainless steel V4A/AISI 316L
Connection	Connector S12	TPE-S cable	Connector S12
Degree of protection	IP 68 / IP 69K	IP 68 / IP 69K	IP 68 / IP 69K
Mounting	Embeddable	Embeddable	Embeddable
Max. switching frequency	300 Hz	100 Hz	100 Hz
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +85°C / -13 ... +185°F	-25 ... +85°C / -13 ... +185°F	-25 ... +85°C / -13 ... +185°F
Output current	≤ 200 mA	≤ 200 mA	≤ 200 mA
PNP NO	DW-LS-703-M18-002	DW-LD-703-M30	DW-LS-703-M30-002
Other types available	NPN NO, PNP NC, NPN NC, non-embeddable	NPN NO, PNP NC, NPN NC, non-embeddable	NPN NO, PNP NC, NPN NC, non-embeddable





ANALOG OUTPUT FOR DISTANCE CONTROL



ANALOG OUTPUT

INDUCTIVE SENSORS

KEY ADVANTAGES

- ✓ Longest sensing ranges
- ✓ Best temperature stability
- ✓ Excellent repeat accuracy
- ✓ Resolution in μm range

RANGE OVERVIEW

Housing size

Extra Distance

ANALOG

C8

p. 123

M8

p. 123-124

M12

p. 124-125

M18

p. 125-126

M30

p. 126-127

FAMILY

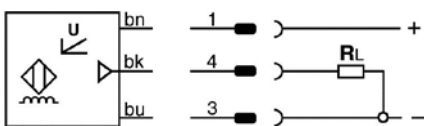
HOUSING SIZE MM

SENSING RANGE MM

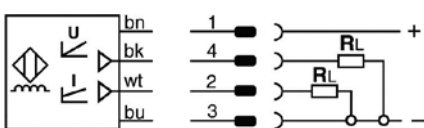
INDUCTIVE

WIRING DIAGRAMS

Analog C8/M8



Analog M12/M18/M30



DATA

Bandwidth (-3 dB)

Output voltage

Housing material

Connection

Degree of protection

Mounting

Supply voltage range

Ambient temperature range

Output current

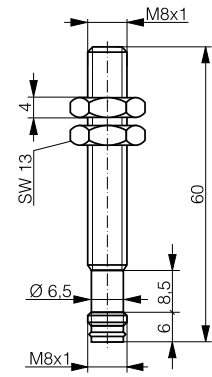
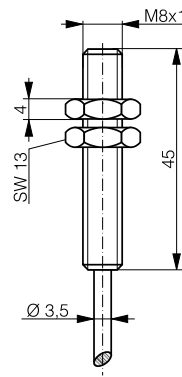
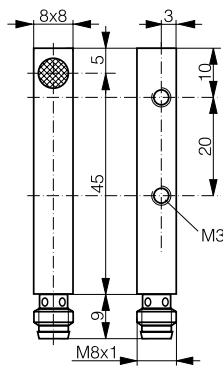
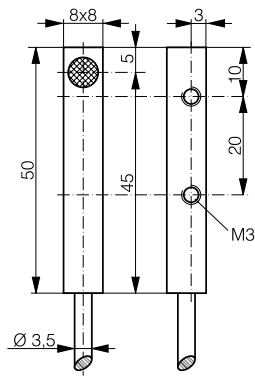
Output 0...10 V

Output 0...5 V

Other types available

ANALOG OUTPUT

EXTRA DISTANCE	EXTRA DISTANCE	EXTRA DISTANCE	EXTRA DISTANCE
□ 8 x 8	□ 8 x 8	M8	M8
0 ... 4	0 ... 4	0 ... 4	0 ... 4



1,600 Hz (at s = 2 mm)	1,600 Hz (at s = 2 mm)	1,600 Hz (at s = 2 mm)	1,600 Hz (at s = 2 mm)
0 ... 10 V	0 ... 10 V	0 ... 5 V / 0 ... 10 V (-390)	0 ... 10 V
Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
PUR cable	Connector S8	PUR cable	Connector S8
IP 67	IP 67	IP 67	IP 67
Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable
15 ... 30 VDC	15 ... 30 VDC	10 ... 30 VDC / 15 ... 30 VDC (-390)	15 ... 30 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
-	-	-	-
DW-AD-509-C8-390	DW-AS-509-C8-390	DW-AD-509-M8-390	DW-AS-509-M8-390
		DW-AD-509-M8	
			On request

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

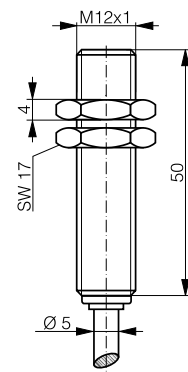
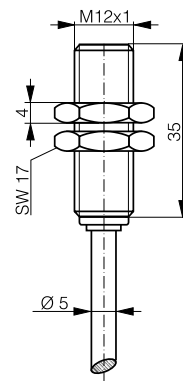
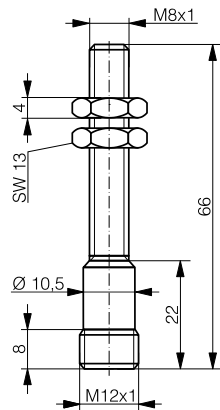
Glossary

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ANALOG OUTPUT

INDUCTIVE

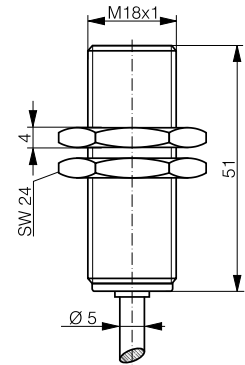
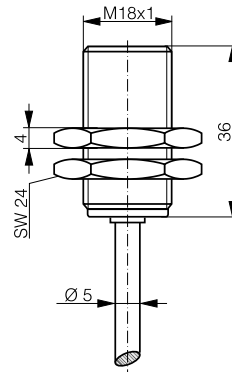
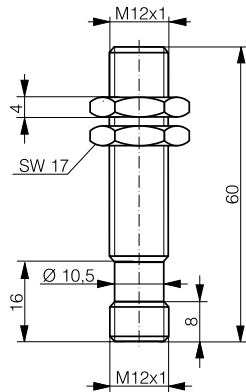
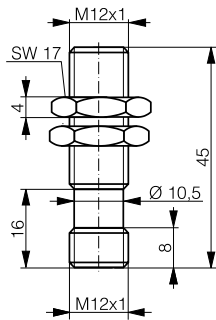
FAMILY	EXTRA DISTANCE	EXTRA DISTANCE	EXTRA DISTANCE
HOUSING SIZE	M8	M12	M12
SENSING RANGE MM	0 ... 4	0 ... 6	0 ... 6



DATA			
Bandwidth (-3 dB)	1,600 Hz (at s = 2 mm)	1,000 Hz (at s = 3 mm)	1,000 Hz (at s = 3 mm)
Output voltage	0 ... 10 V	0 ... 5 V / 0 ... 10 V (-390)	0 ... 5 V / 0 ... 10 V (-390)
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connection	Connector S12	PUR cable	PUR cable
Degree of protection	IP 67	IP 67	IP 67
Mounting	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable
Supply voltage range	15 ... 30 VDC	10 ... 30 / 15 ... 30 VDC (-320)	10 ... 30 / 15 ... 30 VDC (-390)
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	-	1 ... 5 mA (-120 only)	1 ... 5 mA / 4 ... 20 mA (-390)
Outputs 0...5 V / 1...5 mA		DW-AD-509-M12-120	DW-AD-509-M12
Output 0...10 V	DW-AS-509-M8-393	DW-AD-509-M12-320	
Outputs 0...10 V / 4...20 mA			DW-AD-509-M12-390
Other types available	On request		

ANALOG OUTPUT

EXTRA DISTANCE	EXTRA DISTANCE	EXTRA DISTANCE	EXTRA DISTANCE	Inductive
M12	M12	M18	M18	
0 ... 6	0 ... 6	0 ... 10	0 ... 10	



Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

Glossary

Index

1,000 Hz (at s = 3 mm)	1,000 Hz (at s = 3 mm)	500 Hz (at s = 5 mm)	500 Hz (at s = 5 mm)
0 ... 5 V / 0 ... 10 V (-320)	0 ... 5 V / 0 ... 10 V (-390)	0 ... 5 V / 0 ... 10 V (-320)	0 ... 5 V / 0 ... 10 V (-390)
Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connector S12	Connector S12	PUR cable	PUR cable
IP 67	IP 67	IP 67	IP 67
Quasi-embeddable	Quasi-embeddable	Quasi-embeddable	Quasi-embeddable
10 ... 30 / 15 ... 30 VDC (-320)	10 ... 30 / 15 ... 30 VDC (-390)	10 ... 30 / 15 ... 30 VDC (-320)	10 ... 30 / 15 ... 30 VDC (-390)
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
1 ... 5 mA (-120 only)	1 ... 5 mA / 4 ... 20 mA (-390)	1 ... 5 mA / 4 ... 20 mA (-320)	1 ... 5 mA / 4 ... 20 mA (-390)
DW-AS-509-M12-120	DW-AS-509-M12	DW-AD-509-M18-120	DW-AD-509-M18
DW-AS-509-M12-320			
	DW-AS-509-M12-390	DW-AD-509-M18-320	DW-AD-509-M18-390
			On request

ANALOG OUTPUT

FAMILY

EXTRA DISTANCE

EXTRA DISTANCE

EXTRA DISTANCE

HOUSING SIZE

M18

M18

M30

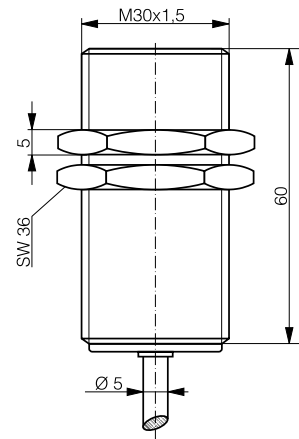
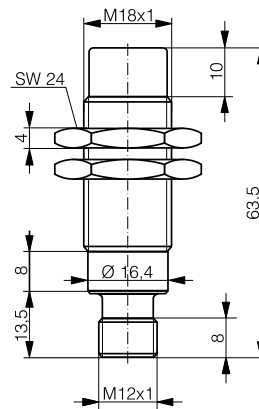
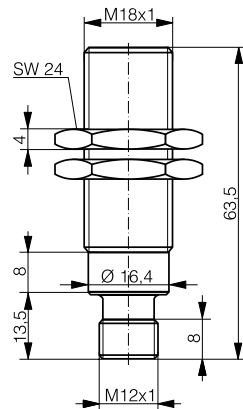
SENSING RANGE MM

0 ... 10

0 ... 20

0 ... 20

INDUCTIVE

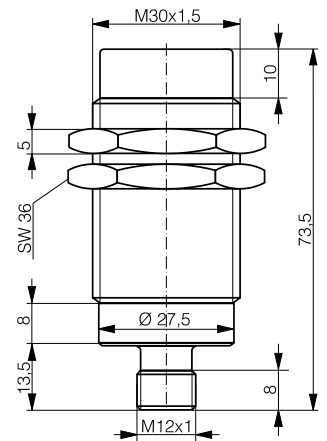
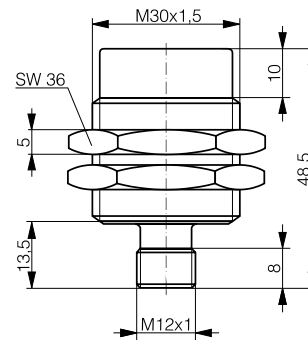
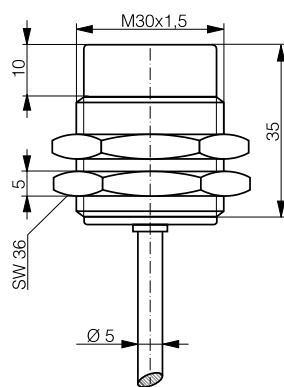
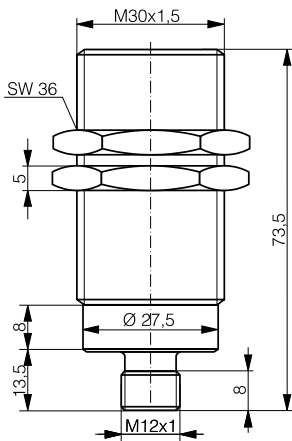


DATA

Bandwidth (-3 dB)	500 Hz (at s = 5 mm)	250 Hz (at s = 10 mm)	200 Hz (at s = 10 mm)
Output voltage	0 ... 5 V / 0 ... 10 V (-390)	0 ... 5 V / 0 ... 10 V (-390)	0 ... 5 V / 0 ... 10 V (-390)
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connection	Connector S12	Connector S12	PUR cable
Degree of protection	IP 67	IP 67	IP 67
Mounting	Quasi-embeddable	Non-embeddable	Quasi-embeddable
Supply voltage range	10 ... 30 / 15 ... 30 VDC (-390)	10 ... 30 / 15 ... 30 VDC (-390)	10 ... 30 / 15 ... 30 VDC (-390)
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	1 ... 5 mA / 4 ... 20 mA (-390)	1 ... 5 mA / 4 ... 20 mA (-390)	1 ... 5 mA / 4 ... 20 mA (-390)
Outputs 0...5 V / 1...5 mA	DW-AS-509-M18-002	DW-AS-519-M18-002	DW-AD-509-M30
Outputs 0...10 V / 4...20 mA	DW-AS-509-M18-390	DW-AS-519-M18-390	DW-AD-509-M30-390
Other types available	On request	On request	On request

ANALOG OUTPUT

EXTRA DISTANCE	EXTRA DISTANCE	EXTRA DISTANCE	EXTRA DISTANCE
M30	M30	M30	M30
0 ... 20	0 ... 40	0 ... 40	0 ... 40



200 Hz (at s = 10 mm)	100 Hz (at s = 20 mm)	100 Hz (at s = 20 mm)	100 Hz (at s = 20 mm)
0 ... 5 V / 0 ... 10 V (-390)	0 ... 5 V / 0 ... 10 V (-320)	0 ... 5 V / 0 ... 10 V (-320)	0 ... 5 V / 0 ... 10 V (-390)
Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connector S12	PUR cable	Connector S12	Connector S12
IP 67	IP 67	IP 67	IP 67
Quasi-embeddable	Non-embeddable	Non-embeddable	Non-embeddable
10 ... 30 / 15 ... 30 VDC (-390)	10 ... 30 / 15 ... 30 VDC (-320)	10 ... 30 / 15 ... 30 VDC (-320)	10 ... 30 / 15 ... 30 VDC (-390)
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
1 ... 5 mA / 4 ... 20 mA (-390)	1 ... 5 mA / 4 ... 20 mA (-320)	1 ... 5 mA / 4 ... 20 mA (-320)	1 ... 5 mA / 4 ... 20 mA (-390)
DW-AS-509-M30-002	DW-AD-519-M30-120	DW-AS-519-M30-120	DW-AS-519-M30-002
DW-AS-509-M30-390	DW-AD-519-M30-320	DW-AS-519-M30-320	DW-AS-519-M30-390
On request	On request	On request	On request

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

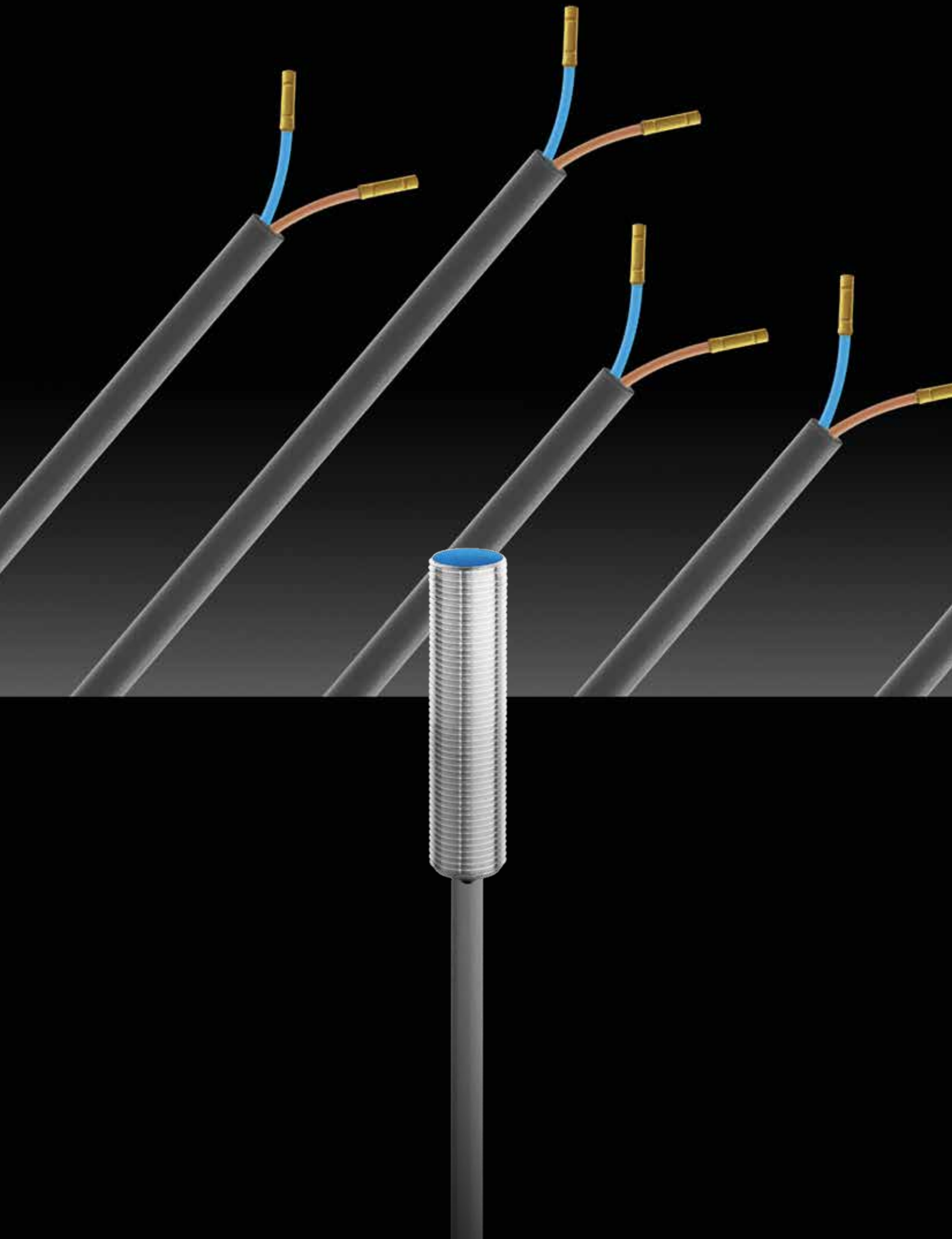
RFID

Connectivity

Accessories

Glossary

Index



EASY INSTALLATION AND HIGH
SWITCHING FREQUENCY

2-WIRE

INDUCTIVE SENSORS



KEY ADVANTAGES

- ✓ Two-wire sensors for series connection
- ✓ DC and AC/DC types
- ✓ NAMUR types with switching frequencies up to 10,000 Hz
- ✓ Sizes from Ø 3 mm to M18 and 5 x 5 mm

RANGE OVERVIEW	Housing size	Classics
2-WIRE	Ø 3 mm	p. 131
	M4	p. 131
	Ø 4 mm	p. 132
	M5	p. 133
	C5	p. 133
	Ø 6.5 mm	p. 134, 140
	M8	p. 134-135, 141-143
	M12	p. 135-136, 144-149
	M18	p. 136-137, 149-153
	M30	p. 137-138, 154-157

FAMILY

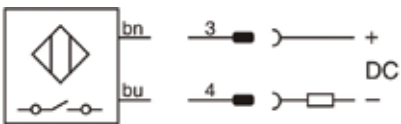
HOUSING SIZE

OPERATING DISTANCE MM

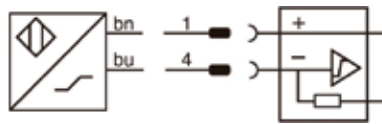
INDUCTIVE

WIRING DIAGRAMS

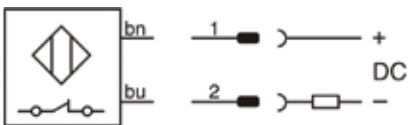
2-wire DC NO



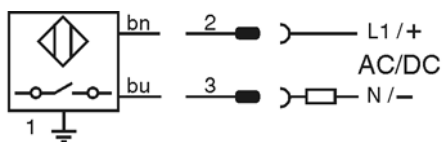
NAMUR



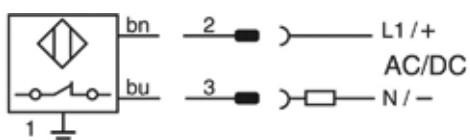
2-wire DC NC



2-wire AC/DC NO



2-wire AC/DC NC



DATA

Housing material

Connection

Degree of protection

Mounting

Max. switching frequency

Supply voltage range

Ambient temperature range





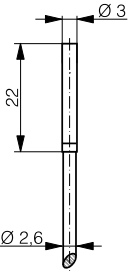
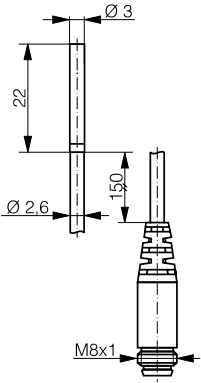
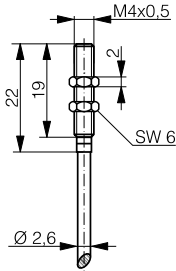
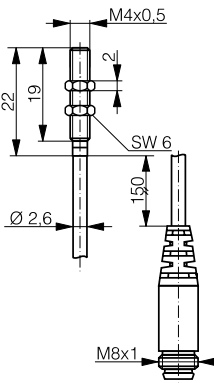
Output current

NAMUR

Other types available

* damped / non-damped

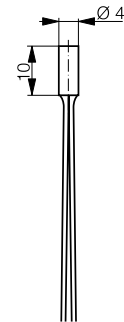
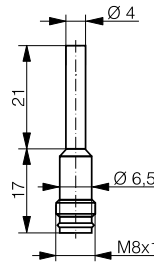
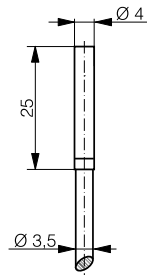
2-WIRE

CLASSICS	CLASSICS	CLASSICS	CLASSICS	Inductive
Ø 3	Ø 3	M4	M4	
0.6	0.6	0.6	0.6	
				Photoelectric
				Ultrasonic
				Capacitive
				Safety
				RFID
NAMUR	NAMUR	NAMUR	NAMUR	Connectivity
				Accessories
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Glossary
PUR cable	PUR cable / Connector S8	PUR cable	PUR cable / Connector S8	
IP 67	IP 67	IP 67	IP 67	
Embeddable	Embeddable	Embeddable	Embeddable	
10,000 Hz	10,000 Hz	10,000 Hz	10,000 Hz	
7.7 ... 9 VDC	7.7 ... 9 VDC	7.7 ... 9 VDC	7.7 ... 9 VDC	
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	
≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*	
DW-AD-605-03	DW-AS-605-03	DW-AD-605-M4	DW-AS-605-M4	Index

2-WIRE

INDUCTIVE

FAMILY	CLASSICS	CLASSICS	CLASSICS
HOUSING SIZE MM	Ø 4	Ø 4	Ø 4
OPERATING DISTANCE MM	0.8	0.8	0.8



NAMUR

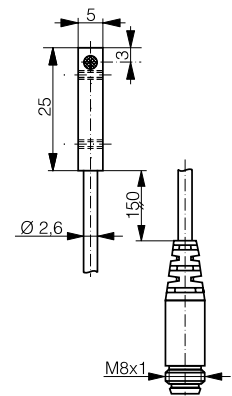
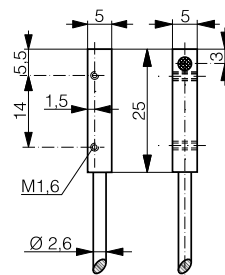
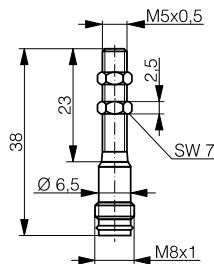
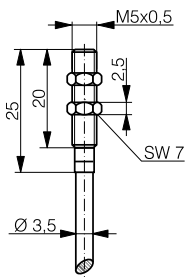
NAMUR

NAMUR

DATA			
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection	PVC cable	Connector S8	Single wires
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable
Max. switching frequency	10,000 Hz	10,000 Hz	10,000 Hz
Supply voltage range	7.7 ... 9 VDC	7.7 ... 9 VDC	7.7 ... 9 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*
NAMUR	DW-AD-605-04	DW-AS-605-04	DW-AD-605-04K
Other types available			
* damped / non-damped			

2-WIRE

CLASSICS	CLASSICS	CLASSICS	CLASSICS
M5	M5	5 x 5	5 x 5
0.8	0.8	0.8	0.8



NAMUR

NAMUR

NAMUR

NAMUR

Stainless steel V2A	Stainless steel V2A	Chrome-plated brass	Chrome-plated brass
PVC cable	Connector S8	PUR cable	PUR cable / Connector S8
IP 67	IP 67	IP 67	IP 67
Embeddable	Embeddable	Embeddable	Embeddable
10,000 Hz	10,000 Hz	10,000 Hz	10,000 Hz
7.7 ... 9 VDC	7.7 ... 9 VDC	7.7 ... 9 VDC	7.7 ... 9 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*
DW-AD-605-M5	DW-AS-605-M5	DW-AD-605-C5	DW-AS-605-C5

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

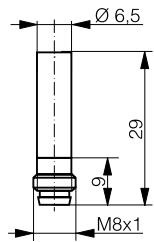
Glossary

Index

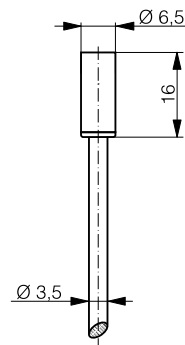
2-WIRE

INDUCTIVE

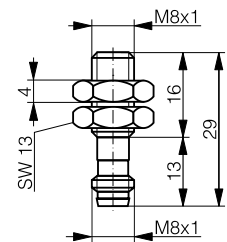
FAMILY	CLASSICS	CLASSICS	CLASSICS
HOUSING SIZE MM	Ø 6.5	Ø 6.5	M8
OPERATING DISTANCE MM	1.5	1.5	1.5



NAMUR



NAMUR

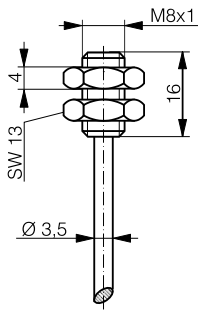


NAMUR

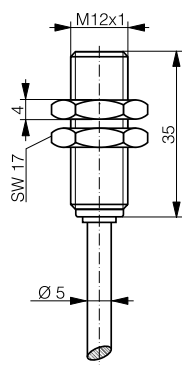
DATA			
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection	Connector S8	PVC cable	Connector S8
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable
Max. switching frequency	10,000 Hz	10,000 Hz	10,000 Hz
Supply voltage range	7.7 ... 9 VDC	7.7 ... 9 VDC	7.7 ... 9 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*
NAMUR	DW-AS-605-065-129	DW-AD-605-065-120	DW-AS-605-M8-129
Other types available			
* damped / non-damped			

2-WIRE

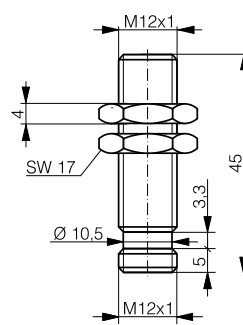
CLASSICS	CLASSICS	CLASSICS	CLASSICS
M8	M12	M12	M12
1.5	2	2	2



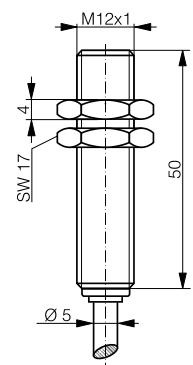
NAMUR



NAMUR



NAMUR



NAMUR

Stainless steel V2A	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
PVC cable	PVC cable	Connector S12	PVC cable
IP 67	IP 67	IP 67	IP 67
Embeddable	Embeddable	Embeddable	Embeddable
10,000 Hz	2500 Hz	2500 Hz	2500 Hz
7.7 ... 9 VDC	7.7 ... 9 VDC	7.7 ... 9 VDC	7.7 ... 9 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*
DW-AD-605-M8-120	DW-AD-605-M12-120	DW-AS-605-M12-120	DW-AD-605-M12

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

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2-WIRE

FAMILY

CLASSICS

CLASSICS

HOUSING SIZE MM

M12

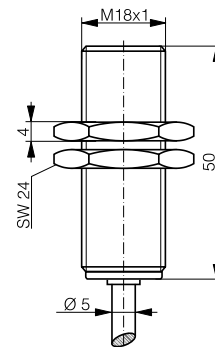
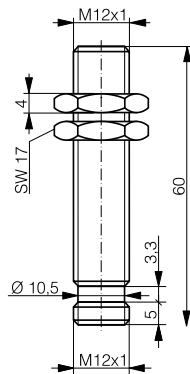
M18

OPERATING DISTANCE MM

2

5

INDUCTIVE



NAMUR

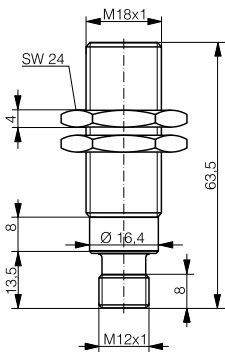
NAMUR

DATA

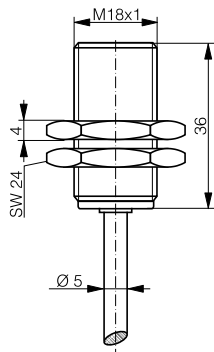
Housing material	Chrome-plated brass	Chrome-plated brass
Connection	Connector S12	PVC cable
Degree of protection	IP 67	IP 67
Mounting	Embeddable	Embeddable
Max. switching frequency	2500 Hz	10,000 Hz
Supply voltage range	7.7 ... 9 VDC	7.7 ... 9 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*
NAMUR	DW-AS-605-M12	DW-AD-605-M18
Other types available		
* damped / non-damped		

2-WIRE

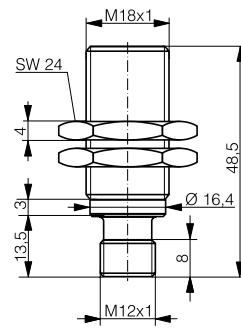
CLASSICS	CLASSICS	CLASSICS	CLASSICS
M18	M18	M18	M30
5	5	5	10



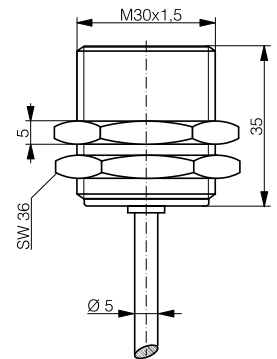
NAMUR



NAMUR



NAMUR



NAMUR

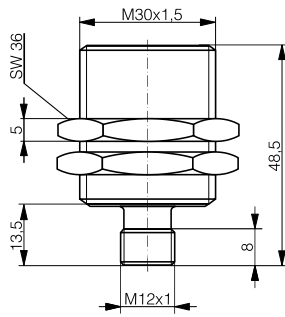
Inductive
Photoelectric
Ultrasonic
Capacitive
Safety
RFID
Connectivity
Accessories
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Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connector S12	PVC cable	Connector S12	PVC cable
IP 67	IP 67	IP 67	IP 67
Embeddable	Embeddable	Embeddable	Embeddable
1000 Hz	1000 Hz	1000 Hz	400 Hz
7.7 ... 9 VDC	7.7 ... 9 VDC	7.7 ... 9 VDC	7.7 ... 9 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*
DW-AS-605-M18-002	DW-AD-605-M18-120	DW-AS-605-M18-120	DW-AD-605-M30-120

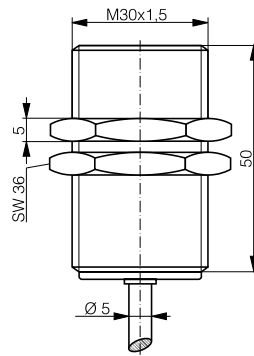
2-WIRE

INDUCTIVE

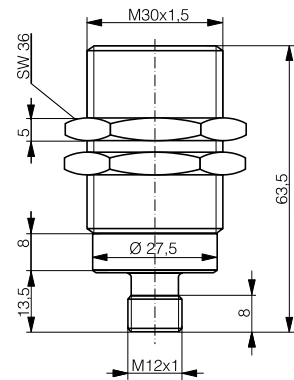
FAMILY	CLASSICS	CLASSICS	CLASSICS
HOUSING SIZE MM	M30	M30	M30
OPERATING DISTANCE MM	10	10	10



NAMUR



NAMUR



NAMUR

DATA			
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connection	Connector S12	PVC cable	Connector S12
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable
Max. switching frequency	400 Hz	400 Hz	400 Hz
Supply voltage range	7.7 ... 9 VDC	7.7 ... 9 VDC	7.7 ... 9 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*	≤ 1 / ≥ 2.2 mA*
NAMUR	DW-AS-605-M30-120	DW-AD-605-M30	DW-AS-605-M30-002
Other types available			
* damped / non-damped			



2-WIRE

FAMILY

CLASSICS

CLASSICS

HOUSING SIZE MM

Ø 6.5

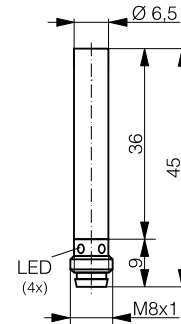
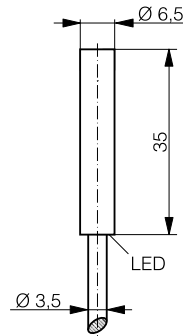
Ø 6.5

OPERATING DISTANCE MM

1.5

1.5

INDUCTIVE

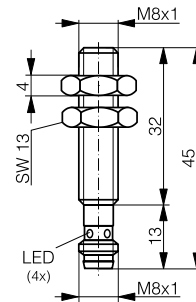
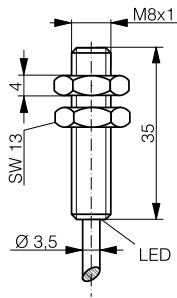


DATA

Housing material	Stainless steel V2A	Stainless steel V2A
Connection	PVC cable	Connector S8
Degree of protection	IP 67	IP 67
Mounting	Embeddable	Embeddable
Max. switching frequency	5000 Hz	5000 Hz
Supply voltage range	10 ... 65 VDC	10 ... 65 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	100 mA	100 mA
DC 2-wire NO	DW-DD-605-065	DW-DS-605-065
DC 2-wire NC	DW-DD-606-065	DW-DS-606-065
Other types available		

2-WIRE

CLASSICS	CLASSICS
M8	M8
1.5	1.5



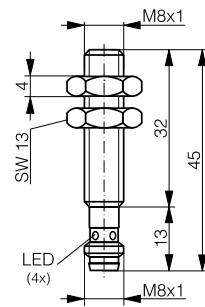
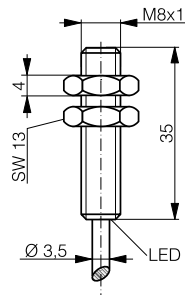
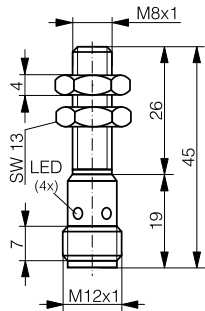
Stainless steel V2A	Stainless steel V2A
PVC cable	Connector S8
IP 67	IP 67
Embeddable	Embeddable
5000 Hz	5000 Hz
10 ... 65 VDC	10 ... 65 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 100 mA	≤ 100 mA
DW-DD-605-M8	DW-DS-605-M8-001
DW-DD-606-M8	DW-DS-606-M8-001

Inductive
Photoelectric
Ultrasonic
Capacitive
Safety
RFID
Connectivity
Accessories
Glossary
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2-WIRE





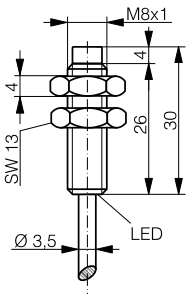
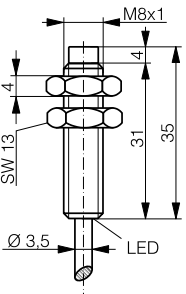
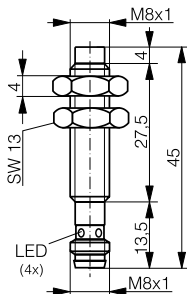
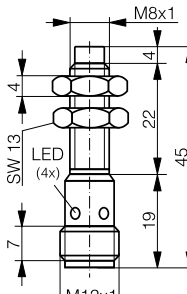
INDUCTIVE

FAMILY	CLASSICS	CLASSICS	CLASSICS
HOUSING SIZE MM	M8	M8	M8
OPERATING DISTANCE MM	1.5	2	2



DATA			
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connection	Connector S12	PVC cable	Connector S8
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable
Max. switching frequency	5000 Hz	5000 Hz	5000 Hz
Supply voltage range	10 ... 65 VDC	10 ... 65 VDC	10 ... 65 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 100 mA	≤ 100 mA	≤ 100 mA
DC 2-wire NO	DW-DS-605-M8	DW-DD-625-M8	DW-DS-625-M8-001
DC 2-wire NC	DW-DS-606-M8	DW-DD-626-M8	DW-DS-626-M8-001
Other types available			

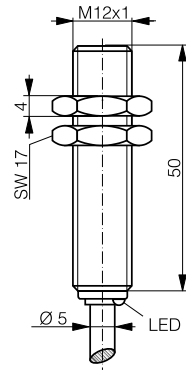
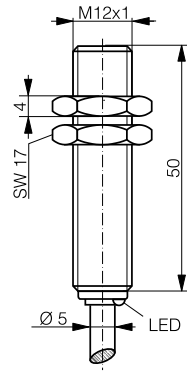
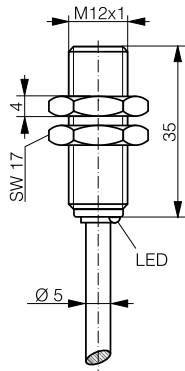
2-WIRE

CLASSICS	CLASSICS	CLASSICS	CLASSICS	Inductive	
M8	M8	M8	M8		
2.5	2.5	2.5	2.5		
				Photoelectric	
					Ultrasonic
				Safety	
				RFID	
				Connectivity	
				Accessories	
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Glossary	
PVC cable	PVC cable	Connector S8	Connector S12		
IP 67	IP 67	IP 67	IP 67		
Non-embeddable	Non-embeddable	Non-embeddable	Non-embeddable	Index	
5000 Hz	5000 Hz	5000 Hz	5000 Hz		
10 ... 65 VDC	10 ... 65 VDC	10 ... 65 VDC	10 ... 65 VDC		
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F		
≤ 100 mA	≤ 100 mA	≤ 100 mA	≤ 100 mA		
DW-DD-615-M8-122	DW-DD-615-M8	DW-DS-615-M8-001	DW-DS-615-M8		
DW-DD-616-M8-122	DW-DD-616-M8	DW-DS-616-M8-001	DW-DS-616-M8		

2-WIRE





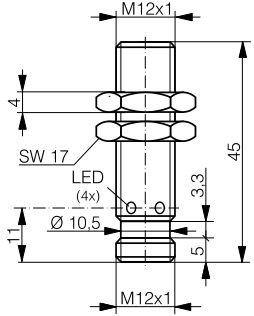
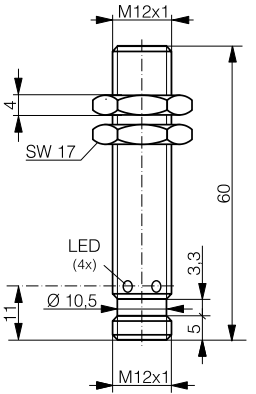
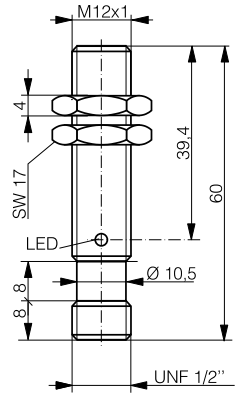
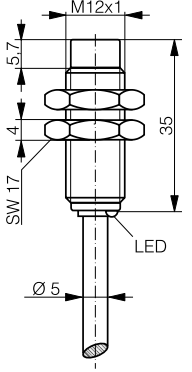
INDUCTIVE

FAMILY	CLASSICS	CLASSICS	CLASSICS
HOUSING SIZE MM	M12	M12	M12
OPERATING DISTANCE MM	2	2	2



DATA			
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connection	PVC cable	PVC cable	PVC cable
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable
Max. switching frequency	3000 Hz	3000 Hz	25 Hz (AC) / 3000 Hz (DC)
Supply voltage range	10 ... 65 VDC	10 ... 65 VDC	20 ... 265 VAC / 10 ... 320 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 100 mA	≤ 100 mA	≤ 200 mA
DC 2-wire NO	DW-DD-605-M12-120	DW-DD-605-M12	
DC 2-wire NC	DW-DD-606-M12-120	DW-DD-605-M12	
AC/DC 2-wire NO			DW-AD-607-M12
AC/DC 2-wire NC			DW-AD-608-M12
Other types available			

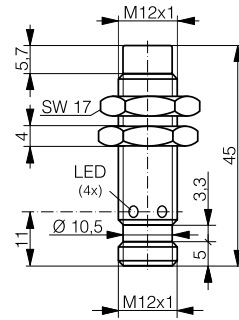
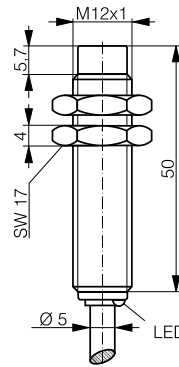
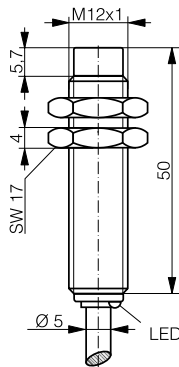
2-WIRE

CLASSICS	CLASSICS	CLASSICS	CLASSICS	Inductive
M12	M12	M12	M12	
2	2	2	4	Photoelectric
				
				Capacitive
				Safety
				RFID
				Connectivity
				Accessories
Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Glossary
Connector S12	Connector S12	Connector 1/2"	PVC cable	
IP 67	IP 67	IP 67	IP 67	Index
Embeddable	Embeddable	Embeddable	Non-embeddable	
3000 Hz	3000 Hz	25 Hz (AC) / 3000 Hz (DC)	2500 Hz	
10 ... 65 VDC	10 ... 65 VDC	20 ... 265 VAC / 10 ... 320 VDC	10 ... 65 VDC	
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	
≤ 100 mA	≤ 100 mA	≤ 200 mA	≤ 100 mA	
DW-DS-605-M12-120	DW-DS-605-M12	DW-AS-607-M12-069	DW-DD-615-M12-120	
DW-DS-606-M12-120	DW-DS-606-M12	DW-AS-608-M12-069	DW-DD-616-M12-120	

2-WIRE





INDUCTIVE

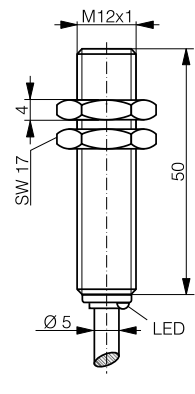
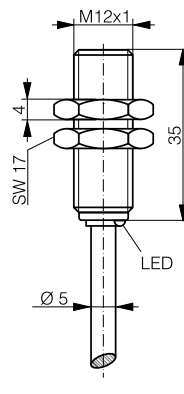
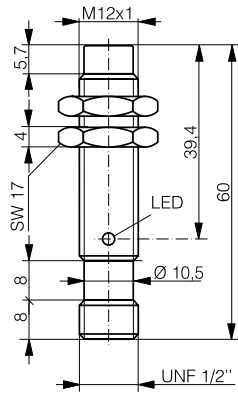
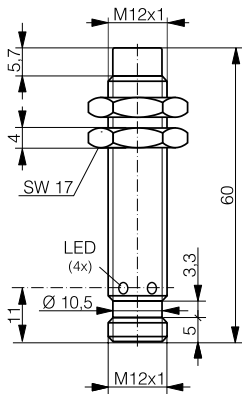
FAMILY	CLASSICS	CLASSICS	CLASSICS
HOUSING SIZE MM	M12	M12	M12
OPERATING DISTANCE MM	4	4	4



DATA			
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connection	PVC cable	PVC cable	Connector S12
Degree of protection	IP 67	IP 67	IP 67
Mounting	Non-embeddable	Non-embeddable	Non-embeddable
Max. switching frequency	2500 Hz	25 Hz (AC) / 2000 Hz (DC)	2500 Hz
Supply voltage range	10 ... 65 VDC	20 ... 265 VAC / 10 ... 320 VDC	10 ... 65 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 100 mA	≤ 200 mA	≤ 100 mA
DC 2-wire NO	DW-DD-615-M12		DW-DS-615-M12-120
DC 2-wire NC	DW-DD-616-M12		DW-DS-616-M12-120
AC/DC 2-wire NO		DW-AD-617-M12	
AC/DC 2-wire NC		DW-AD-618-M12	
Other types available			

2-WIRE

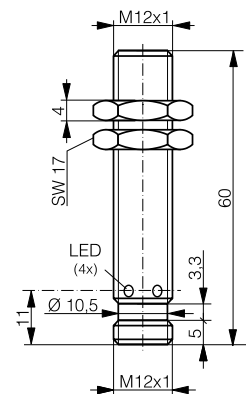
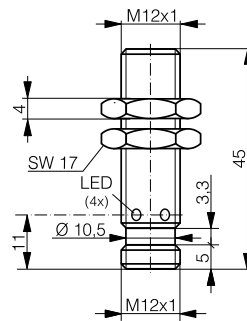
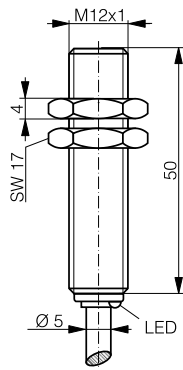
CLASSICS	CLASSICS	CLASSICS	CLASSICS	Inductive
M12	M12	M12	M12	
4	4	4	4	Photoelectric
				
				Ultrasonic
				Capacitive
				Safety
				RFID
				Connectivity
				Accessories
				Glossary
				Index
Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	
Connector S12	Connector 1/2"	PVC cable	PVC cable	
IP 67	IP 67	IP 67	IP 67	
Non-embeddable	Non-embeddable	Embeddable	Embeddable	
2000 Hz	25 Hz (AC) / 2000 Hz (DC)	2000 Hz	2000 Hz	
10 ... 65 VDC	20 ... 265 VAC / 10 ... 320 VDC	10 ... 65 VDC	10 ... 65 VDC	
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	
≤ 100 mA	≤ 200 mA	≤ 100 mA	≤ 100 mA	
DW-DS-615-M12	DW-AS-617-M12-069	DW-DD-625-M12-120	DW-DD-625-M12	
DW-DS-616-M12	DW-AS-618-M12-069	DW-DD-626-M12-120	DW-DD-626-M12	



2-WIRE





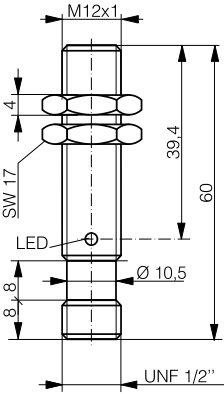
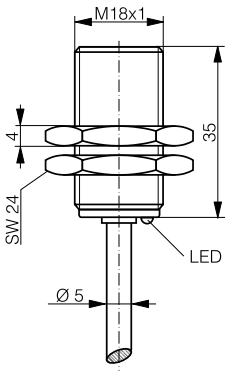
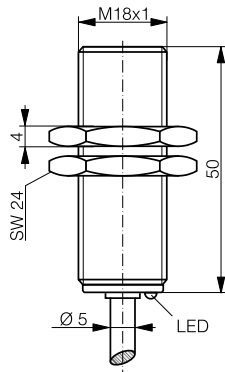
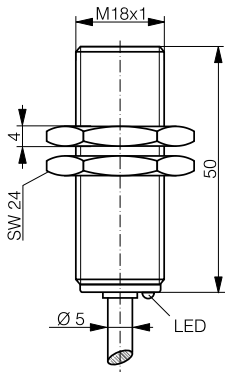
INDUCTIVE

FAMILY	CLASSICS	CLASSICS	CLASSICS
HOUSING SIZE MM	M12	M12	M12
OPERATING DISTANCE MM	4	4	4



DATA			
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connection	PVC cable	Connector S12	Connector S12
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable
Max. switching frequency	25 Hz (AC) / 2000 Hz (DC)	2000 Hz	2000 Hz
Supply voltage range	20 ... 265 VAC / 10 ... 320 VDC	10 ... 65 VDC	10 ... 65 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 200 mA	≤ 100 mA	≤ 100 mA
DC 2-wire NO		DW-DS-625-M12-120	DW-DS-625-M12
DC 2-wire NC		DW-DS-626-M12-120	DW-DS-626-M12
AC/DC 2-wire NO	DW-AD-627-M12		
AC/DC 2-wire NC	DW-AD-628-M12		
Other types available			

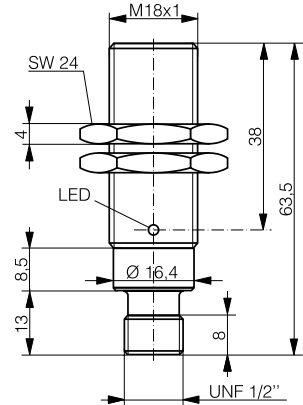
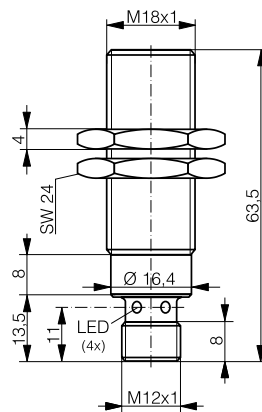
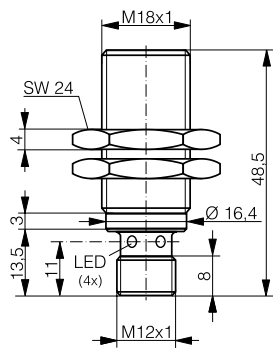
2-WIRE

CLASSICS	CLASSICS	CLASSICS	CLASSICS	Inductive
M12	M18	M18	M18	
4	5	5	5	Photoelectric
				
				Safety
				Connectivity
Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	
Connector 1/2"	PVC cable	PVC cable	PVC cable	
IP 67	IP 67	IP 67	IP 67	
Embeddable	Embeddable	Embeddable	Embeddable	
25 Hz (AC) / 2000 Hz (DC)	1500 Hz	1500 Hz	25 Hz (AC) / 1500 Hz (DC)	Glossary
20 ... 265 VAC / 10 ... 320 VDC	10 ... 65 VDC	10 ... 65 VDC	20 ... 265 VAC / 10 ... 320 VDC	
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	
≤ 200 mA	≤ 100 mA	≤ 100 mA	≤ 200 mA	Index
DW-AS-627-M12-069	DW-DD-605-M18-120	DW-DD-605-M18	DW-AD-607-M18	
DW-AS-628-M12-069	DW-DD-606-M18-120	DW-DD-606-M18	DW-AD-608-M18	

2-WIRE

INDUCTIVE

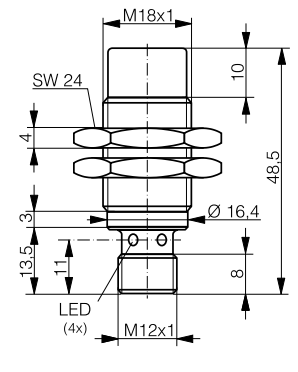
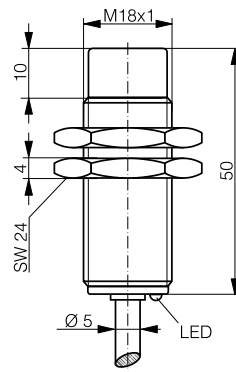
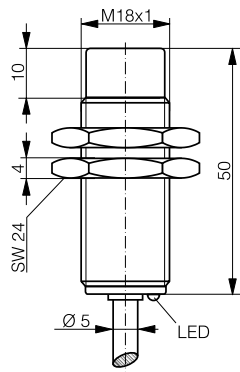
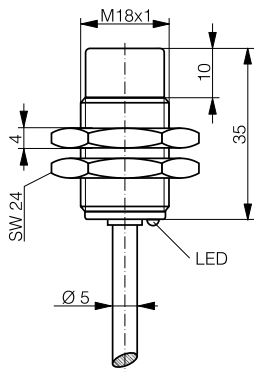
FAMILY	CLASSICS	CLASSICS	CLASSICS
HOUSING SIZE MM	M18	M18	M18
OPERATING DISTANCE MM	5	5	5



DATA			
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connection	Connector S12	Connector S12	Connector 1/2"
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Embeddable	Embeddable
Max. switching frequency	1500 Hz	1500 Hz	25 Hz (AC) / 1500 Hz (DC)
Supply voltage range	10 ... 65 VDC	10 ... 65 VDC	20 ... 265 VAC / 10 ... 320 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 100 mA	≤ 100 mA	≤ 200 mA
DC 2-wire NO	DW-DS-605-M18-120	DW-DS-605-M18-002	DW-AS-607-M18-069
DC 2-wire NC	DW-DS-606-M18-120	DW-DS-606-M18-002	DW-AS-608-M18-069
AC/DC 2-wire NO			
AC/DC 2-wire NC			
Other types available			

2-WIRE

CLASSICS	CLASSICS	CLASSICS	CLASSICS
M18	M18	M18	M18
8	8	8	8



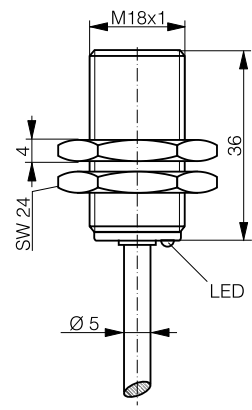
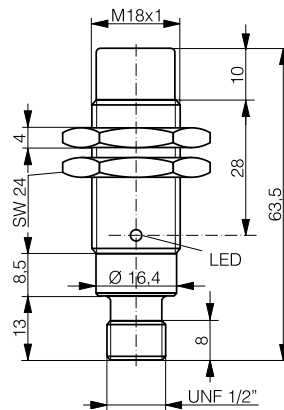
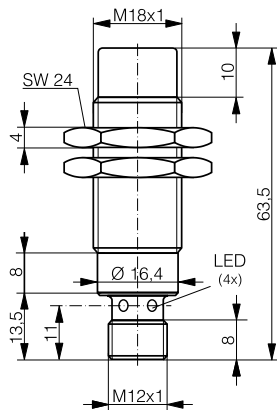
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Photoelectric
Ultrasonic
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Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
PVC cable	PVC cable	PVC cable	Connector S12
IP 67	IP 67	IP 67	IP 67
Non-embeddable	Non-embeddable	Non-embeddable	Non-embeddable
1200 Hz	1200 Hz	25 Hz (AC) / 1200 Hz (DC)	1200 Hz
10 ... 65 VDC	10 ... 65 VDC	20 ... 265 VAC / 10 ... 320 VDC	10 ... 65 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 100 mA	≤ 100 mA	≤ 200 mA	≤ 100 mA
DW-DD-615-M18-120	DW-DD-615-M18	DW-AD-617-M18	DW-DS-615-M18-120
DW-DD-616-M18-120	DW-DD-616-M18	DW-AD-618-M18	DW-DS-616-M18-120

2-WIRE

INDUCTIVE

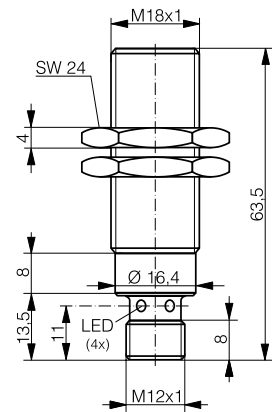
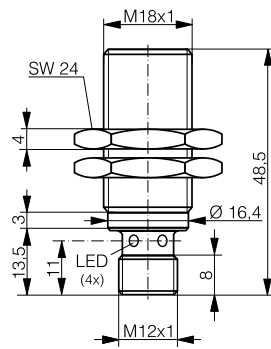
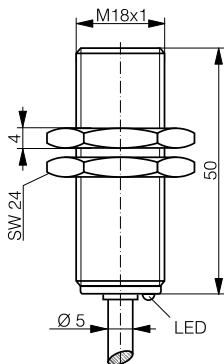
FAMILY	CLASSICS	CLASSICS	CLASSICS
HOUSING SIZE MM	M18	M18	M18
OPERATING DISTANCE MM	8	8	8



DATA			
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connection	Connector S12	Connector 1/2"	PVC cable
Degree of protection	IP 67	IP 67	IP 67
Mounting	Non-embeddable	Non-embeddable	Quasi-embeddable
Max. switching frequency	1200 Hz	25 Hz (AC) / 1200 Hz (DC)	1000 Hz
Supply voltage range	10 ... 65 VDC	20 ... 265 VAC / 10 ... 320 VDC	10 ... 65 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 100 mA	≤ 200 mA	≤ 100 mA
DC 2-wire NO	DW-DS-615-M18-002		DW-DD-625-M18-120
DC 2-wire NC	DW-DS-616-M18-002		DW-DD-626-M18-120
AC/DC 2-wire NO		DW-AS-617-M18-069	
AC/DC 2-wire NC		DW-AS-618-M18-069	
Other types available			

2-WIRE

CLASSICS	CLASSICS	CLASSICS
M18	M18	M18
8	8	8



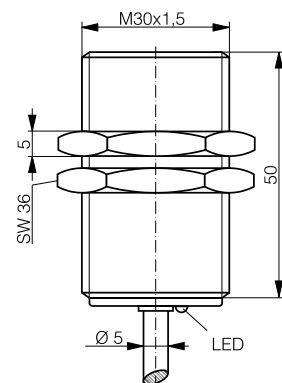
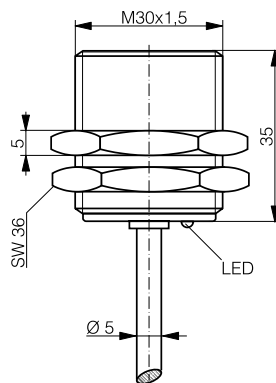
Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
PVC cable	Connector S12	Connector S12
IP 67	IP 67	IP 67
Quasi-embeddable	Quasi-embeddable	Quasi-embeddable
1000 Hz	1000 Hz	1000 Hz
10 ... 65 VDC	10 ... 65 VDC	10 ... 65 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 100 mA	≤ 100 mA	≤ 100 mA
DW-DD-625-M18	DW-DS-625-M18-120	DW-DS-625-M18-002
DW-DD-626-M18	DW-DS-626-M18-120	DW-DS-626-M18-002

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2-WIRE

INDUCTIVE

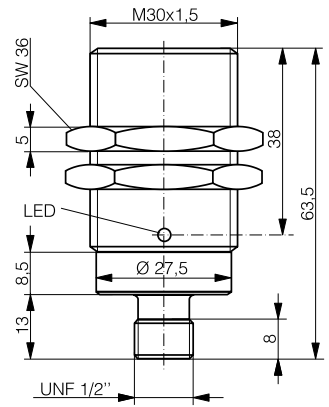
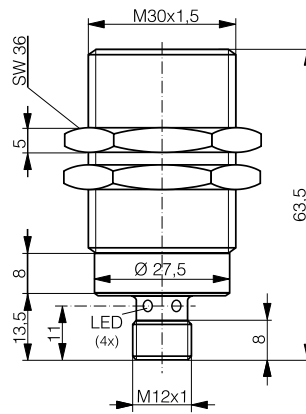
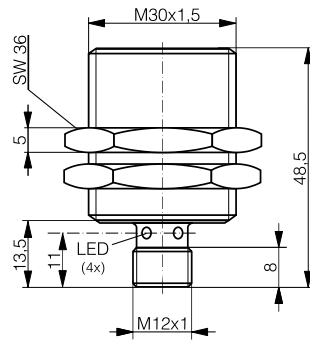
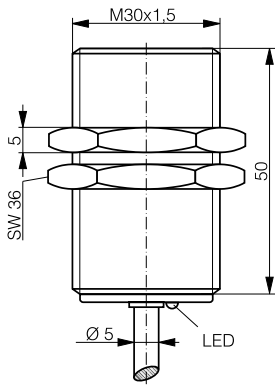
FAMILY	CLASSICS	CLASSICS
HOUSING SIZE MM	M30	M30
OPERATING DISTANCE MM	10	10



DATA		
Housing material	Chrome-plated brass	Chrome-plated brass
Connection	PVC cable	PVC cable
Degree of protection	IP 67	IP 67
Mounting	Embeddable	Embeddable
Max. switching frequency	600 Hz	600 Hz
Supply voltage range	10 ... 65 VDC	10 ... 65 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 100 mA	≤ 100 mA
DC 2-wire NO	DW-DD-605-M30-120	DW-DD-605-M30
DC 2-wire NC	DW-DD-606-M30-120	DW-DD-606-M30
AC/DC 2-wire NO		
AC/DC 2-wire NC		
Other types available		

2-WIRE

CLASSICS	CLASSICS	CLASSICS	CLASSICS
M30	M30	M30	M30
10	10	10	10



Chrome-plated brass	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
PVC cable	Connector S12	Connector S12	Connector 1/2"
IP 67	IP 67	IP 67	IP 67
Embeddable	Embeddable	Embeddable	Embeddable
25 Hz (AC) / 600 Hz (DC)	600 Hz	600 Hz	25 Hz (AC) / 600 Hz (DC)
20 ... 265 VAC / 10 ... 320 VDC	10 ... 65 VDC	10 ... 65 VDC	20 ... 265 VAC / 10 ... 320 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 200 mA	≤ 100 mA	≤ 100 mA	≤ 200 mA
DW-AD-607-M30	DW-DS-605-M30-120	DW-DS-605-M30-002	DW-AS-607-M30-069
DW-AD-608-M30	DW-DS-606-M30-120	DW-DS-606-M30-002	DW-AS-608-M30-069

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

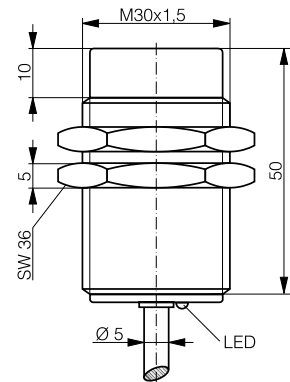
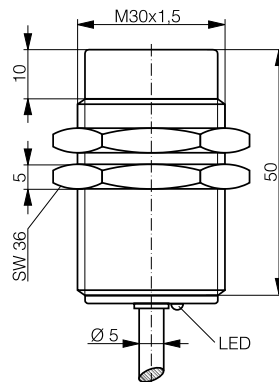
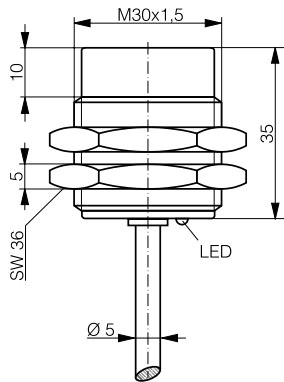
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INDUCTIVE

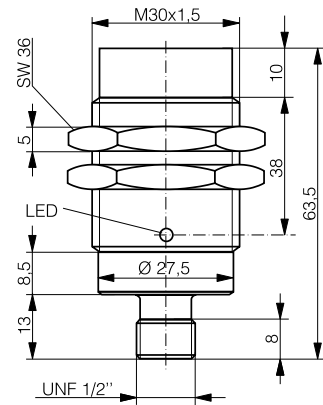
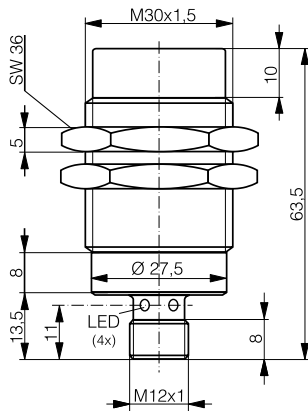
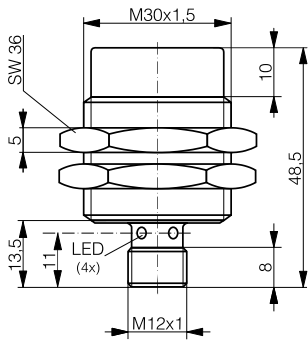
FAMILY	CLASSICS	CLASSICS	CLASSICS
HOUSING SIZE MM	M30	M30	M30
OPERATING DISTANCE MM	15	15	15



DATA			
Housing material	Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connection	PVC cable	PVC cable	PVC cable
Degree of protection	IP 67	IP 67	IP 67
Mounting	Non-embeddable	Non-embeddable	Non-embeddable
Max. switching frequency	500 Hz	500 Hz	25 Hz (AC) / 500 Hz (DC)
Supply voltage range	10 ... 65 VDC	10 ... 65 VDC	20 ... 265 VAC / 10 ... 320 VDC
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
Output current	≤ 100 mA	≤ 100 mA	≤ 200 mA
DC 2-wire NO	DW-DD-615-M30-120	DW-DD-615-M30	DW-AD-617-M30
DC 2-wire NC	DW-DD-616-M30-120	DW-DD-616-M30	DW-AD-618-M30
AC/DC 2-wire NO			DW-AD-617-M30
AC/DC 2-wire NC			DW-AD-618-M30
Other types available			

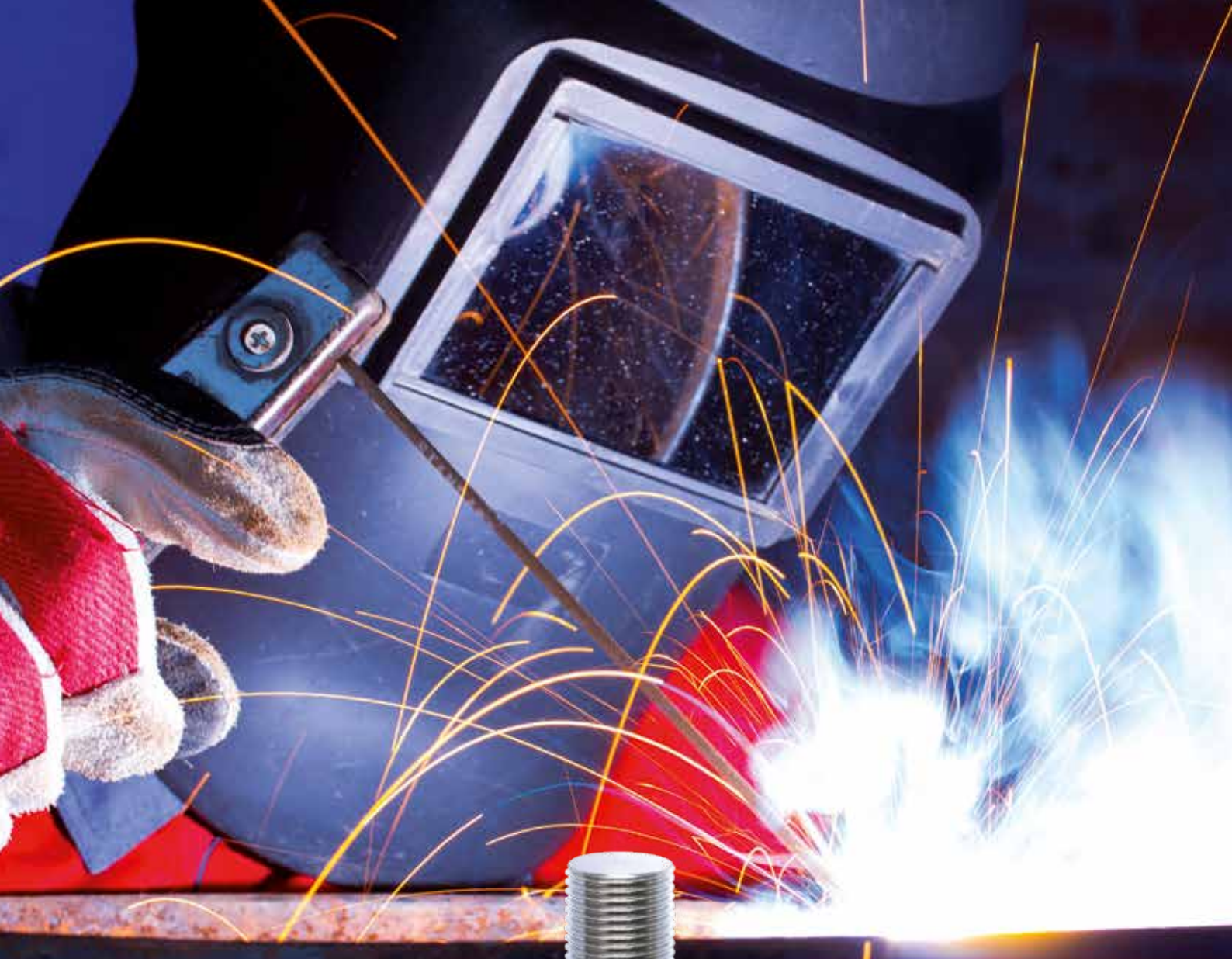
2-WIRE

CLASSICS	CLASSICS	CLASSICS
M30	M30	M30
15	15	15



Chrome-plated brass	Chrome-plated brass	Chrome-plated brass
Connector S12	Connector S12	Connector 1/2"
IP 67	IP 67	IP 67
Non-embeddable	Non-embeddable	Non-embeddable
500 Hz	500 Hz	25 Hz (AC) / 500 Hz (DC)
10 ... 65 VDC	10 ... 65 VDC	20 ... 265 VAC / 10 ... 320 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 100 mA	≤ 100 mA	≤ 200 mA
DW-DS-615-M30-120	DW-DS-615-M30-002	DW-AS-617-M30-069
DW-DS-616-M30-120	DW-DS-616-M30-002	DW-AS-618-M30-069

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DURABLE AND RELIABLE IN WELDING CELLS



WELD- IMMUNE

INDUCTIVE SENSORS

KEY ADVANTAGES

- ✓ Resistant to electromagnetic fields of up to 40 millitesla
- ✓ Extremely robust
- ✓ Easy to clean - even using harsh methods
- ✓ No false switching caused by metal dust or chips
- ✓ Factor 1 on steel and aluminum
- ✓ No extra protection needed
- ✓ Long operating distances

RANGE OVERVIEW

Housing size

Full Inox

WELD- IMMUNE

M8

p. 161

M12

p. 161

M18

p. 161

FAMILY

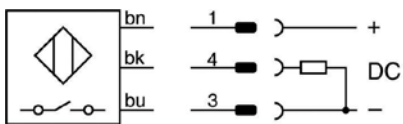
HOUSING SIZE

OPERATING DISTANCE MM

INDUCTIVE

WIRING DIAGRAM

PNP NO



DATA

Sensing face material

Welding systems MF

Welding systems 50 Hz

Housing material

Connection

Degree of protection

Mounting

Max. switching frequency

Supply voltage range

Ambient temperature range

Output current

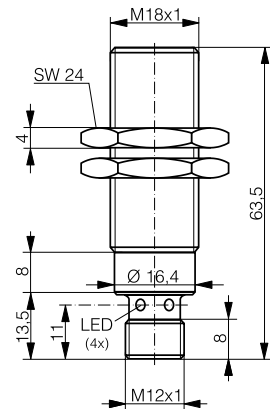
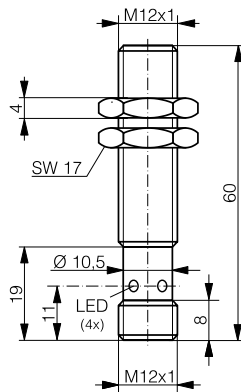
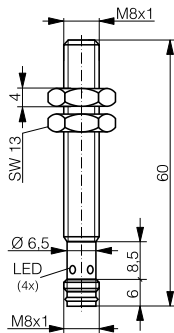
PNP NO

PNP NO

Other types available

WELD-IMMUNE

FULL INOX	FULL INOX	FULL INOX
M8	M12	M18
3	6	10



Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Up to 15 kA	Up to 15 kA	Up to 15 kA
≤ 40 mT (-673) / 500 ms (-761)	≤ 40 mT (-673) / 500 ms (-761)	≤ 40 mT (-673) / 500 ms (-761)
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Connector S8	Connector S12	Connector S12
IP 68 / IP 69K	IP 68 / IP 69K	IP 68 / IP 69K
Embeddable	Embeddable	Embeddable
15 Hz (-673) / 1 Hz (-761)	15 Hz (-673) / 1 Hz (-761)	15 Hz (-673) / 1 Hz (-761)
10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
≤ 200 mA	≤ 200 mA	≤ 200 mA
DW-AS-703-M8-673	DW-AS-703-M12-673	DW-AS-703-M18-673
DW-AS-703-M8-761	DW-AS-703-M12-761	DW-AS-703-M18-761

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DESIGNED FOR SPECIAL REQUIREMENTS

SPECIAL

INDUCTIVE SENSORS

KEY ADVANTAGES

- ✓ Double sheet detection (steel and aluminum) with sensitivity of 0.8 - 1.2 mm per sheet
- ✓ Full Inox: extremely robust one-piece stainless-steel housing,
- ✓ Corrosion resistant
- ✓ IP 68 and IP 69K
- ✓ Pressure resistant up to 80 bar

RANGE OVERVIEW

Housing size

Full Inox

SPECIAL

M30

p. 165

FAMILY

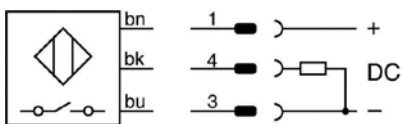
HOUSING SIZE MM

OPERATING DISTANCE MM

INDUCTIVE

WIRING DIAGRAM

PNP NO



DATA

Housing material

Connection

Degree of protection

Mounting

Max. switching frequency

Supply voltage range

Ambient temperature range

Output current

PNP NO

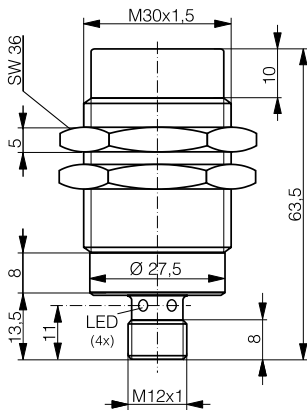
Description

SPECIAL

FULL INOX

M30

3 ... 5



Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

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Accessories

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Stainless steel V2A

Connector S12

IP 68 / IP 69K

Non-embeddable

10 Hz

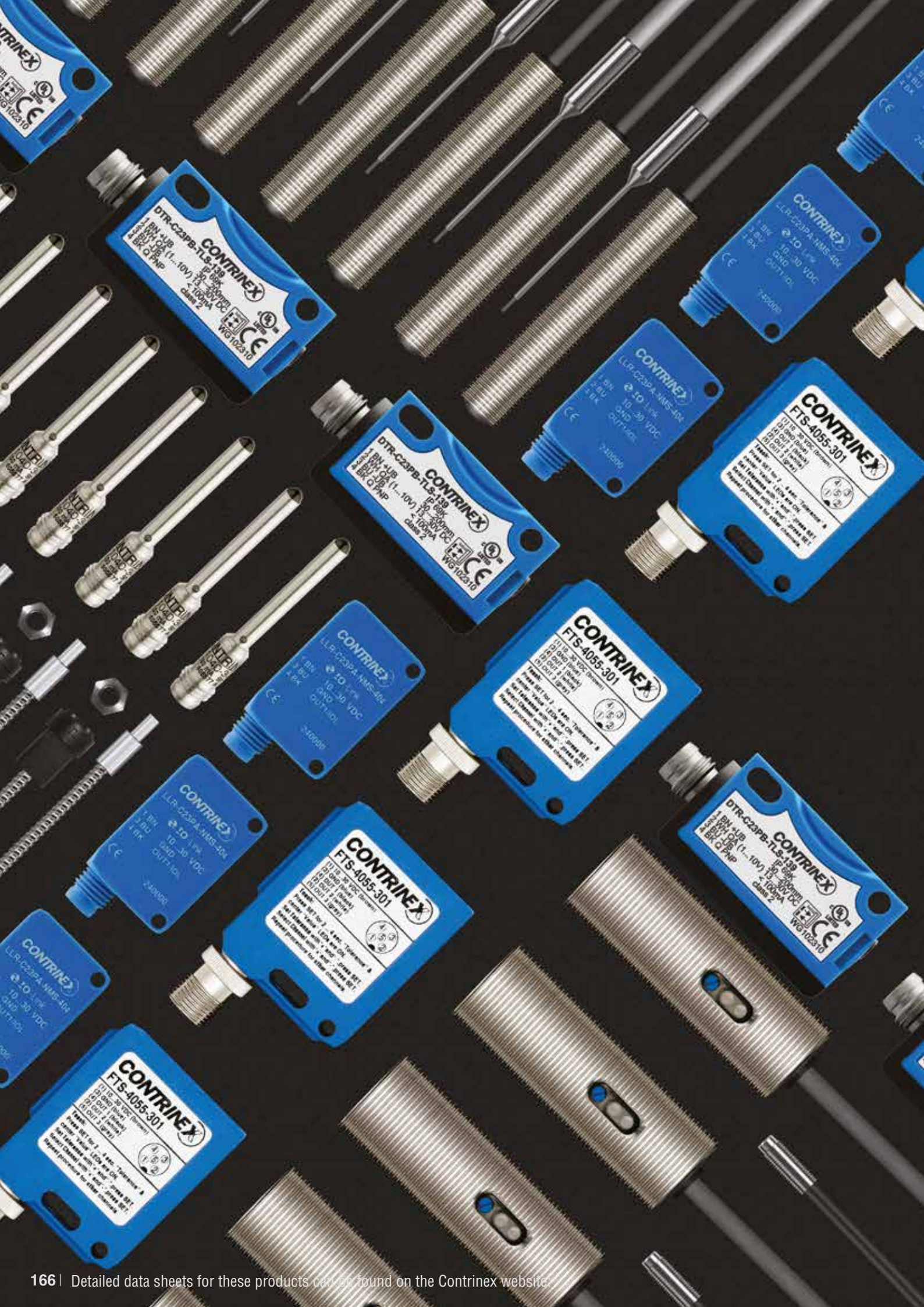
10 ... 30 VDC

-25 ... +70°C / -13 ... +158°F

≤ 200 mA

DW-AS-713-M30-618

Double sheet





PHOTOELECTRIC SENSORS

HIGHLIGHTS:

- ✓ Smallest self-contained subminiature sensors on the market
- ✓ Excellent background suppression characteristics
- ✓ Highly accurate laser sensors
- ✓ Analog output sensors for precise distance control
- ✓ Sensors with short housings and 90° sensing
- ✓ Wide range of fiber-optic amplifiers, including IO-Link
- ✓ Fiber-optic solutions for the most demanding environments
- ✓ Through-beam sensors for longest sensing ranges
- ✓ Excellent color recognition sensors

NEW:

- ✓ High performance contrast sensor with IO-Link
- ✓ Miniature C23 Series with IO-Link
- ✓ Distance measurement sensors in C23 and C55 sizes
- ✓ Subminiature C12 sensors with pinpoint LED



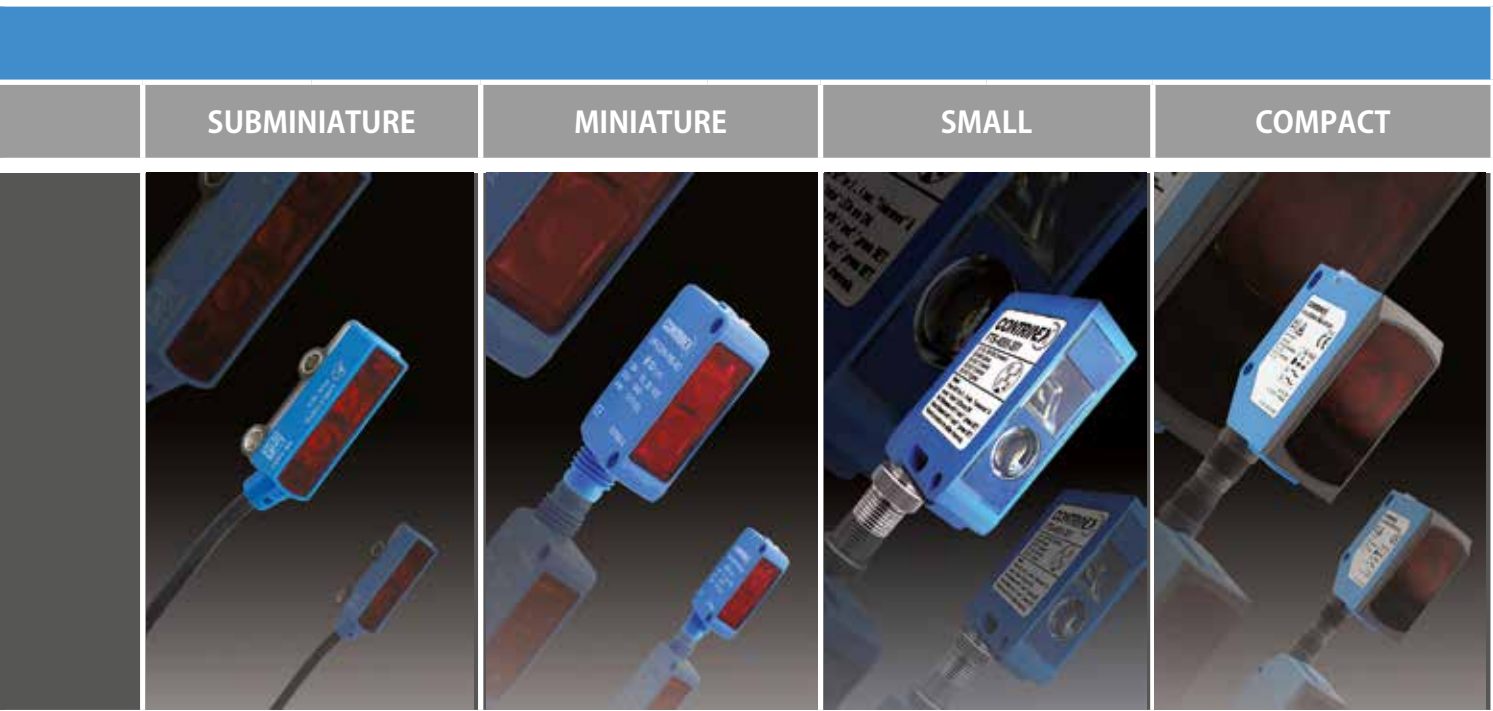
PROGRAM OVERVIEW



CYLINDRICAL

SERIES		1040	1050	1120	1120L	1180 / 1180W	1180L	
HOUSING SIZE IN MM		∅ 4	M5	M12	M12	M18	M18	
SPECIAL					Laser		Laser	
Operating principle	SENSING RANGE							
Diffuse	0 ... 1500 mm	p. 181-183	p. 183-186	p. 191		p. 198-199	p. 203	
Background suppression	2 ... 5000 mm					p. 197-198		
Reflex	0 ... 8000 mm			p. 192		p. 200-201		
Through-beam	0 ... 50'000 mm		p. 186	p. 192	p. 193	p. 201-202	p. 204	
Analog output	10 ... 100 mm							
Contrast	12 mm							
Color	30 ... 40 mm							
Fiber-optic amplifiers *	0 ... 200 mm							
Distance	20 ... 5000 mm							

* Optical amplifiers are presented in the optical fiber section



Inductive
 Photoelectric
 Ultrasonic
 Capacitive
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CUBIC

	C12	0507	C23	3030	3060	4040	4050	C55
	13x21x7 13x27x7	5x7x40	30x20x10 34x20x12	30x30x15	31x60x10	40x40x19	40x50x15	50x50x23
								Laser
		p. 213	p. 218	p. 225-226			p. 233	
	p. 209		p. 217	p. 223-224			p. 233	p. 241
	p. 210		p. 219	p. 227-228			p. 234	
	p. 210		p. 219	p. 229			p. 234	
				p. 223				
							p. 237	
							p. 237	
				p. 255-256	p. 259-261	p. 263		
			p. 221					p. 241

PROGRAM OVERVIEW

HOUSING SIZE	SENSING RANGE						PAGE
	1 mm	10 mm	100 mm	1000 mm	10,000 mm	100,000 mm	
DIFFUSE							
∅ 4 mm / M5	10 mm						181, 183-184
∅ 4 mm / M5	20 mm						182, 184-185
∅ 4 mm / M5	50 mm						182-183, 185-186
5 x 7 mm	20 mm						213
5 x 7 mm	50 mm						213
5 x 7 mm	90 mm						213
M12	300 mm						191
M18 (M18W)	40 ... 600 mm						198-199
M18 △	40 ... 250 mm						203
M18 △	60 ... 600 mm						203
C23	1500 mm						218
30 x 30 mm	600 mm						225
30 x 30 mm	1200 mm						226
40 x 50 mm	30 ... 1200 mm						233
BACKGROUND SUPPRESSION							
M18 (M18W)	10 ... 120 mm						197-198
C12	1 ... 120 mm						209
C23	10 ... 300 mm						217
30 X 30 mm	15 ... 200 mm						223-224
40 X 50 mm	30 ... 500 mm						233
C55 △	0 ... 5000 mm						241
REFLEX							
M12	1500 mm						192
M18 (M18W)	2000 mm						200-201
C12	3000 mm						210
C23	8000 mm						219
30 X 30 mm	2000 mm						227
30 X 30 mm	4000 mm						228
40 X 50 mm	4000 mm						234
ANALOG OUTPUT							
30 x 30 mm	10 ... 100 mm						223

HOUSING SIZE	SENSING RANGE						PAGE
	1 mm	10 mm	100 mm	1000 mm	10,000 mm	100,000 mm	
THROUGH-BEAM							
M5	250 mm						186
M12					10,000 mm		192
M12 \triangle					50,000 mm		193
M18 (M18W)					20,000 mm		201-202
M18 \triangle					50,000 mm		204
C12					2000 mm		210
C23					30,000 mm		219
30 x 30 mm					6000 mm		229
30 x 30 mm					12,000 mm		229
40 x 50 mm					50,000 mm		234
FIBER-OPTIC AMPLIFIER							
30 x 30 mm	60 mm						255
30 x 30 mm	120 mm						256
31 x 60 mm	100 mm						259
31 x 60 mm	200 mm						259-261
40 x 40 mm	150 mm						263
CONTRAST							
40 x 50 mm	12 mm						237
COLOR							
40 x 50 mm	30 ... 40 mm						237
DISTANCE MEASURING							
C23	20 ... 80 mm						221
C23					30 ... 200 mm		221
C55 \triangle					100 ... 5000 mm		241

Inductive
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INTRODUCTION

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.

