Photoelectric Sensor Section

CONTRINEX

HIGHLIGHTS:

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

- ✓ NEW... Color Contrast sensor with IO-Link
- ✓ NEW... Miniature C23 Series with IO-Link
- ✓ NEW... Distance measurement sensors
- ✓ NEW... Sub-miniature C12 sensors

A Swiss Company

CONTRINEX USA

Contrinex is a leading manufacturer of sensors for factory automation. With a North American distribution center near Dallas Texas, this Swiss-founded company has a unique and innovative range of products whose features far surpass those of standard sensors.

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

At a glance

- Technology leading manufacturer of inductive and photoelectric sensors as well as safety and RFID systems
- World market leader for miniature sensors, sensors with long operating distances and devices for particularly demanding operating conditions (all-metal, high-pressure and high-temperature resistant sensors)
- Represented in over 60 countries worldwide, headquarters in Switzerland
- 8000 products
- Programmable IO-Link Sensors for the 4th Industrial Revolution utilize our intelligent ASIC.

CONTRINEX - SENSE MORE, DO MORE

MARKET-LEADING INNOVATION

1979 Sensor business starts with self-contained subminiature inductive sensors: Ø4 mm (instead of M8 before)

1982 Launch of inductive sensor with patented Condist® technology – market leadership with operating distances 3x standard

1986 Launch of Ø3 mm inductive sensors, now market leader for subminiature inductive sensors

1996 Market launch of Ø4 mm subminiature photoelectric sensors

1999 Launch of world's first inductive sensor with full-metal housing – thanks to patented Condet® technology

2005 Integration of Contrinex's excellent performance for inductive sensors in CMOS-ASIC (Application-Specific Integrated Circuit), a proprietary development

2007 Launch of RFID products for closed loop industrial applications. First RFID product range with tags and readers in full-metal housing

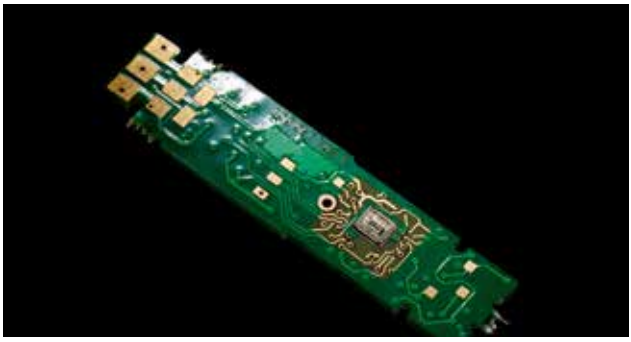
2008 Launch of Safetinex®, the industrial safety product range

2009 The smart sensor is born. Launch of next generation ASIC, a "system on a chip", including IO-Link interface

2011 Development starts on Contrinex's first ASIC for photoelectric sensors

2014 Launch of photoelectric sensor with new generation Contrinex ASIC and IO-Link

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



ASIC sensor technology

Safety product range

Subminiature photoelectric sensor

SENSORS

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

PHOTOELECTRIC
CYLINDRICAL SUBMINIATURE
CYLINDRICAL MINIATURE
CYLINDRICAL SMALL
CUBIC SUBMINIATURE
CUBIC MINIATURE
CUBIC SMALL
CUBIC COMPACT
FIBER-OPTICS

ULTRASONIC
MINIATURE
SMALL
COMPACT

CAPACITIVE
BASIC
HIGH PERFORMANCE

SAFETY

LIGHT CURTAINS
FINGER PROTECTION type 4
HAND PROTECTION type 4
SAFETY RELAYS
ACCESS CONTROL type 4
PROCESS CONTROL type 2

RFID

LOW AND HIGH FREQUENCY
TRANSPONDERS
CONTRINET
USB READ/WRITE MODULES
HANDHELD DEVICES
ACCESSORIES
SOFTWARE
STARTER KITS

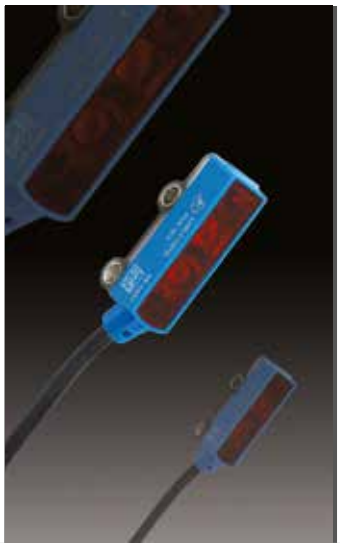
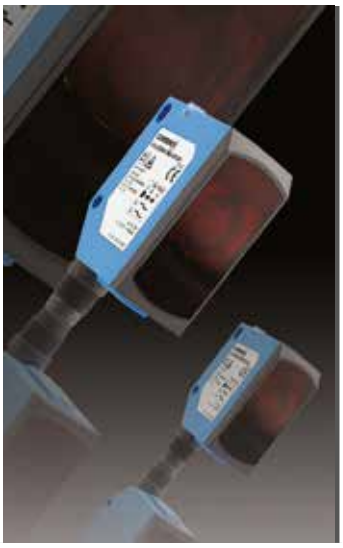
PROGRAM OVERVIEW

PRODUCT RANGE	SUBMINIATURE	MINIATURE	SMALL	
				

CYLINDRICAL

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

* Optical amplifiers are presented in the optical fiber section

	SUBMINIATURE	MINIATURE	SMALL	COMPACT
				

CUBIC

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

PROGRAM OVERVIEW

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

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

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.

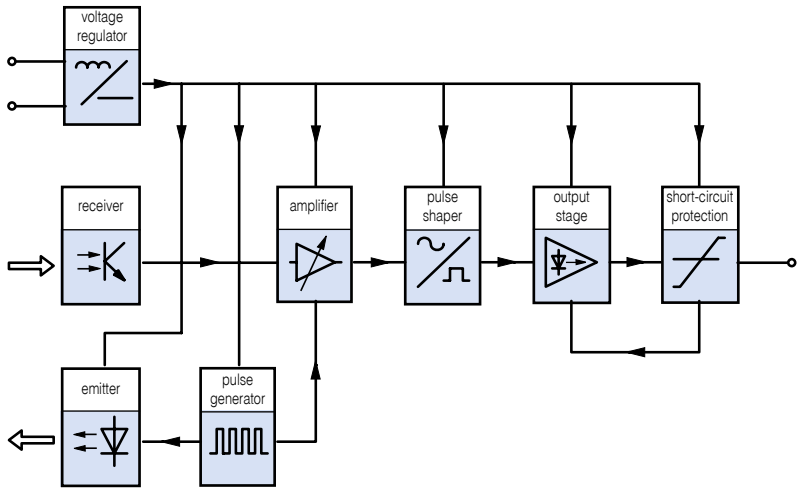


Fig. 9: Functional blocks of a photoelectric sensor

TECHNOLOGY FAMILIES

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

DIFFUSE

Versatile and cost-effective

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

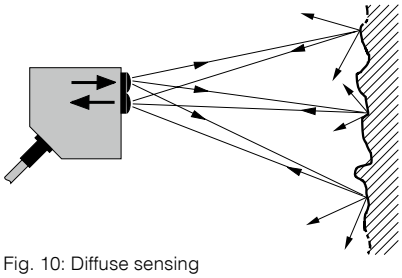


Fig. 10: Diffuse sensing

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.

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.

RETRO REFLECTIVE

Long sensing range in a single-housing device

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

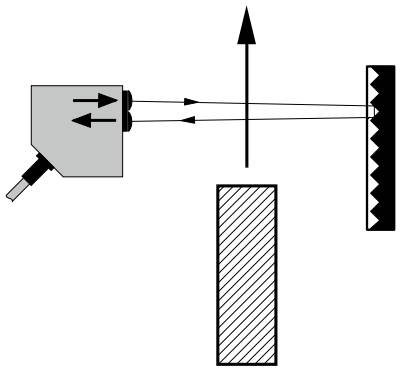


Fig. 11: Reflex sensing

receiver detects the reduced light intensity and triggers the sensor.

The relatively high level of reflected light allows retro-reflective 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 mm

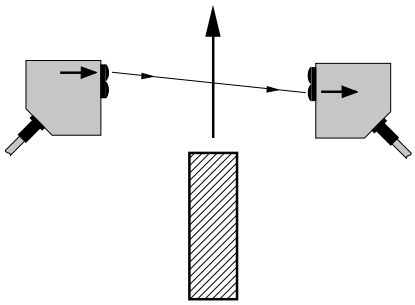


Fig. 12: Through-beam sensing

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 (Ø 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.

DISTANCE

Ultra-precise distance measurement and detection of very large distances

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

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

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

CONTRAST

The best contrast resolution for optimum print-mark detection

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

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

COLOR

Reliable detection of fine color variations, even in harsh environments

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

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

OPTICAL AMPLIFIER

Reliable short and long-range sensing

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

printed circuit board production.

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

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

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

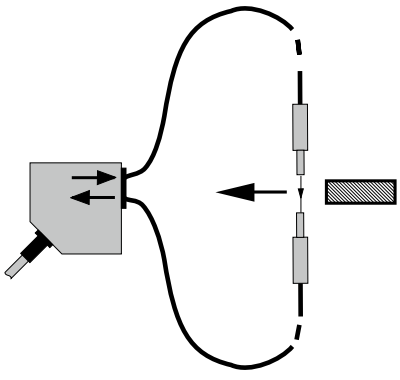


Fig. 13: Optical fiber, through-beam sensing

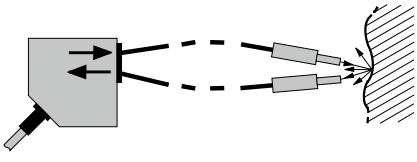


Fig. 14 Optical fiber, diffuse sensing

PRODUCT RANGES

SUBMINIATURE

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

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

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

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

MINIATURE

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

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

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

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

The C23 distance measurement sensor (20 mm x 34 mm x 12 mm) uses triangulation technology to offer precise measurement in an IP 69K rated, cubic housing. Distance measurement is also possible by utilizing the analog voltage outputs available on other cubic models.

Contrinex M12 photoelectric sensors are ideal for high-speed applications in the most challenging environments, with the 1121L capable of detecting even the smallest targets. This laser through-beam sensor is suitable for extended sensing ranges up to 50 meters and has a 1000 Hz maximum switching frequency.

SMALL

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

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

Cubic (40 mm x 40/50 mm) models are suitable for industrial applications including packaging and wrapping machinery, filling systems and general automated equipment. Available in diffuse (energetic or background-suppression), polarized and non-polarized reflex or through-beam technologies with glass or coated-plastic windows, they are insensitive to high levels of ambient light. Best-in-class background suppression allows ultra-reliable target detection, even against light backgrounds. All models feature LED indication of signal degradation if the sensing face is obscured or becomes contaminated, eliminating the risk of errors or lost production. Mounted in a robust, industry-standard 40 mm x 50 mm x 15 mm housing, these sensors are Ecolab approved and rated to IP 67.

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

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

COMPACT

Cubic (50 mm x 50 mm)

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

IO-LINK FUNCTIONALITY* WITH PHOTOELECTRIC SENSORS

Data monitoring:

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

Diagnosis:

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

Sensitivity and teach:

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

Light-on/Dark-on selection:

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

Switching timer:

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

Sensor mode:

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

Sequence selection:

7 For cross-talk immunity with through-beam sensors, up to 10 different emitting sequences can be selected to pair the emitter with the receiver.

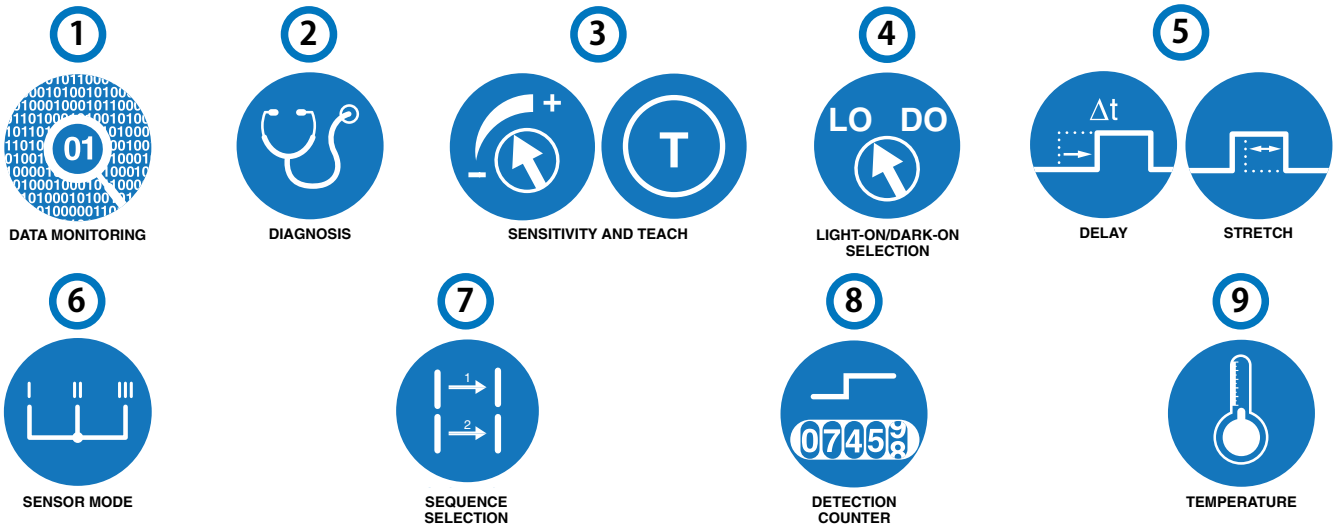
Detection counter:

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




NTRIM
040-30
NTRIM
040-30
NTRIM
040-30

THE SMALLEST ON THE MARKET

CYLINDRICAL SUBMINIATURE

PHOTOELECTRIC SENSORS

KEY ADVANTAGES

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

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

OVERVIEW

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

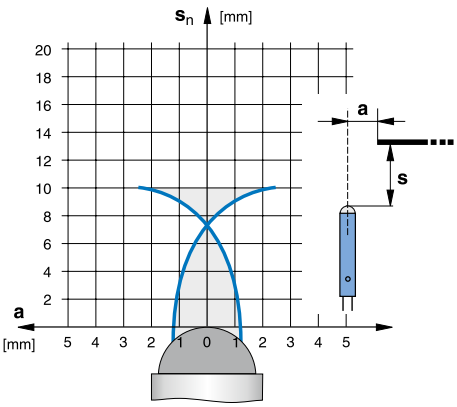
WIRING DIAGRAM

PNP/NPN Light-ON / Dark-ON

Ø 4

DIFFUSE SENSOR

10

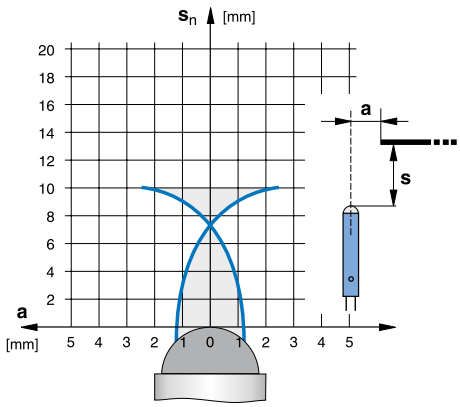


100 x 100 mm white
≤ 15 mA
Sapphire glass
LTK-1040-303-505
LTK-1040-301-505

Ø 4

DIFFUSE SENSOR

10

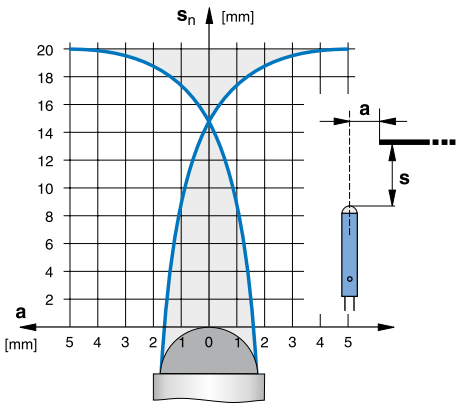


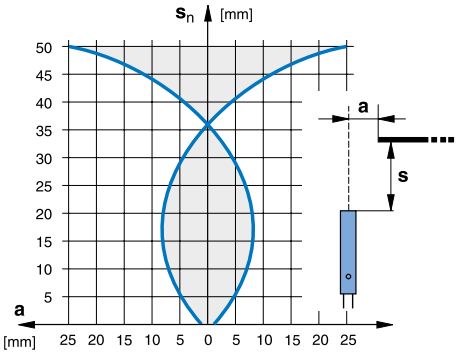
100 x 100 mm white
≤ 15 mA
Sapphire glass
LTS-1040-303-505
LTS-1040-301-505

CYLINDRICAL SUBMINIATURE

PHOTOELECTRIC

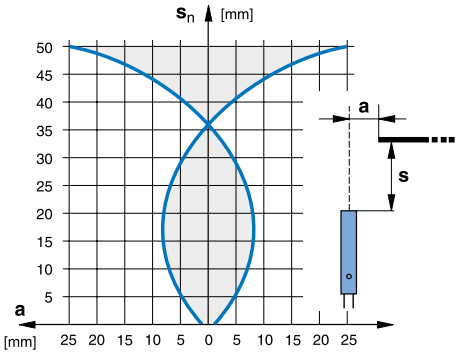
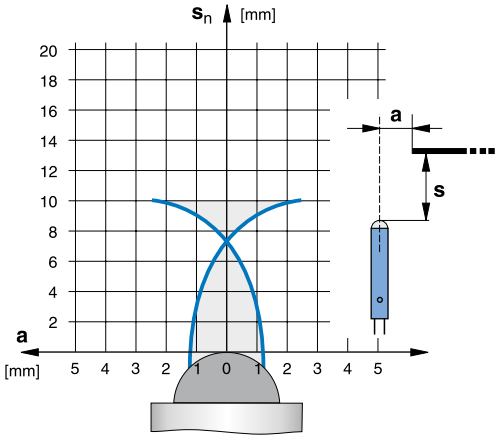
HOUSING SIZE MM	Ø 4	Ø 4
OPERATING PRINCIPLE	DIFFUSE SENSOR	DIFFUSE SENSOR
SENSING RANGE MM	20	50





DATA		
Standard target	100 x 100 mm white	100 x 100 mm white
No-load supply current	≤ 15 mA	≤ 15 mA
Lens material	Sapphire glass	Glass
PNP Light-ON	**LTK-1040-303-506**	**LTK-1040-303**
NPN Light-ON	**LTK-1040-301-506**	**LTK-1040-301**
Other types available		

