



NEW

PHOTOELECTRIC SENSORS

- TRU-C23 UV Transparent
- TRR-C23 Standard Transparent
- M18 Series
- C23 Distance Laser
- C55 Distance IO-Link
- Light Grids

PHOTOELECTRIC SENSOR SECTION



LARGEST SELECTION
OF IO-LINK SENSORS
IN THE INDUSTRY *

A
Swiss
Company

INTRODUCTION

CONTRINEX

Contrinex is a leading manufacturer of sensors for factory automation. The Swiss company, headquartered in Corminboeuf 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 580 employees worldwide. More than 14 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

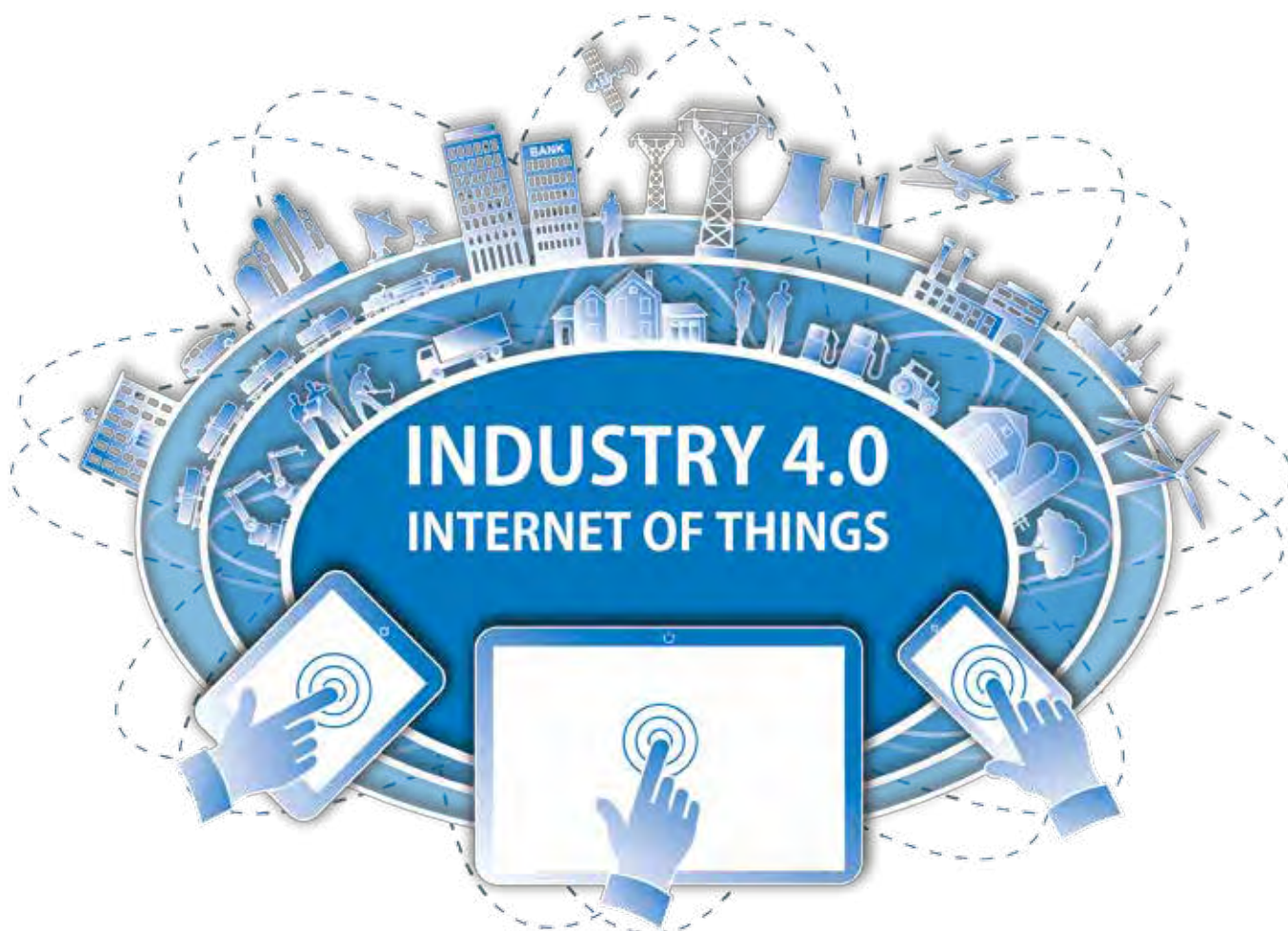
Fit for the future with IO-Link

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 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 Safetinx®, 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
- 2017 Launch of photoelectric sensor with patented UV technology for transparent object detection



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



ASIC sensor technology



Safety product range



Subminiature photoelectric sensor

- [illegible]

Dynamic Measurement

- 
- ment & Control Solution

PROGRAM OVERVIEW

	SERIES		1040	1050	1120	M18P	1180
	HOUSING SIZE IN MM		$\varnothing$ 4  IO-Link 2019	M5  IO-Link 2019	M12  IO-Link 2019	M18  IO-Link	M18  IO-Link 2019
	OPERATING PRINCIPLE	SENSING RANGE	CYLINDRICAL				
STANDARD	Diffuse				 p.191	 p.196	 p.200-201, 205 
	Background suppression					 p.195	 p.199-200
	Reflex				 p.192	 p.197	 p.202-203
	Through-beam				 p.192-193 	 p.197	 p.203-204, 206 
MINIATURE	Diffuse		 p.229-231	 p.232-234			
	Background suppression						
	Reflex						
	Through-beam		 p.231	 p.235			
TRANSPARENT OBJECT	Reflex, UV light						
	Reflex, red light						
FIBER OPTIC SENSORS AND FIBERS	Amplifier						
	Plastic fiber						
	Glass fiber						
DISTANCE	Short range						
	Medium range						
COLOR AND CONTRAST	Color						
	Contrast						
LIGHT GRIDS	Detection						
	Measurement						

											Inductive
	0507	C12	C23	3030	3060	4040	4050	C55	DGI	MGI	
	5x7x40	13x21x7 13x27x7	20x30x10 20x34x12  IO-Link	30x30x15	31x60x10  IO-Link	40x40x19	40x50x15  IO-Link	50x50x23  IO-Link	40x20xH	40x20xH	Photoelectric
	CUBIC										
			 p.210	p.215-216			p.221				Safety
			 p.209	p.213-214			p.221	p.225 			
			 p.211	p.217-218			p.222				
			 p.211	p.219			p.222				
	p.237										RFID
		p.239-240									
		p.240									
		p.241									
			 p.245								Connectivity
			 p.246-247								
				p.253-254	 p.257-259	p.261					Accessories
				p.262-271	p.262-271						
				p.277		p.272-276					
			p.283 								Glossary
								 p.285 			
							p.289				
							 p.289				Index
									p.293		
										p.295	

PROGRAM OVERVIEW

HOUSING SIZE	SENSING RANGE	PAGE
	1 mm 10 mm 100 mm 1000 mm 10,000 mm 100,000 mm	
DIFFUSE		
Ø 4 mm / M5	10 mm	229, 232
Ø 4 mm / M5	20 mm	230, 233
Ø 4 mm / M5	50 mm	231, 234
5 x 7 mm	20 mm	237
5 x 7 mm	50 mm	237
5 x 7 mm	90 mm	237
M12	300 mm	191
M18P	1200 mm	196
M18 (M18W)	600 mm	200-201
M18 ⚠	250 mm	205
M18 ⚠	600 mm	205
C23	1500 mm	210
30 x 30 mm	600 mm	215
30 x 30 mm	1200 mm	216
40 x 50 mm	1200 mm	221
BACKGROUND SUPPRESSION		
M18P	250 mm	195
M18 (M18W)	120 mm	199-200
C12	15 mm	239
C12	30 mm	240
C12	120 mm	239
C23	300 mm	209
30 X 30 mm	200 mm	213-214
40 X 50 mm	500 mm	221
C55 ⚠	5000 mm	225
REFLEX		
M12	1500 mm	192
M18P	7000 mm	197
M18 (M18W)	2000 mm	202-203
C12	3000 mm	240
C23	8000 mm	211
C23 (TRU)	1200 mm	245
C23 (TRR)	5000 mm	246-247
30 X 30 mm	2000 mm	217
30 X 30 mm	4000 mm	218
40 X 50 mm	4000 mm	222
ANALOG OUTPUT		
30 x 30 mm	100 mm	213

							Inductive
HOUSING SIZE	SENSING RANGE					PAGE	
	1 mm	10 mm	100 mm	1000 mm	10,000 mm	100,000 mm	Photoelectric
THROUGH-BEAM							Safety
Ø 4 mm	250 mm					231	
M5	250 mm					235	
M12	10,000 mm					192	
M12 ⚠	50,000 mm					193	
M18P	30,000 mm					197	
M18 (M18W)	20,000 mm					203-204	
M18 ⚠	50,000 mm					206	
C12	2000 mm					241	
C23	30,000 mm					211	
30 x 30 mm	6000 mm					219	RFID
30 x 30 mm	12,000 mm					219	
40 x 50 mm	50,000 mm					222	
FIBER-OPTIC AMPLIFIER							Connectivity
30 x 30 mm	60 mm					253	
30 x 30 mm	120 mm					254	
31 x 60 mm	100 mm					259	
31 x 60 mm	200 mm					257-258	
40 x 40 mm	150 mm					261	
CONTRAST							Accessories
40 x 50 mm	12 mm					289	
COLOR							Glossary
40 x 50 mm	40 mm					289	
DISTANCE MEASURING							
C23	80 mm					283	
C23 ⚠	100 mm					283	
C23	200 mm					283	Index
C55 ⚠	5000 mm					285	
LIGHT GRIDS							
40 x 20.5 mm (Detection grid)	8000 mm					293	Index
40 x 20.5 mm (Measurement grid)	4000 mm					295	

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.

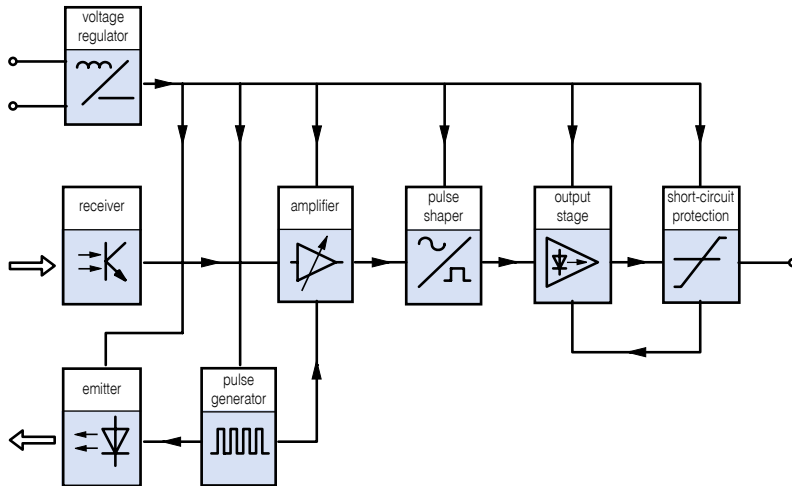


Fig. 9: Functional blocks of a photoelectric sensor

TECHNOLOGY FAMILIES

Contrinex photoelectric devices are divided into five **technology families**, depending on their operating principle. The program includes energetic **diffuse** sensors, diffuse sensors with **background suppression**, **reflex** sensors, **through-beam** sensors and sensors with **analog** output.

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.

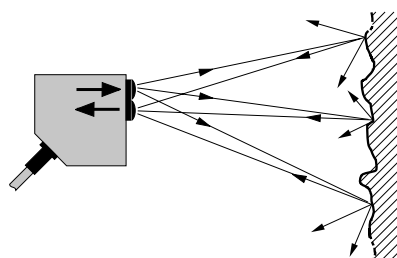


Fig. 10: Diffuse sensing

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 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 receiver detects the reduced light intensity and triggers the sensor.

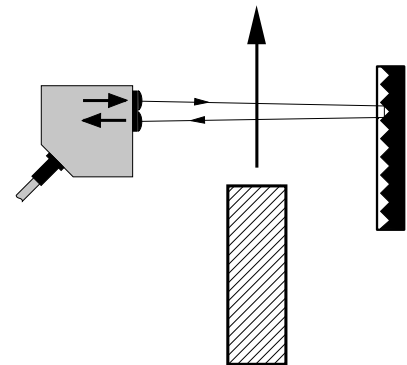


Fig. 11: Reflex sensing

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.

THROUGH-BEAM

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

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).

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.

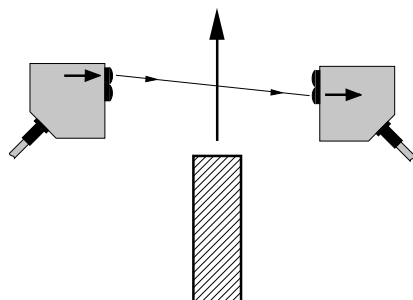


Fig. 12: Through-beam sensing

of process data, continuous diagnosis of sensor status, advanced parameter settings, sensitivity adjustment, a remote teach function and easy checking of sensor ID, to ensure the right sensor is at the right place. See page 186.

MINIATURE

Smallest on the market

The Contrinex **Miniature** range packs exceptional position- and presence-sensing performance into the smallest self-contained photoelectric sensors on the market. Designers have the choice of through-beam or diffuse sensors in $\varnothing 4$ and M5 cylindrical metal housings that offer multiple mounting methods and beam orientation. For fully embedded applications, sensors with spherical sapphire-glass lenses produce focused, cylindrical light beams.

Types with a 5 mm x 7 mm stainless-steel housing and a narrowly focused, cylindrical light beam are suitable for vertical or horizontal mounting directly on the supporting surface. Best-in-class sensing distances of up to 90 mm allow them to be positioned at a safe distance from the target.

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.

PRODUCT RANGES

STANDARD

First-class performance for general use

Contrinex **Standard** photoelectric sensors are ideal for general position- and presence-detection in almost any industry. With first-class sensing ranges and outstanding background suppression characteristics, the Standard range of sensors delivers very high accuracy and reliability. Light sources include infrared, laser and pinpoint LED.

The **Standard** range offers a wide choice of cubic sizes: **C23** (20 x 30 x 10 mm), **3030** (30 x 30 x 15 mm), **4050** (40 x 50 x 15 mm) and **C55** (50 x 50 x 23 mm). Cylindrical types are available in sizes **M12** and **M18**, including some M18 types with housings adapted for right-angle detection.

Standard C23 and **M18P** series are high quality ASIC sensors with an integral **IO-Link** interface in PNP types. This makes them particularly suitable for smart factory applications. IO-Link extends sensor functionality to include continuous monitoring



INTRODUCTION

TRANSPARENT OBJECT

Outstanding reliability and ease of adjustment

The Contrinex **TRU-C23** photoelectric sensor is ideally suited for the presence control of transparent objects. Its patented technology uses **UV light**. Since transparent materials like plastic or glass absorb large amounts of polarized UV light, it is very easy to set the threshold at which the sensor switches. The shape or thickness of the target has no influence on detection. In addition, sensor performance is unaffected by dirt, water drops or aging.



The sensor system comprises an LED that emits polarized UV light and a UV reflector. Overall, the sensor's operating range is around **1200 mm**. Special optics with autocollimation ensure reliable detection and no blind zone, even close to the sensor or through a small notch. For applications requiring the detection of thicker or larger transparent objects, the **C23 Transparent Standard** can be the ideal solution. It operates with polarized, red light and has a maximum operating range up to **5000 mm**. Typical fields of application can be found in the food, pharmaceutical and packaging industries. Both sensor types include an IO-Link interface (see page 186).

FIBER-OPTIC SENSORS AND FIBERS

Reliable short and long-range sensing

The highly versatile **Fiber-Optic** range includes the self-contained **3030** and **4040** series (30 mm x 30 mm x 15 mm and 40 mm x 40 mm x 19 mm) and the DIN-rail mounted **3060** series (31 mm x 60 mm x 10 mm), suitable for multiple-sensor applications. **Synthetic fibers** are available for general use and **glass fibers** for high temperatures and aggressive environments.

Customers requiring intrinsically safe photoelectric sensors with DIN-rail-mounted electronics need not look beyond the Contrinex **3060** series of fiber-optic amplifiers. In a Crastin® housing, every model combines ease of set-up with market-leading features, including **IO-Link** (see page 186). 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.

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 (model 3360), detecting glass is possible at distances up to 100 mm.

Fiber-optic sensors are common in explosive environments or in the presence of strong electromagnetic fields, but also in confined spaces. With bend-radii as small as 2 mm, reliable, accurate sensing is possible even in the most inaccessible areas.



DISTANCE

High precision and direct digital transmission

DTR-C23 and **DTL-C23** sensors use a triangulation method for highly accurate distance measurement at short range. Types with red light (DTR-C23) measure distances of **20 to 80 mm** or **30 to 200 mm**, while the measurement range for laser types (DTL-C23) is **20 to 100 mm**. Applications include small-part detection, position or height checking and monitoring material thickness on winding rolls.

For ranges up to **5000 mm**, **DTL-C55** sensors use the optical time-of-flight (TOF) method. In the **IO-Link** version, measurements are passed directly to the control system as millimeter values in digital form, with no need for an analog-to-digital converter and no signal drop for long lines. In addition, IO-Link provides diagnostic and other functions (see page 186). With two virtual switching points settable either via teach-in or direct parameter write-in, this sensor is ideal for use in mobile logistics, such as forklift trucks.

With both methods, distance measurement is largely independent of target color or surface characteristics. Detected distances can be output via an adjustable analog output and, for a digital output, a switching window of acceptance may be configured by teach-in.

The housings of **DTR-C23** and **DTL-C23** sensors (20 mm x 34 mm x 12 mm) and **DTL-C55** sensors (50 mm x 50 mm x 23 mm) have an **IP67/IP69K** enclosure rating. DTL-C55 sensors have **Ecolab** certification.



COLOR AND CONTRAST

Excellent resolution for smallest variations

Color photoelectric sensors utilize energetic-diffuse sensing technology to detect variations in target color, allowing color sorting or color control. A “teach-in” function is used to program up to three separate outputs. Contrinex color photoelectric sensors also feature five selectable tolerance levels for each output, enabling the sensor to recognize or ignore even the smallest variations of color.

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 (see page 289).

Contrinex color and 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.



LIGHT GRIDS

Fast detection, counting and measurement

The use of infrared **light grids** for non-contact measurement offers many advantages, including fast response times, reliable detection of the most varied objects and immunity to interference from ambient light. Potential applications for these keen-eyed, robust sensors are to be found in such fields of application as logistics or automated packaging systems and in harsh environments such as warehouses and the wood industry.

With the **DGI** (detection) and **MGI** (measurement) series, Contrinex presents compact infrared light grids as a robust plug-and-play solution. With a cross-section of only 40 x 20.5 mm, these space-saving devices are easily integrated into different systems. DGI types offer detection heights up to 2010 mm and are capable of detecting objects with diameters

of 0.9, 2, 4, 8 or 25 mm, depending on type. With response times between 0.8 and 4.8 ms, even small objects moving at high speed can be reliably detected and counted. Fields of application include the production of small parts or foil, packaging equipment and the pharmaceutical industry. In addition to detecting the presence of an object, MGI measurement types can also determine its dimensions and position. These sensors offer measurement heights up to 1438 mm and a resolution of 5 or 12 mm. Measurements are output as analog values of 0-10 V or as a 4-20 mA signal.



IO-LINK FUNCTIONALITY* WITH PHOTOELECTRIC SENSORS (PNP TYPES)

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.