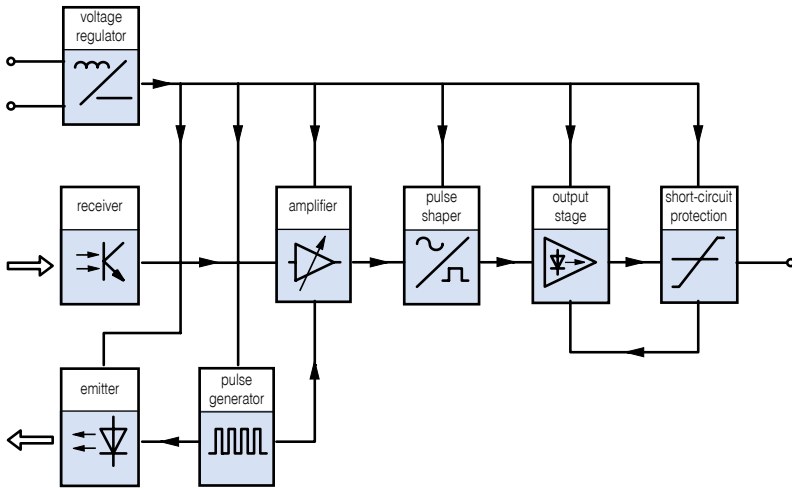


Fig. 9: Functional blocks of a photoelectric sensor

returns to the sensor, striking a position-sensitive receiver. The receiver distinguishes between reflections from the target and reflections from background objects, only triggering the sensor when the signal reaches a value that relates to the preset target distance.

The sensing range is practically insensitive to the target's size, color, shape and surface finish, and background-suppression sensors provide highly reliable detection of "difficult" targets, even against a light background. Stable, accurate detection of small, fast-moving parts on conveyors or automated machinery is possible over the entire sensing range, eliminating false triggering by objects in the background.

REFLEX

Long sensing range in a single-housing device

A reflex, or reflective, photoelectric sensor contains a transmitter and a receiver in a single housing, and emits a pulsed, focused light beam toward a distant reflector. Reflected light returns to the sensor, arriving at the receiver. When a target object interrupts the light beam, the

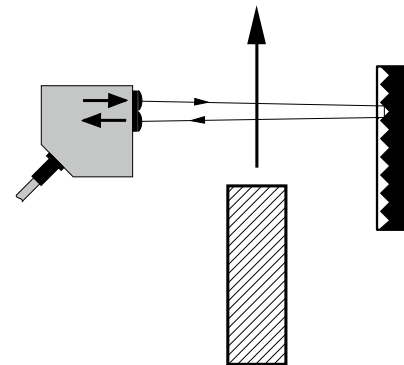


Fig. 11: Reflex sensing

receiver detects the reduced light intensity and triggers the sensor.

The relatively high level of reflected light allows reflex sensors to achieve sensing distances up to eight meters. For applications where the target object itself reflects light back toward the sensor, models with polarization filters are available. The filters ensure that only light returned from the reflector reaches the receiver, ensuring reliable detection, even with reflective targets.

TECHNOLOGY FAMILIES

Contrinex photoelectric devices are divided into **nine technology families**, depending on their operating principle and use. The program includes energetic **diffuse** sensors, diffuse sensors with **background suppression**, **reflex** sensors, **through-beam** sensors, sensors with **analog output**, **color** sensors, **contrast** sensors, **distance measuring** sensors and **optical amplifiers**.

DIFFUSE

Versatile and cost-effective

A diffuse-mode, or energetic-diffuse, photoelectric sensor is a reflective sensor, containing a transmitter and a receiver in a single housing. The sensor emits a light beam toward a distant target that acts as a reflector, returning part of the transmitted light to the sensor. The receiver detects the amount of light reflected by the target, triggering the sensor when the light intensity reaches a threshold value.

Diffuse-mode sensors are cost-effective as they do not require separate reflectors or receivers, and detect reflective targets with ease. Sensing range depends on the target's size, shape, color and surface finish, although sensor sensitivity is adjustable during installation to compensate for targets with poor reflective qualities.

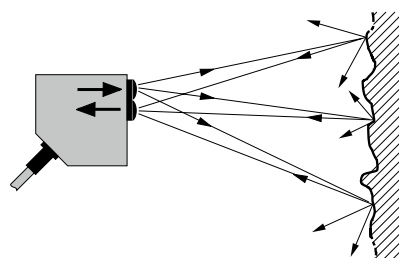


Fig. 10: Diffuse sensing

BACKGROUND SUPPRESSION

Excellent suppression of light-colored backgrounds

Diffuse-mode photoelectric sensors with background suppression emit a focused light beam toward a distant target. Part of the beam is reflected from the target and

THROUGH-BEAM

Emitter and receiver in separate housings for sensing ranges from 0 to 50 mm

A through-beam photoelectric sensor comprises an emitter and receiver, each mounted in a separate housing. The emitter is aligned so that the greatest possible amount of pulsed light from its emitting diode reaches the receiver (Fig. 12). The receiver, which is mounted beyond the target area, processes incoming light in such a way that it is clearly separated from ambient and other light sources. Any interruption of the light beam by a target triggers the sensor, causing its output signal to switch. 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.

Contrinex through-beam photoelectric sensors are ideal for industrial applications where sensing components must be mounted some distance from the target area. Through-beam sensors utilize infrared, visible and laser light sources to detect opaque and semi-transparent targets, reliably and repeatably, at extended distances. They are available in cylindrical versions from subminiature ($\varnothing 4$) to small (M18) and cubic versions from miniature (20 mm x 30 mm x 10 mm) to small (40 mm x 50 mm x 15 mm).

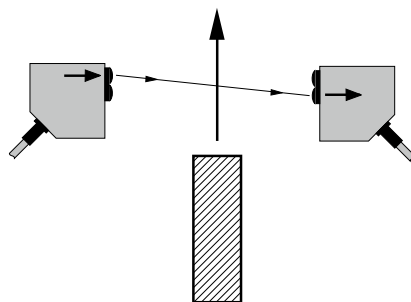


Fig. 12: Through-beam sensing

ANALOG OUTPUT

Precise distance control

Photoelectric sensors with analog outputs are ideal for measuring absolute values of distance. Using background suppression-mode technology, analog photoelectric sensors produce an output signal that is accurately calibrated and approximately proportional to the distance of the target from the sensor. Users have a choice of current or voltage outputs that are compatible with all modern control systems.

Contrinex analog photoelectric sensors provide all the advantages of standard diffuse-mode sensors, and measure target distances up to 100 mm.

DISTANCE

Ultra-precise distance measurement and detection of very large distances

Measurement with C23 and C55 distance sensors is largely independent of color and surface texture. Results are characterized by high accuracy and repeatability. In both types of sensors, the measurements are transmitted through an adjustable analog output. The sensors also offer a second output for a switching window, which is defined by teach-in. The sensor housings have an IP69K enclosure rating. In addition, the C55 is Ecolab certified and therefore suitable for the food industry.

The cubic C23 sensors use triangulation to measure distances up to 200 mm with extreme precision. Measuring just 20 mm x 34 mm x 12 mm, this sensor is suitable for numerous applications.

The C55 Series uses the time-of-flight (TOF) method for highly reliable measurement of large distances from 100 mm to 5000 mm. TOF technology calculates distance by measuring the time light takes to travel from the sensor to the target and back to the sensor. Thanks to this technology, C55 distance measuring sensors offer long detection ranges with excellent precision.

CONTRAST

The best contrast resolution for optimum print-mark detection

Contrast sensors are ideal for detecting print marks in printing, labelling and packaging processes. Using a narrowly focused light beam and RGB emission technology,

contrast sensors automatically select the best emission color (red, green or blue) during the teach-in procedure. Excellent contrast resolution, a high switching frequency (up to 10 kHz) and five tolerance levels ensure accurate detection and positioning, even when contrast differences are minimal. The integral IO-Link interface may be used to reduce changeover times through remote teach-in and parameterization. Other control functions, including monitoring, diagnosis and switching timer adjustment are also available.

Contrinex contrast sensors have a rugged PBTP housing (40 mm x 50 mm x 15 mm) with IP67 enclosure rating and are available in cable or adjustable (0°, 45° or 90°) connector versions.

COLOR

Reliable detection of fine color variations, even in harsh environments

Color photoelectric sensors utilize energetic-diffuse sensing technology to detect variations in target color, allowing color sorting or color control that is independent of target speed or distance. Using a "teach-in" function to program up to three separate outputs, the sensor recognizes or ignores even the smallest variations of shade.

Ideal for automated production processes that need reliable, repeatable color detection for accurate quality control, Contrinex color photoelectric sensors feature five selectable tolerance levels for each shade of color. Robust design ensures that sensor performance is unaffected by varying ambient light levels.

OPTICAL AMPLIFIER

Reliable short and long-range sensing

Customers requiring intrinsically-safe photoelectric sensors with DIN-rail-mounted electronics need not look beyond the Contrinex 3060 series of fiber-optic amplifiers. Packed with functionality in a Crastin® molded-resin housing measuring only 31 mm x 60 mm x 10 mm, every model combines ease of set-up with market-leading features. With switching times as low as 0.1 millisecond, 3060 fiber-optic amplifiers are ideal for sensing fast-moving targets in demanding environments, including robotics, precision handling systems and printed circuit board production.

INTRODUCTION

Distance setting is accomplished either by adjustment of a multi-turn potentiometer or by use of a teach-in function with manual fine adjustment; an optional digital display (model 3066) is also available. Using blue-light sources (models 3360 and 3365), detecting glass and other materials with similar absorption spectra is possible at distances up to 100 mm.

Fiber-optic sensors are common in explosive environments or in the presence of strong electromagnetic fields - in these areas, sensors that rely on electrical signals may present a risk of explosion or fail to operate correctly. Contrinex manufactures world-class fiber-optic sensors and amplifiers that not only meet these needs, but also present a highly practical means of sensing in confined spaces. With bend-radii as small as 2 mm, reliable, accurate sensing is possible even in the most inaccessible areas.

With self-contained fiber-optic sensors available in housings as small as 30 mm x 30 mm x 15 mm, and several models of small DIN-rail mounted amplifiers that accommodate multiple-sensor applications, the Contrinex range is highly versatile. A choice of synthetic optical fibers with impressively low attenuation rates for general use or glass optical fibers for high ambient temperatures and aggressive environments provides options for even the most demanding applications.

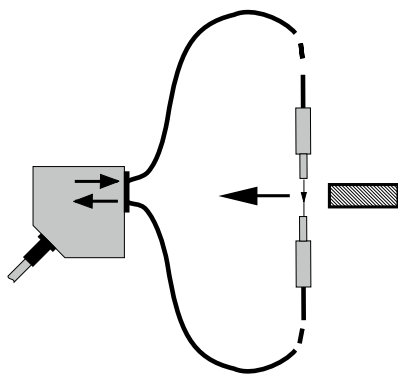


Fig. 13: Optical fiber, through-beam sensing

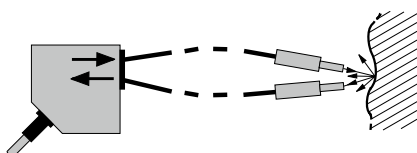


Fig. 14 Optical fiber, diffuse sensing

PRODUCT RANGES

SUBMINIATURE

Cubic (5 mm x 7 mm and 13 mm x 21 mm x 7 mm) and Cylindrical (Ø 4 and M5)

The Contrinex **Subminiature** range packs exceptional position- and presence-sensing performance into the smallest self-contained photoelectric sensors on the market. Through-beam or diffuse sensors in Ø 4 and M5 cylindrical or 5 mm x 7 mm rectangular stainless-steel housings offer multiple mounting methods and possibilities for beam orientation. For fully embedded applications, sensors with spherical sapphire-glass lenses produce focused, cylindrical light beams. Best-in-class sensing distances of up to 90 mm (diffuse) and 250 mm (through-beam) allow sensors to be positioned at a safe distance from the target, minimizing the risk of accidental impact damage. Thanks to robust construction that includes rugged sensing faces, Contrinex **Subminiature** sensors are resistant to chemical contamination and abrasion, delivering maximum operational uptime and world-class reliability.

The C12 Series (13.5 mm x 21.8 mm x 7.7 mm) with small visible light spot thanks to red pinpoint LED offers long sensing ranges up to 2000 mm in a through-beam type and 3000 mm in a polarized reflex type. Two background suppression types are available with fixed sensing ranges up to 15 mm or 30 mm. A third type with 3-turn potentiometer (13.5 mm x 27.5 mm x 7.7 mm) reliably detects objects up to 120 mm.

- Long sensing ranges
- Background suppression up to 120 mm
- Excellent background suppression characteristics
- 45° angle cable outlet for easy installation



MINIATURE

Cubic (20 mm x 30 mm and 30 mm x 30 mm) and Cylindrical (M12)

Contrinex **Miniature** photoelectric sensors provide market-leading performance and reliability in rugged, industry-standard housings to ensure excellent resistance to machine vibration or shock from accidental impact. They are recommended for general automation in the printing, packaging or machine tool industries, and for electronic assembly or mechanical handling systems.

Ideal for applications where space is tight, they also offer excellent sensing distances. Available technologies include diffuse sensing, polarized reflex sensing, through-beam sensing and amplifiers. Versions with excellent background suppression allow ultra-reliable target detection, even against light backgrounds. For applications where precise sensing is required but space is limited, the range includes fiber-optic amplifiers that allow the sensor housing to be mounted remotely.

The C23 series (20 mm x 30 mm x 10 mm) of miniature cubic sensors offers solutions for a wide range of industries and applications. With IO-Link communication on all PNP-type sensors, the C23 series bridges the gap between machines and the digital world to meet the demands of smart factories.



The C23 distance measurement sensor (20 mm x 34 mm x 12 mm) uses triangulation technology to offer precise measurement in an IP 69K rated, cubic housing. Distance measurement is also possible by utilizing the analog voltage outputs available on other cubic models. Contrinex M12 photoelectric sensors are ideal for high-speed applications in the most challenging environments, with the 1121L capable of detecting even the smallest targets. This laser through-beam sensor is suitable for extended sensing ranges up to 50 meters and has a 1000 Hz maximum switching frequency.



SMALL

Cubic (40 mm x 40/50 mm) and Cylindrical (M18)

Contrinex **Small** photoelectric sensors are rugged and highly reliable.

Cubic (40 mm x 40/50 mm) models are suitable for industrial applications including packaging and wrapping machinery, filling systems and general automated equipment. Available in diffuse (energetic or background-suppression),



polarized and non-polarized reflex or through-beam technologies with glass or coated-plastic windows, they are insensitive to high levels of ambient light. Best-in-class background suppression allows ultra-reliable target detection, even against light backgrounds. All models feature LED indication of signal degradation if the sensing face is obscured or becomes contaminated, eliminating the risk of errors or lost production. Mounted in a robust, industry-standard 40 mm x 50 mm x 15 mm housing, these sensors are Ecolab approved and rated to IP 67.

The range includes amplifiers and color sensors with 3 different teachable shades of color and 5 levels of tolerance. For precise print mark detection, contrast sensors are available with excellent contrast resolution, a high switching frequency (up to 10 kHz), five tolerance levels and IO-Link.

Cylindrical M18 models are ideal for demanding industrial environments, including automotive assembly, packaging machinery, conveyor systems and general automation equipment. A comprehensive range comprises diffuse sensors (both energetic and background-suppression variants), reflex sensors and through-beam sensors with the option of either axial or lateral sensing for sensing distances up to 50 meters. The range includes energetic diffuse sensors and through-beam sensors with laser light sources (1180L and 1181L models), allowing extended sensing distances for objects as small as 0.1 mm in size. Robust construction with metal housings and vacuum-encapsulated electronics on all models ensures maximum reliability and minimum downtime.

COMPACT

Cubic (50 mm x 50 mm)

The Contrinex C55 series (50 mm x 50 mm x 23 mm) uses time-of-flight (TOF) technology to measure long distances up to 5000 mm. With an IP 69K enclosure rating and Ecolab approval, these sensors are ideal for the food industry. A background suppression type is also available.



Inductive

Photoelectric

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IO-LINK FUNCTIONALITY* WITH PHOTOELECTRIC SENSORS

Data monitoring:

- 1 Detection status is monitored and continuously transmitted through IO-Link process data. This data contains both the detection state and the stability of detection (sufficient detection margin). It is possible, therefore, to determine whether the sensor is working too close to its detection threshold, for example due to window contamination.

Diagnosis:

- 2 The operating state of the sensor is checked. In case of wire break, under-voltage, disturbances on the receiver, sensor malfunction or installation of the wrong sensor, information is provided directly through IO-Link to enable fast repair, maintenance and replacement.

Sensitivity and teach:

- 3 The sensitivity of the sensor can be adjusted remotely by changing the threshold. Alternatively, the teach function can be used to adapt the threshold to the application. Calibrated sensing ranges ensure easy sensor replacement by uploading the existing sensitivity to the replacement sensor.

Light-on/Dark-on selection:

- 4 The output switching mode can be selected as light-on or dark-on. A single sensor type is configurable for the various needs of an application. This helps reduce the number of different sensor types required in stock.

Switching timer:

- 5 The timing of output switching can be configured. Depending on the needs of an application, output switching can be delayed or the duration stretched.

Sensor mode:

- 6 3 different modes are selectable depending on the application needs: "Normal", "Fast" and "Fine". "Normal" mode is a good balance of speed and precision. In "Fast" mode, speed is higher and in "Fine" mode precision is higher.

Sequence selection:

- 7 For cross-talk immunity with through-beam sensors, up to 9 different emitting sequences can be selected to pair the emitter with the receiver.

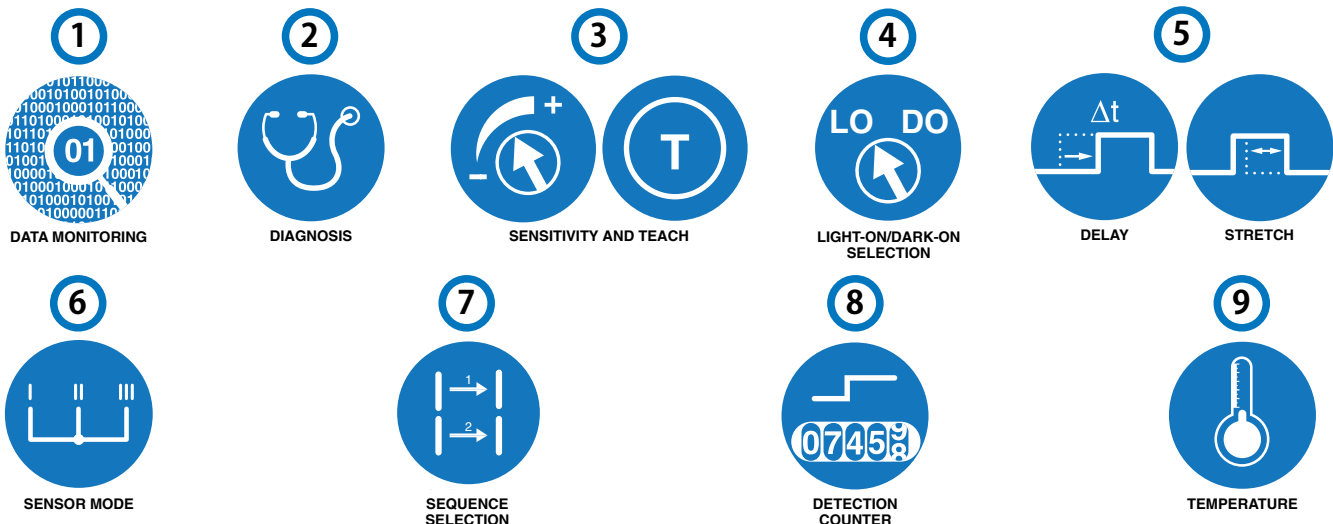
Detection counter:

- 8 Detection events are counted. By registering the number of detections, it is possible to calculate the speed or number of parts. The counter can be reset by means of a unique IO-Link message.

Temperature:

- 9 The internal temperature of the sensor is measured continuously, which provides an indication about the ambient temperature in the application. Moreover, the maximum temperature measured is saved for diagnosis and preventive maintenance purposes.

* Functionalities may vary depending on series and sensor type







THE SMALLEST ON THE MARKET

CYLINDRICAL SUBMINIATURE

PHOTOELECTRIC SENSORS

KEY ADVANTAGES

- ✓ Ø 4 and M5 housings for target detection in limited spaces
- ✓ Rugged metal housing
- ✓ Accurate target detection due to cylindrical light beam
- ✓ Rugged sapphire glass or glass sensing face, scratch and chemically resistant
- ✓ Shock and vibration resistant due to fully vacuum potted electronics
- ✓ High system reserves (excess gain)

RANGE OVERVIEW	Distance mm	Diffuse	Through-beam
CYLINDRICAL SUB- MINIATURE	10	p. 181, 183-184	
	20	p. 182, 184-185	
	50	p. 182-183, 185-186	
	250		p. 186

OVERVIEW

	1040 / 1050
Housing material	Stainless steel V2A
Emitter	IR LED 880 nm
Hysteresis	10 % typ.
Degree of protection	IP 67
Supply voltage range	10 ... 30 VDC
Ambient temperature range	0 ... +55 °C / 32 ... +131 °F
Output current	≤ 100 mA
Output voltage drop	≤ 2 V
Switching frequency	≤ 250 Hz
Switching time	2 msec
Max. ambient light halogen	5000 Lux
Max. ambient light sun	10,000 Lux

WIRING DIAGRAM

PNP/NPN Light-ON / Dark-ON



HOUSING SIZE MM

OPERATING PRINCIPLE

SENSING RANGE MM

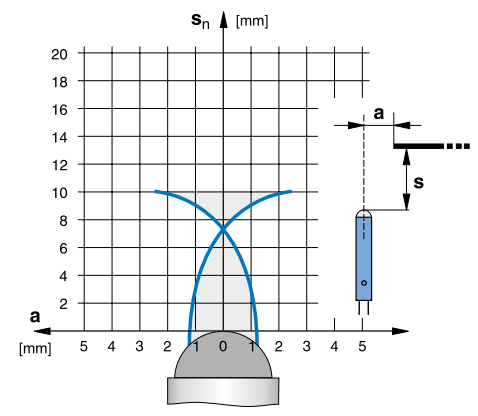
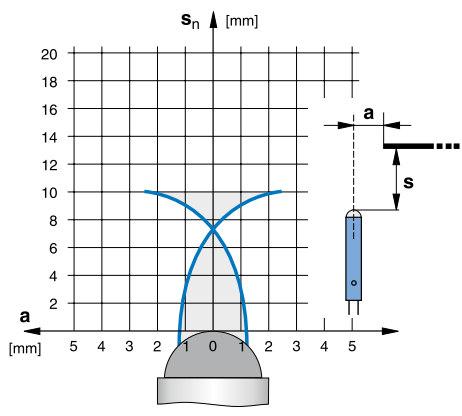
PHOTOELECTRIC

DATA

Standard target
 No-load supply current
 Lens material
 PNP Light-ON
 NPN Light-ON
 Other types available

CYLINDRICAL SUBMINIATURE

Ø 4	Ø 4
DIFFUSE SENSOR	DIFFUSE SENSOR
10	10



100 x 100 mm white	100 x 100 mm white
≤ 15 mA	≤ 15 mA
Sapphire glass	Sapphire glass
LTK-1040-303-505	LTS-1040-303-505
LTK-1040-301-505	LTS-1040-301-505

- Inductive
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- Ultrasonic
- Capacitive
- Safety
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- Accessories
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CYLINDRICAL SUBMINIATURE

HOUSING SIZE MM

Ø 4

Ø 4

OPERATING PRINCIPLE

DIFFUSE SENSOR

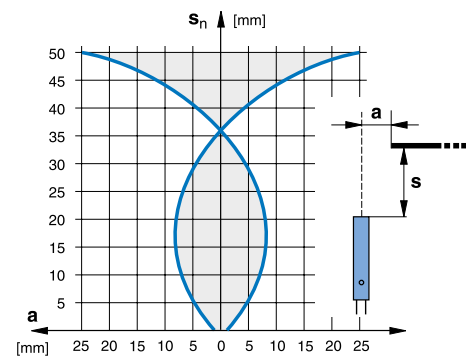
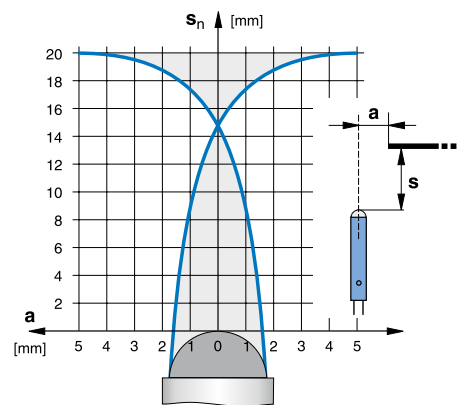
DIFFUSE SENSOR

SENSING RANGE MM

20

50

PHOTOELECTRIC



DATA

Standard target

100 x 100 mm white

100 x 100 mm white

No-load supply current

≤ 15 mA

≤ 15 mA

Lens material

Sapphire glass

Glass

PNP Light-ON

LTK-1040-303-506

LTK-1040-303

NPN Light-ON

LTK-1040-301-506

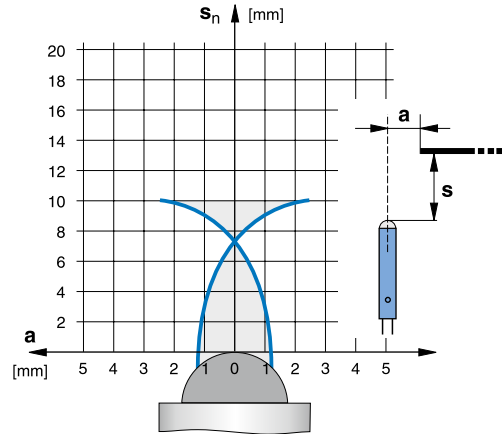
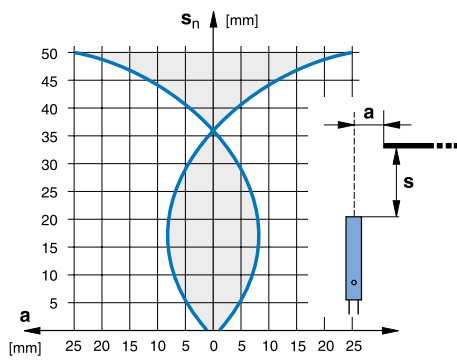
LTK-1040-301

Other types available

CYLINDRICAL SUBMINIATURE

Ø 4	M5
DIFFUSE SENSOR	DIFFUSE SENSOR
50	10

Inductive
Photoelectric
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100 x 100 mm white
≤ 15 mA
Glass
LTS-1040-303
LTS-1040-301

100 x 100 mm white
≤ 15 mA
Sapphire glass
LTK-1050-303-505
LTK-1050-301-505
PNP Dark-ON

CYLINDRICAL SUBMINIATURE

HOUSING SIZE

M5

M5

OPERATING PRINCIPLE

DIFFUSE SENSOR

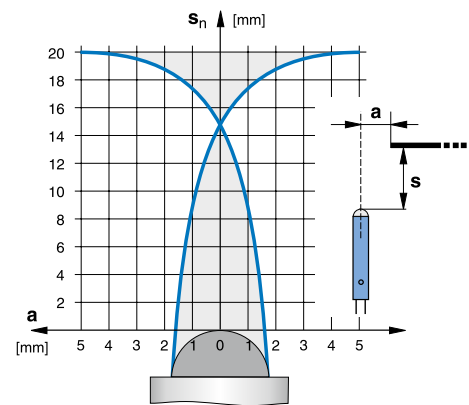
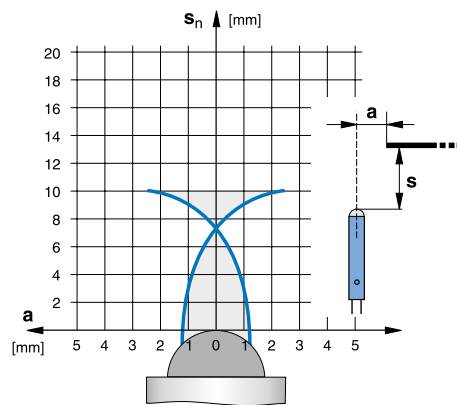
DIFFUSE SENSOR

SENSING RANGE MM

10

20

PHOTOELECTRIC



DATA

Standard target

100 x 100 mm white

100 x 100 mm white

No-load supply current

≤ 15 mA

≤ 15 mA

Lens material

Sapphire glass

Sapphire glass

PNP Light-ON

LTS-1050-303-505

LTK-1050-303-506

NPN Light-ON

LTS-1050-301-505

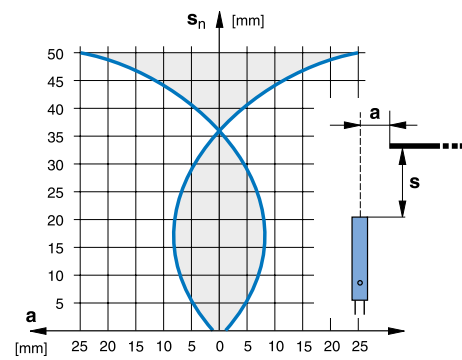
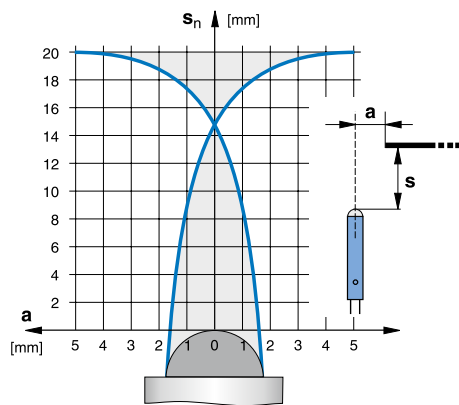
LTK-1050-301-506

Other types available

PNP Dark-ON

CYLINDRICAL SUBMINIATURE

M5	M5
DIFFUSE SENSOR	DIFFUSE SENSOR
20	50



100 x 100 mm white	100 x 100 mm white
≤ 15 mA	≤ 15 mA
Sapphire glass	Glass
LTS-1050-303-506	LTK-1050-303
LTS-1050-301-506	LTK-1050-301

Inductive
Photoelectric
Ultrasonic
Capacitive
Safety
RFID
Connectivity
Accessories
Glossary
Index

CYLINDRICAL SUBMINIATURE

HOUSING SIZE

M5

M5

OPERATING PRINCIPLE

DIFFUSE SENSOR

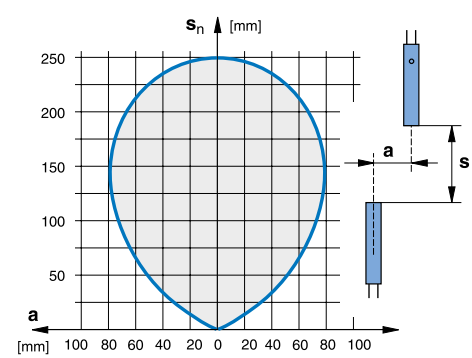
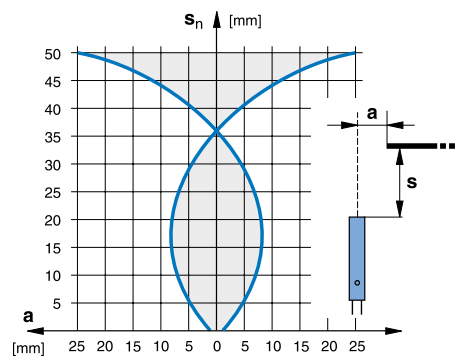
THROUGH-BEAM SENSOR

SENSING RANGE MM

50

250

PHOTOELECTRIC



DATA

Standard target

100 x 100 mm white

-

No-load supply current

≤ 15 mA

≤ 5 mA (receiver) / ≤ 10 mA (emitter)

Lens material

Glass

Glass

PNP Light-ON / Emitter

LTS-1050-303

LLS-1050-200 (emitter)

PNP Dark-ON

LLS-1050-204 (receiver)

Other types available

NPN Light-ON

NPN Dark-ON





M12 STANDARD SIZE FOR MULTIPLE USES

CYLINDRICAL MINIATURE

PHOTOELECTRIC SENSORS

KEY ADVANTAGES

- ✓ M12 miniature sensor series
- ✓ Rugged metal housing
- ✓ Accurate and speed-independent target detection; response time 0.5 msec (laser: 0.1 msec)
- ✓ Shock and vibration resistant due to fully vacuum potted electronics
- ✓ High system reserves (excess gain)
- ✓ Easy adjustment (due to visible red light)
- ✓ Laser sensor (protection class 2)

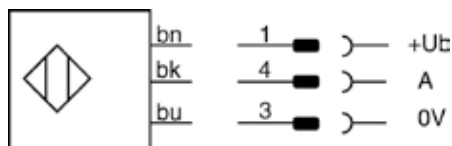
RANGE OVERVIEW	Distance mm	Diffuse	Reflex	Through- beam	Laser
CYLINDRICAL MINIATURE	300	p. 191			
	1500		p. 192		
	10,000			p. 192	
	50,000				p. 193

OVERVIEW

	1120	1121L
Housing material	Chrome-plated brass	Stainless steel V2A
Hysteresis	10 % typ.	10 % typ.
Degree of protection	IP 67	IP 67
Laser protection class	--	2
Supply voltage range	10...36 VDC	10 ... 36 VDC
Ambient temperature range	-25...+55 °C / -13...+131 °F	-10...+50 °C / +14...+122 °F
Output current	≤ 200 mA	≤ 200 mA
Output voltage drop	≤ 2 V	≤ 2 V
Switching frequency	≤ 1000 Hz	≤ 5000 Hz
Switching time	0.5 msec	0.1 msec
Max. ambient light halogen	5000 Lux	5000 Lux
Max. ambient light sun	10,000 Lux	10,000 Lux

WIRING DIAGRAM

PNP / NPN Light-ON / Dark-ON / Emitter



HOUSING SIZE

OPERATING PRINCIPLE

SENSING RANGE MM

PHOTOELECTRIC

DATA

Standard target

No-load supply current

Emitter

Setup

PNP Light-ON

NPN Light-ON

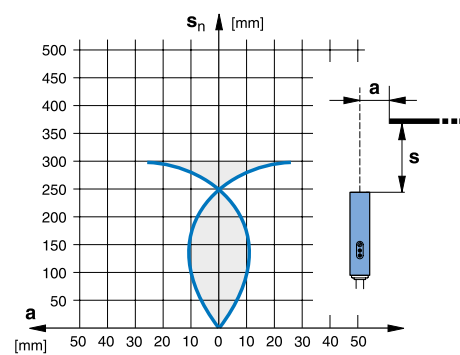
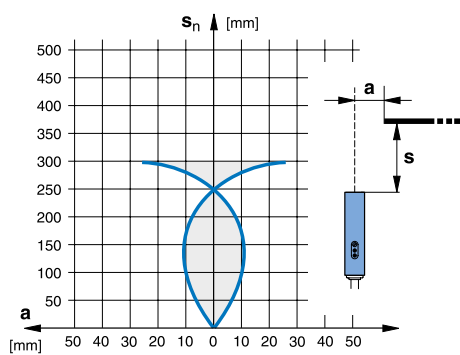
Other types available

CYLINDRICAL MINIATURE

M12	M12
DIFFUSE SENSOR	DIFFUSE SENSOR
300	300



Inductive
Photoelectric
Ultrasonic
Capacitive
Safety
RFID
Connectivity
Accessories
Glossary
Index



100 x 100 mm white	100 x 100 mm white
≤ 15 mA	≤ 15 mA
LED red 660 nm	LED red 660 nm
Potentiometer	Potentiometer
LTK-1120-303	LTS-1120-303
LTK-1120-301	LTS-1120-301

CYLINDRICAL MINIATURE

HOUSING SIZE

M12

M12

OPERATING PRINCIPLE

REFLEX SENSOR

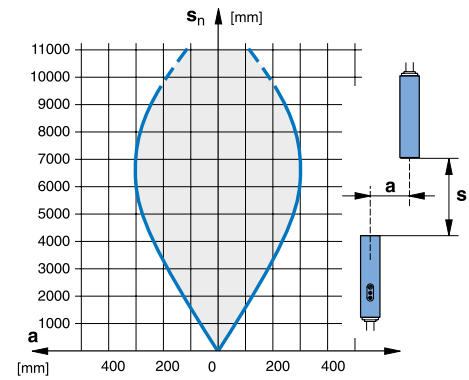
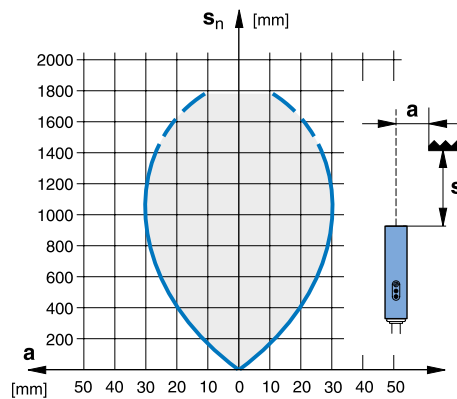
THROUGH-BEAM SENSOR

SENSING RANGE MM

1500

10,000

PHOTOELECTRIC



DATA

Standard target / Reflector type

LXR-0000-084 (see page 247)

-

No-load supply current

≤ 15 mA

≤ 15 mA

Emitter

LED red polarized 660 nm

LED red 660 nm

Setup

-

-

Emitter

LLS-1120-200 (emitter)

PNP Dark-ON

LRS-1120-304

LLS-1120-204 (receiver)

Other types available

NPN Dark-ON, cable version

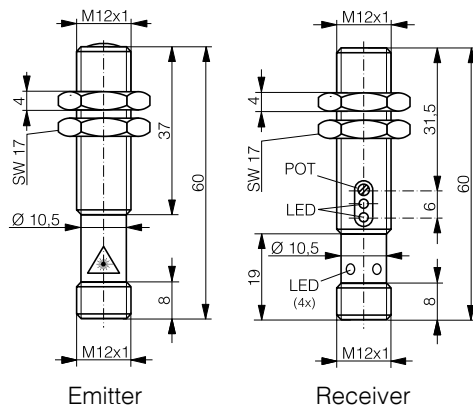
NPN Dark-ON, cable version

CYLINDRICAL MINIATURE

M12 LASER

THROUGH-BEAM SENSOR

50,000



Emitter

Receiver

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

Glossary

Index

≤ 10 mA

Laser red pulsed 660 nm

LLS-1121L-200 (emitter)

LLS-1121L-204 (receiver)

NPN Dark-ON, cable version



M18 STANDARD SIZE, INCLUDING 90° SENSING

CYLINDRICAL SMALL

PHOTOELECTRIC SENSORS

KEY ADVANTAGES

- ✓ Small sensor M18
- ✓ Models for lateral sensing
- ✓ Rugged metal housing
- ✓ Accurate and speed-independent target detection
- ✓ Shock and vibration resistant due to fully vacuum potted electronics
- ✓ High system reserves (excess gain)
- ✓ Easy adjustment (due to visible red light)
- ✓ Laser sensor (protection class 2)

RANGE OVERVIEW	Distance mm	Diffuse	Reflex	Through- beam	Background suppression	Laser
CYLINDRICAL SMALL	120				p. 197-198	
	250					p. 203
	600	p. 198-199				p. 203
	2000		p. 200-201			
	20,000				p. 201-202	
	50,000				p. 204	p. 204

OVERVIEW

	1180 / 1180W	1180L
Housing material	Stainless steel V2A	Stainless steel V2A
Hysteresis	10 % typ.	10 % typ.
Degree of protection	IP 67	IP 67
Laser protection class	-	2
Supply voltage range	10 ... 36 VDC	10 ... 36 VDC
Ambient temperature range	-25...+55 °C / -13...+131 °F	-10...+50 °C / +14...+122 °F
Output current	≤ 200 mA	≤ 200 mA
Output voltage drop	≤ 2 V	≤ 2 V
Switching frequency	≤ 1000 Hz	LT: ≤ 1000 Hz/LL: ≤ 5000 Hz
Switching time	1 msec	0.5 msec
Max. ambient light halogen	5000 Lux	5000 Lux
Max. ambient light sun	10,000 Lux	10,000 Lux

HOUSING SIZE

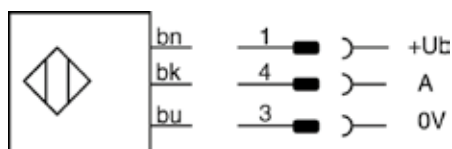
OPERATING PRINCIPLE

SENSING RANGE MM

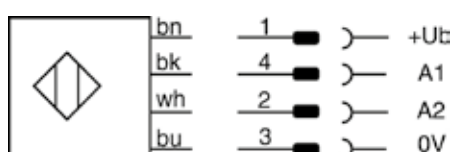
PHOTOELECTRIC

WIRING DIAGRAMS

PNP/NPN Light-ON / Dark-ON / Emitter



PNP/NPN Changeover

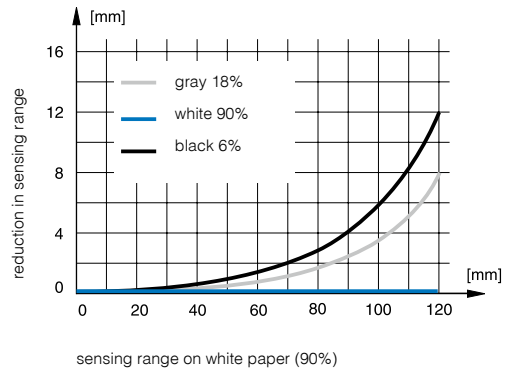
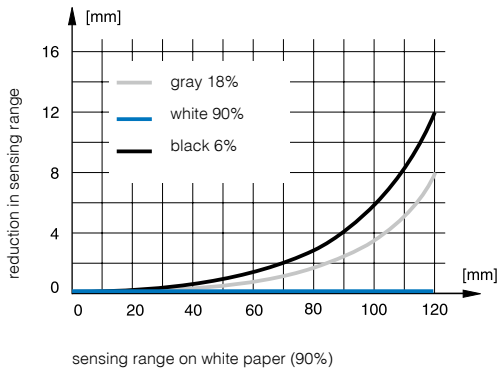


DATA

Standard target
 No-load supply current
 Emitter
 Setup
 PNP Light-ON
 NPN Light-ON
 Other types available

CYLINDRICAL SMALL

M18	M18
DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION	DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION
10 ... 120	10 ... 120



100 x 100 mm white ≤ 25 mA LED red 680 nm Potentiometer LHK-1180-303 LHK-1180-301	100 x 100 mm white ≤ 25 mA LED red 680 nm Potentiometer LHS-1180-303 LHS-1180-301
--	--

- Inductive
- Photoelectric
- Ultrasonic
- Capacitive
- Safety
- RFID
- Connectivity
- Accessories
- Glossary
- Index

CYLINDRICAL SMALL

HOUSING SIZE

M18W

M18

OPERATING PRINCIPLE

DIFFUSE SENSOR WITH
BACKGROUND SUPPRESSION

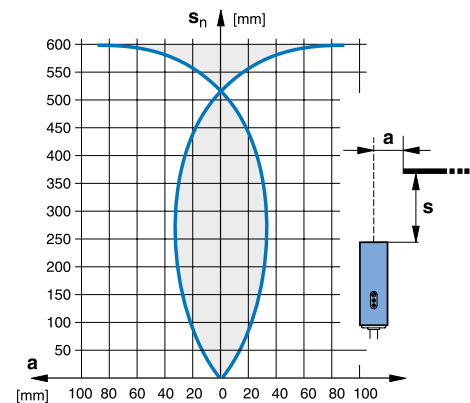
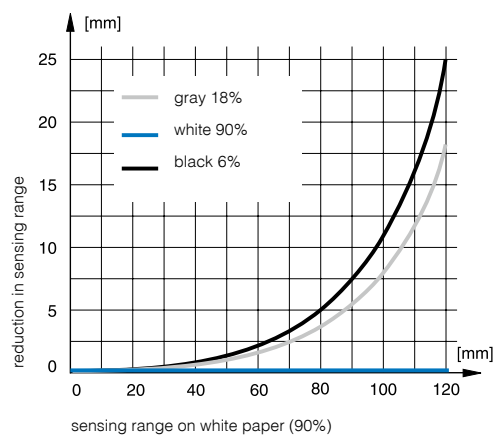
DIFFUSE SENSOR

SENSING RANGE MM

10 ... 120

40 ... 600

PHOTOELECTRIC



DATA

Standard target

100 x 100 mm white

200 x 200 mm white

No-load supply current

≤ 25 mA

≤ 20 mA

Emitter

LED red 680 nm

LED red 630 nm

Setup

Potentiometer

Potentiometer

PNP Light-ON

LHS-1180W-303

LTK-1180-303

PNP Changeover

LTK-1180-103

NPN Changeover

LTK-1180-101

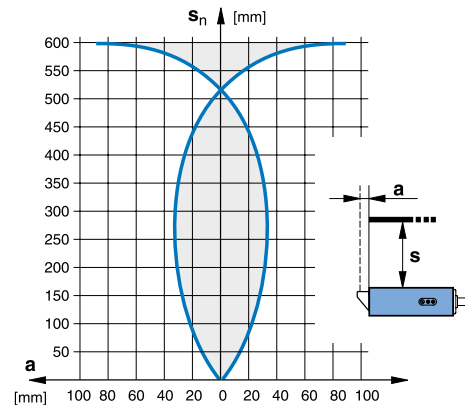
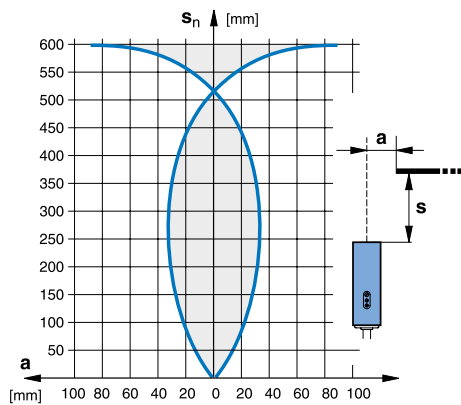
Other types available

NPN Light-ON, cable version

NPN Light-ON

CYLINDRICAL SMALL

M18	M18W
DIFFUSE SENSOR	DIFFUSE SENSOR
40 ... 600	40 ... 600



200 x 200 mm white	200 x 200 mm white
≤ 20 mA	≤ 20 mA
LED red 630 nm	LED red 630 nm
Potentiometer	Potentiometer
LTS-1180-303	LTS-1180W-303
LTS-1180-103	LTS-1180W-103
LTS-1180-101	LTS-1180W-101
NPN Light-ON	NPN Light-ON, cable version

- Inductive
- Photoelectric
- Ultrasonic
- Capacitive
- Safety
- RFID
- Connectivity
- Accessories
- Glossary
- Index

CYLINDRICAL SMALL

HOUSING SIZE

M18

M18

OPERATING PRINCIPLE

REFLEX SENSOR

REFLEX SENSOR

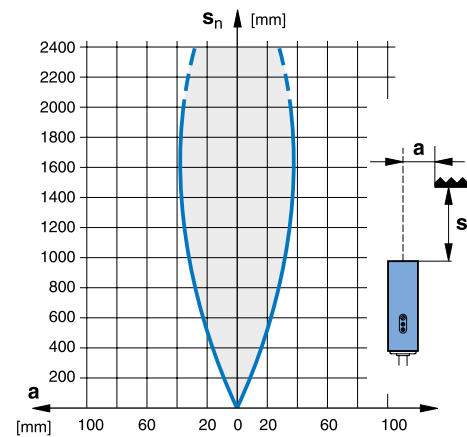
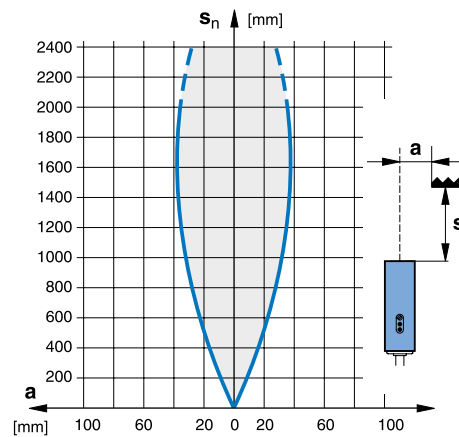
SENSING RANGE MM

2000

2000



PHOTOELECTRIC



DATA

Standard target / Reflector type

LXR-0000-084 (see page 247)

LXR-0000-084 (see page 247)

No-load supply current

≤ 15 mA

≤ 15 mA

Emitter

LED red polarized 660 nm

LED red polarized 660 nm

Setup

-

-

PNP Dark-ON

LRK-1180-304

LRS-1180-304

Emitter

PNP Changeover

NPN Changeover

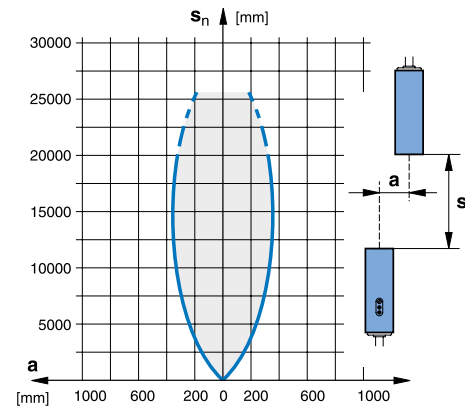
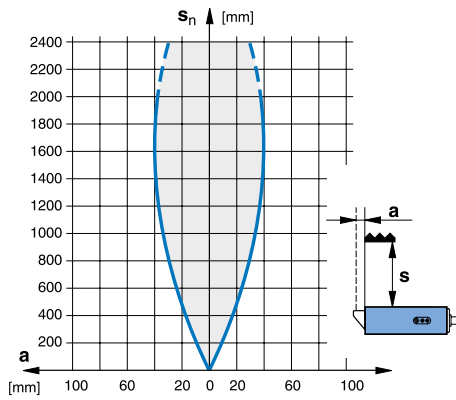
Other types available

NPN Dark-ON

NPN Dark-ON

CYLINDRICAL SMALL

M18W	M18
REFLEX SENSOR	THROUGH-BEAM SENSOR
2000	20,000



LXR-0000-084 (see page 247)	-
≤ 15 mA	≤ 10 mA (receiver) / ≤ 15 mA (emitter)
LED red polarized 660 nm	LED red 660 nm
-	-
LRS-1180W-304	LLK-1180-000
	LLK-1180-003 (receiver)
	LLK-1180-001 (receiver)
NPN Dark-ON, cable version	

Inductive
Photoelectric
Ultrasonic
Capacitive
Safety
RFID
Connectivity
Accessories
Glossary
Index

CYLINDRICAL SMALL

HOUSING SIZE

M18

M18W

OPERATING PRINCIPLE

THROUGH-BEAM SENSOR

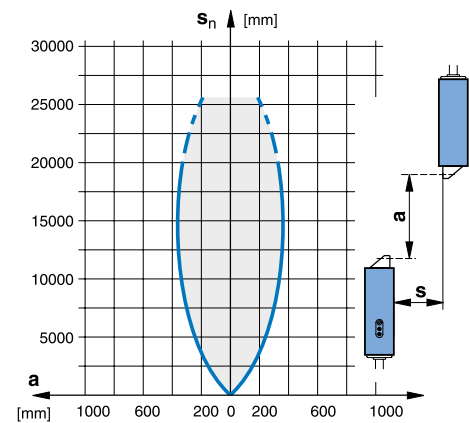
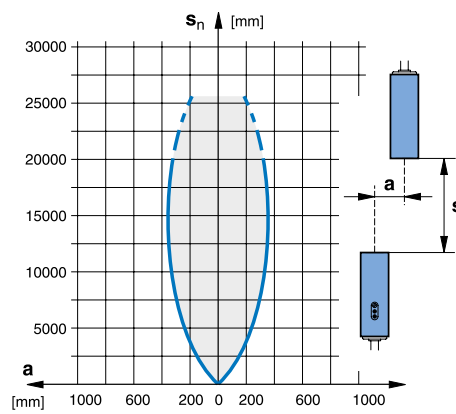
THROUGH-BEAM SENSOR

SENSING RANGE MM

20,000

20,000

PHOTOELECTRIC



DATA

Standard target

-

-

No-load supply current

≤ 10 mA (receiver) / ≤ 15 mA (emitter)

≤ 10 mA (receiver) / ≤ 15 mA (emitter)

Emitter

LED red 660 nm

LED red 660 nm

Setup

-

-

Emitter

LLS-1180-000

LLS-1180W-000

PNP Changeover

LLS-1180-003 (receiver)

LLS-1180W-003 (receiver)

NPN Changeover

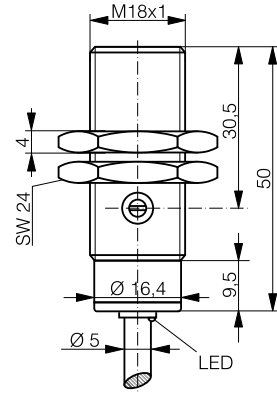
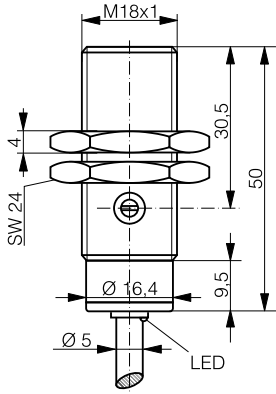
LLS-1180-001 (receiver)

LLS-1180W-001 (receiver)

Other types available

CYLINDRICAL SMALL

M18 LASER	M18 LASER
DIFFUSE SENSOR	DIFFUSE SENSOR
40 ... 250	60 ... 600



100 x 100 mm white ≤ 20 mA Laser red pulsed 660 nm Potentiometer	100 x 100 mm white ≤ 20 mA Laser red pulsed 660 nm Potentiometer
LTS-1180L-103-516 LTS-1180L-101-516 Cable version	LTS-1180L-103 LTS-1180L-101 Cable version

- Inductive
- Photoelectric
- Ultrasonic
- Capacitive
- Safety
- RFID
- Connectivity
- Accessories
- Glossary
- Index

CYLINDRICAL SMALL

HOUSING SIZE

M18 LASER

M18 LASER

OPERATING PRINCIPLE

THROUGH-BEAM SENSOR

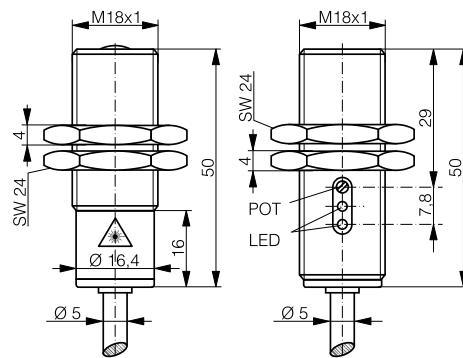
THROUGH-BEAM SENSOR

SENSING RANGE MM

50,000

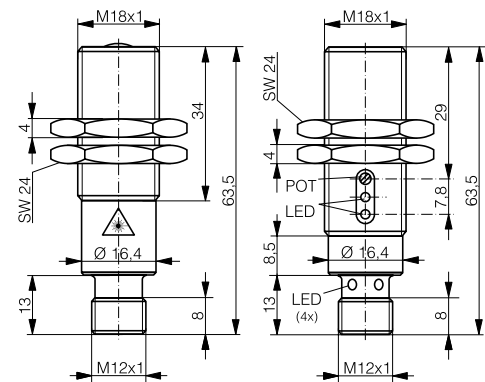
50,000

PHOTOELECTRIC



Emitter

Receiver



Emitter

Receiver

DATA

Standard target

-

-

No-load supply current

≤ 10 mA

≤ 10 mA

Emitter

Laser red pulsed 660 nm

Laser red pulsed 660 nm

Setup

Potentiometer (receiver)

Potentiometer (receiver)

Emitter

LLK-1181L-000

LLS-1181L-000

PNP Changeover

LLK-1181L-003 (receiver)

LLS-1181L-003 (receiver)

NPN Changeover

LLK-1181L-001 (receiver)

LLS-1181L-001 (receiver)

Other types available





SAVE SPACE, KEEP PERFORMANCE

CUBIC SUBMINIATURE

PHOTOELECTRIC SENSORS

KEY ADVANTAGES

C12 series

- ✓ Plastic housing, 13 mm x 21 mm / 27 mm x 7 mm
- ✓ Red pinpoint LED, small visible light spot
- ✓ Excellent background suppression up to 120 mm with 3-turn potentiometer
- ✓ Long sensing ranges

0507 series

- ✓ Rugged diffuse-type sensors in steel housing, 5 mm x 7 mm x 40 mm
- ✓ Accurate target detection due to cylindrical light beam
- ✓ Steel sensors with sapphire-glass sensing face, scratch and chemically resistant

RANGE OVERVIEW	Distance mm	Diffuse	Background suppression	Reflex	Through-beam
CUBIC SUB- MINIATURE	20	p. 213			
	50	p. 213			
	90	p. 213			
	120		p. 209		
	15 / 30		p. 209		
	3000			p. 210	
	2000				p. 210

CUBIC SUBMINIATURE

OVERVIEW

	C12
Housing material	ABS / PMMA
Light source	Red pinpoint LED 640 nm
Degree of protection	IP 67
Supply voltage range	10 ... 30 VDC
Ambient temperature range	-20 ... +50°C / -4 ... +122 °F
Output current	≤ 50 mA
Output voltage drop	≤ 2 V
Switching frequency	≤ 800 Hz
Switching time	0.6 msec

HOUSING SIZE MM

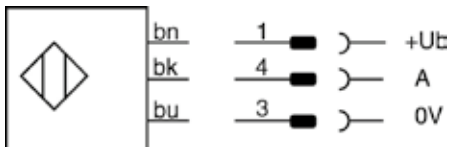
OPERATING PRINCIPLE

SENSING RANGE MM

PHOTOELECTRIC

WIRING DIAGRAM

PNP/NPN Light-ON / Dark-ON / Emitter



DATA

Standard target

Setup

No load supply current

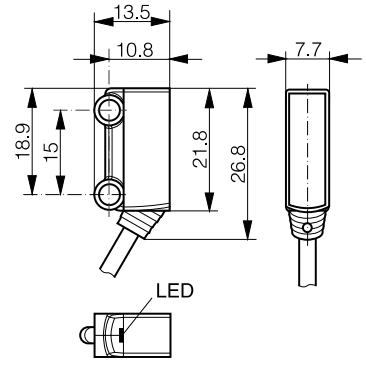
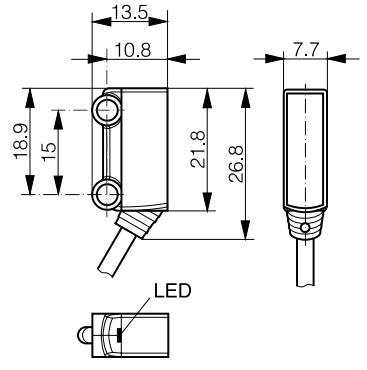
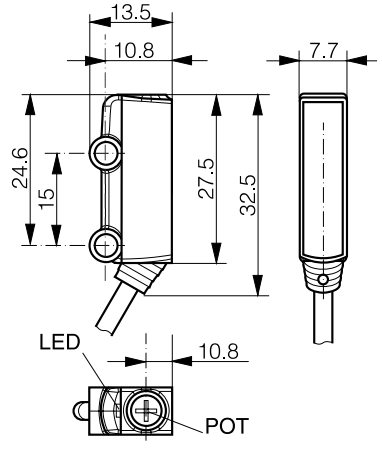
PNP Light-ON

NPN Light-ON

Other types available

CUBIC SUBMINIATURE

□ 13 X 27 X 7	□ 13 X 21 X 7	□ 13 X 21 X 7
DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION	DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION	DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION
2 ... 120	1 ... 15	1 ... 30



Inductive
Photoelectric
Ultrasonic
Capacitive
Safety
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100 x 100 mm white	100 x 100 mm white	100 x 100 mm white
3-turn potentiometer	-	-
≤ 20 mA	≤ 20 mA	≤ 20 mA
LHR-C12PA-PLK-303	LHR-C12PA-NSK-303	LHR-C12PA-NMK-303
LHR-C12PA-PLK-301	LHR-C12PA-NSK-301	LHR-C12PA-NMK-301
0.2 m cable + connector M8	0.2 m cable + connector M8	0.2 m cable + connector M8

CUBIC SUBMINIATURE

HOUSING SIZE MM

□ 13 X 21 X 7

□ 13 X 21 X 7

OPERATING PRINCIPLE

REFLEX SENSOR

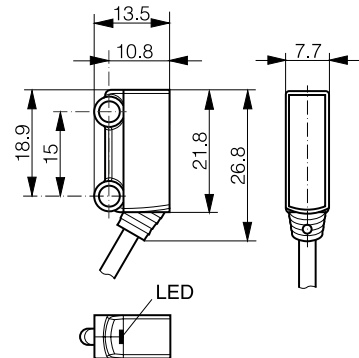
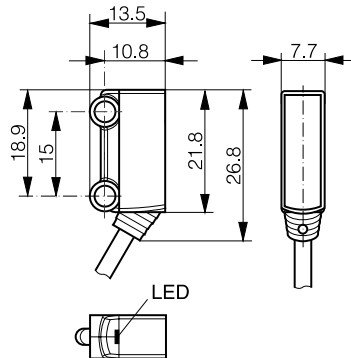
THROUGH-BEAM SENSOR

SENSING RANGE MM

3000

2000

PHOTOELECTRIC



DATA

Reflector type	LXR-0001-064 (see page 248)
Sensitivity adjustment	-
No load supply current	≤ 20 mA
Emitter	
PNP Dark-ON	LRR-C12PA-NMK-304
NPN Dark-ON	LRR-C12PA-NMK-302
Other types available	0.2 m cable + connector M8

	-
	-
	≤ 20 mA
	LLR-C12PA-NMK-300
	LLR-C12PA-NMK-304
	LLR-C12PA-NMK-302
	0.2 m cable + connector M8

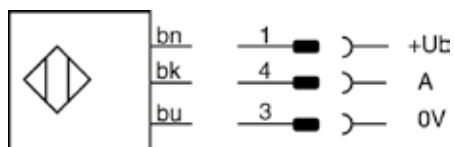


OVERVIEW

	0507
Housing material	Stainless steel V2A
Light source	IR LED 880 nm
Hysteresis	10 % typ.
Degree of protection	IP 67
Supply voltage range	10 ... 30 VDC
Ambient temperature range	0 ... +55°C / 32 ... +131 °F
Output current	≤ 100 mA
Output voltage drop	≤ 2 V
Switching frequency	≤ 250 Hz
Switching time	2.5 msec
Max. ambient light halogen	5000 Lux
Max. ambient light sun	10,000 Lux

WIRING DIAGRAM

PNP/NPN Light-ON / Dark-ON



HOUSING SIZE MM

OPERATING PRINCIPLE

SENSING RANGE MM

PHOTOELECTRIC

DATA

Standard target
 No-load supply current
 Lens material
 PNP Light-ON
 NPN Light-ON
 Other types available

CUBIC SUBMINIATURE

□ 5 X 7 X 40	□ 5 X 7 X 40	□ 5 X 7 X 40
DIFFUSE SENSOR	DIFFUSE SENSOR	DIFFUSE SENSOR
20	50	90



Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

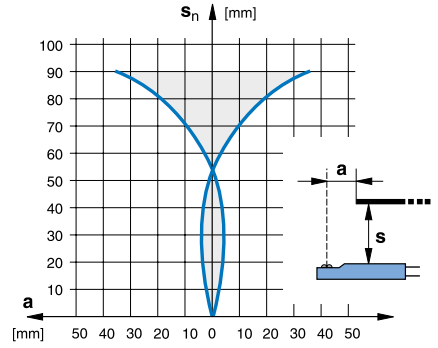
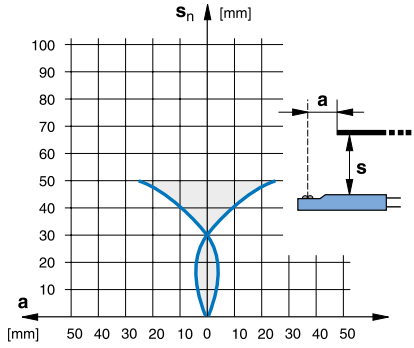
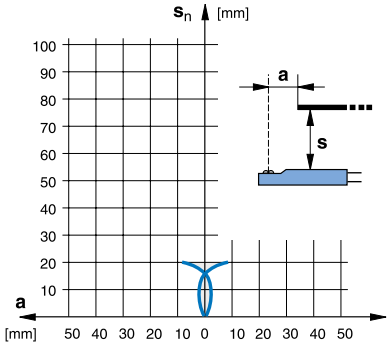
RFID

Connectivity

Accessories

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100 x 100 mm white
≤ 15 mA
Sapphire glass
LTK-0507-303-501
LTK-0507-301-501

100 x 100 mm white
≤ 15 mA
Sapphire glass
LTK-0507-303
LTK-0507-301

100 x 100 mm white
≤ 15 mA
Sapphire glass
LTK-0507-303-502
LTK-0507-301-502



POWERFUL SENSORS IN MINIATURE HOUSING

CUBIC MINIATURE PHOTOELECTRIC SENSORS

KEY ADVANTAGES

C23 series

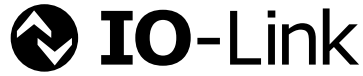
- ✓ Complete series, 20 mm x 30 mm x 10 mm
- ✓ Long sensing ranges
- ✓ Special optics for excellent background suppression characteristics
- ✓ Through-beam type with sensing range up to 30,000 mm, cross-talk immunity and alignment aid
- ✓ IO-Link on all PNP sensors

C23 Distance measuring sensors

- ✓ IP 69K housing, 20 mm x 34 mm x 12 mm
- ✓ Two distance measurement ranges: 20...80 mm and 30...200 mm
- ✓ High precision and repeatability
- ✓ Settable analog range for optimum distance measurement
- ✓ Adjustable digital output for window of acceptance