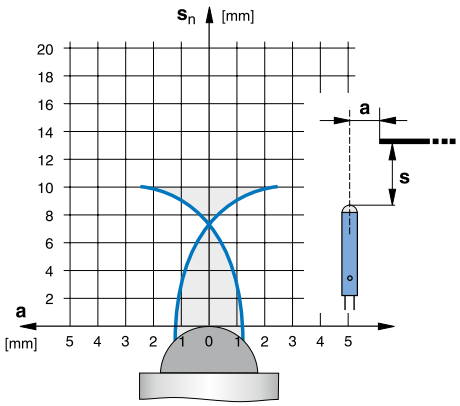
CYLINDRICAL SUBMINIATURE

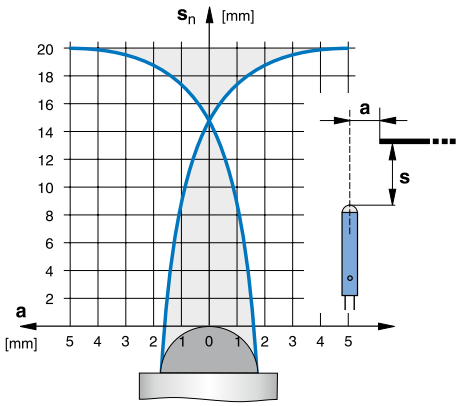
Ø 4	M5
DIFFUSE SENSOR	**DIFFUSE SENSOR**
50	**10**
	
	
100 x 100 mm white	100 x 100 mm white
≤ 15 mA	≤ 15 mA
Glass	Sapphire glass
LTS-1040-303	**LTK-1050-303-505**
LTS-1040-301	**LTK-1050-301-505**
	PNP Dark-ON

CYLINDRICAL SUBMINIATURE

PHOTOELECTRIC

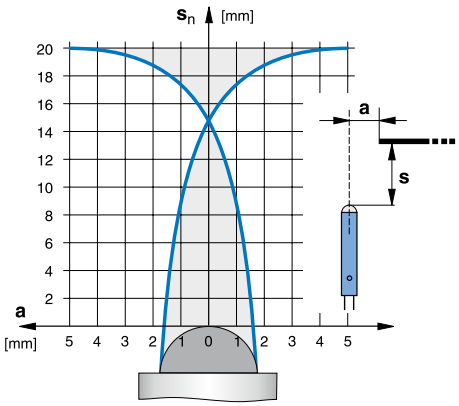
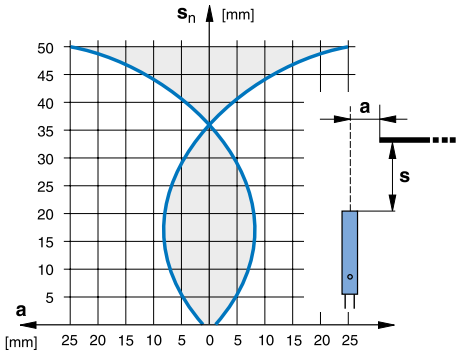
HOUSING SIZE	M5	M5
OPERATING PRINCIPLE	DIFFUSE SENSOR	DIFFUSE SENSOR
SENSING RANGE MM	10	20





DATA		
Standard target	100 x 100 mm white	100 x 100 mm white
No-load supply current	≤ 15 mA	≤ 15 mA
Lens material	Sapphire glass	Sapphire glass
PNP Light-ON	**LTS-1050-303-505**	**LTK-1050-303-506**
NPN Light-ON	**LTS-1050-301-505**	**LTK-1050-301-506**
Other types available	PNP Dark-ON	

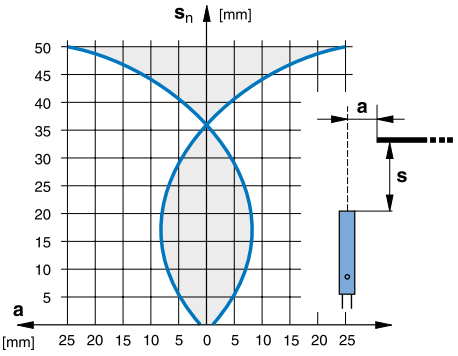
CYLINDRICAL SUBMINIATURE

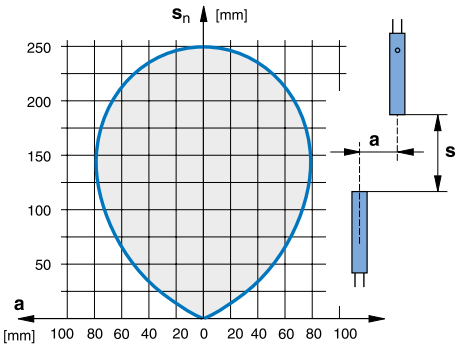
M5	M5
DIFFUSE SENSOR	**DIFFUSE SENSOR**
20	**50**
	
	
100 x 100 mm white	100 x 100 mm white
≤ 15 mA	≤ 15 mA
Sapphire glass	Glass
LTS-1050-303-506	**LTK-1050-303**
LTS-1050-301-506	**LTK-1050-301**

CYLINDRICAL SUBMINIATURE

PHOTOELECTRIC

HOUSING SIZE	M5	M5
OPERATING PRINCIPLE	DIFFUSE SENSOR	THROUGH-BEAM SENSOR
SENSING RANGE MM	50	250





DATA		
Standard target	100 x 100 mm white	-
No-load supply current	≤ 15 mA	≤ 5 mA (receiver) / ≤ 10 mA (emitter)
Lens material	Glass	Glass
PNP Light-ON / Emitter	**LTS-1050-303**	**LLS-1050-200 (emitter)**
PNP Dark-ON		**LLS-1050-204 (receiver)**
Other types available	NPN Light-ON	NPN Dark-ON


CONTRINEX

M12 STANDARD SIZE FOR MULTIPLE USES

CYLINDRICAL MINIATURE

PHOTOELECTRIC SENSORS

KEY ADVANTAGES

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

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

OVERVIEW

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

WIRING DIAGRAM

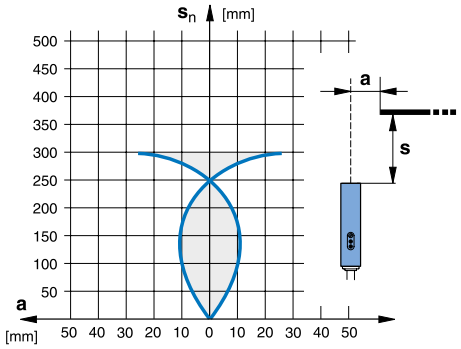
PNP / NPN Light-ON / Dark-ON / Emitter

CYLINDRICAL MINIATURE

M12

DIFFUSE SENSOR

300

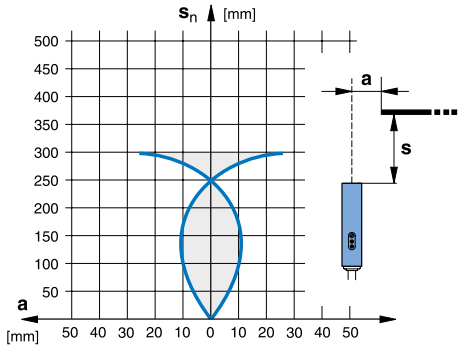


100 x 100 mm white
≤ 15 mA
LED red 660 nm
Potentiometer
LTK-1120-303
LTK-1120-301

M12

DIFFUSE SENSOR

300

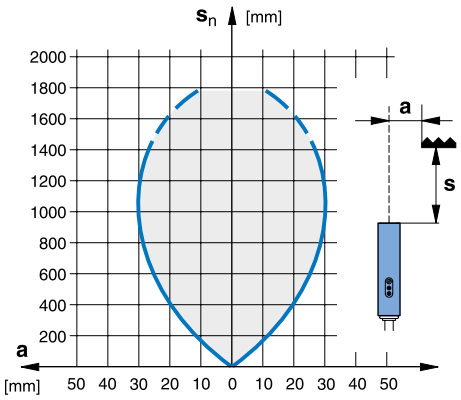


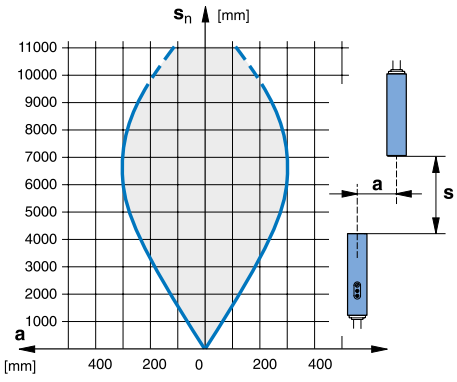
100 x 100 mm white
≤ 15 mA
LED red 660 nm
Potentiometer
LTS-1120-303
LTS-1120-301

CYLINDRICAL MINIATURE

PHOTOELECTRIC

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



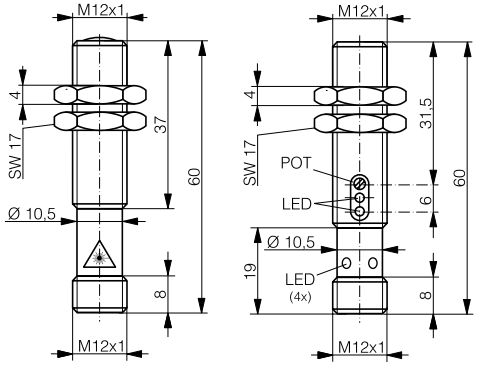


DATA		
Standard target / Reflector type	LXR-0000-084 (see page 247)	-
No-load supply current	≤ 15 mA	≤ 15 mA
Emitter	LED red polarized 660 nm	LED red 660 nm
Setup	-	-
Emitter		**LLS-1120-200 (emitter)**
PNP Dark-ON	**LRS-1120-304**	**LLS-1120-204 (receiver)**
Other types available	NPN Dark-ON, cable version	NPN Dark-ON, cable version

M12 LASER

THROUGH-BEAM SENSOR

50,000



Emitter Receiver

-	
≤ 10 mA	
Laser red pulsed 660 nm	
-	
LLS-1121L-200 (emitter)	
LLS-1121L-204 (receiver)	
NPN Dark-ON, cable version	


CONTRINEX

CYLINDRICAL SMALL

PHOTOELECTRIC SENSORS

KEY ADVANTAGES

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

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

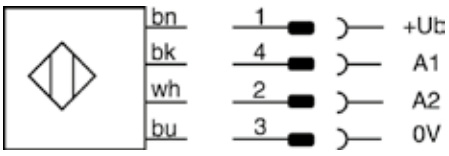
OVERVIEW

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

WIRING DIAGRAMS

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

PNP/NPN Changeover

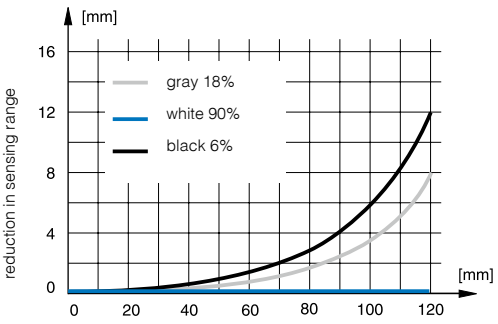


CYLINDRICAL SMALL

M18

DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION

10 ... 120



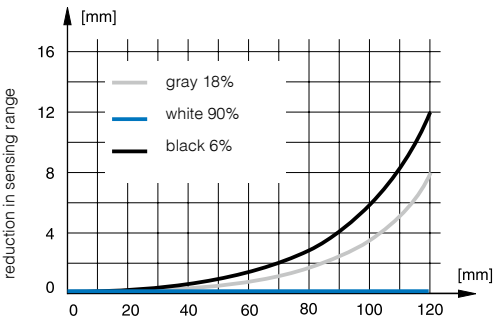
sensing range on white paper (90%)

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

M18

DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION

10 ... 120



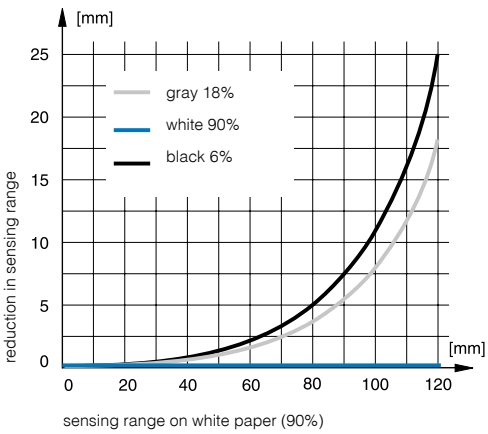
sensing range on white paper (90%)

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

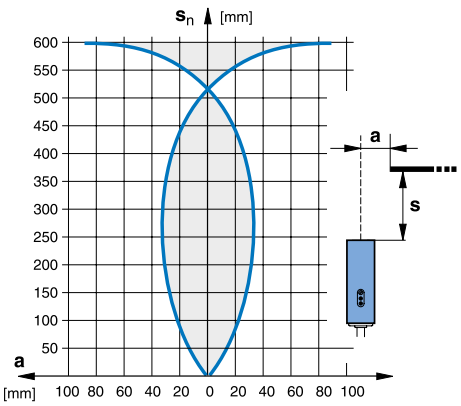
CYLINDRICAL SMALL

PHOTOELECTRIC

HOUSING SIZE	M18W	M18
OPERATING PRINCIPLE	DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION	DIFFUSE SENSOR
SENSING RANGE MM	10 ... 120	40 ... 600



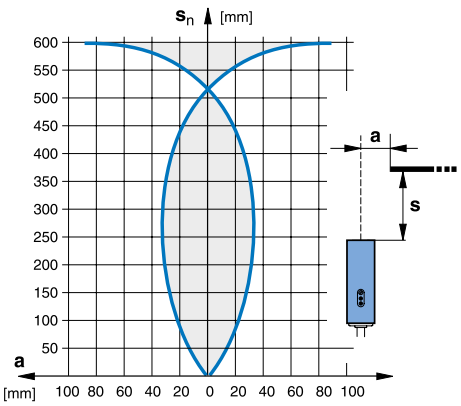
sensing range on white paper (90%)

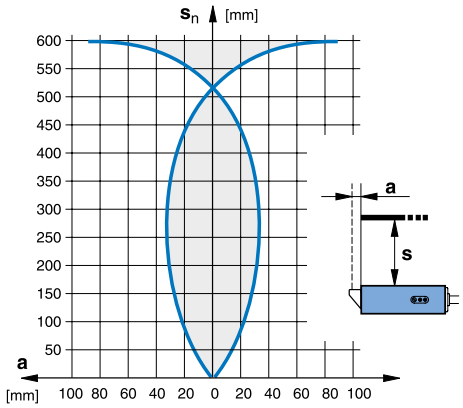


DATA		
Standard target	100 x 100 mm white	200 x 200 mm white
No-load supply current	≤ 25 mA	≤ 20 mA
Emitter	LED red 680 nm	LED red 630 nm
Setup	Potentiometer	Potentiometer
PNP Light-ON	**LHS-1180W-303**	**LTK-1180-303**
PNP Changeover		**LTK-1180-103**
NPN Changeover		**LTK-1180-101**
Other types available	NPN Light-ON, cable version	NPN Light-ON

CYLINDRICAL SMALL

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



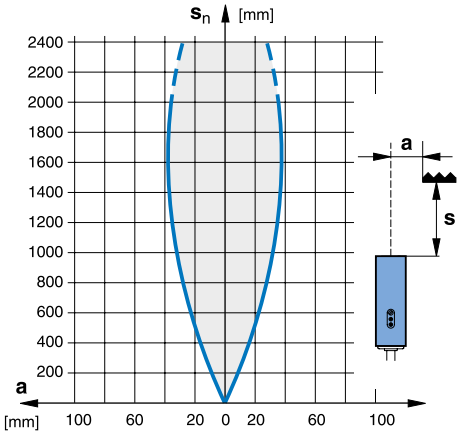


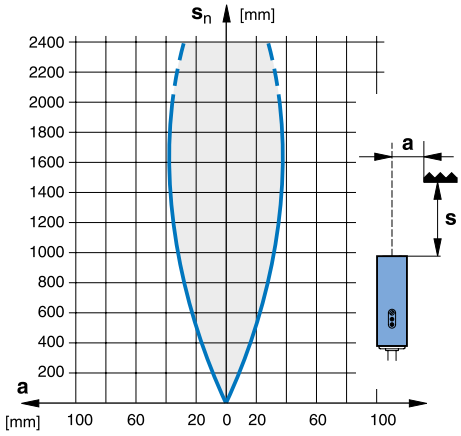
200 x 200 mm white	200 x 200 mm white
≤ 20 mA	≤ 20 mA
LED red 630 nm	LED red 630 nm
Potentiometer	Potentiometer
LTS-1180-303	**LTS-1180W-303**
LTS-1180-103	**LTS-1180W-103**
LTS-1180-101	**LTS-1180W-101**
NPN Light-ON	NPN Light-ON, cable version

CYLINDRICAL SMALL

PHOTOELECTRIC

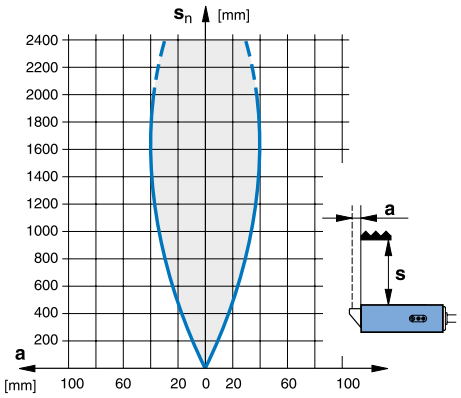
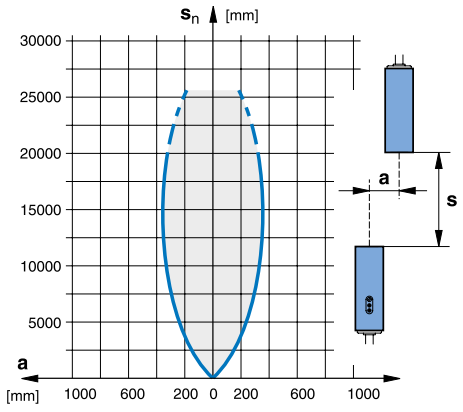
HOUSING SIZE	M18	M18
OPERATING PRINCIPLE	REFLEX SENSOR	REFLEX SENSOR
SENSING RANGE MM	2000	2000





DATA		
Standard target / Reflector type	LXR-0000-084 (see page 247)	LXR-0000-084 (see page 247)
No-load supply current	≤ 15 mA	≤ 15 mA
Emitter	LED red polarized 660 nm	LED red polarized 660 nm
Setup	-	-
PNP Dark-ON	**LRK-1180-304**	**LRS-1180-304**
Emitter		
PNP Changeover		
NPN Changeover		
Other types available	NPN Dark-ON	NPN Dark-ON

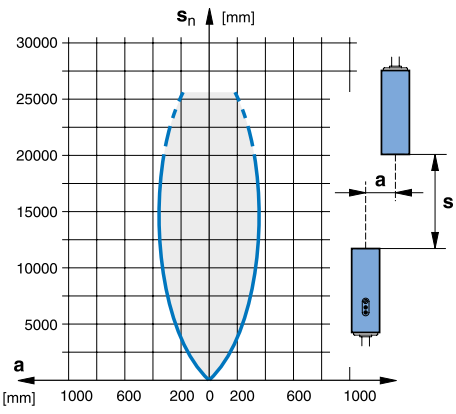
CYLINDRICAL SMALL

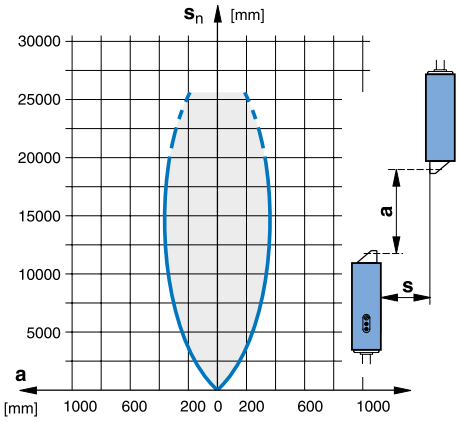
M18W	M18
REFLEX SENSOR	**THROUGH-BEAM SENSOR**
2000	**20,000**
	
