

Photoelectric Sensors

Photoelectric sensors for object detection

Photoelectric sensors check presence, size, color, distance and thickness.

They are excellent specialists with completely different focuses:

- Part recognition and counting
- Stack height monitoring
- Detection through glass
- Small parts detection
- Brand recognition
- Fill level detection and much more.

The wide Balluff spectrum offers every light type, whether red light, infrared or laser technology. In different ranges. With and without background suppression.

Various designs – also in mini version – ensure a wide variety of possible applications. Our photoelectric sensors are optimized for robotics, automation, installation and handling.



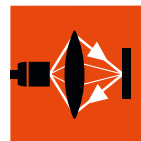
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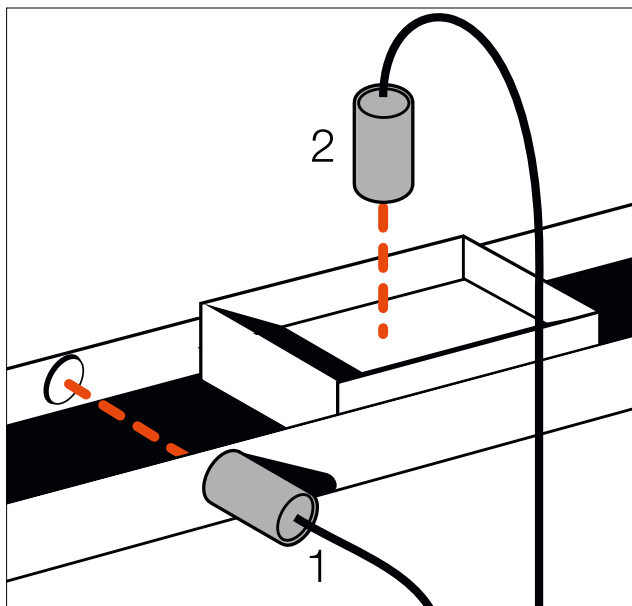
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Basic information and definitions can be found on page 934.



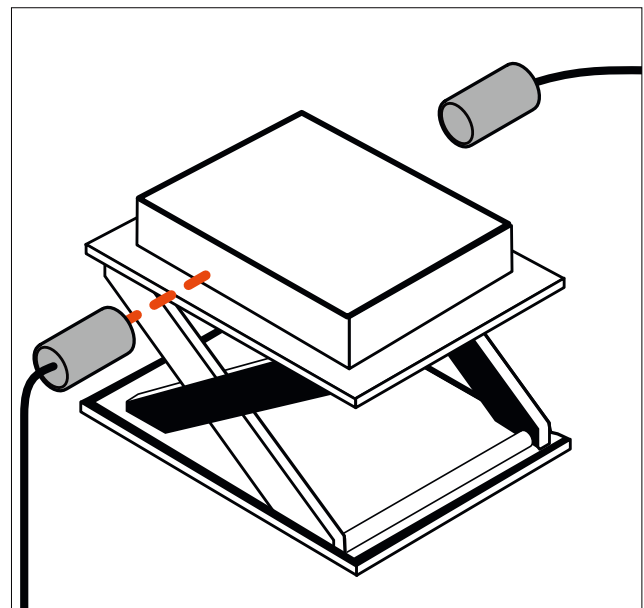
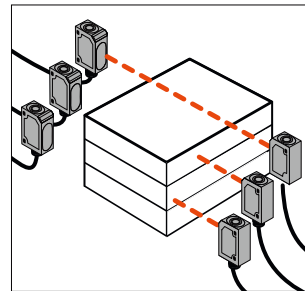


Querying the size and content of containers

The retroreflective sensor (1) indicates the presence of the box. The pulse duration can be used to count or measure box lengths. The diffuse sensor (2) with background suppression checks the contents of the box. Its range is adjustable.

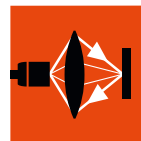
Checking stack height

Through-beam light sensors that consist of an emitter and receiver can be installed one on top of the other. Each through-beam sensor then scans a specific stack height. The accuracy of the scan is within a few millimeters, if apertures are used.



Tracking a hoist

The through-beams are assigned so that the uppermost metal plate interrupts the light beam. The beam path is open when the metal plate is removed for processing. The through-beams provide a switching signal, and the hoist is automatically reset to the height of a metal plate.



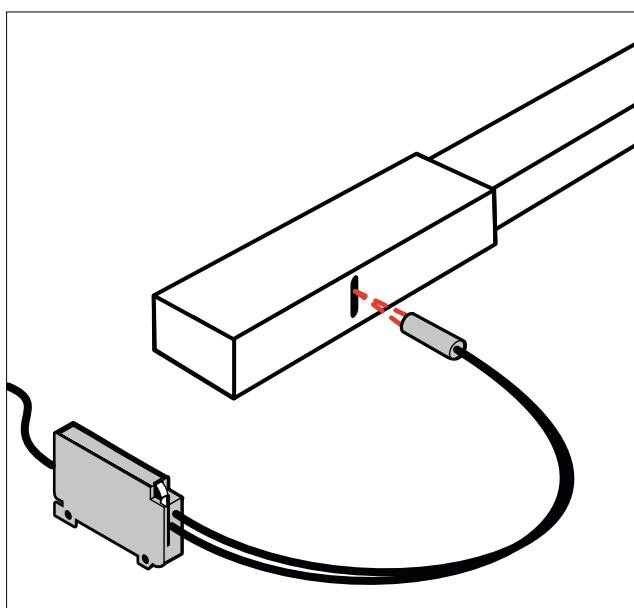
Photoelectric Sensors
Performance Spectrum
Product Overview

Photoelectric Sensors

Photoelectric Sensors with Special Properties

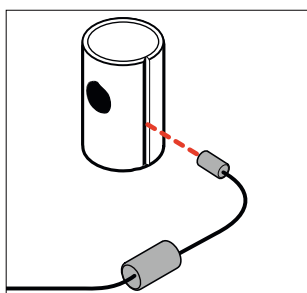
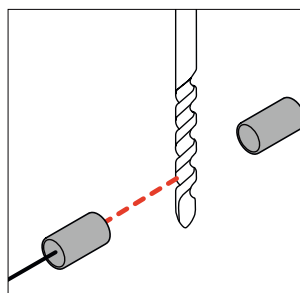
Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



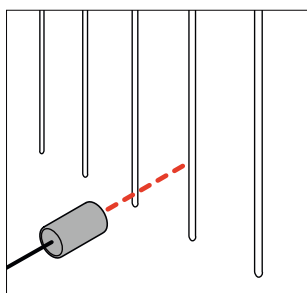
Scanning a read mark

In order to recognize a reading mark, a base unit and plastic fiber optics are used. This way a mark – such as a bright line – can be scanned on a dark background, as occur on belts, hoses or containers.



Detecting a groove

To sense a groove on a bearing pillow, a diffuse sensor is adjusted using a fiber optic cable so that the bearing pillow is reliably detected. The groove interrupts the beam (no reflection), and the switch changes its output condition.

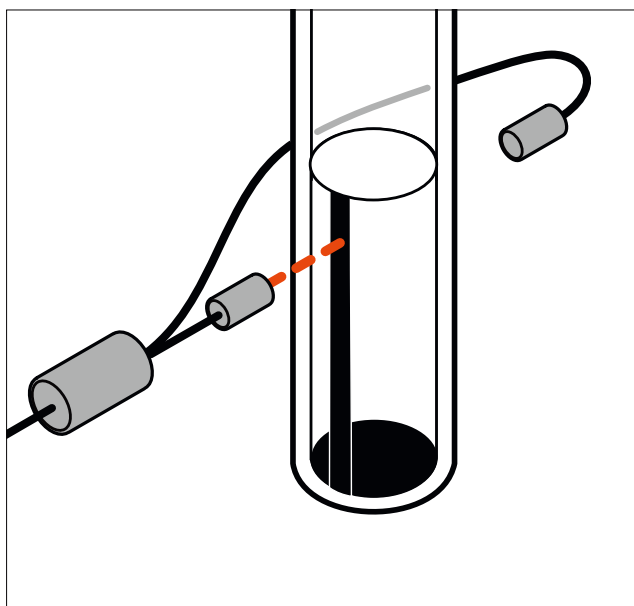


Checking drill breakage

Using a through-beam light sensor with double-slotted apertures, a drill breakage check can be carried out from 2 m away. Drills larger than approx. 2 mm diameter can be checked this way. If even smaller drills (down to 1 mm Ø) have to be checked, then a laser through-beam sensor can be used.

Detecting small parts

With an optical adapter such as the BOS 18-PK-1, small parts can be measured and the background simultaneously suppressed. In this way, with a sensing distance of up to 13 mm, for example, fibers with a diameter of 0.05 mm can be queried, where the color plays a subordinate role. Diffuse sensors with background suppression enable larger ranges.

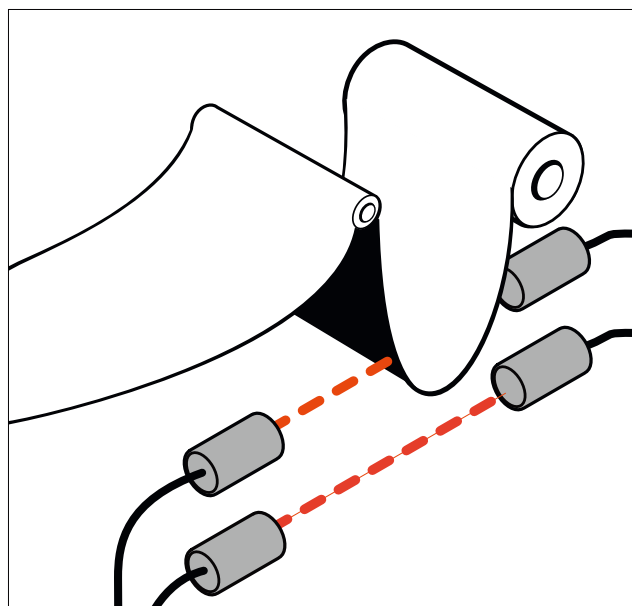
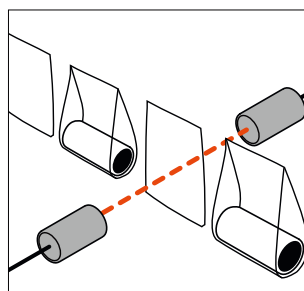


Querying fill level in transparent containers

During the fill level query in a transparent container (cylinder), a diffuse sensor with fiber optics is used as a through-beam sensor. If no liquid is at the sensor height, the light beam is not broken, so that it hits the receiver. If enough fluid is available, the light beam is deflected away from the receiver. The switch changes its output condition.

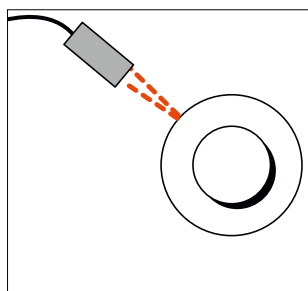
Querying packaging contents

A through-beam sensor is used in order to query the content of a package (e.g., bandages). To do so, the emitter and receiver are arranged so that the light beam goes through the packaging. If the packaging is empty, the light is sufficient to light up the receiver. If it is filled, the packaging contents interrupt the emitter's light beam, and the sensor switches.



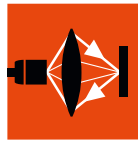
Recognizing different diameters

In order to be able to recognize different shaft diameters, a diffuse sensor with background suppression (HGA) is used in such a manner that it switches with large diameters. Small diameters, on the other hand, are suppressed as "background" so that the sensor does not switch.



Checking sag

Two through-beam sensors can be used to control the positioning of a roller conveyor. In addition, the through-beams are arranged above each other so that at optimum slack, the lower light beam is clear and the upper beam interrupted. If both light beams are clear, more roll tension is needed. If both are interrupted, there is too much material (slack) present.



Photoelectric Sensors
Performance Spectrum
Product Overview

Photoelectric Sensors

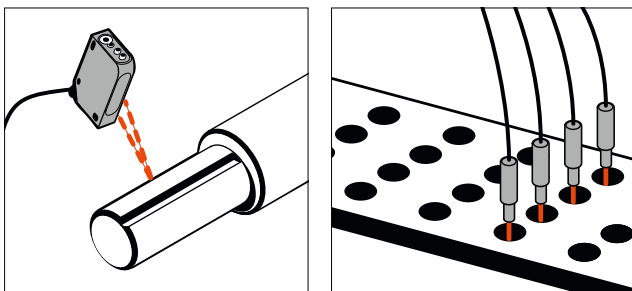
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

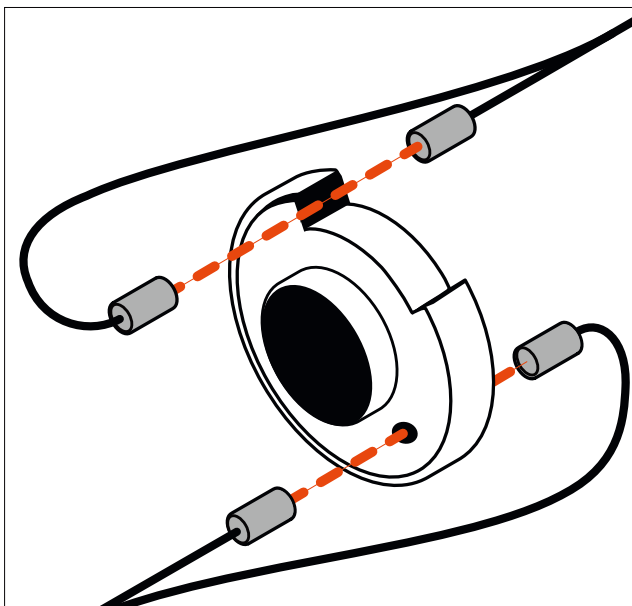
Positioning parts

In order to correctly position pivoted parts, its groove can be scanned. A laser sensor with background suppression is calibrated so that it recognizes the surface of the pivoted part. If the light beam strikes the slot, the light is reflected back to the sensor at a different angle. The switch recognizes this as a background signal and ignores it, i. e. changes its switching state.



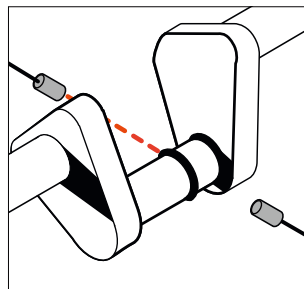
Checking the level: Granular material in small packages

Multiple sensors simultaneously check the content of a whole series of small packages on a conveyor belt. In addition, the user can shorten the plastic fiber optics to the desired length. Its standard length is 2 m.



Checking the quality of workpieces

Multiple sensors with fiber optic attachments simultaneously check different features of a workpiece. Only if all drill holes, screws, dimensional accuracies, surface qualities etc. are present may the workpiece be processed further. Later failures and downtime are thus avoided.

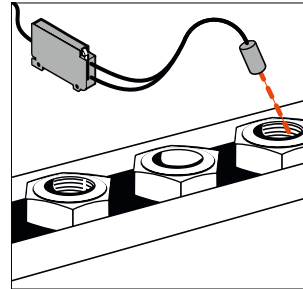
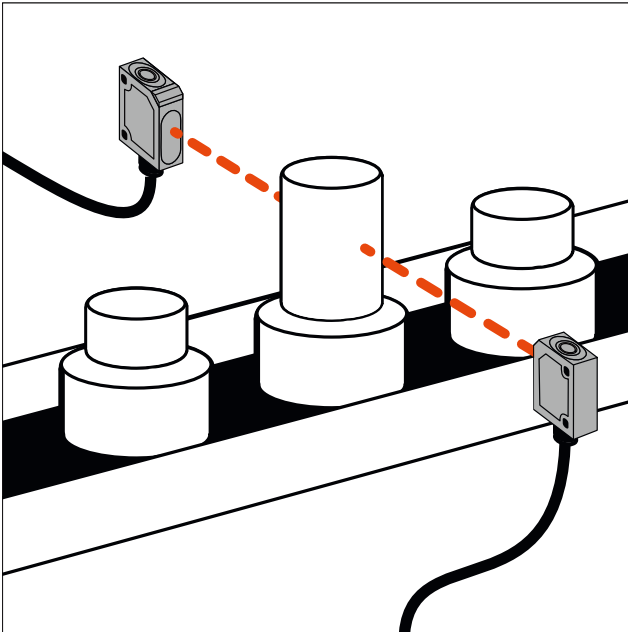


Detecting the bead of a camshaft

To detect whether a bead is present, a diffuse sensor with fiber optics is used. This fiber optic is arranged on a level parallel to the camshaft. If a bead is present on the camshaft, the light beam is interrupted. With no bead, the beam path is free.

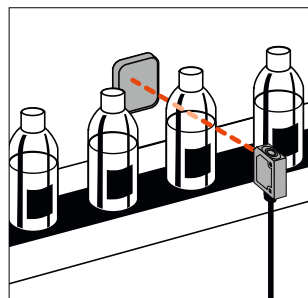
Sorting parts

In order to be able to sort parts of various heights, a through-beam sensor is used. To do so, a teach-in process is used so that taller parts interrupt the light beam and can be sorted out. The quick and secure teach-in enables quick adaptation to changed conditions.



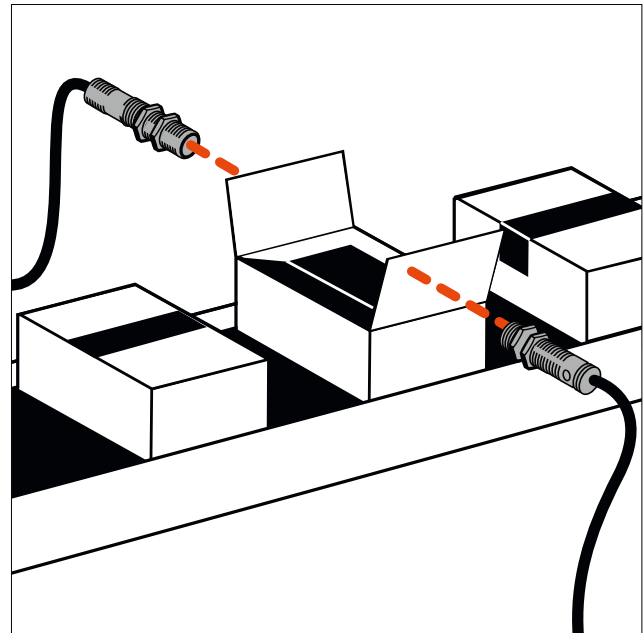
Checking threads

Prior to assembling nuts, a check needs to be made to determine whether a thread is present or not. If the thread is present, they will reflect the light back to the fiber optics and the sensor will operate. If the thread is missing, there will be a total reflection on the blank wall of the drill hole, and as a result, no light will be reflected to the fiber optics. The sensor does not switch.



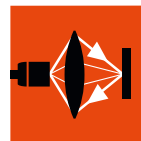
Counting transparent bottles

Transparent objects absorb only a little light. In order to measure them accurately, retroreflective light sensors with small hysteresis are best suited. Through their teach-in-buttons, the sensors can additionally be set very easily, and their configuration can be changed even when the process is running. Unnecessary downtimes are thus prevented easily.



Checking packaging

In order to check whether a packaging is correctly closed, a through-beam sensor is configured so that the light beam runs just above the packaging. If it is not correctly closed, the obstructing lid interrupts the light beam, and the through-beam sensor signals it.



Photoelectric Sensors
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Product Overview

Photoelectric Sensors

Photoelectric Sensors with Special Properties

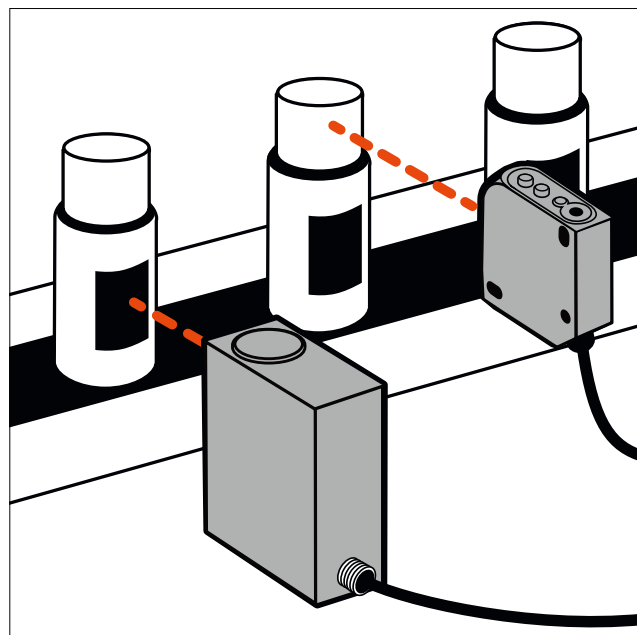
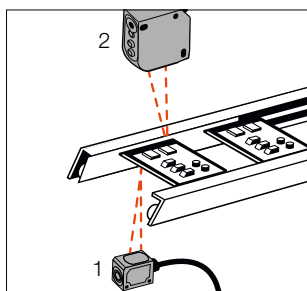
Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Positioning and checking equipment

To bring the circuit board to a particular inspection position, a focused diffuse sensor (1) is used. The board crosses the light beam of the sensor exactly in its focus. This enables maximum precision.

Through the small spot of light of the laser diffuse sensor (2) and its background suppression, it can be checked whether even small components are present on the board.

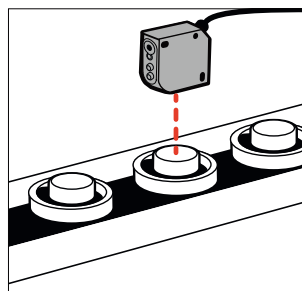
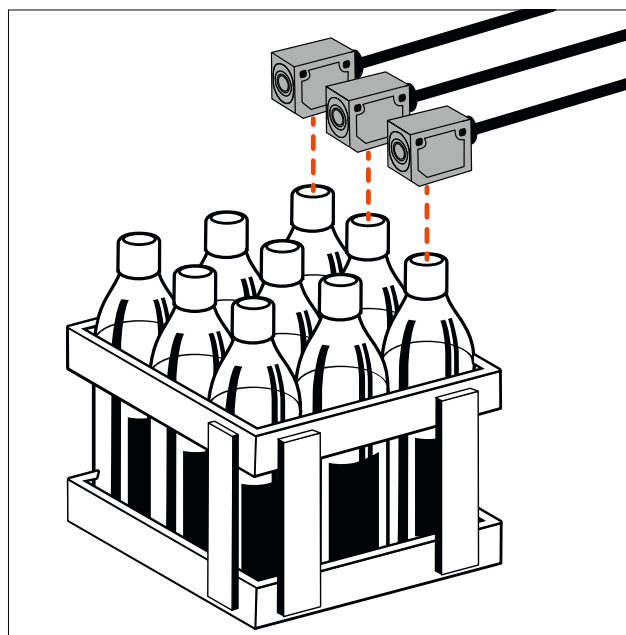


Final inspection of labels and caps

For the final inspection of dish detergent bottles, a check must be made to determine whether the label and cap are attached. A contrast sensor is used for the label inspection. This distinguishes between the relative reflectivity of the label and the bottle. The cap is detected using a diffuse sensor with background suppression. The advantage of background suppression is that the screw closure can be faded out if the cap is missing.

Checking completeness

In order to be able to check an assembly process in detail, diffuse sensors with background suppression (HGA) are used. These sense small objects with high precision and are not misled by different colors. If details need to be measured even more accurately, we recommend laser sensors with background suppression.



Inspecting closing caps

Depending on installation circumstances and the required switching distance, a wide variety of diffuse sensors with background suppression can be employed. In this way, you can choose excellent specialists from the tightest installation conditions, the maximum resolution or high ranges. Contact us



Type	BOS 08M	BOS 08M	BOS 12M	BOS 12M laser	BOS 18M	BOS 18M red light
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Housing material	Metal	Stainless steel	Metal	Metal	Metal	Metal
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Range/sensing distance

Through-beam sensor emitter/receiver	0...1.1 m	0...1.5 m	0...5 m	0...3 m, 0...30 m	0...20 m, 0...25 m	0...20 m
Retroreflective sensor						
Retroreflective light sensor with polarizing filter	25...550 mm		0...1.5 m		4 m, 6 m	7 m
Retroreflective sensor for glass detection						
Diffuse sensor	0...55 mm		0...100 mm, 0...200 mm, 0...400 mm		1...400 mm, 1...600 mm	1...300 mm, 1...600 mm
Diffuse sensor with background suppression			0...24 mm, 10...60 mm			30...150 mm, 30...300 mm
Diffuse sensor with foreground suppression						

Technical data

Supply voltage	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
Output function	PNP NO/NC	PNP NO	PNP NO/NC	PNP NO/NC	PNP NO/NC	PNP NO/NC
Connection	Connectors/cables	Cable	Connectors/cables	Connectors/cables	Plug connector	Plug connector
Ambient temperature	-10...+60 °C	-10...+60 °C	-5...+55 °C, -15...+55 °C, -20...+60 °C	-10...+50 °C	-5...+55 °C	-5...+55 °C
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
Light	Red light	Infrared light	Infrared light/red light	Laser	Infrared light/red light	Red light
Special features						
Page	38	40	44	51	56	62

Dynamic
Sensor
Control



**BOS 18M
red light
Teach-in**

Metal



**BOS 18M
red light
angle head**

Metal



**BOS 18M
infrared**

Metal



**BOS 18M
Laser**

Metal



**BOS 18M
laser with
angle head**

Metal



BOS 18E

Stainless steel

Global



BOS 18KF

Plastic

Global



**BOS 18KF
laser**

Plastic



Photoelectric
Sensors
Performance
Spectrum
Product
Overview

Photoelectric
Sensors

Photoelectric
Sensors with
Special Proper-
ties

Photoelectric
Distance
Sensors
for Analog
Distance
Measurement

Accessories for
Photoelectric
Sensors

	0...20 m	0...16 m	0...50 m	0...50 m, 0...60 m	0...50 m	16 m	0...20 m	0...60 m
	5 m	2 m	10 m	0.1...16 m	0.1...9 m	4 m	0.1...4.5 m	
			7 m			2 m	0.1...5 m	0.1...16 m
							0.1...1.7 m	
	1...500 mm	0...400 mm	1...800 mm	0...350 mm	0...250 mm	0...100 mm, 0...200 mm, 0...400 mm	0...100 mm, 0...400 mm, 0...700 mm	0...350 mm
		10...120 mm, 40...120 mm		30...150 mm		0...40 mm	50...100 mm, 100 mm 40...100 mm	
	10...30 V DC	10...30 V DC, 10...36 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
	PNP NO/NC	PNP NO/NC	PNP NO/NC	PNP NO/NC	PNP NO/NC	PNP NO/NC	PNP NO/NC	PNP NO/NC
	Plug connector	Plug connector	Plug connector	Connectors/ cables	Connectors/ cables	Plug connector	Connectors/ cables	Connectors/ cables
	-5...+55 °C	-15...+55 °C, -25...+55 °C	-5...+55 °C	-5...+55 °C, -10...+55 °C, -15...+55 °C	-5...+55 °C	-5...+75 °C, -20...+75 °C	-25...+55 °C	-10...+50 °C
	IP 67	IP 67	IP 67	IP 65/IP 67	IP 67	IP 69K/IP 68	IP 67	IP 67
	Red light	Red light	Infrared light	Laser	Laser	Infrared light/ red light	Infrared light/ red light	Laser
	with DSC							
	70	72	76	82	86	96	104	112



Type	BOS 18KW with angle head	BOS 18KW laser with angle head	BOS 30M	BOS Q08M	BOS Q08M Laser	BOS 2K
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Housing material	Plastic	Plastic	Metal	Metal	Metal	Plastic
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Range/sensing distance

Through-beam sensor emitter/receiver	0...15 m	0...50 m		0...2.2 m	0...3 m	0...1.2 m	
Retroreflective light sensor with polarizing filter	0.1...3 m	0.1...9 m		25...550 mm		45...800 m	
Retroreflective sensor for glass detection	0.1...1.7 m						
Retroreflective light sensor with autocollimation							
Diffuse sensor	0...80 mm, 0...400 mm	0...250 mm	0...2 m	0...55 mm		1...55 mm	
Diffuse sensor with background suppression	50...100 mm			5...50 mm		1...15 mm, 1...30 mm	
Diffuse sensor with foreground and background suppression							

Technical data

Supply voltage	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	
Output function	PNP NO/NC	PNP NO/NC	PNP/NPN	PNP NO/NC	PNP NO/NC	PNP NO/NC	
Connection	Connectors/ cables	Connectors/ cables	Plug connector	Connectors/ cables	Connectors/ cables	Connectors/ cables	
Ambient temperature	-25...+55 °C	-10...+50 °C	-20...+60 °C	-10...+60 °C	0...+50 °C	-20...+50 °C	
Degree of protection	IP 67	IP 67	IP 65	IP 67	IP 67	IP 67	
Light	Infrared light/ red light	Laser	Infrared light	Red light	Laser	Red light	
Page	122	128	137	140	144	150	

Global



BOS 5K

Plastic



BOS 6K

Plastic



**BOS 6K
Laser**

Plastic



BOS 21M

Metal



**BOS 21M
Laser**

Metal



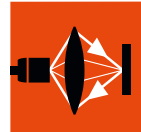
BOS 23K

Plastic



**BOS 23K
Laser**

Plastic



Photoelectric Sensors
Performance Spectrum
Product Overview

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

	BOS 5K	BOS 6K	BOS 6K Laser	BOS 21M	BOS 21M Laser	BOS 23K	BOS 23K Laser	
	0...10 m	0...6.5 m		0...20 m	0...60 m	0...20 m	0...25 m	
	0.1...4 m		0.05...3 m	0.1...8 m	0.1...20 m	0.3...12 m	0.3...12 m	
		0...500 mm, 50...700 mm		0...2 m				
		0...500 mm	0...4 m	0...4 m				
	1...900 mm, 50...200 mm	20...300 mm		0.01...1 m, 0.05...2 m	0...600 mm	0...2 m	0...1.2 m	
		25...100 mm	20...60 mm, 30...110 mm	70...200 mm	50...100 mm	70...800 mm	120...600 mm, 150...800 mm	
				70...200 mm				
	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC, 12...30 V DC	
	PNP NO/NC	PNP NO/NC	PNP NO/NC	PNP NO/NC	PNP NO/NC	PNP NO/NC	PNP NO/NC	
	Connectors/ cables	Connectors/ cables	Connectors/ cables	Plug connector	Plug connector	Plug connector	Plug connector	
	-25...+55 °C	-20...+60 °C	-20...+60 °C	-10...+50 °C, -25...+55 °C	-10...+50 °C	-20...+60 °C	-20...+60 °C	
	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67, IP 69K	IP 67, IP 69K	
	Infrared light/ red light	Red light	Laser/red light	Infrared light/ red light	Laser	Red light	Laser	
	160	170	176	184	190	198	200	



Type

BOS 26K **BOS 26K Laser** **BOS 50K** **BOS 63M Laser** **BOS 64K**

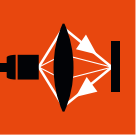
Housing material Plastic Plastic Plastic Metal PBT

Range/sensing distance

Through-beam sensor emitter/receiver			0...60 m		0...50 m
Retroreflective light sensor with polarizing filter			0.1...18 m		0.1...10 m
Retroreflective light sensor with autocollimation	0...5.5 m	0...6 m, 0...7 m, 0...20 m			
Diffuse sensor			1...2000 mm 1...3500 mm		0.05...2 m
Diffuse sensor with background suppression	30...300 mm, 150...600 mm	30...150 mm, 40...60 mm, 50...300 mm	200...2000 mm	0.2...6 m	0.2...2 mm

Technical data

Supply voltage	10...30 V DC	10...30 V DC	10...30 V DC	15...30 V DC	24...60 V DC
Output function	PNP NO/NC	PNP NO/NC	PNP NO/NC	2× PNP	Relay
Connection	Plug connector	Plug connector	Plug connector	Plug connector	Screw terminal
Ambient temperature	-20...+60 °C	-15...+45 °C, -20...+45 °C	-5...+55 °C, -10...+60 °C,	-10...+60 °C	-25...+55 °C
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67	IP 67	IP 67
Light	Infrared light/red light	Laser	Red light	Laser	Infrared, Red light
Special features			partially with IO-Link		
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**Product
Overview**

Photoelectric
Sensors

Photoelectric
Sensors with
Special Proper-
ties

Photoelectric
Distance
Sensors
for Analog
Distance
Measurement

Accessories for
Photoelectric
Sensors



Type

BFB 75K

BOS 73K

BOS 6K

BOS 18KF

BOS

BFO

Housing material

Plastic

Plastic

Plastic

Plastic

Metal

Plastic

Range/sensing distance

Optical fiber base units

Depending on fiber used

Depending on fiber used

Depending on fiber used

Depending on fiber used

Depending on fiber used

Distance sensor

Diffuse sensor with background suppression
Contrast sensor

Technical data

Supply voltage

10...30 V DC

11...26 V DC

10...30 V DC

10...30 V DC

10...30 V DC

Output function

PNP/NPN
NO/NC

PNP NO/NC

PNP/NPN
NO/NC

PNP/NPN
NO/NC

PNP NO/NC

Connection

Connectors/
cables

Connectors/
cables

Connectors/
cables

Connectors/
cables

Plug
connector

Ambient temperature

-20...+60 °C

-25...+55 °C

-20...+60 °C

-25...+55 °C

-20...+60 °C

-40...+105 °C

Degree of protection as per IEC 60529

IP 64

IP 54

IP 67

IP 67

IP 67

Light

Red light

Red light

Red light

Red light

Infrared light

for red light

Special features

with display,
analog
output

with display

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Photoelectric Sensors
Performance Spectrum
Product Overview

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



BFO 18
glass fiber optics
Metal, Silicon, polyurethane

BOD 6K
Plastic



BOD 21M
laser
Metal



BOD 26K
laser
Plastic



BOD 63M
laser
Metal



BOD 66M
Metal



BOD 66M
laser
Metal



BKT 6K
laser
Plastic

		20...80 mm	25...45 mm, 20...200 mm, 20...500 mm	45...85 mm, 30...100 mm, 80...300 mm	200...2000 mm, 200...6000 mm	100...600 mm	150...800 mm 150...2000 mm	
		20...80 mm		30...100 mm, 80...300 mm	200...2000 mm, 200...6000 mm	100...600 mm	150...800 mm 150...2000 mm	40...150 mm
		15...30 V DC	18...30 V DC	18...28 V DC, 18...30 V DC	15...30 V DC	18...30 V DC	18...30 V DC	10...30 V DC
		analog PNP NO/NC	analog PNP NO/NC	analog PNP NO/NC	analog PNP NO Plug connector	analog PNP NO Plug connector	analog PNP NO Plug connector	PNP/NPN NO/NC
		Connectors/ cables	Plug connector	Connectors/ cables	Plug connector	Plug connector	Plug connector	Connectors/ cables
	-20...+85 °C, -0...+170 °C	-20...+60 °C	-10...+50 °C	0...+45 °C, -10...+60 °C	-10...+60 °C	-20...+50 °C	-20...+50 °C	-20...+60 °C
		IP 67	IP 67	IP 67	IP 67	IP 65	IP 65	IP 67
	for infrared light	Red light	Laser	Laser	Laser	Red light	Laser	Laser
	Custom lengths possible	Teach-in						Focused light beam
	346	355	356	358	367	371	373	297



Type

BKT 18KF

BKT 21M

BKT 67M

BLT 18KF

BLT 21M

BFS 26K

Housing material

Plastic

Metal

Metal

Plastic

Metal

Plastic

Range/sensing distance

Contrast sensor

10 mm±2 mm

19 mm±2 mm

9 mm ±3 mm
(18 mm) ±4 mm

8...20 mm

0...40 mm

Luminescence sensor

Color sensor

12...32 mm,
15...30 mm,
18...22 mm,

Fork sensor

Technical data

Supply voltage

10...30 V DC

10...30 V DC,

10...30 V DC

10...30 V DC

10...30 V DC

12...28 V DC

Output function

PNP NO/NC

PNP/NPN
NO/NC

PNP/NPN/
Analog
NO/NC

PNP NO/NC

PNP NO/NC

3 × PNP
NO

Connection

Connectors/
cables

Plug
connector

Plug
connector

Connectors/
cables

Plug
connector

Plug
connector

Ambient temperature

-25...+55 °C

-25...+55 °C

-10...+55 °C

-25...+55 °C

-10...+55 °C

-10...+55 °C

Degree of protection as per IEC 60529

IP 67

IP 67

IP 67

IP 67

IP 67

IP 67

Light

White light

White light

Red, green
and blue light
Interchange-
able optics

UV

UV

White light

Special features

various
Light spot
sizes

Page

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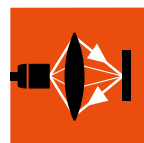
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Photoelectric Sensors
Performance Spectrum
Product Overview

	BFS 33M true color sensor	BGL red light	BGL pin point	BGL infrared	BGL laser	BGL 21	BGL_C analog	
	Metal	Metal	Metal	Metal	Metal	Metal	Metal	
						2 mm	30 mm, 50 mm	Photoelectric Sensors
								Photoelectric Sensors with Special Properties
	up to 400 mm							Photoelectric Distance Sensors for Analog Distance Measurement
		5, 10, 20, 30, 50, 80, 120, 180, 220 mm	5, 10, 20, 30, 50, 80, 120, 180, 220 mm	5, 10, 20, 30, 50, 80, 120, 180, 220 mm	30, 50, 80, 120 mm			Accessories for Photoelectric Sensors
	24 V DC 3 × push-pull RS 232	10...30 V DC PNP NO/NC	10...30 V DC PNP NO/NC	10...30 V DC PNP NO/NC	10...30 V DC PNP NO/NC	10...30 V DC PNP/NPN NO/NC	18...30 V DC PNP/analog NO/NC	
	Cable	Plug connector	Plug connector	Plug connector	Plug connector	Plug connector	Plug connector	
	+10...+55 °C IP 54	-10...+60 °C IP 67	-10...+60 °C IP 67	-10...+60 °C IP 67	-10...+60 °C IP 67	-20...+60 °C IP 65	-5...+55 °C IP 65	
	White light	Red light	Red light, pin point	Infrared	Laser	Infrared/ red, green light for label sensing	Red light	
	True color Sensor			Fluid detection	Transparent Detection		IO-Link, DSC	
	291	240	244	248	252	259	276	

Type	 BWL red light	 BWL pin point	 BWL infrared	 BWL laser	 BWL automotive	 BOW
Housing material	Metal	Metal	Metal	Metal	Metal	Metal
Range/sensing distance						
Fork sensor						
Angled light sensor	40, 54, 68, 90, 110 mm	40, 54, 68, 90, 110 mm	40, 54, 68, 90, 110 mm	40, 54, 68, 90, 110 mm	22×22 mm, 43×43 mm, 42×62 mm	
Optical window sensor						40×80 mm, 80×80 mm, 120×80 mm
Light grids						
Technical data						
Supply voltage	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
Output function	PNP NO/NC	PNP NO/NC	PNP NO/NC	PNP NO/NC	PNP NO	PNP NO
Connection	Plug connector	Plug connector	Plug connector	Plug connector	Plug connector	Plug connector
Ambient temperature	-10...+60 °C	-10...+60 °C	-10...+60 °C	-10...+60 °C	-10...+60 °C	-10...+55 °C
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67	IP 67	IP 67	IP 65
Light	Red light	Red light, Pin point	Infrared light	Laser	Infrared light	Infrared light
Special features	stackable	stackable	stackable	stackable		Dynamic measuring procedures
Page	262	264	266	268	270	282



BLG

Metal



Photoelectric Sensors
 Performance Spectrum
Product Overview

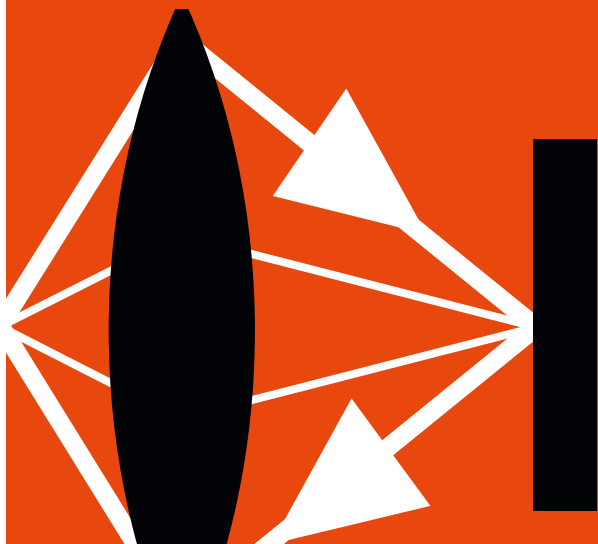
	0.15...2.1 m							
	24 V DC, PNP/analog NO Plug connector 0...+55 °C IP 65 Infrared light							
	various mea- surement field heights 287							

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Photoelectric Sensors

Photoelectric sensors for object detection

Our broad portfolio of standard sensors provides the ideal solution for every application, whether using through-beam, retroreflective or diffuse light sensors. You can freely choose your light type. This stems from the fact that, regardless of type, the sensors operate with easily visible red light, invisible infrared light or incredibly precise laser light.

All of the sensors are robust and reliable – even under harsh ambient conditions or in complex applications.



Cylinder Designs

BOS 08M	36
BOS 12M	42
BOS 18M	52
BOS 18E	94
BOS 18KF	102
BOS 18KW	120
BOS 30M	134



Block Designs

BOS Q08M	138
BOS 2K	148
BOS 5K	158
BOS 6K	168
BOS 21M	182
BOS 23K	196
BOS 26K	208
BOS 50K	218
BOS 63M	228
BOS 64K	232

Fork Sensors BGL

Red light	240
Pin point	244
Infrared	248
Laser	252
Special	254
Label detection	258

Angle Sensors BWL

Red light	262
Pin point	264
Infrared	266
Laser	268
Automotive	270



Basic information and definitions can be found on page 934.

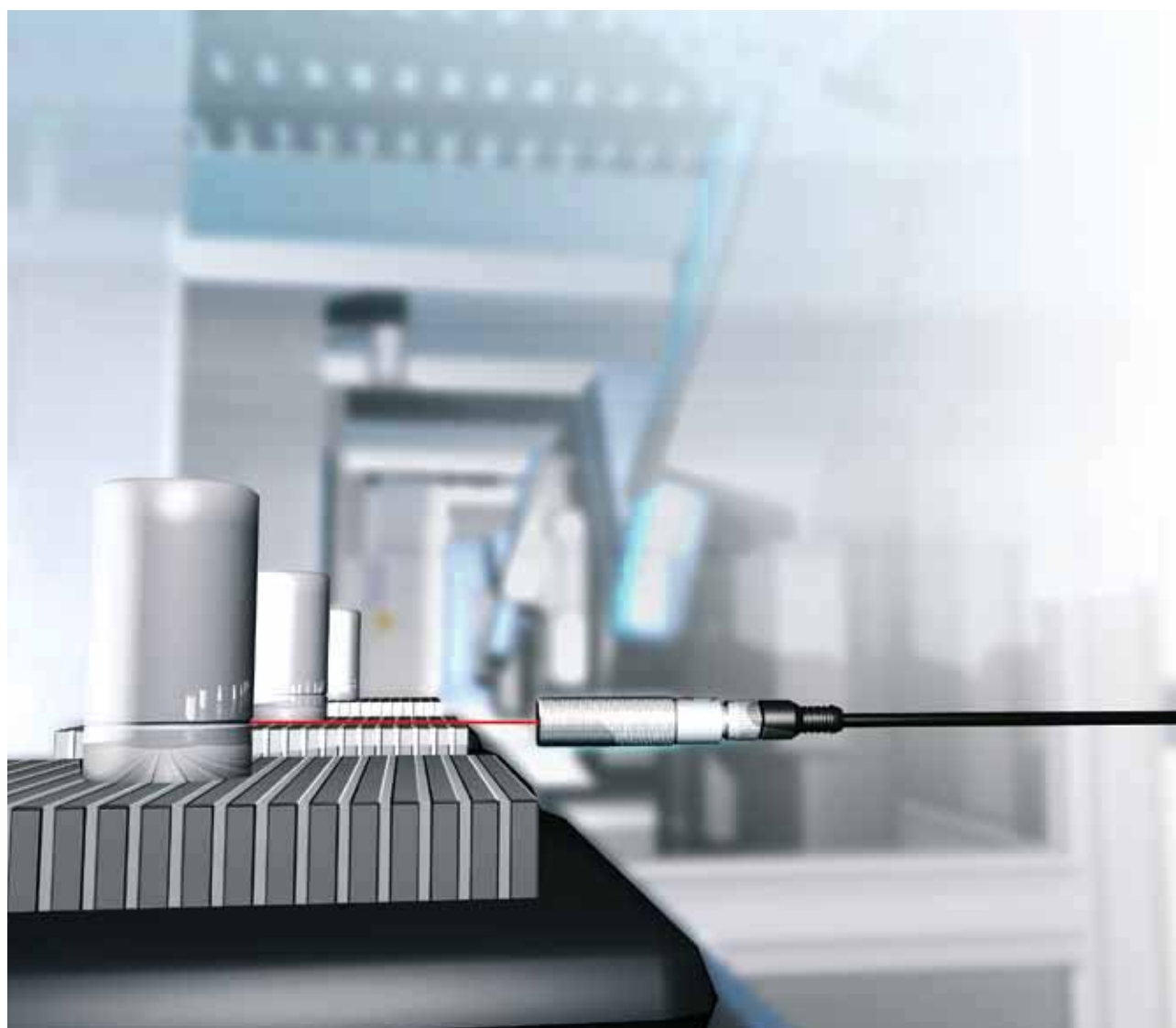


Photoelectric Sensors BOS 08M

Small size – big performance

The Opto-mini.s **BOS 08M** sensors stand out with their ease of handling and fixed sensing distances and ranges. They are small, robust, flexible and affordable.

This is how the small photoelectric sensors open up possibilities in highly dynamic applications such as robot arms. This is precisely where components that have very low weight and small dimensions while retaining high switching precision are in demand.



Photoelectric Sensors

BOS 08M

Product overview



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance

Sensors for Analog

Distance Measurement

Accessories for Photoelectric Sensors

Type	Sensing distance/Range	Material Housing		Light type		Output	Switching type		Switching frequency	U _s	Connection		Page
		Nickel-plated CuZn	Stainless steel	Red light	Infrared		PNP transistor	Light switching			Dark switching	10...30V DC	
Diffuse sensor													
BOS0006	BOS 08M-PS-RD11-S49	0...55 mm	■	■	■	■	■		400 Hz	■	■		38
BOS0004	BOS 08M-PO-RD11-S49	0...55 mm	■		■	■		■	400 Hz	■	■		38
BOS0005	BOS 08M-PS-RD11-02	0...55 mm	■		■	■	■		400 Hz	■		■	38
BOS0003	BOS 08M-PO-RD11-02	0...55 mm	■		■	■		■	400 Hz	■		■	38
Retroreflective sensor with polarizing filter													
BOS00RC	BOS 08M-PS-PR11-S49	25...550 mm	■		■	■		■	400 Hz	■	■		38
BOS00R9	BOS 08M-PO-PR11-S49	25...550 mm	■		■	■	■		400 Hz	■	■		38
BOS00RA	BOS 08M-PS-PR11-02	25...550 mm	■		■	■		■	400 Hz	■		■	39
BOS00R8	BOS 08M-PO-PR11-02	25...550 mm	■		■	■	■		400 Hz	■		■	39
Through-beam sensor Receiver													
BOS00W9	BOS 08M-PS-RE11-S49	0...1.1 m	■		■	■		■	400 Hz	■	■		39
BOS0153	BOS 08M-PO-RE11-S49	0...1.1 m	■		■	■	■		400 Hz	■	■		39
BOS018F	BOS 08M-PS-RE11-02	0...1.1 m	■		■	■		■	400 Hz	■		■	39
BOS018E	BOS 08M-PO-RE11-02	0...1.1 m	■		■	■	■		400 Hz	■		■	39
BOS01F7	BOS 08E-PS-IE11-02	0...1.5 m		■		■		■	400 Hz	■		■	40
Through-beam sensor Emitter													
BOS0151	BOS 08M-X-RS11-S49	0...1.1 m	■		■					■	■		39
BOS018H	BOS 08M-X-RS11-02	0...1.1 m	■		■					■		■	39
BOS01F6	BOS 08E-X-IS11-02	0...1.5 m		■		■				■		■	40

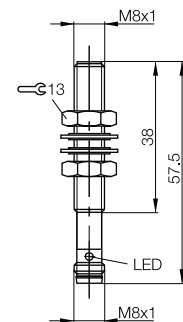
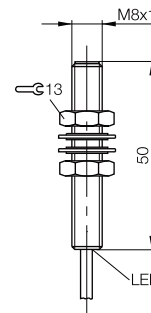
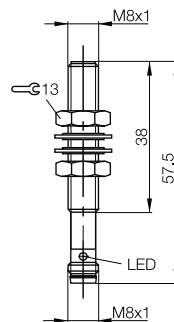
NPN on request



Type		Diffuse sensor	Diffuse sensor	Retroreflective sensor
Detection range		0...55 mm	0...55 mm	25...550 mm
PNP NO	Ordering code	BOS0006	BOS0005	
	Part number	BOS 08M-PS-RD11-S49	BOS 08M-PS-RD11-02	
PNP NC	Ordering code	BOS0004	BOS0003	
	Part number	BOS 08M-PO-RD11-S49	BOS 08M-PO-RD11-02	
PNP NO	Polarizing filter	Ordering code		BOS00RC
	Part number			BOS 08M-PS-PR11-S49
PNP NC	Polarizing filter	Ordering code		BOS00R9
	Part number			BOS 08M-PO-PR11-S49
PNP NO	Receiver	Ordering code		
	Part number			
PNP NC	Receiver	Ordering code		
	Part number			
	Emitter	Ordering code		
	Part number			
Supply voltage U _S		10...30 V DC	10...30 V DC	10...30 V DC
Output current		100 mA	100 mA	100 mA
No-load supply current I ₀ max.		20 mA	20 mA	20 mA
Switching type		Light or dark switching	Light or dark switching	Light or dark switching
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes	Yes/Yes
Settings		Fixed	Fixed	Fixed
Emitter, light type		LED, red light	LED, red light	LED, red light
Wavelength		640 Nm	640 Nm	640 Nm
Received light indicator		Yellow LED	Yellow LED	Yellow LED
Response time		1.25 ms	1.25 ms	1.25 ms
Switching frequency f		400 Hz	400 Hz	400 Hz
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Ambient temperature T _a		-10...+60 °C	-10...+60 °C	-10...+60 °C
Permissible ambient light per		EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
Material	Housing	Nickel-plated CuZn	Nickel-plated CuZn	Nickel-plated CuZn
	Optical surface	PMMA	PMMA	PMMA
Connection		M8 connector, 3-pin	2 m PUR cable 3x0.14 mm ²	M8 connector, 3-pin

Reference object: white, 90% reflection, 200x200 mm
Reference reflector: BOS R-9

For wiring diagrams see page 41.





Retroreflective sensor 25...550 mm	Through-beam sensor 0...1.1 m	Through-beam sensor 0...1.1 m	Through-beam sensor 0...1.1 m	Through-beam sensor 0...1.1 m
BOS00RA BOS 08M-PS-PR11-02				
BOS00R8 BOS 08M-PO-PR11-02				
	BOS00W9 BOS 08M-PS-RE11-S49		BOS018F BOS 08M-PS-RE11-02	
	BOS0153 BOS 08M-PO-RE11-S49		BOS018E BOS 08M-PO-RE11-02	
		BOS0151 BOS 08M-X-RS11-S49		BOS018H BOS 08M-X-RS11-02
10...30 V DC 100 mA 20 mA	10...30 V DC 100 mA ≤ 15 mA	10...30 V DC ≤ 15 mA	10...30 V DC 100 mA ≤ 15 mA	10...30 V DC ≤ 15 mA
Light or dark switching Yes/Yes Fixed	Light or dark switching Yes/Yes Fixed	Yes/Yes Fixed	Light or dark switching Yes/Yes Fixed	Yes/Yes Fixed
LED, red light 640 Nm Yellow LED 1.25 ms 400 Hz	Yellow LED 1.25 ms 400 Hz	LED, red light 640 Nm	Yellow LED 1.25 ms 400 Hz	LED, red light 640 Nm
IP 67 -10...+60 °C EN 60947-5-2	IP 67 -10...+60 °C EN 60947-5-2	IP 67 -10...+60 °C EN 60947-5-2	IP 67 -10...+60 °C EN 60947-5-2	IP 67 -10...+60 °C EN 60947-5-2
Nickel-plated CuZn PMMA 2 m PUR cable, 3×0.14 mm ²	Nickel-plated CuZn PMMA M8 connector, 3-pin	Nickel-plated CuZn PMMA M8 connector, 3-pin	Nickel-plated CuZn PMMA 2 m PUR cable, 3×0.14 mm ²	Nickel-plated CuZn PMMA 2 m PUR cable, 2×0.14 mm ²



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

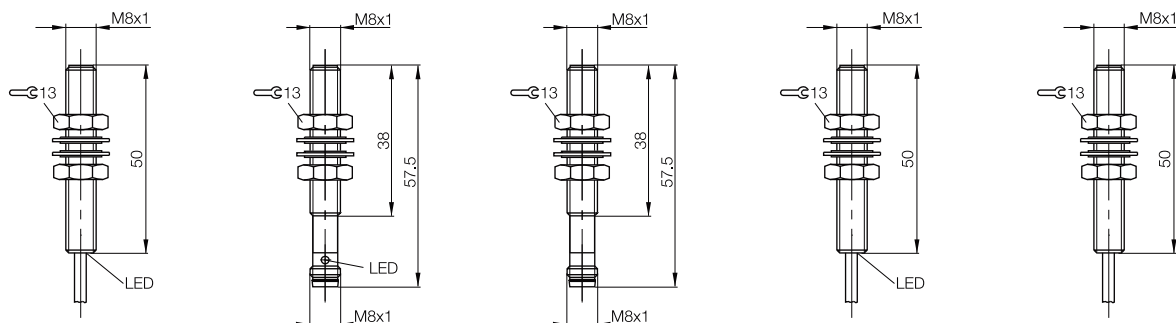
Fork Sensors
BGL

Angle Sensors
BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

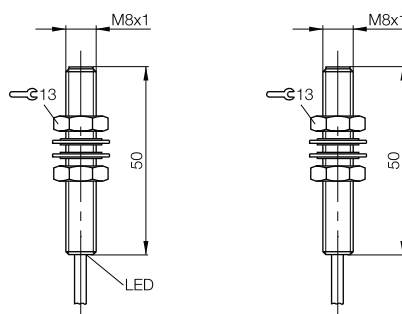
Accessories for Photoelectric Sensors

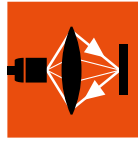


M8 Stainless Steel mini.s



Type		Through-beam sensor	Through-beam sensor
Detection range		0...1.5 m	0...1.5 m
PNP NO Receiver	Ordering code	BOS01F7	
	Part number	BOS 08E-PS-IE11-02	
Emitter	Ordering code		BOS01F6
	Part number		BOS 08E-X-IS11-02
Supply voltage U_s		10...30 V DC	10...30 V DC
Output current		100 mA	
No-load supply current I_0 max.		≤ 8 mA	≤ 15 mA
Switching type		Dark switching	
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes
Settings		Fixed	Fixed
Emitter, light type			LED, infrared light
Wavelength			940 Nm
Received light indicator		Yellow LED	
Response time		1.25 ms	
Switching frequency f		400 Hz	
Degree of protection as per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-10...60°C	-10...60°C
Permissible ambient light per		EN 60947-5-2	EN 60947-5-2
Material	Housing	Stainless steel 1.4404	Stainless steel 1.4404
	Optical surface	PMMA	PMMA
Connection		2 m PUR cable, 3×0.14 m ²	2 m PUR cable, 2×0.14 m ²





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors BGL

Angle Sensors BWL

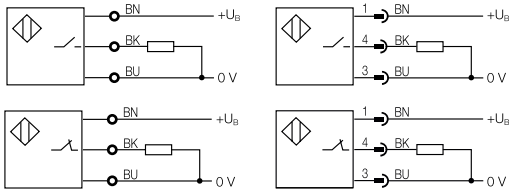
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

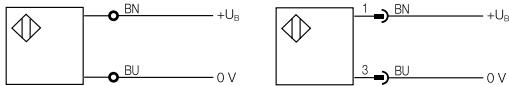
Accessories for Photoelectric Sensors

Wiring diagrams

Diffuse, retroreflective, through-beam sensor receivers



Through-beam sensor emitters



Display elements

Yellow LED: Received light indicator

The LED can show 3 different statuses:

- LED off: No object detected
- LED lights up and stays on: Object detected
- LED flashes: Contamination indicator/signal not stable

Recommended accessories
 (please order separately)

Description	Ordering code
Reflector	BAM00WL



You can find special accessories for diffuse sensors, such as **reflectors, apertures, lenses, filters and deflection heads**, in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Suitable connectors
 (please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M8, 3-pin	Straight	PUR	Black	2 m	BCC02M8
M8, 3-pin	Straight	PVC	Gray	2 m	BCC02NU
M8, 3-pin	Angled	PUR	Black	2 m	BCC02ML
M8, 3-pin	Angled	PVC	Gray	2 m	BCC02P5

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.

Simplification with potential

Brilliant solutions impress with their simplicity, as does our **BOS 12M** series. That is because these sensors in a fully potted metal housing with IP 67 degree of protection have been optimized for typical applications. This simplification creates potential.

All the sensors are enclosed in the same housing as a typical inductive proximity switch (M12×1) for this reason. This means photoelectric sensors and inductive proximity switches are mechanically and electrically compatible.

Their installation also draws attention with its simplicity. This is because BOS 12M sensors are fastened in place simply by drilling holes. This provides the following benefits:

- Simplifies the design of machines and systems.
- Adapts sensor principles more quickly.
- Allows accessories to be used in multiple ways, thereby reducing stock levels as well.

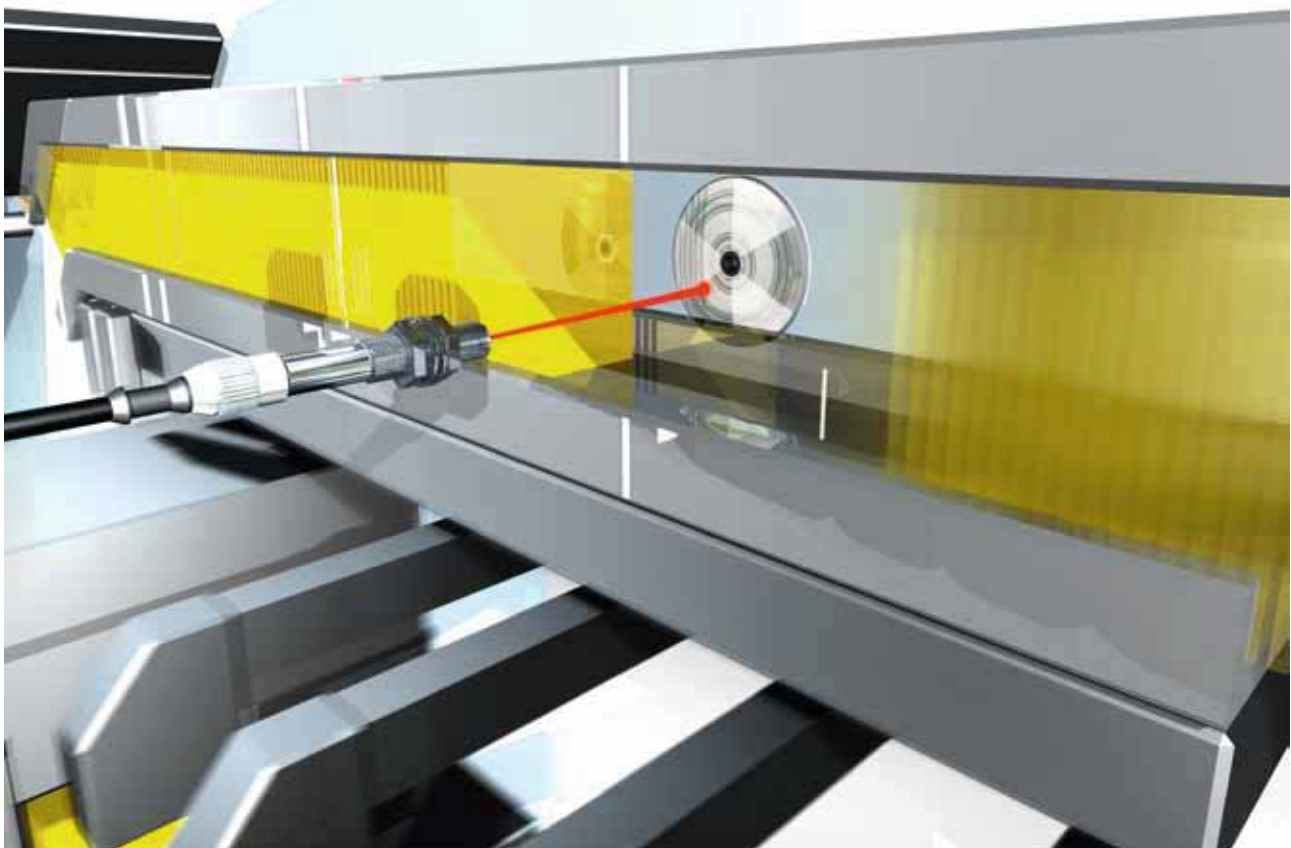
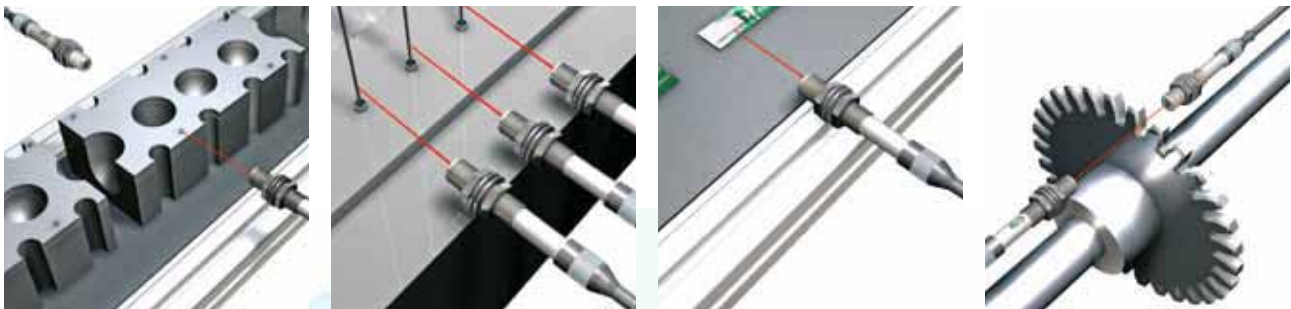
For long ranges or for detecting small parts, laser through-beam light sensors are available in two different designs.

Features

- Supply voltage 10...30 V DC, protected from polarity reversal
- Function indicator for the output
- IP 67 degree of protection
- Standard (M12×1) metal housing
- Red and infrared light versions
- Fixed and adjustable sensitivity
- PNP or NPN, light or dark switching
- Cable and connector versions (M12 connector)

Applications

- General automation tasks
- Assembly and handling technology
- Machine tool building
- Packaging industry
- Robots
- Machine tool building



Photoelectric Sensors

BOS 12M Global

Product overview



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors BGL

Angle Sensors BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type	Sensing distance/Range	Light type			Output	Switching type		Switching frequency	U _s	Connec-tion		Special features		Page
		Red light	Infrared	Laser		PNP transistor	Light switching			Dark switching	10...30 V DC	M12 plug, 4-pin	Cable, 3 m	
Diffuse sensor with background suppression														
BOS007R	BOS 12M-PS-1N11-S4-C	0...24 mm	■		■	■		1 kHz	■	■				44
BOS007T	BOS 12M-PU-1HA-S4-C	10...60 mm	■		■	■	■	1 kHz	■	■		■	■	44
Diffuse sensor														
BOS0012	BOS 12M-PS-1YA-S4-C	1...100 mm	■		■	■		200 Hz	■	■				44
BOS000P	BOS 12M-PO-1YA-S4-C	1...100 mm	■		■		■	200 Hz	■	■				44
BOS0010	BOS 12M-PS-1YA-BO-C-03	1...100 mm	■		■	■		200 Hz	■		■			45
BOS000N	BOS 12M-PO-1YA-BO-C-03	1...100 mm	■		■		■	200 Hz	■		■			45
BOS0043	BOS 12M-PS-1YB-S4-C	1...200 mm	■		■	■		200 Hz	■	■				45
BOS000T	BOS 12M-PO-1YB-S4-C	1...200 mm	■		■		■	200 Hz	■	■				45
BOS0013	BOS 12M-PS-1YB-BO-C-03	1...200 mm	■		■	■		200 Hz	■		■			45
BOS000R	BOS 12M-PO-1YB-BO-C-03	1...200 mm	■		■		■	200 Hz	■		■			45
BOS000W	BOS 12M-PS-1PB-S4-C	1...200 mm		■	■	■		200 Hz	■	■		■		45
BOS000U	BOS 12M-PS-1PB-BO-C-03	1...200 mm		■	■	■		200 Hz	■		■	■		45
BOS0045	BOS 12M-PS-1PD-S4-C	1...400 mm		■	■	■		200 Hz	■	■		■		46
BOS0044	BOS 12M-PO-1PD-S4-C	1...400 mm		■	■		■	200 Hz	■	■		■		46
BOS000Y	BOS 12M-PS-1PD-BO-C-03	1...400 mm		■	■	■		200 Hz	■		■	■		46
BOS000L	BOS 12M-PO-1PD-BO-C-03	1...400 mm		■	■		■	200 Hz	■		■	■		46
Retroreflective sensor with polarizing filter														
BOS00RE	BOS 12M-PS-1QA-S4-C	0...1.5 m	■		■		■	200 Hz	■	■		■		46
BOS00RJ	BOS 12M-PO-1QA-S4-C	0...1.5 m	■		■	■		200 Hz	■	■		■		46
BOS00RK	BOS 12M-PS-1QA-BO-C-03	0...1.5 m	■		■		■	200 Hz	■		■	■		47
BOS00RH	BOS 12M-PO-1QA-BO-C-03	0...1.5 m	■		■	■		200 Hz	■		■	■		47
Through-beam sensor Receiver														
BOS00UE	BLE 12M-PA-1PD-S4-C	0...5 m	■		■	■	■	500 Hz	■	■		■		47
BOS00UC	BLE 12M-PA-1PD-BO-C-03	0...5 m	■		■	■	■	500 Hz	■		■	■		47
Through-beam sensor Emitter														
BOS00W2	BLS 12M-XX-1RD-S4-L	0...5 m	■						■	■				47
BOS00UW	BLS 12M-XX-1RD-BO-L-03	0...5 m	■						■		■			47
Laser through-beam sensor Receiver														
BOS00WF	BOS 12M-PA-LE10-S4				■	■	■	1 kHz	■	■		■		51
BOS00WE	BOS 12M-PA-LE10-03				■	■	■	1 kHz	■		■	■		51
Laser through-beam sensor Emitter														
BOS00WH	BOS 12M-X-LS11-S4	0...3 m			■				■	■				51
BOS00WL	BOS 12M-XT-LS11-S4	0...3 m			■				■	■				51
BOS00WK	BOS 12M-XT-LS11-03	0...3 m			■				■		■			51
BOS00WJ	BOS 12M-X-LS12-S4	0...30 m			■				■	■				51
BOS00WN	BOS 12M-XT-LS12-S4	0...30 m			■				■	■				51
BOS00WM	BOS 12M-XT-LS12-03	0...30 m			■				■		■			51

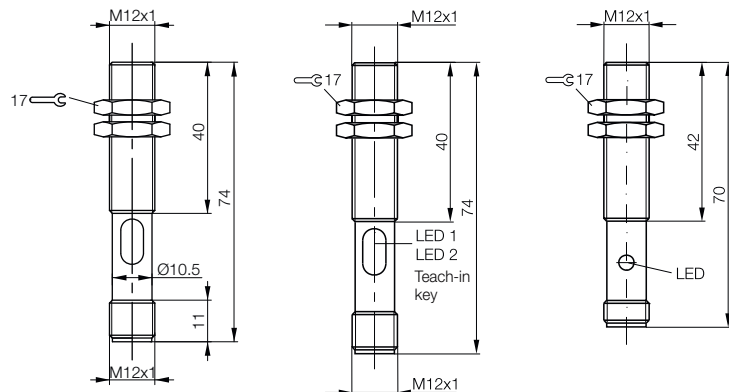
NPN on request



Type		Diffuse sensor with background suppression	Diffuse sensor with background suppression	Diffuse sensor
Detection range		0...24 mm	10...60 mm	1...100 mm
PNP NO Background suppression	Ordering code	BOS007R		
	Part number	BOS 12M-PS-1N1I-S4-C		
PNP NO/NC Background suppression, Teach-in	Ordering code		BOS007T	
	Part number		BOS 12M-PU-1HA-S4-C	
PNP NO	Ordering code			BOS0012
	Part number			BOS 12M-PS-1YA-S4-C
PNP NC	Ordering code			BOS000P
	Part number			BOS 12M-PO-1YA-S4-C
Supply voltage U_S		10...30 V DC	10...30 V DC	10...30 V DC
Output current		100 mA	100 mA	≤ 200 mA
No-load supply current I_0 max.		≤ 25 mA	≤ 25 mA	≤ 20 mA
Switching type		Light switching	Light/dark switching (selectable)	Light or dark switching
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes	Yes/Yes
Settings		Fixed	Teach-in	Fixed
Emitter, light type		LED, red light	LED, red light	LED, red light
Wavelength		660 Nm	660 Nm	660 Nm
Light spot diameter		5×5 mm	5×5 mm at 50 mm	
Distance hysteresis		≤ 5%	≤ 5%	
Gray value shift (90%/18%)		≤ 5%	≤ 6%	
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Stability indicator		Green LED	Green LED	
Response time		0.5 ms	0.5 ms	2.5 ms
Switching frequency f		1 kHz	1 kHz	200 Hz
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Ambient temperature T_a		-20...+60 °C	-20...+60 °C	-15...+55 °C
Permissible ambient light		5 klx	5 klx	5 klx
Material	Housing	Nickel-plated CuZn	Nickel-plated CuZn	Nickel-plated CuZn
	Optical surface	PMMA	PMMA	PMMA
Connection		M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Reference object: white, 90% reflection, 200×200 mm

For wiring diagrams see page 49.





Diffuse sensor 1...100 mm	Diffuse sensor 1...200 mm	Diffuse sensor 1...200 mm	Diffuse sensor 1...200 mm	Diffuse sensor 1...200 mm
BOS0010 BOS 12M-PS-1YA-B0-C-03	BOS000W BOS 12M-PS-1PB-S4-C	BOS000U BOS 12M-PS-1PB-B0-C-03	BOS0043 BOS 12M-PS-1YB-S4-C	BOS0013 BOS 12M-PS-1YB-B0-C-03
BOS000N BOS 12M-PO-1YA-B0-C-03			BOS000T BOS 12M-PO-1YB-S4-C	BOS000R BOS 12M-PO-1YB-B0-C-03
10...30 V DC ≤ 200 mA ≤ 20 mA Light or dark switching Yes/Yes Fixed LED, red light 660 Nm	10...30 V DC ≤ 200 mA ≤ 20 mA Light switching Yes/Yes Potentiometer, 270° LED, infrared light 880 Nm	10...30 V DC ≤ 200 mA ≤ 20 mA Light switching Yes/Yes Potentiometer, 270° LED, infrared light 880 Nm	10...30 V DC ≤ 200 mA ≤ 20 mA Light or dark switching Yes/Yes Fixed LED, red light 660 Nm	10...30 V DC ≤ 200 mA ≤ 20 mA Light or dark switching Yes/Yes Fixed LED, red light 660 Nm
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
2.5 ms 200 Hz IP 67 -15...+55 °C 5 klx Nickel-plated CuZn PMMA 3 m PVC cable, 3x0.34 mm ²	2.5 ms 200 Hz IP 67 -5...+55 °C 5 klx Nickel-plated CuZn PMMA M12 connector, 4-pin	2.5 ms 200 Hz IP 67 -5...+55 °C 5 klx Nickel-plated CuZn PMMA 3 m PVC cable, 3x0.34 mm ²	2.5 ms 200 Hz IP 67 -15...+55 °C 5 klx Nickel-plated CuZn PMMA M12 connector, 4-pin	2.5 ms 200 Hz IP 67 -15...+55 °C 5 klx Nickel-plated CuZn PMMA 3 m PVC cable, 3x0.34 mm ²



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

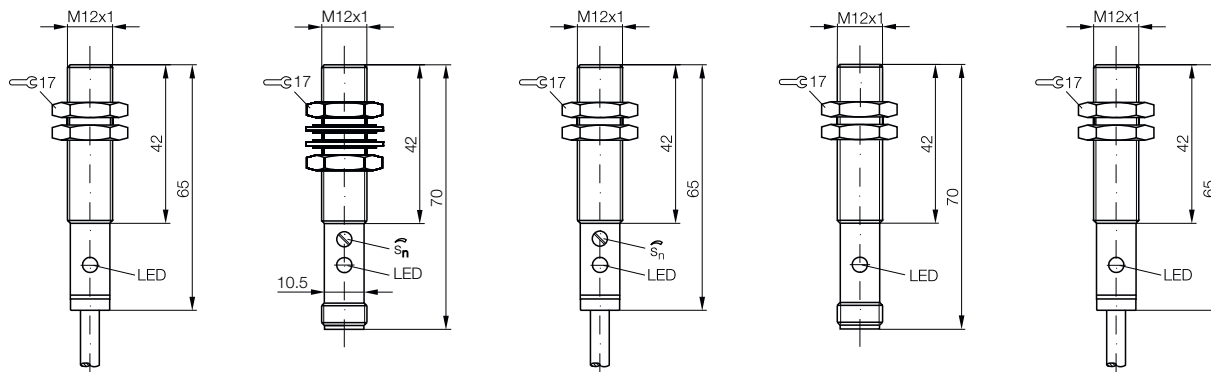
Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

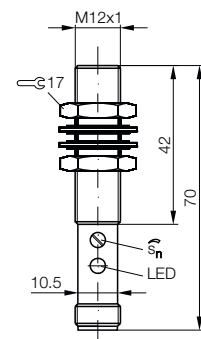
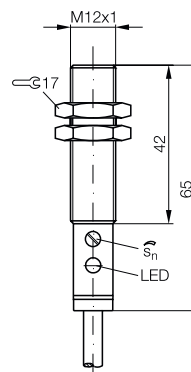
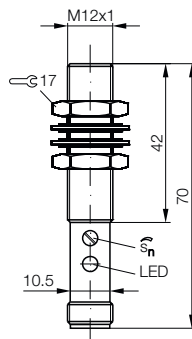


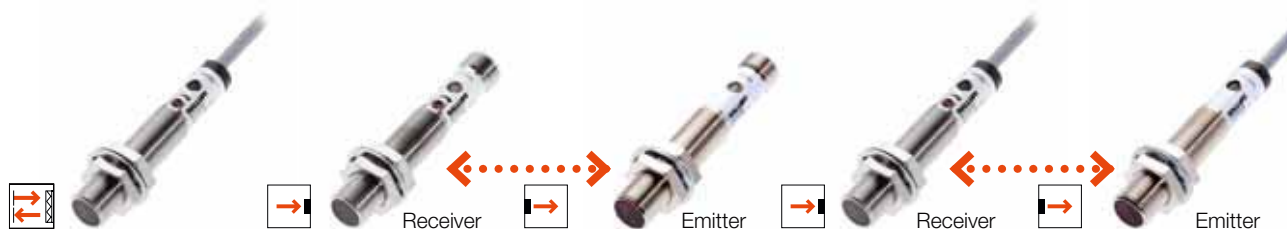


Type		Diffuse sensor	Diffuse sensor	Retroreflective sensor
Detection range		1...400 mm	1...400 mm	0...1.5 m
PNP NO	Ordering code	BOS0045	BOS000Y	
	Part number	BOS 12M-PS-1PD-S4-C	BOS 12M-PS-1PD-B0-C-03	
PNP NC	Ordering code	BOS0044	BOS000L	
	Part number	BOS 12M-PO-1PD-S4-C	BOS 12M-PO-1PD-B0-C-03	
PNP NO Polarizing filter	Ordering code			BOS00RE
	Part number			BOS 12M-PS-1QA-S4-C
PNP NC Polarizing filter	Ordering code			BOS00RJ
	Part number			BOS 12M-PO-1QA-S4-C
PNP complementary Receiver	Ordering code			
	Part number			
Emitter	Ordering code			
	Part number			
Supply voltage U_S		10...30 V DC	10...30 V DC	10...30 V DC
Output current		≤ 200 mA	≤ 200 mA	≤ 200 mA
No-load supply current I_0 max.		≤ 20 mA	≤ 20 mA	≤ 20 mA
Switching type		Light or dark switching	Light or dark switching	Light or dark switching
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes	Yes/Yes
Settings		Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°
Emitter, light type		LED, infrared light	LED, infrared light	LED, red light
Wavelength		880 Nm	880 Nm	660 Nm
Power-on indicator				
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Response time		2.5 ms	2.5 ms	2.5 ms
Switching frequency f		200 Hz	200 Hz	200 Hz
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Ambient temperature T_a		-15...+55 °C	-15...+55 °C	-15...+55 °C
Permissible ambient light		5 klx	5 klx	5 klx
Material	Housing	Nickel-plated CuZn	Nickel-plated CuZn	Nickel-plated CuZn
	Optical surface	PMMA	PMMA	PMMA
Connection		M12 connector, 4-pin	3 m PVC cable, 3x0.34 mm ²	M12 connector, 4-pin

Reference object: white, 90% reflection, 200x200 mm
Reference reflector: BOS R-1

For wiring diagrams see page 49.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

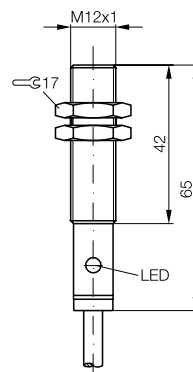
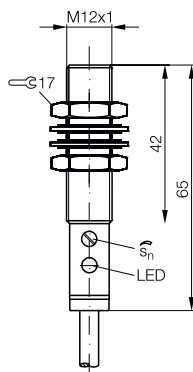
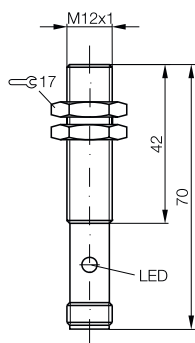
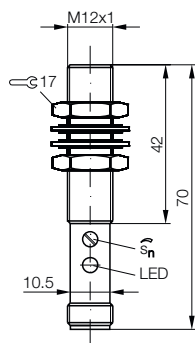
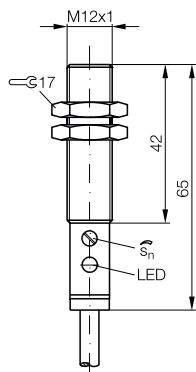
BWL

Photoelectric Sensors with Special Properties

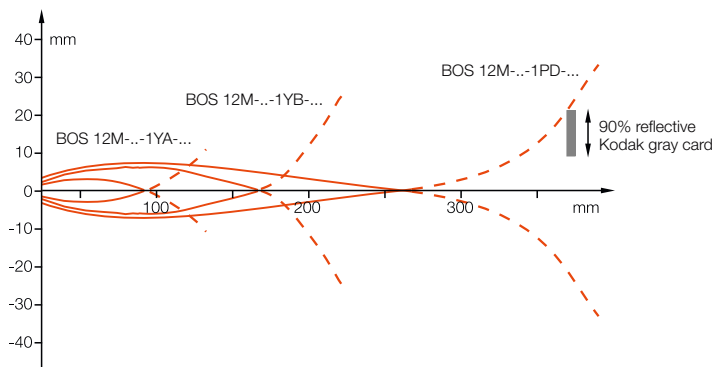
Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Retroreflective sensor 0...1.5 m	Through-beam sensor 0...5 m	Through-beam sensor 0...5 m	Through-beam sensor 0...5 m	Through-beam sensor 0...5 m
BOS00RK BOS 12M-PS-1QA-B0-C-03				
BOS00RH BOS 12M-PO-1QA-B0-C-03				
	BOS00UE BLE 12M-PA-1PD-S4-C		BOS00UC BLE 12M-PA-1PD-B0-C-03	
		BOS00W2 BLS 12M-XX-1RD-S4-L		BOS00UW BLS 12M-XX-1RD-B0-L-03
10...30 V DC ≤ 200 mA ≤ 20 mA	10...30 V DC ≤ 200 mA ≤ 20 mA	10...30 V DC ≤ 20 mA	10...30 V DC ≤ 200 mA ≤ 20 mA	10...30 V DC ≤ 20 mA
Light or dark switching Yes/Yes	Light and dark switching Yes/Yes	Yes/Yes	Light and dark switching Yes/Yes	Yes/Yes
Potentiometer, 270°	Potentiometer, 270°		Potentiometer, 270°	
LED, red light 660 Nm	LED, red light 660 Nm	LED, red light 660 Nm Green LED	LED, red light 660 Nm	LED, red light 660 Nm Green LED
Yellow LED 2.5 ms 200 Hz	Yellow LED 1 ms 500 Hz		Yellow LED 1 ms 500 Hz	
IP 67	IP 67	IP 67	IP 67	IP 67
-15...+55 °C	-15...+55 °C	-15...+55 °C	-15...+55 °C	-15...+55 °C
5 klx	5 klx	5 klx	5 klx	5 klx
Nickel-plated CuZn PMMA	Nickel-plated CuZn PMMA	Nickel-plated CuZn PMMA	Nickel-plated CuZn PMMA	Nickel-plated CuZn PMMA
3 m PVC cable 3x0.34 mm ²	M12 connector, 4-pin	M12 connector, 4-pin	3 m PVC cable, 3x0.34 mm ²	3 m PVC cable, 3x0.34 mm ²

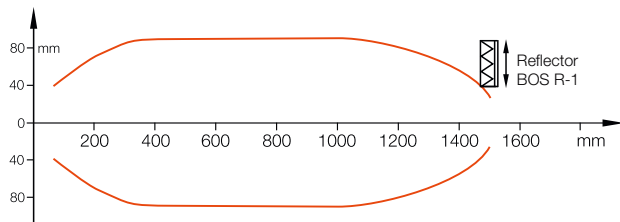


Diffuse sensor BOS 12M-..-1YA/1YB/1PD-...