RANGE OVERVIEW	Distance mm	Diffuse	Reflex	Through-beam	Background suppression	Analog	Distance
CUBIC MINIATURE	600 / 1200	p. 225-226					
	2000 / 4000		p. 227-228				
	6000 / 12,000			p. 229			
	200				p. 223-224		
	10 ... 100					p. 223	
	300				p. 217		
	1500	p. 218					
	8000		p. 219				
	30,000				p. 219		
	20...80/30...200						p. 221

OVERVIEW



HOUSING SIZE MM	
OPERATING PRINCIPLE	
SENSING RANGE MM	

	C23
Housing material	ABS / PMMA
Degree of protection	IP 67
Supply voltage range	10 ... 30 VDC
Ambient temperature range	-25 ... +65°C / -13 ... +149 °F
Output current (total both outputs)	≤ 100 mA
Output voltage drop	≤ 2 V
Max. ambient light halogen	5000 Lux
Max. ambient light sun	10,000 Lux
Compatible mounting bracket	See pages 242-244

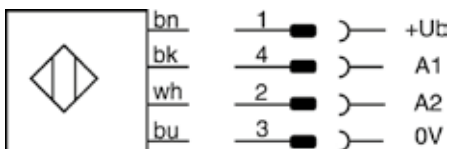
PHOTOELECTRIC

WIRING DIAGRAMS

PNP/NPN Light-ON / Dark-ON / Emitter



PNP/NPN Light-ON / Dark-ON



DATA
Standard target
No-load supply current
Light source
Switching frequency (normal mode)
Setup
PNP Light-ON / IO-Link
PNP Light-ON/Dark-ON / IO-Link
PNP Light-ON/IO-Link+stability alarm
NPN Light-ON
NPN Light-ON / Dark-ON
NPN Light-ON + stability alarm
Other types available

CUBIC MINIATURE

□ 20 X 30 X 10

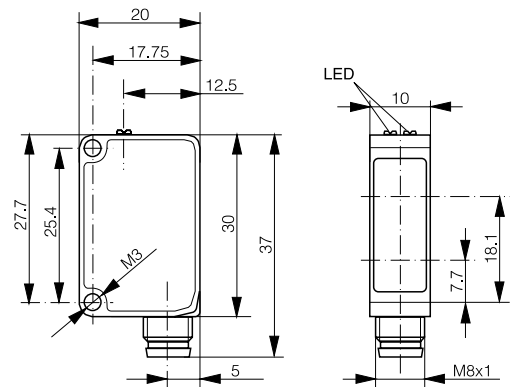
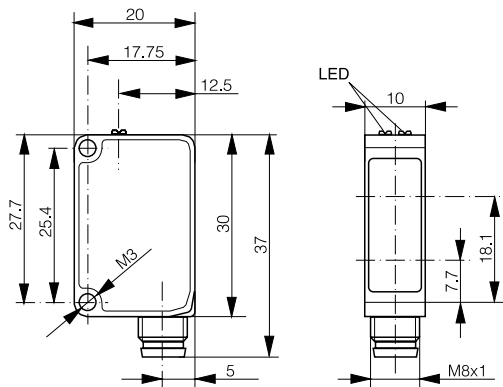
DIFFUSE SENSOR WITH
BACKGROUND SUPPRESSION

10 ... 300

□ 20 X 30 X 10

DIFFUSE SENSOR WITH
BACKGROUND SUPPRESSION

10 ... 300



100 x 100 mm white

≤ 30 mA

Red pinpoint LED 640 nm

≤ 1000 Hz

Potentiometer

LHR-C23PA-PMS-403

LHR-C23PA-PMS-603

LHR-C23PA-PMS-60C

LHR-C23PA-PMS-301

LHR-C23PA-PMS-101

LHR-C23PA-PMS-10A

Cable version

100 x 100 mm white

≤ 30 mA

Red pinpoint LED 640 nm

≤ 1000 Hz

Teach button

LHR-C23PA-TMS-403

LHR-C23PA-TMS-603

LHR-C23PA-TMS-60C

LHR-C23PA-TMS-301

LHR-C23PA-TMS-101

LHR-C23PA-TMS-10A

Cable version

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

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CUBIC MINIATURE

HOUSING SIZE MM

□ 20 X 30 X 10

□ 20 X 30 X 10

OPERATING PRINCIPLE

DIFFUSE SENSOR

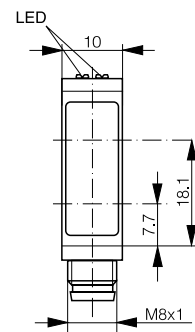
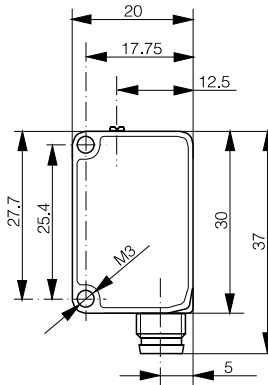
DIFFUSE SENSOR

SENSING RANGE MM

1500

1500

PHOTOELECTRIC



DATA		
Standard target / Reflector type	200 x 200 mm white	200 x 200 mm white
No-load supply current	≤ 15 mA	≤ 15 mA
Light source	Red LED 630 nm	Red LED 630 nm
Switching frequency (normal mode)	≤ 1500 Hz	≤ 1500 Hz
Setup	Potentiometer	IO-Link
Emitter / IO Link		LTR-C23PA-NMS-403
PNP Light-ON / IO-Link	LTR-C23PA-PMS-403	
PNP Light-ON/Dark-ON / IO-Link	LTR-C23PA-PMS-603	
PNP Light-ON/IO-Link+stability alarm	LTR-C23PA-PMS-60C	
NPN Light-ON	LTR-C23PA-PMS-301	
NPN Light-ON / Dark-ON	LTR-C23PA-PMS-101	
NPN Light-ON + stability alarm	LTR-C23PA-PMS-104	
Other types available	Cable version	Cable version

CUBIC MINIATURE

□ 20 X 30 X 10

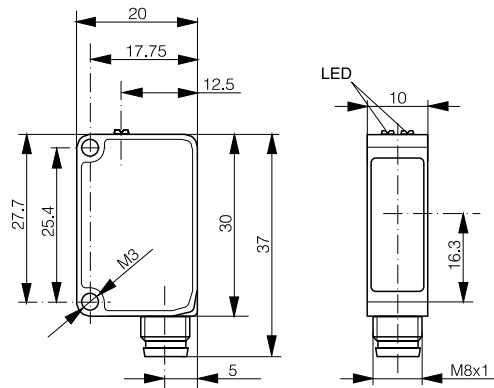
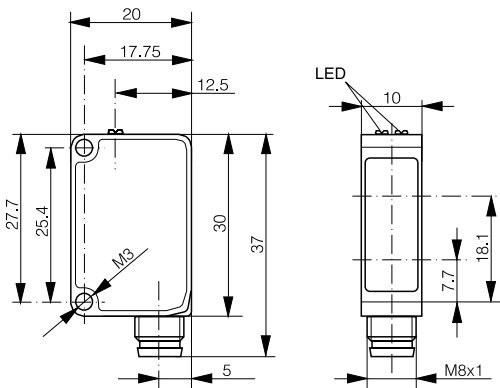
REFLEX SENSOR

8000

□ 20 X 30 X 10

THROUGH-BEAM SENSOR

30,000



LXR-0000-084 (see page 247)

≤ 15 mA

Red LED 630 nm

≤ 1500 Hz

IO-Link

LRR-C23PA-NMS-404

LRR-C23PA-NMS-603

LRR-C23PA-NMS-60D

LRR-C23PA-NMS-302

LRR-C23PA-NMS-101

LRR-C23PA-NMS-10B

Cable version

≤ 9 mA (receiver) / ≤ 7 mA (emitter)

Red LED 630 nm

≤ 1000 Hz

IO-Link

LLR-C23PA-NMS-400 (emitter)

LLR-C23PA-NMS-404

LLR-C23PA-NMS-603

LLR-C23PA-NMS-60D

LLR-C23PA-NMS-302

LLR-C23PA-NMS-101

LLR-C23PA-NMS-10B

Alignment aid, cable version

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

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OVERVIEW

	C23 DISTANCE
Housing material	ABS / PMMA
Degree of protection	IP 67 / IP 69K
Supply voltage range	13 ... 30 VDC
Ambient temperature range	-20 ... +60°C / -4 ... +140 °F
No-load supply current	≤ 30 mA
Output current	≤ 100 mA
Output voltage drop	≤ 2 V
Switching frequency	≤ 1000 Hz
Response time (analog)	0.4 msec (80 mm) / 3.4 msec (200 mm)
Setup	Teach button
Compatible mounting bracket	See pages 242-244

HOUSING SIZE MM

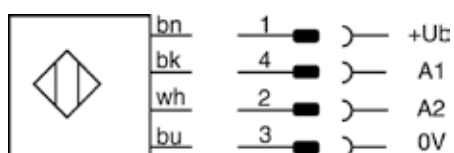
OPERATING PRINCIPLE

MEASUREMENT RANGE MM

PHOTOELECTRIC

WIRING DIAGRAM

PNP/NPN Light-ON/Dark-ON + Analog 1 ... 10V



DATA

Light source

Light spot size

Resolution

Linearity

Repeatability

PNP Light/Dark-ON+analog 1...10V

NPN Light/Dark-ON+analog 1...10V

Other types available

CUBIC MINIATURE

□ 20 X 34 X 12

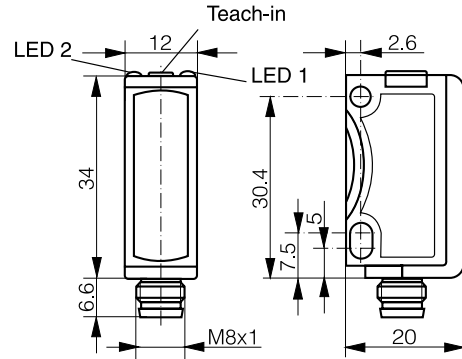
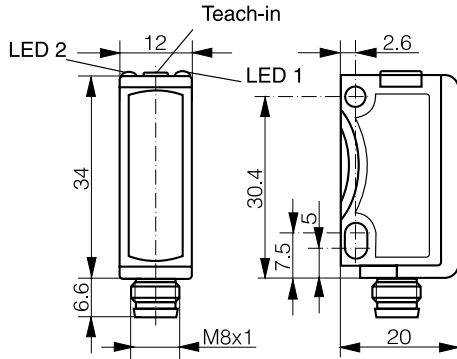
DISTANCE MEASURING SENSOR

20 ... 80

□ 20 X 34 X 12

DISTANCE MEASURING SENSOR

30 ... 200



LED red 632 nm

5 mm at 50 mm

0.12 mm

+/- 0.4 mm

≤ 0.4 mm

DTR-C23PB-TMS-139

DTR-C23PB-TMS-129

LED red 632 nm

7 mm at 60 mm

0.68 mm

+/- 2 mm

≤ 1 mm

DTR-C23PB-TLS-139

DTR-C23PB-TLS-129

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

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OVERVIEW

	3#3#
Housing material	PBTP (Crastin)
Hysteresis	10 % typ.
Degree of protection	IP 67
Supply voltage range	10 ... 36 VDC / 15 ... 36 VDC (LA#-3130-119)
Ambient temperature range	-25 ... +55°C / -13 ... +131 °F
Output current (total both outputs)	≤ 200 mA / -- (LA)
Output voltage drop	≤ 2 V / -- (LA)
Max. ambient light halogen	5000 Lux
Max. ambient light sun	10,000 Lux
Setup	Potentiometer
Compatible mounting bracket	See page 245

HOUSING SIZE MM

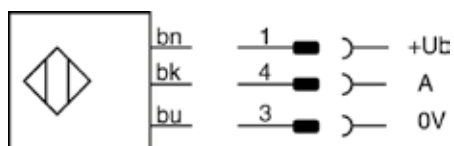
OPERATING PRINCIPLE

SENSING RANGE MM

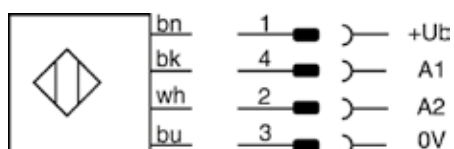
PHOTOELECTRIC

WIRING DIAGRAMS

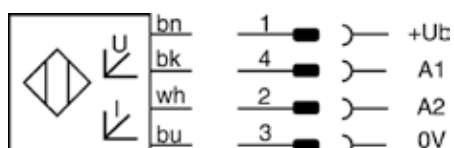
PNP/NPN Light-ON / Dark-ON / Emitter



PNP/NPN Changeover



Analog



DATA

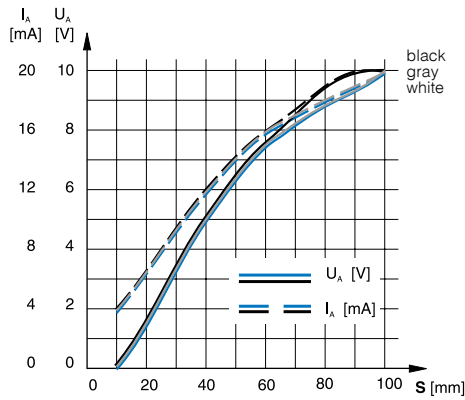
- Standard target
- No-load supply current
- Emitter
- Max. switching frequency
- Switching time
- Analog output
- PNP Changeover
- Other types available

CUBIC MINIATURE

□ 30 X 30 X 15

WITH ANALOG OUTPUT

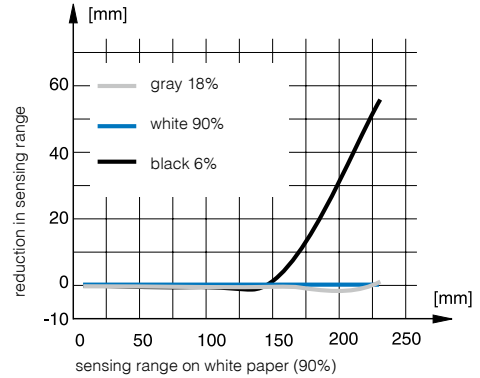
10 ... 100



□ 30 X 30 X 15

DIFFUSE SENSOR WITH
BACKGROUND SUPPRESSION

15 ... 200



Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

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100 x 100 mm white

≤ 25 mA

LED red 660 nm

-

-

LAS-3130-119

Cable version

100 x 100 mm white

≤ 25 mA

LED red 660 nm

500 Hz

1 msec

LHS-3130-103

NPN Changeover

CUBIC MINIATURE

HOUSING SIZE MM

□ 30 X 30 X 15

□ 30 X 30 X 15

OPERATING PRINCIPLE

DIFFUSE SENSOR WITH
BACKGROUND SUPPRESSION

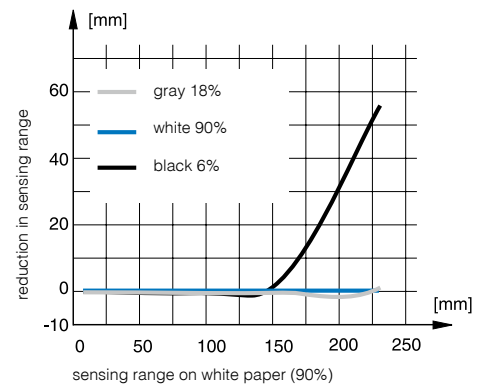
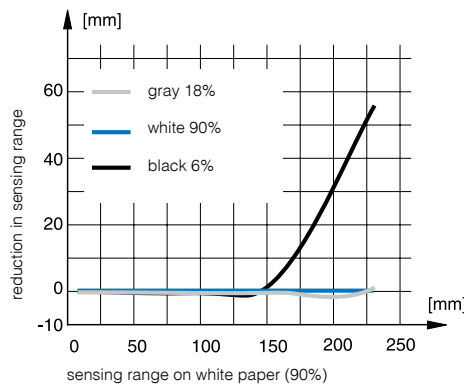
DIFFUSE SENSOR WITH
BACKGROUND SUPPRESSION

SENSING RANGE MM

15 ... 200

15 ... 200

PHOTOELECTRIC



DATA

Standard target

100 x 100 mm white

100 x 100 mm white

No-load supply current

≤ 25 mA

≤ 25 mA

Emitter

LED red 660 nm

LED red 660 nm

Max. switching frequency

500 Hz

500 Hz

Switching time

1 msec

1 msec

PNP Light-ON

LHK-3131-303

LHS-3131-303

NPN Light-ON

LHK-3131-301

LHS-3131-301

Other types available

CUBIC MINIATURE

□ 30 X 30 X 15

DIFFUSE SENSOR

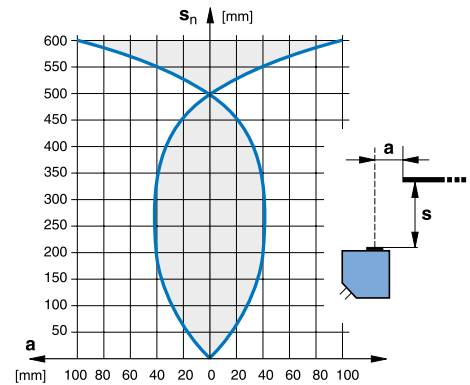
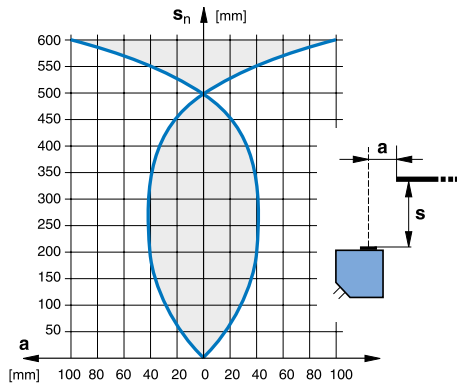
600



□ 30 X 30 X 15

DIFFUSE SENSOR

600



200 x 200 mm white

≤ 15 mA

IR LED 880 nm

1000 Hz

0.5 msec

LTS-3031-303

LTS-3031-301

200 x 200 mm white

≤ 15 mA

IR LED 880 nm

1000 Hz

0.5 msec

LTK-3031-303

LTK-3031-301

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

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Connectivity

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CUBIC MINIATURE

HOUSING SIZE MM

□ 30 X 30 X 15

□ 30 X 30 X 15

OPERATING PRINCIPLE

DIFFUSE SENSOR

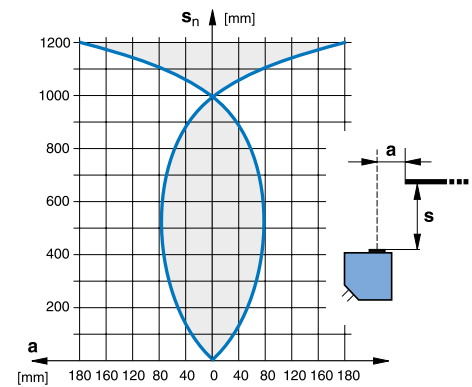
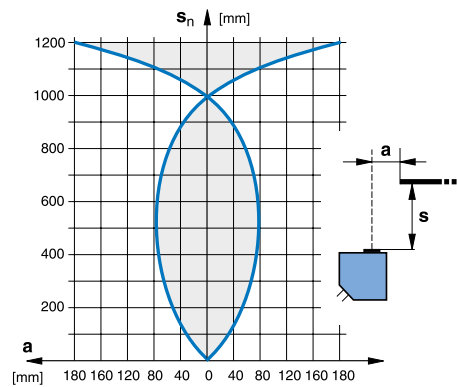
DIFFUSE SENSOR

SENSING RANGE MM

1200

1200

PHOTOELECTRIC



DATA

Standard target / Reflector type

200 x 200 mm white

200 x 200 mm white

No-load supply current

≤ 20 mA

≤ 20 mA

Emitter

IR LED 880 nm

IR LED 880 nm

Max. switching frequency

1000 Hz

1000 Hz

Switching time

0.5 msec

0.5 msec

PNP Changeover

LTS-3030-103

LTK-3030-103

NPN Changeover

LTS-3030-101

LTK-3030-101

PNP Dark-ON

Other types available

CUBIC MINIATURE

□ 30 X 30 X 15

REFLEX SENSOR

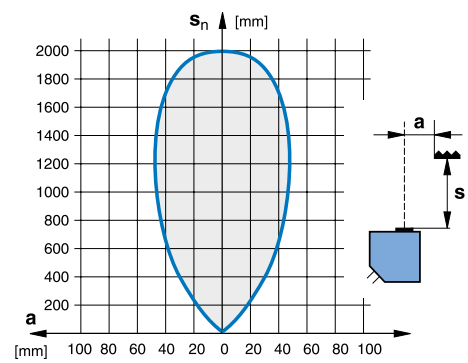
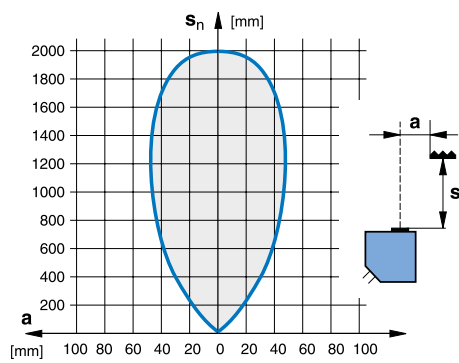
2000



□ 30 X 30 X 15

REFLEX SENSOR

2000



LXR-0000-084 (see page 247)

≤ 15 mA

LED red polarized 660 nm

1000 Hz

0.5 msec

LRS-3031-304

NPN Dark-ON

LXR-0000-084 (see page 247)

≤ 15 mA

LED red polarized 660 nm

1000 Hz

0.5 msec

LRK-3031-304

NPN Dark-ON

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

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CUBIC MINIATURE

HOUSING SIZE MM

□ 30 X 30 X 15

□ 30 X 30 X 15

OPERATING PRINCIPLE

REFLEX SENSOR

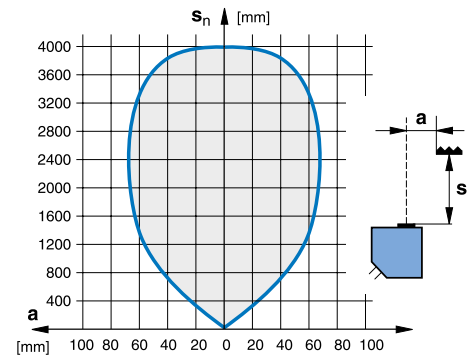
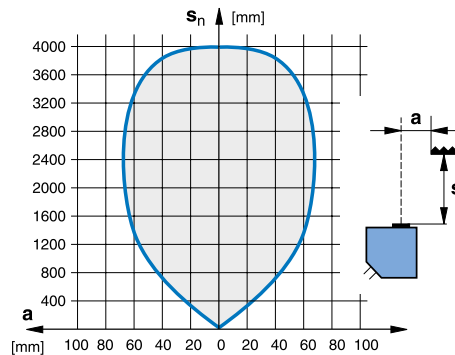
REFLEX SENSOR

SENSING RANGE MM

4000

4000

PHOTOELECTRIC



DATA

Standard target / Reflector type

LXR-0000-084 (see page 247)

LXR-0000-084 (see page 247)

No-load supply current

≤ 20 mA

≤ 20 mA

Emitter

LED red polarized 660 nm

LED red polarized 660 nm

Max. switching frequency

1000 Hz

1000 Hz

Switching time

0.5 msec

0.5 msec

Emitter

PNP Changeover

LRS-3030-103

LRK-3030-103

NPN Changeover

LRS-3030-101

LRK-3030-101

PNP Dark-ON

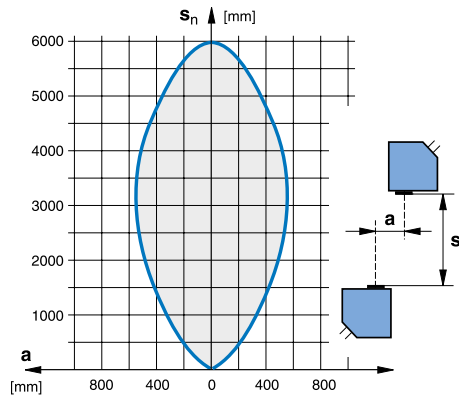
Other types available

CUBIC MINIATURE

□ 30 X 30 X 15

THROUGH-BEAM SENSOR

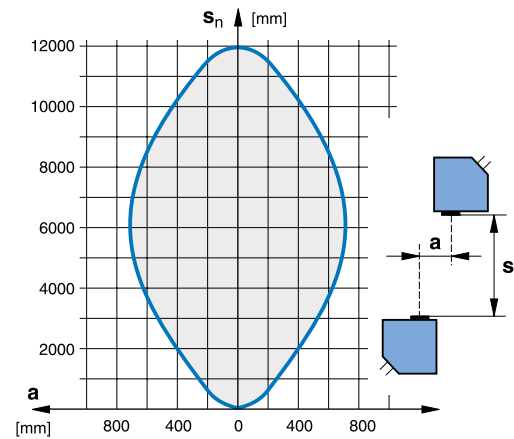
6000



□ 30 X 30 X 15

THROUGH-BEAM SENSOR

12,000



Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

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≤ 10 mA (receiver) / ≤ 15 mA (emitter)

IR LED 880 nm

1000 Hz

0.5 msec

LLS-3031-200

LLS-3031-204 (receiver)

NPN Dark-ON

≤ 10 mA (receiver) / ≤ 15 mA (emitter)

IR LED 880 nm

1000 Hz

0.5 msec

LLS-3030-000

LLS-3030-003 (receiver)

LLS-3030-001 (receiver)



(1) OUT 1 (black)
(2) OUT 2 (white)
(3) OUT 3 (grey)

Note:
Press SET for 2...4 sec; "Tolerance" A
center "Value" LEDs are ON
Set tolerance with "↑" and "↓"; press SET.
Select Channel with "↑" and "↓"; press SET.
Repeat procedure for other channels.

CONTRINEX
FTS-4035-301

U.S. & CAN. ONLY
24 VDC (max)
100 mA (max)
IP67 (max)
IP69K (max)
IP69K (max)
IP69K (max)

Note:
Press SET for 2...4 sec; "Tolerance" A
center "Value" LEDs are ON
Set tolerance with "↑" and "↓"; press SET.
Select Channel with "↑" and "↓"; press SET.
Repeat procedure for other channels.

CONTRINEX
FTS-4035-301

U.S. & CAN. ONLY
24 VDC (max)
100 mA (max)
IP67 (max)
IP69K (max)
IP69K (max)
IP69K (max)

Note:
Press SET for 2...4 sec; "Tolerance" A
center "Value" LEDs are ON
Set tolerance with "↑" and "↓"; press SET.
Select Channel with "↑" and "↓"; press SET.
Repeat procedure for other channels.

EXCELLENT VALUE FOR DEMANDING APPLICATIONS

CUBIC SMALL

PHOTOELECTRIC SENSORS

KEY ADVANTAGES

- ✓ Small sensor series with outstanding performance, 40 mm x 50 mm x 15 mm
- ✓ Ecolab tested and approved
- ✓ Sensing face of coated plastic
- ✓ Color sensor
- ✓ Contrast sensor for precise print mark detection
- ✓ IO-Link interface

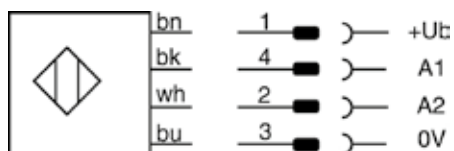
RANGE OVERVIEW	Distance mm	Diffuse	Reflex	Through-beam	Background suppression	Color	Contrast
CUBIC SMALL	12						p. 237
	30 ... 40					p. 237	
	500				p. 233		
	1200	p. 233					
	4000			p. 234			
	50,000				p. 234		

OVERVIEW

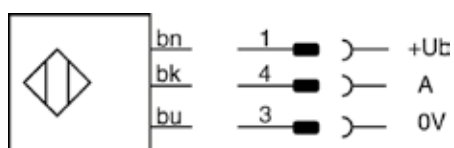
	4050
Housing material	PBTP
Hysteresis	$\leq 10 \% s_n$
Degree of protection	IP 67
Supply voltage range	10 ... 36 VDC
Ambient temperature range	-5 ... +55°C / 23 ... +131°F
Output current (total of both outputs)	≤ 200 mA
Output voltage drop	≤ 2 V
Max. ambient light halogen	5000 Lux
Max. ambient light sun	10,000 Lux
Compatible mounting bracket	See page 246

WIRING DIAGRAMS

PNP/NPN Changeover



Emitter



HOUSING SIZE MM

OPERATING PRINCIPLE

SENSING RANGE MM

PHOTOELECTRIC

DATA

Standard target
No-load supply current
Emitter
Max. switching frequency
Switching time
Setup
PNP Changeover
NPN Changeover
Other types available

CUBIC SMALL

□ 40 X 50 X 15

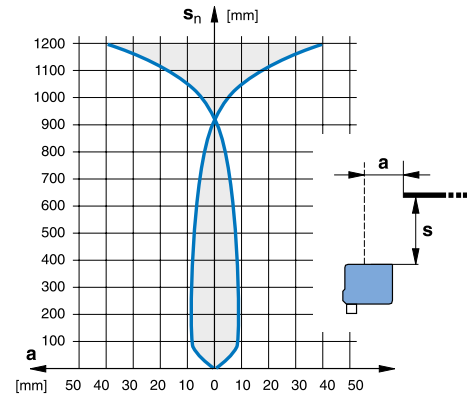
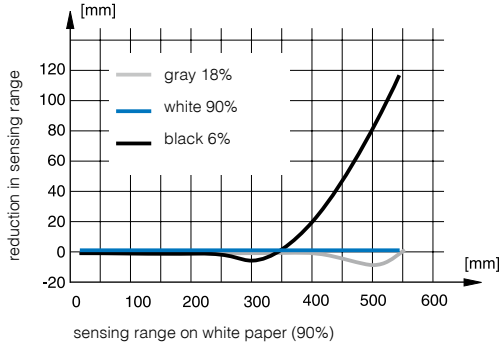
**DIFFUSE SENSOR WITH
BACKGROUND SUPPRESSION**

30 ... 500

□ 40 X 50 X 15

DIFFUSE SENSOR

1200



100 x 100 mm white

≤ 30 mA

LED red 630 nm

500 Hz

1 msec

Potentiometer

LHS-4150-103

LHS-4150-101

Cable version

200 x 200 mm white

≤ 25 mA

LED red 630 nm

1500 Hz

0.5 msec

Potentiometer

LTS-4150-103

LTS-4150-101

Cable version

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

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CUBIC SMALL

HOUSING SIZE MM

□ 40 X 50 X 15

□ 40 X 50 X 15

OPERATING PRINCIPLE

REFLEX SENSOR

THROUGH-BEAM SENSOR

SENSING RANGE MM

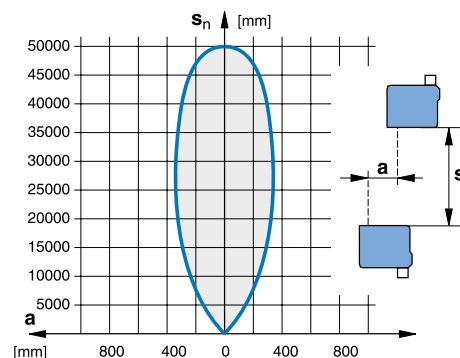
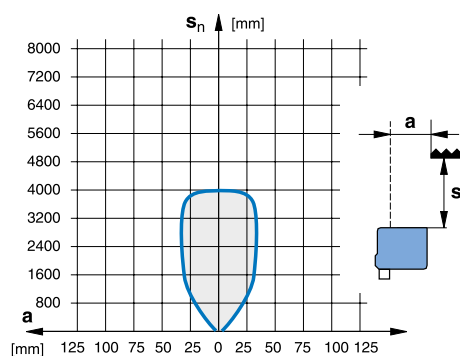
4000

50,000

PHOTOELECTRIC



AUTOCOLLIMATION



DATA

Standard target/Reflector type

LXR-0000-084 (see page 247)

-

No-load supply current

≤ 20 mA

≤ 15 mA

Emitter

LED red polarized 680 nm

LED red 630 nm

Max. switching frequency

1500 Hz

1500 Hz

Switching time

0.5 msec

0.5 msec

Setup

Potentiometer

Potentiometer (receiver)

PNP Changeover

LRS-4150-103

LLS-4150-003 (receiver)

Emitter

LLS-4150-000

Other types available

NPN Changeover, PNP/NPN Light-ON
+ Excess gain

NPN Changeover, PNP/NPN Light-ON
+ Excess gain



OVERVIEW



HOUSING SIZE MM

OPERATING PRINCIPLE

SENSING RANGE MM

	4050 COLOR	4050 CONTRAST
Housing material	PBTP	PBTP
Average positioning tolerance	± 5 mm (tol. 3)	± 2 mm (min.)
Degree of protection	IP 67	IP 67
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-5 ... +55°C / 23 ... +131°F	-5 ... +55°C / 23 ... +131°F
Output current	≤ 200 mA	≤ 100 mA
Output voltage drop	≤ 2 V	≤ 2.5 V
Switching frequency	4000 Hz	10,000 Hz
Switching time	0.4 msec	50 μsec (micro)
Max. ambient light halogen	5000 Lux	5000 Lux
Max. ambient light sun	10,000 Lux	10,000 Lux
Compatible mounting bracket	See page 246	See page 246

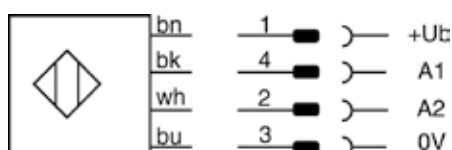
PHOTOELECTRIC

WIRING DIAGRAMS

3 X PNP Light-ON



PUSH-PULL + Teach / Switching mode selector



DATA

Light source
Light spot size (distance)
No-load supply current
Setup
3xPNP Light-ON
PUSH-PULL / IO-Link
Other types available

CUBIC SMALL

□ 40 X 50 X 15

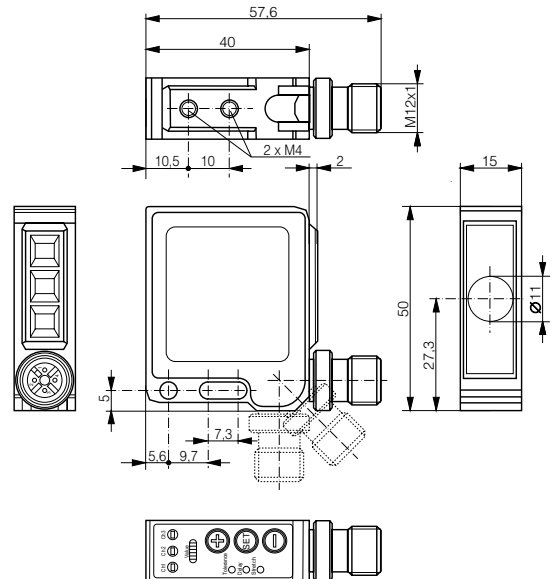
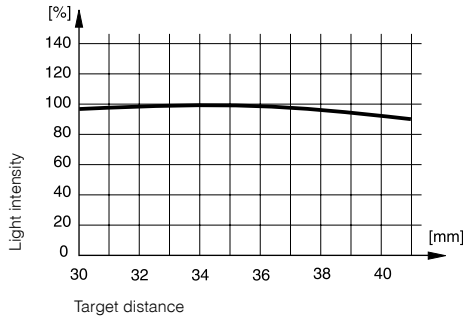
COLOR SENSOR (DIFFUSE)

30 ... 40

□ 40 X 50 X 15

CONTRAST SENSOR (DIFFUSE)

12



Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

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LED white

Ø 4 mm (35 mm)

≤ 35 mA

Teach button

FTS-4155-303

Cable version

LED red, green, blue (autoselect)

1.5 x 3.5 mm (12 mm)

≤ 35 mA

Teach button / Teach input / IO-Link

KTS-4155-407

Cable version



TOP QUALITY, RUGGED AND COST-EFFECTIVE

CUBIC COMPACT

PHOTOELECTRIC SENSORS

KEY ADVANTAGES

C55 distance measuring sensors

- ✓ Distance measurement up to 5000 mm, housing 50 mm x 50 mm x 23 mm
- ✓ High precision and repeatability
- ✓ Settable analog range for optimum distance measurement
- ✓ Adjustable digital output for window of acceptance
- ✓ Background suppression variant with 2 outputs
- ✓ Types available with enclosure rating IP 69K and Ecolab

RANGE OVERVIEW	Distance mm	Distance measuring	Background suppression
CUBIC COMPACT	5000	p. 241	p. 241

OVERVIEW

	C55 DISTANCE
Housing material	ABS / PMMA
Degree of protection	IP 67 / IP 69K, Ecolab
Supply voltage range	18 ... 30 VDC
Ambient temperature range	-40 ... +60°C / -40 ... +140°F
No-load supply current	≤ 60 mA
Output current	≤ 100 mA
Output voltage drop	≤ 2 V
Switching frequency	≤ 250 Hz (DTL) / ≤ 500 Hz (LHL)
Response time (analog)	2 msec (DTL) / 1 msec (LHL)
Setup	Teach button
Compatible mounting bracket	See page 245

WIRING DIAGRAM

PNP/NPN auto-detect, Light-ON/Dark-ON + Analog + Teach



HOUSING SIZE

OPERATING PRINCIPLE

MEASUREMENT RANGE MM

PHOTOELECTRIC

DATA

Light source

Light spot size

Resolution

Linearity

PNP/NPN auto-detect
+ Analog 4 ... 20 mA

PNP/NPN auto-detect
+ Analog 0 ... 10 V

PNP/NPN auto-detect (x2)

Other types available

CUBIC COMPACT

□ 50 X 50 X 23

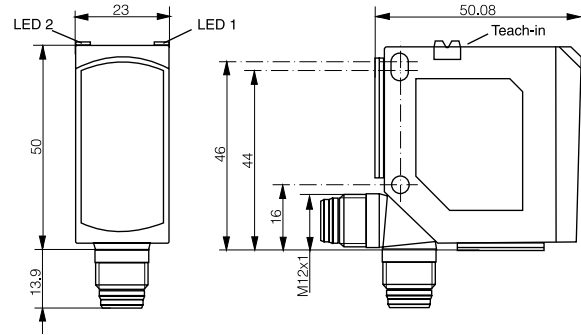
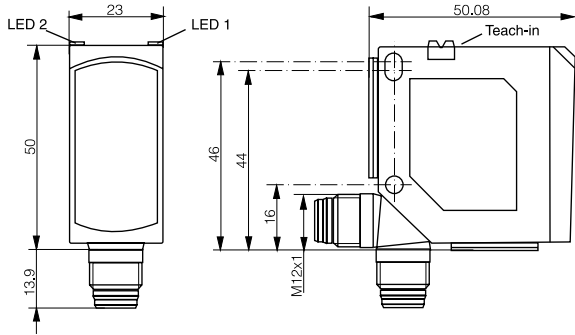
DISTANCE MEASURING SENSOR

100 ... 5000

□ 50 X 50 X 23

DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION

0 ... 5000



Laser class 1 red 650 nm
5 mm x 4 mm at 3000 mm
< 5 mm
+/- 30 mm

DTL-C55PA-TMS-119-502

DTL-C55PA-TMS-119-503

Laser class 1 red 650 nm
5 mm x 4 mm at 3000 mm

-

-

LHL-C55PA-TMS-107-501

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

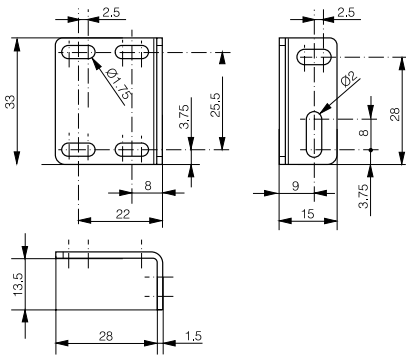
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PHOTOELECTRIC ACCESSORIES

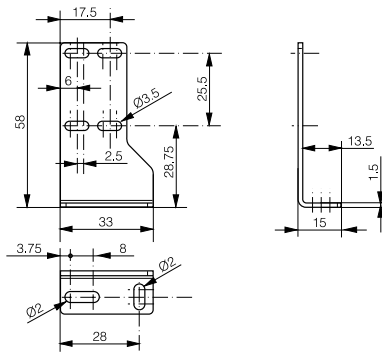
UNIVERSAL MOUNTING BRACKET

Material: stainless steel V2A
Part reference: **LXW-C23PA-000**



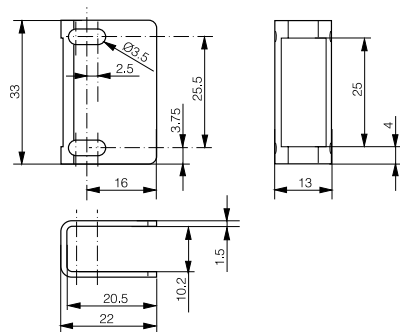
UNIVERSAL MOUNTING BRACKET

Material: stainless steel V2A
Part reference: **LXW-C23PA-001**



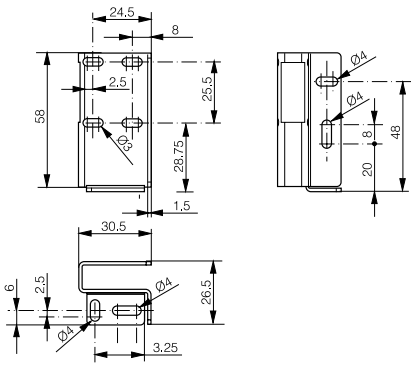
UNIVERSAL MOUNTING BRACKET

Material: stainless steel V2A
Part reference: **LXW-C23PA-002**



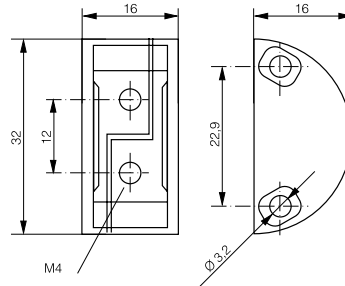
UNIVERSAL MOUNTING BRACKET

Material: stainless steel V2A
 Part reference: **LXW-C23PA-003**



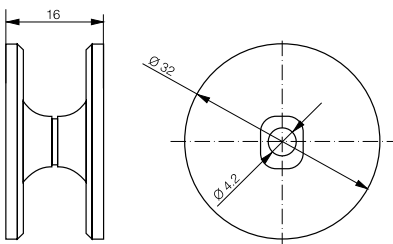
UNIVERSAL MOUNTING BRACKET

Material: aluminum anodised
 Part reference: **LXW-C23PB-000**



UNIVERSAL MOUNTING BRACKET

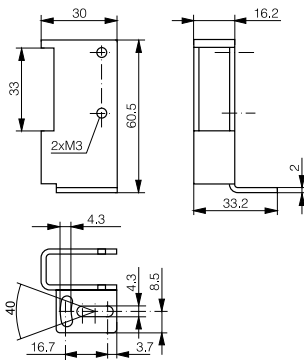
Material: aluminum
 Part reference: **LXW-C23PB-001**



PHOTOELECTRIC ACCESSORIES

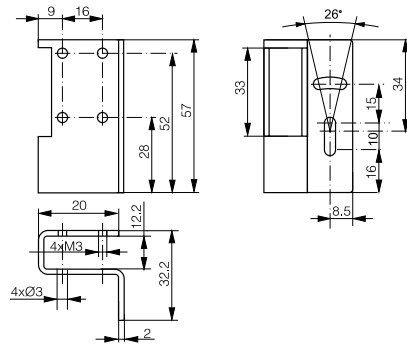
UNIVERSAL MOUNTING BRACKET

Material: stainless steel V2A
Part reference: **LXW-C23PB-002**



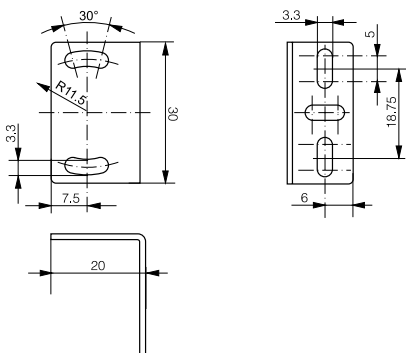
UNIVERSAL MOUNTING BRACKET

Material: stainless steel V2A
Part reference: **LXW-C23PB-003**



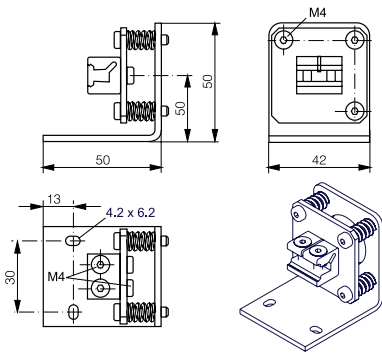
UNIVERSAL MOUNTING BRACKET

Material: nickel-plated steel
Part reference: **LXW-C23PB-004**



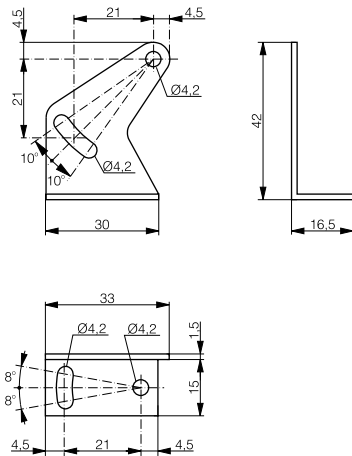
UNIVERSAL MOUNTING BRACKET

Material: stainless steel V2A
 Part reference: **LXW-C55PA-000**



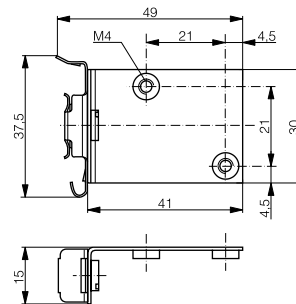
UNIVERSAL MOUNTING BRACKET

For 3#30 / 3#31 series
 Material: stainless steel V2A
 Part reference: **LXW-3030-000**



DIN-RAIL MOUNTING BRACKET

(TS35) for 3#30 / 3#31 series
 Material: stainless steel V2A
 Part reference: **LXW-3030-001**



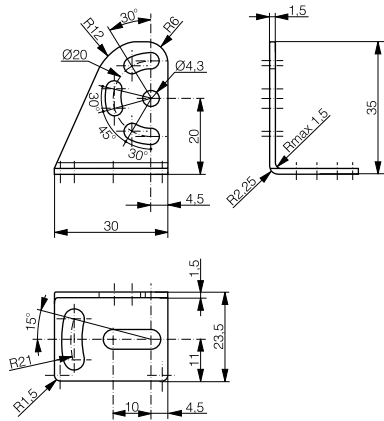
PHOTOELECTRIC ACCESSORIES

UNIVERSAL MOUNTING BRACKET

For 4050 series

Material: stainless steel V2A

Part reference: **LXW-4050-000**

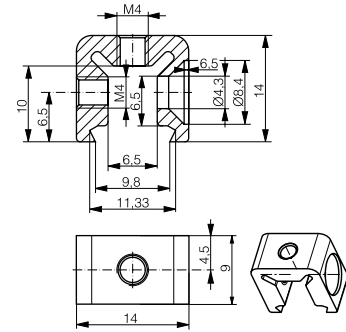


CLAMP BRACKET

For 4050 series

Material: aluminum

Part reference: **LXW-4050-002**

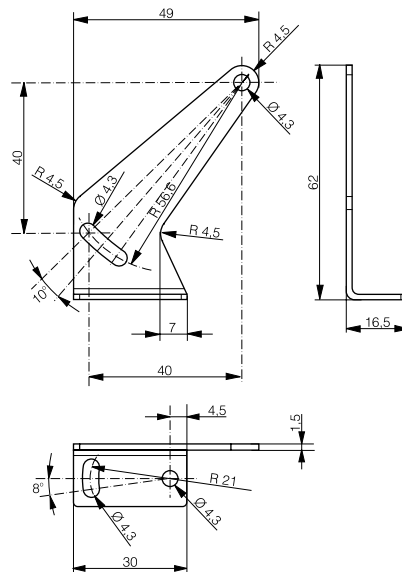


UNIVERSAL MOUNTING BRACKET

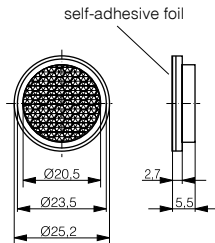
For 5050 series

Material: stainless steel V2A

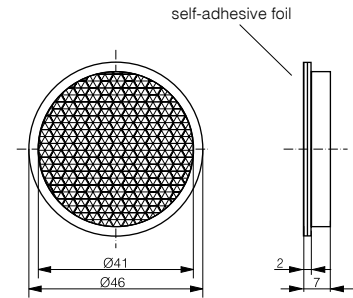
Part reference: **LXW-5050-000**



REFLECTOR Ø 25 MM

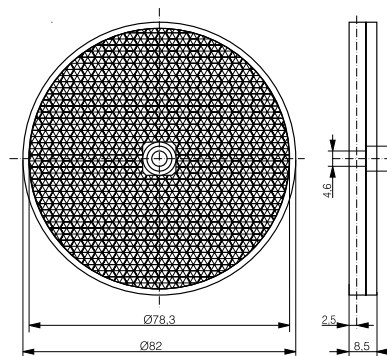
Part reference: **LXR-0000-025**

REFLECTOR Ø 46 MM

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

REFLECTOR Ø 82 MM

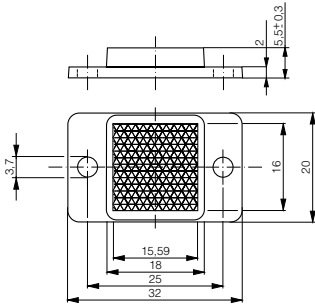
Reference reflector for all reflex sensors

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

PHOTOELECTRIC ACCESSORIES

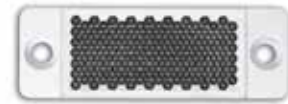
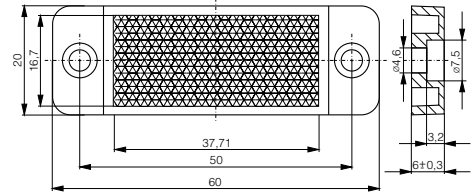
REFLECTOR 32 X 20 MM

Part reference: **LXR-0001-032**



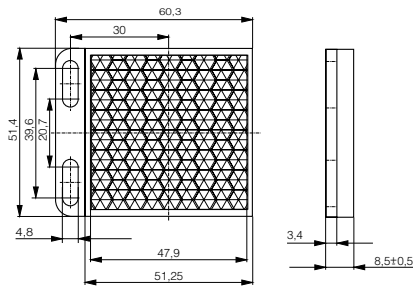
REFLECTOR 60 X 20 MM

Part reference: **LXR-0001-062**



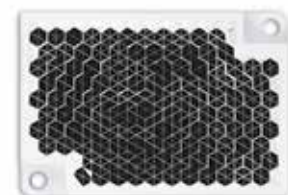
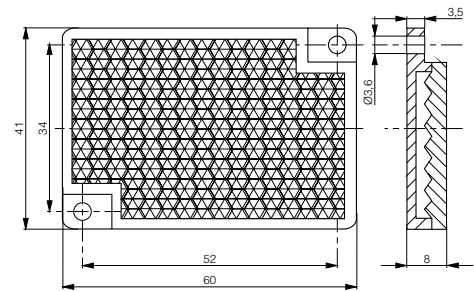
REFLECTOR 60 X 51 MM

Part reference: **LXR-0001-065**



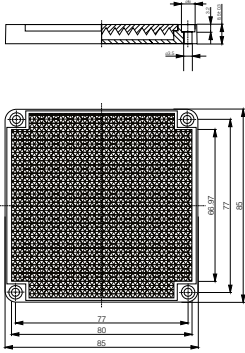
REFLECTOR 60 X 41 MM

Part reference: **LXR-0001-064**



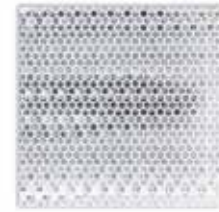
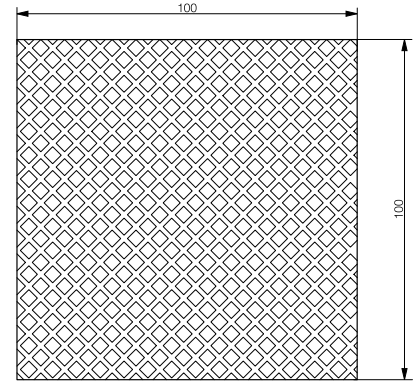
REFLECTOR 85 X 85 MM

Part reference: **LXR-0001-088**



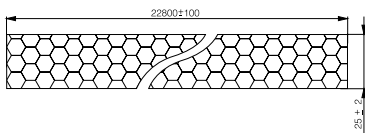
REFLECTIVE FOIL 100 X 100 MM

For all reflex sensors (IMOS IRF 6000)
Part reference: **LXR-0002-100**



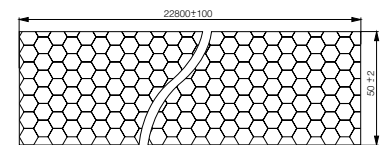
REFLECTIVE ROLL 25 MM X 22.8 M

Part reference: **LXR-0003-025**



REFLECTIVE ROLL 50 MM X 22.8 M

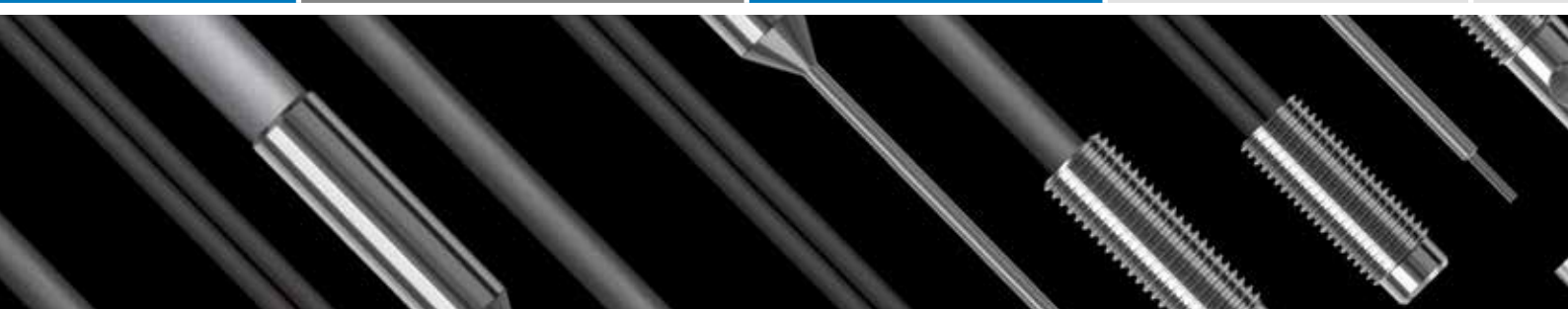
Part reference: **LXR-0003-050**



PROGRAM OVERVIEW

FAMILY	PRODUCT RANGE	SUBMINIATURE					
OPTICAL FIBERS	CYLINDRICAL						
	HOUSING SIZE	No sensing head	Ø 2.3	M3	Ø 3.2	Ø 4	
	SYNTHETIC FIBERS	Diffuse	p. 265	p. 265	p. 265		
		Through-beam	p. 268		p. 268	p. 268	
		Cylindrical light beam					p. 271
		Background suppression					
		Liquid level monitoring					
		Low and high temperatures					
		Multi-beam detection					
	GLASS FIBERS	Diffuse					
Through-beam							

FAMILY	PRODUCT RANGE	MINIATURE	SMALL
AMPLIFIERS	CUBIC		
	SERIES	303#	3060
	HOUSING SIZE	30 x 30 x 15 mm	31 x 60 x 10 mm
	MAX. DISTANCE	120 mm	200 mm
	SETUP	Potentiometer	Potentiometer
	FOR USE WITH SYNTHETIC FIBERS	p. 255-256	p. 261
	FOR USE WITH GLASS FIBERS	p. 255-256	



	SUBMINIATURE		MINIATURE				SMALL		Inductive
	CYLINDRICAL						CUBIC		Photoelectric
	M4	M5	Ø 6	M6	Ø 8	M8	□ 27 x 30	□ 18 x 32	
				p. 266-267					
	p. 269-270			p. 270					
		p. 271							
							p. 272		
						p. 273			
	p. 274			p. 274					
								p. 273	
			p. 277-278	p. 282	p. 277-278				
	p. 282		p. 279, 281		p. 280-281				

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

	SMALL							
--	-------	--	--	--	--	--	--	--

	CUBIC							
--	-------	--	--	--	--	--	--	--

RFID

	3065	3066	3360	4040
	31 x 60 x 10 mm	31 x 60 x 10 mm	31 x 60 x 10 mm	40 x 40 x 19 mm
	200 mm	200 mm	100 mm	150 mm
	Teach-in	Teach / IO-Link	Potentiometer	Potentiometer
	p. 259-260	p. 260-261	p. 259	
				p. 263

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PROGRAM OVERVIEW

HOUSING SIZE	SENSING RANGE														PAGE
	12 mm	20 mm	45 mm	60 mm	70 mm	80 mm	140 mm	150 mm	200 mm	260 mm	550 mm	700 mm	900 mm	1800 mm	

SYNTHETIC OPTICAL FIBERS

DIFFUSE SENSING		
Double fiber (10 m)	60 ... 200 mm	265
∅ 2.3 miniature	20 ... 70 mm	265
M3 miniature	20 ... 70 mm	265
M6 standard	60 ... 200 mm	266-267
M6 flexible	45 ... 150 mm	266-267
M6 luminous	80 ... 260 mm	266
M6 coaxial	60 ... 200 mm	266
THROUGH-BEAM SENSING		
Indiv. fiber (10 m)	200 ... 700 mm	268
M3 miniature	60 ... 200 mm	268
∅ 3.2 standard 90°	60 ... 200 mm	268
M4 standard	200 ... 700 mm	269
M4 flexible	150 ... 550 mm	269-270
M4 luminous	250 ... 900 mm	269
M6 standard 90°	550 ... 1800 mm	270
CYLINDRICAL LIGHT BEAM		
∅ 4 miniature	60 ... 140 mm	271
M5 miniature	60 ... 140 mm	271
BACKGROUND SUPPRESSION		
27 x 30 mm flexible 90°	12 mm	272
27 x 30 mm flexible	12 mm	272
LIQUID LEVEL MONITORING		
M8		273
LOW & HIGH TEMPERATURES		
M4	150 ... 550 mm	274
M6	45 ... 150 mm	274
MULTI-BEAM		
18 x 32 mm	45 ... 150 mm	273



HOUSING SIZE	SENSING RANGE													PAGE
	5 mm	15 mm	30 mm	50 mm	60 mm	120 mm	150 mm	200 mm	250 mm	500 mm	800 mm	1500 mm		

Inductive
Photoelectric

GLASS OPTICAL FIBERS (FOR SERIES 4040 SENSORS)

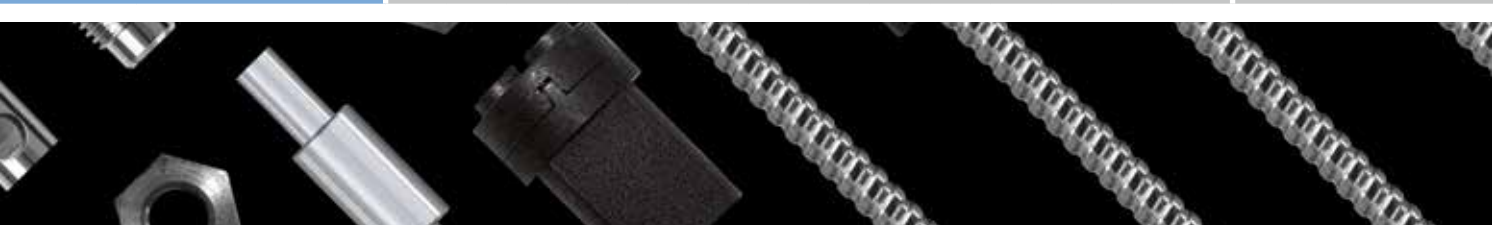
AXIAL DIFFUSE SENSING														
∅ 6 mm	5 mm												277	
	15 mm												277	
∅ 8 mm	50 mm											277		
	150 mm												277	
RADIAL DIFFUSE SENSING														
∅ 6 mm	15 mm												278	
∅ 8 mm	30 mm											278		
	150 mm												278	
AXIAL THROUGH-BEAM SENSING														
∅ 6 mm	50 mm												279	
	200 mm												279	
∅ 8 mm	800 mm												280	
	1500 mm												280	
RADIAL THROUGH-BEAM SENSING														
∅ 6 mm	200 mm												281	
∅ 8 mm	800 mm												281	
	1500 mm												281	

Ultrasonic
Capacitive
Safety
RFID
Connectivity

GLASS OPTICAL FIBERS (FOR SERIES 3030/3031 SENSORS) Connection as with synthetic fibers

DIFFUSE AND THROUGH-BEAM SENSING														
M6 diffuse sensing	60 ... 120 mm												282	
M4 through-beam sensing	250 ... 500 mm												282	

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OVERVIEW

	303#
Housing material	PBTP (Crastin)
Hysteresis	10 % typ.
Degree of protection	IP 67
Supply voltage range	10 ... 36 VDC
Ambient temperature range	-25 ... +55°C / -13 ... +131°F
Output current (total both outputs)	≤ 200 mA
Output voltage drop	≤ 2 V
Max. ambient light halogen	5000 Lux
Max. ambient light sun	10,000 Lux
Setup	Potentiometer
Compatible mounting bracket	See page 275

HOUSING SIZE MM

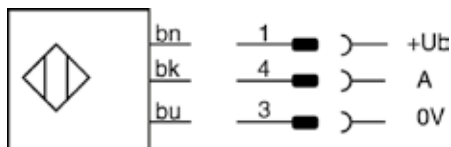
OPERATING PRINCIPLE

SENSING RANGE MM

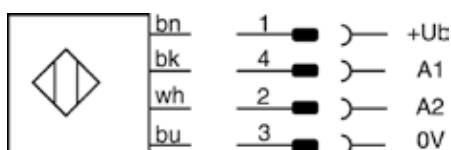
PHOTOELECTRIC

WIRING DIAGRAMS

PNP Light/Dark-ON / NPN Light-ON



PNP/NPN Changeover



DATA

Standard target
No-load supply current
Emitter
Max. switching frequency
Switching time
PNP Light-ON
PNP Dark-ON
NPN Light-ON
Other types available

CUBIC MINIATURE

□ 30 X 30 X 15

FIBER-OPTIC AMPLIFIER

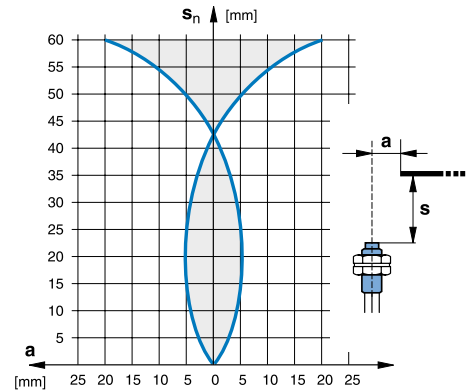
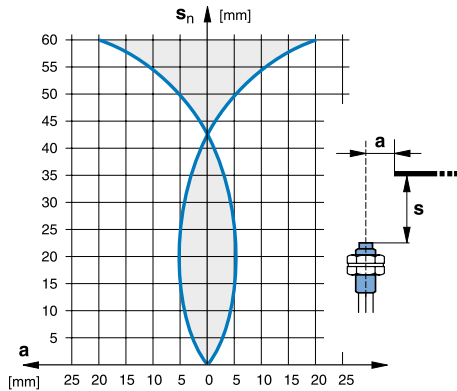
60



□ 30 X 30 X 15

FIBER-OPTIC AMPLIFIER

60



100 x 100 mm white

≤ 15 mA

LED red 660 nm

1000 Hz

0.5 msec

LFS-3031-303

LFS-3031-304

LFS-3031-301

NPN Dark-ON

100 x 100 mm white

≤ 15 mA

LED red 660 nm

1000 Hz

0.5 msec

LFK-3031-303

LFK-3031-304

LFK-3031-301

NPN Dark-ON

Inductive

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CUBIC MINIATURE

HOUSING SIZE MM

□ 30 X 30 X 15

□ 30 X 30 X 15

OPERATING PRINCIPLE

FIBER-OPTIC AMPLIFIER

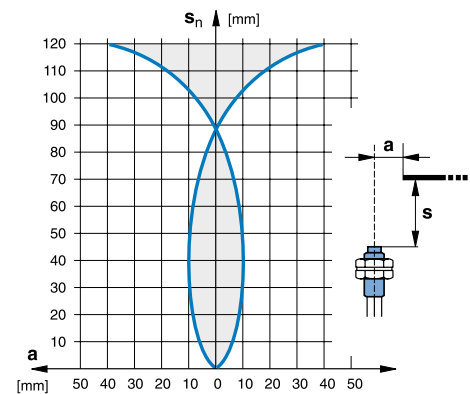
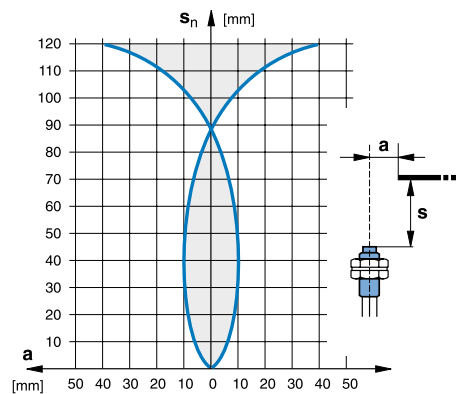
FIBER-OPTIC AMPLIFIER

SENSING RANGE MM

120

120

PHOTOELECTRIC



DATA

Standard target

100 x 100 mm white

100 x 100 mm white

No-load supply current

≤ 20 mA

≤ 20 mA

Emitter

LED red 660 nm

LED red 660 nm

Max. switching frequency

1000 Hz

1000 Hz

Switching time

0.5 msec

0.5 msec

PNP Changeover

LFS-3030-103

LFK-3030-103

Other types available

NPN Changeover

NPN Changeover



OVERVIEW



HOUSING SIZE MM

OPERATING PRINCIPLE

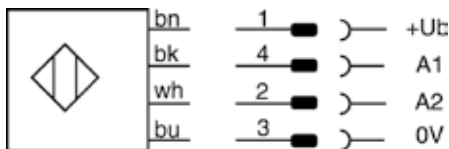
SENSING RANGE MM

	3#6#
Housing material	PBTP (Crastin)
Hysteresis	10 % typ. / ≤ 5 % (3066)
Degree of protection	IP 64
Supply voltage range	10 ... 30 VDC
Ambient temperature range	-25...+55°C/-13...+131°F // -5...+55°C/+23... +131°F (3066)
Output current	≤ 200 mA
Output voltage drop	≤ 2 V
Max. ambient light halogen	5000 Lux
Max. ambient light sun	10,000 Lux
Compatible mounting bracket	See page 275

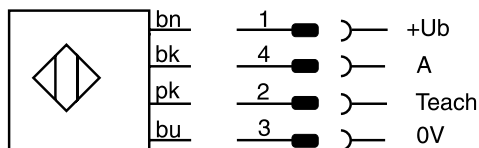
PHOTOELECTRIC

WIRING DIAGRAMS

PNP Light/Dark-ON switchable



PNP Light/Dark-ON with teach-in

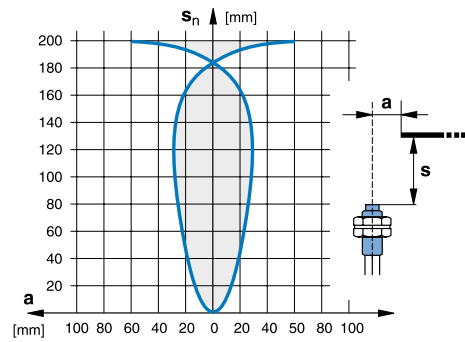
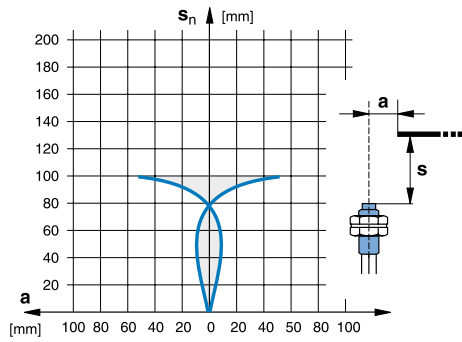


DATA

Standard target
No-load supply current
Emitter
Max. switching frequency
Setup
PNP Light-ON/Dark-ON switchable + Excess gain
Other types available

CUBIC SMALL

□ 31 X 60 X 10	□ 31 X 60 X 10
FIBER-OPTIC AMPLIFIER - BLUE LIGHT	FIBER-OPTIC AMPLIFIER
100	200



100 x 100 mm white	100 x 100 mm white
≤ 15 mA	≤ 25 mA
LED blue 465 nm	LED red 680 nm
1500 Hz	1500 Hz
Potentiometer	Teach-in
LFS-3360-103	LFK-3065-103
NPN Light-ON/Dark-ON + Excess gain	NPN / Blue light devices / Increased switching frequency

Inductive
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CUBIC SMALL

HOUSING SIZE MM

□ 31 X 60 X 10

□ 31 X 60 X 10

OPERATING PRINCIPLE

FIBER-OPTIC AMPLIFIER

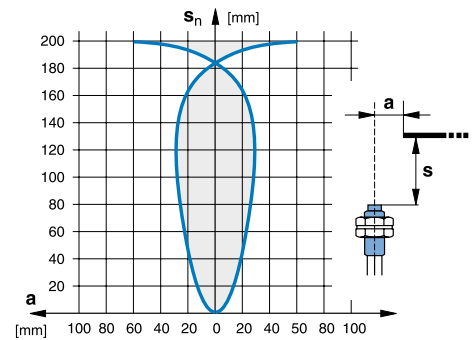
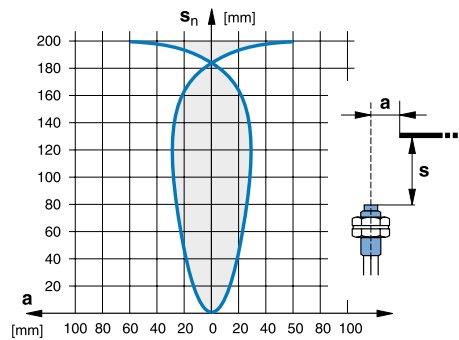
FIBER-OPTIC AMPLIFIER

SENSING RANGE MM

200

200

PHOTOELECTRIC



DATA

Standard target	100 x 100 mm white
No-load supply current	≤ 25 mA
Emitter	LED red 680 nm
Max. switching frequency	1500 Hz
Setup	Teach-in
PNP Light-ON/Dark-ON switchable + Excess gain	LFS-3065-103
PNP Light-ON/Dark-ON switchable	LFS-3066-103
PNP Light-ON/Dark-ON switchable + IO Link	
Other types available	NPN Light-ON/Dark-ON switchable + Excess gain

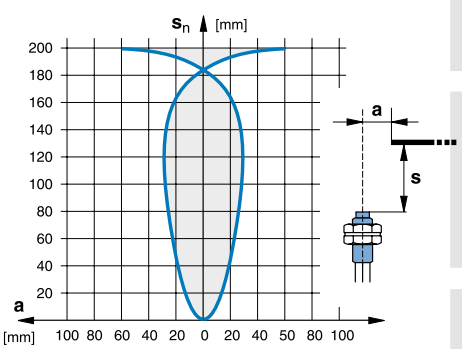
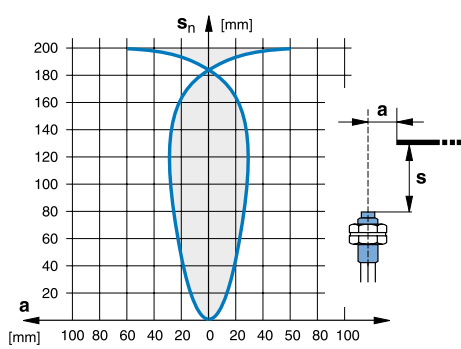
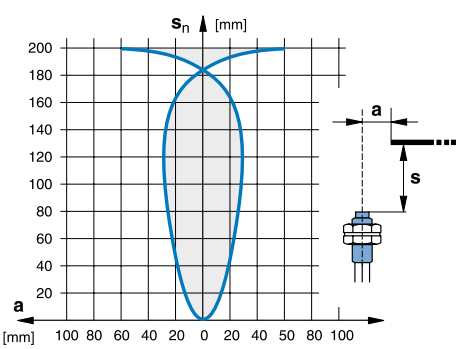
Standard target	100 x 100 mm white
No-load supply current	≤ 30 mA
Emitter	LED red 680 nm
Max. switching frequency	4000 Hz
Setup	Teach-in
PNP Light-ON/Dark-ON switchable + Excess gain	LFS-3065-103
PNP Light-ON/Dark-ON switchable	LFS-3066-103
PNP Light-ON/Dark-ON switchable + IO Link	
Other types available	NPN Light-ON/Dark-ON switchable

Standard target	100 x 100 mm white
No-load supply current	≤ 30 mA
Emitter	LED red 680 nm
Max. switching frequency	4000 Hz
Setup	Teach-in
PNP Light-ON/Dark-ON switchable + Excess gain	LFS-3065-103
PNP Light-ON/Dark-ON switchable	LFS-3066-103
PNP Light-ON/Dark-ON switchable + IO Link	
Other types available	NPN Light-ON/Dark-ON switchable

CUBIC SMALL

□ 31 X 60 X 10	□ 31 X 60 X 10	□ 31 X 60 X 10
FIBER-OPTIC AMPLIFIER	FIBER-OPTIC AMPLIFIER	FIBER-OPTIC AMPLIFIER
200	200	200

IO-Link



100 x 100 mm white ≤ 30 mA LED red 680 nm 4000 Hz Teach-in	100 x 100 mm white ≤ 15 mA LED red 680 nm 1500 Hz Potentiometer	100 x 100 mm white ≤ 15 mA LED red 680 nm 1500 Hz Potentiometer
LFS-3066-403	LFK-3060-103	LFS-3060-103
NPN Light-ON/Dark-ON switchable + Excess gain		NPN Light-ON/Dark-ON switchable + Excess gain

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OVERVIEW

	4040
Housing material	PBTP (Crastin)
Hysteresis	10 % typ.
Degree of protection	IP 67
Supply voltage range	10 ... 36 VDC
Ambient temperature range	-25 ... +55°C / -13 ... +131°F
Output current (total of both outputs)	≤ 200 mA
Output voltage drop	≤ 2 V
Switching frequency	≤ 1000 Hz
Switching time	0.5 msec
Max. ambient light halogen	5000 Lux
Max. ambient light sun	10,000 Lux
Compatible mounting bracket	See page 275

HOUSING SIZE MM

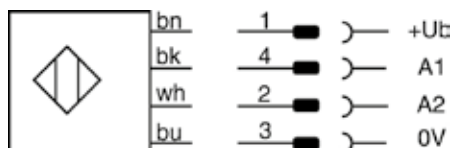
OPERATING PRINCIPLE

SENSING RANGE MM

PHOTOELECTRIC

WIRING DIAGRAM

PNP/NPN Changeover



DATA

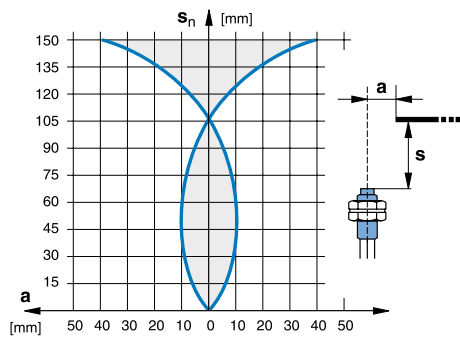
Standard target
 No-load supply current
 Emitter
 Setup
 PNP Changeover
 Other types available

CUBIC SMALL

□ 40 X 40 X 19

FIBER-OPTIC AMPLIFIER

150



Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

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100 x 100 mm white

≤ 20 mA

IR LED 880 nm

Potentiometer

LFS-4040-103

NPN Changeover

SYNTHETIC OPTICAL FIBERS

- ✓ Very small dimensions
- ✓ Long sensing ranges
- ✓ Small bending radii
- ✓ Can be cut on site
- ✓ Large selection of types
- ✓ Mechanically rugged sensing head