	
LXR-0000-084 (see page 247)	-
≤ 15 mA	≤ 10 mA (receiver) / ≤ 15 mA (emitter)
LED red polarized 660 nm	LED red 660 nm
-	-
LRS-1180W-304	
	LLK-1180-000
	LLK-1180-003 (receiver)
	LLK-1180-001 (receiver)
NPN Dark-ON, cable version	

CYLINDRICAL SMALL

PHOTOELECTRIC

HOUSING SIZE	M18	M18W
OPERATING PRINCIPLE	THROUGH-BEAM SENSOR	THROUGH-BEAM SENSOR
SENSING RANGE MM	20,000	20,000





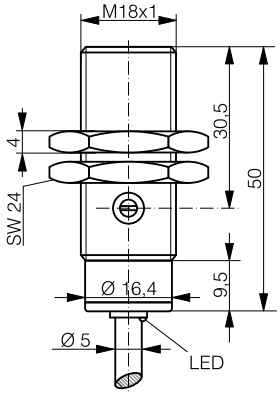
DATA		
Standard target	-	-
No-load supply current	≤ 10 mA (receiver) / ≤ 15 mA (emitter)	≤ 10 mA (receiver) / ≤ 15 mA (emitter)
Emitter	LED red 660 nm	LED red 660 nm
Setup	-	-
Emitter	**LLS-1180-000**	**LLS-1180W-000**
PNP Changeover	**LLS-1180-003 (receiver)**	**LLS-1180W-003 (receiver)**
NPN Changeover	**LLS-1180-001 (receiver)**	**LLS-1180W-001 (receiver)**
Other types available		

CYLINDRICAL SMALL

M18 LASER

DIFFUSE SENSOR

40 ... 250

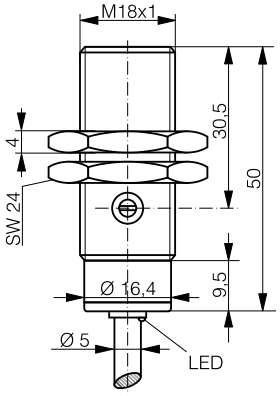


100 x 100 mm white
≤ 20 mA
Laser red pulsed 660 nm
Potentiometer
LTS-1180L-103-516
LTS-1180L-101-516
Cable version

M18 LASER

DIFFUSE SENSOR

60 ... 600

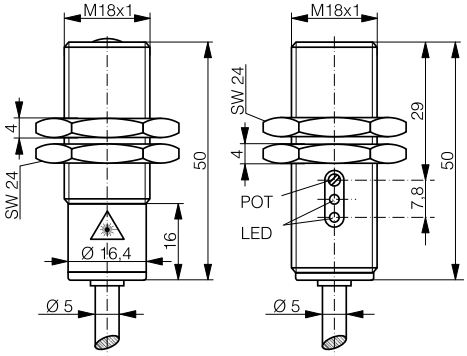


100 x 100 mm white
≤ 20 mA
Laser red pulsed 660 nm
Potentiometer
LTS-1180L-103
LTS-1180L-101
Cable version

CYLINDRICAL SMALL

PHOTOELECTRIC

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



Emitter | Receiver | Emitter | Receiver

DATA		
Standard target	-	-
No-load supply current	≤ 10 mA	≤ 10 mA
Emitter	Laser red pulsed 660 nm	Laser red pulsed 660 nm
Setup	Potentiometer (receiver)	Potentiometer (receiver)
Emitter	**LLK-1181L-000**	**LLS-1181L-000**
PNP Changeover	**LLK-1181L-003 (receiver)**	**LLS-1181L-003 (receiver)**
NPN Changeover	**LLK-1181L-001 (receiver)**	**LLS-1181L-001 (receiver)**
Other types available		


LHR-C-12PA-
PLK-303
LHR-C-12PA-
PLK-303

SAVE SPACE, KEEP PERFORMANCE

CUBIC SUBMINIATURE

PHOTOELECTRIC SENSORS

KEY ADVANTAGES

C12 series

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

0507 series

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

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

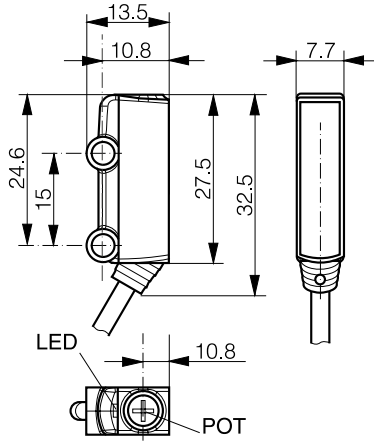
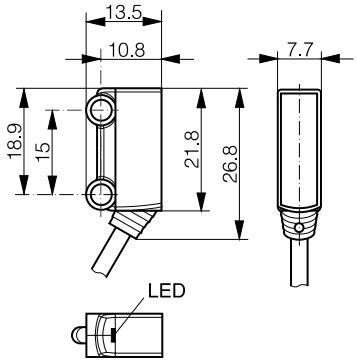
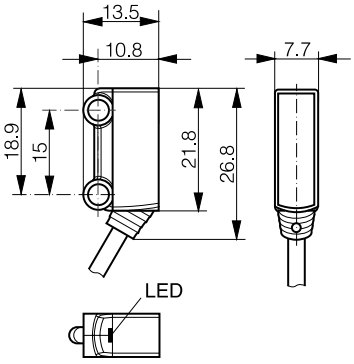
OVERVIEW

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

WIRING DIAGRAM

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

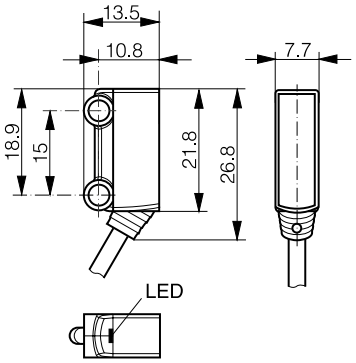
CUBIC SUBMINIATURE

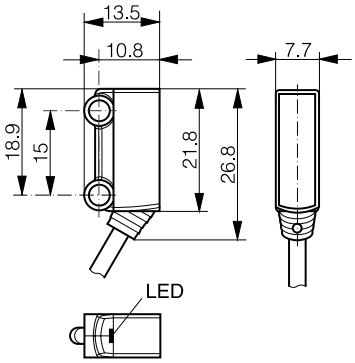
☐ 13 X 27 X 7	☐ 13 X 21 X 7	☐ 13 X 21 X 7
DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION	**DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION**	**DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION**
2 ... 120	**1 ... 15**	**1 ... 30**
		
		
100 x 100 mm white	100 x 100 mm white	100 x 100 mm white
3-turn potentiometer	-	-
≤ 20 mA	≤ 20 mA	≤ 20 mA
LHR-C12PA-PLK-303	**LHR-C12PA-NSK-303**	**LHR-C12PA-NMK-303**
LHR-C12PA-PLK-301	**LHR-C12PA-NSK-301**	**LHR-C12PA-NMK-301**
0.2 m cable + connector M8	0.2 m cable + connector M8	0.2 m cable + connector M8

CUBIC SUBMINIATURE

PHOTOELECTRIC

HOUSING SIZE	☐ 13 X 21 X 7	☐ 13 X 21 X 7
OPERATING PRINCIPLE	REFLEX SENSOR	THROUGH-BEAM SENSOR
SENSING RANGE MM	3000	2000





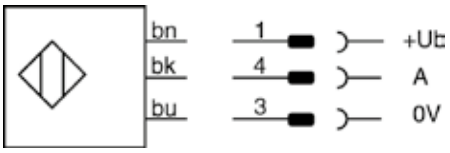
DATA		
Standard target	LXR-0001-064 (see page 249)	-
Sensitivity adjustment	-	-
No load supply current	≤ 20 mA	≤ 20 mA
Emitter		**LLR-C12PA-NMK-300**
PNP Dark-ON	**LRR-C12PA-NMK-304**	**LLR-C12PA-NMK-304**
NPN Dark-ON	**LRR-C12PA-NMK-302**	**LLR-C12PA-NMK-302**
Other types available	0.2 m cable + connector M8	0.2 m cable + connector M8

OVERVIEW

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

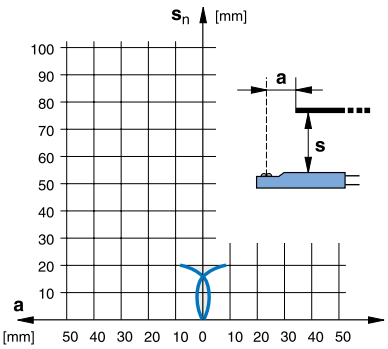
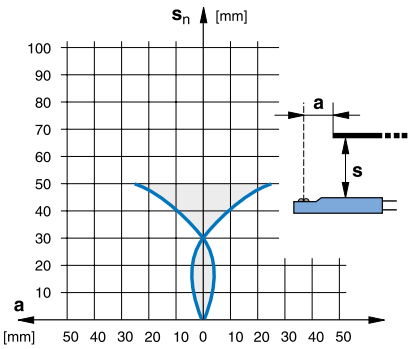
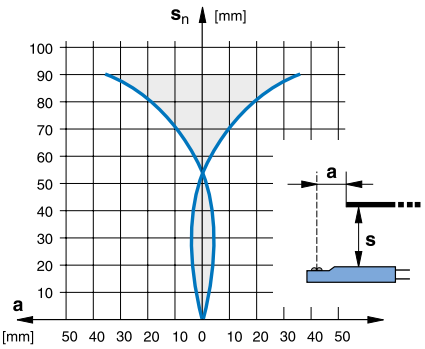
WIRING DIAGRAM

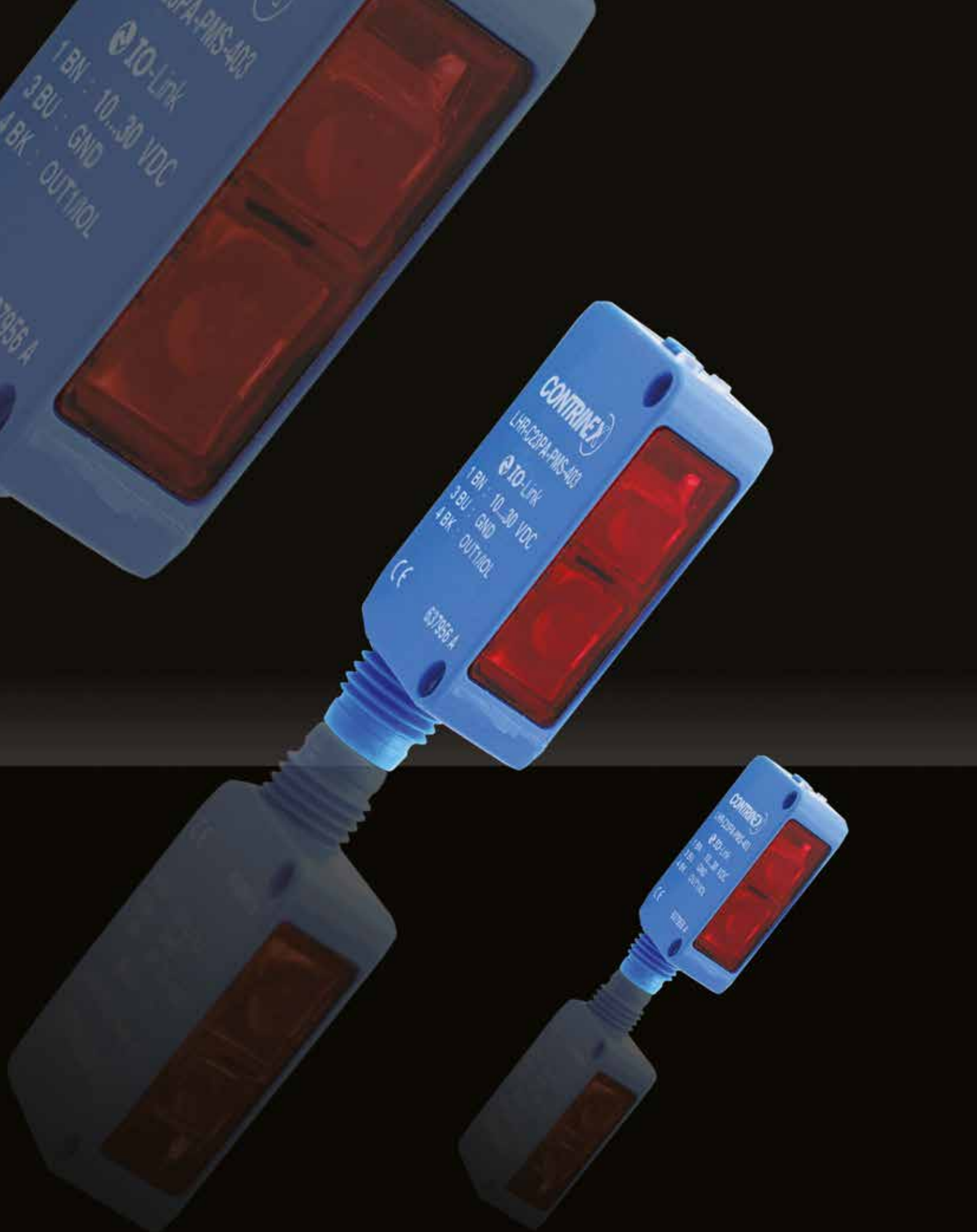
PNP/NPN Light-ON / Dark-ON



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

CUBIC SUBMINIATURE

☐ 5 X 7 X 40	☐ 5 X 7 X 40	☐ 5 X 7 X 40
DIFFUSE SENSOR	**DIFFUSE SENSOR**	**DIFFUSE SENSOR**
20	**50**	**90**
		
		
100 x 100 mm white	100 x 100 mm white	100 x 100 mm white
≤ 15 mA	≤ 15 mA	≤ 15 mA
Sapphire glass	Sapphire glass	Sapphire glass
LTK-0507-303-501	**LTK-0507-303**	**LTK-0507-303-502**
LTK-0507-301-501	**LTK-0507-301**	**LTK-0507-301-502**


CONTRINEX
LHR-C23PA-PMS-403
IO-Link
1 BN - 10...30 VDC
3 BU - GND
4 BK - OUT1/IOL
637956 A

CUBIC MINIATURE

PHOTOELECTRIC SENSORS

KEY ADVANTAGES

C23 series

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

C23 Distance measuring sensors

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

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

OVERVIEW

IO-Link

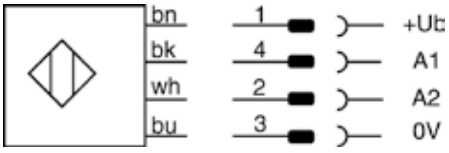
	C23
Housing material	ABS / PMMA
Degree of protection	IP 67
Supply voltage range	10 ... 30 VDC
Ambient temperature range	-25 ... +65 °C / -13 ... +149 °F
Output current (total both outputs)	≤ 100 mA
Output voltage drop	≤ 2 V
Max. ambient light halogen	5000 Lux
Max. ambient light sun	10,000 Lux
Compatible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

PHOTOELECTRIC

WIRING DIAGRAMS

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

PNP/NPN Light-ON / Dark-ON



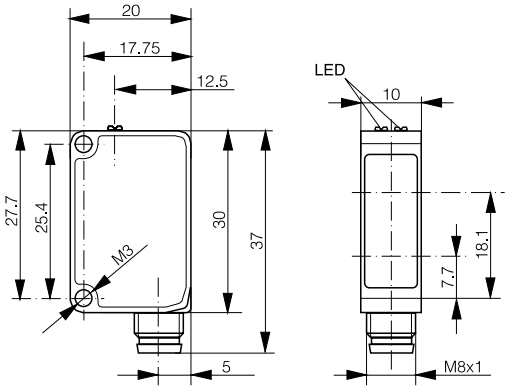
DATA

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

☐ 20 X 30 X 10

DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION

10 ... 300

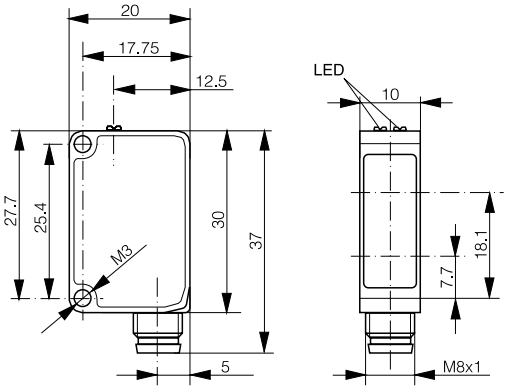


100 x 100 mm white
≤ 30 mA
Red pinpoint LED 640 nm
≤ 1000 Hz
Potentiometer
LHR-C23PA-PMS-403
LHR-C23PA-PMS-603
LHR-C23PA-PMS-60C
LHR-C23PA-PMS-301
LHR-C23PA-PMS-101
LHR-C23PA-PMS-10A
Cable version

☐ 20 X 30 X 10

DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION

10 ... 300

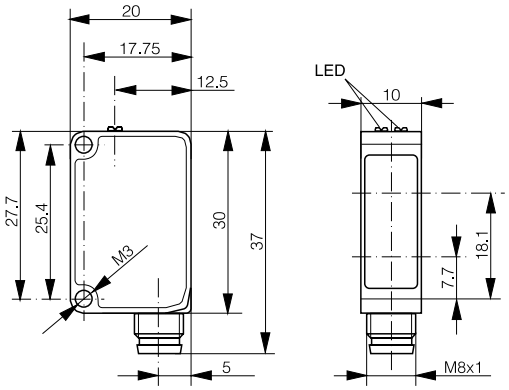


100 x 100 mm white
≤ 30 mA
Red pinpoint LED 640 nm
≤ 1000 Hz
Teach button
LHR-C23PA-TMS-403
LHR-C23PA-TMS-603
LHR-C23PA-TMS-60C
LHR-C23PA-TMS-301
LHR-C23PA-TMS-101
LHR-C23PA-TMS-10A
Cable version

CUBIC MINIATURE

PHOTOELECTRIC

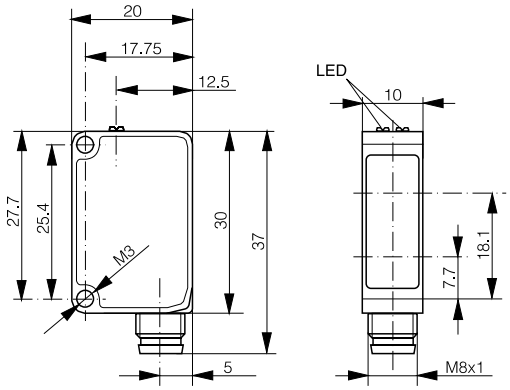
HOUSING SIZE	☐ 20 X 30 X 10	☐ 20 X 30 X 10
OPERATING PRINCIPLE	DIFFUSE SENSOR	DIFFUSE SENSOR
SENSING RANGE MM	1500	1500