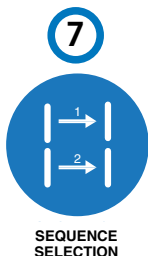
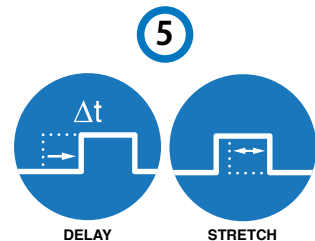
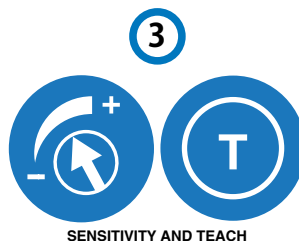
Detection counter:

- 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







FIRST-CLASS PERFORMANCE FOR GENERAL USE

STANDARD

PHOTOELECTRIC SENSORS

KEY ADVANTAGES

- ✓ First-class sensing ranges
- ✓ Outstanding background suppression characteristics
- ✓ Cubic sizes: C23 (20 x 30 x 10 mm), 3030 (30 x 30 x 15 mm), 4050 (40 x 50 x 15 mm) and C55 (50 x 50 x 23)
- ✓ Cylindrical M12 and M18 series with metal housing
- ✓ M18P series with short, plastic housing
- ✓ C23 and M18P series: high quality ASIC sensors with an integral  IO-Link interface in PNP types
- ✓ Light sources: red, infrared, laser and pinpoint LED

RANGE OVERVIEW	Series	Diffuse	Background suppression	Reflex	Through-beam
STANDARD	1120 (M12)	p. 191		p. 192	p. 192-193
	M18P (M18)	p. 196	p. 195	p. 197	p. 197
	1180 (M18)	p. 200-201, 205	p. 199-200	p. 202-203	p. 203-204, 206
	C23 (20x30x10)	p. 210	p. 209	p. 211	p. 211
	3030 (30x30x15)	p. 215-216	p. 213-214	p. 217-218	p. 219
	4050 (40x50x15)	p. 221	p. 221	p. 222	p. 222
	C55 (50x50x23)		p. 225		

STANDARD 1120

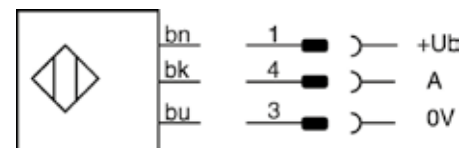
PHOTOELECTRIC SENSORS

ADVANTAGES

- ✓ M12 sensor series
- ✓ Rugged metal housing
- ✓ Shock & vibration resistant due to fully potted electronics
- ✓ Laser types (protection class 2) for accurate detection of smallest targets
- ✓ Sensing range up to 50 m
- ✓  **IO-Link** in 2019

WIRING DIAGRAM

PNP or NPN, 1 output



OVERVIEW	1120	1121L
Housing material	Chrome-plated brass	Stainless steel V2A
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
Switching frequency	≤ 1000 Hz	≤ 5000 Hz

1120 SERIES



1120

HOUSING SIZE MM

M12

M12

OPERATING PRINCIPLE

DIFFUSE SENSOR

DIFFUSE SENSOR

SENSING RANGE MM

300

300

Inductive

Photoelectric

Safety

RFID

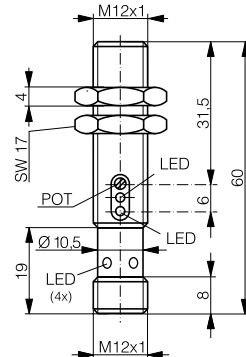
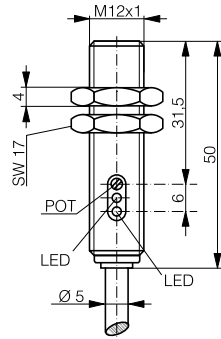
Connectivity

Accessories

Glossary

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PHOTOELECTRIC



DATA

IO-Link 2019

IO-Link 2019

Light source

LED red 660 nm

LED red 660 nm

Setup

Potentiometer

Potentiometer

PNP Light-ON

LTK-1120-303

LTS-1120-301

NPN Light-ON

LTK-1120-301

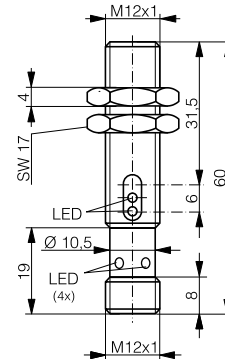
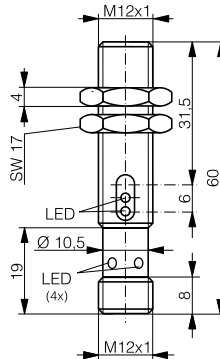
LTS-1120-301

Other types available

STANDARD

PHOTOELECTRIC

HOUSING SIZE	M12	M12
OPERATING PRINCIPLE	REFLEX SENSOR	THROUGH-BEAM SENSOR
SENSING RANGE MM	1500	10,000



DATA	 IO-Link 2019	 IO-Link 2019
Light source	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)
NPN Dark-ON	LRS-1120-302	LLS-1120-202 (receiver)
Other types available	Cable version	Cable version

1120 SERIES



1120

M12	
THROUGH-BEAM SENSOR	
50,000	

Inductive

Photoelectric

Safety

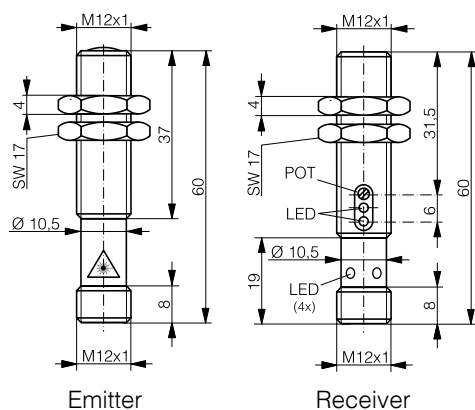
RFID

Connectivity

Accessories

Glossary

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Emitter

Receiver



Laser red pulsed 660 nm

-

LLS-1121L-200 (emitter)

LLS-1121L-204 (receiver)

LLS-1121L-202 (receiver)

Cable version

STANDARD M18 PLASTIC

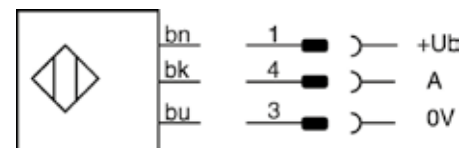
PHOTOELECTRIC SENSORS

ADVANTAGES

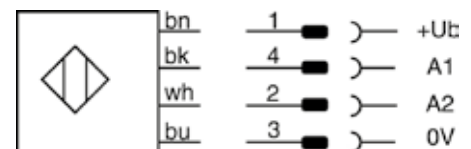
- ✓ First-class sensing ranges
- ✓ Short housing: M18 x 33 mm (cable version), M18 x 37 mm (connector version)
- ✓ Excellent background suppression characteristics with pinpoint LED
- ✓ Mutual interference immunity
- ✓  **IO-Link** on all PNP sensors
- ✓ Easy flush mounting
- ✓ Easy-to-mount special accessories for right-angle emission

WIRING DIAGRAMS

PNP or NPN, 1 output



PNP or NPN, 2 outputs



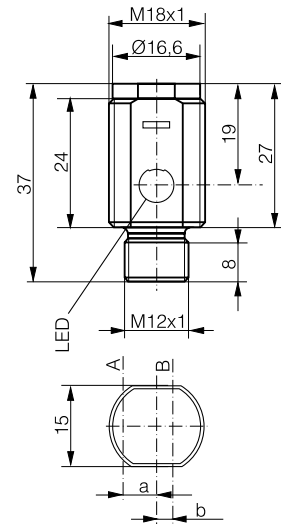
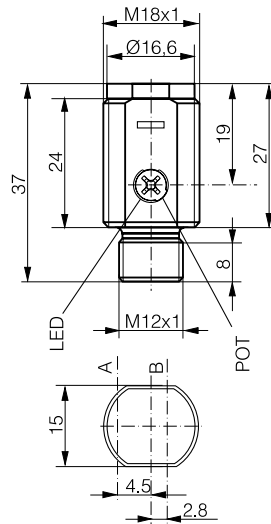
OVERVIEW	M18P
Housing material	ABS / PMMA
Degree of protection	IP 67
Supply voltage range	10 ... 30 VDC
Ambient temperature range	-25 ... +65°C / -13 ... +149°F
Output current	≤ 200 mA
Compatible mounting brackets	See pages 300-301
Accessories	See pages 441-455

M18P SERIES



PHOTOELECTRIC

HOUSING SIZE MM	M18	M18
OPERATING PRINCIPLE	DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION	DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION
SENSING RANGE MM	250	250



DATA	IO-Link	IO-Link
Light source	LED red pinpoint 640 nm	LED red pinpoint 640 nm
Switching frequency (normal mode)	≤ 700 Hz	≤ 700 Hz
Setup	Potentiometer	Teach button or IO-Link
PNP Light-ON	LHR-M18PA-PMS-403	LHR-M18PA-TMS-403
PNP Light-ON + Dark-ON	LHR-M18PA-PMS-603	LHR-M18PA-TMS-603
PNP Light-ON + stability alarm	LHR-M18PA-PMS-60C	LHR-M18PA-TMS-60C
NPN Light-ON	LHR-M18PA-PMS-301	LHR-M18PA-TMS-301
NPN Light-ON + Dark-ON	LHR-M18PA-PMS-101	LHR-M18PA-TMS-101
NPN Light-ON + stability alarm	LHR-M18PA-PMS-10A	LHR-M18PA-TMS-10A
Other types available	Cable version	Cable version

Inductive

Photoelectric

Safety

RFID

Connectivity

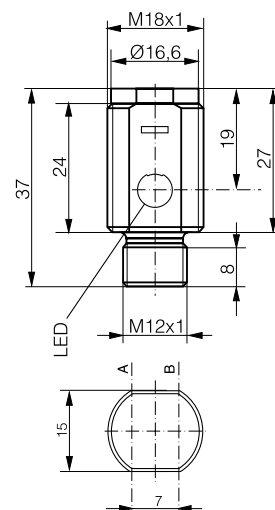
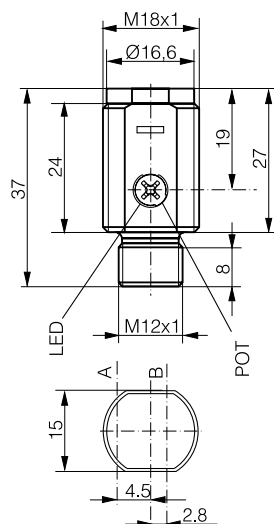
Accessories

Glossary

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STANDARD

HOUSING SIZE MM	M18	M18
OPERATING PRINCIPLE	DIFFUSE SENSOR	DIFFUSE SENSOR
SENSING RANGE MM	1200	1200



DATA	IO-Link	IO-Link
Light source	LED red 630 nm	LED red 630 nm
Switching frequency (normal mode)	≤ 1500 Hz	≤ 1500 Hz
Setup	Potentiometer	IO-Link
PNP Light-ON	LTR-M18PA-PMS-403	LTR-M18PA-NMS-403
PNP Light-ON + Dark-ON	LTR-M18PA-PMS-603	
PNP Light-ON + stability alarm	LTR-M18PA-PMS-60C	
NPN Light-ON	LTR-M18PA-PMS-301	
NPN Light-ON + Dark-ON	LTR-M18PA-PMS-101	
NPN Light-ON + stability alarm	LTR-M18PA-PMS-104	
Other types available	Cable version	Cable version

M18P SERIES



Inductive

Photoelectric

Safety

RFID

Connectivity

Accessories

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HOUSING SIZE MM

M18

M18

OPERATING PRINCIPLE

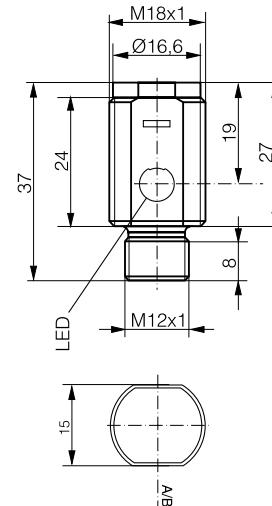
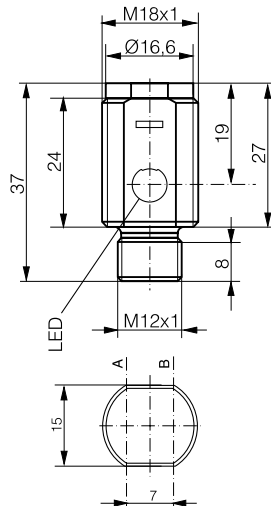
REFLEX SENSOR

THROUGH-BEAM SENSOR

SENSING RANGE MM

7000

30,000



DATA

IO-Link

IO-Link

Light source

LED red polarized 630 nm

LED red 630 nm

Switching frequency (normal mode)

≤ 1500 Hz

≤ 1000 Hz

Setup

IO-Link

IO-Link

Emitter

LLR-M18PA-NMS-400

PNP Dark-ON

LRR-M18PA-NMS-404

LLR-M18PA-NMS-404

PNP Light-ON + Dark-ON

LRR-M18PA-NMS-603

LLR-M18PA-NMS-603

PNP Dark-ON + stability alarm

LRR-M18PA-NMS-60D

LLR-M18PA-NMS-60D

NPN Dark-ON

LRR-M18PA-NMS-302

LLR-M18PA-NMS-302

NPN Light-ON + Dark-ON

LRR-M18PA-NMS-101

LLR-M18PA-NMS-101

NPN Dark-ON + stability alarm

LRR-M18PA-NMS-10B

LLR-M18PA-NMS-10B

Other types available

Cable version

Cable version

STANDARD M18

PHOTOELECTRIC SENSORS

ADVANTAGES

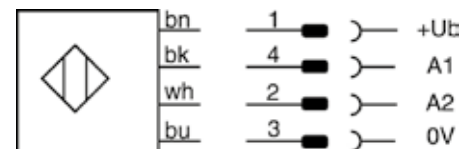
- ✓ M18 sensor series
- ✓ Models for lateral sensing
- ✓ Rugged metal housing
- ✓ Shock & vibration resistant due to fully potted electronics
- ✓ Laser types (protection class 2) for accurate detection of smallest targets
- ✓ Sensing range up to 50 m
- ✓  **IO-Link** in 2019

WIRING DIAGRAMS

PNP or NPN, 1 output



PNP or NPN, 2 outputs



OVERVIEW	1180 / 1180W	1180L
Housing material	Chrome-plated brass	Stainless steel V2A
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
Switching frequency	≤ 1000 Hz	LT: ≤ 1000 Hz/LL: ≤ 5000 Hz

1180 SERIES



1180

HOUSING SIZE MM	M18	M18
OPERATING PRINCIPLE	DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION	DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION
SENSING RANGE MM	120	120

Inductive

Photoelectric

Safety

RFID

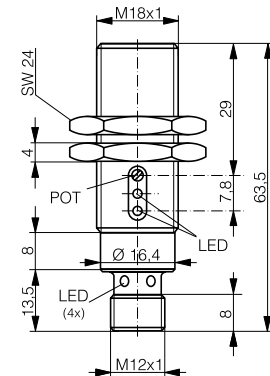
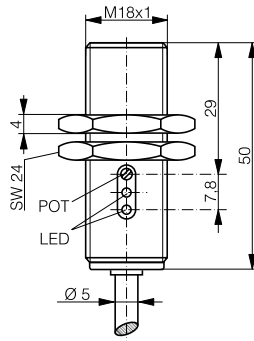
Connectivity

Accessories

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PHOTOELECTRIC



DATA	IO-Link 2019	IO-Link 2019
Light source	LED red 680 nm	LED red 680 nm
Setup	Potentiometer	Potentiometer
PNP Light-ON	LHK-1180-303	LHS-1180-303
NPN Light-ON	LHK-1180-301	LHS-1180-301
Other types available		

STANDARD

HOUSING SIZE

M18

M18

OPERATING PRINCIPLE

DIFFUSE SENSOR WITH
BACKGROUND SUPPRESSION

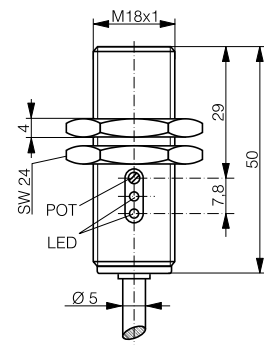
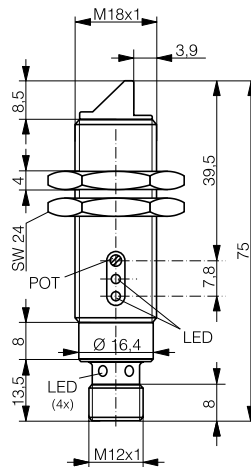
DIFFUSE SENSOR

SENSING RANGE MM

120

600

PHOTOELECTRIC



DATA

IO-Link 2019

IO-Link 2019

Light source

LED red 680 nm

LED red 630 nm

Setup

Potentiometer

Potentiometer

PNP Light-ON

LHS-1180W-303

NPN Light-ON

LHS-1180W-301

PNP Light-ON + Dark-ON

LTK-1180-103

NPN Light-ON + Dark-ON

LTK-1180-101

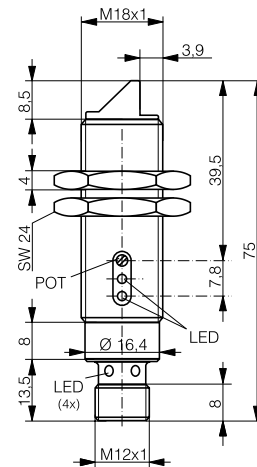
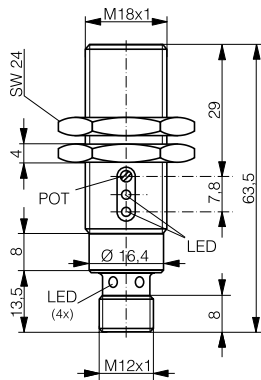
Other types available

Cable version

1180 SERIES



M18	M18
DIFFUSE SENSOR	DIFFUSE SENSOR
600	600



IO-Link 2019	IO-Link 2019
LED red 630 nm	LED red 630 nm
Potentiometer	Potentiometer
LTS-1180-103	LTS-1180W-103
LTS-1180-101	LTS-1180W-101
	Cable version

Inductive

Photoelectric

Safety

RFID

Connectivity

Accessories

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STANDARD

HOUSING SIZE

M18

M18

OPERATING PRINCIPLE

REFLEX SENSOR

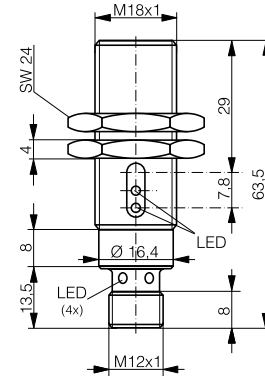
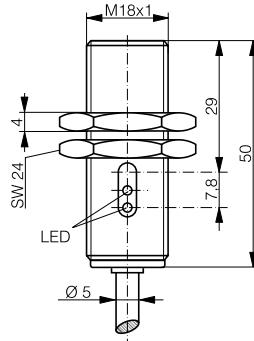
REFLEX SENSOR

SENSING RANGE MM

2000

2000

PHOTOELECTRIC



DATA

IO-Link 2019

IO-Link 2019

Light source

LED red polarized 660 nm

LED red polarized 660 nm

Setup

-

-

PNP Dark-ON

LRK-1180-304

LRS-1180-304

NPN Dark-ON

LRK-1180-302

LRS-1180-302

Emitter

PNP Light-ON + Dark-ON

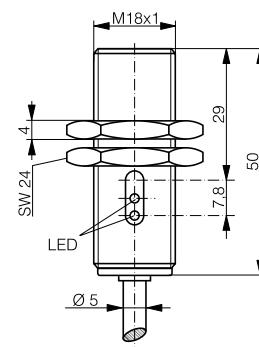
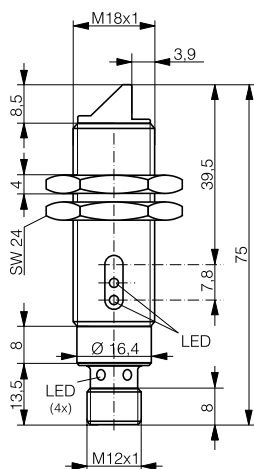
NPN Light-ON + Dark-ON

Other types available

1180 SERIES



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



IO-Link 2019	IO-Link 2019
LED red polarized 660 nm	LED red 660 nm
-	-
LRS-1180W-304	
LRS-1180W-302	
	LLK-1180-000
	LLK-1180-003 (receiver)
	LLK-1180-001 (receiver)
Cable version	

STANDARD

HOUSING SIZE

M18

M18

OPERATING PRINCIPLE

THROUGH-BEAM SENSOR

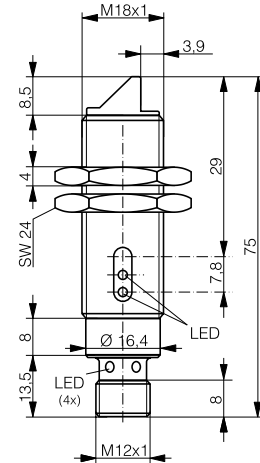
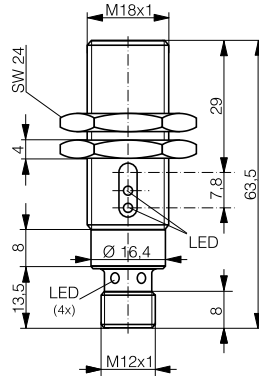
THROUGH-BEAM SENSOR

SENSING RANGE MM

20,000

20,000

PHOTOELECTRIC



DATA

IO-Link 2019

IO-Link 2019

Light source

LED red 660 nm

LED red 660 nm

Setup

-

-

Emitter

LLS-1180-000

LLS-1180W-000

PNP Light-ON + Dark-ON

LLS-1180-003 (receiver)

LLS-1180W-003 (receiver)

NPN Light-ON + Dark-ON

LLS-1180-001 (receiver)

LLS-1180W-001 (receiver)

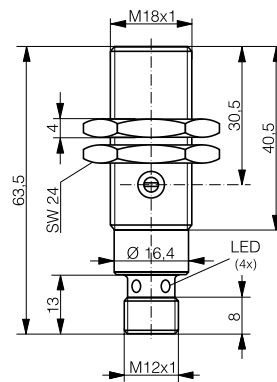
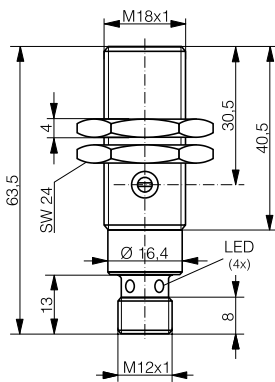
Other types available

Cable version

1180 SERIES



M18	M18
DIFFUSE SENSOR	DIFFUSE SENSOR
250	600



Laser red pulsed 660 nm	Laser red pulsed 660 nm
Potentiometer	Potentiometer
LTS-1180L-103-516	LTS-1180L-103
LTS-1180L-101-516	LTS-1180L-101
Cable version	Cable version

Inductive

Photoelectric

Safety

RFID

Connectivity

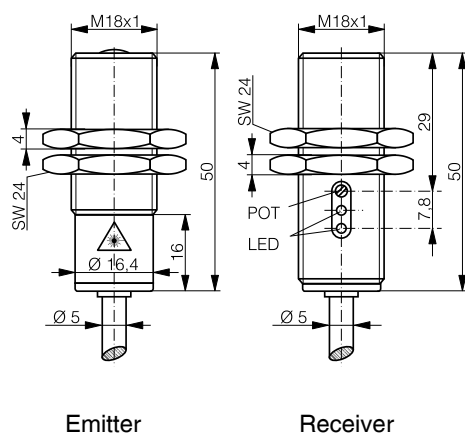
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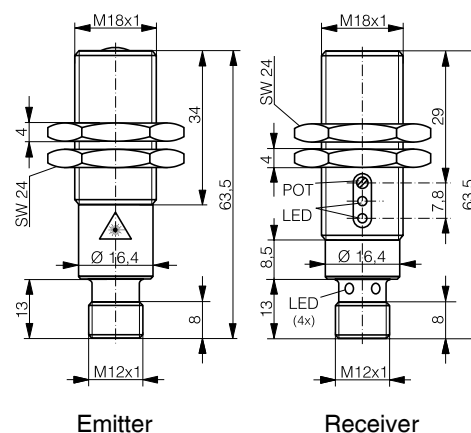
STANDARD

HOUSING SIZE	M18	M18
OPERATING PRINCIPLE	THROUGH-BEAM SENSOR	THROUGH-BEAM SENSOR
SENSING RANGE MM	50,000	50,000



Emitter

Receiver



Emitter

Receiver

DATA		
Light source	Laser red pulsed 660 nm	Laser red pulsed 660 nm
Setup	Potentiometer (receiver)	Potentiometer (receiver)
Emitter	LLK-1181L-000	LLS-1181L-000
PNP Light-ON + Dark-ON	LLK-1181L-003 (receiver)	LLS-1181L-003 (receiver)
NPN Light-ON + Dark-ON	LLK-1181L-001 (receiver)	LLS-1181L-001 (receiver)
Other types available		



STANDARD C23

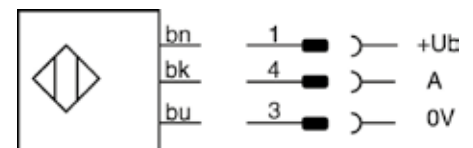
PHOTOELECTRIC SENSORS

ADVANTAGES

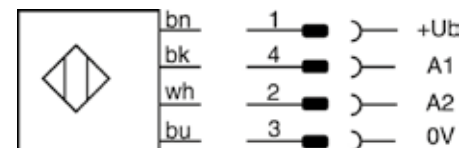
- ✓ First-class sensing ranges
- ✓ Small plastic housing, 20 mm x 30 mm x 10 mm
- ✓ Excellent background suppression characteristics with pinpoint LED
- ✓  **IO-Link** interface available on PNP types
- ✓ Mutual interference immunity
- ✓ Versions available with stability alarm as second output
- ✓ Enclosure rating IP67, Ecolab approved
- ✓ Versatile mounting brackets for ease of installation