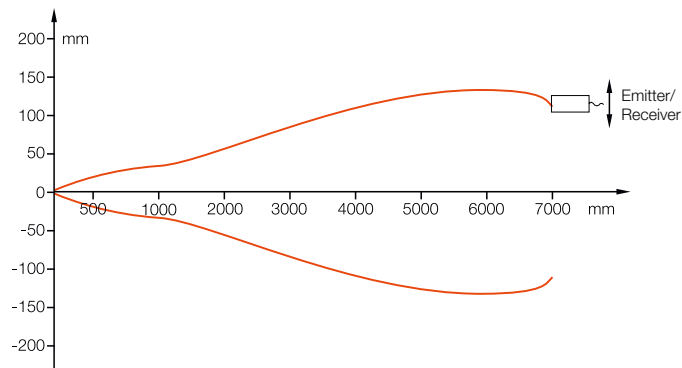
Sensing distance measured with side approach of Kodak gray card.

Retroreflective sensor BOS 12M-..-1QA-...

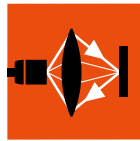


Range measured with side approach with reflector.

Through-beam sensor BLE/BLS 12M-...



The maximum possible offset between the emitter and receiver is measured for the through-beam sensor.



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

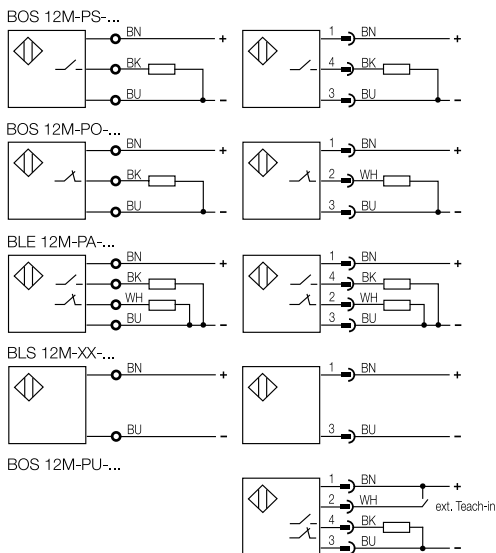
Orientation aid

The additional function indicator on the receiver of the through-beam sensor enables fast and simple alignment between the emitter and receiver.

First attach the receiver and then the emitter. As soon as the emitter is located within the active range of the receiver, the function indicator on the front of the sensor goes out. This indicates an optical connection between the emitter and receiver. It is also easily visible when the sensor is flush mounted.



Wiring diagrams



Recommended accessories
 (please order separately)

Description	Ordering code
① Reflector	BAM00WL
② Reflector	BAM00UK
③ Diagonal mirror	BAM00R0
④ Air shield	BAM00PY
⑤ Slit aperture	BAM00PW
⑥ Mounting cuff	BAM01KM
⑦ Cover nut	BAM01Y6



Suitable connectors
 (please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N



Connectors without LED are suitable for PNP and NPN sensors.

You can find special accessories for diffuse sensors, such as **reflectors, apertures, lenses, filters and deflection heads**, in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.

The basis of the 12 laser through-beam sensor BOS is its two different emitters. Emitter version **LS11** is for small parts detection and offers a resolution of 50 µm at the focal point of 500 mm.

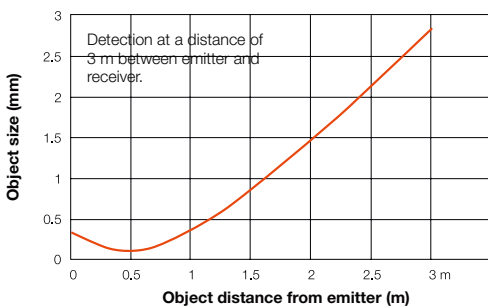
The **LS12** version is not focused and is used for long ranges up to 30 m. The receivers can be PNP or NPN, and any emitter can be combined with any receiver.

All sensors are Laser Class 1 and are available with a connector or cable.



Small parts detection

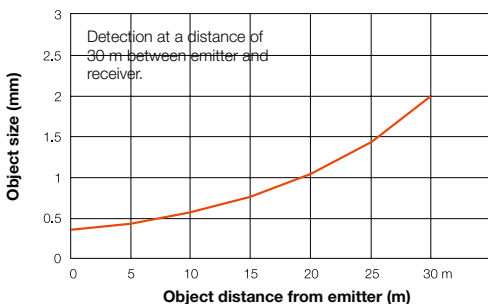
BOS 12M-XT-**LS11**-..



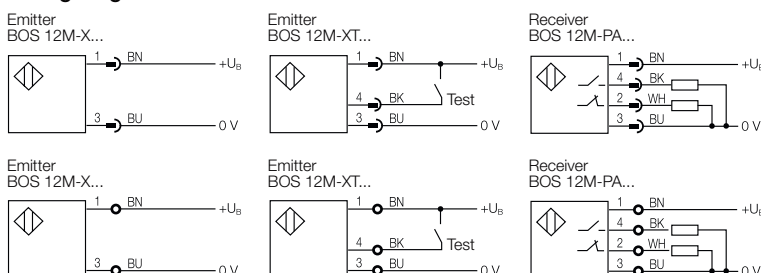
BOS 12M-XT-**LS12**-..



BOS 12M-XT-**LS12**-..



Wiring diagrams



Type	
Detection range	
Emitter	Ordering code
50 µm high resolution	Part number
Emitter	Ordering code
Long range 30 m	Part number
PNP	Ordering code
NO/NC	Part number
Receiver	Part number
Supply voltage U_s	
Output current	
No-load supply current I_0 max.	
Switching type	
Polarity reversal/short-circuit protected	
Settings	
Help function	
Emitter, light type	
Wavelength	
Laser class	
Output function indicator	
Response time	
Switching frequency f	
Degree of protection as per IEC 60529	
Ambient temperature T_a	
Permissible ambient light per	
Material	Housing
	Optical surface
Connection	



Photoelectric Sensors

BOS 12M



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors BGL

Angle Sensors BWL

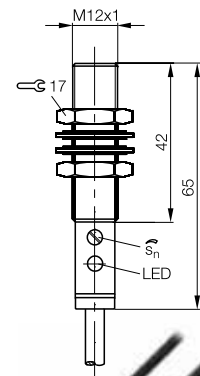
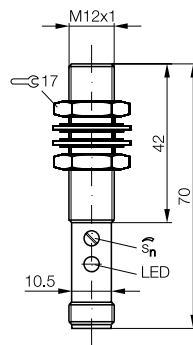
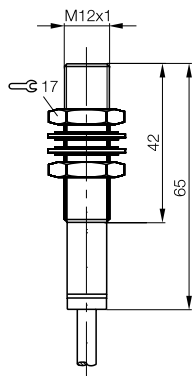
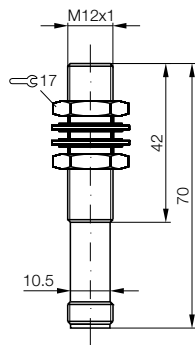
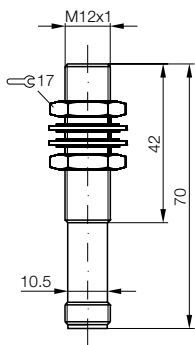
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Laser through-beam light sensor 0...3 m/0...30 m	Laser through-beam light sensor 0...3 m/0...30 m	Laser through-beam light sensor 0...3 m/0...30 m	Laser through-beam light sensor	Laser through-beam light sensor
BOS00WH	BOS00WL	BOS00WK		
BOS12M-X-LS11-S4	BOS 12M-XT-LS11-S4	BOS 12M-XT-LS11-03		
BOS00WJ	BOS00WN	BOS00WM		
BOS12M-X-LS12-S4	BOS 12M-XT-LS12-S4	BOS 12M-XT-LS12-03		
			BOS00WF	BOS00WE
			BOS 12M-PA-LE10-S4	BOS 12M-PA-LE10-03
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
≤ 10 mA	≤ 10 mA	≤ 10 mA	≤ 200 mA ≤ 15 mA	≤ 200 mA ≤ 15 mA
Yes/Yes	Yes/Yes	Yes/Yes	Light/dark switching (complementary) Yes/Yes Potentiometer, 270°	Light/dark switching (complementary) Yes/Yes Potentiometer, 270°
Laser, red light 655 Nm 1	Test input Laser, red light 655 Nm 1	Test input Laser, red light 655 Nm 1		
			Yellow LED 0.5 ms 1 kHz	Yellow LED 0.5 ms 1 kHz
IP 67	IP 67	IP 67	IP 67	IP 67
-10...+50 °C	-10...+50 °C	-10...+50 °C	-10...+50 °C	-10...+50 °C
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
Glass	Glass	Glass	PMMA	PMMA
M12 connector, 4-pin	M12 connector, 4-pin	3 m PVC cable, 3x0.34 mm ²	M12 connector, 4-pin	3 m PVC cable, 4x0.34 mm ²



Recommended accessories

(please order separately)

Description	Ordering code
Mounting cuff	BAM00R2



Suitable connectors

(please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N



More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Connectors without LED are suitable for PNP and NPN sensors.

BOS 18M GlobalProx – sound and cost-effective



We often come across systems in which a sensor adjustment is not required, not possible or is undesirable. Our BOS-18M diffuse sensors and light barriers from the Global family are the correct choice for these applications. All of these sensors have a fixed setting. This shortens the time required for system commissioning and protects against tampering. Equipped with a sound basic range of functions, these sensors also have the best possible price/performance ratio.

- Sound performance and reliable object detection
- Ideal for standard applications, e.g. in automation
- Cost-effective alternative for all types of light
- Plug and play: All of these sensors have a fixed setting
- Universal fastening thanks to wide range of assembly accessories

Red light sensors M18 – for the highest precision

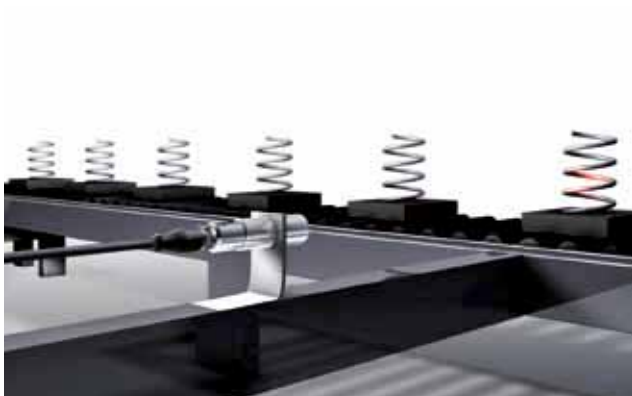


Precise switching behavior – excellent repeat accuracy

Cutting-edge LED technology and the latest Fresnel lenses are combined in this unit to form an innovative and powerful photoelectric sensor. In practice this means: Improved repeat accuracy and precise switching behavior even at large distances.

- Long range
- Rugged M18 metal housing
- State-of-the-art LED technology with sharply contoured light spot

BOS 18M background suppression – expertise with all kinds of light



Balluff M18 laser diffuse sensors with background suppression are a genuine highlight. They are available with different light types, allowing you to simply select according to your requirements. The perfectly focused light beam is able to detect the smallest of parts, grooves or holes with maximum precision and reliability. The large light spot of the red light variant with 300 mm is ideal for detecting objects with notches, holes or openings, because breakthroughs and free areas are simply bridged. The 150 mm red light version is ideal for distinguishing between foreground and background with high precision at extremely short distances.

- Exact, almost color-independent object detection
- The correct light type for every application – laser or red light
- Precise setting with 10-turn potentiometer
- Robust M18 metal housing with same design for all types
- Universal fastening and alignment thanks to wide range of assembly accessories

BOS 18M Teach-in



For users who prefer the teach-in procedure for sensor setting, Balluff now offers its successful red light series BOS 18M, with long ranges, precise switching behavior and very high levels of repeat accuracy. The top sensor in its class is quickly set at the push of a button.

Further advantage: The BOS 18M Teach-in reports "difficulties" immediately, by means of our patented "Dynamic Sensor Control" diagnostic system, which is available as an option. The DSC allows you to react immediately to contamination or malfunctions. Even users without DSC can make use of the contamination detection as the sensors are also optionally available with a separate alarm output.

- Continuous sensor monitoring of contamination and malfunctions
- Switchable output
- Simple teach-in procedure
- Standardized BOS-18M design for fast sensor change

BOS 18M infrared – invisible power



The successful BOS-18M series now also includes invisible infrared light. This light type displays its benefits precisely in dirty production environments: Objects are reliably detected regardless of dust and dirt. With its range of over 100 meters, the high-power version of the through-beam sensor impresses particularly in this area. The standardized design of all BOS 18Ms permits a simple change between the different types of light – without assembly change.

- Reliable object detection even in a contaminated environment
- Invisible light – does not irritate personnel
- Simple and fast setting with potentiometer
- Through-beam sensor with test input for function check
- Wide range of assembly accessories

BOS 18M Laser



The **BOS 18M(R) Laser** series is characterized by long ranges and absolute precision in small parts detection.

These sensors are Laser Class 1 and are available with axial or radial light exit. Newly added is a diffuse version with background suppression (Laser Class 2) and a sensing distance of 150 mm.

- Long ranges (50 m)
- High switching frequency (1.5 kHz)
- Straight- and right-angle versions
- Drill break monitoring
- Precise parts positioning
- Fast counting of objects
- High precision

The **BOS 18MR** product family has a built-in angled mirror made of scratch-resistant glass which is attached to the housing. Since the optical head does not protrude over the side, installation from the front is no problem.

- Standard M18×1 housing made of metal (nickel plated brass)
- All sensors use visible red light
- IP 67 degree of protection
- Supply voltage 10...30 V DC, polarity reversal protected
- Output short circuit protected
- Roller conveyors
- Conveying lines
- Packaging industry



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors BGL

Angle Sensors BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type	Sensing distance/Range	Light exit		Light type		Output		Switching type		Switching frequency	U _s	Con-nection	Special features						Page
		Straight	Angled	Red light	Infrared	Laser	PNP transistor	PNP transistor with DSC	Light switching				Dark switching	10...30 V DC	M12 plug, 4-pin	Cable	Polarizing filter	Teach-in	
Diffuse sensor with background suppression																			
BOS0081	BOS 18MR-PA-1HA-S4-C	40...120 mm	■	■			■		■	■	600 Hz	■	■					72	
BOS010J	BOS 18MR-PS-1HA-E5-C-S4	10...120 mm	■	■			■		■		500 Hz	■	■					72	
BOS01J4	BOS 18M-PA-RH23-S4	30...150 mm	■		■		■		■	■	500 Hz	■	■					62	
BOS01J2	BOS 18M-PSV-RH23-S4	30...150 mm	■		■		■		■		500 Hz	■	■			■		62	
BOS002H	BOS 18M-PS-LH22-S4	30...150 mm	■			■	■		■		500 Hz	■	■					82	
BOS002K	BOS 18M-PSV-LH22-S4	30...150 mm	■			■	■		■		500 Hz	■	■			■		82	
BOS001Z	BOS 18M-POV-LH22-S4	30...150 mm	■			■	■		■	■	500 Hz	■	■			■		82	
BOS01C5	BOS 18M-PA-LH23-S4	30...150 mm	■			■	■		■	■	500 Hz	■	■				■	83	
BOS01C4	BOS 18M-PSV-LH23-S4	30...150 mm	■			■	■		■		500 Hz	■	■			■	■	83	
BOS014W	BOS 18M-PA-RH22-S4	30...300 mm	■		■		■		■	■	500 Hz	■	■					63	
BOS019P	BOS 18M-PS-RH22-S4	30...300 mm	■		■		■		■		500 Hz	■	■					63	
BOS019N	BOS 18M-PSV-RH22-S4	30...300 mm	■		■		■		■		500 Hz	■	■			■		63	
BOS019R	BOS 18M-POV-RH22-S4	30...300 mm	■		■		■		■	■	500 Hz	■	■			■		63	
Diffuse sensor																			
BOS0141	BOS 18MR-PA-LD10-02	250 mm	■			■	■		■	■	1.5 kHz	■	■				■	86	
BOS0142	BOS 18MR-PA-LD10-S4	250 mm	■			■	■		■	■	1.5 kHz	■	■				■	86	
BOS01CA	BOS 18M-PA-RD21-S4	300 mm	■		■		■		■	■	400 Hz	■	■					64	
BOS01E7	BOS 18M-PS-RD21-S4	300 mm	■		■		■		■		400 Hz	■	■					64	
BOS01E8	BOS 18M-PO-RD21-S4	300 mm	■		■		■		■		400 Hz	■	■					65	
BOS013F	BOS 18M-PA-LD10-02	350 mm	■			■	■		■	■	1.5 kHz	■	■				■	83	
BOS013H	BOS 18M-PA-LD10-S4	350 mm	■			■	■		■	■	1.5 kHz	■	■				■	83	
BOS010K	BOS 18MR-PS-10D-E5-C-S4	400 mm	■	■			■		■		1 kHz	■	■					73	
BOS01FA	BOS 18M-PS-RD23-S4	400 mm	■		■		■		■		400 Hz	■	■					56	
BOS01FC	BOS 18M-PO-RD23-S4	400 mm	■		■		■		■		400 Hz	■	■					56	
BOS01HL	BOS 18M-PS-ID23-S4	600 mm	■			■	■		■	■	400 Hz	■	■					56	
BOS01J8	BOS 18M-PUV-RD30-S4	500 mm	■		■		■		■	■	1 kHz	■	■			■	■	70	
BOS01CU	BOS 18M-PUD-RD30-S4	500 mm	■		■		■	■	■	■	200 Hz	■	■			■		70	
BOS01CF	BOS 18M-PA-RD20-S4	600 mm	■		■		■		■	■	400 Hz	■	■					65	
BOS01C1	BOS 18M-PS-RD20-S4	600 mm	■		■		■		■		400 Hz	■	■					65	
BOS01E3	BOS 18M-PO-RD20-S4	600 mm	■		■		■		■		400 Hz	■	■					65	
BOS01J1	BOS 18M-PS-ID24-S4	400 mm	■		■		■		■		200 Hz	■	■					76	
BOS01EY	BOS 18M-PA-ID20-S4	800 mm	■		■		■		■	■	400 Hz	■	■					76	
Retroreflective sensor																			
BOS010L	BOS 18MR-PS-1QB-E5-C-S4	2 m	■	■			■		■		1 kHz	■	■			■		73	
BOS01F8	BOS 18M-PS-PR23-S4	4 m	■		■		■		■		400 Hz	■	■				■	57	
BOS01F9	BOS 18M-PO-PR23-S4	4 m	■		■		■		■		400 Hz	■	■				■	57	
BOS01J9	BOS 18M-PUV-PR30-S4	5 m	■		■		■		■	■	1 kHz	■	■			■	■	71	
BOS01CT	BOS 18M-PUD-PR30-S4	5 m	■		■		■	■	■	■	200 Hz	■	■			■	■	71	
BOS01HK	BOS 18M-PS-IR23-S4	6 m	■		■		■		■		400 Hz	■	■				■	57	
BOS01CE	BOS 18M-PA-PR20-S4	7 m	■		■		■		■		400 Hz	■	■					66	
BOS01FJ	BOS 18M-PA-PR20-S4S	7 m	■		■		■		■		400 Hz	■	■					66	
BOS01C3	BOS 18M-PS-PR20-S4	7 m	■		■		■		■		400 Hz	■	■					67	
BOS01CZ	BOS 18M-PO-PR20-S4	7 m	■		■		■		■		400 Hz	■	■					67	
BOS01EM	BOS 18M-PO-PR20-S4S	7 m	■		■		■		■		400 Hz	■	■					67	
BOS01HR	BOS 18M-PA-IR21-S4	7 m	■		■		■		■		400 Hz	■	■			■		77	
BOS0145	BOS 18MR-PA-LR10-02	9 m	■			■	■		■	■	1.5 kHz	■	■			■		87	
BOS0146	BOS 18MR-PA-LR10-S4	9 m	■			■	■		■	■	1.5 kHz	■	■			■		87	

NPN on request

Photoelectric Sensors

BOS 18M

Product overview



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

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Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric

Distance

Sensors

for Analog

Distance

Measurement

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Sensors

Type	Sensing distance/Range	Light exit	Light type			Output		Switching type		Switching frequency	U _s	Con-nection		Special features				Page
			Straight	Angled	Red light	Infrared	Laser	PNP transistor	PNP transistor with DSC			Light switching	Dark switching	10...30 V DC	M12 plug, 4-pin	Cable	Polarizing filter	
Retr reflective sensor																		
BOS01F0	BOS 18M-PA-IR20-S4	10 m	■		■	■		■	■	400 Hz	■	■						77
BOS01F1	BOS 18M-PS-IR20-S4	10 m	■		■	■		■	■	400 Hz	■	■						77
BOS013M	BOS 18M-PA-LR10-S4	16 m	■			■	■	■	■	1.5 kHz	■	■		■				84
BOS013L	BOS 18M-PA-LR10-02	16 m	■			■	■	■	■	1.5 kHz	■		■	■				84
Through-beam sensor Receiver																		
BOS010E	BLE 18MR-PA-1PP-E5-C-S4	0...16 m		■	■		■	■	■	1 kHz	■	■						73
BOS01CC	BOS 18M-PA-RE20-S4	0...20 m	■	■		■		■	■	400 Hz	■	■						68
BOS01FK	BOS 18M-PA-RE20-S4S	0...20 m	■	■		■		■	■	400 Hz	■	■						68
BOS01EE	BOS 18M-PO-RE20-S4	0...20 m	■	■		■		■		400 Hz	■	■						69
BOS01EF	BOS 18M-PO-RE20-S4S	0...20 m	■	■		■		■		400 Hz	■	■						69
BOS01C2	BOS 18M-PS-RE20-S4	0...20 m	■	■		■		■	■	400 Hz	■	■						69
BOS01FF	BOS 18M-PO-RE23-S4	0...20 m	■	■		■		■		400 Hz	■	■				■		58
BOS01FE	BOS 18M-PS-RE23-S4	0...20 m	■	■		■		■	■	400 Hz	■	■				■		58
BOS01J7	BOS 18M-PUV-RE30-S4	0...20 m	■	■		■		■	■	1 kHz	■	■		■	■			71
BOS01CW	BOS 18M-PUD-RE30-S4	0...20 m	■	■		■	■	■	■	200 Hz	■	■		■				71
BOS01HP	BOS 18M-PS-IE23-S4	0...50 m	■		■		■	■	■	400 Hz	■	■					■	59
BOS0074	BLE 18M-BA-1LT-S4-C	0...50 m	■			■	■	■	■	6 kHz	■	■						92
BOS0075	BLE 18M-BO-1LT-S4-C	0...50 m	■			■	■	■	■	6 kHz	■	■						92
BOS0076	BLE 18MR-BA-1LT-S4-C	0...50 m	■			■	■	■	■	6 kHz	■	■						92
BOS0143	BOS 18MR-PA-LE10-02	0...50 m	■			■	■	■	■	1.5 kHz	■	■		■				88
BOS0144	BOS 18MR-PA-LE10-S4	0...50 m	■			■	■	■	■	1.5 kHz	■	■		■				89
BOS013K	BOS 18M-PA-LE10-S4	0...60 m	■			■	■	■	■	1.5 kHz	■	■						85
BOS013J	BOS 18M-PA-LE10-02	0...60 m	■			■	■	■	■	1.5 kHz	■		■					85
BOS01F3	BOS 18M-PA-IE20-S4	0...100 m	■		■		■	■	■	400 Hz	■	■						79
Through-beam sensor Emitter																		
BOS010F	BLS 18MR-XX-1P-E5-L-S4	0...16 m		■	■						■	■						73
BOS01C0	BOS 18M-X-RS20-S4	0...20 m	■		■						■	■						69
BOS01EP	BOS 18M-XT-RS20-S4	0...20 m	■		■						■	■						69
BOS01FH	BOS 18M-X-RS23-S4	0...20 m	■		■						■	■						58
BOS01CY	BOS 18M-X-RS30-S4	0...20 m	■		■						■	■						71
BOS01HM	BOS 18M-X-IS23-S4	0...50 m	■		■						■	■						59
BOS01F5	BOS 18M-X-IS20-S4	0...50 m	■		■						■	■						78
BOS01HN	BOS 18M-XT-IS20-S4	0...50 m	■		■						■	■						78
BOS00AW	BLS 18M-XX-1LT-S4-C	0...50 m	■			■					■	■						93
BOS00AU	BLS 18MR-XX-1LT-S4-C	0...50 m	■			■					■	■						93
BOS0147	BOS 18MR-XT-LS10-02	0...50 m	■			■					■		■					88
BOS0148	BOS 18MR-XT-LS10-S4	0...50 m	■			■					■	■						89
BOS013R	BOS 18M-XT-LS10-S4	0...60 m	■			■					■	■						85
BOS013P	BOS 18M-XT-LS10-02	0...60 m	■			■					■		■					85
BOS01HT	BOS 18M-X-IS24-S4	0...100 m	■			■					■	■						78
BOS01HU	BOS 18M-XT-IS24-S4	0...100 m	■			■					■	■						78

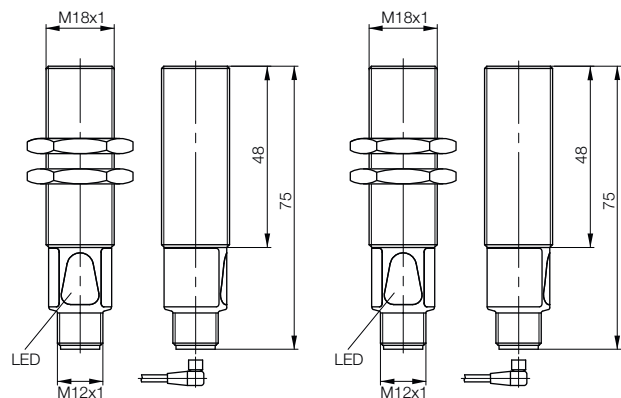
NPN on request



Type		Diffuse sensor	Diffuse sensor
Detection range		1...400 mm	1...600 mm
PNP NO	Ordering code	BOS01FA	BOS01HL
	Part number	BOS 18M-PS-RD23-S4	BOS 18M-PS-ID23-S4
PNP NC	Ordering code	BOS01FC	
	Part number	BOS 18M-PO-RD23-S4	
PNP NO	Polarizing filter	Ordering code	
		Part number	
PNP NC	Polarizing filter	Ordering code	
		Part number	
Supply voltage U_S		10...30 V DC	10...30 V DC
Output current		100 mA	100 mA
No-load supply current I_0 max.		≤ 50 mA	≤ 30 mA
Switching type		Light or dark switching	Light switching
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes
Settings		Fixed	Fixed
Emitter, light type		LED, red light	LED, infrared
Wavelength		620...670 nm	850 Nm
Received light indicator		Yellow LED	Yellow LED
Response time		1.25 ms	1.25 ms
Switching frequency f		400 Hz	400 Hz
Degree of protection as per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-5...+55 °C	-5...+55 °C
Permissible ambient light		10 klx	5 klx
Material	Housing	Nickel-plated brass	Nickel-plated brass
	Optical surface	Glass	Glass
Connection		M12 connector, 4-pin	M12 connector, 4-pin

Reference object: white, 90% reflection, 200×200 mm
 Reference reflector: BOS R-1

For wiring diagrams see page 61.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

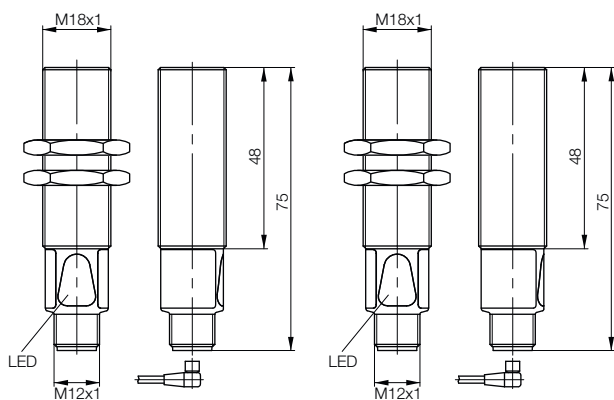
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



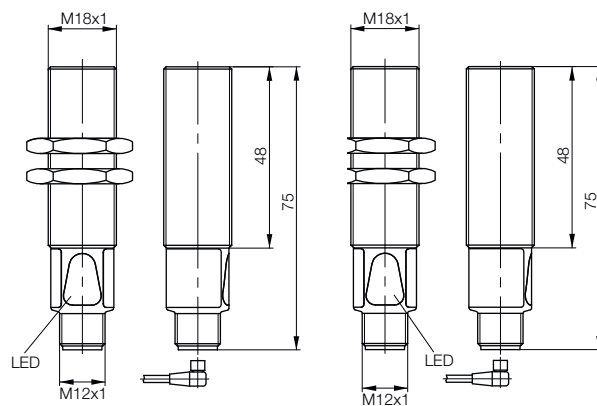
	Retroreflective sensor 4 m	Retroreflective sensor 6 m		
		BOS01HK		
		BOS 18M-PS-IR23-S4		
	BOS01F8			
	BOS 18M-PS-PR23-S4			
	BOS01F9			
	BOS 18M-PO-PR23-S4			
	10...30 V DC	10...30 V DC		
	100 mA	100 mA		
	≤ 50 mA	≤ 30 mA		
	Light or dark switching	Dark switching		
	Yes/Yes	Yes/Yes		
	Fixed	Fixed		
	LED, red light	LED, infrared		
	620...670 nm	850 Nm		
	Yellow LED	Yellow LED		
	1.25 ms	1.25 ms		
	400 Hz	400 Hz		
	IP 67	IP 67		
	-5...+55 °C	-5...+55 °C		
	10 klx	5 klx		
	Nickel-plated brass	Nickel-plated brass		
	Glass	Glass		
	M12 connector, 4-pin	M12 connector, 4-pin		





Type			Through-beam sensor	Through-beam sensor
Detection range			0...20 m	0...20 m
PNP NO	Receiver	Ordering code	BOS01FE	
		Part number	BOS 18M-PS-RE23-S4	
PNP NC	Receiver	Ordering code	BOS01FF	
		Part number	BOS 18M-PO-RE23-S4	
	Emitter	Ordering code		BOS01FH
		Part number		BOS 18M-X-RS23-S4
Supply voltage U_s			10...30 V DC	10...30 V DC
Output current			100 mA	
No-load supply current I_0 max.			≤ 35 mA	≤ 50 mA
Switching type			Light or dark switching	
Polarity reversal/short-circuit protected			Yes/Yes	Yes/Yes
Settings			Fixed	Fixed
Emitter, light type			LED, red light	LED, red light
Wavelength			620...670 nm	620...670 nm
Received light indicator			Yellow LED	
Power-on indicator				Green LED
Response time			1.25 ms	
Switching frequency f			400 Hz	
Degree of protection as per IEC 60529			IP 67	IP 67
Ambient temperature T_a			-5...+55 °C	-5...+55 °C
Permissible ambient light			10 klx	10 klx
Material	Housing		Nickel-plated brass	Nickel-plated brass
	Optical surface		Glass	Glass
Connection			M12 connector, 4-pin	M12 connector, 4-pin

For wiring diagrams see page 61.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

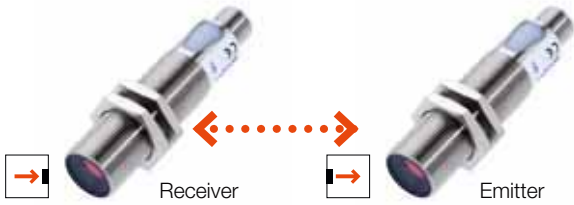
Angle Sensors

BWL

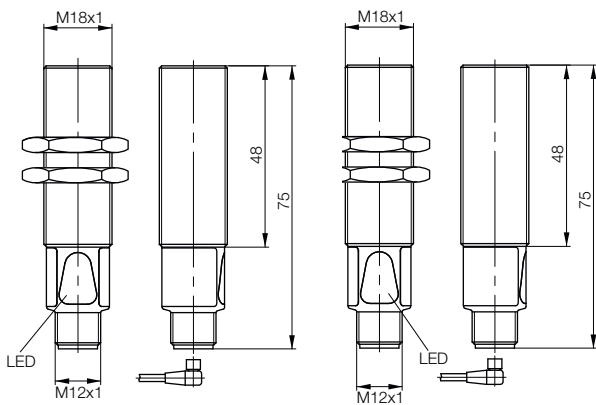
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

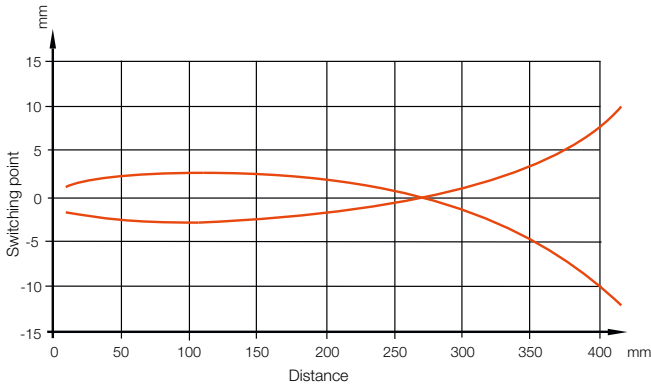
Accessories for Photoelectric Sensors



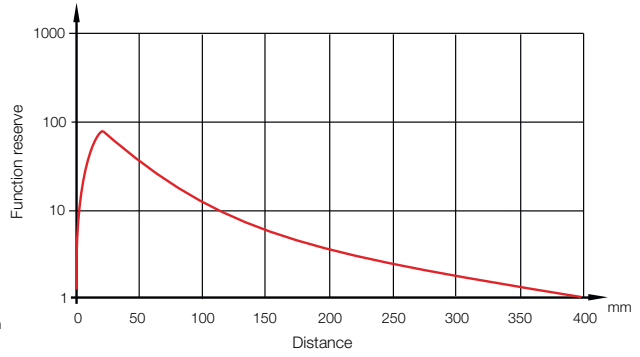
Through-beam sensor 0...50 m BOS01HP BOS 18M-PS-IE23-S4	Through-beam sensor 0...50 m BOS01HM BOS 18M-X-IS23-S4		
10...30 V DC	10...30 V DC		
100 mA			
≤ 30 mA	≤ 20 mA		
Dark switching			
Yes/Yes	Yes/Yes		
Fixed	Fixed		
LED, infrared	LED, infrared		
850 Nm	850 Nm		
Yellow LED	Green LED		
1.25 ms			
400 Hz			
IP 67	IP 67		
-5...+55 °C	-5...+55 °C		
5 klx	5 klx		
Nickel-plated brass	Nickel-plated brass		
Glass	Glass		
M12 connector, 4-pin	M12 connector, 4-pin		



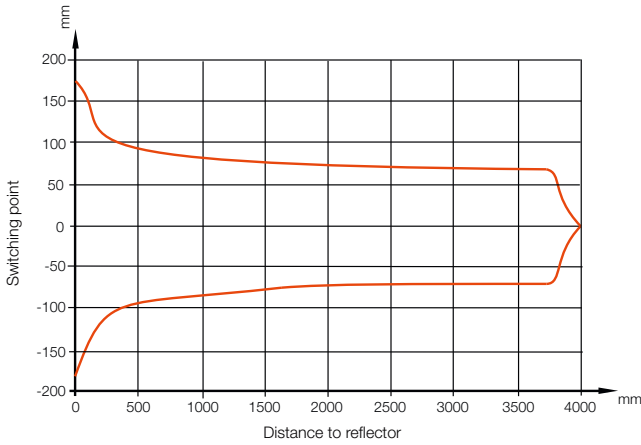
Diffuse sensor BOS 18M...RD23
response curve



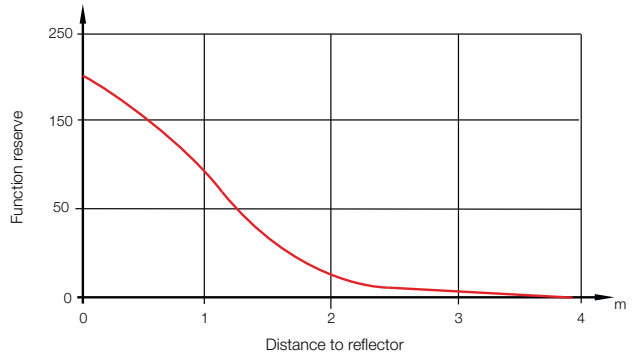
Diffuse sensor BOS 18M...RD23
function reserve



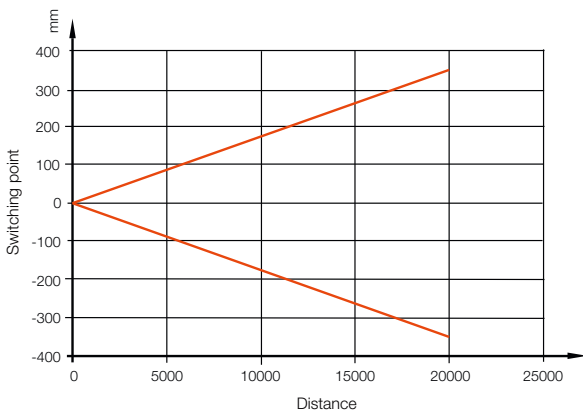
Retroreflective sensor BOS 18M...PR23
response curve



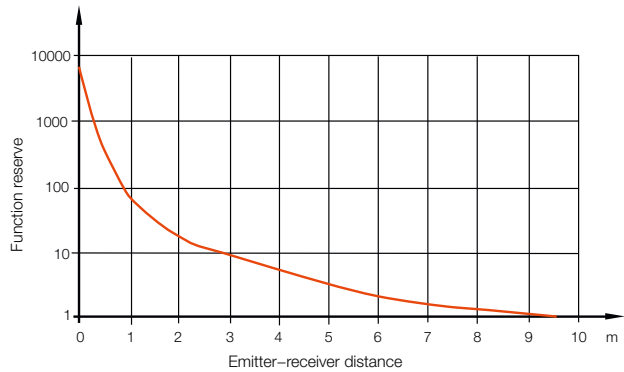
Retroreflective sensor BOS 18M...PR23
Function reserve



Through-beam sensor BOS 18M...RE/RS23
response curve

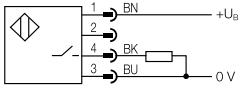


Through-beam sensor BOS 18M...RE/RS23
Function reserve

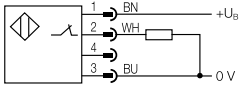


Wiring diagrams

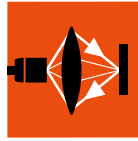
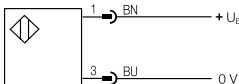
BOS 18M-PS...



BOS 18M-PO...



BOS 18M-X...



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Recommended accessories
 (please order separately)

Description	Ordering code
① Mounting clamp	BAM00T3
② Mounting bracket	BAM00RY
③ Reflector	BAM00UK



Suitable connectors
 (please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N



Special accessories for photoelectric sensors, such as **reflectors, apertures, lenses, filters and deflection heads** can be found in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.

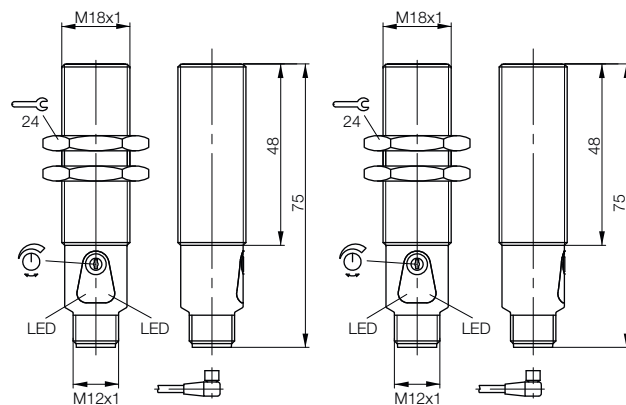
M18 Metal Red Light



Type		Diffuse sensor with background suppression	Diffuse sensor with background suppression
Detection range		30...150 mm	30...150 mm
PNP NC/NO	Ordering code	BOS01J4	
	Part number	BOS 18M-PA-RH23-S4	
PNP NO	Ordering code		
	Part number		
PNP NC	Ordering code		
	Part number		
PNP NO	Error output		
	Ordering code		BOS01J2
	Error output		BOS 18M-PSV-RH23-S4
Supply voltage U_S		10...30 V DC	10...30 V DC
Output current		100 mA	100 mA
No-load supply current I_0 max.		≤ 40 mA	≤ 40 mA
Switching type		Light and dark switching	Light switching
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes
Settings		10-turn potentiometer	10-turn potentiometer
Emitter, light type		LED, red light	LED, red light
Wavelength		620...670 nm	620...670 nm
Response time		1 ms	1 ms
Switching frequency f		500 Hz	500 Hz
Degree of protection as per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-5...+55 °C	-5...+55 °C
Permissible ambient light		10 klx	10 klx
Material	Housing	Nickel-plated brass	Nickel-plated brass
	Optical surface	Glass	Glass
Connection		M12 connector, 4-pin	M12 connector, 4-pin

Reference object: white, 90% reflection, 200x200 mm

For wiring diagrams see page 75.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

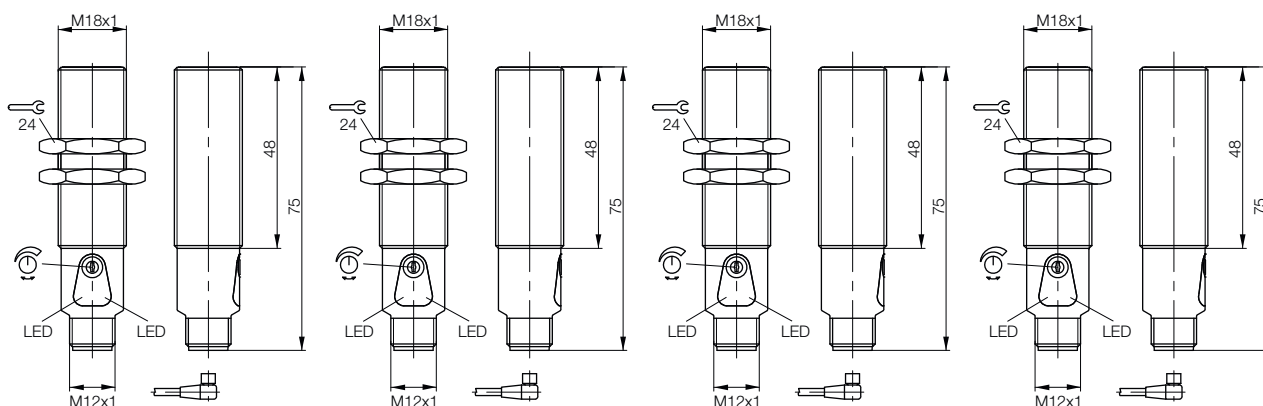
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Diffuse sensor with background suppression 30...300 mm BOS014W BOS 18M-PA-RH22-S4	Diffuse sensor with background suppression 30...300 mm BOS019P BOS 18M-PS-RH22-S4	Diffuse sensor with background suppression 30...300 mm BOS019N BOS 18M-PSV-RH22-S4	Diffuse sensor with background suppression 30...300 mm BOS019R BOS 18M-POV-RH22-S4
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
100 mA	100 mA	100 mA	100 mA
≤ 50 mA	≤ 50 mA	≤ 50 mA	≤ 50 mA
Light and dark switching	Light and dark switching	Light switching	Dark switching
Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
10-turn potentiometer	10-turn potentiometer	10-turn potentiometer	10-turn potentiometer
LED, red light	LED, red light	LED, red light	LED, red light
620...670 nm	620...670 nm	620...670 nm	620...670 nm
1ms	1ms	1ms	1ms
500 Hz	500 Hz	500 Hz	500 Hz
IP 67	IP 67	IP 67	IP 67
-5...+55 °C	-5...+55 °C	-5...+55 °C	-5...+55 °C
10 klx	10 klx	10 klx	10 klx
Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
Glass	Glass	Glass	Glass
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



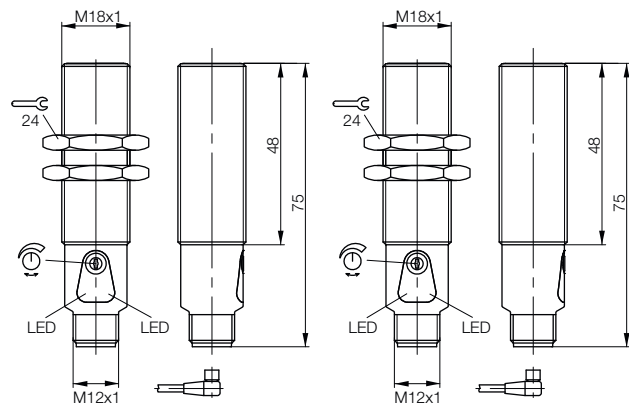
M18 Metal Red Light



Type			Diffuse sensor	Diffuse sensor
Detection range			1...300 mm	1...300 mm
PNP	NC/NO	Ordering code	BOS01CA	
		Part number	BOS 18M-PA-RD21-S4	
PNP	NO	Ordering code		BOS01E7
		Part number		BOS 18M-PS-RD21-S4
PNP	NC	Ordering code		
		Part number		
Supply voltage U_s			10...30 V DC	10...30 V DC
Output current			100 mA	100 mA
No-load supply current I_0 max.			≤ 50 mA	≤ 50 mA
Switching type			Light and dark switching	Light switching
Polarity reversal/short-circuit protected			Yes/Yes	Yes/Yes
Settings			Potentiometer, 270°	Potentiometer, 270°
Emitter, light type			LED, red light	LED, red light
Wavelength			620...670 nm	620...670 nm
Response time			1.25 ms	1.25 ms
Switching frequency f			400 Hz	400 Hz
Degree of protection as per IEC 60529			IP 67	IP 67
Ambient temperature T_a			-5...+55 °C	-5...+55 °C
Permissible ambient light			10 klx	10 klx
Material	Housing		Nickel-plated brass	Nickel-plated brass
	Optical surface		Glass	Glass
Connection			M12 connector, 4-pin	M12 connector, 4-pin

Reference object: white, 90% reflection, 200×200 mm

For wiring diagrams see page 75.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

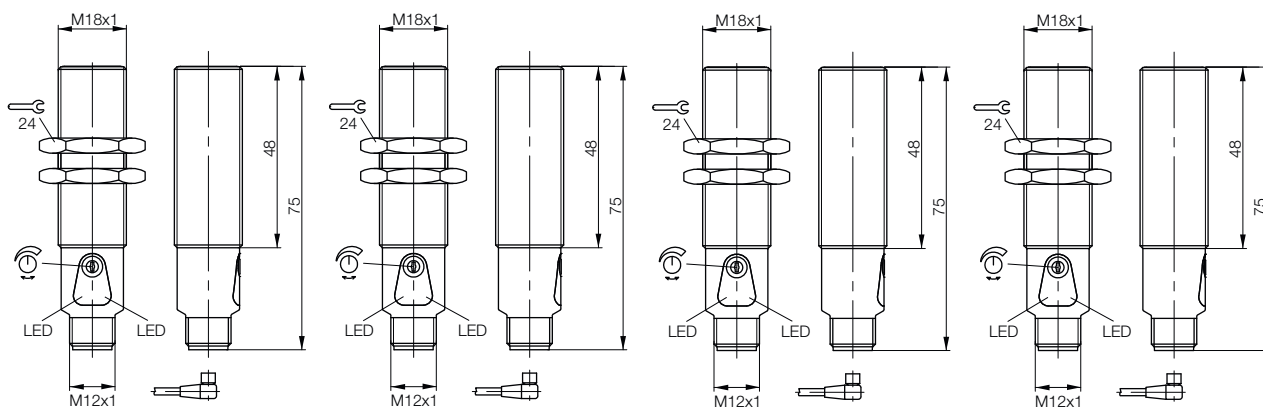
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Diffuse sensor 1...300 mm	Diffuse sensor 1...600 mm	Diffuse sensor 1...600 mm	Diffuse sensor 1...600 mm
	BOS01CF BOS 18M-PA-RD20-S4		
		BOS01C1 BOS 18M-PS-RD20-S4	
BOS01E8 BOS 18M-PO-RD21-S4			BOS01E3 BOS 18M-PO-RD20-S4
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
100 mA	100 mA	100 mA	100 mA
≤ 50 mA	≤ 50 mA	≤ 50 mA	≤ 50 mA
Dark switching	Light and dark switching	Light switching	Dark switching
Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°
LED, red light	LED, red light	LED, red light	LED, red light
620...670 nm	620...670 nm	620...670 nm	620...670 nm
1.25 ms	1.25 ms	1.25 ms	1.25 ms
400 Hz	400 Hz	400 Hz	400 Hz
IP 67	IP 67	IP 67	IP 67
-5...+55 °C	-5...+55 °C	-5...+55 °C	-5...+55 °C
10 klx	10 klx	10 klx	10 klx
Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
Glass	Glass	Glass	Glass
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



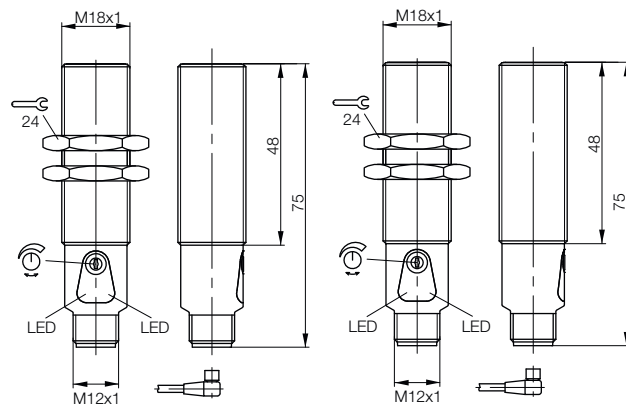
M18 Metal Red Light

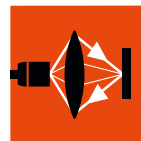


Type		Retroreflective sensor	Retroreflective sensor
Detection range		7 m	7 m
PNP NC/NO	Ordering code	BOS01CE	
	Part number	BOS 18M-PA-PR20-S4	
PNP NC/NO	Ordering code		BOS01FJ
Output special assignment	Part number		BOS 18M-PA-PR20-S4S
PNP NO	Ordering code		
	Part number		
PNP NC	Ordering code		
	Part number		
PNP NC	Ordering code		
Output special assignment	Part number		
Supply voltage U_s		10...30 V DC	10...30 V DC
Output current		100 mA	100 mA
No-load supply current I_0 max.		≤ 50 mA	≤ 50 mA
Switching type		Light and dark switching	Light and dark switching
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes
Settings		Potentiometer, 270°	Potentiometer, 270°
Emitter, light type		LED, red light	LED, red light
Wavelength		620...670 nm	620...670 nm
Response time		1.25 ms	1.25 ms
Switching frequency f		400 Hz	400 Hz
Degree of protection as per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-5...+55 °C	-5...+55 °C
Permissible ambient light		10 klx	10 klx
Material	Housing	Nickel-plated brass	Nickel-plated brass
	Optical surface	Glass	Glass
Connection		M12 connector, 4-pin	M12 connector, 4-pin

Reference reflector: BOS R-1

For wiring diagrams see page 75.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

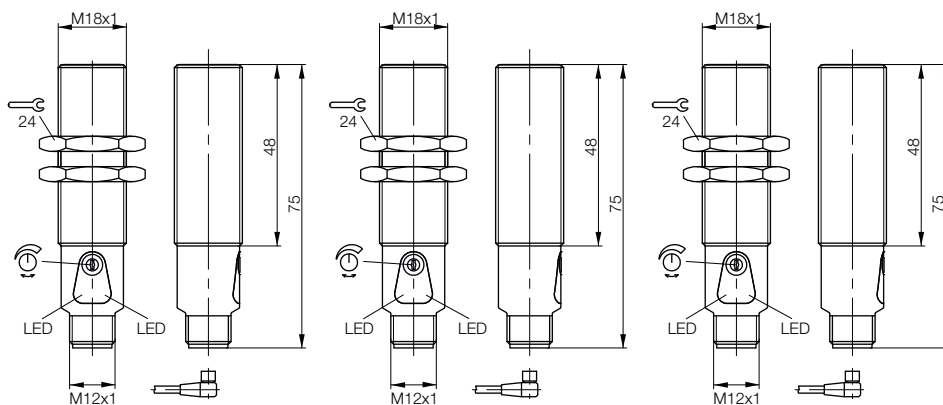
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Retroreflective sensor 7 m	Retroreflective sensor 7 m	Retroreflective sensor 7 m	
BOS01C3 BOS 18M-PS-PR20-S4	BOS01CZ BOS 18M-PO-PR20-S4	BOS01EM BOS 18M-PO-PR20-S4S	
10...30 V DC	10...30 V DC	10...30 V DC	
100 mA	100 mA	100 mA	
≤ 50 mA	≤ 50 mA	≤ 50 mA	
Dark switching	Light switching	Light switching	
Yes/Yes	Yes/Yes	Yes/Yes	
Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°	
LED, red light	LED, red light	LED, red light	
620...670 nm	620...670 nm	620...670 nm	
1.25 ms	1.25 ms	1.25 ms	
400 Hz	400 Hz	400 Hz	
IP 67	IP 67	IP 67	
-5...+55 °C	-5...+55 °C	-5...+55 °C	
10 klx	10 klx	10 klx	
Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	
Glass	Glass	Glass	
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	



M18 Metal Red Light



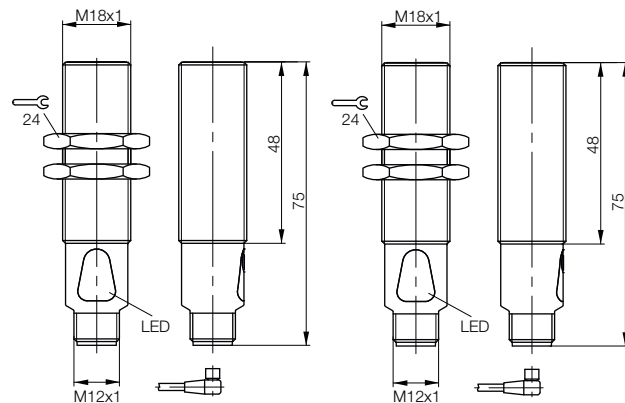
Receiver



Receiver

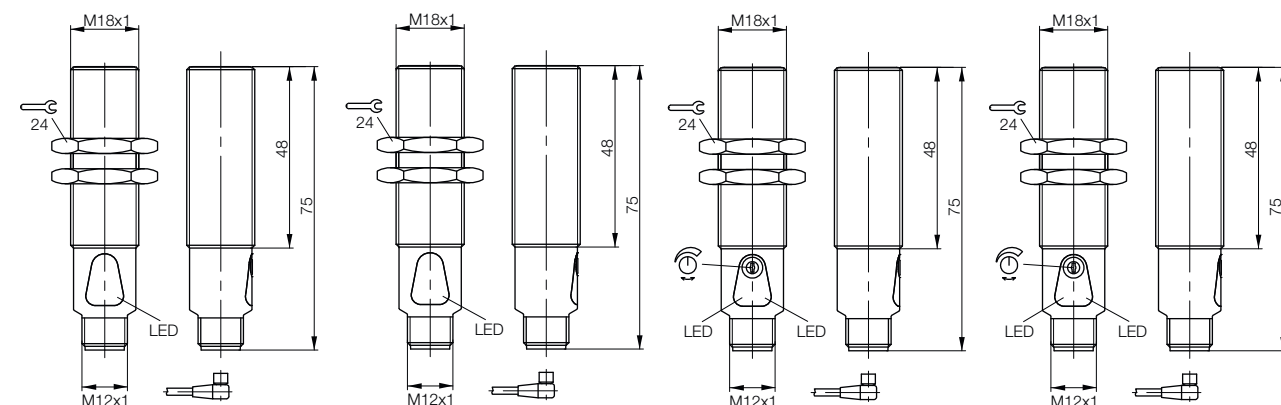
Type	Through-beam sensor		Through-beam sensor	
Detection range	0...20 m		0...20 m	
PNP NC/NO Receiver	Ordering code	BOS01CC	Ordering code	BOS01FK
	Part number	BOS 18M-PA-RE20-S4	Part number	BOS 18M-PA-RE20-S4S
PNP NO Receiver	Ordering code		Ordering code	
	Part number		Part number	
PNP NC Receiver	Ordering code		Ordering code	
	Part number		Part number	
	Emitter		Emitter	
	Ordering code		Ordering code	
	Part number		Part number	
	Emitter Test input		Emitter Test input	
	Ordering code		Ordering code	
	Part number		Part number	
Supply voltage U_s	10...30 V DC		10...30 V DC	
Output current	100 mA		100 mA	
No-load supply current I_0 max.	≤ 35 mA		≤ 35 mA	
Switching type	Light and dark switching		Light and dark switching	
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes	
Settings				
Emitter, light type	LED, red light		LED, red light	
Wavelength	620...670 nm		620...670 nm	
Response time	1.25 ms		1.25 ms	
Switching frequency f	400 Hz		400 Hz	
Degree of protection as per IEC 60529	IP 67		IP 67	
Ambient temperature T_a	$-5...+55$ °C		$-5...+55$ °C	
Permissible ambient light	10 klx		10 klx	
Material	Housing	Nickel-plated brass	Housing	Nickel-plated brass
	Optical surface	Glass	Optical surface	Glass
Connection	M12 connector, 4-pin		M12 connector, 4-pin	

For wiring diagrams see page 75.





Through-beam sensor 0...20 m	Through-beam sensor 0...20 m	Through-beam sensor 0...20 m	Through-beam sensor 0...20 m
BOS01C2 BOS 18M-PS-RE20-S4	BOS01EF BOS 18M-PO-RE20-S4S	BOS01C0 BOS 18M-X-RS20-S4	BOS01EP BOS 18M-XT-RS20-S4
10...30 V DC 100 mA ≤ 35 mA Light or dark switching Yes/Yes	10...30 V DC 100 mA ≤ 35 mA Light switching Yes/Yes	10...30 V DC ≤ 50 mA Yes/Yes Potentiometer, 270° LED, red light 620...670 nm	10...30 V DC ≤ 50 mA Yes/Yes Potentiometer, 270° LED, red light 620...670 nm
LED, red light 620...670 nm 1.25 ms 400 Hz IP 67 -5...+55 °C 10 klx Nickel-plated brass Glass M12 connector, 4-pin	LED, red light 620...670 nm 1.25 ms 400 Hz IP 67 -5...+55 °C 10 klx Nickel-plated brass Glass M12 connector, 4-pin	IP 67 -5...+55 °C 10 klx Nickel-plated brass Glass M12 connector, 4-pin	IP 67 -5...+55 °C 10 klx Nickel-plated brass Glass M12 connector, 4-pin



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

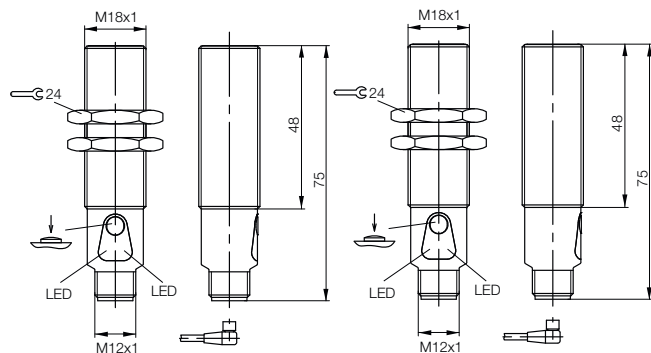
M18 Metal Red Light Teach-in



Type	Diffuse sensor		Diffuse sensor
Detection range	1...500 mm		1...500 mm
PNP NC/NO	Error output	Ordering code	BOS01J8
		Part number	BOS 18M-PUV-RD30-S4
PNP NC/NO	Dynamic Sensor Control	Ordering code	BOS01CU
		Part number	BOS 18M-PUD-RD30-S4
PNP NC/NO	Polarizing filter, Error output	Ordering code	
		Part number	
PNP NC/NO	Polarizing filter, Dynamic Sensor Control	Ordering code	
		Part number	
Emitter		Ordering code	
		Part number	
Supply voltage U_s	10...30 V DC		10...30 V DC
Output current	100 mA		100 mA
No-load supply current I_0 max.	≤ 40 mA		≤ 40 mA
Switching type	Light and dark switching		Light and dark switching
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes
Settings	Teach-in		Teach-in
Emitter, light type	LED, red light		LED, red light
Wavelength	626 Nm		626 Nm
Response time	2.5 ms		2.5 ms
Switching frequency f	1 kHz		200 Hz
Degree of protection as per IEC 60529	IP 67		IP 67
Ambient temperature T_a	$-5...+55$ °C		$-5...+55$ °C
Permissible ambient light	10 klx		10 klx
Material	Housing	Nickel-plated brass	Nickel-plated brass
	Optical surface	Glass	Glass
Connection	M12 connector, 4-pin		M12 connector, 4-pin

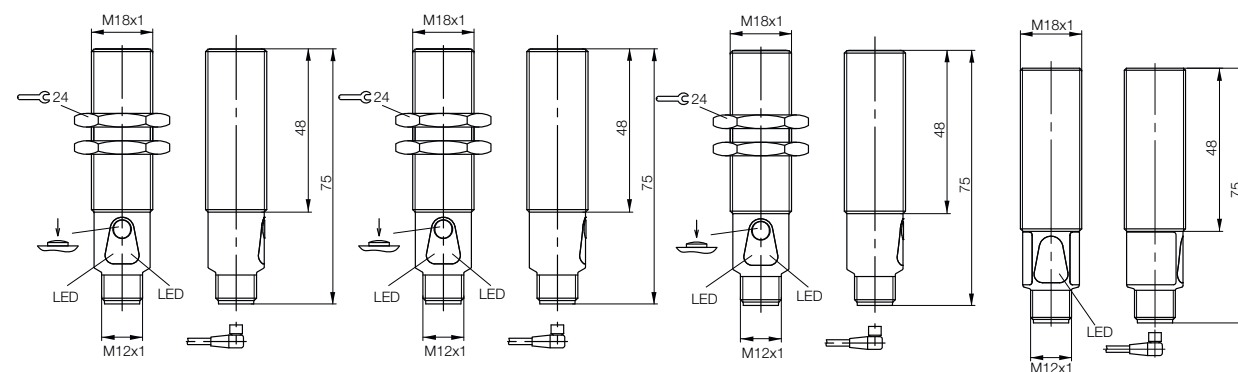
Reference object: white, 90% reflection, 200x200 mm
 Reference reflector: BOS R-1

For wiring diagrams see page 75.





Retroreflective sensor 5 m	Retroreflective sensor 5 m	Through-beam sensor 0...20 m BOS01J7 BOS 18M-PUV-RE30-S4 BOS01CW BOS 18M-PUD-RE30-S4	Through-beam sensor 0...20 m BOS01CY BOS 18M-X-RS30-S4
BOS01J9 BOS 18M-PUV-PR30-S4	BOS01CT BOS 18M-PUD-PR30-S4		
10...30 V DC 100 mA ≤ 40 mA Light and dark switching Yes/Yes Teach-in LED, red light 626 Nm 2.5 ms 1 kHz IP 67 -5...+55 °C 10 klx Nickel-plated brass Glass M12 connector, 4-pin	10...30 V DC 100 mA ≤ 40 mA Light and dark switching Yes/Yes Teach-in LED, red light 626 Nm 2.5 ms 200 Hz IP 67 -5...+55 °C 10 klx Nickel-plated brass Glass M12 connector, 4-pin	10...30 V DC 100 mA ≤ 25 mA Light and dark switching Yes/Yes Teach-in LED, red light 626 Nm 2.5 ms 1 kHz / 200 Hz IP 67 -5...+55 °C 10 klx Nickel-plated brass Glass M12 connector, 4-pin	10...30 V DC ≤ 25 mA Yes/Yes LED, red light IP 67 -5...+55 °C Nickel-plated brass Glass M12 connector, 4-pin



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

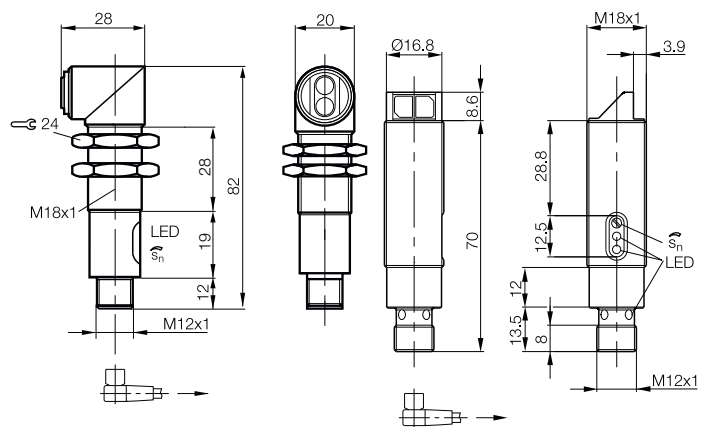
M18 Metal with Angle Head



Type	Diffuse sensor with background suppression		Diffuse sensor with background suppression
Detection range	40...120 mm		10...120 mm
PNP NC/NO	Ordering code	BOS0081	
	Part number	BOS 18MR-PA-1HA-S4-C	
PNP NO	Ordering code		BOS010J
	Part number		BOS 18MR-PS-1HA-E5-C-S4
PNP NC/NO Receiver	Ordering code		
	Part number		
Emitter	Ordering code		
	Part number		
Supply voltage U_S	10...30 V DC		10...36 V DC
Output current	200 mA		200 mA
No-load supply current I_0 max.	≤ 30 mA		≤ 20 mA
Switching type	Light and dark switching		Light switching
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes
Settings	18-turn potentiometer		Potentiometer, 270°
Emitter, light type	LED, red light		LED, red light
Wavelength	660 Nm		660 Nm
Response time	0.8 ms		≤ 1 ms
Switching frequency f	600 Hz		500 Hz
Degree of protection as per IEC 60529	IP 67		IP 67
Ambient temperature T_a	-15...+55 °C		-25...+55 °C
Permissible ambient light	2 klx		10 klx
Material	Housing	Nickel-plated brass	Nickel-plated brass
	Optical surface	Glass	Glass
Connection	M12 connector, 4-pin		M12 connector, 4-pin

Reference object: white, 90% reflection, 200x200 mm
 Reference reflector: BOS R-1

For wiring diagrams see page 75.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

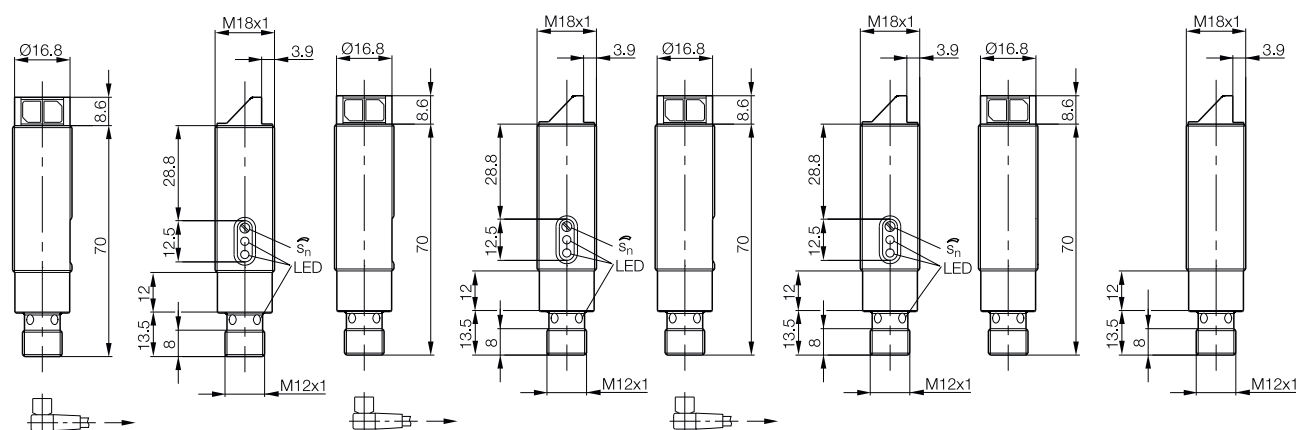
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

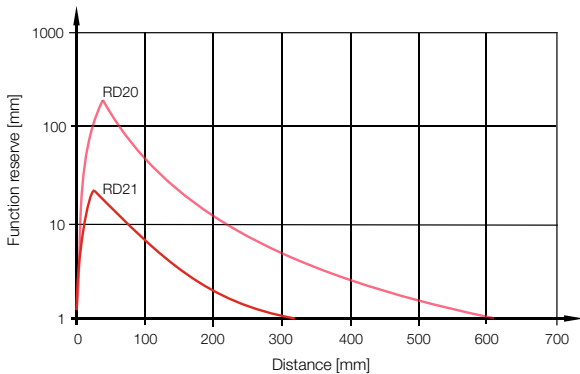
Accessories for Photoelectric Sensors



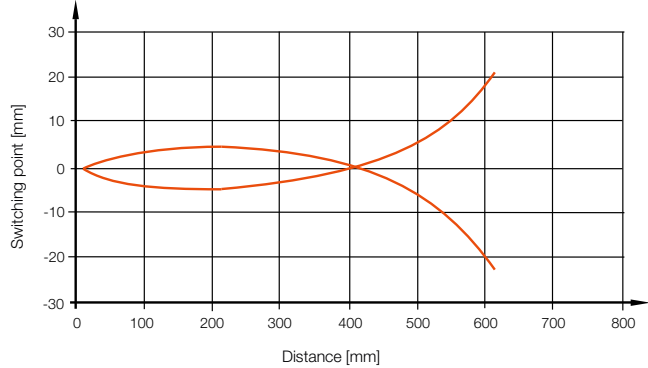
Diffuse sensor 0...400 mm	Retroreflective sensor 2 m	Through-beam sensor 0...16 m	Through-beam sensor 0...16 m
BOS010K	BOS010L	BOS010E	BOS010F
BOS 18MR-PS-1OD-E5-C-S4	BOS 18MR-PS-1QB-E5-C-S4	BLE 18MR-PA-1PP-E5-C-S4	BLS 18MR-XX-1P-E5-L-S4
10...36 V DC	10...36 V DC	10...36 V DC	10...36 V DC
200 mA	200 mA	200 mA	200 mA
≤ 20 mA	≤ 20 mA	≤ 20 mA	≤ 20 mA
Light switching	Dark switching	Dark switching	
Yes/Yes	Yes/Yes	Yes/Yes	
Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°	
LED, red light	LED, red light	LED, red light	LED, red light
660 Nm	660 Nm	660 Nm	660 Nm
≤ 0.5 ms	≤ 0.5 ms	≤ 0.5 ms	
1 kHz	1 kHz	1 kHz	
IP 67	IP 67	IP 67	IP 67
-25...+55 °C	-25...+55 °C	-25...+55 °C	-25...+55 °C
10 klx	10 klx	10 klx	10 klx
Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
Glass	Glass	Glass	Glass
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



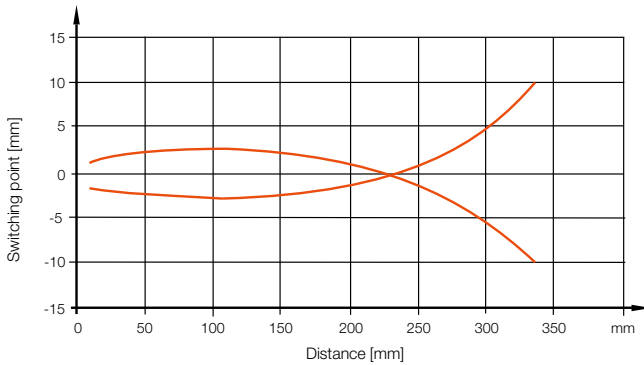
Diffuse sensor BOS 18M...RD
function reserve



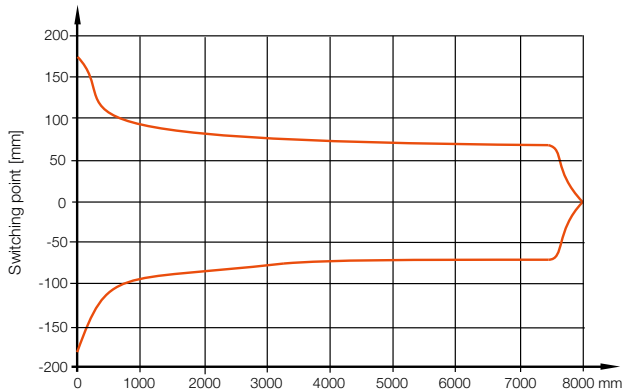
Diffuse sensor BOS 18M...RD20
Response curve



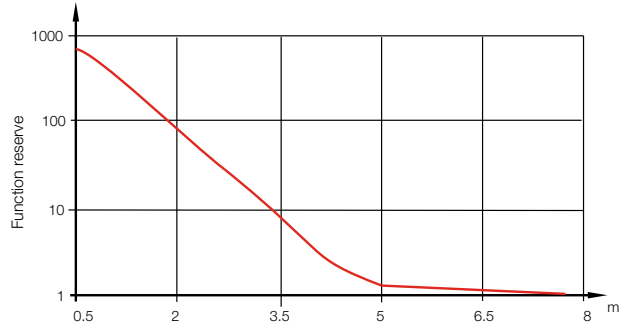
Diffuse sensor BOS 18M...RD21..
Response curve



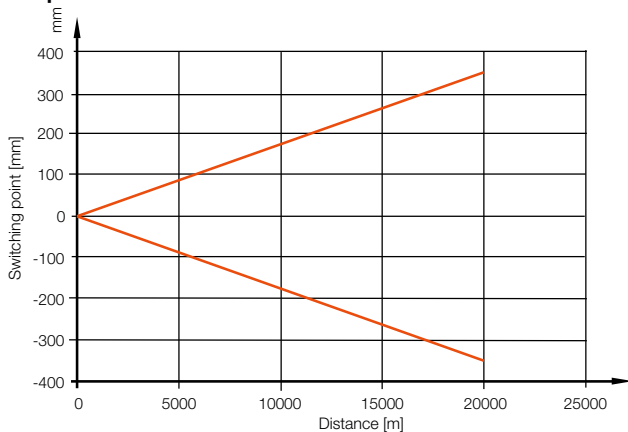
Retroreflective sensor BOS 18M...PR20...
Response curve



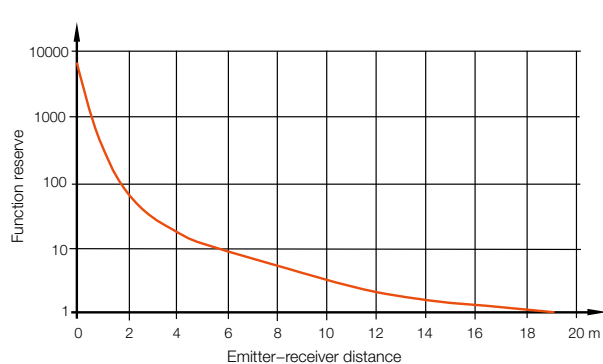
Retroreflective sensor BOS 18M...PR20...
Function reserve



Through-beam sensor BOS 18M...RE/RS20
Response curve



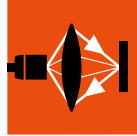
Through-beam sensor BOS 18M...RE/RS20
Function reserve



Photoelectric Sensors

BOS 18M red light

Light spot size, connection, accessories



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors BGL

Angle Sensors BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Diffuse sensor BOS 18M light spot sizes

...RD20...		...RD21...	
Distance	Light spot Ø	Distance	Light spot Ø
30 mm	9 mm	30 mm	9 mm
100 mm	11x11 mm	100 mm	11x11 mm
300 mm	24x24 mm	300 mm	24x24 mm
600 mm	48x48 mm		

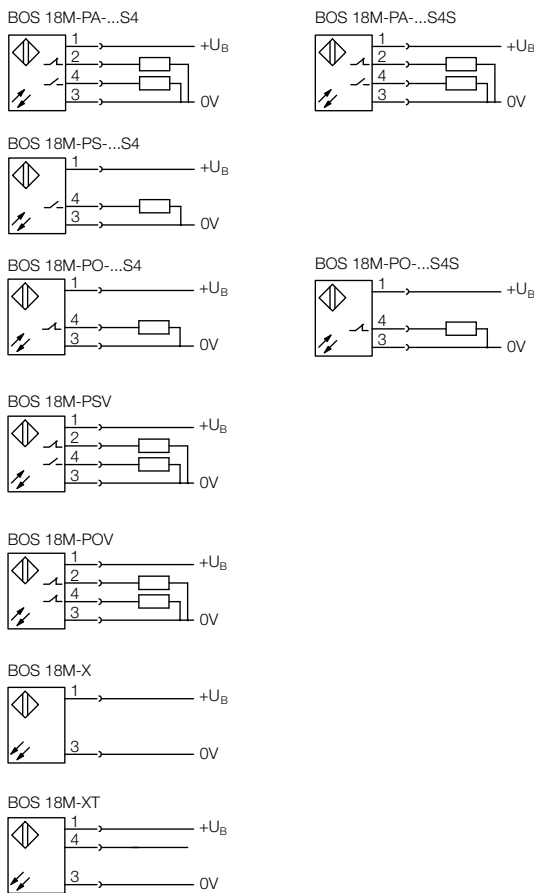
...PR20...