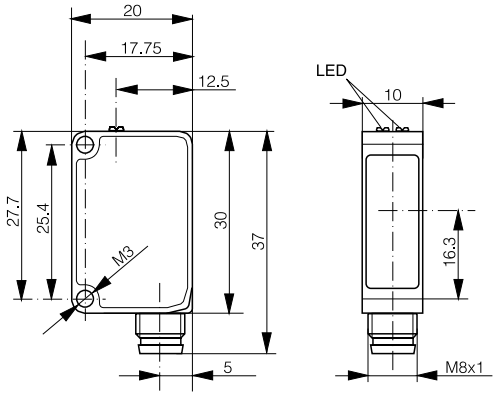


DATA		
Standard target	200 x 200 mm white	200 x 200 mm white
No-load supply current	≤ 15 mA	≤ 15 mA
Light source	Red LED 630 nm	Red LED 630 nm
Switching frequency (normal mode)	≤ 1500 Hz	≤ 1500 Hz
Setup	Potentiometer	IO-Link
Emitter / IO Link		**LTR-C23PA-NMS-403**
PNP Light-ON / IO-Link	**LTR-C23PA-PMS-403**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

CUBIC MINIATURE

☐ 20 X 30 X 10	☐ 20 X 30 X 10
REFLEX SENSOR	**THROUGH-BEAM SENSOR**
8000	**30,000**





LXR-0000-084 (see page 247)	-
≤ 15 mA	≤ 9 mA (receiver) / ≤ 7 mA (emitter)
Red LED 630 nm	Red LED 630 nm
≤ 1500 Hz	≤ 1000 Hz
IO-Link	IO-Link
	LLR-C23PA-NMS-400 (emitter)
LRR-C23PA-NMS-404	**LLR-C23PA-NMS-404**
LRR-C23PA-NMS-603	**LLR-C23PA-NMS-603**
LRR-C23PA-NMS-60D	**LLR-C23PA-NMS-60D**
LRR-C23PA-NMS-302	**LLR-C23PA-NMS-302**
LRR-C23PA-NMS-101	**LLR-C23PA-NMS-101**
LRR-C23PA-NMS-10B	**LLR-C23PA-NMS-10B**
Cable version	Alignment aid, cable version

OVERVIEW

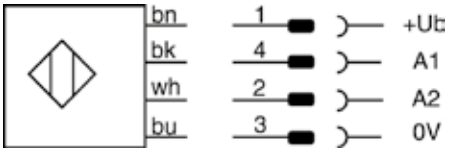
HOUSING SIZE
OPERATING PRINCIPLE
MEASUREMENT RANGE MM

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

PHOTOELECTRIC

WIRING DIAGRAM

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



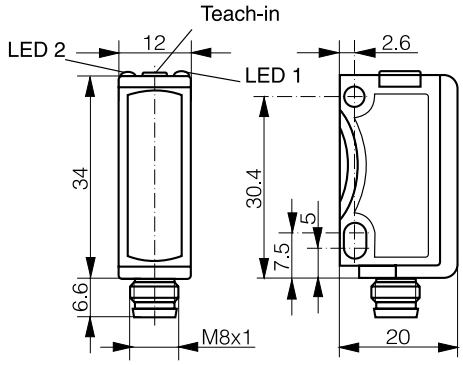
DATA
Light source
Light spot size
Resolution
Linearity
Repeatability
PNP Light/Dark-ON+analog 1...10V
NPN Light/Dark-ON+analog 1...10V
Other types available

CUBIC MINIATURE

☐ 20 X 34 X 12

DISTANCE MEASURING SENSOR

20 ... 80

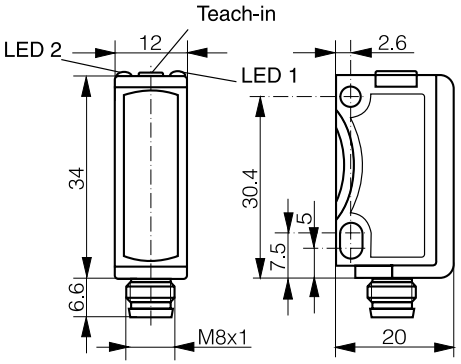


LED red 632 mm
5 mm at 50 mm
0.12 mm
+/- 0.4 mm
≤ 0.4 mm
DTR-C23PB-TMS-139
DTR-C23PB-TMS-129

☐ 20 X 34 X 12

DISTANCE MEASURING SENSOR

30 ... 200



LED red 632 mm
7 mm at 60 mm
0.68 mm
+/- 2 mm
≤ 1 mm
DTR-C23PB-TLS-139
DTR-C23PB-TLS-129

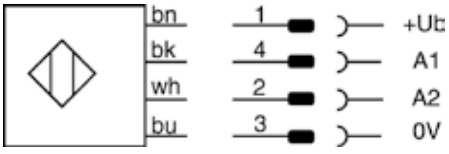
OVERVIEW

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

WIRING DIAGRAMS

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

PNP/NPN Changeover



Analog

PHOTOELECTRIC

HOUSING SIZE MM

OPERATING PRINCIPLE

SENSING RANGE MM

DATA

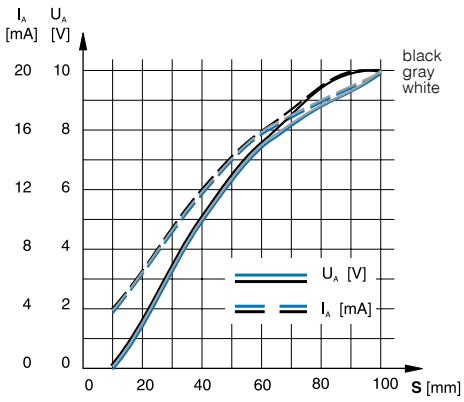
- Standard target
- No-load supply current
- Emitter
- Max. switching frequency
- Switching time
- Analog output
- PNP Changeover
- Other types available

CUBIC MINIATURE

☐ 30 X 30 X 15

WITH ANALOG OUTPUT

10 ... 100

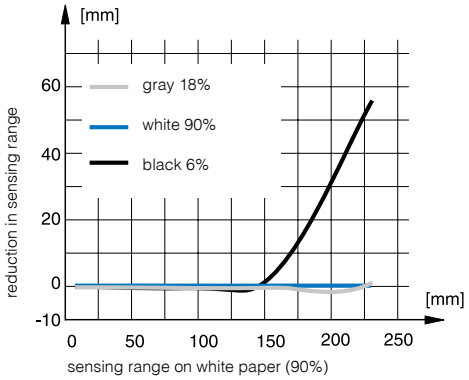


100 x 100 mm white
≤ 25 mA
LED red 660 nm
-
-
LAS-3130-119
Cable version

☐ 30 X 30 X 15

DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION

15 ... 200

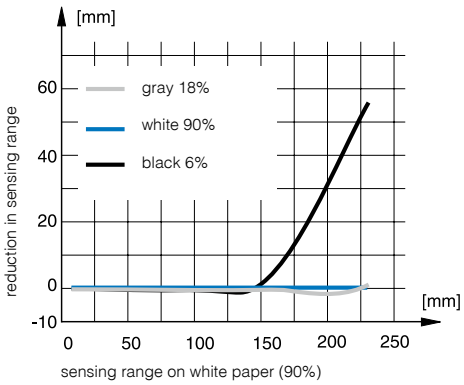


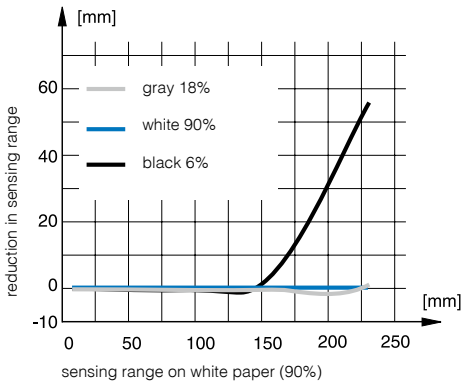
100 x 100 mm white
≤ 25 mA
LED red 660 nm
500 Hz
1 msec
LHS-3130-103
NPN Changeover

CUBIC MINIATURE

PHOTOELECTRIC

HOUSING SIZE MM	☐ 30 X 30 X 15	☐ 30 X 30 X 15
OPERATING PRINCIPLE	DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION	DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION
SENSING RANGE MM	15 ... 200	15 ... 200





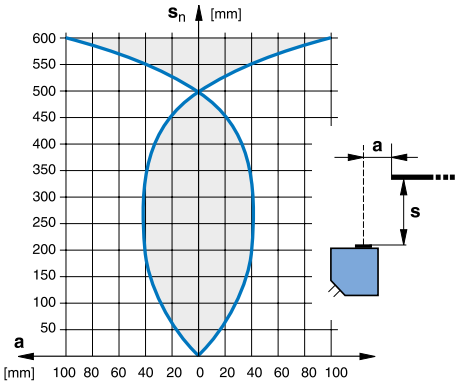
DATA		
Standard target	100 x 100 mm white	100 x 100 mm white
No-load supply current	≤ 25 mA	≤ 25 mA
Emitter	LED red 660 nm	LED red 660 nm
Max. switching frequency	500 Hz	500 Hz
Switching time	1 msec	1 msec
PNP Light-ON	**LHK-3131-303**	**LHS-3131-303**
NPN Light-ON	**LHK-3131-301**	**LHS-3131-301**
Other types available		

CUBIC MINIATURE

☐ 30 X 30 X 15

DIFFUSE SENSOR

600

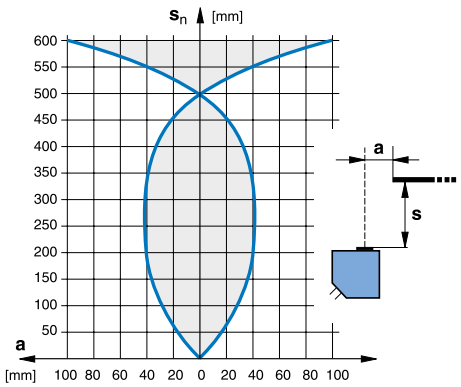


200 x 200 mm white
≤ 15 mA
IR LED 880 nm
1000 Hz
0.5 msec
LTS-3031-303
LTS-3031-301

☐ 30 X 30 X 15

DIFFUSE SENSOR

600

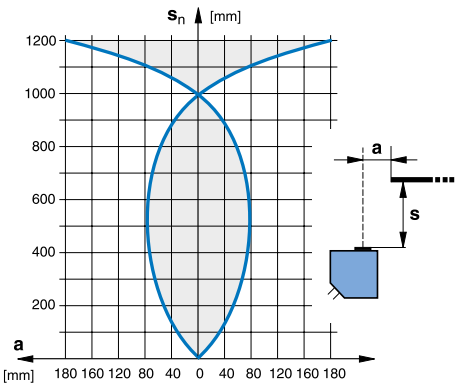


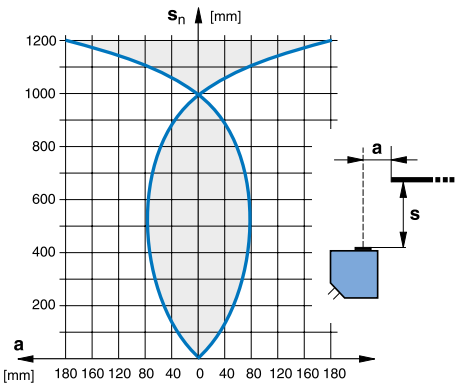
200 x 200 mm white
≤ 15 mA
IR LED 880 nm
1000 Hz
0.5 msec
LTK-3031-303
LTK-3031-301

CUBIC MINIATURE

PHOTOELECTRIC

HOUSING SIZE MM	☐ 30 X 30 X 15	☐ 30 X 30 X 15
OPERATING PRINCIPLE	DIFFUSE SENSOR	DIFFUSE SENSOR
SENSING RANGE MM	1200	1200





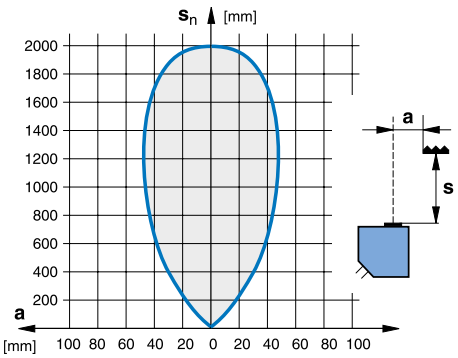
DATA		
Standard target / Reflector type	200 x 200 mm white	200 x 200 mm white
No-load supply current	≤ 20 mA	≤ 20 mA
Emitter	IR LED 880 nm	IR LED 880 nm
Max. switching frequency	1000 Hz	1000 Hz
Switching time	0.5 msec	0.5 msec
PNP Changeover	**LTS-3030-103**	**LTK-3030-103**
NPN Changeover	**LTS-3030-101**	**LTK-3030-101**
PNP Dark-ON		
Other types available		

CUBIC MINIATURE

☐ 30 X 30 X 15

REFLEX SENSOR

2000

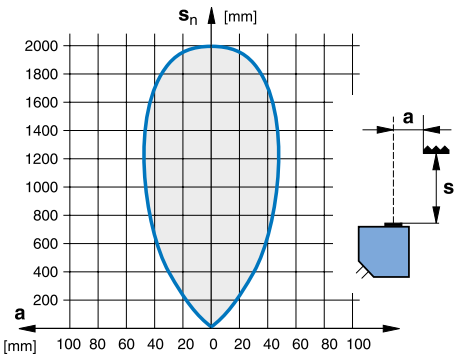


LXR-0000-084 (see page 247)
≤ 15 mA
LED red polarized 660 nm
1000 Hz
0.5 msec
LRS-3031-304
NPN Dark-ON

☐ 30 X 30 X 15

REFLEX SENSOR

2000

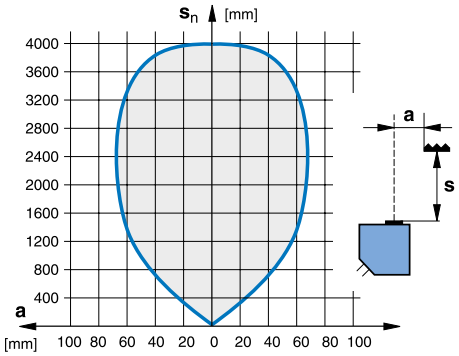


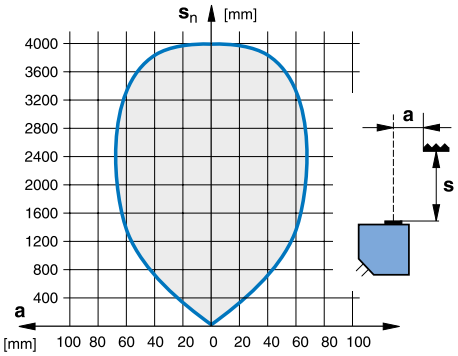
LXR-0000-084 (see page 247)
≤ 15 mA
LED red polarized 660 nm
1000 Hz
0.5 msec
LRK-3031-304
NPN Dark-ON

CUBIC MINIATURE

PHOTOELECTRIC

HOUSING SIZE MM	☐ 30 X 30 X 15	☐ 30 X 30 X 15
OPERATING PRINCIPLE	REFLEX SENSOR	REFLEX SENSOR
SENSING RANGE MM	4000	4000





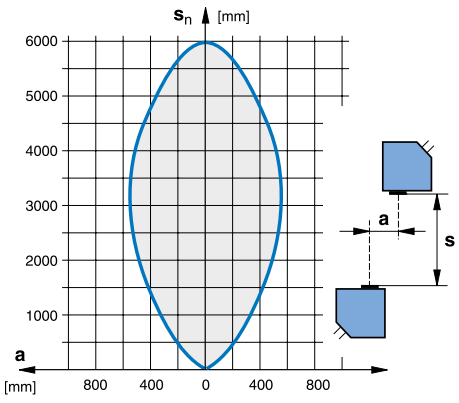
DATA		
Standard target / Reflector type	LXR-0000-084 (see page 247)	LXR-0000-084 (see page 247)
No-load supply current	≤ 20 mA	≤ 20 mA
Emitter	LED red polarized 660 nm	LED red polarized 660 nm
Max. switching frequency	1000 Hz	1000 Hz
Switching time	0.5 msec	0.5 msec
Emitter		
PNP Changeover	**LRS-3030-103**	**LRK-3030-103**
NPN Changeover	**LRS-3030-101**	**LRK-3030-101**
PNP Dark-ON		
Other types available		

CUBIC MINIATURE

☐ 30 X 30 X 15

THROUGH-BEAM SENSOR

6000

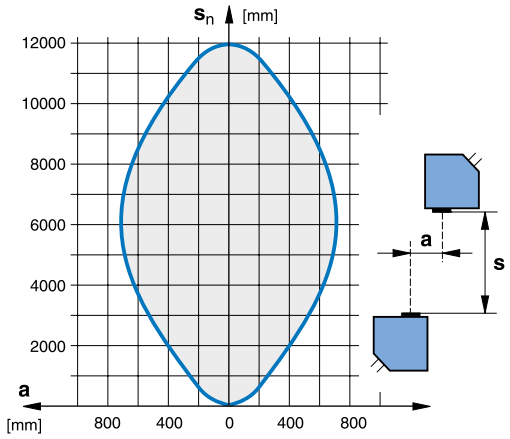


-
≤ 10 mA (receiver) / ≤ 15 mA (emitter)
IR LED 880 nm
1000 Hz
0.5 msec
LLS-3031-200
LLS-3031-204 (receiver)
NPN Dark-ON

☐ 30 X 30 X 15

THROUGH-BEAM SENSOR

12,000



-
≤ 10 mA (receiver) / ≤ 15 mA (emitter)
IR LED 880 nm
1000 Hz
0.5 msec
LLS-3030-000
LLS-3030-003 (receiver)
LLS-3030-001 (receiver)


CONTRINEX
FTS-4055-301
CONTRINEX
FTS-4055-301

EXCELLENT VALUE FOR DEMANDING APPLICATIONS

CUBIC SMALL

PHOTOELECTRIC SENSORS

KEY ADVANTAGES

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

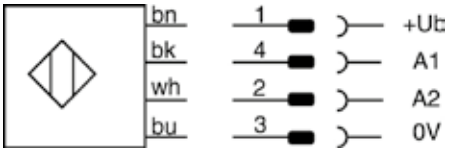
RANGE OVERVIEW	Distance mm	Diffuse	Retro-reflective	Through-beam	Background suppression	Color	Contrast
CUBIC SMALL	12						p. 237
	30 ... 40					p. 237	
	500				p. 233		
	1200	p. 233					
	4000		p. 234				
	50,000			p. 234			