WIRING DIAGRAMS

PNP or NPN, 1 output



PNP or NPN, 2 outputs



OVERVIEW	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	≤ 100 mA
Compatible mounting brackets	See pages 296-298

C23 SERIES



HOUSING SIZE MM

□ 20 X 30 X 10

□ 20 X 30 X 10

OPERATING PRINCIPLE

DIFFUSE SENSOR WITH
BACKGROUND SUPPRESSION

DIFFUSE SENSOR WITH
BACKGROUND SUPPRESSION

SENSING RANGE MM

300

300

Inductive

Photoelectric

Safety

RFID

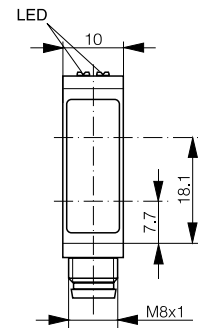
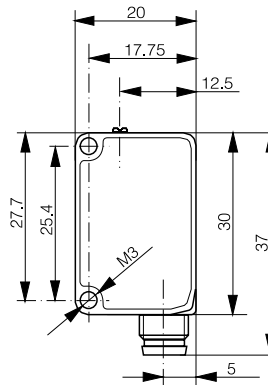
Connectivity

Accessories

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PHOTOELECTRIC



DATA

IO-Link

IO-Link

Light source

Red pinpoint LED 640 nm

Red pinpoint LED 640 nm

Switching frequency (normal mode)

≤ 1000 Hz

≤ 1000 Hz

Setup

Potentiometer

Teach button or IO-Link

PNP Light-ON

LHR-C23PA-PMS-403

LHR-C23PA-TMS-403

PNP Light-ON + Dark-ON

LHR-C23PA-PMS-603

LHR-C23PA-TMS-603

PNP Light-ON + stability alarm

LHR-C23PA-PMS-60C

LHR-C23PA-TMS-60C

NPN Light-ON

LHR-C23PA-PMS-301

LHR-C23PA-TMS-301

NPN Light-ON + Dark-ON

LHR-C23PA-PMS-101

LHR-C23PA-TMS-101

NPN Light-ON + stability alarm

LHR-C23PA-PMS-10A

LHR-C23PA-TMS-10A

Other types available

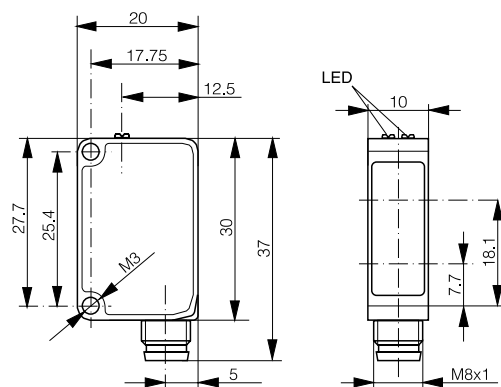
Cable version

Cable version

STANDARD

PHOTOELECTRIC

HOUSING SIZE MM	□ 20 X 30 X 10	□ 20 X 30 X 10
OPERATING PRINCIPLE	DIFFUSE SENSOR	DIFFUSE SENSOR
SENSING RANGE MM	1500	1500



DATA	IO-Link	IO-Link
Light source	Red LED 630 nm	Red LED 630 nm
Switching frequency (normal mode)	≤ 1500 Hz	≤ 1500 Hz
Setup	Potentiometer	IO-Link
PNP Light-ON	LTR-C23PA-PMS-403	LTR-C23PA-NMS-403
PNP Light-ON + Dark-ON	LTR-C23PA-PMS-603	
PNP Light-ON + 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

C23 SERIES



Inductive

Photoelectric

Safety

RFID

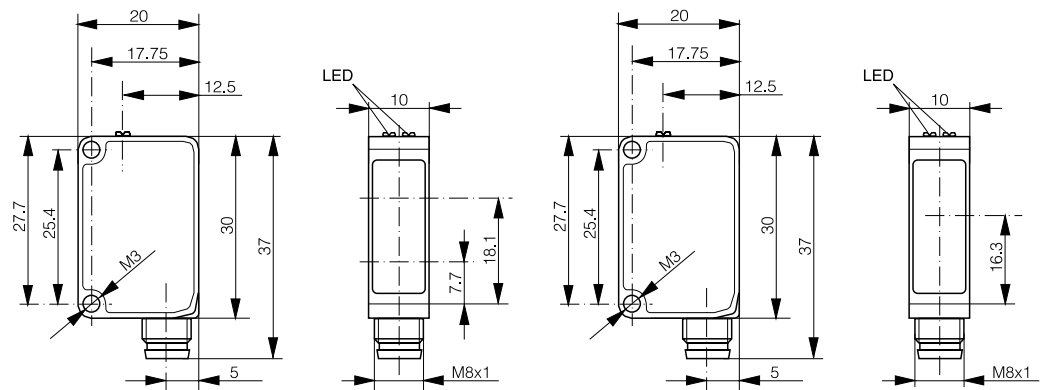
Connectivity

Accessories

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HOUSING SIZE MM	□ 20 X 30 X 10	□ 20 X 30 X 10
OPERATING PRINCIPLE	REFLEX SENSOR	THROUGH-BEAM SENSOR
SENSING RANGE MM	8000	30,000



DATA	IO-Link	IO-Link
Light source	LED red polarized 630 nm	LED red polarized 630 nm
Switching frequency (normal mode)	≤ 1500 Hz	≤ 1000 Hz
Setup	IO-Link	IO-Link
Emitter		LLR-C23PA-NMS-400
PNP Dark-ON	LRR-C23PA-NMS-404	LLR-C23PA-NMS-404
PNP Light-ON + Dark-ON	LRR-C23PA-NMS-603	LLR-C23PA-NMS-603
PNP Dark-ON + stability alarm	LRR-C23PA-NMS-60D	LLR-C23PA-NMS-60D
NPN Dark-ON	LRR-C23PA-NMS-302	LLR-C23PA-NMS-302
NPN Light-ON + Dark-ON	LRR-C23PA-NMS-101	LLR-C23PA-NMS-101
NPN Dark-ON + stability alarm	LRR-C23PA-NMS-10B	LLR-C23PA-NMS-10B
Other types available	Cable version	Cable version

STANDARD 3030

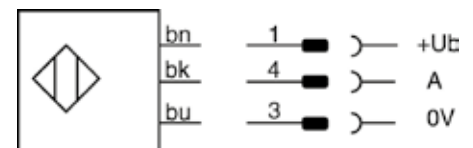
PHOTOELECTRIC SENSORS

ADVANTAGES

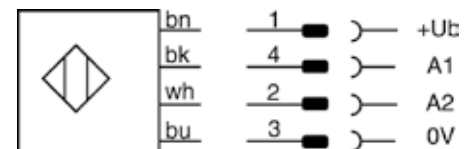
- ✓ Complete miniature sensor series 30 x 30 x 15 mm in rugged Crastin housings
- ✓ Sensing range up to 12,000 mm for through-beam type
- ✓ Shock & vibration resistant due to fully potted electronics
- ✓ Diffuse sensors with precise background suppression
- ✓ Polarizing filter (reflex sensors)
- ✓ High system reserves (excess gain)
- ✓ Pre-failure warning (pollution monitoring)
- ✓ Changeover outputs
- ✓ Analog outputs

WIRING DIAGRAMS

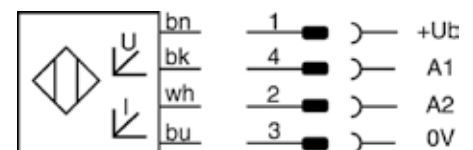
PNP or NPN, 1 output



PNP or NPN, 2 outputs



Analog, 2 outputs



OVERVIEW	3#3#
Housing material	PBTP (Crastin)
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	≤ 200 mA / -- (LA)
Compatible mounting brackets	See page 301



3030

3030 SERIES

HOUSING SIZE MM	□ 30 X 30 X 15	□ 30 X 30 X 15
OPERATING PRINCIPLE	WITH ANALOG OUTPUT	DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION
SENSING RANGE MM	100	200

Inductive

Photoelectric

Safety

RFID

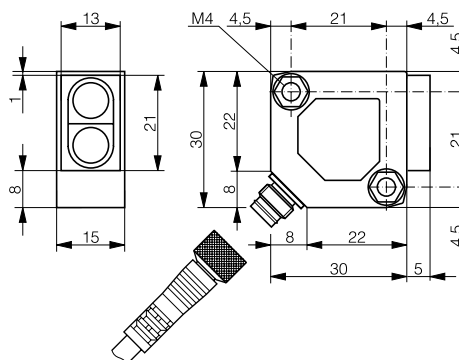
Connectivity

Accessories

Glossary

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PHOTOELECTRIC



DATA		
Light source	LED red 660 nm	LED red 660 nm
Max. switching frequency		500 Hz
Setup	Potentiometer	Potentiometer
Analog output	LAS-3130-119	
PNP Light-ON + Dark-ON		LHS-3130-103
NPN Light-ON + Dark-ON		LHS-3130-101
Other types available	Cable version	

PHOTOELECTRIC

Technical drawing of a mechanical part with dimensions and a screw. The drawing includes a top view, a side view, and a perspective view of a screw. Dimensions are given in millimeters (mm).

Top View Dimensions:

- Overall width: 30 mm
- Overall height: 45 mm
- Left side features two circular holes, each with a diameter of 13 mm, spaced 21 mm apart.
- Right side features a rectangular cutout with a width of 4.5 mm and a height of 21 mm.
- Bottom edge features a rectangular slot with a width of 8 mm and a depth of 4.5 mm.

Side View Dimensions:

- Overall width: 30 mm
- Overall height: 45 mm
- Left side features a circular hole with a diameter of 13 mm, spaced 21 mm apart.
- Right side features a rectangular cutout with a width of 4.5 mm and a height of 21 mm.
- Bottom edge features a rectangular slot with a width of 8 mm and a depth of 4.5 mm.

Screw Dimensions:

- Thread: M4
- Head diameter: 4.5 mm
- Head height: 21 mm
- Body diameter: 4.5 mm
- Body length: 22 mm
- Bottom edge features a rectangular slot with a width of 8 mm and a depth of 4.5 mm.

3030 SERIES



3030

☐ 30 X 30 X 15	☐ 30 X 30 X 15
DIFFUSE SENSOR	DIFFUSE SENSOR
600	600

Inductive

Photoelectric

Safety

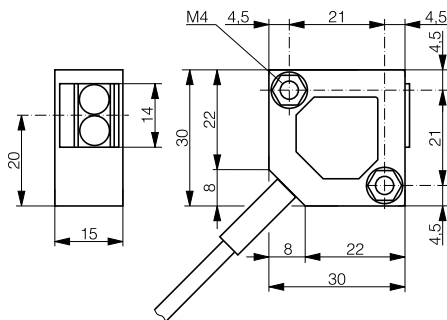
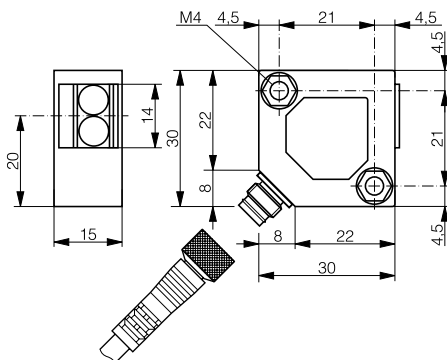
RFID

Connectivity

Accessories

Glossary

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IR LED 880 nm	IR LED 880 nm
1000 Hz	1000 Hz
Potentiometer	Potentiometer
LTS-3031-303	LTK-3031-303
LTS-3031-301	LTK-3031-301

PHOTOELECTRIC

[illegible]

3030 SERIES



3030

□ 30 X 30 X 15

REFLEX SENSOR

2000

□ 30 X 30 X 15

REFLEX SENSOR

2000

Inductive

Photoelectric

Safety

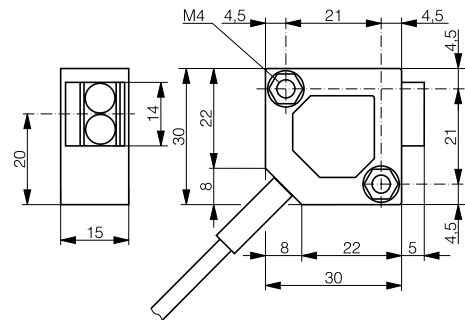
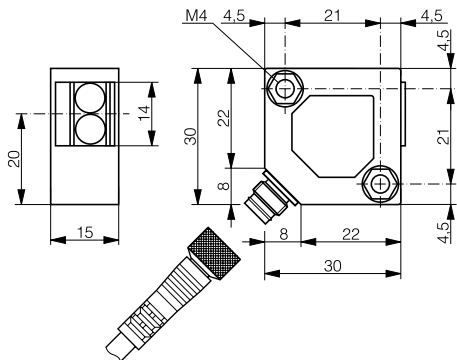
RFID

Connectivity

Accessories

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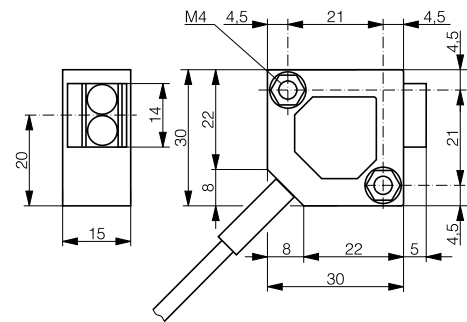
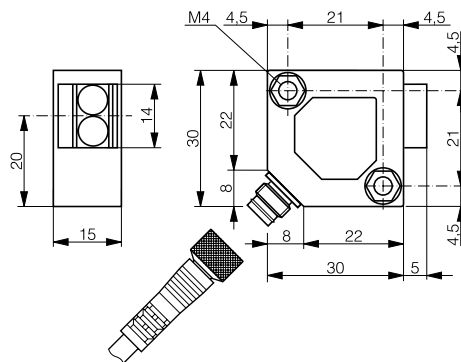
LED red polarized 660 nm
1000 Hz
Potentiometer

LRS-3031-304
LRS-3031-302

LED red polarized 660 nm
1000 Hz
Potentiometer

LRK-3031-304
LRK-3031-302

PHOTOELECTRIC

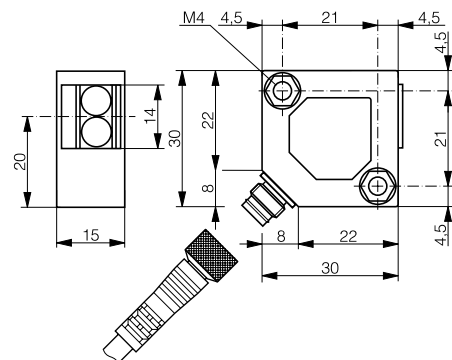
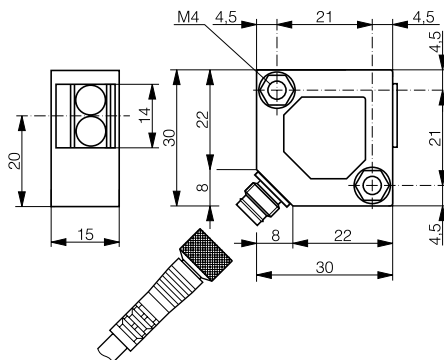


3030 SERIES



3030

30 X 30 X 15	30 X 30 X 15
THROUGH-BEAM SENSOR	THROUGH-BEAM SENSOR
6000	12,000



IR LED 880 nm	IR LED 880 nm
1000 Hz	1000 Hz
Potentiometer	Potentiometer
LLS-3031-200	LLS-3030-000
	LLS-3030-003 (receiver)
LLS-3031-204 (receiver)	
LLS-3031-202 (receiver)	
Cable version	

Inductive

Photoelectric

Safety

RFID

Connectivity

Accessories

Glossary

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STANDARD 4050

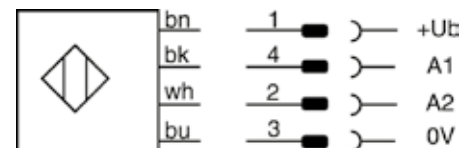
PHOTOELECTRIC SENSORS

ADVANTAGES

- ✓ Compact plastic housing, 40 mm x 50 mm x 15 mm
- ✓ Excellent background suppression characteristics
- ✓ Reflex types with special autocollimation optics
- ✓ Adjustable connector
- ✓ Ecolab tested and approved

WIRING DIAGRAMS

PNP or NPN, 2 outputs



Emitter



OVERVIEW	4050
Housing material	PBTP
Degree of protection	IP 67
Supply voltage range	10 ... 36 VDC
Ambient temperature range	-5 ... +55°C / 23 ... +131°F
Output current	≤ 200 mA
Compatible mounting brackets	See page 302

4050 SERIES



4050

HOUSING SIZE MM	□ 40 X 50 X 15	□ 40 X 50 X 15
OPERATING PRINCIPLE	DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION	DIFFUSE SENSOR
SENSING RANGE MM	500	1200

Inductive

Photoelectric

Safety

RFID

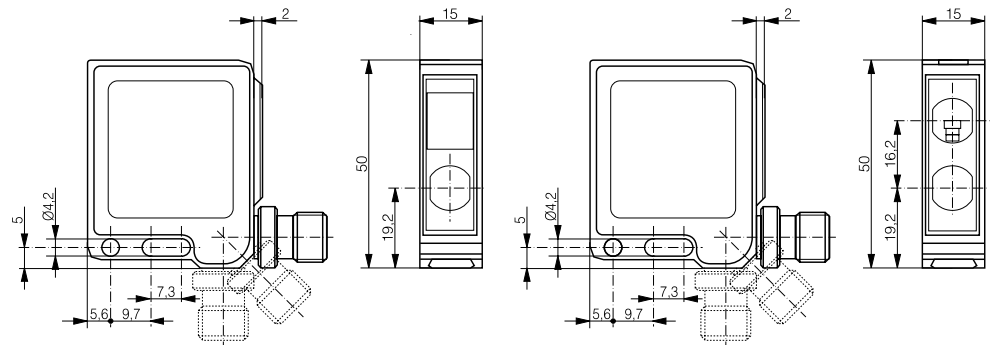
Connectivity

Accessories

Glossary

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PHOTOELECTRIC



DATA		
Light source	LED red 630 nm	LED red 630 nm
Max. switching frequency	500 Hz	1500 Hz
Setup	Potentiometer	Potentiometer
PNP Light-ON + Dark-ON	LHS-4150-103	LTS-4150-103
NPN Light-ON + Dark-ON	LHS-4150-101	LTS-4150-101
Other types available	Cable version	Cable version

STANDARD

HOUSING SIZE MM

□ 40 X 50 X 15

□ 40 X 50 X 15

OPERATING PRINCIPLE

REFLEX SENSOR

THROUGH-BEAM SENSOR

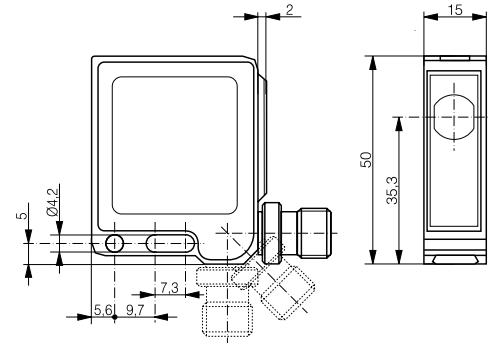
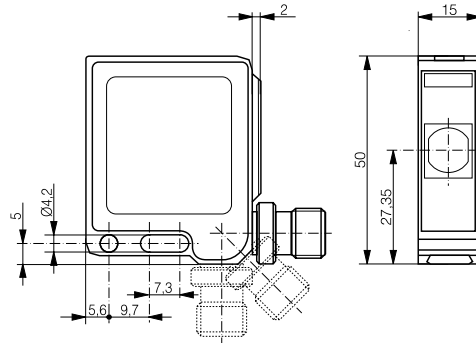
SENSING RANGE MM

4000

50,000

PHOTOELECTRIC

AUTOCOLLIMATION



DATA

Light source

LED red polarized 680 nm

LED red 630 nm

Max. switching frequency

1500 Hz

1500 Hz

Setup

Potentiometer

Potentiometer

PNP Light-ON + Dark-ON

LRS-4150-103

LLS-4150-003 (receiver)

NPN Light-ON + Dark-ON

LRS-4150-101

LLS-4150-001 (receiver)

Emitter

LLS-4150-000

Other types available

Cable version

Cable version



STANDARD C55

PHOTOELECTRIC SENSORS

ADVANTAGES

- ✓ Compact plastic housing 50 mm x 50 mm x 23 mm, IP67 & IP69K, Ecolab certified
- ✓ Time-Of-Flight principle for background suppression
- ✓ Laser class 1 emission
- ✓ Range up to 5000 mm
- ✓ Reliable detection of tilted objects

WIRING DIAGRAM

PNP / NPN auto-detect, 2 outputs + Teach



OVERVIEW	C55 DISTANCE
Housing material	ABS / PMMA
Degree of protection	IP 67 / IP 69K
Supply voltage range	18 ... 30 VDC
Ambient temperature range	-40 ... +60°C / -40 ... +140°F
Output current	≤ 100 mA
Switching frequency	≤ 500 Hz (LHL)
Setup	Teach button
Compatible mounting brackets	See page 299

C55 SERIES



C55

HOUSING SIZE MM	□ 50 X 50 X 23
OPERATING PRINCIPLE	DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION
SENSING RANGE MM	5000

Inductive

Photoelectric

Safety

RFID

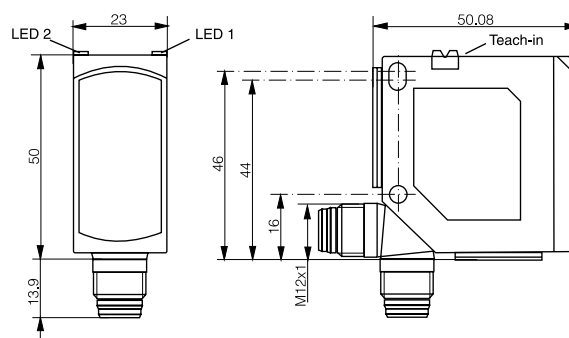
Connectivity

Accessories

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PHOTOELECTRIC



DATA	
Light source	Laser class 1 red 650 nm
Light spot size	5 mm x 4 mm at 3000 nm
PNP/NPN auto-detect (x2)	LHL-C55PA-TMS-107-501
Other types available	



SMALLEST ON THE MARKET

MINIATURE PHOTOELECTRIC SENSORS

KEY ADVANTAGES

1040/1050/0507 series

- ✓ Rugged diffuse or through-beam sensors in steel housing :
Ø 4, M5 or 5 mm x 7 mm x 40 mm
- ✓ Steel sensors with sapphire-glass sensing face, scratch and chemically resistant
- ✓ Accurate target detection due to cylindrical light beam
- ✓  **IO-Link** in 2019