TECHNICAL DATA	
Ambient temperature range	-25 ... +70°C / -55 ... +105°C* (-13 ... +158°F / -67 ... +221°F*)
Standard length	2 m ± 0.1 m (other lengths on request)
Fiber bending radii:	
miniature / multi-beam	15 mm
standard / coaxial	25 mm
low & high temperature	25 mm
liquid level monitoring	25 mm
flexible / background suppression	2 mm
luminous (enhanced brightness)	40 mm
Bending radius of light-outlet tube	25 mm
Tensile load	30 N max.
Fiber material	PMMA
Sleeve material	Polyethylene
Sensing head material	Stainless steel V2A / PBTP**
Sensing head light-outlet tube material	Stainless steel V2A
Optical attenuation:	
standard / luminous (enhanced brightness)	0.2 dB / m max. at 660 nm
miniature / low & high temperature	0.2 dB / m max. at 660 nm
flexible / coaxial / multi-beam	0.3 dB / m max. at 660 nm
Angle of incidence	See data sheets
Tightening torque:	
M3	1 Nm
M4	2 Nm
M5	3 Nm
M6	4 Nm
M8	10 Nm

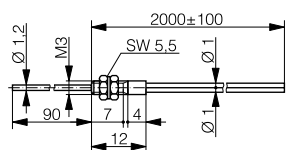
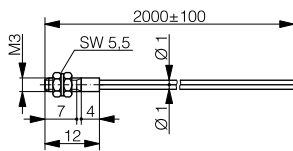
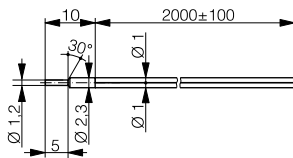
* LFP-1002-020-002 / LFP-2002-020-002

** LFP-1108 / 1109 / 1011-020

SYNTHETIC OPTICAL FIBERS

DIFFUSE SENSING

Dimensions: light emission on the left



Double fiber (10 m)		No sensing head	
Part reference	LFP-0005-100		
Sensing range	with series 3030	120 mm	(2 m fiber, diffuse sensing)
	with series 3031	60 mm	(2 m fiber, diffuse sensing)
	with series 3060/65/66	200 mm	(2 m fiber, diffuse sensing)
Outside fiber	separable double fiber, \varnothing 2.2 mm		
Inner fiber	\varnothing 1.0 mm		
Special characteristics	Long sensing range		

Housing size: \varnothing 2.3 mm		Miniature	
Part reference	LFP-1012-020		
Sensing range	with series 3030	40 mm	(with 2 m fiber length)
	with series 3031	20 mm	(with 2 m fiber length)
	with series 3060/65/66	70 mm	(with 2 m fiber length)
Outside fiber	1 separable double fiber, \varnothing 1 mm*		
Inner fiber	\varnothing 0.5 mm		
Special characteristics	Highest resolution		
* Adaptor included in delivery package			

Housing size: M3		Miniature	
Part reference	LFP-1001-020		
Sensing range	with series 3030	40 mm	(with 2 m fiber length)
	with series 3031	20 mm	(with 2 m fiber length)
	with series 3060/65/66	70 mm	(with 2 m fiber length)
Outside fiber	1 separable double fiber, \varnothing 1 mm*		
Inner fiber	\varnothing 0.5 mm		
Special characteristics	Highest resolution		
* Adaptor included in delivery package			

Housing size: M3		Miniature	
Part reference	LFP-1004-020		
Sensing range	with series 3030	40 mm	(with 2 m fiber length)
	with series 3031	20 mm	(with 2 m fiber length)
	with series 3060/65/66	70 mm	(with 2 m fiber length)
Outside fiber	1 separable double fiber, \varnothing 1 mm*		
Inner fiber	\varnothing 0.5 mm		
Special characteristics	Sensing head with bendable light-outlet tube for ease of positioning; highest resolution		
* Adaptor included in delivery package			

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

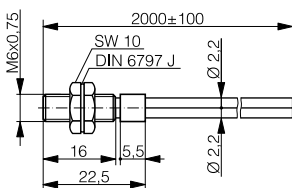
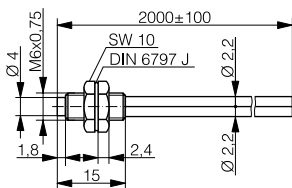
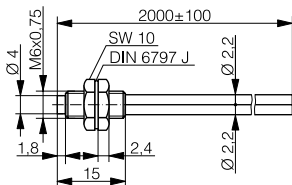
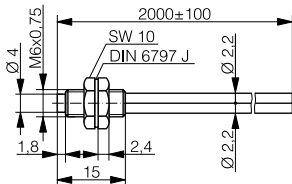
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SYNTHETIC OPTICAL FIBERS

DIFFUSE SENSING

Dimensions: light emission on the left



Housing size: M6	Standard	
Part reference	LFP-1002-020	
Sensing range	with series 3030	120 mm (with 2 m fiber length)
	with series 3031	60 mm (with 2 m fiber length)
	with series 3060/65/66	200 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, Ø 2.2 mm	
Inner fiber	Ø 1.0 mm	
Special characteristics	Long sensing range	

Housing size: M6	Flexible	
Part reference	LFP-1102-020	
Sensing range	with series 3030	90 mm (with 2 m fiber length)
	with series 3031	45 mm (with 2 m fiber length)
	with series 3060/65/66	150 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, Ø 2.2 mm	
Inner fiber	151 x Ø 75 µm	
Special characteristics	Very small bending radius	

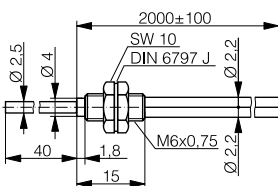
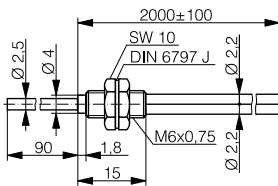
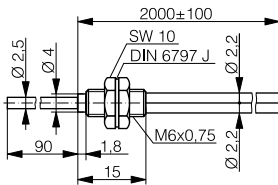
Housing size: M6	Luminous (enhanced brightness)	
Part reference	LFP-1202-020	
Sensing range	with series 3030	160 mm (with 2 m fiber length)
	with series 3031	80 mm (with 2 m fiber length)
	with series 3060/65/66	260 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, Ø 2.2 mm	
Inner fiber	Ø 1.5 mm	
Special characteristics	Longest sensing range	

Housing size: M6	Coaxial	
Part reference	LFP-1003-020	
Sensing range	with series 3030	120 mm (with 2 m fiber length)
	with series 3031	60 mm (with 2 m fiber length)
	with series 3060/65/66	200 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, Ø 2.2 mm	
Inner fiber	Ø 1.0 mm	
Special characteristics	Coaxial arrangement of fibers, thus axially symmetric beam	

SYNTHETIC OPTICAL FIBERS

DIFFUSE SENSING

Dimensions: light emission on the left



Housing size: M6	Standard	
Part reference	LFP-1005-020	
Sensing range	with series 3030	120 mm (with 2 m fiber length)
	with series 3031	60 mm (with 2 m fiber length)
	with series 3060/65/66	200 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, Ø 2.2 mm	
Inner fiber	Ø 1.0 mm	
Special characteristics	Sensing head with bendable light-outlet tube for ease of positioning	
	Long sensing range	

Housing size: M6	Flexible	
Part reference	LFP-1105-020	
Sensing range	with series 3030	90 mm (with 2 m fiber length)
	with series 3031	45 mm (with 2 m fiber length)
	with series 3060/65/66	150 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, Ø 2.2 mm	
Inner fiber	151 x Ø 75 µm	
Special characteristics	Sensing head with bendable light-outlet tube for ease of positioning	
	Very small bending radius	

Housing size: M6	Standard	
Part reference	LFP-1013-020	
Sensing range	with series 3030	120 mm (with 2 m fiber length)
	with series 3031	60 mm (with 2 m fiber length)
	with series 3060/65/66	200 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, Ø 2.2 mm	
Inner fiber	Ø 1.0 mm	
Special characteristics	Sensing head with bendable light-outlet tube for ease of positioning	
	Long sensing range	

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

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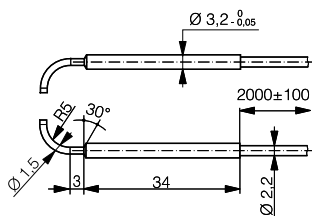
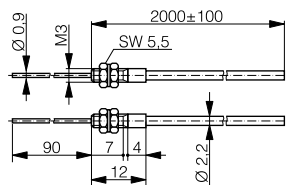
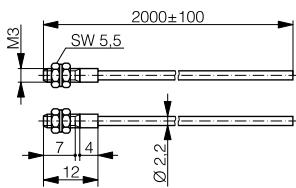
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SYNTHETIC OPTICAL FIBERS

THROUGH-BEAM SENSING

Dimensions: light emission on the left



Individual fiber (10 m)	No sensing head	
Part reference	LFP-0004-100	
Sensing range	with series 3030	400 mm (2 m fiber, thru-beam sensing)
	with series 3031	200 mm (2 m fiber, thru-beam sensing)
	with series 3060/65/66	700 mm (2 m fiber, thru-beam sensing)
Outside fiber	individual fiber, Ø 2.2 mm	
Inner fiber	Ø 1.0 mm	
Special characteristics	Long sensing range	

Housing size: M3	Miniature	
Part reference	LFP-2001-020	
Sensing range	with series 3030	120 mm (with 2 m fiber length)
	with series 3031	60 mm (with 2 m fiber length)
	with series 3060/65/66	200 mm (with 2 m fiber length)
Outside fiber	2 individual fibers, Ø 2.2 mm	
Inner fiber	Ø 0.5 mm	
Special characteristics	Highest resolution	

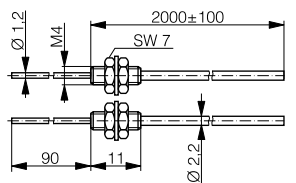
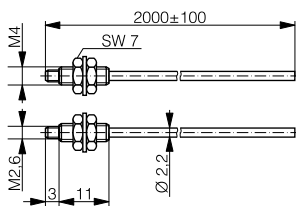
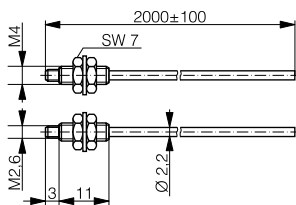
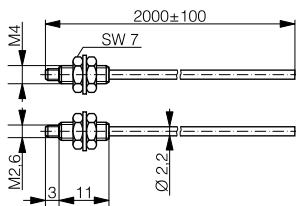
Housing size: M3	Miniature	
Part reference	LFP-2003-020	
Sensing range	with series 3030	120 mm (with 2 m fiber length)
	with series 3031	60 mm (with 2 m fiber length)
	with series 3060/65/66	200 mm (with 2 m fiber length)
Outside fiber	2 individual fibers, Ø 2.2 mm	
Inner fiber	Ø 0.5 mm	
Special characteristics	Sensing head with bendable light-outlet tube for ease of positioning	
	Highest resolution	

Housing size: Ø 3.2 mm	Standard 90°	
Part reference	LFP-2006-020	
Sensing range	with series 3030	120 mm (with 2 m fiber length)
	with series 3031	60 mm (with 2 m fiber length)
	with series 3060/65/66	200 mm (with 2 m fiber length)
Outside fiber	2 individual fibers, Ø 2.2 mm	
Inner fiber	Ø 1.0 mm	
Special characteristics	Lateral sensing	

SYNTHETIC OPTICAL FIBERS

THROUGH-BEAM SENSING

Dimensions: light emission on the left



Housing size: M4		Standard
Part reference	LFP-2002-020	
Sensing range	with series 3030	400 mm (with 2 m fiber length)
	with series 3031	200 mm (with 2 m fiber length)
	with series 3060/65/66	700 mm (with 2 m fiber length)
Outside fiber	2 individual fibers, Ø 2.2 mm	
Inner fiber	Ø 1.0 mm	
Special characteristics	Long sensing range	

Housing size: M4		Flexible
Part reference	LFP-2102-020	
Sensing range	with series 3030	300 mm (with 2 m fiber length)
	with series 3031	150 mm (with 2 m fiber length)
	with series 3060/65/66	550 mm (with 2 m fiber length)
Outside fiber	2 individual fibers, Ø 2.2 mm	
Inner fiber	151 x Ø 75 µm	
Special characteristics	Very small bending radius	

Housing size: M4		Luminous (enhanced brightness)
Part reference	LFP-2202-020	
Sensing range	with series 3030	500 mm (with 2 m fiber length)
	with series 3031	250 mm (with 2 m fiber length)
	with series 3060/65/66	900 mm (with 2 m fiber length)
Outside fiber	2 individual fibers, Ø 2.2 mm	
Inner fiber	Ø 1.5 mm	
Special characteristics	Longest sensing range	

Housing size: M4		Standard
Part reference	LFP-2004-020	
Sensing range	with series 3030	400 mm (with 2 m fiber length)
	with series 3031	200 mm (with 2 m fiber length)
	with series 3060/65/66	700 mm (with 2 m fiber length)
Outside fiber	2 individual fibers, Ø 2.2 mm	
Inner fiber	Ø 1.0 mm	
Special characteristics	Sensing head with bendable light-outlet tube for ease of positioning	
	Long sensing range	

Inductive

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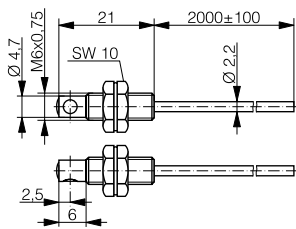
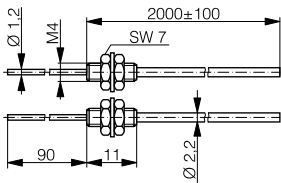
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SYNTHETIC OPTICAL FIBERS

THROUGH-BEAM SENSING

Dimensions: light emission on the left



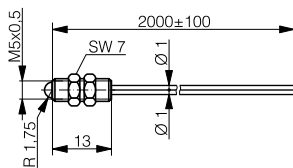
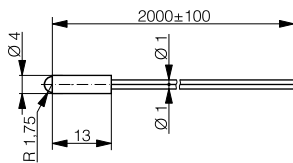
Housing size: M4	Flexible	
Part reference	LFP-2104-020	
Sensing range	with series 3030	300 mm (with 2 m fiber length)
	with series 3031	150 mm (with 2 m fiber length)
	with series 3060/65/66	500 mm (with 2 m fiber length)
Outside fiber	2 individual fibers, \varnothing 2.2 mm	
Inner fiber	151 x \varnothing 75 μ m	
Special characteristics	Sensing head with bendable light-outlet tube for ease of positioning	
	Very small bending radius	

Housing size: M6	Standard 90°	
Part reference	LFP-2005-020	
Sensing range	with series 3030	1100 mm (with 2 m fiber length)
	with series 3031	550 mm (with 2 m fiber length)
	with series 3060/65/66	1800 mm (with 2 m fiber length)
Outside fiber	2 individual fibers, \varnothing 2.2 mm	
Inner fiber	\varnothing 1.0 mm	
Special characteristics	Lateral sensing	
	Long sensing range	

SYNTHETIC OPTICAL FIBERS

APPLICATION-SPECIFIC CYLINDRICAL LIGHT BEAM

Dimensions: light emission on the left

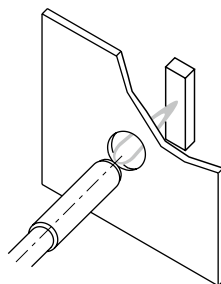


- ✓ Diffuse fibers particularly suitable for the detection of objects in recesses and behind covers (through holes and gaps)
- ✓ Extremely small sensing heads
- ✓ Quasi-cylindrical light beam
- ✓ Recessed mounting possible
- ✓ Sapphire glass optical parts, thus easy to clean

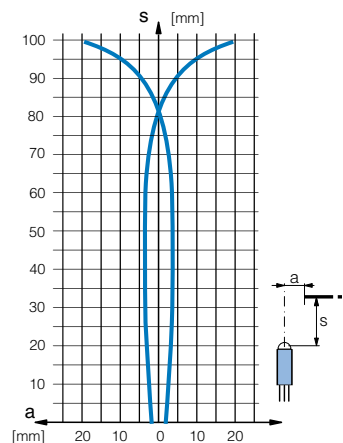
Housing size: \varnothing 4 mm		Miniature / spherical optics	
Part reference	LFP-1006-020		
Sensing range	with series 3030	100 mm	(with 2 m fiber length)
	with series 3031	60 mm	(with 2 m fiber length)
	with series 3060/65/66	140 mm	(with 2 m fiber length)
Outside fiber	1 separable double fiber, \varnothing 1 mm*		
Inner fiber	\varnothing 0.5 mm		
Special characteristics	Spherical optics for cylindrical light beam		
* Adaptor included in delivery package			

Housing size: M5		Miniature / spherical optics	
Part reference	LFP-1007-020		
Sensing range	with series 3030	100 mm	(with 2 m fiber length)
	with series 3031	60 mm	(with 2 m fiber length)
	with series 3060/65/66	140 mm	(with 2 m fiber length)
Outside fiber	1 separable double fiber, \varnothing 1 mm*		
Inner fiber	\varnothing 0.5 mm		
Special characteristics	Spherical optics for cylindrical light beam		
* Adaptor included in delivery package			

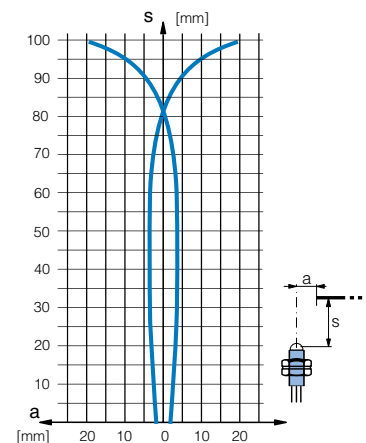
Response curves (with series 3030):



Detection through holes and gaps



LFP-1006-020

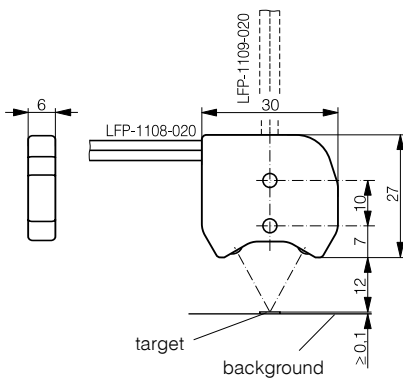


LFP-1007-020

SYNTHETIC OPTICAL FIBERS

APPLICATION-SPECIFIC BACKGROUND SUPPRESSION

- ✓ Diffuse fiber with background suppression
- ✓ Factory adjusted operating distance of 12 mm
- ✓ Fully potted optical parts
- ✓ Recognition of position and thickness differences of only 0.1 mm
- ✓ Suitable for rough environments, thanks to glass-fiber reinforced PBTP housing
- ✓ Scratch resistant, easy-to-clean glass lenses



Housing size: □ 27 x 30 Background suppression / flexible / 90°

Part reference	LFP-1108-020
Operating distance	12 mm
Outside fiber	2 separate fibers, \varnothing 2.2 mm
Inner fiber	151 x \varnothing 75 μ m
Special characteristics	Lateral sensing
	Detectable height difference: 0.1 mm
	Minimum detectable target size: 0.15 mm ²
	Minimum detectable wire diameter: 0.1 mm

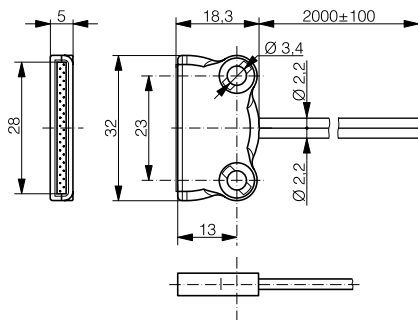
Housing size: □ 27 x 30 Background suppression / flexible

Part reference	LFP-1109-020
Operating distance	12 mm
Outside fiber	2 separate fibers, \varnothing 2.2 mm
Inner fiber	151 x \varnothing 75 μ m
Special characteristics	Axial sensing
	Detectable height difference: 0.1 mm
	Minimum detectable target size: 0.15 mm ²
	Minimum detectable wire diameter: 0.1 mm

SYNTHETIC OPTICAL FIBERS

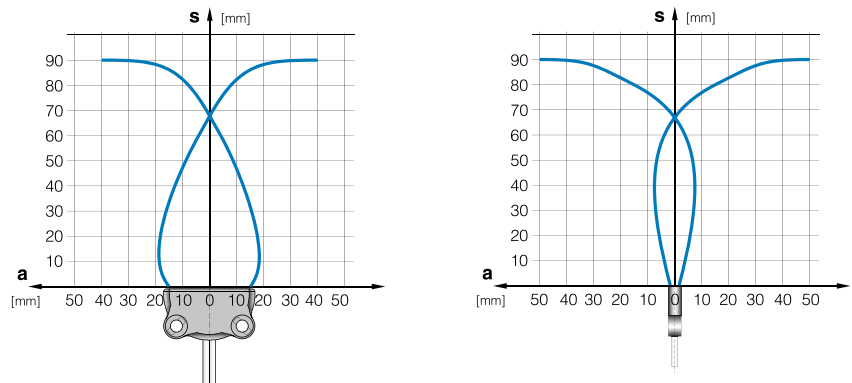
APPLICATION-SPECIFIC MULTI-BEAM

- ✓ Multi-beam diffuse fiber
- ✓ Detection of objects across the whole width of the sensing head (28 mm)
- ✓ Suitable for rough environments, thanks to PBTP housing
- ✓ Lateral mounting



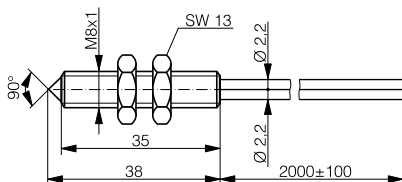
Housing size:	18 x 32	Multi-beam
Part reference	LFP-1011-020	
Sensing range	with series 3030	90 mm (with 2 m fiber length)
	with series 3031	45 mm (with 2 m fiber length)
	with series 3060/65/66	150 mm (with 2 m fiber length)
Outside fiber	2 separate fibers, \varnothing 2.2 mm	
Inner fiber	16 x \varnothing 0.265 mm	
Special characteristics	Wide detection range (28 mm)	

Response curves (with series 3030):



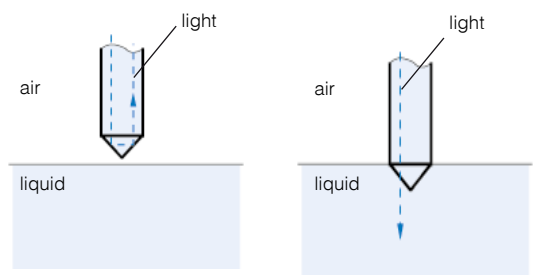
APPLICATION-SPECIFIC LIQUID LEVEL MONITORING

- ✓ Contact liquid detection (with the exception of white milky liquids)
- ✓ Fully potted optical parts
- ✓ Scratch-resistant, easy-to-clean glass prism
- ✓ Impervious (degree of protection: IP 68)



Housing size:	M8	Liquid level monitoring
Part reference	LFP-1010-020	
Outside fiber	2 separate fibers, \varnothing 2.2 mm	
Inner fiber	\varnothing 0.5 mm	
Special characteristics	Contact liquid detection	

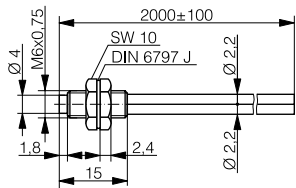
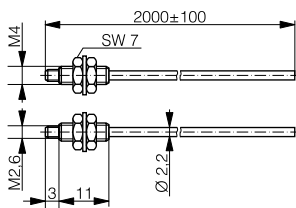
Operating principle:



SYNTHETIC OPTICAL FIBERS

APPLICATION-SPECIFIC LOW & HIGH TEMPERATURES

Dimensions: light emission on the left



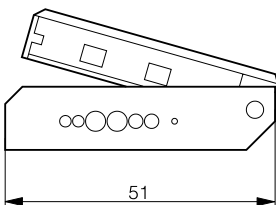
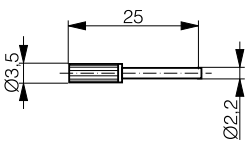
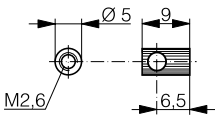
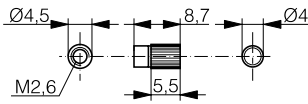
- ✓ Diffuse (LFP-1002-020-002) and through-beam (LFP-2002-020-002) fibers
- ✓ Extended temperature range : -55 ... +105°C / -67 ... +221°F
- ✓ Very small dimensions
- ✓ Long sensing ranges
- ✓ Small bending radii
- ✓ Can be cut on site

Housing size: M4		Low & high temperature resistant	
Part reference	LFP-2002-020-002		
Sensing range	with series 3030	300 mm (with 2 m fiber length)	
	with series 3031	150 mm (with 2 m fiber length)	
	with series 3060/65/66	550 mm (with 2 m fiber length)	
Outside fiber	2 individual fibers, Ø 2.2 mm		
Inner fiber	Ø 1.0 mm		
Special characteristics	Extended temperature range of -55...+105°C / -67...+221°F		

Housing size: M6		Low & high temperature resistant	
Part reference	LFP-1002-020-002		
Sensing range	with series 3030	90 mm (with 2 m fiber length)	
	with series 3031	45 mm (with 2 m fiber length)	
	with series 3060/65/66	150 mm (with 2 m fiber length)	
Outside fiber	1 separable double fiber, Ø 2.2 mm		
Inner fiber	Ø 1.0 mm		
Special characteristics	Extended temperature range of -55...+105°C / -67...+221°F		

SYNTHETIC OPTICAL FIBERS

ACCESSORIES



Axial front lens for increased sensing ranges

Part reference	LFP-0001-000	
Sensing range	with series 3030	3000 mm (2 m fibers)
	with series 3031	1500 mm (2 m fibers)
	with series 3060/65/66	5000 mm (5 m fibers)
Can be used with	LFP-2#02-020	
Delivery package	1 pair	

90° front lens for increased sensing ranges

Part reference	LFP-0002-000	
Sensing range	with series 3030	1000 mm (2 m fibers)
	with series 3031	500 mm (2 m fibers)
	with series 3060/65/66	1700 mm (2 m fibers)
Can be used with	LFP-2#02-020	
Delivery package	1 pair	

Adaptor

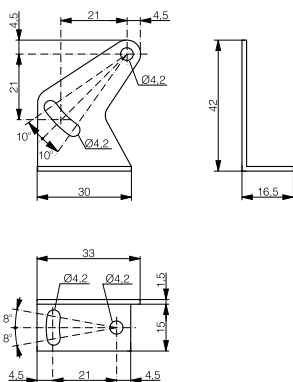
Part reference	LFP-0003-000
Suitable for	fine synthetic optical fibers

Cutting tool

Part reference	LXF-0000-000
Suitable for	all synthetic optical fibers

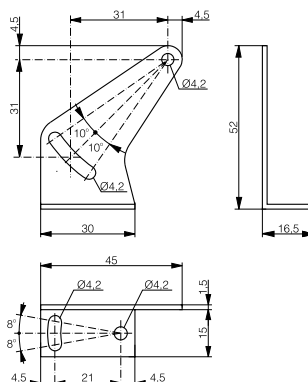
UNIVERSAL MOUNTING BRACKET

For 3#30 / 3#31 series
Material: stainless steel V2A
Part reference: **LXW-3030-000**



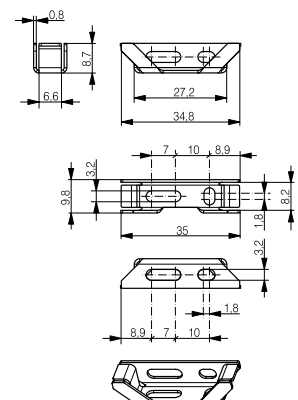
UNIVERSAL MOUNTING BRACKET

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



UNIVERSAL MOUNTING BRACKET

For 3#6# series
Material: stainless steel V2A
Part reference: **LXW-3060-000**



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GLASS OPTICAL FIBERS

- ✓ For high ambient temperatures (models with chrome-plated brass and silicone sleeves)
- ✓ Executions for extreme environmental conditions
- ✓ Small dimensions
- ✓ Long sensing ranges
- ✓ Suitable for the detection of smallest objects
- ✓ Large selection of types

TECHNICAL DATA		
Ambient temperature range	PVC sleeve	0 ... +70°C
		32 ... +158°F
	Wound brass sleeve	-25 ... +160°C
		-13 ... +320°F
	Silicone sleeve	-25 ... +150°C
		-13 ... +302°F
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	0.01 dB / m max. at 880 nm	
Angle of incidence	See data sheets	

Depending on the type involved, glass optical fibers consist of 200 to 5000 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:

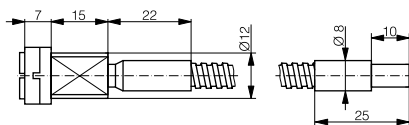
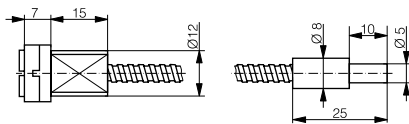
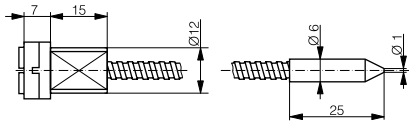
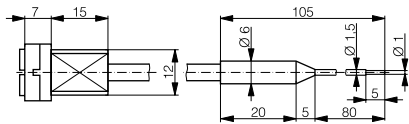
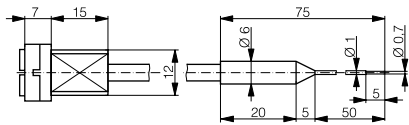
- PVC sleeve: the economical solution if no special stresses are to be expected.
- Wound sleeve of chrome-plated brass: for permanent operating temperatures of up to +160°C (+320°F), and maximum protection against crushing.
- Silicone sleeve with stainless-steel braiding for strain relief: for use in corrosive media, at temperatures of up to +150°C (+302°F), 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 sensing ranges, small cross-sections for short ranges, high resolutions, and detection of small objects.

GLASS OPTICAL FIBERS

AXIAL DIFFUSE SENSING

Dimensions: light emission on the right



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

Housing size: \varnothing 6 mm

Part reference	LFG-1005-###
Sensing range	with series 4040 5 mm
Special characteristics	With bendable light-outlet tube For the detection of smallest objects
Sleeve	Silicone, \varnothing 4.7 mm
Min. bending radius	20 mm / light-outlet tube: 5 mm (do not bend the inner and outer 10 mm)
Max. tensile load	10 N

Housing size: \varnothing 6 mm

Part reference	LFG-1015-###
Sensing range	with series 4040 15 mm
Special characteristics	With bendable light-outlet tube For places difficult to access
Sleeve	Silicone, \varnothing 4.7 mm
Min. bending radius	20 mm / light-outlet tube: 5 mm (do not bend the inner and outer 10 mm)
Max. tensile load	10 N

Housing size: \varnothing 6 mm

Part reference	LFG-1010-###
Sensing range	with series 4040 15 mm
Special characteristics	For the detection of smallest objects in places difficult to access
Sleeve	Wound sleeve of chrome-plated brass, \varnothing 4.7 mm
Min. bending radius	23 mm
Max. tensile load	20 N

Housing size: \varnothing 8 mm

Part reference	LFG-1020-###
Sensing range	with series 4040 50 mm
Special characteristics	Multi-purpose medium sensing range model
Sleeve	Wound sleeve of chrome-plated brass, \varnothing 4.7 mm
Min. bending radius	25 mm
Max. tensile load	50 N

Housing size: \varnothing 8 mm

Part reference	LFG-1030-###
Sensing range	with series 4040 150 mm
Special characteristics	For long sensing range
Sleeve	Wound sleeve of chrome-plated brass, \varnothing 6.7 mm
Min. bending radius	25 mm
Max. tensile load	50 N

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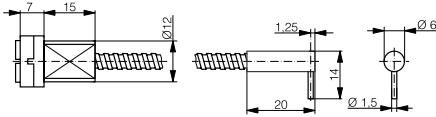
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GLASS OPTICAL FIBERS

RADIAL DIFFUSE SENSING

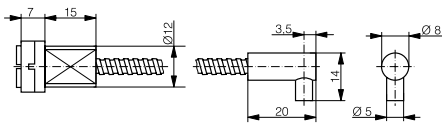
length of glass fiber in cm, standard lengths -025 (250 mm) / -050 (500 mm) / -100 (1000 mm)

Dimensions: light emission on the right



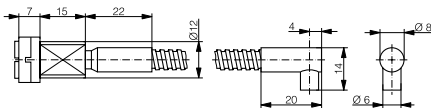
Housing size: Ø 6 mm

Part reference	LFG-2010-###
Sensing range	with series 4040 15 mm
Special characteristics	For the detection of smallest objects in places difficult to access
Leg length	14 mm
Sleeve	Wound sleeve of chrome-plated brass, Ø 4.7 mm
Min. bending radius	23 mm
Max. tensile load	20 N



Housing size: Ø 8 mm

Part reference	LFG-2020-###
Sensing range	with series 4040 30 mm
Special characteristics	Multi-purpose medium sensing range model
Leg length	14 mm
Sleeve	Wound sleeve of chrome-plated brass, Ø 4.7 mm
Min. bending radius	25 mm
Max. tensile load	50 N



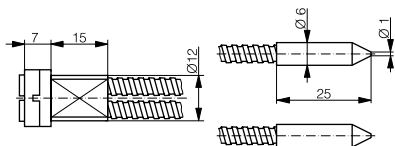
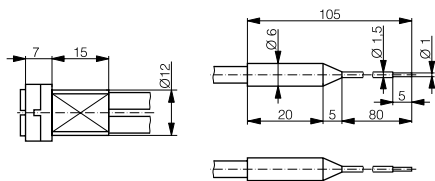
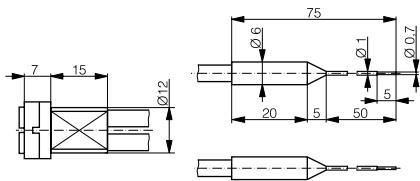
Housing size: Ø 8 mm

Part reference	LFG-2030-###
Sensing range	with series 4040 150 mm
Special characteristics	For long sensing range
Leg length	14 mm
Sleeve	Wound sleeve of chrome-plated brass, Ø 6.7 mm
Min. bending radius	25 mm
Max. tensile load	50 N

GLASS OPTICAL FIBERS

AXIAL THROUGH-BEAM SENSING

Dimensions: light emission on the right



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

Housing size: Ø 6 mm

Part reference	LFG-3005-###
Sensing range	with series 4040 50 mm
Special characteristics	With bendable light-outlet tube For the detection of smallest objects
Sleeve	Silicone, Ø 4.7 mm
Min. bending radius	20 mm / light-outlet tube: 5 mm (do not bend the inner and outer 10 mm)
Max. tensile load	10 N

Housing size: Ø 6 mm

Part reference	LFG-3015-###
Sensing range	with series 4040 200 mm
Special characteristics	With bendable light-outlet tube For places difficult to access
Sleeve	Silicone, Ø 4.7 mm
Min. bending radius	20 mm / light-outlet tube: 5 mm (do not bend the inner and outer 10 mm)
Max. tensile load	10 N

Housing size: Ø 6 mm

Part reference	LFG-3010-###
Sensing range	with series 4040 200 mm
Special characteristics	For the detection of smallest objects in places difficult to access
Sleeve	Wound sleeve of chrome-plated brass, Ø 4.7 mm
Min. bending radius	23 mm
Max. tensile load	20 N

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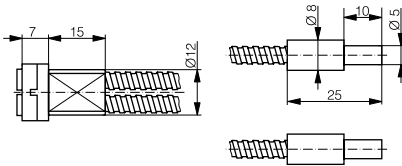
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GLASS OPTICAL FIBERS

AXIAL THROUGH-BEAM SENSING

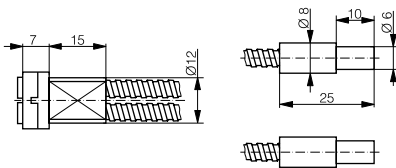
length of glass fiber in cm, standard lengths -025 (250 mm) / -050 (500 mm) / -100 (1000 mm)

Dimensions: light emission on the right



Housing size: Ø 8 mm

Part reference	LFG-3020-###
Sensing range	with series 4040 800 mm
Special characteristics	Multi-purpose medium sensing range model
Sleeve	Wound sleeve of chrome-plated brass, Ø 4.7 mm
Min. bending radius	25 mm
Max. tensile load	50 N



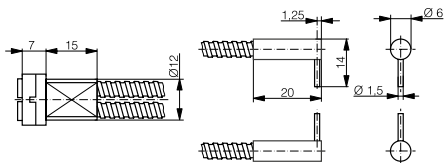
Housing size: Ø 8 mm

Part reference	LFG-3030-###
Sensing range	with series 4040 1500 mm
Special characteristics	For long sensing range
Sleeve	Wound sleeve of chrome-plated brass, Ø 4.7 mm
Min. bending radius	25 mm
Max. tensile load	50 N

GLASS OPTICAL FIBERS

RADIAL THROUGH-BEAM SENSING

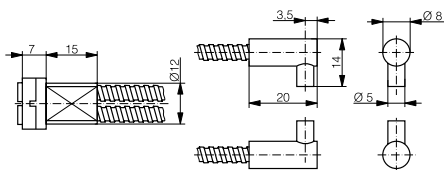
Dimensions: light emission on the right



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

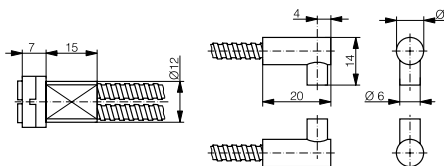
Housing size: \varnothing 6 mm

Part reference	LFG-4010-###
Sensing range	with series 4040 200 mm
Special characteristics	For the detection of smallest objects in places difficult to access
Leg length	14 mm
Sleeve	Wound sleeve of chrome-plated brass, \varnothing 4.7 mm
Min. bending radius	23 mm
Max. tensile load	20 N



Housing size: \varnothing 8 mm

Part reference	LFG-4020-###
Sensing range	with series 4040 800 mm
Special characteristics	Multi-purpose medium sensing range model
Leg length	14 mm
Sleeve	Wound sleeve of chrome-plated brass, \varnothing 4.7 mm
Min. bending radius	25 mm
Max. tensile load	50 N



Housing size: \varnothing 8 mm

Part reference	LFG-4030-###
Sensing range	with series 4040 1500 mm
Special characteristics	For long sensing range
Leg length	14 mm
Sleeve	Wound sleeve of chrome-plated brass, \varnothing 4.7 mm
Min. bending radius	25 mm
Max. tensile load	50 N

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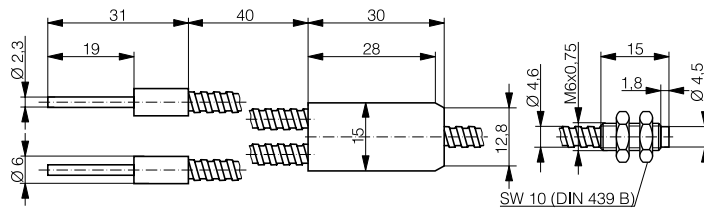
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GLASS OPTICAL FIBERS

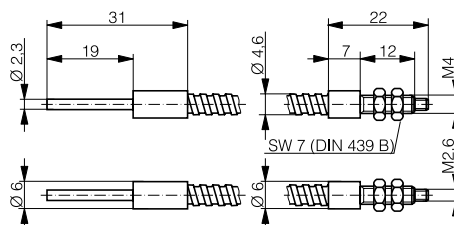
Dimensions: light emission on the right

FOR SERIES 3030 / 3031 SENSORS (CONNECTION AS WITH SYNTHETIC FIBERS)

Housing size: M6	Diffuse sensing	
Part reference	LFG-1022-050	
Sensing range	with series 3030	120 mm
	with series 3031	60 mm
Special characteristics	For difficult environmental conditions	
Sleeve	Wound sleeve of chrome-plated brass, \varnothing 4.6 mm	
Min. bending radius	25 mm	
Max. tensile load	20 N	

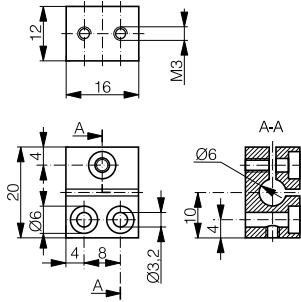


Housing size: M4	Through-beam sensing	
Part reference	LFG-3022-050	
Sensing range	with series 3030	500 mm
	with series 3031	250 mm
Special characteristics	For difficult environmental conditions	
Sleeve	Wound sleeve of chrome-plated brass, \varnothing 4.6 mm	
Min. bending radius	25 mm	
Max. tensile load	20 N	



GLASS OPTICAL FIBERS

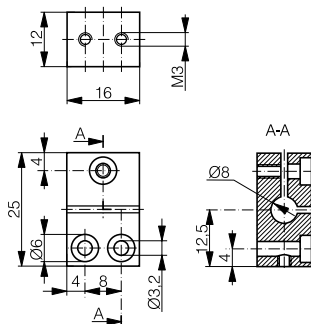
ACCESSORIES



For Ø 6 mm heads

Fiber mounting clamp

Part reference	LXG-0000-060
Characteristics	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 Ø 8 mm heads

Fiber mounting clamp

Part reference	LXG-0000-080
Characteristics	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-###

Inductive

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Safety

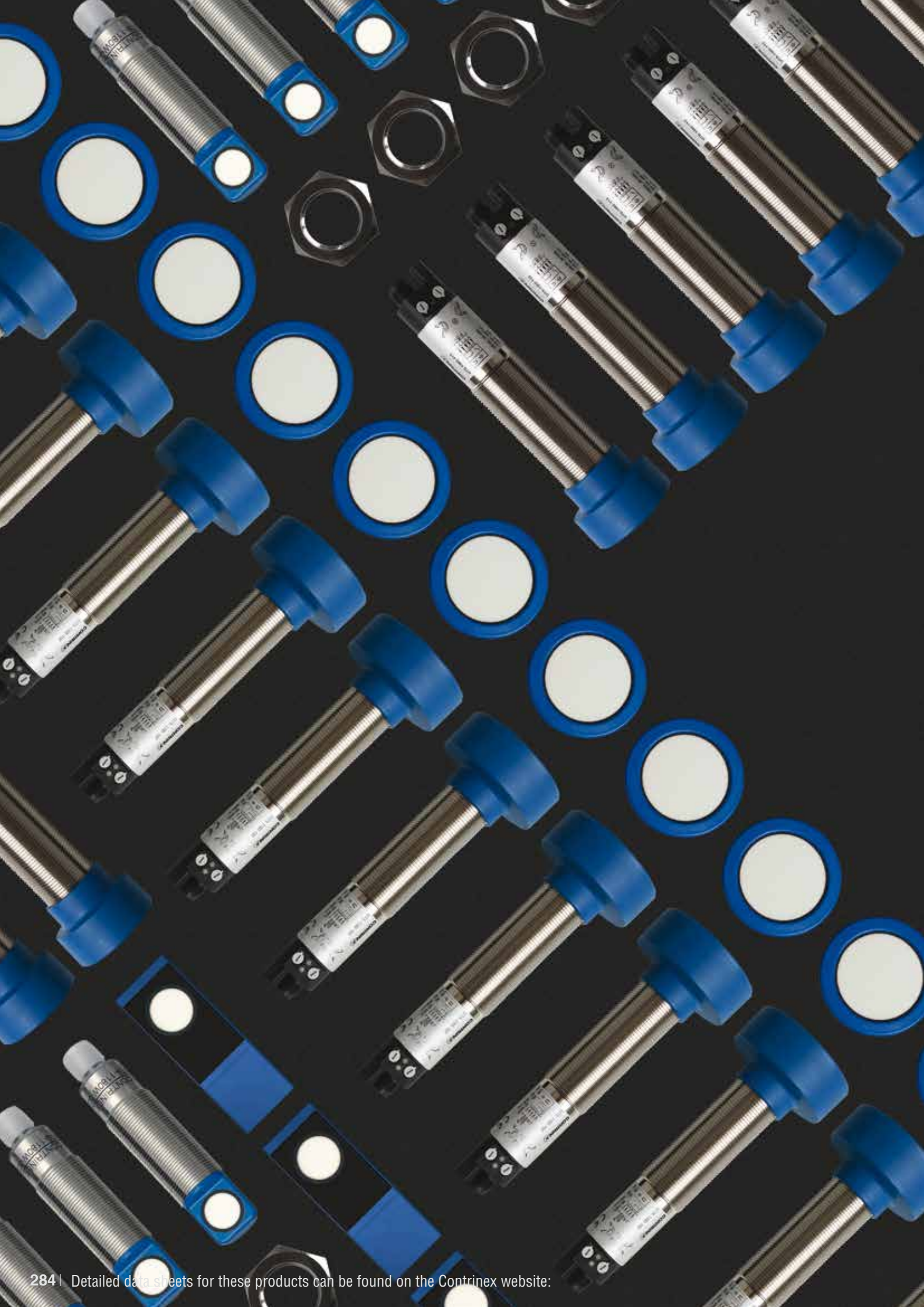
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ULTRASONIC SENSORS

HIGHLIGHTS:

- ✓ Detection independent of target material, color, shape or surface
- ✓ Ready-to-use cylindrical sensors with integral connector
- ✓ Easy adjustment by either potentiometer or teach-in
- ✓ Dual output sensors, including analog and digital
- ✓ High resolution analog output, current or voltage
- ✓ Normal length or short housings and 90° sensing
- ✓ Reduced blind zone
- ✓ High excess gain – insensitive to dirt and ambient noise

NEW:

- ✓ M12 sensors for applications with limited space
- ✓ M12 sensors with external teach
- ✓ M12 sensors with analog output

PROGRAM OVERVIEW

PRODUCT RANGE		MINIATURE	SMALL	COMPACT
				

HOUSING SIZE	OPERATING DISTANCE			
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DIFFUSE (WITH BACKGROUND SUPPRESSION)

M12	30 ... 400 mm	p. 293		
M18C (short)	30 ... 700 mm		p. 298	
M18W (90°)	30 ... 700 mm		p. 298-299	

REFLEX

M18C (short)	0 ... 700 mm		p. 297	
M18W (90°)	0 ... 700 mm		p. 297	

DIFFUSE & REFLEX

M18	50 ... 1000 mm		p. 299	
M30	60 ... 6000 mm			p. 305

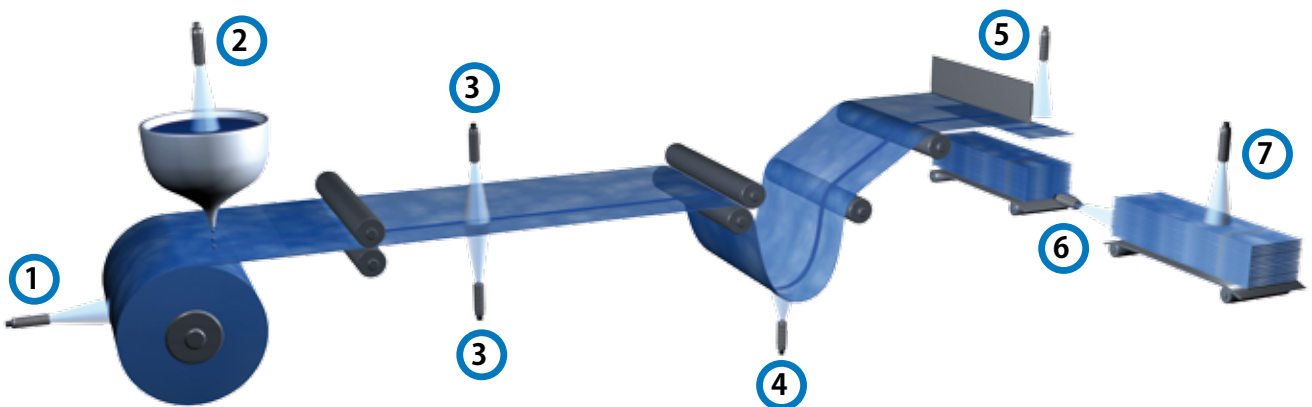
ANALOG

M12	30 ... 400 mm	p. 293		
M18	50 ... 1000 mm		p. 299-300	
M30	60 ... 6000 mm			p. 306-307

PROGRAM OVERVIEW

HOUSING SIZE	SENSING RANGE														PAGE
	30 mm	50 / 60 mm	100 mm	150 mm	200 mm	300 mm	400 mm	600 mm	700 mm	1000 mm	1300 mm	1500 mm	3000 mm	6000 mm	
DIFFUSE (WITH BACKGROUND SUPPRESSION)															
M12								30 ... 400 mm							293
M18C (short)								30 ... 700 mm							298
M18W (90°)								30 ... 700 mm							298-299
REFLEX															
M18C (short)								0 ... 700 mm							297
M18W (90°)								0 ... 700 mm							297
DIFFUSE & REFLEX															
M18				50 ... 1000 mm											299
M30				60 ... 6000 mm											305
ANALOG															
M12								30 ... 400 mm							293
M18				50 ... 1000 mm											299-300
M30				60 ... 6000 mm											306-307

1. Wind and unwind monitoring
2. Liquid level monitoring
3. Thickness control
4. Loop tension control
5. Detect or count (completeness check)
6. Position feedback
7. Distance / height control



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INTRODUCTION

OPERATING PRINCIPLE

Ultrasonic sensors can be used as contact-free devices 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 devices 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.

SENSING RANGE

Due to the sensor's 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 sensing 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 sensors 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 sensors 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 sensors. 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 sensors in applications where the safety of people is dependent on their functioning is not permitted.

TECHNOLOGY FAMILIES

Contrinex ultrasonic sensors are cylindrical in form and delivered ready-to-connect with an integral 4- or 5-pole S12 connector. In addition to switching outputs, high resolution analog output (current or voltage) and dual-output (analog+digital or digital+digital) sensors are also available. Devices are offered in three technology versions: **Diffuse**, **Reflex** and **Diffuse & Reflex**.

DIFFUSE

Excellent background suppression

With diffuse sensors, the target itself reflects the ultrasonic impulses. When the target enters a preset sensing area, the echo reflected from it causes the device to switch. To eliminate false switching, the Contrinex ultrasonic **Diffuse** family includes excellent background suppression in **Miniature** (M12) and **Small** (M18) devices. The latter are available in normal or short housings, including 90° sensing and teach-in versions. Sensing ranges extend from 30 to 700 mm.

REFLEX

Blind zone elimination

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 sensor and the reflector, the sensor no longer recognizes the latter, which causes the output to switch. The Contrinex ultrasonic **Reflex** family comprises **Small** (M18) devices with short housings, including 90° sensing and teach-in. Use of a reflector eliminates the blind zone, so that sensing ranges extend from 0 to 700 mm.

DIFFUSE & REFLEX

Background suppression or blind zone elimination

These sensors may either be used as a diffuse sensor with background suppression, or with a fixed reflector to function as a reflex sensor with blind zone elimination. The Contrinex ultrasonic **Diffuse & Reflex** family includes **Small** (M18) and **Compact** (M30) devices. The latter are available in versions with greatly extended operating distances and 1 or 2 PNP N.O. outputs. Sensing ranges extend up to 6000 mm.

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.

MULTIPLEX

The fourth connection can be used as an external release input. Thus, ultrasonic sensors can be activated or deactivated with an external control, without switching the supply voltage on and off. An external multiplex operation can be achieved by switching the ultrasonic sensors on and off one after the other via the release input. In this case, assurance is always given that the ultrasonic sensors do not influence one another. In multiplex mode more than 10 sensors can be mounted close together without mutual interference.

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, page 308).

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

MOUNTING

Ultrasonic sensors 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 sensor 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.



M12 STANDARD SIZE FOR TIGHT SPACES

MINIATURE

ULTRASONIC SENSORS

KEY ADVANTAGES

- ✓ External teach function
- ✓ Miniature cylindrical housing
- ✓ Analog and digital outputs available
- ✓ Detection independent of target's color, shape, material and surface structure
- ✓ Excellent temperature compensation

RANGE OVERVIEW	Distance mm	Diffuse	Diffuse with analog output
MINIATURE	30 ... 400	p. 293	p. 293

HOUSING SIZE

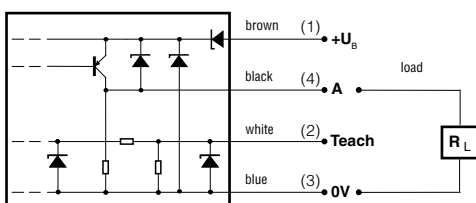
OPERATING PRINCIPLE

SENSING RANGE MM

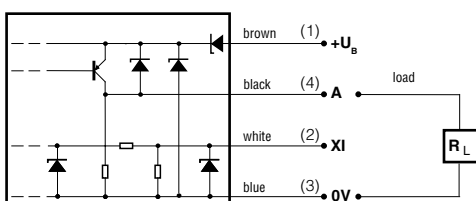
ULTRASONIC

WIRING DIAGRAMS

PNP NO with teach-in



PNP NO output / Analog output



DATA

Housing material

Degree of protection

Rated ultrasonic frequency

Max. switching frequency

Output current

Ambient temperature range

1 x PNP NO / S12

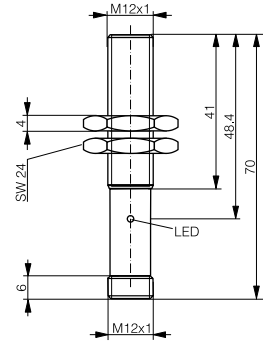
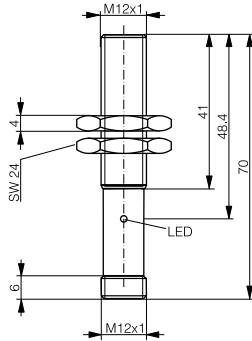
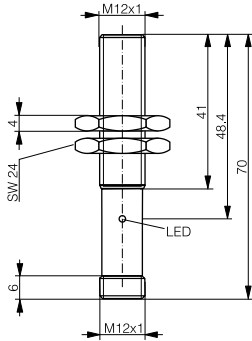
Analog 4 ... 20 mA

Analog 0 ... 10 V

Other types available

MINIATURE

M12	M12 WITH ANALOG OUTPUT	M12 WITH ANALOG OUTPUT
DIFFUSE SENSOR WITH BACKGROUND SUPP.	DIFFUSE SENSOR	DIFFUSE SENSOR
30 ... 400	30 ... 400	30 ... 400



Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
IP 65	IP 65	IP 65
310 kHz	310 kHz	310 kHz
8 Hz	-	-
100 mA	-	-
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
UTS-1121-303	UTS-1121-329	UTS-1121-319

- Inductive
- Photoelectric
- Ultrasonic**
- Capacitive
- Safety
- RFID
- Connectivity
- Accessories
- Glossary
- Index



M18 STANDARD SIZE, ADAPTABLE MOUNTING

SMALL

ULTRASONIC DIFFUSE OR REFLEX SENSORS

KEY ADVANTAGES

- ✓ Ready-to-connect small devices
- ✓ Can be operated as diffuse or reflex sensors (with interface)
- ✓ Detection independent of target's color, shape, material and surface structure
- ✓ Reduced blind zone
- ✓ 90° sensing, short housings

RANGE OVERVIEW	Distance mm	Diffuse & Reflex	Reflex	Diffuse with back-ground supp.	Diffuse with analog output
SMALL	0 ... 200		p. 297	p. 298	
	0 ... 700		p. 297	p. 298-299	
	0 ... 1000	p. 299			p. 299-300

HOUSING SIZE

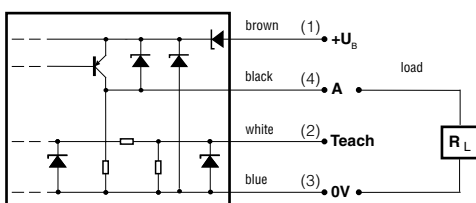
OPERATING PRINCIPLE

SENSING RANGE MM

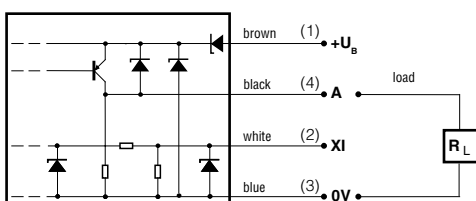
ULTRASONIC

WIRING DIAGRAMS

PNP NO with teach-in



PNP NO output / Analog output

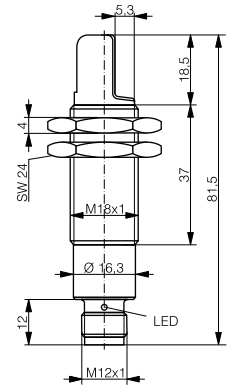
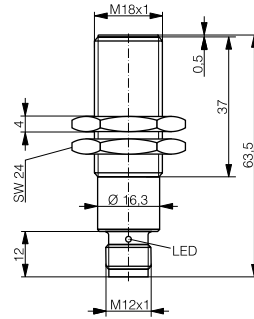
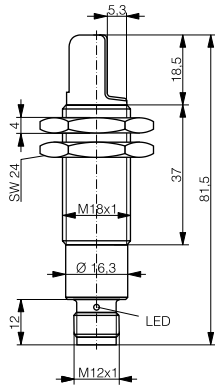
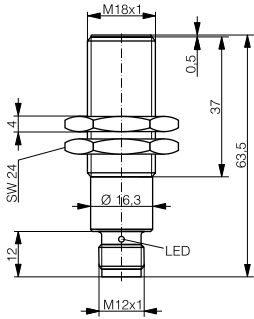


DATA

Housing material
Degree of protection
Rated ultrasonic frequency
Max. switching frequency
Output current
Ambient temperature range
1 x PNP NO / S12
Other types available

SMALL

M18 WITH TEACH-IN	M18 WITH TEACH-IN	M18 WITH TEACH-IN	M18 WITH TEACH-IN
REFLEX SENSOR	REFLEX SENSOR	REFLEX SENSOR	REFLEX SENSOR
0 ... 200	0 ... 200	0 ... 700	0 ... 700



Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

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Connectivity

Accessories

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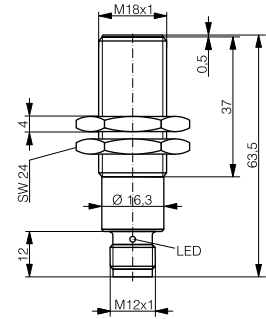
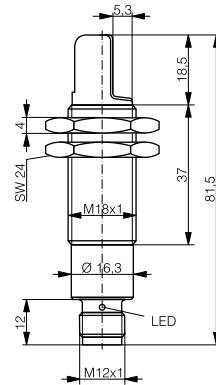
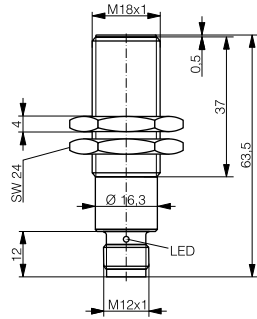
Index

Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
IP 65	IP 65	IP 65	IP 65
400 kHz	400 kHz	200 kHz	200 kHz
10 Hz	10 Hz	5 Hz	5 Hz
150 mA	150 mA	150 mA	150 mA
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
URS-1180C-303	URS-1180W-303	URS-1181C-303	URS-1181W-303

SMALL

ULTRASONIC

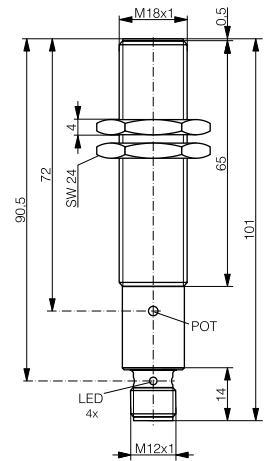
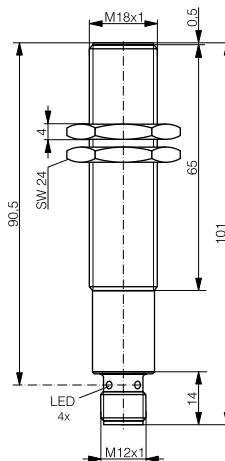
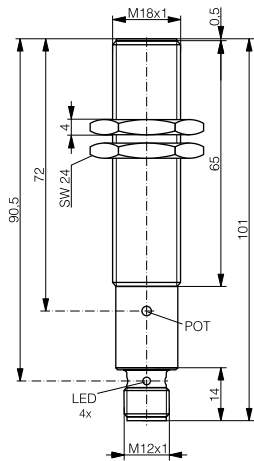
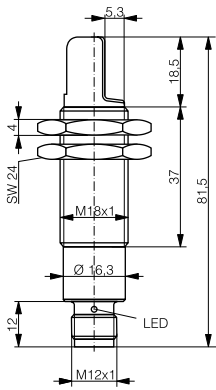
HOUSING SIZE	M18 WITH TEACH-IN	M18 WITH TEACH-IN	M18 WITH TEACH-IN
OPERATING PRINCIPLE	DIFFUSE SENSOR WITH BACKGROUND SUPP.	DIFFUSE SENSOR WITH BACKGROUND SUPP.	DIFFUSE SENSOR WITH BACKGROUND SUPP.
SENSING RANGE MM	30 ... 200	30 ... 200	100 ... 700



DATA			
Housing material	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
Degree of protection	IP 65	IP 65	IP 65
Rated ultrasonic frequency	400 kHz	400 kHz	200 kHz
Max. switching frequency	10 Hz	10 Hz	5 Hz
Output current	150 mA	150 mA	150 mA
Ambient temperature range	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
1 x PNP NO / S12	UTS-1180C-303	UTS-1180W-303	UTS-1181C-303
Analog 4 ... 20 mA			
Other types available			

SMALL

M18 WITH TEACH-IN	M18	M18 WITH ANALOG OUTPUT	M18
DIFFUSE SENSOR WITH BACKGROUND SUPP.	DIFFUSE AND REFLEX SENSOR	DIFFUSE SENSOR	DIFFUSE AND REFLEX SENSOR
100 ... 700	50 ... 300	50 ... 300	150 ... 1000



Inductive

Photoelectric

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Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
IP 65	IP 67	IP 67	IP 67
200 kHz	400 kHz	400 kHz	200 kHz
5 Hz	5 Hz	---	4 Hz
150 mA	150 mA	---	150 mA
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
UTS-1181W-303	UTS-1180-303	UTS-1180-329	UTS-1181-303

SMALL

HOUSING SIZE

M18 WITH
ANALOG OUTPUT

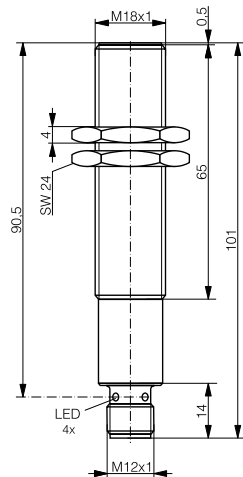
OPERATING PRINCIPLE

DIFFUSE SENSOR

SENSING RANGE MM

150 ... 1000

ULTRASONIC



DATA

Housing material	Nickel-plated brass		
Degree of protection	IP 67		
Rated ultrasonic frequency	200 kHz		
Max. switching frequency	-		
Output current	-		
Ambient temperature range	-25 ... +70°C / -13 ... +158°F		
Analog 4 ... 20 mA	UTS-1181-329		
Other types available			





M30 STANDARD SIZE, FITS MOST SITUATIONS

COMPACT

ULTRASONIC SENSORS WITH 2 OUTPUTS

KEY ADVANTAGES

- ✓ Ready-to-connect compact devices
- ✓ Switching or analog output or a combination of both
- ✓ Detection independent of target's color, shape, material and surface structure
- ✓ Reduced blind zone

RANGE OVERVIEW	Distance mm	Diffuse and Reflex	Diffuse with analog output
COMPACT	60 ... 300	p. 305	p. 306
	200 ... 1300	p. 305	p. 306
	400 ... 3000	p. 305	p. 306
	600 ... 6000	p. 305	p. 307

HOUSING SIZE

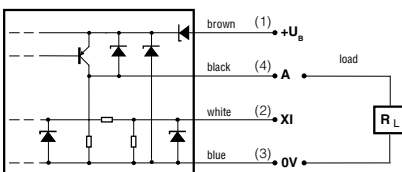
OPERATING PRINCIPLE

SENSING RANGE MM

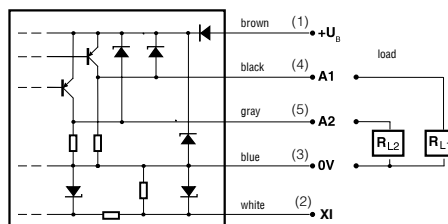
ULTRASONIC

WIRING DIAGRAMS

PNP NO

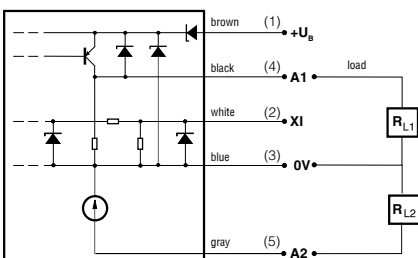


2 x PNP NO

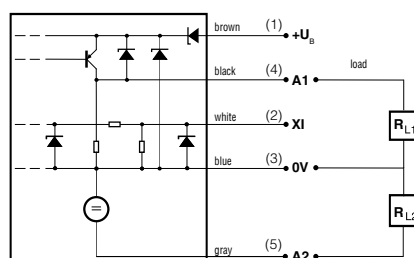


*UTS-130#-107 only

PNP NO + analog outputs (current)



PNP NO + analog outputs (voltage)

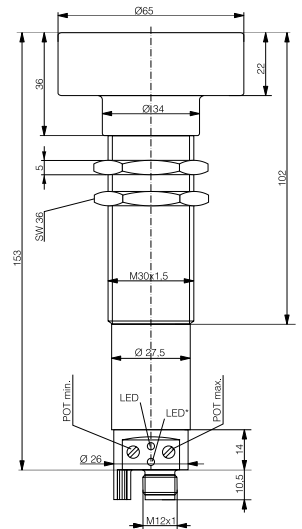
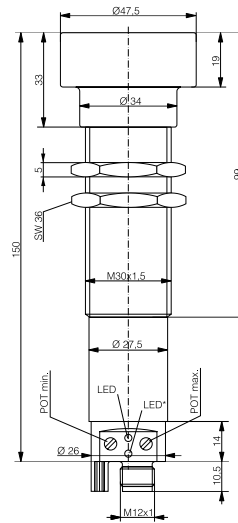
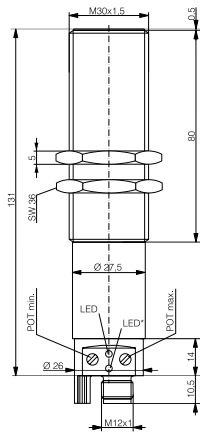
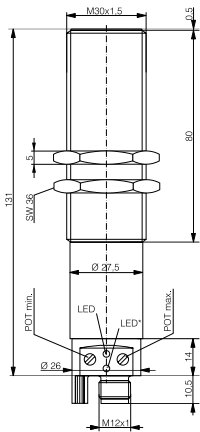


DATA

- Housing material
- Degree of protection
- Rated ultrasonic frequency
- Max. switching frequency
- Output current
- Ambient temperature range
- 1 x PNP NO / S12
- 2 x PNP NO / S12
- Other types available

COMPACT

M30	M30	M30	M30
DIFFUSE AND REFLEX SENSOR	DIFFUSE AND REFLEX SENSOR	DIFFUSE AND REFLEX SENSOR	DIFFUSE AND REFLEX SENSOR
60 ... 300	200 ... 1300	400 ... 3000	600 ... 6000



Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
IP 65	IP 65	IP 65	IP 65
400 kHz	200 kHz	120 kHz	80 kHz
8 Hz	4 Hz	2 Hz	1 Hz
300 mA	300 mA	300 mA	300 mA
-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F	-25 ... +70°C / -13 ... +158°F
UTS-1300-303	UTS-1301-303	UTS-1302-303	UTS-1303-303
UTS-1300-107	UTS-1301-107	UTS-1302-107	UTS-1303-107

- Inductive
- Photoelectric
- Ultrasonic
- Capacitive
- Safety
- RFID
- Connectivity
- Accessories
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COMPACT

HOUSING SIZE

M30 WITH
ANALOG OUTPUT

M30 WITH
ANALOG OUTPUT

M30 WITH
ANALOG OUTPUT

OPERATING PRINCIPLE

DIFFUSE AND
REFLEX SENSOR

DIFFUSE AND
REFLEX SENSOR

DIFFUSE AND
REFLEX SENSOR

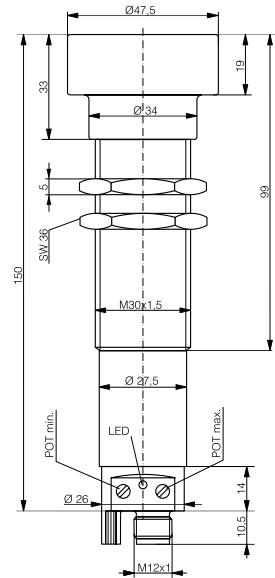
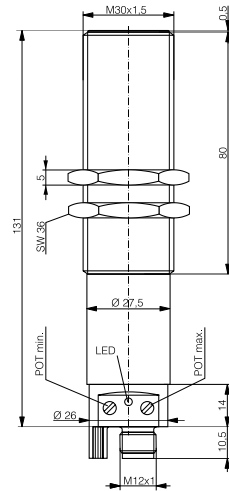
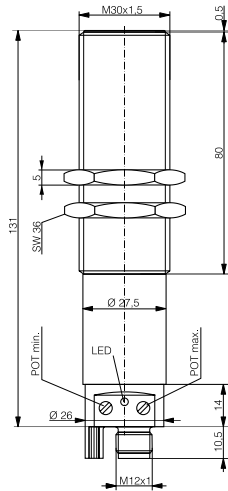
SENSING RANGE MM

60 ... 300

200 ... 1300

400 ... 3000

ULTRASONIC



DATA

Housing material

Nickel-plated brass

Nickel-plated brass

Nickel-plated brass

Degree of protection

IP 65

IP 65

IP 65

Rated ultrasonic frequency

400 kHz

200 kHz

120 kHz

Max. switching frequency

5 Hz

4 Hz

2 Hz

Output current

300 mA

300 mA

300 mA

Ambient temperature range

-25 ... +70°C / -13 ... +158°F

-25 ... +70°C / -13 ... +158°F

-25 ... +70°C / -13 ... +158°F

Analog 4 ... 20 mA + PNP NO / S12

UTS-1300-123

UTS-1301-123

UTS-1302-123

Analog 0 ... 10 V + PNP NO / S12

UTS-1300-113

UTS-1301-113

UTS-1302-113

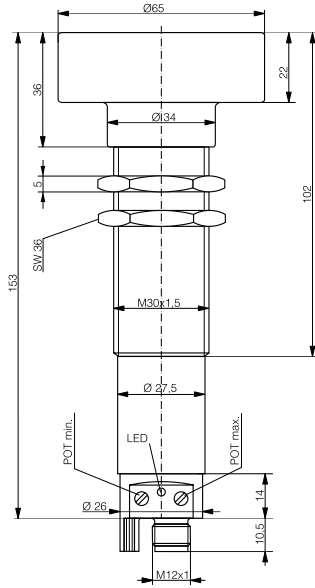
Other types available

COMPACT

M30 WITH
ANALOG OUTPUT

DIFFUSE AND
REFLEX SENSOR

600 ... 6000



Inductive

Photoelectric

Ultrasonic

Capacitive

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Nickel-plated brass

IP 65

80 kHz

1 Hz

300 mA

-25 ... +70°C / -13 ... +158°F

UTS-1303-123

UTS-1303-113

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 and 1180/1181W) 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 and 1180/1181W.

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



S12 INTERFACE CABLE WITH TEACH-IN BUTTON

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

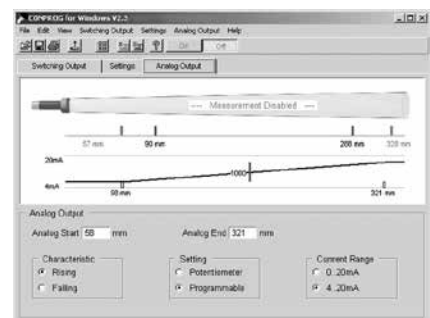
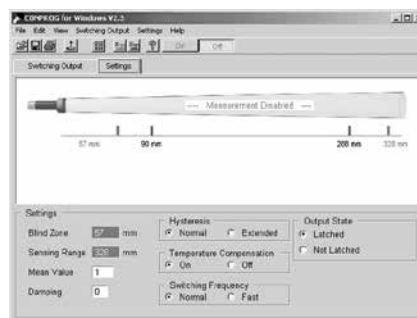
Part reference: **APE-0000-003**

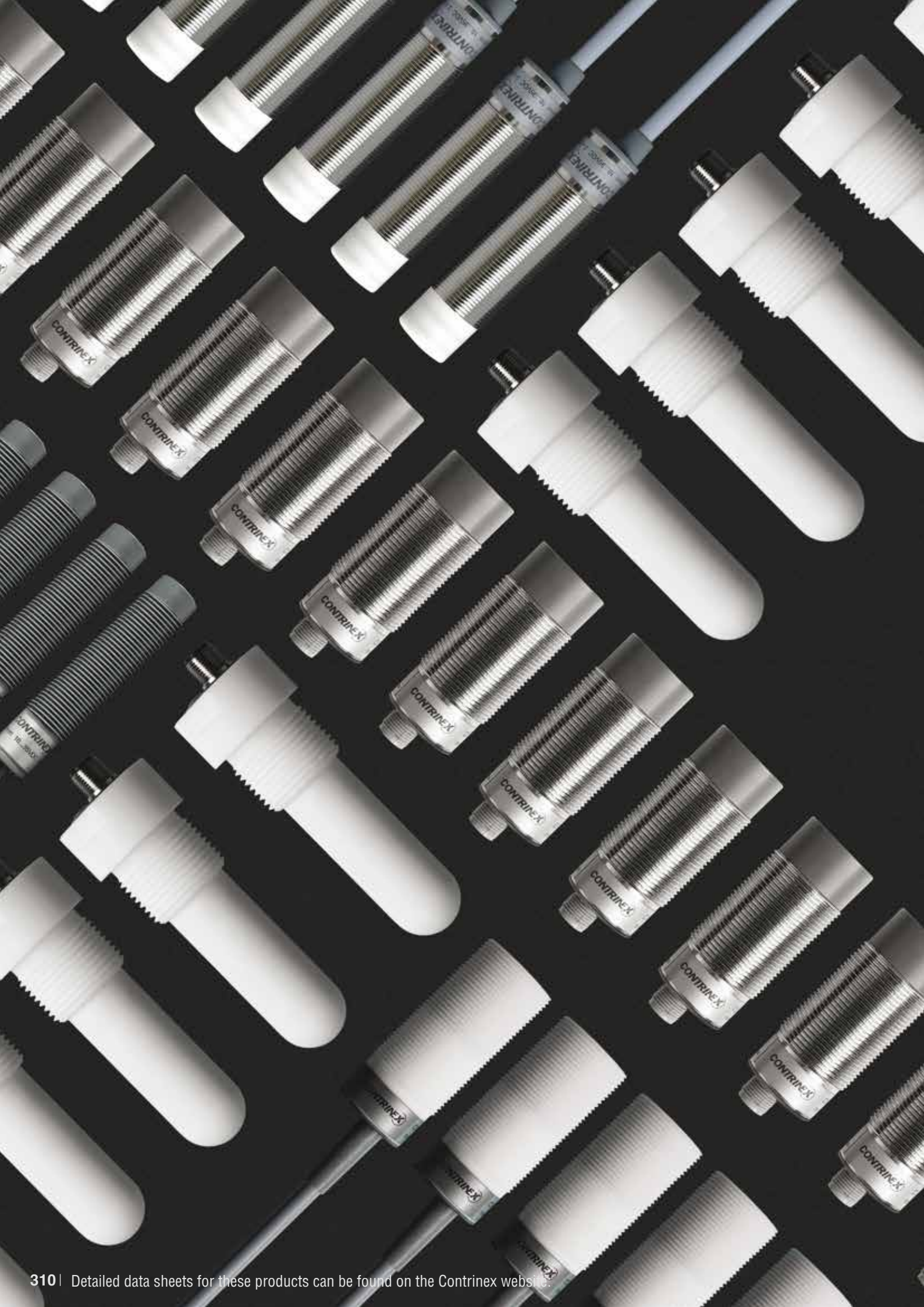


CONPROG PC SOFTWARE

for Windows.