OVERVIEW

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

WIRING DIAGRAMS

PNP/NPN Changeover



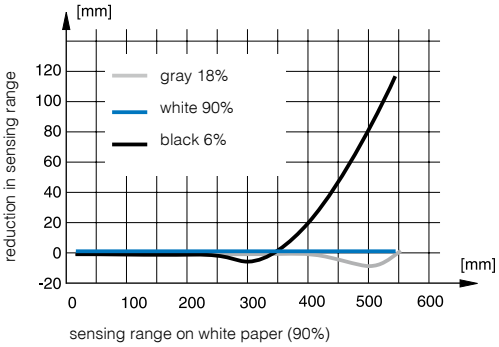
Emitter

CUBIC SMALL

☐ 40 X 50 X 15

DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION

30 ... 500

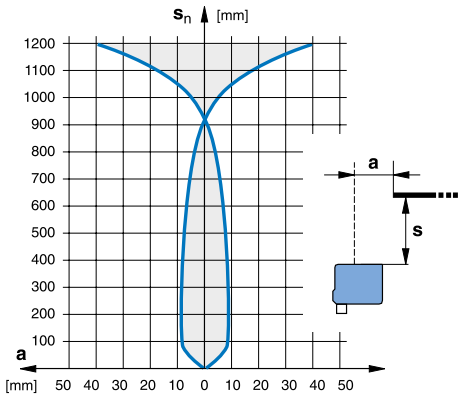


100 x 100 mm white
≤ 30 mA
LED red 630 nm
500 Hz
1 msec
Potentiometer
LHS-4150-103
LHS-4150-101
Cable version

☐ 40 X 50 X 15

DIFFUSE SENSOR

1200



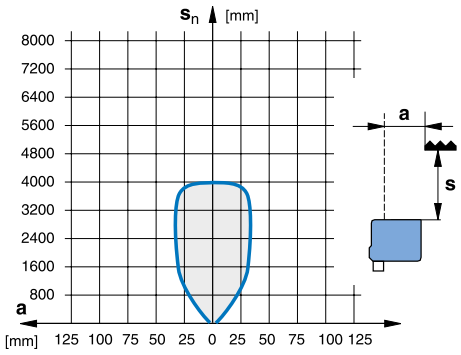
200 x 200 mm white
≤ 25 mA
LED red 630 nm
1500 Hz
0.5 msec
Potentiometer
LTS-4150-103
LTS-4150-101
Cable version

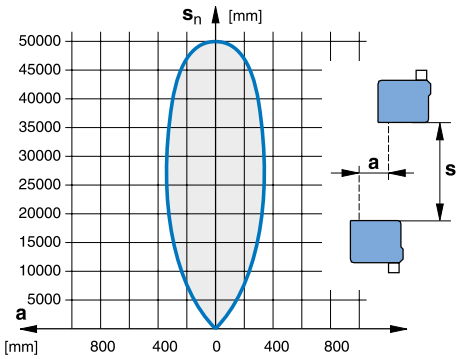
CUBIC SMALL

PHOTOELECTRIC

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

AUTOCOLLIMATION





DATA		
Standard target/Reflector type	LXR-0000-084 (see page 247)	-
No-load supply current	≤ 20 mA	≤ 15 mA
Emitter	LED red polarized 680 nm	LED red 630 nm
Max. switching frequency	1500 Hz	1500 Hz
Switching time	0.5 msec	0.5 msec
Setup	Potentiometer	Potentiometer (receiver)
PNP Changeover	**LRS-4150-103**	**LLS-4150-003 (receiver)**
Emitter		**LLS-4150-000**
Other types available	NPN Changeover, PNP/NPN Light-ON + Excess gain	NPN Changeover, PNP/NPN Light-ON + Excess gain

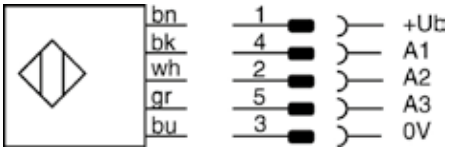
OVERVIEW

IO-Link

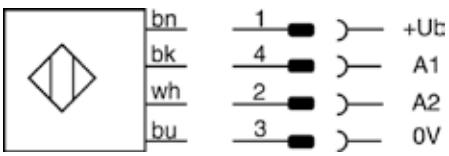
	4050 COLOR	4050 CONTRAST
Housing material	PBTP	PBTP
Average positioning tolerance	± 5 mm (tol. 3)	± 2 mm (min.)
Degree of protection	IP 67	IP 67
Supply voltage range	10 ... 30 VDC	10 ... 30 VDC
Ambient temperature range	-5 ... +55°C / 23 ... +131°F	-5 ... +55°C / 23 ... +131°F
Output current	≤ 200 mA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

WIRING DIAGRAMS

3 X PNP Light-ON



PUSH-PULL + Teach / Switching mode selector

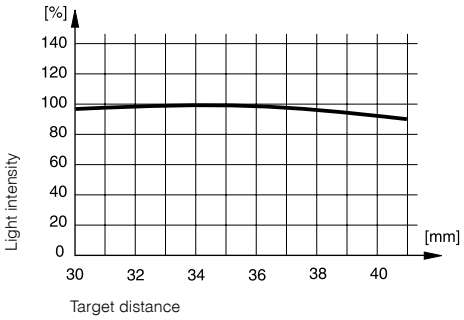


CUBIC SMALL

☐ 40 X 50 X 15

COLOR SENSOR (DIFFUSE)

30 ... 40

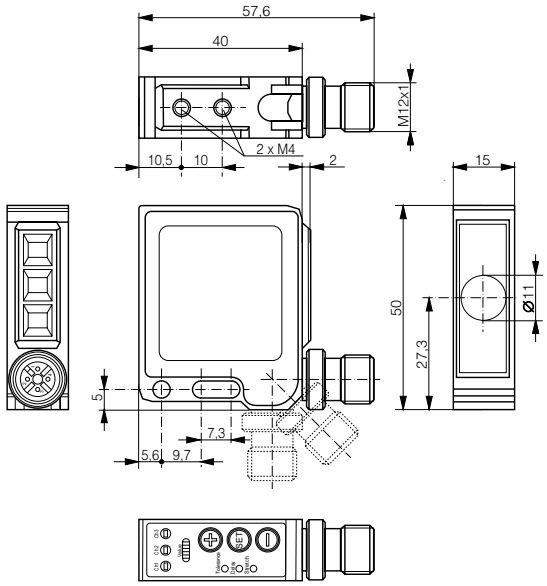


LED white
Ø 4 mm (35 mm)
≤ 35 mA
Teach button
FTS-4155-303
Cable version

☐ 40 X 50 X 15

CONTRAST SENSOR (DIFFUSE)

12



LED red, green, blue (autoselect)
1.5 x 3.5 mm (12 mm)
≤ 35 mA
Teach button / Teach input / IO-Link
KTS-4155-407
Cable version


CONTRINEX
Laser class 1
IP 69K
Step 1 Step 2
3s 1s
Q1
Q2
Sn=0..5m
18...30V DC <100mA

CUBIC COMPACT

PHOTOELECTRIC SENSORS

KEY ADVANTAGES

C55 distance measuring sensors

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

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

OVERVIEW

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

WIRING DIAGRAM

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

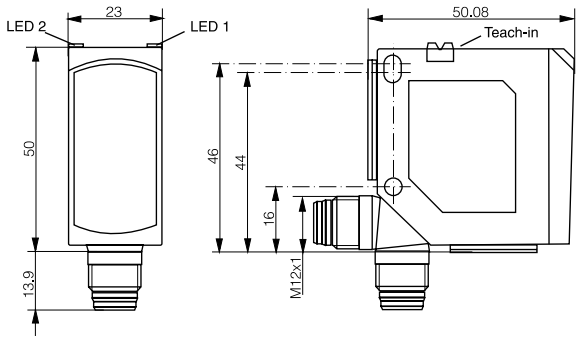
HOUSING SIZE	
OPERATING PRINCIPLE	
MEASUREMENT RANGE MM	

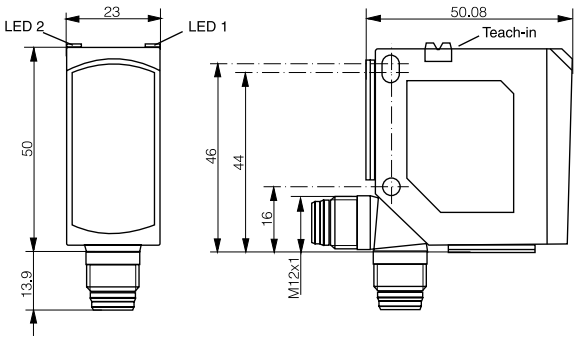
PHOTOELECTRIC

DATA	
Light source	
Light spot size	
Resolution	
Linearity	
PNP/NPN auto-detect + Analog 4 ... 20 mA	
PNP/NPN auto-detect + Analog 0 ... 10 V	
PNP/NPN auto-detect (x2)	
Other types available	

CUBIC COMPACT

☐ 50 X 50 X 23	☐ 50 X 50 X 23
DISTANCE MEASURING SENSOR	**DIFFUSE SENSOR WITH BACKGROUND SUPPRESSION**
100 ... 5000	**0 ... 5000**

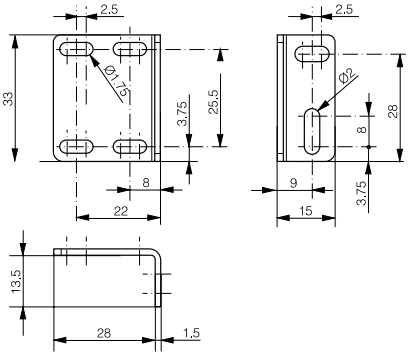




Laser class 1 red 650 mm	Laser class 1 red 650 mm
5 mm x 4 mm at 3000 mm	5 mm x 4 mm at 3000 mm
< 5 mm	-
+/- 30 mm	-
DTL-C55PA-TMS-119-502	
DTL-C55PA-TMS-119-503	
	LHL-C55PA-TMS-119-501

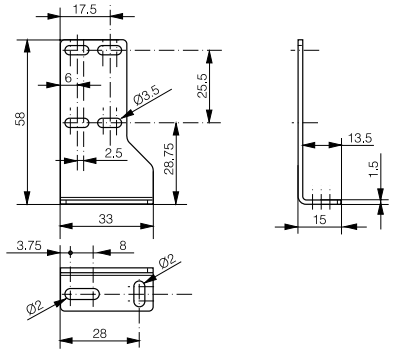
UNIVERSAL MOUNTING BRACKET

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



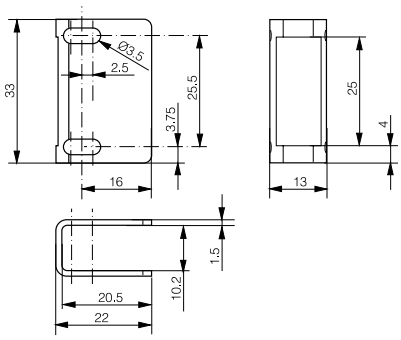
UNIVERSAL MOUNTING BRACKET

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



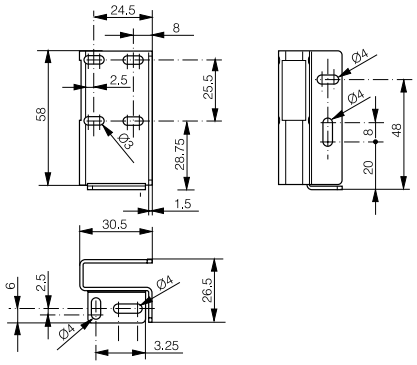
UNIVERSAL MOUNTING BRACKET

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



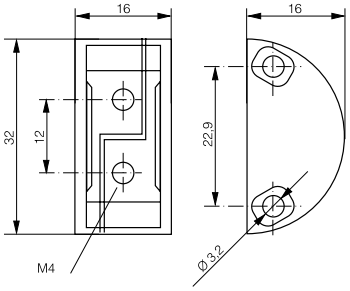
UNIVERSAL MOUNTING BRACKET

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



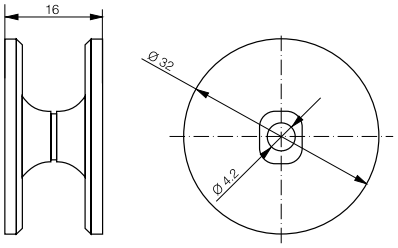
UNIVERSAL MOUNTING BRACKET

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



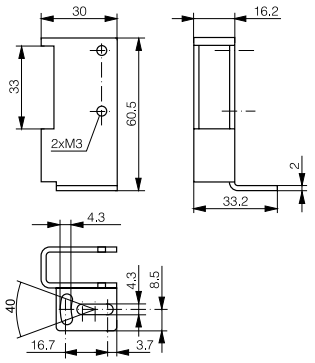
UNIVERSAL MOUNTING BRACKET

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



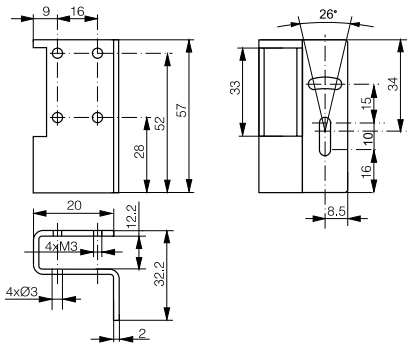
UNIVERSAL MOUNTING BRACKET

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



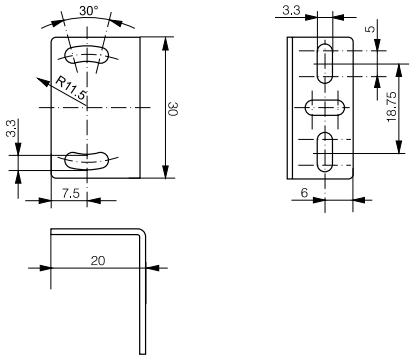
UNIVERSAL MOUNTING BRACKET

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



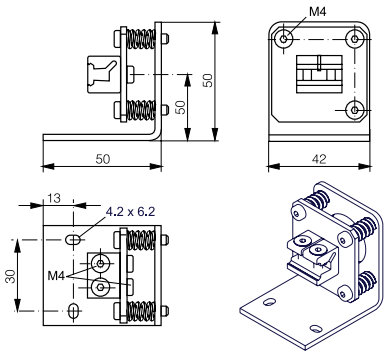
UNIVERSAL MOUNTING BRACKET

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



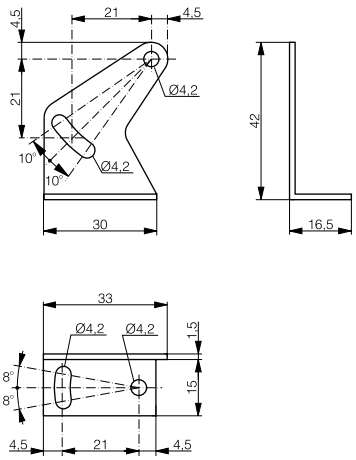
UNIVERSAL MOUNTING BRACKET

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



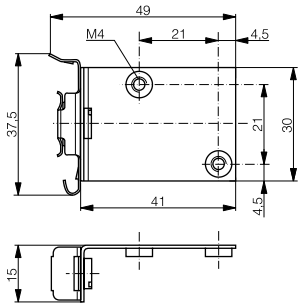
UNIVERSAL MOUNTING BRACKET

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



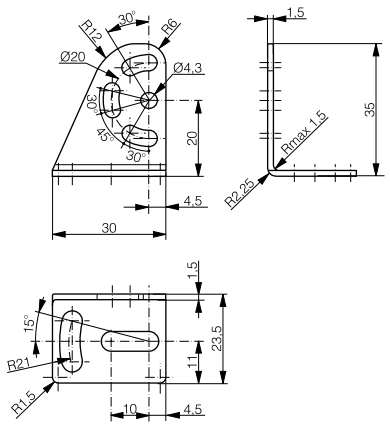
DIN-RAIL MOUNTING BRACKET

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



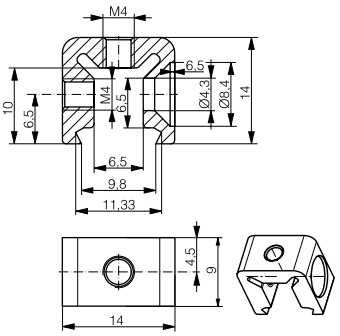
UNIVERSAL MOUNTING BRACKET

For 4050 series
Material: stainless steel V2A
Part reference: ***LXW-4050-000***



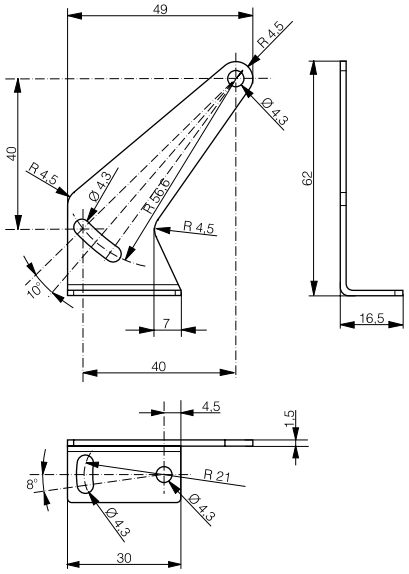
CLAMP BRACKET

For 4050 series
Material: aluminum
Part reference: ***LXW-4050-002***



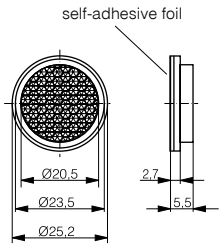
UNIVERSAL MOUNTING BRACKET

For 5050 series
Material: stainless steel V2A
Part reference: ***LXW-5050-000***



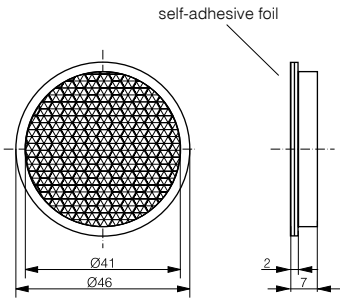
REFLECTOR Ø 25 MM

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



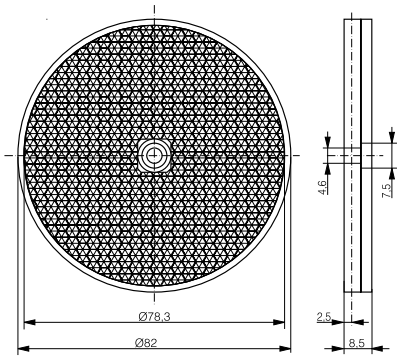
REFLECTOR Ø 46 MM

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



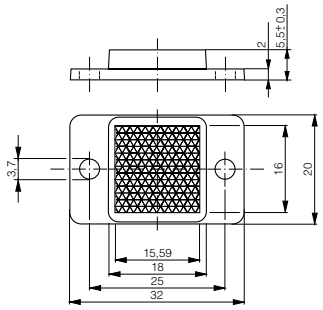
REFLECTOR Ø 82 MM

Reference reflector for all reflex sensors
Part reference: ***LXR-0000-084***



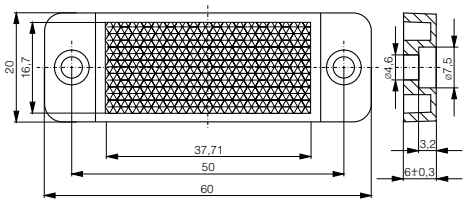
REFLECTOR 32 X 20 MM

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



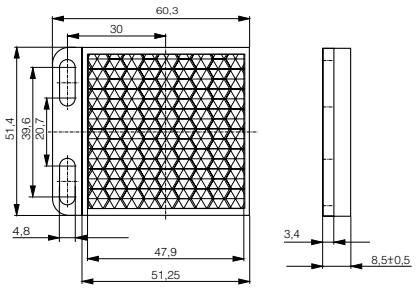
REFLECTOR 60 X 20 MM

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



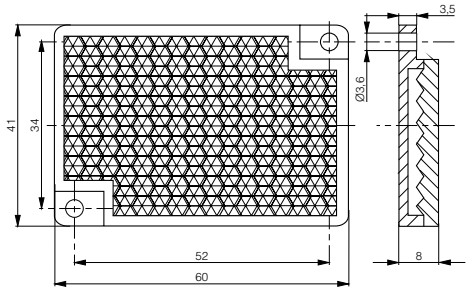
REFLECTOR 60 X 51 MM

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



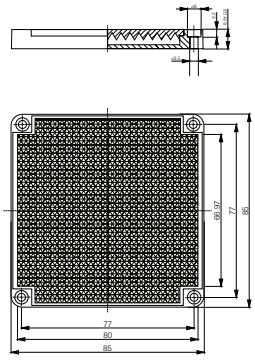
REFLECTOR 60 X 41 MM

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



REFLECTOR 85 X 85 MM

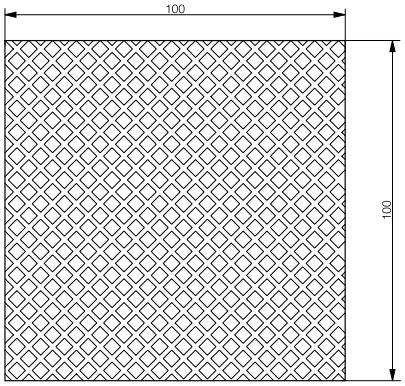
Part reference: ***LXR-0001-088***



REFLECTIVE FOIL 100 X 100 MM

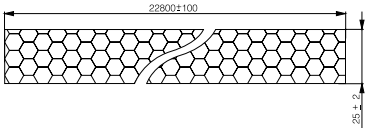
For all reflex sensors (IMOS IRF 6000)