C12 series

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

RANGE OVERVIEW	Series	Diffuse	Background suppression	Reflex	Through-beam
MINIATURE	1040 (Ø4)	p. 229-231			p. 231
	1050 (M5)	p. 232-234			p. 235
	0507 (5x7x40)	p. 237			
	C12 (13x21/27x7)		p. 239-240	p. 240	p. 241

MINIATURE 1040/1050

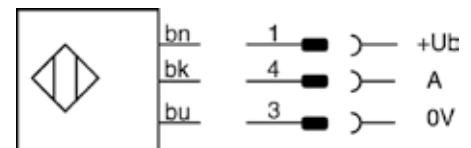
PHOTOELECTRIC SENSORS

ADVANTAGES

- ✓ Rugged metal housing
- ✓ Rugged sapphire-glass or glass sensing face, scratch & chemically resistant
- ✓ Shock & vibration resistant due to fully vacuum-potted electronics
- ✓ Accurate target detection due to cylindrical light beam

WIRING DIAGRAM

PNP or NPN, 1 output



OVERVIEW	1040 / 1050
Housing material	Stainless steel V2A
Emitter	IR LED 880 nm
Degree of protection	IP 67
Supply voltage range	10 ... 30 VDC
Ambient temperature range	0 ... +55 °C / 32 ... +131 °F
Output current	≤ 100 mA
Switching frequency	≤ 250 Hz

1040 SERIES

1040



HOUSING SIZE MM

Ø 4

Ø 4

OPERATING PRINCIPLE

DIFFUSE SENSOR

DIFFUSE SENSOR

SENSING RANGE MM

10

10

Inductive

Photoelectric

Safety

RFID

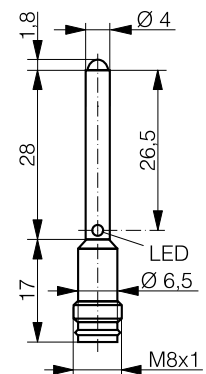
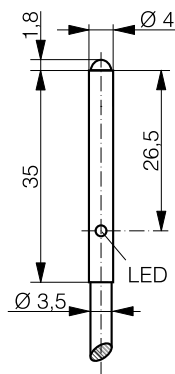
Connectivity

Accessories

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PHOTOELECTRIC



DATA

IO-Link 2019

IO-Link 2019

Lens material

Sapphire glass

Sapphire glass

PNP Light-ON

LTK-1040-303-505

LTS-1040-303-505

NPN Light-ON

LTK-1040-301-505

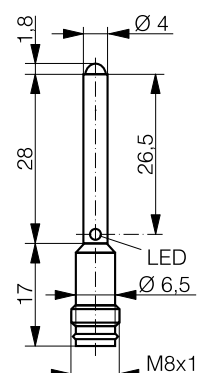
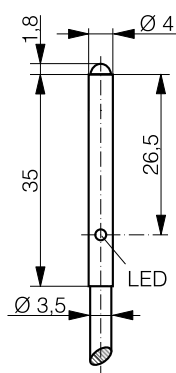
LTS-1040-301-505

Other types available

PHOTOELECTRIC

MINIATURE

HOUSING SIZE MM	Ø 4	Ø 4
OPERATING PRINCIPLE	DIFFUSE SENSOR	DIFFUSE SENSOR
SENSING RANGE MM	20	20



DATA	IO-Link 2019	IO-Link 2019
Lens material	Sapphire glass	Sapphire glass
Emitter		
PNP Light-ON	LTK-1040-303-506	LTS-1040-303-506
NPN Light-ON	LTK-1040-301-506	LTS-1040-301-506
PNP Dark-ON		
NPN Dark-ON		
Other types available		

1040 SERIES



1040

Ø 4	Ø 4	Ø 4
DIFFUSE SENSOR	DIFFUSE SENSOR	THROUGH-BEAM SENSOR
50	50	250

Inductive

Photoelectric

Safety

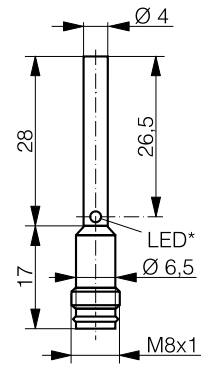
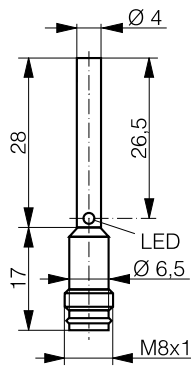
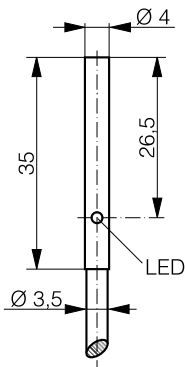
RFID

Connectivity

Accessories

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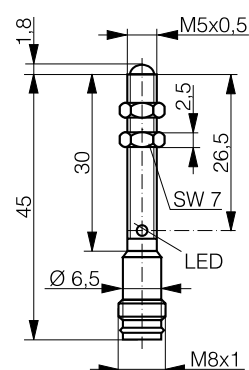
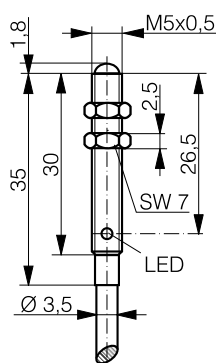


* receiver only

IO-Link 2019	IO-Link 2019	IO-Link 2019
Glass	Glass	Glass
LTK-1040-303	LTS-1040-303	LLS-1040-200
LTK-1040-301	LTS-1040-301	
		LLS-1040-204 (receiver)
		LLS-1040-202 (receiver)
		Cable version

MINIATURE

HOUSING SIZE	M5	M5
OPERATING PRINCIPLE	DIFFUSE SENSOR	DIFFUSE SENSOR
SENSING RANGE MM	10	10



DATA	 IO-Link 2019	 IO-Link 2019
Lens material	Sapphire glass	Sapphire glass
PNP Light-ON	LTK-1050-303-505	LTS-1050-303-505
NPN Light-ON	LTK-1050-301-505	LTS-1050-301-505
Other types available		

1050

Index

MINIATURE

HOUSING SIZE

M5

M5

OPERATING PRINCIPLE

DIFFUSE SENSOR

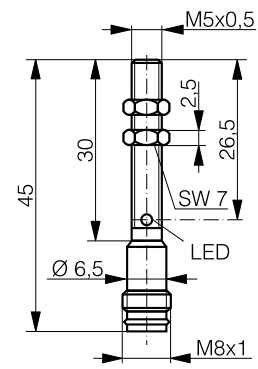
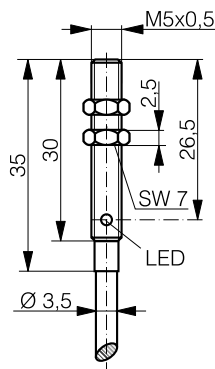
DIFFUSE SENSOR

SENSING RANGE MM

50

50

PHOTOELECTRIC



DATA

 IO-Link 2019

 IO-Link 2019

Lens material

Glass

Glass

Emitter

PNP Light-ON

LTK-1050-303

LTS-1050-303

NPN Light-ON

LTK-1050-301

LTS-1050-301

PNP Dark-ON

NPN Dark-ON

Other types available

1050 SERIES



1050

M5	
THROUGH-BEAM SENSOR	
250	

Inductive

Photoelectric

Safety

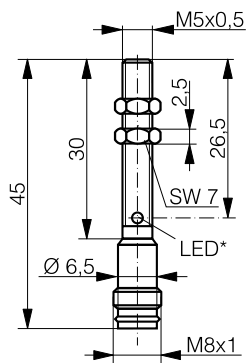
RFID

Connectivity

Accessories

Glossary

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* receiver only

IO-Link 2019	
Glass	
LLS-1050-200	
LLS-1050-204 (receiver)	
LLS-1050-202 (receiver)	
Cable version	

MINIATURE 0507

PHOTOELECTRIC SENSORS

ADVANTAGES

- ✓ Rugged metal housing
- ✓ Rugged sapphire-glass or glass sensing face, scratch & chemically resistant
- ✓ Shock & vibration resistant due to fully vacuum-potted electronics

WIRING DIAGRAM

PNP or NPN, 1 output



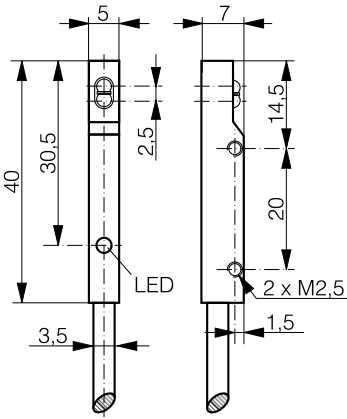
OVERVIEW	0507
Housing material	Stainless steel V2A
Light source	IR LED 880 nm
Degree of protection	IP 67
Supply voltage range	10 ... 30 VDC
Ambient temperature range	0 ... +55°C / 32 ... +131 °F
Output current	≤ 100 mA
Switching frequency	≤ 250 Hz

0507 SERIES



HOUSING SIZE MM	□ 5 X 7 X 40	□ 5 X 7 X 40	5 X 7 X 40
OPERATING PRINCIPLE	DIFFUSE SENSOR	DIFFUSE SENSOR	DIFFUSE SENSOR
SENSING RANGE MM	20	50	90

PHOTOELECTRIC



DATA			
Lens material	Sapphire glass	Sapphire glass	Sapphire glass
PNP Light-ON	LTK-0507-303-501	LTK-0507-303	LTK-0507-303-502
NPN Light-ON	LTK-0507-301-501	LTK-0507-301	
Other types available			

Inductive

Photoelectric

Safety

RFID

Connectivity

Accessories

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MINIATURE C12

PHOTOELECTRIC SENSORS

ADVANTAGES

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

WIRING DIAGRAM

PNP or NPN, 1 output



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
Switching frequency	≤ 800 Hz

C12 SERIES



C12

HOUSING SIZE MM

□ 13 X 27 X 7

□ 13 X 21 X 7

OPERATING PRINCIPLE

DIFFUSE SENSOR WITH
BACKGROUND SUPPRESSION

DIFFUSE SENSOR WITH
BACKGROUND SUPPRESSION

SENSING RANGE MM

120

15

Inductive

Photoelectric

Safety

RFID

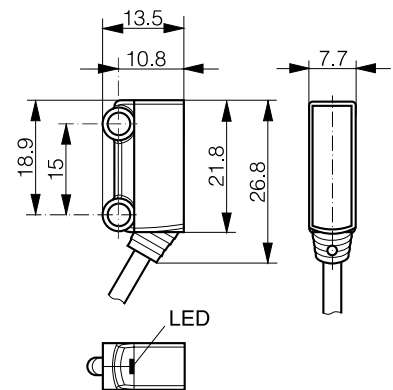
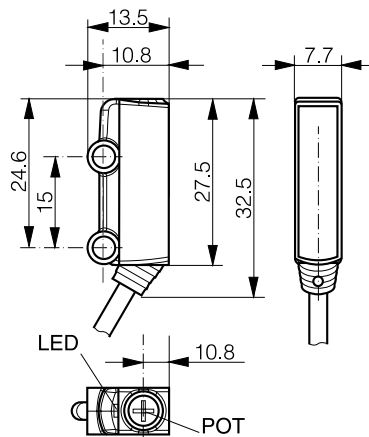
Connectivity

Accessories

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PHOTOELECTRIC



DATA

Setup

3-turn potentiometer

-

PNP Light-ON

LHR-C12PA-PLK-303

LHR-C12PA-NSK-303

NPN Light-ON

LHR-C12PA-PLK-301

LHR-C12PA-NSK-301

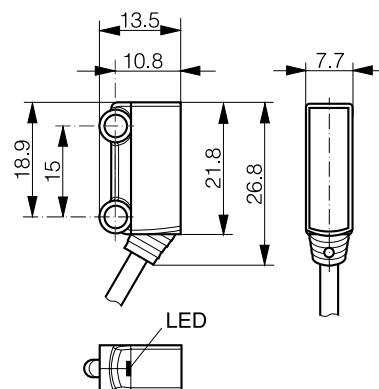
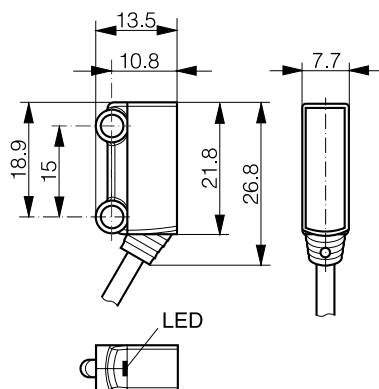
Other types available

0.2 m cable + connector S8

0.2 m cable + connector S8

MINIATURE

HOUSING SIZE MM	□ 13 X 21 X 7	□ 13 X 21 X 7
OPERATING PRINCIPLE	DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION	REFLEX SENSOR
SENSING RANGE MM	30	3000



DATA		
Setup	-	-
Emitter		
PNP Light-ON	LHR-C12PA-NMK-303	
NPN Light-ON	LHR-C12PA-NMK-301	
PNP Dark-ON		LRR-C12PA-NMK-304
NPN Dark-ON		LRR-C12PA-NMK-302
Other types available	0.2 m cable + connector S8	0.2 m cable + connector S8

C12 SERIES



Inductive

Photoelectric

Safety

RFID

Connectivity

Accessories

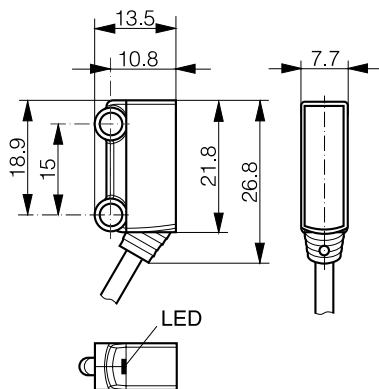
Glossary

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□ 13 X 21 X 7

THROUGH-BEAM SENSOR

2000



LLR-C12PA-NMK-300

LLR-C12PA-NMK-304 (receiver)

LLR-C12PA-NMK-302 (receiver)

0.2 m cable + connector S8



OUTSTANDING RELIABILITY AND EASE OF ADJUSTMENT

TRANSPARENT OBJECT

PHOTOELECTRIC SENSORS

KEY ADVANTAGES

C23 Transparent UV

- ✓ Extremely reliable detection thanks to strong absorption of UV light by plastic and glass material
- ✓ Easy sensor set-up, even for thinnest transparent objects
- ✓ Low environmental sensitivity minimizes threshold adjustments and maximizes uptime
- ✓ Sensing range up to 1200 mm
- ✓  **IO-Link**

C23 Transparent Standard

- ✓ Sensing range up to 5000 mm
- ✓ Red polarized light
- ✓  **IO-Link**

RANGE OVERVIEW

TRANSPARENT OBJECT

Series

C23 (20x30x10)

Reflex, UV light

p. 245

Reflex, red light

p. 246-247

TRANSPARENT OBJECT C23

PHOTOELECTRIC SENSORS

ADVANTAGES

C23 Transparent UV

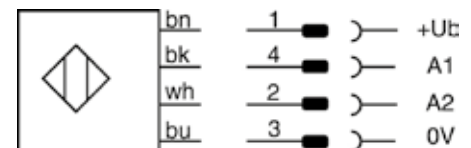
- ✓ Extremely reliable detection thanks to strong absorption of UV light by plastic and glass material
- ✓ Easy sensor set-up, even for thinnest transparent objects
- ✓ Low environmental sensitivity minimizes threshold adjustments and maximizes uptime
- ✓ Autocollimated, polarized UV light beam eliminates blind zone, allowing detection of targets close to the sensor or through a small notch
- ✓ Sensing range up to 1200 mm
- ✓ Adjustment by teach button or  **IO-Link**
- ✓ Mutual interference immunity
- ✓ Enclosure rating IP 67, Ecolab approved

C23 Transparent Standard

- ✓ Sensing range up to 5000 mm
- ✓ Red polarized light
- ✓ Suitable for thicker or larger transparent objects
- ✓ Adjustment by potentiometer or by teach button or  **IO-Link**
- ✓ Enclosure rating IP 67, Ecolab approved

WIRING DIAGRAM

PNP or NPN, 2 outputs



OVERVIEW	C23 TRANSPARENT UV	C23 TRANSPARENT STANDARD
Housing material	ABS / PMMA	ABS / PMMA
Degree of protection	IP 67	IP 67
Supply voltage range	15 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-25 ... +55°C / -13 ... +131°F	-25 ... +65°C / -13 ... +149 °F
Output current (total both outputs)	≤ 100 mA	≤ 100 mA
Compatible reflectors	See pages 304-305	See pages 303-304
Compatible mounting bracket	See pages 296-297	See pages 296-297

C23 UV LIGHT



Inductive

Photoelectric

Safety

RFID

Connectivity

Accessories

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HOUSING SIZE MM

□ 20 X 30 X 10

□ 20 X 30 X 10

OPERATING PRINCIPLE

TRANSPARENT REFLEX

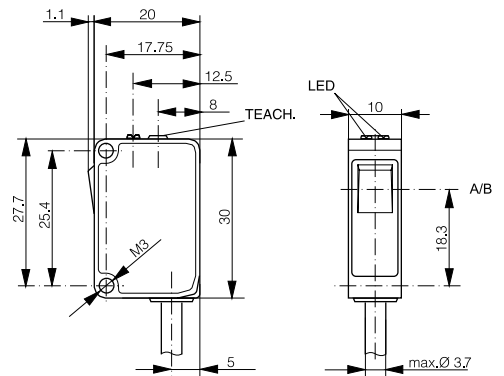
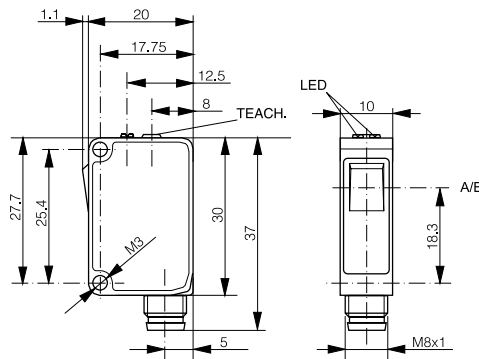
TRANSPARENT REFLEX

SENSING RANGE MM

1200

1200

PHOTOELECTRIC



A: emitter axis B: receiver axis

A: emitter axis B: receiver axis

DATA

IO-Link

IO-Link

Light source

LED UV 275 nm, Risk Group 2

LED UV 275 nm, Risk Group 2

Switching frequency (normal mode)

≤ 1000 Hz

≤ 1000 Hz

Setup

Teach button or IO-Link

Teach button or IO-Link

PNP Light-ON + Dark-ON

TRU-C23PA-TMS-603

TRU-C23PA-TMK-603

PNP Dark-ON + stability alarm

TRU-C23PA-TMS-60D

TRU-C23PA-TMK-60D

NPN Light-ON + Dark-ON

TRU-C23PA-TMS-101

TRU-C23PA-TMK-101

NPN Dark-ON + stability alarm

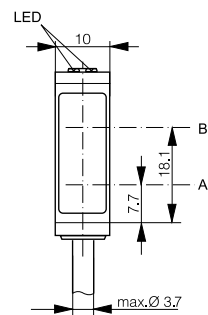
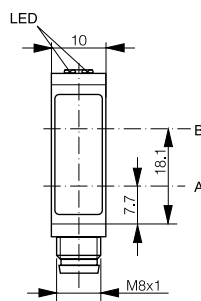
TRU-C23PA-TMS-10B

TRU-C23PA-TMK-10B

Other types available

PHOTOELECTRIC

PHOTOELECTRIC



A: emitter axis B: receiver axis

PHOTOELECTRIC

C23 RED LIGHT



Inductive

Photoelectric

Safety

RFID

Connectivity

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□ 20 X 30 X 10

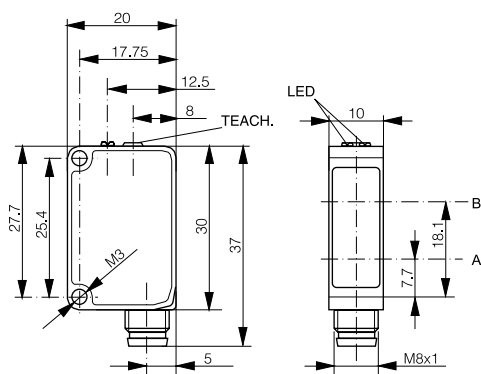
TRANSPARENT REFLEX

5000

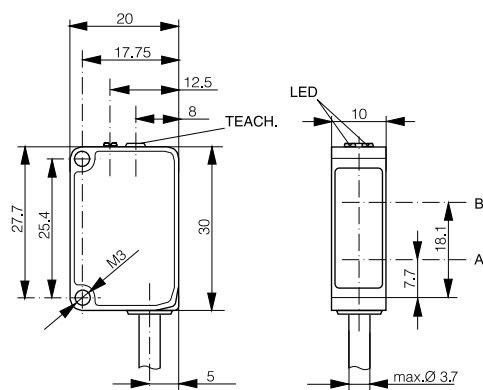
□ 20 X 30 X 10

TRANSPARENT REFLEX

5000



A: emitter axis B: receiver axis



A: emitter axis B: receiver axis

IO-Link

LED red polarized 630 nm
≤ 1500 Hz

Teach button or IO-Link

TRR-C23PA-TMS-603

TRR-C23PA-TMS-60D

TRR-C23PA-TMS-101

TRR-C23PA-TMS-10B

IO-Link

LED red polarized 630 nm
≤ 1500 Hz

Teach button or IO-Link

TRR-C23PA-TMK-603

TRR-C23PA-TMK-60D

TRR-C23PA-TMK-101

TRR-C23PA-TMK-10B



RELIABLE SHORT AND LONG-RANGE SENSING

FIBER OPTIC PHOTOELECTRIC SENSORS

KEY ADVANTAGES

Fiber-optic sensors

- ✓ Robust 3030 and 4040 series (30 mm x 30 mm x 15 mm and 40 mm x 40 mm x 19 mm)
- ✓ DIN-rail mounted 3060 series (31 mm x 60 mm x 10 mm) suitable for multiple-sensor applications
- ✓ Distance setting by potentiometer or teach-in
- ✓  **IO-Link**

Fibers

- ✓ Large selection of types, including cylindrical light beam, multi-beam, liquid level monitoring and low & high temperature
- ✓ Diffuse or through-beam sensing, axial or radial
- ✓ Synthetic fibers with bending radii from 2 mm, suitable for cutting on-site
- ✓ Glass fibers for high temperatures and aggressive environments

RANGE OVERVIEW	Series	Amplifier	Plastic fiber	Glass fiber
FIBER OPTIC	3030 (30x30x15)	p. 252-254	p. 262-270	p. 277
	3060 (31x60x10)	p. 256-259	p. 262-270	
	4040 (40x40x19)	p. 260-261		p. 272-276