Distance	Light spot Ø
3 cm	13 mm
10 cm	14 mm
30 cm	20x20 mm
1 m	45x45mm
2 m	80x80 mm
3 m	120x120 mm

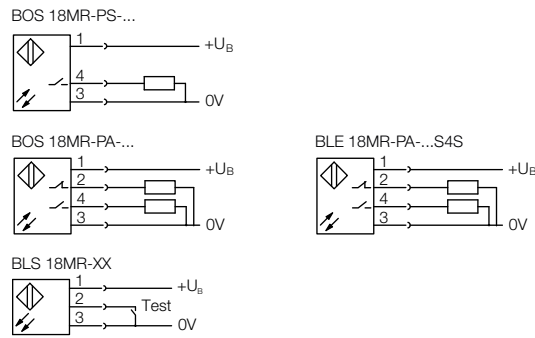
...RS20...

Distance	Light spot Ø
3 cm	14 mm
10 cm	17 mm
30 cm	25 mm
60 cm	32x32 mm
1 m	45x45 mm
2 m	80x80 mm
3 m	118x118 mm

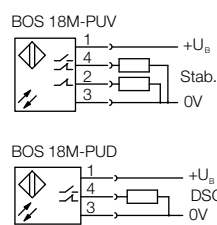
Wiring diagrams Red light



Wiring diagrams Angled



Wiring diagrams Teach-in



Recommended accessories (please order separately)

Description	Ordering code
① Mounting clamp	BAM00T3
② Mounting bracket	BAM00RY
③ Reflector	BAM00UK



Suitable connectors (please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N



Special accessories for photoelectric sensors, such as **reflectors, apertures, lenses, filters and deflection heads** can be found in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Connectors without LED are suitable for PNP and NPN sensors.

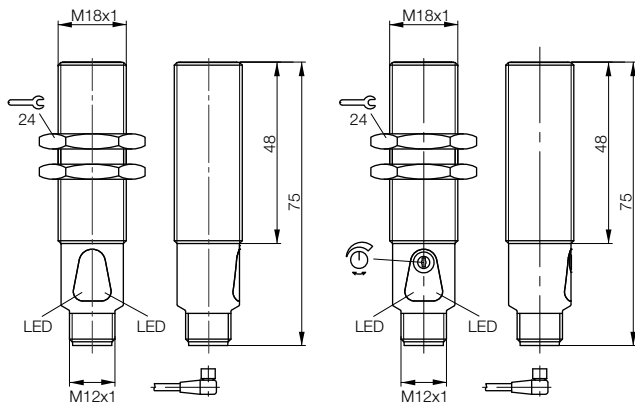
More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.



Type			Diffuse sensor	Diffuse sensor
Detection range			2...40 mm (glass)	1...800 mm
PNP NC/NO		Ordering code		BOS01EY
		Part number		BOS 18M-PA-ID20-S4
PNP NO		Ordering code		
		Part number		
PNP NO	Glass detection	Ordering code	BOS01J1	
		Part number	BOS 18M-PS-ID24-S4	
Supply voltage U_S			10...30 V DC	10...30 V DC
Output current				100 mA
No-load supply current I_0 max.			≤ 30 mA	≤ 30 mA
Switching type			Light switching	Light and dark switching
Polarity reversal/short-circuit protected			Yes/Yes	Yes/Yes
Settings				Potentiometer, 270°
Emitter, light type			Infrared	LED, infrared
Wavelength			850 Nm	850 Nm
Response time			2.5 ms	1.25 ms
Switching frequency f			200 Hz	400 Hz
Degree of protection as per IEC 60529			IP 67	IP 67
Ambient temperature T_a			-5...+55 °C	-5...+55 °C
Permissible ambient light			3 klx	5 klx
Material	Housing		Nickel-plated brass	Nickel-plated brass
	Optical surface		Glass	Glass
Connection			M12 connector, 4-pin	M12 connector, 4-pin

Reference object: white, 90% reflection, 200×200 mm
 Reference reflector: BOS R-1

For wiring diagrams see page 81.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

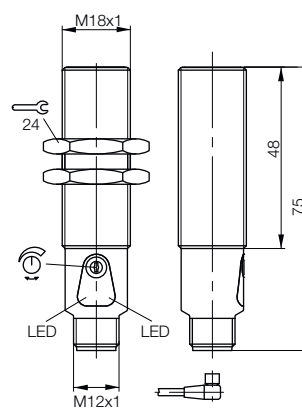
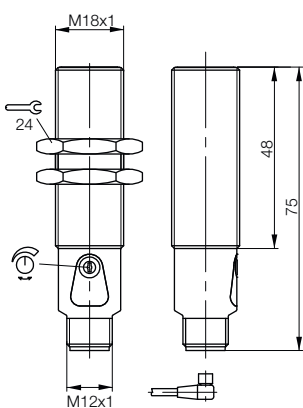
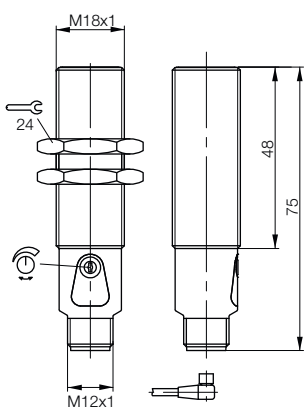
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



	Retroreflective sensor 7 m Polarizing filter BOS01HR BOS 18M-PA-IR21-S4	Retroreflective sensor 10 m BOS01F0 BOS 18M-PA-IR20-S4	Retroreflective sensor 10 m BOS01F1 BOS 18M-PS-IR20-S4	
	10...30 V DC	10...30 V DC	10...30 V DC	
	100 mA	100 mA	100 mA	
	≤ 30 mA	≤ 30 mA	≤ 30 mA	
	Light and dark switching	Light and dark switching	Dark switching	
	Yes/Yes	Yes/Yes	Yes/Yes	
	Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°	
	LED, infrared	LED, infrared	LED, infrared	
	850 Nm	850 Nm	850 Nm	
	1.25 ms	1.25 ms	1.25 ms	
	400 Hz	400 Hz	400 Hz	
	IP 67	IP 67	IP 67	
	-5...+55 °C	-5...+55 °C	-5...+55 °C	
	5 klx	5 klx	5 klx	
	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	
	Glass	Glass	Glass	
	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	





Emitter

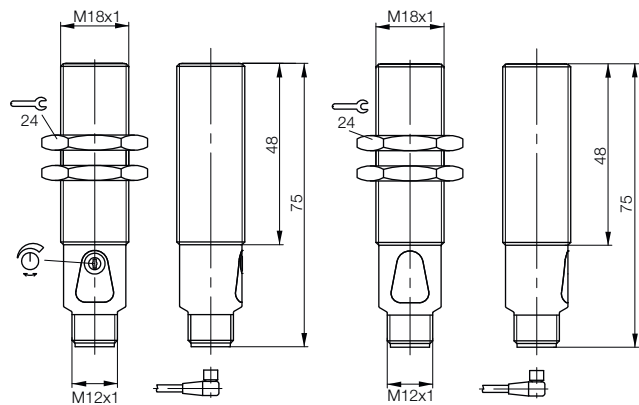


Emitter

Type	Through-beam sensor		Through-beam sensor
Detection range	0...50 m		0...100 m high power
PNP NC/NO	Ordering code		
	Part number		
PNP NO	Ordering code		
	Part number		
PNP NC/NO Receiver	Ordering code		
	Part number		
	Emitter	Ordering code	BOS01F5
		Part number	BOS 18M -X-IS20-S4
	Emitter Test input	Ordering code	BOS01HT
		Part number	BOS 18M-X-IS24-S4
		Ordering code	BOS01HN
		Part number	BOS 18M-X-IS20-S4
		Ordering code	BOS01HU
		Part number	BOS 18M-X-IS24-S4
Supply voltage U_s		10...30 V DC	10...30 V DC
Output current			
No-load supply current I_0 max.		≤ 30 mA	≤ 30 mA
Switching type			
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes
Settings		Potentiometer, 270°	
Emitter, light type		LED, infrared	LED, infrared
Wavelength		850 Nm	850 Nm
Response time			
Switching frequency f			400 Hz
Degree of protection as per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-5...+55 °C	-5...+55 °C
Permissible ambient light		5 klx	5 klx
Material	Housing	Nickel-plated brass	Nickel-plated brass
	Optical surface	Glass	Glass
Connection		M12 connector, 4-pin	M12 connector, 4-pin

Reference object: white, 90% reflection, 200×200 mm
 Reference reflector: BOS R-1

For wiring diagrams see page 81.





Photoelectric Sensors

BOS 18M infrared



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

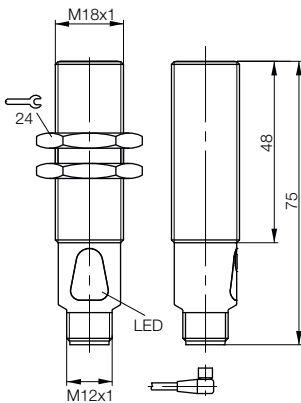
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

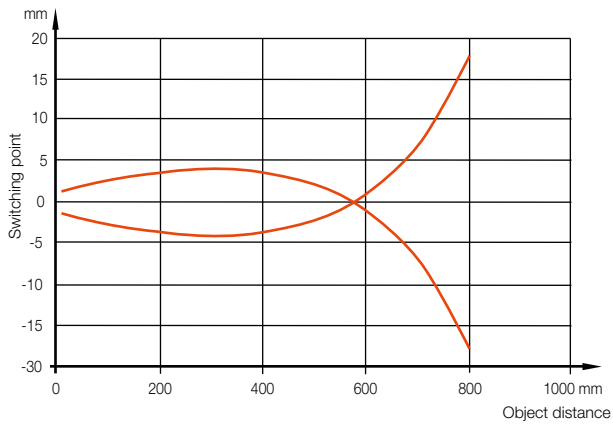
Accessories for Photoelectric Sensors



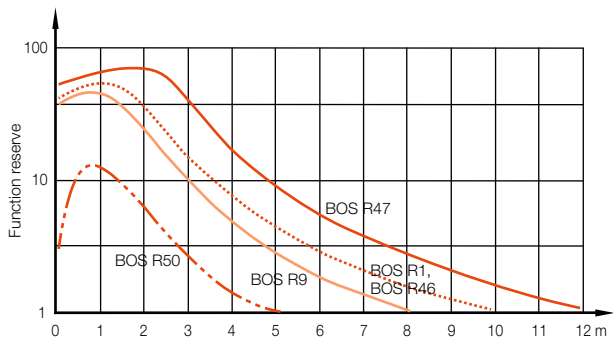
Through-beam sensor 0...50 m/0...100 m			
BOS01F3 BOS 18M-PA-IE20-S4			
10...30 V DC 100 mA ≤ 20 mA Light and dark switching Yes/Yes			
LED, infrared 850 Nm 1.25 ms 400 Hz IP 67 -5...+55 °C 5 klx Nickel-plated brass Glass M12 connector, 4-pin			



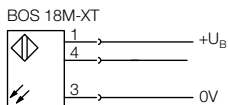
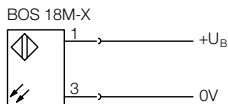
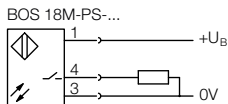
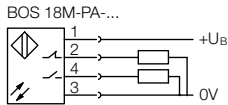
Diffuse sensor BOS 18M...ID20-S4 response curve



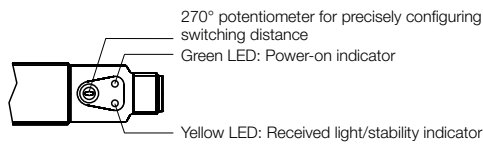
Retroreflective sensor BOS 18M...IR20/IR21-S4



Wiring diagrams



Indicators and operating elements



Green LED power-on indicator

LED lights up: Supply voltage is present.

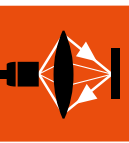
Yellow LED receiving light/stability indicator

LED lights up: Light at receiver.

LED flashes at function reserve < 1.5. Unreliable range.

Potentiometer

Used for precisely configuring the switching point



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors BGL

Angle Sensors BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Recommended accessories
 (please order separately)

Description	Ordering code
① Mounting clamp	BAM00T3
② Mounting bracket	BAM00RY
③ Reflector	BAM00UK



Suitable connectors
 (please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N



Connectors without LED are suitable for PNP and NPN sensors.

Special accessories for photoelectric sensors, such as **reflectors, apertures, lenses, filters and deflection heads** can be found in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

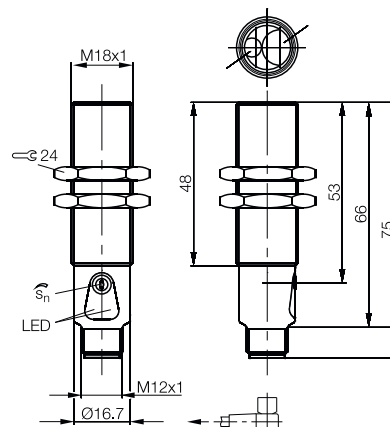
More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.



Type	Diffuse sensor with background suppression		Diffuse sensor with background suppression	
Detection range	30...150 mm		30...150 mm	
PNP	NO	Ordering code	BOS002H	
		Part number	BOS 18M-PS-LH22-S4	
PNP	NO	Error output	Ordering code	BOS002K
			Part number	BOS 18M-PSV-LH22-S4
PNP	NC	Error output	Ordering code	BOS001Z
			Part number	BOS 18M-POV-LH22-S4
PNP	NC/NO	Ordering code		
		Part number		
Supply voltage U_S	10...30 V DC		10...30 V DC	
Output current	100 mA		100 mA	
No-load supply current I_0 max.	≤ 30 mA		≤ 30 mA	
Switching type	Light switching		Dark switching	
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes	
Settings	10-turn potentiometer		10-turn potentiometer	
Emitter, light type	Laser, red light		Laser, red light	
Wavelength	670 Nm		670 Nm	
Laser class	2		2	
Response time	1 ms		1 ms	
Switching frequency f	500 Hz		500 Hz	
Degree of protection as per IEC 60529	IP 67		IP 67	
Ambient temperature T_a	$-5...+55$ °C		$-5...+55$ °C	
Permissible ambient light	10 klx		10 klx	
Material	Housing	Nickel-plated brass	Housing	Nickel-plated brass
	Optical surface	PMMA	Optical surface	PMMA
Connection	M12 connector, 4-pin		M12 connector, 4-pin	

Reference object: white, 90% reflection, 200×200 mm

For wiring diagrams see page 91.





Photoelectric Sensors

BOS 18M Laser

Sensing distance 150 mm, 350 mm



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

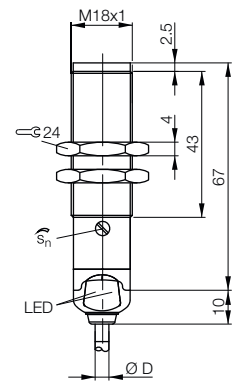
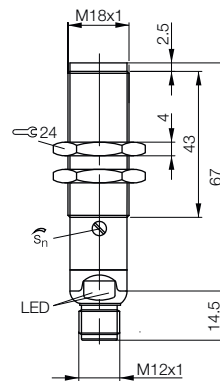
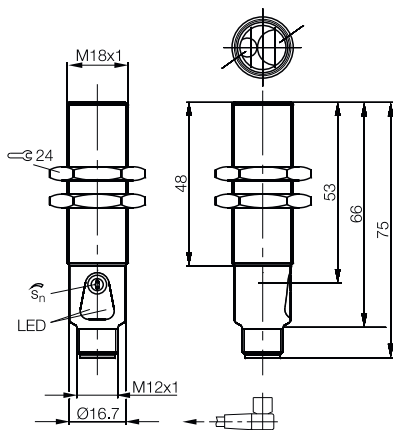
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Diffuse sensor with background suppression 30...150 mm	Diffuse sensor with background suppression 30...150 mm	Diffuse sensor 0...350 mm	Diffuse sensor 0...350 mm
	BOS01C4 BOS 18M-PSV-LH23-S4		
BOS01C5 BOS 18M-PA-LH23-S4		BOS013H BOS 18M-PA-LD10-S4	BOS013F BOS 18M-PA-LD10-02
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
100 mA	100 mA	100 mA	100 mA
≤ 30 mA	≤ 30 mA	≤ 35 mA	≤ 35 mA
Light and dark switching	Light switching	Light and dark switching	Light and dark switching
Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
10-turn potentiometer	10-turn potentiometer	Potentiometer, 270°	Potentiometer, 270°
Laser, red light	Laser, red light	Laser, red light	Laser, red light
650 Nm	650 Nm	650 Nm	650 Nm
1	1	1	1
1 ms	1 ms	333 μs	333 μs
500 Hz	500 Hz	1.5 kHz	1.5 kHz
IP 67	IP 67	IP 67	IP 67
-5...+55 °C	-5...+55 °C	-5...+55 °C	-5...+55 °C
10 klx	10 klx	5 klx	5 klx
Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
PMMA	PMMA	PMMA	PMMA
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	2 m PVC cable, 4x0.14 mm ²

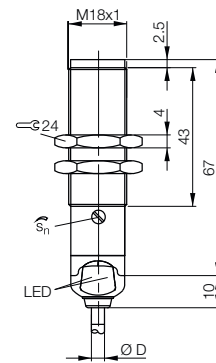
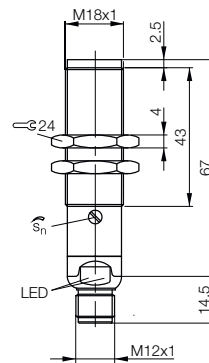




Type	Retroreflective sensor with polarizing filter		Retroreflective sensor with polarizing filter	
Detection range	0.1...16 m		0.1...16 m	
PNP	NC/NO	Ordering code	BOS013M	BOS013L
		Part number	BOS 18M-PA-LR10-S4	BOS 18M-PA-LR10-02
Emitter		Ordering code		
		Part number		
Supply voltage U_s	10...30 V DC		10...30 V DC	
Output current	100 mA		100 mA	
No-load supply current I_0 max.	≤ 35 mA		≤ 35 mA	
Switching type	Light and dark switching		Light and dark switching	
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes	
Settings	Potentiometer, 270°		Potentiometer, 270°	
Emitter, light type	Laser, red light		Laser, red light	
Wavelength	650 Nm		650 Nm	
Laser class	1		1	
Response time	333 μ s		333 μ s	
Switching frequency f	1.5 kHz		1.5 kHz	
Degree of protection as per IEC 60529	IP 67		IP 67	
Ambient temperature T_a	-10...+55 °C		-10...+55 °C	
Permissible ambient light	5 klx		5 klx	
Material	Housing	Nickel-plated brass	Housing	Nickel-plated brass
	Optical surface	PMMA	Optical surface	PMMA
Connection	M12 connector, 4-pin		2 m PVC cable, 4x0.14 mm	

Reference reflector: BOS R-1

For wiring diagrams see page 91.





Photoelectric Sensors

BOS 18M Laser

Range 60 m



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Receiver



Receiver

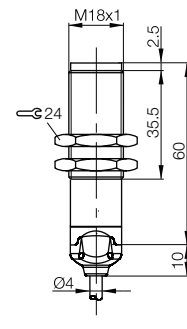
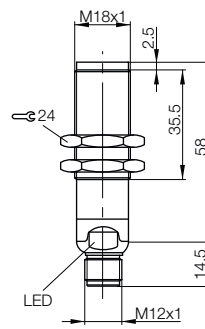
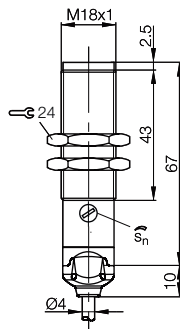
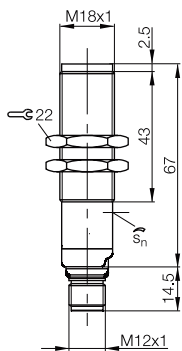


Emitter



Emitter

Through-beam sensor	Through-beam sensor	Through-beam sensor	Through-beam sensor
0...60 m	0...60 m	0...60 m	0...60 m
BOS013K	BOS013J		BOS013P
BOS 18M-PA-LE10-S4	BOS 18M-PA-LE10-02		BOS 18M-XT-LS10-02
		BOS013R	
		BOS 18M-XT-LS10-S4	
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
100 mA	100 mA	≤ 30 mA	≤ 30 mA
≤ 35 mA	≤ 35 mA		
Light and dark switching	Light and dark switching	Yes/Yes	Yes/Yes
Yes/Yes	Yes/Yes		
Potentiometer, 270°	Potentiometer, 270°		
Laser, red light	Laser, red light	Laser, red light	Laser, red light
650 Nm	650 Nm	650 Nm	650 Nm
1	1	1	1
333 μs	333 μs		
1.5 kHz	1.5 kHz		
IP 67	IP 67	IP 67	IP 67
-10...+55 °C	-10...+55 °C	-10...+55 °C	-10...+55 °C
5 klx	5 klx	5 klx	5 klx
Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
PMMA	PMMA	PMMA	PMMA
M12 connector,	2 m PVC cable,	M12 connector,	2 m PVC cable,
4-pin	4x0.14 mm	4-pin	4x0.14 mm

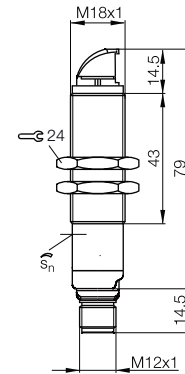
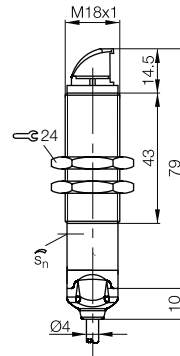




Type	Diffuse sensor		Diffuse sensor
Detection range	0...250 mm		0...250 mm
PNP NO/NC	Ordering code BOS0141		BOS0142
	Part number	BOS 18MR-PA-LD10-02	BOS 18MR-PA-LD10-S4
Supply voltage U_S	10...30 V DC		10...30 V DC
Output current	100 mA		100 mA
No-load supply current I_0 max.	≤ 35 mA		≤ 35 mA
Switching type	Light and dark switching		Light and dark switching
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes
Settings	Potentiometer, 270°		Potentiometer, 270°
Emitter, light type	Laser, red light		Laser, red light
Wavelength	650 Nm		650 Nm
Laser class	1		1
Response time	333 μs		333 μs
Switching frequency f	1.5 kHz		1.5 kHz
Degree of protection as per IEC 60529	IP 67		IP 67
Ambient temperature T_a	-10...+55 °C		-10...+55 °C
Permissible ambient light	5 klx		5 klx
Material	Housing	Nickel-plated brass	Nickel-plated brass
	Optical surface	PMMA	PMMA
Connection		2 m PVC cable, 4×0.14 mm ²	M12 connector, 4-pin

Reference object: white, 90% reflection, 200×200 mm
 Reference reflector: BOS R-1

For wiring diagrams see page 91.





Photoelectric Sensors
BOS 18M Laser
Range 9 m



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

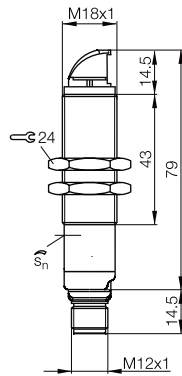
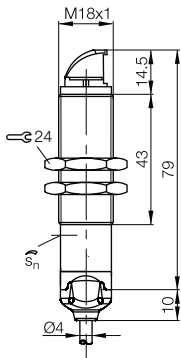
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



	Retroreflective sensor with polarizing filter 0.1...9 m	Retroreflective sensor with polarizing filter 0.1...9 m		
	BOS0145	BOS0146		
	BOS 18MR-PA-LR10-02	BOS 18MR-PA-LR10-S4		
	10...30 V DC	10...30 V DC		
	100 mA	100 mA		
	≤ 35 mA	≤ 35 mA		
	Light and dark switching	Light and dark switching		
	Yes/Yes	Yes/Yes		
	Potentiometer, 270°	Potentiometer, 270°		
	Laser, red light	Laser, red light		
	650 Nm	650 Nm		
	1	1		
	333 μs	333 μs		
	1.5 kHz	1.5 kHz		
	IP 67	IP 67		
	-10...+55 °C	-10...+55 °C		
	5 klx	5 klx		
	Nickel-plated brass	Nickel-plated brass		
	PMMA	PMMA		
	2 m PVC cable, 4x0.14 mm ²	M12 connector, 4-pin		



M18 Metal Laser with Angle Head



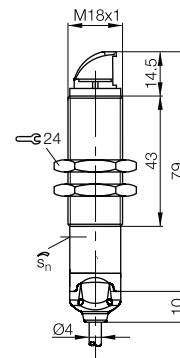
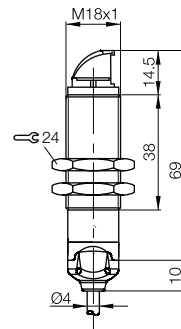
Emitter



Receiver

Type			Through-beam sensor	Through-beam sensor
Detection range			0...50 m	0...50 m
PNP	NC/NO	Ordering code		BOS0143
	Receiver	Part number		BOS 18MR-PA-LE10-02
	Emitter	Ordering code	BOS0147	
		Part number	BOS 18MR-XT-LS10-02	
Supply voltage U _S			10...30 V DC	10...30 V DC
Output current				100 mA
No-load supply current I ₀ max.			≤ 30 mA	≤ 35 mA
Switching type				Light and dark switching
Polarity reversal/short-circuit protected			Yes/Yes	Yes/Yes
Settings				Potentiometer, 270°
Emitter, light type			Laser, red light	Laser, red light
Wavelength			650 Nm	650 Nm
Laser class			1	1
Response time				333 μs
Switching frequency f				1.5 kHz
Degree of protection as per IEC 60529			IP 67	IP 67
Ambient temperature T _a			-10...+55 °C	-10...+55 °C
Permissible ambient light			5 klx	5 klx
Material	Housing		Nickel-plated brass	Nickel-plated brass
	Optical surface		PMMA	PMMA
Connection			2 m PVC cable, 4x0.14 mm ²	2 m PVC cable, 4x0.14 mm ²

For wiring diagrams see page 91.





Photoelectric Sensors

BOS 18M Laser



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

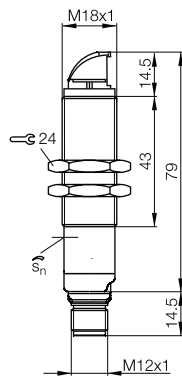
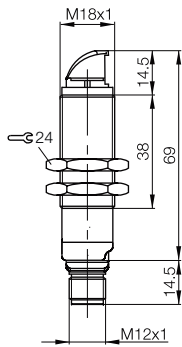
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

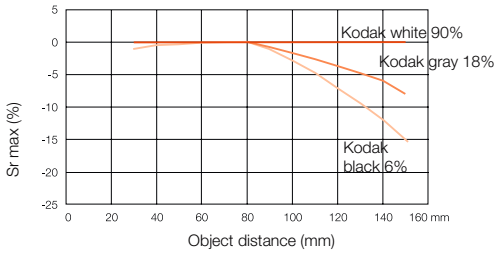
Accessories for Photoelectric Sensors



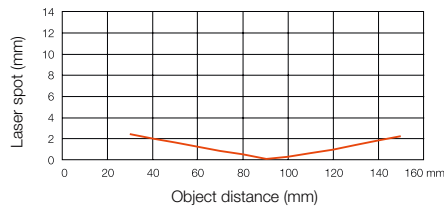
Through-beam sensor 0...50 m	Through-beam sensor 0...50 m		
	BOS0144		
	BOS 18MR-PA-LE10-S4		
BOS0148			
BOS 18MR-XT-LS10-S4			
10...30 V DC	10...30 V DC		
≤ 30 mA	100 mA ≤ 35 mA		
Yes/Yes	Light and dark switching Yes/Yes		
Laser, red light	Potentiometer, 270° Laser, red light		
650 Nm	Laser, red light 650 Nm		
1	1		
	333 μs		
	1.5 kHz		
IP 67	IP 67		
-10...+55 °C	-10...+55 °C		
5 klx	5 klx		
Nickel-plated brass	Nickel-plated brass		
PMMA	PMMA		
M12 connector, 4-pin	M12 connector, 4-pin		



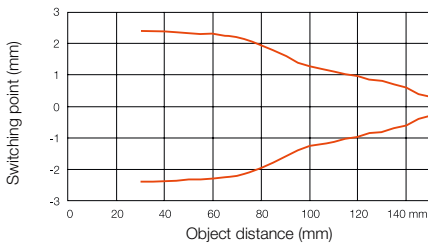
Diffuse sensor with background suppression BOS 18M-...LH
Gray value shift



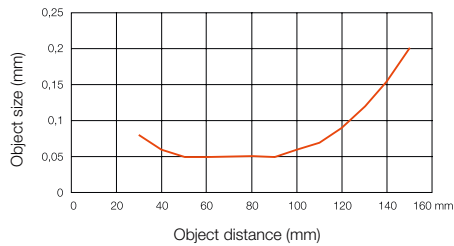
Diffuse sensor with background suppression BOS 18M-...LH
Light spot diameter at distance



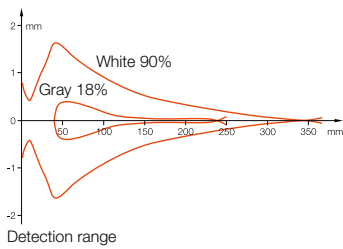
Diffuse sensor with background suppression BOS 18M-...LH
Turn-on point for lateral approach



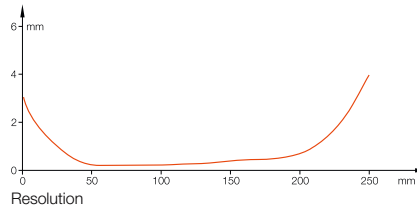
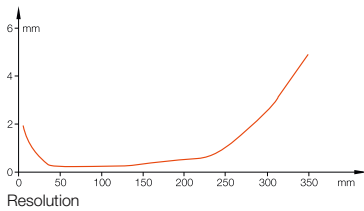
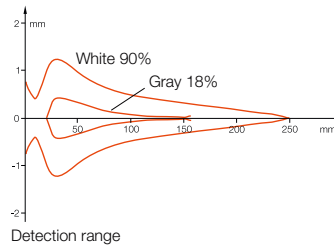
Diffuse sensor with background suppression BOS 18M-...LH
Smallest detectable part



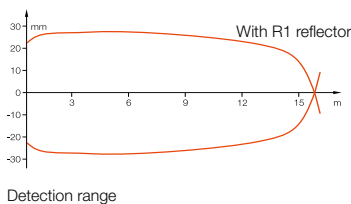
Diffuse sensor BOS 18M-...LD10-...



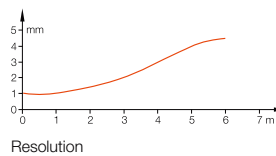
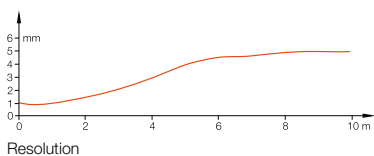
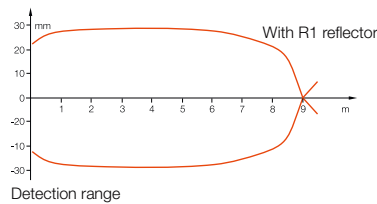
Diffuse sensor BOS 18MR-...LD10-...

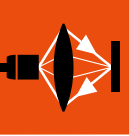


Retroreflective sensor BOS 18M-...LR10-...



Retroreflective sensor BOS 18MR-...LR10-...





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

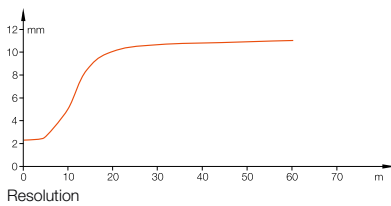
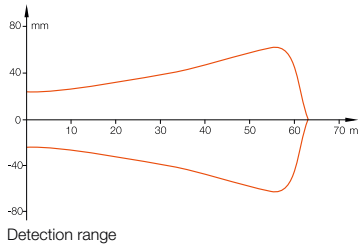
BWL

Photoelectric Sensors with Special Properties

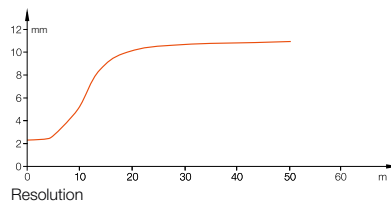
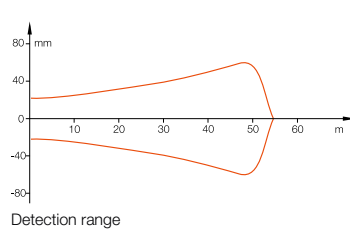
Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

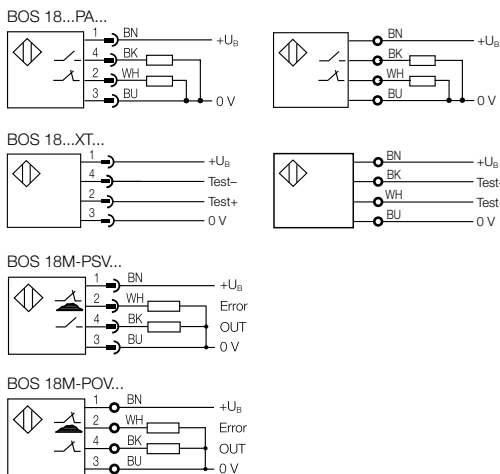
Through-beam sensor BOS 18M--LE/LS10--



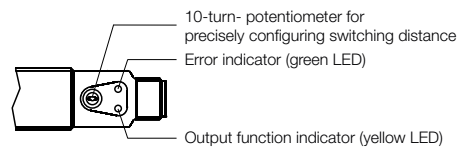
Through-beam sensor BOS 18MR--LE/LS10--



Wiring diagrams



Indicators and operating elements



Green LED

The green LED turns on when the sensor is working in an unreliable range. The green LED flashes when there is a short circuit on the output.

Yellow LED

Output function indicator: The yellow LED comes on when the output is active.

Error output

The error output is active when the sensor is working in an unreliable range.

Potentiometer

Used for precisely configuring the switching point and background suppression.

Recommended accessories
 (please order separately)

Description	Ordering code
① Mounting clamp	BAM00T3
② Mounting bracket	BAM00RY
③ Reflector	BAM00UK



Suitable connectors
 (please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N

Special accessories for photoelectric sensors, such as **reflectors, apertures, lenses, filters and deflection heads** can be found in this catalog starting on page 376.

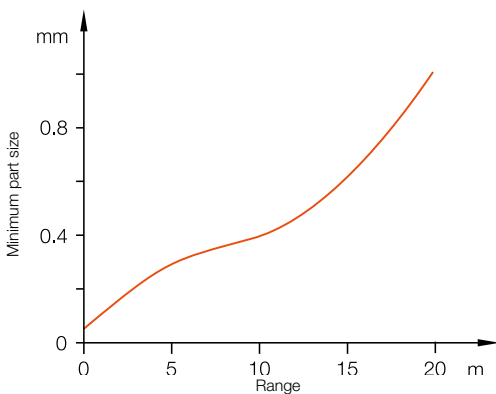
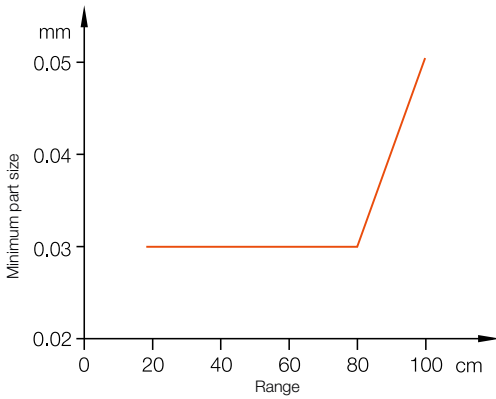
More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.

Accuracy diagram

Smallest detectable part size as a function of range.

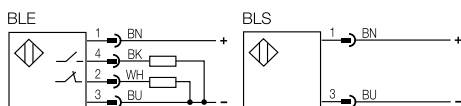


Light spot perpendicular to transport direction of the object.



Type				
Detection range				
PNP	NC/NO	Receiver	Ordering code	
			Part number	
PNP	NC	Receiver	Ordering code	
			Part number	
		Emitter	Ordering code	
			Part number	
Supply voltage U_s				
Output current				
No-load supply current I_0 max.				
Switching type				
Polarity reversal/short-circuit protected				
Settings				
Emitter, light type				
Wavelength				
Laser class				
Response time				
Switching frequency f				
Degree of protection as per IEC 60529				
Ambient temperature T_a				
Permissible ambient light				
Material		Housing		
		Optical surface		
Connection				

Wiring diagrams



Recommended accessories
 (please order separately)

Description	Ordering code
Mounting cuff	BAM00T3



More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Suitable connectors
 (please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N

Connectors without LED are suitable for PNP and NPN sensors.



Photoelectric Sensors

BOS 18M

Laser through-beam sensor



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

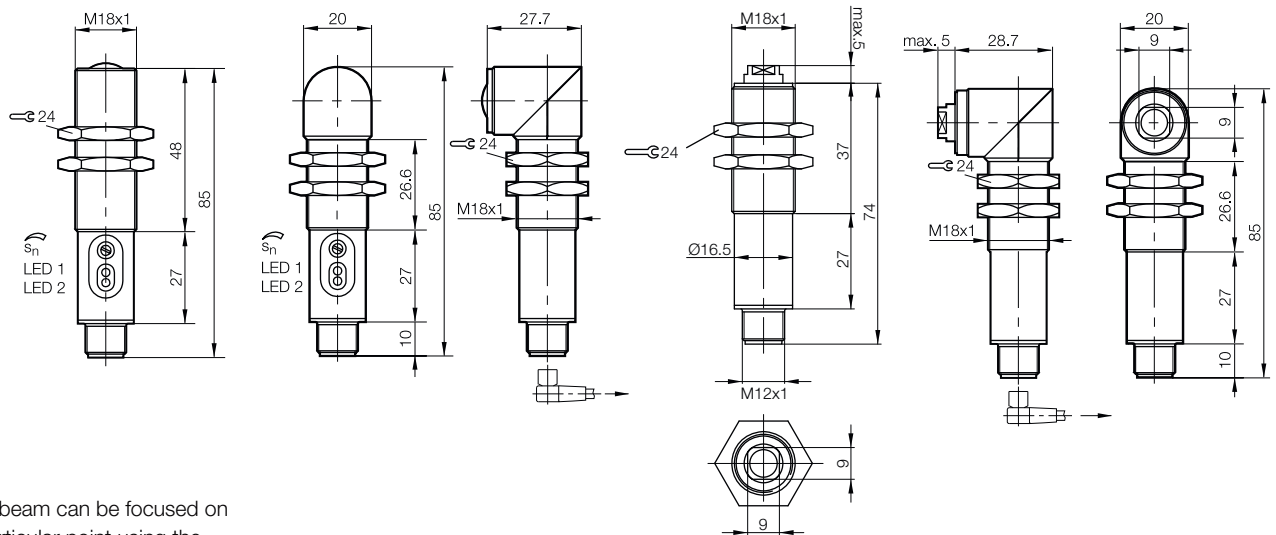
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Measurement

Accessories for Photoelectric Sensors



Through-beam sensor 0...50 m	Through-beam sensor 0...50 m	Through-beam sensor 0...50 m	Through-beam sensor 0...50 m
BOS0074	BOS0076		
BLE 18M-BA-1LT-S4-C	BLE 18MR-BA-1LT-S4-C		
BOS0075			
BLE 18M-BO-1LT-S4-C			
		BOS00AW	BOS00AU
		BLS 18M-XX-1LT-S4-C	BLS 18MR-XX-1LT-S4-C
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
200 mA	200 mA		
≤ 15 mA	≤ 15 mA	≤ 10 mA	≤ 10 mA
Light/dark switching	Light and dark switching		
Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
18-turn potentiometer	18-turn potentiometer		
		Laser, red light 650 Nm 2	Laser, red light 650 Nm 2
0.08 ms	0.08 ms		
6 kHz	6 kHz		
IP 65	IP 65	IP 65	IP 65
-15...+55 °C	-15...+55 °C	-15...+55 °C	-15...+55 °C
2 klx	2 klx	2 klx	2 klx
Nickel-plated brass	Nickel-plated brass	Nickel-plated brass	Nickel-plated brass
Glass	Glass	Glass	Glass
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



The beam can be focused on a particular point using the included focusing tool. The detection of small parts is optimum in this spot.

Parts with a diameter of up to 0.03 mm can be detected at a distance of 20...80 cm between the emitter and receiver.



Photoelectric sensors from the **Proxinox** series are made of corrosion-resistant **stainless steel 1.4571** and therefore do not wear down. Their optical surface is made of 2 mm thick glass (also available in plastic for the food industry), making it stable and shockproof.

The housing design is identical for all the sensors in the **BOS 18E** series. A special housing nose and optics construction provides optimum sealing and rigidity. In addition to the usual IP 68 protection, steam cleaning is also permitted.

In addition to retroreflective and through-beam sensors with a fine-tunable range, the **BOS 18E** series offers diffuse sensors whose sensing distances of 100 mm, 200 mm to 400 mm have been fine-tuned. These diffuse sensors are manufactured with tight tolerances. This makes them ideal for rapid and simple assembly. Easily visible red light (for 100 and 200 mm) also makes them easy to align.

The through-beam model operates using infrared light. The high-energy beam can penetrate ordinary paper. The through-beam sensor is ideal for harsh environments, for example in the food processing and machine tools industry, where a sensor with a large function reserve is needed.

Features

- Supply voltage 10...30 V DC, polarity reversal protected
- Output short circuit protected
- Tough stainless steel housing without holes and with stainless steel nuts
- IP 68 degree of protection (BWN Pr. 27), can also withstand steam cleaning
- Optical surface of tough 2 mm Borofloat glass or scratch-resistant PMMA, secured in place by crimping.
- Laser-inscribed housing

Applications

- Bottling equipment
- Food industry
- Packaging industry
- Laundry and dry-cleaning equipment
- Machine tools
- Heavy industry
- Wherever other sensors don't measure up



Photoelectric Sensors

BOS 18E

Product overview



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

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Photoelectric Distance Sensors for Analog Distance Measurement

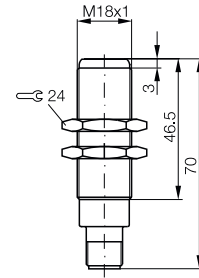
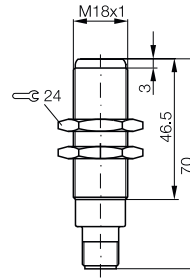
Type	Sensing distance/Range	Light type		Output	Switching type		Switching frequency	U _S	Connection		Special features		Page
		Red light	Infrared		PNP transistor	Light switching			Dark switching	10...30 V DC	M12 plug, 4-pin	Cable	
Diffuse sensor with background suppression													
BOS0016	BOS 18E-PS-1N2M-S4-D	0...40 mm	■	■	■		100 Hz	■	■				96
Diffuse sensor													
BOS0047	BOS 18E-PS-1YA-E5-D-S4	0...100 mm	■	■	■		100 Hz	■	■				96
BOS0015	BOS 18E-PO-1YA-E5-D-S4	0...100 mm	■			■	100 Hz	■	■				96
BOS0017	BOS 18E-PS-1XA-SA1-S4	0...100 mm		■	■	■	100 Hz	■	■				97
BOS001A	BOS 18E-PS-1YB-E5-D-S4	0...200 mm	■		■	■	100 Hz	■	■				97
BOS0018	BOS 18E-PS-1XB-SA1-S4	0...200 mm		■	■	■	100 Hz	■	■				97
BOS001C	BOS 18E-PS-1YD-E5-D-S4	0...400 mm	■		■	■	100 Hz	■	■				97
BOS0019	BOS 18E-PS-1XD-SA1-S4	0...400 mm		■	■	■	100 Hz	■	■				98
Retroreflective sensor													
BOS00RN	BOS 18E-PS-1UB-E5-D-S4	2 m	■		■		100 Hz	■	■		■		98
BOS00RL	BOS 18E-PO-1UB-E5-D-S4	2 m	■		■	■	100 Hz	■	■		■		98
BOS00RP	BOS 18E-PS-1UB-SA1-S4	2 m	■		■	■	100 Hz	■	■		■		99
BOS0046	BOS 18E-PS-1WD-E5-D-S4	4 m	■		■	■	100 Hz	■	■				99
Through-beam sensor Receiver													
BOS00UJ	BLE 18E-PS-1P-E5-D-S4	16 m		■	■	■	100 Hz	■	■				99
BOS00UF	BLE 18E-PO-1P-E5-D-S4	16 m		■	■	■	100 Hz	■	■				99
BOS00UH	BLE 18E-PO-1P-E5-D-S4S	16 m		■	■	■	100 Hz	■	■				99
BOS00UK	BLE 18E-PS-1P-SA1-S4	16 m		■	■	■	100 Hz	■	■				99
Through-beam sensor Emitter													
BOS00UY	BLS 18E-XX-1P-E5-X-S4	16 m		■				■	■				99
BOS00UZ	BLS 18E-XX-1P-SA1-S4	16 m		■				■	■				99



Type	Diffuse sensor with background suppression		Diffuse sensor
Detection range	0...40 mm		0...100 mm
PNP NO	Ordering code	BOS0016	BOS0047
	Part number	BOS 18E-PS-1N2M-S4-D	BOS 18E-PS-1YA-E5-D-S4
PNP NC	Ordering code		BOS0015
	Part number		BOS 18E-PO-1YA-E5-D-S4
Supply voltage U _S	10...30 V DC		10...30 V DC
Output current	200 mA		200 mA
No-load supply current I ₀ max.	≤ 20 mA		≤ 20 mA
Switching type	Light switching		Light or dark switching
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes
Settings	Fixed		Fixed
Emitter, light type	LED, red light		LED, red light
Wavelength	660 Nm		660 Nm
Response time	5 ms		5 ms
Switching frequency f	100 Hz		100 Hz
Degree of protection as per IEC 60529	IP 68 per BWN Pr. 27		IP 68 per BWN Pr. 27
Ambient temperature T _a	-5...+75 °C		-20...+75 °C
Permissible ambient light	2 klx		2 klx
Material	Housing	Stainless steel 1.4571	Stainless steel 1.4571
	Optical surface	Glass	Glass
Connection	M12 connector, 4-pin		M12 connector, 4-pin

Reference object: white, 90% reflection, 200×200 mm

For wiring diagrams see page 101.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

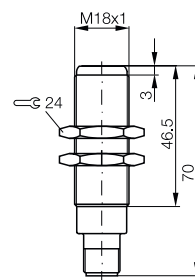
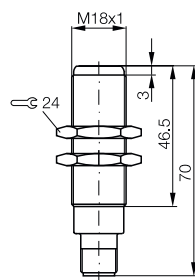
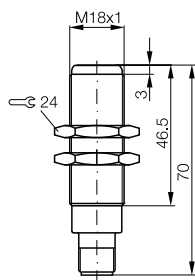
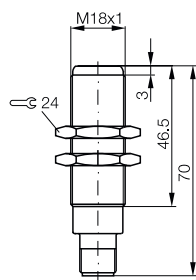
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



	Diffuse sensor 0...100 mm	Diffuse sensor 0...200 mm	Diffuse sensor 0...200 mm	Diffuse sensor 0...400 mm
	BOS0017	BOS001A	BOS0018	BOS001C
	BOS 18E-PS-1XA-SA1-S4	BOS 18E-PS-1YB-E5-D-S4	BOS 18E-PS-1XB-SA1-S4	BOS 18E-PS-1YD-E5-D-S4
	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
	200 mA	200 mA	200 mA	200 mA
	≤ 20 mA	≤ 20 mA	≤ 20 mA	≤ 20 mA
	Light switching	Light switching	Light switching	Light switching
	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
	Fixed	Fixed	Fixed	Fixed
	LED, infrared	LED, red light	LED, infrared	LED, red light
	880 Nm	660 Nm	880 Nm	660 Nm
	5 ms	5 ms	5 ms	5 ms
	100 Hz	100 Hz	100 Hz	100 Hz
	IP 68 per BWN Pr. 27	IP 68 per BWN Pr. 27	IP 68 per BWN Pr. 27	IP 68 per BWN Pr. 27
	-5...+75 °C	-20...+75 °C	-5...+75 °C	-20...+75 °C
	2 klx	2 klx	2 klx	2 klx
	Stainless steel 1.4571	Stainless steel 1.4571	Stainless steel 1.4571	Stainless steel 1.4571
	PMMA scratch-resistant	Glass	PMMA scratch-resistant	Glass
	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

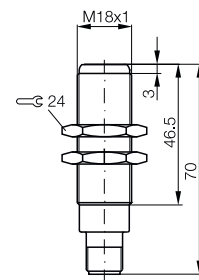
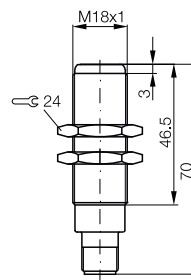




Type		Diffuse sensor	Retroreflective sensor
Detection range		0...400 mm	2 m with polarizing filter
PNP NO	Ordering code	BOS0019	BOS00RN
	Part number	BOS 18E-PS-1XD-SA1-S4	BOS 18E-PS-1UB-E5-D-S4
PNP NC	Ordering code		BOS00RL
	Part number		BOS 18E-PO-1UB-E5-D-S4
PNP NO Receiver	Ordering code		
	Part number		
PNP NC Receiver	Ordering code		
	Part number		
PNP NC Receiver Output special assignment	Ordering code		
	Part number		
	Emitter	Ordering code	
		Part number	
Supply voltage U_s		10...30 V DC	10...30 V DC
Output current		200 mA	200 mA
No-load supply current I_0 max.		≤ 20 mA	≤ 20 mA
Switching type		Light switching	Light or dark switching
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes
Settings		Fixed	Fixed
Emitter, light type		LED, infrared	LED, red light
Wavelength		880 Nm	660 Nm
Response time		5 ms	5 ms
Switching frequency f		100 Hz	100 Hz
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 27	IP 68 per BWN Pr. 27
Ambient temperature T_a		-5...+75 °C	-20...+75 °C
Permissible ambient light		2 klx	2 klx
Material	Housing	Stainless steel 1.4571	Stainless steel 1.4571
	Optical surface	PMMA scratch-resistant	Glass
Connection		M12 connector, 4-pin	M12 connector, 4-pin

Reference object: white, 90% reflection, 200x200 mm
 Reference reflector: BOS R-1

For wiring diagrams see page 101.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

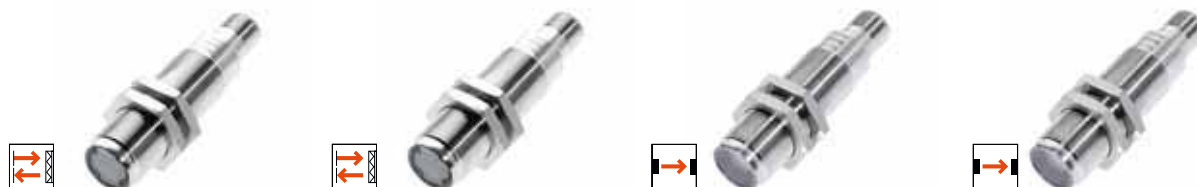
Angle Sensors

BWL

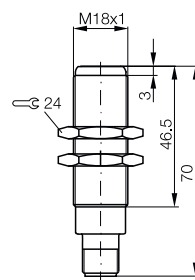
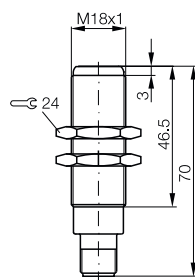
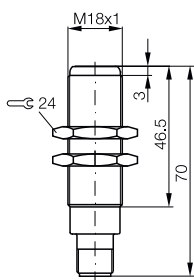
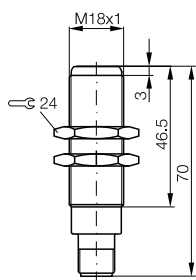
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

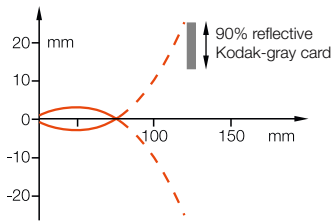
Accessories for Photoelectric Sensors



	Retroreflective sensor 2 m with polarizing filter	Retroreflective sensor 4 m	Through-beam sensor 16 m	Through-beam sensor 16 m
	BOS00RP	BOS0046		
	BOS 18E-PS-1UB-SA1-S4	BOS 18E-PS-1WD-E5-D-S4		
			BOS00UJ	BOS00UK
			BLE 18E-PS-1P-E5-D-S4	BLE 18E-PS-1P-SA1-S4
			BOS00UF	
			BLE 18E-PO-1P-E5-D-S4	
			BOS00UH	
			BLE 18E-PO-1P-E5-D-S4S	
			BOS00UY	BOS00UZ
			BLS 18E-XX-1P-E5-X-S4	BLS 18E-XX-1P-SA1-S4
	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
	200 mA	200 mA	200 mA	200 mA
	≤ 20 mA	≤ 20 mA	≤ 15 mA (BLS ≤ 40 mA)	≤ 15 mA (BLS ≤ 35 mA)
	Dark switching	Dark switching	Light or dark switching	Dark switching
	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
	Fixed	Fixed	Fixed	Fixed
	LED, red light	LED, red light	LED, infrared	LED, infrared
	660 Nm	660 Nm	880 Nm	880 Nm
	5 ms	5 ms	5 ms	5 ms
	100 Hz	100 Hz	100 Hz	100 Hz
	IP 68 per BWN Pr. 27	IP 68 per BWN Pr. 27	IP 68 per BWN Pr. 27	IP 68 per BWN Pr. 27
	-20...+75 °C	-20...+75 °C	-5...+75 °C	-5...+75 °C
	2 klx	2 klx	2 klx	2 klx
	Stainless steel 1.4571	Stainless steel 1.4571	Stainless steel 1.4571	Stainless steel 1.4571
	PMMA scratch-resistant	Glass	Glass	PMMA scratch-resistant
	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

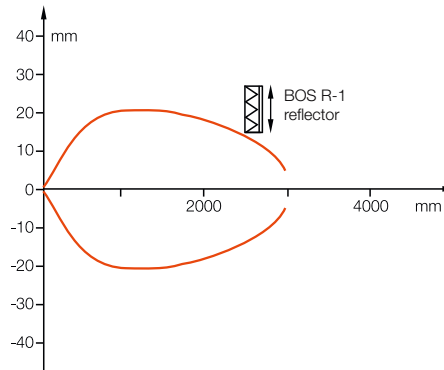


Diffuse sensor BOS 18E-...-1YA-...



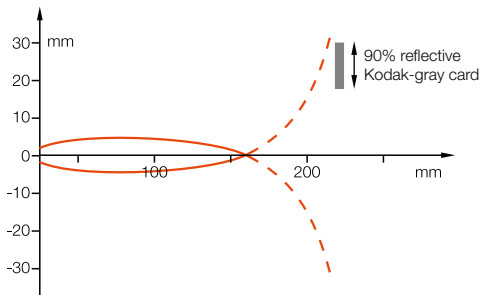
Sensing distance with side approach of Kodak-gray card.

Retroreflective sensor BOS 18E-...-1UB-...



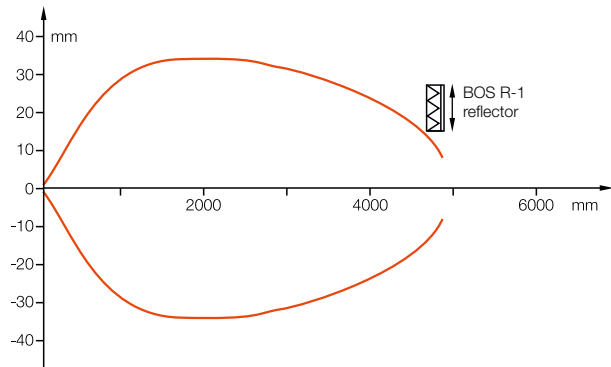
Range measured with side approach with reflector.

Diffuse sensor BOS 18E-...-1YB-...



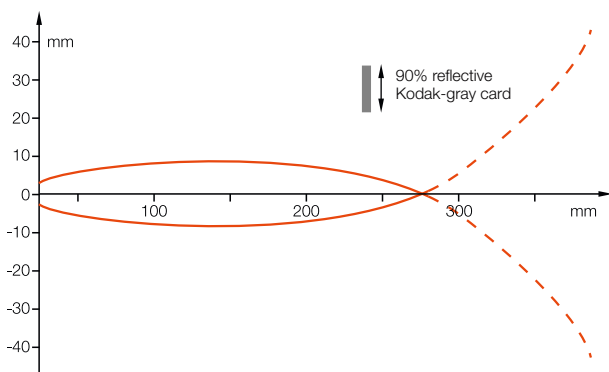
Sensing distance with side approach of Kodak-gray card.

Retroreflective sensor BOS 18E-...-1WD-...



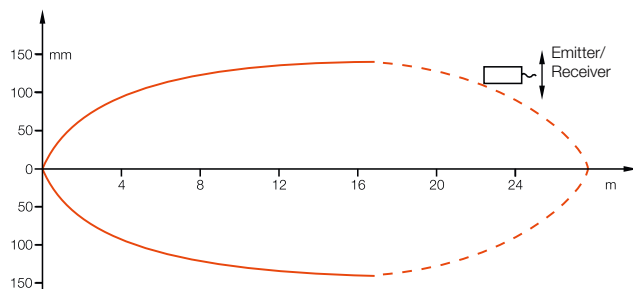
Range measured with side approach with reflector.

Diffuse sensor BOS 18E-...-1YD-...



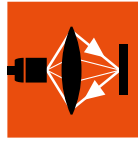
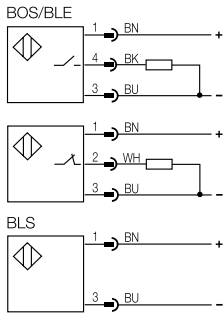
Sensing distance with side approach of Kodak-gray card.

Through-beam BLE/BLS 18E-...



For a through-beam sensor, the maximum possible offset between the emitter and receiver is measured.

Wiring diagrams



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Recommended accessories
 (please order separately)

Description	Ordering code
① Mounting clamp	BAM00T3
② Reflector	BAM00UK
③ Round aperture	BAM00R6
④ Air shield	BAM00R9



Special accessories for photoelectric sensors, such as **reflectors, apertures, lenses, filters and deflection heads** can be found in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Suitable connectors
 (please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	5 m	BCC0EZ9
M12, 4-pin	Straight	PVC	Gray	5 m	BCC0EZF
M12, 4-pin	Angled	PUR	Black	5 m	BCC0EZC
M12, 4-pin	Angled	PVC	Gray	5 m	BCC0EZH



Connectors without LED are suitable for PNP and NPN sensors.

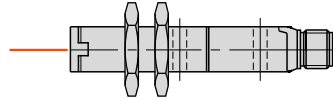
More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.

BOS 18KF – with expanded product line

BOS 18KF series sensors are available with red or infrared light or with a Class 1 laser.

They are configured using a potentiometer or via teach-in. The plastic housing with flattened sides allows installation using the included M18-nuts or screws through the sensor housing.

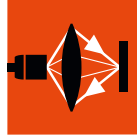
The sensors are available as cable- or M12- connector styles with PNP- or NPN- output.



Photoelectric Sensors

BOS 18KF Global

Product overview



Photoelectric Sensors

Photoelectric Sensors

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Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type	Sensing distance/Range	Light type			Output	Switching type		Switching frequency	U _s	Connection		Special features			Page
		Red light	Infrared	Laser		PNP transistor	Light switching			Dark switching	10...30V DC	M12 plug, 4-pin	Cable	Polarizing filter	
Diffuse sensor with background suppression															
BOS00JM BOS 18KF-PA-1HA-S4-C	50...100 mm	■			■	■	■	500 Hz	■	■			■		104
BOS00JL BOS 18KF-PA-1HA-C-02	50...100 mm	■			■	■	■	500 Hz	■		■		■		104
BOS00JW BOS 18KF-PA-1N1R-S4-C	100 mm	■			■	■	■	1 kHz	■	■					105
BOS00JU BOS 18KF-PA-1N1R-C-02	100 mm	■			■	■	■	1 kHz	■		■				105
Diffuse sensor with background suppression															
BOS00JK BOS 18KF-PA-1GA-S4-C	40...100 mm	■			■	■	■	250 Hz	■	■			■		105
Diffuse sensor															
BOS00K9 BOS 18KF-PA-1XA-S4-C	0...100 mm		■		■	■	■	1 kHz	■	■					105
BOS00K8 BOS 18KF-PA-1XA-C-02	0...100 mm		■		■	■	■	1 kHz	■		■				106
BOS00JP BOS 18KF-PA-1LOC-S4-C	0...350 mm			■	■	■	■	1.5 kHz	■	■					112
BOS00JN BOS 18KF-PA-1LOC-C-02	0...350 mm			■	■	■	■	1.5 kHz	■		■				112
BOS00JZ BOS 18KF-PA-1PD-S4-C	0...400 mm		■		■	■	■	1 kHz	■	■					106
BOS00JY BOS 18KF-PA-1PD-C-02	0...400 mm		■		■	■	■	1 kHz	■		■				107
BOS00K1 BOS 18KF-PA-1PE-S4-C	0...700 mm		■		■	■	■	1 kHz	■	■					107
BOS00K0 BOS 18KF-PA-1PE-C-02	0...700 mm		■		■	■	■	1 kHz	■		■				107
Retroreflective sensor															
BOS00K7 BOS 18KF-PA-1TB-S4-C	0.1...1.7 m	■			■	■	■	1 kHz	■	■			■	■	108
BOS00K6 BOS 18KF-PA-1TB-C-02	0.1...1.7 m	■			■	■	■	1 kHz	■		■		■	■	108
BOS00K3 BOS 18KF-PA-1QD-S4-C	0.1...4.5 m	■			■	■	■	1 kHz	■	■			■		109
BOS00K2 BOS 18KF-PA-1QD-C-02	0.1...4.5 m	■			■	■	■	1 kHz	■		■		■		109
BOS00K5 BOS 18KF-PA-1RE-S4-C	0.1...5 m	■			■	■	■	1 kHz	■	■					109
BOS00K4 BOS 18KF-PA-1RE-C-02	0.1...5 m	■			■	■	■	1 kHz	■		■				109
BOS00JT BOS 18KF-PA-1LQP-S4-C	0.1...16 m			■	■	■	■	1.5 kHz	■	■			■		113
BOS00JR BOS 18KF-PA-1LQP-C-02	0.1...16 m			■	■	■	■	1.5 kHz	■		■		■		113
Through-beam sensor Receiver															
BOS00CK BLE 18KF-PA-1PP-S4-C	0...20 m		■		■	■	■	250 Hz	■	■					110
BOS00CJ BLE 18KF-PA-1PP-C-02	0...20 m		■		■	■	■	250 Hz	■		■				111
BOS00CH BLE 18KF-PA-1LT-S4-C	0...60 m			■	■	■	■	1.5 kHz	■	■					114
BOS00CF BLE 18KF-PA-1LT-C-02	0...60 m			■	■	■	■	1.5 kHz	■		■				115
Through-beam sensor Emitter															
BOS00EP BLS 18KF-XX-1P-S4-L	0...20 m		■						■	■					110
BOS00EN BLS 18KF-XX-1P-L-02	0...20 m		■						■		■				111
BOS00EM BLS 18KF-XX-1LT-S4-L	0...60 m			■					■	■					114
BOS00EL BLS 18KF-XX-1LT-L-02	0...60 m			■					■		■				115

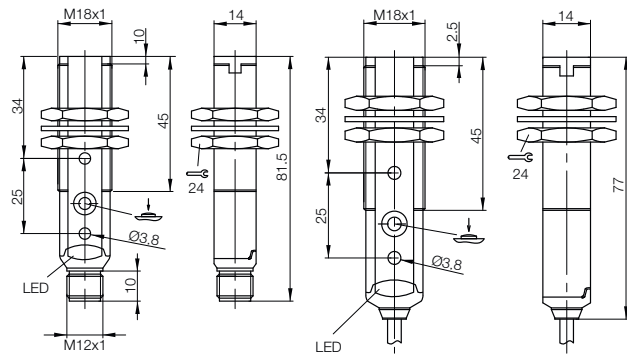
NPN on request



Type	Diffuse sensor with background suppression		Diffuse sensor with background suppression
Detection range	50...100 mm		50...100 mm
PNP NC/NO	Ordering code		
	Part number		
PNP NC/NO Teach-in	Ordering code	BOS00JM	BOS00JL
	Part number	BOS 18KF-PA-1HA-S4-C	BOS 18KF-PA-1HA-C-02
Supply voltage U_s	10...30 V DC		10...30 V DC
Output current	100 mA		100 mA
No-load supply current I_0 max.	≤ 30 mA		≤ 30 mA
Switching type	Light and dark switching		Light and dark switching
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes
Settings	Teach-in		Teach-in
Emitter, light type	LED, red light		LED, red light
Wavelength	630 Nm		630 Nm
Light spot diameter	approx. 8 mm at 100 mm		approx. 8 mm at 100 mm
Output function indicator	Yellow LED		Yellow LED
Stability indicator	Green/red LED		Green/red LED
Response time	1 ms		1 ms
Switching frequency f	500 Hz		500 Hz
Degree of protection as per IEC 60529	IP 67		IP 67
Ambient temperature T_a	$-25...+55$ °C		$-25...+55$ °C
Reference standard	EN 60947-5-2		EN 60947-5-2
Material	Housing	PBT	PBT
	Optical surface	PMMA	PMMA
Connection	M12 connector, 4-pin		2 m PVC cable, 4x0.14 mm ²

Reference object: white, 90% reflection, 200x200 mm

For wiring diagrams see page 119.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

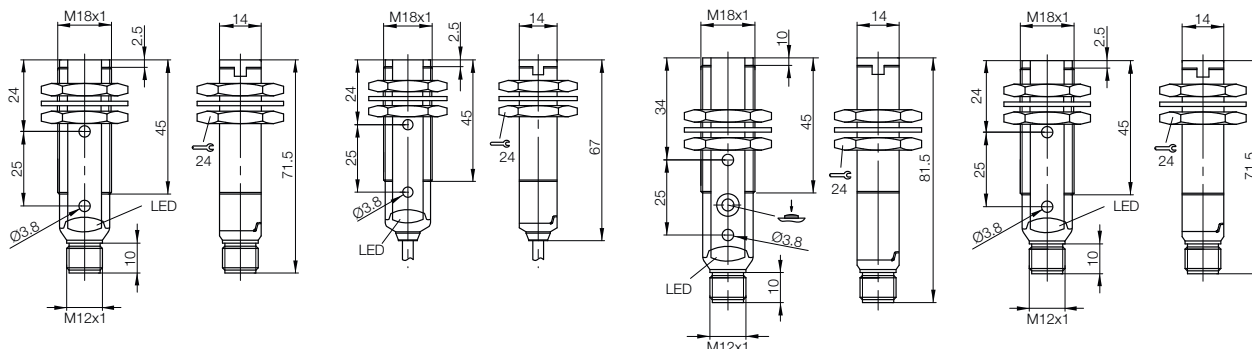
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



	Diffuse sensor with background suppression 100 mm BOS00JW BOS 18KF-PA-1N1R-S4-C	Diffuse sensor with background suppression 100 mm BOS00JU BOS 18KF-PA-1N1R-C-02	Diffuse sensor with background suppression 40...100 mm BOS00JK BOS 18KF-PA-1GA-S4-C	Diffuse sensor 0...100 mm BOS00K9 BOS 18KF-PA-1XA-S4-C
	10...30 V DC 100 mA ≤ 35 mA Light and dark switching Yes/Yes Fixed LED, red light 630 Nm approx. 20 mm at 100 mm Yellow LED Green/red LED 0.5 ms 1 kHz IP 67 -25...+55 °C EN 60947-5-2 PBT PMMA M12 connector, 4-pin	10...30 V DC 100 mA ≤ 35 mA Light and dark switching Yes/Yes Fixed LED, red light 630 Nm approx. 20 mm at 100 mm Yellow LED Green/red LED 0.5 ms 1 kHz IP 67 -25...+55 °C EN 60947-5-2 PBT PMMA 2 m PVC cable, 4x0.14 mm ³	10...30 V DC 100 mA ≤ 30 mA Light and dark switching Yes/Yes Teach-in LED, red light 630 Nm approx. 8 mm at 100 mm Yellow LED Green/red LED 2 ms 250 Hz IP 67 -25...+55 °C EN 60947-5-2 PBT PMMA M12 connector, 4-pin	10...30 V DC 100 mA ≤ 35 mA Light and dark switching Yes/Yes Fixed LED, infrared 880 Nm approx. 80 mm at 100 mm Yellow LED 0.5 ms 1 kHz IP 67 -25...+55 °C EN 60947-5-2 PBT PMMA M12 connector, 4-pin

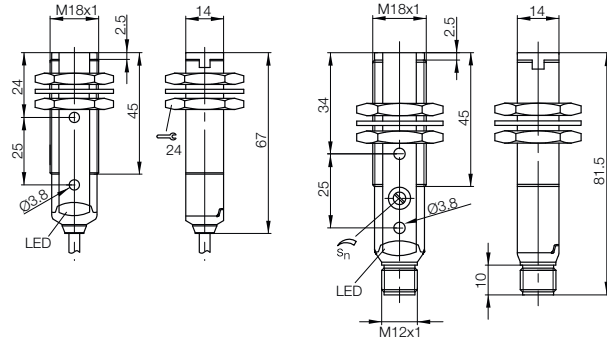




Type		Diffuse sensor	Diffuse sensor
Detection range		0...100 mm	0...400 mm
PNP NC/NO	Ordering code	BOS00K8	BOS00JZ
	Part number	BOS 18KF-PA-1XA-C-02	BOS 18KF-PA-1PD-S4-C
Supply voltage U_s		10...30 V DC	10...30 V DC
Output current		100 mA	100 mA
No-load supply current I_0 max.		≤ 35 mA	≤ 35 mA
Switching type		Light/dark (complementary)	Light/dark (complementary)
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes
Settings		Fixed	Potentiometer, 270°
Emitter, light type		LED, infrared	LED, infrared
Wavelength		880 Nm	880 Nm
Light spot diameter		approx. 80 mm at 100 mm	approx. 100 mm at 300 mm
Output function indicator		Yellow LED	Yellow LED
Stability indicator			Green LED
Response time		0.5 ms	0.5 ms
Switching frequency f		1 kHz	1 kHz
Degree of protection as per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-25...+55 °C	-25...+55 °C
Reference standard		EN 60947-5-2	EN 60947-5-2
Material	Housing	PBT	PBT
	Optical surface	PMMA	PMMA
Connection		2 m PVC cable, 4x0.14 mm ³	M12 connector, 4-pin

Reference object: white, 90% reflection, 200x200 mm

For wiring diagrams see page 119.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

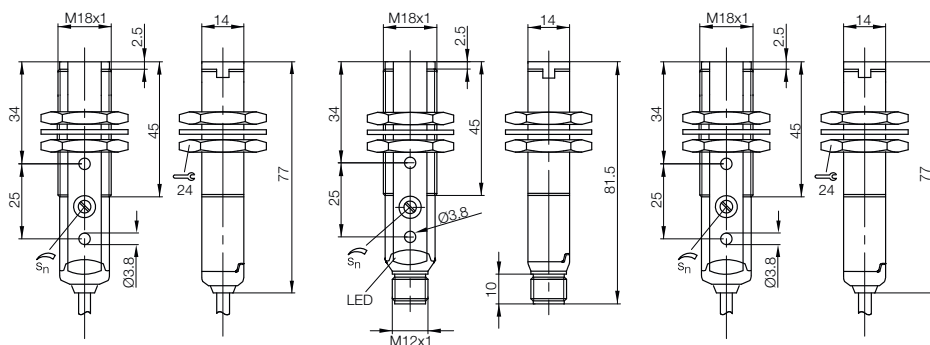
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Diffuse sensor 0...400 mm BOS00JY	Diffuse sensor 0...700 mm BOS00K1	Diffuse sensor 0...700 mm BOS00K0	
BOS 18KF-PA-1PD-C-02	BOS 18KF-PA-1PE-S4-C	BOS 18KF-PA-1PE-C-02	
10...30 V DC	10...30 V DC	10...30 V DC	
100 mA	100 mA	100 mA	
≤ 35 mA	≤ 35 mA	≤ 35 mA	
Light/dark (complementary)	Light/dark (complementary)	Light/dark (complementary)	
Yes/Yes	Yes/Yes	Yes/Yes	
Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°	
LED, infrared	LED, infrared	LED, infrared	
880 Nm	880 Nm	880 Nm	
approx. 100 mm at 300 mm	approx. 200 mm at 600 mm	approx. 200 mm at 600 mm	
Yellow LED	Yellow LED	Yellow LED	
Green LED	Green LED	Green LED	
0.5 ms	0.5 ms	0.5 ms	
1 kHz	1 kHz	1 kHz	
IP 67	IP 67	IP 67	
-25...+55 °C	-25...+55 °C	-25...+55 °C	
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	
PBT	PBT	PBT	
PMMA	PMMA	PMMA	
2 m PVC cable, 4x0.14 mm ³	M12 connector, 4-pin	2 m PVC cable, 4x0.14 mm ³	

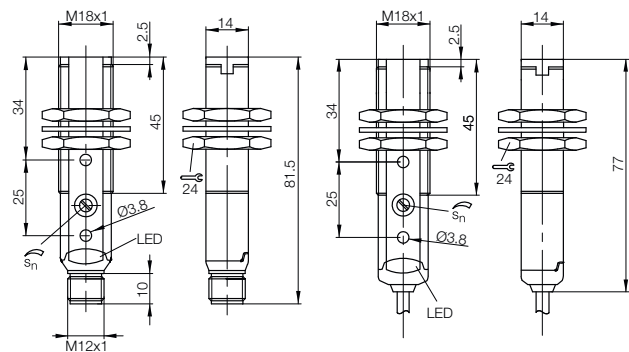


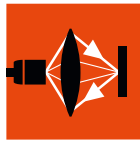


Type	Retroreflective sensor		Retroreflective sensor	
Detection range	0.1...1.7 m		0.1...1.7 m	
PNP NC/NO	Polarizing filter, transparency detection	Ordering code Part number	BOS00K7 BOS 18KF-PA-1TB-S4-C	BOS00K6 BOS 18KF-PA-1TB-C-02
PNP NC/NO	Polarizing filter	Ordering code Part number		
PNP NC/NO		Ordering code Part number		
Supply voltage U_s	10...30 V DC		10...30 V DC	
Output current	100 mA		100 mA	
No-load supply current I_0 max.	≤ 35 mA		≤ 35 mA	
Switching type	Light/dark (complementary)		Light/dark (complementary)	
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes	
Settings	Potentiometer, 270°		Potentiometer, 270°	
Emitter, light type	LED, red light		LED, red light	
Wavelength	660 Nm		660 Nm	
Light spot diameter	approx. 45 mm at 1 m		approx. 45 mm at 1 m	
Output function indicator	Yellow LED		Yellow LED	
Stability indicator	Green LED		Green LED	
Response time	0.5 ms		0.5 ms	
Switching frequency f	1 kHz		1 kHz	
Degree of protection as per IEC 60529	IP 67		IP 67	
Ambient temperature T_a	-25...+55 °C		-25...+55 °C	
Reference standard	EN 60947-5-2		EN 60947-5-2	
Material	Housing	PBT	PBT	
	Optical surface	PMMA	PMMA	
Connection	M12 connector, 4-pin		2 m PVC cable, 4x0.14 mm ³	

Reference reflector: BOS R-1

For wiring diagrams see page 119.