Part reference: ***LXR-0002-100***



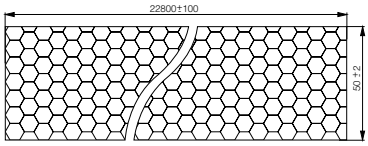
REFLECTIVE ROLL 25 MM X 22.8 M

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



REFLECTIVE ROLL 50 MM X 22.8 M

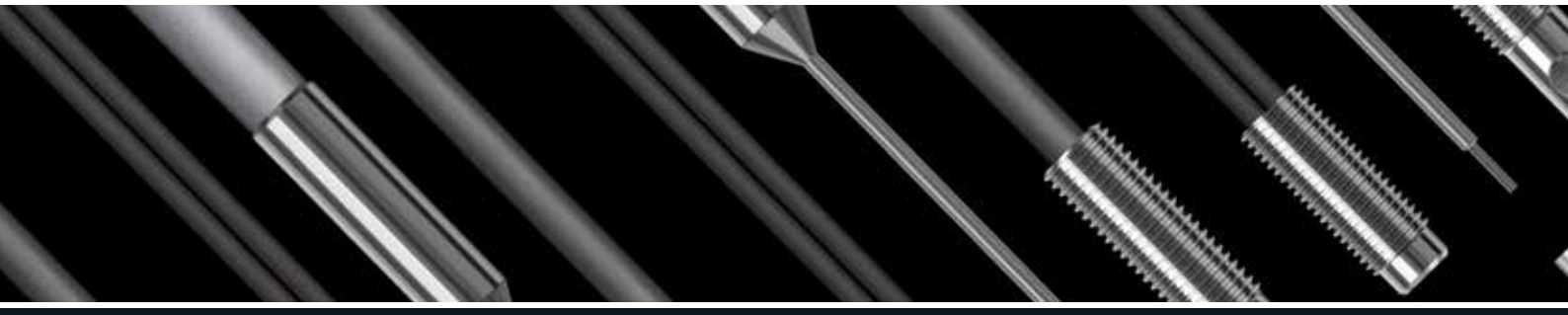
Part reference: ***LXR-0003-050***



PROGRAM OVERVIEW

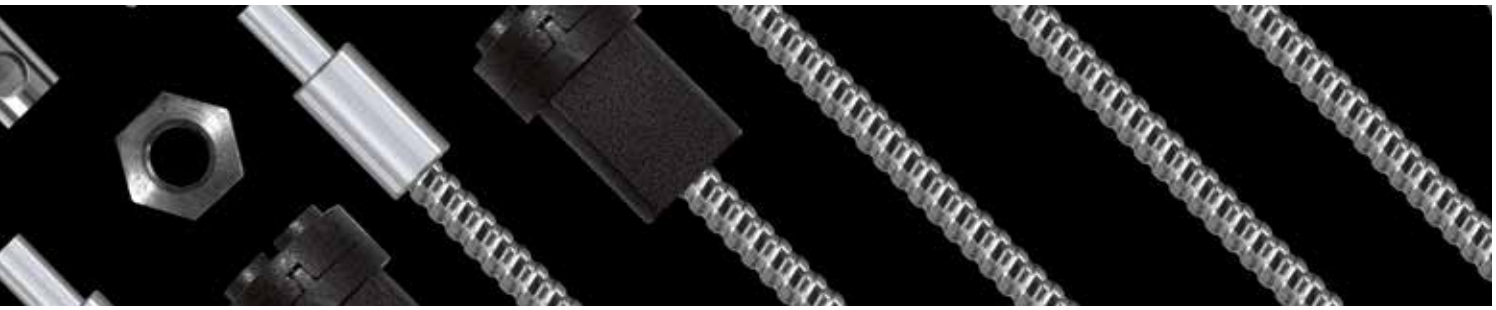
FAMILY	PRODUCT RANGE		SUBMINIATURE				
OPTICAL FIBERS	CYLINDRICAL						
	HOUSING SIZE		No sensing head	Ø 2.3	M3	Ø 3.2	Ø 4
	SYNTHETIC FIBERS	Diffuse	p. 265	p. 265	p. 265		
		Through-beam	p. 268		p. 268	p. 268	
		Cylindrical light beam					p. 271
		Background suppression					
		Liquid level monitoring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

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



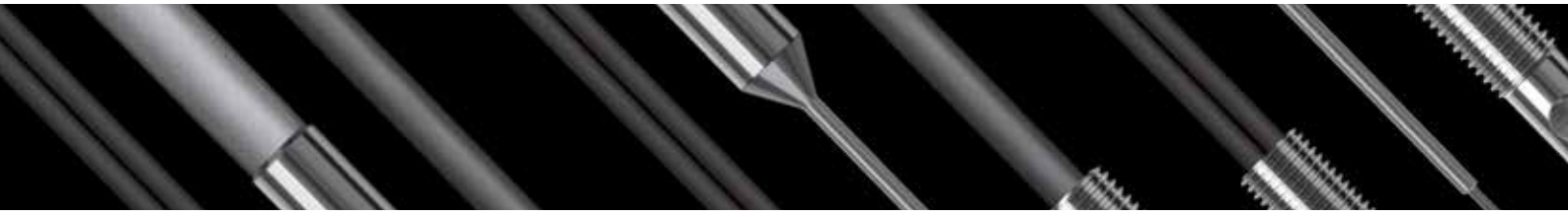
	SUBMINIATURE		MINIATURE				SMALL	
	CYLINDRICAL						CUBIC	
	M4	M5	Ø 6	M6	Ø 8	M8	□ 27 x 30	□ 18 x 32
				p. 266-267				
	p. 269-270			p. 270				
		p. 271						
							p. 272	
						p. 273		
	p. 274			p. 274				
								p. 273
			p. 277-278	p. 282	p. 277-278			
	p. 282		p. 279, 281		p. 280-281			

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



PROGRAM OVERVIEW

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



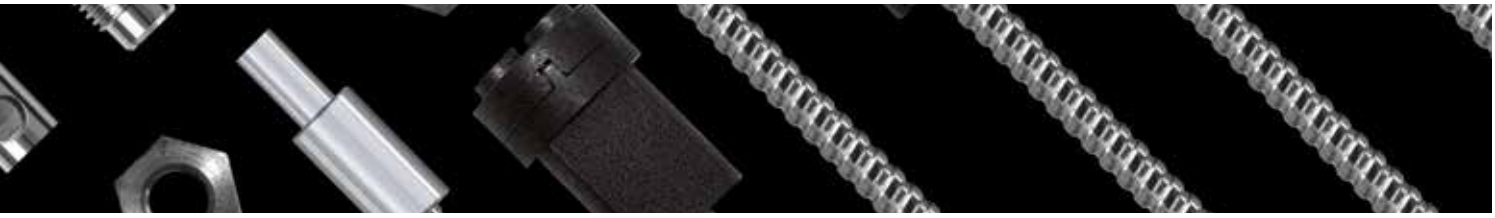
HOUSING SIZE	SENSING RANGE	PAGE
	5 mm · 15 mm · 30 mm · 50 mm · 60 mm · 120 mm · 150 mm · 200 mm · 250 mm · 500 mm · 800 mm · 1500 mm	

GLASS OPTICAL FIBERS (FOR SERIES 4040 SENSORS)

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

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

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



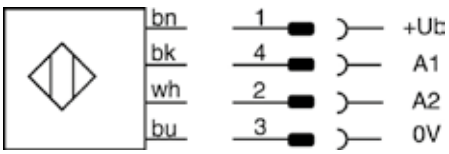
OVERVIEW

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

WIRING DIAGRAMS

PNP Light/Dark-ON / NPN Light-ON

PNP/NPN Changeover

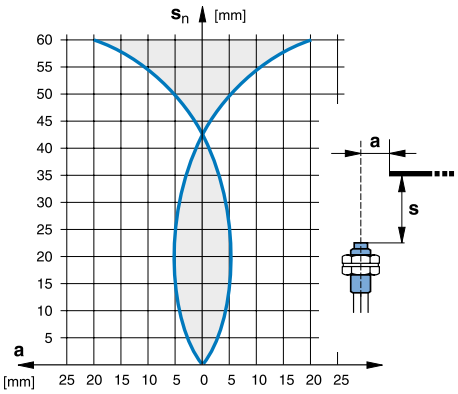


CUBIC MINIATURE

☐ 30 X 30 X 15

FIBER-OPTIC AMPLIFIER

60

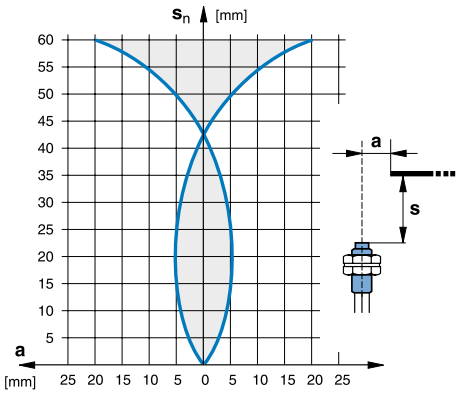


100 x 100 mm white
≤ 15 mA
LED red 660 nm
1000 Hz
0.5 msec
LFS-3031-303
LFS-3031-304
LFS-3031-301
NPN Dark-ON

☐ 30 X 30 X 15

FIBER-OPTIC AMPLIFIER

60

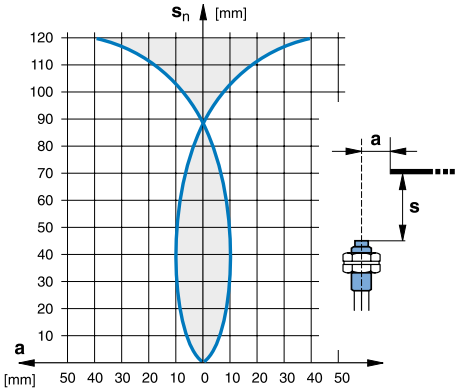


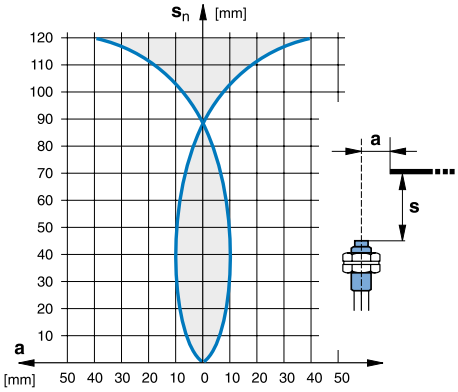
100 x 100 mm white
≤ 15 mA
LED red 660 nm
1000 Hz
0.5 msec
LFK-3031-303
LFK-3031-304
LFK-3031-301
NPN Dark-ON

CUBIC MINIATURE

PHOTOELECTRIC

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





DATA		
Standard target	100 x 100 mm white	100 x 100 mm white
No-load supply current	≤ 20 mA	≤ 20 mA
Emitter	LED red 660 nm	LED red 660 nm
Max. switching frequency	1000 Hz	1000 Hz
Switching time	0.5 msec	0.5 msec
PNP Changeover	**LFS-3030-103**	**LFK-3030-103**
Other types available	NPN Changeover	NPN Changeover

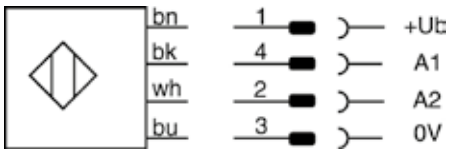
OVERVIEW

IO-Link

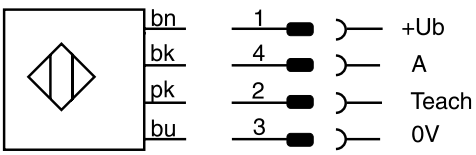
	3#6#
Housing material	PBTP (Crastin)
Hysteresis	10 % typ. / ≤ 5 % (3066)
Degree of protection	IP 64
Supply voltage range	10 ... 30 VDC
Ambient temperature range	-25...+55 °C/-13...+131 °F // -5...+55 °C/+23... +131 °F (3066)
Output current	≤ 200 mA
Output voltage drop	≤ 2 V
Max. ambient light halogen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

WIRING DIAGRAMS

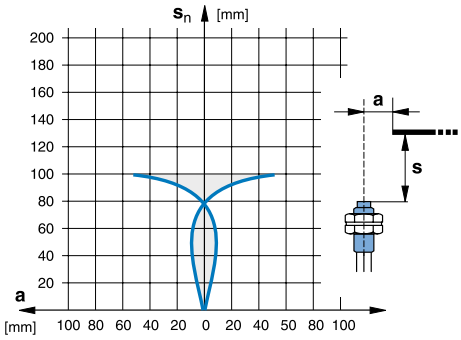
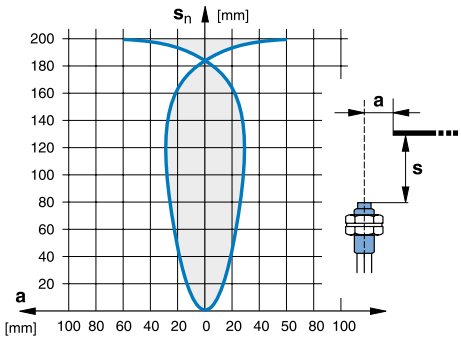
PNP Light/Dark-ON switchable



PNP Light/Dark-ON with teach-in



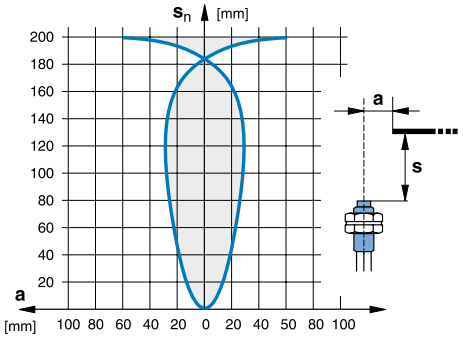
CUBIC SMALL

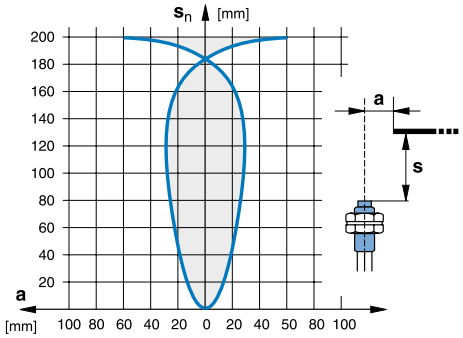
☐ 31 X 60 X 10	☐ 31 X 60 X 10
FIBER-OPTIC AMPLIFIER - BLUE LIGHT	**FIBER-OPTIC AMPLIFIER**
100	**200**
	
	
100 x 100 mm white	100 x 100 mm white
≤ 15 mA	≤ 25 mA
LED blue 465 nm	LED red 680 nm
1500 Hz	1500 Hz
Potentiometer	Teach-in
LFS-3360-103	**LFK-3065-103**
NPN Light-ON/Dark-ON + Excess gain	NPN / Blue light devices / Increased switching frequency

CUBIC SMALL

PHOTOELECTRIC

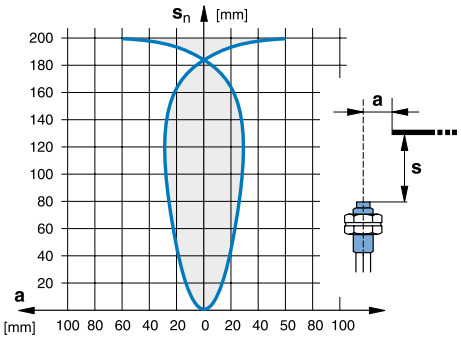
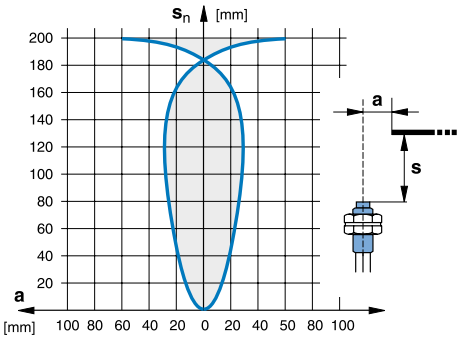
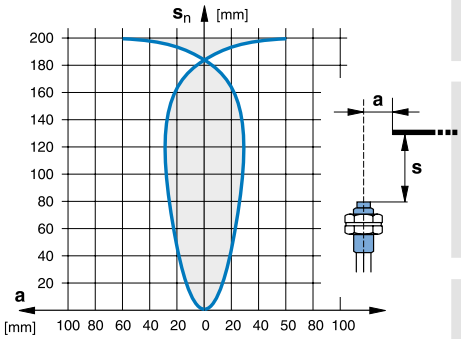
HOUSING SIZE MM	☐ 31 X 60 X 10	☐ 31 X 60 X 10
OPERATING PRINCIPLE	FIBER-OPTIC AMPLIFIER	FIBER-OPTIC AMPLIFIER
SENSING RANGE MM	200	200





DATA		
Standard target	100 x 100 mm white	100 x 100 mm white
No-load supply current	≤ 25 mA	≤ 30 mA
Emitter	LED red 680 nm	LED red 680 nm
Max. switching frequency	1500 Hz	4000 Hz
Setup	Teach-in	Teach-in
PNP Light-ON/Dark-ON switchable + Excess gain	**LFS-3065-103**	
PNP Light-ON/Dark-ON switchable		**LFS-3066-103**
PNP Light-ON/Dark-ON switchable + IO Link		
Other types available	NPN Light-ON/Dark-ON switchable + Excess gain	NPN Light-ON/Dark-ON switchable