PROGRAM OVERVIEW

AMPLIFIERS	SERIES	3030	3031	
	HOUSING SIZE	30 x 30 x 15 mm	30 x 30 x 15 mm	
	MAX. DISTANCE	120 mm	60 mm	
	SETUP	Potentiometer	Potentiometer	
	FOR USE WITH SYNTHETIC FIBERS	p. 254	p. 253	
	FOR USE WITH GLASS FIBERS	p. 254	p. 253	

OPTICAL FIBERS	HOUSING SIZE		Ø 2.3	M3	Ø 3.2	Ø 4	
	SYNTHETIC FIBERS	Diffuse	p. 263	p. 263			
		Through-beam		p. 266	p. 266		
		Cylindrical light beam				p. 268	
		Liquid level monitoring					
		Low and high temperatures					
		Multi-beam detection					
	GLASS FIBERS	Diffuse					
		Through-beam					



								Inductive
	3060		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	Photoelectric
	200 mm		200 mm		100 mm		150 mm	
	Potentiometer		Teach /  IO-Link		Potentiometer		Potentiometer	
	p. 258		p. 257		p. 259			Safety
							p. 261	
	M4	M5	Ø 6	M6	Ø 8	M8	□ 18 x 32	RFID
				p. 264-265				
	p. 266-267			p. 267				
		p. 268						Connectivity
						p. 269		
	p. 270			p. 270				
							p. 269	Accessories
			p. 273-274	p. 278	p. 273-274			
	p. 278		p. 275, 277		p. 276-277			
								Glossary
								Index



AMPLIFIER 3030

PHOTOELECTRIC SENSORS

ADVANTAGES

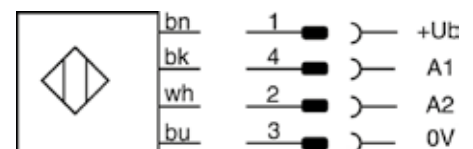
- ✓ Fiber-optic amplifiers in rugged Crastin housing
30 x 30 x 15 mm
- ✓ Shock & vibration resistant due to fully potted electronics
- ✓ Sensing range up to 120 mm

WIRING DIAGRAMS

PNP or NPN, 1 output



PNP or NPN, 2 outputs



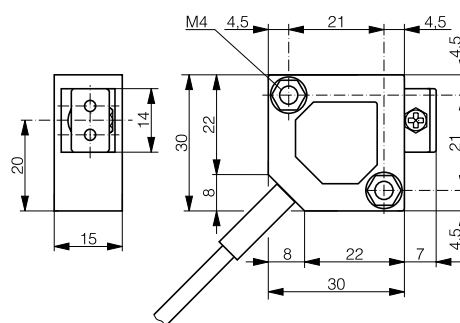
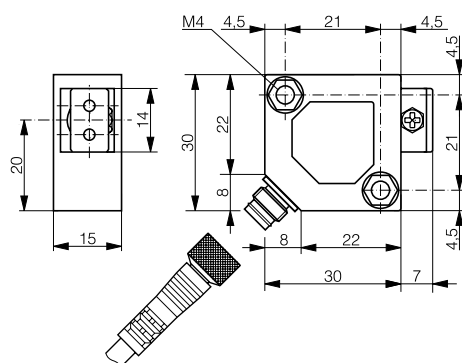
OVERVIEW	3030
Housing material	PBTP (Crastin)
Degree of protection	IP 67
Supply voltage range	10 ... 36 VDC
Ambient temperature range	-25 ... +55°C / -13 ... +131°F
Output current (total both outputs)	≤ 200 mA
Setup	Potentiometer
Compatible mounting bracket	See page 271

PHOTOELECTRIC

3030 SERIES



HOUSING SIZE MM	□ 30 X 30 X 15	□ 30 X 30 X 15
OPERATING PRINCIPLE	FIBER-OPTIC AMPLIFIER	FIBER-OPTIC AMPLIFIER
SENSING RANGE MM	60	60



DATA		
Light source	LED red 660 nm	LED red 660 nm
Max. switching frequency	1000 Hz	1000 Hz
PNP Light-ON	LFS-3031-303	LFK-3031-303
PNP Dark-ON	LFS-3031-304	LFK-3031-304
NPN Light-ON	LFS-3031-301	LFK-3031-301
NPN Dark-ON	LFS-3031-302	LFK-3031-302
Other types available		

Inductive

Photoelectric

Safety

RFID

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AMPLIFIER

HOUSING SIZE MM

□ 30 X 30 X 15

□ 30 X 30 X 15

OPERATING PRINCIPLE

FIBER-OPTIC AMPLIFIER

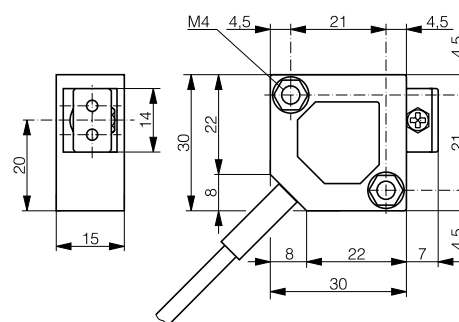
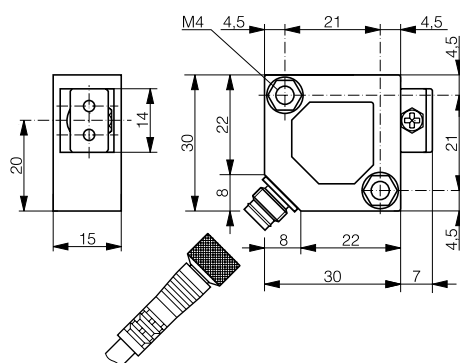
FIBER-OPTIC AMPLIFIER

SENSING RANGE MM

120

120

PHOTOELECTRIC



DATA

Light source

LED red 660 nm

LED red 660 nm

Max. switching frequency

1000 Hz

1000 Hz

PNP Light-ON + Dark-ON

LFS-3030-103

LFK-3030-103

NPN Light-ON + Dark-ON

LFS-3030-101

LFK-3030-101

Other types available



AMPLIFIER 3060

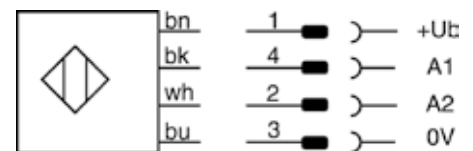
PHOTOELECTRIC SENSORS

ADVANTAGES

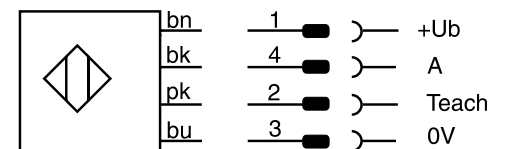
- ✓ Complete series of fiber-optic amplifiers for plastic fibers and DIN-rail mounting
- ✓ Small housings 31 x 60 x 10 mm
- ✓ Sensing ranges up to 200 mm
- ✓  **IO-Link**
- ✓ Blue light version for glass detection

WIRING DIAGRAMS

PNP or NPN, 2 outputs



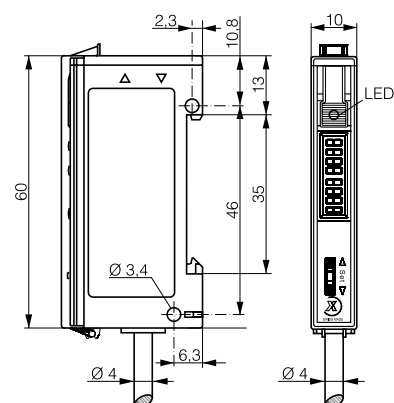
PNP or NPN, 1 output + teach-in



OVERVIEW	3060
Housing material	PBTP (Crastin)
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
Compatible mounting bracket	See page 271

Inductive

Photoelectric



Safety

RFID

Connectivity

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AMPLIFIER

HOUSING SIZE MM

□ 31 X 60 X 10

□ 31 X 60 X 10

OPERATING PRINCIPLE

FIBER-OPTIC AMPLIFIER

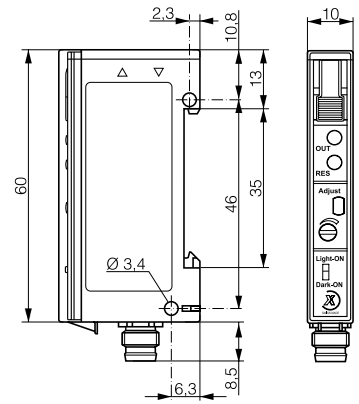
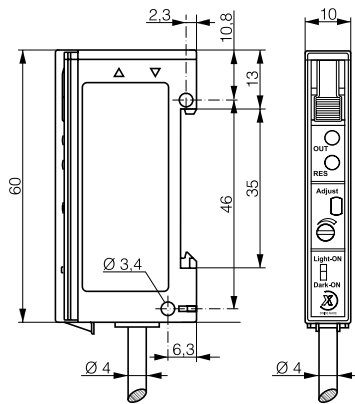
FIBER-OPTIC AMPLIFIER

SENSING RANGE MM

200

200

PHOTOELECTRIC



DATA

Light source

LED red 680 nm

LED red 680 nm

Max. switching frequency

1500 Hz

1500 Hz

Setup

Potentiometer

Potentiometer

PNP Light-ON/Dark-ON switchable
+ Excess gain

LFK-3060-103

LFS-3060-103

NPN Light-ON/Dark-ON switchable
+ Excess gain

LFK-3060-101

LFS-3060-101

Other types available

3060 SERIES



3060

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

Inductive

Photoelectric

Safety

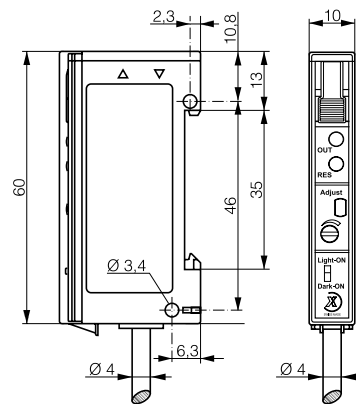
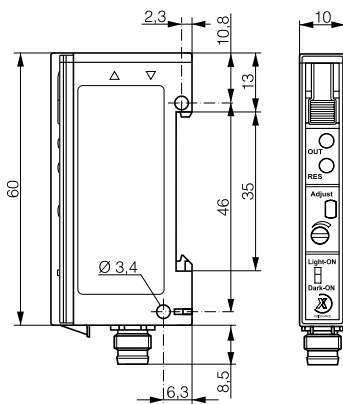
RFID

Connectivity

Accessories

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LED blue 465 nm	LED blue 465 nm
1500 Hz	1500 Hz
Potentiometer	Potentiometer
LFS-3360-103	LFK-3360-103
LFS-3360-101	LFK-3360-101

AMPLIFIER 4040

PHOTOELECTRIC SENSORS

ADVANTAGES

- ✓ Fiber-optic amplifiers for glass fibers
- ✓ Rugged Crastin housing 40 x 40 x 19 mm
- ✓ Shock and vibration resistant due to fully potted electronics
- ✓ Long operating distance of 150 mm with LFG-1030-050 glass fiber
- ✓ Convenient sensitivity adjustment by 20-turn potentiometer

WIRING DIAGRAM

PNP or NPN, 2 outputs



OVERVIEW	4040
Housing material	PBTP (Crastin)
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
Switching frequency	≤ 1000 Hz
Compatible mounting bracket	See page 271



4040

4040 SERIES

HOUSING SIZE MM	□ 40 X 40 X 19
OPERATING PRINCIPLE	FIBER-OPTIC AMPLIFIER
SENSING RANGE MM	150

Inductive

Photoelectric

Safety

RFID

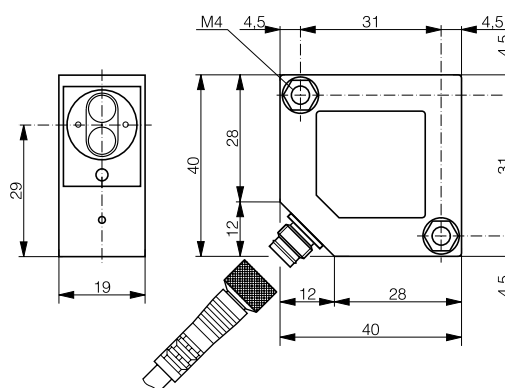
Connectivity

Accessories

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PHOTOELECTRIC



DATA	
Light source	IR LED 880 nm
Setup	Potentiometer
PNP Light-ON + Dark-ON (connector)	LFS-4040-103
PNP Light-ON + Dark-ON (cable)	LFK-4040-103

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	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

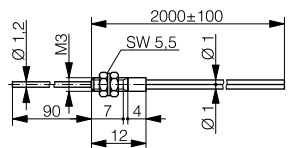
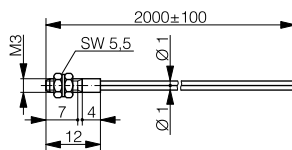
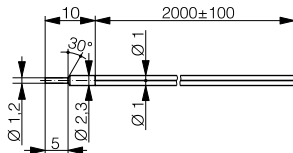
* LFP-1002-020-002 / LFP-2002-020-002

** LFP-1011-020

SYNTHETIC OPTICAL FIBERS

DIFFUSE SENSING

Dimensions: light emission on the left



Housing size: Ø 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 3#6#	70 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, Ø 1 mm*	
Inner fiber	Ø 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 3#6#	70 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, Ø 1 mm*	
Inner fiber	Ø 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 3#6#	70 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, Ø 1 mm*	
Inner fiber	Ø 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

Safety

RFID

Connectivity

Accessories

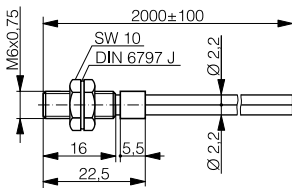
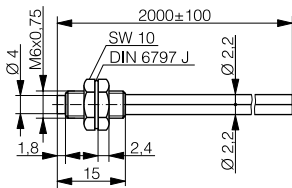
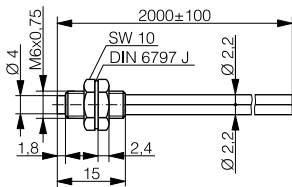
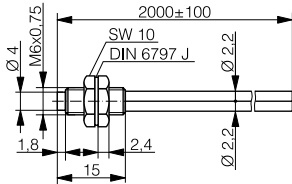
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SYNTHETIC OPTICAL FIBERS

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 3#6# 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 3#6# 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

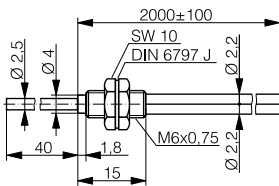
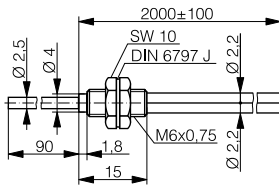
Housing size: M6	Luminous (enhanced brightness)
Part reference	LFP-1202-020
Sensing range	with series 3030 160 mm (with 2 m fiber length)
	with series 3031 80 mm (with 2 m fiber length)
	with series 3#6# 260 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, Ø 2.2 mm
Inner fiber	Ø 1.5 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 3#6# 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 3#6# 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	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 3#6# 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

Safety

RFID

Connectivity

Accessories

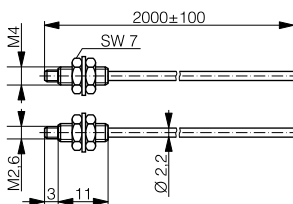
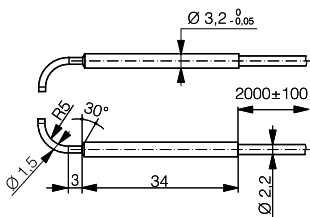
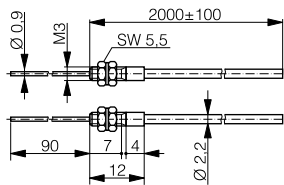
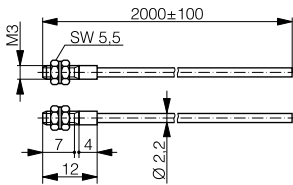
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SYNTHETIC OPTICAL FIBERS

THROUGH-BEAM SENSING

Dimensions: light emission on the left



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 3#6#	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 3#6#	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	

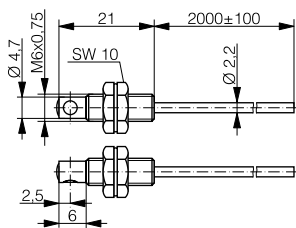
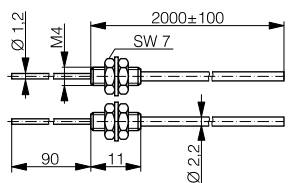
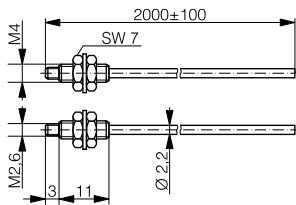
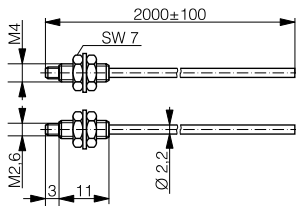
Housing size: Ø 3.2 mm	Standard 90°	
Part reference	LFP-2006-020	
Sensing range	with series 3030	120 mm (with 2 m fiber length)
	with series 3031	60 mm (with 2 m fiber length)
	with series 3#6#	200 mm (with 2 m fiber length)
Outside fiber	2 individual fibers, Ø 2.2 mm	
Inner fiber	Ø 1.0 mm	
Special characteristics	Lateral sensing	

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 3#6#	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	

SYNTHETIC OPTICAL FIBERS

THROUGH-BEAM SENSING

Dimensions: light emission on the left



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 3#6# 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 3#6# 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 3#6# 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

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, Ø 2.2 mm
Inner fiber	Ø 1.0 mm
Special characteristics	Lateral sensing
	Long sensing range

Inductive

Photoelectric

Safety

RFID

Connectivity

Accessories

Glossary

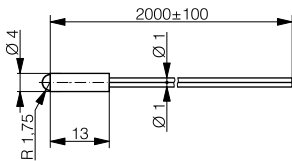
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SYNTHETIC OPTICAL FIBERS

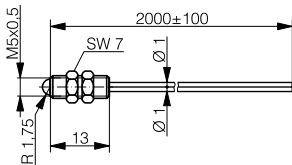
APPLICATION-SPECIFIC CYLINDRICAL LIGHT BEAM

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

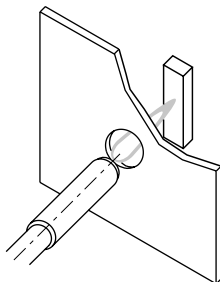


Housing size: Ø 4 mm	Miniature / spherical optics	
Part reference	LFP-1006-020	
Sensing range	with series 3030	100 mm (with 2 m fiber length)
	with series 3031	60 mm (with 2 m fiber length)
	with series 3#6#	140 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, Ø 1 mm*	
Inner fiber	Ø 0.5 mm	
Special characteristics	Spherical optics for cylindrical light beam	
* Adaptor included in delivery package		

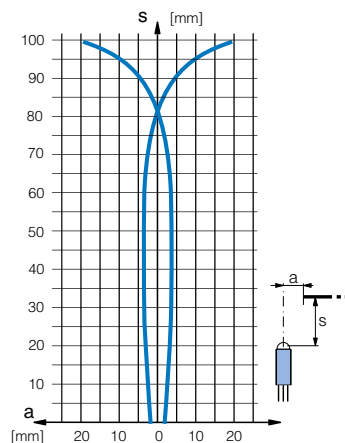


Housing size: M5	Miniature / spherical optics	
Part reference	LFP-1007-020	
Sensing range	with series 3030	100 mm (with 2 m fiber length)
	with series 3031	60 mm (with 2 m fiber length)
	with series 3#6#	140 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, Ø 1 mm*	
Inner fiber	Ø 0.5 mm	
Special characteristics	Spherical optics for cylindrical light beam	
* Adaptor included in delivery package		

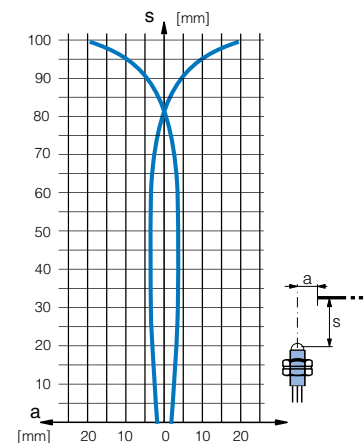
Response curves (with series 3030):



Detection through holes and gaps



LFP-1006-020

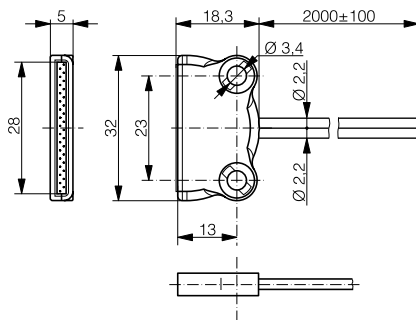


LFP-1007-020

SYNTHETIC OPTICAL FIBERS

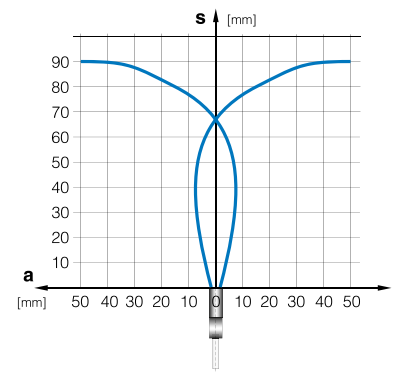
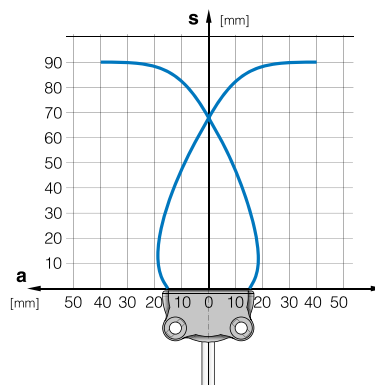
APPLICATION-SPECIFIC MULTI-BEAM

- ✓ 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



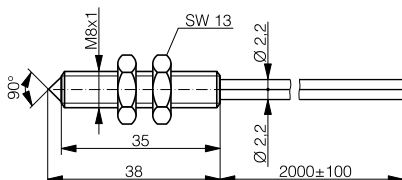
Housing size: ☐ 18 x 32	Multi-beam	
Part reference	LFP-1011-020	
Sensing range	with series 3030	90 mm (with 2 m fiber length)
	with series 3031	45 mm (with 2 m fiber length)
	with series 3#6#	150 mm (with 2 m fiber length)
Outside fiber	2 separate fibers, $\varnothing$ 2.2 mm	
Inner fiber	16 x $\varnothing$ 0.265 mm	
Special characteristics	Wide detection range (28 mm)	

Response curves (with series 3030):