Photoelectric Sensors

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Angle Sensors

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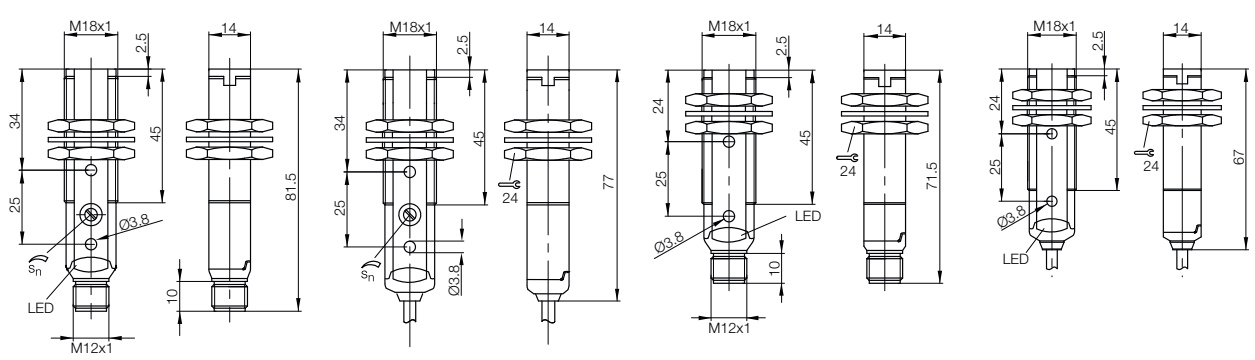
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



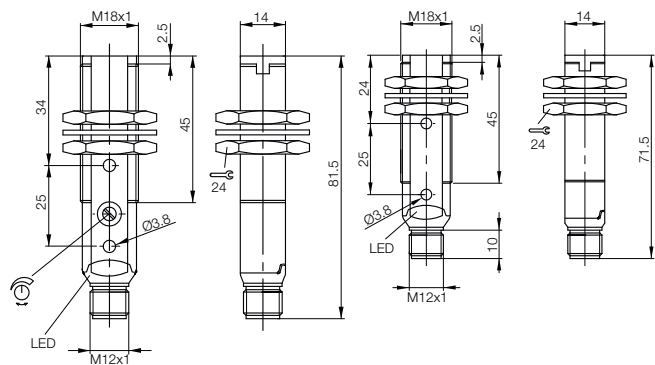
Retroreflective sensor 0.1...4.5 m	Retroreflective sensor 0.1...4.5 m	Retroreflective sensor 0.1...5 m	Retroreflective sensor 0.1...5 m
BOS00K3 BOS 18KF-PA-1QD-S4-C	BOS00K2 BOS 18KF-PA-1QD-C-02	BOS00K5 BOS 18KF-PA-1RE-S4-C	BOS00K4 BOS 18KF-PA-1RE-C-02
10...30 V DC 100 mA ≤ 35 mA Light/dark (complementary) Yes/Yes Potentiometer, 270° LED, red light 660 Nm approx. 65 mm at 3 m Yellow LED Green LED 0.5 ms 1 kHz IP 67 -25...+55 °C EN 60947-5-2 PBT PMMA M12 connector, 4-pin	10...30 V DC 100 mA ≤ 35 mA Light/dark (complementary) Yes/Yes Potentiometer, 270° LED, red light 660 Nm approx. 65 mm at 3 m Yellow LED Green LED 0.5 ms 1 kHz IP 67 -25...+55 °C EN 60947-5-2 PBT PMMA 2 m PVC cable, 4x0.14 mm ³	10...30 V DC 100 mA ≤ 35 mA Light/dark (complementary) Yes/Yes Fixed LED, infrared 880 Nm approx. 100 mm at 2 m Yellow LED Green LED 0.5 ms 1 kHz IP 67 -25...+55 °C EN 60947-5-2 PBT PMMA M12 connector, 4-pin	10...30 V DC 100 mA ≤ 35 mA Light/dark (complementary) Yes/Yes Fixed LED, infrared 880 Nm approx. 100 mm at 2 m Yellow LED Green LED 0.5 ms 1 kHz IP 67 -25...+55 °C EN 60947-5-2 PBT PMMA 2 m PVC cable, 4x0.14 mm ³

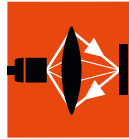




Type		Through-beam sensor	Through-beam sensor
Detection range		0...20 m	0...20 m
PNP NC/NO	Receiver	Ordering code BOS00CK	
		Part number BLE 18KF-PA-1PP-S4-C	
	Emitter	Ordering code	BOS00EP
		Part number	BLS 18KF-XX-1P-S4-L
Supply voltage U_S		10...30 V DC	10...30 V DC
Output current		100 mA	
No-load supply current I_0 max.		≤ 30 mA	≤ 35 mA
Switching type		Light/dark (complementary)	
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes
Settings		Potentiometer, 270°	
Help functions			Test input
Emitter, light type			LED, infrared
Wavelength			880 nm
Light spot diameter			approx. 500 mm at 15 m
Power-on indicator		Green LED	Green LED
Output function indicator		Yellow LED	
Response time		2 ms	
Switching frequency f		250 Hz	
Degree of protection as per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-25...+55 °C	-25...+55 °C
Reference standard		EN 60947-5-2	EN 60947-5-2
Material	Housing	PBT	PBT
	Optical surface	PMMA	PMMA
Connection		M12 connector, 4-pin	M12 connector, 4-pin

For wiring diagrams see page 119.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

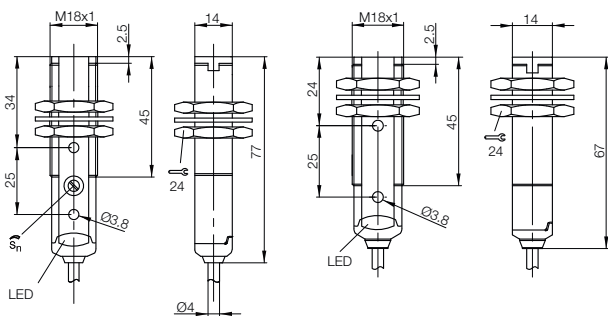
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



	Through-beam sensor 0...20 m BOS00CJ BLE 18KF-PA-1PP-C-02	Through-beam sensor 0...20 m BOS00EN BLS 18KF-XX-1P-L-02		
	10...30 V DC 100 mA ≤ 30 mA Light/dark (complementary) Yes/Yes Potentiometer, 270°	10...30 V DC ≤ 35 mA Yes/Yes Test input LED, infrared 880 ms approx. 500 mm at 15 m Green LED		
	Green LED Yellow LED 2 ms 250 Hz IP 67 -25...+55 °C EN 60947-5-2 PBT PMMA 2 m PVC cable, 4x0.14 mm ²	IP 67 -25...+55 °C EN 60947-5-2 PBT PMMA 2 m PVC cable, 4x0.14 mm ²		

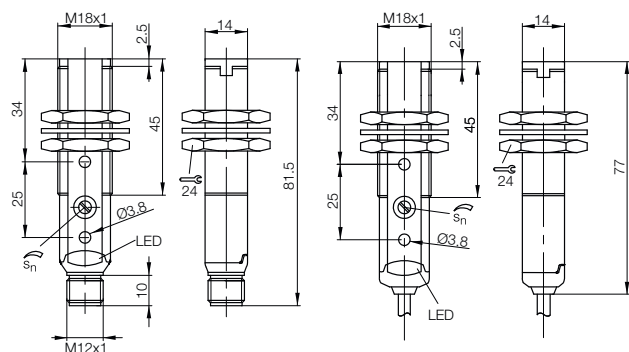




Type	Diffuse sensor		Diffuse sensor
Detection range	0...350 mm		0...350 mm
PNP NC/NO	Ordering code	BOS00JP	BOS00JN
	Part number	BOS 18KF-PA-1LOC-S4-C	BOS 18KF-PA-1LOC-C-02
PNP NC/NO	Polarizing filter	Ordering code	
		Part number	
Supply voltage U_s	10...30 V DC		10...30 V DC
Output current	100 mA		100 mA
No-load supply current I_0 max.	≤ 35 mA		≤ 35 mA
Switching type	Light and dark switching		Light and dark switching
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes
Settings	Potentiometer, 270°		Potentiometer, 270°
Emitter, light type	Laser, red light		Laser, red light
Wavelength	650 Nm		650 Nm
Laser class	1		1
Resolution	approx. 0.3 mm at 50 mm approx. 0.3 mm at 100 mm approx. 0.5 mm at 150 mm		approx. 0.3 mm at 50 mm approx. 0.3 mm at 100 mm approx. 0.5 mm at 150 mm
Power-on indicator	Green LED		Green LED
Output function indicator	Yellow LED		Yellow LED
Response time	333 μ s		333 μ s
Switching frequency f	1.5 kHz		1.5 kHz
Degree of protection as per IEC 60529	IP 67		IP 67
Ambient temperature T_a	-10...+50 °C		-10...+50 °C
Reference standard	EN 60947-5-2		EN 60947-5-2
Material	Housing	PBT	PBT
	Optical surface	PMMA	PMMA
Connection	M12 connector, 4-pin		2 m PVC cable, 4x0.14 mm ²

Reference object: white, 90% reflection, 200x200 mm
 Reference reflector: BOS R-1

For wiring diagrams see page 119.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors BGL

Angle Sensors BWL

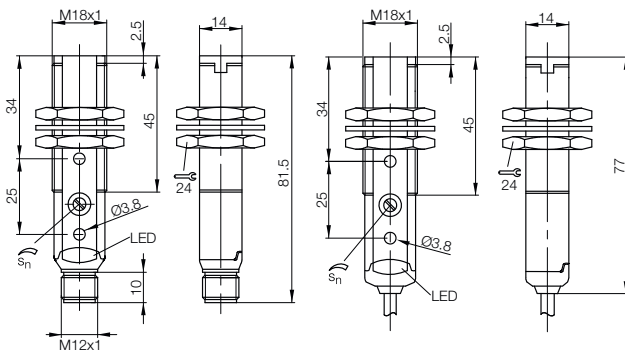
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



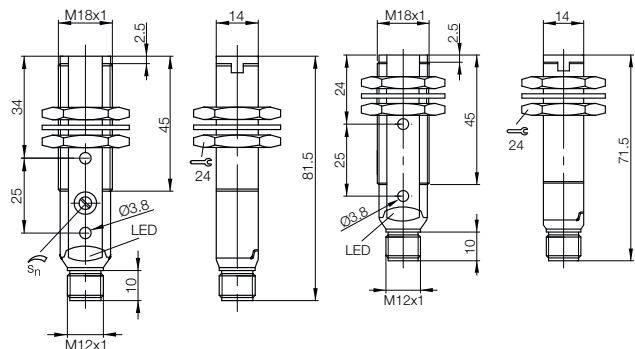
Retroreflective sensor 0.1...16 m	Retroreflective sensor 0.1...16 m		
BOS00JT	BOS00JR		
BOS 18KF-PA-1LQP-S4-C	BOS 18KF-PA-1LQP-C-02		
10...30 V DC	10...30 V DC		
100 mA	100 mA		
≤ 35 mA	≤ 35 mA		
Light and dark switching	Light and dark switching		
Yes/Yes	Yes/Yes		
Potentiometer, 270°	Potentiometer, 270°		
Laser, red light	Laser, red light		
650 Nm	650 Nm		
1	1		
approx. 0.9 mm at 1 m approx. 2 mm at 3 m	approx. 0.9 mm at 1 m approx. 2 mm at 3 m		
Green LED	Green LED		
Yellow LED	Yellow LED		
333 μs	333 μs		
1.5 kHz	1.5 kHz		
IP 67	IP 67		
-10...+50 °C	-10...+50 °C		
EN 60947-5-2	EN 60947-5-2		
PBT	PBT		
PMMA	PMMA		
M12 connector, 4-pin	2 m PVC cable, 4x0.14 mm ²		





Type	Through-beam sensor		Through-beam sensor
Detection range	0...60 m		0...60 m
PNP NC/NO	Receiver	Ordering code Part number	
	Emitter	Ordering code Part number	BOS00EM BLS 18KF-XX-1LT-S4-L
Supply voltage U_s	10...30 V DC		10...30 V DC
Output current	100 mA		
No-load supply current I_0 max.	≤ 30 mA		≤ 35 mA
Switching type	Light and dark switching		
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes
Settings	Potentiometer, 270°		
Emitter, light type			Laser, red light
Wavelength			650 Nm
Laser class			1
Resolution			approx. 2.5 mm at 5 m approx. 5 mm at 10 m approx. 10 mm at 20 m
Power-on indicator	Green LED		
Output function indicator	Yellow LED		
Response time	333 μ s		
Switching frequency f	1.5 kHz		
Degree of protection as per IEC 60529	IP 67		IP 67
Ambient temperature T_a	-10...+50 °C		-10...+50 °C
Reference standard	EN 60947-5-2		EN 60947-5-2
Material	Housing	PBT	PBT
	Optical surface	PMMA	PMMA
Connection	M12 connector, 4-pin		M12 connector, 4-pin

For wiring diagrams see page 119.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors BGL

Angle Sensors BWL

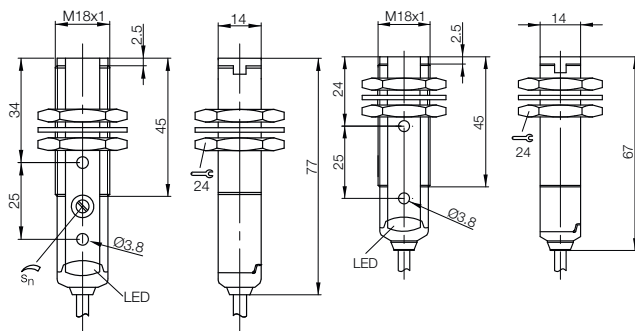
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

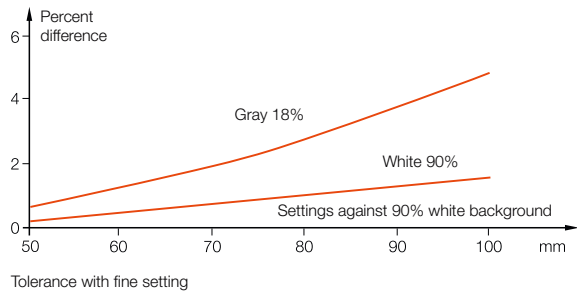
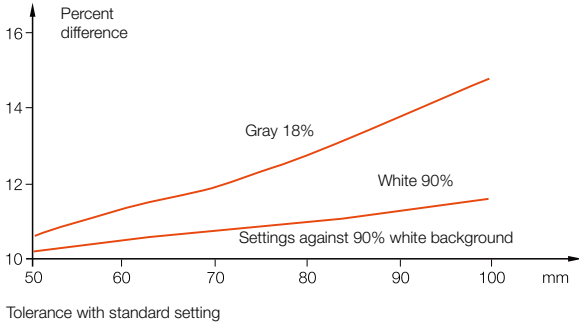
Accessories for Photoelectric Sensors



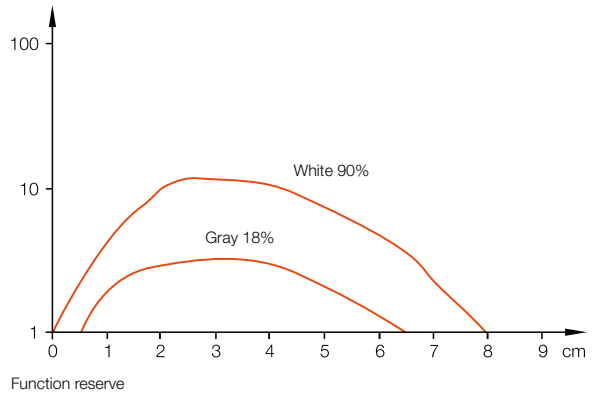
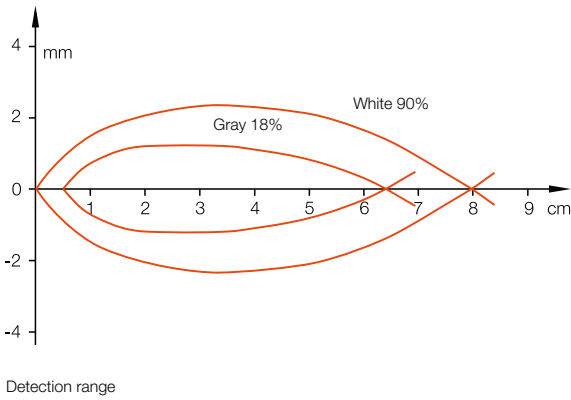
	Through-beam sensor 0...60 m BOS00CF BLE 18KF-PA-1LT-C-02	Through-beam sensor 0...60 m BOS00EL BLS 18KF-XX-1LT-L-02		
	10...30 V DC 100 mA ≤ 30 mA Light and dark switching Yes/Yes Potentiometer, 270°	10...30 V DC ≤ 35 mA Yes/Yes Laser, red light 650 Nm 1 approx. 2.5 mm at 5 m approx. 5 mm at 10 m approx. 10 mm at 20 m Green LED		
	Green LED Yellow LED 333 μs 1.5 kHz IP 67 -10...+50 °C EN 60947-5-2 PBT PMMA 2 m PVC cable, 4x0.14 mm ²	IP 67 -10...+50 °C EN 60947-5-2 PBT PMMA 2 m PVC cable, 4x0.14 mm ²		



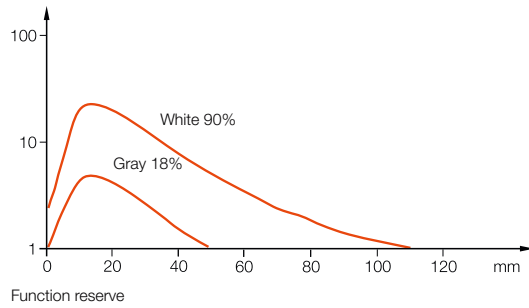
Diffuse sensor BOS 18KF-...-1HA-...



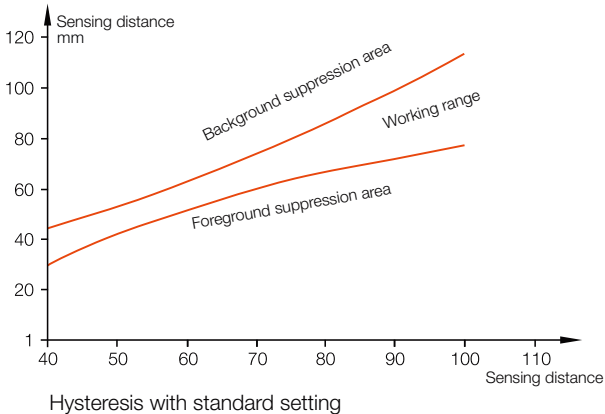
Diffuse sensor BOS 18KF-...-1N1R-...



Diffuse sensor BOS 18KF-...-1XA-...



Diffuse sensor BOS 18KF-...-1GA-...





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

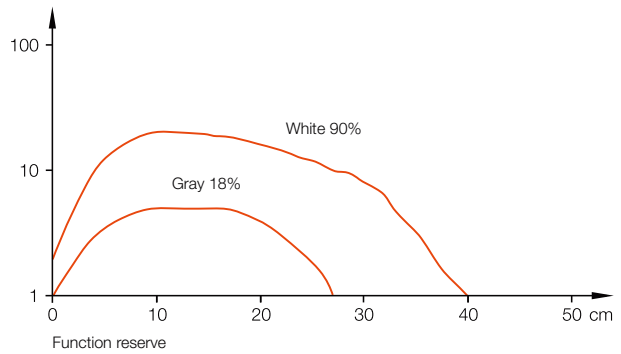
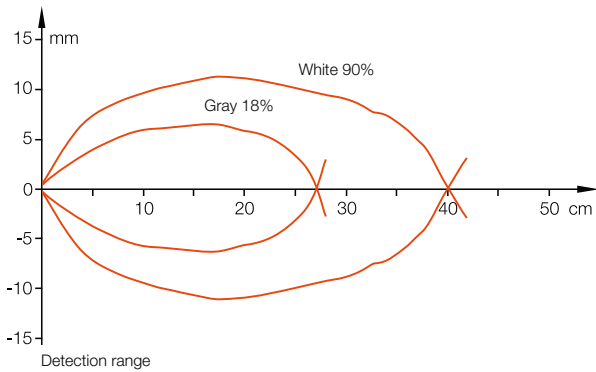
BWL

Photoelectric Sensors with Special Properties

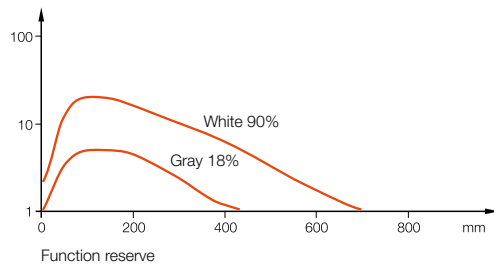
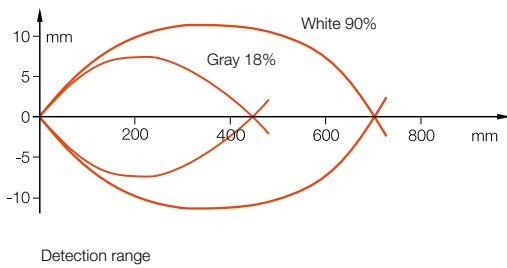
Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

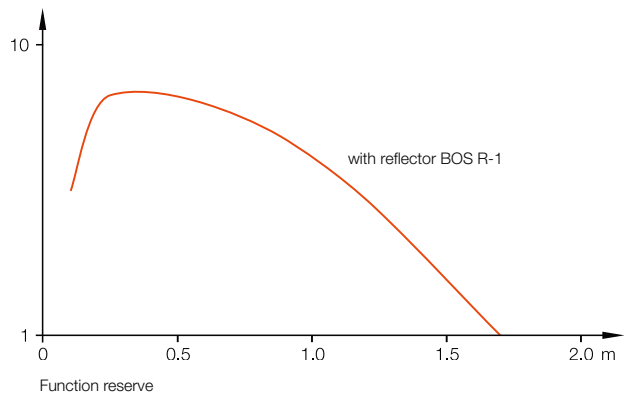
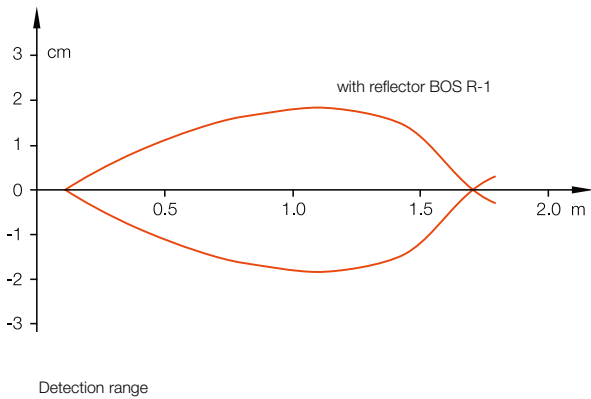
Diffuse sensor BOS 18KF-...-1PD-...



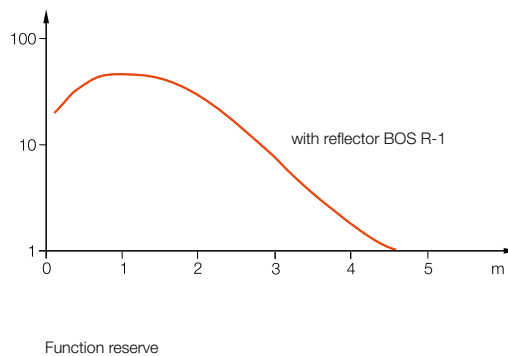
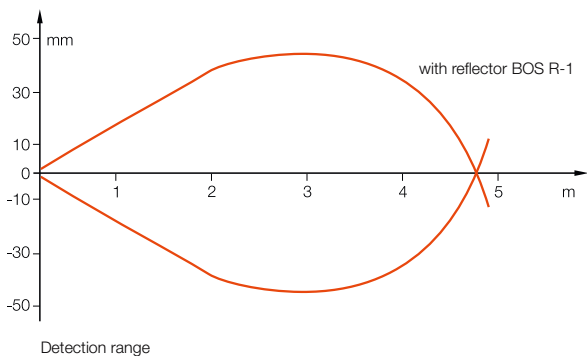
Diffuse sensor BOS 18KF-...-1PE-...



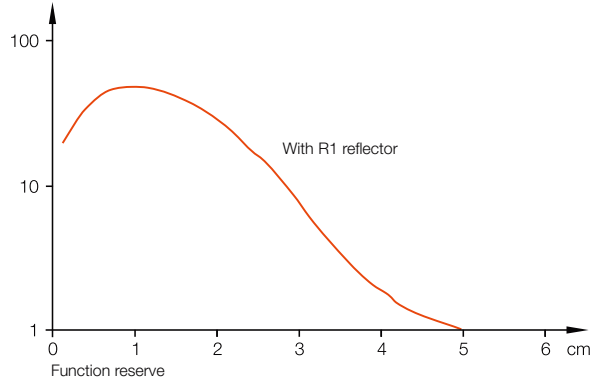
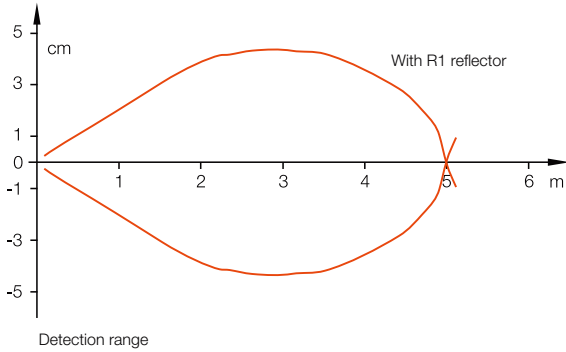
Retroreflective sensor BOS 18KF-...-1TB-...



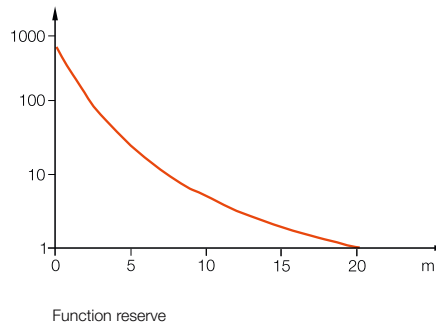
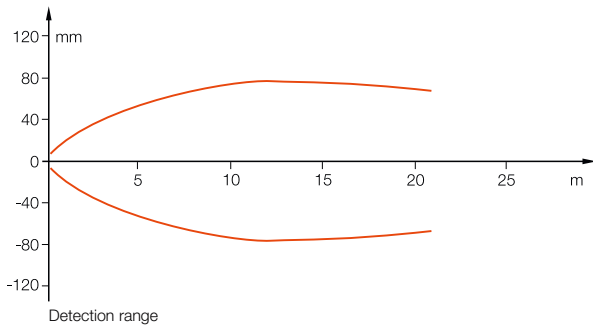
Retroreflective sensor BOS 18KF-...-1QD-...



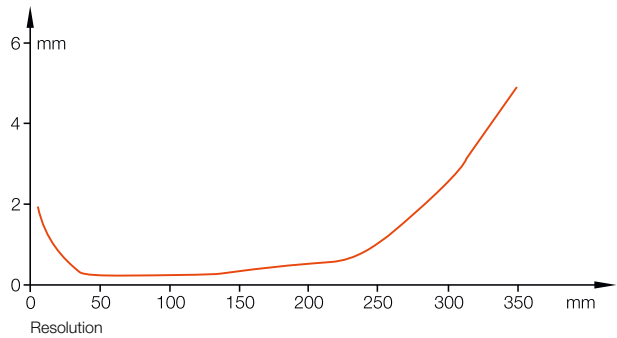
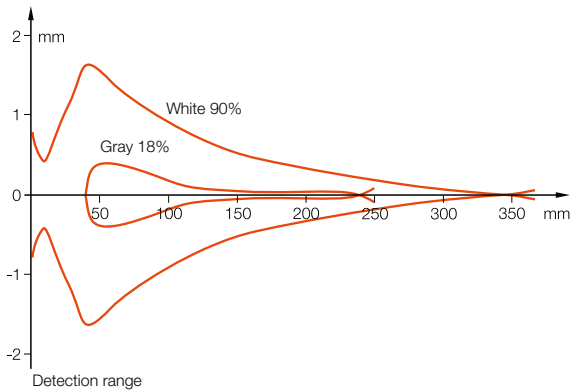
Retroreflective sensor BOS 18KF...-1RE-...



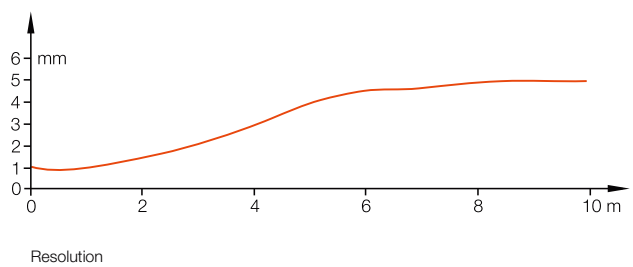
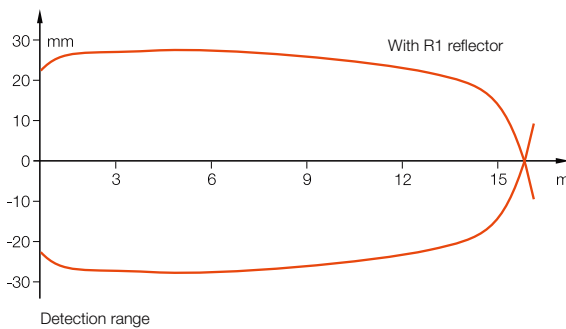
Through-beam sensor BLE/BLS 18KF...-1PP/1P-...

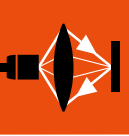


Diffuse sensor BOS 18KF...-1LOC-...



Retroreflective sensor BOS 18KF...-1LQP-...





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors BGL

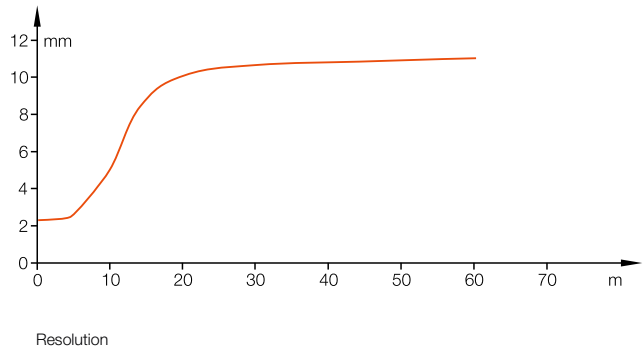
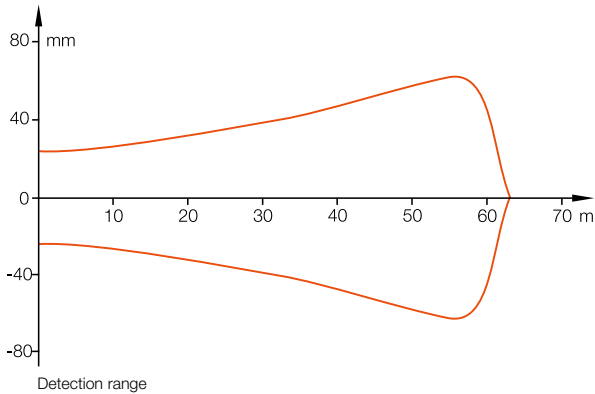
Angle Sensors BWL

Photoelectric Sensors with Special Properties

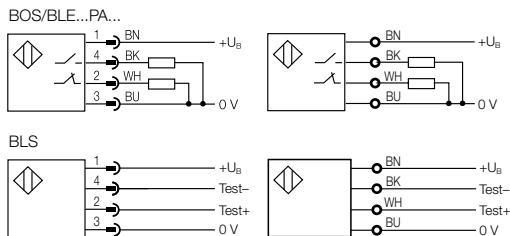
Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

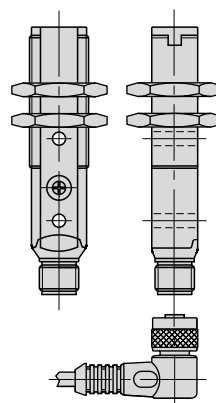
Through-beam sensor BLE/BLS 18KF...-1LT...



Wiring diagrams



Connector orientation



BOS 18KF

Recommended accessories
 (please order separately)

Description	Ordering code
① Mounting clamp	BAM00T3
② Mounting bracket	BAM00RY
③ Reflector	BAM00UK
④ Round aperture	BAM00R6
⑤ Cover nut	BAM00RL
⑥ Air shield	BAM00R9



You can find special accessories for diffuse sensors, such as **reflectors, apertures, lenses, filters and deflection heads**, in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Suitable connectors
 (please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N

Connectors without LED are suitable for PNP and NPN sensors.

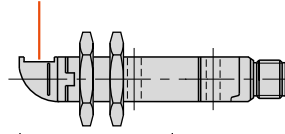
More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.

BOS 18KW – with expanded product line

BOS 18KW series sensors are available with red- or infrared light or with a Class 1 laser.

They are configured using a potentiometer or via teach-in. The plastic housing with flattened sides allows installation using the included M18-nuts or screws through the sensor housing.

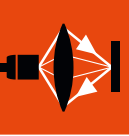
The sensors are available as cable- or M12- connector styles with PNP- or NPN- output.



Photoelectric Sensors

BOS 18KW Global

Product overview



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type	Sensing distance/Range	Light type			Output	Switching type		Switching frequency	U _s	Connection		Special features		Page
		Red light	Infrared	Laser		PNP transistor	Light switching			Dark switching	10...30VDC	M12 plug, 4-pin	Cable	
Diffuse sensor with background suppression														
BOS00LH BOS 18KW-PA-1HA-S4-C	50...100 mm	■			■	■	■	500 Hz	■	■			■	122
BOS00LF BOS 18KW-PA-1HA-C-02	50...100 mm	■			■	■	■	500 Hz	■		■		■	122
Diffuse sensor														
BOS00M1 BOS 18KW-PA-1XA-S4-C	0...80 mm		■		■	■	■	1 kHz	■	■				123
BOS00M0 BOS 18KW-PA-1XA-C-02	0...80 mm		■		■	■	■	1 kHz	■		■			123
BOS00LK BOS 18KW-PA-1LOB-S4-C	0...250 mm			■	■	■	■	1.5 kHz	■	■				128
BOS00LJ BOS 18KW-PA-1LOB-C-02	0...250 mm			■	■	■	■	1.5 kHz	■		■			128
BOS00LT BOS 18KW-PA-1PD-S4-C	0...400 mm		■		■	■	■	1 kHz	■	■				123
BOS00LR BOS 18KW-PA-1PD-C-02	0...400 mm		■		■	■	■	1 kHz	■		■			123
Retroreflective sensor														
BOS00LZ BOS 18KW-PA-1TB-S4-C	0.1...1.7 m	■			■	■	■	1 kHz	■	■		■		124
BOS00LY BOS 18KW-PA-1TB-C-02	0.1...1.7 m	■			■	■	■	1 kHz	■		■	■		124
BOS00LW BOS 18KW-PA-1QC-S4-C	0.1...3 m	■			■	■	■	1 kHz	■	■		■		125
BOS00LU BOS 18KW-PA-1QC-C-02	0.1...3 m	■			■	■	■	1 kHz	■		■	■		125
BOS00LM BOS 18KW-PA-1LQH-S4-C	0.1...9 m			■	■	■	■	1.5 kHz	■	■		■		129
BOS00LL BOS 18KW-PA-1LQH-C-02	0.1...9 m			■	■	■	■	1.5 kHz	■		■	■		129
Through-beam sensor Receiver														
BOS00CW BLE 18KW-PA-1PP-S4-C	0...15 m		■		■	■	■	250 Hz	■	■				126
BOS00CU BLE 18KW-PA-1PP-C-02	0...15 m		■		■	■	■	250 Hz	■		■			127
BOS00CT BLE 18KW-PA-1LT-S4-C	0...50 m			■	■	■	■	1.5 kHz	■	■				130
Through-beam sensor Emitter														
BOS00EW BLS 18KW-XX-1P-S4-L	0...15 m		■			■	■		■	■				126
BOS00EU BLS 18KW-XX-1P-L-02	0...15 m		■			■	■		■		■			127
BOS00ET BLS 18KW-XX-1LT-S4-L	0...50 m			■					■	■				130

NPN on request

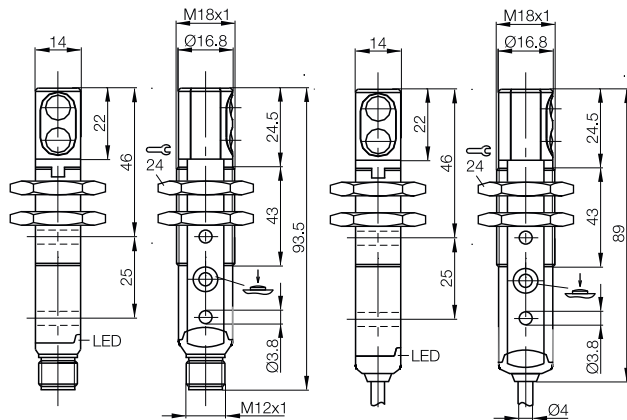
**M18 Plastic
with Angle Head
Global**

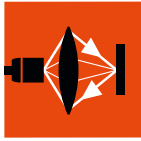


Type	Diffuse sensor with background suppression		Diffuse sensor with background suppression	
Detection range	50...100 mm		50...100 mm	
PNP NC/NO	Ordering code			
	Part number			
PNP NC/NO Teach-in	Ordering code	BOS00LH	BOS00LF	
	Part number	BOS 18KW-PA-1HA-S4-C	BOS 18KW-PA-1HA-C-02	
Supply voltage U_s		10...30 V DC	10...30 V DC	
Output current		100 mA	100 mA	
No-load supply current I_0 max.		≤ 30 mA	≤ 35 mA	
Switching type		Light and dark switching	Light and dark switching	
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes	
Settings		Teach-in	Teach-in	
Emitter, light type		LED, red light	LED, red light	
Wavelength		630 Nm	660 Nm	
Light spot diameter		approx. 10 mm at 100 mm	approx. 10 mm at 100 mm	
Output function indicator		Yellow LED	Yellow LED	
Stability indicator		Green/red LED	Green/red LED	
Response time		1 ms	0.5 ms	
Switching frequency f		500 Hz	1 kHz	
Degree of protection as per IEC 60529		IP 67	IP 67	
Ambient temperature T_a		-25...+55 °C	-25...+55 °C	
Permissible ambient light		EN 60947-5-2	EN 60947-5-2	
Material	Housing	PBT	PBT	
	Optical surface	PMMA	PMMA	
Connection		M12 connector, 4-pin	2 m PVC cable, 4x0.14 mm ²	

Reference object: white, 90% reflection, 200x200 mm

For wiring diagrams see page 133.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors
 BGL

Angle Sensors
 BWL

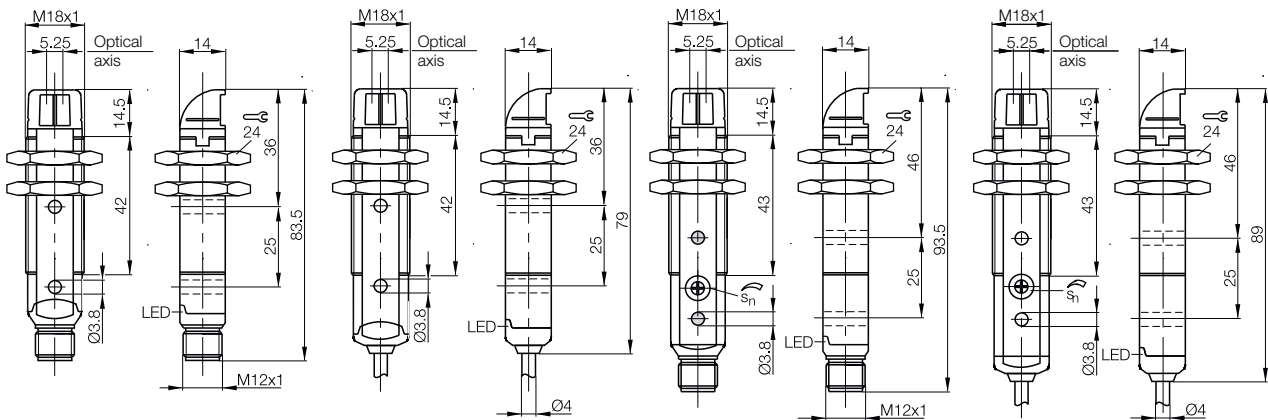
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Diffuse sensor 0...80 mm BOS00M1 BOS 18KW-PA-1XA-S4-C	Diffuse sensor 0...80 mm BOS00M0 BOS 18KW-PA-1XA-C-02	Diffuse sensor 0...400 mm BOS00LT BOS 18KW-PA-1PD-S4-C	Diffuse sensor 0...400 mm BOS00LR BOS 18KW-PA-1PD-C-02
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
100 mA	100 mA	100 mA	100 mA
≤ 35 mA	≤ 35 mA	≤ 35 mA	≤ 35 mA
Light and dark switching	Light and dark switching	Light and dark switching	Light and dark switching
Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
Fixed	Fixed	Potentiometer, 270°	Potentiometer, 270°
LED, infrared	LED, infrared	LED, infrared	LED, infrared
880 Nm	880 Nm	880 Nm	880 Nm
approx. 55 mm at 100 mm	approx. 55 mm at 100 mm	approx. 35 mm at 400 mm	approx. 35 mm at 400 mm
Yellow LED	Yellow LED	Yellow LED Green LED	Yellow LED Green LED
0.5 ms	0.5 ms	0.5 ms	0.5 ms
1 kHz	1 kHz	1 kHz	1 kHz
IP 67	IP 67	IP 67	IP 67
-25...+55 °C	-25...+55 °C	-25...+55 °C	-25...+55 °C
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
PBT	PBT	PBT	PBT
PMMA	PMMA	PMMA	PMMA
M12 connector, 4-pin	2 m PVC cable, 4x0.14 mm ²	M12 connector, 4-pin	2 m PVC cable, 4x0.14 mm ²

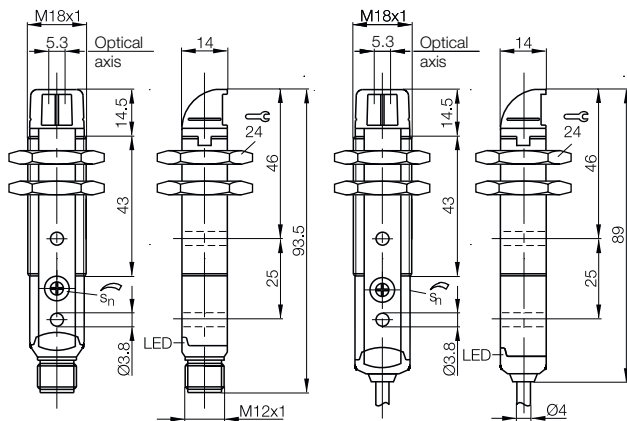


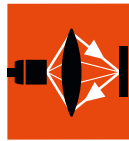


Type	Retroreflective sensor		Retroreflective sensor	
Detection range	0.1...1.7 m		0.1...1.7 m	
PNP NC/ NO	Polarizing filter, Transparency detection	Ordering code Part number	BOS00LZ BOS 18KW-PA-1TB-S4-C	BOS00LY BOS 18KW-PA-1TB-C-02
PNP NC/ NO	Polarizing filter	Ordering code Part number		
Supply voltage U_s	10...30 V DC		10...30 V DC	
Output current	100 mA		100 mA	
No-load supply current I_0 max.	≤ 35 mA		≤ 35 mA	
Switching type	Light and dark switching		Light and dark switching	
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes	
Settings	Potentiometer, 270°		Potentiometer, 270°	
Emitter, light type	LED, red light		LED, red light	
Wavelength	660 Nm		660 Nm	
Light spot diameter	approx. 60 mm at 1 m		approx. 60 mm at 1 m	
Output function indicator	Yellow LED		Yellow LED	
Stability indicator	Green LED		Green LED	
Response time	0.5 ms		0.5 ms	
Switching frequency f	1 kHz		1 kHz	
Degree of protection as per IEC 60529	IP 67		IP 67	
Ambient temperature T_a	-25...+55 °C		-25...+55 °C	
Permissible ambient light	EN 60947-5-2		EN 60947-5-2	
Material	Housing	PBT	PBT	
	Optical surface	PMMA	PMMA	
Connection	M12 connector, 4-pin		2 m PVC cable, 4x0.14 mm ²	

Reference reflector: BOS R-1

For wiring diagrams see page 133.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors BGL

Angle Sensors BWL

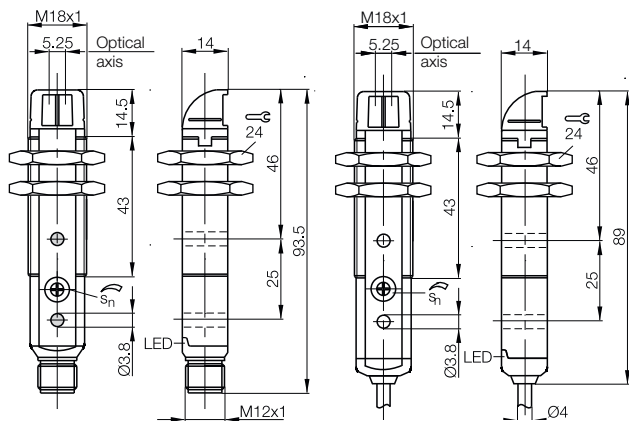
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Retroreflective sensor 0.1...3 m	Retroreflective sensor 0.1...3 m		
BOS00LW	BOS00LU		
BOS 18KW-PA-1QC-S4-C	BOS 18KW-PA-1QC-C-02		
10...30 V DC	10...30 V DC		
100 mA	100 mA		
≤ 35 mA	≤ 35 mA		
Light and dark switching	Light and dark switching		
Yes/Yes	Yes/Yes		
Potentiometer, 270°	Potentiometer, 270°		
LED, red light	LED, red light		
660 Nm	660 Nm		
approx. 60 mm at 2 m	approx. 60 mm at 2 m		
Yellow LED	Yellow LED		
Green LED	Green LED		
0.5 ms	0.5 ms		
1 kHz	1 kHz		
IP 67	IP 67		
-25...+55 °C	-25...+55 °C		
EN 60947-5-2	EN 60947-5-2		
PBT	PBT		
PMMA	PMMA		
M12 connector, 4-pin	2 m PVC cable, 4x0.14 mm ²		

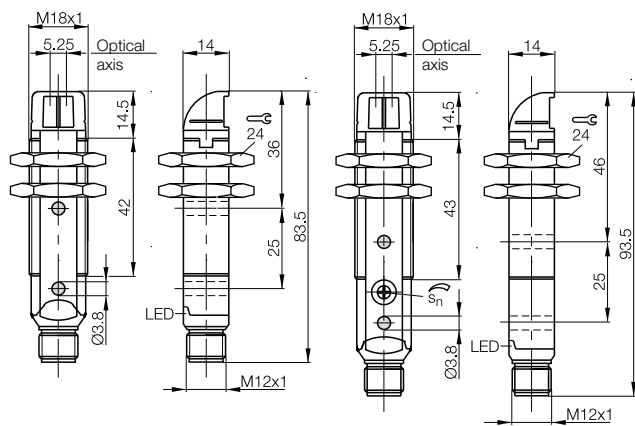


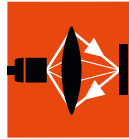
**M18 Plastic
with Angle Head
Global**



Type	Through-beam sensor			Through-beam sensor
Detection range	0...15 m			0...15 m
PNP NC/NO	Receiver	Ordering code		BOS00CW
		Part number		BLE 18KW-PA-1PP-S4-C
PNP NC/NO	Emitter	Ordering code	BOS00EW	
		Part number	BLS 18KW-XX-1P-S4-L	
Supply voltage U_s	10...30 V DC			10...30 V DC
Output current	100 mA			100 mA
No-load supply current I_0 max.	≤ 35 mA			≤ 30 mA
Switching type				Light and dark switching
Polarity reversal/short-circuit protected	Yes/Yes			Yes/Yes
Settings				Potentiometer, 270°
Help functions	Test input			
Emitter, light type	LED, infrared			
Wavelength	880 Nm			
Light spot diameter	approx. 470 mm at 10 m			
Power-on indicator	Green LED			Green LED
Output function indicator				Yellow LED
Response time				2 ms
Switching frequency f				250 Hz
Degree of protection as per IEC 60529	IP 67			IP 67
Ambient temperature T_a	$-25...+55$ °C			$-25...+55$ °C
Permissible ambient light	EN 60947-5-2			EN 60947-5-2
Material	Housing	PBT		PBT
	Optical surface	PMMA		PMMA
Connection	M12 connector, 4-pin			M12 connector, 4-pin

For wiring diagrams see page 133.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

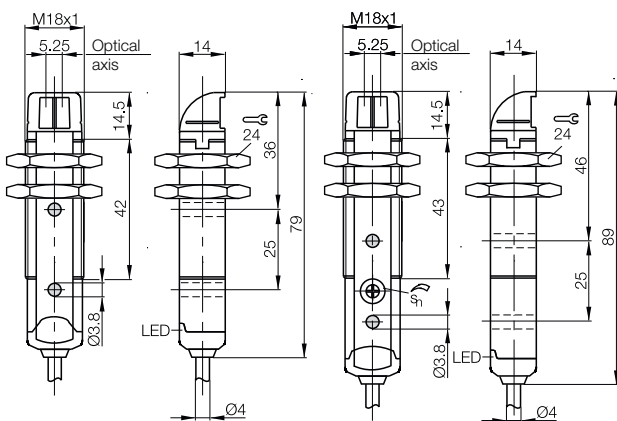
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Through-beam sensor 0...15 m	Through-beam sensor 0...15 m		
	BOS00CU		
	BLE 18KW-PA-1PP-C-02		
BOS00EU			
BLS 18KW-XX-1P-L-02			
10...30 V DC	10...30 V DC		
≤ 35 mA	100 mA		
Yes/Yes	≤ 30 mA		
	Light and dark switching		
	Yes/Yes		
	Potentiometer, 270°		
Test input			
LED, infrared			
880 Nm			
approx. 470 mm at 10 m			
Green LED			
	Green LED		
	Yellow LED		
	2 ms		
	250 Hz		
IP 67	IP 67		
-25...+55 °C	-25...+55 °C		
EN 60947-5-2	EN 60947-5-2		
PBT	PBT		
PMMA	PMMA		
2 m PVC cable, 4x0.14 mm ²	2 m PVC cable, 4x0.14 mm ²		

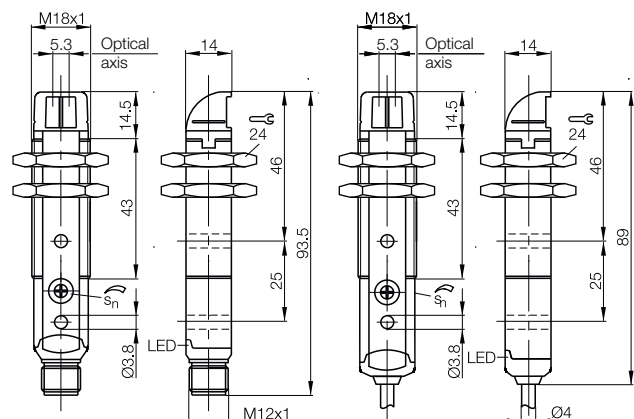




Type	Diffuse sensor		Diffuse sensor
Detection range	0...250 mm		0...250 mm
PNP NC/NO	Ordering code	BOS00LK	BOS00LJ
	Part number	BOS 18KW-PA-1LOB-S4-C	BOS 18KW-PA-1LOB-C-02
PNP NC/NO	Polarizing filter	Ordering code	
		Part number	
Supply voltage U _S	10...30 V DC		10...30 V DC
Output current	100 mA		100 mA
No-load supply current I ₀ max.	≤ 35 mA		≤ 35 mA
Switching type	Light and dark switching		Light and dark switching
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes
Settings	Potentiometer, 270°		Potentiometer, 270°
Emitter, light type	Laser, red light		Laser, red light
Wavelength	650 Nm		650 Nm
Laser class	1		1
Resolution	approx. 0.3 mm at 50 mm approx. 0.3 mm at 100 mm approx. 0.5 mm at 150 mm		approx. 0.3 mm at 50 mm approx. 0.3 mm at 100 mm approx. 0.5 mm at 150 mm
Power-on indicator	Green LED		Green LED
Output function indicator	Yellow LED		Yellow LED
Response time	333 μs		333 μs
Switching frequency f	1.5 kHz		1.5 kHz
Degree of protection as per IEC 60529	IP 67		IP 67
Ambient temperature T _a	-10...+50 °C		-10...+50 °C
Reference standard	EN 60947-5-2		EN 60947-5-2
Material	Housing	PBT	PBT
	Optical surface	PMMA	PMMA
Connection	M12 connector, 4-pin		2 m PVC cable, 4x0.14 mm ²

Reference object: white, 90% reflection, 200x200 mm
 Reference reflector: BOS R-1

For wiring diagrams see page 133.





Photoelectric Sensors

BOS 18KW Laser Global



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

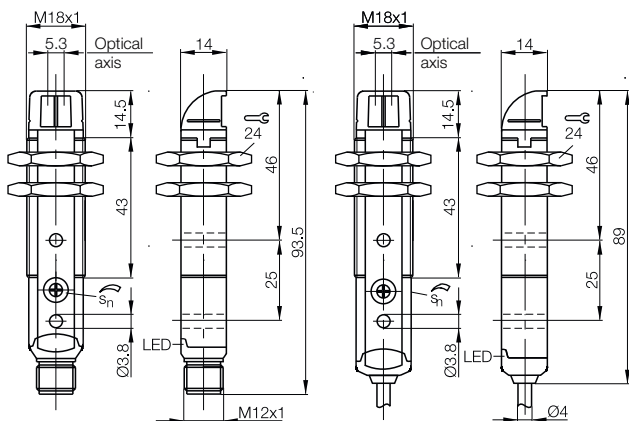
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



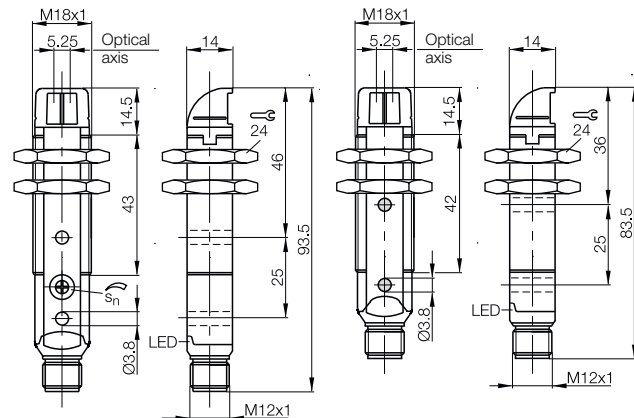
Retroreflective sensor 0.1...9 m	Retroreflective sensor 0.1...9 m		
BOS00LM	BOS00LL		
BOS 18KW-PA-1LQH-S4-C	BOS 18KW-PA-1LQH-C-02		
10...30 V DC	10...30 V DC		
100 mA	100 mA		
≤ 35 mA	≤ 35 mA		
Light and dark switching	Light and dark switching		
Yes/Yes	Yes/Yes		
Potentiometer, 270°	Potentiometer, 270°		
Laser, red light	Laser, red light		
650 Nm	650 Nm		
1	1		
approx. 0.9 mm at 1 m approx. 2 mm at 3 m	approx. 0.9 mm at 1 m approx. 2 mm at 3 m		
Green LED	Green LED		
Yellow LED	Yellow LED		
333 μs	333 μs		
1.5 kHz	1.5 kHz		
IP 67	IP 67		
-10...+50 °C	-10...+50 °C		
EN 60947-5-2	EN 60947-5-2		
PBT	PBT		
PMMA	PMMA		
M12 connector, 4-pin	2 m PVC cable, 4x0.14 mm ²		





Type	Through-beam sensor		Through-beam sensor
Detection range	0...50 m		0...50 m
PNP NC/NO	Emitter	Ordering code	BOS00ET
		Part number	BLS 18KW-XX-1LT-S4-L
PNP NC/NO	Receiver	Ordering code	BOS00CT
		Part number	BLE 18KW-PA-1LT-S4-C
Supply voltage U_s	10...30 V DC		10...30 V DC
Output current	100 mA		
No-load supply current I_0 max.	≤ 30 mA		≤ 35 mA
Switching type	Light and dark switching		
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes
Settings	Potentiometer, 270°		
Help function			Test input
Emitter, light type			Laser, red light
Wavelength			650 Nm
Laser class			1
Resolution			approx. 2.5 mm at 5 m approx. 5 mm at 10 mm approx. 10 mm at 20 mm
Power-on indicator	Green LED		
Output function indicator	Yellow LED		
Response time	333 μ s		
Switching frequency f	1.5 kHz		
Degree of protection as per IEC 60529	IP 67		IP 67
Ambient temperature T_a	-10...+50 °C		-10...+50 °C
Reference standard	EN 60947-5-2		EN 60947-5-2
Material	Housing	PBT	PBT
	Optical surface	PMMA	PMMA
Connection	M12 connector, 4-pin		M12 connector, 4-pin

For wiring diagrams see page 133.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors BGL

Angle Sensors BWL

Photoelectric Sensors with Special Properties

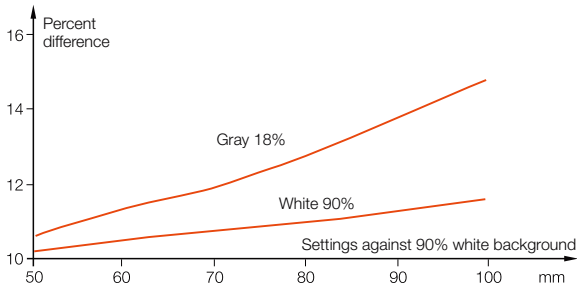
Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

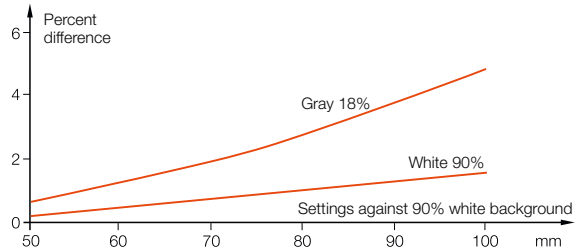
Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Diffuse sensor BOS 18KW--1HA--...

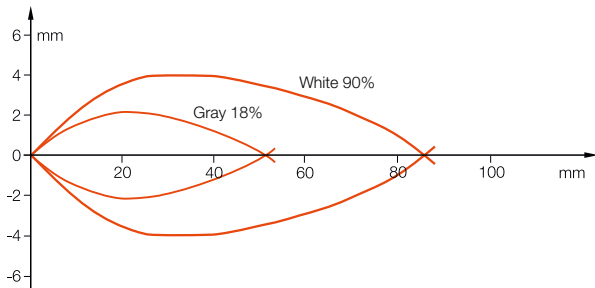


Tolerance with standard setting

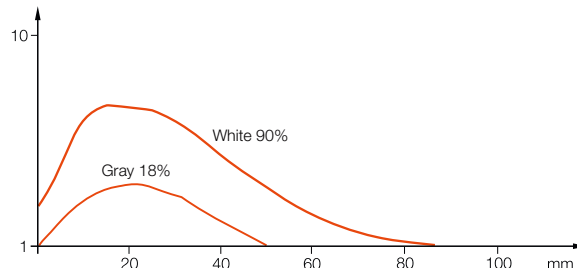


Tolerance with fine setting

Diffuse sensor BOS 18KW--1XA--...

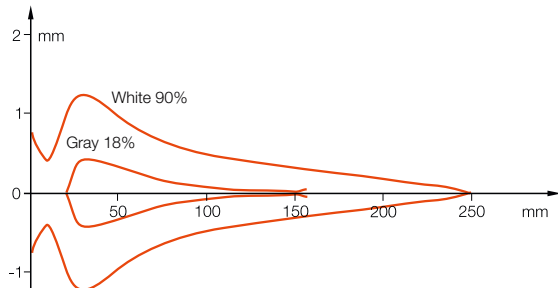


Detection range

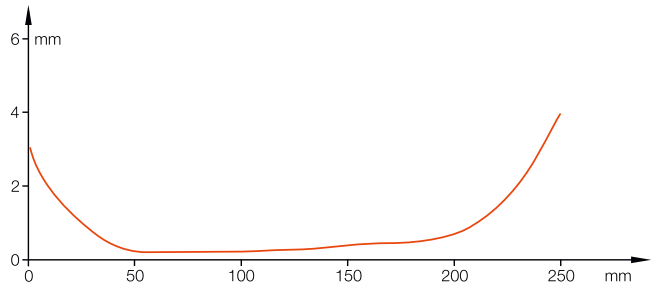


Function reserve

Diffuse sensor BOS 18KW--1LOB--...

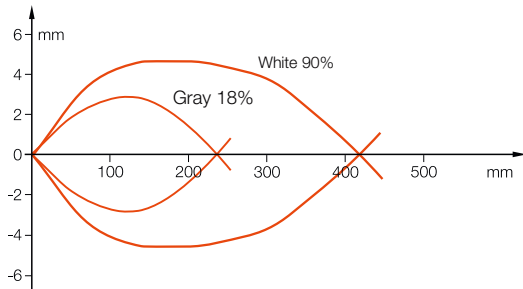


Detection range

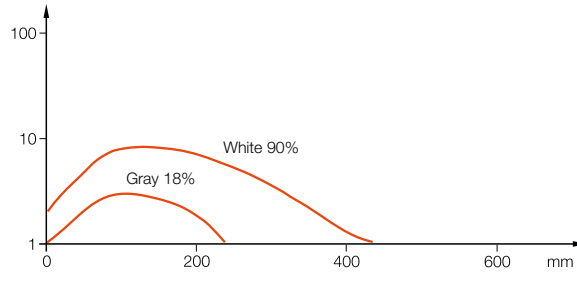


Resolution

Diffuse sensor BOS 18KW--1PD--...

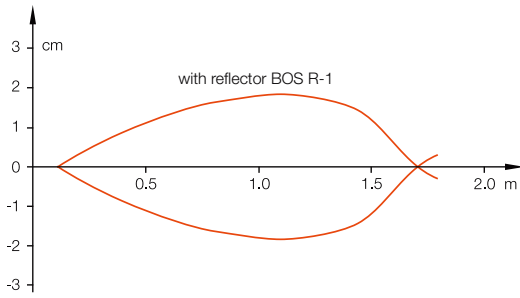


Detection range

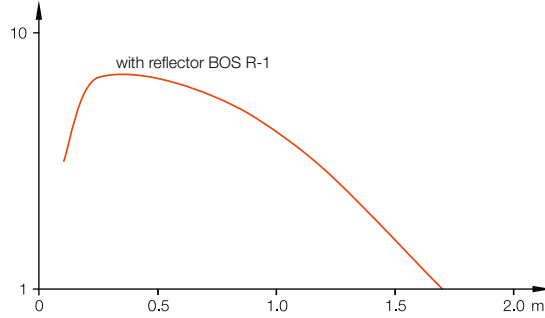


Function reserve

Retroreflective sensor BOS 18KW--1TB...

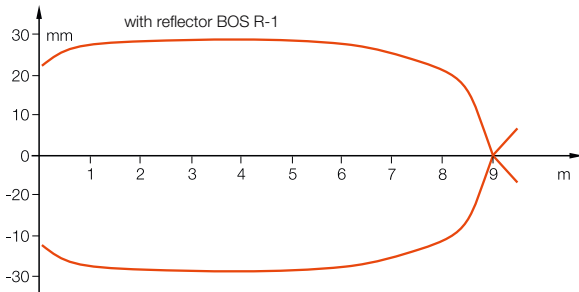


Detection range

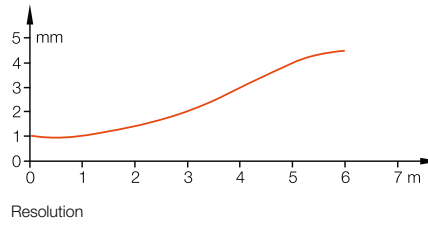


Function reserve

Retroreflective BOS 18KW--1LQH...

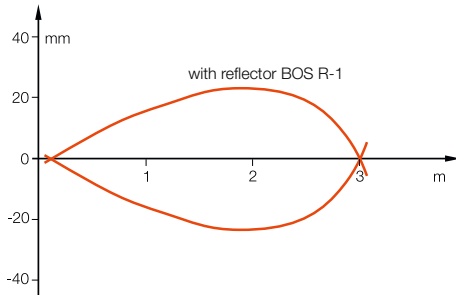


Detection range

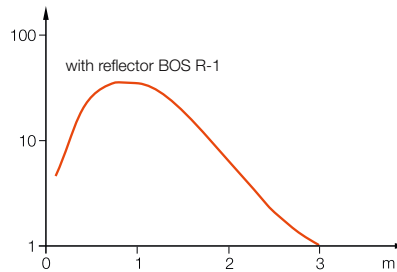


Resolution

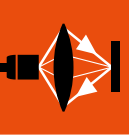
Retroreflective sensor BOS 18KW--1QC...



Detection range



Function reserve



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors BGL

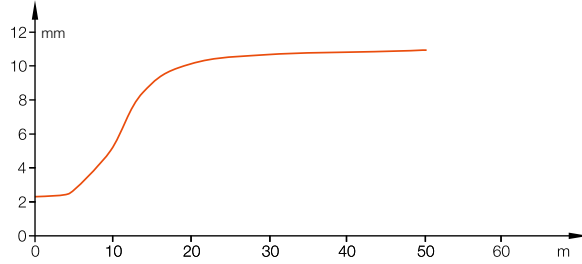
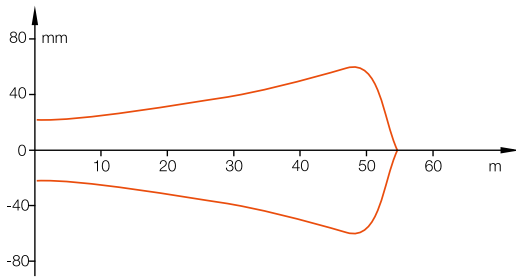
Angle Sensors BWL

Photoelectric Sensors with Special Properties

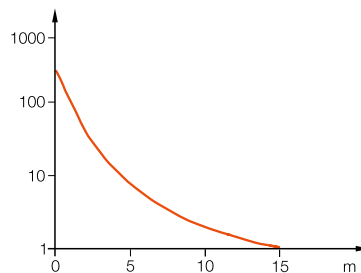
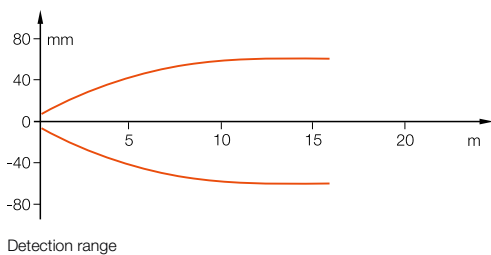
Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

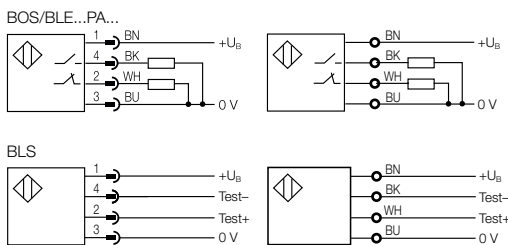
Through-beam sensor BLE/BLS 18KW-..-1LT-...



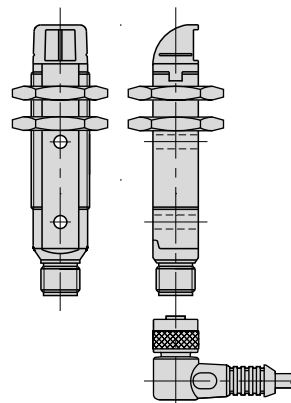
Through-beam BLE/BLS 18KW-..-1PP/1P-...



Wiring diagrams



Connector orientation



Recommended accessories
 (please order separately)

Description	Ordering code
① Mounting clamp	BAM00T3
② Mounting bracket	BAM00RY
③ Reflector	BAM00UK



Suitable connectors
 (please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N



You can find special accessories for diffuse sensors, such as **reflectors, apertures, lenses, filters and deflection heads**, in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.

The **BOS 30M** series combines the high optical performance of large block-shaped sensors with the installation-friendly characteristics of cylindrical sensors.

The long 2 m sensing distance provides great function reserve under less than favorable operating conditions. A tough glass disk protects the optics from debris such as hot swarf, and the 18-turn- potentiometer enables precise sensitivity configuration. In addition, the integrated contamination indicator provides warning of contamination or external influences in order to avoid impairing the optics.

The BOS 30M series provides a very high performance and robust design together with special glass optical fiber BFO 18V-... A design that is particularly well-suited to the automotive industry.

Features

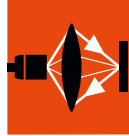
- Long sensing distance
- Tough design (metal housing and glass protective shield)
- 18-turn- potentiometer
- NO-/NC- toggle
- Compatible with special glass optical fiber
- Automotive industry approved
- Contamination indicator

Applications

- Automotive industry
- Conveying and warehouse equipment
- Construction machinery
- Woodworking industry
- In harsh environments



Photoelectric Sensors
BOS 30M
 Product overview



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type

■ Ordering code

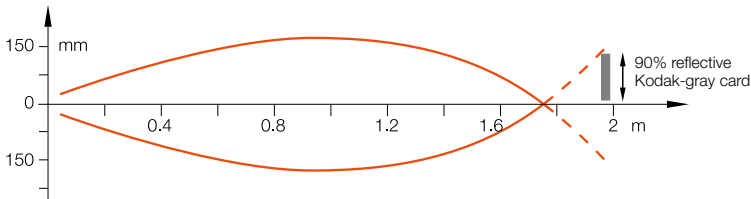
■ Part number



Diffuse sensor

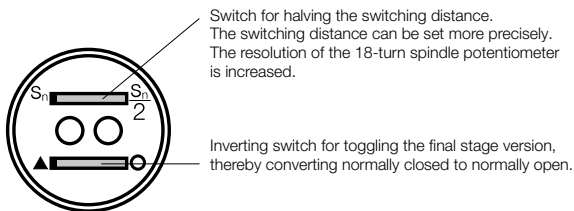
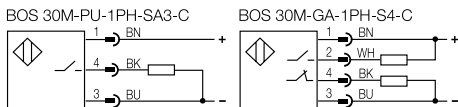
Type	Sensing distance/Range	Light type		Output		Switching type		Switching frequency	U _s	Connection		Page
		Infrared		PNP transistor	NPN transistor	Light switching	Dark switching				M12 plug, 4-pin	
BOS0134	BOS 30M-GA-1PH-S4-C	0...2 m	■	■		■	■	100 Hz	■	■		137
BOS008T	BOS 30M-PU-1PH-SA3-C	0...2 m	■	■	■	■	■	100 Hz	■	■		137

Diffuse sensor BOS 30M-...-1PH-...



Sensing distance with side approach of Kodak-gray card.