Included with APE-0000-001 interface device







CAPACITIVE SENSORS

HIGHLIGHTS:



- ✓ Detection of virtually all target materials
- ✓ Easy adjustment with potentiometer and LED
- ✓ Detection through non-metallic pipes and containers
- ✓ Sensors for use in harsh chemical environments

NEW:

- ✓ Reliable level control of sticky and viscous materials
- ✓ Sensors with hygienic, FDA-compliant, PTFE housings



PROGRAM OVERVIEW

PRODUCT RANGE		BASIC	HIGH PERFORMANCE
			
HOUSING SIZE	OPERATING DISTANCE		

CYLINDRICAL

M12	2 mm	p. 319	p. 327
	4 mm		p. 327
M18	5 mm	p. 320	p. 328
	8 mm	p. 320-321	p. 328
M30	10 mm	p. 321	p. 328
	15 mm	p. 322	p. 329
∅ 26 / G1	5 mm		p. 329

CUBIC

48.5 x 32 x 17 mm	15 mm	p. 323	
120 x 80 x 30 mm	40 mm	p. 323	

HOUSING SIZE	OPERATING DISTANCE											PAGE
	2 mm	4 mm	6 mm	8 mm	10 mm	12 mm	14 mm	16 mm	40 mm			
M12	2 mm											319, 327
		4 mm										327
M18			5 mm									320, 328
				8 mm								320-321, 328
M30					10 mm							321, 328
								15 mm				322, 329
∅ 26 / G1			5 mm									329
48.5 x 32 x 17 mm								15 mm				323
120 x 80 x 30 mm									40 mm			323

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INTRODUCTION

Capacitive sensors are used in machines, installations and vehicles for monitoring the levels of liquids, pastes and bulk material. These materials can even be detected through non-metallic dividing walls. In addition, capacitive sensors are suitable as limit switches, contact-free position switches, for monitoring and positioning, as pulse generators for counting purposes, distance and speed measurement, and much more.

OPERATING PRINCIPLE

The electrodes at the device's sensing face permit the sensor to detect the dielectric conditions in its close surroundings. Depending on the distance between the target (or material) to be detected and the capacitive sensor, the capacitance in the measuring zone changes. The capacitance is dependent not only on the above-mentioned distance, but also on the dielectric constant (ϵ_r) of the target, as well as its shape. As the sensor approaches the target, the capacitance increases. When the set threshold value is reached, the transistor-oscillator is activated. By means of the built-in electronics, a changeable, electrical current is generated which, depending on the execution of the device, is available as a linear current signal or as a binary voltage at the output.

Using capacitive sensors, electronic circuits and PLCs, as well as relays or contactors can be controlled directly.

Capacitive sensors are enclosed in synthetic or metal housings and potted in epoxy resin. They are, moreover, insensitive to dirt and shock.

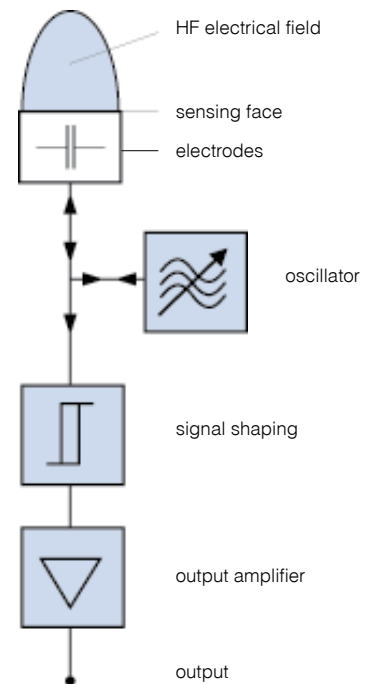


Fig. 15: operating principle

DELIVERY PROGRAM

Contrinex capacitive sensors deliver a reliable solution for all kinds of level sensing tasks. They are suitable for detection and position monitoring with virtually any target material. The program includes sensors in cylindrical (M12, M18 M30 or Ø 26/G1) or cubic form. Two ranges are offered: a cost effective **Basic** range, which includes AC/DC output switching, and a **High performance** range for difficult sensing tasks.

BASIC

Cost-effective with any target material – ideal for fill level sensing

The Contrinex **Basic** range consists of cylindrical and cubic devices. Cylindrical devices are available in 4-wire M12, M18 and M30 standard sizes. All 3 sizes may have PNP or NPN changeover outputs, while M18 devices are also available with 2-wire switching outputs (**AC/DC**, NO). Housings are either in durable polyphenylene oxide (PPO) or stainless steel



(V2A AISI 304) with a PPO sensing face. Sensor connection is by means of cable or an integral connector. All device types are available in embeddable versions, allowing detection through container walls. In addition, M18 and M30-sized devices are also available in non-embeddable versions that permit longer operating distances.

Cubic devices are available, sized 32 x 34 mm in a PVC housing with 3-wire connection, or 120 x 80 mm in a PBT housing with 4-wire connection.

With operating distances from 0.5 mm to 25 mm, Contrinex **Basic** range capacitive sensors are the cost effective solution for level sensing tasks in the plastics industry, in particular for the level control of granulates in feeders, pipes or silos.

HIGH PERFORMANCE

Challenging environments and viscous or sticky target materials

The Contrinex **High performance** range consists of 4-wire devices in M12, M18 and M30 standard sizes. All 3 sizes may have PNP or NPN changeover outputs. Hous-



ings are either in hygienic polytetrafluoroethylene (PTFE/Teflon) or stainless steel (V2A AISI 304) with a PTFE sensing face. Sensor connection is by means of cable or an integral connector. All these device sizes are available in non-embeddable or embeddable versions.

Devices with a PTFE housing are FDA compliant and ideal for applications in food and pharmaceutical industries. This hygienic housing material cannot contaminate produced goods and resists chemical cleaning agents.

For the difficult task of sensing sticky and viscous materials, the **High performance** range includes Ø 26/G1-sized sensors in a non-embeddable PTFE housing with PNP Changeover output.

With operating distances from 0 to 30 mm, Contrinex High performance range capacitive sensors are the ideal solution for difficult sensing tasks in demanding industries and environments.

SERIES AND PARALLEL CONNECTION

Capacitive 2-wire sensors with binary output can be used in series or parallel connection, similar to mechanical contacts. Attention has to be paid to the device-specific voltage drop, i.e. the residual voltage U_{gr} , which multiplies in the case of series connection according to the number of devices. In the case of parallel connection of sensors with thyristor output, the first switching output takes the whole load current.

ADJUSTMENT OF THE OPERATING DISTANCE

Equipped with a 20-turn potentiometer, these Contrinex sensors allow for adjustment of the operating distance, which can be either longer than or shorter than the rated operating distance. Under favorable conditions, an operating distance of up to the maximum given value can be set.

MOUNTING

As with inductive sensors, two kinds of mounting are distinguished for capacitive sensors: embeddable or non-embeddable.

Sensors for embeddable installation in metal or other materials can be arranged side by side, and are particularly suitable for the contact-free detection of solid bodies or liquid levels through non-metallic dividing walls (max. wall thickness 4 mm).

When mounting two or more sensors for non-embeddable installation side by side in metal or other materials, some free space must be provided. Non-embeddable sensors are particularly suitable for applications where the medium to be detected comes into contact with the sensing head (e.g. level monitoring of bulk material, pastes or liquids).



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COST EFFECTIVE WITH ANY TARGET MATERIAL

BASIC

CAPACITIVE SENSORS

KEY ADVANTAGES

- ✓ Synthetic housings
- ✓ For the detection of all kind of materials
- ✓ Adjustable operating distances
- ✓ Easy potentiometer set-up
- ✓ 4-wire devices

RANGE OVERVIEW	Housing size	Cylindrical	AC / DC	Cubic
BASIC	M12	p. 319		
	M18	p. 320-321		
	M30	p. 321-322	p. 320	
	48.5 x 32 x 17 mm			p. 323
	120 x 80 x 30 mm			p. 323

OVERVIEW

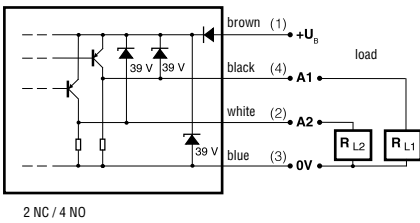
Ambient temperature range	-25 ... +70 °C / -13 ... +158 °F
Setup	Potentiometer

HOUSING SIZE
OPERATING DISTANCE MM

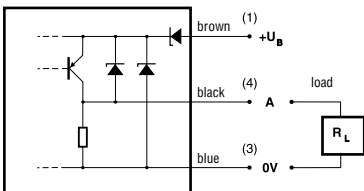
CAPACITIVE

WIRING DIAGRAMS

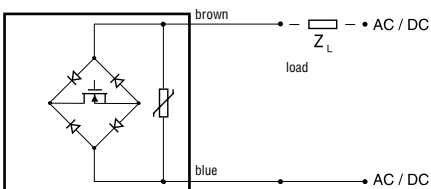
PNP Changeover outputs



PNP normally open (NO)



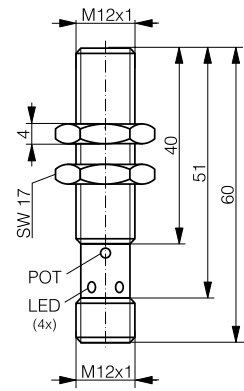
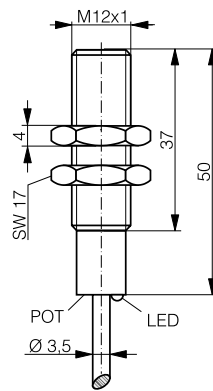
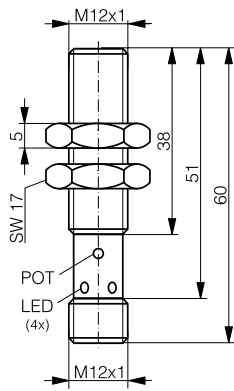
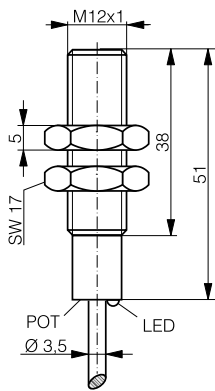
2-wire AC/DC



DATA
Op. distance min./max. adjustable
Housing material
Sensing face material
Degree of protection
Mounting
Max. switching frequency
LED
Supply voltage range
PNP Changeover
Other types available

BASIC

M12	M12	M12	M12
2	2	2	2



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0.5 ... 5 mm	0.5 ... 5 mm	0.5 ... 5 mm	0.5 ... 5 mm
PPO	PPO	Stainless steel V2A	Stainless steel V2A
PPO	PPO	PPO	PPO
IP 67	IP 67	IP 67	IP 67
Embeddable	Embeddable	Embeddable	Embeddable
300 Hz	50 Hz	300 Hz	300 Hz
Yellow	Yellow / green	Yellow	Yellow
12 ... 30 VDC	10 ... 35 VDC	12 ... 30 VDC	12 ... 30 VDC
CSK-1121-203	CSS-1120-203	CSK-1121-103	CSS-1121-103

BASIC

HOUSING SIZE

M18

M18

M18

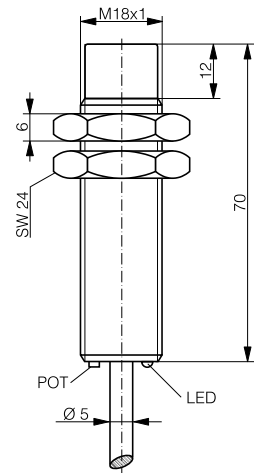
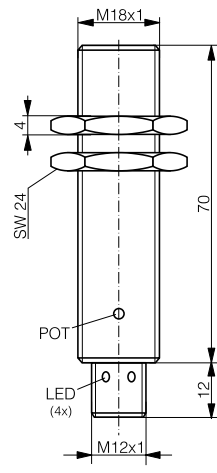
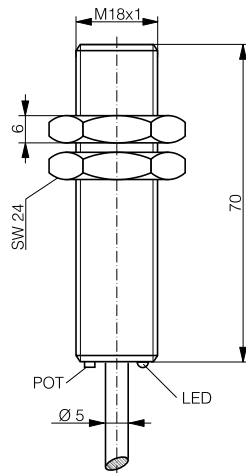
OPERATING DISTANCE MM

5

5

8

CAPACITIVE



DATA

Op. distance min./max. adjustable

1 ... 8 mm

1 ... 8 mm

1 ... 10 mm

Housing material

PPO

PPO

PPO

Sensing face material

PPO

PPO

PPO

Degree of protection

IP 67

IP 67

IP 67

Mounting

Embeddable

Embeddable

Non-embeddable

Max. switching frequency

200 Hz

200 Hz

50 Hz

LED

Yellow

Yellow

Yellow

Supply voltage range

12 ... 30 VDC

12 ... 30 VDC

12 ... 30 VDC

PNP Changeover

CSK-1181-203

CSS-1181-203

CSK-1181-213

AC/DC 2-wire NO

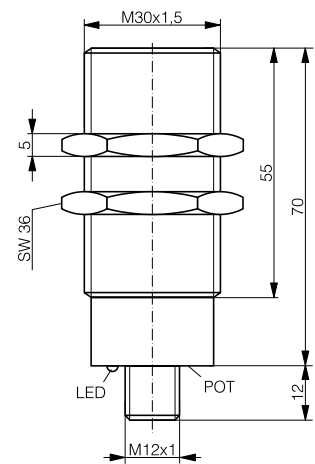
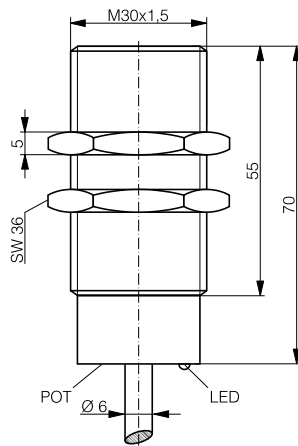
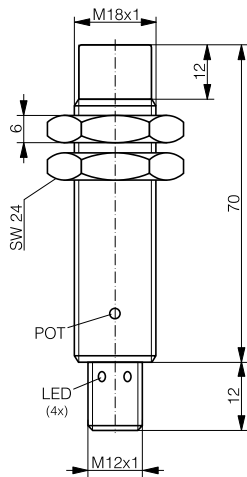
CSK-1180-207

CSK-1180-217

Other types available

BASIC

M18	M30	M30
8	10	10



1 ... 10 mm	2 ... 20 mm	2 ... 20 mm
PPO	PPO	PPO
PPO	PPO	PPO
IP 67	IP 67	IP 67
Non-embeddable	Embeddable	Embeddable
50 Hz	150 Hz	150 Hz
Yellow	Yellow	Yellow
12 ... 30 VDC	12 ... 30 VDC	12 ... 30 VDC
CSS-1181-213	CSK-1301-203	CSS-1301-203

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BASIC

HOUSING SIZE

M30

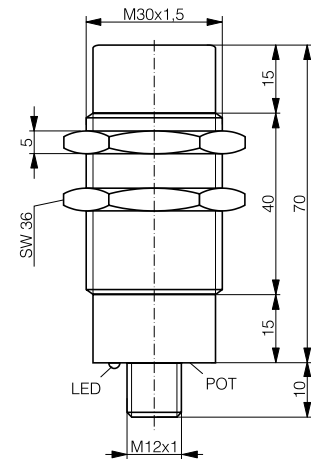
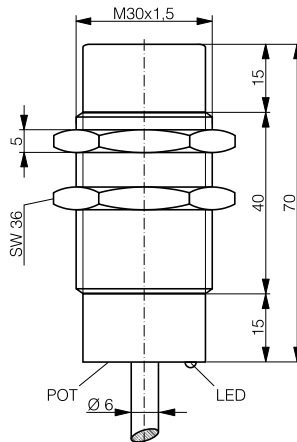
M30

OPERATING DISTANCE MM

15

15

CAPACITIVE



DATA

Op. distance min./max. adjustable

2 ... 25 mm

2 ... 25 mm

Housing material

PPO

PPO

Sensing face material

PPO

PPO

Degree of protection

IP 67

IP 67

Mounting

Non-embeddable

Non-embeddable

Max. switching frequency

50 Hz

50 Hz

LED

Yellow

Yellow

Supply voltage range

12 ... 30 VDC

12 ... 30 VDC

PNP Changeover

CSK-1301-213

CSS-1301-213

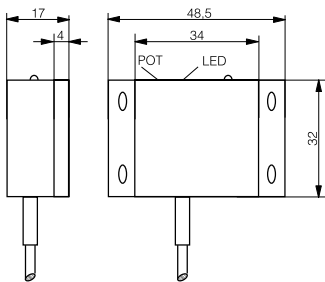
PNP NO

Other types available

BASIC

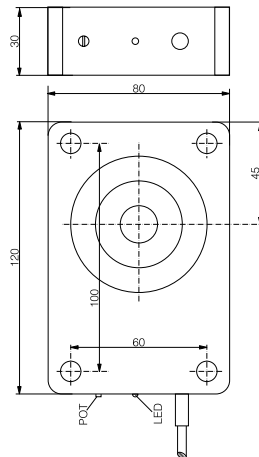
□ 48.5 x 32 x 17

15



□ 120 x 80 x 30

40



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0 ... 17 mm

PVC

PVC

IP 67

Embeddable

50 Hz

Yellow / green

10 ... 30 VDC

CSK-3320-208

2 ... 70 mm

PBTP

PBTP

IP 67

Non-embeddable

50 Hz

Yellow / green

10 ... 35 VDC

CSK-3800-213



RELIABLE IN CHALLENGING SITUATIONS

HIGH PERFORMANCE CAPACITIVE SENSORS

KEY ADVANTAGES

- ✓ Metal or PTFE housing
- ✓ Medium optimized performance
- ✓ FDA compliant housings for hygienic applications
- ✓ Reliable detection of viscous and sticky materials
- ✓ Adjustable operating distances
- ✓ 3- and 4-wire devices

RANGE OVERVIEW	Housing size	Cylindrical
HIGH PERFORMANCE	M12	p. 327
	M18	p. 328
	M30	p. 328-329
	∅ 26 / G1	p. 329

OVERVIEW

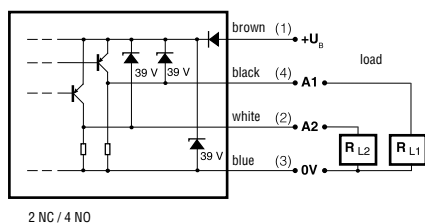
Ambient temperature range	-25 ... +70 °C / -13 ... +158 °F
Setup	Potentiometer

HOUSING SIZE	
OPERATING DISTANCE MM	

CAPACITIVE

WIRING DIAGRAM

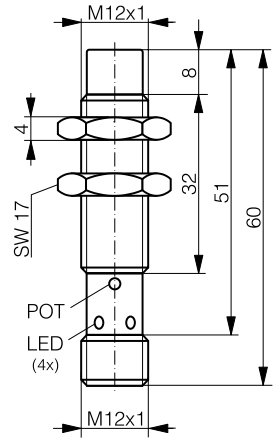
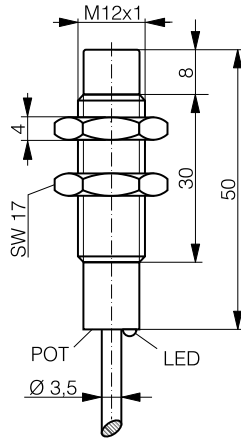
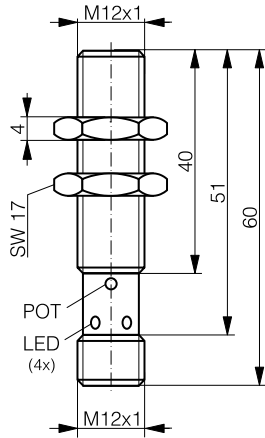
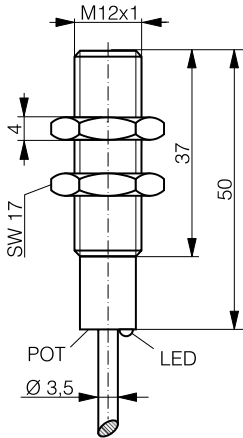
PNP Changeover outputs



DATA	
Op. distance min./max. adjustable	
Housing material	
Sensing face material	
Degree of protection	
Mounting	
Max. switching frequency	
LED	
Supply voltage range	
PNP Changeover	
Other types available	

HIGH PERFORMANCE

M12	M12	M12	M12
2	2	4	4



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0 ... 6 mm	0 ... 6 mm	1 ... 8 mm	1 ... 8 mm
Stainless steel V2A	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
PTFE	PTFE	PTFE	PTFE
IP 67	IP 67	IP 67	IP 67
Embeddable	Embeddable	Non-embeddable	Non-embeddable
500 Hz	500 Hz	50 Hz	50 Hz
Yellow / green	Yellow / green	Yellow	Yellow
10 ... 35 VDC	10 ... 35 VDC	12 ... 30 VDC	12 ... 30 VDC
CSK-1120-103	CSS-1120-103	CSK-1120-113	CSS-1120-113

HIGH PERFORMANCE

HOUSING SIZE

M18

M18

M30

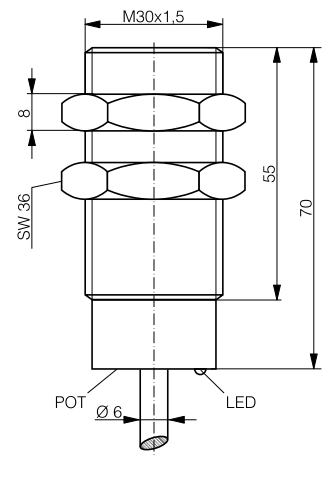
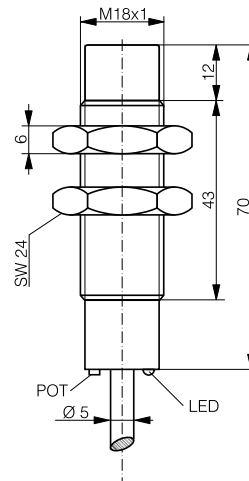
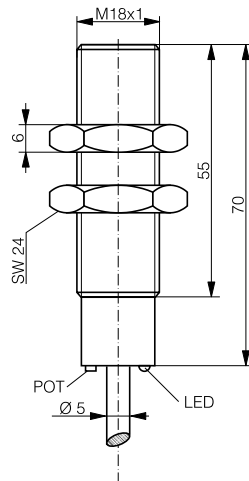
OPERATING DISTANCE MM

5

8

10

CAPACITIVE



DATA

Op. distance min./max. adjustable	0.5 ... 10 mm	0.5 ... 15 mm	0.5 ... 25 mm
Housing material	PTFE	PTFE	PTFE
Sensing face material	PTFE	PTFE	PTFE
Degree of protection	IP 67	IP 67	IP 67
Mounting	Embeddable	Non-embeddable	Embeddable
Max. switching frequency	300 Hz	50 Hz	200 Hz
LED	Yellow / green	Yellow / green	Yellow / green
Supply voltage range	10 ... 35 VDC	10 ... 35 VDC	10 ... 35 VDC
PNP Changeover	CSK-1180-303	CSK-1180-313	CSK-1300-303
Other types available			

HIGH PERFORMANCE

M30	M30	Ø 26/G1	Ø 26/G1
15	15	5	5



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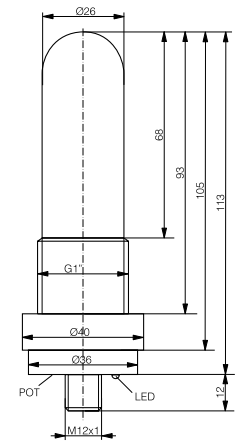
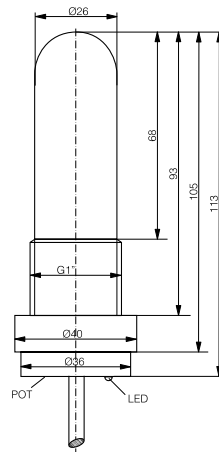
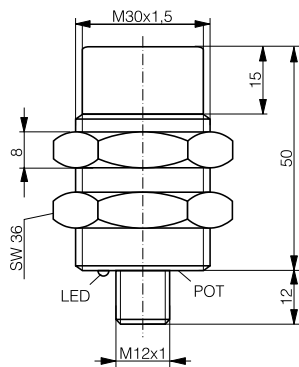
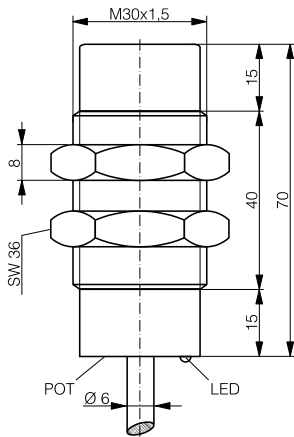
RFID

Connectivity

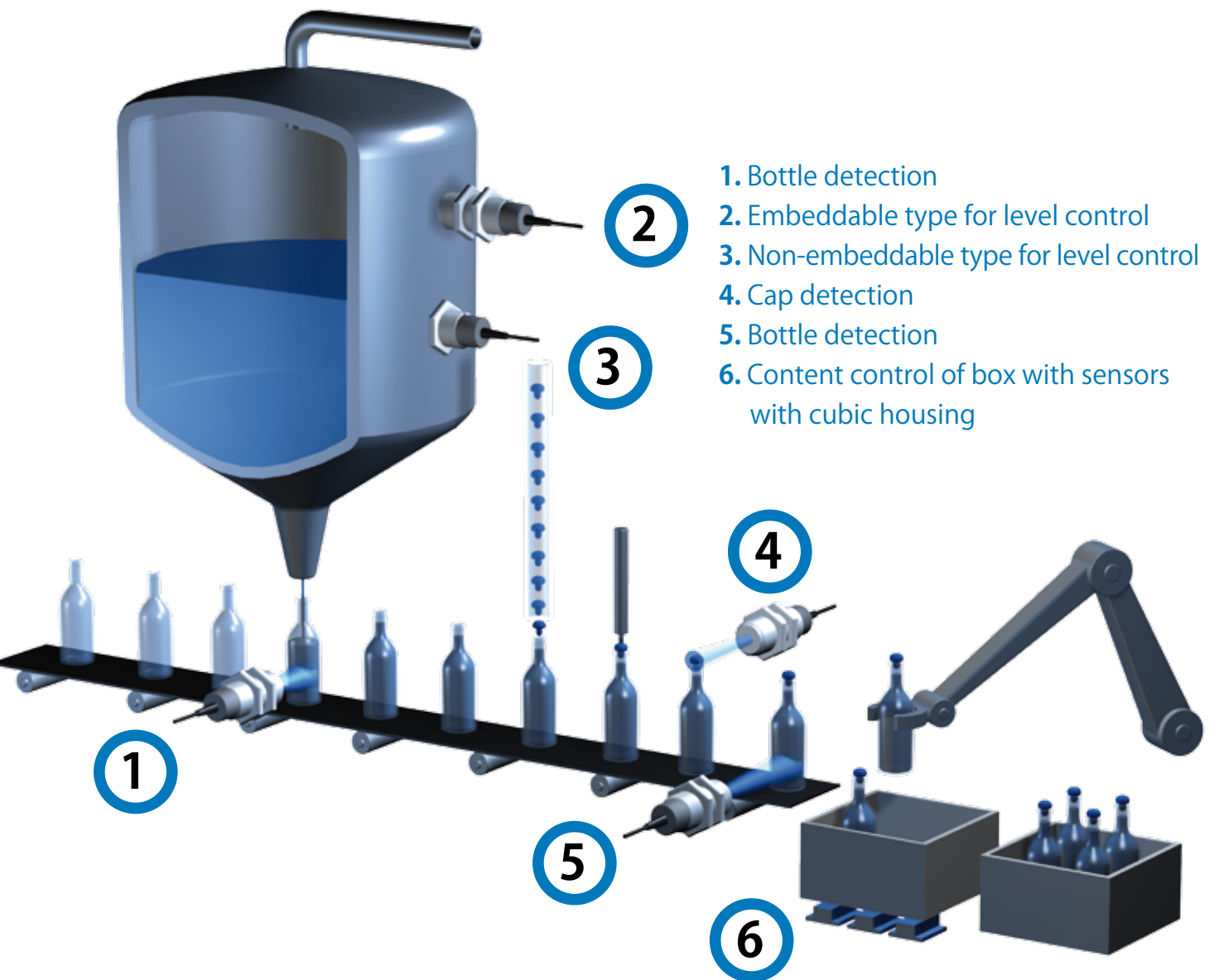
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1 ... 30 mm	1 ... 30 mm	0 ... 20 mm	0 ... 20 mm
PTFE	PTFE	PTFE	PTFE
PTFE	PTFE	PTFE	PTFE
IP 67	IP 67	IP 67	IP 67
Non-embeddable	Non-embeddable	Non-embeddable	Non-embeddable
50 Hz	50 Hz	50 Hz	50 Hz
Yellow / green	Yellow / green	Yellow / green	Yellow / green
10 ... 35 VDC	10 ... 35 VDC	10 ... 35 VDC	10 ... 35 VDC
CSK-1300-313	CSS-1300-313	GSK-2260-313	GSS-2260-313









CONTRINEX

SAFETINEX

SAFETY LIGHT CURTAINS AND ACCESS CONTROL BARRIERS

HIGHLIGHTS

- ✓ Finger, Hand and Body Access resolutions
- ✓ Operating range from 0.25...50 m
- ✓ Protective heights from 142...1827 mm
- ✓ Category 2 or 4 according to EN/ISO 13489-1
- ✓ Certified TÜV, CE and UL
- ✓ IP 65 and IP 67
- ✓ Permanent autocontrol
- ✓ 2 channel selection
- ✓ Low power consumption

NEW

- ✓ Category 2, Type 2, SIL 1 (pending), PL c light curtains with hand resolution



CONTRINEX

THE SAFETINEX PRODUCT RANGE INCLUDES:



SAFETINEX YBB TYPE 4 FOR FINGER PROTECTION

- Safety light curtain with 14 mm resolution
- Protective height from 142 mm to 1690 mm
- Operating range up to 3.5 m
- Cable version : 2, 5 and 10 m PUR-UL shielded cable
- M12 connector



SAFETINEX YBB TYPE 4 FOR HAND PROTECTION

- Safety light curtain with 30 mm resolution
- Protective height from 279 mm to 1827 mm
- Operating range up to 12 m
- Cable version : 2, 5 and 10 m PUR-UL shielded cable
- M12 connector



SAFETINEX YCA TYPE 4 FOR ACCESS CONTROL

- Safety access control barriers with beam gap of 300, 400 or 500 mm
- Protective height from 832 mm to 1532 mm
- Operating range : 1 ... 15 m / 10 ... 50 m (can be configured)
- Cable version : 2, 5 and 10 m PUR-UL shielded cable
- M12 connector



SAFETINEX YBB TYPE 2 FOR HAND PROTECTION

- Safety light curtain with 30 mm resolution
- Protective height from 150 mm to 1827 mm
- Operating range up to 12 m
- M12 connector

Each component is housed in a rugged aluminum profile fitted with two lateral sliding grooves.

The Safetinex product range is complemented by a range of accessories.

INTRODUCTION

SAFETINEX SAFETY SYSTEMS

The Safetinx product line produced by Contrinex offers high-quality safeguarding solutions for both personnel and machinery. The range comprises highly sensitive Type-4 devices for finger, hand and access protection in various lengths.

The safety portfolio now also comprises a complete range of hand protection devices in various lengths for Type 2, category 2, PL c applications.

Safetinx products have been developed in compliance with the applicable international safety standards and have obtained the required product certification for use in the European Union, the United States of America and all other countries where the applicable IEC standards have been adopted. A complete range of Safetinx light curtains and access control barriers is offered for the highest safety requirements: safety category 4, PL e according to EN/ISO 13849-1, Type 4 according to IEC 61496-1 and -2. In addition, hand protection devices are available with a Type 2 safety rating (IEC 61496-1 and -2) which meet category 2, PL c according to EN/ISO 13849-1 and SIL 1 according to IEC 61508 (pending). All Safetinx products have successfully obtained the highly rated TÜV certification.

ACTIVE OPTOELECTRONIC PROTECTIVE DEVICES (AOPD)

Whenever a safety system around a danger zone is necessary, the first consideration is whether or not optical protection is suitable at all. For this to be the case, it must be possible for the machine control to be electrically influenced by means of the device's semiconductor output. Moreover, it must also be possible to instantly terminate or exit the hazardous process in every operating phase. Further, there must be no danger of injury due to heat, radiation or from materials or components ejected by the machine. If such danger exists, then either the optical system is not suitable, or the danger must be otherwise excluded by applying additional safety measures.

The selection of a specific safeguarding measure involves an evaluation of the hazard, in order to determine the applicable safety level and resolution of the protective device.

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INTRODUCTION

SAFEGUARDING FUNCTION

The resolution of the safety light curtain or access control barrier must be chosen according to the application and the required safeguarding function. It is defined as the minimum size of an object that can be reliably and safely detected at any position when placed in the protective field. The choice of a specific resolution depends on the part of the body which needs protection (finger, hand or whole body). In all cases, the primary function of the protective device is to stop the machine before the hazardous point is reached and to prevent unintentional machine start-up. This function must comply with the category of the safety-related components of the machine.

OPERATING PRINCIPLE

The Safetinx YBB light curtains and YCA access control barriers operate with infrared beams. When the device detects a finger, a hand or a person entering the defined hazardous area, the protective equipment immediately stops the machine, or renders it harmless. When operating in manual restart mode, the reset button enabling the operator to restart the machine must be located outside the hazardous area. From there, the operator must have a full view of the hazardous area to make sure that nobody is in danger before restarting the machine.

Safetinx light curtains and access control barriers are designed to ensure protection of operators working in hazardous areas. A high reliability is achieved by implementing a fail-safe system: devices are thus permanently self-controlled. An internal failure deactivates the output signals, as would an intrusion into the protective field.

APPLICATION AREAS

The Safetinx YBB range is best suited where finger and hand protection is required close to the hazardous area (point of operation). Depending on the application, a resolution of either 14 mm (finger protection) or 30 mm (hand protection) will be advisable. Safetinx YCA access control barriers, on the other hand, are suitable for the protection of people potentially entering a larger dangerous area.

Thanks to their Type 4, category 4, PL e safety level, Safetinx devices can be used on equipment requiring high protection reliability, such as machine tools, robots, hydraulic presses, automated stock management, weaving looms, etc. If the result of the risk assessment allows their use, Type 2 devices (category 2, PL c, SIL 1 (pending)) offer cost effective and safe solutions.



AVANTAGES OF THE SAFETINEX RANGE

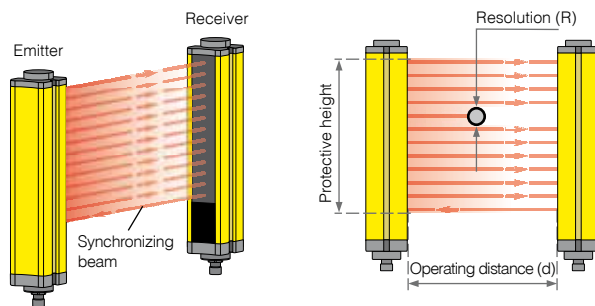
Safetinx safety devices offer the following advantages:

- Very short response time:
 - Finger protection Type 4: 5.2 to 43.6 ms
 - Hand protection Type 4: 5.2 to 24.4 ms
 - Access control Type 4: 4.2 to 6.7 ms
 - Hand protection Type 2: 14 to 66 ms
- Up to 50 m operating distance
- 2-channel selection minimizing safety relevant cross-talk between neighboring AOPDs (type 4 only)
- Fully compliant with industry standards and certified by internationally recognized organizations
- Devices with TÜV certification, either Type 4 with Performance Level e, or Type 2 with Performance Level c
- Beam synchronized, no need for wired connection between sender and receiver
- Short-circuit protected outputs and voltage-reversal protection
- Low power consumption
- Built-in alignment system and easy adjustment of the units thanks to the high flexibility of the Safetinx bracket
- Various connector versions to fit any application
- Robust aluminum housing coated with resistant finish
- Compact design: 42 mm x 48 mm housing profile
- Competitive price

Furthermore, Safetinx light curtains and access control barriers have been designed to provide users with a comfortable work environment. Their use involves no additional unproductive movements and no waste of time. Users can freely access and move around the machine in complete safety.

OPERATING PRINCIPLE

Safetinx light curtains and access control barriers are optoelectronic safety devices that include a sender and a receiver unit between which coded infrared beams are sequentially exchanged. The receiver unit is connected to a safety relay which transmits signals to the machine control system. Synchronization between the sender and receiver devices is performed optically, i.e. wired connection between the two units is not necessary.



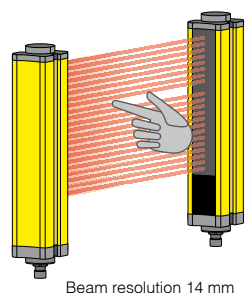
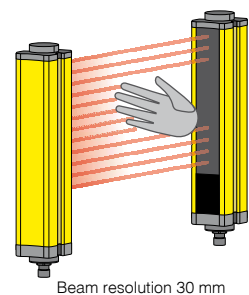
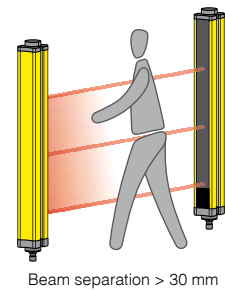
Reception of all beams activates the two independently generated semiconductor outputs (OSSDs) of the receiver unit. The interruption of one or more beams deactivates the outputs within the response time of the AOPD. Any internal fault is detected by the device's permanent self-control function and has the same result as an intrusion into the protective field.

SELF PROTECTED OUTPUTS

Both OSSD1 and OSSD2 are self-protected and actively monitored PNP outputs. Both outputs are controlled by independent current-monitored high-side switches. Thanks to continuous monitoring, any short-circuit between an output and the power supply or ground is detected within the response time, leading to the deactivation of the other output. Similarly, a cross-circuit between the two outputs is also detected and both OSSDs are deactivated within the specified response time. The OSSD outputs are switched off and remain in that state as long as the fault remains.

AOPD DETECTION CAPABILITY

The light curtain or barrier detection capability (or resolution) depends on the distance between the centerlines of each beam emitted by the sender. The choice for a specific resolution depends on the part of the body which needs protection (finger, hand, whole body).







LIGHT CURTAINS

FINGER PROTECTION TYPE 4

MAIN FEATURES

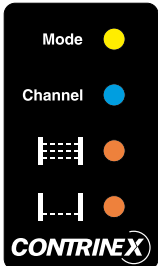
- ✓ Resolution: 14 mm
- ✓ Operating range: 0.25 ... 3.5 m
- ✓ Protective height: 142 ... 1690 mm
- ✓ Category 4, PL e according to EN/ISO 13849-1
- ✓ Type 4 according to IEC 61496-1 and -2
- ✓ Certified TÜV, CE and UL
- ✓ IP 65, IP 67 with operating temperatures as low as -35°C (-31°F)
- ✓ 2-channel selection
- ✓ Optical synchronization
- ✓ Permanent autocontrol



FINGER PROTECTION

LEDS

LED indicators on the YBB **sender** unit



Mode:

Yellow when test mode is active

Channel:

Blue when channel 1 is selected

Purple when channel 2 is selected

Alignment (full):

Steady orange when the screen is not fully aligned

Blinking orange when the first third of the screen is aligned

Off when screen is fully aligned

Alignment (low beam):

Steady orange when the lowest beam is not aligned

Blinking orange when the lowest beam is aligned

Off when screen is fully aligned

LED indicators on the YBB **receiver** unit



Power:

Green when power is ON

Channel:

Blue when channel 1 is selected

Purple when channel 2 is selected

Status ON:

Green when OSSD outputs are ON

Status OFF:

Red when OSSD outputs are OFF

TECHNICAL DATA

Dimensions	42 mm x 48 mm x Ht
Resolution	14 mm
Protective height	142 ... 1690 mm
Supply voltage range	24 VDC \pm 20 %
Current consumption sender	50 mA max. / 1.5 W max.
Current consumption receiver (excl. load)	160 mA max. / 4.7 W max.
Output current	0.2 A max. per output
Safety level (EN/ISO 13849-1)	Category 4, PL e
Safety type (IEC 61496-1 and -2)	Type 4
Protection class (IEC 61140)	III
Ambient temperature range	-35 ... +60°C (-31 ... +140°F)
Storage temperature range	-40 ... +70°C (-40 ... +158°F)
Degree of protection (EN 60529)	IP 65 + IP 67
Housing material	Aluminum
Material of optical parts	PMMA
Operating range	0.25 ... 3.5 m
Sender wavelength	IR 950 nm

HOUSING

Aluminum profile 42 mm x 48 mm with dual fixing groove.

ELECTRONIC PROTECTION

Safetinex light curtains are self-protected against overloads and short-circuits. They can also withstand short high-voltage overloads.

CONNECTION

Safetinex light curtains with M12 5-pole connector are standard. Versions with PUR cable, 2 m, 5 m or 10 m long, are available on request.

DOCUMENTATION

Detailed data sheets for these products can be found on the Contrinex website www.contrinex.com or ordered free of charge from our distributors.

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

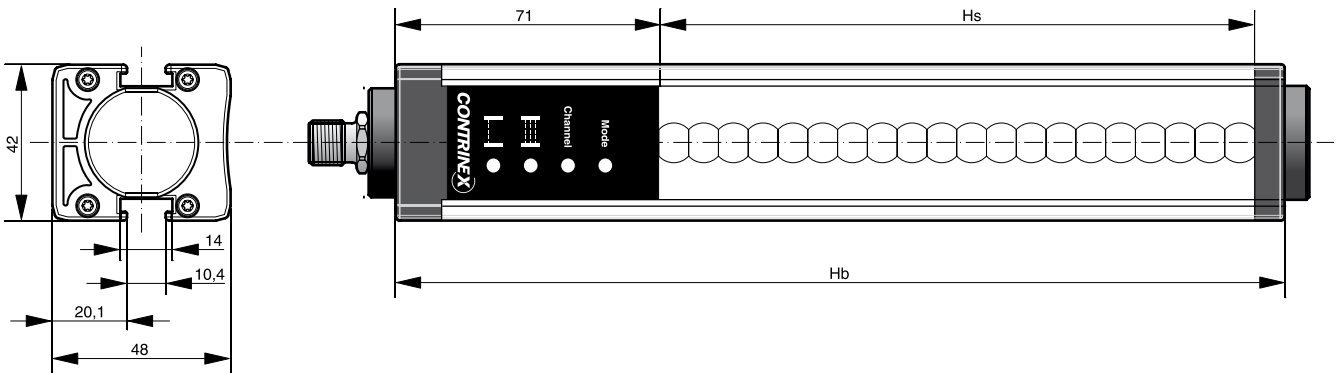
Connectivity

Accessories

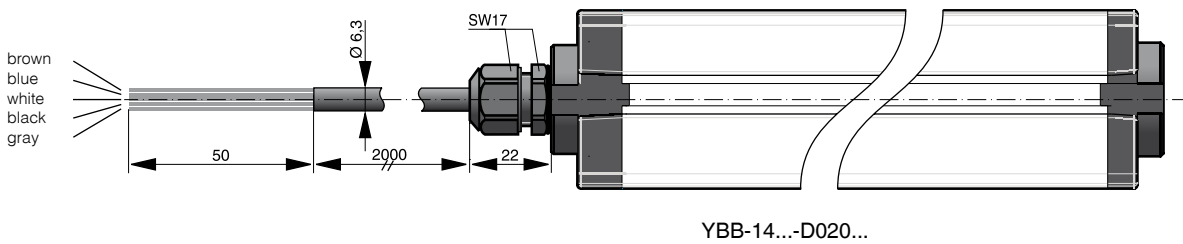
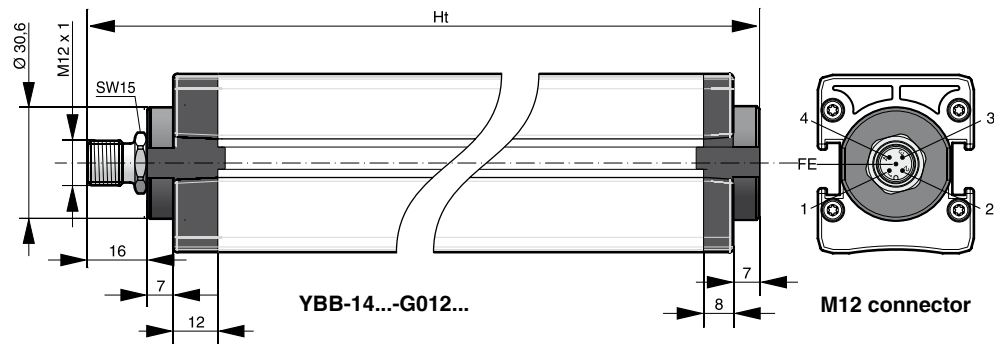
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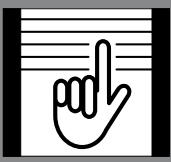
DIMENSIONS



PIN ASSIGNMENT



ASSIGNMENT	FUNCTION	PINS/WIRES ON SENDER		PINS/WIRES ON RECEIVER	
		M12 CONNECTOR	CABLE	M12 CONNECTOR	CABLE
Supply voltage	24 VDC for channel 1 / 0 V for channel 2	1	brown	1	brown
Supply voltage	0 V for channel 1 / 24 VDC for channel 2	3	blue	3	blue
Test mode	0 V: test active / 24 V: test inactive	4	black	-	-
Output	OSSD1	-	-	2	white
Output	OSSD2	-	-	4	black
Functional earth	Shield	FE	gray	FE	gray



FINGER PROTECTION



TYPE-SPECIFIC DATA

Type	0150	0250	0400
Total height (Ht) [mm] *	251	380	509
Housing height (Hb) [mm]	221	350	479
Protective height (Hs) [mm]	142	271	400
Number of beams	17	33	49
Current consumption [mA]	135	140	145
Response time [ms]	5.2	8.4	11.6

PART REFERENCE (BOLD: PREFERRED TYPES)

PNP / Connector M12	Sender	YBB-14S4-0150-G012	YBB-14S4-0250-G012	YBB-14S4-0400-G012
	Receiver	YBB-14R4-0150-G012	YBB-14R4-0250-G012	YBB-14R4-0400-G012
PNP / PUR-cable 2 m	Sender	YBB-14S4-0150-D020	YBB-14S4-0250-D020	YBB-14S4-0400-D020
	Receiver	YBB-14R4-0150-D020	YBB-14R4-0250-D020	YBB-14R4-0400-D020
PNP / PUR-cable 5 m	Sender	YBB-14S4-0150-D050	YBB-14S4-0250-D050	YBB-14S4-0400-D050
	Receiver	YBB-14R4-0150-D050	YBB-14R4-0250-D050	YBB-14R4-0400-D050
PNP / PUR-cable 10 m	Sender	YBB-14S4-0150-D100	YBB-14S4-0250-D100	YBB-14S4-0400-D100
	Receiver	YBB-14R4-0150-D100	YBB-14R4-0250-D100	YBB-14R4-0400-D100

TYPE-SPECIFIC DATA

Type	1000	1200	1300
Total height (Ht) [mm] *	1154	1283	1412
Housing height (Hb) [mm]	1124	1253	1382
Protective height (Hs) [mm]	1045	1174	1303
Number of beams	129	145	161
Current consumption [mA]	175	185	190
Response time [ms]	27.6	30.8	34

PART REFERENCE (BOLD: PREFERRED TYPES)

PNP / Connector M12	Sender	YBB-14S4-1000-G012	YBB-14S4-1200-G012	YBB-14S4-1300-G012
	Receiver	YBB-14R4-1000-G012	YBB-14R4-1200-G012	YBB-14R4-1300-G012
PNP / PUR-cable 2 m	Sender	YBB-14S4-1000-D020	YBB-14S4-1200-D020	YBB-14S4-1300-D020
	Receiver	YBB-14R4-1000-D020	YBB-14R4-1200-D020	YBB-14R4-1300-D020
PNP / PUR-cable 5 m	Sender	YBB-14S4-1000-D050	YBB-14S4-1200-D050	YBB-14S4-1300-D050
	Receiver	YBB-14R4-1000-D050	YBB-14R4-1200-D050	YBB-14R4-1300-D050
PNP / PUR-cable 10 m	Sender	YBB-14S4-1000-D100	YBB-14S4-1200-D100	YBB-14S4-1300-D100
	Receiver	YBB-14R4-1000-D100	YBB-14R4-1200-D100	YBB-14R4-1300-D100

* Total height given with M12 connector. For cable version, add 6 mm.



0500	0700	0800	0900
638	767	896	1025
608	737	866	995
529	658	787	916
65	81	97	113
150	160	165	170
14.8	18	21.2	24.4

YBB-14S4-0500-G012
YBB-14R4-0500-G012

YBB-14S4-0500-D020
 YBB-14R4-0500-D020
 YBB-14S4-0500-D050
 YBB-14R4-0500-D050
 YBB-14S4-0500-D100
 YBB-14R4-0500-D100

YBB-14S4-0700-G012
YBB-14R4-0700-G012

YBB-14S4-0700-D020
 YBB-14R4-0700-D020
 YBB-14S4-0700-D050
 YBB-14R4-0700-D050
 YBB-14S4-0700-D100
 YBB-14R4-0700-D100

YBB-14S4-0800-G012
YBB-14R4-0800-G012

YBB-14S4-0800-D020
 YBB-14R4-0800-D020
 YBB-14S4-0800-D050
 YBB-14R4-0800-D050
 YBB-14S4-0800-D100
 YBB-14R4-0800-D100

YBB-14S4-0900-G012
YBB-14R4-0900-G012

YBB-14S4-0900-D020
 YBB-14R4-0900-D020
 YBB-14S4-0900-D050
 YBB-14R4-0900-D050
 YBB-14S4-0900-D100
 YBB-14R4-0900-D100

1400	1600	1700	
1541	1670	1799	
1511	1640	1769	
1432	1561	1690	
177	193	209	
195	200	210	
37.2	40.4	43.6	

YBB-14S4-1400-G012
YBB-14R4-1400-G012

YBB-14S4-1400-D020
 YBB-14R4-1400-D020
 YBB-14S4-1400-D050
 YBB-14R4-1400-D050
 YBB-14S4-1400-D100
 YBB-14R4-1400-D100

YBB-14S4-1600-G012
YBB-14R4-1600-G012

YBB-14S4-1600-D020
 YBB-14R4-1600-D020
 YBB-14S4-1600-D050
 YBB-14R4-1600-D050
 YBB-14S4-1600-D100
 YBB-14R4-1600-D100

YBB-14S4-1700-G012
YBB-14R4-1700-G012

YBB-14S4-1700-D020
 YBB-14R4-1700-D020
 YBB-14S4-1700-D050
 YBB-14R4-1700-D050
 YBB-14S4-1700-D100
 YBB-14R4-1700-D100





CONTRINEX SAFETINEA

CONTRINEX

Power

Channel

LIGHT CURTAINS

HAND PROTECTION TYPE 4

MAIN FEATURES

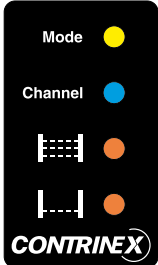
- ✓ Resolution: 30 mm
- ✓ Operating range: 0.25 ... 12 m
- ✓ Protective height: 279 ... 1827 mm
- ✓ Category 4, PL e according to EN/ISO 13849-1
- ✓ Type 4 according to IEC 61496-1 and -2
- ✓ Certified TÜV, CE and UL
- ✓ IP 65, IP 67 with operating temperatures as low as -35°C (-31°F)
- ✓ 2-channel selection
- ✓ Optical synchronization
- ✓ Permanent autocontrol



HAND PROTECTION

LEDS

LED indicators on the YBB **sender** unit



Mode:

Yellow when test mode is active

Channel:

Blue when channel 1 is selected

Purple when channel 2 is selected

Alignment (full):

Steady orange when the screen is not fully aligned

Blinking orange when the first third of the screen is aligned

Off when screen is fully aligned

Alignment (low beam):

Steady orange when the lowest beam is not aligned

Blinking orange when the lowest beam is aligned

Off when screen is fully aligned

LED indicators on the YBB **receiver** unit



Power:

Green when power is ON

Channel:

Blue when channel 1 is selected

Purple when channel 2 is selected

Status ON:

Green when OSSD outputs are ON

Status OFF:

Red when OSSD outputs are OFF

TECHNICAL DATA

Dimensions	42 mm x 48 mm x Ht
Resolution	30 mm
Protective height	279 ... 1827 mm
Supply voltage range	24 VDC \pm 20 %
Current consumption sender	45 mA max. / 1.5 W max.
Current consumption receiver (excl. load)	130 mA max. / 4.7 W max.
Output current	0.2 A max. per output
Safety level (EN/ISO 13849-1)	Category 4, PL e
Safety type (IEC 61496-1 and -2)	Type 4
Protection class (IEC 61140)	III
Ambient temperature range	-35 ... +60°C (-31 ... +140°F)
Storage temperature range	-40 ... +70°C (-40 ... +158°F)
Degree of protection (EN 60529)	IP 65 + IP 67
Housing material	Aluminum
Material of optical parts	PMMA
Operating range	0.25 ... 12 m
Sender wavelength	IR 850 nm

HOUSING

Aluminum profile 42 mm x 48 mm with dual fixing groove.

ELECTRONIC PROTECTION

Safetinx light curtains are self-protected against overloads and short-circuits. They can also withstand short high-voltage overloads.

CONNECTION

Safetinx light curtains with M12 5-pole connector are standard. Versions with PUR cable, 2 m, 5 m or 10 m long, are available on request.

DOCUMENTATION

Detailed data sheets for these products can be found on the Contrinex website www.contrinex.com or ordered free of charge from our distributors.

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

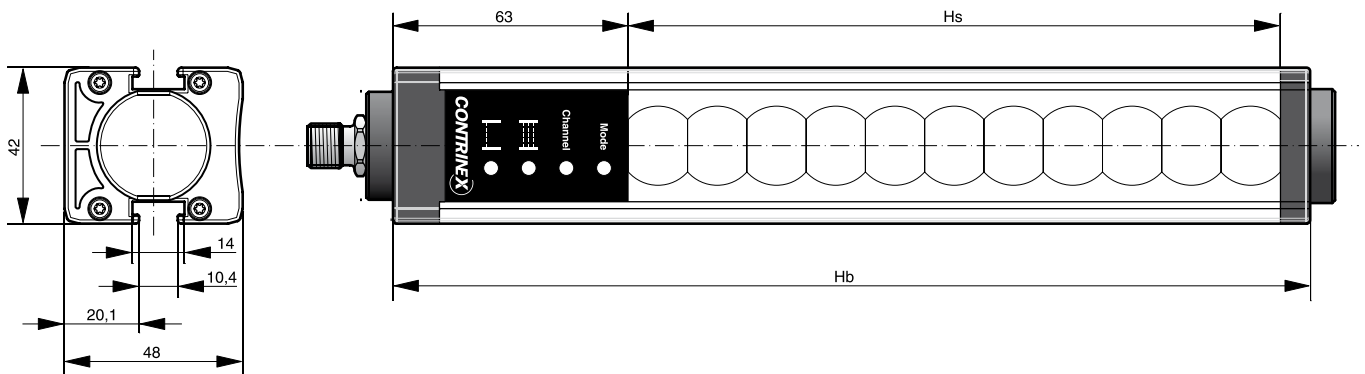
Connectivity

Accessories

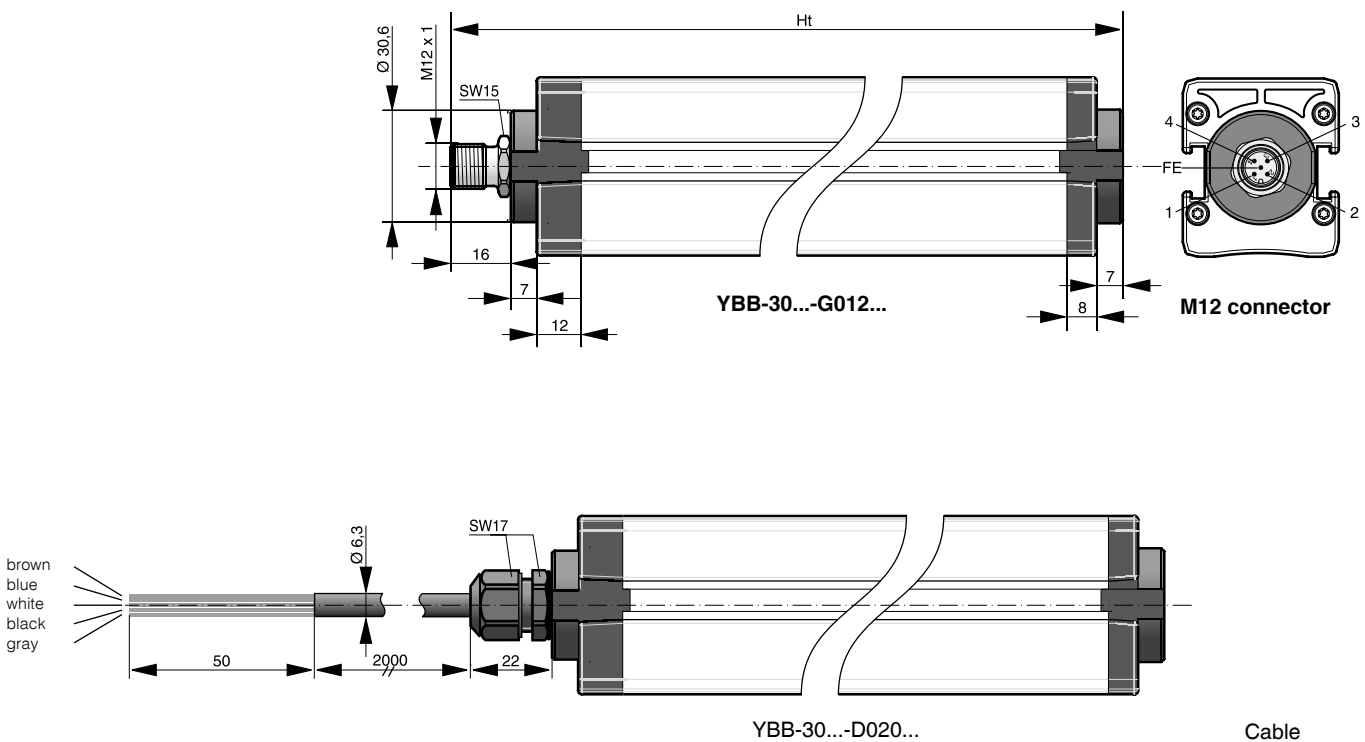
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DIMENSIONS



PIN ASSIGNMENT



ASSIGNMENT	FUNCTION	PINS/WIRES ON SENDER		PINS/WIRES ON RECEIVER	
		M12 CONNECTOR	CABLE	M12 CONNECTOR	CABLE
Supply voltage	24 VDC for channel 1 / 0 V for channel 2	1	brown	1	brown
Supply voltage	0 V for channel 1 / 24 VDC for channel 2	3	blue	3	blue
Test mode	0 V: test active / 24 V: test inactive	4	black	-	-
Output	OSSD1	-	-	2	white
Output	OSSD2	-	-	4	black
Functional earth	Shield	FE	gray	FE	gray



HAND PROTECTION



TYPE-SPECIFIC DATA

Type	0250	0400	0500
Total height (Ht) [mm] *	380	509	638
Housing height (Hb) [mm]	350	479	608
Protective height (Hs) [mm]	279	408	537
Number of beams	17	25	33
Current consumption [mA]	125	130	130
Response time [ms]	5.2	6.8	8.4

PART REFERENCE (BOLD: PREFERRED TYPES)

PNP / Connector M12	Sender	YBB-30S4-0250-G012	YBB-30S4-0400-G012	YBB-30S4-0500-G012
	Receiver	YBB-30R4-0250-G012	YBB-30R4-0400-G012	YBB-30R4-0500-G012
PNP / PUR-cable 2 m	Sender	YBB-30S4-0250-D020	YBB-30S4-0400-D020	YBB-30S4-0500-D020
	Receiver	YBB-30R4-0250-D020	YBB-30R4-0400-D020	YBB-30R4-0500-D020
PNP / PUR-cable 5 m	Sender	YBB-30S4-0250-D050	YBB-30S4-0400-D050	YBB-30S4-0500-D050
	Receiver	YBB-30R4-0250-D050	YBB-30R4-0400-D050	YBB-30R4-0500-D050
PNP / PUR-cable 10 m	Sender	YBB-30S4-0250-D100	YBB-30S4-0400-D100	YBB-30S4-0500-D100
	Receiver	YBB-30R4-0250-D100	YBB-30R4-0400-D100	YBB-30R4-0500-D100

TYPE-SPECIFIC DATA

Type	1200	1300	1400
Total height (Ht) [mm] *	1283	1412	1541
Housing height (Hb) [mm]	1253	1382	1511
Protective height (Hs) [mm]	1182	1311	1440
Number of beams	73	81	89
Current consumption [mA]	150	155	160
Response time [ms]	16.4	18	19.6

PART REFERENCE (BOLD: PREFERRED TYPES)

PNP / Connector M12	Sender	YBB-30S4-1200-G012	YBB-30S4-1300-G012	YBB-30S4-1400-G012
	Receiver	YBB-30R4-1200-G012	YBB-30R4-1300-G012	YBB-30R4-1400-G012
PNP / PUR-cable 2 m	Sender	YBB-30S4-1200-D020	YBB-30S4-1300-D020	YBB-30S4-1400-D020
	Receiver	YBB-30R4-1200-D020	YBB-30R4-1300-D020	YBB-30R4-1400-D020
PNP / PUR-cable 5 m	Sender	YBB-30S4-1200-D050	YBB-30S4-1300-D050	YBB-30S4-1400-D050
	Receiver	YBB-30R4-1200-D050	YBB-30R4-1300-D050	YBB-30R4-1400-D050
PNP / PUR-cable 10 m	Sender	YBB-30S4-1200-D100	YBB-30S4-1300-D100	YBB-30S4-1400-D100
	Receiver	YBB-30R4-1200-D100	YBB-30R4-1300-D100	YBB-30R4-1400-D100

* Total height given with M12 connector. For cable version, add 6 mm.



0700767
737
666
41
135
10**0800**896
866
795
49
140
11.6**0900**1025
995
924
57
140
13.2**1000**1154
1124
1053
65
145
14.8**YBB-30S4-0700-G012****YBB-30R4-0700-G012**YBB-30S4-0700-D020
YBB-30R4-0700-D020
YBB-30S4-0700-D050
YBB-30R4-0700-D050
YBB-30S4-0700-D100
YBB-30R4-0700-D100**YBB-30S4-0800-G012****YBB-30R4-0800-G012**YBB-30S4-0800-D020
YBB-30R4-0800-D020
YBB-30S4-0800-D050
YBB-30R4-0800-D050
YBB-30S4-0800-D100
YBB-30R4-0800-D100**YBB-30S4-0900-G012****YBB-30R4-0900-G012**YBB-30S4-0900-D020
YBB-30R4-0900-D020
YBB-30S4-0900-D050
YBB-30R4-0900-D050
YBB-30S4-0900-D100
YBB-30R4-0900-D100**YBB-30S4-1000-G012****YBB-30R4-1000-G012**YBB-30S4-1000-D020
YBB-30R4-1000-D020
YBB-30S4-1000-D050
YBB-30R4-1000-D050
YBB-30S4-1000-D100
YBB-30R4-1000-D100**1600**1670
1640
1569
97
160
21.2**1700**1799
1769
1698
105
165
22.8**1800**1928
1898
1827
113
170
24.4**YBB-30S4-1600-G012****YBB-30R4-1600-G012**YBB-30S4-1600-D020
YBB-30R4-1600-D020
YBB-30S4-1600-D050
YBB-30R4-1600-D050
YBB-30S4-1600-D100
YBB-30R4-1600-D100**YBB-30S4-1700-G012****YBB-30R4-1700-G012**YBB-30S4-1700-D020
YBB-30R4-1700-D020
YBB-30S4-1700-D050
YBB-30R4-1700-D050
YBB-30S4-1700-D100
YBB-30R4-1700-D100**YBB-30S4-1800-G012****YBB-30R4-1800-G012**YBB-30S4-1800-D020
YBB-30R4-1800-D020
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YBB-30S4-1800-D100
YBB-30R4-1800-D100

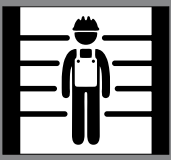


BARRIERS

ACCESS CONTROL TYPE 4

MAIN FEATURES

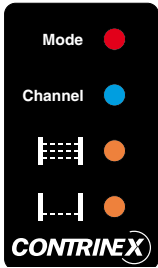
- ✓ Beam gap: 300, 400 or 500 mm (3 to 6 beams)
- ✓ Operating range: 1 ... 15 m or 10 ... 50 m (can be configured)
- ✓ Protective height: 832 ... 1532 mm
- ✓ Category 4, PL e according to EN/ISO 13849-1
- ✓ Type 4 according to IEC 61496-1 and -2
- ✓ Certified TÜV, CE and UL
- ✓ IP 65, IP 67 with operating temperatures as low as -35°C (-31°F)
- ✓ 2-channel selection
- ✓ Optical synchronization
- ✓ Permanent autocontrol



ACCESS CONTROL

LEDS

LED indicators on the YCA **sender** unit



Mode:

Off when max. operating range 15 m
Blue when max. operating range 50 m
Red or purple in case of wiring error

Channel:

Blue when channel 1 selected
Purple when channel 2 selected

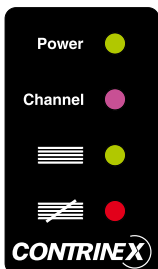
Alignment (full):

Steady orange when screen not fully aligned
Blinking orange when first third of screen aligned
Off when screen is fully aligned

Alignment (low beam):

Steady orange when lowest beam not aligned
Blinking orange when lowest beam aligned
Off when screen fully aligned

LED indicators on the YCA **receiver** unit



Power:

Green when power ON

Channel:

Blue when channel 1 selected
Purple when channel 2 selected

Status ON:

Green when OSSD outputs ON

Status OFF:

Red when OSSD outputs OFF

TECHNICAL DATA

Dimensions	42 mm x 48 mm x Ht
Beam gap	300, 400 or 500 mm (3 to 6 beams)
Protective height	832 ... 1532 mm
Supply voltage range	24 VDC \pm 15 %
Current consumption sender	35 mA max. / 1.0 W max.
Current consumption receiver (excl. load)	75 mA max. / 2.2 W max.
Output current	0.2 A max. per output
Safety level (EN/ISO 13849-1)	Category 4, PL e
Safety type (IEC 61496-1 and -2)	Type 4
Protection class (IEC 61140)	III
Ambient temperature range	-35 ... +60°C (-31 ... +140°F)
Storage temperature range	-40 ... +70°C (-40 ... +158°F)
Degree of protection (EN 60529)	IP 65 + IP 67
Housing material	Aluminum
Material of optical parts	PMMA
Operating range	1 ... 15 m / 10 ... 50 m (can be configured)
Sender wavelength	IR 850 nm

HOUSING

Aluminum profile 42 mm x 48 mm with dual fixing groove.

CONFIGURATION OF OPERATING RANGE

Depending on wiring, the maximum operating range can be fixed to either 50 m or 15 m.

ELECTRONIC PROTECTION

Safetinx access control barriers are self-protected against overloads and short-circuits. They can also withstand short high-voltage overloads.

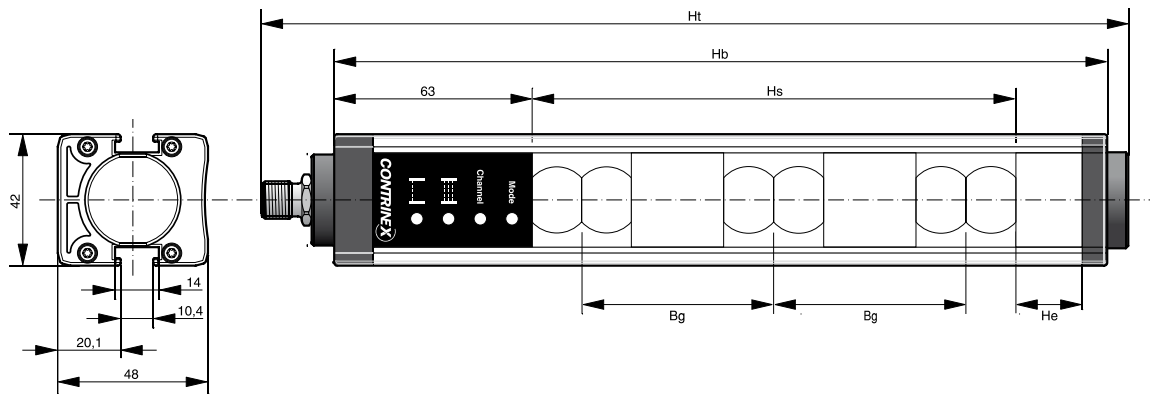
CONNECTION

Safetinx light curtains with M12 5-pole connector are standard. Versions with PUR cable, 2 m, 5 m or 10 m long, are available on request.

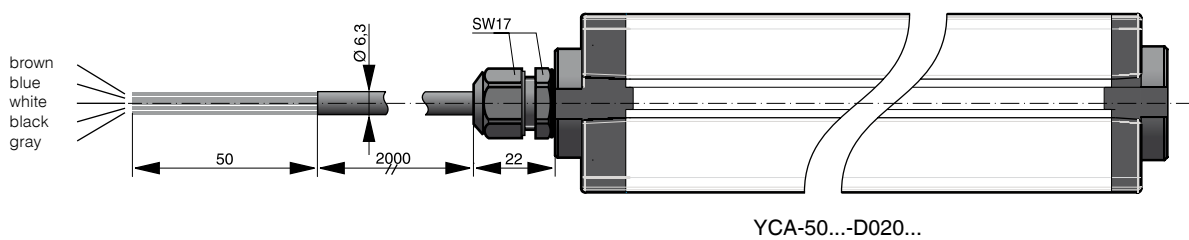
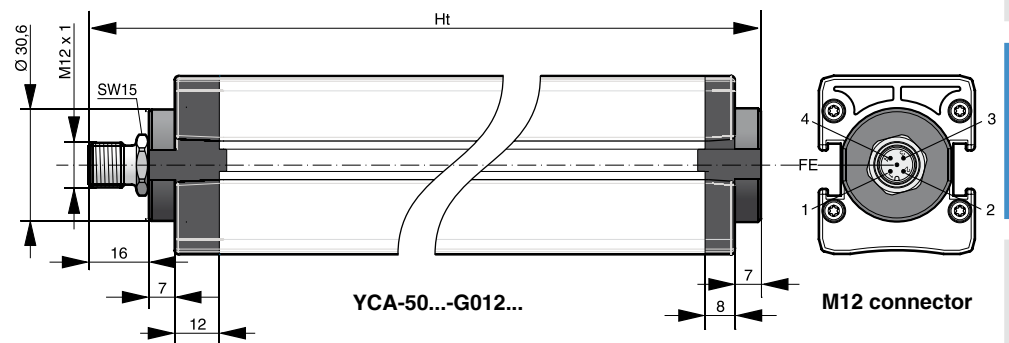
DOCUMENTATION

Detailed data sheets for these products can be found on the Contrinex website www.contrinex.com or ordered free of charge from our distributors.

DIMENSIONS

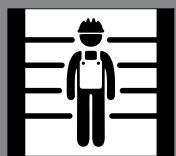


PIN ASSIGNMENT



Cable

ASSIGNMENT	FUNCTION	PINS/WIRES ON SENDER		PINS/WIRES ON RECEIVER	
		M12 CONNECTOR	CABLE	M12 CONNECTOR	CABLE
Supply voltage	24 VDC for channel 1 / 0 V for channel 2	1	brown	1	brown
Supply voltage	0 V for channel 1 / 24 VDC for channel 2	3	blue	3	blue
Operating range selection	24 V: operating range 10 ... 50 m 0 V: operating range 1 ... 15 m	4	black	-	-
Operating range selection	0 V: operating range 10 ... 50 m 24 V: operating range 1 ... 15 m	2	white	-	-
Output	OSSD1	-	-	2	white
Output	OSSD2	-	-	4	black
Functional earth	Shield	FE	gray	FE	gray



ACCESS CONTROL



TYPE-SPECIFIC DATA

	4	5	6
Number of beams	4	5	6
Beam gap (Bg) [mm]	300	300	300
Total height (Ht) [mm] *	1154	1412	1670
Housing height (Hb) [mm]	1124	1382	1640
Protective height (Hs) [mm]	932	1232	1532
Height extension (He) [mm]	121	79	37
Current consumption [mA]	110	110	110
Response time [ms]	5.0	5.9	6.7

PART REFERENCE (BOLD: PREFERRED TYPES)

		YCA-50S4-4300-G012	YCA-50S4-5300-G012	YCA-50S4-6300-G012
PNP / Connector M12	Sender	YCA-50S4-4300-G012	YCA-50S4-5300-G012	YCA-50S4-6300-G012
	Receiver	YCA-50R4-4300-G012	YCA-50R4-5300-G012	YCA-50R4-6300-G012
PNP / PUR-cable 2 m	Sender	YCA-50S4-4300-D020	YCA-50S4-5300-D020	YCA-50S4-6300-D020
	Receiver	YCA-50R4-4300-D020	YCA-50R4-5300-D020	YCA-50R4-6300-D020
PNP / PUR-cable 5 m	Sender	YCA-50S4-4300-D050	YCA-50S4-5300-D050	YCA-50S4-6300-D050
	Receiver	YCA-50R4-4300-D050	YCA-50R4-5300-D050	YCA-50R4-6300-D050
PNP / PUR-cable 10 m	Sender	YCA-50S4-4300-D100	YCA-50S4-5300-D100	YCA-50S4-6300-D100
	Receiver	YCA-50R4-4300-D100	YCA-50R4-5300-D100	YCA-50R4-6300-D100

TYPE-SPECIFIC DATA

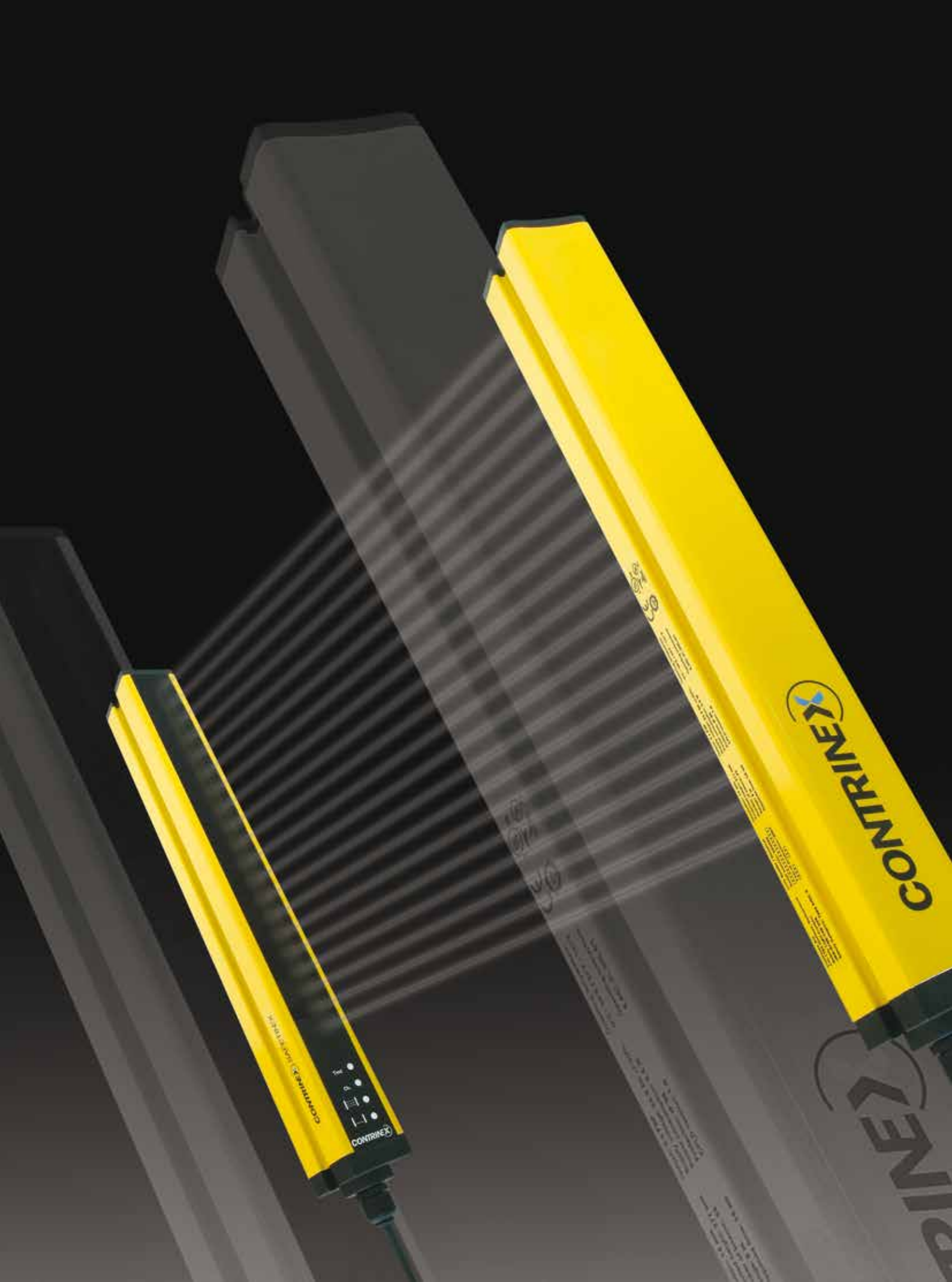
	3	4	3
Number of beams	3	4	3
Beam gap (Bg) [mm]	400	400	500
Total height (Ht) [mm] *	1025	1412	1154
Housing height (Hb) [mm]	995	1382	1124
Protective height (Hs) [mm]	832	1232	1032
Height extension (He) [mm]	92	79	21
Current consumption [mA]	110	110	110
Response time [ms]	4.2	5.0	4.2

PART REFERENCE (BOLD: PREFERRED TYPES)

		YCA-50S4-3400-G012	YCA-50S4-4400-G012	YCA-50S4-3500-G012
PNP / Connector M12	Sender	YCA-50S4-3400-G012	YCA-50S4-4400-G012	YCA-50S4-3500-G012
	Receiver	YCA-50R4-3400-G012	YCA-50R4-4400-G012	YCA-50R4-3500-G012
PNP / PUR-cable 2 m	Sender	YCA-50S4-3400-D020	YCA-50S4-4400-D020	YCA-50S4-3500-D020
	Receiver	YCA-50R4-3400-D020	YCA-50R4-4400-D020	YCA-50R4-3500-D020
PNP / PUR-cable 5 m	Sender	YCA-50S4-3400-D050	YCA-50S4-4400-D050	YCA-50S4-3500-D050
	Receiver	YCA-50R4-3400-D050	YCA-50R4-4400-D050	YCA-50R4-3500-D050
PNP / PUR-cable 10 m	Sender	YCA-50S4-3400-D100	YCA-50S4-4400-D100	YCA-50S4-3500-D100
	Receiver	YCA-50R4-3400-D100	YCA-50R4-4400-D100	YCA-50R4-3500-D100

* Total height given with M12 connector. For cable version, add 6 mm.