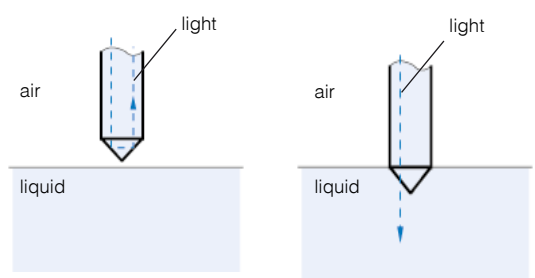
APPLICATION-SPECIFIC LIQUID LEVEL MONITORING

- ✓ 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:



Inductive

Photoelectric

Safety

RFID

Connectivity

Accessories

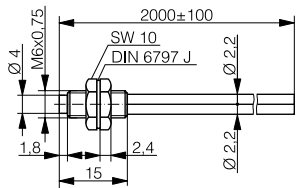
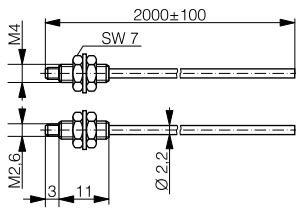
Glossary

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SYNTHETIC OPTICAL FIBERS

APPLICATION-SPECIFIC LOW & HIGH TEMPERATURES

Dimensions: light emission on the left



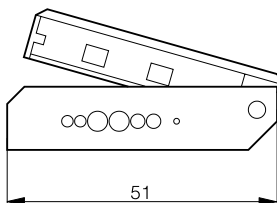
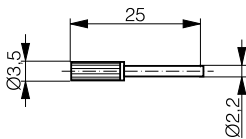
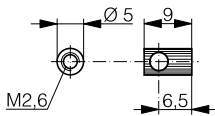
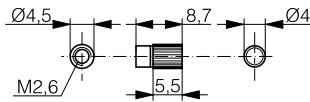
- ✓ Diffuse (LFP-1002-020-002) and through-beam (LFP-2002-020-002) fibers
- ✓ Extended temperature range : -55 ... +105°C / -67 ... +221°F
- ✓ Very small dimensions
- ✓ Long sensing ranges
- ✓ Small bending radii
- ✓ Can be cut on site

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 3#6#	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 3#6#	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 3#6#	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 3#6#	1700 mm (2 m fibers)
Can be used with	LFP-2#02-020	
Delivery package	1 pair	

Adaptor

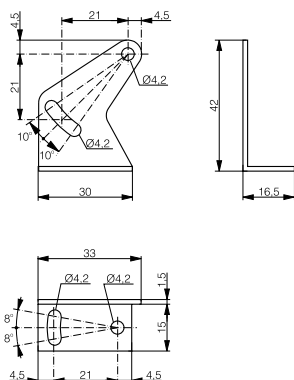
Part reference	LFP-0003-000	
Suitable for	fine synthetic optical fibers	

Cutting tool

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

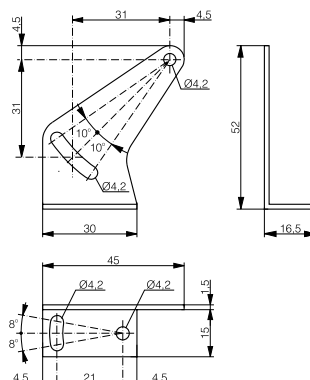
UNIVERSAL MOUNTING BRACKET

For 3030 / 3031 series
Material: stainless steel V2A
Part reference: **LXW-3030-000**



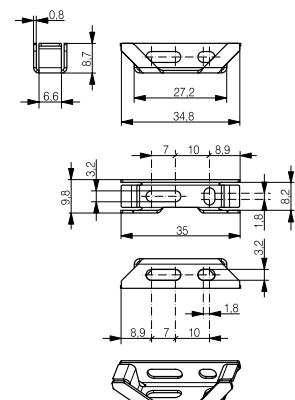
UNIVERSAL MOUNTING BRACKET

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**



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:

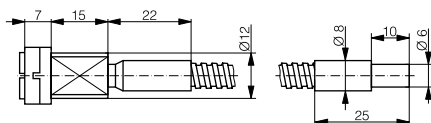
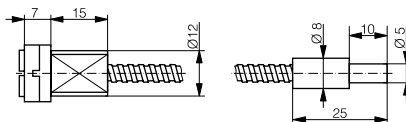
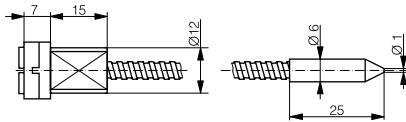
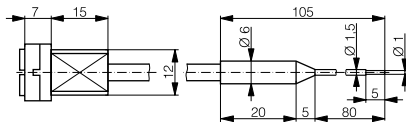
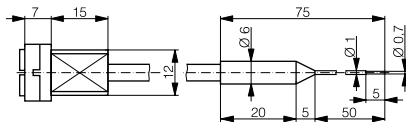
- PVC sleeve: the economical solution if no special stresses are to be expected.
- Wound sleeve of chrome-plated brass: for permanent operating temperatures of up to +160°C (+320°F), and maximum protection against crushing.
- Silicone sleeve with stainless-steel braiding for strain relief: for use in 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: Ø 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, 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-1015-###
Sensing range	with series 4040 15 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-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, Ø 4.7 mm
Min. bending radius	23 mm
Max. tensile load	20 N

Housing size: Ø 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, Ø 4.7 mm
Min. bending radius	25 mm
Max. tensile load	50 N

Housing size: Ø 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, Ø 6.7 mm
Min. bending radius	25 mm
Max. tensile load	50 N

Inductive

Photoelectric

Safety

RFID

Connectivity

Accessories

Glossary

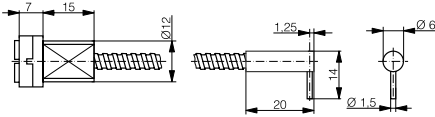
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GLASS OPTICAL FIBERS

RADIAL DIFFUSE SENSING

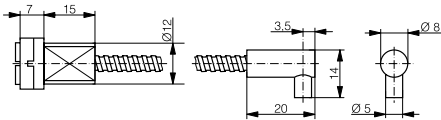
length of glass fiber in cm, standard lengths -025 (250 mm) / -050 (500 mm) / -100 (1000 mm)

Dimensions: light emission on the right



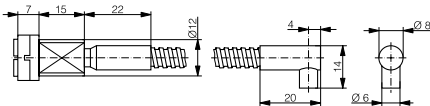
Housing size: Ø 6 mm

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



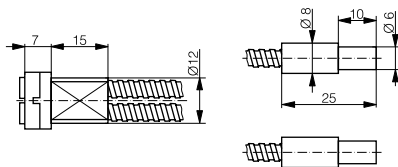
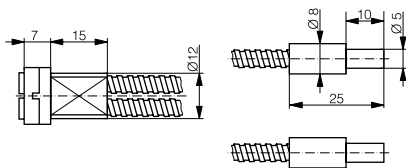
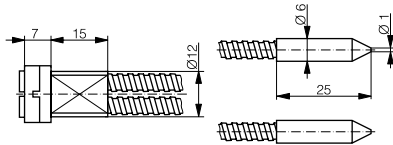
Housing size: Ø 8 mm

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-3010-050
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

Housing size: Ø 8 mm

Part reference	LFG-3020-050
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

Inductive

Photoelectric

Safety

RFID

Connectivity

Accessories

Glossary

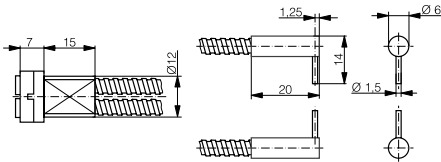
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GLASS OPTICAL FIBERS

RADIAL THROUGH-BEAM SENSING

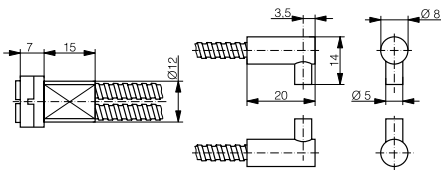
length of glass fiber in cm, standard lengths -025 (250 mm) / -050 (500 mm) / -100 (1000 mm)

Dimensions: light emission on the right



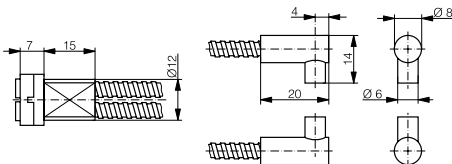
Housing size: Ø 6 mm

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, Ø 4.7 mm
Min. bending radius	23 mm
Max. tensile load	20 N



Housing size: Ø 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, Ø 4.7 mm
Min. bending radius	25 mm
Max. tensile load	50 N



Housing size: Ø 8 mm

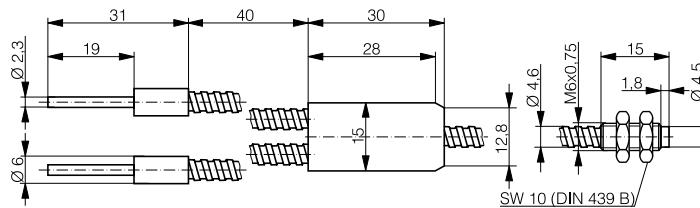
Part reference	LFG-4030-100
Sensing range	with series 4040 1500 mm
Special characteristics	For long sensing range
Leg length	14 mm
Sleeve	Wound sleeve of chrome-plated brass, Ø 4.7 mm
Min. bending radius	25 mm
Max. tensile load	50 N

GLASS OPTICAL FIBERS

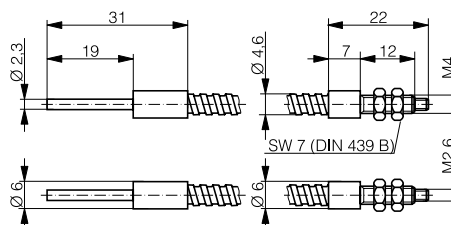
Dimensions: light emission on the right

**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	

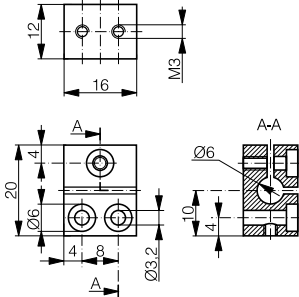


Housing size: M4	Through-beam sensing	
Part reference	LFG-3022-050	
Sensing range	with series 3030	500 mm
	with series 3031	250 mm
Special characteristics	For difficult environmental conditions	
Sleeve	Wound sleeve of chrome-plated brass, $\varnothing$ 4.6 mm	
Min. bending radius	25 mm	
Max. tensile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

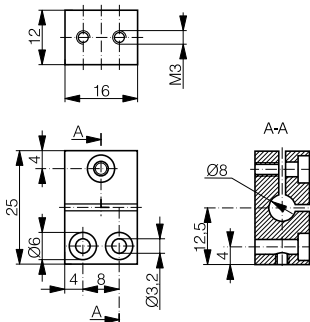


GLASS OPTICAL FIBERS

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-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-###





HIGH PRECISION AND DIRECT DIGITAL TRANSMISSION

DISTANCE PHOTOELECTRIC SENSORS

KEY ADVANTAGES

C23 Distance measuring sensors

- ✓ Two distance measurement ranges: 20...80 mm and 30...200 mm
- ✓ Housing 20 mm x 34 mm x 12 mm
- ✓ High precision and repeatability
- ✓ Settable analog range for optimum distance measurement
- ✓ Enclosure rating IP 67 / IP 69K

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
- ✓ Enclosure rating IP 67 / IP 69K, Ecolab approved
- ✓  IO-Link

RANGE OVERVIEW	Series	Short range	Medium range
DISTANCE	C23 (20x34x12)	p. 282-283	
	C55 (50x50x23)		p. 284-285



DISTANCE C23

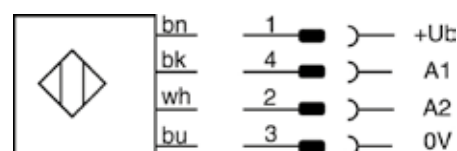
PHOTOELECTRIC SENSORS

ADVANTAGES

- ✓ Two distance measurement ranges: 20...80 mm and 30...200 mm
- ✓ Housing 20 mm x 34 mm x 12 mm
- ✓ High precision and repeatability
- ✓ Settable analog range for optimum distance measurement
- ✓ Enclosure rating IP 67 / IP 69K

WIRING DIAGRAM

PNP or NPN + analog, 2 outputs



OVERVIEW	C23
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
Output current	≤ 100 mA
Switching frequency	≤ 1000 Hz
Setup	Teach button
Compatible mounting bracket	See pages 297-298

C23 SERIES



C23

HOUSING SIZE MM	□ 20 X 34 X 12	□ 20 X 34 X 12	□ 20 X 34 X 12
OPERATING PRINCIPLE	DISTANCE MEASURING SENSOR	DISTANCE MEASURING SENSOR	DISTANCE MEASURING SENSOR
SENSING RANGE MM	80	100	200

Inductive

Photoelectric

Safety

RFID

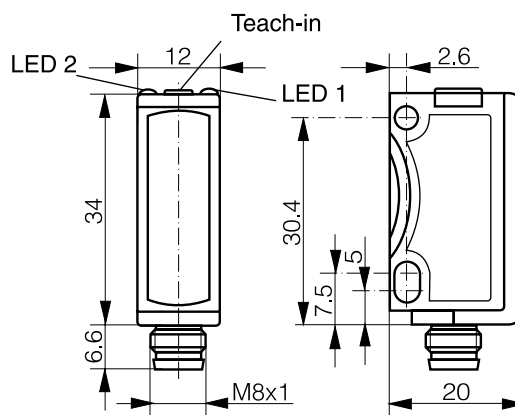
Connectivity

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PHOTOELECTRIC



DATA			
Light source	LED red 632 nm	Laser class 1, red 650 nm	LED red 632 nm
Light spot size	5 mm at 50 mm	1.5 mm at 80 mm	7 mm at 60 mm
Resolution	0.12 mm	0.12 mm	0.68 mm
Linearity	+/- 0.4 mm	+/- 0.25 mm	+/- 2 mm
Repeatability	≤ 0.4 mm	≤ 0.25 mm	≤ 1 mm
PNP Light-ON+Dark-ON+Analog 1...10V	DTR-C23PB-TMS-139		DTR-C23PB-TLS-139
NPN Light-ON+Dark-ON+Analog 1...10V	DTR-C23PB-TMS-129		DTR-C23PB-TLS-129
PNP/NPN auto-detect+Analog 1...10V		DTL-C23PB-TMS-139-501	
Other types available			



DISTANCE C55

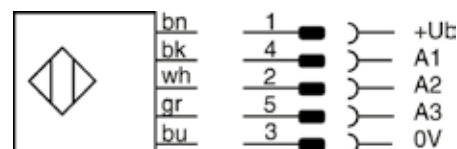
PHOTOELECTRIC SENSORS

ADVANTAGES

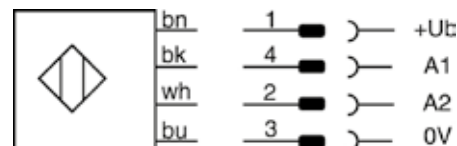
- ✓ Distance measurement up to 5000 mm
- ✓ Housing 50 mm x 50 mm x 23 mm
- ✓ High precision and repeatability
- ✓ Settable analog range for optimum distance measurement
- ✓ Enclosure rating IP67/IP69K, Ecolab approved
- ✓  **IO-Link**

WIRING DIAGRAMS

PNP / NPN auto-detect + analog, 2 outputs + teach-in



PNP / NPN auto-detect, 1 output + teach-in



OVERVIEW	C55 DISTANCE
Housing material	ABS / PMMA
Degree of protection	IP 67 / IP 69K
Supply voltage range	18 ... 30 VDC
Ambient temperature range	-40 ... +60°C / -40 ... +140°F
Output current	≤ 100 mA
Switching frequency	≤ 250 Hz (DTL) / ≤ 500 Hz (-505)
Setup	Teach button / or IO-Link (-505)
Compatible mounting bracket	See page 299

C55 SERIES



C55

HOUSING SIZE MM

□ 50 X 50 X 23

□ 50 X 50 X 23

OPERATING PRINCIPLE

DISTANCE MEASURING
SENSOR

DISTANCE MEASURING
SENSOR

SENSING RANGE MM

5000

5000

Inductive

Photoelectric

Safety

RFID

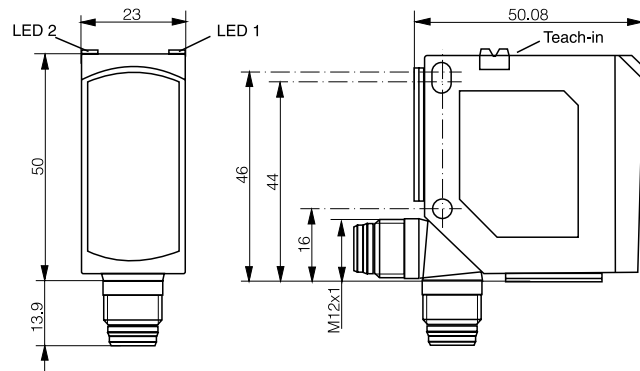
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PHOTOELECTRIC



DATA



IO-Link 

Light source

Laser class 1 red 650 nm

Laser class 1 red 655 nm

Light spot size

5 mm x 4 mm at 3000 mm

5 mm x 4 mm at 3000 mm

Resolution

< 5 mm

< 5 mm

Linearity

+/- 30 mm

+/- 30 mm

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

DTL-C55PA-TMS-119-502

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

DTL-C55PA-TMS-119-503

PNP/NPN auto-detect, Light-ON / Dark-ON

DTL-C55PA-TMS-407-505

Other types available



**EXCELLENT RESOLUTION FOR SMALLEST
VARIATIONS**



COLOR AND CONTRAST

PHOTOELECTRIC SENSORS

KEY ADVANTAGES

- ✓ Rugged housing, 40 mm x 50 mm x 15 mm
- ✓ Connector adjustable at 0°, 45° and 90°
- ✓ 5 switching tolerance levels

Color sensors

- ✓ 3 color teach channels with independent outputs
- ✓ High positioning tolerance
- ✓ High switching frequency: up to 4 kHz

Contrast sensors

- ✓ Detection of very small print marks thanks to a narrow, collimated light spot
- ✓ RGB emission technology with best emission color automatically selected
- ✓  **IO-Link**

RANGE OVERVIEW	Series	Color	Contrast
COLOR AND CONTRAST	4050 (40x50x15)	p. 289	p. 289

COLOR AND CONTRAST

4050

PHOTOELECTRIC SENSORS

ADVANTAGES

- ✓ Rugged housing, 40 mm x 50 mm x 15 mm
- ✓ Connector adjustable at 0°, 45° and 90°
- ✓ 5 switching tolerance levels

Color sensors

- ✓ 3 color teach channels with independent outputs
- ✓ High positioning tolerance
- ✓ High switching frequency: up to 4 kHz

Contrast sensors

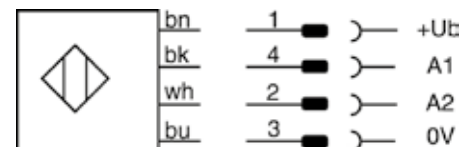
- ✓ Detection of very small print marks thanks to a narrow, collimated light spot
- ✓ RGB emission technology with best emission color automatically selected
- ✓ Excellent tolerance to target distance variations
- ✓ High switching frequency: up to 10 kHz
- ✓  **IO-Link**

WIRING DIAGRAMS

PNP or NPN, 3 outputs



PUSH-PULL, 1 output + teach or switching mode selector



OVERVIEW	4050 COLOR	4050 CONTRAST
Housing material	PBTP	PBTP
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
Switching frequency	4000 Hz	10,000 Hz
Compatible mounting bracket	See page 302	See page 302

4050 SERIES



HOUSING SIZE MM

40 X 50 X 15

40 X 50 X 15

OPERATING PRINCIPLE

COLOR SENSOR (DIFFUSE)

CONTRAST SENSOR (DIFFUSE)

SENSING RANGE MM

40

12

Inductive

Photoelectric

Safety

RFID

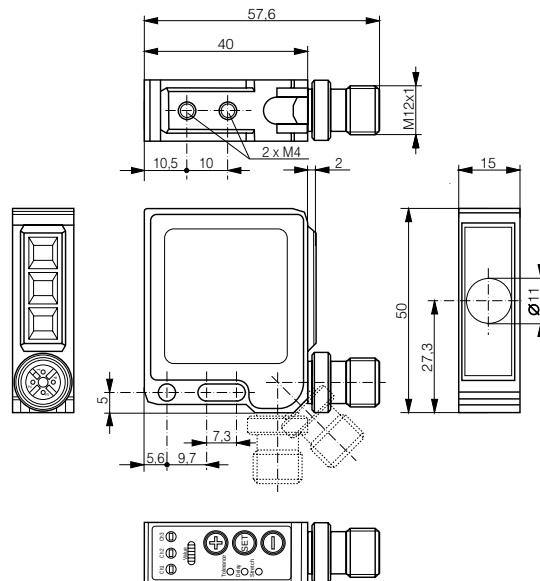
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PHOTOELECTRIC



DATA

Light source

LED white

LED red, green, blue (autoselect)

Light spot size (distance)

Ø 4 mm (35 mm)

1.5 x 3.5 mm (12 mm)