Wiring diagrams



Recommended accessories
(please order separately)

Description	Ordering code
Mounting clamp	BAM00TN



You can find special accessories for diffuse sensors, such as **reflectors, apertures, lenses, filters and deflection heads**, in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

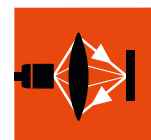
Suitable connectors
(please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

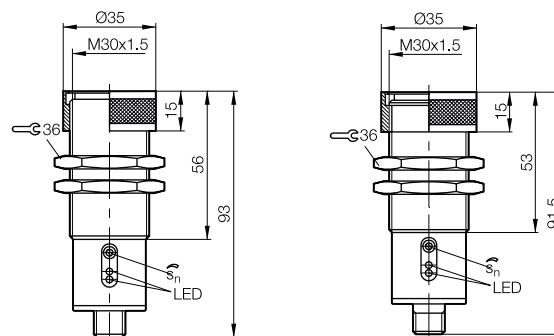
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type	Diffuse sensor		Diffuse sensor
Detection range	0...2 m		0...2 m
PNP	Daylight filter	Ordering code	BOS008T
		Part number	BOS 30M-PU-1PH-SA3-C
PNP/NPN	Daylight filter	Ordering code	BOS0134
		Part number	BOS 30M-GA-1PH-S4-C
Supply voltage U_s	10...30 V DC		10...30 V DC
Output current	200 mA		200 mA
No-load supply current I_0 max.	≤ 40 mA		≤ 40 mA
Switching type	Light and dark switching		Light and dark switching
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes
Settings	Potentiometer, 18-turn		Potentiometer, 18-turn
Emitter, light type	LED, infrared		LED, infrared
Wavelength	880 Nm		880 Nm
Power-on indicator	Green LED		Green LED
Output function indicator	Yellow LED		Yellow LED
Stability indicator	Red LED		Red LED
Response time	5 ms		5 ms
Switching frequency f	100 Hz		100 Hz
Degree of protection as per IEC 60529	IP 65		IP 65
Ambient temperature T_a	$-20...+60$ °C		$-20...+60$ °C
Material	Housing	Nickel-plated CuZn	Nickel-plated CuZn
	Optical surface	Glass	Glass
Connection	M12 connector, 4-pin		M12 connector, 4-pin

Reference object: white, 90% reflection, 200×200 mm

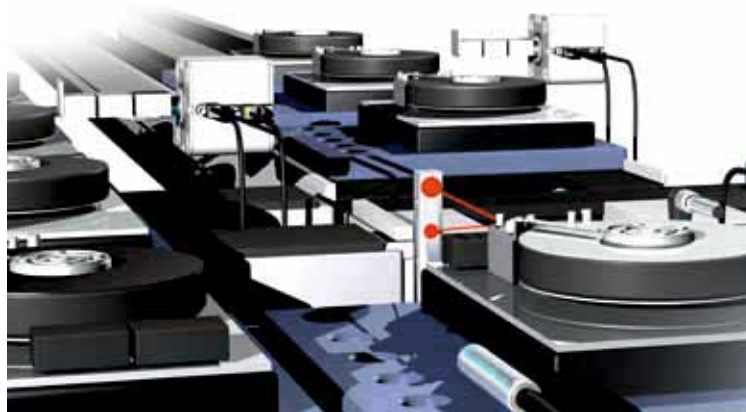


Diffuse sensor and reflection and through-beam sensor are now also available in the block-shaped housing with 8 mm edge length. These new Opto-mini.s **BOS Q08M** persuade with simple handling with fixed set detection and range. In this way, they provide the small diffuse sensors solutions in highly dynamic applications such as robot arms. This is precisely where components that have very low weight and small dimensions while retaining high switching precision are in demand.

Reliably detect the smallest parts

Balluff through-beam sensors BOS Q08M are innovative, compact products that reach a high performance level. Nothing else produces comparable results under similar conditions. These sensors are therefore particularly recommended if there is little space available. A focused light beam is able to detect even the smallest of parts, grooves or holes reliably. In this way, they check things like heights very reliably. And in cramped systems, the high-performance, compact units are also characterized by the fact that their fine laser beam (PinPoint laser/red light) can be aligned very precisely in the middle of closely set parts to ensure reliable detection.

- Small design for small spaces
- Rugged metal housing
- Reliable detection of small parts up to 0.4 mm (PinPoint red light) or 0.28 mm (laser)
- Uses a patented mounting concept for Bosch profiles that allows quick, precise positioning



Photoelectric Sensors

BOS Q08M

Product overview



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type	Sensing distance/Range	Light type			Output	Switching type		Switching frequency	U _s	Connection			Page
		Red light	Red light pin point	Laser		PNP transistor	Light switching			Dark switching	M8 connector, 3-pin	Pigtail M8 plug, 3-pin	
Diffuse sensor with background suppression									10...30 V DC				
BOS0163 BOS Q08M-PS-KF20-00,2-S49	5...50 mm	■	■	■	■	■	■	400 Hz	■	■	■	■	140
BOS0168 BOS Q08M-PO-KF20-00,2-S49	5...50 mm	■	■	■	■	■	■	400 Hz	■	■	■	■	140
BOS0160 BOS Q08M-PS-KF20-S49	5...50 mm	■	■	■	■	■	■	400 Hz	■	■	■	■	140
BOS0164 BOS Q08M-PO-KF20-S49	5...50 mm	■	■	■	■	■	■	400 Hz	■	■	■	■	140
BOS0161 BOS Q08M-PS-KF20-02	5...50 mm	■	■	■	■	■	■	400 Hz	■	■	■	■	141
BOS0165 BOS Q08M-PO-KF20-02	5...50 mm	■	■	■	■	■	■	400 Hz	■	■	■	■	141
Diffuse sensor													
BOS0041 BOS Q08M-PS-RD11-S49	0...55 mm	■	■	■	■	■	■	500 Hz	■	■	■	■	141
BOS003Z BOS Q08M-PO-RD11-S49	0...55 mm	■	■	■	■	■	■	500 Hz	■	■	■	■	141
BOS0040 BOS Q08M-PS-RD11-02	0...55 mm	■	■	■	■	■	■	500 Hz	■	■	■	■	141
BOS003Y BOS Q08M-PO-RD11-02	0...55 mm	■	■	■	■	■	■	500 Hz	■	■	■	■	141
Retroreflective sensor with polarizing filter													
BOS00U6 BOS Q08M-PS-PR11-S49	25...550 mm	■	■	■	■	■	■	500 Hz	■	■	■	■	142
BOS00U4 BOS Q08M-PO-PR11-S49	25...550 mm	■	■	■	■	■	■	500 Hz	■	■	■	■	142
BOS00U5 BOS Q08M-PS-PR11-02	25...550 mm	■	■	■	■	■	■	500 Hz	■	■	■	■	142
BOS00U3 BOS Q08M-PO-PR11-02	25...550 mm	■	■	■	■	■	■	500 Hz	■	■	■	■	142
BOS01MU BOS Q08M-PS-LR20-00,2-S49	0...100 mm	■	■	■	■	■	■	400 Hz	■	■	■	■	144
BOS01MW BOS Q08M-PO-LR20-00,2-S49	0...100 mm	■	■	■	■	■	■	400 Hz	■	■	■	■	144
BOS01MP BOS Q08M-PS-LR20-S49	0...100 mm	■	■	■	■	■	■	400 Hz	■	■	■	■	144
BOS01MR BOS Q08M-PO-LR20-S49	0...100 mm	■	■	■	■	■	■	400 Hz	■	■	■	■	144
BOS01MZ BOS Q08M-PS-LR20-02	0...100 mm	■	■	■	■	■	■	400 Hz	■	■	■	■	145
Through-beam sensor Receiver													
BOS00YC BOS Q08M-PS-KE20-00,2-S49	0...2.2 m	■	■	■	■	■	■	400 Hz	■	■	■	■	143
BOS00Y8 BOS Q08M-PO-KE20-00,2-S49	0...2.2 m	■	■	■	■	■	■	400 Hz	■	■	■	■	143
BOS00YF BOS Q08M-PS-KE20-S49	0...2.2 m	■	■	■	■	■	■	400 Hz	■	■	■	■	143
BOS00YA BOS Q08M-PO-KE20-S49	0...2.2 m	■	■	■	■	■	■	400 Hz	■	■	■	■	143
BOS00YE BOS Q08M-PS-KE20-02	0...2.2 m	■	■	■	■	■	■	400 Hz	■	■	■	■	143
BOS00Y9 BOS Q08M-PO-KE20-02	0...2.2 m	■	■	■	■	■	■	400 Hz	■	■	■	■	143
BOS0197 BOS Q08M-PS-LE20-00,2-S49	0...3 m	■	■	■	■	■	■	400 Hz	■	■	■	■	146
BOS0194 BOS Q08M-PO-LE20-00,2-S49	0...3 m	■	■	■	■	■	■	400 Hz	■	■	■	■	146
BOS0199 BOS Q08M-PS-LE20-S49	0...3 m	■	■	■	■	■	■	400 Hz	■	■	■	■	146
BOS0196 BOS Q08M-PO-LE20-S49	0...3 m	■	■	■	■	■	■	400 Hz	■	■	■	■	146
BOS0198 BOS Q08M-PS-LE20-02	0...3 m	■	■	■	■	■	■	400 Hz	■	■	■	■	147
BOS0195 BOS Q08M-PO-LE20-02	0...3 m	■	■	■	■	■	■	400 Hz	■	■	■	■	147
Through-beam sensor Emitter													
BOS00YH BOS Q08M-X-KS20-00,2-S49	0...2.2 m	■	■	■	■	■	■	■	■	■	■	■	143
BOS00YK BOS Q08M-X-KS20-S49	0...2.2 m	■	■	■	■	■	■	■	■	■	■	■	143
BOS00YJ BOS Q08M-X-KS20-02	0...2.2 m	■	■	■	■	■	■	■	■	■	■	■	143
BOS019M BOS Q08M-X-LS20-00,2-S49	0...3 m	■	■	■	■	■	■	■	■	■	■	■	146
BOS018K BOS Q08M-X-LS20-S49	0...3 m	■	■	■	■	■	■	■	■	■	■	■	146
BOS018M BOS Q08M-X-LS20-02	0...3 m	■	■	■	■	■	■	■	■	■	■	■	147

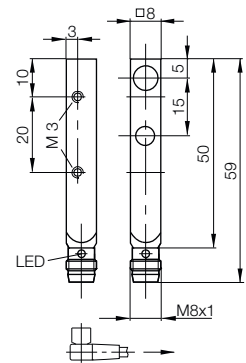
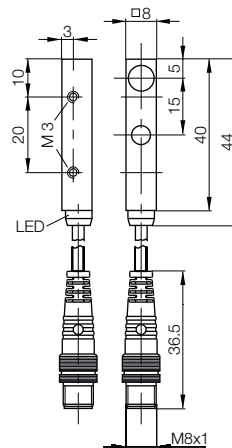
NPN on request



Type		Diffuse sensor with background suppression	Diffuse sensor with background suppression
Detection range		5...50 mm	5...50 mm
PNP NO	Ordering code	BOS0163	BOS0160
	Part number	BOS Q08M-PS-KF20-00,2-S49	BOS Q08M-PS-KF20-S49
PNP NC	Ordering code	BOS0168	BOS0164
	Part number	BOS Q08M-PO-KF20-00,2-S49	BOS Q08M-PO-KF20-S49
Supply voltage U_s		10...30 V DC	10...30 V DC
Output current		100 mA	100 mA
No-load supply current I_0 max.		≤ 15 mA	≤ 15 mA
Switching type		Light or dark switching	Light or dark switching
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes
Settings		Fixed	Fixed
Emitter, light type		Pin point-LED, red light	Pin point-LED, red light
Wavelength		655 Nm	655 Nm
Received light indicator		Yellow LED	Yellow LED
Response time		1.25 ms	1.25 ms
Switching frequency f		400 Hz	400 Hz
Degree of protection as per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-10...+60 °C	-10...+60 °C
Permissible ambient light per		EN 60947-5-2	EN 60947-5-2
Material	Housing	Nickel-plated GD-Zn	Nickel-plated GD-Zn
	Optical surface	PMMA, PC	PMMA, PC
Connection		Pigtail 20 cm, M8 plug, 3-pin	M8 connector, 3-pin

Reference object: white, 90% reflection, 200×200 mm

For wiring diagrams see page 146.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric

Distance

Sensors

for Analog

Distance

Measurement

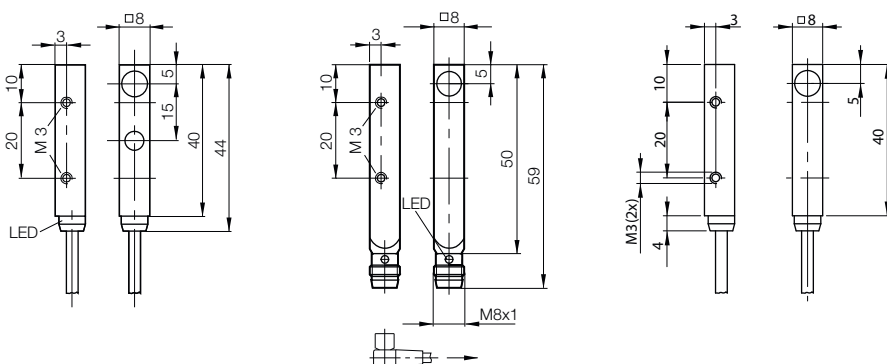
Accessories for

Photoelectric

Sensors



	Diffuse sensor with background suppression	Diffuse sensor	Diffuse sensor	
	5...50 mm	0...55 mm	0...55 mm	
	BOS0161	BOS0041	BOS0040	
	BOS Q08M-PS-KF20-02	BOS Q08M-PS-RD11-S49	BOS Q08M-PS-RD11-02	
	BOS0165	BOS003Z	BOS003Y	
	BOS Q08M-PO-KF20-02	BOS Q08M-PO-RD11-S49	BOS Q08M-PO-RD11-02	
	10...30 V DC	10...30 V DC	10...30 V DC	
	100 mA	100 mA	100 mA	
	≤ 15 mA	≤ 15 mA	≤ 15 mA	
	Light or dark switching	Light or dark switching	Light or dark switching	
	Yes/Yes	Yes/Yes	Yes/Yes	
	Fixed	Fixed	Fixed	
	Pin point-LED, red light	LED, red light	LED, red light	
	655 Nm	640 Nm	640 Nm	
	Yellow LED	Yellow LED	Yellow LED	
	1.25 ms	1.25 ms	1.25 ms	
	400 Hz	400 Hz	400 Hz	
	IP 67	IP 67	IP 67	
	-10...+60 °C	-10...+60 °C	-10...+60 °C	
	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	
	Nickel-plated GD-Zn	Nickel-plated GD-Zn	Nickel-plated GD-Zn	
	PMMA, PC	PMMA	PMMA	
	2 m PUR cable, 3x0.14 mm ²	M8 connector, 3-pin	2 m PUR cable, 3x0.14 mm ²	

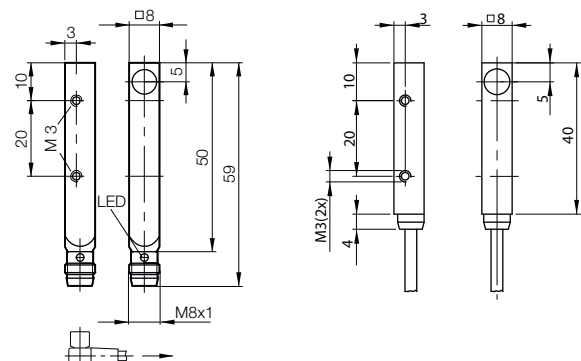




Type			Retroreflective sensor	Retroreflective sensor
Detection range			25...550 mm	25...550 mm
PNP NO	Polarizing filter	Ordering code	BOS00U6	BOS00U5
		Part number	BOS Q08M-PS-PR11-S49	BOS Q08M-PS-PR11-02
PNP NC	Polarizing filter	Ordering code	BOS00U4	BOS00U3
		Part number	BOS Q08M-PO-PR11-S49	BOS Q08M-PO-PR11-02
PNP NO	Receiver	Ordering code		
		Part number		
PNP NC	Receiver	Ordering code		
		Part number		
	Emitter	Ordering code		
		Part number		
Supply voltage U_s			10...30 V DC	10...30 V DC
Output current			100 mA	100 mA
No-load supply current I_0 max.			≤ 20 mA	≤ 20 mA
Switching type			Light or dark switching	Light or dark switching
Polarity reversal/short-circuit protected			Yes/Yes	Yes/Yes
Settings			Fixed	Fixed
Emitter, light type			LED, red light	LED, red light
Wavelength			640 Nm	640 Nm
Smallest detectable part				
Received light indicator			Yellow LED	Yellow LED
Response time			1.25 ms	1.25 ms
Switching frequency f			400 Hz	400 Hz
Degree of protection as per IEC 60529			IP 67	IP 67
Ambient temperature T_a			-10...+60 °C	-10...+60 °C
Permissible ambient light per			EN 60947-5-2	EN 60947-5-2
Material	Housing		Nickel-plated GD-Zn	Nickel-plated GD-Zn
	Optical surface		PMMA	PMMA
Connection			M8 connector, 3-pin	2 m PUR cable, 3x0.14 mm ²

Reference reflector: BOS R-9

For wiring diagrams see page 146.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric

Distance

Sensors

for Analog

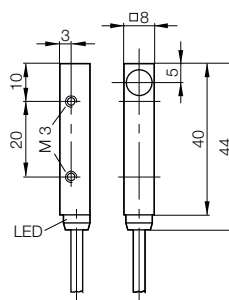
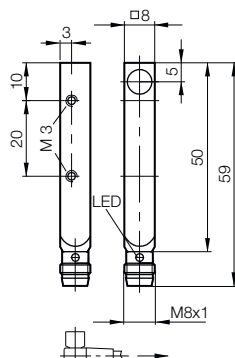
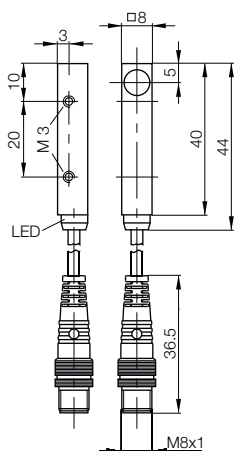
Distance

Measurement

Accessories for Photoelectric Sensors



Through-beam sensor 0...2.2 m	Through-beam sensor 0...2.2 m	Through-beam sensor 0...2.2 m	
BOS00YC BOS Q08M-PS-KE20-00,2-S49	BOS00YF BOS Q08M-PS-KE20-S49	BOS00YE BOS Q08M-PS-KE20-02	
BOS00Y8 BOS Q08M-PO-KE20-00,2-S49	BOS00YA BOS Q08M-PO-KE20-S49	BOS00Y9 BOS Q08M-PO-KE20-02	
BOS00YH BOS Q08M-X-KS20-00,2-S49	BOS00YK BOS Q08M-X-KS20-S49	BOS00YJ BOS Q08M-X-KS20-02	
10...30 V DC	10...30 V DC	10...30 V DC	
100 mA	100 mA	100 mA	
≤ 15 mA	≤ 15 mA	≤ 15 mA	
Light or dark switching	Light or dark switching	Light or dark switching	
Yes/Yes	Yes/Yes	Yes/Yes	
Fixed	Fixed	Fixed	
Pin point-LED, red light	Pin point-LED, red light	Pin point-LED, red light	
655 Nm	655 Nm	655 Nm	
0.4 mm	0.4 mm	0.4 mm	
Yellow LED	Yellow LED	Yellow LED	
1.25 ms	1.25 ms	1.25 ms	
400 Hz	400 Hz	400 Hz	
IP 67	IP 67	IP 67	
-10...+60 °C	-10...+60 °C	-10...+60 °C	
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	
Nickel-plated GD-Zn	Nickel-plated GD-Zn	Nickel-plated GD-Zn	
PMMA	PMMA	PMMA	
Pigtail 20 cm, M8 plug, 3-pin	M8 connector, 3-pin	2 m PUR cable, 3×0.14 mm ²	

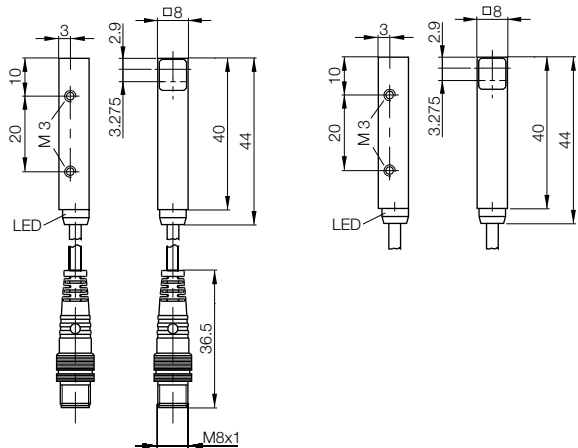


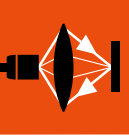


Type			Retroreflective sensor	Retroreflective sensor
Detection range			0...1 m	0...1 m
PNP NO	Polarizing filter	Ordering code	BOS01MU	BOS01MP
		Part number	BOS Q08M-PS-LR20-00-2-S49	BOS Q08M-PS-LR20-S49
PNP NC	Polarizing filter	Ordering code	BOS01MW	BOS01MR
		Part number	BOS Q08M-PO-LR20-00-2-S49	BOS Q08M-PO-LR20-S49
Supply voltage U_s			10...30 V DC	10...30 V DC
Output current			100 mA (receiver)	100 mA (receiver)
No-load supply current I_0 max.			≤ 10 mA	≤ 10 mA
Switching type			Light switching	Light switching
Polarity reversal/short-circuit protected			Yes/Yes	Yes/Yes
Settings			Fixed	Fixed
Emitter, light type			Laser, red light	Laser, red light
Wavelength			655 Nm	655 Nm
Laser class			1	1
Smallest detectable part			0.3 mm	0.3 mm
Received light indicator			Yellow LED	Yellow LED
Response time			1.25 ms	1.25 ms
Switching frequency f			400 Hz	400 Hz
Degree of protection as per IEC 60529			IP 67	IP 67
Ambient temperature T_a			-5...+55 °C	-5...+55 °C
Permissible ambient light per			EN 60947-5-2	EN 60947-5-2
Material	Housing		Nickel-plated GD-Zn	Nickel-plated GD-Zn
	Optical surface		PMMA	PMMA
Connection			Pigtail 20 cm, M8 connector, 3-pin	M8 connector, 3-pin

Reference reflector: BOS R-22

If the distance between the sensor and reflector is less than 70 mm, we recommend using the reflector BOS R-56 or the reflective tape BOS R-40.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

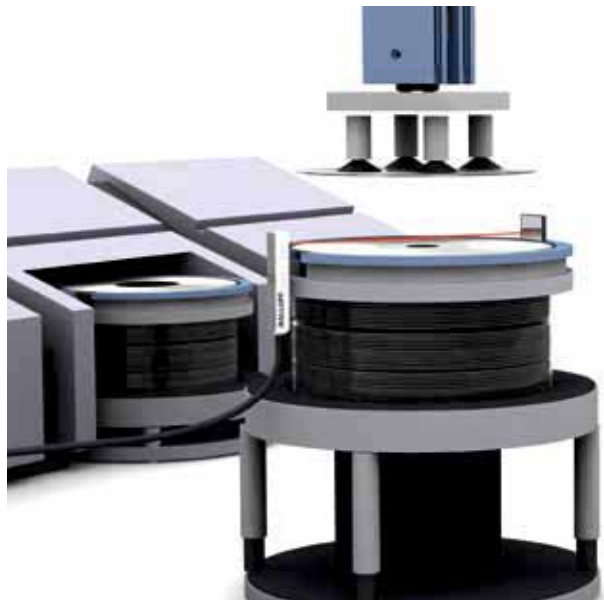
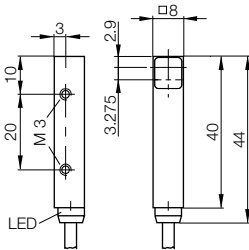
BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

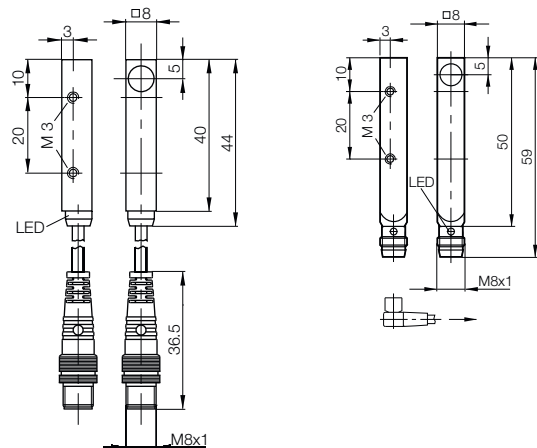
Accessories for Photoelectric Sensors

	Retroreflective sensor			
	0...1 m			
	BOS01MZ			
	BOS Q08M-PS-LR20-02			
	10...30 V DC			
	100 mA (receiver)			
	≤ 10 mA			
	Dark switching			
	Yes/Yes			
	Fixed			
	Laser, red light			
	655 Nm			
	1			
	0.3 mm			
	Yellow LED			
	1.25 ms			
	400 Hz			
	IP 67			
	-5...+55 °C			
	EN 60947-5-2			
	Nickel-plated GD-Zn			
	PMMA			
	2 m PUR cable,			
	3x0.14 mm ²			



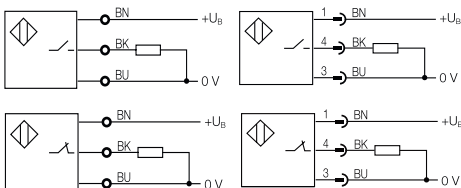


Type			Through-beam sensor	Through-beam sensor
Detection range			0...3 m	0...3 m
PNP NO	Receiver	Ordering code	BOS0197	BOS0199
		Part number	BOS Q08M-PS-LE20-00,2-S49	BOS Q08M-PS-LE20-S49
PNP NC	Receiver	Ordering code	BOS0194	BOS0196
		Part number	BOS Q08M-PO-LE20-00,2-S49	BOS Q08M-PO-LE20-S49
	Emitter	Ordering code	BOS019M	BOS018K
		Part number	BOS Q08M-X-LS20-00,2-S49	BOS Q08M-X-LS20-S49
Supply voltage U_s			10...30 V DC	10...30 V DC
Output current			100 mA (receiver)	100 mA (receiver)
No-load supply current I_0 max.			≤ 15 mA	≤ 15 mA
Switching type			Light or dark switching	Light or dark switching
Polarity reversal/short-circuit protected			Yes/Yes	Yes/Yes
Settings			Fixed	Fixed
Emitter, light type			Laser, red light	Laser, red light
Wavelength			650 Nm	650 Nm
Laser class			1	1
Smallest detectable part			0.28 mm	0.28 mm
Received light indicator			Yellow LED	Yellow LED
Response time			1.25 ms	1.25 ms
Switching frequency f			400 Hz	400 Hz
Degree of protection as per IEC 60529			IP 67	IP 67
Ambient temperature T_a			0...+50 °C	0...+50 °C
Permissible ambient light per			EN 60947-5-2	EN 60947-5-2
Material	Housing		Nickel-plated GD-Zn	Nickel-plated GD-Zn
	Optical surface		PMMA	PMMA
Connection			Pigtail 20 cm, M8 plug, 3-pin	M8 connector, 3-pin

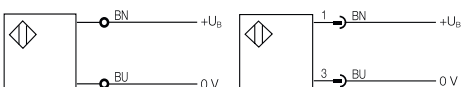


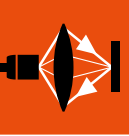
Wiring diagrams

Diffuse, retroreflective,
 through-beam sensor receivers



Through-beam sensor emitters





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

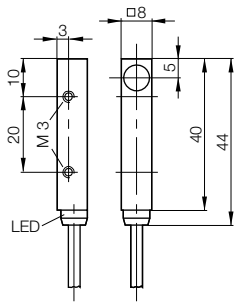
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Through-beam sensor				
0...3 m				
BOS0198				
BOS Q08M-PS-LE20-02				
BOS0195				
BOS Q08M-PO-LE20-02				
BOS018M				
BOS Q08M-X-LS20-02				
10...30 V DC				
100 mA (receiver)				
≤ 15 mA				
Light or dark switching				
Yes/Yes				
Fixed				
Laser, red light				
650 Nm				
1				
0.28 mm				
Yellow LED				
1.25 ms				
400 Hz				
IP 67				
0...+50 °C				
EN 60947-5-2				
Nickel-plated GD-Zn				
PMMA				
2 m PUR cable, 3x0.14 mm ²				



Clamping holders
For Bosch profile: **BES Q08-KH-3**



Recommended accessories
(please order separately)

Description	Ordering code
Reflector	BAM00WL



You can find special accessories for diffuse sensors, such as **reflectors, apertures, lenses, filters and deflection heads**, in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Suitable connectors
(please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M8, 3-pin	Straight	PUR	Black	2 m	BCC02M8
M8, 3-pin	Straight	PVC	Gray	2 m	BCC02NU
M8, 3-pin	Angled	PUR	Black	2 m	BCC02ML
M8, 3-pin	Angled	PVC	Gray	2 m	BCC02P5



Connectors without LED are suitable for PNP and NPN sensors.

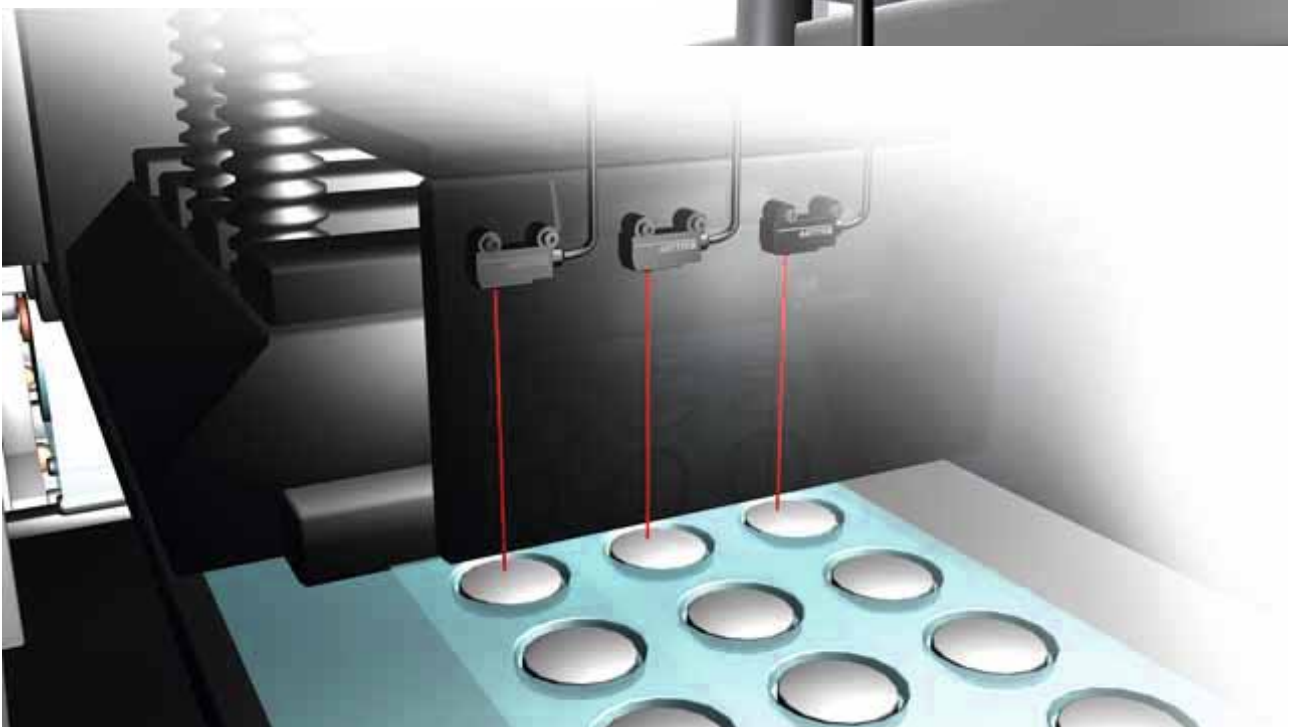
More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.

Requirements such as extremely tight mounting spaces under the most difficult of conditions are easily handled by the sub-mini **BOS 2K series**.

The electronic circuitry is housed in a plastic enclosure just 20.6×12.5×7.6 mm. Metal sleeves in the housing ensure secure and simple mounting.

The laser-like, visible light spot makes precise small-parts detection possible. Unmatched ranges up to 1.2 m and fast response times ensure compatibility with dynamic applications.

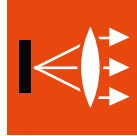
The BOS 2K series is a complete series with diffuse sensors, retro-reflective light sensors and through-beam sensor as well as diffuse sensors with background suppression. That means this series offers the complete functionality demanded of a modern sensor series.



Photoelectric Sensors

BOS 2K

Product overview



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type	Sensing distance/Range	Light type		Output	Switching type		Switching frequency	U _S	Connection			Page
		Red light			Light switching	Dark switching			M8 connector, 3-pin	M8 connector, 4-pin	Cable	
Diffuse sensor with background suppression												
BOS0104	BOS 2K-PS-RH10-00,2-S75	1...15 mm	■	■	■		800 Hz	■		■		150
BOS0103	BOS 2K-PS-RH10-00,2-S49	1...15 mm	■	■	■		800 Hz	■	■			150
BOS00ZN	BOS 2K-PO-RH10-00,2-S49	1...15 mm	■	■		■	800 Hz	■	■			150
BOS0105	BOS 2K-PS-RH10-02	1...15 mm	■	■	■		800 Hz	■			■	151
BOS0107	BOS 2K-PS-RH11-00,2-S75	1...30 mm	■	■	■		800 Hz	■		■		151
BOS0106	BOS 2K-PS-RH11-00,2-S49	1...30 mm	■	■	■		800 Hz	■	■			151
BOS0108	BOS 2K-PS-RH11-02	1...30 mm	■	■	■		800 Hz	■			■	151
BOS00ZP	BOS 2K-PO-RH11-02	1...30 mm	■	■		■	800 Hz	■			■	151
Diffuse sensor												
BOS00ZY	BOS 2K-PS-RD10-00,2-S75	1...55 mm	■	■	■		800 Hz	■		■		152
BOS00ZW	BOS 2K-PS-RD10-00,2-S49	1...55 mm	■	■	■		800 Hz	■	■			152
BOS00ZZ	BOS 2K-PS-RD10-02	1...55 mm	■	■	■		800 Hz	■			■	153
Retroreflective sensor with polarizing filter												
BOS00ZT	BOS 2K-PS-PR10-00,2-S75	45...800 mm	■	■		■	800 Hz	■		■		153
BOS00ZR	BOS 2K-PS-PR10-00,2-S49	45...800 mm	■	■		■	800 Hz	■	■			153
BOS00ZK	BOS 2K-PO-PR10-00,2-S49	45...800 mm	■	■	■		800 Hz	■	■			153
BOS00ZU	BOS 2K-PS-PR10-02	45...800 mm	■	■		■	800 Hz	■			■	153
BOS00ZL	BOS 2K-PO-PR10-02	45...800 mm	■	■	■		800 Hz	■			■	153
Through-beam sensor Receiver												
BOS0101	BOS 2K-PS-RE10-00,2-S75	0...1.2 m	■	■		■	200 Hz	■		■		154
BOS0100	BOS 2K-PS-RE10-00,2-S49	0...1.2 m	■	■		■	200 Hz	■	■			155
BOS0102	BOS 2K-PS-RE10-02	0...1.2 m	■	■		■	200 Hz	■			■	155
BOS00ZM	BOS 2K-PO-RE10-02	0...1.2 m	■	■	■		200 Hz	■			■	155
Through-beam sensor Emitter												
BOS010A	BOS 2K-X-RS10-00,2-S75	0...1.2 m	■					■		■		154
BOS0109	BOS 2K-X-RS10-00,2-S49	0...1.2 m	■					■	■			155
BOS010C	BOS 2K-X-RS10-02	0...1.2 m	■					■			■	155

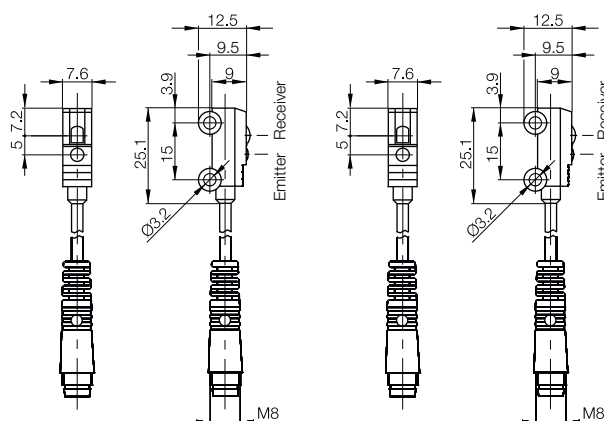
NPN on request

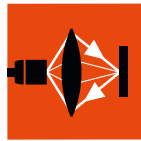


Type		Diffuse sensor with background suppression	Diffuse sensor with background suppression
Detection range		1...15 mm	1...15 mm
PNP NO	Ordering code	BOS0104	BOS0103
	Part number	BOS 2K-PS-RH10-00,2-S75	BOS 2K-PS-RH10-00,2-S49
PNP NC	Ordering code		BOS00ZN
	Part number		BOS 2K-PO-RH10-00,2-S49
Supply voltage U_s		10...30 V DC	10...30 V DC
Output current		50 mA	50 mA
No-load supply current I_0 max.		≤ 20 mA	≤ 20 mA
Switching type		Light switching	Light or dark switching
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes
Settings		Fixed	Fixed
Emitter, light type		Pin point-LED, red light	Pin point-LED, red light
Wavelength		640 Nm	640 Nm
Light spot diameter		approx. 1.2 mm at 8 mm approx. 2.5 mm at 15 mm	approx. 1.2 mm at 8 mm approx. 2.5 mm at 15 mm
Output function indicator		Red LED	Red LED
Response time		0.6 ms	0.6 ms
Switching frequency f		800 Hz	800 Hz
Degree of protection as per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-20...+50 °C	-20...+50 °C
Permissible ambient light per		EN 60947-5-2	EN 60947-5-2
Material	Housing	ABS	ABS
	Optical surface	PMMA	PMMA
Connection		Pigtail 20 cm, M8 plug, 4-pin	Pigtail 20 cm, M8 plug, 3-pin

Reference object: white, 90% reflection, 200×200 mm

For wiring diagrams see page 157.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

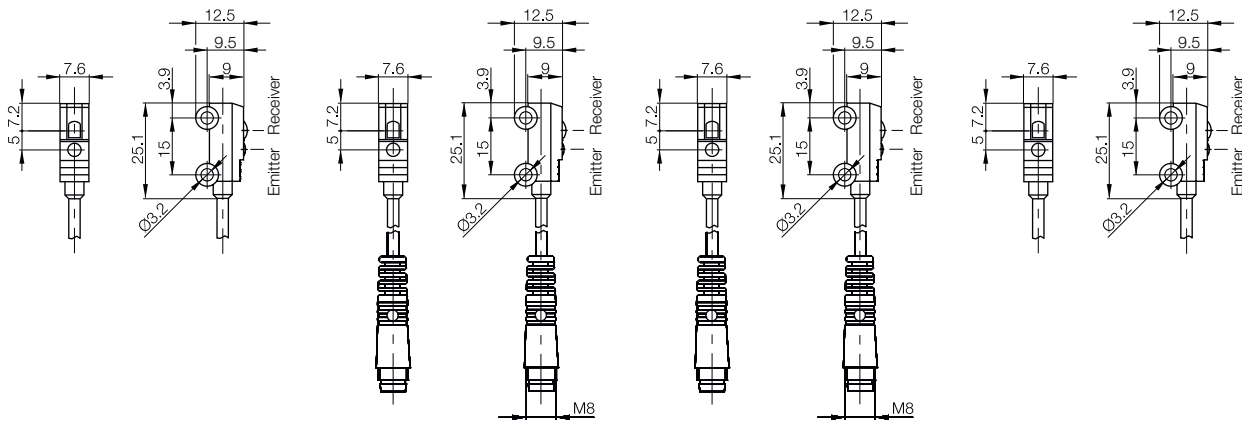
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Diffuse sensor with background suppression 1...15 mm BOS0105 BOS 2K-PS-RH10-02	Diffuse sensor with background suppression 1...30 mm BOS0107 BOS 2K-PS-RH11-00,2-S75	Diffuse sensor with background suppression 1...30 mm BOS0106 BOS 2K-PS-RH11-00,2-S49	Diffuse sensor with background suppression 1...30 mm BOS0108 BOS 2K-PS-RH11-02
			BOS00ZP BOS 2K-PO-RH11-02
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
50 mA	50 mA	50 mA	50 mA
≤ 20 mA	≤ 20 mA	≤ 20 mA	≤ 20 mA
Light switching	Light switching	Light switching	Light or dark switching
Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
Fixed	Fixed	Fixed	Fixed
Pin point-LED, red light	Pin point-LED, red light	Pin point-LED, red light	Pin point-LED, red light
640 Nm	640 Nm	640 Nm	640 Nm
approx. 1.2 mm at 8 mm	approx. 1.0 mm at 15 mm	approx. 1.0 mm at 15 mm	approx. 1.0 mm at 15 mm
approx. 2.5 mm at 15 mm	approx. 4.5 mm at 30 mm	approx. 4.5 mm at 30 mm	approx. 4.5 mm at 30 mm
Red LED	Red LED	Red LED	Red LED
0.6 ms	0.6 ms	0.6 ms	0.6 ms
800 Hz	800 Hz	800 Hz	800 Hz
IP 67	IP 67	IP 67	IP 67
-20...+50 °C	-20...+50 °C	-20...+50 °C	-20...+50 °C
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
ABS	ABS	ABS	ABS
PMMA	PMMA	PMMA	PMMA
2 m PVC cable, 3x0.09 mm ²	Pigtail 20 cm, M8 plug, 4-pin	Pigtail 20 cm, M8 plug, 3-pin	2 m PVC cable, 3x0.09 mm ²

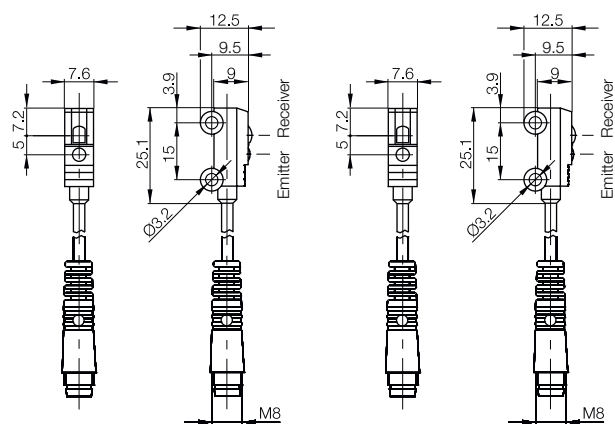




Type		Diffuse sensor	Diffuse sensor
Detection range		1...55 mm	1...55 mm
PNP NO	Ordering code	BOS00ZY	BOS00ZW
	Part number	BOS 2K-PS-RD10-00,2-S75	BOS 2K-PS-RD10-00,2-S49
PNP NO	Polarizing filter	Ordering code	
		Part number	
PNP NC	Polarizing filter	Ordering code	
		Part number	
Supply voltage U_S		10...30 V DC	10...30 V DC
Output current		50 mA	50 mA
No-load supply current I_0 max.		≤ 20 mA	≤ 20 mA
Switching type		Light switching	Light switching
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes
Settings		Fixed	Fixed
Emitter, light type		Pin point-LED, red light	Pin point-LED, red light
Wavelength		640 Nm	640 Nm
Light spot diameter		approx. 3.5 mm at 50 mm	approx. 3.5 mm at 50 mm
Output function indicator		Red LED	Red LED
Response time		0.6 ms	0.6 ms
Switching frequency f		800 Hz	800 Hz
Degree of protection as per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-20...+50 °C	-20...+50 °C
Permissible ambient light per		EN 60947-5-2	EN 60947-5-2
Material	Housing	ABS	ABS
	Optical surface	PMMA	PMMA
Connection		Pigtail 20 cm, M8 plug, 4-pin	Pigtail 20 cm, M8 plug, 3-pin

Reference object: white, 90% reflection, 200x200 mm
Reference reflector: BOS R-9

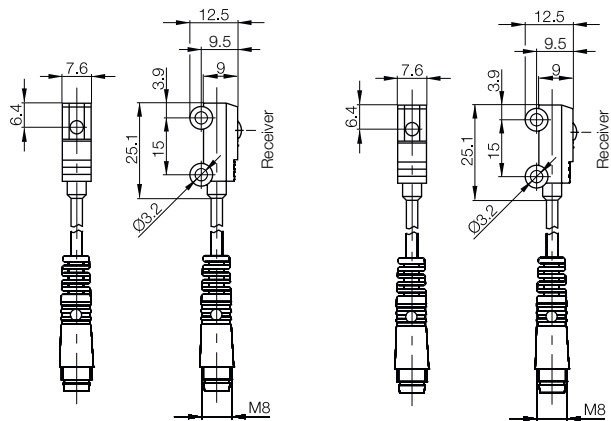
For wiring diagrams see page 157.





Type			Through-beam sensor	Through-beam sensor
Detection range			0...1.2 m	0...1.2 m
PNP NO	Receiver	Ordering code	BOS0101	
		Part number	BOS 2K-PS-RE10-00,2-S75	
PNP NC	Receiver	Ordering code		
		Part number		
	Emitter	Ordering code		BOS010A
		Part number		BOS 2K-X-RS10-00,2-S75
Supply voltage U_S			10...30 V DC	10...30 V DC
Output current			50 mA	
No-load supply current I_0 max.			≤ 10 mA	≤ 20 mA
Switching type			Dark switching	
Polarity reversal/short-circuit protected			Yes/Yes	Yes/Yes
Settings			Fixed	
Emitter, light type				Pin point-LED, red light
Wavelength				640 Nm
Output function indicator			Red LED	
Response time			2.5 ms	
Switching frequency f			200 Hz	
Degree of protection as per IEC 60529			IP 67	IP 67
Ambient temperature T_a			-20...+50 °C	-20...+50 °C
Permissible ambient light per			EN 60947-5-2	EN 60947-5-2
Material	Housing		ABS	ABS
	Optical surface		PMMA	PMMA
Connection			Pigtail 20 cm, M8 plug, 4-pin	Pigtail 20 cm, M8 plug, 4-pin

For wiring diagrams see page 157.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

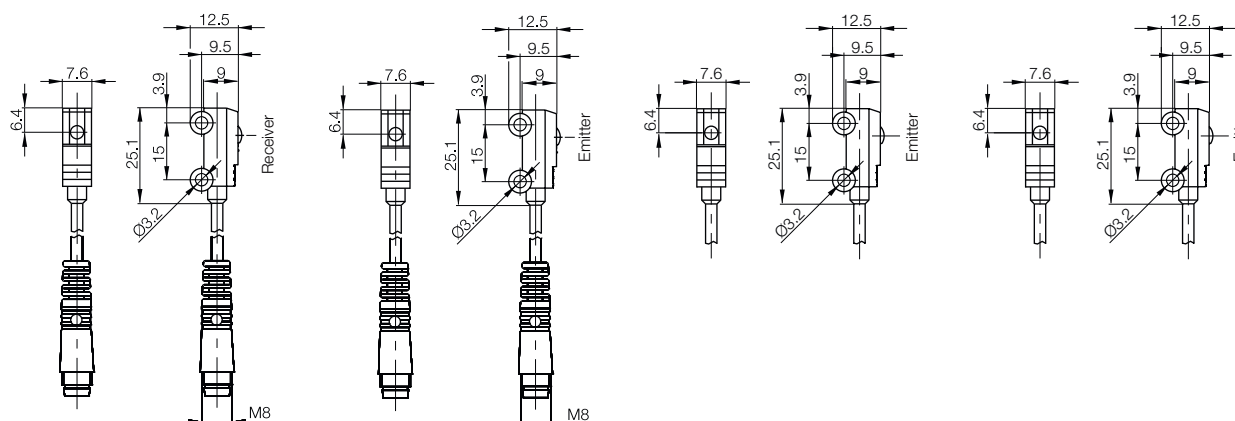
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

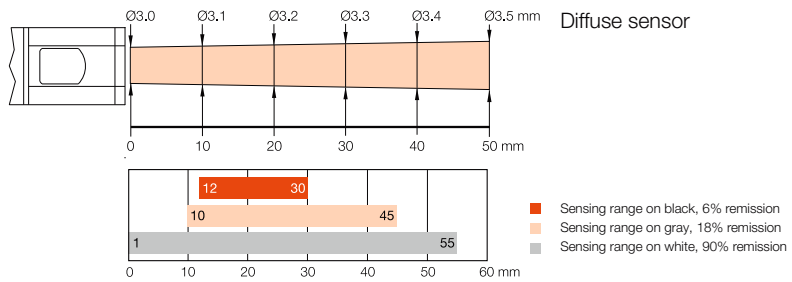
Accessories for Photoelectric Sensors



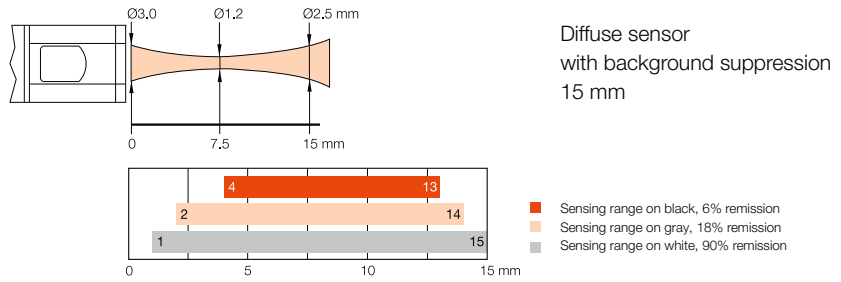
	Through-beam sensor 0...1.2 m BOS0100 BOS 2K-PS-RE10-00,2-S49	Through-beam sensor 0...1.2 m BOS0109 BOS 2K-X-RS10-00,2-S49	Through-beam sensor 0...1.2 m BOS0102 BOS 2K-PS-RE10-02 BOS002M BOS 2K-PO-RE10-02	Through-beam sensor 0...1.2 m BOS010C BOS 2K-X-RS10-02
	10...30 V DC 50 mA ≤ 10 mA Dark switching Yes/Yes Fixed	10...30 V DC ≤ 20 mA Yes/Yes	10...30 V DC 50 mA ≤ 10 mA Light or dark switching Yes/Yes Fixed	10...30 V DC ≤ 20 mA Yes/Yes
	Red LED 2.5 ms 200 Hz IP 67 -20...+50 °C EN 60947-5-2 ABS PMMA Pigtail 20 cm, M8 plug, 3-pin	Pin point-LED, red light 640 Nm IP 67 -20...+50 °C EN 60947-5-2 ABS PMMA Pigtail 20 cm, M8 plug, 3-pin	Red LED 2.5 ms 200 Hz IP 67 -20...+50 °C EN 60947-5-2 ABS PMMA 2 m PVC cable, 3×0.09 mm ²	Pin point-LED, red light 640 Nm IP 67 -20...+50 °C EN 60947-5-2 ABS PMMA 2 m PVC cable, 3×0.09 mm ²



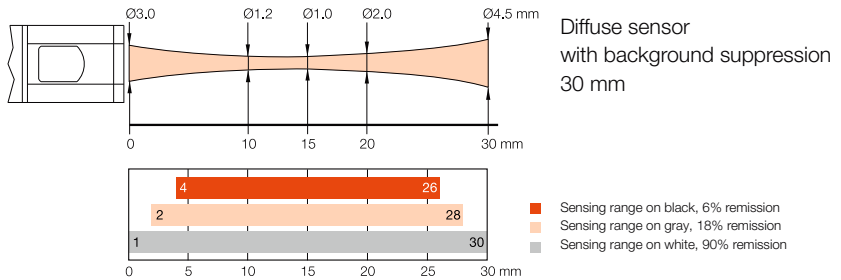
Light spot diameter
Diffuse, 50 mm



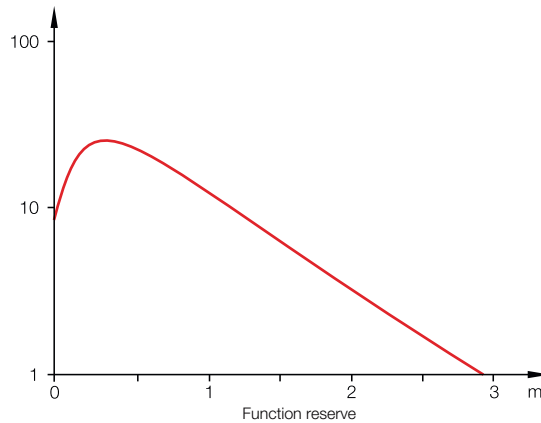
Light spot diameter
Diffuse sensor with background suppression, 15 mm



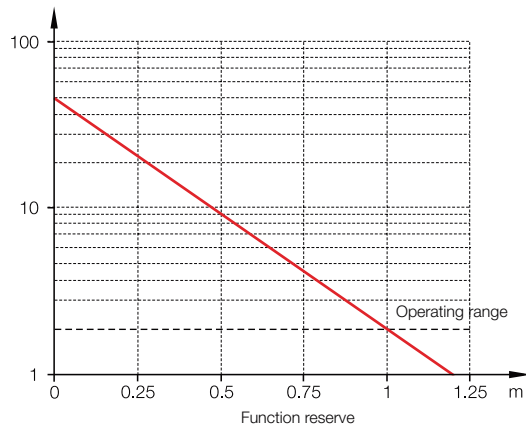
Light spot diameter
Diffuse sensor with background suppression, 30 mm



Retroreflective sensor

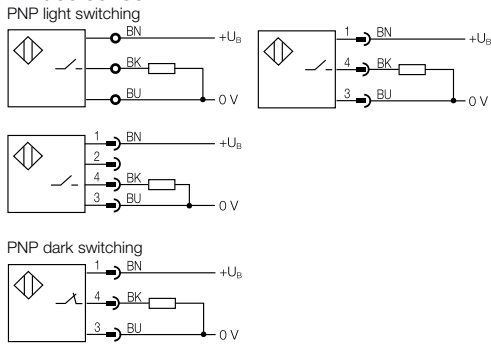


Through-beam sensor

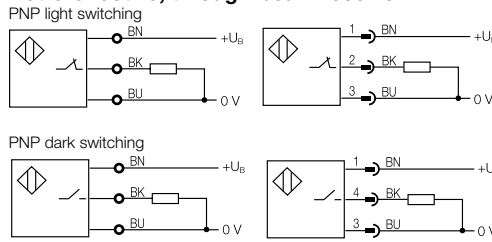


Wiring diagrams

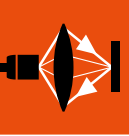
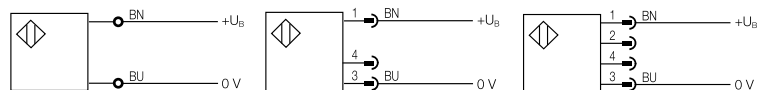
Diffuse sensor



Retroreflective, through-beam receiver



Through-beam sensor emitters



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

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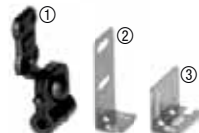
Photoelectric Sensors with Special Properties

Photoelectric Sensors with Special Properties

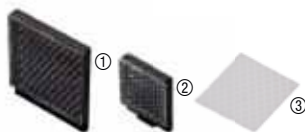
Photoelectric Sensors with Special Properties

Recommended accessories
 (please order separately)

Description	Ordering code
① Mounting bracket	BAM00T4
② Mounting bracket	BAM00T6
③ Mounting bracket	BAM00T5



Description	Ordering code
① Reflector	BAM00WL
② Reflector	BAM00W0
③ Reflective tape	BAM00W5



Special accessories for photoelectric sensors, such as **reflectors, apertures, lenses, filters and deflection heads** can be found in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Suitable connectors
 (please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M8, 3-pin	Straight	PUR	Black	2 m	BCC02M8
M8, 3-pin	Straight	PVC	Gray	2 m	BCC02NU
M8, 3-pin	Angled	PUR	Black	2 m	BCC02ML
M8, 3-pin	Angled	PVC	Gray	2 m	BCC02P5

Size	Design	Cable material	Color	Length	Ordering code
M8, 4-pin	Straight	PUR	Black	2 m	BCC02N2
M8, 4-pin	Straight	PVC	Gray	2 m	BCC02PL
M8, 4-pin	Angled	PUR	Black	2 m	BCC02NC
M8, 4-pin	Angled	PVC	Gray	2 m	BCC02PZ

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.

The advantage of miniature sensors is easy to see:

Small size with big performance makes for flexibility and design freedom. Not only are they easier to install, above all, many applications can be solved easily with a mini-sensor. Even the photoelectric BOS 5K series stands out due to its optical power and its compact design. This series includes various diffuse sensors with background suppression, diffuse sensors with narrow spot geometry, energetic diffuse sensors, retroreflective models with polarizing filter and through-beam sensors. For electrical connection of the sensors, plugs with a cable or M8-plugs are available.

The new **BOS 5K** series features:

- Small, compact design
- Concentration on the most important basic functions
- Attractive price in the lower segment
- Wide-ranging accessories for increased functionality





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

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Photoelectric Distance Sensors for Analog Distance Measurement

Type	Sensing distance/Range	Light type		Output		Switching type		Switching frequency	U _S	Connection			Page
		Red light	Infrared	PNP	NPN	Light switching	Dark switching			10...30 VDC	M8 connector, 3-pin	M8 connector, 4-pin	
Diffuse sensor with background suppression													
BOS012A BOS 5K-PS-RH12-S75	40...200 mm	■		■			■	500 Hz	■		■		160
BOS011Z BOS 5K-PO-RH12-S75	40...200 mm	■		■			■	500 Hz	■		■		160
BOS015U BOS 5K-PS-RH12-S49	40...200 mm	■		■			■	500 Hz	■	■			160
BOS015W BOS 5K-PO-RH12-S49	40...200 mm	■		■			■	500 Hz	■	■			160
BOS0129 BOS 5K-PS-RH12-02	40...200 mm	■		■			■	500 Hz	■			■	161
BOS011Y BOS 5K-PO-RH12-02	40...200 mm	■		■			■	500 Hz	■			■	161
Diffuse sensor													
BOS0124 BOS 5K-PS-ID10-S75	0...900 mm		■	■			■	500 Hz	■		■		161
BOS011L BOS 5K-PO-ID10-S75	0...900 mm		■	■			■	500 Hz	■		■		161
BOS015J BOS 5K-PS-ID10-S49	0...900 mm		■	■			■	500 Hz	■	■			161
BOS015K BOS 5K-PO-ID10-S49	0...900 mm		■	■			■	500 Hz	■	■			161
BOS0123 BOS 5K-PS-ID10-02	0...900 mm		■	■			■	500 Hz	■			■	161
BOS011K BOS 5K-PO-ID10-02	0...900 mm		■	■			■	500 Hz	■			■	161
Diffuse small beam													
BOS0128 BOS 5K-PS-RD11-S75	50...200 mm	■		■			■	500 Hz	■		■		162
BOS011W BOS 5K-PO-RD11-S75	50...200 mm	■		■			■	500 Hz	■		■		162
BOS015N BOS 5K-PS-RD11-S49	50...200 mm	■		■			■	500 Hz	■	■			162
BOS015P BOS 5K-PO-RD11-S49	50...200 mm	■		■			■	500 Hz	■	■			162
BOS0127 BOS 5K-PS-RD11-02	50...200 mm	■		■			■	500 Hz	■			■	163
BOS011U BOS 5K-PO-RD11-02	50...200 mm	■		■			■	500 Hz	■			■	163
Retroreflective sensor with polarizing filter													
BOS012E BOS 5K-PS-RR10-S75	0.1...4 m	■		■			■	500 Hz	■		■		163
BOS0121 BOS 5K-PO-RR10-S75	0.1...4 m	■		■			■	500 Hz	■		■		163
BOS0122 BOS 5K-PO-RR10-S75-S	0.1...4 m	■		■			■	500 Hz	■		■		163
BOS015E BOS 5K-PS-RR10-S49	0.1...4 m	■		■			■	500 Hz	■	■			163
BOS015C BOS 5K-PO-RR10-S49	0.1...4 m	■		■			■	500 Hz	■	■			163
BOS012C BOS 5K-PS-RR10-02	0.1...4 m	■		■			■	500 Hz	■			■	163
BOS0120 BOS 5K-PO-RR10-02	0.1...4 m	■		■			■	500 Hz	■			■	163
Through-beam sensor													
BOS0126 BOS 5K-PS-IX10-S75	0...10 m	■		■			■	500 Hz	■		■		164
BOS011R BOS 5K-PO-IX10-S75	0...10 m	■		■			■	500 Hz	■		■		164
BOS011T BOS 5K-PO-IX10-S75-S	0...10 m	■		■			■	500 Hz	■		■		164
BOS0158 BOS 5K-PS-IX10-S49	0...10 m	■		■			■	500 Hz	■	■			165
BOS0157 BOS 5K-PO-IX10-S49	0...10 m	■		■			■	500 Hz	■	■			165
BOS0125 BOS 5K-PS-IX10-02	0...10 m	■		■			■	500 Hz	■			■	165
BOS011N BOS 5K-PO-IX10-02	0...10 m	■		■			■	500 Hz	■			■	165

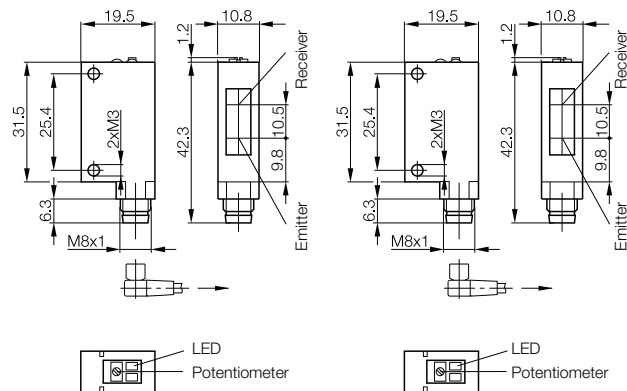
NPN on request



Type		Diffuse sensor with background suppression	Diffuse sensor with background suppression
Detection range		40...200 mm	40...200 mm
PNP NO	Ordering code	BOS012A	BOS015U
	Part number	BOS 5K-PS-RH12-S75	BOS 5K-PS-RH12-S49
PNP NC	Ordering code	BOS011Z	BOS015W
	Part number	BOS 5K-PO-RH12-S75	BOS 5K-PO-RH12-S49
Supply voltage U_s		10...30 V DC	10...30 V DC
Output current		100 mA	100 mA
No-load supply current I_0 max.		≤ 30 mA	≤ 30 mA
Switching type		Light or dark switching	Light or dark switching
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes
Settings		Potentiometer, 6-turn	Potentiometer, 6-turn
Emitter, light type		LED, red light	LED, red light
Wavelength		660 Nm	660 Nm
Output function indicator		Yellow LED	Yellow LED
Stability indicator			
Response time		1 ms	1 ms
Switching frequency f		500 Hz	500 Hz
Degree of protection as per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-25...+55 °C	-25...+55 °C
Permissible ambient light per		5 klx (artificial light)/10 klx (sunlight)	5 klx (artificial light)/10 klx (sunlight)
Material	Housing	PC/PBT	PC/PBT
	Optical surface	PC	PC
Connection		M8 connector, 4-pin	M8 connector, 3-pin

Reference object: white, 90% reflection, 200×200 mm

For wiring diagrams see page 167.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

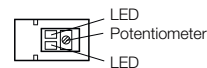
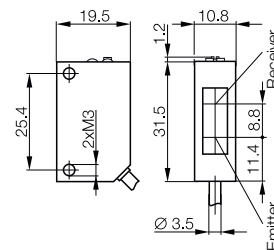
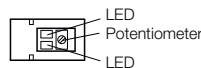
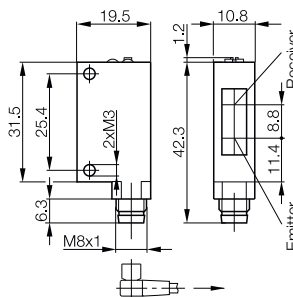
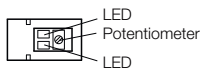
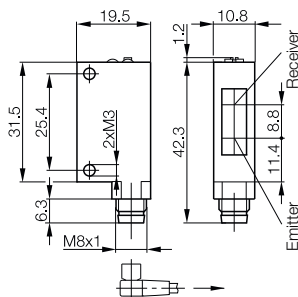
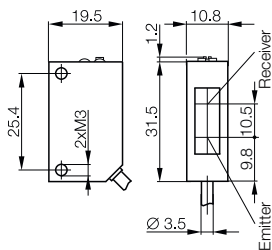
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Diffuse sensor with background suppression 40...200 mm	Diffuse sensor 0...900 mm	Diffuse sensor 0...900 mm	Diffuse sensor 0...900 mm
BOS0129	BOS0124	BOS015J	BOS0123
BOS 5K-PS-RH12-02	BOS 5K-PS-ID10-S75	BOS 5K-PS-ID10-S49	BOS 5K-PS-ID10-02
BOS011Y	BOS011L	BOS015K	BOS011K
BOS 5K-PO-RH12-02	BOS 5K-PO-ID10-S75	BOS 5K-PO-ID10-S49	BOS 5K-PO-ID10-02
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
100 mA	100 mA	100 mA	100 mA
≤ 30 mA	≤ 30 mA	≤ 30 mA	≤ 30 mA
Light or dark switching	Light or dark switching	Light or dark switching	Light or dark switching
Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
Potentiometer, 6-turn	Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°
LED, red light	LED, infrared	LED, infrared	LED, infrared
660 Nm	880 Nm	880 Nm	880 Nm
Yellow LED	Yellow LED	Yellow LED	Yellow LED
	Green LED	Green LED	Green LED
1 ms	1 ms	1 ms	1 ms
500 Hz	500 Hz	500 Hz	500 Hz
IP 67	IP 67	IP 67	IP 67
-25...+55 °C	-25...+55 °C	-25...+55 °C	-25...+55 °C
5 klx (artificial light)/10 klx (sunlight)	5 klx (artificial light)/10 klx (sunlight)	5 klx (artificial light)/10 klx (sunlight)	5 klx (artificial light)/10 klx (sunlight)
PC/PBT	PC/PBT	PC/PBT	PC/PBT
PC	PC	PC	PC
2 m PVC cable, 3×0.2 mm ²	M8 connector, 4-pin	M8 connector, 3-pin	2 m PVC cable, 3×0.2 mm ²

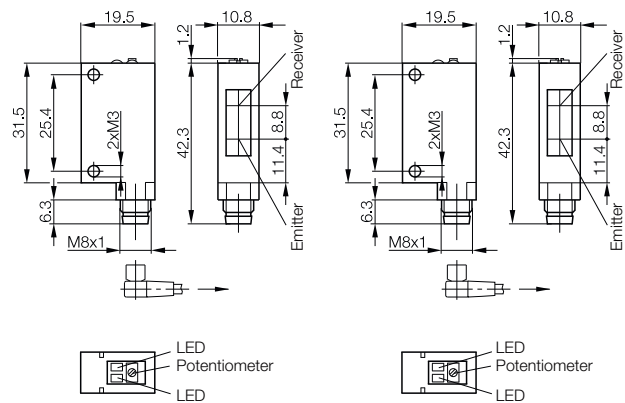




Type	Small beam diffuse sensor		Small beam diffuse sensor	
Detection range	50...200 mm		50...200 mm	
PNP NO	Ordering code	BOS0128	BOS015N	
	Part number	BOS 5K-PS-RD11-S75	BOS 5K-PS-RD11-S49	
PNP NC	Ordering code	BOS011W	BOS015P	
	Part number	BOS 5K-PO-RD11-S75	BOS 5K-PO-RD11-S49	
PNP NC	Special assignment	Ordering code		
	Output	Part number		
Supply voltage U_S	10...30 V DC		10...30 V DC	
Output current	100 mA		100 mA	
No-load supply current I_0 max.	≤ 30 mA		≤ 30 mA	
Switching type	Light or dark switching		Light or dark switching	
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes	
Settings	Potentiometer, 270°		Potentiometer, 270°	
Emitter, light type	LED, red light		LED, red light	
Wavelength	660 Nm		660 Nm	
Output function indicator	Yellow LED		Yellow LED	
Stability indicator	Green LED		Green LED	
Response time	1 ms		1 ms	
Switching frequency f	500 Hz		500 Hz	
Degree of protection as per IEC 60529	IP 67		IP 67	
Ambient temperature T_a	-25...+55 °C		-25...+55 °C	
Permissible ambient light	5 klx (artificial light)/10 klx (sunlight)		5 klx (artificial light)/10 klx (sunlight)	
Material	Housing	PC/PBT	PC/PBT	
	Optical surface	PC	PC	
Connection	M8 connector, 4-pin		M8 connector, 3-pin	

Reference object: white, 90% reflection, 200x200 mm
 Reference reflector: BOS R-1

For wiring diagrams see page 167.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

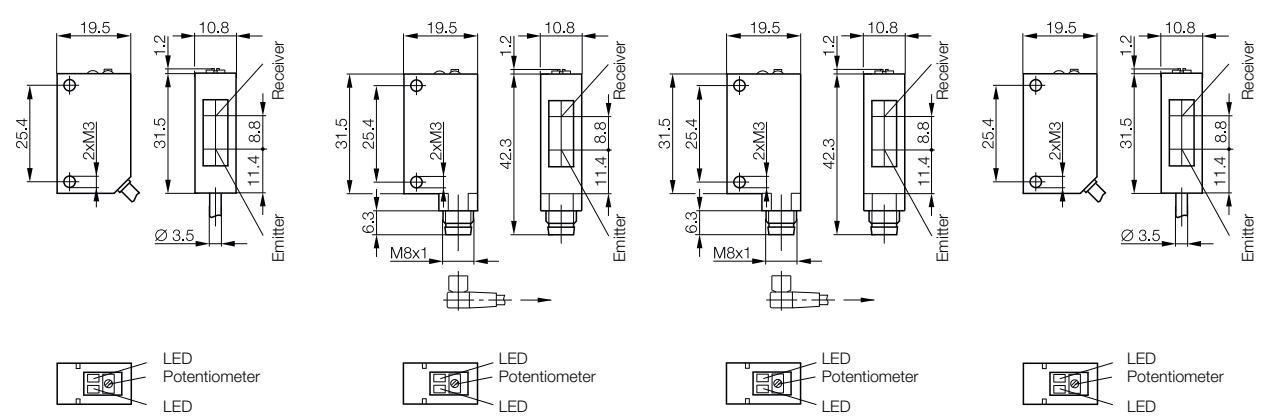
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Small beam diffuse sensor 50...200 mm BOS0127 BOS 5K-PS-RD11-02	Retroreflective sensor 0.1...4 m BOS012E BOS 5K-PS-RR10-S75	Retroreflective sensor 0.1...4 m BOS015E BOS 5K-PS-RR10-S49	Retroreflective sensor 0.1...4 m BOS012C BOS 5K-PS-RR10-02
BOS011U BOS 5K-PO-RD11-02	BOS0121 BOS 5K-PO-RR10-S75	BOS015C BOS 5K-PO-RR10-S49	BOS0120 BOS 5K-PO-RR10-02
	BOS0122 BOS 5K-PO-RR10-S75-S		
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
100 mA	100 mA	100 mA	100 mA
≤ 30 mA	≤ 30 mA	≤ 30 mA	≤ 30 mA
Light or dark switching	Light or dark switching	Light or dark switching	Light or dark switching
Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°
LED, red light	LED, red light	LED, red light	LED, red light
660 Nm	660 Nm	660 Nm	660 Nm
Yellow LED	Yellow LED	Yellow LED	Yellow LED
Green LED	Green LED	Green LED	Green LED
1 ms	1 ms	1 ms	1 ms
500 Hz	500 Hz	500 Hz	500 Hz
IP 67	IP 67	IP 67	IP 67
-25...+55 °C	-25...+55 °C	-25...+55 °C	-25...+55 °C
5 klx (artificial light)/10 klx (sunlight)	5 klx (artificial light)/10 klx (sunlight)	5 klx (artificial light)/10 klx (sunlight)	5 klx (artificial light)/10 klx (sunlight)
PC/PBT	PC/PBT	PC/PBT	PC/PBT
PC	PC	PC	PC
2 m PVC cable, 3x0.2 mm ²	M8 connector, 4-pin	M8 connector, 3-pin	2 m PVC cable, 3x0.2 mm ²

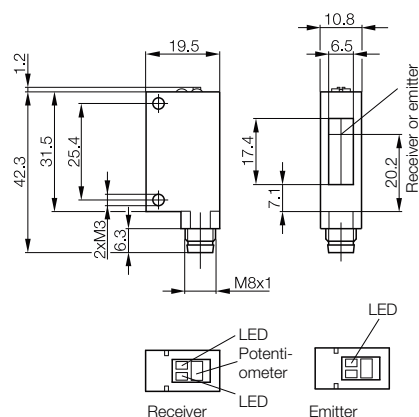




Type	Through-beam sensor		
Detection range	0...10 m		
PNP NO	Ordering code	BOS0126	
	Part number	BOS 5K-PS-IX10-S75	
PNP NC	Ordering code	BOS011R	
	Part number	BOS 5K-PO-IX10-S75	
PNP NC	Special assignment	Ordering code	BOS011T
	Output	Part number	BOS 5K-PO-IX10-S75-S
Supply voltage U_S	10...30 V DC		
Output current	100 mA		
No-load supply current I_0 max.	≤ 20 mA (receiver), ≤ 15 mA (emitter)		
Switching type	Light or dark switching		
Polarity reversal/short-circuit protected	Yes/Yes		
Settings	Potentiometer, 270°		
Emitter, light type	LED, infrared		
Wavelength	880 Nm		
Power-on indicator	Green LED (emitter)		
Output function indicator	Yellow LED (receiver)		
Stability indicator	Green LED (receiver)		
Response time	1 ms		
Switching frequency f	500 Hz		
Degree of protection as per IEC 60529	IP 67		
Ambient temperature T_a	-25...+55 °C		
Permissible ambient light	5 klx (artificial light)/10 klx (sunlight)		
Material	Housing	PC/PBT	
	Optical surface	PC	
Connection	M8 connector, 4-pin		

For wiring diagrams see page 167.