TEST

ALIGN

POWER

CONTRINEX

ALIGN

POWER

POWER

CONTRINEX

LIGHT CURTAINS

HAND PROTECTION TYPE 2

MAIN FEATURES

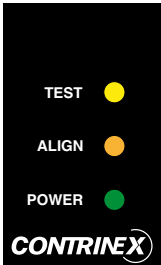
- ✓ Resolution: 30 mm
- ✓ Operating range: 0.25 ... 12 m
- ✓ Protective height: 150 ... 1827 mm
- ✓ Category 2, PL c according to EN/ISO 13849-1
- ✓ Type 2 according to IEC 61496-1 and -2
- ✓ Certified TÜV, CE
- ✓ Optical synchronization
- ✓ Permanent autocontrol



HAND PROTECTION

LEDS

LED indicators on the YBB **sender** unit



Test:

Yellow when intrusion simulation is active
Off when there is no intrusion simulation

Alignment:

Steady orange when the lowest beam is not aligned

Quick blinking orange when the lowest beam is aligned

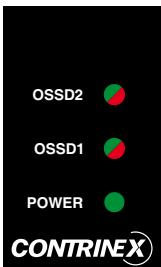
Blinking orange when at least 6 beams are aligned

Off when screen is fully aligned

Power:

Green when power is ON

LED indicators on the YBB **receiver** unit



OSSD2:

Green when OSSD2 is ON

Red when OSSD2 is OFF

OSSD1:

Green when OSSD1 is ON

Red when OSSD1 is OFF

Power:

Green when power is ON

TECHNICAL DATA

Dimensions	42 mm x 48 mm x Ht
Resolution	30 mm
Protective height	150 ... 1827 mm
Supply voltage range	24 VDC \pm 20 %
Current consumption sender	27 mA max. / 0.8 W max.
Current consumption receiver (excl. load)	58 mA max. / 1.7 W max.
Output current	0.2 A max. per output
Safety level (EN/ISO 13849-1)	Category 2, PLc
Safety type (IEC 61496-1 and -2)	Type 2
Protection class (IEC 61140)	III
Ambient temperature range	0 ... +50°C (+32 ... +122°F)
Storage temperature range	-25 ... +70°C (-13 ... +158°F)
Degree of protection (EN 60529)	IP 65 + IP 67
Housing material	Aluminum
Material of optical parts	PMMA
Operating range	0.25 ... 12 m
Sender wavelength	IR 850 nm

HOUSING

Aluminum profile 42 mm x 48 mm with dual fixing groove.

ELECTRONIC PROTECTION

Safetinx light curtains are self-protected against overloads and short-circuits. They can also withstand short high-voltage overloads.

CONNECTION

Safetinx light curtains are connected via a standard M12 5-pole connector.

DOCUMENTATION

Detailed data sheets for these products can be found on the Contrinex website www.contrinex.com or ordered free of charge from our distributors.

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

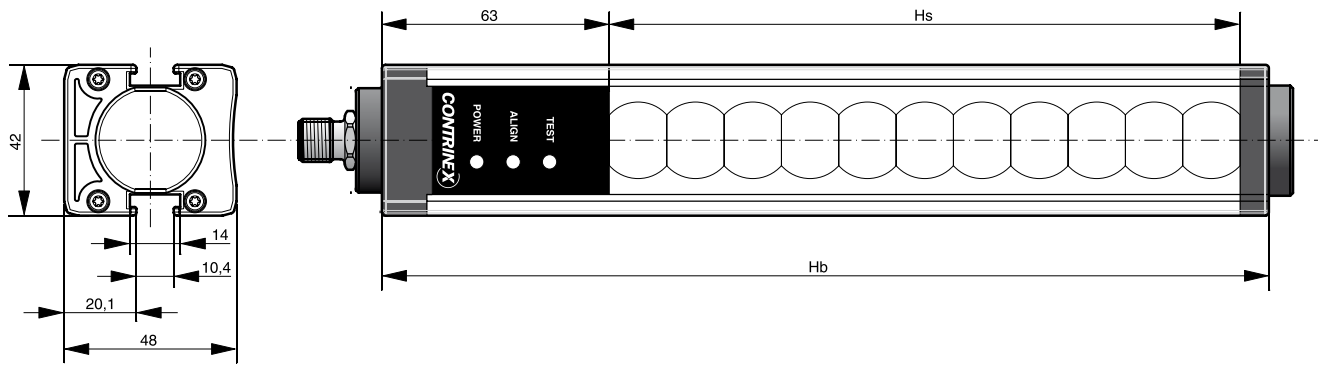
Connectivity

Accessories

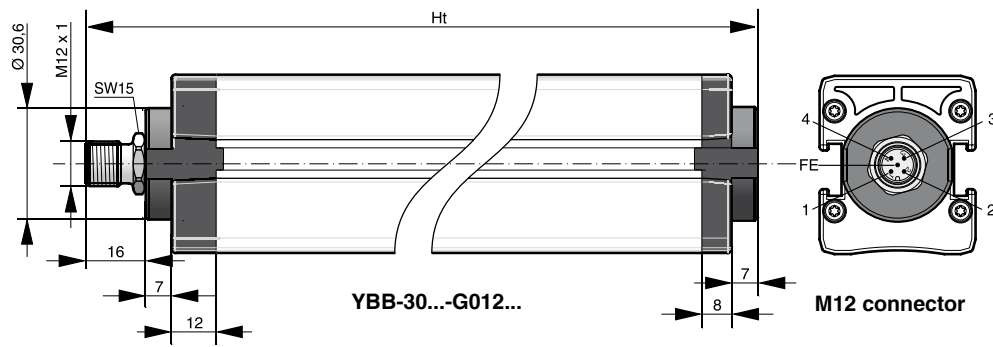
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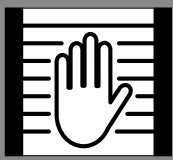
DIMENSIONS



PIN ASSIGNMENT



ASSIGNMENT	FUNCTION	PINS ON SENDER		PINS ON RECEIVER	
		M12 CONNECTOR		M12 CONNECTOR	
Supply voltage	24 VDC	1		1	
Supply voltage	0 V	3		3	
Test mode	0 V: test active / 24 V: test inactive	4		-	
Output	OSSD1	-		2	
Output	OSSD2	-		4	
Functional earth	Shield	FE		FE	



HAND PROTECTION



TYPE-SPECIFIC DATA

Type	0150	0250	0400	0500
Total height (Ht) [mm]*	251	380	509	638
Housing height (Hb) [mm]	221	350	479	608
Protective height (Hs) [mm]	150	279	408	537
Number of beams	9	17	25	33
Current consumption [mA]	70	74	77	79
Response time [ms]	14	18	22	26

PART REFERENCE

PNP / Connector M12	Sender	YBB-30S2-0150-G012	YBB-30S2-0250-G012	YBB-30S2-0400-G012	YBB-30S2-0500-G012
	Receiver	YBB-30R2-0150-G012	YBB-30R2-0250-G012	YBB-30R2-0400-G012	YBB-30R2-0500-G012

TYPE-SPECIFIC DATA

Type	0700	0800	0900	1000
Total height (Ht) [mm]*	767	896	1025	1154
Housing height (Hb) [mm]	737	866	995	1124
Protective height (Hs) [mm]	666	795	924	1053
Number of beams	41	49	57	65
Current consumption [mA]	80	81	81	82
Response time [ms]	30	34	38	42

PART REFERENCE

PNP / Connector M12	Sender	YBB-30S2-0700-G012	YBB-30S2-0800-G012	YBB-30S2-0900-G012	YBB-30S2-1000-G012
	Receiver	YBB-30R2-0700-G012	YBB-30R2-0800-G012	YBB-30R2-0900-G012	YBB-30R2-1000-G012

TYPE-SPECIFIC DATA

Type	1200	1300	1400	1600
Total height (Ht) [mm]*	1283	1412	1541	1670
Housing height (Hb) [mm]	1253	1382	1511	1640
Protective height (Hs) [mm]	1182	1311	1440	1569
Number of beams	73	81	89	97
Current consumption [mA]	83	83	84	84
Response time [ms]	46	50	54	58

PART REFERENCE

PNP / Connector M12	Sender	YBB-30S2-1200-G012	YBB-30S2-1300-G012	YBB-30S2-1400-G012	YBB-30S2-1600-G012
	Receiver	YBB-30R2-1200-G012	YBB-30R2-1300-G012	YBB-30R2-1400-G012	YBB-30R2-1600-G012

TYPE-SPECIFIC DATA

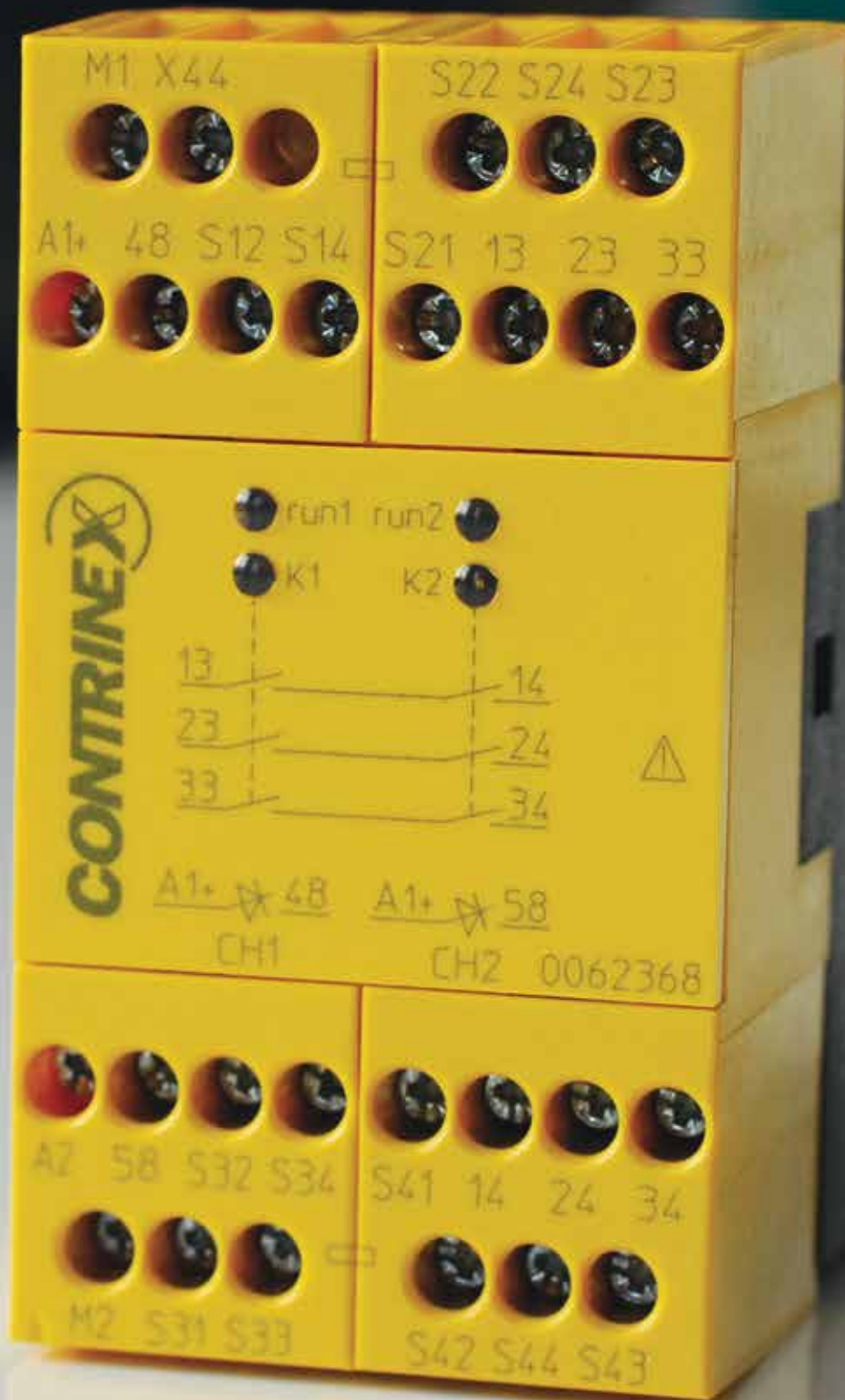
Type	1700	1800
Total height (Ht) [mm]*	1799	1928
Housing height (Hb) [mm]	1769	1898
Protective height (Hs) [mm]	1698	1827
Number of beams	105	113
Current consumption [mA]	85	85
Response time [ms]	62	66

PART REFERENCE

PNP / Connector M12	Sender	YBB-30S2-1700-G012	YBB-30S2-1800-G012
	Receiver	YBB-30R2-1700-G012	YBB-30R2-1800-G012

* Total height given with M12 connector





SAFETY

RELAYS

MAIN FEATURES

- ✓ For safety light curtains and access control barriers with symmetric (such as Safetinx YBB and YCA models) or asymmetric outputs
- ✓ Safety Integrity Level (SIL) 3 according to IEC/EN 61508
- ✓ Claimed Level (SIL CL) 3 according to IEC/EN 62061
- ✓ Performance Level (PL) e and category 4 according to EN/ISO 13849-1
- ✓ Safety category 4 according to EN 954-1
- ✓ Certified TÜV, CE and UL

SAFETY RELAY

- ✓ Outputs: - 3 N.O. safety contacts
- 1 N.C. monitoring contact
- ✓ Manual or automatic restart
- ✓ LED indicator for channel 1, 2 and power supply
- ✓ 22.5 mm wide, DIN-rail-mountable housing

MULTI-FUNCTIONAL RELAY

- ✓ Outputs: - 3 x N.O. safety contacts
- 2 semiconductor outputs, short-circuit and overload protected
- ✓ Wire-break detection on AOPD input
- ✓ Under- and overvoltage detection and indication
- ✓ Reaction time: max. 30 ms
- ✓ LED indicators for RUN operation, channel 1/2
- ✓ 45 mm wide, DIN-rail-mountable housing

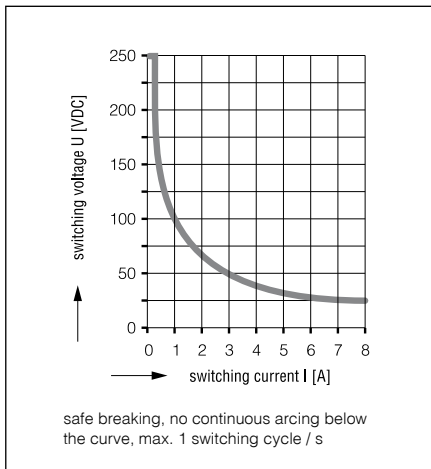


Diagram 1: limit curve for arc-free operation under resistive load

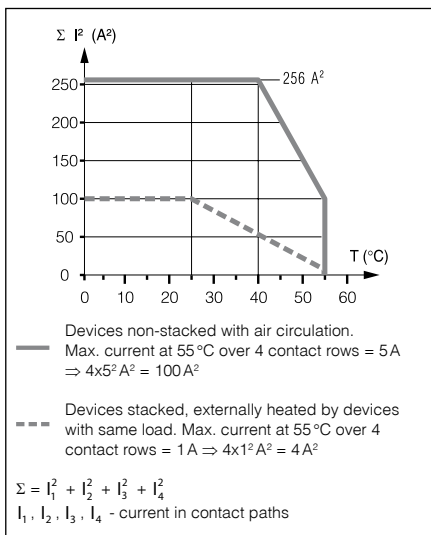
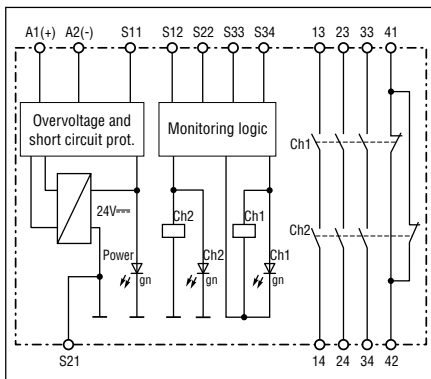


Diagram 2: total current limit curve



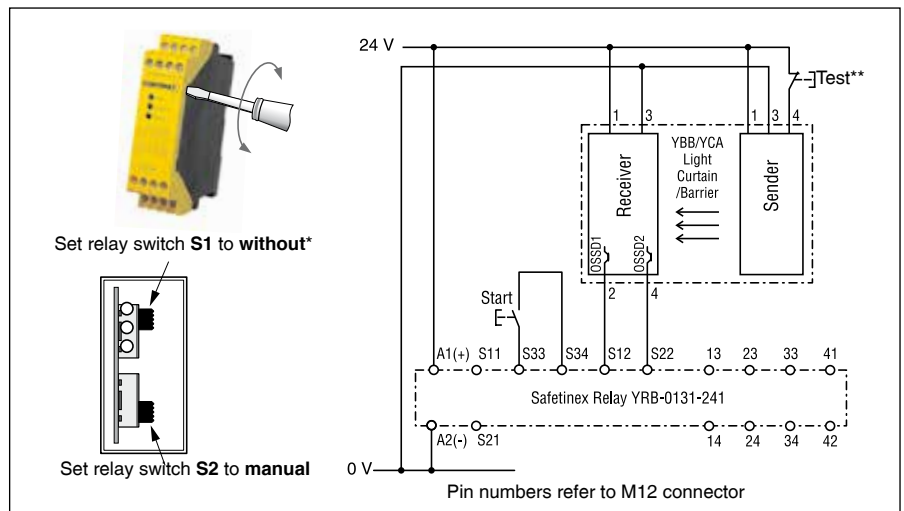
Relay block diagram

PART REFERENCE

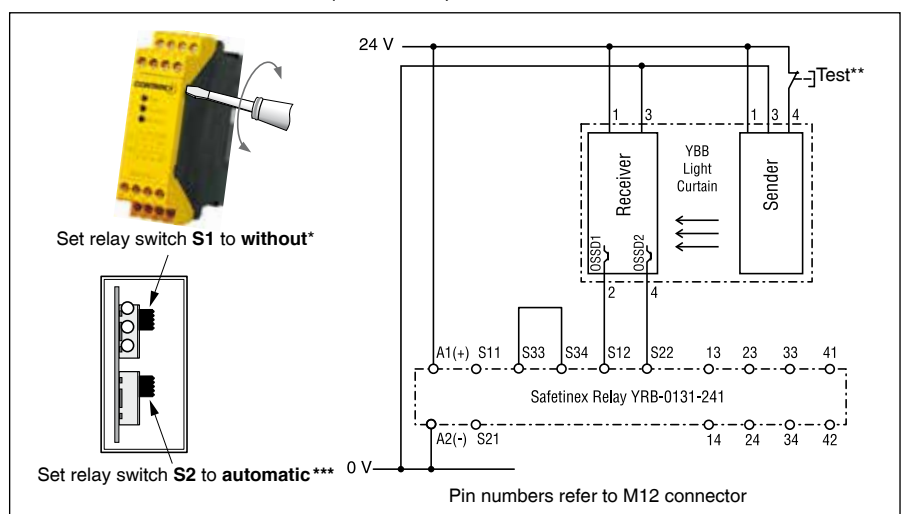
Safety relay

YRB-0131-241

MANUAL RESTART MODE (Channel 1)



AUTOMATIC RESTART MODE (Channel 1)



* Position of switch S1:

- With symmetric outputs on light curtains or access control barriers (such as Safetinex YBB and YCA models), set switch S1 to "without".
- With asymmetric outputs on light curtains or access control barriers, set switch S1 to "with".

** Test button is only applicable for YBB models.

*** Automatic restart is **not allowed** for YCA access control devices.

MULTI-FUNCTIONAL RELAY



YRB-0330-242

APPLICATION AREA

- The following operation types can be selected by means of a rotary switch:
 - **Protective operation**, e.g. light curtains
 - **Protective operation with muting**, e.g. conveyor belts
 - Setting of various signal cycles of muting sensors
 - Setting of max. permissible muting time
 - Override function by means of start button
 - **Stepping operation**, e.g. presses
 - 1, 2 or 3 cycles
 - Number of cycles can be set by means of key switch
- Suitable for connection of type 4 AOPDs or type 2 AOPDs according to IEC/EN 61496-1, cross-circuit monitoring in AOPDs
- Connection of max.
 - 3 2-channel AOPDs, or
 - 2 2-channel AOPDs and 2 1-channel muting sensors, or
 - 1 2-channel AOPD and 4 1-channel muting sensors, or
 - 2 2-channel AOPDs and key switch for cycle switching
 - additionally: start button and machine contact with line-fault detection

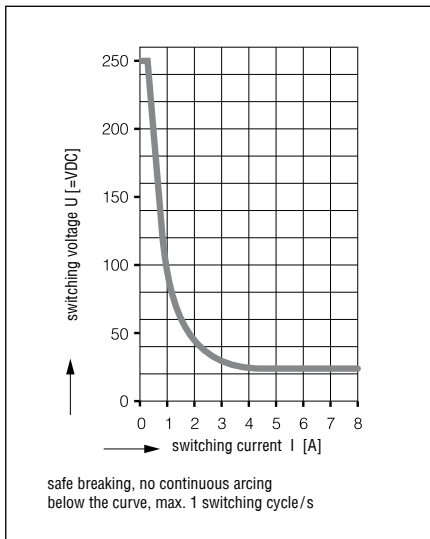
TECHNICAL DATA

INPUT

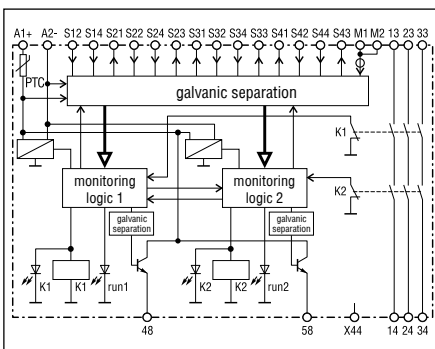
Nominal voltage U_N	24 VDC
Voltage range at max. 5% ripple content	0.85 ... 1.15 U_N
Nominal consumption	max. 170 mA (no load on semiconductor outputs)
Control voltage on	
S21, S23, S31, S33, S41, S43, 48, 58	23 VDC at U_N
Control current on	
S12, S14, S22, S24, S32, S34, S42, S44	4.5 mA each at U_N
Min. voltage on	
S12, S14, S22, S24, S32, S34, S42, S44	16 VDC
Device protection	Internal by means of PTC
Min. current on M1, M2	25 mA (lamp active)

OUTPUT

Contacts	3 x N.O.	
Contact type	Relay, positively driven	
Operating delay (typ. at U_N):		
Manual start	max. 50 ms	
Automatic start	max. 1.5 s	
Automatic restart	max. 55 ms	
Release delay (reaction time)	max. 30 ms	
	(max. 50 ms when error on AOPD and only 1 input channel of AOPD off)	
Nominal output voltage	250 VAC	
	DC: see limit curve for arc-free operation	
Switching of low loads	≥ 100 mV	
Thermal current I_{th}	5 A	
Switching capacity		
to AC 15	3 A / 230 VAC	IEC/EN 60947-5-1
to DC 13 at 0.1 Hz	8 A / 24 VDC	IEC/EN 60947-5-1



Limit curve for arc-free operation



Block diagram

SEMICONDUCTOR OUTPUTS

Output (terminals 48 and 58)	Transistor outputs, plus switching
Nominal output voltage	24 VDC, max. 100 mA continuous current, max. 400 mA for 0.5 s internal short-circuit, over-temperature and overload protection

GENERAL DATA

Electrical life	10 ⁹ switching cycles	IEC/EN 60947-5-1
to AC 15 at 2 A, AC 230 V		
Permissible operating frequency	max. 1200 switching cycles/h	
Short-circuit strength:		
max. fuse rating	6 A gL	IEC/EN 60947-5-1
line circuit breaker	C 8 A	
Mechanical life	10 x 10 ⁶ switching cycles	
Temperature range	0 ... +50 °C (+32 ... +122 °F)	
Clearance and creepage distance:		
Nominal impulse voltage / Pollution degree	4 kV / 2	IEC/EN 60664-1
EMC:		
Electrostatic discharge (ESD)	8 kV (contact discharge)	IEC/EN 61000-4-2 (according to test degree 3)
HF irradiation	10 V / m	IEC/EN 61000-4-3
Fast transients:		
- on power supply wires A1 - A2	2 kV	IEC/EN 61000-4-4
- on signal and control wires	2 kV	IEC/EN 61000-4-4
Surge voltage:		
- between power supply wires	1 kV	IEC/EN 61000-4-5
- between wire and ground	2 kV	IEC/EN 61000-4-5
- HF-wire guided	10 V	IEC/EN 61000-4-6
Interference suppression	Limit value class B	EN 55011
Degree of protection:	according to IEC/EN 61496-1 (1997), the device must be installed in a control housing with degree of protection 54.	
Housing	IP 40	IEC/EN 60529
Terminals	IP 20	IEC/EN 60529
Housing	Thermoplastic polymer with V0 behavior acc. to UL Subject 94	
Vibration resistance according to IEC/EN 61496-1	Amplitude 0.35 mm Frequency 10 ... 55 Hz IEC/EN 60068-2-6	
Shock resistance:		
Acceleration	10 g	
Impulse length	16 ms	
Number of shocks	1000 per axis on three axes	
Climatic resistance	0 / 050 / 04	IEC/EN 60068-1
Terminals	EN 50005	
Wire connection	according to DIN 46228-1/-2/-3/-4	
Wire fixing	M3.5 captive plus-minus terminal screws Box terminal with wire protection	
Mounting	DIN rail	IEC/EN 60715
Weight	320 g	
Dimensions (W x H x D)	45 mm x 84 mm x 118 mm	

PART REFERENCE

Multi-functional safety relay	YRB-0330-242
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Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

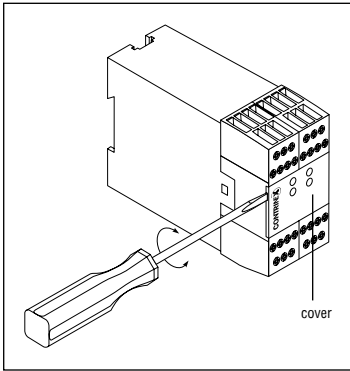
Connectivity

Accessories

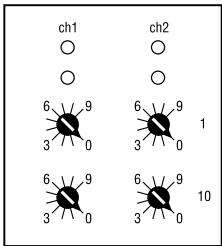
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APPLICATION EXAMPLES



Device setting



Inside view

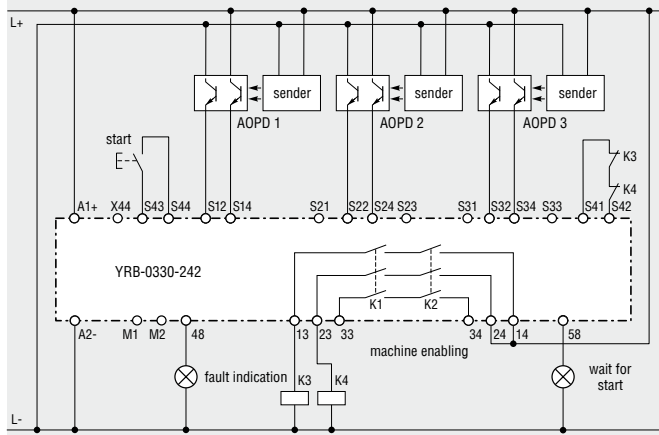


Diagram 1: Protective operation with 3 AOPDs, manual or automatic start, setting with feedback input

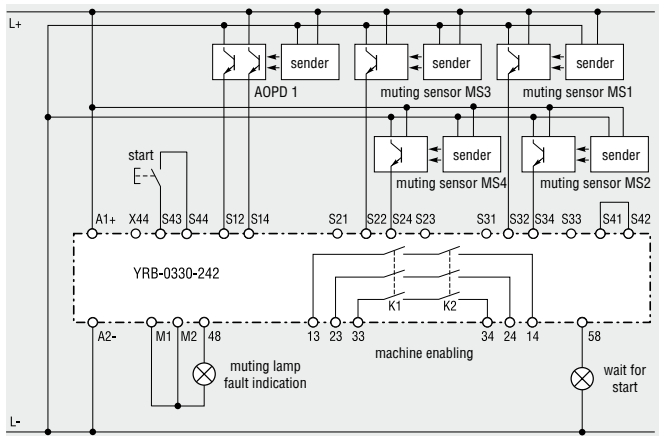


Diagram 2: Protective operation with muting, 4 muting sensors, 1 AOPD

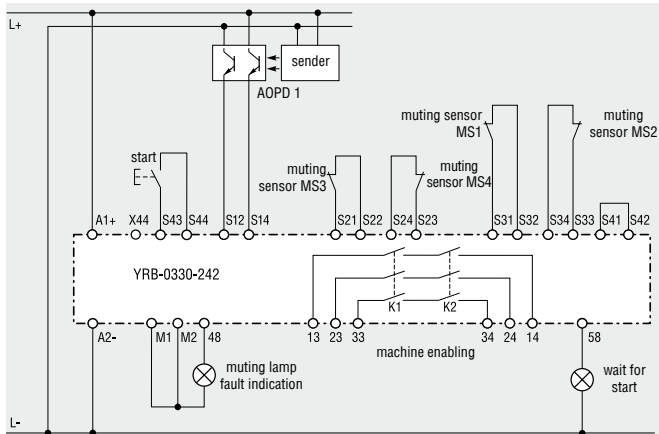


Diagram 3: Protective operation with muting via 4 muting-sensor contacts

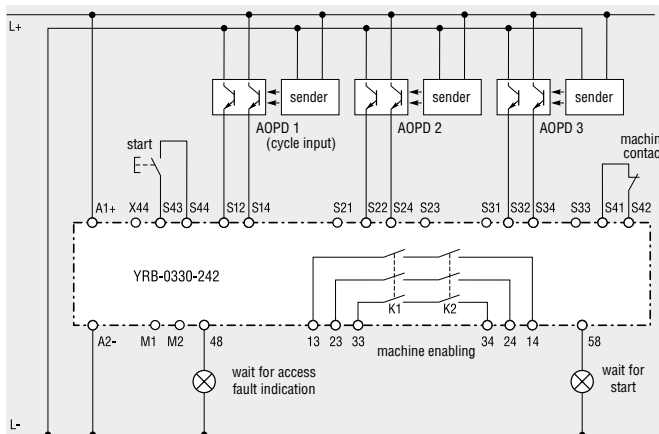


Diagram 4: Stepping operation with 3 AOPDs

ACCESSORIES

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

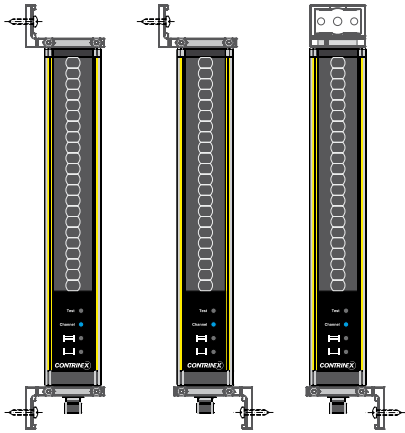
RFID

Connectivity

Accessories

Glossary

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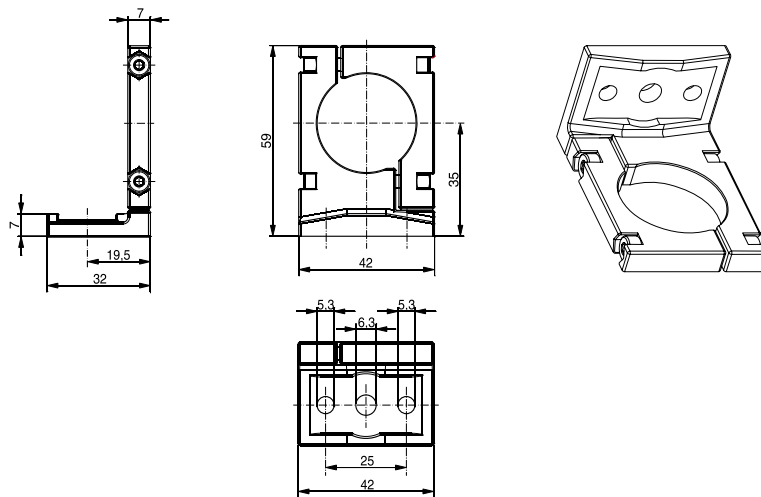
TOP/BOTTOM MOUNTING BRACKET

- Synthetic swivel mounting bracket
- Easy-to-use

A pair of mounting brackets is supplied with each light curtain or access control barrier unit.

DIMENSIONS

TOP/BOTTOM MOUNTING BRACKETS



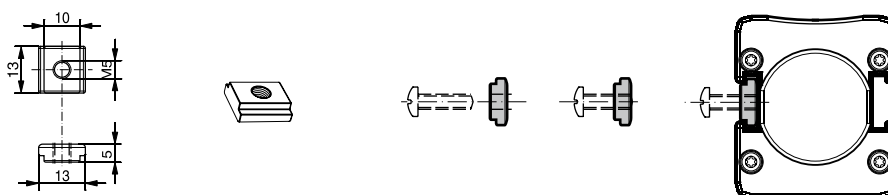
PART REFERENCE

Top/bottom mounting brackets, synthetic (pair)

YXW-0001-000

DIMENSIONS

SLIDING T-NUTS FOR SIDE MOUNTING

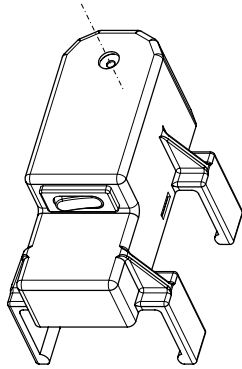


PART REFERENCE

T-nuts for side mounting, metal (pair)

YXW-0003-000

LASER ALIGNMENT TOOL



MAIN FEATURES

- Easily clippable onto Safetinx YBB and YCA devices
- Range : up to 50m
- Output power < 1 mW (class 2)
- Standard AA batteries

TECHNICAL DATA

Laser module optical output power	< 1 mW (class 2)
Laser beam spot size at 10 m	< 10 mm
Range	≤ 50 m
Housing material	PA with 30% fiberglass
Dimensions	80 mm x 48 mm x 56 mm

PART REFERENCE

Laser alignment tool	YXL-0001-000
----------------------	--------------



LASER ALIGNMENT TOOL



CABLE CONNECTORS

M12 4-POLE

TECHNICAL DATA

Rated voltage	250 V AC/DC max.
Rated current	4 A max.
Sleeve material	PUR non-flammable IEC 332-2, halogen-free DIN VDE 0472 part 815, silicone-free, RoHS
Wire structure	4 x 0.34 mm ²
Wire insulation	PP, halogen-free
Outer cable diameter	∅ 4.7 mm
Temperature range	-25 ... +80 °C (-13 ... +175 °F)
Degree of protection	IP 67
Certification	UL E227529, section 4

PART REFERENCE

PUR, unshielded, S12 4-pole, 2 m	S12-4FUG-020
PUR, unshielded, S12 4-pole, 5 m	S12-4FUG-050
PUR, unshielded, S12 4-pole, 10 m	S12-4FUG-100

M12 4-POLE WITH V4A (AISI 316L/DIN 1.4404) CONNECTORS (FOOD SAFE)

TECHNICAL DATA

Rated voltage	32 V AC/DC max.
Rated current	4 A max.
Sleeve material	PVC
Wire structure	4 x 0.34 mm ²
Wire insulation	PVC
Outer cable diameter	∅ 5.2 mm ± 5 %
Temperature range	-5 ... +70 °C (+23 ... +158 °F)
Degree of protection	IP 67, IP 68 & IP 69K
Certification	CSA, Ecolab

PART REFERENCE

PVC, unshielded, S12 4-pole, 2 m	S12-4FVG-020-NNLN
PVC, unshielded, S12 4-pole, 5 m	S12-4FVG-050-NNLN
PVC, unshielded, S12 4-pole, 10 m	S12-4FVG-100-NNLN

M12 5-POLE SHIELDED

TECHNICAL DATA

Rated voltage	60 V AC/DC max.
Rated current	4 A max. per contact
Electromagnetic protection	shielded
Sleeve material	PUR
Wire structure	5 x 0.34 mm ²
Wire insulation	PP
Outer cable diameter	∅ 6.3 mm ± 5 %
Temperature range	-25 ... +80 °C (-13 ... +175 °F)
Degree of protection	IP 67
Certification	UL, CSA

PART REFERENCE

PUR, shielded, S12 5-pole, 2 m	S12-5FUG-020-NWSN
PUR, shielded, S12 5-pole, 5 m	S12-5FUG-050-NWSN
PUR, shielded, S12 5-pole, 10 m	S12-5FUG-100-NWSN

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

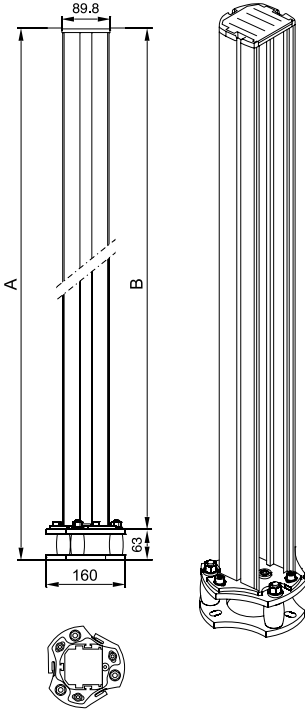
Accessories

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DEVICE COLUMNS

DIMENSIONS



DEVICE COLUMNS FOR LIGHT CURTAINS AND ACCESS CONTROL BARRIERS

- Robust protective profile, attractive design
- Special spring elements automatically reset position in case of mechanical impact
- Complete assembly kit for both device and floor mounting included
- Easy to mount: vertical and axial adjustments can be quickly completed in just a few steps

APPLICATION AREA

Free-standing floor mounting for safety light curtains and access control barriers, such as Safetinx YBB and YCA models

TECHNICAL DATA

Housing
Surface

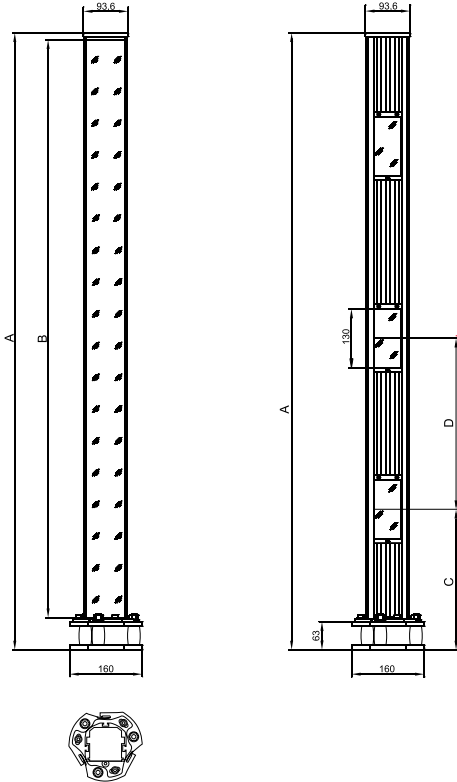
Aluminum profile and steel floor plates
Powder-varnished, yellow (RAL 1021)

PART REFERENCE

Device column	Total height (A) [mm]	Housing height (B) [mm]	Suitable for
YXC-1060-F00	1060	977	YBB-####-0150-#### to YBB-####-0800-####
YXC-1360-F00	1360	1277	YBB-####-0900-####, YBB-####-1000-####, YCA-####-3400-####, YCA-####-4300-####
YXC-1660-F00	1660	1577	YBB-####-1200-#### to YBB-####-1400-####, YCA-####-3500-####, YCA-####-5300-####, YCA-####-4400-####
YXC-1960-F00	1960	1877	YBB-####-1600-####, YBB-####-1700-####, YCA-####-6300-####

MIRROR COLUMNS

DIMENSIONS



MIRROR COLUMNS FOR LIGHT CURTAINS AND ACCESS CONTROL BARRIERS

- Robust protective profile, attractive design
- **Special spring elements automatically reset position in case of mechanical impact**
- Complete assembly kit for both device and floor mounting included
- Easy to mount: vertical and axial adjustments can be quickly completed in just a few steps
- Single mirror or exchangeable and separately adjustable individual mirrors in accordance with EN 999

APPLICATION AREA

The mirror columns YXC-####-M## are used for the beam deflection of safety light curtains and access control barriers, such as Safetinex YBB and YCA models, in order to achieve multi-sided safeguarding of danger zones, while eliminating the need for additional light curtains or access control barriers. Spring elements at the base of the column provide for automatic reset following mechanical impact.

YXC-####-M11 models feature a single large mirror and are therefore suitable for use with light curtains as well as access control barriers. YXC-1360-M23/M24, on the other hand, feature 3 or 4 smaller mirrors and may consequently only be used with access control barriers.

TECHNICAL DATA

Housing	Aluminum profile and steel floor plates
Surface	Powder-varnished, yellow (RAL 1021)

PART REFERENCE

Single-mirror column	Total height (A) [mm]	Mirror height (B) [mm]	Multi-mirror column	Total height (A) [mm]	Beam gap (D) [mm]	Height lowest beam (C) [mm]
YXC-1060-M11	1060	974	YXC-1360-M23	1360	2 x 400	300
YXC-1360-M11	1360	1274	YXC-1360-M24	1360	3 x 300	300
YXC-1660-M11	1660	1574				
YXC-1960-M11	1960	1874				

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

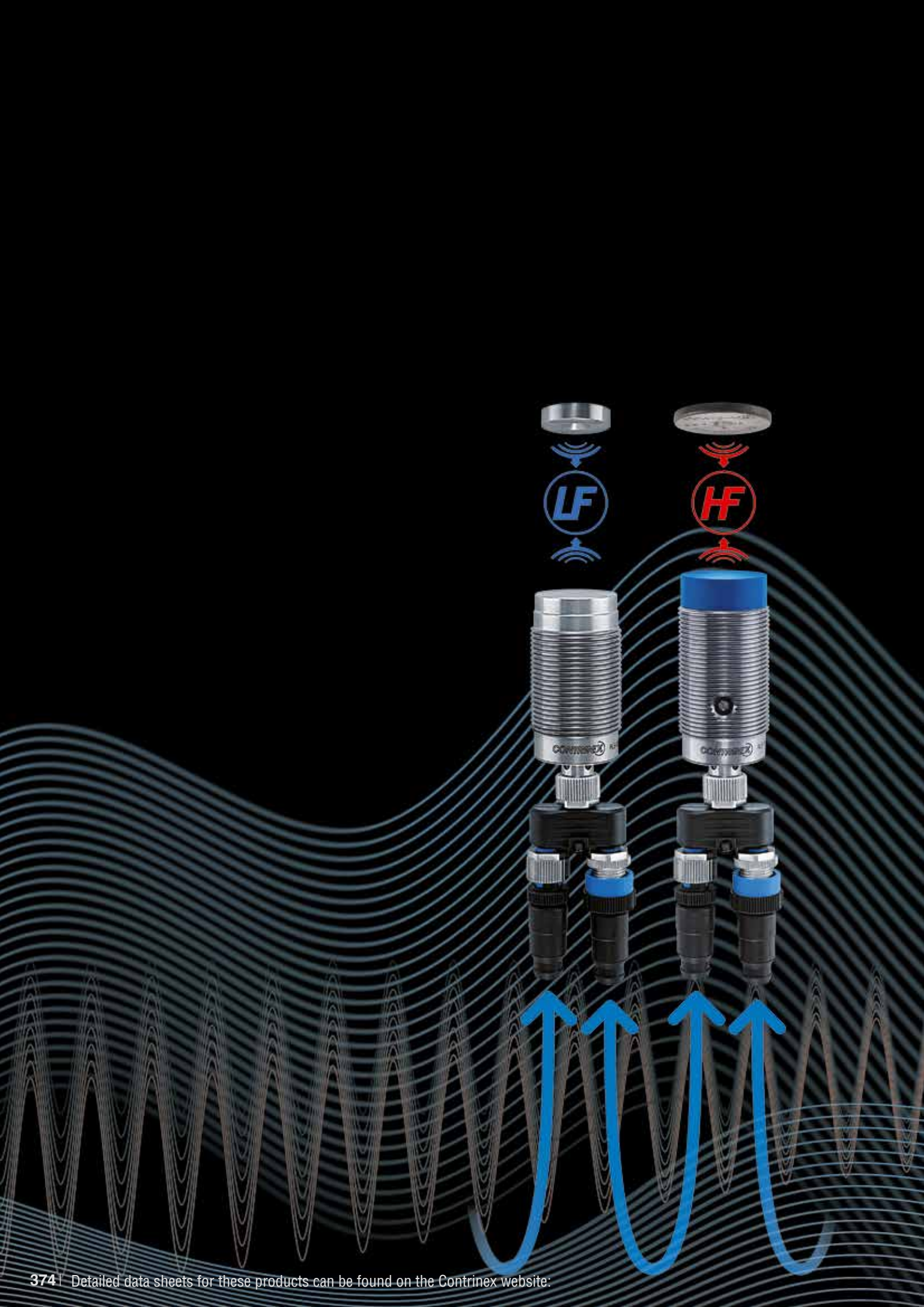
RFID

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RADIO FREQUENCY IDENTIFICATION SYSTEMS (RFID)

RFID

LOW AND HIGH FREQUENCY

HIGHLIGHTS

- ✓ Low and high frequency systems networkable on ContriNet

Low-frequency system

- ✓ All-metal housings, IP 68 and IP 69K
- ✓ Food safe and saltwater resistant (316L/V4A)
- ✓ VHT tags for very high temperatures, up to 180°C (356°F)
- ✓ All tags embeddable in metal

High-frequency system

- ✓ ISO/IEC 15693 compatible
- ✓ VHT tags for very high temperatures, embeddable in metal
- ✓ UHT tags for ultra high temperatures, up to 250°C (482°F)
- ✓ IO-Link read/Write Modules

INTRODUCTION

RFID SYSTEMS

RFID (Radio Frequency Identification) is used in numerous automation and logistics domains. It allows objects to be identified by means of electronic labels (transponders or tags).

Compared to classic systems, such as bar codes or laser marking, RFID technology offers important advantages. Transponder information can be read or written even when there is no direct line of vision between it and the Read/Write Module. In addition, information can be added, modified or replaced. It is a useful technology for automated production, reducing human error while increasing reliability, flexibility and traceability.

Conident® is the general name of the Contrinex RFID system, including transponders, Read/Write Modules and interfaces in both low frequency (LF) and high frequency (HF) technology.

ContriNet is the name of the Contrinex RFID network. This network is particularly user friendly since it allows the connection of LF and/or HF Read/Write Modules in the same network, reducing the number of interfaces. **ContriNet** is an RS485 network with a specific Contrinex protocol.

An RFID system always has the structure illustrated on page 377.

LOW FREQUENCY (LF) RFID (31.25 kHz)

Contrinex LF RFID technology features not only conventional components, but also a range of all-metal Read/Write Modules and transponders in stainless steel. These devices are particularly suitable for difficult operating environments where they will be exposed to cleaning, harsh chemicals, water and frost. They are highly resistant to mechanical shocks.

- Reads and writes through metal
- Works in a metallic environment
- Works in harsh environments
- Non-standard technology
- Very high temperature tags (VHT 180°C / 356°F) embeddable in metal

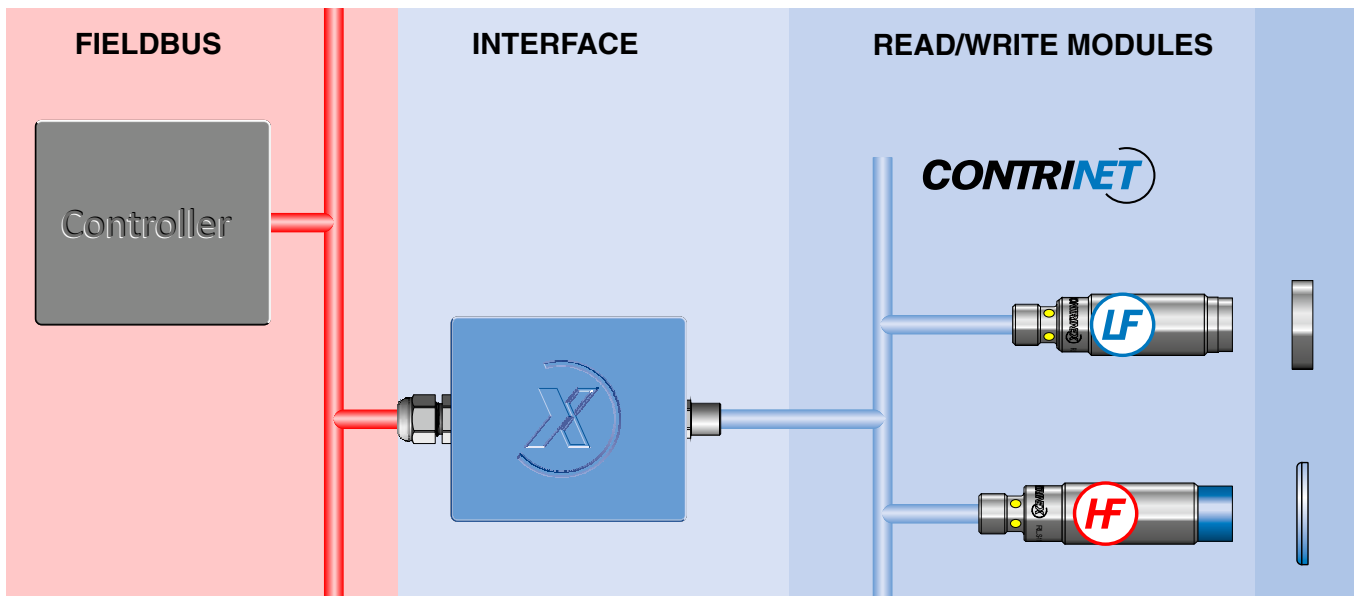
HIGH FREQUENCY (HF) RFID (13.56 MHz)

Contrinex HF RFID technology complies with ISO/IEC 15693 and is therefore open to any components that meet this standard. HF systems allow fast communication between transponders and Read/Write Modules as well as extended functionality for tag data protection.

- ISO/IEC 15693
- Ultra high temperature tags (UHT 250°C / 482°F)
- Very high temperature tags (VHT 180°C / 356°F) embeddable in metal

RFID COMPONENTS

- **Transponders (or tags):** A transponder is an electronic label that stores data. Transponder memory includes a unique preset number as an identifier and a writeable zone specific to the object. Writeable data may include, for example, the object's history or the parameters of operations to which it will be subjected.
- **Read/Write Modules (RWMs):** A Read/Write Module is a device that allows data to be written to or read from a transponder.
- **Interface:** The interface connects the Read/Write Modules to an industrial fieldbus.



Communication between the RWM and any tags is provided by the modulation of a carrier. The frequency indicated for any RFID system is the frequency of its carrier.

APPLICATIONS

WASHING STATIONS

In the harsh environment of a washing station, RFID transponders and Read/Write Modules are exposed to hot water, mechanical shocks, corrosive chemicals and high-pressure jetting. Despite these challenges, identification systems must operate continuously with high reliability.

Typically, RFID tags are mounted on the part carriers. On arrival at the washing station, information from the tag is used to select the correct washing cycle for the part type and process.

Conident® advantages

ConID passive tags require no power source and minimal maintenance. Rugged, low frequency tags with all-metal housings are sealed to IP 67 or IP 69K to resist water penetration and can withstand temperatures up to 180°C (+356°F). Their extended sensing range reduces the risk of mechanical damage. Read/write units interface directly with customer control systems.



MACHINE TOOLS

The presence under pressure of lubricating and cooling fluids, combined with metal particles, makes the machine tool environment particularly difficult. Identification components must resist fluid penetration to prevent downtime and ensure the reliability of data.

An industrial network of Read/Write Modules, interfaces and tags forms a complete RFID system to control the path of each workpiece through all machining cycles, programming and logging every step.

Conident® advantages

All-metal, low-frequency tags and Read/Write Modules are resistant to corrosion, impact and abrasion. For use in the harshest environments, laser welded tags are fully sealed and can be embedded in metal. They function reliably in water, withstand high pressure cleaning and resist aggressive solvents. Tags are optimized for operating temperatures from -40 to +180°C (-40 to +356°F) and have a protection rating of IP 68 and IP 69K. Read/Write Modules are not influenced by the presence of metal particles.



TESTING LINES

Product testing lines may comprise several test stations, each performing a fixed sequence of tests. For efficient diagnosis, identification systems must integrate well into the overall control system.

In a typical RFID system, part carriers are equipped with tags and every test station has a Read/Write Module (RWM). To program the testing machine, the RWM reads from each tag the type of test required for an individual part. After each test, the RWM writes the results back into the appropriate tag memory. Test reports are automatically forwarded to the controller for product acceptance or rejection and fault correction.

Conident® advantages

The Contrinex HF RFID system includes numerous interfaces for integration into control systems. The structure is extremely simple, with just one master for all Read/Write Modules. Direct connection to an RS485 bus is possible. ConID HF software allows RFID components to be tested using an ordinary PC. System stability and EMC characteristics are very good.



PAINT SHOPS

Identification components in paint shops are exposed to a variety of rinsing, coating and burning operations, including electrophoresis. Since soiling makes visual identification difficult or impossible, rugged RFID systems are an excellent solution.

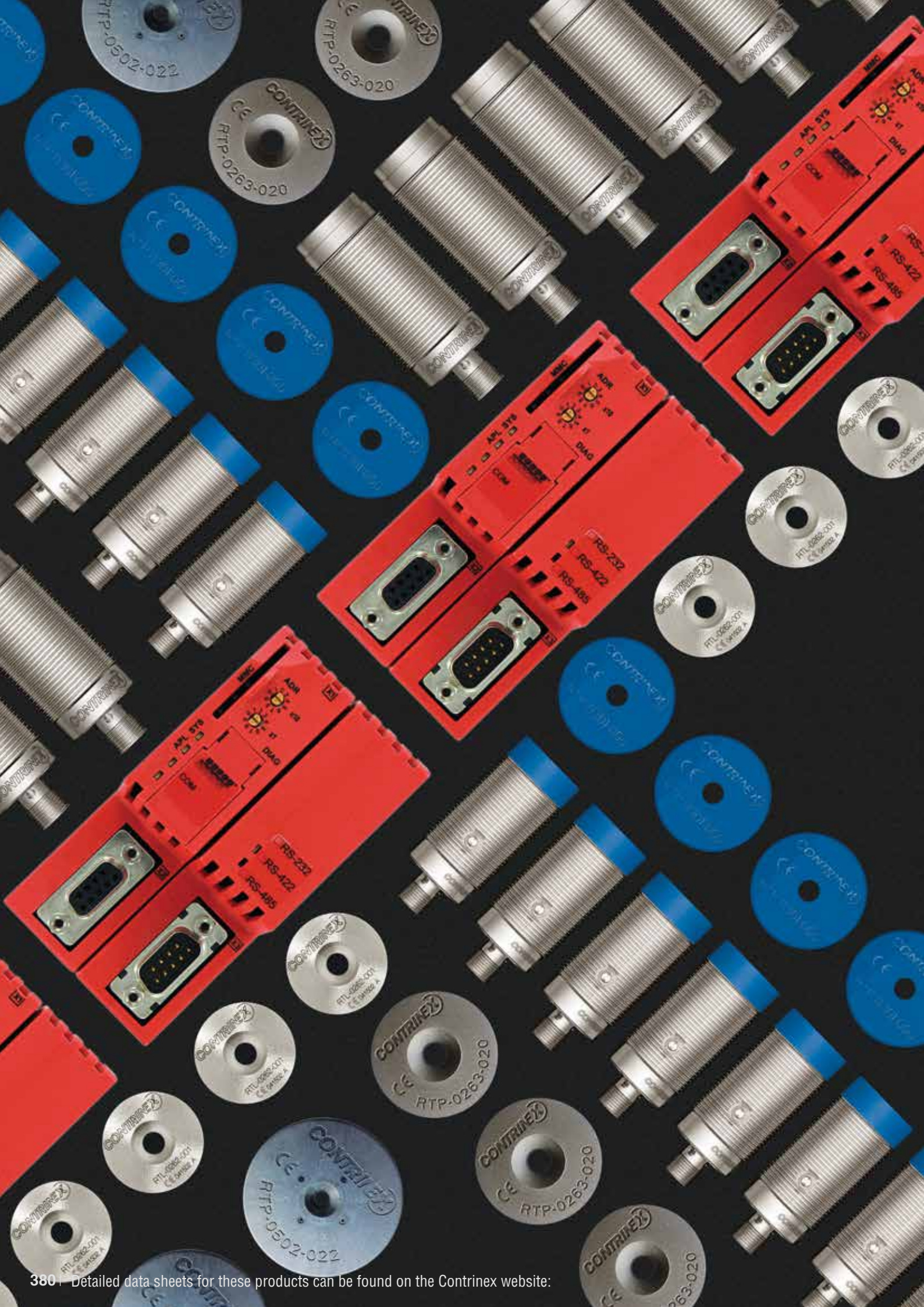
The RFID tag accompanies each product throughout all processes. It can store individual data, including customer requirements, directly on the product or carrier. This allows for highly automated, customized processes with smaller batches and central data storage.

Conident® advantages

The high-frequency system includes specially adapted, high-temperature tags with IP68/IP69K protection. Their silicone-free composition makes them ideal for paint-shop applications. They are resistant to various detergents and can be read/written directly on leaving the high temperature zone (cooling not required):

- Tag RTP-0263-020, for embedded or non-embedded mounting in metal; Ø 26 mm (1.02”), temperature resistant up to 180°C (356°F)
- Tag RTP-0502-022, non-embeddable; Ø 50 mm (1.97”), temperature resistant up to 250°C (482°F).







LF **HF** TRANSPONDERS 384-395

LF **HF** CONTRINET 396-409

HF IO-LINK READ/WRITE MODULES 410-413

LF **HF** USB READ/WRITE MODULES 414-419

LF **HF** ACCESSORIES 420-423

LF **HF** SOFTWARE 424-427



PROGRAM OVERVIEW

		LOW FREQUENCY	HIGH FREQUENCY
TRANSPONDERS	Transponders	p. 386-391	p. 392-395
CONTRINET	Read/Write Modules	p. 400-401	p. 401
	Interfaces:	p. 402-406	p. 402-406
	PROFIBUS-DP	p. 402	p. 402
	DeviceNet	p. 403	p. 403
	EtherNet/IP / PROFINet IO	p. 403	p. 403
	EtherCat / POWERLINK	p. 403	p. 403
	TCP/IP industrial interfaces	p. 405-406	p. 405-406
USB Adaptor	p. 407-408	p. 407-408	
IO-LINK R/W MODULES	IO-Link Read/Write Modules		p. 412-413
USB R/W MODULES	USB Read/Write Modules	p. 416	p. 417
SOFTWARE	Demonstration software	p. 426	p. 426
	Tree View	p. 426	p. 426
	Working area / Captured packets	p. 427	p. 427

TRANSPONDER OVERVIEW

LOW FREQUENCY TRANSPONDERS (PASSIVE)

TRANSPONDER	Mounting	Material	Characteristics	Page
RTM / RTF Ø 10 - Ø 26 M16 - M30	Embeddable or non-embeddable	Stainless steel V2A	-40 ... +80°C (-40 to +176°F)	388-389
RTL Ø 10 - Ø 26 M16 - M30	Embeddable or non-embeddable	Stainless steel V4A	-40 ... +125°C or +180°C (-40 ... +257°F or +356°F) IP 68 & IP 69K Food safe Corrosion resistant	390-391
RTP Ø 20 - Ø 50	Embeddable	PBTP glass-fiber reinforced	-40 ... +125°C (-40 to +257°F) IP 68 & IP 69K Food safe Corrosion resistant Insensitive to soiling	387

HIGH FREQUENCY TRANSPONDERS (PASSIVE)

TRANSPONDER	Mounting	Material	Characteristics	Page
RTP Ø 20 - Ø 50	Non-embeddable	PBTP glass-fiber reinforced	-25 ... +85°C (-13 to +185°F) IP 67 Compatible with ISO/IEC 15693 Insensitive to soiling	393
RTP Ø 9	Non-embeddable	PPS and epoxy	-25 ... +85°C (-13 to +185°F) IP 67 Compatible with ISO/IEC 15693 Insensitive to soiling	394
RTP Ø 50	Non-embeddable	LCP	-25 ... +250°C (-13 to +482°F) IP 68 & IP 69K Compatible with ISO/IEC 15693 Insensitive to soiling	395
RTP Ø 26	Embeddable mounting in metal	PPS	-25 ... +180°C (-13 to +356°F) IP 68 & IP 69K Compatible with ISO/IEC 15693 Insensitive to soiling	394

Inductive

Photoelectric

Ultrasonic

Capacitive

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TRANSPONDERS FOR ALL ENVIRONMENTS

TRANSPONDERS



KEY ADVANTAGES

- ✓ Passive (no battery)
- ✓ LF and HF can be used in same application

LF

- ✓ Stainless steel tags (transponders) for harsh environments
- ✓ Insensitive to soiling
- ✓ Food safe and saltwater resistant tags, IP 69K
- ✓ Tags readable/writeable through metal

HF

- ✓ Compatible with ISO/IEC 15693
- ✓ Insensitive to soiling
- ✓ Tags for temperatures up to 250°C (482°F)
- ✓ PPS tags that can be embedded in metal, IP 69K



LOW FREQUENCY

STRUCTURE OF MEMORY

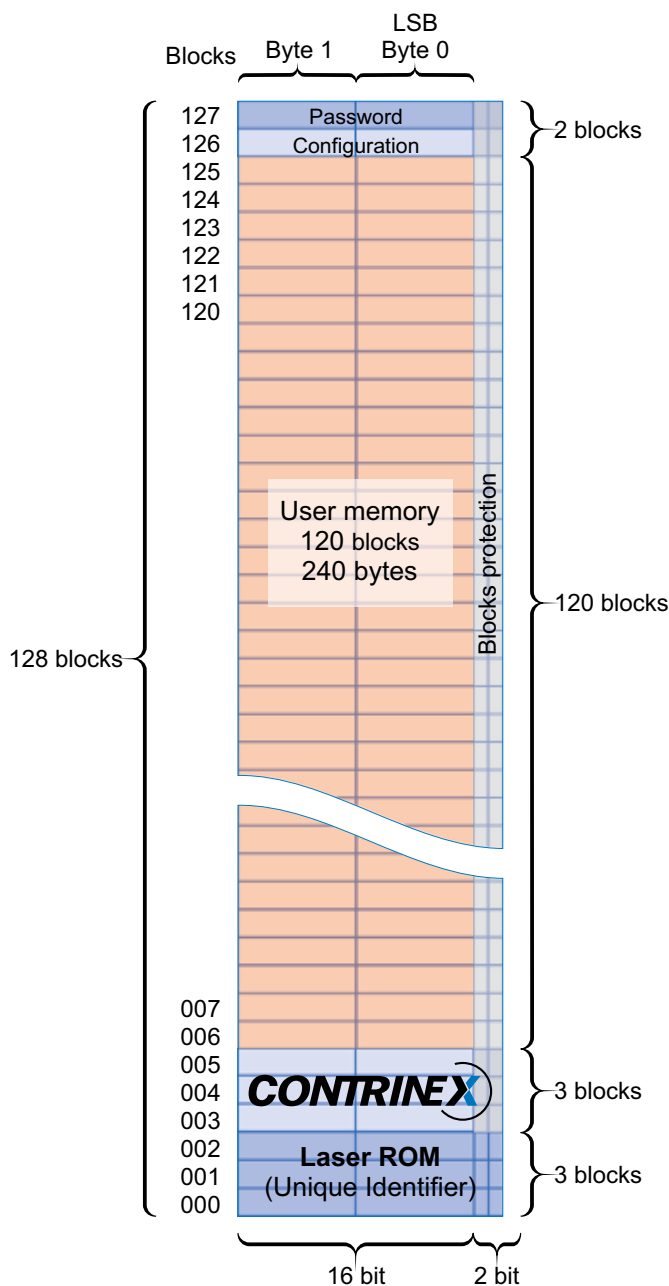
PLASTIC

HOUSING SIZE

MAX. READ/WRITE DISTANCE MM

TECHNICAL DATA

Compatible IC type	EM4056
Read/write memory	240 byte
Read only memory	12 byte



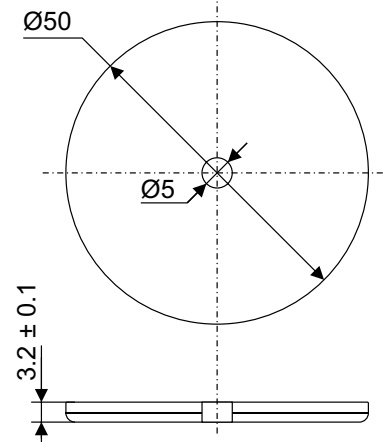
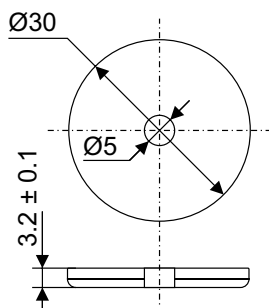
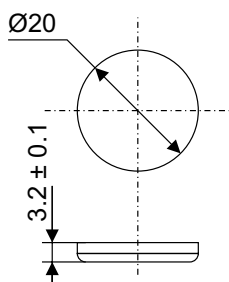
Various tag memory protection possibilities are provided, including password protection and OTP write protection of data blocks.

DATA

Housing material	
Mounting	
Ambient temperature range	
Weight	
Part reference	

TRANSPONDERS

Ø 20	Ø 30	Ø 50
28	29	41



PBTP glass-fiber reinforced Embeddable -40 ... +125°C / -40 ... +257°F 1.3 g RTP-0201-000	PBTP glass-fiber reinforced Embeddable -40 ... +125°C / -40 ... +257°F 2.3 g RTP-0301-000	PBTP glass-fiber reinforced Embeddable -40 ... +125°C / -40 ... +257°F 5.7 g RTP-0501-000
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Inductive

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Ultrasonic

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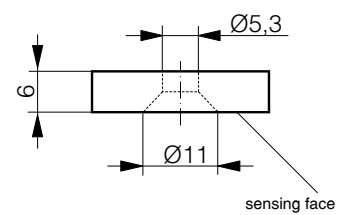
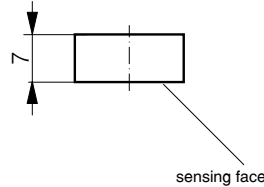
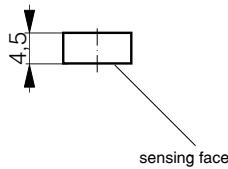
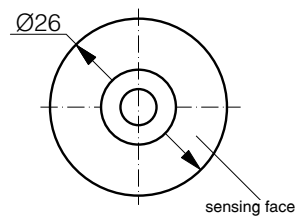
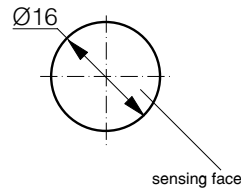
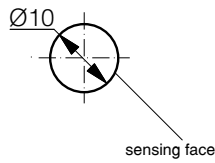
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LOW FREQUENCY

STAINLESS STEEL V2A

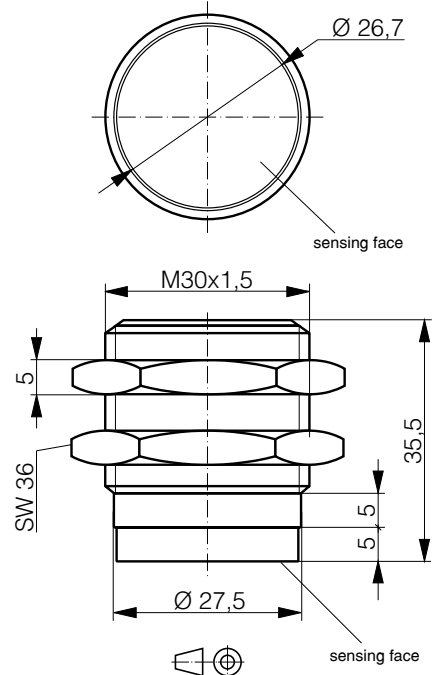
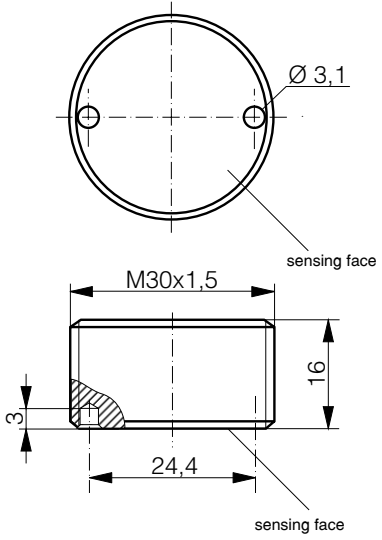
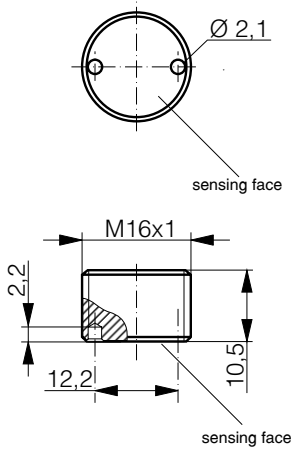
HOUSING SIZE MM	Ø 10	Ø 16	Ø 26
MAX. READ/WRITE DISTANCE MM	17	19	27



DATA			
Housing material	Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Mounting	Embeddable	Embeddable	Embeddable
Ambient temperature range	-40 ... +80°C / -40 ... +176°F	-40 ... +80°C / -40 ... +176°F	-40 ... +80°C / -40 ... +176°F
Weight	1.1 g	2.7 g	7.0 g
Part reference	RTM-0100-000	RTM-0160-000	RTM-0260-000

TRANSPONDERS

M16	M30	M30
13	18	23



Stainless steel V2A	Stainless steel V2A	Stainless steel V2A
Embeddable	Embeddable	Non-embeddable
-40 ... +80°C / -40 ... +176°F	-40 ... +80°C / -40 ... +176°F	-40 ... +80°C / -40 ... +176°F
6.9 g	31.4 g	98.7 g
RTM-2160-000	RTM-2300-000	RTF-1300-000

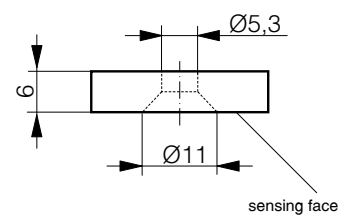
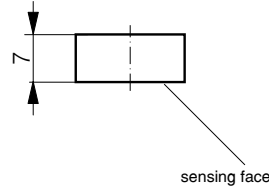
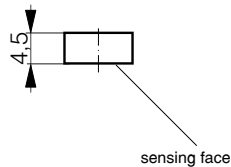
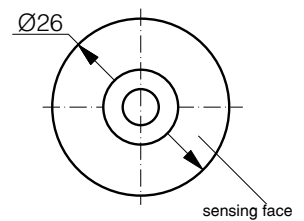
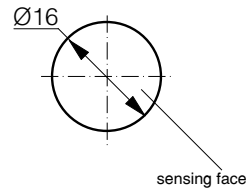
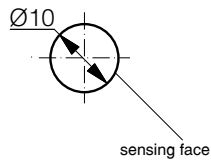
- Inductive
- Photoelectric
- Ultrasonic
- Capacitive
- Safety
- RFID
- Connectivity
- Accessories
- Glossary
- Index



LOW FREQUENCY

STAINLESS STEEL V4A, LASER WELDED

HOUSING SIZE MM	Ø 10	Ø 16	Ø 26
MAX. READ/WRITE DISTANCE MM	17	19	27

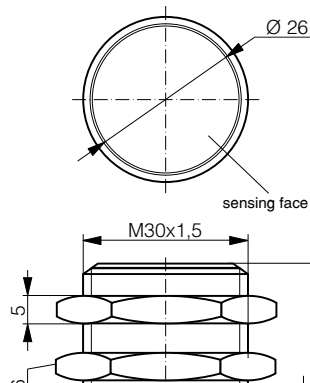
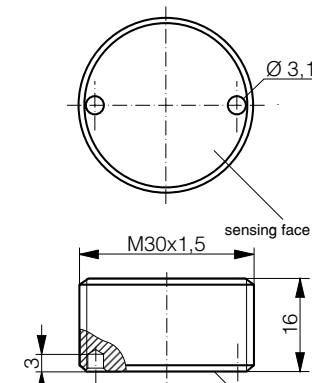
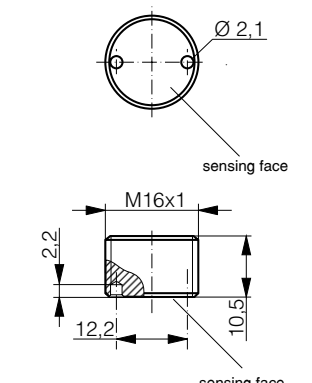
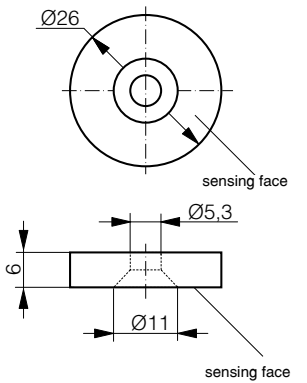


DATA	Ø 10	Ø 16	Ø 26
Housing material	Stainless steel V4A	Stainless steel V4A	Stainless steel V4A
Mounting	Embeddable	Embeddable	Embeddable
Ambient temperature range	-40 ... +125°C / -40 ... +257°F	-40 ... +125°C / -40 ... +257°F	-40 ... +125°C / -40 ... +257°F
Weight	1.5 g	3.3 g	12.5 g
Part reference	RTL-0102-001	RTL-0162-001	RTL-0262-001

TRANSPONDERS

Ø 26	M16	M30	M30
27	13	18	23

Inductive
Photoelectric
Ultrasonic
Capacitive
Safety
RFID
Connectivity
Accessories
Glossary
Index



Stainless steel V4A	Stainless steel V4A	Stainless steel V4A	Stainless steel V4A
Embeddable	Embeddable	Embeddable	Non-embeddable
-40 ... +180°C / -40 ... +356°F	-40 ... +125°C / -40 ... +257°F	-40 ... +125°C / -40 ... +257°F	-40 ... +125°C / -40 ... +257°F
12.5 g	7.9 g	33.1 g	44.1 g
RTL-0262-003	RTL-2162-001	RTL-2302-001	RTL-1302-001



HIGH FREQUENCY

STRUCTURE OF MEMORY

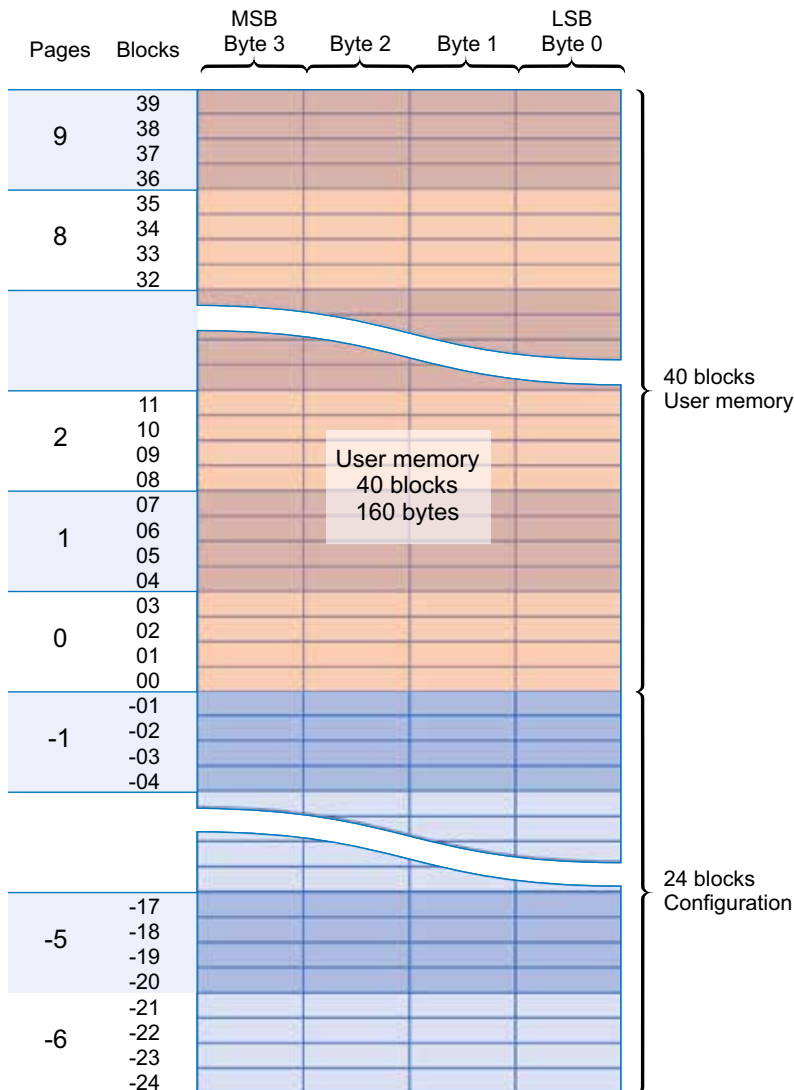
PLASTIC

HOUSING SIZE MM

MAX. READ/WRITE DISTANCE MM

TECHNICAL DATA

Compatible IC type	SL2 ICS53 I-Code SLI-S
Read/write memory	160 byte
Read only memory	96 byte
Standard	ISO/IEC 15693



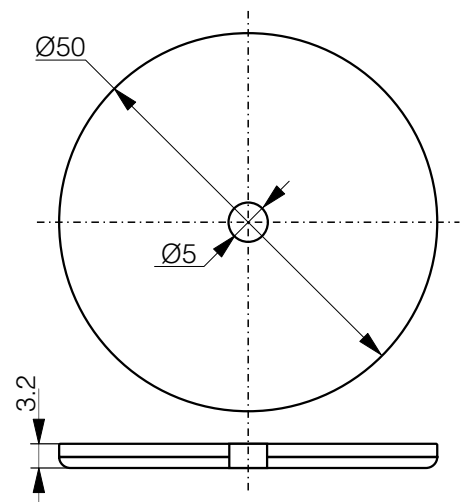
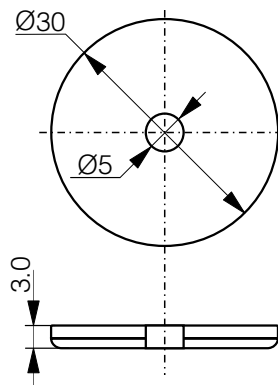
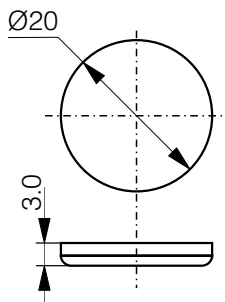
Various tag memory protection possibilities are provided, including password protection and OTP write protection of data blocks.