No-load supply current

≤ 35 mA

≤ 35 mA

Setup

Teach button

Teach button or Teach input or IO-Link

3 x PNP Light-ON

FTS-4155-303

3 x NPN Light-ON

FTS-4155-301

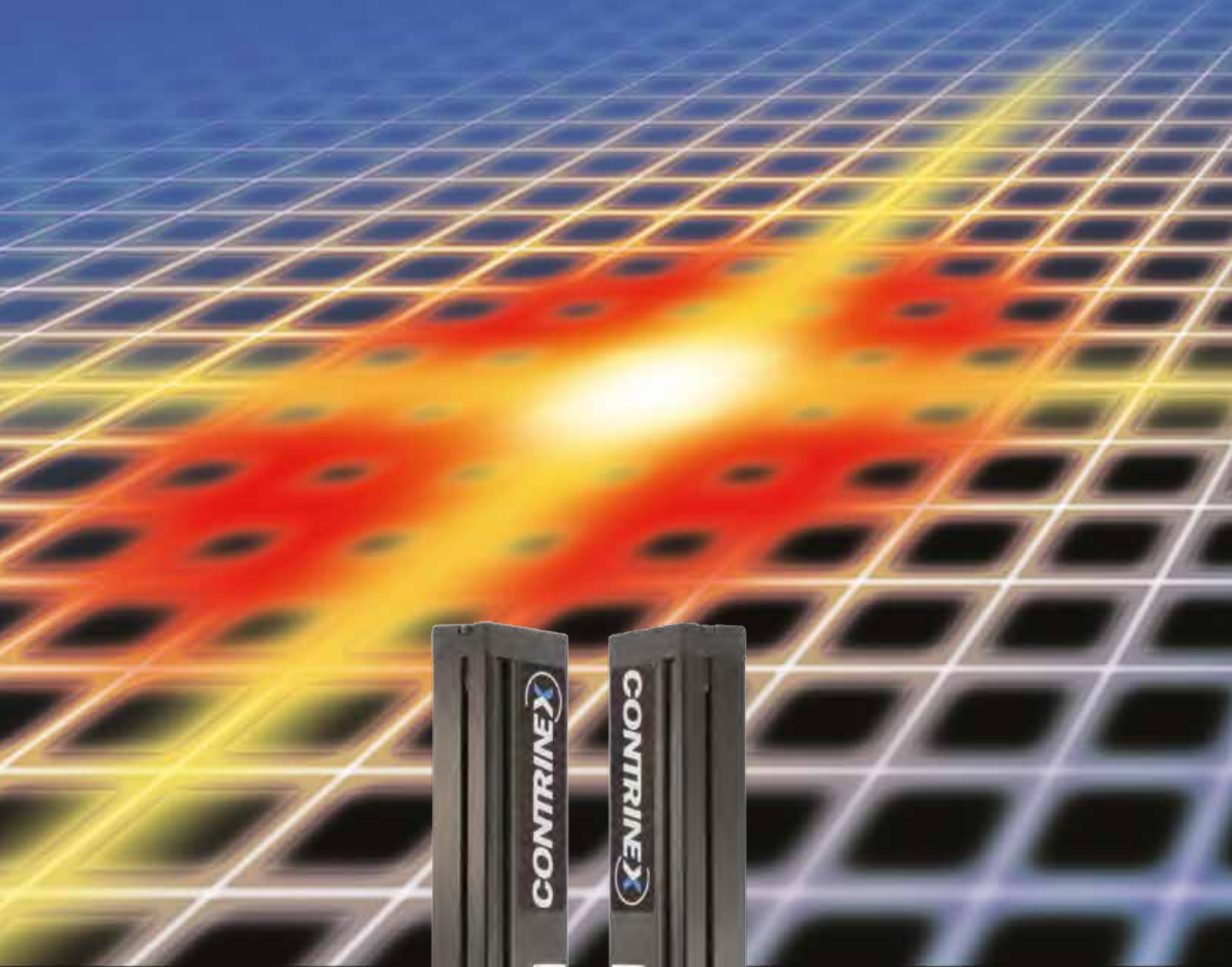
PUSH-PULL

KTS-4155-407

Other types available

Cable version

Cable version



FAST DETECTION, COUNTING AND MEASUREMENT

LIGHT GRIDS PHOTOELECTRIC SENSORS

KEY ADVANTAGES

- ✓ Plug-and-play installation
- ✓ Small installation space with cross-section: 40 x 20.5 mm

DGI series

- ✓ Fast, precise detection and counting
- ✓ Resolution of 0.9 mm to 25 mm, capable of detecting even the smallest object
- ✓ Detection range up to 8000 mm
- ✓ Beam height from 75 mm up to 2010 mm

MGI series

- ✓ Easy, reliable measurement of position and dimensions
- ✓ Center beam spacing 5 mm and 12 mm
- ✓ Measurement range up to 4000 mm
- ✓ Beam height from 230 mm up to 1420 mm

RANGE OVERVIEW	Series	Detection	Measurement
STANDARD	DGI (40x20.5xH)	p. 293	
	MGI (40x20.5xH)		p. 295



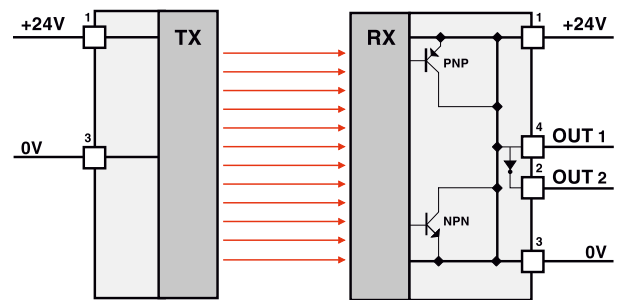
LIGHT GRIDS DETECTION

PHOTOELECTRIC SENSORS

ADVANTAGES

- ✓ Compact aluminum housing (40 mm x 20.5 mm x height)
- ✓ Resolution of 0.9 mm to 25 mm, capable of detecting even the smallest object
- ✓ Detection range up to 8000 mm
- ✓ Beam height from 75 mm up to 2010 mm
- ✓ 2 push-pull outputs (PNP + NPN), Light-ON + Dark-ON
- ✓ Fast response time from 0.8 to 4.8 ms
- ✓ Potentiometer for fine adjustment on 0.9 mm and 2 mm resolution grids

WIRING DIAGRAM



OVERVIEW	DETECTION GRID
Housing material	Aluminum
Window material	PMMA
Degree of protection	IP 65
Light source	LED, infrared
Supply voltage range	24 VDC $\pm$ 20 %
Ambient temperature range	-5 ... +50°C / +23 ... +122°F
Output current	$\leq$ 80 mA

DETECTION GRID



HOUSING SIZE MM	40 X 20.5 X H
OPERATING PRINCIPLE	DETECTION GRID
SENSING RANGE MM	8000

Inductive

Photoelectric

Safety

RFID

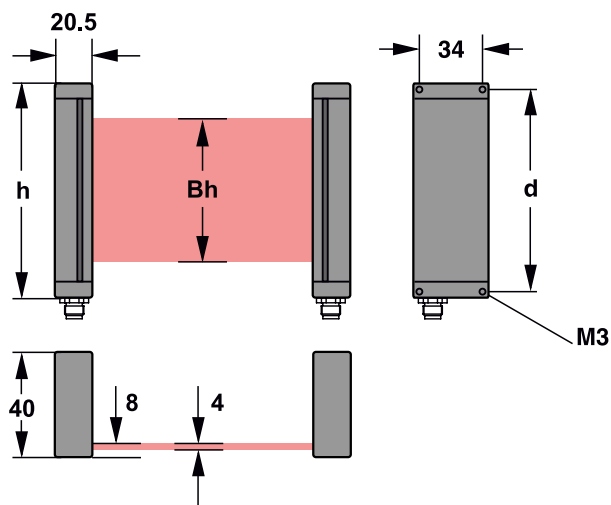
Connectivity

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PHOTOELECTRIC



AVAILABLE TYPES					
PART REFERENCE	RESOLUTION (MM)	HEIGHT h (MM)	BEAM HEIGHT Bh (MM)	DETECTION RANGE (MM)	POTENTIOMETER
DGI-01A-0075-PMS-107	0.9	100	75	100...400	✓
DGI-01A-0155-PMS-107	0.9	180	155	150...400	✓
DGI-02A-0075-PMS-107	2	100	75	80...800	✓
DGI-02A-0155-PMS-107	2	180	155	150...800	✓
DGI-04A-0075-NMS-107	4	100	75	80...800	-
DGI-04A-0155-NMS-107	4	180	155	150...800	-
DGI-08A-0190-NMS-107	8	212	190	300...4000	-
DGI-08A-0480-NMS-107	8	500	480	300...4000	-
DGI-25A-0480-NMS-107	25	500	480	300...8000	-
DGI-25A-0960-NMS-107	25	980	960	300...8000	-
DGI-25A-2010-NMS-107	25	2036	2010	300...8000	-



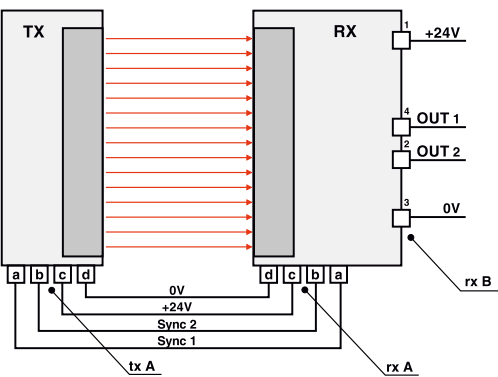
LIGHT GRIDS MEASUREMENT

PHOTOELECTRIC SENSORS

ADVANTAGES

- ✓ Compact aluminum housing (40 mm x 20.5 mm x height)
- ✓ Center beam spacing 5 mm and 12 mm
- ✓ Measurement range up to 4000 mm
- ✓ Beam height from 230 mm up to 1420 mm
- ✓ Analog output 0-10 V or 4-20 mA
- ✓ Fast response time from 3 to 14 ms
- ✓ 4 switching modes selectable through multi-switch

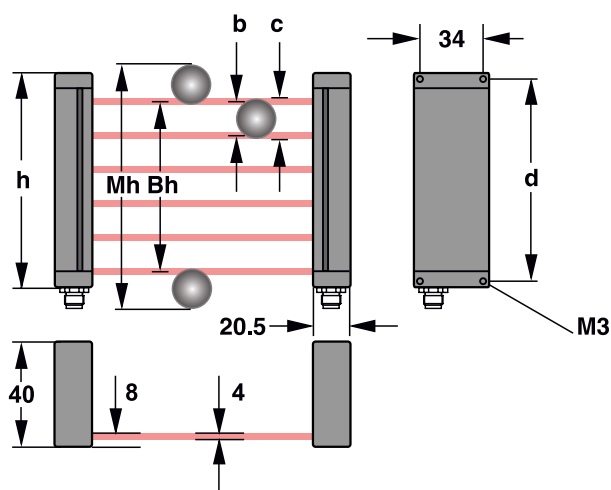
WIRING DIAGRAM



OVERVIEW	MEASUREMENT GRID
Housing material	Aluminum
Window material	PMMA
Degree of protection	IP 65
Light source	LED, infrared
Supply voltage range	24 VDC $\pm$ 20 %
Ambient temperature range	-5 ... +50°C / +23 ... +122°F
Analog output	4 ... 20 mA / 0 ... 10 V

Inductive

Photoelectric



Safety

RFID

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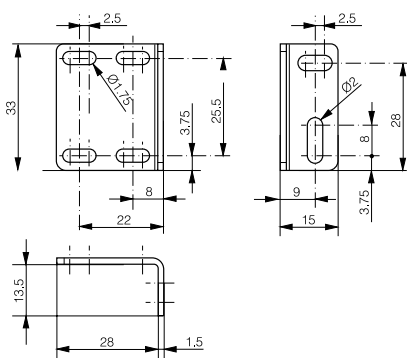
PHOTOELECTRIC ACCESSORIES

UNIVERSAL MOUNTING BRACKET

For C23PA series

Material: stainless steel V2A

Part reference: **LXW-C23PA-000**

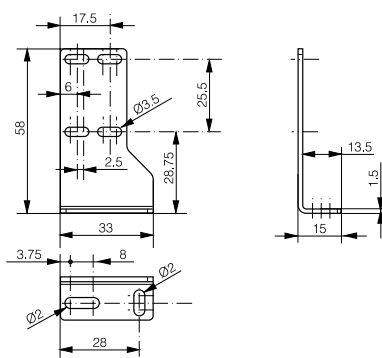


UNIVERSAL MOUNTING BRACKET

For C23PA series

Material: stainless steel V2A

Part reference: **LXW-C23PA-001**

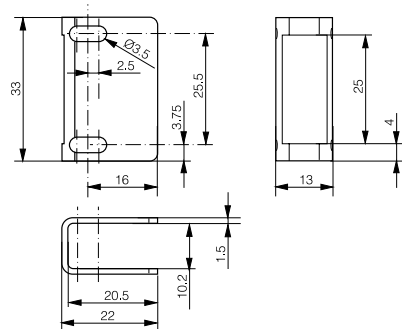


UNIVERSAL MOUNTING BRACKET

For C23PA series

Material: stainless steel V2A

Part reference: **LXW-C23PA-002**

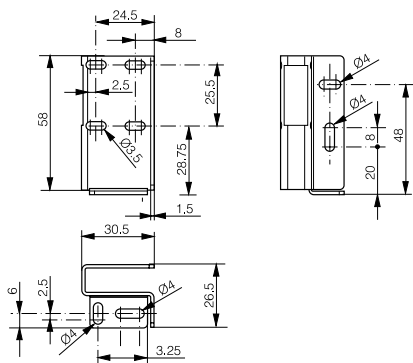


UNIVERSAL MOUNTING BRACKET

For C23PA series

Material: stainless steel V2A

Part reference: **LXW-C23PA-003**

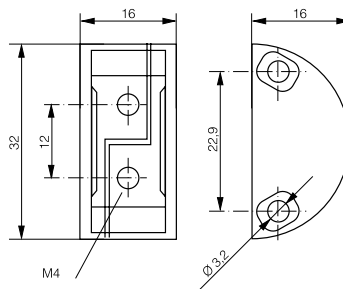


UNIVERSAL MOUNTING BRACKET

For C23PB distance sensors

Material: aluminum anodised

Part reference: **LXW-C23PB-000**

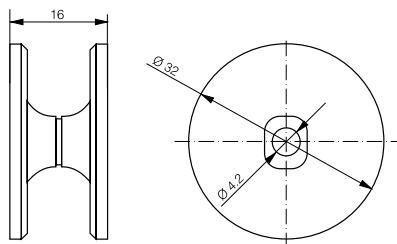


UNIVERSAL MOUNTING BRACKET

For C23PB distance sensors

Material: aluminum

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



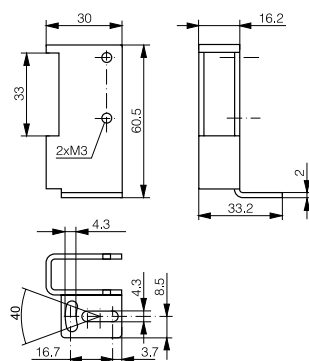
PHOTOELECTRIC ACCESSORIES

UNIVERSAL MOUNTING BRACKET

For C23PB distance sensors

Material: stainless steel V2A

Part reference: **LXW-C23PB-002**

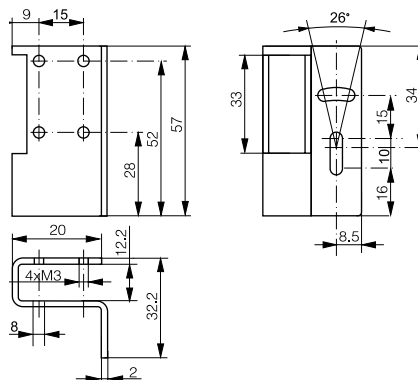


UNIVERSAL MOUNTING BRACKET

For C23PB distance sensors

Material: stainless steel V2A

Part reference: **LXW-C23PB-003**

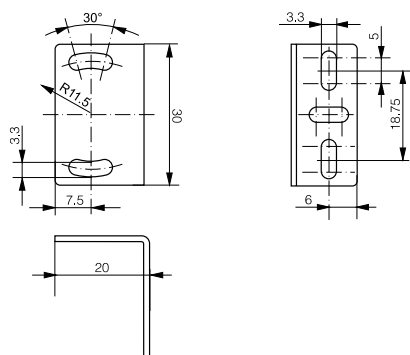


UNIVERSAL MOUNTING BRACKET

For C23PB distance sensors

Material: nickel-plated steel

Part reference: **LXW-C23PB-004**

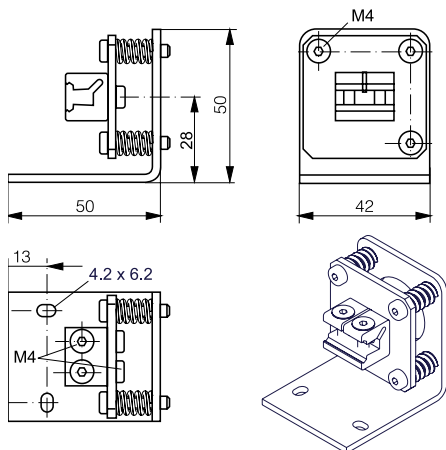


UNIVERSAL MOUNTING BRACKET

For C55 series

Material: stainless steel V2A

Part reference: **LXW-C55PA-000**

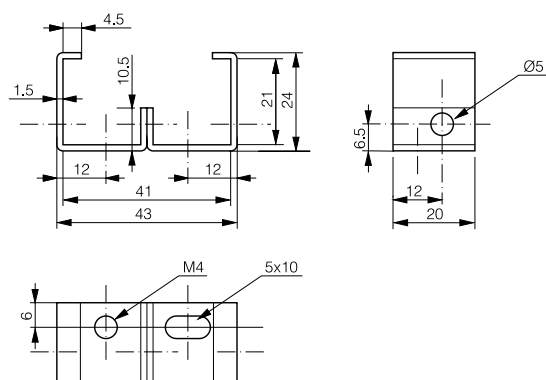


UNIVERSAL MOUNTING BRACKET

For light grids

Material: stainless steel V2A

Part reference: **LXW-DGMGA-000**



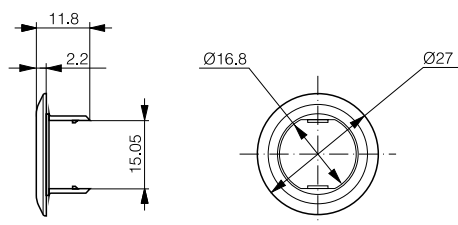
PHOTOELECTRIC ACCESSORIES

UNIVERSAL MOUNTING BRACKET

For M18PA series

Material: ABS

Part reference: **LXW-M18PA-000**

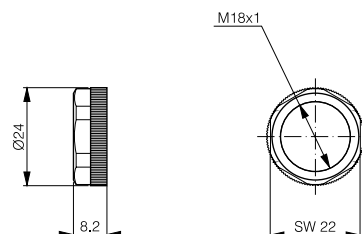


UNIVERSAL MOUNTING BRACKET

For M18PA series

Material: ABS

Part reference: **LXW-M18PA-001**

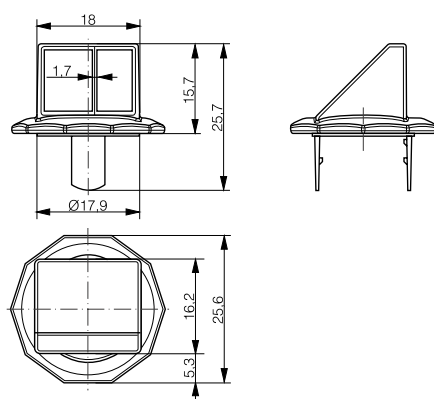


SPECIAL MOUNTING FOR 90°

For M18PA series

Material: ABS / PMMA

Part reference: **LHW-M18PA-000**

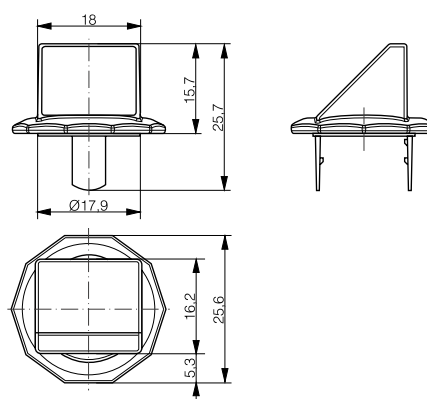


SPECIAL MOUNTING FOR 90°

For M18PA series

Material: ABS / PMMA

Part reference: **LLW-M18PA-000**

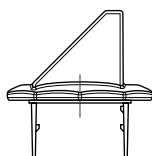
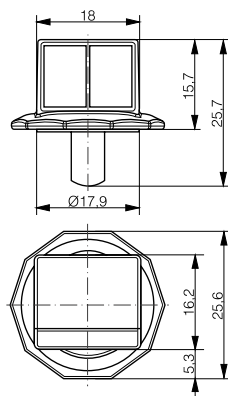


SPECIAL MOUNTING FOR 90°

For M18PA series

Material: ABS / PMMA

Part reference: **LTW-M18PA-000**

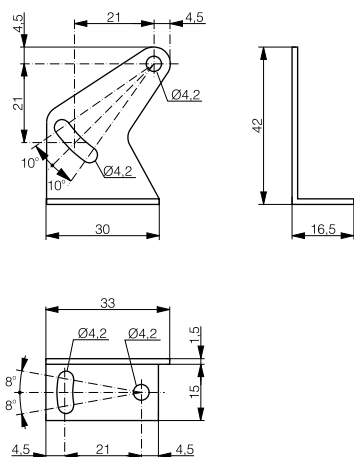


UNIVERSAL MOUNTING BRACKET

For 3#30 / 3#31 series

Material: stainless steel V2A

Part reference: **LXW-3030-000**

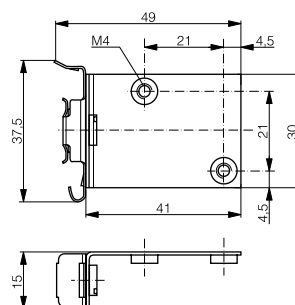


DIN-RAIL MOUNTING BRACKET

(TS35) for 3#30 / 3#31 series

Material: stainless steel V2A

Part reference: **LXW-3030-001**



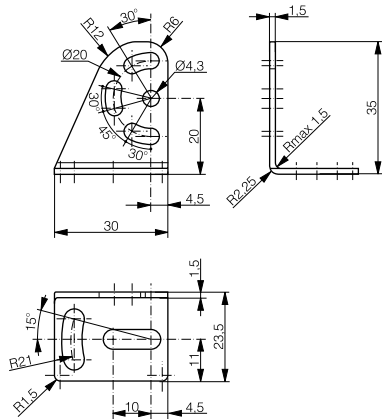
PHOTOELECTRIC ACCESSORIES

UNIVERSAL MOUNTING BRACKET

For 4050 series

Material: stainless steel V2A

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

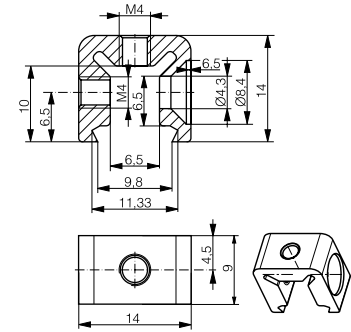


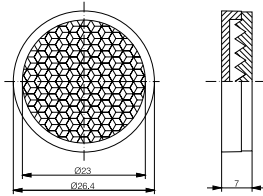
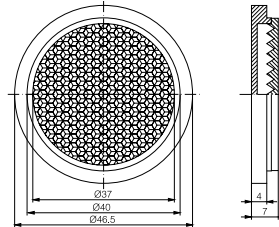
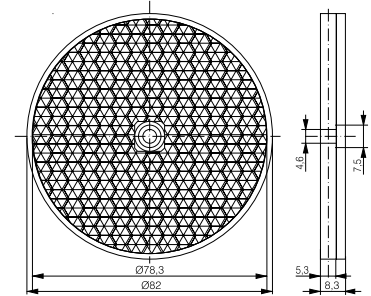
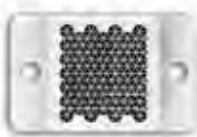
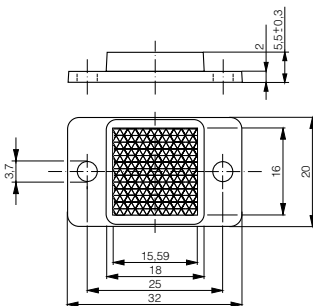
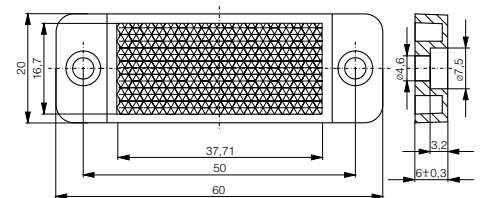
CLAMP BRACKET