Ordering code includes emitter and receiver.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

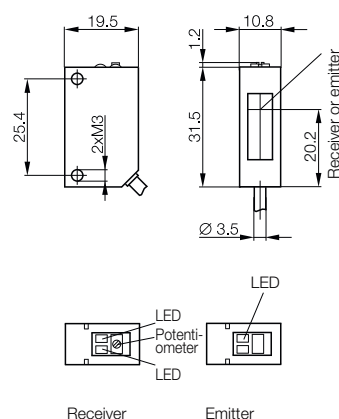
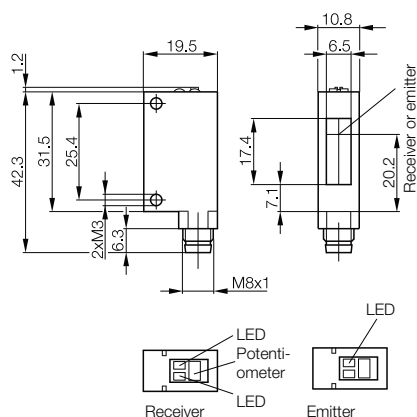
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

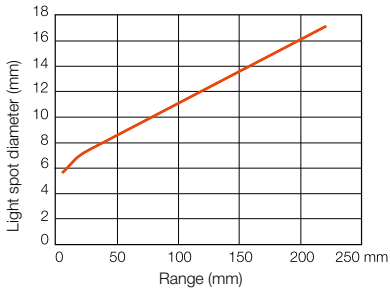


Through-beam sensor 0...10 m BOS0158 BOS 5K-PS-IX10-S49	Through-beam sensor 0...10 m BOS0125 BOS 5K-PS-IX10-02
BOS0157 BOS 5K-PO-IX10-S49	BOS011N BOS 5K-PO-IX10-02
10...30 V DC 100 mA ≤ 20 mA (receiver), ≤ 15 mA (emitter) Light or dark switching Yes/Yes Potentiometer, 270° LED, infrared 880 Nm Green LED (emitter) Yellow LED (receiver) Green LED (receiver) 1 ms 500 Hz IP 67 -25...+55 °C 5 klx (artificial light)/10 klx (sunlight) PC/PBT PC M8 connector, 3-pin	10...30 V DC 100 mA ≤ 20 mA (receiver), ≤ 15 mA (emitter) Light or dark switching Yes/Yes Potentiometer, 270° LED, infrared 880 Nm Green LED (emitter) Yellow LED (receiver) Green LED (receiver) 1 ms 500 Hz IP 67 -25...+55 °C 5 klx (artificial light)/10 klx (sunlight) PC/PBT PC 2 m PVC cable, 3(2)×0.2 mm ² (emitter)

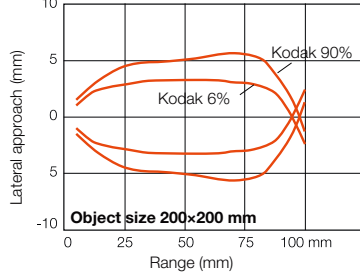


Diffuse sensor with background suppression BOS 5K-__-RH12-__

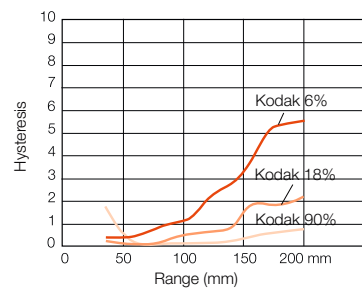
Light spot diameter



Characteristic response curve (background suppression 100 mm)

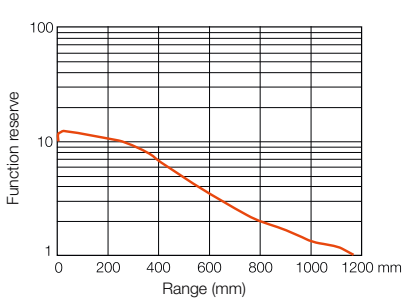


Range vs. hysteresis

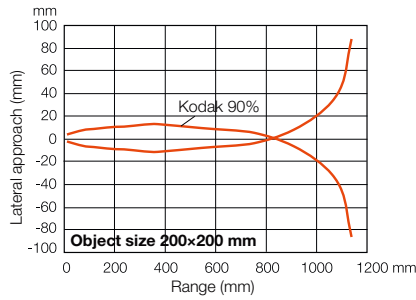


Diffuse sensor BOS 5K-__-ID10-__

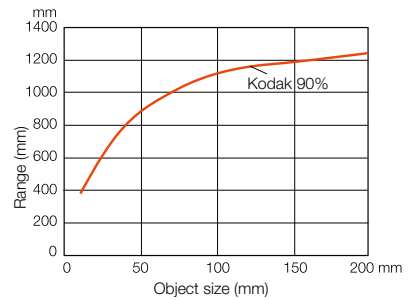
Receiving characteristics



Characteristic response curve

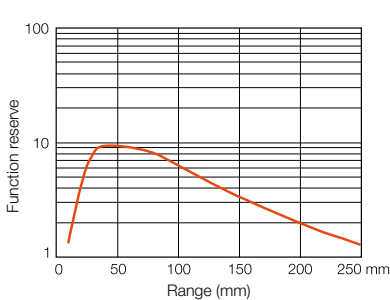


Object size vs. hysteresis

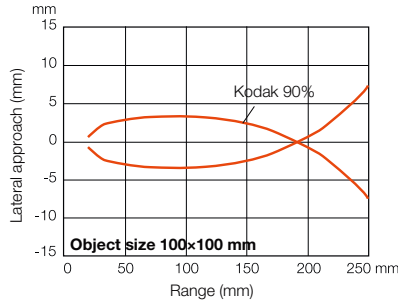


Diffuse sensor, small beam BOS 5K-__-RD11-__

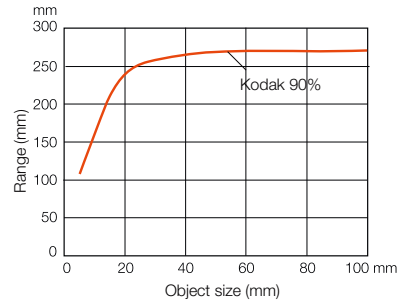
Receiving characteristics



Characteristic response curve

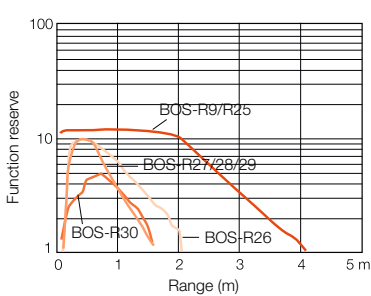


Object size vs. hysteresis

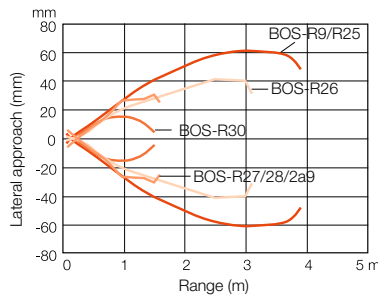


Retroreflective sensor BOS 5K-__-RR10-__

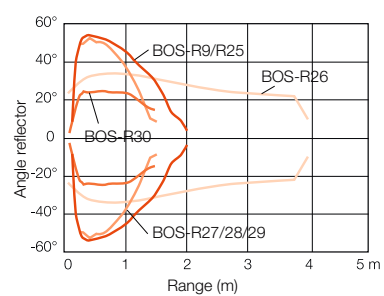
Receiving characteristics



Characteristic response curve

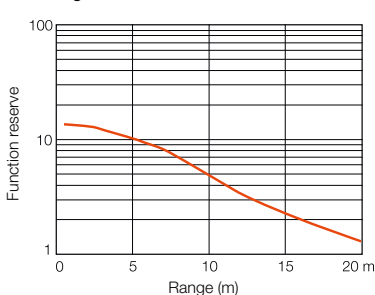


Angular offset

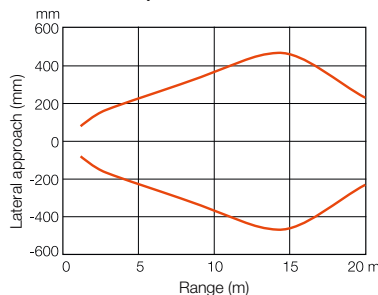


Through-beam sensor BOS 5K-__-IX10-__

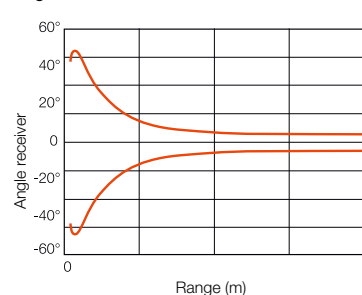
Receiving characteristics

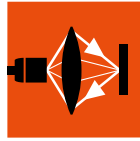


Characteristic response curve



Angular offset





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

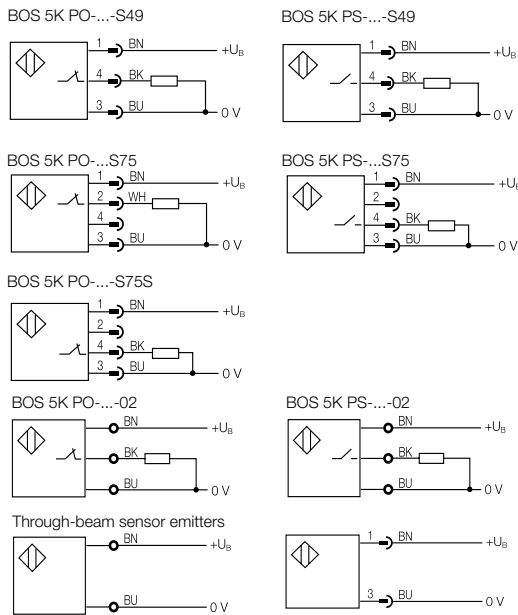
BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Wiring diagrams



Recommended accessories
 (please order separately)

Description	Ordering code
① Mounting bracket	BAM00U5
② Mounting bracket	BAM00U6
③ Mounting bracket	BAM00U7



Description	Ordering code
① Reflector	BAM00WL
② Reflector	BAM00W0
③ Reflective tape	BAM00W5



Special accessories for photoelectric sensors, such as **reflectors, apertures, lenses, filters and deflection heads** can be found in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Suitable connectors
 (please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M8, 3-pin	Straight	PUR	Black	2 m	BCC02M8
M8, 3-pin	Straight	PVC	Gray	2 m	BCC02NU
M8, 3-pin	Angled	PUR	Black	2 m	BCC02ML
M8, 3-pin	Angled	PVC	Gray	2 m	BCC02P5

Size	Design	Cable material	Color	Length	Ordering code
M8, 4-pin	Straight	PUR	Black	2 m	BCC02N2
M8, 4-pin	Straight	PVC	Gray	2 m	BCC02PL
M8, 4-pin	Angled	PUR	Black	2 m	BCC02NC
M8, 4-pin	Angled	PVC	Gray	2 m	BCC02PZ

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.

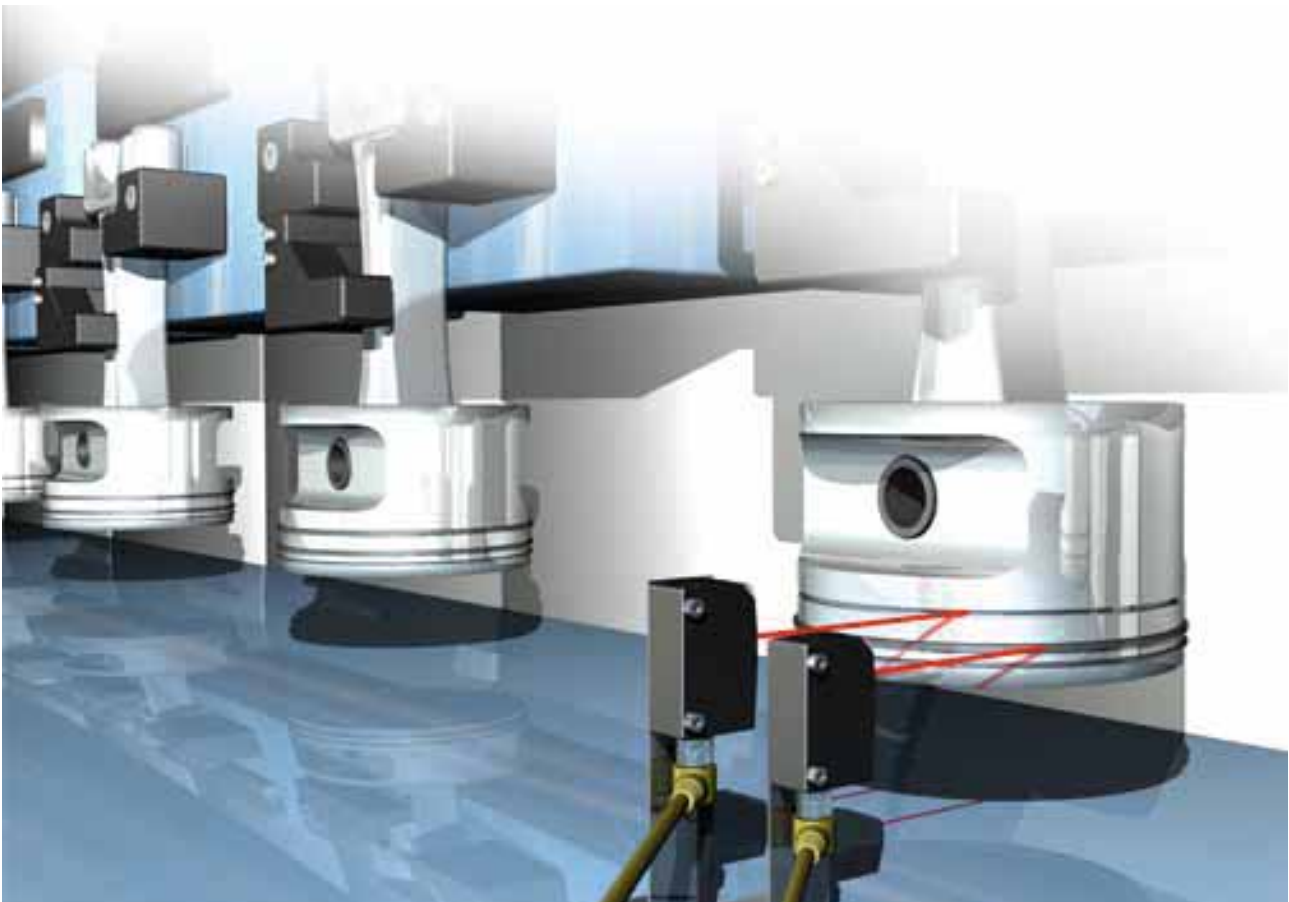
Due to its high performance, the **BOS 6K** can be used almost anywhere. When space is at a premium, it is particularly advantageous. This is because its small size allows better integration of the sensors into the machine. Red light and background suppression make the sensor extremely user-friendly. Additionally, there are multiple varieties of lasers for an "absolute" detection of small parts, so that even objects smaller than 1 mm can be accurately measured. Calibration using the control lines means the sensor can be installed at virtually inaccessible locations. Dynamic teach-in in running operation means less attention needs to be paid to the sensors.

Features

- Teach-in-button and control line
- Dynamic teach-in possible (i. e., without stopping the machine)
- Multi-function display visible from any direction
- Disable buttons
- Versions with 3- or 4-pin M8-plug or with 2 m cable
- Solid workmanship with IP 67 protection
- Red light- and laser versions

Applications

- Packaging machines
- Handling- and assembly
- Specialty machines
- Printing and paper machinery



Photoelectric Sensors

BOS 6K

Product Overview



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type	Sensing distance/Range	Light type		Output	Switching type		Switching frequency	U _S	Connection			Special features			Page
		Red light	Laser		PNP transistor	Light switching			Dark switching	10...30 V DC	M8 connector, 3-pin	M8 connector, 4-pin	Cable	Polarizing filter	
Diffuse sensor with background suppression															
BOS009Y BOS 6K-PU-1HA-S75-C	25...100 mm	■		■	■	■	1 kHz	■		■					170
BOS009U BOS 6K-PU-1HA-S49-C	25...100 mm	■		■	■	■	1 kHz	■	■						170
BOS009T BOS 6K-PU-1HA-C-02	25...100 mm	■		■	■	■	1 kHz	■			■				171
BOS00A0 BOS 6K-PU-1LHA-S75-C	20...60 mm			■	■	■	1 kHz	■		■					176
BOS009Z BOS 6K-PU-1LHA-C-02	20...60 mm			■	■	■	1 kHz	■			■				176
BOS00A2 BOS 6K-PU-1LHA-SA1-S75-C	30...110 mm			■	■	■	1 kHz	■		■					177
BOS00A1 BOS 6K-PU-1LHA-SA1-C-02	30...110 mm			■	■	■	1 kHz	■			■				177
Diffuse sensor															
BOS00A9 BOS 6K-PU-10C-S75-C	20...300 mm	■		■	■	■	1 kHz	■		■					171
BOS00A8 BOS 6K-PU-10C-S49-C	20...300 mm	■		■	■	■	1 kHz	■	■						171
BOS00A7 BOS 6K-PU-10C-C-02	20...300 mm	■		■	■	■	1 kHz	■			■				171
Retroreflective sensor															
BOS00AE BOS 6K-PU-1QA-S75-C	50...700 mm	■		■	■	■	1 kHz	■		■			■	■	172
BOS00AC BOS 6K-PU-1QA-S49-C	50...700 mm	■		■	■	■	1 kHz	■	■				■	■	172
BOS00AA BOS 6K-PU-1QA-C-02	50...700 mm	■		■	■	■	1 kHz	■			■		■	■	173
BOS00A4 BOS 6K-PU-1LQA-S75-C	0.05...3 m			■	■	■	4 kHz	■		■			■		177
BOS00A3 BOS 6K-PU-1LQA-C-02	0.05...3 m			■	■	■	4 kHz	■			■		■		177
BOS00AJ BOS 6K-PU-1QC-S75-C	0.05...3 m	■		■	■	■	1 kHz	■		■			■		173
BOS00AH BOS 6K-PU-1QC-S49-C	0.05...3 m	■		■	■	■	1 kHz	■	■				■		173
BOS00AF BOS 6K-PU-1QC-C-02	0.05...3 m	■		■	■	■	1 kHz	■			■		■		173
Retroreflective sensor with autocollimation															
BOS00AL BOS 6K-PU-1TA-S75-C	0...500 mm	■		■	■	■	1 kHz	■		■			■	■	174
BOS00AK BOS 6K-PU-1TA-C-02	0...500 mm	■		■	■	■	1 kHz	■			■		■	■	174
BOS01CH BOS 6K-PU-1LQD-S75-C	0...4 m			■	■	■	4 kHz	■		■			■		178
BOS01HH BOS 6K-PU-1LQD-S49-C	0...4 m			■	■	■	4 kHz	■	■				■		178
Through-beam sensor Receiver															
BOS007J BLE 6K-PU-1E-S75-C	0...6.5 m	■		■	■	■	500 Hz	■		■					175
BOS007H BLE 6K-PU-1E-S49-C	0...6.5 m	■		■	■	■	500 Hz	■	■						175
BOS007F BLE 6K-PU-1E-C-02	0...6.5 m	■		■	■	■	500 Hz	■			■				175
Through-beam sensor Emitter															
BOS007P BLS 6K-XX-1E-S75	0...6.5 m	■						■		■					175
BOS007N BLS 6K-XX-1E-S49	0...6.5 m	■						■	■						175
BOS007M BLS 6K-XX-1E-02	0...6.5 m	■						■			■				175

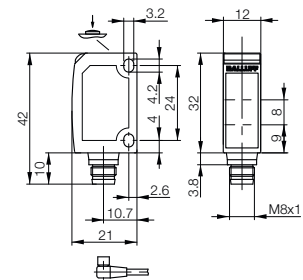
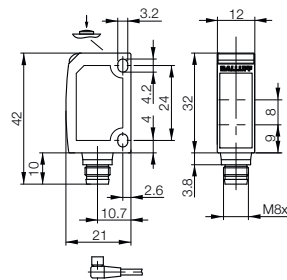
NPN on request

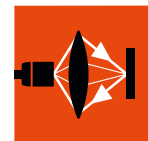


Type		Diffuse sensor with background suppression	Diffuse sensor with background suppression
Detection range		25...100 mm	25...100 mm
PNP NC/NO	Ordering code	BOS009Y	BOS009U
	Part number	BOS 6K-PU-1HA-S75-C	BOS 6K-PU-1HA-S49-C
Supply voltage U_S		10...30 V DC	10...30 V DC
Output current		100 mA	100 mA
No-load supply current I_0 max.		≤ 35 mA	≤ 35 mA
Switching type		Light/dark switching (selectable)	Light/dark switching (selectable)
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes
Settings		Teach-in	Teach-in
Emitter, light type		LED, red light	LED, red light
Wavelength		660 Nm	660 Nm
Light spot diameter		approx. 5x5 mm at 60 mm	approx. 5x5 mm at 60 mm
Gray value shift (90%/18%)		$\leq 10\%$	$\leq 10\%$
Distance hysteresis		$\leq 5\%$	$\leq 5\%$
Switching state indicator		Yellow LED	Yellow LED
Stability indicator		Green LED	Green LED
Response time		0.5 ms	0.5 ms
Switching frequency f		1 KHz	1 KHz
Degree of protection as per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-20...+60 °C	-20...+60 °C
Permissible ambient light per		5 klx	5 klx
Material	Housing	Impact-resistant ABS	Impact-resistant ABS
	Optical surface	PMMA	PMMA
Connection		M8 connector, 4-pin	M8 connector, 3-pin

Reference object: white, 90% reflection, 200x200 mm

For wiring diagrams see page 180.





Photoelectric Sensors

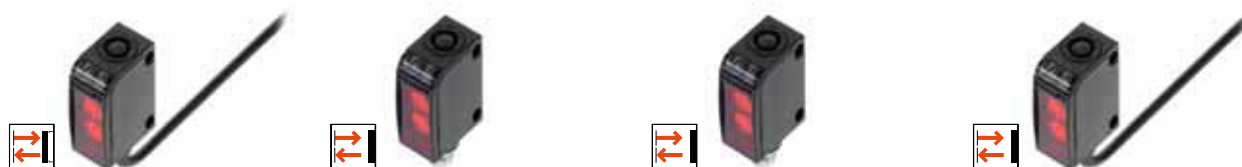
Photoelectric Sensors
Cylinder Designs
Block Designs
Fork Sensors
BGL

Angle Sensors
BWL

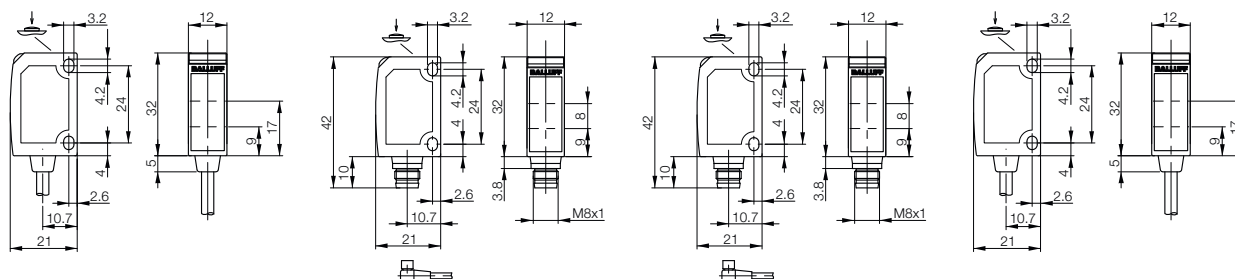
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Diffuse sensor with background suppression 25...100 mm BOS009T BOS 6K-PU-1HA-C-02	Diffuse sensor 20...300 mm BOS00A9 BOS 6K-PU-10C-S75-C	Diffuse sensor 20...300 mm BOS00A8 BOS 6K-PU-10C-S49-C	Diffuse sensor 20...300 mm BOS00A7 BOS 6K-PU-10C-C-02
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
100 mA	100 mA	100 mA	100 mA
≤ 35 mA	≤ 25 mA	≤ 25 mA	≤ 25 mA
Light/dark switching (selectable)	Light/dark switching (selectable)	Light/dark switching (selectable)	Light/dark switching (selectable)
Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
Teach-in	Teach-in	Teach-in	Teach-in
LED, red light	LED, red light	LED, red light	LED, red light
660 Nm	660 Nm	660 Nm	660 Nm
approx. 5x5 mm at 60 mm	approx. 12x12 mm at 160 mm	approx. 12x12 mm at 160 mm	approx. 12x12 mm at 160 mm
≤ 10%			
≤ 5 %			
Yellow LED	Yellow LED	Yellow LED	Yellow LED
Green LED	Green LED	Green LED	Green LED
0.5 ms	0.5 ms	0.5 ms	0.5 ms
1 KHz	1 KHz	1 KHz	1 KHz
IP 67	IP 67	IP 67	IP 67
-20...+60 °C	-20...+60 °C	-20...+60 °C	-20...+60 °C
5 klx	5 klx	5 klx	5 klx
Impact-resistant ABS	Impact-resistant ABS	Impact-resistant ABS	Impact-resistant ABS
PMMA	PMMA	PMMA	PMMA
2 m PVC cable, 4x0.14 mm ²	M8 connector, 4-pin	M8 connector, 3-pin	2 m cable PCV, 4x0.14 mm ²

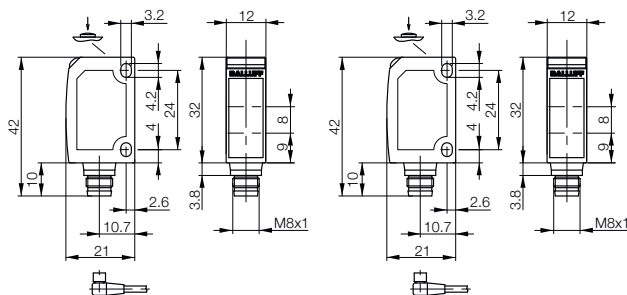




Type	Retroreflective sensor		Retroreflective sensor	
Detection range	50...700 mm		50...700 mm	
PNP NC/NO	Polarizing filter, Glass detection	Ordering code Part number	BOS00AE BOS 6K-PU-1QA-S75-C	BOS00AC BOS 6K-PU-1QA-S49-C
PNP NC/NO	Polarizing filter	Ordering code Part number		
Supply voltage U_s	10...30 V DC		10...30 V DC	
Output current	100 mA		100 mA	
No-load supply current I_0 max.	≤ 35 mA		≤ 35 mA	
Switching type	Light/dark switching (selectable)		Light/dark switching (selectable)	
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes	
Settings	Teach-in		Teach-in	
Emitter, light type	LED, red light		LED, red light	
Wavelength	660 Nm		660 Nm	
Light spot diameter	20x20 mm up to 500 mm		20x20 mm up to 500 mm	
Switching state indicator	Yellow LED		Yellow LED	
Stability indicator	Green LED		Green LED	
Response time	0.5 ms		0.5 ms	
Switching frequency f	1 KHz		1 KHz	
Degree of protection as per IEC 60529	IP 67		IP 67	
Ambient temperature T_a	-20...+60 °C		-20...+60 °C	
Permissible ambient light per	5 klx		5 klx	
Material	Housing	Impact-resistant ABS	Impact-resistant ABS	
	Optical surface	PMMA	PMMA	
Connection		M8 connector, 4-pin	M8 connector, 3-pin	

Reference reflector: BOS R-9

For wiring diagrams see page 180.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric

Distance

Sensors

for Analog

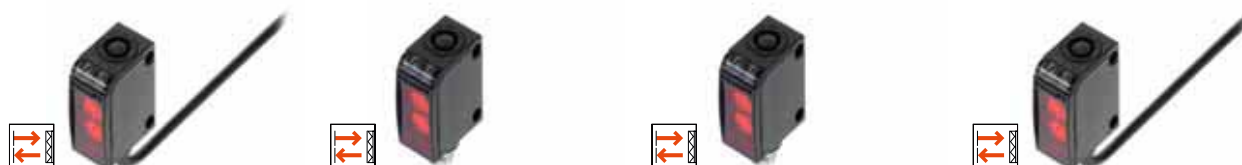
Distance

Measurement

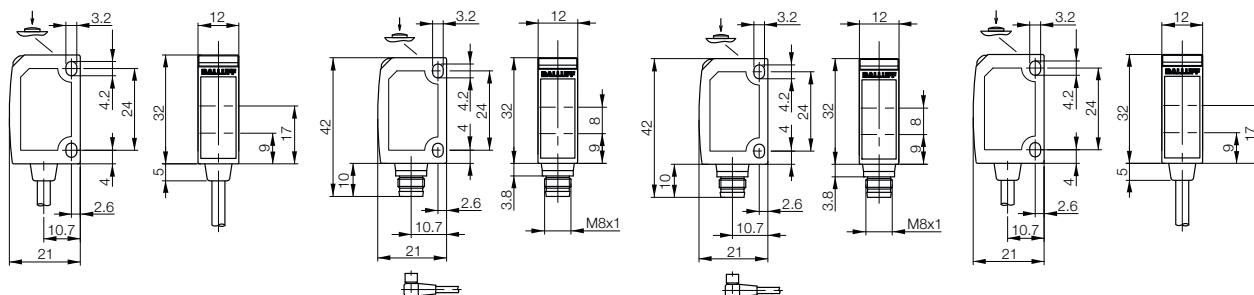
Accessories for

Photoelectric

Sensors



Retroreflective sensor 50...700 mm BOS00AA BOS 6K-PU-1QA-C-02	Retroreflective sensor 0.05...3 m BOS00AJ BOS 6K-PU-1QC-S75-C	Retroreflective sensor 0.05...3 m BOS00AH BOS 6K-PU-1QC-S49-C	Retroreflective sensor 0.05...3 m BOS00AF BOS 6K-PU-1QC-C-02
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
100 mA	100 mA	100 mA	100 mA
≤ 35 mA	≤ 25 mA	≤ 25 mA	≤ 25 mA
Light/dark switching (selectable)	Light/dark switching (selectable)	Light/dark switching (selectable)	Light/dark switching (selectable)
Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
Teach-in	Teach-in	Teach-in	Teach-in
LED, red light	LED, red light	LED, red light	LED, red light
660 Nm	660 Nm	660 Nm	660 Nm
20x20 mm up to 500 mm	approx. 75x75 mm at 1.5 m	approx. 75x75 mm at 1.5 m	approx. 75x75 mm at 1.5 m
Yellow LED	Yellow LED	Yellow LED	Yellow LED
Green LED	Green LED	Green LED	Green LED
0.5 ms	0.5 ms	0.5 ms	0.5 ms
1 KHz	1 KHz	1 KHz	1 KHz
IP 67	IP 67	IP 67	IP 67
-20...+60 °C	-20...+60 °C	-20...+60 °C	-20...+60 °C
5 klx	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
Impact-resistant ABS	Impact-resistant ABS	Impact-resistant ABS	Impact-resistant ABS
PMMA	PMMA	PMMA	PMMA
2 m cable PCV, 4x0.14 mm ²	M8 connector, 4-pin	M8 connector, 3-pin	2 m cable PCV, 4x0.14 mm ²





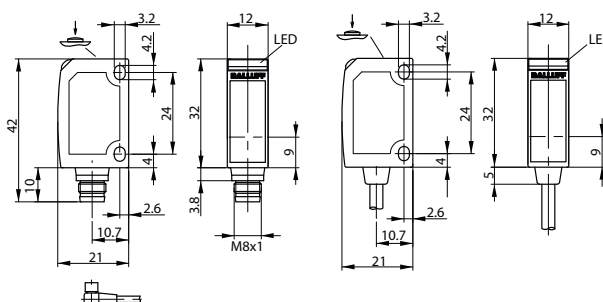
Type			Retroreflective light sensor with autocollimation	Retroreflective light sensor with autocollimation	
Detection range			0...500 mm	0...500 mm	
PNP NC/NO	Polarizing filter, glass detection, autocollimation	Ordering code	BOS00AL	BOS00AK	
		Part number	BOS 6K-PU-1TA-S75-C	BOS 6K-PU-1TA-C-02	
PNP NC/NO	Receiver	Ordering code			
		Part number			
	Emitter	Ordering code			
		Part number			
Supply voltage U_s			10...30 V DC	10...30 V DC	
Output current			100 mA	100 mA	
No-load supply current I_0 max.			≤ 25 mA	≤ 25 mA	
Switching type			Light/dark switching (selectable)	Light/dark switching (selectable)	
Polarity reversal/short-circuit protected			Yes/Yes	Yes/Yes	
Settings			Teach-in	Teach-in	
Emitter, light type			LED, red light	LED, red light	
Wavelength			660 Nm	660 Nm	
Light spot diameter			20×20 mm up to 500 mm	20×20 mm up to 500 mm	
Switching state indicator			Yellow LED	Yellow LED	
Stability indicator			Green LED	Green LED	
Response time			0.5 ms	0.5 ms	
Switching frequency f			1 KHz	1 KHz	
Degree of protection as per IEC 60529			IP 67	IP 67	
Ambient temperature T_a			-20...+60 °C	-20...+60 °C	
Permissible ambient light per			5 klx	5 klx	
Material	Housing		Impact-resistant ABS	Impact-resistant ABS	
	Optical surface		PMMA	PMMA	
Connection			M8 connector, 4-pin	2 m cable PCV, 4x0.14 mm ²	

Reference reflector: BOS R-22

For wiring diagrams see page 180.

can only be used with reflector BOS R-22

can only be used with reflector BOS R-22





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

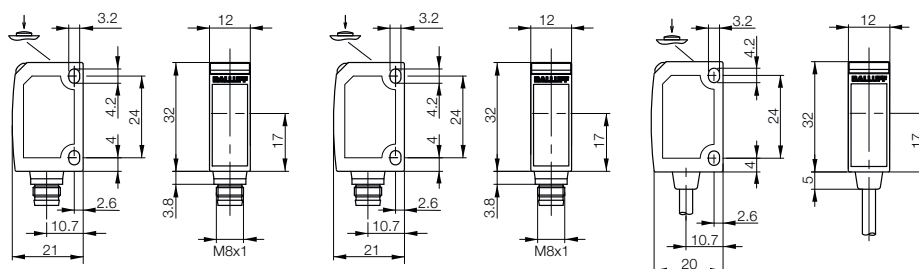
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Through-beam sensor	Through-beam sensor	Through-beam sensor	
0...6.5 m	0...6.5 m	0...6.5 m	
BOS007J	BOS007H	BOS007F	
BLE 6K-PU-1E-S75-C	BLE 6K-PU-1E-S49-C	BLE 6K-PU-1E-C-02	
BOS007P	BOS007N	BOS007M	
BLS 6K-XX-1E-S75	BLS 6K-XX-1E-S49	BLS 6K-XX-1E-02	
10...30 V DC	10...30 V DC	10...30 V DC	
100 mA	100 mA	100 mA	
≤ 25 mA	≤ 25 mA	≤ 25 mA	
Light/dark switching (selectable)	Light/dark switching (selectable)	Light/dark switching (selectable)	
Yes/Yes	Yes/Yes	Yes/Yes	
Teach-in	Teach-in	Teach-in	
LED, red light	LED, red light	LED, red light	
660 Nm	660 Nm	660 Nm	
Yellow LED	Yellow LED	Yellow LED	
Green LED	Green LED	Green LED	
1 ms	1 ms	1 ms	
500 Hz	500 Hz	500 Hz	
IP 67	IP 67	IP 67	
-20...+60 °C	-20...+60 °C	-20...+60 °C	
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	
Impact-resistant ABS	Impact-resistant ABS	Impact-resistant ABS	
PMMA	PMMA	PMMA	
M8 connector, 4-pin	M8 connector, 3-pin	2 m cable PCV, 4x0.14 mm ²	

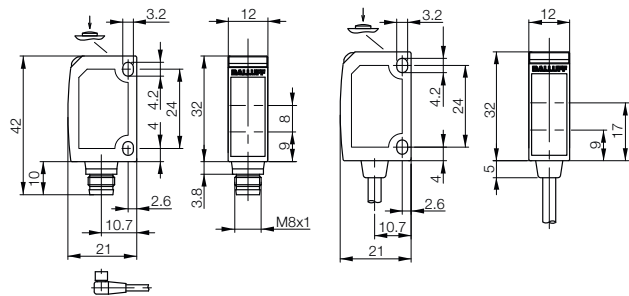




Type	Diffuse sensor with background suppression		Diffuse sensor with background suppression	
Detection range	20...60 mm		20...60 mm	
PNP NC/NO	Ordering code	BOS00A0	Ordering code	BOS009Z
	Part number	BOS 6K-PU-1LHA-S75-C	Part number	BOS 6K-PU-1LHA-C-02
PNP NC/NO	Polarizing filter	Ordering code	Ordering code	
		Part number	Part number	
Supply voltage U_s	10...30 V DC		10...30 V DC	
Output current	100 mA		100 mA	
No-load supply current I_0 max.	≤ 25 mA		≤ 25 mA	
Switching type	Light/dark switching (selectable)		Light/dark switching (selectable)	
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes	
Settings	Teach-in		Teach-in	
Emitter, light type	Laser, red light		Laser, red light	
Wavelength	650 Nm		650 Nm	
Laser class	1		1	
Light spot diameter	0.5 mm in focus (35 mm)		0.5 mm in focus (35 mm)	
Distance hysteresis				
Gray value shift (90%/18%)	$\leq 7\%$		$\leq 7\%$	
Switching state indicator	Yellow LED		Yellow LED	
Stability indicator	Green LED		Green LED	
Response time	0.5 ms		0.5 ms	
Switching frequency f	1 KHz		1 KHz	
Degree of protection as per IEC 60529	IP 67		IP 67	
Ambient temperature T_a	$-20...+60$ °C		$-20...+60$ °C	
Permissible ambient light per	EN 60947-5-2		EN 60947-5-2	
Material	Housing	Impact-resistant ABS	Housing	Impact-resistant ABS
	Optical surface	PMMA	Optical surface	PMMA
Connection		M8 connector, 4-pin		2 m PVC cable, 4x0.14 mm ²

Reference object: white, 18% reflection, 200x200 mm
 Reference reflector: BOS R-22

For wiring diagrams see page 180.





Photoelectric Sensors

BOS 6K Laser



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

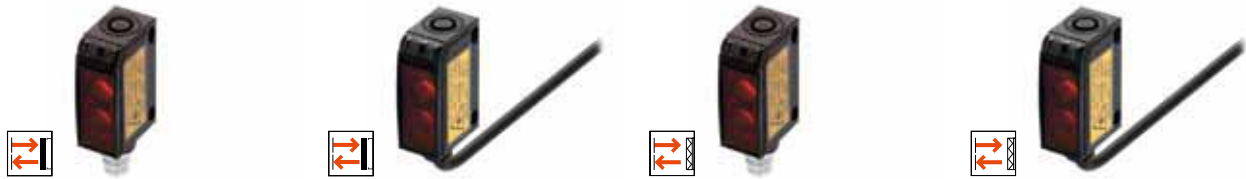
Angle Sensors

BWL

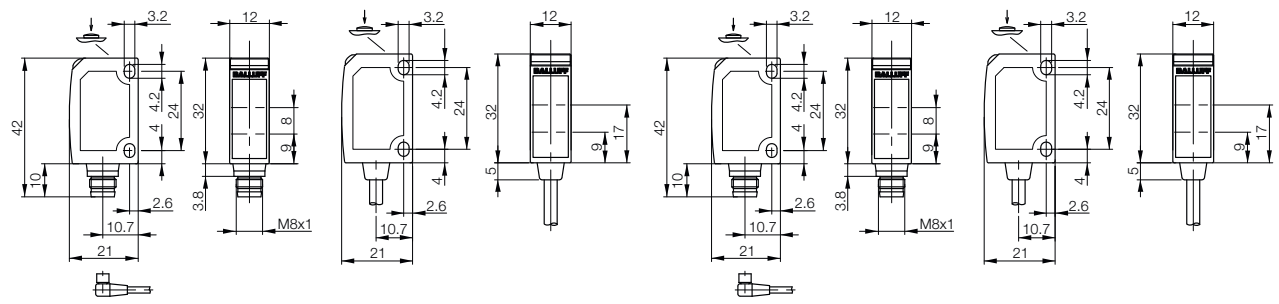
Photoelectric Sensors with Special Properties

Photoelectric Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Diffuse sensor with background suppression 30...110 mm BOS00A2 BOS 6K-PU-1LHA-SA1-S75-C	Diffuse sensor with background suppression 30...110 mm BOS00A1 BOS 6K-PU-1LHA-SA1-C-02	Retroreflective sensor 0.05...3 m BOS00A4 BOS 6K-PU-1LQA-S75-C	Retroreflective sensor 0.05...3 m BOS00A3 BOS 6K-PU-1LQA-C-02
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
100 mA	100 mA	100 mA	100 mA
≤ 25 mA	≤ 25 mA	≤ 25 mA	≤ 25 mA
Light/dark switching (selectable)	Light/dark switching (selectable)	Light/dark switching (selectable)	Light/dark switching (selectable)
Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
Teach-in	Teach-in	Teach-in	Teach-in
Laser, red light	Laser, red light	Laser, red light	Laser, red light
650 Nm	650 Nm	650 Nm	650 Nm
2	2	1	1
0.7 mm in focus (85 mm ± 5 mm)	0.7 mm in focus (85 mm ± 5 mm)	1 mm in 300 mm	1 mm in 300 mm
≤ 7%	≤ 7%		
Yellow LED	Yellow LED	Yellow LED	Yellow LED
Green LED	Green LED	Green LED	Green LED
0.5 ms	0.5 ms	0.125 ms	0.125 ms
1 KHz	1 KHz	4KHz	4KHz
IP 67	IP 67	IP 67	IP 67
-20...+60 °C	-20...+60 °C	-20...+60 °C	-20...+60 °C
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
Impact-resistant ABS	Impact-resistant ABS	Impact-resistant ABS	Impact-resistant ABS
PMMA	PMMA	PMMA	PMMA
M8 connector, 4-pin	2 m cable PCV, 4x0.14 mm ²	M8 connector, 4-pin	2 m cable PCV, 4x0.14 mm ²

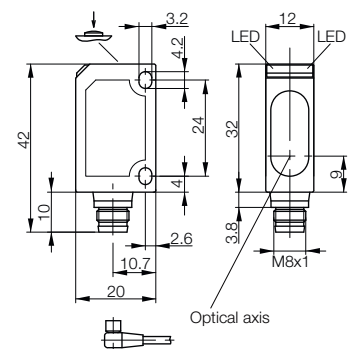
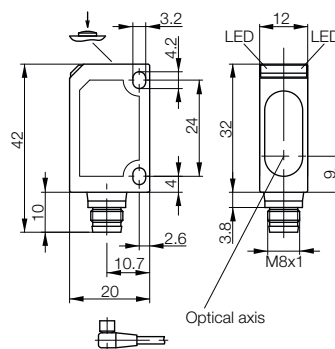




Type	Retroreflective light sensor with autocollimation		BOS01CH	Retroreflective light sensor with autocollimation		BOS01HH
Detection range			0...4 m			0...4 m
PNP	Polarizing filter	Ordering code	BOS01CH			BOS01HH
		Part number	BOS 6K-PU-1LQD-S75-C			BOS 6K-PU-1LQD-S49-C
Supply voltage U_S			10...30 V DC			10...30 V DC
Output current			100 mA			100 mA
No-load supply current I_0 max.			≤ 25 mA			≤ 25 mA
Switching type			Light/dark switching (selectable)			Light/dark switching (selectable)
Polarity reversal/short-circuit protected			Yes/Yes			Yes/Yes
Settings			Teach-in			Teach-in
Emitter, light type			Laser, red light			Laser, red light
Wavelength			650 Nm			650 Nm
Laser class			1			1
Light spot diameter			2 mm in 2500 mm			2 mm in 2500 mm
Switching state indicator			Yellow LED			Yellow LED
Stability indicator			Green LED			Green LED
Response time			0.125 ms			0.125 ms
Switching frequency f			4KHz			4KHz
Degree of protection as per IEC 60529			IP 67			IP 67
Ambient temperature T_a			-20...+60 °C			-20...+60 °C
Permissible ambient light per			EN 60947-5-2			EN 60947-5-2
Material	Housing		Impact-resistant ABS			Impact-resistant ABS
	Optical surface		PMMA			PMMA
Connection			M8 connector, 4-pin			M8 connector, 3-pin

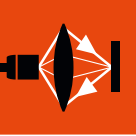
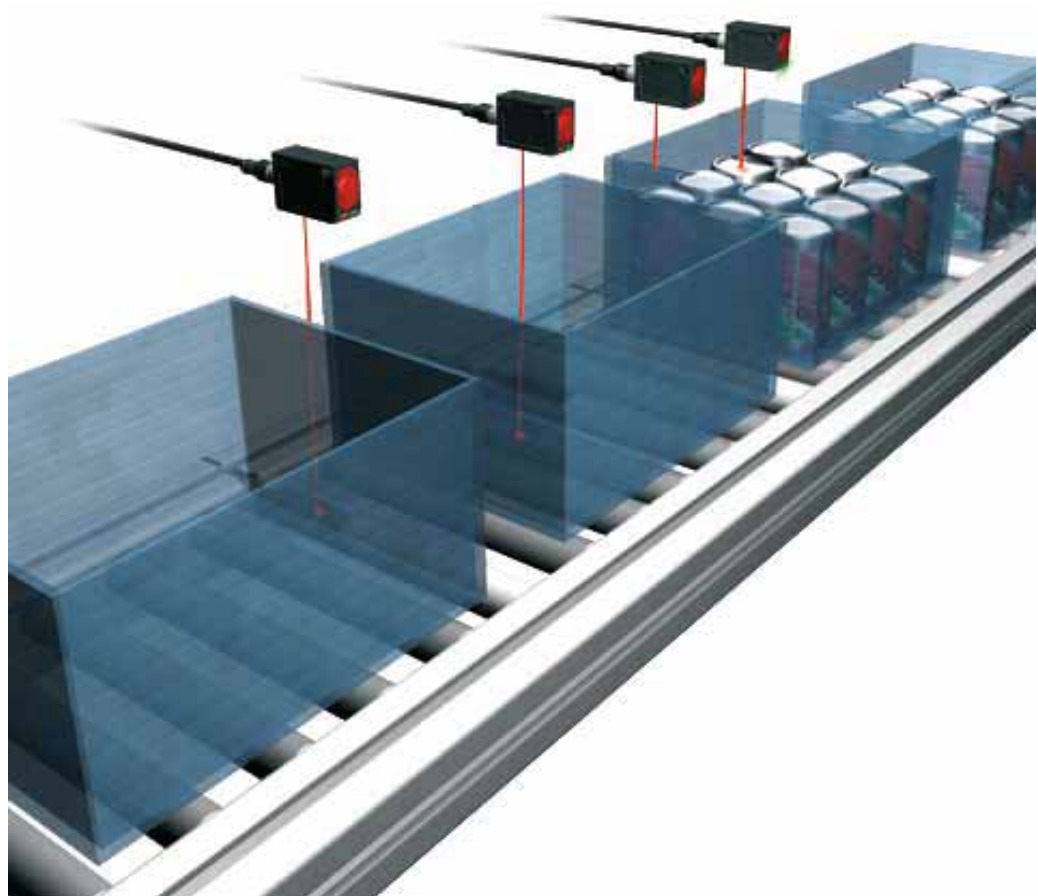
Reference reflector: BOS R-22

Wiring diagrams on page 176.





Photoelectric Sensors
BOS 6K Laser



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

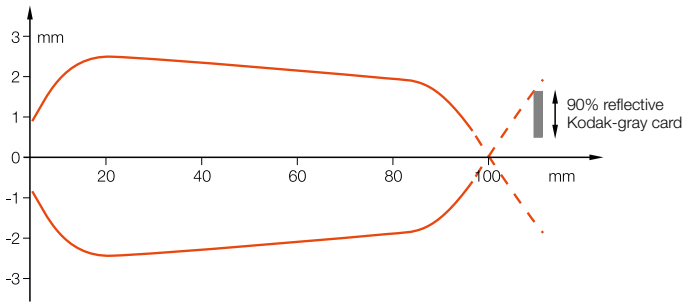
BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

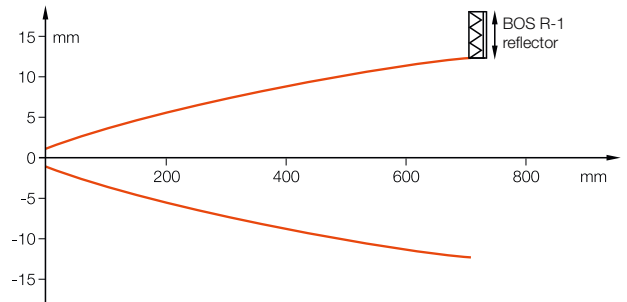
Accessories for Photoelectric Sensors

Diffuse sensor BOS 6K--1HA--...



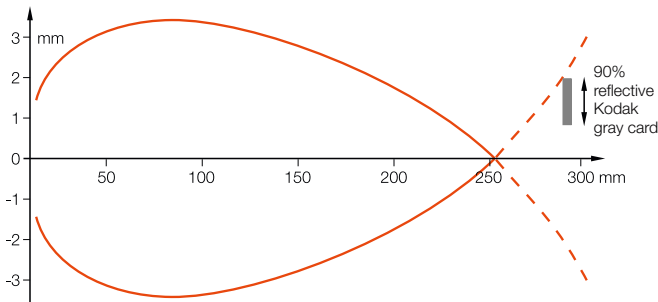
Sensing distance with side approach of Kodak-gray card.

Retroreflective sensor BOS 6K--1QA--...



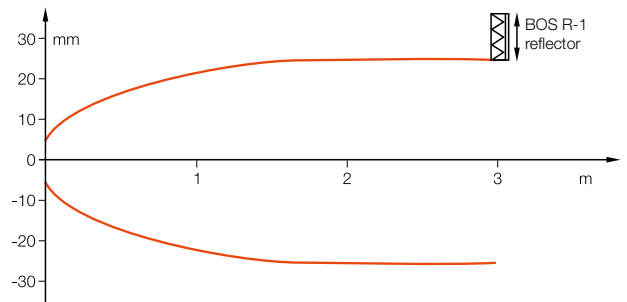
Range measured with side approach with reflector.

Diffuse sensor BOS 6K--1OC--...



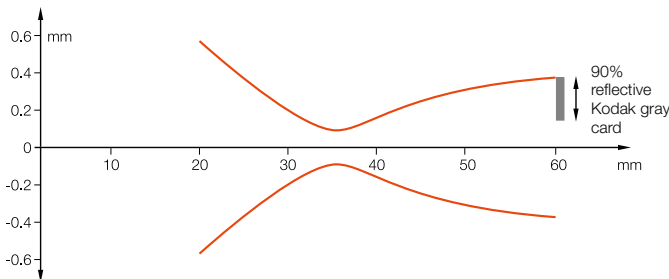
Sensing distance with side approach of Kodak-gray card.

Retroreflective sensor BOS 6K--1QC--...



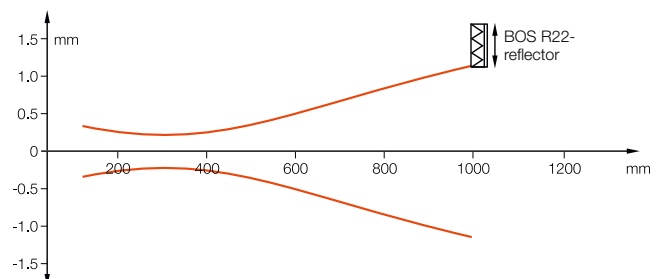
Range measured with side approach with reflector.

Diffuse sensor BOS 6K--1LHA--...



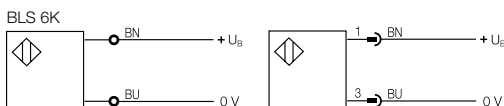
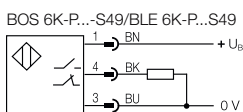
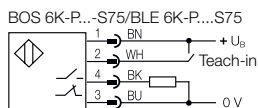
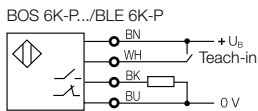
Sensing distance with side approach of Kodak-gray card.

Retroreflective sensor BOS 6K--1LQA--...

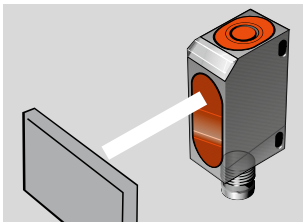


Range measured with side approach with reflector.

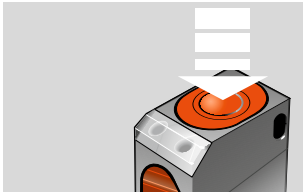
Wiring diagrams



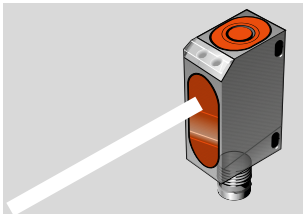
Diffuse sensor



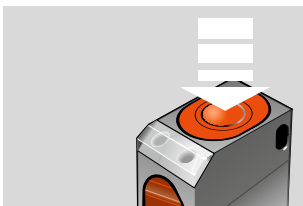
Direct sensor at object.



Press button for approx. 3 sec. until both LEDs flash at the same time.

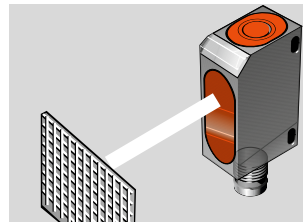


Remove object from beam path.

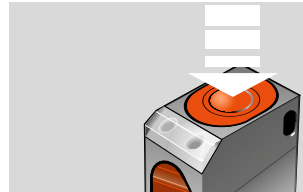


Hold down button for 1 sec. Green LED flashes briefly and then stays on. The sensor is ready. If both LEDs blink at the same time, reconfigure your settings.

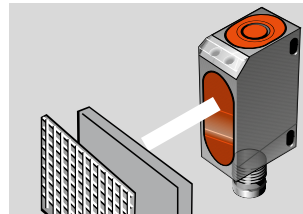
Retroreflective/through-beam



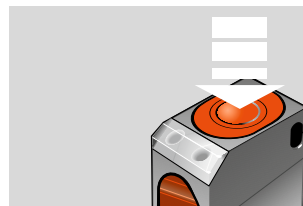
Direct sensor at reflector/receiver.



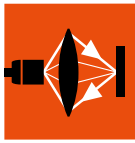
Press button for approx. 3 sec. until both LEDs flash at the same time.



Bring objects into detection range.



Hold down button for 1 sec. Green LED flashes briefly and then stays on. The sensor is ready. If both LEDs blink at the same time, reconfigure your settings.



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Recommended accessories
 (please order separately)

Description	Ordering code
① Reflector	BAM00UK
② Reflector	BAM00WL
③ Laser reflector	BAM00UY
④ Mounting bracket	BAM00UH



Suitable connectors
 (please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M8, 3-pin	Straight	PUR	Black	2 m	BCC02M8
M8, 3-pin	Straight	PVC	Gray	2 m	BCC02NU
M8, 3-pin	Angled	PUR	Black	2 m	BCC02ML
M8, 3-pin	Angled	PVC	Gray	2 m	BCC02P5

Connectors without LED are suitable for PNP and NPN sensors.

Size	Design	Cable material	Color	Length	Ordering code
M8, 4-pin	Straight	PUR	Black	2 m	BCC02N2
M8, 4-pin	Straight	PVC	Gray	2 m	BCC02PL
M8, 4-pin	Angled	PUR	Black	2 m	BCC02NC
M8, 4-pin	Angled	PVC	Gray	2 m	BCC02PZ

Connectors without LED are suitable for PNP and NPN sensors.

You can find special accessories for diffuse sensors, such as **reflectors, apertures, lenses, filters and deflection heads**, in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.

BOS 21M – the complete series in one compact, robust metal housing with comprehensive functionality. State-of-the-art sensor technology and innovative manufacturing technologies leave nothing to be desired for versatile applications in robotics and automation, packaging technology, installing, and handling technology, etc. Teach-in switches and potentiometers assure fast startup as well as simple and economical operation of the sensors.

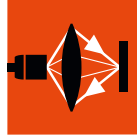
A wide range of accessories such as mounting brackets, stands, dovetail clamps, etc., enable adjustable mounting of the sensors in any position.



Photoelectric Sensors

BOS 21M

Product overview



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

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Fork Sensors

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Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type	Sensing distance/Range	Light type			Output	Switching type		Switching frequency	U _S	Connec-tion	Special features					Page
		Red light	Infrared	Laser		PNP transistor	Light switching				Dark switching	Teach-in	Polarizing filter	Autocollimation	Glass detection	
Diffuse sensor with background suppression																
BOS0034	BOS 21M-PUS-LH12-S4	50...100 mm			■	■	■	■	1 kHz	■	■		■			190
BOS0035	BOS 21M-PUS-RH12-S4	70...200 mm	■			■	■	■	1 kHz	■	■		■			184
BOS0036	BOS 21M-PUS-RV13-S4	70...200 mm	■			■	■	■	1 kHz	■	■		■			185
Diffuse sensor																
BOS0033	BOS 21M-PA-RD10-S4	0.01...1 m	■			■	■	■	500 Hz	■	■					185
BOS0031	BOS 21M-PA-ID10-S4	0.05...2 m		■		■	■	■	500 Hz	■	■					185
BOS0032	BOS 21M-PA-LD10-S4	0...600 mm			■	■	■	■	2 kHz	■	■					191
Retroreflective sensor																
BOS00TR	BOS 21M-PA-PR10-S4	0.1...8 m	■			■	■	■	1 kHz	■	■		■			186
BOS00TT	BOS 21M-PA-PR10-S4S	0.1...8 m	■			■	■	■	1 kHz	■	■		■		■	186
BOS00TL	BOS 21M-PA-LR10-S4	0.1...20 m			■	■	■	■	2 kHz	■	■		■			191
BOS00TM	BOS 21M-PA-LR10-S4S	0.1...20 m			■	■	■	■	2 kHz	■	■		■		■	191
Retroreflective sensor with autocollimation																
BOS00TN	BOS 21M-PA-PK10-S4	0...4 m	■			■	■	■	1 kHz	■	■		■	■		187
BOS00TP	BOS 21M-PA-PK10-S4S	0...4 m	■			■	■	■	1 kHz	■	■		■	■	■	187
Retroreflective sensor for Detecting Glass																
BOS00TY	BOS 21M-PA-PT14-S4	0...2 m	■			■	■	■	1 kHz	■	■		■	■	■	187
BOS00TU	BOS 21M-PA-PT10-S4	0...2 m	■			■	■	■	1 kHz	■	■		■	■	■	187
BOS00TW	BOS 21M-PA-PT10-S4S	0...2 m	■			■	■	■	1 kHz	■	■		■	■	■	187
Through-beam sensor Receiver																
BOS00WT	BOS 21M-PA-IE10-S4	0...20 m			■	■	■	■	500 Hz	■	■					188
BOS00WU	BOS 21M-PA-IE10-S4S	0...20 m			■	■	■	■	500 Hz	■	■				■	188
BOS00WW	BOS 21M-PA-LE10-S4	0...60 m			■	■	■	■	1.5 kHz	■	■					191
BOS00WY	BOS 21M-PA-LE10-S4S	0...60 m			■	■	■	■	1.5 kHz	■	■				■	191
Through-beam sensor Emitter																
BOS00WZ	BOS 21M-XT-IS11-S4	0...20 m			■					■	■					189
BOS00Y0	BOS 21M-XT-LS11-S4	0...60 m			■					■	■					191

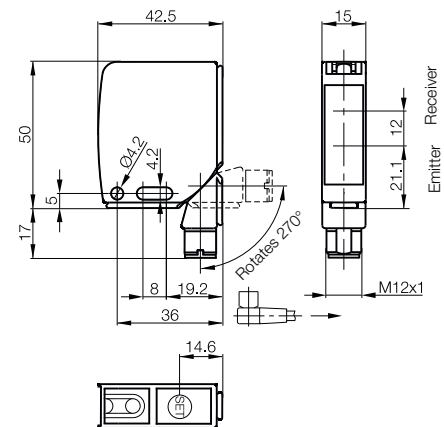
NPN on request



Type	Diffuse sensor with background suppression	
Detection range	70...200 mm	
PNP NC/NO	Ordering code	BOS0035
	Part number	BOS 21M-PUS-RH12-S4
PNP NC/NO	Ordering code	
	Part number	
Supply voltage U_s	10...30 V DC	
Output current	100 mA	
No-load supply current I_0 max.	≤ 50 mA	
Switching type	Light/dark switching (selectable)	
Polarity reversal/short-circuit protected	Yes/Yes	
Settings	Teach-in	
Emitter, light type	LED, red light	
Wavelength	670 Nm	
Output function indicator	Yellow LED	
Stability indicator	Green/red LED	
Response time	0.5 ms	
Switching frequency f	1 kHz	
Degree of protection as per IEC 60529	IP 67	
Ambient temperature T_a	-10...+50 °C	
Permissible ambient light	10 klx	
Material	Housing	GD-Zn/Al
	Optical surface	PMMA
Connection	M12 connector, 4-pin	

Reference object: white, 90% reflection, 200×200 mm

Wiring diagrams on page 195.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

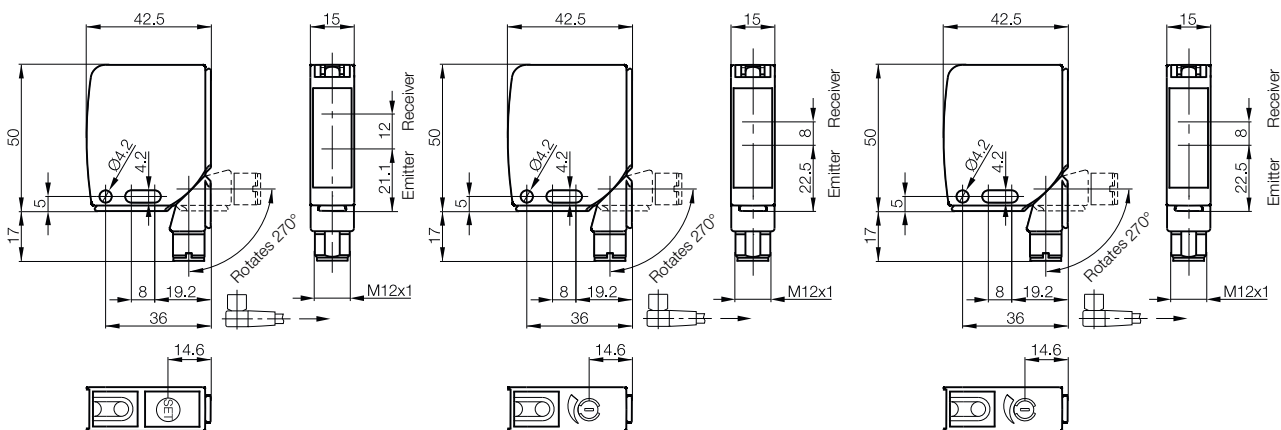
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Diffuse sensor with foreground and background suppression 70...200 mm BOS0036 BOS 21M-PUS-RV13-S4	Diffuse sensor 0.01...1 m BOS0033 BOS 21M-PA-RD10-S4	Diffuse sensor 0.05...2 m BOS0031 BOS 21M-PA-ID10-S4
10...30 V DC	10...30 V DC	10...30 V DC
100 mA	100 mA	100 mA
≤ 50 mA	≤ 35 mA	≤ 35 mA
Light/dark switching (selectable) Yes/Yes	Light/dark (complementary) Yes/Yes	Light/dark (complementary) Yes/Yes
Teach-in	Potentiometer, 270°	Potentiometer, 270°
LED, red light 670 Nm	LED, red light 650 Nm	LED, infrared 880 Nm
Yellow LED	Yellow LED	Yellow LED
Green LED	Green LED	Green LED
0.5 ms	1 ms	1 ms
1 kHz	500 Hz	500 Hz
IP 67	IP 67	IP 67
-10...+50 °C	-25...+55 °C	-25...+55 °C
10 klx	10 klx	10 klx
GD-Zn/Al	GD-Zn/Al	GD-Zn/Al
PMMA	PMMA	PMMA
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

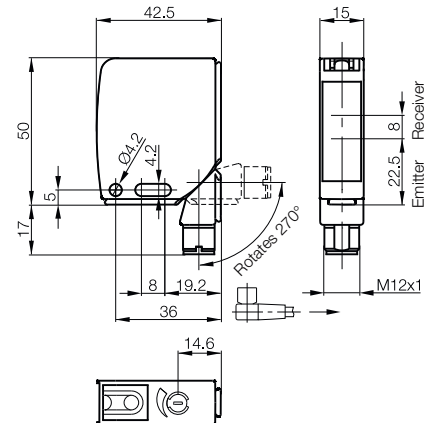




Type				Retroreflective sensor
Detection range				0.1...8 m
PNP NC/ NO	Polarizing filter	Ordering code	BOS00TR	
		Part number	BOS 21M-PA-PR10-S4	
PNP NC/ NO	Polarizing filter Output special assignment	Ordering code	BOS00TT	
		Part number	BOS 21M-PA-PR10-S4S	
PNP NC/ NO	Polarizing filter, autocollimation	Ordering code		
		Part number		
PNP NC/ NO	Polarizing filter, autocollimation Output special assignment	Ordering code		
		Part number		
PNP NC/ NO	Polarizing filter, glass detection, autocollimation	Ordering code		
		Part number		
PNP NC/ NO	Polarizing filter, glass detection, autocol- limation, Output special assignment	Ordering code		
		Part number		
Supply voltage U_S				10...30 V DC
Output current				100 mA
No-load supply current I_0 max.				≤ 35 mA
Switching type				Light/dark (complementary)
Polarity reversal/short-circuit protected				Yes/Yes
Settings				Potentiometer, 270°
Emitter, light type				LED, red light
Wavelength				650 Nm
Output function indicator				Yellow LED
Stability indicator				Green LED
Response time				0.5 ms
Switching frequency f				1 kHz
Degree of protection as per IEC 60529				IP 67
Ambient temperature T_a				-25...+55 °C
Permissible ambient light				10 klx
Material	Housing			GD-Zn/Al
	Optical surface			PMMA
Connection				M12 connector, 4-pin

Reference reflector: BOS R-1

For wiring diagrams see page 195.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

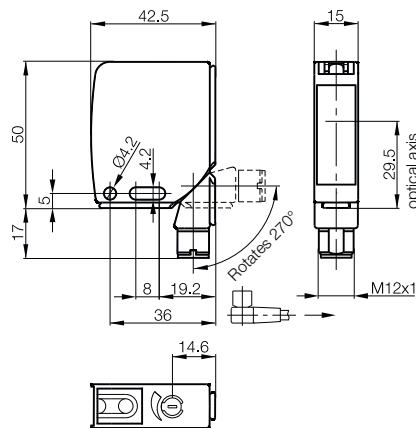
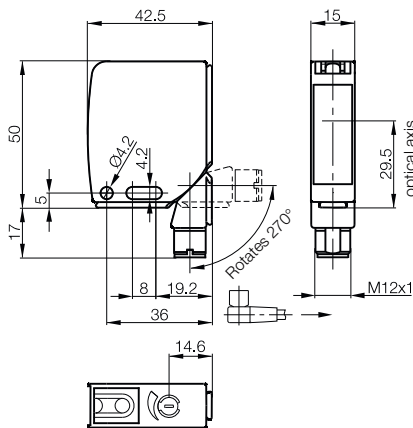
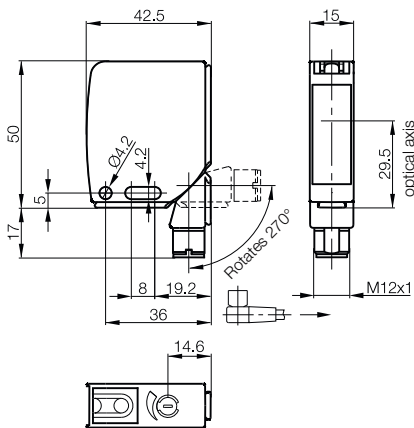
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



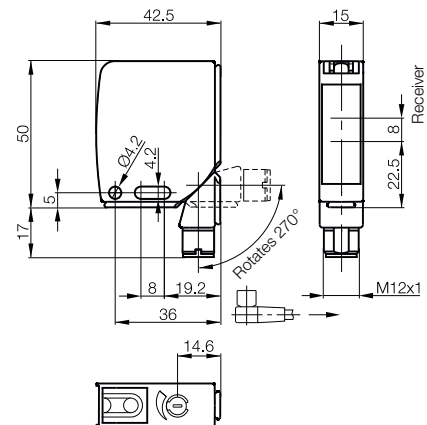
Retroreflective sensor with autocollimation 0...4 m	Retroreflective sensor for Detecting Glass 0...2 m	Retroreflective sensor for Detecting Glass 0...2 m
BOS00TN BOS 21M-PA-PK10-S4		
BOS00TP BOS 21M-PA-PK10-S4S		
	BOS00TU BOS 21M-PA-PT10-S4	BOS00TY BOS 21M-PA-PT14-S4
	BOS00TW BOS 21M-PA-PT10-S4S	
10...30 V DC 100 mA ≤ 35 mA Light/dark (complementary) Yes/Yes Potentiometer, 270° LED, red light 650 Nm Yellow LED Green LED 0.5 ms 1 kHz IP 67 -25...+55 °C 10 klx GD-Zn/Al Glass M12 connector, 4-pin	10...30 V DC 100 mA ≤ 35 mA Light/dark (complementary) Yes/Yes Potentiometer, 270° LED, red light 650 Nm Yellow LED 0.5 ms 1 kHz IP 67 -25...+55 °C 10 klx GD-Zn/Al Glass M12 connector, 4-pin	10...30 V DC 100 mA ≤ 35 mA Light/dark (complementary) Yes/Yes Potentiometer, 270° LED, red light 650 Nm Yellow LED 0.5 ms 1 kHz IP 67 -25...+55 °C 10 klx GD-Zn/Al PMMA M12 connector, 4-pin





Type	Through-beam sensor		
Detection range	0...20 m		
PNP NC/ Receiver	Ordering code	BOS00WT	
NO	Part number	BOS 21M-PA-IE10-S4	
PNP NC/ Receiver	Ordering code	BOS00WU	
NO Output special assignment	Part number	BOS 21M-PA-IE10-S4S	
Emitter	Ordering code		
	Part number		
Supply voltage U_s	10...30 V DC		
Output current	100 mA		
No-load supply current I_0 max.	≤ 35 mA		
Switching type	Light/dark (complementary)		
Polarity reversal/short-circuit protected	Yes/Yes		
Settings	Potentiometer, 270°		
Help functions			
Emitter, light type	LED, infrared		
Wavelength	880 Nm		
Power-on indicator			
Output function indicator	Yellow LED (receiver)		
Stability indicator	Green LED (receiver)		
Response time	1 ms		
Switching frequency f	500 Hz		
Degree of protection as per IEC 60529	IP 67		
Ambient temperature T_a	-25...+55 °C		
Permissible ambient light	10 klx		
Material	Housing	GD-Zn/Al	
	Optical surface	PMMA	
Connection	M12 connector, 4-pin		

For wiring diagrams see page 195.





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Fork Sensors

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Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Through-beam sensor
0...20 m

BOS00WZ

BOS 21M-XT-IS11-S4

10...30 V DC

≤ 35 mA

Yes/Yes

Test input

Green LED

IP 67

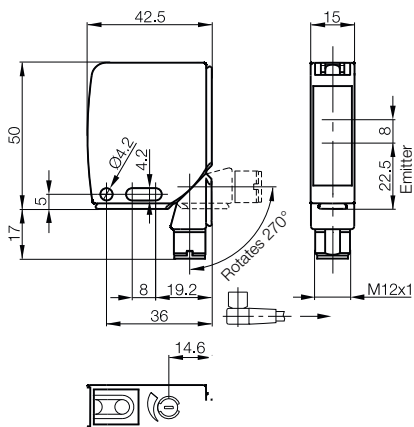
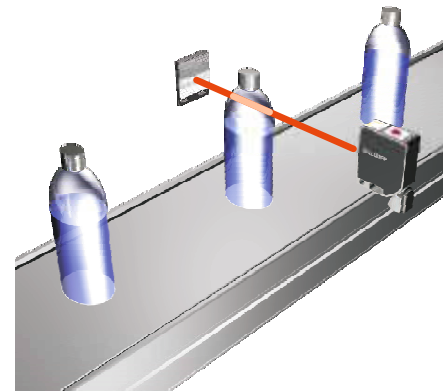
-25...+55 °C

10 klx

GD-Zn/Al

PMMA

M12 connector, 4-pin

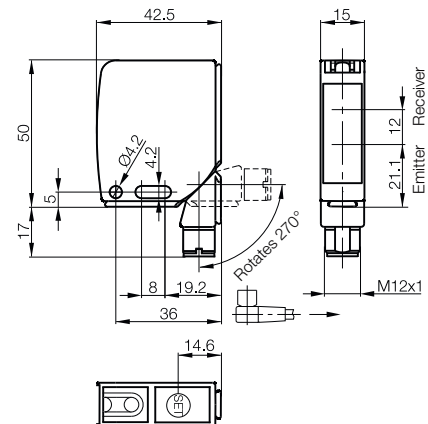




Type				Diffuse sensor with background suppression
Detection range				50...100 mm
PNP	NC/NO		Ordering code	BOS0034
			Part number	BOS 21M-PUS-LH12-S4
PNP	NC/NO	Polarizing filter	Ordering code	
			Part number	
PNP	NC/NO	Polarizing filter	Ordering code	
		Output special assignment	Part number	
PNP	NC/NO	Receiver	Ordering code	
			Part number	
PNP	NC/NO	Receiver	Ordering code	
		Output special assignment	Part number	
		Emitter	Ordering code	
			Part number	
Supply voltage U_s				10...30 V DC
Output current				100 mA
No-load supply current I_0 max.				60 mA
Switching type				Light/dark switching (selectable)
Polarity reversal/short-circuit protected				Yes/Yes
Settings				Teach-in
Help functions				
Emitter, light type				Laser, red light
Wavelength				650 Nm
Laser class				1
Power-on indicator				
Output function indicator				Yellow LED
Stability indicator				Green/red LED
Response time				0.5 ms
Switching frequency f				1 kHz
Degree of protection as per IEC 60529				IP 67
Ambient temperature T_a				-10...+50 °C
Permissible ambient light				5 klx
Material	Housing			GD-Zn/Al
	Optical surface			PMMA
Connection				M12 connector, 4-pin

Reference object: white, 90% reflection, 200×200 mm
 Reference reflector: BOS R-1

For wiring diagrams see page 195.