CUBIC SMALL

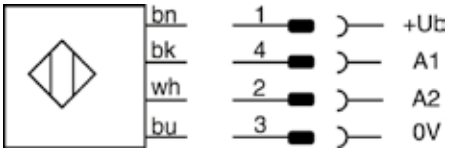
☐ 31 X 60 X 10	☐ 31 X 60 X 10	☐ 31 X 60 X 10
FIBER-OPTIC AMPLIFIER	**FIBER-OPTIC AMPLIFIER**	**FIBER-OPTIC AMPLIFIER**
200	**200**	**200**
IO-Link		
		
		
100 x 100 mm white	100 x 100 mm white	100 x 100 mm white
≤ 30 mA	≤ 15 mA	≤ 15 mA
LED red 680 nm	LED red 680 nm	LED red 680 nm
4000 Hz	1500 Hz	1500 Hz
Teach-in	Potentiometer	Potentiometer
	LFK-3060-103	**LFS-3060-103**
LFS-3066-403		
	NPN Light-ON/Dark-ON switchable + Excess gain	NPN Light-ON/Dark-ON switchable + Excess gain

OVERVIEW

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

WIRING DIAGRAM

PNP/NPN Changeover

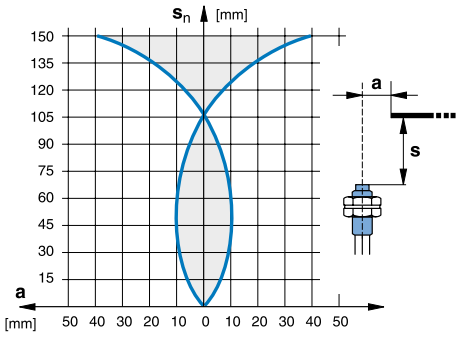


CUBIC SMALL

☐ 40 X 40 X 19

FIBER-OPTIC AMPLIFIER

150



100 x 100 mm white	
≤ 20 mA	
IR LED 880 nm	
Potentiometer	
LFS-4040-103	
NPN Changeover	

SYNTHETIC OPTICAL FIBERS

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

TECHNICAL DATA

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

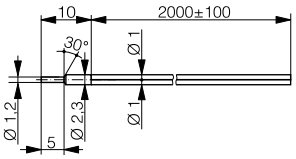
* LFP-1002-020-002 / LFP-2002-020-002

** LFP-1108 / 1109 / 1011-020

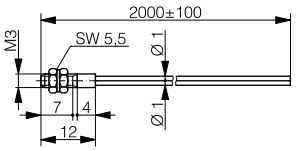
DIFFUSE SENSING

Dimensions: *light emission on the left*

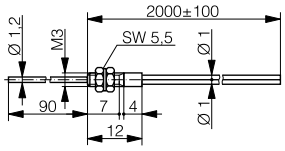
Double fiber (10 m)	No sensing head	
Part reference	LFP-0005-100	
Sensing range	with series 3030	120 mm (2 m fiber, diffuse sensing)
	with series 3031	60 mm (2 m fiber, diffuse sensing)
	with series 3060/65/66	200 mm (2 m fiber, diffuse sensing)
Outside fiber	separable double fiber, ∅ 2.2 mm	
Inner fiber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



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



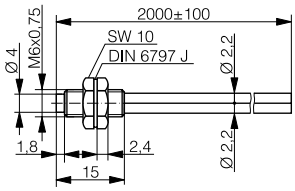
Housing size: M3	Miniature	
Part reference	LFP-1001-020	
Sensing range	with series 3030	40 mm (with 2 m fiber length)
	with series 3031	20 mm (with 2 m fiber length)
	with series 3060/65/66	70 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, ∅ 1 mm*	
Inner fiber	∅ 0.5 mm	
Special characteristics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



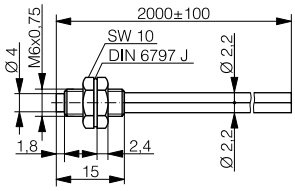
Housing size: M3	Miniature	
Part reference	LFP-1004-020	
Sensing range	with series 3030	40 mm (with 2 m fiber length)
	with series 3031	20 mm (with 2 m fiber length)
	with series 3060/65/66	70 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, ∅ 1 mm*	
Inner fiber	∅ 0.5 mm	
Special characteristics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

DIFFUSE SENSING

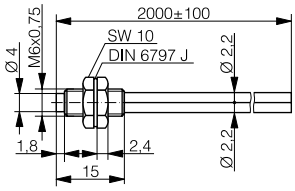
Dimensions: *light emission on the left*



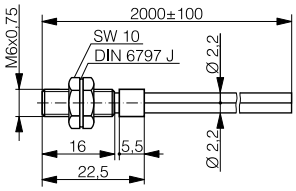
Housing size: M6	Standard	
Part reference	LFP-1002-020	
Sensing range	with series 3030	120 mm (with 2 m fiber length)
	with series 3031	60 mm (with 2 m fiber length)
	with series 3060/65/66	200 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, ∅ 2.2 mm	
Inner fiber	∅ 1.0 mm	
Special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



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



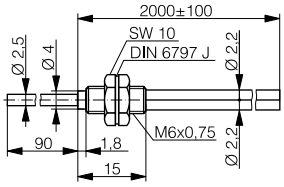
Housing size: M6	Luminous (enhanced brightness)	
Part reference	LFP-1202-020	
Sensing range	with series 3030	160 mm (with 2 m fiber length)
	with series 3031	80 mm (with 2 m fiber length)
	with series 3060/65/66	260 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, ∅ 2.2 mm	
Inner fiber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



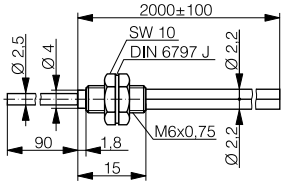
Housing size: M6	Coaxial	
Part reference	LFP-1003-020	
Sensing range	with series 3030	120 mm (with 2 m fiber length)
	with series 3031	60 mm (with 2 m fiber length)
	with series 3060/65/66	200 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, ∅ 2.2 mm	
Inner fiber	∅ 1.0 mm	
Special characteristics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

DIFFUSE SENSING

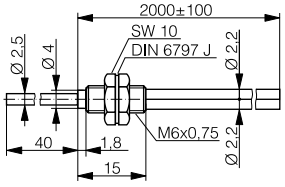
Dimensions: *light emission on the left*



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



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

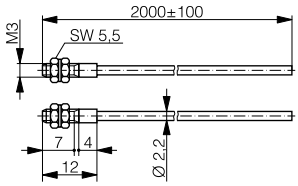


Housing size: M6	Standard	
Part reference	LFP-1013-020	
Sensing range	with series 3030	120 mm (with 2 m fiber length)
	with series 3031	60 mm (with 2 m fiber length)
	with series 3060/65/66	200 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, ∅ 2.2 mm	
Inner fiber	∅ 1.0 mm	
Special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

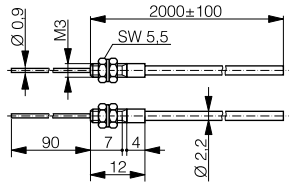
THROUGH-BEAM SENSING

Dimensions: *light emission on the left*

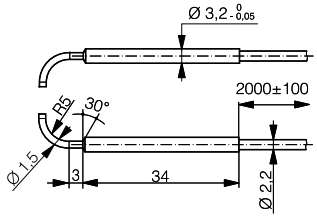
Individual fiber (10 m)	No sensing head	
Part reference	LFP-0004-100	
Sensing range	with series 3030	400 mm (2 m fiber, thru-beam sensing)
	with series 3031	200 mm (2 m fiber, thru-beam sensing)
	with series 3060/65/66	700 mm (2 m fiber, thru-beam sensing)
Outside fiber	individual fiber, ∅ 2.2 mm	
Inner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



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



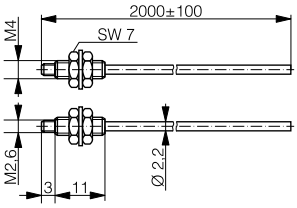
Housing size: M3	Miniature	
Part reference	LFP-2003-020	
Sensing range	with series 3030	120 mm (with 2 m fiber length)
	with series 3031	60 mm (with 2 m fiber length)
	with series 3060/65/66	200 mm (with 2 m fiber length)
Outside fiber	2 individual fibers, ∅ 2.2 mm	
Inner fiber	∅ 0.5 mm	
Special characteristics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



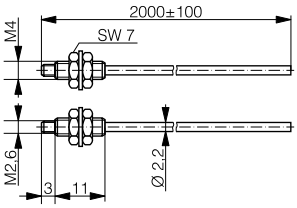
Housing size: ∅ 3.2 mm	Standard 90°	
Part reference	LFP-2006-020	
Sensing range	with series 3030	120 mm (with 2 m fiber length)
	with series 3031	60 mm (with 2 m fiber length)
	with series 3060/65/66	200 mm (with 2 m fiber length)
Outside fiber	2 individual fibers, ∅ 2.2 mm	
Inner fiber	∅ 1.0 mm	
Special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

THROUGH-BEAM SENSING

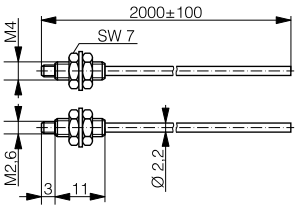
Dimensions: *light emission on the left*



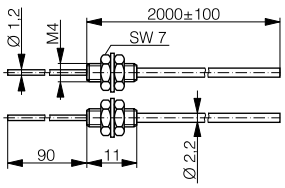
Housing size: M4	Standard	
Part reference	LFP-2002-020	
Sensing range	with series 3030	400 mm (with 2 m fiber length)
	with series 3031	200 mm (with 2 m fiber length)
	with series 3060/65/66	700 mm (with 2 m fiber length)
Outside fiber	2 individual fibers, ∅ 2.2 mm	
Inner fiber	∅ 1.0 mm	
Special characteristics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



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



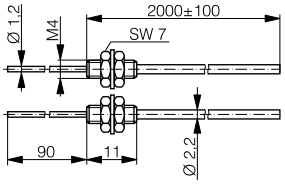
Housing size: M4	Luminous (enhanced brightness)	
Part reference	LFP-2202-020	
Sensing range	with series 3030	500 mm (with 2 m fiber length)
	with series 3031	250 mm (with 2 m fiber length)
	with series 3060/65/66	900 mm (with 2 m fiber length)
Outside fiber	2 individual fibers, ∅ 2.2 mm	
Inner fiber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



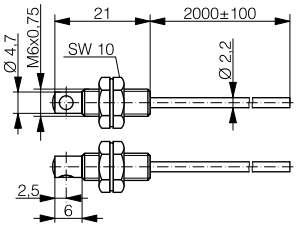
Housing size: M4	Standard	
Part reference	LFP-2004-020	
Sensing range	with series 3030	400 mm (with 2 m fiber length)
	with series 3031	200 mm (with 2 m fiber length)
	with series 3060/65/66	700 mm (with 2 m fiber length)
Outside fiber	2 individual fibers, ∅ 2.2 mm	
Inner fiber	∅ 1.0 mm	
Special characteristics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

THROUGH-BEAM SENSING

***Dimensions**: light emission on the left*



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

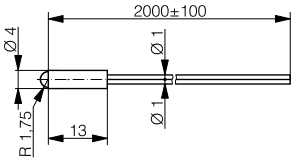


Housing size: M6	Standard 90°	
Part reference	LFP-2005-020	
Sensing range	with series 3030	1100 mm (with 2 m fiber length)
	with series 3031	550 mm (with 2 m fiber length)
	with series 3060/65/66	1800 mm (with 2 m fiber length)
Outside fiber	2 individual fibers, ∅ 2.2 mm	
Inner fiber	∅ 1.0 mm	
Special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

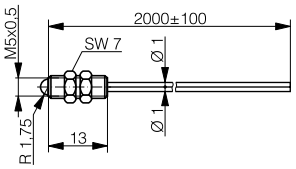
APPLICATION-SPECIFIC CYLINDRICAL LIGHT BEAM

- ✓ 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

Dimensions: *light emission on the left*

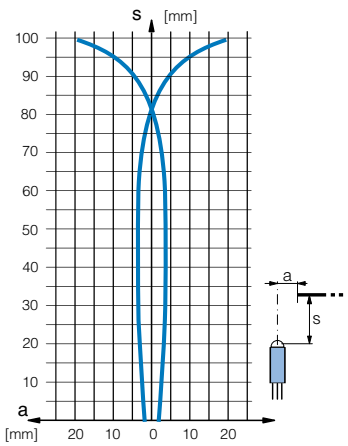


Housing size: ∅ 4 mm	Miniature / spherical optics	
Part reference	LFP-1006-020	
Sensing range	with series 3030	100 mm (with 2 m fiber length)
	with series 3031	60 mm (with 2 m fiber length)
	with series 3060/65/66	140 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, ∅ 1 mm*	
Inner fiber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

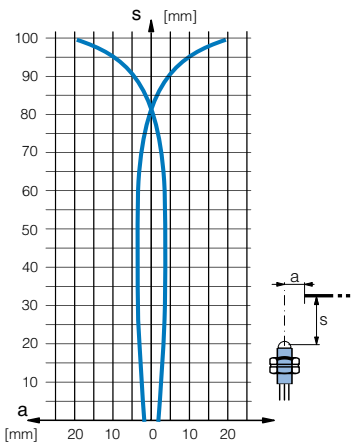


Housing size: M5	Miniature / spherical optics	
Part reference	LFP-1007-020	
Sensing range	with series 3030	100 mm (with 2 m fiber length)
	with series 3031	60 mm (with 2 m fiber length)
	with series 3060/65/66	140 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, ∅ 1 mm*	
Inner fiber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

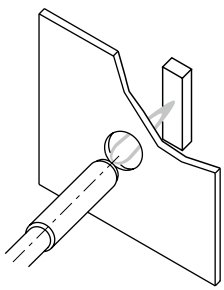
Response curves (with series 3030):



LFP-1006-020



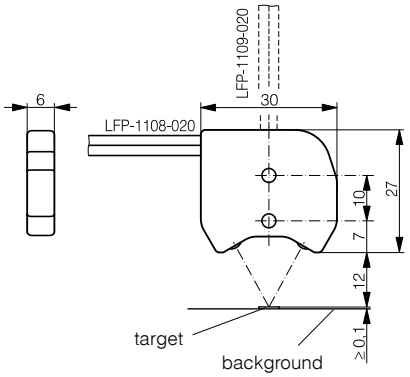
LFP-1007-020



Detection through holes and gaps

APPLICATION-SPECIFIC BACKGROUND SUPPRESSION

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

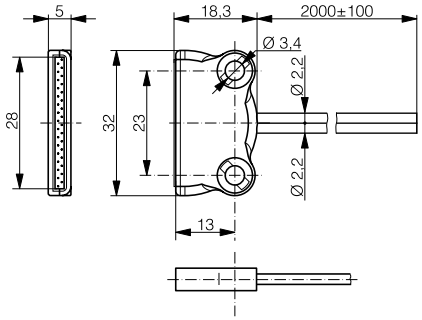


Housing size: ☐ 27 x 30	Background suppression / flexible / 90°
Part reference	LFP-1108-020
Operating distance	12 mm
Outside fiber	2 separate fibers, ∅ 2.2 mm
Inner fiber	151 x ∅ 75 µm
Special characteristics	Lateral sensing
	Detectable height difference: 0.1 mm
	Minimum detectable target size: 0.15 mm²
	Minimum detectable wire diameter: 0.1 mm

Housing size: ☐ 27 x 30	Background suppression / flexible
Part reference	LFP-1109-020
Operating distance	12 mm
Outside fiber	2 separate fibers, ∅ 2.2 mm
Inner fiber	151 x ∅ 75 µm
Special characteristics	Axial sensing
	Detectable height difference: 0.1 mm
	Minimum detectable target size: 0.15 mm²
	Minimum detectable wire diameter: 0.1 mm

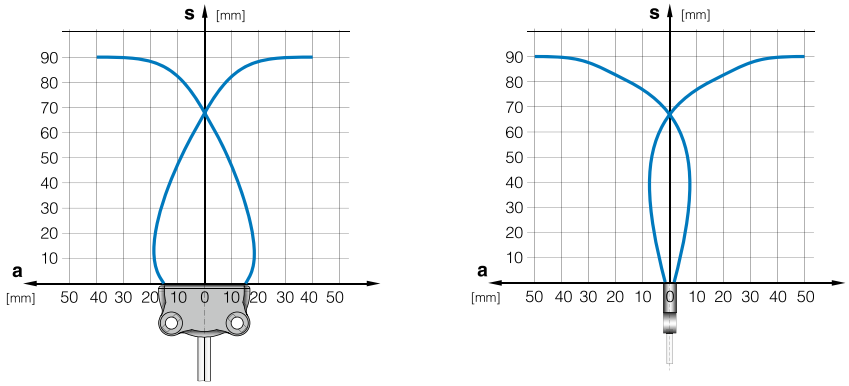
APPLICATION-SPECIFIC MULTI-BEAM

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



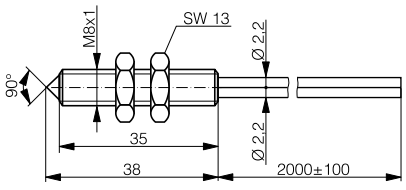
Housing size: ☐ 18 x 32	Multi-beam	
Part reference	LFP-1011-020	
Sensing range	with series 3030	90 mm (with 2 m fiber length)
	with series 3031	45 mm (with 2 m fiber length)
	with series 3060/65/66	150 mm (with 2 m fiber length)
Outside fiber	2 separate fibers, ∅ 2.2 mm	
Inner fiber	16 x ∅ 0.265 mm	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

Response curves (with series 3030):



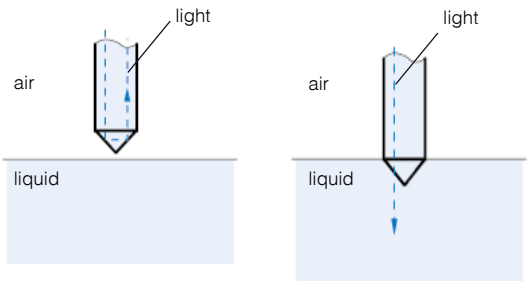
APPLICATION-SPECIFIC LIQUID LEVEL MONITORING

- ✓ 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, ∅ 2.2 mm
Inner fiber	∅ 0.5 mm
Special characteristics	Contact liquid detection

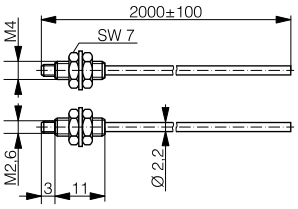
Operating principle:



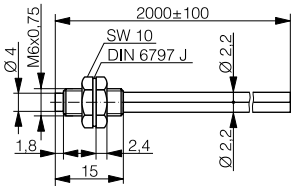
APPLICATION-SPECIFIC LOW & HIGH TEMPERATURES