For 4050 series

Material: aluminum

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

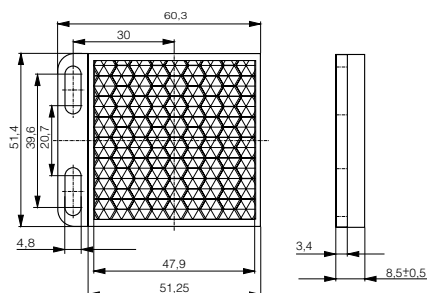


REFLECTOR Ø 26 MM*Part reference: LXR-0000-025***REFLECTOR Ø 46 MM***Part reference: LXR-0000-046***REFLECTOR Ø 82 MM***Part reference: LXR-0000-084***REFLECTOR 32 X 20 MM***Part reference: LXR-0001-032***REFLECTOR 60 X 20 MM***Part reference: LXR-0001-062*

PHOTOELECTRIC ACCESSORIES

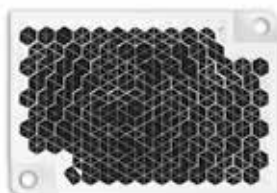
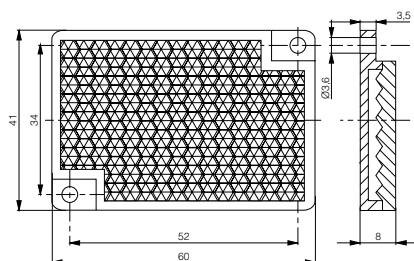
REFLECTOR 60 X 51 MM

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



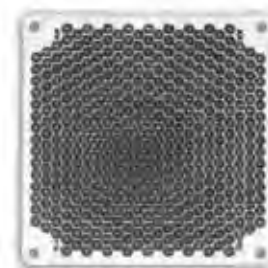
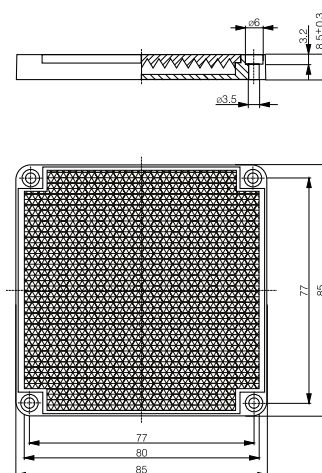
REFLECTOR 60 X 41 MM

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



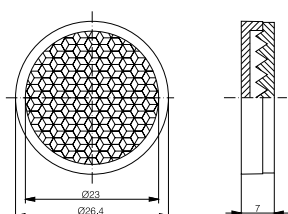
REFLECTOR 85 X 85 MM

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



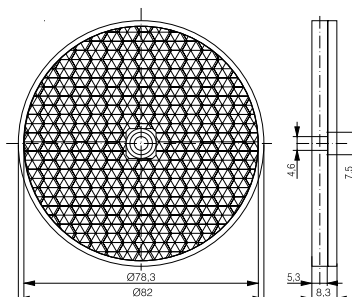
REFLECTOR Ø 26 MM FOR UV

Part reference: **LXU-0000-025**



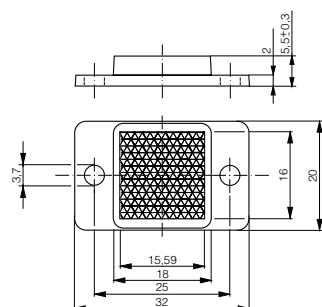
REFLECTOR Ø 82 MM FOR UV

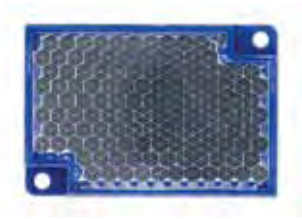
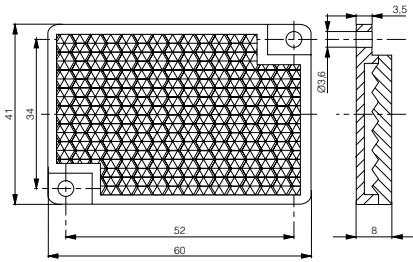
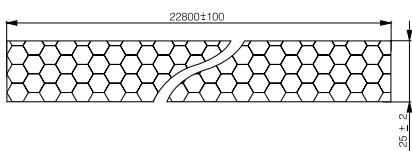
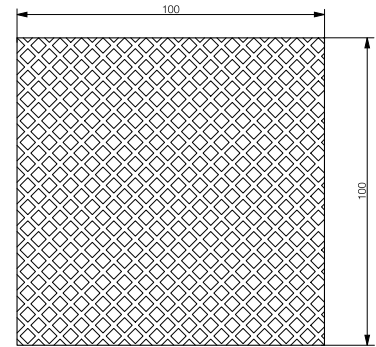
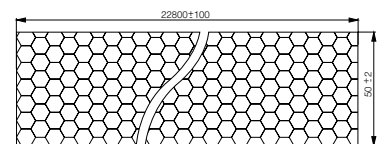
Part reference: **LXU-0000-084**



REFLECTOR 32 X 20 MM FOR UV

Part reference: **LXU-0001-032**

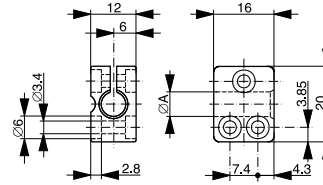


REFLECTOR 60 X 41 MM FOR UV*Part reference: LXU-0001-064***REFLECTIVE ROLL 25 MM X 22.8 M***Part reference: LXR-0003-025***REFLECTIVE FOIL 100 X 100 MM***Part reference: LXR-0002-100***REFLECTIVE ROLL 50 MM X 22.8 M***Part reference: LXR-0003-050*

ACCESSORIES

SENSOR MOUNTING CLAMPS

Ø3, Ø4, Ø5, Ø6.5, Ø8



TECHNICAL DATA

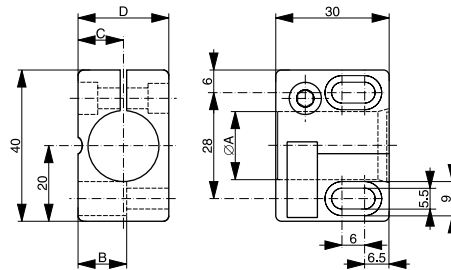
Part reference	Type	A			
ASU-0001-030	without limit stop	Ø 3 mm			
ASU-0001-040	without limit stop	Ø 4 mm			
ASU-0001-050	without limit stop	Ø 5 mm			
ASU-0001-065	without limit stop	Ø 6.5 mm			
ASU-0001-080	without limit stop	Ø 8 mm			
ASU-0002-080	with limit stop	Ø 8 mm			

Material: PA 6 black

Screw: DIN 912, M3 zinc-plated

Nut: DIN 934, M3 zinc-plated

Ø12, Ø18



TECHNICAL DATA

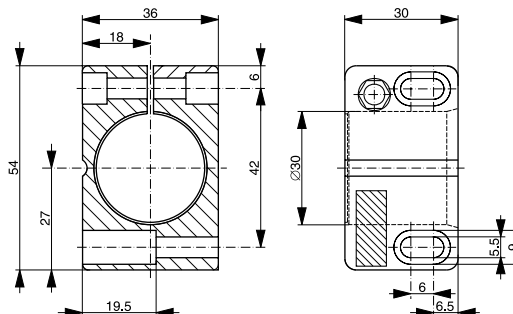
Part reference	Type	A	B	C	D
ASU-0001-120	without limit stop	Ø 12 mm	9.75 mm	9 mm	18 mm
ASU-0002-120	with limit stop	Ø 12 mm	9.75 mm	9 mm	18 mm
ASU-0001-180	without limit stop	Ø 18 mm	12.85 mm	12 mm	24 mm
ASU-0002-180	with limit stop	Ø 18 mm	12.85 mm	12 mm	24 mm

Material: PA 6 GK (Ø 18 mm), PA 6 (Ø 12 mm) black

Screw: DIN 912, M5 zinc-plated

Nut: DIN 934, M5 zinc-plated

Ø30



TECHNICAL DATA

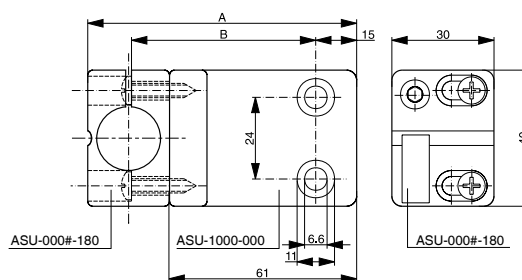
Part reference	Type				
ASU-0001-300	without limit stop	Ø 30 mm			
ASU-0002-300	with limit stop	Ø 30 mm			

Material: PA 6 GK black

Screw: DIN 912, M5 x 25 zinc-plated

Nut: DIN 934, M5 zinc-plated

BASES FOR MOUNTING CLAMPS Ø12, Ø18



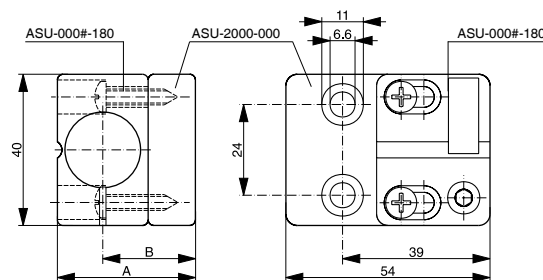
TECHNICAL DATA

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

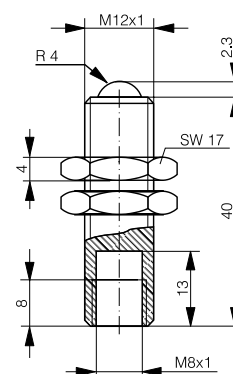
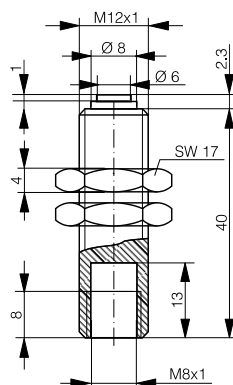
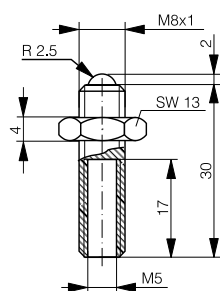
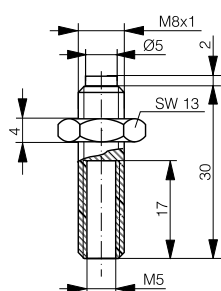
Part reference	Type	A with $\varnothing 12$ mm / $\varnothing 18$ mm	B with $\varnothing 12$ mm / $\varnothing 18$ mm
ASU-2000-000	vertical	30.5 mm / 36.5 mm	21.5 mm / 24.5 mm

Material: PA 6 black

Screws: DIN 7981, $\varnothing 4.2$ zinc-plated

MECHANICAL STOPS

FOR M5 AND M8 INDUCTIVE SENSORS

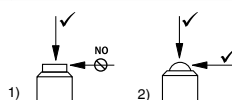


TECHNICAL DATA

Part reference	Inner diameter	Outer diameter	Plunger type	Max. force on housing	Max. force on plunger
AMS-0001-M08	M5 x 0.5	M8 x 1	Flat ¹⁾	8000 N	2000 N
AMS-0002-M08	M5 x 0.5	M8 x 1	Spherical ²⁾	8000 N	2000 N
AMS-0001-M12	M8 x 1	M12 x 1	Flat ¹⁾	15,000 N	2000 N
AMS-0002-M12	M8 x 1	M12 x 1	Spherical ²⁾	15,000 N	2000 N

Material: Steel XC 48, black

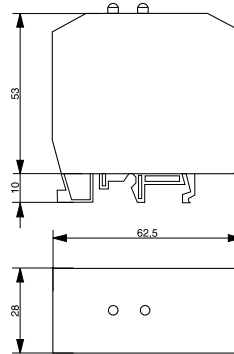
Max. tightening torque: 30 Nm (M08), 50 Nm (M12)



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):



AMPLIFIERS FOR 3-WIRE SENSORS

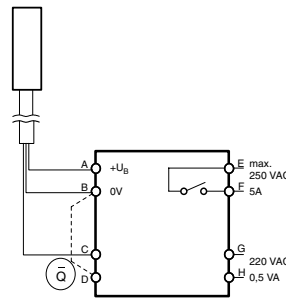
DW-AZ-100-A3

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:



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 600mAh (included)
- Battery life longer than 2 hours at 50 mA current supply
- Micro-USB interface to recharge battery with universal mobile phone charger



AMPLIFIERS FOR NAMUR SENSORS

DW-AZ-100-AN

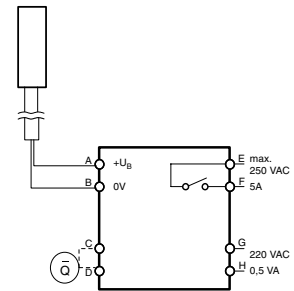
These devices are suitable for NAMUR sensors. Operating the switch activates the relay, and the contact closes. A wire bridge between C and D inverts this function.

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

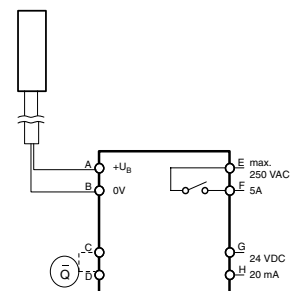
These devices are suitable for NAMUR sensors. Operating the switch activates the relay, and the contact closes. A wire bridge between C and D inverts this function.

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:



PHOTOELECTRIC SENSORS

NEW DESIGNATION SINCE 2013

LTR-C23PA-PMS-403 (-XXX)

SENSOR TYPE

Diffuse	LT
Retro-reflex	LR
Through-beam	LL
Background suppression	LH
Distance diffuse	DT
Transparent retro-reflex	TR

EMISSION TYPE

Red	R
Laser	L
UV	U

HOUSING TYPE

Cubic	C
Cylindrical threaded	M

HOUSING SIZE

Cubic 1# mm x 2# mm	12
Cubic 2# mm x 3# mm	23
Cubic 5# mm x 5# mm	55
Cylindrical 18 mm	18

HOUSING MATERIAL

Plastic	P
---------	---

PERFORMANCE

Standard	A, B
----------	------

ADJUSTMENT TYPE

No teach or potentiometer	N
Potentiometer	P
Teach button	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
Cable + connector	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 pigtail	V
Synthetic optical fiber	P
Glass optical fiber	G
Reflector (standard)	R
Reflector for UV light	U
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)	3060
31x60 mm (teach-in)	3065
31x60 mm (teach-in & digital display)	3066
31x60 mm (blue light)	3360
40 x 40 mm	4040
40 x 50 mm	415#

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:	
Light-ON + Dark-ON or switchable	01
Light-ON and excess gain	02
4-wire devices, PNP, output:	
Light-ON + Dark-ON or switchable	03
Light-ON and excess gain	04
3-wire devices, NPN, output:	
Light-ON	01
Dark-ON	02
3-wire devices, PNP, output:	
Light-ON	03
Dark-ON	04

DIMENSIONS

Synthetic optical fibers	
Length in dm (2 m)	020
Length in dm (5 m)	050
Length in dm (10 m)	100
Glass optical fibers	
Length in cm (0.25 m)	025
Length in cm (0.50 m)	050
Length in cm (1 m)	100
Length in cm (2 m)	200
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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PHOTOELECTRIC SENSORS

LIGHT GRIDS

DGI-02A-0075-PMS-107

LIGHT GRID TYPE

Detection grid	DG
Measurement grid	MG

LIGHT SOURCE

Infrared	I
----------	---

RESOLUTION / CENTER BEAM SPACING

Resolution in mm (DGI)	##
Center beam spacing in mm (MGI)	##

SERIES

Standard	A
----------	---

DIMENSIONS

Beam height in mm	####
-------------------	------

OUTPUT

Analog	49
Push-Pull	07

NUMBER OF WIRES

4-wire	1
--------	---

CONNECTION TYPE

Connector	S
-----------	---

SENSING RANGE

Standard	M
----------	---

ADJUSTMENT TYPE

No potentiometer	N
Potentiometer	P

PHOTOELECTRIC SENSORS

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DGI-01A-0075-PMS-107	2/293	LHS-1180W-301	2/200	LRK-1180-302	2/202
DGI-01A-0155-PMS-107	2/293	LHS-1180W-303	2/200	LRK-1180-304	2/202
DGI-02A-0075-PMS-107	2/293	LHS-3130-101	2/213	LRK-3030-101	2/218
DGI-02A-0155-PMS-107	2/293	LHS-3130-103	2/213	LRK-3030-103	2/218
DGI-04A-0075-NMS-107	2/293	LHS-3131-301	2/214	LRK-3031-302	2/217
DGI-04A-0155-NMS-107	2/293	LHS-3131-303	2/214	LRK-3031-304	2/217
DGI-08A-0190-NMS-107	2/293	LHS-4150-101	2/221	LRR-C12PA-NMK-302	2/240
DGI-08A-0480-NMS-107	2/293	LHS-4150-103	2/221	LRR-C12PA-NMK-304	2/240
DGI-25A-0480-NMS-107	2/293	LLK-1180-000	2/203	LRR-C23PA-NMS-101	2/211
DGI-25A-0960-NMS-107	2/293	LLK-1180-001 (receiver)	2/203	LRR-C23PA-NMS-10B	2/211
DGI-25A-2010-NMS-107	2/293	LLK-1180-003 (receiver)	2/203	LRR-C23PA-NMS-302	2/211
DTL-C23PB-TMS-139-501	2/283	LLK-1181L-000	2/206	LRR-C23PA-NMS-404	2/211
DTL-C55PA-TMS-119-502	2/285	LLK-1181L-001 (receiver)	2/206	LRR-C23PA-NMS-603	2/211
DTL-C55PA-TMS-119-503	2/285	LLK-1181L-003 (receiver)	2/206	LRR-C23PA-NMS-60D	2/211
DTL-C55PA-TMS-407-505	2/285	LLR-C12PA-NMK-300	2/241	LRR-M18PA-NMS-101	2/197
DTR-C23PB-TLS-129	2/283	LLR-C12PA-NMK-302 (receiver)	2/241	LRR-M18PA-NMS-10B	2/197
DTR-C23PB-TLS-139	2/283	LLR-C12PA-NMK-304 (receiver)	2/241	LRR-M18PA-NMS-302	2/197
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LHK-3131-303	2/214	LLR-M18PA-NMS-302	2/197	LRS-3030-101	2/218
LHL-C55PA-TMS-107-501	2/225	LLR-M18PA-NMS-400	2/197	LRS-3030-103	2/218
LHR-C12PA-NMK-301	2/240	LLR-M18PA-NMS-404	2/197	LRS-3031-302	2/217
LHR-C12PA-NMK-303	2/240	LLR-M18PA-NMS-603	2/197	LRS-3031-304	2/217
LHR-C12PA-NSK-301	2/239	LLR-M18PA-NMS-60D	2/197	LRS-4150-101	2/222
LHR-C12PA-NSK-303	2/239	LLS-1040-200	2/231	LRS-4150-103	2/222
LHR-C12PA-PLK-301	2/239	LLS-1040-202 (receiver)	2/231	LTK-0507-301-501	2/237
LHR-C12PA-PLK-303	2/239	LLS-1040-204 (receiver)	2/231	LTK-0507-301	2/237
LHR-C23PA-PMS-101	2/209	LLS-1050-200	2/235	LTK-0507-303-501	2/237
LHR-C23PA-PMS-10A	2/209	LLS-1050-202 (receiver)	2/235	LTK-0507-303-502	2/237
LHR-C23PA-PMS-301	2/209	LLS-1050-204 (receiver)	2/235	LTK-0507-303	2/237
LHR-C23PA-PMS-403	2/209	LLS-1120-200 (emitter)	2/192	LTK-1040-301-505	2/229
LHR-C23PA-PMS-603	2/209	LLS-1120-202 (receiver)	2/192	LTK-1040-301-506	2/230
LHR-C23PA-PMS-60C	2/209	LLS-1120-204 (receiver)	2/192	LTK-1040-301	2/231
LHR-C23PA-TMS-101	2/209	LLS-1121L-200 (emitter)	2/193	LTK-1040-303-505	2/229
LHR-C23PA-TMS-10A	2/209	LLS-1121L-202 (receiver)	2/193	LTK-1040-303-506	2/230
LHR-C23PA-TMS-301	2/209	LLS-1121L-204 (receiver)	2/193	LTK-1040-303	2/231
LHR-C23PA-TMS-403	2/209	LLS-1180-000	2/204	LTK-1050-301-505	2/232
LHR-C23PA-TMS-603	2/209	LLS-1180-001 (receiver)	2/204	LTK-1050-301-506	2/233
LHR-C23PA-TMS-60C	2/209	LLS-1180-003 (receiver)	2/204	LTK-1050-301	2/234
LHR-M18PA-PMS-101	2/195	LLS-1180W-000	2/204	LTK-1050-303-505	2/232
LHR-M18PA-PMS-10A	2/195	LLS-1180W-001 (receiver)	2/204	LTK-1050-303-506	2/233
LHR-M18PA-PMS-301	2/195	LLS-1180W-003 (receiver)	2/204	LTK-1050-303	2/234
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LHR-M18PA-PMS-603	2/195	LLS-1181L-001 (receiver)	2/206	LTK-1120-303	2/191
LHR-M18PA-PMS-60C	2/195	LLS-1181L-003 (receiver)	2/206	LTK-1180-101	2/200
LHR-M18PA-TMS-101	2/195	LLS-3030-000	2/219	LTK-1180-103	2/200
LHR-M18PA-TMS-10A	2/195	LLS-3030-003 (receiver)	2/219	LTK-3030-101	2/216
LHR-M18PA-TMS-301	2/195	LLS-3031-200	2/219	LTK-3030-103	2/216
LHR-M18PA-TMS-403	2/195	LLS-3031-202 (receiver)	2/219	LTK-3031-301	2/215
LHR-M18PA-TMS-603	2/195	LLS-3031-204 (receiver)	2/219	LTK-3031-303	2/215
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LTR-C23PA-PMS-403	2/210	TRU-C23PA-TMK-10B	2/245
LTR-C23PA-PMS-603	2/210	TRU-C23PA-TMK-603	2/245
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LTR-M18PA-NMS-403	2/196	TRU-C23PA-TMS-101	2/245
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LTR-M18PA-PMS-603	2/196		
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LTS-1180L-101-516	2/205		
LTS-1180L-101	2/205		
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LTS-1180W-101	2/201		
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