Photoelectric Sensors

BOS 21M Laser



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

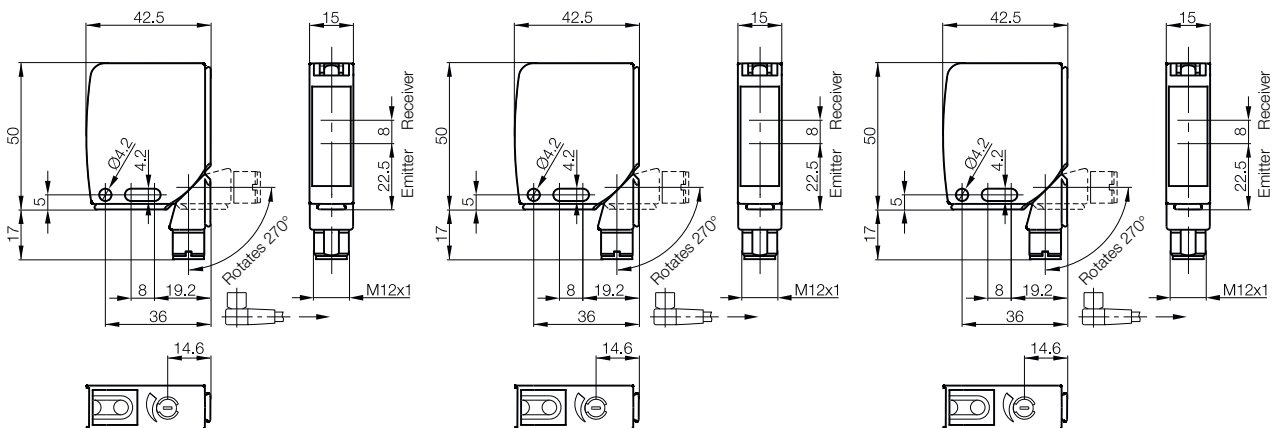
Photoelectric Distance Sensors

Sensors for Analog Distance Measurement

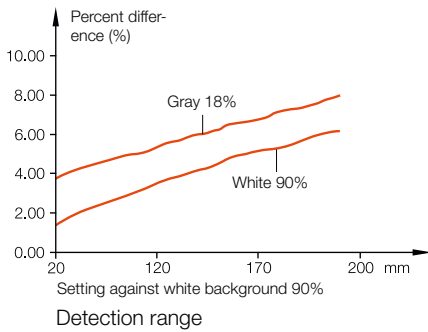
Accessories for Photoelectric Sensors



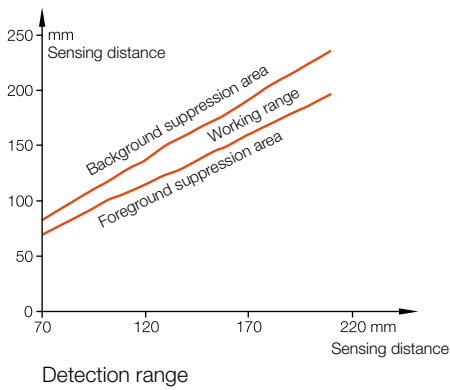
Diffuse sensor 0...600 mm BOS0032 BOS 21M-PA-LD10-S4	Retroreflective sensor 0.1...20 m BOS00TL BOS 21M-PA-LR10-S4 BOS00TM BOS 21M-PA-LR10-S4S	Through-beam sensor 0...60 m BOS00WW BOS 21M-PA-LE10-S4 BOS00WY BOS 21M-PA-LE10-S4S BOS00Y0 BOS 21M-XT-LS11-S4
10...30 V DC	10...30 V DC	10...30 V DC
100 mA	100 mA	100 mA
35 mA	35 mA	≤ 35 mA
Light/dark (complementary)	Light/dark (complementary)	Light/dark (complementary)
Yes/Yes	Yes/Yes	Yes/Yes
Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°
Laser, red light 650 Nm 1 Green LED Yellow LED	Laser, red light 650 Nm 1 Green LED Yellow LED	Laser, red light 650 Nm 1 Green LED Yellow LED
0.25 ms 2 kHz IP 67 -10...+50 °C 5 klx GD-Zn/Al PMMA M12 connector, 4-pin	0.25 ms 2 kHz IP 67 -10...+50 °C 5 klx GD-Zn/Al PMMA M12 connector, 4-pin	1 ms 500 Hz IP 67 -25...+55 °C 10 klx GD-Zn/Al PMMA M12 connector, 4-pin



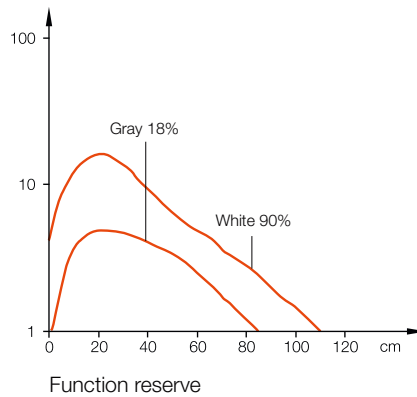
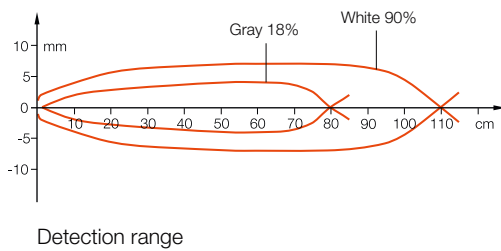
Diffuse sensor with background suppression
BOS 21M-PUS-RH12



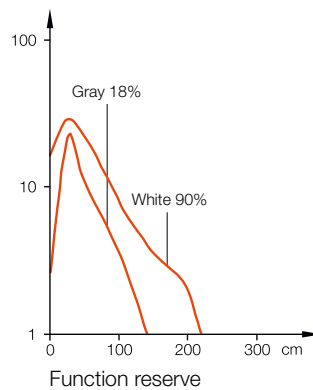
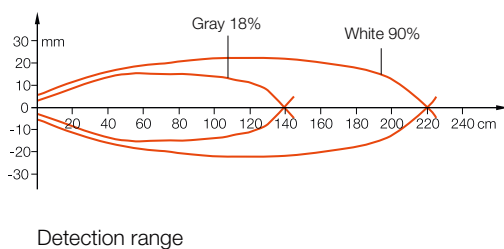
Diffuse sensor with fore- and background suppression
BOS 21M-PUS-RV13

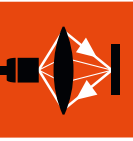


Diffuse sensor
BOS 21M-PA-RD10



Diffuse sensor, long range
BOS 21M-PA-ID10





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

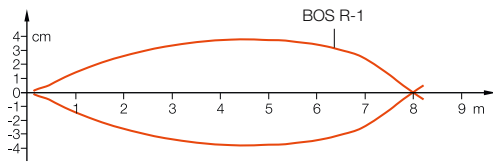
BWL

Photoelectric Sensors with Special Properties

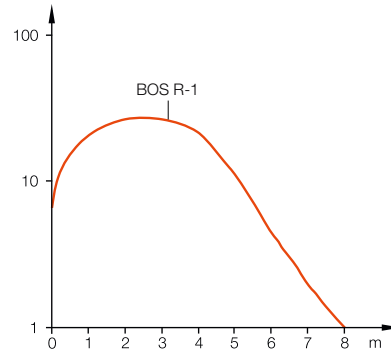
Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Retroreflective sensor with polarization
BOS 21M-PA-PR10

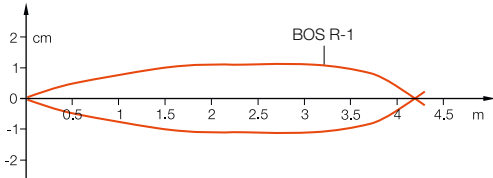


Detection range

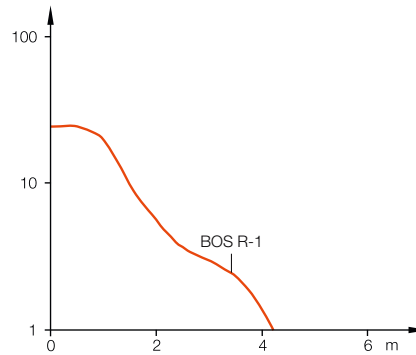


Function reserve

Retroreflective sensor with autocollimation
BOS 21M-PA-PK10

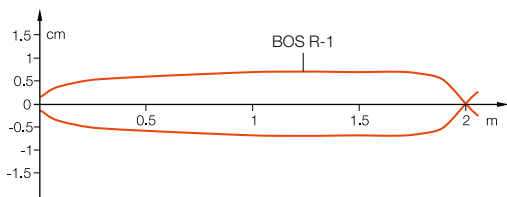


Detection range

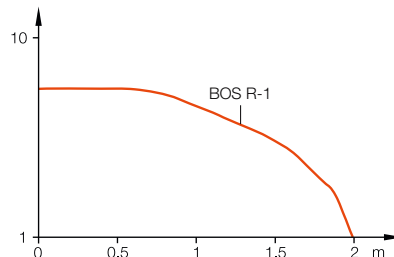


Function reserve

Retroreflective sensor with glass detection
BOS 21M-PA-PT_S4

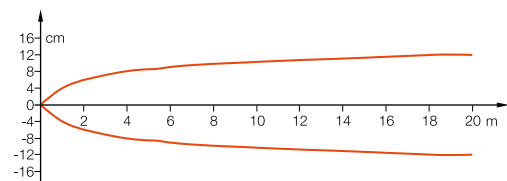


Detection range

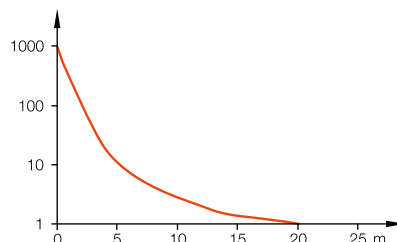


Resolution

Through-beam sensor
BOS 21M-PA-IE10

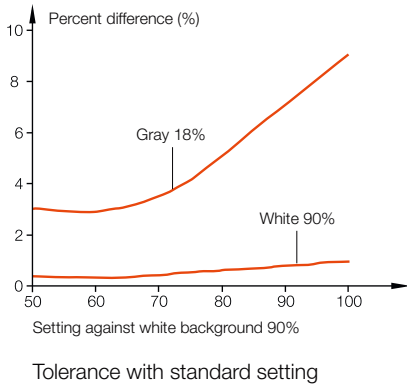


Detection range

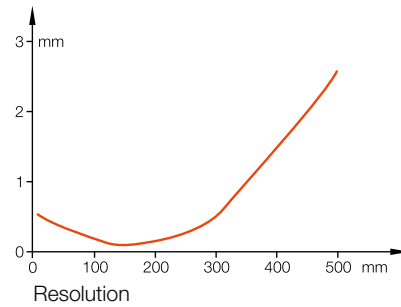
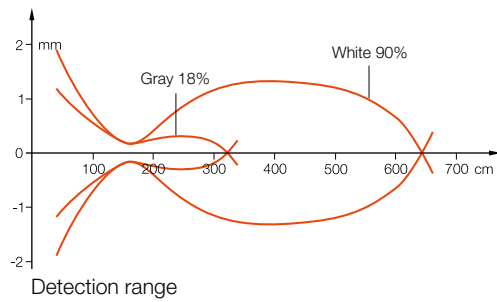


Function reserve

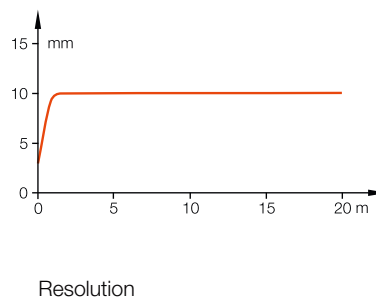
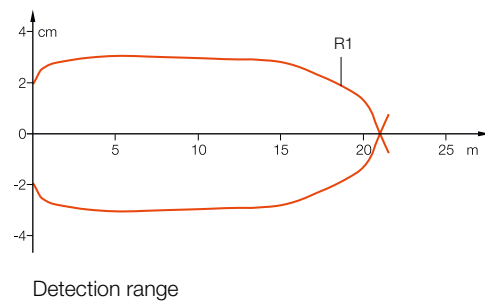
Laser diffuse sensor with background suppression
BOS 21M-PUS-LH12-



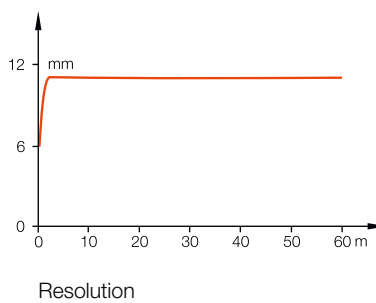
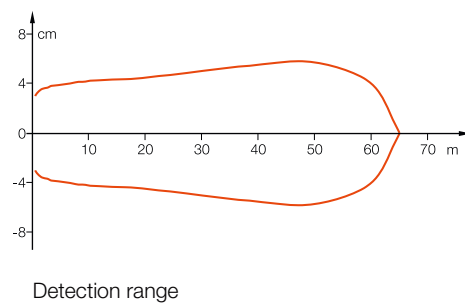
Laser diffuse sensor
BOS 21M-PA-LD10-



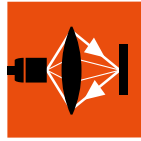
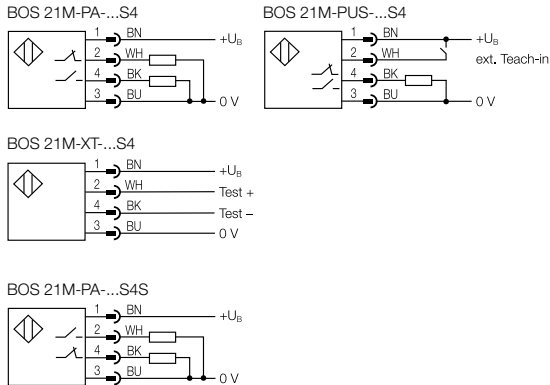
Laser retroreflective sensor with polarization
BOS 21M-PA-LR10-



Laser through-beam sensor
BOS 21M-PA-LE10-



Wiring diagrams



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Recommended accessories
 (please order separately)

Description	Ordering code
① Reflector	BAM00UK
② Reflector	BAM00WL
③ Clamping holders	BAM00TF
④ Clamping holders	BAM00TH
⑤ Adapter plate	BAM00T7
⑥ Mounting bracket	BAM00T9
⑦ Mounting bracket	BAM00TA



Suitable connectors
 (please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N

Connectors without LED are suitable for PNP and NPN sensors.

You can find special accessories for diffuse sensors, such as **reflectors, apertures, lenses, filters and deflection heads**, in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

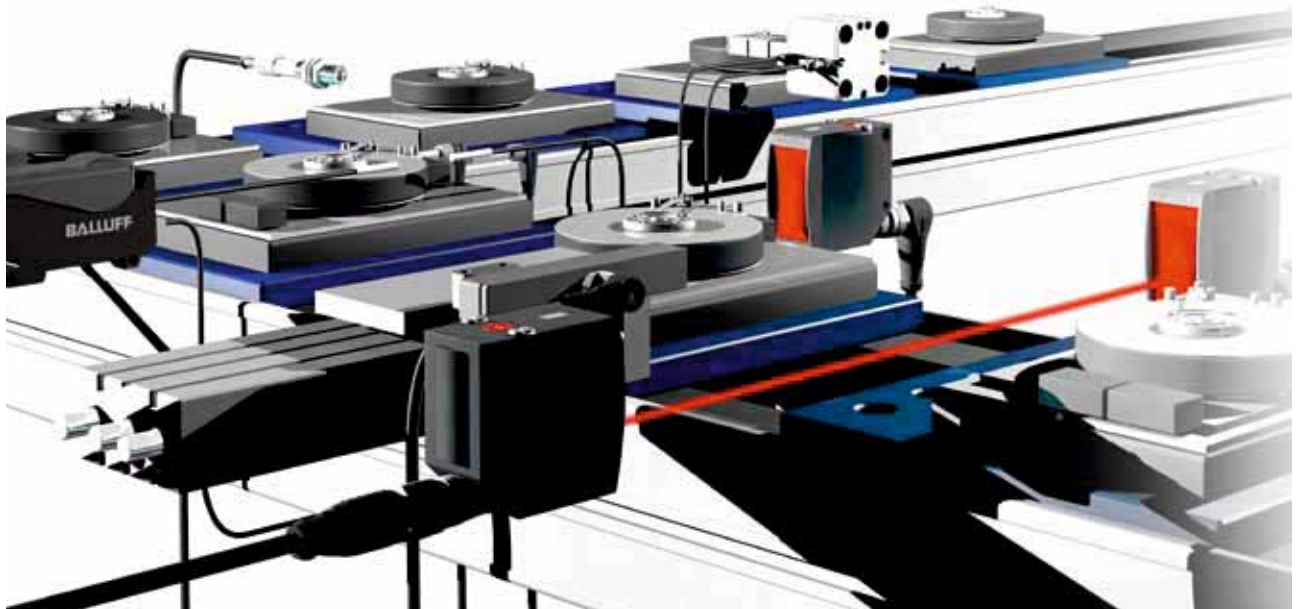
More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.

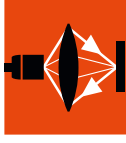
The new photoelectric series **BOS 23K** stands for precise switching behavior with exact positioning tasks. Its high ranges and compact design provide for great freedom in designing the system.

The laser variants are ideal for detecting small parts.

Additional Features

- Highly visible red light/laser light for precision alignment
- LEDs visible from all sides
- Adjustable mounting options
- Outstanding price/performance ratio





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type	Sensing distance/Range	Light type		Output	Switching type		Switching frequency	U _S	Conne- ction		Special features				Page
		Red light	Laser		PNP transistor	Light switching			Dark switching	10...30 V DC	M12 connector, 4-pin	Polarizing filter	Laser Class 1	Teach-in	
Diffuse sensor with background suppression															
BOS01FL BOS 23K-PA-RH10-S4	70...800 mm	■		■	■	■	600 Hz	■	■						198
BOS0178 BOS 23K-PU-RH10-S4	70...800 mm	■		■	■	■	600 Hz	■	■						198
BOS017C BOS 23K-PU-LH10-S4	120...600 mm			■	■	■	1 kHz	■	■			■			200
BOS01FR BOS 23K-PA-LH10-S4	120...600 mm			■	■	■	1 kHz	■	■			■			200
BOS01FT BOS 23K-PA-LH20-S4	150...800 mm			■	■	■	1 kHz	■	■						200
BOS017H BOS 23K-PU-LH20-S4	150...800 mm			■	■	■	1 kHz	■	■						200
Diffuse sensor															
BOS01FM BOS 23K-PA-RD10-S4	0...2 m	■		■	■	■	600 Hz	■	■				■		198
BOS016Z BOS 23K-PU-RD10-S4	0...2 m	■		■	■	■	600 Hz	■	■				■		198
BOS0175 BOS 23K-PU-LD20-S4	0...1.2 m			■	■	■	600 Hz	■	■				■		201
Retroreflective sensor															
BOS01FN BOS 23K-PA-RR10-S4	0...14 m	■		■	■	■	600 Hz	■	■			■	■		199
BOS016P BOS 23K-PU-RR10-S4	0...14 m	■		■	■	■	600 Hz	■	■			■	■		199
BOS01HJ BOS 23K-PA-LR10-S4	0...14 m			■	■	■	2 kHz	■	■			■	■	■	201
BOS016U BOS 23K-PU-LR10-S4	0...14 m			■	■	■	2 kHz	■	■			■	■	■	201
Retroreflective sensor with autocollimation															
BOS01NC BOS 23K-PA-LK10-S4	0.1...20 m	■	■	■	■	■	2.5 kHz	■	■			■	■	■	203
Through-beam sensor Receiver															
BOS01FP BOS 23K-PA-RE10-S4	0...25 m	■		■	■	■	500 Hz	■	■				■		199
BOS016F BOS 23K-PU-RE10-S4	0...25 m	■		■	■	■	500 Hz	■	■				■		199
BOS01FU BOS 23K-PA-LE10-S4	0...30 m			■	■	■	3.5 kHz	■	■			■	■		201
BOS016L BOS 23K-PU-LE10-S4	0...30 m			■	■	■	3.5 kHz	■	■			■	■		201
Through-beam sensor Emitter															
BOS016E BOS 23K-XT-RS11-S4	0...25 m	■						■	■				■		199
BOS016K BOS 23K-XT-LS11-S4	0...30 m			■				■	■			■	■		201

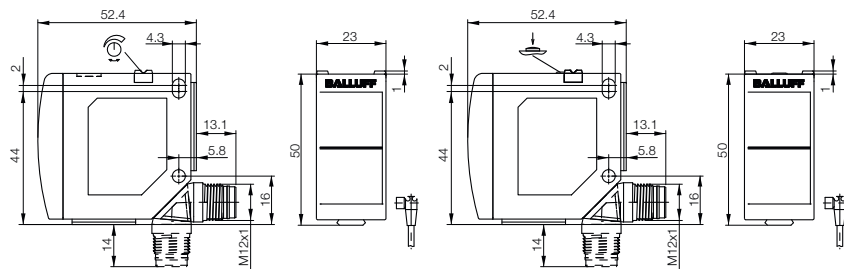
NPN on request



Type		Diffuse sensor with background suppression		Diffuse sensor	
Detection range		90 %	3...1200 mm	90 %	5...2000 mm
		18 %	5...800 mm	18 %	10...1200 mm
		6 %	10...600 mm	6 %	90...600 mm
PNP Complementary	Ordering code	BOS01FL		BOS01FM	
	Part number	BOS 23K-PA-RH10-S4		BOS 23K-PA-RD10-S4	
PNP NO/NC switchable	Ordering code	BOS0178		BOS016Z	
	Part number	BOS 23K-PU-RH10-S4		BOS 23K-PU-RD10-S4	
PNP Complementary	Ordering code				
	Part number				
PNP NO/NC switchable	Ordering code				
	Part number				
PNP Receiver	Ordering code				
	Part number				
PNP Receiver	Ordering code				
	Part number				
Emitter	Ordering code				
	Part number				
Supply voltage U_S		10...30 V DC		10...30 V DC	
Output current		100 mA		100 mA	
No-load supply current I_0 max.		≤ 30 mA		≤ 30 mA	
Switching type		Light/dark		Light/dark	
Polarity reversal/short-circuit protected		Yes/Yes		Yes/Yes	
Settings		18-turn potentiometer		Teach-in / control input	
Emitter, light type		LED, red light		LED, red light	
Wavelength		640 Nm		640 Nm	
Power-on indicator		Green LED		Green LED	
Output function indicator		Yellow LED		Yellow LED	
Stability indicator		Flashing yellow LED		Flashing yellow LED	
Response time		0.833 ms		0.833 ms	
Switching frequency f		600 Hz		600 Hz	
Degree of protection as per IEC 60529		IP 67/IP 69K		IP 67/IP 69K	
Ambient temperature T_a		-20...+60 °C		-20...+60 °C	
Permissible ambient light		EN 60947-5-2		EN 60947-5-2	
Material	Housing	PC-ABS		PC-ABS	
	Optical surface	PMMA		PMMA	
Connection		M12 connector, 4-pin		M12 connector, 4-pin	

Reference object: white, 90% reflection,
 200x200 mm
 Reference reflector: BOS R-1

For wiring diagrams see page 207.





Photoelectric Sensors

Photoelectric Sensors
 Cylinder Designs
Block Designs
 Fork Sensors
 BGL
 Angle Sensors
 BWL

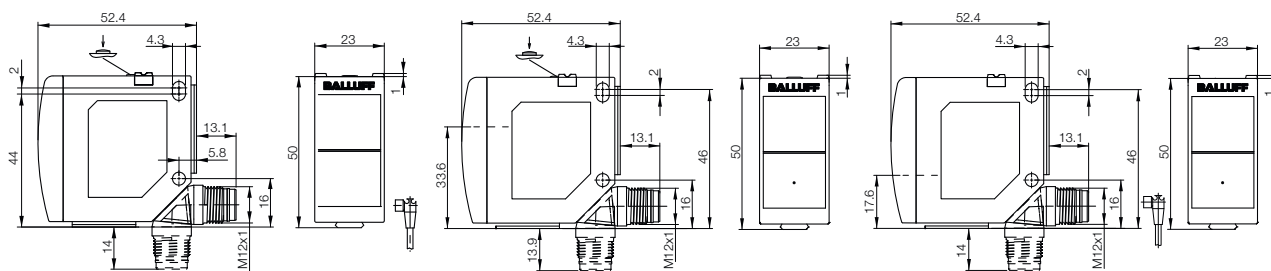
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Retroreflective sensor 0.3...12 m	Through-beam sensor 0...20 m	Through-beam sensor 0...20 m
BOS01FN BOS 23K-PA-RR10-S4		
BOS016P BOS 23K-PU-RR10-S4		
	BOS01FP BOS 23K-PA-RE10-S4	
	BOS016F BOS 23K-PU-RE10-S4	
		BOS016E BOS 23K-XT-RS11-S4
10...30 V DC 100 mA ≤ 30 mA Light/dark Yes/Yes Teach-in / control input LED, red light 640 Nm Green LED Yellow LED Flashing yellow LED 0.833 ms 600 Hz IP 67/IP 69K -20...+60 °C EN 60947-5-2 PC-ABS PMMA M12 connector, 4-pin	10...30 V DC 100 mA ≤ 30 mA Light/dark Yes/Yes Teach-in / control input LED, red light 640 Nm Green LED Yellow LED Flashing yellow LED 1 ms 500 Hz IP 67/IP 69K -20...+60 °C EN 60947-5-2 PC-ABS PMMA M12 connector, 4-pin	10...30 V DC ≤ 30 mA IP 67/IP 69K -20...+60 °C EN 60947-5-2 PC-ABS PMMA M12 connector, 4-pin





Laser Class 1

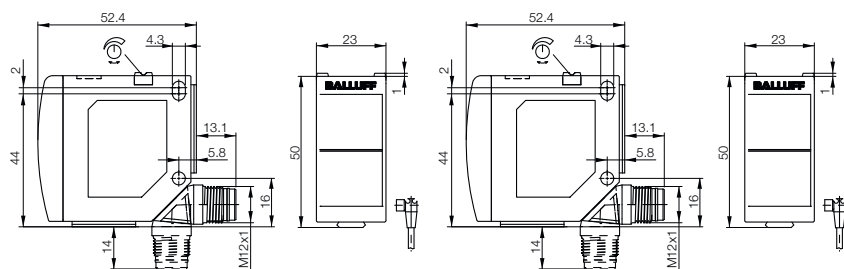


Laser Class 2

Type	Diffuse sensor with background suppression		Diffuse sensor with background suppression	
Detection range	90 %	5...800 mm	90 %	5...1000 mm
	18 %	10...600 mm	18 %	10...800 mm
	6 %	30...500 mm	6 %	15...700 mm
PNP Complementary	Ordering code	BOS01FR	BOS01FT	
	Part number	BOS 23K-PA-LH10-S4	BOS 23K-PA-LH20-S4	
PNP NO/NC switchable	Ordering code	BOS017C	BOS017H	
	Part number	BOS 23K-PU-LH10-S4	BOS 23K-PU-LH20-S4	
PNP Complementary	Ordering code			
	Part number			
PNP NO/NC switchable	Ordering code			
	Part number			
PNP NO/NC Receiver	Ordering code			
	Part number			
PNP NO/NC Receiver	Ordering code			
	Part number			
	Ordering code			
	Part number			
Supply voltage U_s	12...30 V DC		12...30 V DC	
Output current	100 mA		100 mA	
No-load supply current I_0 max.	≤ 30 mA		≤ 30 mA	
Switching type	Light/dark		Light/dark	
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes	
Settings	18-turn potentiometer		18-turn potentiometer	
Emitter, light type	Laser, red light		Laser, red light	
Wavelength	655 Nm		655 Nm	
Laser class	1		2	
Light spot diameter	2 mm at 600 mm		2.5x3.5 mm at 800 mm	
Power-on indicator	Green LED		Green LED	
Output function indicator	Yellow LED		Yellow LED	
Stability indicator	Flashing yellow LED		Flashing yellow LED	
Response time	0.5 ms		0.5 ms	
Switching frequency f	1 kHz		1 kHz	
Degree of protection as per IEC 60529	IP 67/IP 69K		IP 67/IP 69K	
Ambient temperature T_a	$-20...+60$ °C		$-20...+60$ °C	
Permissible ambient light	EN 60947-5-2		EN 60947-5-2	
Material	Housing	PC-ABS	PC-ABS	
	Optical surface	PMMA	PMMA	
Connection	M12 connector, 4-pin		M12 connector, 4-pin	

Reference object: white, 90% reflection,
 200x200 mm
 Reference reflector: BOS R-1

For wiring diagrams see page 207.





Photoelectric Sensors

BOS 23K Laser



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

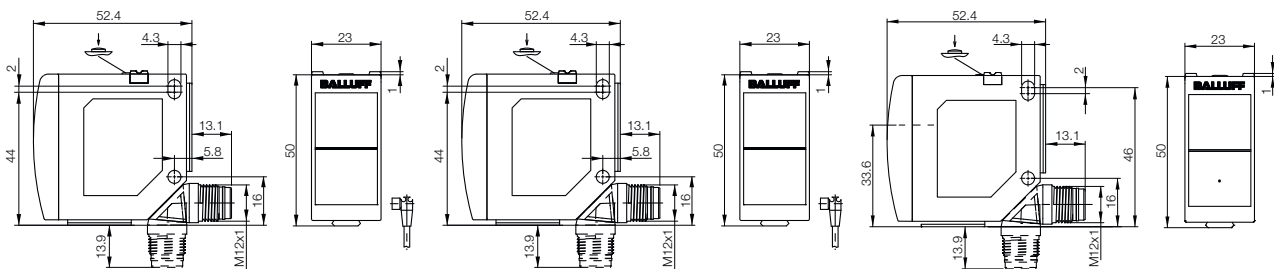
Photoelectric Distance Sensors

for Analog Distance Measurement

Accessories for Photoelectric Sensors



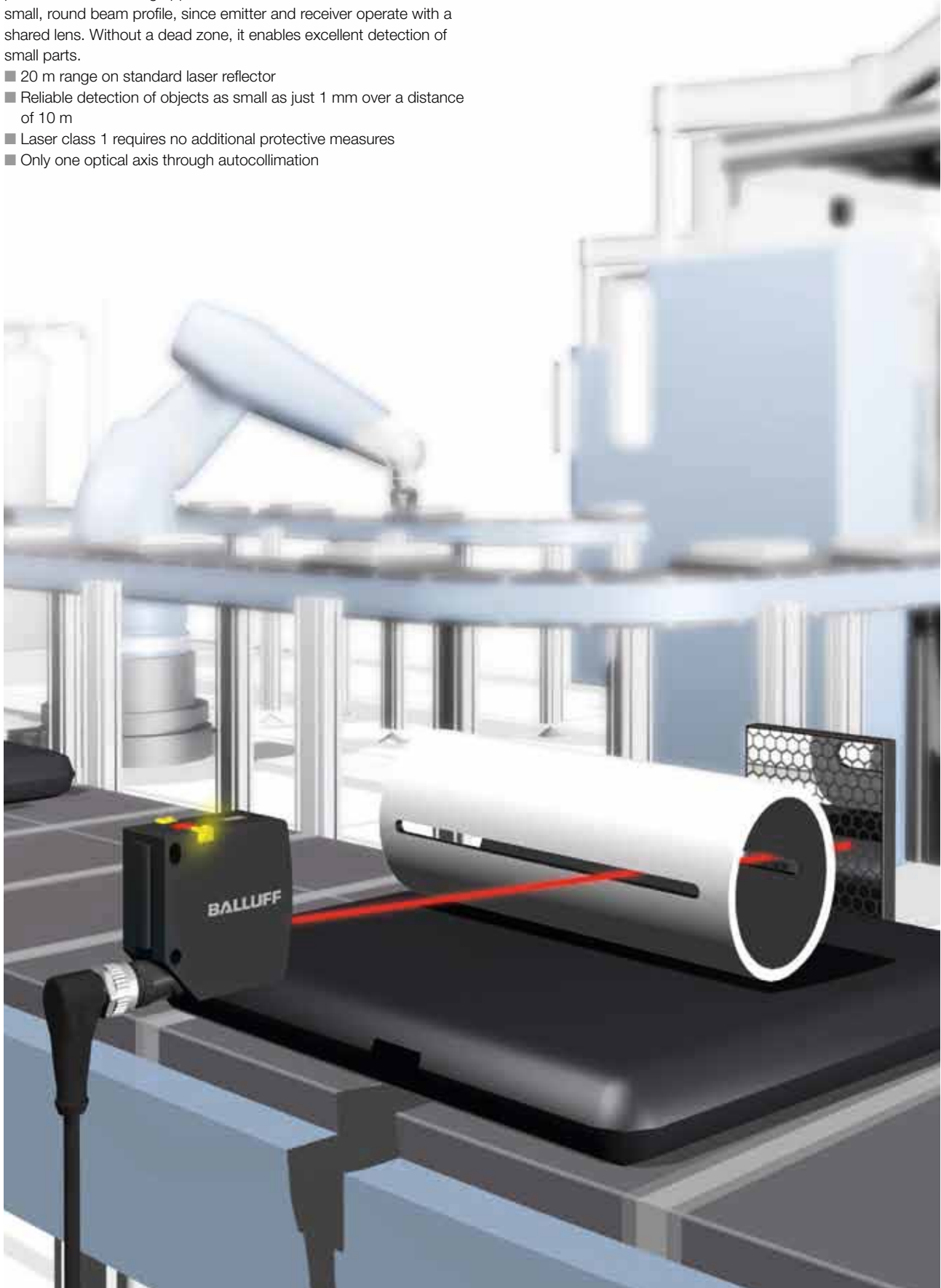
Diffuse sensor	Retroreflective sensor	Through-beam sensor
90 % 5...1200 mm 18 % 10...700 mm 6 % 100...400 mm	0.3...12 m	0...25 m
BOS0175 BOS 23K-PU-LD20-S4	BOS01HJ BOS 23K-PA-LR10-S4 BOS016U BOS 23K-PU-LR10-S4	BOS01FU BOS 23K-PA-LE10-S4 BOS016L BOS 23K-PU-LE10-S4 BOS016K BOS 23K-XT-LS11-S4
10...30 V DC 100 mA ≤ 30 mA Light/dark Yes/Yes Teach-in button / control input Laser, red light 655 Nm 2 1.2x2.2 m at 1200 mm Green LED Yellow LED Flashing yellow LED 0.833 ms 600 Hz IP 67/IP 69K -20...+60 °C EN 60947-5-2 PC-ABS PMMA M12 connector, 4-pin	10...30 V DC 100 mA ≤ 30 mA Light/dark Yes/Yes Teach-in button / control input Laser, red light 655 Nm 1 Green LED Yellow LED Flashing yellow LED 0.25 ms 2 kHz IP 67/IP 69K -20...+60 °C EN 60947-5-2 PC-ABS PMMA M12 connector, 4-pin	10...30 V DC 100 mA ≤ 30 mA Light/dark Yes/Yes Teach-in button / control input Laser, red light 655 Nm 1 17 mm at 14 m Green LED Yellow LED Flashing yellow LED 0.14 ms 3.5 kHz IP 67/IP 69K -20...+60 °C EN 60947-5-2 PC-ABS PMMA M12 connector, 4-pin



BOS 23K – ideal for detecting small parts

The BOS 23K laser retroreflective sensor is a high-performance product for demanding applications. The autocollimation offers a small, round beam profile, since emitter and receiver operate with a shared lens. Without a dead zone, it enables excellent detection of small parts.

- 20 m range on standard laser reflector
- Reliable detection of objects as small as just 1 mm over a distance of 10 m
- Laser class 1 requires no additional protective measures
- Only one optical axis through autocollimation





Photoelectric Sensors
BOS 23K Laser retroreflective sensor
with autocollimation



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

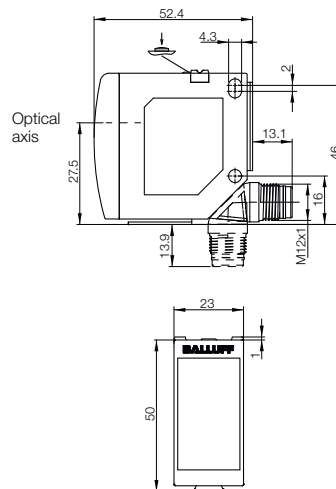
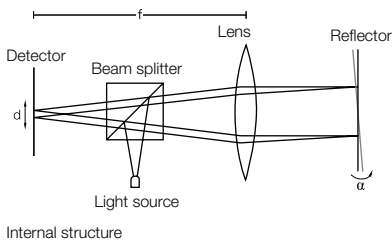
Accessories for Photoelectric Sensors



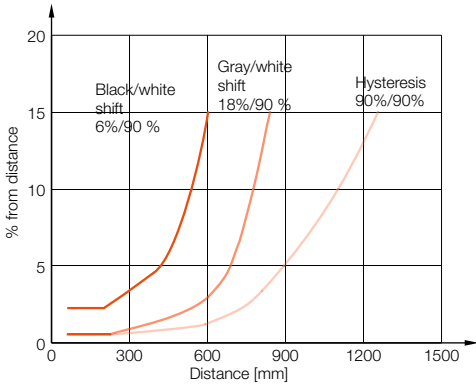
Type	Retroreflective sensor	
Detection range	0.1...20 m	
2×PNP complementary	Ordering code	BOS01NC
	Part number	BOS 23K-PA-LK10-S4
Supply voltage U_S	10...30 V DC	
Output current	100 mA	
No-load supply current I_0 max.	≤ 30 mA	
Switching type	Light/dark	
Polarity reversal/short-circuit protected	Yes/Yes	
Settings	Teach-in button / control input	
Emitter, light type	Laser, red light	
Wavelength	655 Nm	
Laser class	1	
Power-on indicator	Green LED	
Output function indicator	Yellow LED	
Stability indicator	Flashing yellow LED	
Response time	0.2 ms	
Switching frequency f	2.5 kHz	
Degree of protection as per IEC 60529/DIN 40050	IP 67/IP 69K	
Ambient temperature T_a	-20...+60 °C	
Permissible ambient light	EN 60947-5-2	
Material	Housing	PC-ABS
	Optical surface	PMMA
Connection	M12 connector, 4-pin	
Reference reflector	BOS R-22	

Reference object: white, 90% reflection, 200×200 mm
 Reference reflector: BOS R-22

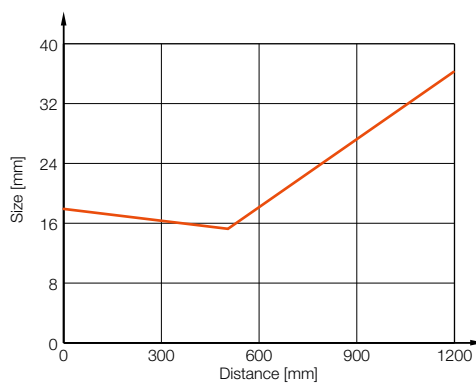
For wiring diagrams see page 207.



**Diffuse sensor with background suppression BOS 23K-...-RH10-...
Scanning features**



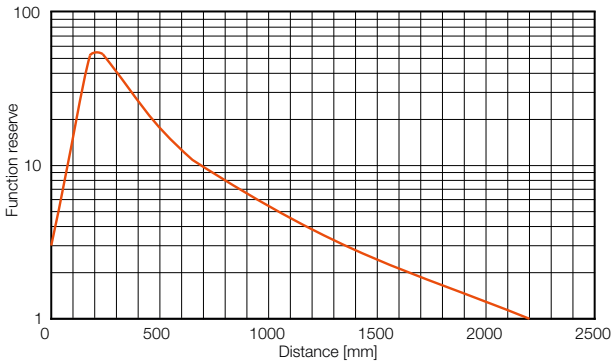
**Diffuse sensor with background suppression BOS 23K-...-RH10-...
Light spot size**



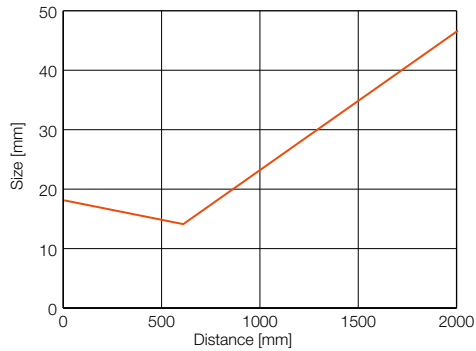
Detection range BOS 23K-...-RH10-...

Reference material	Detection range
White 90%	3...1200 mm
Gray 18%	5...800 mm
Black 6%	10...600 mm

**Diffuse sensor BOS 23K-...-RD10-...
Function reserve**



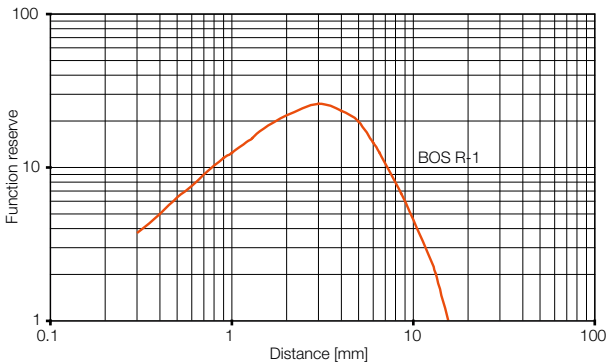
**Diffuse sensor BOS 23K-...-RD10-...
Light spot size**



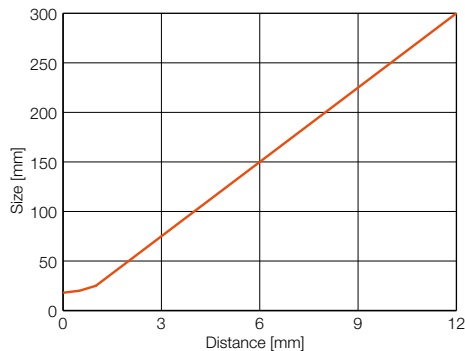
Detection range BOS 23K-...-RD10-...

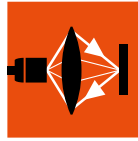
Reference material	Detection range
White 90%	5...2000 mm
Gray 18%	10...1200 mm
Black 6%	90...600 mm

**Retroreflective sensor BOS 23K-...-RR10-...
Function reserve**



**Retroreflective sensor BOS 23K-...-RR10-...
Light spot diameter**





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

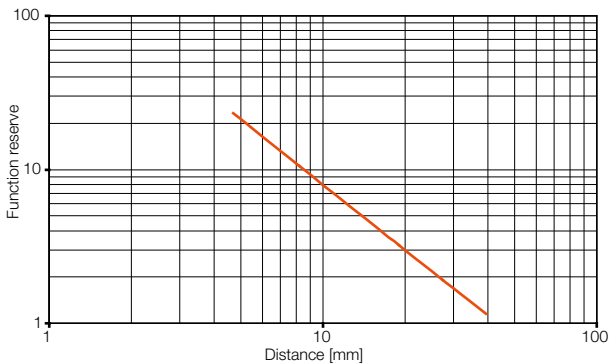
BWL

Photoelectric Sensors with Special Properties

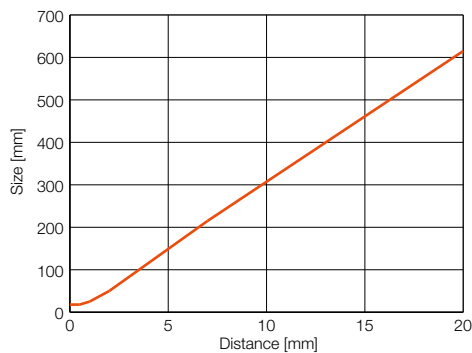
Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

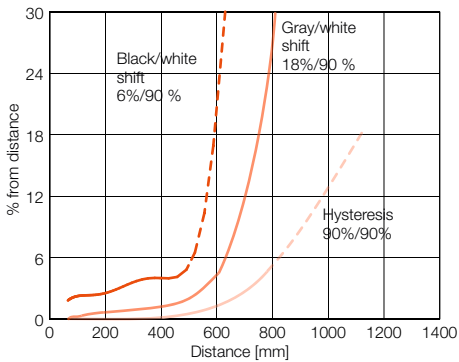
Through-beam sensor BOS 23K-...-RS../RE
Function reserve



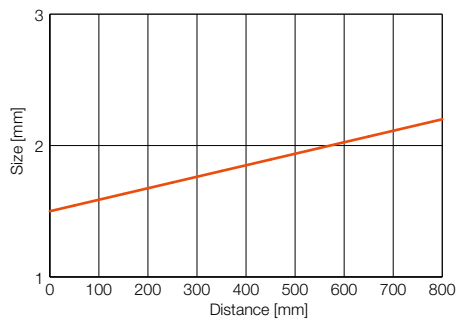
Through-beam sensor BOS 23K-...-RS../RE
Light spot size



Laser diffuse sensor with background suppression BOS 23K-...-LH10-...
Scanning features



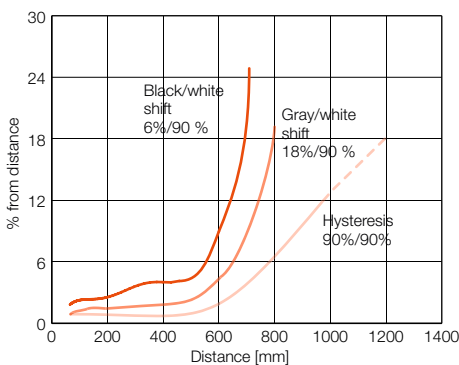
Laser diffuse sensor with background suppression BOS 23K-...-LH10-...
Light spot size



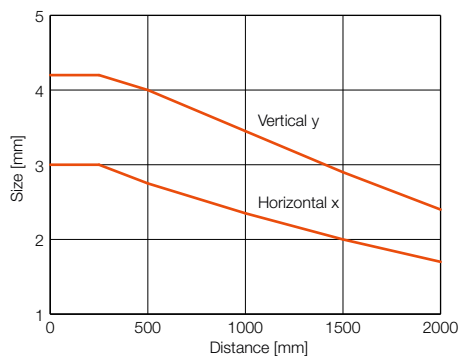
Detection range BOS 23K-...-LH10-...

Reference material	Detection range
White 90%	5...800 mm
Gray 18%	10...600 mm
Black 6%	30...500 mm

Laser diffuse sensor with background suppression BOS 23K-...-LH20-...
Scanning features



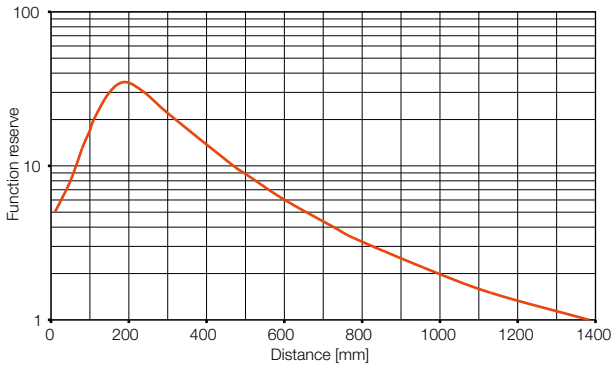
Laser diffuse sensor with background suppression BOS 23K-...-LH20-...
Light spot size



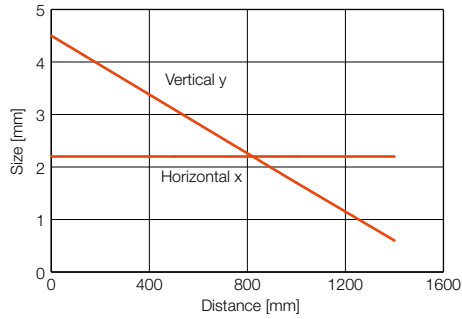
Detection range BOS 23K-...-LH20-...

Reference material	Detection range
White 90%	5...1000 mm
Gray 18%	10...800 mm
Black 6%	15...700 mm

**Laser diffuse sensor BOS 23K-...-LD20-...
 Function reserve**



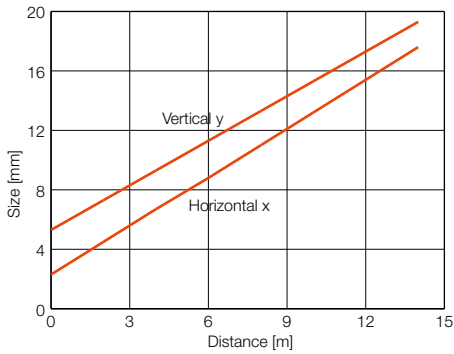
**Laser diffuse sensor BOS 23K-...-LD20-...
 Light spot size**



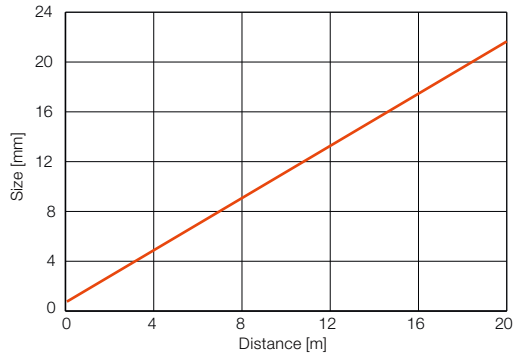
Detection range BOS 23K-...-LD20-...

Reference material	Detection range
White 90%	5...1200 mm
Gray 18%	10...700 mm
Black 6%	100...400 mm

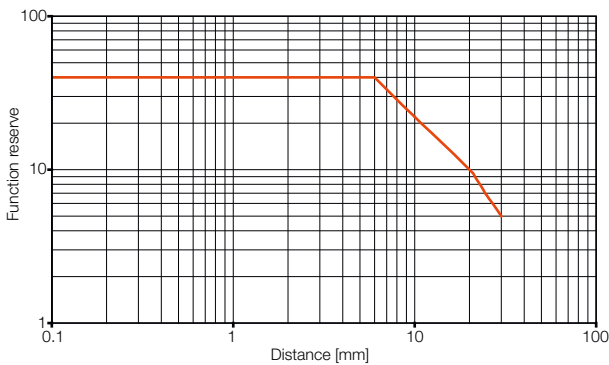
**Laser retroreflective sensor BOS 23K-...-LR10-...
 Light spot size**



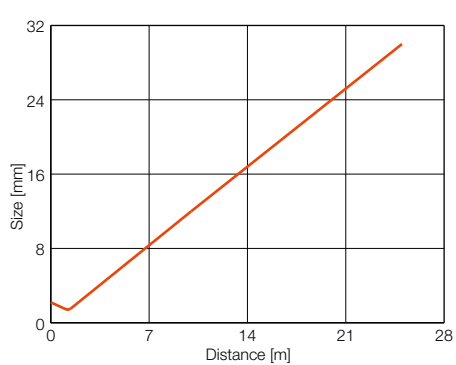
**Laser light sensor with autocollimation,
 BOS 23K-PA-LK10-S4, light spot size**



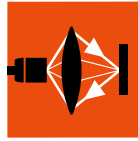
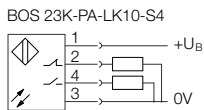
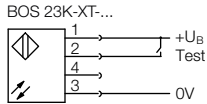
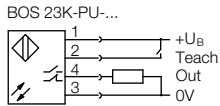
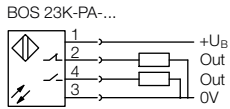
**Laser through-beam sensor BOS 23K-...-LE../LS-...
 Function reserve**



**Laser through-beam sensor BOS 23K-...-LE../LS-...
 Light spot size**



Wiring diagrams



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

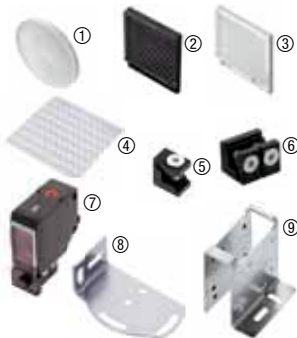
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Recommended accessories
 (please order separately)

Description	Ordering code
① Reflector	BAM00UK
② Reflector	BAM00WL
③ Laser reflector	BAM00UY
④ Reflective tape	BAM01JM
⑤ Clamping holders	BAM00TF
⑥ Clamping holders	BAM00TH
⑦ Weld protection	BAM01L8
⑧ Mounting bracket	BAM01FK
⑨ Mounting bracket	BAM01FM



You can find special accessories for diffuse sensors, such as **reflectors, apertures, lenses, filters and deflection heads**, in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Suitable connectors
 (please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N



Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.

The BOS 26K series is ideally suited wherever greater demands are made in terms of precision, handling, high sensing distance or range, and detection of small parts.

The retroreflective sensors feature autocollimation, that is, the emitter and receiver beams coincide geometrically.

Advantage: Exact switching points for any desired side-approaching object in the entire beam path.

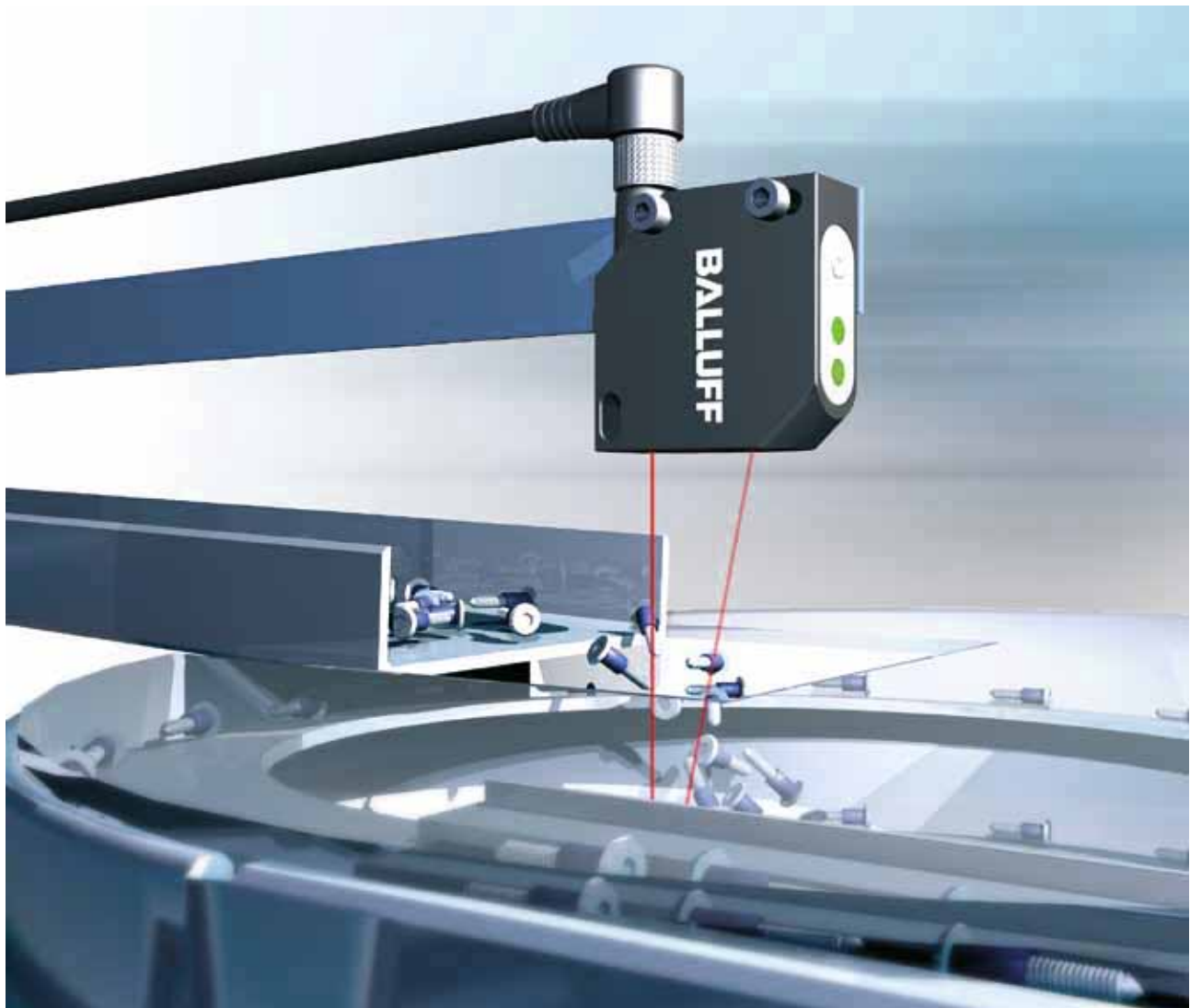
The diffuse sensor with background suppression **BOS 26K-...-1LHB**, with its focused light beam, can accurately detect very small objects in virtually any color between 30 and 150 mm. The focusing feature enables a spot size of just 0.1 mm at a distance of 80 mm.

Features

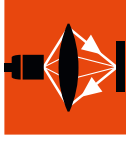
- Rotatable M12 connector
- Precise setting mechanism with two revolutions (720°)
- Clear digital display for the sensitivity setting
- Switching status and contamination indicator visible from any direction
- Complementary PNP output
- High switching frequency for laser version

Applications

- Precise detection of small parts
- Positioning tasks
- Detail checking
- Conveyor inspection (background suppression)
- Conveyor technology
- Automation technology
- Handling machines, robotics
- Machine tool building
- Specialty machines



Photoelectric Sensors
BOS 26K
Product Overview



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type	Sensing distance/Range	Light type			Output	Switching type		Switching frequency	U _S	Connection	Special features				Page
		Red light	Infrared	Laser		PNP	Light switching				Dark switching	Polarizing filter	Autocollimation	Laser Class 1	
Diffuse sensor with background suppression															
BOS008C BOS 26K-PA-1LHA-SA1-S4-C	40...60 mm			■	■	■	■	2.5 kHz	■	■					212
BOS008E BOS 26K-PA-1LHB-S4-C	30...150 mm			■	■	■	■	2.5 kHz	■	■					213
BOS0089 BOS 26K-PA-1HC-S4-C	30...300 mm	■			■	■	■	1 kHz	■	■					210
BOS008F BOS 26K-PA-1LHC-S4-C	50...300 mm			■	■	■	■	2.5 kHz	■	■					213
BOS008A BOS 26K-PA-1IE-S4-C	150...600 mm		■		■	■	■	800 Hz	■	■					211
Retroreflective sensor with polarizing filter															
BOS008M BOS 26K-PA-1QE-S4-C	0...5.5 mm	■			■	■	■	1 kHz	■	■	■	■			211
BOS008N BOS 26K-PO-1QE-SA1-C	0...5.5 mm	■			■	■		1 kHz	■	■	■	■		■	211
BOS008L BOS 26K-PA-1LQP-S4-C	0...20 m			■	■	■	■	2.5 kHz	■	■	■	■	■		214
BOS008J BOS 26K-PA-1LQE-SA1-S4-C	0...7 mm			■	■	■	■	2.5 kHz	■	■	■	■	■		215
BOS008K BOS 26K-PA-1LQE-SA2-S4-C	0...6 mm			■	■	■	■	2.5 kHz	■	■	■	■	■		215

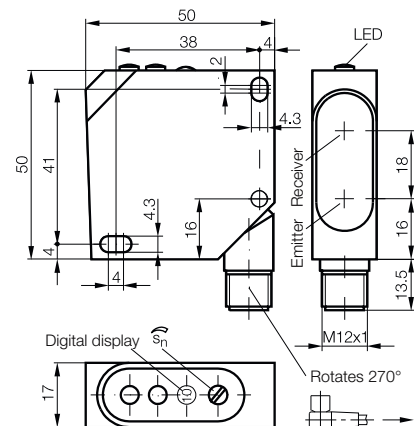
NPN on request



Type			Diffuse sensor with background suppression
Detection range			30...300 mm
PNP	NC/NO	Ordering code	BOS0089
		Part number	BOS 26K-PA-1HC-S4-C
PNP	NC/NO	Polarizing filter, autocollimation,	Ordering code
			Part number
PNP	NC	Polarizing filter, autocollimation, Alarm output	Ordering code
			Part number
Supply voltage U_s			10...30 V DC
Output current			200 mA
No-load supply current I_0 max.			≤ 35 mA
Switching type			Light/dark (complementary)
Polarity reversal/short-circuit protected			Yes/Yes
Settings			2-turn potentiometer with indicator
Help function			
Emitter, light type			LED, red light, pulsed
Wavelength			660 Nm
Light spot diameter			approx. 8 mm at 200 mm
Gray value shift (90%/18%)			8 %
Distance hysteresis			<5%
Power-on indicator			Green LED
Output function indicator			Yellow LED
Stability indicator			Red LED
Response time			0.5 ms
Switching frequency f			1 kHz
Degree of protection as per IEC 60529			IP 67
Ambient temperature T_a			-20...+60 °C
Permissible ambient light			EN 60947-5-2
Material	Housing		ABS, impact-resistant
	Optical surface		PMMA
Connection			M12 connector, 4-pin

Reference object: white, 90% reflection, 200x200 mm
 Reference reflector: BOS R-1

For wiring diagrams see page 217.





Photoelectric Sensors

Photoelectric Sensors
 Cylinder Designs
Block Designs
 Fork Sensors
 BGL
 Angle Sensors
 BWL

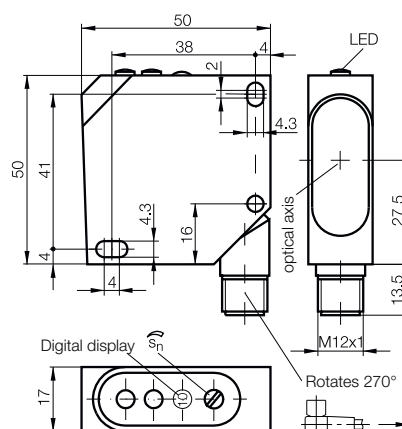
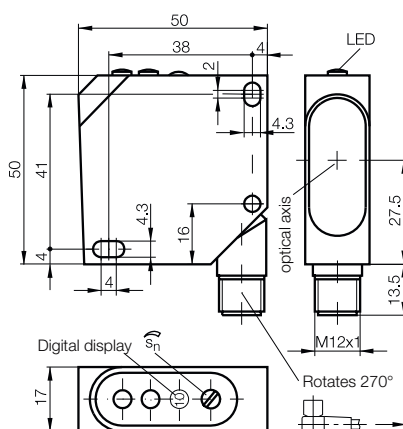
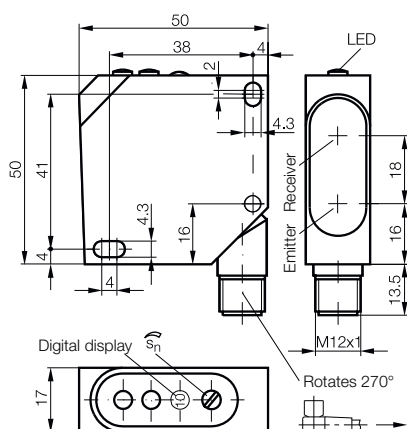
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Diffuse sensor with background suppression 150...600 mm BOS008A BOS 26K-PA-1IE-S4-C	Retroreflective sensor 0...5.5 m BOS008M BOS 26K-PA-1QE-S4-C	Retroreflective sensor 0...5.5 m BOS008N BOS 26K-PO-1QE-SA1-C
10...30 V DC 200 mA ≤ 70 mA Light/dark (complementary) Yes/Yes 2-turn potentiometer with indicator	10...30 V DC 200 mA ≤ 30 mA Light/dark (complementary) Yes/Yes 2-turn potentiometer with indicator	10...30 V DC 200 mA ≤ 30 mA Light switching Yes/Yes 2-turn potentiometer with indicator Contamination output
LED, infrared, pulsed 880 Nm approx. 20 mm at 400 mm 12 % <5%	LED, red light, pulsed 660 Nm Ø 15 mm in 500 mm	LED, red light, pulsed 660 Nm Ø 15 mm in 500 mm
Green LED Yellow LED Red LED 0.625 ms 800 Hz IP 67 -20...+60 °C EN 60947-5-2 ABS, impact-resistant PMMA M12 connector, 4-pin	Green LED Yellow LED Red LED 0.5 ms 1 kHz IP 67 -20...+60 °C EN 60947-5-2 ABS, impact-resistant PMMA M12 connector, 4-pin	Green LED Yellow LED Red LED 0.5 ms 1 kHz IP 67 -20...+60 °C EN 60947-5-2 ABS, impact-resistant PMMA M12 connector, 4-pin

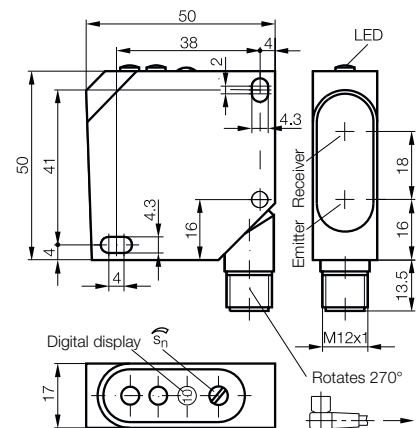




Type	Diffuse sensor with background suppression	
Detection range	40...60 mm	
PNP NC/NO	Ordering code	BOS008C
	Part number	BOS 26K-PA-1LHA-SA1-S4-C
Supply voltage U_s	10...30 V DC	
Output current	200 mA	
No-load supply current I_0 max.	≤ 50 mA	
Switching type	Light/dark (complementary)	
Polarity reversal/short-circuit protected	Yes/Yes	
Settings	2-turn potentiometer with indicator	
Emitter, light type	Laser, red light	
Wavelength	670 Nm	
Laser class	2	
Light spot diameter	see table	
Gray value shift (90%/18%)	1 %	
Distance hysteresis	≤ 50 μ m	
Power-on indicator	Green LED	
Output function indicator	Yellow LED	
Stability indicator	Red LED	
Response time	0.2 ms	
Switching frequency f	2.5 kHz	
Degree of protection as per IEC 60529	IP 67	
Ambient temperature T_a	$-20...+45$ °C	
Permissible ambient light	EN 60947-5-2	
Material	Housing	ABS, impact-resistant
	Optical surface	PMMA
Connection	M12 connector, 4-pin	

Reference object: white, 90% reflection, 200×200 mm

For wiring diagrams see page 217.



Light spot diameter [mm]

Sensing distance	40	45	50	55	60
Light spot \varnothing	0.25	0.7	1.1	1.5	1.8



Photoelectric Sensors

BOS 26K Laser



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

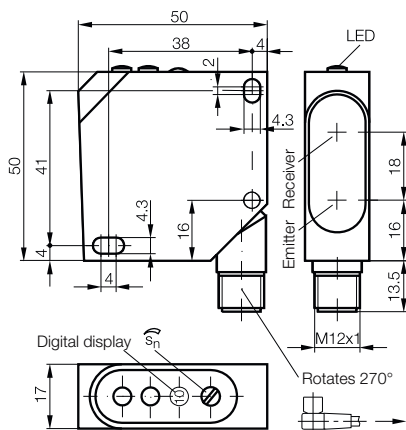
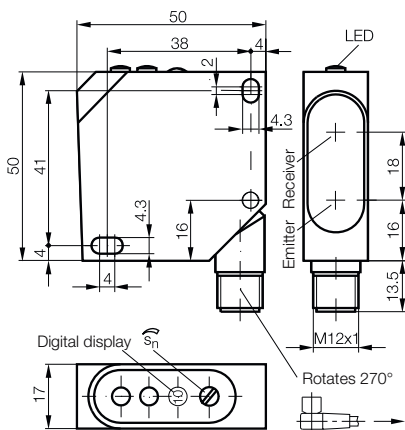
Photoelectric Distance Sensors

for Analog Distance Measurement

Accessories for Photoelectric Sensors



Diffuse sensor with background suppression 30...150 mm BOS008E BOS 26K-PA-1LHB-S4-C	Diffuse sensor with background suppression 50...300 mm BOS008F BOS 26K-PA-1LHC-S4-C
10...30 V DC	10...30 V DC
200 mA	200 mA
≤ 50 mA	≤ 50 mA
Light/dark (complementary)	Light/dark (complementary)
Yes/Yes	Yes/Yes
2-turn potentiometer with indicator	2-turn potentiometer with indicator
Laser, red light	Laser, red light
670 Nm	650 Nm
2	2
see table	3×1 mm at 300 mm
8 %	5 %
5 %	2 %
Green LED	Green LED
Yellow LED	Yellow LED
Red LED	Red LED
0.2 ms	0.2 ms
2.5 kHz	2.5 kHz
IP 67	IP 67
-15...+45 °C	-20...+45 °C
5 klx	5 klx
ABS, impact-resistant	ABS, impact-resistant
PMMA	PMMA
M12 connector, 4-pin	M12 connector, 4-pin



Light spot diameter [mm]

Sensing distance	30	60	80	100	150
Light spot Ø	1.8	0.7	0.1	1.1	2.5

Light spot diameter [mm]

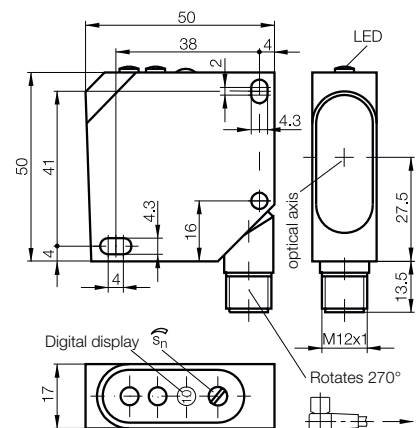
Sensing distance	50	100	200
Light spot Ø	5×1.8	4×1.5	3.8×1.2



Type	Retroreflective sensor		
Detection range	0...20 m		
PNP	NC/NO	Polarizing filter, autocollimation	Ordering code Part number
			BOS008L BOS 26K-PA-1LQP-S4-C
Supply voltage U_s	10...30 V DC		
Output current	200 mA		
No-load supply current I_0 max.	≤ 40 mA		
Switching type	Light/dark (complementary)		
Polarity reversal/short-circuit protected	Yes/Yes		
Settings	2-turn potentiometer with indicator		
Emitter, light type	Laser, red light		
Wavelength	650 Nm		
Laser class	1		
Light spot diameter	11 mm in 12 m		
Power-on indicator	Green LED		
Output function indicator	Yellow LED		
Stability indicator	Red LED		
Response time	0.2 ms		
Switching frequency f	2.5 kHz		
Degree of protection as per IEC 60529	IP 67		
Ambient temperature T_a	-20...+45 °C		
Permissible ambient light	5 klx		
Material	Housing	ABS, impact-resistant	
	Optical surface	PMMA	
Connection	M12 connector, 4-pin		

Reference object: white, 90% reflection, 200×200 mm

For wiring diagrams see page 217.



Light spot diameter

Sensing distance [m]	4	12	20
Light spot Ø [mm]	4	11	19



Photoelectric Sensors
BOS 26K Laser



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric

Distance

Sensors

for Analog

Distance

Measurement

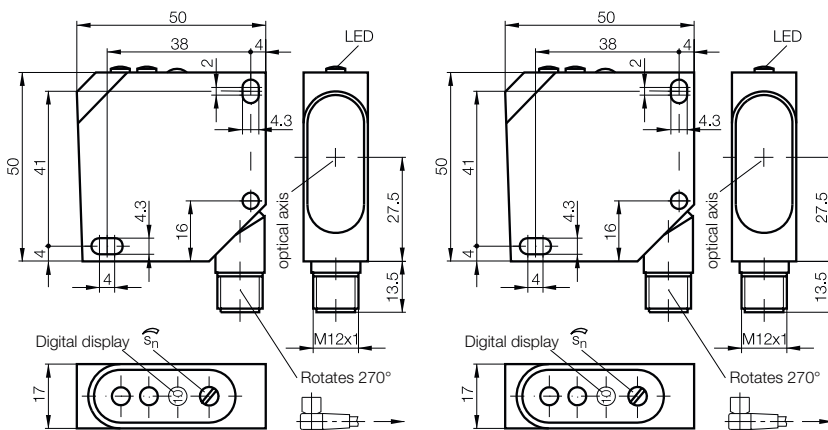
Accessories for

Photoelectric

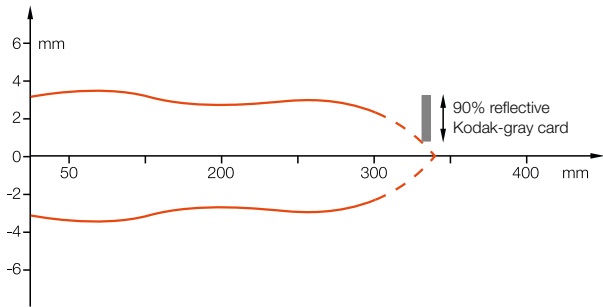
Sensors



Retroreflective sensor	Retroreflective sensor
0...7 m	0...6 m
BOS008J	BOS008K
BOS 26K-PA-1LQE-SA1-S4-C	BOS 26K-PA-1LQE-SA2-S4-C
10...30 V DC	10...30 V DC
200 mA	200 mA
≤ 40 mA	≤ 40 mA
Light/dark (complementary)	Light/dark (complementary)
Yes/Yes	Yes/Yes
2-turn potentiometer with indicator	2-turn potentiometer with indicator
Laser, red light	Laser, red light
650 Nm	650 Nm
1	1
1.5 mm in 150 mm	1.5 mm in 50 mm
Green LED	Green LED
Yellow LED	Yellow LED
Red LED	Red LED
0.2 ms	0.2 ms
2.5 kHz	2.5 kHz
IP 67	IP 67
-20...+45 °C	-20...+45 °C
5 klx	5 klx
ABS, impact-resistant	ABS, impact-resistant
PMMA	PMMA
M12 connector, 4-pin	M12 connector, 4-pin

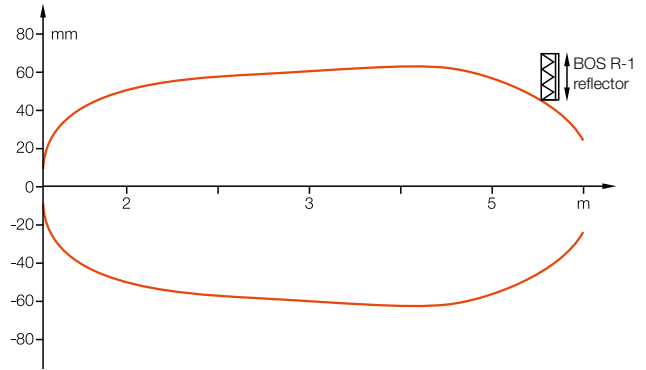


Diffuse sensor BOS 26K...-1HC...



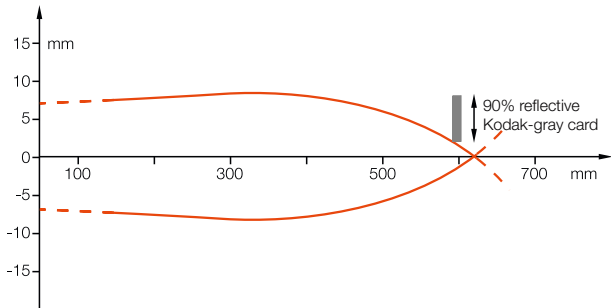
Sensing distance with side approach of Kodak-gray card.

Retroreflective sensor BOS 26K...-1QE...



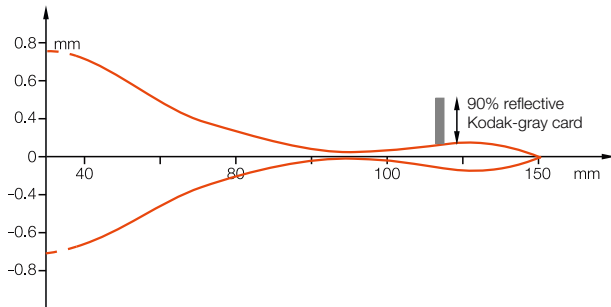
Range measured with side approach with reflector.

Diffuse sensor BOS 26K...-1IE...



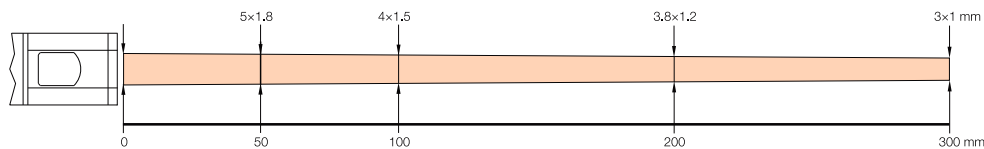
Sensing distance with side approach of Kodak-gray card.

Diffuse sensor BOS 26K...-1LHB...

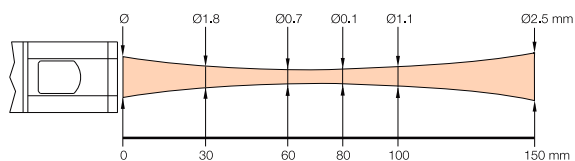


Sensing distance with side approach of Kodak-gray card.

Light beam geometry BOS 26K...1LHC



Light beam geometry BOS 26K...1LHB





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

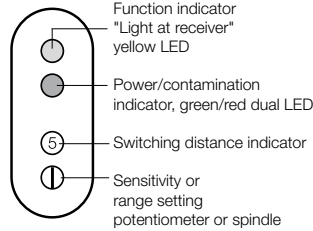
Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

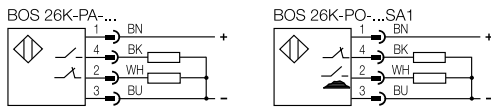
Contamination indicator

The BOS 26K has 2 -LED indicators: a yellow one for the function indicator and a green/red one for the power- and contamination indicator. Should the received light intensity drop below a certain level, this will be indicated by the red LED. This allows contamination or maladjustment to be detected early.

Indicators and operating elements



Wiring diagrams



Recommended accessories
 (please order separately)

Description	Ordering code
① Reflector	BAM00UK
② Reflector	BAM00WL
③ Laser reflector	BAM00UY
④ Laser reflector	BAM00UM
⑤ Laser reflector	BAM00UN
⑥ Mounting bracket	BAM00TK
⑦ Adapter plate	BAM00T7



Suitable connectors
 (please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N

Connectors without LED are suitable for PNP and NPN sensors.

You can find special accessories for diffuse sensors, such as **reflectors, apertures, lenses, filters and deflection heads**, in this catalog starting on page 376.

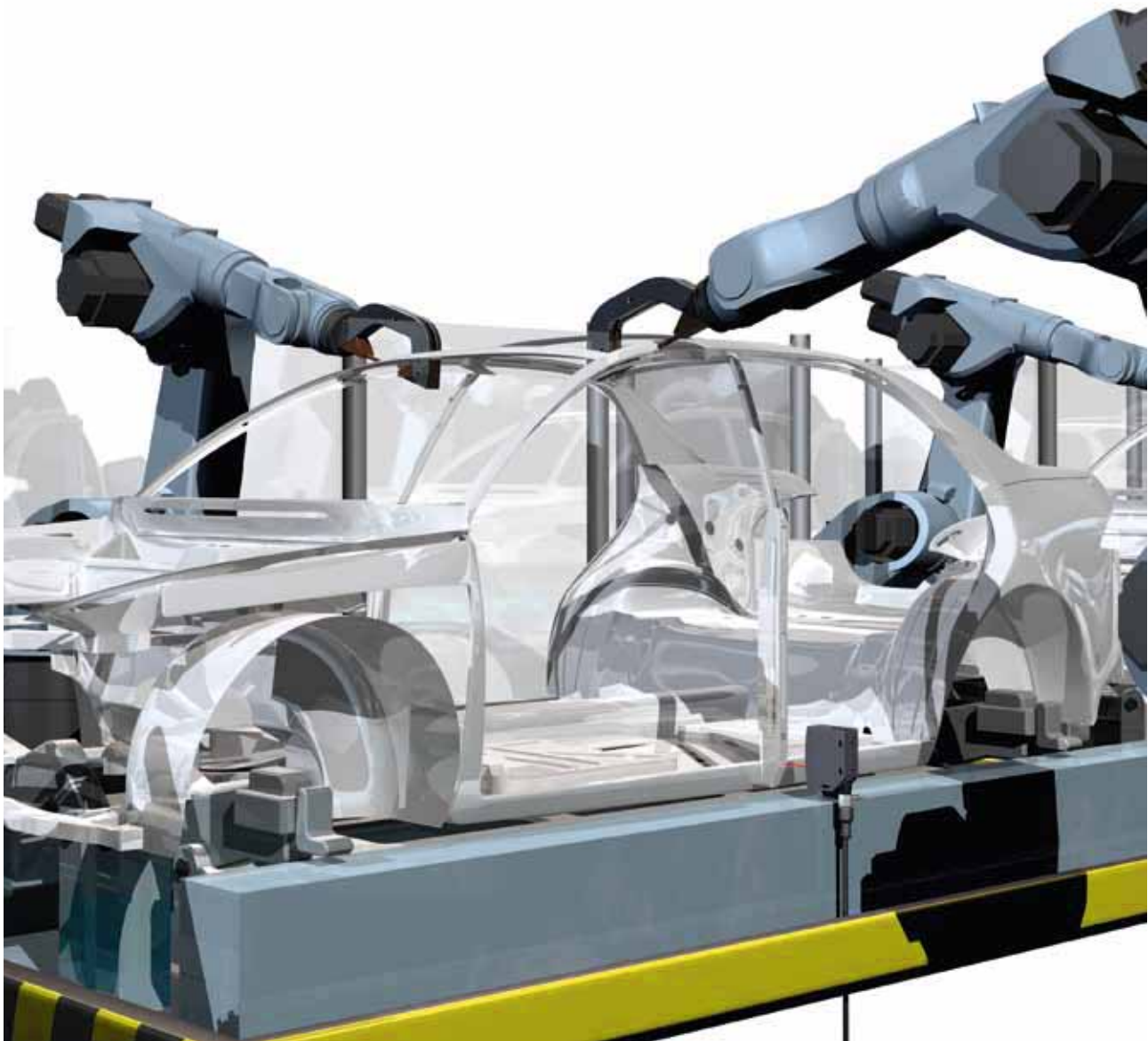
More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.