DATA

Housing material	
Mounting	
Ambient temperature range	
Weight	
Part reference	

TRANSPONDERS

Ø 20	Ø 30	Ø 50
26	36	47



PBTP glass-fiber reinforced	PBTP glass-fiber reinforced	PBTP glass-fiber reinforced
Non-embeddable	Non-embeddable	Non-embeddable
-25 ... +85°C / -13 ... +185°F	-25 ... +85°C / -13 ... +185°F	-25 ... +85°C / -13 ... +185°F
1.3 g	2.7 g	6.6 g
RTP-0201-020	RTP-0301-020	RTP-0501-020

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

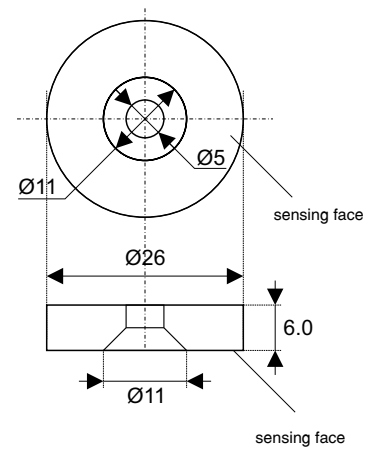
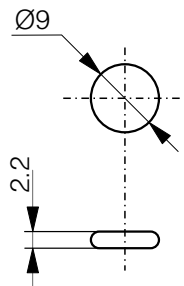
Glossary

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HIGH FREQUENCY

	PLASTIC	PLASTIC EMBEDDABLE IN METAL
HOUSING SIZE	Ø 9	Ø 26
MAX. READ/WRITE DISTANCE MM	16	34



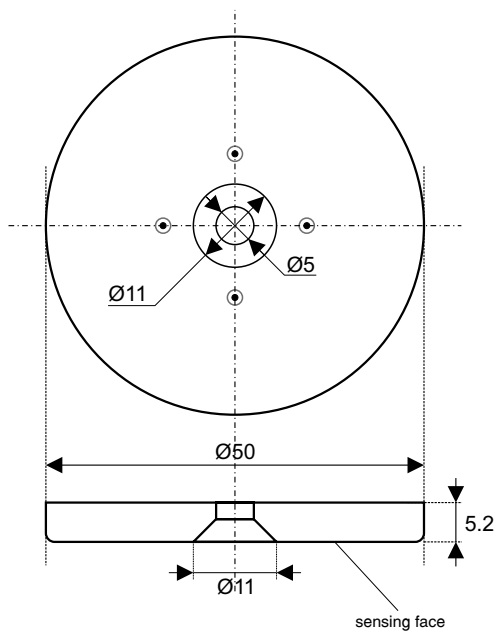
DATA		
Housing material	PPS + Epoxy	PPS, silicone free
Mounting	Non-embeddable	Embeddable
Ambient temperature range	-40 ... +85°C / -40 ... +185°F	-25 ... +180°C / -13 ... +356°F
Weight	0.25 g	3.3 g
Part reference	RTP-0090-020	RTP-0263-020

TRANSPONDERS

PLASTIC ULTRA HIGH TEMPERATURE

Ø 50

60



Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

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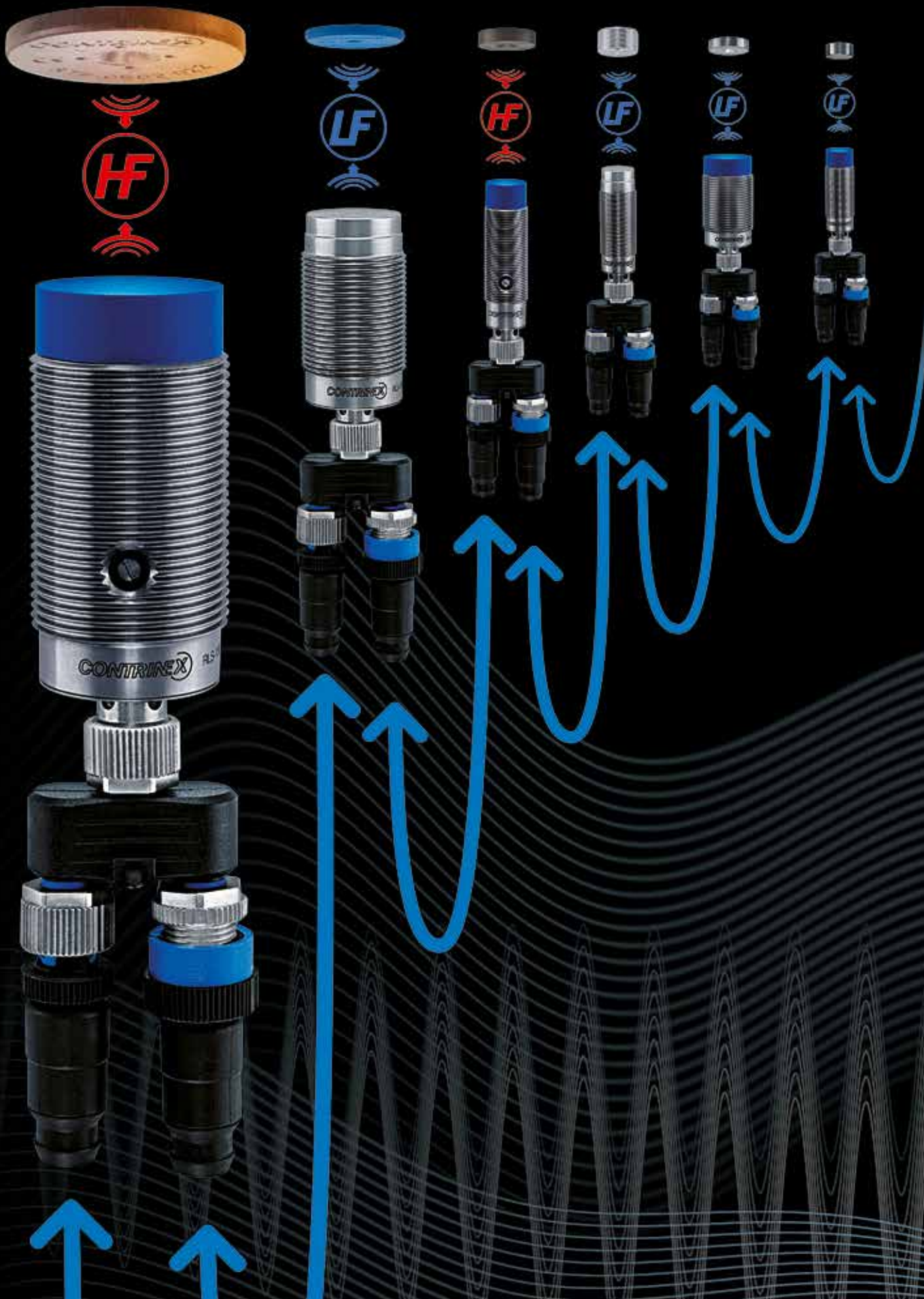
LCP (Liquid Crystal Polymer), silicone free

Non-embeddable

-25 ... +250°C / -13 ... +482°F

16.9 g

RTP-0502-022



THE CONTRINEX NETWORK

CONTRINET



LOW FREQUENCY



HIGH FREQUENCY

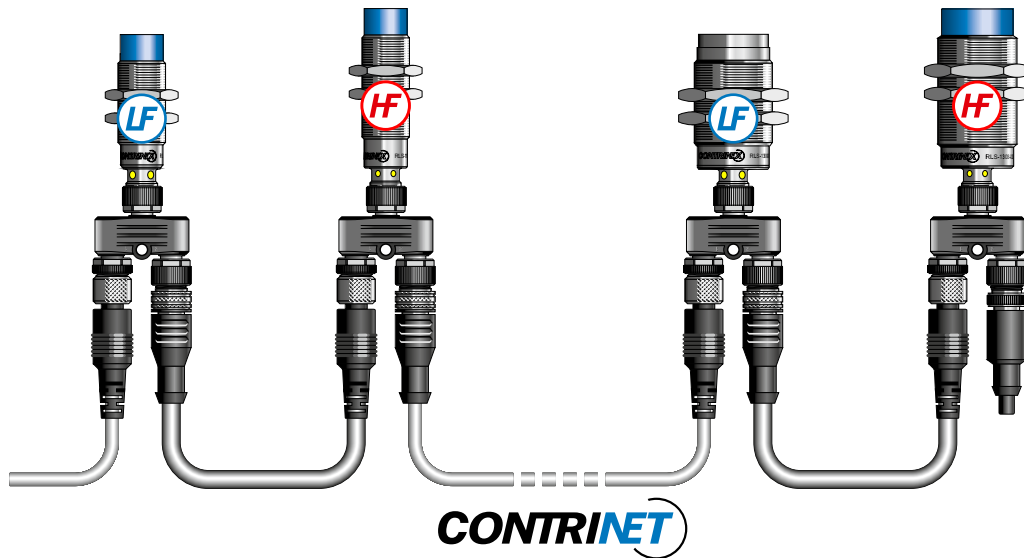
KEY ADVANTAGES

- ✓ Powerful RS485 network for LF and HF systems
- ✓ Threaded Read/Write Modules (RWMs) with S12 connector and RS485 output
- ✓ LF and HF RWMs can be mixed on the same network
- ✓ Rugged all-metal RWMs with impervious sensing face
- ✓ High-temperature RWMs for up to +125°C (257°F)
- ✓ Interfaces for most industrial fieldbuses and USB

CONTRINET

CONTRINET: THE CONTRINEX NETWORK

CONTRINET



ContriNet is the RFID network of Contrinex. It is an RS485 physical network with a specific Contrinex protocol. Full documentation is provided.


ContriNet allows LF and/or HF Read/Write Modules to be connected in series:

- Up to 10 with one USB interface
- Up to 31 with one industrial bus interface
- Up to 254 on a half-duplex RS485 interface

While the usual interfaces allow connection of a limited number of Read/Write Modules, the ContriNet network can be used to reduce the number of interfaces, which makes the ConID system more economic.

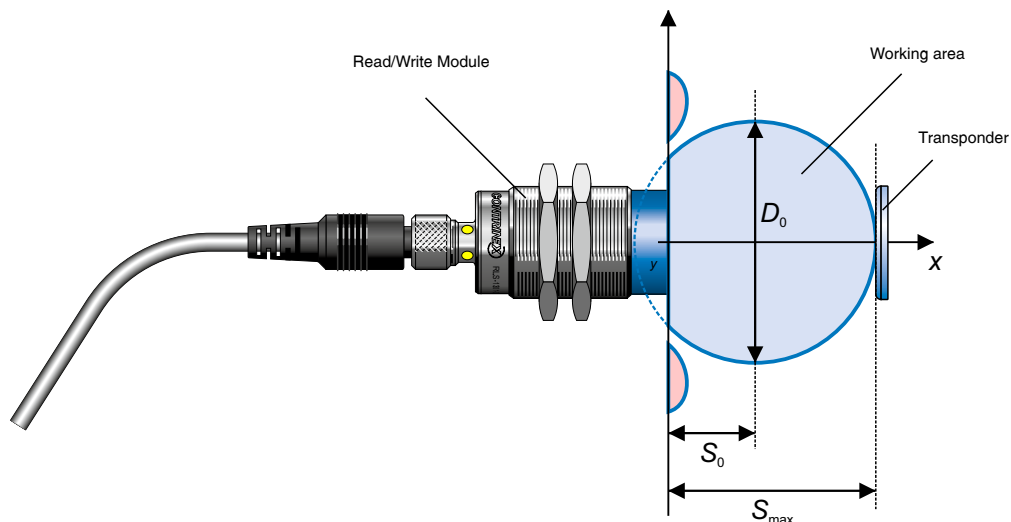
In principle, a ContriNet network can extend to a length of 200 m.

LOW FREQUENCY

	RLS-1180-030		RLS-1300-030		RLS-1181-030		RLS-1301-030	
	S_{max}	D_o	S_{max}	D_o	S_{max}	D_o	S_{max}	D_o
RTP-0201-000	7.7	14.0	4.5	22.2	25.4	28.8	28.0	32.3
RTP-0301-000	11.9	23.2	12.2	26.2	25.9	32.6	28.7	36.5
RTP-0501-000	7.4	59.1	7.8	47.8	36.3	49.3	40.7	52.2
RTM-0100-000	8.4	13.0	8.6	19.0	16.5	12.6	13.4	20.7
RTM-0160-000	10.7	15.9	12.1	21.6	17.1	21.1	18.7	25.7
RTM-0260-000	12.5	22.2	12.9	23.8	22.6	28.6	26.1	21.9
RTM-2160-000	6.3	8.6			12.5	16.0	12.5	20.4
RTM-2300-000	8.6	15.4	4.4	26.5	15.6	19.9	18.0	22.6
RTF-1300-000	11.9	20.4	12.4	22.8	20.7	26.6	22.8	29.8

HIGH FREQUENCY

	RLS-1183-020		RLS-1303-020	
	S_{max}	D_o	S_{max}	D_o
RTP-0201-020	14	19	26	31
RTP-0301-020	29	34	36	41
RTP-0501-020	24	46	47	54
RTP-0090-020	9	13	16	22
RTP-0263-020	22	26	34	37
RTP-0502-022	42	50	60	65



Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

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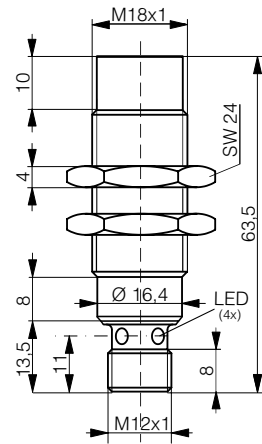
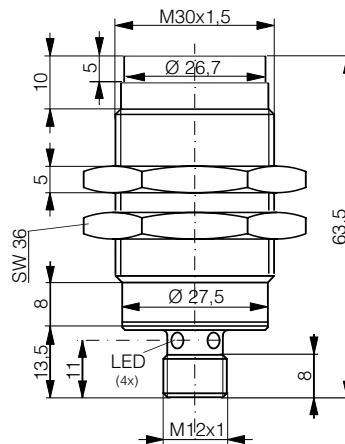
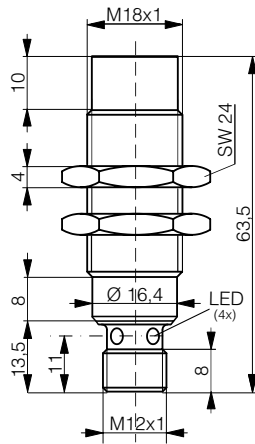
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CONTRINET

LOW FREQUENCY READ/WRITE MODULE

HOUSING SIZE	M18	M30	M18
MAX. READ/WRITE DISTANCE MM	12	13	37



DATA			
Housing material	Stainless steel V2A	Stainless steel V2A	PBTP / chrome-plated brass
Max. current consumption	30 mA	30 mA	30 mA
Mounting	Non-embeddable	Non-embeddable	Non-embeddable
Ambient temperature range	-25...+80°C / -13...+176°F	-25...+80°C / -13...+176°F	-25...+80°C / -13...+176°F
Storage temperature range	-25...+80°C / -13...+176°F	-25...+80°C / -13...+176°F	
Connection type	Connector S12	Connector S12	Connector S12
Weight (incl. nuts)	37 g	127 g	37 g
Part reference	RLS-1180-030	RLS-1300-030	RLS-1181-030



HIGH FREQUENCY READ/WRITE MODULE

M30

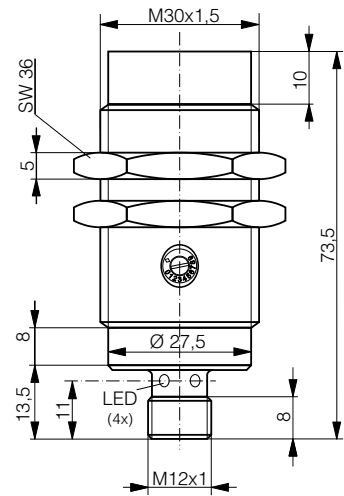
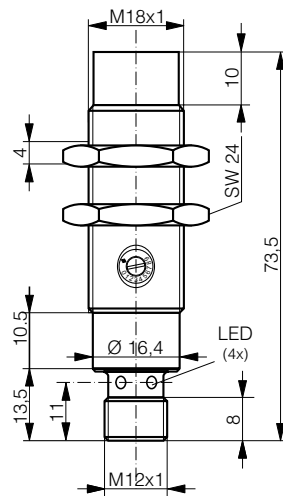
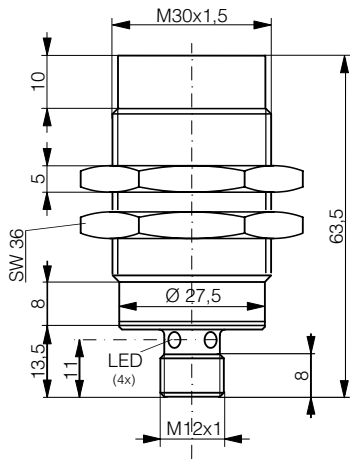
M18

M30

41

42

60



PBTP / chrome-plated brass

30 mA

Non-embeddable

-25...+80°C / -13...+176°F

Connector S12

127 g

RLS-1301-030

PBTP / Stainless steel V2A

60 mA

Non-embeddable

-25...+80°C / -13...+176°F

Connector S12

37 g

RLS-1183-020

PBTP / Stainless steel V2A

60 mA

Non-embeddable

-25...+80°C / -13...+176°F

Connector S12

95 g

RLS-1303-020

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

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CONTRINET

CONTRINET INTERFACES

HOUSING SIZE MM

100 X 52 X 64

FIELDBUS

PROFIBUS-DP



AT A GLANCE

- Compact, ready-to-use device
- Allows connection of ContriNet to an industrial fieldbus
- Synthetic housing in ABS
- Mounting on rail DIN EN 60715

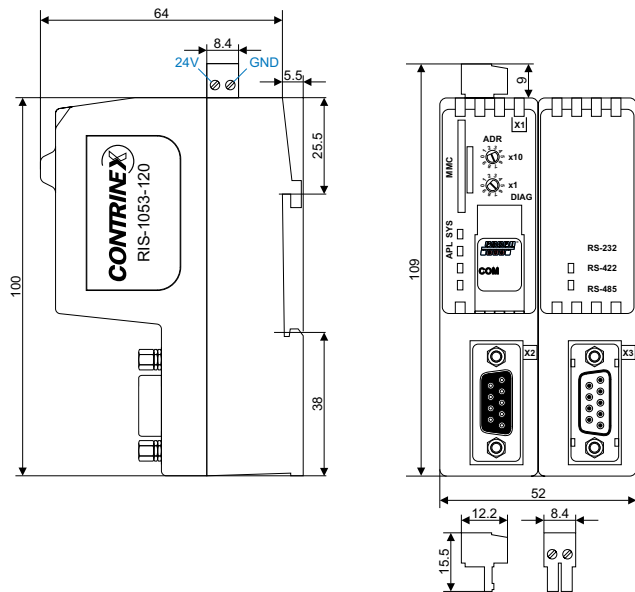
FIELDBUS

PROFIBUS-DP	RIS-1053-120
DeviceNet	RIS-1053-220
EtherNet/IP	RIS-1053-320
PROFINet IO	RIS-1053-520
EtherCAT	RIS-1053-620
POWERLINK	RIS-1053-820

FIRMWARE

On SD card

Selectable using the RIS-1053-X20 card configurator software



DATA

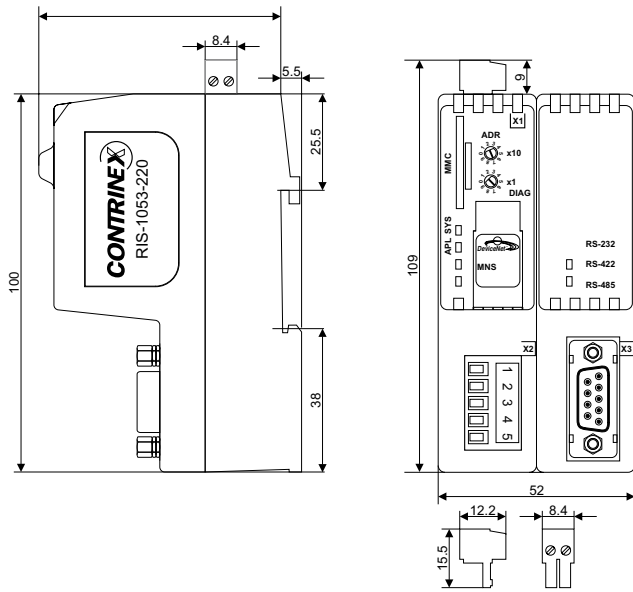
Housing material	ABS
Mounting	DIN rail EN 60715
Ambient temperature range	0 ... +50°C / +32 ... +122°F
Storage temperature range	0 ... +50°C / +32 ... +122°F
Weight	150 g
Part reference	RIS-1053-120

100 X 52 X 64


100 X 52 X 64

DEVICENET


**ETHERNET/IP / PROFINET IO
ETHERCAT / POWERLINK**



- APL SYS
-
-
-
-


MS
NS


- APL SYS
-
-
-
-


SF
BF

- APL SYS
-
-
-
-


RUN
ERR

- APL SYS
-
-
-
-


BS
BE

ABS

ABS

DIN rail EN 60715

DIN rail EN 60715

0 ... +50°C / +32 ... +122°F

0 ... +50°C / +32 ... +122°F

0 ... +50°C / +32 ... +122°F

0 ... +50°C / +32 ... +122°F

150 g

150 g

RIS-1053-220

RIS-1053-E20

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

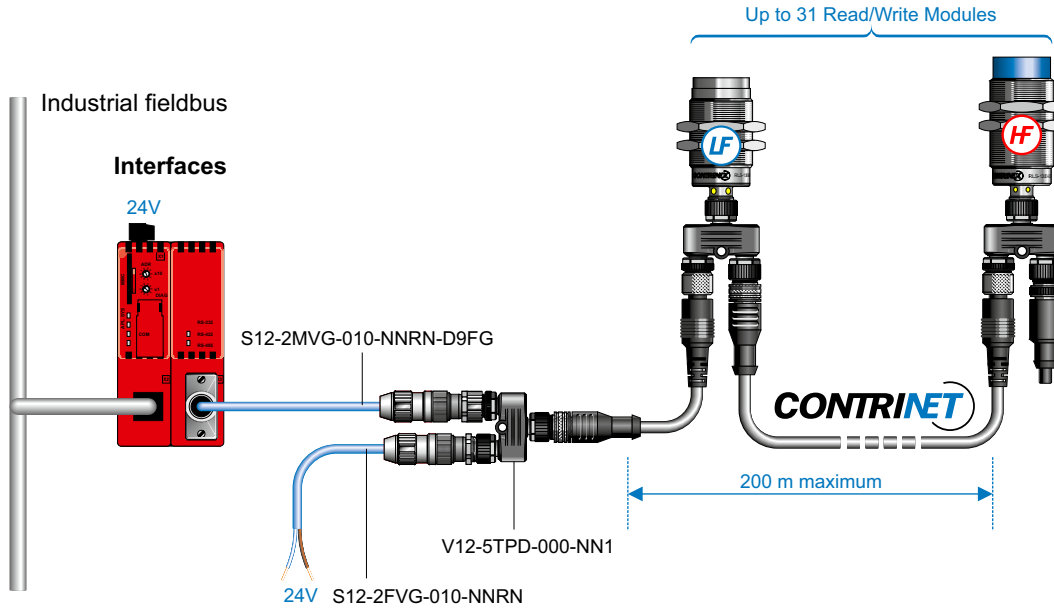
Accessories

Glossary

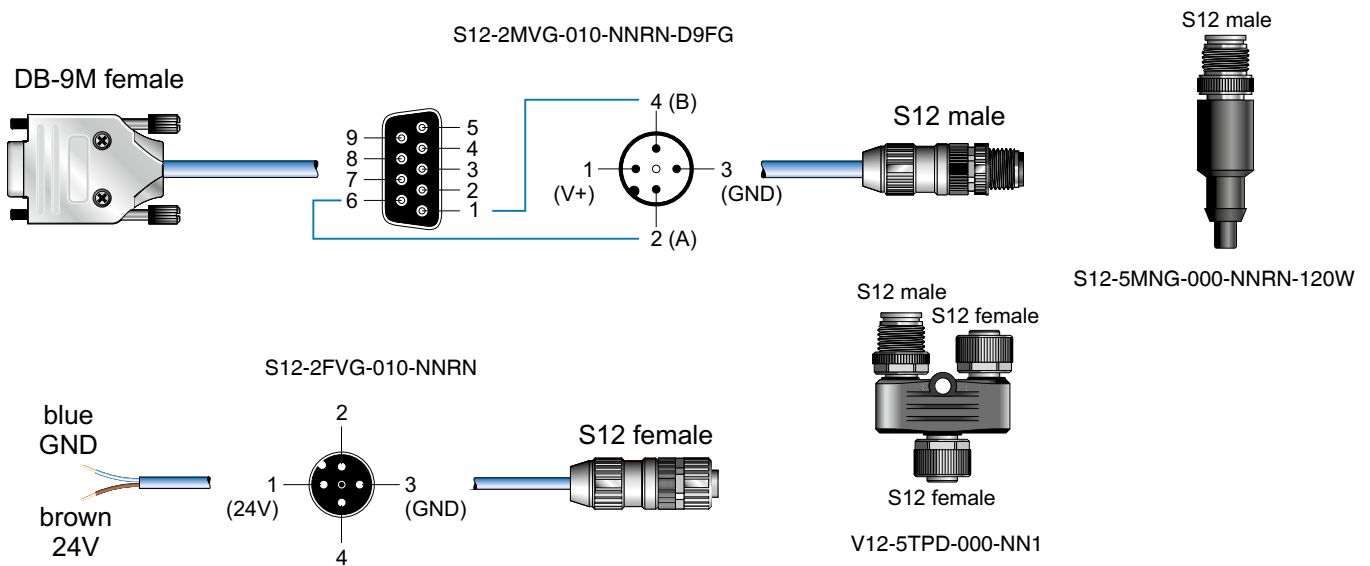
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CONTRINET

CONTRINET APPLICATION WITH INTERFACES



ACCESSORIES TO CONNECT INTERFACES TO CONTRINET



*Other cables available page 423

DATA

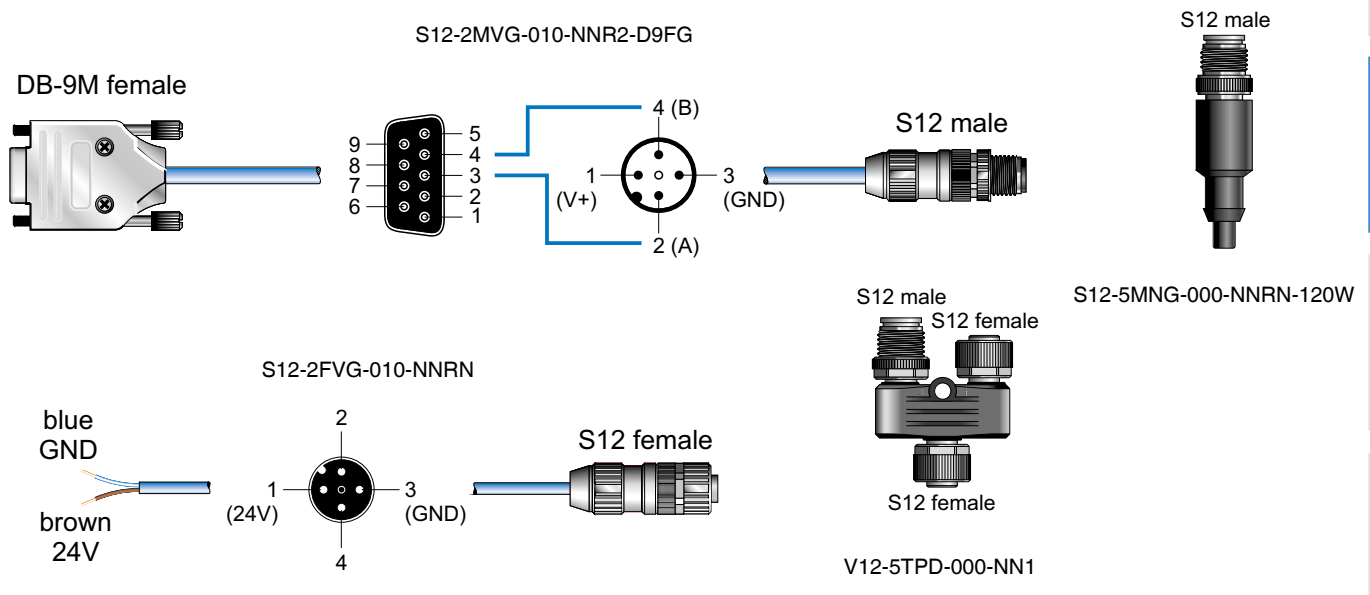
S12-2MVG-010-NNRN-D9FG	S12 - DB9 RIS HF PVC 1 m
S12-2FVG-010-NNRN	24V - S12 power supply cable
V12-5TPD-000-NN1	S12 T-connector
S12-4MNG-000-NNT2	S12 male connector
S12-4FNG-000-NNT2	S12 female connector
S12-5MNG-000-NNRN-120W	S12 ContriNet terminator 120 Ω

TCP/IP INDUSTRIAL INTERFACE



RIS-1613-400

ACCESSORIES TO CONNECT TCP/IP INTERFACE TO CONTRINET



DATA

S12-2MVG-010-NNR2-D9FG	DB9 - S12 cable
S12-2FVG-010-NNRN	24V - S12 power supply cable
V12-5TPD-000-NN1	S12 T-connector
S12-5MNG-000-NNRN-120W	S12 ContriNet terminator 120 Ω

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

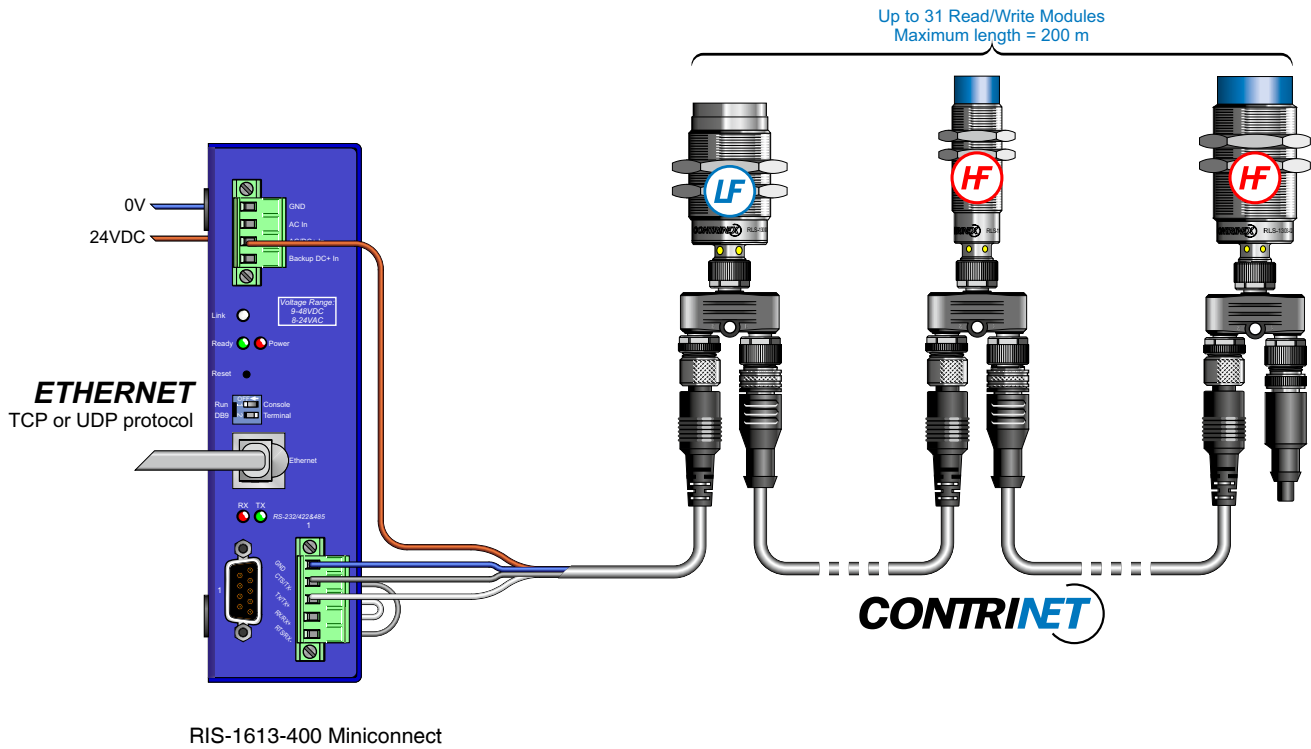
Accessories

Glossary

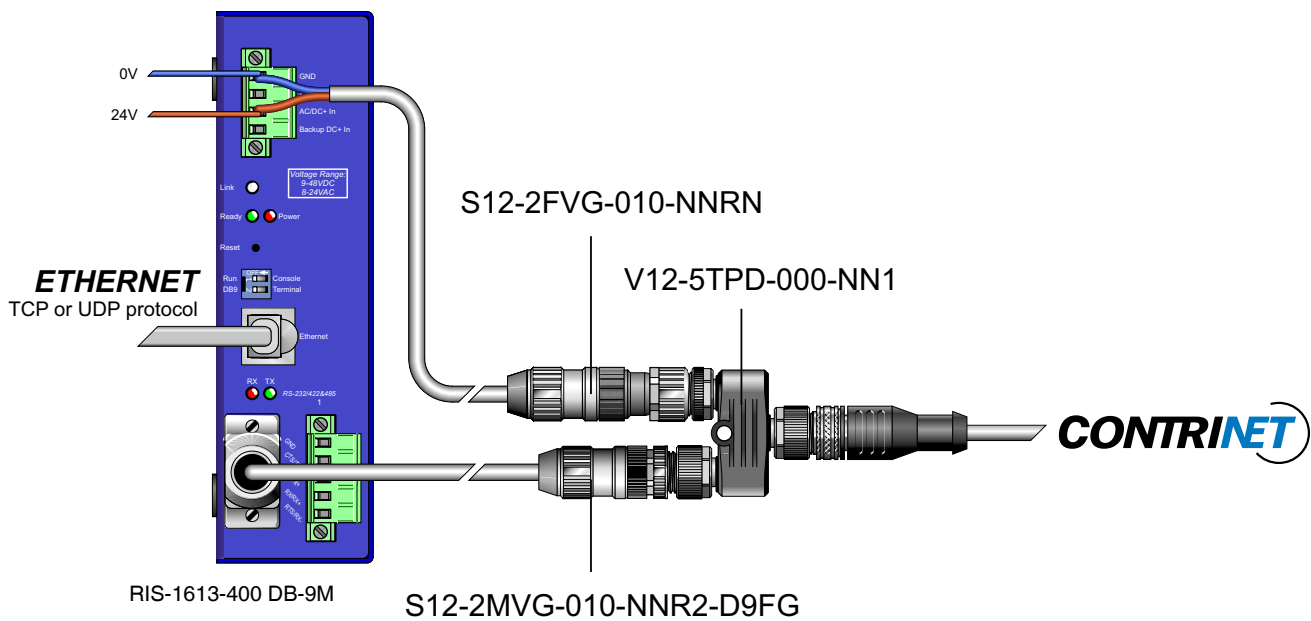
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CONTRINET

APPLICATION WITH CONNECTOR MINICONNECT



APPLICATION WITH CONNECTOR DB-9M



USB ADAPTOR

HOUSING SIZE MM

67 X 66 X 28

AT A GLANCE

- Synthetic ABS housing
- Serial RS485 connection to ContriNet
- USB connection to control PC

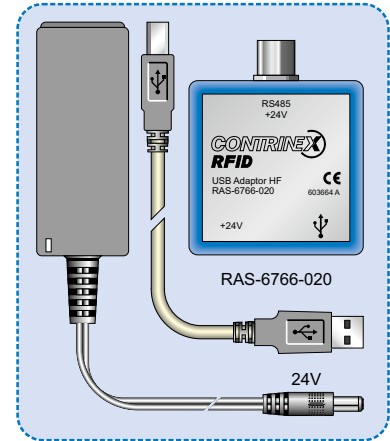
LEDS

Red LED:

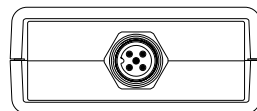
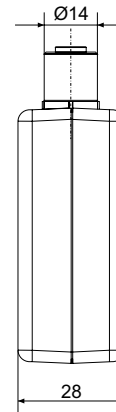
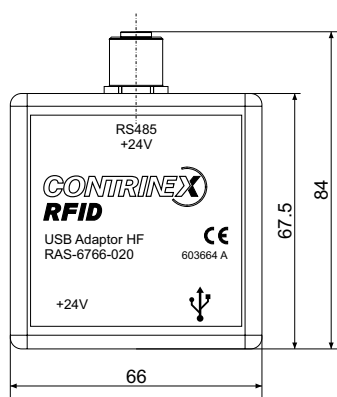
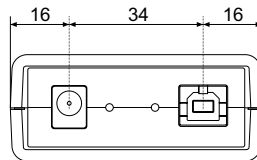
Describes the connection control PC - USB connector.

Green LED:

Indicates that the device is fed by an external power supply unit.



The set contains:
1 USB adaptor, 1 power supply, 1 USB cable



DATA

Housing material	ABS
Power supply	24 V
Max. current consumption	625 mA
Connection (RS485 side)	Connector S12
Ambient temperature range	0 ... +50°C / +32 ... +122°F (with external power supply unit)
Storage temperature range	-40 ... +85°C / -40 ... +185°F
Weight	67 g
Part reference	RAS-6766-020

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

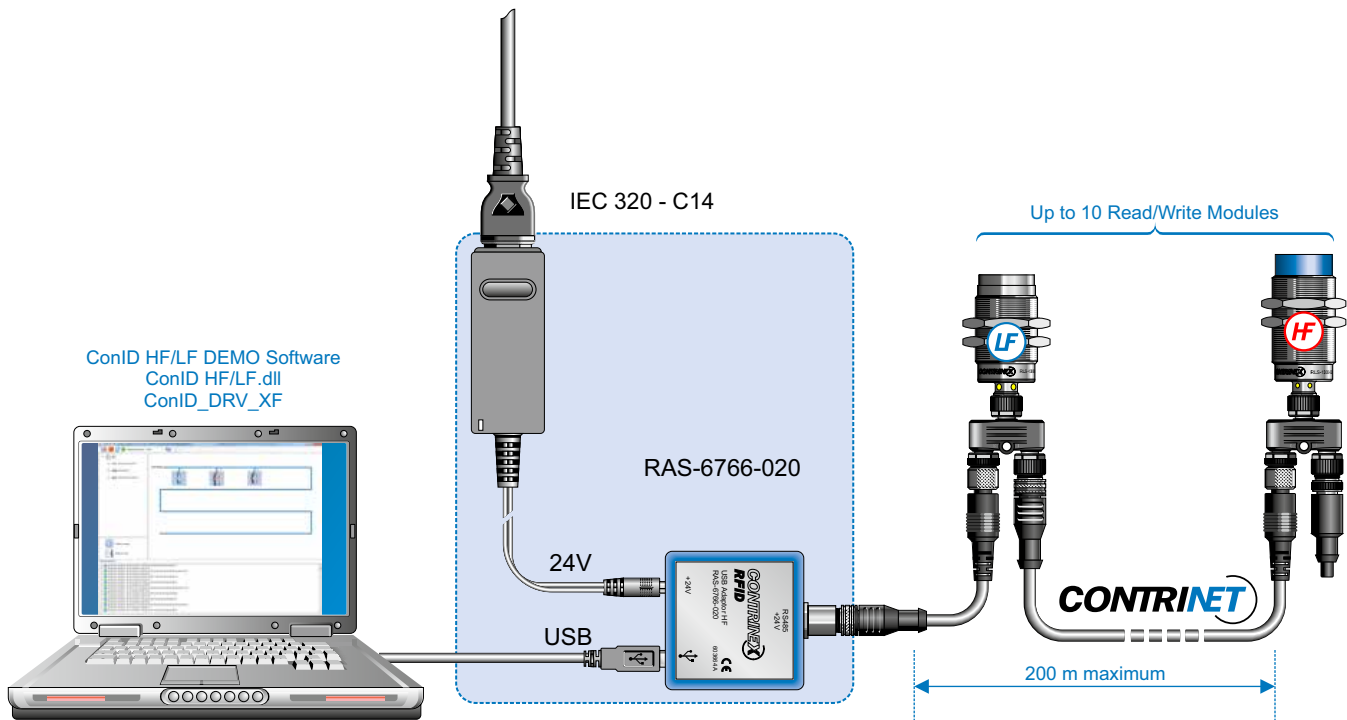
Accessories

Glossary

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CONTRINET

APPLICATION WITH USB ADAPTOR



CONNECTION

The adaptor acts as the interface between a network of Read/Write Modules and the USB port of the control PC. The delivery package includes a USB cable.

EXTERNAL POWER SUPPLY UNIT

An external power supply unit (24V / 15W, 625 mA) is included in the delivery package.

DRIVERS AND SOFTWARE

Drivers (ConID Driver XX) compatible with the various Windows versions and software for demonstration and training use (ConID HF/LF) can be downloaded from the Contrinex website.





10011010100110100100100100100110101
10011010100110100100100100100110101010
1001101010011010010010010010



EASY TO GO !

IO-LINK R/W MODULES



HIGH FREQUENCY

KEY ADVANTAGES

- ✓ Threaded Read/Write Modules (RWMs) with S12 connector
- ✓ IO-Link interface V1.1
- ✓ M18 and M30
- ✓ Two operating modes:
 - ✓ As IO-Link device
 - ✓ As stand-alone SIO with conditional output switch:
 - ✓ Tag presence
 - ✓ Data block comparison



IO-LINK R/W MODULES

RFID IO-LINK RWM

AT A GLANCE

- High frequency Read/Write Modules (RWMs) with IO-Link interface
- Compatible with ISO 15693 transponders (4 or 8-bytes memory block)
- IO-Link interface V1.1
- Two operating modes:
 - As IO-Link device
 - As stand-alone SIO with conditional output switch:
 - Tag presence
 - Data block comparison

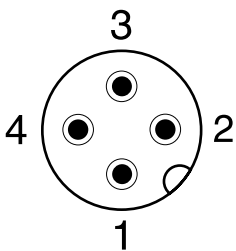
HOUSING SIZE

MAX. READ/WRITE DISTANCE MM

WIRING DIAGRAM



PIN	SIGNAL	FUNCTION
1	L+	+24 V
2	I/Q	DO (tag presence or data comparison)
3	L-	0V
4	C/Q	SDCI/SIO (tag presence or data comparison)



DATA	
Housing material	
Max. current consumption	
Mounting	
Ambient temperature range	
Storage temperature range	
Connection type	
Degree of protection	
Weight (with nuts)	
Part reference	

IO-LINK R/W MODULES

Inductive		
M18	M30	
42	60	

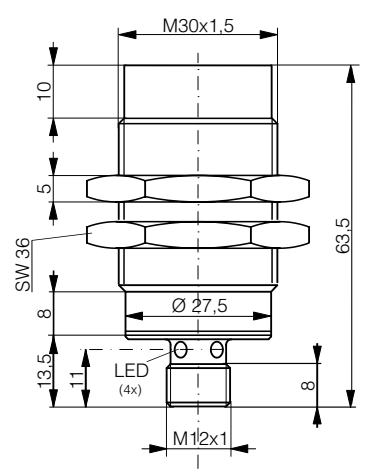
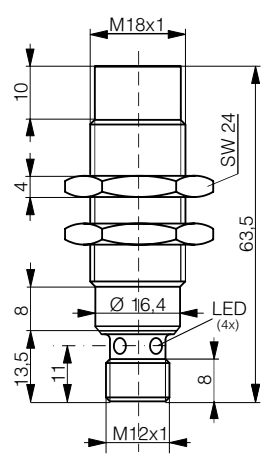
Inductive



Photoelectric

Ultrasonic

Capacitive



Safety

RFID

Connectivity

Accessories

PBTP / Chrome-plated brass	PBTP / Chrome-plated brass	
50 mA	50 mA	
Non-embeddable	Non-embeddable	
-25 ... +80°C / -13 ... +176°F	-25 ... +80°C / -13 ... +176°F	
-25 ... +80°C / -13 ... +176°F	-25 ... +80°C / -13 ... +176°F	
Connector S12	Connector S12	
IP 67	IP 67	
51 g	120 g	
RLS-1181-320	RLS-1301-320	

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PRACTICAL CONNECTION POSSIBILITIES

USB R/W MODULES



LOW FREQUENCY



HIGH FREQUENCY

KEY ADVANTAGES

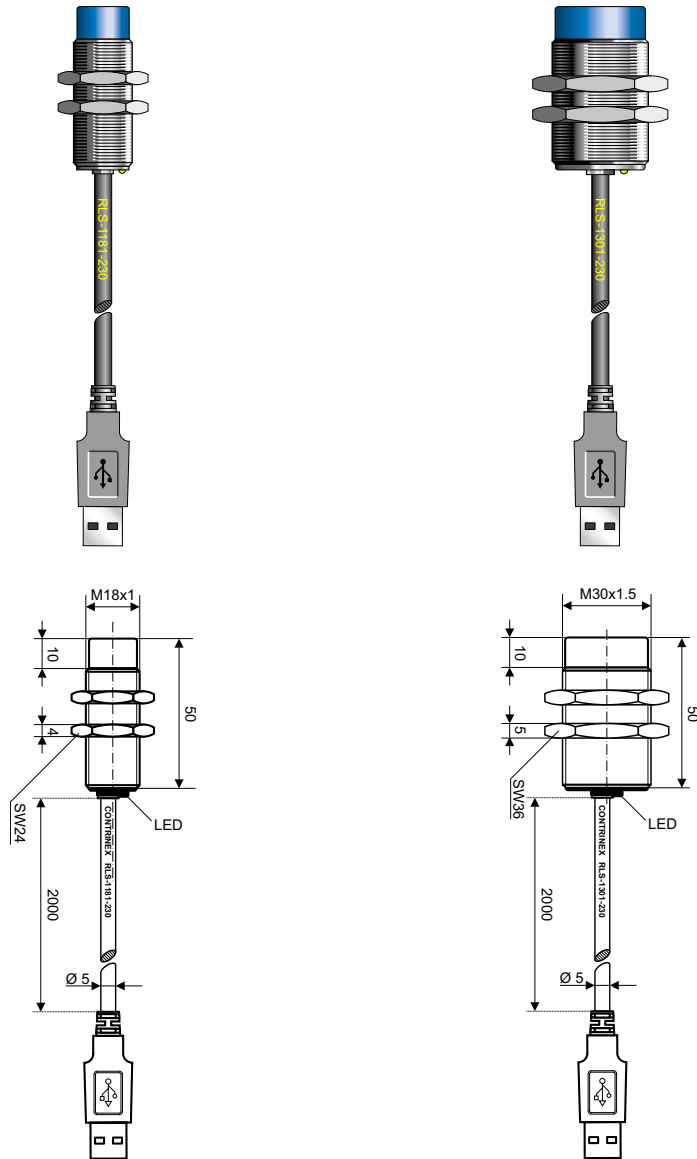
- ✓ Direct connection of Read/Write Module (RWM) to PC
- ✓ Compatible with ConID LF/HF DEMO software
- ✓ LF and HF types in sizes M18 and M30



USB R/W MODULES

LOW FREQUENCY USB READ/WRITE MODULE

HOUSING SIZE	M18	M30
MAX. READ/WRITE DISTANCE MM	28	38



DATA	M18	M30
Housing material	PBTP / chrome-plated brass	PBTP / chrome-plated brass
Max. current consumption	200 mA	200 mA
Mounting	Non-embeddable	Non-embeddable
Ambient temperature range	-25 ... +80°C / -13 ... +176°F	-25 ... +80°C / -13 ... +176°F
Storage temperature range	-25 ... +80°C / -13 ... +176°F	-25 ... +80°C / -13 ... +176°F
Connection type	USB A male	USB A male
Weight (incl. nuts)	107 g	144 g
Part reference	RLS-1181-230	RLS-1301-230



HIGH FREQUENCY USB READ/WRITE MODULE

M18

M18

M30

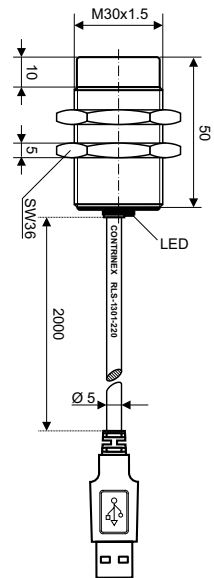
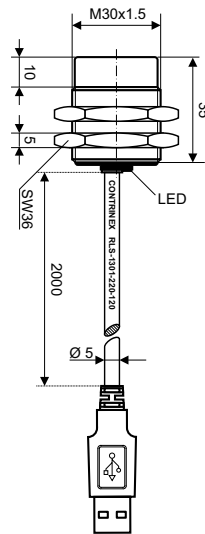
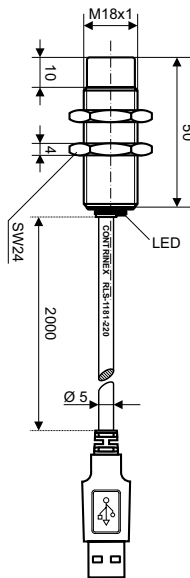
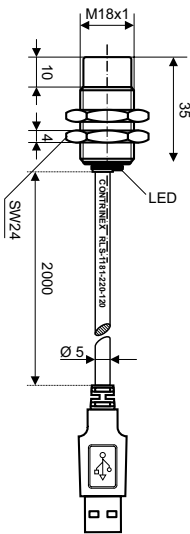
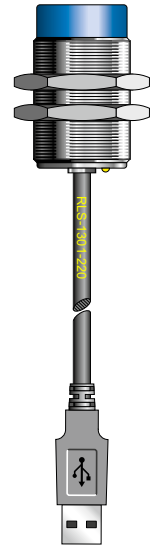
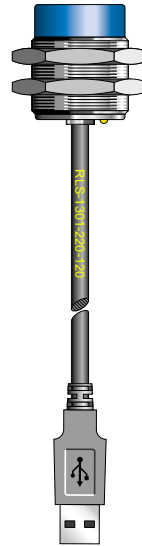
M30

35

35

50

50



PBTP / chrome-plated brass

200 mA

Non-embeddable

-25 ... +70°C / -13 ... +158°F

-25 ... +70°C / -13 ... +158°F

USB A male

97 g

RLS-1181-220-120

PBTP / chrome-plated brass

200 mA

Non-embeddable

-25 ... +70°C / -13 ... +158°F

-25 ... +70°C / -13 ... +158°F

USB A male

107 g

RLS-1181-220

PBTP / chrome-plated brass

200 mA

Non-embeddable

-25 ... +70°C / -13 ... +158°F

-25 ... +70°C / -13 ... +158°F

USB A male

144 g

RLS-1301-220-120

PBTP / chrome-plated brass

200 mA

Non-embeddable

-25 ... +70°C / -13 ... +158°F

-25 ... +70°C / -13 ... +158°F

USB A male

165 g

RLS-1301-220

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

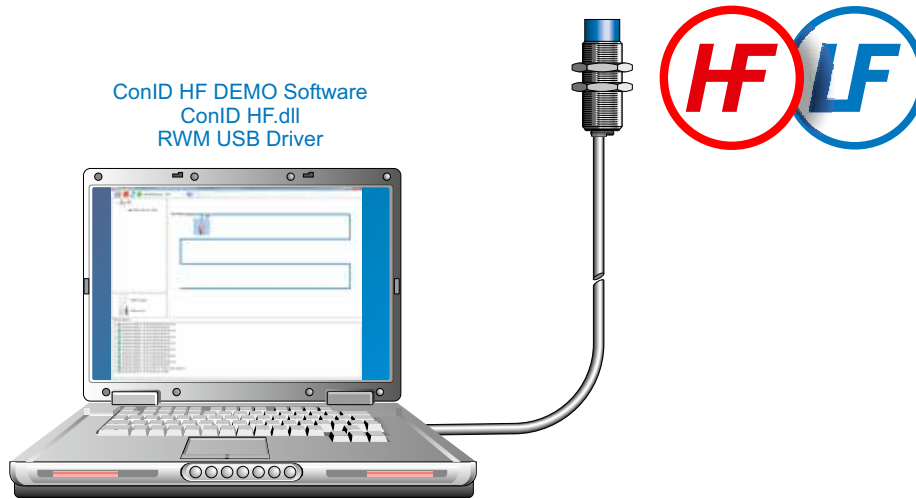
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Accessories

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APPLICATION WITH USB READ/WRITE MODULE



The default address of USB Read/Write Modules is 254.

USB Read/Write Modules are not compatible with ContriNet but they have the same firmware. In particular, they are compatible with DEMO program ConID HF/LF.





ACCESSORIES



LOW FREQUENCY



HIGH FREQUENCY

RFID accessories

- ✓ Standard cables
- ✓ Quick-lock cables

ACCESSORIES

SHIELDED CABLES



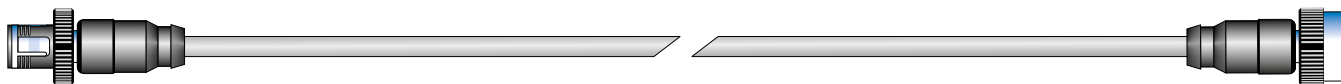
PART REFERENCE	TYPE	CABLE	LENGTH
S12-4FUG-020-NWRN-12MG	Socket straight / plug straight	PUR	2 m
S12-4FUG-050-NWRN-12MG	Socket straight / plug straight	PUR	5 m

STANDARD CABLES



PART REFERENCE	TYPE	CABLE	LENGTH
S12-4FVG-006-12MG	Socket straight / plug straight	PVC	0.6 m
S12-4FVG-020-12MG	Socket straight / plug straight	PVC	2 m
S12-4FVG-050-12MG	Socket straight / plug straight	PVC	5 m
S12-4FUG-006-12MG	Socket straight / plug straight	PUR	0.6 m
S12-4FUG-020-12MG	Socket straight / plug straight	PUR	2 m
S12-4FUG-050-12MG	Socket straight / plug straight	PUR	5 m

QUICK-LOCK CABLES



PART REFERENCE	TYPE	CABLE	LENGTH
S12-4FWW-003-NNNQ-12MG	Socket right angle / plug straight	PVC	0,3 m
S12-4FVG-006-NNNQ-12MG	Socket straight / plug straight	PVC	0,6 m
S12-4FUG-003-NNNQ-12MG	Socket straight / plug straight	PUR	0,3 m
S12-4FUG-006-NNNQ-12MG	Socket straight / plug straight	PUR	0,6 m

CONTRINET TOOL FOR DEMONSTRATION, TRAINING AND DEVELOPMENT

SOFTWARE



LOW FREQUENCY



HIGH FREQUENCY

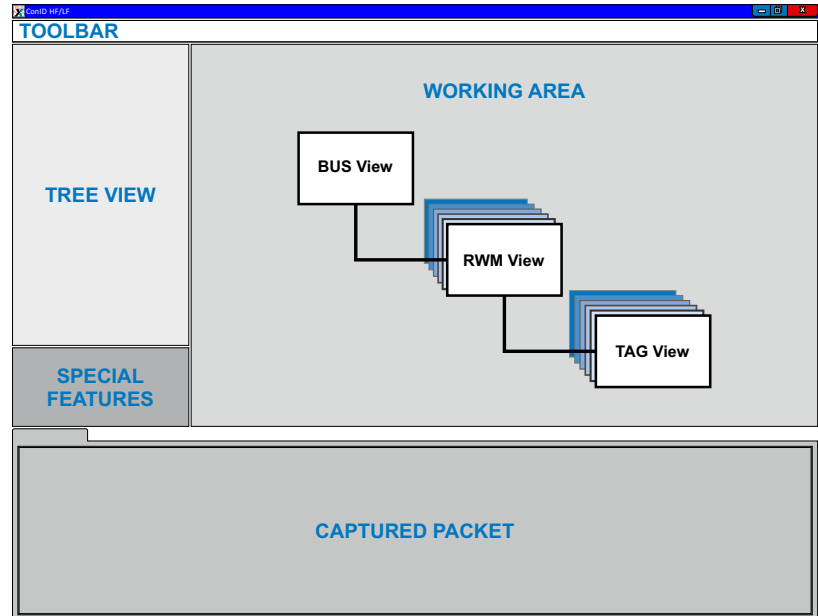
KEY ADVANTAGES

- ✓ User-friendly screen
- ✓ Intuitive control
- ✓ Access to individual components
- ✓ Detailed frame analysis

DEMONSTRATION AND TRAINING SOFTWARE, CONID HF-LF

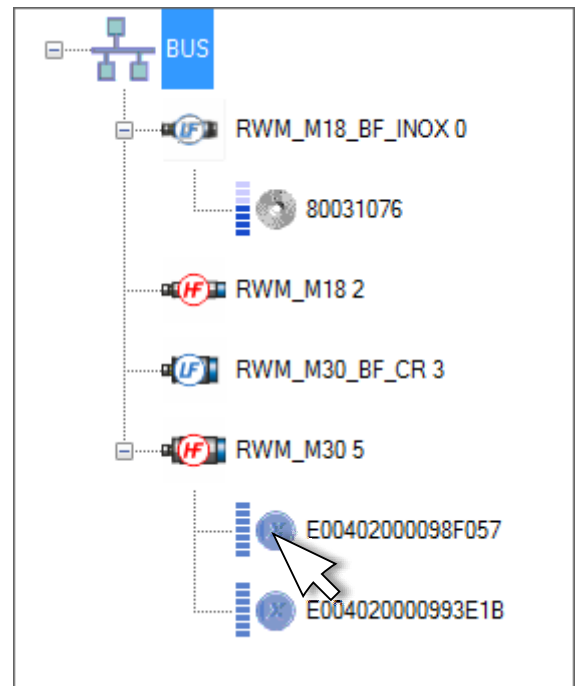
ConID HF-LF software allows users to familiarize themselves with Contrinex RFID and, in particular, understand how ContriNet works.

A user-friendly screen allows intuitive control of the various program options. It is divided into five fields, allowing the user to access a specific component to which chosen commands will apply.



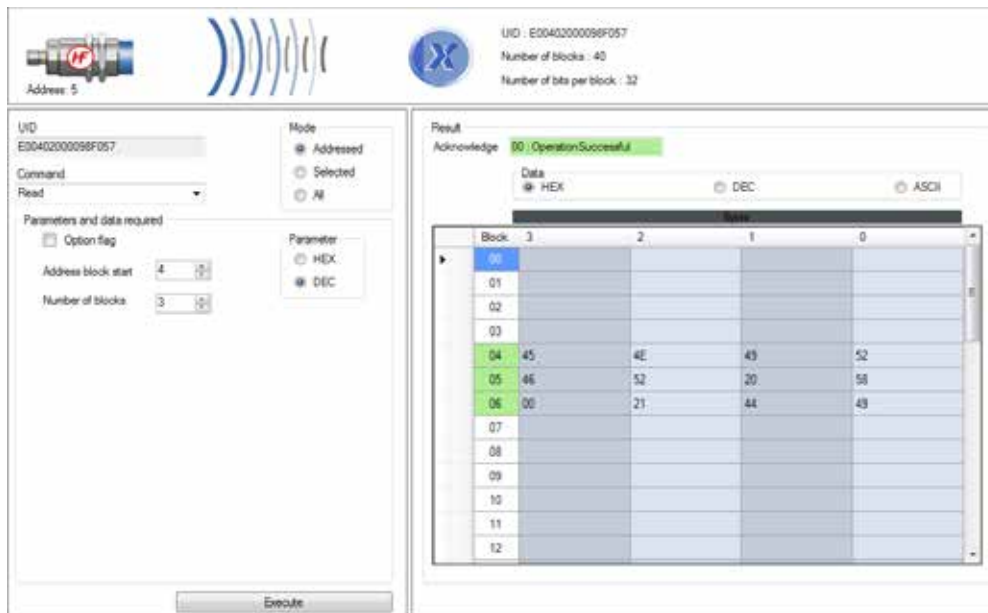
TREE VIEW

The Tree View describes the ContriNet network as a whole, i.e. all Read/Write Modules connected to the network and the transponders in front of the RWMs.



WORKING AREA

To access commands specific to any one of these components, just click the mouse on a component to display in the work area all the possible commands for that component. For example, the following shows the work area displayed after clicking on an HF transponder.



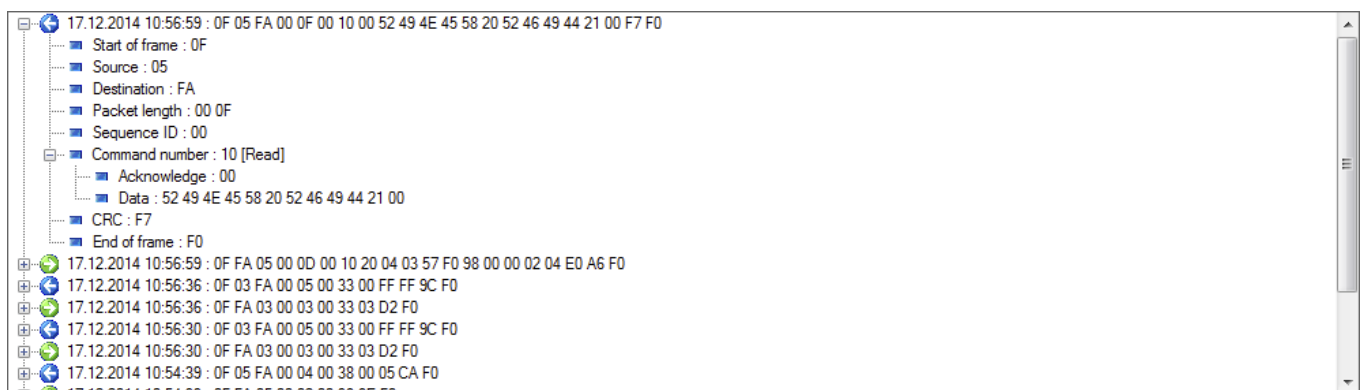
The work area consists of three fields:

- The upper field showing the component involved and its attributes
- The command field, below left
- The results box, below right

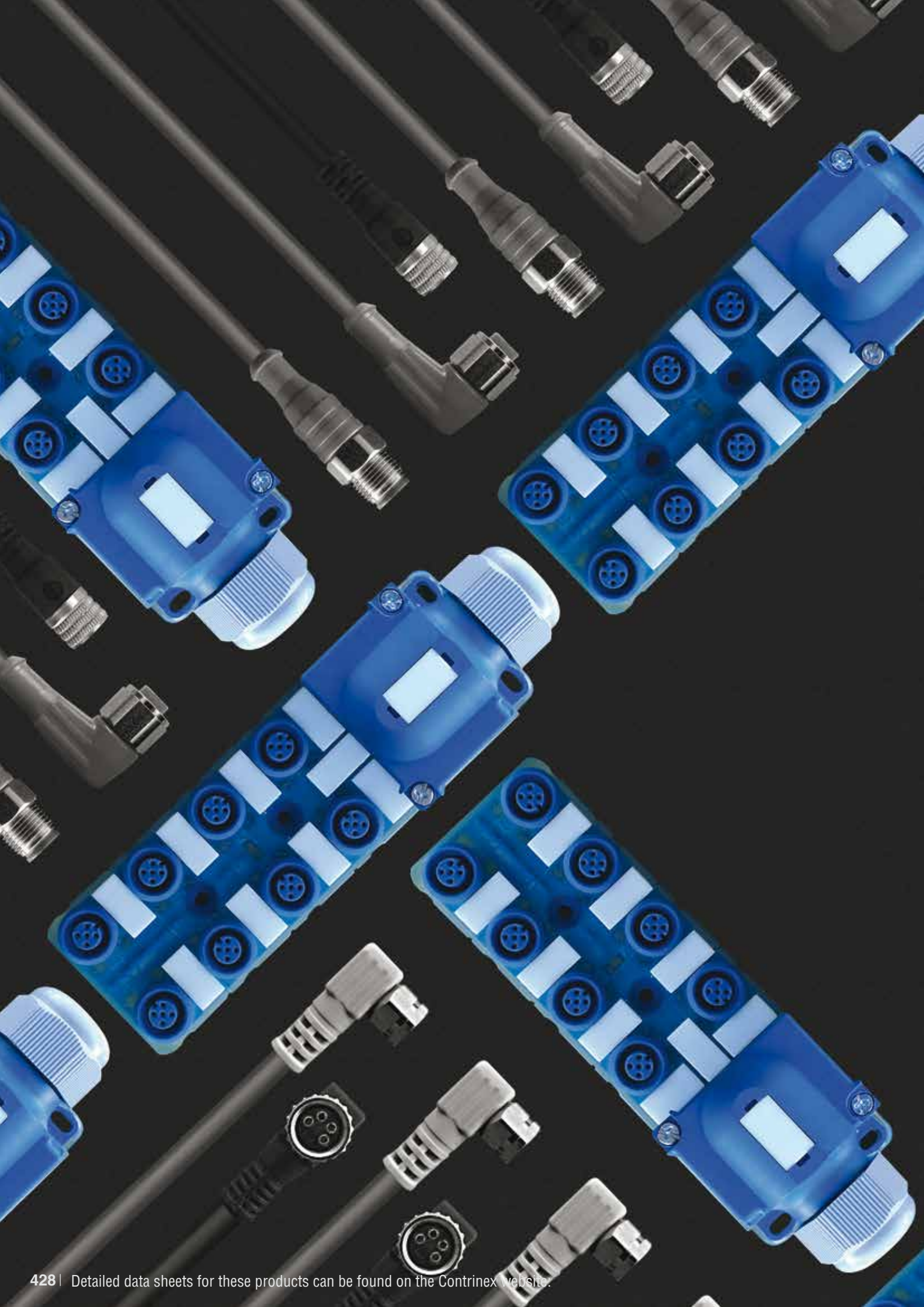
CAPTURED PACKETS

Another interesting field concerns captured packets. This field contains frames of all past transactions between the PC controller and a specific Read/Write Module.

These frames can be opened, allowing the user to decrypt each byte in the frame.



This tool is extremely useful because it shows the structure of exchanged frames and provides full information to the integrator during programming of the controller or PLC that controls the industrial bus.