Dimensions: *light emission on the left*

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

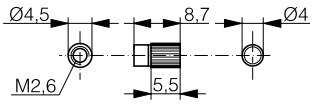


Housing size: M4	Low & high temperature resistant	
Part reference	LFP-2002-020-002	
Sensing range	with series 3030	300 mm (with 2 m fiber length)
	with series 3031	150 mm (with 2 m fiber length)
	with series 3060/65/66	550 mm (with 2 m fiber length)
Outside fiber	2 individual fibers, ∅ 2.2 mm	
Inner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

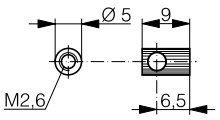


Housing size: M6	Low & high temperature resistant	
Part reference	LFP-1002-020-002	
Sensing range	with series 3030	90 mm (with 2 m fiber length)
	with series 3031	45 mm (with 2 m fiber length)
	with series 3060/65/66	150 mm (with 2 m fiber length)
Outside fiber	1 separable double fiber, ∅ 2.2 mm	
Inner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

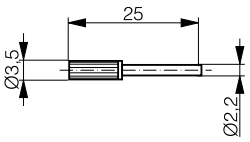
ACCESSORIES



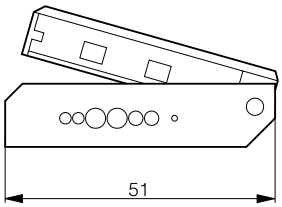
Axial front lens for increased sensing ranges		
Part reference	LFP-0001-000	
Sensing range	with series 3030	3000 mm (2 m fibers)
	with series 3031	1500 mm (2 m fibers)
	with series 3060/65/66	5000 mm (5 m fibers)
Can be used with	LFP-2#02-020	
Delivery package	1 pair	



90° front lens for increased sensing ranges		
Part reference	LFP-0002-000	
Sensing range	with series 3030	1000 mm (2 m fibers)
	with series 3031	500 mm (2 m fibers)
	with series 3060/65/66	1700 mm (2 m fibers)
Can be used with	LFP-2#02-020	
Delivery package	1 pair	



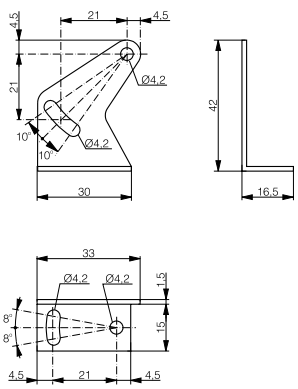
Adaptor	
Part reference	LFP-0003-000
Suitable for	fine synthetic optical fibers



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

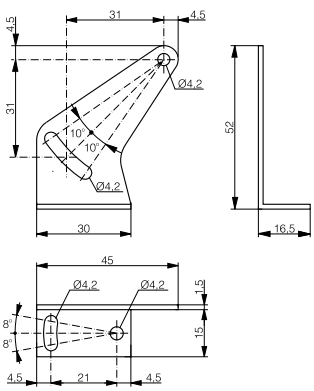
UNIVERSAL MOUNTING BRACKET

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



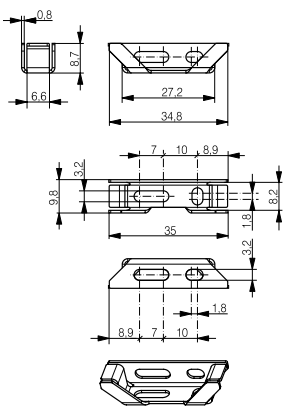
UNIVERSAL MOUNTING BRACKET

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



UNIVERSAL MOUNTING BRACKET

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



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:

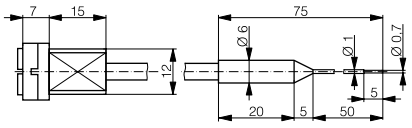
- PVC sleeve: the economical solution if no special stresses are to be expected.
- Wound sleeve of chrome-plated brass: for permanent operating temperatures of up to +160°C (+320°F), and maximum protection against crushing.
- Silicone sleeve with stainless-steel braiding for strain relief: for use in 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.

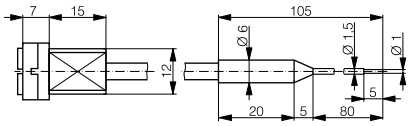
AXIAL DIFFUSE SENSING

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

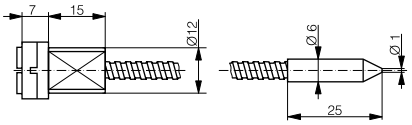
Dimensions: *light emission on the right*



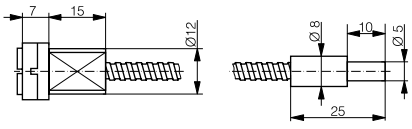
Housing size: ∅ 6 mm	
Part reference	LFG-1005-###
Sensing range	with series 4040 5 mm
Special characteristics	With bendable light-outlet tube
	For the detection of smallest objects
Sleeve	Silicone, ∅ 4.7 mm
Min. bending radius	20 mm / light-outlet tube: 5 mm
	(do not bend the inner and outer 10 mm)
Max. tensile load	10 N



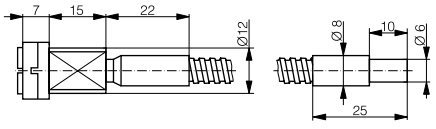
Housing size: ∅ 6 mm	
Part reference	LFG-1015-###
Sensing range	with series 4040 15 mm
Special characteristics	With bendable light-outlet tube
	For places difficult to access
Sleeve	Silicone, ∅ 4.7 mm
Min. bending radius	20 mm / light-outlet tube: 5 mm
	(do not bend the inner and outer 10 mm)
Max. tensile load	10 N



Housing size: ∅ 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, ∅ 4.7 mm
Min. bending radius	23 mm
Max. tensile load	20 N



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

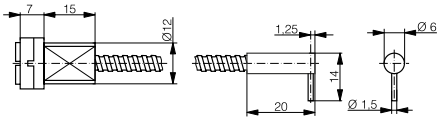


Housing size: ∅ 8 mm	
Part reference	LFG-1030-###
Sensing range	with series 4040 150 mm
Special characteristics	For long sensing range
Sleeve	Wound sleeve of chrome-plated brass, ∅ 6.7 mm
Min. bending radius	25 mm
Max. tensile load	50 N

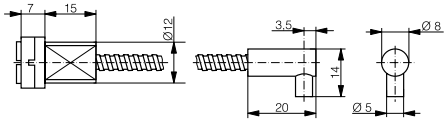
RADIAL DIFFUSE SENSING

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

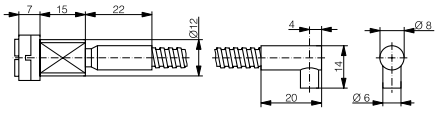
Dimensions: *light emission on the right*



Housing size: ∅ 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, ∅ 4.7 mm
Min. bending radius	23 mm
Max. tensile load	20 N



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

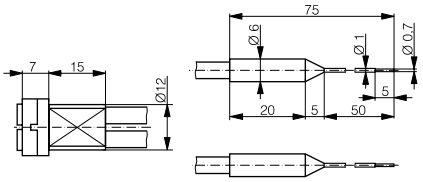


Housing size: ∅ 8 mm	
Part reference	LFG-2030-###
Sensing range	with series 4040 150 mm
Special characteristics	For long sensing range
Leg length	14 mm
Sleeve	Wound sleeve of chrome-plated brass, ∅ 6.7 mm
Min. bending radius	25 mm
Max. tensile load	50 N

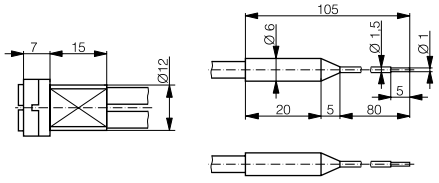
AXIAL THROUGH-BEAM SENSING

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

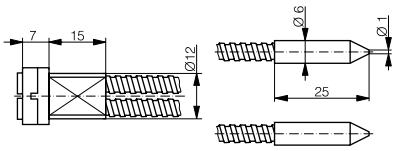
Dimensions: *light emission on the right*



Housing size: ∅ 6 mm	
Part reference	LFG-3005-###
Sensing range	with series 4040 50 mm
Special characteristics	With bendable light-outlet tube
	For the detection of smallest objects
Sleeve	Silicone, ∅ 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: ∅ 6 mm	
Part reference	LFG-3015-###
Sensing range	with series 4040 200 mm
Special characteristics	With bendable light-outlet tube
	For places difficult to access
Sleeve	Silicone, ∅ 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

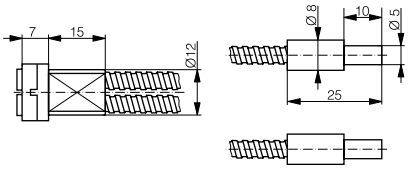


Housing size: ∅ 6 mm	
Part reference	LFG-3010-###
Sensing range	with series 4040 200 mm
Special characteristics	For the detection of smallest objects
	in places difficult to access
Sleeve	Wound sleeve of chrome-plated brass, ∅ 4.7 mm
Min. bending radius	23 mm
Max. tensile load	20 N

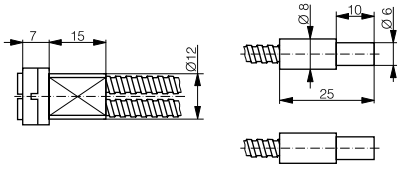
AXIAL THROUGH-BEAM SENSING

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

Dimensions: *light emission on the right*



Housing size: ∅ 8 mm		
Part reference	LFG-3020-###	
Sensing range	with series 4040	800 mm
Special characteristics	Multi-purpose medium sensing range model	
Sleeve	Wound sleeve of chrome-plated brass, ∅ 4.7 mm	
Min. bending radius	25 mm	
Max. tensile load	50 N	

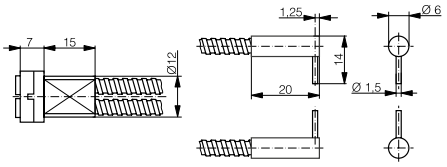


Housing size: ∅ 8 mm		
Part reference	LFG-3030-###	
Sensing range	with series 4040	1500 mm
Special characteristics	For long sensing range	
Sleeve	Wound sleeve of chrome-plated brass, ∅ 4.7 mm	
Min. bending radius	25 mm	
Max. tensile load	50 N	

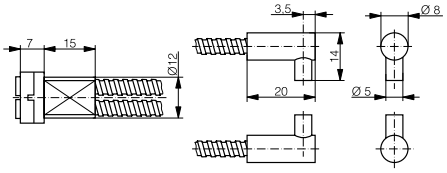
RADIAL THROUGH-BEAM SENSING

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

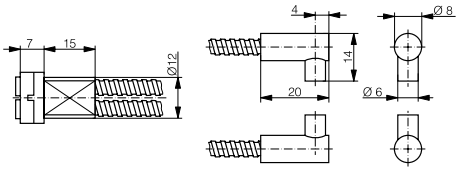
Dimensions: *light emission on the right*



Housing size: ∅ 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, ∅ 4.7 mm
Min. bending radius	23 mm
Max. tensile load	20 N



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

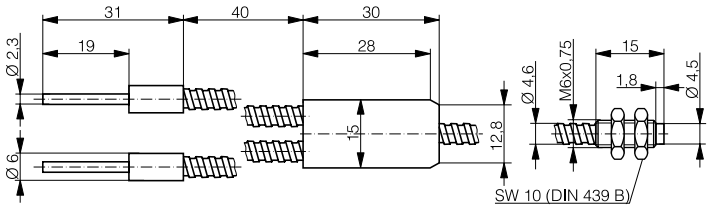


Housing size: ∅ 8 mm	
Part reference	LFG-4030-###
Sensing range	with series 4040 1500 mm
Special characteristics	For long sensing range
Leg length	14 mm
Sleeve	Wound sleeve of chrome-plated brass, ∅ 4.7 mm
Min. bending radius	25 mm
Max. tensile load	50 N

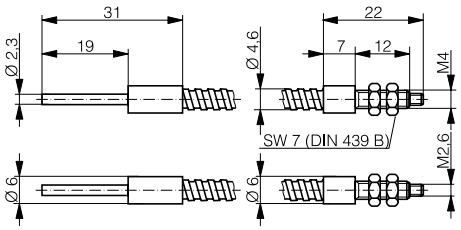
Dimensions: *light emission on the right*

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

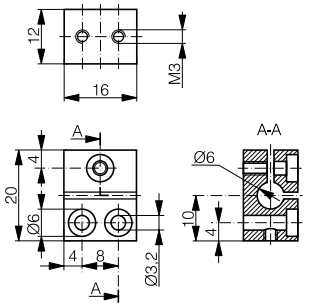
Housing size: M6	Diffuse sensing	
Part reference	LFG-1022-050	
Sensing range	with series 3030	120 mm
	with series 3031	60 mm
Special characteristics	For difficult environmental conditions	
Sleeve	Wound sleeve of chrome-plated brass, ∅ 4.6 mm	
Min. bending radius	25 mm	
Max. tensile load	20 N	



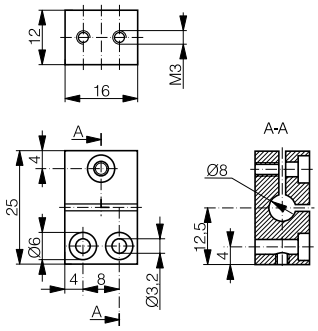
Housing size: M4	Through-beam sensing	
Part reference	LFG-3022-050	
Sensing range	with series 3030	500 mm
	with series 3031	250 mm
Special characteristics	For difficult environmental conditions	
Sleeve	Wound sleeve of chrome-plated brass, ∅ 4.6 mm	
Min. bending radius	25 mm	
Max. tensile load	20 N	



ACCESSORIES



For ∅ 6 mm heads	Fiber mounting clamp
Part reference	LXG-0000-060
Characteristics	Mounting clamp for axial and radial light-outlet tubes
Material	Nickel-plated brass
Suitable for the following fibers	LFG-1005-### / LFG-1015-###
	LFG-1010-### / LFG-2010-###
	LFG-3005-### / LFG-3015-###
	LFG-3010-### / LFG-4010-###



For ∅ 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-###

LTR-C23PA-PMS-403-(-XXX)

SENSOR TYPE

Diffuse	LT
Retro reflective	LR
Through-beam	LL
Background suppression	LH
Distance diffuse	DT

EMISSION TYPE

Red	R
Laser	L

HOUSING TYPE

Cubic	C

HOUSING SIZE

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

HOUSING MATERIAL

Plastic	P

PERFORMANCE

Standard	A, B

ADJUSTMENT TYPE

No teach or potentiometer	N
Potentiometer	P
Teach	T

SPECIAL EXECUTIONS

OUTPUT

4-wire devices, NPN	
Light-ON + Dark-ON	01
Light-ON + stability alarm	0A
Dark-ON + stability alarm	0B
4-wire devices, PNP	
Light-ON + Dark-ON	03
Light-ON + stability alarm	0C
Dark-ON + stability alarm	0D
3-wire devices, NPN	
Light-ON	01
Dark-ON	02
3-wire devices, PNP	
Light-ON	03
Dark-ON	04
Other	
3- or 4-wire through-beam sensor (emitter)	00
Analog	#9
Special	##

4-wire sensor	1
3-wire sensor	3
3-wire sensor with IO-Link	4
4-wire sensor with IO-Link	6

CONNECTION TYPE

Cable	K
Connector	S
Pigtail	V

DETECTION DISTANCE

Short	S
Standard	M
Long	L
Extra long	X

LTS-1180-303 (-XXX)

PHOTOELECTRIC SENSOR	L
COLOR SENSOR	F

SENSOR TYPE

With analog output	A
For fibers / fiber	F
With background suppression	H
Through-beam sensor	L
Retro-reflective sensor	R
Diffuse sensor	T
Accessories	X
Device with cable	K
Device with connector	S
Device with screw terminal	T
Device with molded connector	V
Synthetic optical fiber	P
Glass optical fiber	G
Reflector	R
Cutting tool	F
Mounting bracket	W

SERIES

Cylindrical devices	
Ø 4	1040
M5	1050
M12	1120
M12 laser	112#L
M18	1180
M18 laser	118#L
M18 with lateral light emission	1180W

Rectangular devices	
5 x 7 mm	0507
30x30 mm (high-performance)	3#30
30x30 mm (standard)	3#31
31x60 mm (standard)	3#60
31x60 mm (teach-in)	3#65
31x60 mm (teach-in & digital display)	3066
31x60 mm (high frequency)	326#
31x60 mm (blue light)	336#
40 x 40 mm	4040
40 x 50 mm	4#5#

Synthetic optical fibers	
Diffuse sensor	1###
Through-beam sensor	2###
Miniature / standard / coaxial	#0##
Flexible	#1##
Luminous (enhanced brightness)	#2##

Glass optical fibers	
Axial diffuse sensor	1###
Radial diffuse sensor	2###
Axial through-beam sensor	3###
Radial through-beam sensor	4###
Accessories	0###

SPECIAL EXECUTIONS

EXECUTION

3- or 4-wire through-beam sensor (emitter)	00
4-wire devices, NPN, output:	
Changeover or switchable	01
Light-ON and excess gain	02
4-wire devices, PNP, output:	
Changeover or switchable	03
Light-ON and excess gain	04
AC/DC devices	
Through-beam sensor (emitter)	10
With relay output	15
With relay output and timer	65
3-wire devices, NPN, output:	
Light-ON	01
Dark-ON	02
3-wire devices, PNP, output:	
Light-ON	03
Dark-ON	04
With built-in timer	+50

DIMENSIONS

Synthetic optical fibers	
Length in dm (2 m)	020
Glass optical fibers	
Length in cm (0.25 m)	025
Length in cm (0.50 m)	050
Length in cm (1 m)	100
Accessories	
General	###

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

OPTICAL FIBERS

CONTRINEX

ALL OVER THE WORLD

EUROPE
Austria
Belgium*
Croatia
Czech Republic
Denmark
Estonia
Finland
France*
Germany*
Great Britain*
Greece
Hungary
Ireland
Italy*
Luxembourg
Netherlands
Norway
Poland
Portugal*
Romania
Russian Federation
Slovakia
Slovenia
Spain
Sweden
Switzerland*
Turkey
Ukraine

AFRICA
Morocco
South Africa

THE AMERICAS
Argentina
Brazil*
Canada
Chile
Mexico*
Peru
United States*
Venezuela

ASIA
China*
India*
Indonesia
Japan*
Korea
Malaysia
Pakistan
Philippines
Singapore*
Taiwan
Thailand
Vietnam

AUSTRALASIA
Australia
New Zealand

MIDDLE EAST
Israel
United Arab Emirates

* Contrinex subsidiary

EUROPE

CONTRINEX AG Industrial Electronics
route André Piller 50 - PO Box - CH 1762 Givisiez - Switzerland
Tel: +41 26 460 46 46 - Fax: +41 26 460 46 40
www.contrinex.com

NORTH AMERICA

CONTRINEX INC
1421 Champion Dr - Ste 308 - Carrollton, Texas 75006 - USA
Tel: +1 972 685 3010 - Fax: +1 972 685 6957
www.contrinexusa.com

customer.service@contrinex.com

Toll Free: 1-866-289-2899