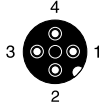

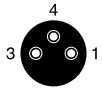

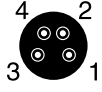

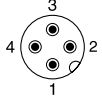
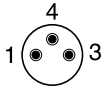
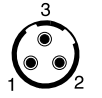




CONNECTIVITY

HIGHLIGHTS:

- ✓ Comprehensive cable and connector program
- ✓ IP 69K and Ecolab-tested cables for the food and beverage industry
- ✓ UL-approved cables and connectors
- ✓ Cables with straight or right-angle sockets
- ✓ Distribution boxes
- ✓ Field-attachable connectors
- ✓ T-connectors
- ✓ User-friendly standard portfolio

CABLES / CONNECTORS DESCRIPTION

SOCKET	TYPE	PIN ASSIGNMENT	TYPE
	M8 straight socket		M12 4-pole socket
	M12 straight socket		M8 3-pole socket
	M8 right angle socket		M8 4-pole socket
	M12 right angle socket		M12 4-pole plug
			M8 3-pole plug
			M12 3-pole dual key plug (S13)
PLUG	TYPE		
	M8 straight plug		
	M12 straight plug		



CONNECTING CABLES PVC WITH OPEN ENDED WIRES

PART REFERENCE	SOCKET			CABLE	
	Size	Pins	Config.	Material	Length
S08-3FVG-020	M8	3-pole	straight	PVC	2 m
S08-3FVG-050	M8	3-pole	straight	PVC	5 m
S08-3FVG-100	M8	3-pole	straight	PVC	10 m
S08-4FVG-020	M8	4-pole	straight	PVC	2 m
S08-4FVG-050	M8	4-pole	straight	PVC	5 m
S08-4FVG-100	M8	4-pole	straight	PVC	10 m
S08-3FVW-020	M8	3-pole	right angle	PVC	2 m
S08-3FVW-050	M8	3-pole	right angle	PVC	5 m
S08-3FVW-100	M8	3-pole	right angle	PVC	10 m
S08-4FVW-020	M8	4-pole	right angle	PVC	2 m
S08-4FVW-050	M8	4-pole	right angle	PVC	5 m
S08-4FVW-100	M8	4-pole	right angle	PVC	10 m
S12-3FVG-020	M12	3-pole	straight	PVC	2 m
S12-3FVG-050	M12	3-pole	straight	PVC	5 m
S12-3FVG-100	M12	3-pole	straight	PVC	10 m
S12-4FVG-020	M12	4-pole	straight	PVC	2 m
S12-4FVG-050	M12	4-pole	straight	PVC	5 m
S12-4FVG-100	M12	4-pole	straight	PVC	10 m
S12-5FVG-020	M12	5-pole	straight	PVC	2 m
S12-5FVG-100	M12	5-pole	straight	PVC	10 m
S12-3FVW-020	M12	3-pole	right angle	PVC	2 m
S12-3FVW-050	M12	3-pole	right angle	PVC	5 m
S12-3FVW-100	M12	3-pole	right angle	PVC	10 m
S12-4FVW-020	M12	4-pole	right angle	PVC	2 m
S12-4FVW-050	M12	4-pole	right angle	PVC	5 m
S12-4FVW-100	M12	4-pole	right angle	PVC	10 m

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

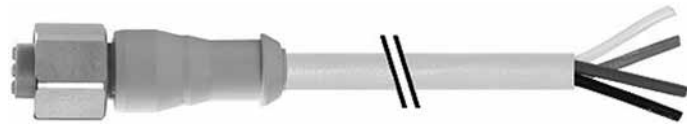
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CONNECTING CABLES PUR WITH OPEN ENDED WIRES

PART REFERENCE	SOCKET			CABLE	
	Size	Pins	Config.	Material	Length
S08-3FUG-020	M8	3-pole	straight	PUR	2 m
S08-3FUG-050	M8	3-pole	straight	PUR	5 m
S08-3FUG-100	M8	3-pole	straight	PUR	10 m
S08-4FUG-020	M8	4-pole	straight	PUR	2 m
S08-4FUG-050	M8	4-pole	straight	PUR	5 m
S08-4FUG-100	M8	4-pole	straight	PUR	10 m
S08-3FUW-020	M8	3-pole	right angle	PUR	2 m
S08-3FUW-050	M8	3-pole	right angle	PUR	5 m
S08-3FUW-100	M8	3-pole	right angle	PUR	10 m
S08-4FUW-020	M8	4-pole	right angle	PUR	2 m
S08-4FUW-050	M8	4-pole	right angle	PUR	5 m
S08-4FUW-100	M8	4-pole	right angle	PUR	10 m
S12-3FUG-020	M12	3-pole	straight	PUR	2 m
S12-3FUG-050	M12	3-pole	straight	PUR	5 m
S12-3FUG-100	M12	3-pole	straight	PUR	10 m
S12-4FUG-020	M12	4-pole	straight	PUR	2 m
S12-4FUG-050	M12	4-pole	straight	PUR	5 m
S12-4FUG-100	M12	4-pole	straight	PUR	10 m
S12-3FUW-020	M12	3-pole	right angle	PUR	2 m
S12-3FUW-050	M12	3-pole	right angle	PUR	5 m
S12-3FUW-100	M12	3-pole	right angle	PUR	10 m
S12-4FUW-020	M12	4-pole	right angle	PUR	2 m
S12-4FUW-050	M12	4-pole	right angle	PUR	5 m
S12-4FUW-100	M12	4-pole	right angle	PUR	10 m



example

CONNECTING CABLES PVC/TPE WITH OPEN ENDED WIRES FOR FOOD APPLICATIONS IP 69K

PART REFERENCE	SOCKET			CABLE	
	Size	Pins	Config.	Material	Length
S08-3FVG-020-NNLN	M8	3	straight	PVC	2 m
S08-3FVW-020-NNLN	M8	3	right angle	PVC	2 m
S12-4FVG-020-NNLN	M12	4	straight	PVC	2 m
S12-4FVG-050-NNLN	M12	4	straight	PVC	5 m
S12-4FVG-100-NNLN	M12	4	straight	PVC	10 m
S12-4FVW-020-NNLN	M12	4	right angle	PVC	2 m
S12-4FVW-100-NNLN	M12	4	right angle	PVC	10 m
S12-4FAG-050-NNLN	M12	4	straight	TPE-S	5 m
S12-4FAG-100-NNLN	M12	4	straight	TPE-S	10 m
S12-4FAG-150-NNLN	M12	4	straight	TPE-S	15 m



S13

example

CONNECTING CABLES PUR WITH OPEN ENDED WIRES FOR AC SENSORS (230 V MAX)

PART REFERENCE	SOCKET			CABLE	
	Size	Pins	Config.	Material	Length
S13-3FUG-020	M12	3	straight	PUR	2 m
S13-3FUW-020	M12	3	right angle	PUR	2 m
S13-3FUG-050	M12	3	straight	PUR	5 m
S13-3FUW-050	M12	3	right angle	PUR	5 m



example

CONNECTING CABLES PVC

PART REFERENCE	SOCKET			CABLE		PLUG	
	Size	Pins	Config.	Material	Length	Size	Config.
S08-3FVG-006-08MG	M8	3	straight	PVC	0.6 m	M8	straight
S08-3FVG-020-08MG	M8	3	straight	PVC	2 m	M8	straight
S08-3FVG-050-08MG	M8	3	straight	PVC	5 m	M8	straight
S12-4FVG-006-12MG	M12	4	straight	PVC	0.6 m	M12	straight
S12-4FVG-020-12MG	M12	4	straight	PVC	2 m	M12	straight
S12-4FVG-050-12MG	M12	4	straight	PVC	5 m	M12	straight



example

CONNECTING CABLES PUR

PART REFERENCE	SOCKET			CABLE		PLUG	
	Size	Pins	Config.	Material	Length	Size	Config.
S08-3FUG-006-08MG	M8	3	straight	PUR	0.6 m	M8	straight
S08-3FUG-020-08MG	M8	3	straight	PUR	2 m	M8	straight
S08-3FUG-050-08MG	M8	3	straight	PUR	5 m	M8	straight
S12-4FUG-006-12MG	M12	4	straight	PUR	0.6 m	M12	straight
S12-4FUG-020-12MG	M12	4	straight	PUR	2 m	M12	straight
S12-4FUG-050-12MG	M12	4	straight	PUR	5 m	M12	straight



example

CONNECTING CABLES PVC FOR FOOD APPLICATIONS

PART REFERENCE	SOCKET			CABLE		PLUG	
	Size	Pins	Config.	Material	Length	Size	Config.
S12-4FVG-020-NNLN-12MG	M12	4	straight	PVC	2 m	M12	straight
S12-4FVG-050-NNLN-12MG	M12	4	straight	PVC	5 m	M12	straight
S12-4FAG-100-NNLN-12MG	M12	4	straight	TPE-S	10 m	M12	straight
S12-4FVG-100-NNLN-12MG	M12	4	straight	PVC	10 m	M12	straight



example

CONNECTING CABLES M8/M12

PART REFERENCE	SOCKET			CABLE		PLUG	
	Size	Pins	Config.	Material	Length	Size	Config.
S08-3FVG-020-12MG	M8	3	straight	PVC	2 m	M12	straight
S08-4FVG-020-12MG	M8	4	straight	PVC	2 m	M12	straight
S08-3FUG-020-12MG	M8	3	straight	PUR	2 m	M12	straight
S08-4FUG-006-12MG	M8	4	straight	PUR	0.6 m	M12	straight

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

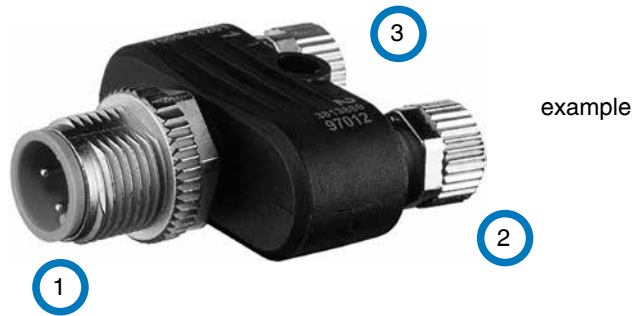
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T-CONNECTOR

PART REFERENCE	CONNECTION 1		CABLE		CONNECTION 2	CONNECTION 3
	Size	Pins	Material	Length	Size	Size
V12-4TPD-003-UN0	M12 plug	4	PVC	0.3	M12 socket	M12 plug



DISTRIBUTION BOXES

PART REFERENCE	SOCKET			CONNECTION
	Size	Pins	Number connections	Length
V12-54PD-050-UYN	M12	5	4 Plug Distribution box	5 m
V12-54PD-100-UYN	M12	5	4 Plug Distribution box	10 m
V12-58PD-050-UYN	M12	5	8 Plug Distribution box	5 m
V12-58PD-100-UYN	M12	5	8 Plug Distribution box	10 m
V12-58MD-100-UYN	M12	5	8 Plug Metal Distribution box	10 m



example

FIELD ATTACHABLE CONNECTORS

PART REFERENCE	SOCKET			CABLE	
	Size	Pins	Config.	Outer Ø	Wire Ø
S08-3FNG-000-NNT1	M8	3	straight	3.0 - 5.0	0.14 - 0.38
S08-4FNG-000-NNT1	M8	4	straight	3.0 - 5.0	0.14 - 0.38
S08-3MNG-000-NNT1	M8	3	straight	3.0 - 5.0	0.14 - 0.38
S08-4MNG-000-NNT1	M8	4	straight	3.0 - 5.0	0.14 - 0.38
S08-3MNG-000-NNT2	M8	3	straight	4.0 - 8.0	0.14 - 0.50
S12-4FNG-000-NNT1	M12	4	straight	3.0 - 5.0	0.14 - 0.38
S12-4FNG-000-NNT2	M12	4	straight	4.0 - 8.0	0.14 - 0.50
S12-5FNG-000-NNT2	M12	5	straight	4.0 - 8.0	0.14 - 0.50
S12-4FNW-000-NNT1	M12	4	right angle	3.5 - 5.0	0.08 - 0.34
S12-4FNW-000-NNT2	M12	4	right angle	4.0 - 8.0	0.14 - 0.50
S12-5FNW-000-NNT2	M12	5	right angle	4.0 - 8.0	0.14 - 0.50
S12-4MNG-000-NNT1	M12	4	straight	3.0 - 5.0	0.14 - 0.38
S12-4MNG-000-NNT2	M12	4	straight	4.0 - 8.0	0.14 - 0.50
S12-5MNG-000-NNT2	M12	5	straight	4.0 - 8.0	0.14 - 0.50
S12-4MNW-000-NNT2	M12	4	right angle	4.0 - 8.0	0.14 - 0.50
S12-5MNW-000-NNT2	M12	5	right angle	4.0 - 8.0	0.14 - 0.50

CABLES WITH INTEGRATED LED

PART REFERENCE	SOCKET			CABLE		
	Size	Pins	Config.	Material	Length	LED
S12-3FUW-050-YNNN	M12	3	right angle	PUR	5 m	PNP
S12-3FVW-050-YNNN	M12	3	right angle	PVC	5 m	PNP
S08-3FUW-020-YNNN	M8	3	right angle	PUR	2 m	PNP

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

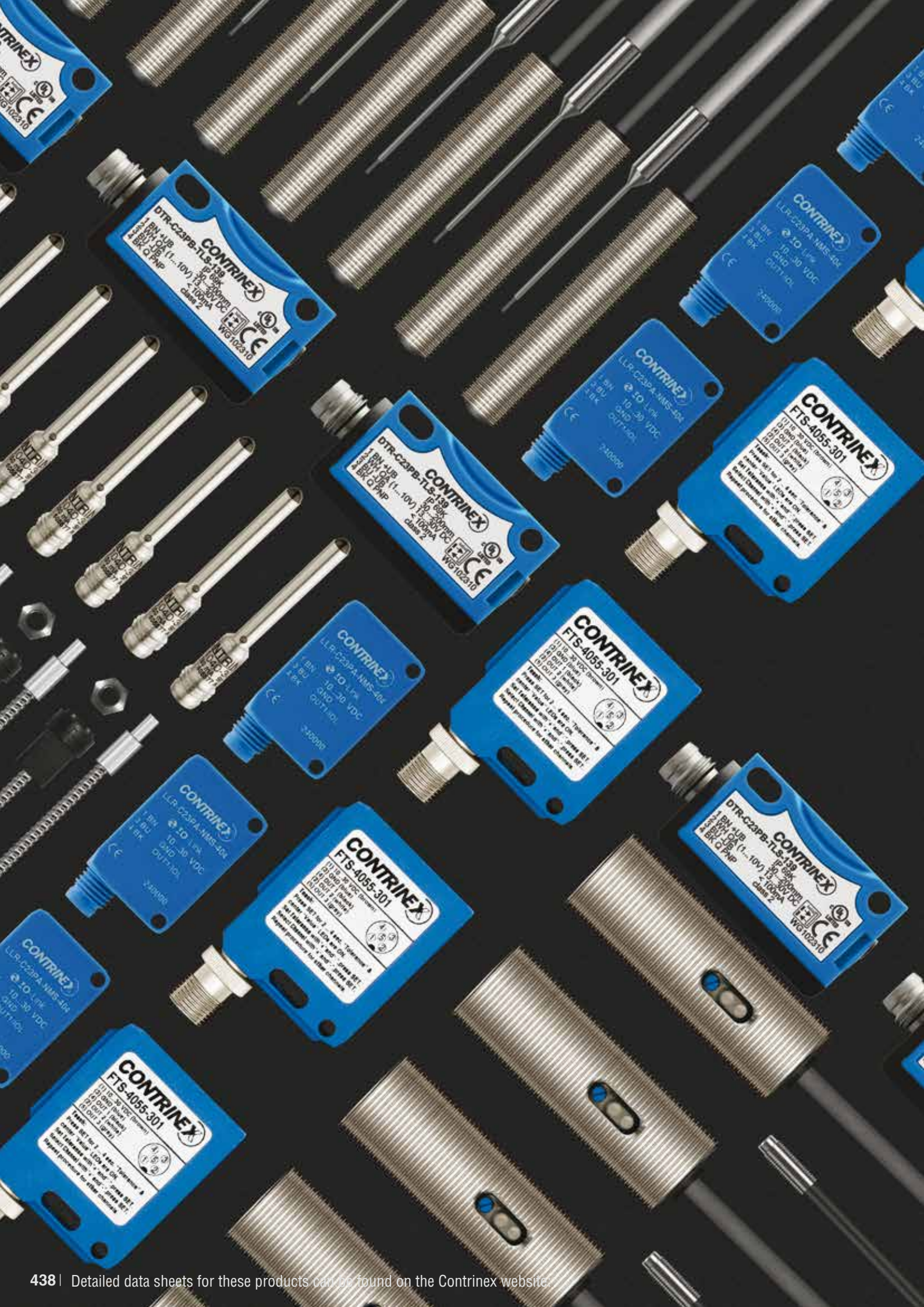
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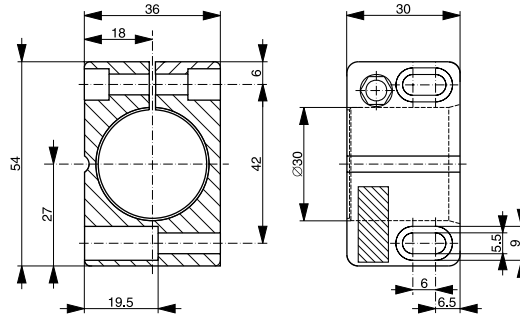
ACCESSORIES

HIGHLIGHTS:

- ✓ Sensor testers for fast field checks
- ✓ Sensor mounting clamps
- ✓ Bases for mounting clamps
- ✓ Snap-on power supply units
- ✓ Amplifiers for 3-wire and NAMUR sensors



Ø30



TECHNICAL DATA

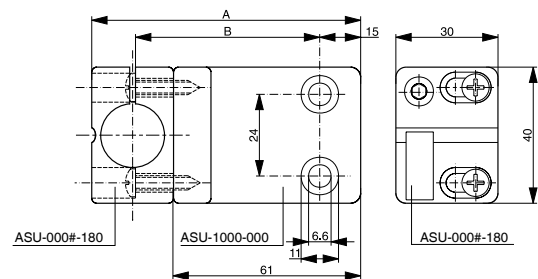
Part reference	Type				
ASU-0001-300	without limit stop	Ø 30 mm			
ASU-0002-300	with limit stop	Ø 30 mm			

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



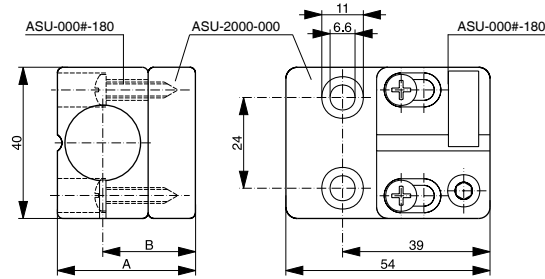
TECHNICAL DATA

Part reference	Type	A with Ø 12 mm / Ø 18 mm	B with Ø 12 mm / Ø 18 mm
ASU-1000-000	horizontal	79 mm / 85 mm	55 mm / 58 mm

Material: PA 6 black

Screws: DIN 7981, Ø 4.2 zinc-plated

ACCESSORIES



TECHNICAL DATA

Part reference	Type	A with \varnothing 12 mm / \varnothing 18 mm	B with \varnothing 12 mm / \varnothing 18 mm
ASU-2000-000	vertical	30.5 mm / 36.5 mm	21.5 mm / 24.5 mm

Material: PA 6 black

Screws: DIN 7981, \varnothing 4.2 zinc-plated

SENSOR TESTER

ATE-0000-010

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

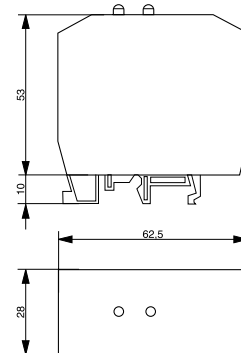
- Suitable for PNP and NPN devices, NO, NC or push-pull versions
- LED and acoustic indicators
- Built-in steel target (non-standardized) for checking inductive sensors
- Automatic switch off after approx. 120 sec. of non-use
- Up to 100 mA sensor current
- Rechargeable LiPo battery 9V 600 mAh (included)
- Battery life longer than 2 hours at 50 mA current supply
- Micro-USB interface to recharge battery with universal mobile phone charger



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):

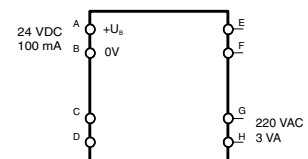


POWER SUPPLY UNIT

TECHNICAL DATA

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

Wiring diagram:



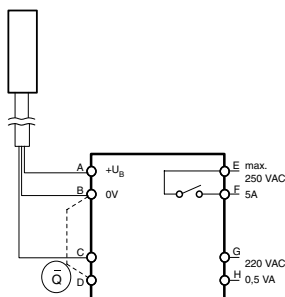
AMPLIFIERS FOR 3-WIRE SENSORS

DW-AZ-100-A3

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

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

Wiring diagram:

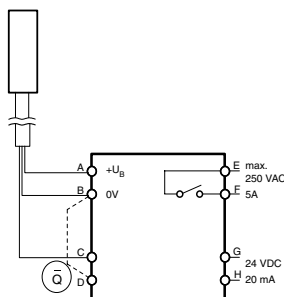


DW-AZ-100-D3

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

TECHNICAL DATA	
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 SENSORS

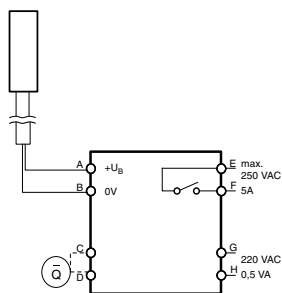
DW-AZ-100-AN

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

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

TECHNICAL DATA	
Supply voltage	220 VAC
Power drain	0.5 VA

Wiring diagram:



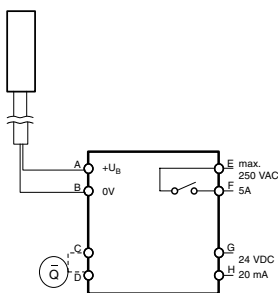
DW-AZ-100-DN

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

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

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

Wiring diagram:





GLOSSARY

HIGHLIGHTS:

- ✓ Clearance
- ✓ Connectors
- ✓ Correction factors
- ✓ Degrees of protection
- ✓ EMC
- ✓ Excess gain
- ✓ Hysteresis
- ✓ Mounting
- ✓ Oil resistance
- ✓ Operating distance
- ✓ Parallel connection
- ✓ Switching frequency
- ✓ Tightening torque
- ✓ Turn-on/turn-off time



 **INDUCTIVE SENSORS**

 **PHOTOELECTRIC SENSORS**

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 system reserve (excess-gain) signal.

DIFFUSE SENSORS

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 1040/1050/0507). 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 position. Fit the reflex sensor with the optical axis aligned on the reflector so that it switches reliably. Test with target. Reduce sensitivity if necessary.

DIFFUSE SENSORS

Align the unit's optical axis with the target so that switching occurs reliably. Check that enough system reserves (excess gain) are available, i.e. the green LED must light up (series 1120, 1180, 1180W, 3030, 3031, 3060, 4040, 4050 and C23). 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 sensor 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 sensors 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.

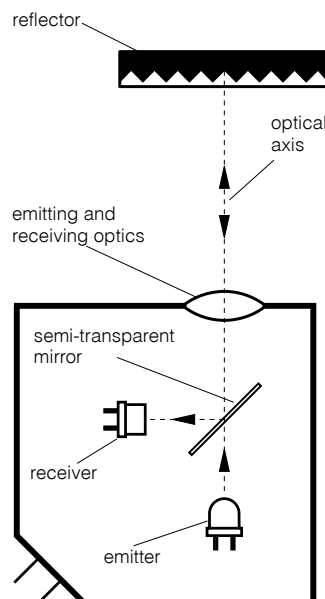


Fig. 16

B

BACKGROUND SUPPRESSION



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

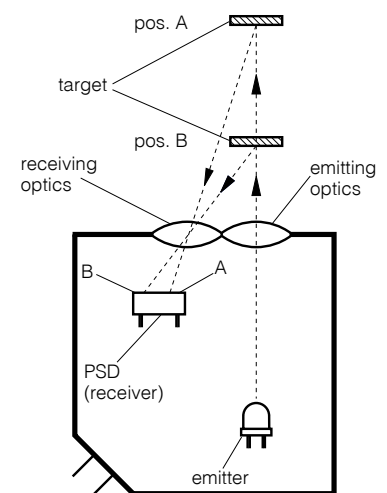


Fig. 17

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.

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 sensors in this catalog meet the requirements of European standards EN 60947-1 and EN 60947-5-2, and therefore correspond to EMC directive 2004/108/EC, as well as low-voltage directive 2006/95/EC. Consequently, they are labeled with the CE mark.

CE

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 or NO signal, and another for the dark-ON or NC 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 additional security monitoring.

CLASSICS FAMILY



The **Classics** family (600 series) is one of three inductive sensing technologies offered by Contrinex. **Classics** family sensors rely on conventional inductive oscillator and coil technology (see page 20).

Sensors are sized from Ø 3 up to M30 and C44 (40 mm x 40 mm). PNP, NPN and 2-wire AC/DC output configurations are available, combined with sensing distances between 0.6 mm and 40 mm.

The **Classics** technology family includes devices from the following ranges: **Basic**, **Miniature**, **Extra pressure**, **Extra temperature**, **High temperature**, **Weld-immune** and **Special**.

CLEARANCE



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

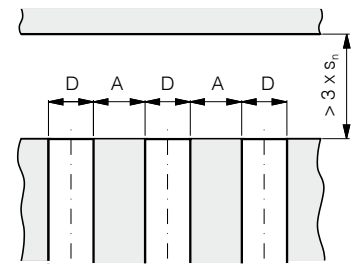


Fig. 18

EXTRA DISTANCE (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

CLASSICS (SERIES 600, 620*)

Size D	embeddable A (mm)	non-emb. A (mm)
Ø 3	0 / *2	---
M4	0 / *1	---
Ø 4	0 / *1	---
M5	0 / *1	---
C 5	0 / *1	---
Ø 6.5	3 / *3.5	--- / *15.5
M8	2 / *4	10 / *14
C8	2 / *2	---
M12	4 / *12	28 / *33
M18	7 / *22	32
M30	10	50
C44	35	120

DIFFUSE SENSORS (FIG. 19)

Series	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 4050	150

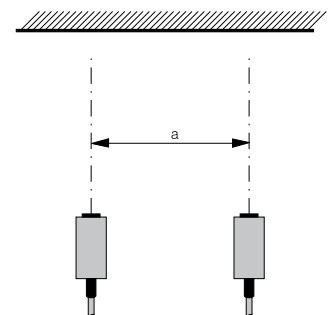


Fig. 19

FULL INOX (SERIES 700)

Size D	embeddable A (mm)	non-emb. A (mm)
M8	14	52
M12	38	108
M18	42	182
M30	80	270



Photoelectric sensors 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 WITH BACKGROUND SUPPRESSION

Series	distance a (mm)
Series 1180 / 1180W	50
Series 3130	50
Series 3131	50
Series 4050	100

REFLEX SENSORS (FIG. 20)

Series	distance a (mm)
Series 1120	150
Series 1180 / 1180W	250
Series 3030	500
Series 3031	250
Series 4050	200

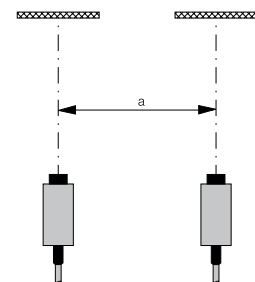


Fig. 20

THROUGH-BEAM SENSORS (FIG. 21)

Series	distance a (mm)
Series 1040 / 50	50
Series 1120	150
Series 1180 / 1180W	250
Series 3030	500
Series 3031	250
Series 4050	500

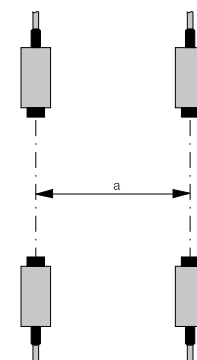


Fig. 21

FIBER-OPTIC AMPLIFIERS

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

CONDET® TECHNOLOGY



An innovative technology for producing inductive sensors. 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 Full Inox family (700 series) (see also page 20). It permits:

- generally long operating distances
- long operating distances also on non-ferrous metals, such as aluminum, brass, copper, etc.
- **one-piece** stainless steel housing (sensing face included)

CONDIST® TECHNOLOGY

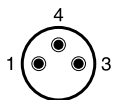


Developed and patented by Contrinex, this innovative technology makes use of a high-performance oscillator for inductive sensors. Operating distances from **2.2 to 4 times** the standard values are possible thanks to excellent temperature and voltage stability. Devices of the Extra distance family (500 and 520 series) work with such an oscillator (see also page 21).

CONNECTORS



PIN ASSIGNMENT SIZE S8:



NO and NC

+U _B	pin 1	brown
0V	pin 3	blue
output	pin 4	black

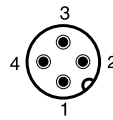
NAMUR

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:



NO

+U _B	pin 1	brown
0V	pin 3	blue
output	pin 4	black

NC

+U _B	pin 1	brown
0V	pin 3	blue
output	pin 2	white

2-wire DC / NO

L-	pin 3	brown
L+	pin 4	blue

2-wire DC / NC

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

PIN ASSIGNMENT SIZE 1/2":

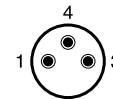


2-wire AC/DC / NO and NC

L1	pin 3	blue
L2	pin 2	brown
GND	pin 1	yellow/green



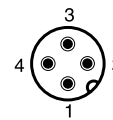
PIN ASSIGNMENT SIZE S8 3 POLE:



NO and NC

+U _B	pin 1	brown
0V	pin 3	blue
output	pin 4	black

PIN ASSIGNMENT SIZE S12 3 POLE:



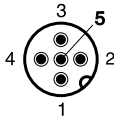
NO

+U _B	pin 1	brown
0V	pin 3	blue
output	pin 4	black

NC

+U _B	pin 1	brown
0V	pin 3	blue
output	pin 2	white

PIN ASSIGNMENT SIZE S12 5 POLE:



NO and NC

+U _B	pin 1	brown
output 2	pin 2	white
OV	pin 3	blue
output 1	pin 4	black
test	pin 5	gray

PIN ASSIGNMENT SIZE S8 4 POLE:



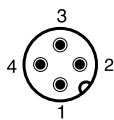
NO and NC

+U _B	pin 1	brown
output 2	pin 2	white
OV	pin 3	blue
output 1	pin 4	black

Teach

+U _B	pin 1	brown
output 2	pin 2	white
OV	pin 3	blue
output 1	pin 4	black

PIN ASSIGNMENT SIZE S12 4 POLE:



NO and NC

+U _B	pin 1	brown
output 2	pin 2	white
OV	pin 3	blue
output 1	pin 4	black

CORRECTION FACTORS



The specified operating distance **s** of inductive sensors 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.

CLASSICS (SERIES 600 / 620)

Material influence (indicative values):

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

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

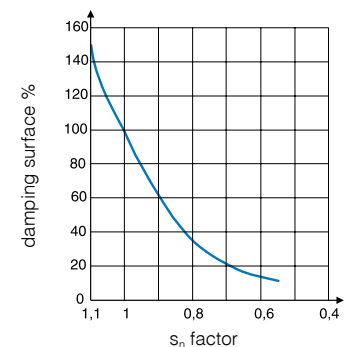
EXTRA DISTANCE (SERIES 500 / 520*)

Material influence (indicative values):

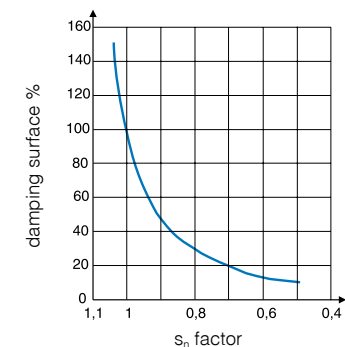
Target material	Operating distance
Steel type FE 360	$s_n \times 1.00$
Aluminum	$s_n \times 0.36 / *0.28$
Brass	$s_n \times 0.44 / *0.37$
Copper	$s_n \times 0.32 / *0.24$
Stainless steel (V2A)	$s_n \times 0.69$

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

Geometrical influence:



Geometrical influence:

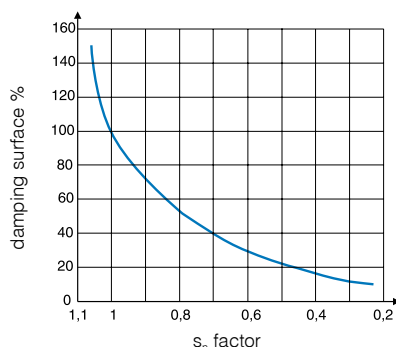


FULL INOX (SERIES 700)

Material influence (indicative values):

Target material	Operating distance
Steel type FE 360	$s_n \times 1.0$
Aluminum	$s_n \times 1.0$
Brass	$s_n \times 1.3$
Copper	$s_n \times 0.8$
Stainless steel (1 mm thick)	$s_n \times 0.5$
Stainless steel (2 mm thick)	$s_n \times 0.9$

Geometrical influence:



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



Test card (Kodak paper, white)	100%
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 anodized	150%
Aluminum sheet, matt (brushed finish)	120%
Stainless steel, polished	230%

The specified sensing ranges 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 listed here apply (these are guideline values only).

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 \pm 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 \pm 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 \geq 1 month.

9K Protection against water which, if 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 $80 \pm 5^\circ\text{C}$ ($176 \pm 41^\circ\text{F}$); pressure 8,000 - 10,000 kPa (80 - 100 bar / 1160.8 - 1451 psi); 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**lectromagnetic **C**ompatibility) resistance of the devices satisfies the highest demands. For exact values, please refer to the data sheets.

All devices comply with the EU directive no. 2004/108/EC. In addition, they undergo severe field testing.

EXCESS-GAIN INDICATION (SYSTEM RESERVE INDICATION)



The excess-gain indication circuit detects the excess radiation power which falls on the light incidence surface and is processed by the light receiver. The excess gain 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

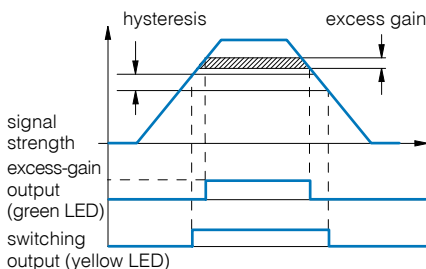


Fig. 22

with a second LED (green), which lights up when less than approximately 80% of the available operating distance is used. Models with an excess-gain output make the excess-gain signal available to the user for further processing. Thus, operating conditions which are no longer reliable can be recognized in time.

EXTRA DISTANCE FAMILY



The **Extra Distance** family (series 500/520) is one of three inductive sensing technologies offered by Contrinex. **Extra Distance** family sensors rely on conventional inductive oscillator and coil technology, but with a completely different signal evaluation circuit for better stability and therefore **long operating distances**. The most important contribution to this comes from the Contrinex patented Condist® oscillator (see pages 20-21).

Sensors are sized from Ø 4 to M30, with long operating distances up to 40 mm.

The Extra Distance technology family includes devices from the **Basic**, **Miniature**, **Extra pressure**, **High pressure** and **Analog output** ranges.

F

FULL INOX FAMILY



The **Full Inox** family (series 700) is one of three inductive sensing technologies offered by Contrinex. **Full Inox** family sensors rely on Contrinex's patented Condet® technology (see page 21).

Full Inox sensors have a one-piece, stainless steel housing and are exceptionally robust and chemically resistant. They are not only the most durable inductive sensors on the market, but also offer long operating distances on any conductive metal.

Sensors are sized from Ø 4 to M30, with long operating distances up to 40 mm and protection class IP 67 and IP 69K

The **Full Inox** technology family includes devices from the **Miniature**, **Extreme**, **High pressure**, **Washdown**, **Weld-immune** and **Special** ranges.

H

HYSTERESIS



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

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

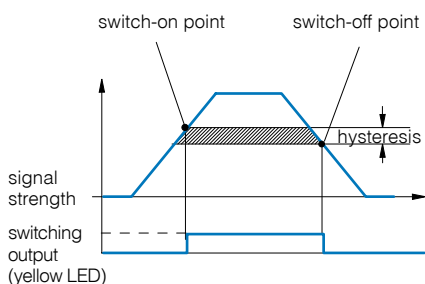


Fig. 23



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.

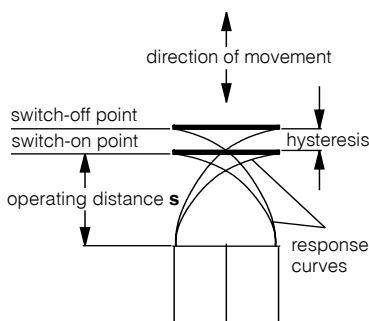


Fig. 24

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 sensors 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 **free-wheeling diode** directly to the load is recommended (due to the leakage power in the built-in Zener diode).

INSTALLATION



Photoelectric sensors 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 sensors, see [MOUNTING](#).

INSULATION VOLTAGE



The devices in this catalog are designed for an insulation voltage (between connecting leads and housing) of 75 VDC / 50 VAC (for supply voltages up to 75 VDC / 50 VAC) or 300 VDC / 250 VAC (for supply voltages between 75 VDC / 50 VAC and 300 VDC / 250 VAC).

IP 64 / IP 65 / IP 67 / IP 68 / IP 69K



Refer to [DEGREES OF PROTECTION](#).

IR LIGHT



IR is the abbreviation of “**Infra-Red**”. 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.



LEAD LENGTHS



For the sensor, 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 pages 428-437) 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**.



All photoelectric sensors have one or two **Light Emitting Diodes (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 system reserves (excess gain) for reliable operation are 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).

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 sensor, 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



Strong fields can saturate the ferrite core of inductive sensors, thereby increasing the operating distance, or even provoking false switching. 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 sensors 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 sensing ranges 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 device is operated in the proximity of another device with the same modulation frequency, interference can occur.

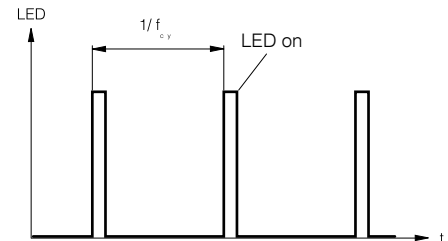


Fig. 25

MOUNTING



For photoelectric sensors, see **INSTALLATION**.



EMBEDDABLE SENSORS

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

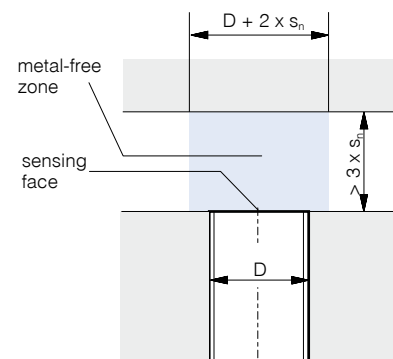


Fig. 26

QUASI-EMBEDDABLE SENSORS

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

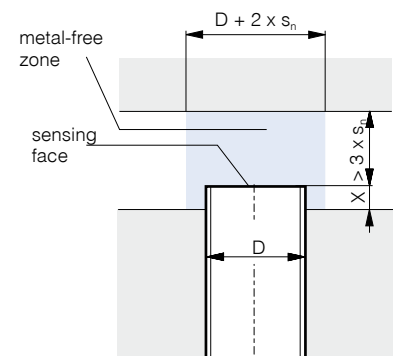


Fig. 27

Mounting in steel and in non-ferrous metals:

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

Mounting in stainless steel:

Housing size D	X (mm)
Ø 6.5	0.0
C8	0.0
M12	1.0
M18	1.5
M30	2.0

NON-EMBEDDABLE SENSORS

When mounting non-embeddable sensors 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.

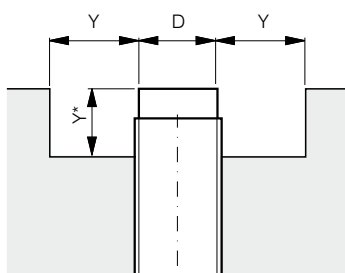


Fig. 28

Housing size D	Y (mm)
M8	8
M12	12
M18	22
M30	40
C44	60 / *40

N

NC



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

NO



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 sensor 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**.

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

RFID

Connectivity

Accessories

Glossary

Index

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).

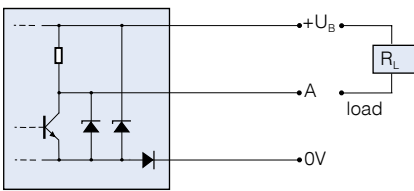


Fig. 29



OIL RESISTANCE



Long-term contact with any oils may affect plastics and weaken their resistance. However, inductive Full Inox sensors (series 700), 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 sensors, 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 generally of glass (with the exception of series 4150 and 5050), 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 oil, 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 sensors 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 sensor, whichever is the greater.

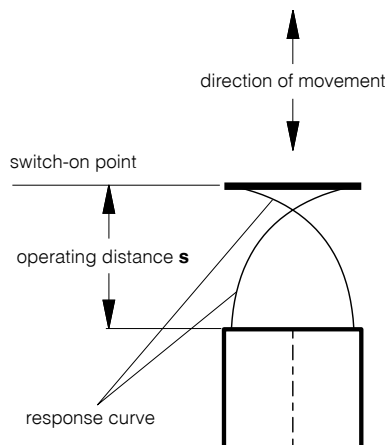


Fig. 30

Rated operating distance s_n

This is the operating distance for which the sensor 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 $\pm 10\%$.

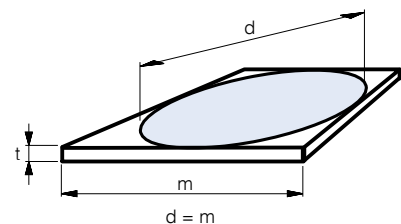


Fig. 31

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**.



See **SENSING RANGE**.

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.

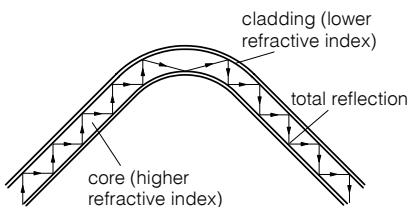


Fig. 32

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 capacitive 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 sensors contain a built-in output resistance (pull-up or pull-down 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 sensors 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 sensors in parallel, in order to perform logic functions, is possible without any problem (Figs. 33 and 34).

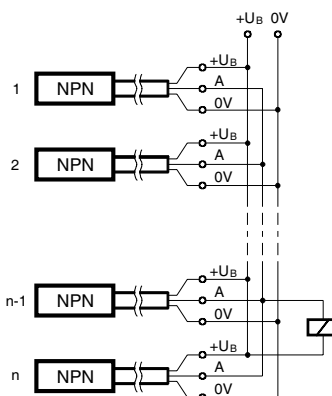


Fig. 33

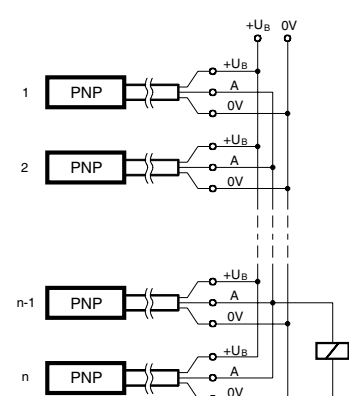


Fig. 34

Please note:

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

PNP CONFIGURATION



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

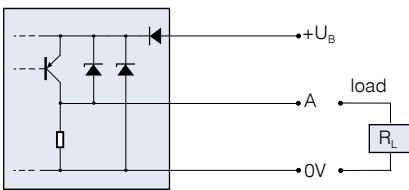


Fig. 35

POLARITY REVERSAL PROTECTION



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

POLARIZATION FILTER

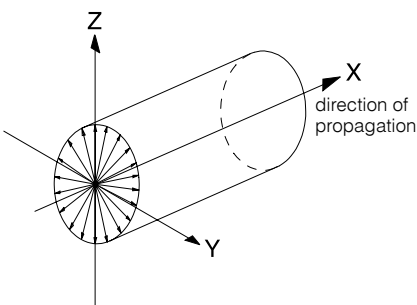


Fig. 36

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.

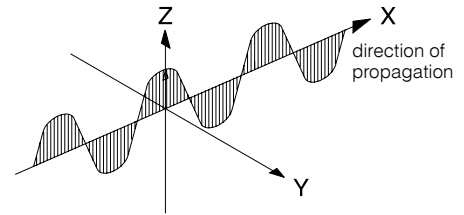


Fig. 37

POWER-ON RESET



When switched on, the sensor output is activated for a short time due to physical reasons, even without the presence of a target in front of the sensing face. Sensors 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.

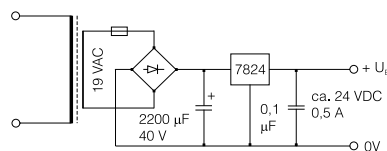


Fig. 38

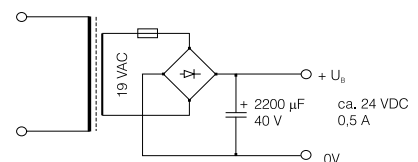


Fig. 39

The Contrinex accessory program also includes a suitable power supply unit (see page 442).

Please observe:

- Unsuitable power supply units are the most frequent reason for sensor 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.

R

REFLECTORS



By means of built-in polarization filters, polarized 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 $\pm 15^\circ$).

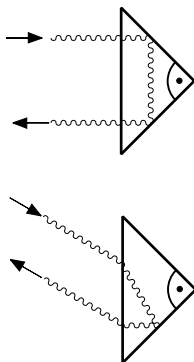


Fig. 40

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 s , over an 8-hour period at an ambient temperature of $23 \pm 5^\circ\text{C}$ ($73.4 \pm 41^\circ\text{F}$) 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):

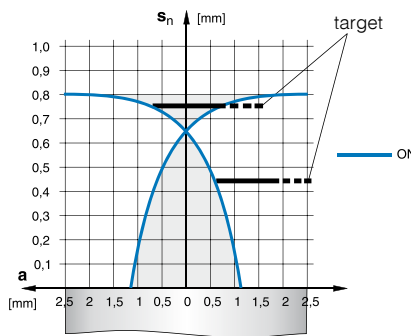


Fig. 41 DW-AD-603-M5

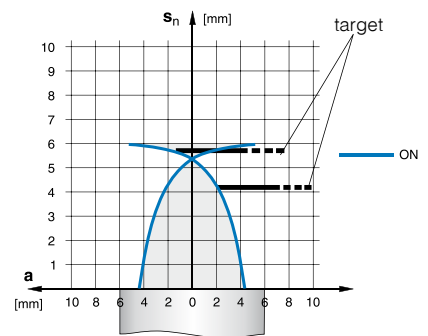


Fig. 42 DW-AD-503-M12

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



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.

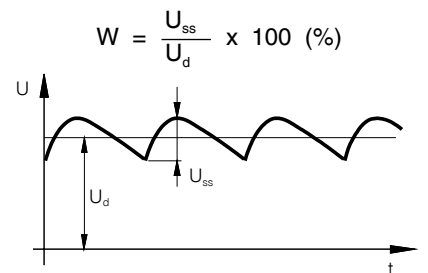


Fig. 43

S

SAFETY



The devices in this catalog have not been designed for safety-relevant use. In cases where the safety of people is dependent on their functioning, it is the user's responsibility to ensure that the relevant standards, in particular ISO 13849-1, and regulations are complied with. Contrinex assumes no liability for personal injury.

SENSING RANGE



The specified sensing range of photoelectric sensors is the maximum usable distance between the device and the standard target (diffuse sensors); between the device 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 sensing range. Moreover, the specified reflector (reflex sensors) or standard target (diffuse sensors) must be used.

SERIES CONNECTION



The connection of sensors in series in order to achieve logic functions is possible, but not recommended. The same effect can be achieved by the **parallel connection** of sensors with **NC function** (instead of the series connection of models with NO function), or vice versa. However, please note that, as a result, the output signal is inverted.

SHOCK RESISTANCE



The sensors 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



The devices in this catalog 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 sensor, and are allowed in permanence. The same applies to overloads. During short-circuits, the LEDs do not function.

SPHERICAL OPTICS



Spherical lenses are special versions of double convex lenses. They feature a short focal length and a good light incidence area. Fig. 44 shows such a design in sensor type LT#-1040/1050-30#-50# (see pages 180-185).

For diffuse sensors, the sphere is cut in two to separate the reception from the emission channel.

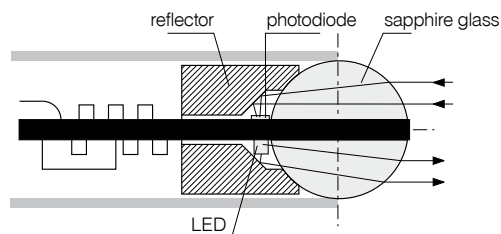


Fig. 44

The emitter and receiver chips are mounted as closely as possible to the surface of the sphere and slightly off the optical axis (see Fig. 44). This causes the emitted beam to intersect the receiver's sensing range at a specific distance from the device, resulting in a relatively short sensing range, but a virtually cylindrical detection zone. A cylindrical detection zone is particularly useful in some applications, such as the detection of targets through narrow holes or gaps.

STANDARDS



The sensors 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 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 sensors 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 sensors 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).

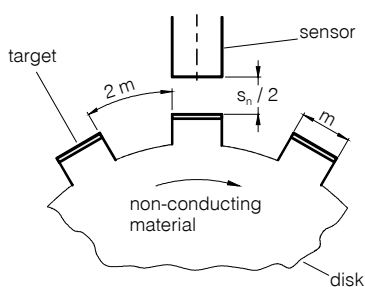


Fig. 45



In the case of photoelectric sensors, the frequency of operating cycles (f) is determined from the formula:

$$f = \frac{1}{t_{on} + t_{off}}$$

where:

t_{on} is the turn on time

t_{off} is the turn off time

t_{on} and t_{off} are measured in accordance with IEC60947-5-2 2007 paragraph 8.5.3. (see also **Turn-on/turn-off time**, in this glossary).

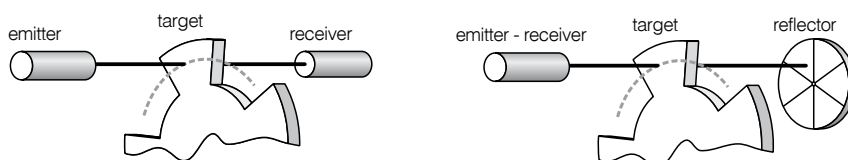


Fig. 46: Through-beam and reflex modes: the light beam must be fully broken by the target.

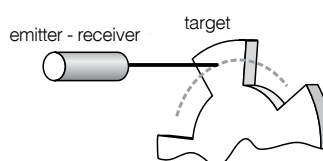


Fig. 47: Diffuse mode: the target must be of the same material as the standard target.

T

TEACH-IN



Some devices have a teach-in capability instead of a potentiometer to adjust their sensing range, etc. Teach-in is achieved either directly by pressing a button or remotely via IO-Link.

TEMPERATURE DRIFT



The set sensing ranges 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 sensing range, as a function of ambient temperature, follows approximately the curves shown in Fig. 48.

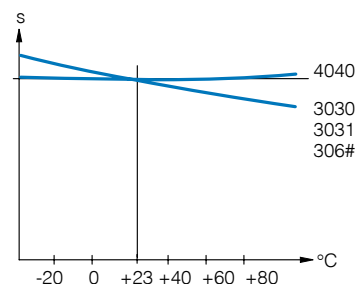


Fig. 48



The specified operating distances refer to a nominal ambient temperature of 23°C (73.4°F). The operating distance, as a function of ambient temperature, follows approximately the curve shown in Fig. 49.

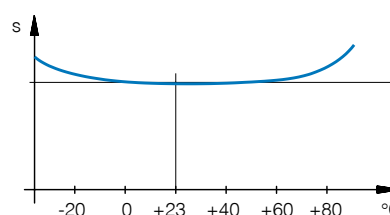


Fig. 49

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 (-13°F to + 158°F), the operating distance varies by a maximum of ± 10% compared to its value at 23°C (73.4°F).

TURN-ON / TURN-OFF TIME



The output **turn-on** time t_{on} is the minimum period of time required for a sensor to detect the **presence** of a light beam and output an ON signal.

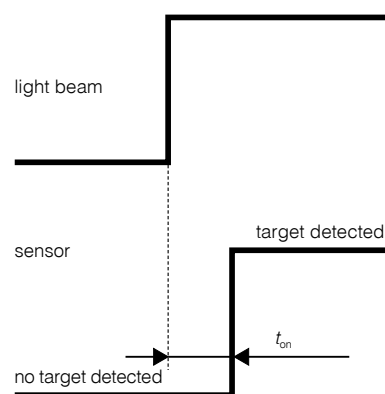


Fig. 50: Output turn-on time

The output **turn-off** time t_{off} is the minimum period of time required for a sensor to detect the **absence** of a light beam and output an OFF signal.

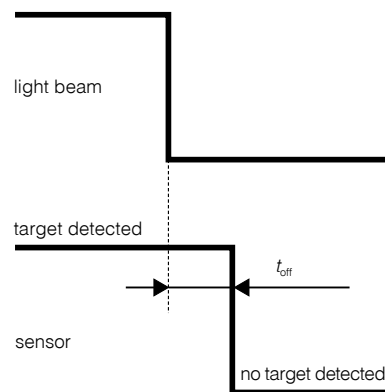


Fig. 51: Output turn-off time

t_{on} and t_{off} are measured in accordance with IEC60947-5-2 2007 paragraph 8.5.3.

TEST INPUT



The emitters of through-beam sensors 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 sensors. The specified maximum permissible tightening torques must therefore not be exceeded.



FULL INOX (SERIES 700)

Housing size D	M (Nm)
M8	8
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



CLASSICS / EXTRA DISTANCE (SERIES 500*, 520*, 600, 620)

Housing size D	M (Nm)
M4	0.8
M5	1.5
C5	0.2
M8	8 / *4
C8	1
M12	10**
M18	25
M30	70

** 6 Nm for the first 10 mm

TIME DELAY BEFORE AVAILABILITY



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

V

VIBRATION RESISTANCE



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

WIRING



Sensor 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

Inductive

Photoelectric

Ultrasonic

Capacitive

Safety

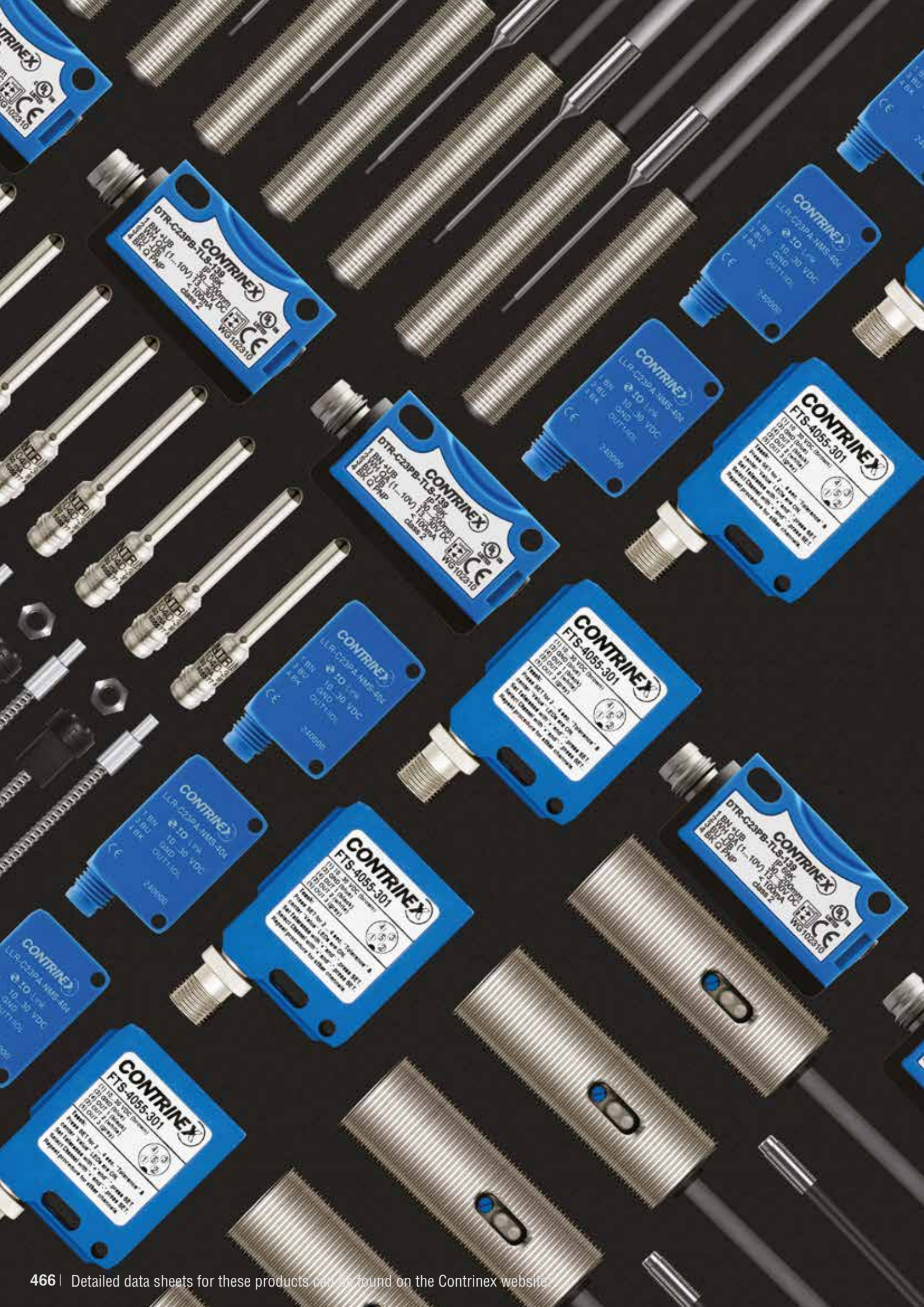
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HIGHLIGHTS:

- ✓ **Inductive:** sensor type, connection, series, output, housing
- ✓ **Photoelectric:** sensor type, series, dimensions, execution
- ✓ **Ultrasonic:** sensor type, connection, housing, operating distance, output, polarity
- ✓ **Capacitive:** sensor type, connection, dimensions, operating distance, housing, mounting, output
- ✓ **Safety:** light curtains, relays, mirror and columns, accessories
- ✓ **RFID:** transponders, Read/Write Modules, interfaces
- ✓ **Connectivity:** distribution boxes, cables and connectors



INDUCTIVE SENSORS

DW-AD-503-M8E (-12X/-XXX)

INDUCTIVE SENSOR DW

SENSOR TYPE

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

CONNECTION

Cable	D
Connector	S
Cable with molded connector	V

SERIES

500 / 520 (Extra Distance)	5
600 / 620 (Classics)	6
700 (Full Inox)	7

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

OUTPUT

NPN NO	1
NPN NC	2
PNP NO	3
PNP NC	4
PNP changeover	A
NPN changeover	B

SHORT / SPECIAL EXECUTIONS

Series E (impervious)	E
Series 700P (all-metal & high-pressure resistant)	G

HOUSING SIZE

Threaded	
M4	4
M5	5
M8	8
M12	12
M18	18
M30	30
M50	50
Smooth	
Ø 3 mm	3
Ø 4 mm	4
Ø 6.5 mm	65
Ø 8 mm	80
5 x 5 mm	5
8 x 8 mm	8
20 x 32 mm	23
40 x 40 mm	44

HOUSING

Threaded cylindrical housing	M
Rectangular housing	C
Smooth cylindrical housing	0
High-pressure resistant	P

OUTPUT

2-wire DC	
NO / NAMUR	5
NC	6

2-wire AC/DC	
NO	7
NC	8
Analog	9

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PHOTOELECTRIC SENSORS

LTR-C23PA-PMS-403 (-XXX)

SENSOR TYPE

Diffuse	LT
Retro-reflex	LR
Through-beam	LL
Background suppression	LH
Distance diffuse	DT

EMISSION TYPE

Red	R
Laser	L

HOUSING TYPE

Cubic	C
-------	---

HOUSING SIZE

Cubic 1# mm x 2# mm	12
Cubic 2# mm x 3# mm	23
Cubic 5# mm x 5# mm	55

HOUSING MATERIAL

Plastic	P
---------	---

PERFORMANCE

Standard	A, B
----------	------

ADJUSTMENT TYPE

No teach or potentiometer	N
Potentiometer	P
Teach	T

SPECIAL EXECUTIONS

OUTPUT

4-wire devices, NPN

Light-ON + Dark-ON	01
Light-ON + stability alarm	0A
Dark-ON + stability alarm	0B

4-wire devices, PNP

Light-ON + Dark-ON	03
Light-ON + stability alarm	0C
Dark-ON + stability alarm	0D

3-wire devices, NPN

Light-ON	01
Dark-ON	02

3-wire devices, PNP

Light-ON	03
Dark-ON	04

Other

3- or 4-wire through-beam sensor (emitter)	00
Analog	#9
Special	##

4-wire sensor	1
3-wire sensor	3
3-wire sensor with IO-Link	4
4-wire sensor with IO-Link	6

CONNECTION TYPE

Cable	K
Connector	S
Pigtail	V

DETECTION DISTANCE

Short	S
Standard	M
Long	L
Extra long	X

PHOTOELECTRIC SENSORS

LTS-1180-303 (-XXX)

PHOTOELECTRIC SENSOR	L
COLOR SENSOR	F
CONTRAST SENSOR	K

SENSOR TYPE

With analog output	A
For fibers / fiber	F
With background suppression	H
Through-beam sensor	L
Reflex sensor	R
Diffuse sensor	T
Accessories	X
Device with cable	K
Device with connector	S
Device with screw terminal	T
Device with molded connector	V
Synthetic optical fiber	P
Glass optical fiber	G
Reflector	R
Cutting tool	F
Mounting bracket	W

SERIES

Cylindrical devices	
Ø 4	1040
M5	1050
M12	1120
M12 laser	112#L
M18	1180
M18 laser	118#L
M18 with lateral light emission	1180W

Rectangular devices	
5 x 7 mm	0507
30x30 mm (high-performance)	3#30
30x30 mm (standard)	3#31
31x60 mm (standard)	3#60
31x60 mm (teach-in)	3#65
31x60 mm (teach-in & digital display)	3066
31x60 mm (high frequency)	326#
31x60 mm (blue light)	336#
40 x 40 mm	4040
40 x 50 mm	4#5#

Synthetic optical fibers	
Diffuse sensor	1###
Through-beam sensor	2###
Miniature / standard / coaxial	#0##
Flexible	#1##
Luminous (enhanced brightness)	#2##

Glass optical fibers	
Axial diffuse sensor	1###
Radial diffuse sensor	2###
Axial through-beam sensor	3###
Radial through-beam sensor	4###
Accessories	0###

SPECIAL EXECUTIONS

EXECUTION

3- or 4-wire through-beam sensor (emitter)	00
4-wire devices, NPN, output:	
Changeover or switchable	01
Light-ON and excess gain	02
4-wire devices, PNP, output:	
Changeover or switchable	03
Light-ON and excess gain	04
AC/DC devices	
Through-beam sensor (emitter)	10
With relay output	15
With relay output and timer	65
3-wire devices, NPN, output:	
Light-ON	01
Dark-ON	02
3-wire devices, PNP, output:	
Light-ON	03
Dark-ON	04
With built-in timer	+50

DIMENSIONS

Synthetic optical fibers	
Length in dm (2 m)	020
Glass optical fibers	
Length in cm (0.25 m)	025
Length in cm (0.50 m)	050
Length in cm (1 m)	100
Accessories	
General	###

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

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UTS-1180C-303 (-XXX)

ULTRASONIC SENSOR

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SENSOR 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
--------------------	----------

HOUSING SIZE

Cylindrical devices	
M12	12
M18	18
M30	30

SPECIAL EXECUTIONS

POLARITY

PNP NO (+ analog)	3
2 switching outputs	7
Analog output	9

OUTPUT

Switching output	0
Analog (voltage)	1
Analog (current)	2
Through-beam sensor	0
5-wire, (2 outputs), diffuse / reflex sensor	1
4-wire, (1 output), diffuse / reflex sensor	3

HOUSING

Short	C
For lateral sensing	W

OPERATING DISTANCE

Shortest operating distance	0
Increased operating distance	1
Long operating distance	2
Very long operating distance	3

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CAPACITIVE SENSORS

CSK-1120-103

CAPACITIVE SENSOR C

SENSOR TYPE

Basic / High performance S

CONNECTION

Cable K
Connector S

DIMENSIONS

Cylindrical devices	
M12	112
M18	118
M30	130
Ø 26 / G1	226
Cubic devices	
48.5 x 32 mm	332
120 x 80 mm	380

OUTPUT

PNP, changeover	3
AC/DC NO	7
PNP, NO	8

MOUNTING

Embeddable	0
Non-embeddable	1

HOUSING TYPE

Metal housing	1
Synthetic housing	2
PTFE housing	3

OPERATING DISTANCE

Increased operating distance	0
Standard operating distance	1

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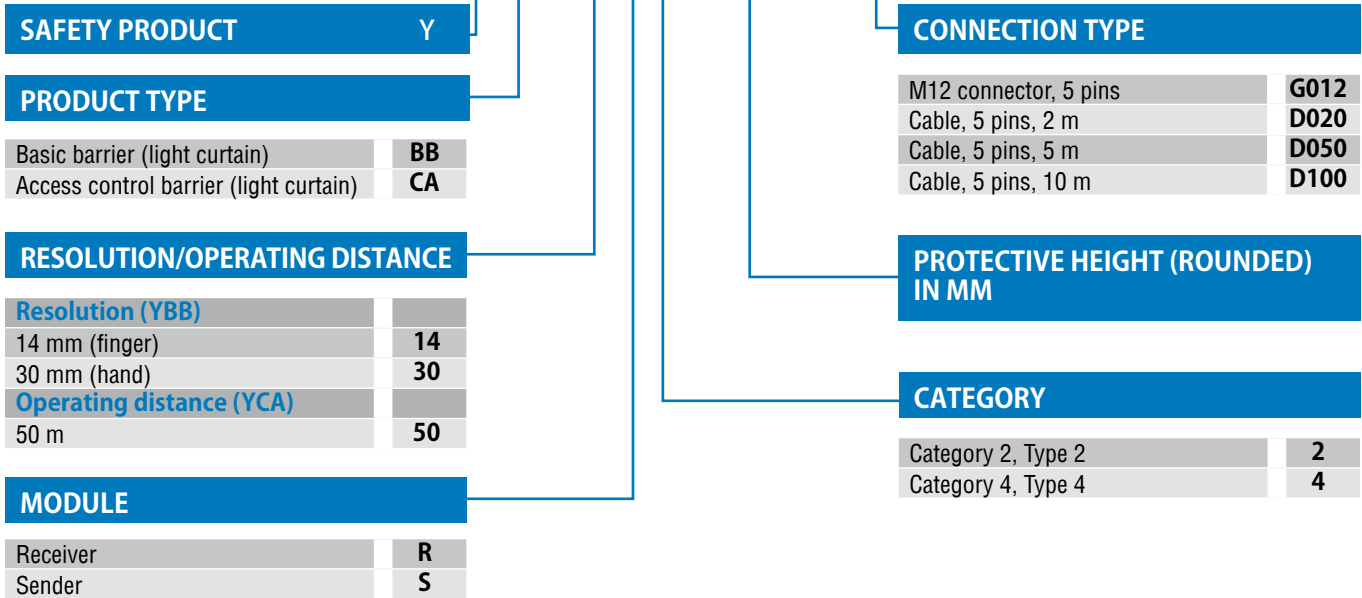
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LIGHT CURTAINS

YBB-30S4-0800-G012

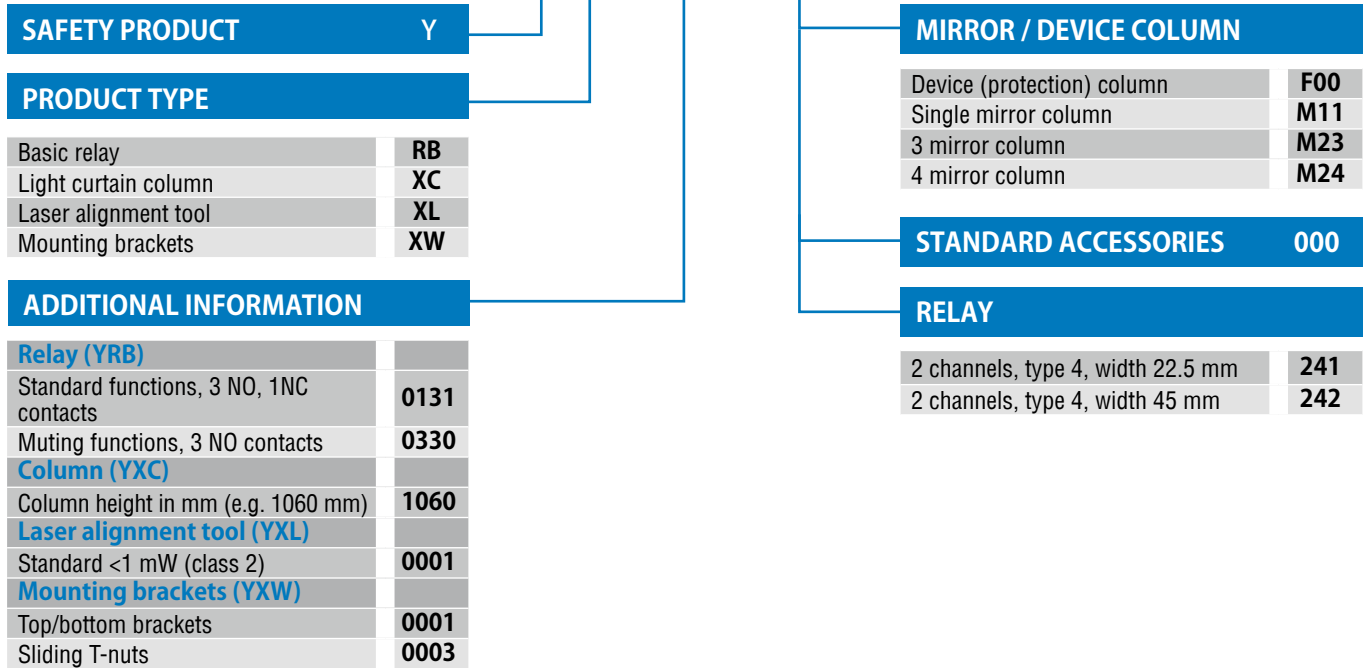


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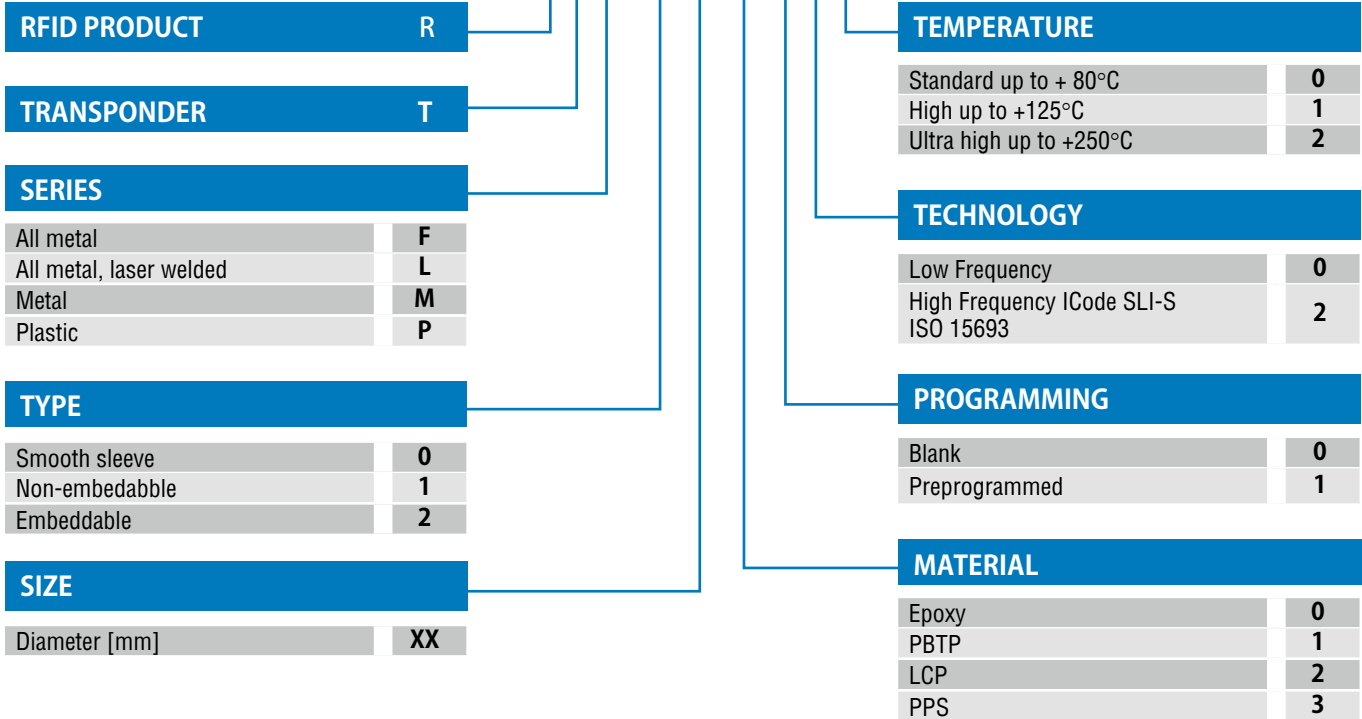
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RFID PRODUCTS

READ/WRITE MODULES

RLS-1181-030

RFID PRODUCTS	R		TEMPERATURE	
READ/WRITE MODULE	L		Standard up to + 80°C	0
CONNECTION	S		High up to +125°C	1
S12 connector, 4-pins			TECHNOLOGY	
USB A male			Conclent HF	2
TYPE			Conclent LF	3
Smooth sleeve		0	NETWORK	
Non-embedabble		1	ContriNet	0
Embeddable		2	USB	2
SIZE			IO-Link	3
M18		18	MATERIAL	
M30		30	Stainless steel V2A	0
			PBTP / Chrome-plated brass	1
			Stainless steel V4A	2
			PBTP / Stainless steel V2A	3

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RLS-1181-030	6/400
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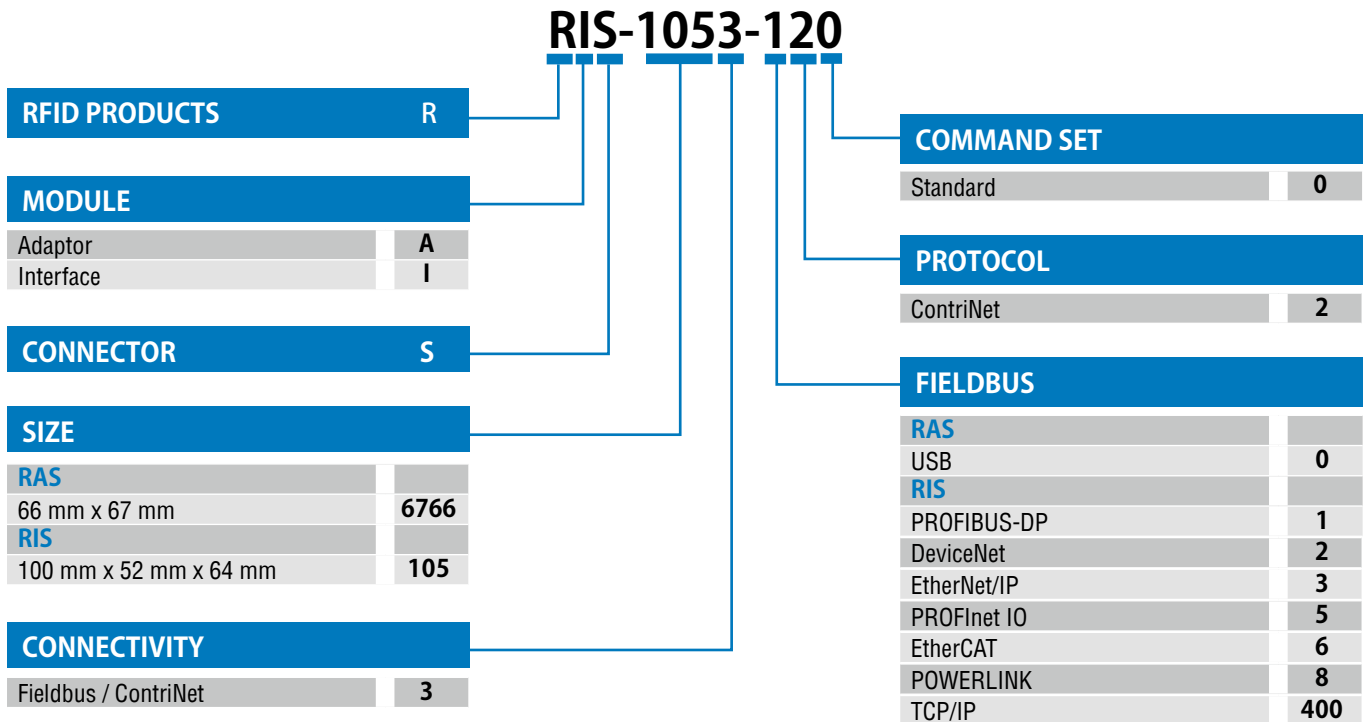
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 RIS-1053-620
 RIS-1053-820
 RIS-1613-400

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CABLE DISTRIBUTION BOXES

V12-58PD-050-UYN (-###)

DISTRIBUTION BOX **V**

CONNECTIONS

Accessory	00
M8	08
M12	12

POLE NUMBER OF CONNECTIONS

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

NUMBER OF CONNECTIONS

Hood for all types	0
2 connections	T
4 connections	4
6 connections	6
8 connections	8
10 connections	1

MATERIAL

Plastic	P
Metal	M

SPECIAL EXECUTIONS

TECHNOLOGY

Standard (passive distribution box)	N
Wiring according diagram no.	#

LED

Yes	Y
No	N

CABLE MATERIAL

No cable	N
PVC	V
PUR	U

CONNECTION

No cable	000
Cable 0.3 m	003
Cable 2 m	020
Cable 5 m	050
Cable 10 m	100
Connector M12	012
Connector M23	023

TYPE

Distribution box with cable	D
Distribution box for straight connection	G
Distribution box for right-angle connection	W
Base element without hood	B
Hood with cable	H
Hood without cable	E
Base element + hood with cable	Y

CABLE DISTRIBUTION BOXES

<i>Part reference</i>	<i>Chapter/page</i>
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CABLES / CONNECTORS

S12-4FAG-020[-NNLN-12MG]-(XXX)

CONNECTION CABLE

S

CONNECTOR SIZE FEMALE

M8	08
M12	12
M23	23

NUMBER OF POLES

3-pole	3
4-pole	4
5-pole	5
11-pole	B
19-pole	J

CONNECTOR TYPE

Female (socket)	F
Male (plug)	M

CABLE MATERIAL

No cable	N
PVC	V
PUR	U
TPE-S	A

CABLE EXIT (FEMALE)

Straight	G
Right-angle	W

CABLE LENGTH

No cable	000
0.3 m	003
0.6 m	006
1 m	010
1.5 m	015
2 m (standard)	020
5 m	050
10 m	100

3-pole, NO & NC	015
100 pieces	921

CABLE EXIT (MALE)

Straight	G
Right-angle	W

CONNECTOR TYPE

Male (plug)	M
Female (socket)	F

CONNECTOR SIZE MALE

M8	08
M12	12
M23	23

CONNECTION TYPE

Standard	N
Quick-lock	Q
Cable Ø 3.0 - 5.0 mm / wire 0.08 - 0.38 mm ²	1
Cable Ø 4.0 - 8.0 mm / wire 0.14 - 0.50 mm ²	2

APPLICATION

Standard	N
Food	L
RFID	R
Field attachable	T
Safety	S

EXECUTION

Standard or no cable	N
Shielded	W

LED

Yes, PNP	Y
Yes, NPN	Z
No	N

CABLES / CONNECTORS

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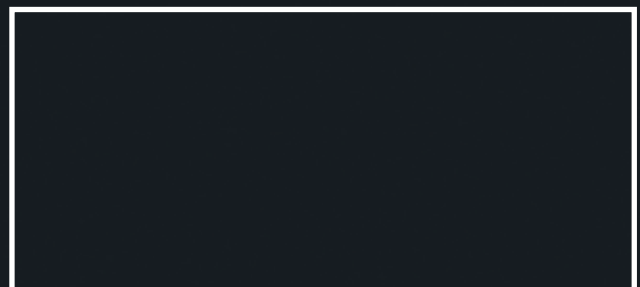
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