The new light barriers and diffuse sensors in the BOS 50K series combine top performance and compact dimensions. Thanks to their long range, these all-rounders are suitable for use in numerous sectors: from the automotive industry all the way to wood processing. The background suppression is particularly impressive with an almost color-independent detection of objects – and that at maximum sensing distance.

The most important features at a glance

- Reliable object detection even at large distances
- Real background suppression for a sensing distance of up to 2 m even on dark objects
- Simple alignment due to bright, clearly visible beam spot
- Simple and fast setting with potentiometer
- Through-beam sensor with test input for function check
- Varied and time-saving assembly options



Photoelectric Sensors

BOS 50K

Product overview



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type	Sensing distance/Range	Light type	Output			Switching type		Switching frequency	U _S	Connec-tion	Special features		Page
			PNP transistor	IO-Link	Contamination output	Light switching	Dark switching				Polarizing filter	Teach-in	
Diffuse sensor with background suppression		Red light							10...30VDC	M12 connector, 4-pin			
BOS018P BOS 50K-PA-RH12-S4	200...2000 mm	■	■			■	■	500 Hz	■	■			220
BOS018N BOS 50K-PS-RH12-S4	200...2000 mm	■	■			■		500 Hz	■	■			220
BOS0156 BOS 50K-PSV-RH12-S4	200...2000 mm	■	■	■		■		500 Hz	■	■			220
BOS018U BOS 50K-POV-RH12-S4	200...2000 mm	■	■	■		■		500 Hz	■	■			220
Diffuse sensor													
BOS01CS BOS 50K-PA-RD10-S4	1...2000 mm	■	■			■	■	400 Hz	■	■			221
BOS01CP BOS 50K-PS-RD10-S4	1...2000 mm	■	■			■		400 Hz	■	■			221
BOS01JO BOS 50K-PO-RD10-S4	1...2000 mm	■	■				■	400 Hz	■	■			221
BOS01JA BOS 50K-PU-RD11-S4	1...3500 mm	■	■			■	■	200 Hz	■	■	■		221
BOS01JJ BOS 50K-PI-RD11-S4	1...3500 mm	■	■	■		■	■	200 Hz	■	■	■		221
Retroreflective sensor													
BOS01CR BOS 50K-PA-PR10-S4	0.1...18 m	■	■			■	■	400 Hz	■	■	■		222
BOS01CL BOS 50K-PS-PR10-S4	0.1...18 m	■	■				■	400 Hz	■	■	■		222
BOS01HY BOS 50K-PO-PR10-S4	0.1...18 m	■	■			■		400 Hz	■	■	■		222
Through-beam sensor Receiver													
BOS01CK BOS 50K-PA-RE10-S4	0...60 m	■	■			■	■	400 Hz	■	■			223
BOS01CM BOS 50K-PS-RE10-S4	0...60 m	■	■				■	400 Hz	■	■			223
BOS01HZ BOS 50K-PO-RE10-S4	0...60 m	■	■			■		400 Hz	■	■			223
Through-beam sensor Emitter													
BOS01EU BOS 50K-X-RS10-S4		■							■	■			223
BOS01CN BOS 50K-XT-RS10-S4		■							■	■			223

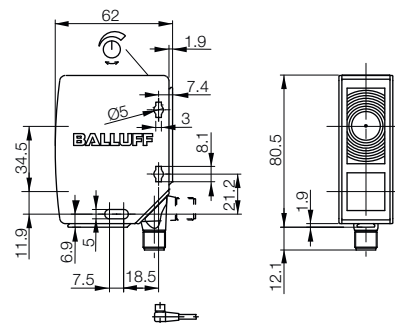
NPN on request



Type			Diffuse sensor with background suppression
Detection range			200...2000 mm
PNP	Complementary	Ordering code	BOS018P
		Part number	BOS 50K-PA-RH12-S4
PNP	NO/NC	Ordering code	
	Switchable	Part number	
PNP	NO/NC	Ordering code	
	Switchable IO-Link	Part number	
PNP	NO	Ordering code	BOS018N
		Part number	BOS 50K-PS-RH12-S4
PNP	NC	Ordering code	
		Part number	
PNP	NO with	Ordering code	BOS0156
	Error output	Part number	BOS 50K-PSV-RH12-S4
PNP	NC with	Ordering code	BOS018U
	Error output	Part number	BOS 50K-POV-RH12-S4
Supply voltage U_s			10...30 V DC
Output current			100 mA
No-load supply current I_0 max.			≤ 50 mA
Switching type			Light/dark switching
Polarity reversal/short-circuit protected			Yes/Yes
Settings			Potentiometer, 10-turn
Emitter, light type			LED, red light
Wavelength			630 Nm
Light spot diameter			75×75 mm at 1.5 m
Gray value shift (90%/18%)			8 %
Power indicator			Green LED
Received light indicator			Yellow LED
Stability indicator			
Error indicator			Yellow LED (flashes)
Response time			1 ms
Switching frequency f			500 Hz
Degree of protection as per IEC 60529			IP 67
Ambient temperature T_a			-10...+60 °C
Permissible ambient light			10 klx
Material	Housing		ABS/PC
	Optical surface		Glass
Connection			M12 connector, 4-pin

Reference object: white, 90% reflection, 200×200 mm

For wiring diagrams see page 227.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric

Distance

Sensors

for Analog

Distance

Measurement

Accessories for

Photoelectric

Sensors



Diffuse sensor

1...2000 mm

BOS01CS

BOS 50K-PA-RD10-S4

BOS01CP

BOS 50K-PS-RD10-S4

BOS01J0

BOS 50K-PO-RD10-S4

Diffuse sensor

1...3500 mm

BOS01JA

BOS 50K-PU-RD11-S4

BOS01JJ **IO-Link**

BOS 50K-PI-RD11-S4

10...30 V DC

100 mA

≤ 50 mA

Light/dark switching

Yes/Yes

Potentiometer, 270°

LED, red light

630 Nm

50×50 mm at 2 m

Green LED

Yellow LED

Yellow LED, flashes

1.25 ms

400 Hz

IP 67

-5...+55 °C

5 klx

ABS/PC

Glass

M12 connector, 4-pin

10...30 V DC

100 mA

≤ 50 mA

Light/dark switching

Yes/Yes

Teach-in

LED, red light

630 Nm

80×80 mm at 3.5 m

Green LED

Yellow LED

Yellow LED, flashes

2.5 ms

200 Hz

IP 67

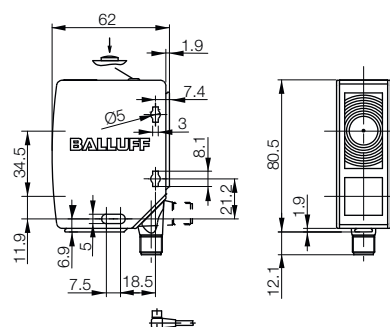
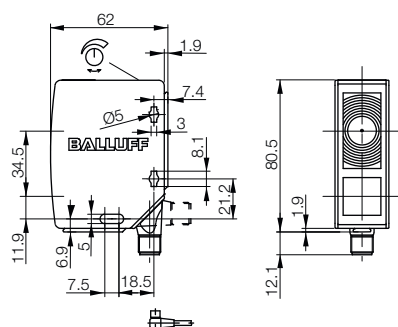
-5...+55 °C

10 klx

ABS/PC

Glass

M12 connector, 4-pin

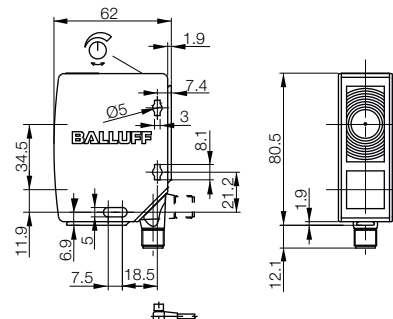


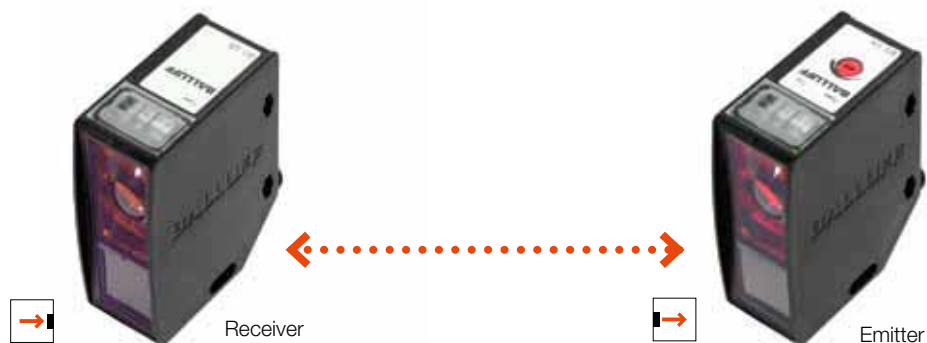


Type	Retroreflective sensor		
Detection range	0.1...18 m		
PNP NO/NC	Polarizing filter	Ordering code	BOS01CR
		Part number	BOS 50K-PA-PR10-S4
PNP NO	Polarizing filter	Ordering code	BOS01CL
		Part number	BOS 50K-PS-PR10-S4
PNP NC	Polarizing filter	Ordering code	BOS01HY
		Part number	BOS 50K-PO-PR10-S4
Emitter	Test input	Ordering code	
		Part number	
Emitter		Ordering code	
		Part number	
Supply voltage U_s	10...30 V DC		
Output current	100 mA		
No-load supply current I_0 max.	≤ 50 mA		
Switching type	Light/dark		
Polarity reversal/short-circuit protected	Yes/Yes		
Settings	Potentiometer, 270°		
Emitter, light type	LED, red light		
Wavelength	630 Nm		
Light spot diameter	200×200 mm at 10 m		
Power indicator	Green LED		
Received light indicator	Yellow LED		
Stability indicator	Yellow LED flashes		
Response time	1.25 ms		
Switching frequency f	400 Hz		
Degree of protection as per IEC 60529	IP 67		
Ambient temperature T_a	-5...+55 °C		
Permissible ambient light	10 klx		
Material	Housing	ABS/PC	
	Optical surface	Glass	
Connection	M12 connector, 4-pin		

Reference object: white, 90% reflection, 200×200 mm
 Reference reflector: BOS R-1

For wiring diagrams see page 227.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Accessories for Photoelectric Sensors

Accessories for Photoelectric Sensors

Accessories for Photoelectric Sensors

Accessories for Photoelectric Sensors

Accessories for Photoelectric Sensors

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Accessories for Photoelectric Sensors

Accessories for Photoelectric Sensors

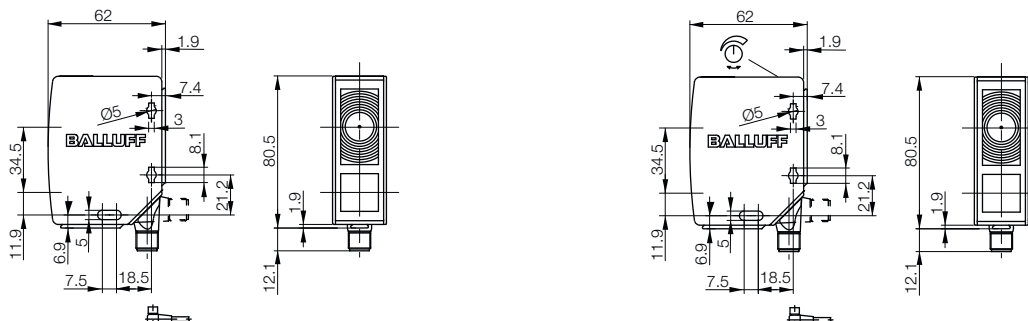
Accessories for Photoelectric Sensors

Accessories for Photoelectric Sensors

Accessories for Photoelectric Sensors

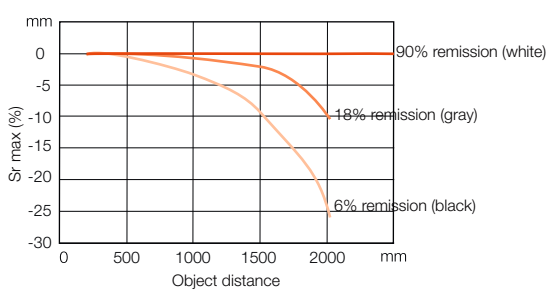
Accessories for Photoelectric Sensors

Through-beam sensor 0...60 m BOS01CK BOS 50K-PA-RE10-S4	Through-beam sensor 0...60 m BOS01CN BOS 50K-XT-RS10-S4
BOS01CM BOS 50K-PS-RE10-S4	BOS01EU BOS 50K-X-RS10-S4
BOS01HZ BOS 50K-PO-RE10-S4	
10...30 V DC 100 mA ≤ 35 mA Light/dark Yes/Yes Fixed	10...30 V DC ≤ 50 mA Yes/Yes Potentiometer, 270° LED, red light 630 Nm 180×180 mm at 10 m Green LED
Green LED Yellow LED	
1.25 ms 400 Hz IP 67 -5...+55 °C 10 klx ABS/PC Glass M12 connector, 4-pin	IP 67 -5...+55 °C 10 klx ABS/PC Glass M12 connector, 4-pin



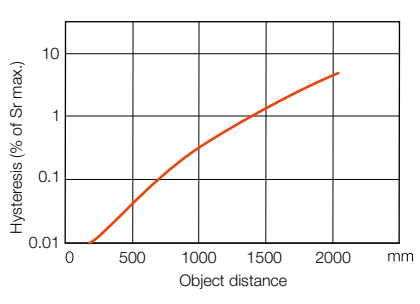
Photoelectric Sensors
BOS 50K
Function diagrams

Diffuse sensor with background suppression
BOS 50K--RH12-S4--...



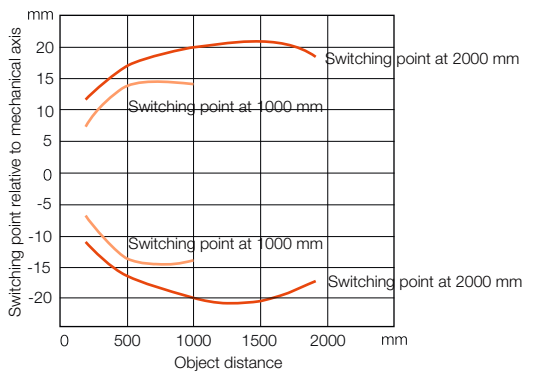
Switching distance deviation depending on object distance
 With differing level of remission

Diffuse sensor
BOS 50K--RH12-S4--...



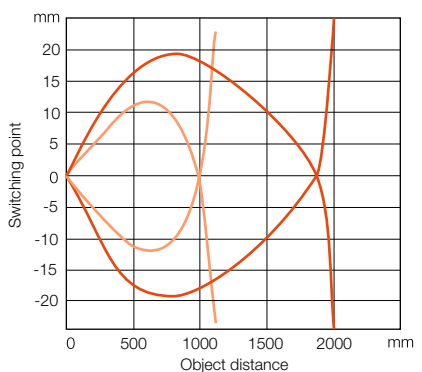
Switching hysteresis depending on object distance

Diffuse sensor with background suppression
BOS 50K--RH12-S4--...



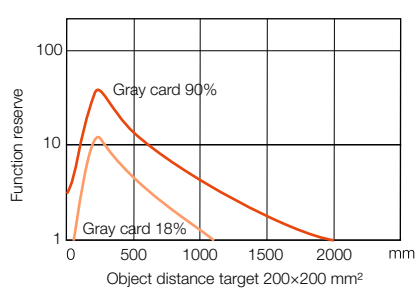
Response curve with switch-on point from left and right side

Diffuse sensor
BOS 50K--RD10-S4



Response curve depending on distance

Diffuse sensor
BOS 50K--RD10-S4



Function reserve depending on distance



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

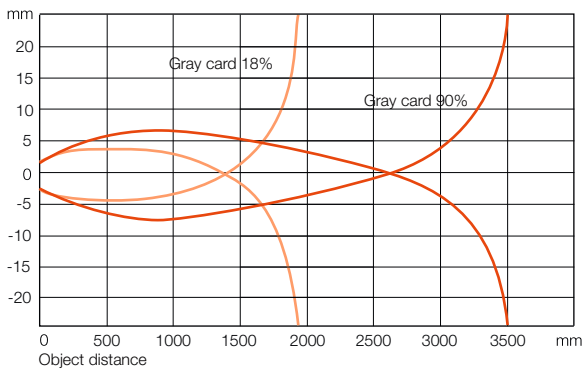
BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

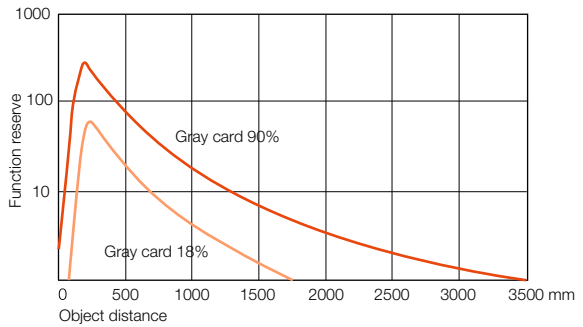
Accessories for Photoelectric Sensors

Diffuse sensor
BOS 50K-..-RD11-S4



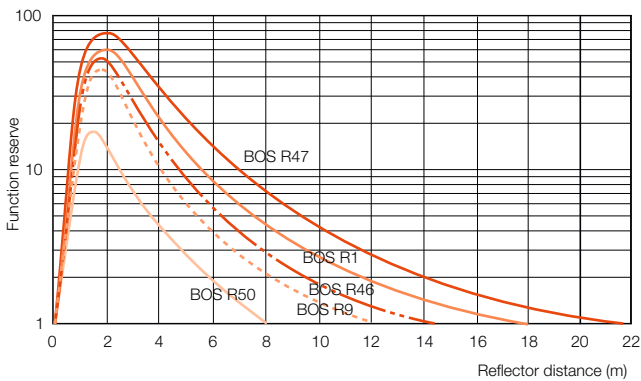
Response curve depending on object distance

Diffuse sensor
BOS 50K-..-RD11-S4



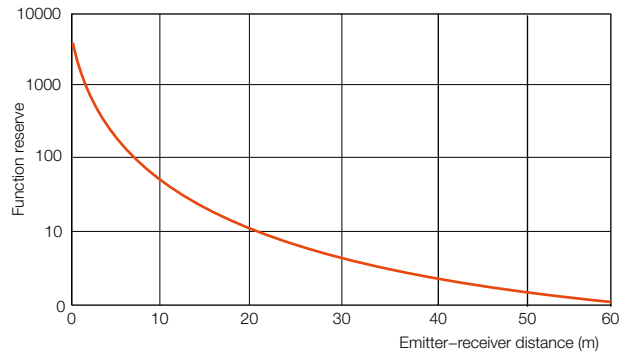
Function reserve depending on object distance

Retroreflective sensor
BOS 50K-..-PR10-S4

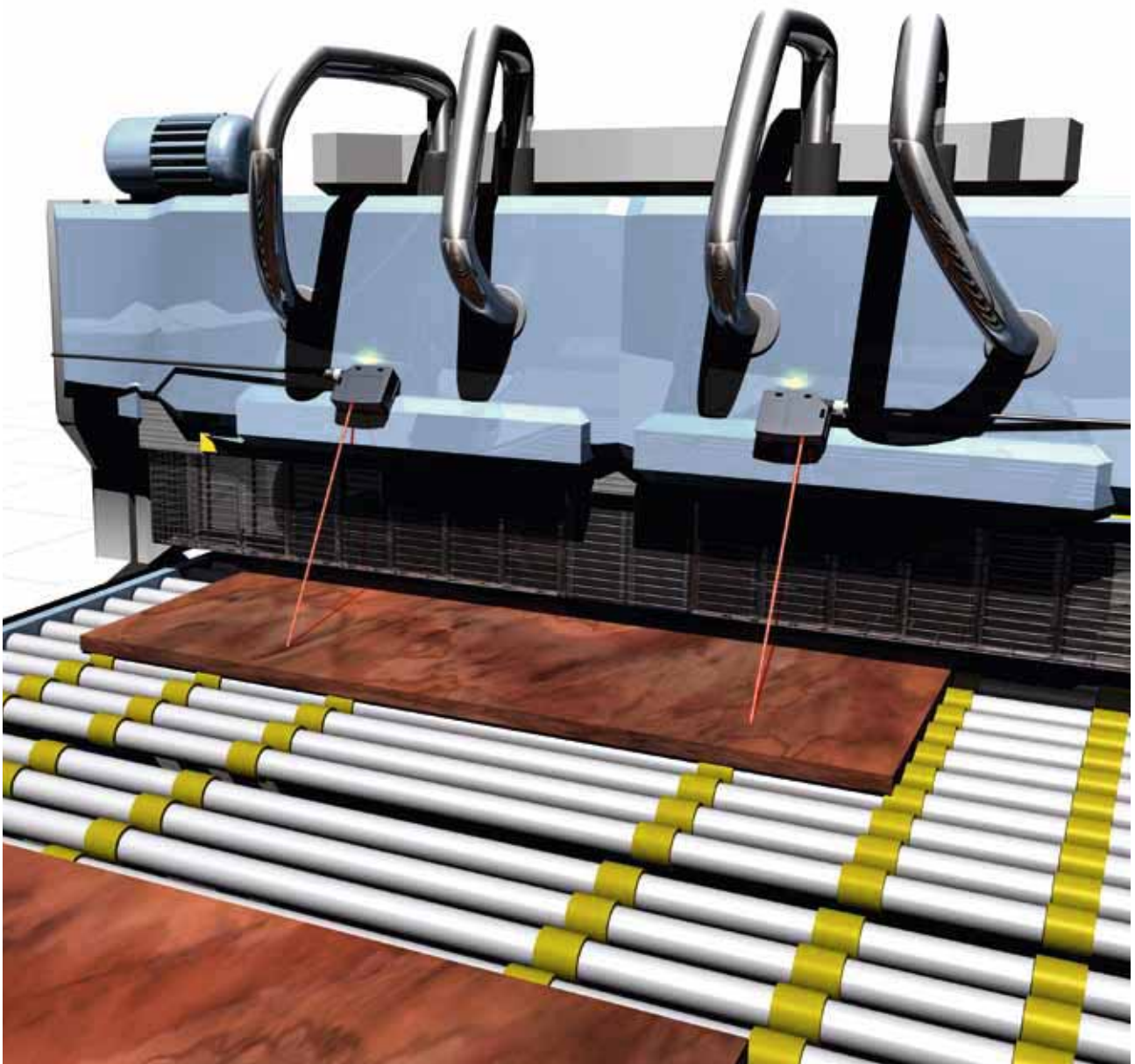


Function reserve depending on distance between sensor and reflector

Through-beam sensor
BOS 50K-..-RE/RS10-S4



Function reserve depending on distance between emitter and receiver



Photoelectric Sensors

BOS 50K

Light spot sizes, function diagrams, connection, accessories

Light spot sizes

BOS 50K...RD10...

Distance	Light spot Ø
0.5 m	25×25 mm
1 m	30×30 mm
2 m	45×45 mm

BOS 50K...PR10...

Distance	Light spot Ø
0.5 m	25×25 mm
1 m	30×30 mm
2 m	45×45 mm
3 m	65×65 mm
4 m	85×85 mm

BOS 50K...PS10...

Distance	Light spot Ø
10 m	200×200 mm

BOS 50K...RD11...

Distance	Light spot Ø
0.5 m	25×25 mm
1 m	30×30 mm
2 m	45×45 mm
3 m	65×65 mm
3.5 m	75×75 mm

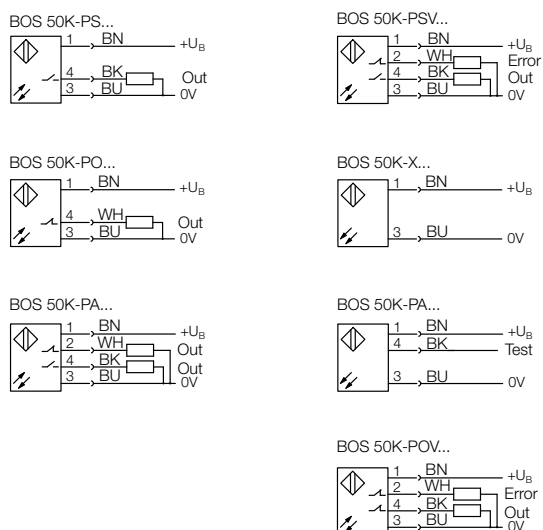
BOS 50K...RH1210...

Distance	Light spot Ø
200 mm	22×22 mm
2000 mm	80×80 mm

Indicators and operating elements



Wiring diagrams



Recommended accessories (please order separately)

Description	Ordering code
① Reflector	BAM00UK
② Reflector	BAM00WL
③ Reflector	BAM01JN
④ Reflector	BAM01JP
⑤ Reflective tape	BAM01JM
⑥ Mounting bracket	BAM01E8
⑦ Weld protection	BAM01U6



Suitable connectors (please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N

Connectors without LED are suitable for PNP and NPN sensors.



You can find special accessories for diffuse sensors, such as **reflectors, apertures, lenses, filters and deflection heads**, in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric

Distance

Sensors

for Analog

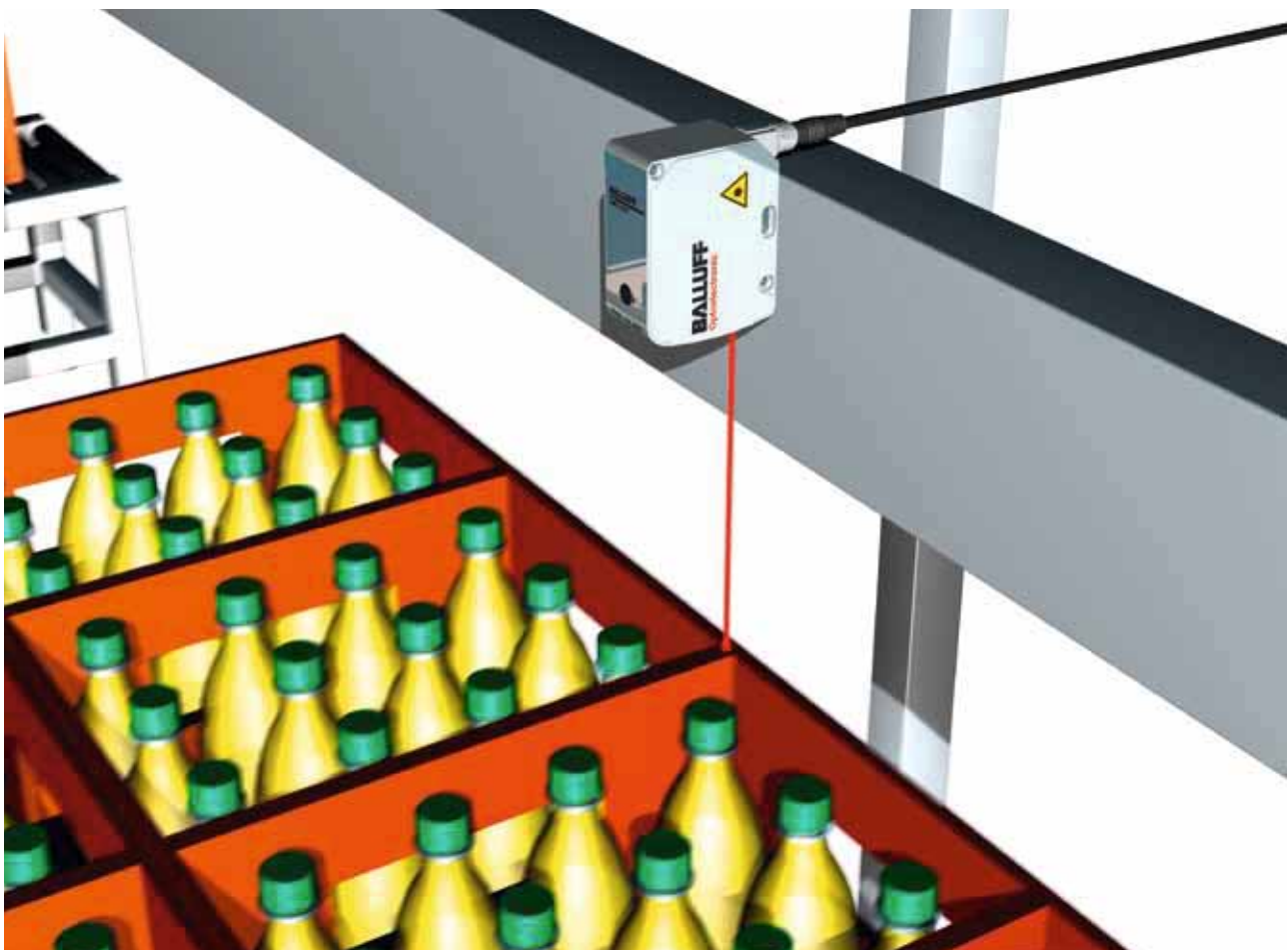
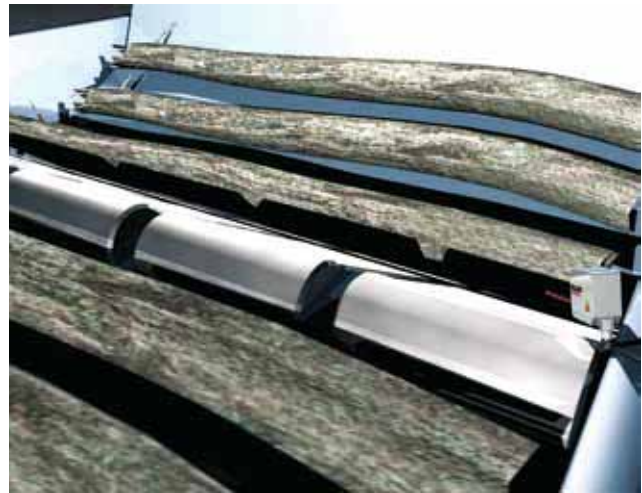
Distance

Measurement

Accessories for Photoelectric Sensors

The **BOS 63M** is a specialist among the diffuse sensors with regard to background suppression. The laser makes it ideally suited for detecting objects from far away when they are right in front of a background. The precise laser beam detects even small objects or object details from great distances.

With two solid 4-turn potentiometers, the two switching outputs can be configured independently and exactly. An integrated error indicator informs you about the current sensor status.



Photoelectric Sensors
BOS 63M
Product overview



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors
BGL

Angle Sensors
BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type

- Ordering code
- Part number



Diffuse sensor with background suppression

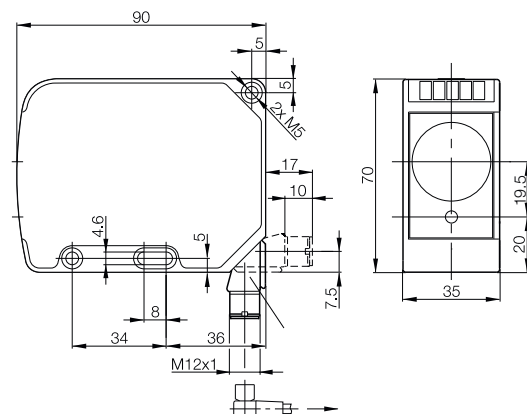
Sensing distance/Range	Light type	Output	Switching type	Switching frequency	U _S	Connection	Special features	Page
BOS019J BOS 63M-PS-LH13-S4	Laser	2× PNP transistor	Light switching	250 Hz	15...30 V DC	M12 connector, 4-pin		230

NPN on request



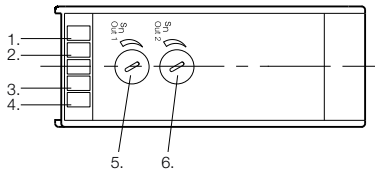
Type	Diffuse sensor with background suppression	
Detection range	0.2...6 m	
2× PNP	Ordering code	BOS019J
	Part number	BOS 63M-PS-LH13-S4
Supply voltage U_S	15...30 V DC	
Output current	200 mA	
No-load supply current I_0 max.	75 mA	
Switching type	Light switching	
Polarity reversal/short-circuit protected	Yes/Yes	
Settings	Potentiometer, 4-turn (2x)	
Emitter, light type	Laser, red light	
Wavelength	660 Nm	
Laser class	2	
Light spot size	10 mm	
Gray value shift	$\leq 1.5\%$	
Switching hysteresis	≤ 15 mm	
Repeat accuracy	$\leq \pm 4$ mm	
Power-on indicator	Green LED	
Output function indicator	Yellow LED (2x)	
Error indicator	Red LED	
Response time	2 ms	
Switching frequency f	250 Hz	
Degree of protection as per IEC 60529	IP 67	
Ambient temperature T	$-10...+60^\circ\text{C}$	
Permissible ambient light	10 klx	
Material	Housing	GD-AL
	Optical surface	Glass
Connection	M12 connector, 4-pin	

Reference object: white, 90% reflection, 200×200 mm



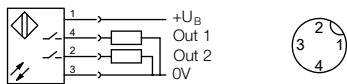


Indicators and operating elements

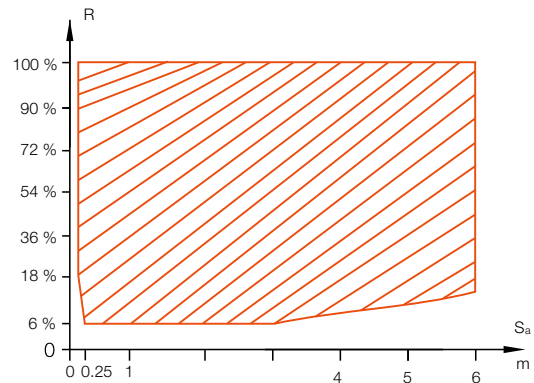


1. Power indicator (green)
2. Output function indicator Out 1 (yellow)
3. Output function indicator Out 2 (yellow)
4. Error indicator (red)
5. 4-turn potentiometer for switching distance 1
6. 4-turn potentiometer for switching distance 2

Wiring diagram



Working range as a function of object reflectivity



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Recommended accessories
(please order separately)

Description	Ordering code
Mounting bracket	BAM00P6



You can find special accessories for diffuse sensors, such as **reflectors, apertures, lenses, filters and deflection heads**, in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Suitable connectors
(please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N



Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.

The new photoelectric sensor family BOS 64K is suitable for being connected directly to a power grid with 230 V. A 24 V power supply is not required. The relay output makes it possible to directly switch loads up to 3 A. The housing with IP 67 degree of protection is made of fiberglass-reinforced plastic.

For a wide variety of applications you can get diffuse sensors, diffuse sensors with background suppression (HGA), retroreflective sensors and through-beam sensors.

The diffuse, retroreflective and through-beam sensors can be conveniently adjusted using a 240° potentiometer. The diffuse sensor with background suppression is precisely adapted to applications via a 7-turn potentiometer. Numerous special functions such as On and Off delay or One-Shot with an adjustable time are available.

Applications

- Monitoring of doors and gates
- Scanning the loading of pallets
- Detecting vehicles on a ramp
- With applications requiring a high range
- If no power supply is available





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL




Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type	Sensing distance/Range	Light type		Output	Switching type		Switching frequency	U _s		Connection	Page
		Red light	Infrared		Light switching	Dark switching		20...240 V AC	24...60 V DC		
 Diffuse sensor with background suppression											
BOS01K1 BOS 64K-AA-IH12-TG	0.2...2 m	■		■	■	■	■	■	■	■	234
 Diffuse sensor											
BOS01K2 BOS 64K-AA-ID10-TG	0.05...2 m	■		■	■	■	■	■	■	■	234
 Retroreflective sensor with polarizing filter											
BOS01K3 BOS 64K-AA-PR10-TG	0.1...10 m	■		■	■	■	■	■	■	■	235
 Through-beam sensor Receiver											
BOS01K4 BOS 64K-AA-IE10-TG	0...50 m	■		■	■	■	■	■	■	■	235
 Through-beam sensor Emitter											
BOS01K5 BOS 64K-AA-IS10-TG	0...50 m	■						■	■	■	235



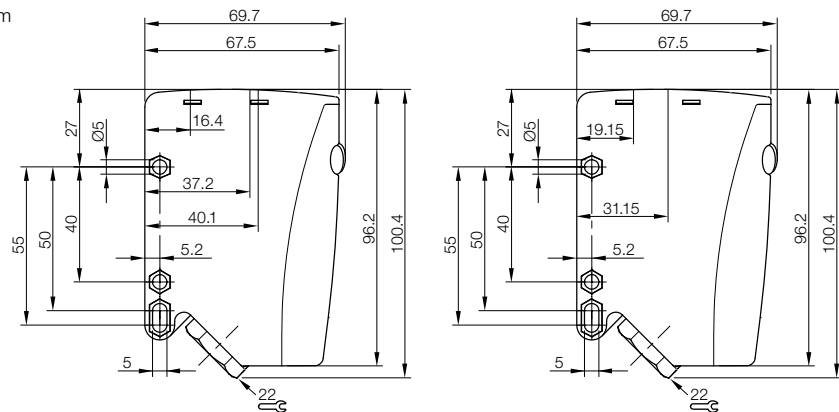


Type		Diffuse sensor with background suppression	Diffuse sensor
Detection range		0.2...2 m	0.05...2 m
Time function	Ordering code	BOS01K1	BOS01K2
	Part number	BOS 64K-AA-IH12-TG	BOS 64K-AA-ID10-TG
Time function	Ordering code		
Polarizing filter, red light	Part number		
Time function	Ordering code		
Receiver	Part number		
Time function	Ordering code		
Emitter	Part number		
Supply voltage AC U_s		24...240 V AC	24...240 V AC
Supply voltage DC U_s		24...60 V DC	24...60 V DC
Switching type		Light and dark (switchable)	Light and dark (switchable)
Light type		Infrared	Infrared
Settings		Potentiometer, 7-turn	Potentiometer, 240°
Power-on indicator			
Output function indicator		Yellow LED	Yellow LED
Stability indicator		Green LED	Green LED
Response time		25 ms	25 ms
Switching frequency f		20 Hz	20 Hz
Degree of protection as per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-25...+55 °C	-25...+55 °C
Permissible ambient light		as per EN 60947-5-2	as per EN 60947-5-2
Material	Housing	PBT (fiberglass-reinforced)	PBT (fiberglass-reinforced)
	Optical surface	PC	PC
Connection		Screw terminal	Screw terminal

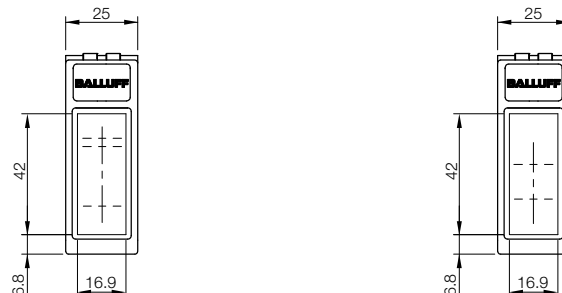
Reference object: white, 90% reflection, 200x200 mm
 Reference reflector: BOS R-1

For wiring diagrams see page 237.

Mounting bracket in scope of delivery for sensor.



Wiring chamber



Photoelectric Sensors

BOS 64K (AC)



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

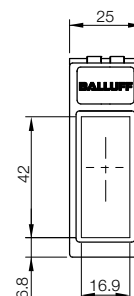
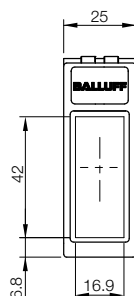
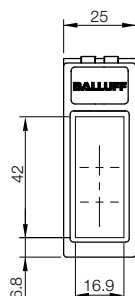
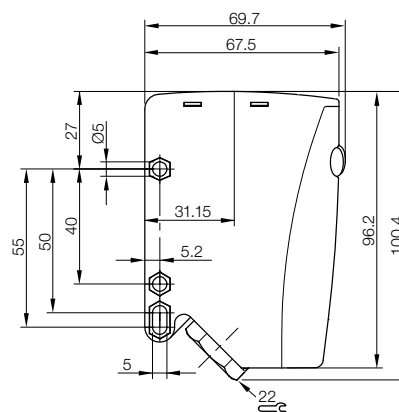
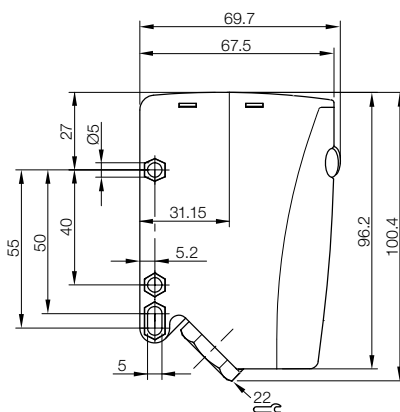
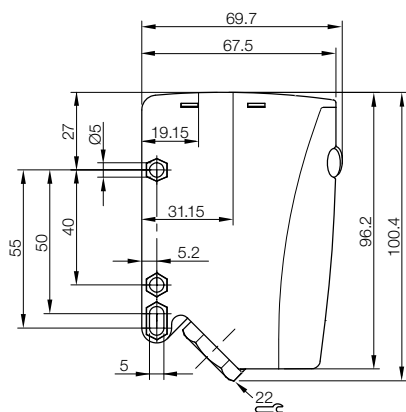
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Retroreflective sensor 0.1...10 m	Through-beam sensor 0...50 m	Through-beam sensor 0...50 m
BOS01K3 BOS 64K-AA-PR10-TG	BOS01K4 BOS 64K-AA-IE10-TG	BOS01K5 BOS 64K-AA-IS10-TG
24...240 V AC 24...60 V DC Light and dark (switchable) Red light Potentiometer, 240°	24...240 V AC 24...60 V DC Light and dark (switchable) Infrared Potentiometer, 240°	24...240 V AC 24...60 V DC Infrared Green LED
Yellow LED Green LED 25 ms 20 Hz IP 67 -25...+55 °C as per EN 60947-5-2 PBT (fiberglass-reinforced) PC Screw terminal	Yellow LED Green LED 25 ms 20 Hz IP 67 -25...+55 °C as per EN 60947-5-2 PBT (fiberglass-reinforced) PC Screw terminal	IP 67 -25...+55 °C PBT (fiberglass-reinforced) PC Screw terminal

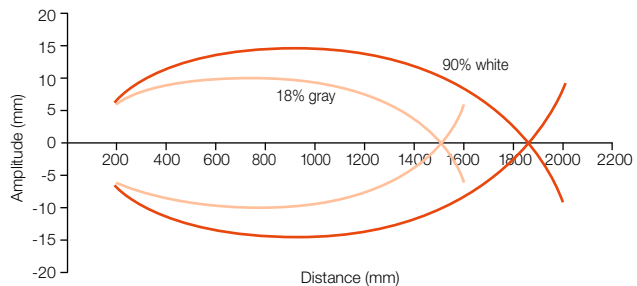


Photoelectric Sensors

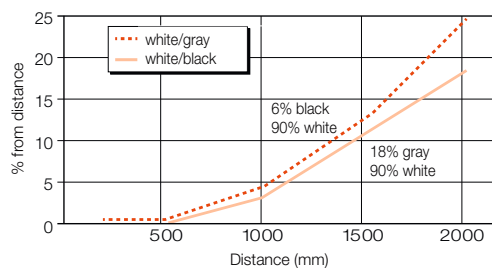
BOS 64K (AC)

Function diagrams, connection

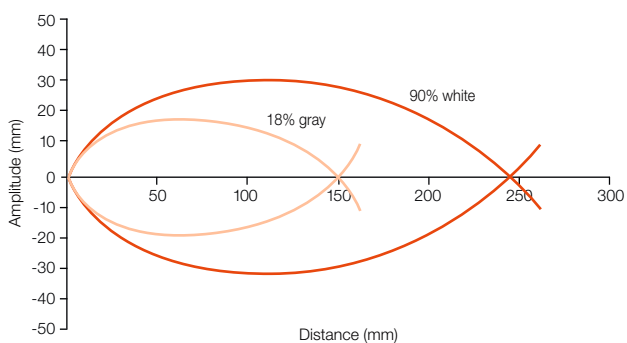
Diffuse sensor with background suppression, BOS01K1



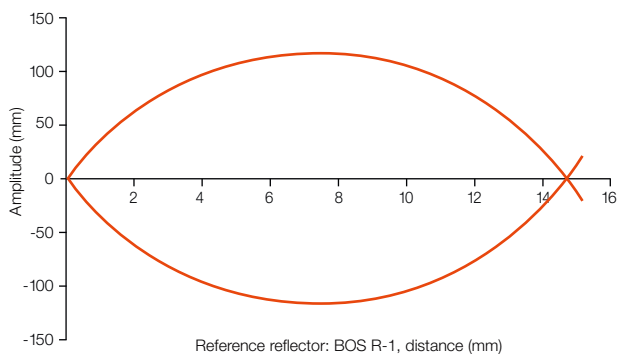
scanning features



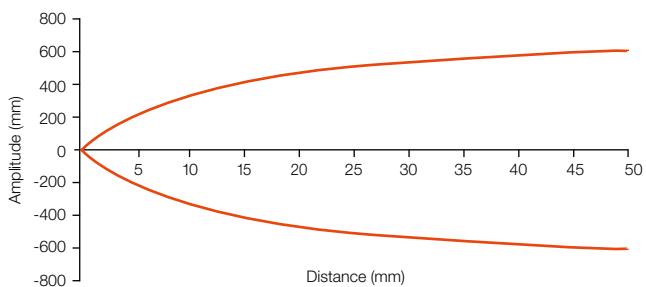
Diffuse sensor, BOS01K2

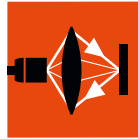


Retroreflective light sensor on BOS R-1 BOS01K3, BOS01K4



Through-beam sensor, BOS01K5





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

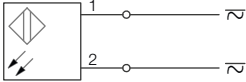
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

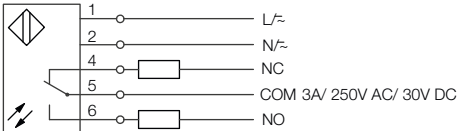
Accessories for Photoelectric Sensors

Wiring diagrams

BOS 64K through-beam sensor, emitter,
 AC/DC, direct/alternating current voltage,
 Screw terminals



BOS 64K diffuse sensor, diffuse sensor with background suppression,
 Through-beam sensor, receiver,
 AC/DC, direct/alternating current voltage,
 Relay-changeover contact, screw terminals



Recommended accessories
 (please order separately)

Description	Ordering code
Reflector	BAM00UK



You can find special accessories for diffuse sensors, such as **reflectors, apertures, lenses, filters and deflection heads**, in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

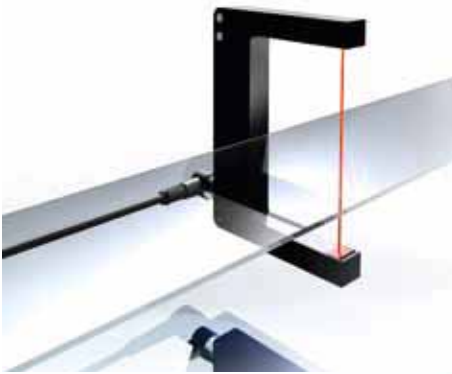
Through-beam sensors are unsurpassed in their accuracy, their ability to distinguish small parts and fine detail and their operating reliability. However, they do take some time to install and configure. This does not apply to fork sensors, since the emitter and receiver are already installed and easy to adjust. Nevertheless, their accuracy, ability to distinguish small parts and fine detail and their operating reliability is outstanding. Laser fork sensors achieve the best results in these kinds of tasks. Balluff laser fork sensors are ideally used for precisely positioning and reliably detecting fast-moving processes and small parts. This opens a vast range of applications in robotics and automation.

Features

- Integrated electronic processor unit
- Rugged metal housing
- Glass optical surface
- High resolution
- Available in red light, laser light, IR or pin point
- Identical housing dimensions for all light types
- 10x10 mm fork arm, even for large fork openings
- Stackable
- Laser Class 1

Applications

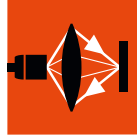
- Parts sensing on conveyor and feed belts
- Label sensing on transparent backing material
- Part dimension checking
- Counting parts in assembly lines
- Tool break monitoring
- Position checking
- Feed control on automatic assembly equipment
- Checking for completeness (e.g. connector pins)
- Level monitoring of containers
- Handling- and assembly



Photoelectric Sensors

Fork sensors BGL

Product overview



Photoelectric Sensors

Photoelectric Sensors
Cylinder Designs
Block Designs

Fork Sensors BGL

Angle Sensors BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type	Fork opening	Resolution	Light type					Output		Switching type		Switching frequency	U _s	Connection		Features		Page
			Red light	Red light, pin point	Laser light	Infrared	Red and green light	PNP transistor	DSC (Dynamic Sensor Control)	Light switching	Dark switching			10...30 V DC	M8 plug, 3-pin	M8 plug, 4-pin	Transparency detection	
Fork sensors																		
BGL001W	BGL 5A-001-S49	5 mm	0.3 mm	■					■	■	■	3 kHz	■	■				240
BGL001Z	BGL 5A-005-S49	5 mm	0.2 mm		■				■	■	■	5 kHz	■	■				244
BGL0021	BGL 5A-007-S49	5 mm	0.8 mm				■		■	■	■	3 kHz	■	■				248
BGL0001	BGL 10A-001-S49	10 mm	0.3 mm	■					■	■	■	3 kHz	■	■				240
BGL0003	BGL 10A-005-S49	10 mm	0.2 mm		■				■	■	■	5 kHz	■	■				244
BGL0005	BGL 10A-007-S49	10 mm	0.8 mm				■		■	■	■	3 kHz	■	■				248
BGL000R	BGL 20A-001-S49	20 mm	0.3 mm	■					■	■	■	1.5 kHz	■	■				241
BGL000U	BGL 20A-005-S49	20 mm	0.2 mm		■				■	■	■	5 kHz	■	■				245
BGL000Y	BGL 20A-007-S49	20 mm	0.8 mm				■		■	■	■	2 kHz	■	■				249
BGL0016	BGL 30A-001-S49	30 mm	0.3 mm	■					■	■	■	1.5 kHz	■	■				241
BGL0019	BGL 30A-003-S49	30 mm	50 μm			■			■	■	■	5 kHz	■	■				252
BGL001C	BGL 30A-005-S49	30 mm	0.2 mm		■				■	■	■	5 kHz	■	■				245
BGL001F	BGL 30A-007-S49	30 mm	0.8 mm				■		■	■	■	2 kHz	■	■				249
BGL003J	BGL 30A-011-S49	30 mm	0.6 mm				■		■	■	■	2 kHz	■	■			■	256
BGL003N	BGL 30A-013-S49	30 mm	0.8 mm				■		■	■	■	200 Hz	■	■				257
BGL001J	BGL 50A-001-S49	50 mm	0.4 mm	■					■	■	■	1.5 kHz	■	■				241
BGL001M	BGL 50A-003-S49	50 mm	80 μm			■			■	■	■	5 kHz	■	■				253
BGL001P	BGL 50A-005-S49	50 mm	0.3 mm		■				■	■	■	5 kHz	■	■				245
BGL001T	BGL 50A-007-S49	50 mm	1.0 mm				■		■	■	■	2 kHz	■	■				249
BGL003P	BGL 50A-013-S49	50 mm	1.0 mm				■		■	■	■	200 Hz	■	■				257
BGL0023	BGL 80A-001-S49	80 mm	0.4 mm	■					■	■	■	1.5 kHz	■	■				242
BGL0025	BGL 80A-003-S49	80 mm	0.1 mm			■			■	■	■	5 kHz	■	■				253
BGL0027	BDL 80A-005-S49	80 mm	0.4 mm		■				■	■	■	5 kHz	■	■				246
BGL0029	BDL 80A-007-S49	80 mm	1.2 mm				■		■	■	■	2 kHz	■	■				250
BGL002T	BDL 80A-009-S49	80 mm	50 μm			■			■	■	■	5 kHz	■	■			■	255
BGL003L	BDL 80A-011-S49	80 mm	0.8 mm				■		■	■	■	2 kHz	■	■			■	257
BGL003R	BDL 80A-013-S49	80 mm	1.2 mm				■		■	■	■	200 Hz	■	■				257
BGL0007	BGL 120A-001-S49	120 mm	0.5 mm	■					■	■	■	1.5 kHz	■	■				242
BGL0009	BGL 120A-003-S49	120 mm	0.15 mm			■			■	■	■	5 kHz	■	■				253
BGL000C	BGL 120A-005-S49	120 mm	0.5 mm		■				■	■	■	5 kHz	■	■				246
BGL000F	BGL 120A-007-S49	120 mm	1.5 mm				■		■	■	■	1 kHz	■	■				250
BGL000J	BGL 180A-001-S49	180 mm	0.6 mm	■					■	■	■	1.5 kHz	■	■				243
BGL000L	BGL 180A-005-S49	180 mm	0.6 mm		■				■	■	■	5 kHz	■	■				247
BGL000N	BGL 180A-007-S49	180 mm	1.5 mm				■		■	■	■	2 kHz	■	■				251
BGL0010	BGL 220A-001-S49	220 mm	0.6 mm	■					■	■	■	1.5 kHz	■	■				243
BGL0012	BGL 220A-005-S49	220 mm	0.6 mm		■				■	■	■	5 kHz	■	■				247
BGL0014	BGL 220A-007-S49	220 mm	1.5 mm				■		■	■	■	2 kHz	■	■				251
BGL002L	BGL 21-IR	2 mm	0.25 mm				■		■	■	■	25 kHz	■	■			■	259
BGL002M	BGL 21-RG	2 mm	0.25 mm				■		■	■	■	25 kHz	■	■			■	259

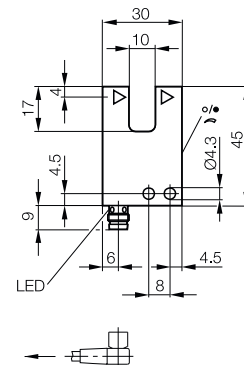
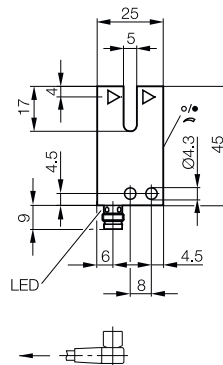
NPN on request



Series	BGL	BGL	
Fork opening	5 mm	10 mm	
Fork depth	17 mm	17 mm	
PNP NO/NC	Ordering code	BGL001W	BGL0001
	Part number	BGL 5A-001-S49	BGL 10A-001-S49
Supply voltage U_S	10...30 V DC	10...30 V DC	
No-load supply current I_0 max.	≤ 35 mA	≤ 35 mA	
Output current	200 mA	200 mA	
Switching type	Light/dark switching (selectable)	Light/dark switching (selectable)	
Polarity reversal/short-circuit protected	Yes/Yes	Yes/Yes	
Settings	Potentiometer, 270°	Potentiometer, 270°	
Emitter, light type	LED, red light	LED, red light	
Wavelength	640 Nm	640 Nm	
Resolution (smallest discernible part)	0.3 mm	0.3 mm	
Repeat accuracy	20 μ m	20 μ m	
Switching hysteresis	≤ 0.1 mm	≤ 0.1 mm	
Output function indicator	Yellow LED	Yellow LED	
Response time	0.166 ms	0.166 ms	
Switching frequency	3 kHz	3 kHz	
Degree of protection as per IEC 60529	IP 67	IP 67	
Ambient temperature T_a	-10...+60 °C	-10...+60 °C	
Ambient light limit according to	EN 60947-5-2	EN 60947-5-2	
Material	Housing: GD-Zn	GD-Zn	
	Optical surface: Glass	Glass	
Connection	M8 connector, 3-pin	M8 connector, 3-pin	



Other fork openings on request.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Fork Sensors

BGL

Angle Sensors

BWL

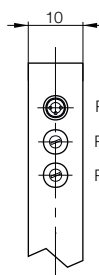
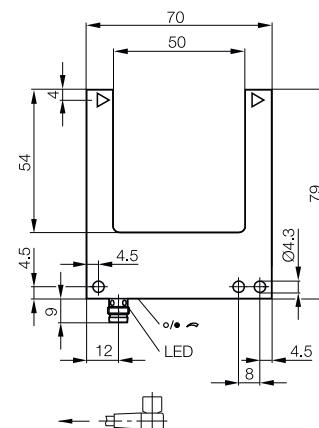
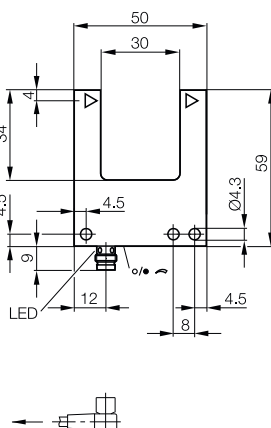
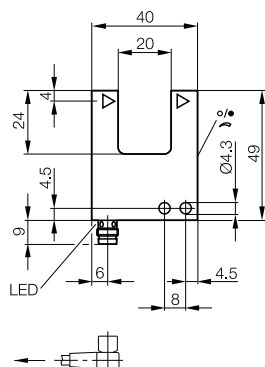
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

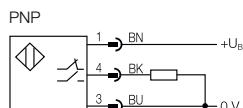
Accessories for Photoelectric Sensors



BGL 20 mm 24 mm BGL000R	BGL 30 mm 34 mm BGL0016	BGL 50 mm 54 mm BGL001J
BGL 20A-001-S49	BGL 30A-001-S49	BGL 50A-001-S49
10...30 V DC	10...30 V DC	10...30 V DC
≤ 35 mA	≤ 35 mA	≤ 35 mA
200 mA	200 mA	200 mA
Light/dark switching (selectable)	Light/dark switching (selectable)	Light/dark switching (selectable)
Yes/Yes	Yes/Yes	Yes/Yes
Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°
LED, red light	LED, red light	LED, red light
640 Nm	640 Nm	640 Nm
0.3 mm	0.3 mm	0.4 mm
20 μm	20 μm	40 μm
≤ 0.1 mm	≤ 0.1 mm	≤ 0.15 mm
Yellow LED	Yellow LED	Yellow LED
0.33 ms	0.33 ms	0.33 ms
1.5 kHz	1.5 kHz	1.5 kHz
IP 67	IP 67	IP 67
-10...+60 °C	-10...+60 °C	-10...+60 °C
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
GD-Zn	GD-Zn	GD-Zn
Glass	Glass	Glass
M8 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin



Wiring diagram



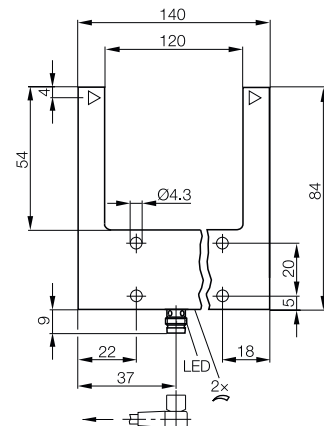
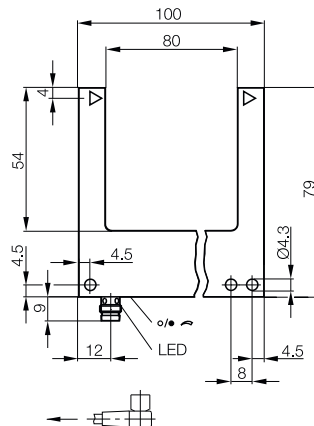


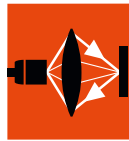
Series	BGL	BGL	
Fork opening	80 mm	120 mm	
Fork depth	54 mm	54 mm	
PNP NO/NC	Ordering code	BGL0023	BGL0007
	Part number	BGL 80A-001-S49	BGL 120A-001-S49
Supply voltage U_S	10...30 V DC	10...30 V DC	
No-load supply current I_0 max.	≤ 35 mA	≤ 35 mA	
Output current	200 mA	200 mA	
Switching type	Light/dark switching (selectable)	Light/dark switching (selectable)	
Polarity reversal/short-circuit protected	Yes/Yes	Yes/Yes	
Settings	Potentiometer, 270°	Potentiometer, 270°	
Emitter, light type	LED, red light	LED, red light	
Wavelength	640 Nm	640 Nm	
Resolution (smallest discernible part)	0.4 mm	0.5 mm	
Repeat accuracy	60 μm	80 μm	
Switching hysteresis	≤ 0.2 mm	≤ 0.2 mm	
Output function indicator	Yellow LED	Yellow LED	
Response time	0.33 ms	0.33 ms	
Switching frequency	1.5 kHz	1.5 kHz	
Degree of protection as per IEC 60529	IP 67	IP 67	
Ambient temperature T_a	-10...+60 °C	-10...+60 °C	
Ambient light limit according to	EN 60947-5-2	EN 60947-5-2	
Material	Housing: GD-Zn	GD-Zn	
	Optical surface: Glass	Glass	
Connection	M8 connector, 3-pin	M8 connector, 3-pin	



Connector orientation

Other fork openings on request.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors BGL

Angle Sensors BWL

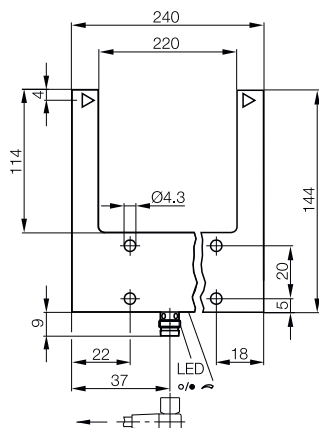
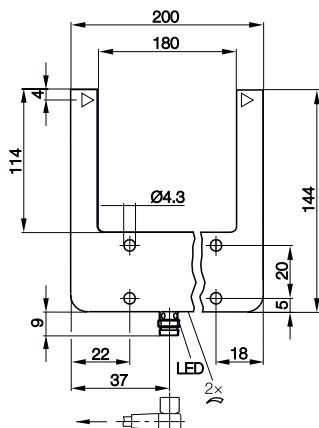
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

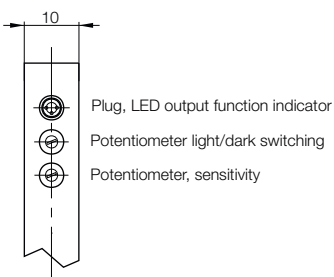
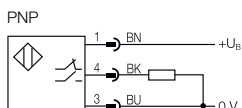
Accessories for Photoelectric Sensors



BGL	BGL	
180 mm	220 mm	
114 mm	114 mm	
BGL000J	BGL0010	
BGL 180A-001-S49	BGL 220A-001-S49	
10...30 V DC	10...30 V DC	
≤ 35 mA	≤ 35 mA	
200 mA	200 mA	
Light/dark switching (selectable)	Light/dark switching (selectable)	
Yes/Yes	Yes/Yes	
Potentiometer, 270°	Potentiometer, 270°	
LED, red light	LED, red light	
640 Nm	640 Nm	
0.6 mm	0.6 mm	
80 μm	80 μm	
≤ 0.2 mm	≤ 0.2 mm	
Yellow LED	Yellow LED	
0.33 ms	0.33 ms	
1.5 kHz	1.5 kHz	
IP 67	IP 67	
-10...+60 °C	-10...+60 °C	
EN 60947-5-2	EN 60947-5-2	
GD-Zn	GD-Zn	
Glass	Glass	
M8 connector, 3-pin	M8 connector, 3-pin	



Wiring diagram

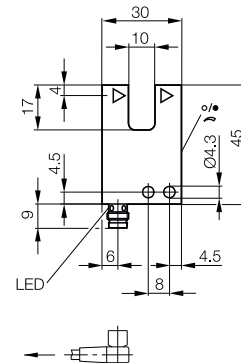
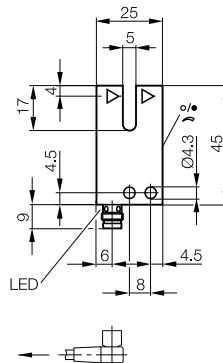




Series	BGL	BGL	
Fork opening	5 mm	10 mm	
Fork depth	17 mm	17 mm	
PNP NO/NC	Ordering code	BGL001Z	BGL0003
	Part number	BGL 5A-005-S49	BGL 10A-005-S49
Supply voltage U_S	10...30 V DC	10...30 V DC	
No-load supply current I_0 max.	≤ 35 mA	≤ 35 mA	
Output current	200 mA	200 mA	
Switching type	Light/dark switching (selectable)	Light/dark switching (selectable)	
Polarity reversal/short-circuit protected	Yes/Yes	Yes/Yes	
Settings	Potentiometer, 270°	Potentiometer, 270°	
Emitter, light type	Red light, pin point	Red light, pin point	
Wavelength	640 Nm	640 Nm	
Resolution (smallest discernible part)	0.2 mm	0.2 mm	
Repeat accuracy	20 μ m	20 μ m	
Switching hysteresis	≤ 70 μ m	≤ 70 μ m	
Output function indicator	Yellow LED	Yellow LED	
Response time	0.1 ms	0.1 ms	
Switching frequency	5 kHz	5 kHz	
Degree of protection as per IEC 60529	IP 67	IP 67	
Ambient temperature T_a	-10...+60 °C	-10...+60 °C	
Ambient light limit according to	EN 60947-5-2	EN 60947-5-2	
Material	Housing: GD-Zn Optical surface: Glass	GD-Zn Glass	
Connection	M8 connector, 3-pin	M8 connector, 3-pin	



Other fork openings on request.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Fork Sensors

BGL

Angle Sensors

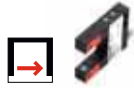
BWL

Photoelectric Sensors with Special Properties

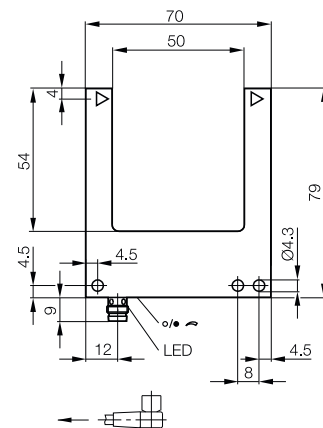
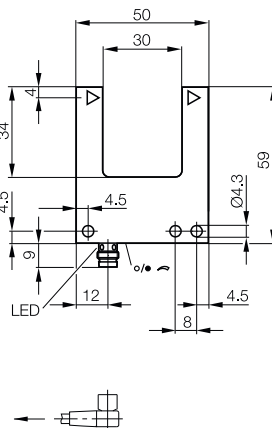
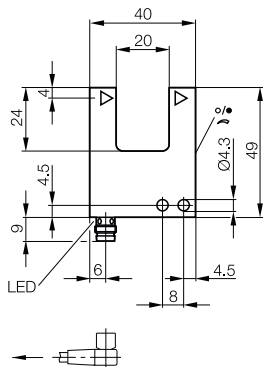
Photoelectric Distance Sensors

for Analog Distance Measurement

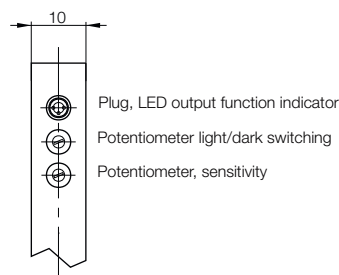
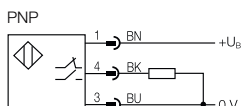
Accessories for Photoelectric Sensors



BGL 20 mm 24 mm BGL000U	BGL 30 mm 34 mm BGL001C	BGL 50 mm 54 mm BGL001P
BGL 20A-005-S49	BGL 30A-005-S49	BGL 50A-005-S49
10...30 V DC	10...30 V DC	10...30 V DC
≤ 35 mA	≤ 35 mA	≤ 35 mA
200 mA	200 mA	200 mA
Light/dark switching (selectable)	Light/dark switching (selectable)	Light/dark switching (selectable)
Yes/Yes	Yes/Yes	Yes/Yes
Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°
Red light, pin point	Red light, pin point	Red light, pin point
640 Nm	640 Nm	640 Nm
0.2 mm	0.2 mm	0.3 mm
20 μm	20 μm	30 μm
≤ 70 μm	≤ 70 μm	≤ 0.1 mm
Yellow LED	Yellow LED	Yellow LED
0.1 ms	0.1 ms	0.1 ms
5 kHz	5 kHz	5 kHz
IP 67	IP 67	IP 67
-10...+60 °C	-10...+60 °C	-10...+60 °C
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
GD-Zn	GD-Zn	GD-Zn
Glass	Glass	Glass
M8 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin



Wiring diagram

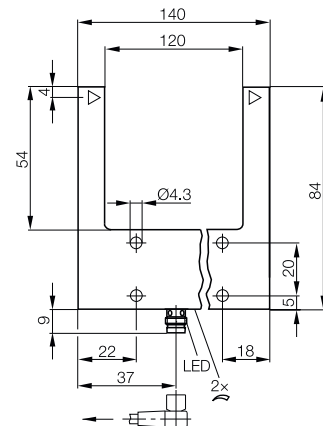
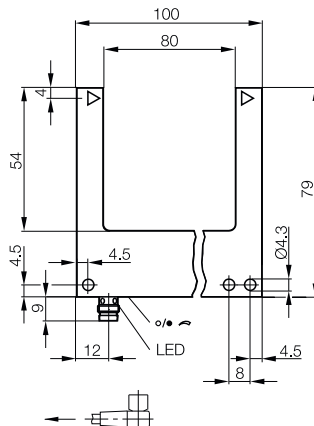




Series	BGL	BGL	
Fork opening	80 mm	120 mm	
Fork depth	54 mm	54 mm	
PNP NO/NC	Ordering code	BGL0027	BGL000C
	Part number	BGL 80A-005-S49	BGL 120A-005-S49
Supply voltage U_S	10...30 V DC	10...30 V DC	
No-load supply current I_0 max.	≤ 35 mA	≤ 35 mA	
Output current	200 mA	200 mA	
Switching type	Light/dark switching (selectable)	Light/dark switching (selectable)	
Polarity reversal/short-circuit protected	Yes/Yes	Yes/Yes	
Settings	Potentiometer, 270°	Potentiometer, 270°	
Emitter, light type	Red light, pin point	Red light, pin point	
Wavelength	640 Nm	640 Nm	
Resolution (smallest discernible part)	0.4 mm	0.5 mm	
Repeat accuracy	40 μm	50 μm	
Switching hysteresis	≤ 0.15 mm	≤ 0.15 mm	
Output function indicator	Yellow LED	Yellow LED	
Response time	0.1 ms	0.1 ms	
Switching frequency	5 kHz	5 kHz	
Degree of protection as per IEC 60529	IP 67	IP 67	
Ambient temperature T_a	-10...+60 °C	-10...+60 °C	
Ambient light limit according to	EN 60947-5-2	EN 60947-5-2	
Material	Housing	GD-Zn	GD-Zn
	Optical surface	Glass	Glass
Connection	M8 connector, 3-pin	M8 connector, 3-pin	



Other fork openings on request.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

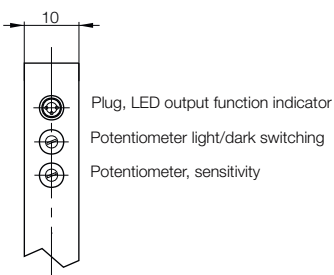
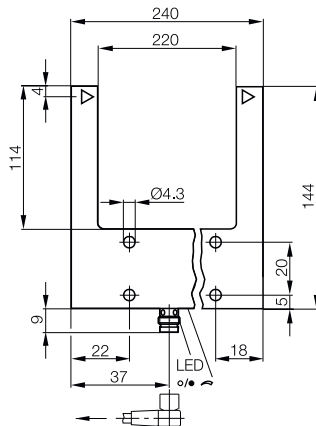
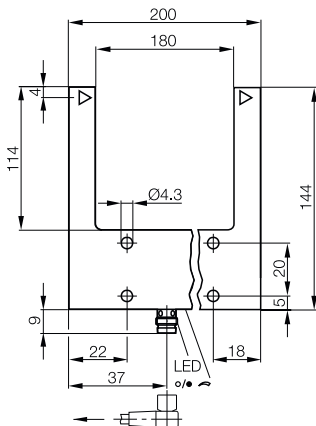
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

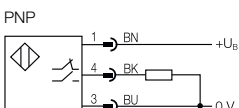
Accessories for Photoelectric Sensors



BGL 180 mm 114 mm BGL000L	BGL 220 mm 114 mm BGL0012	
BGL 180A-005-S49	BGL 220A-005-S49	
10...30 V DC	10...30 V DC	
≤ 35 mA	≤ 35 mA	
200 mA	200 mA	
Light/dark switching (selectable)	Light/dark switching (selectable)	
Yes/Yes	Yes/Yes	
Potentiometer, 270°	Potentiometer, 270°	
Red light, pin point	Red light, pin point	
640 Nm	640 Nm	
0.6 mm	0.6 mm	
60 μm	60 μm	
≤ 0.2 mm	≤ 0.2 mm	
Yellow LED	Yellow LED	
0.1 ms	0.1 ms	
5 kHz	5 kHz	
IP 67	IP 67	
-10...+60 °C	-10...+60 °C	
EN 60947-5-2	EN 60947-5-2	
GD-Zn	GD-Zn	
Glass	Glass	
M8 connector, 3-pin	M8 connector, 3-pin	



Wiring diagram

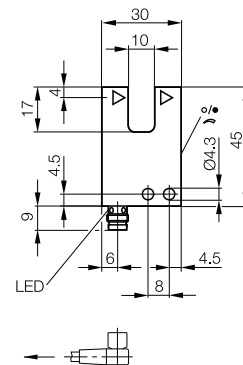
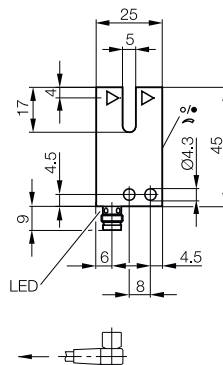




Series	BGL	BGL	
Fork opening	5 mm	10 mm	
Fork depth	17 mm	17 mm	
PNP NO/NC	Ordering code	BGL0021	BGL0005
	Part number	BGL 5A-007-S49	BGL 10A-007-S49
Supply voltage U_S	10...30 V DC	10...30 V DC	
No-load supply current I_0 max.	≤ 35 mA	≤ 35 mA	
Output current	200 mA	200 mA	
Switching type	Light/dark switching (selectable)	Light/dark switching (selectable)	
Polarity reversal/short-circuit protected	Yes/Yes	Yes/Yes	
Settings	Potentiometer, 270°	Potentiometer, 270°	
Emitter, light type	Infrared	Infrared	
Wavelength	880 Nm	880 Nm	
Resolution (smallest discernible part)	0.8 mm	0.8 mm	
Repeat accuracy	0.1 mm	0.1 mm	
Switching hysteresis	≤ 0.3 mm	≤ 0.3 mm	
Power-on indicator	Green LED	Green LED	
Output function indicator	Yellow LED	Yellow LED	
Response time	0.166 ms	0.166 ms	
Switching frequency	3 kHz	3 kHz	
Degree of protection as per IEC 60529	IP 67	IP 67	
Ambient temperature T_a	-10...+60 °C	-10...+60 °C	
Ambient light limit according to	EN 60947-5-2	EN 60947-5-2	
Material	Housing: GD-Zn Optical surface: Glass	GD-Zn Glass	
Connection	M8 connector, 3-pin	M8 connector, 3-pin	



Other fork openings on request.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors BGL

Angle Sensors BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

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Photoelectric Distance Sensors for Analog Distance Measurement

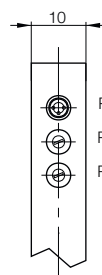
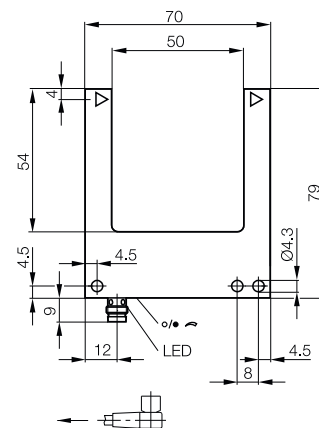
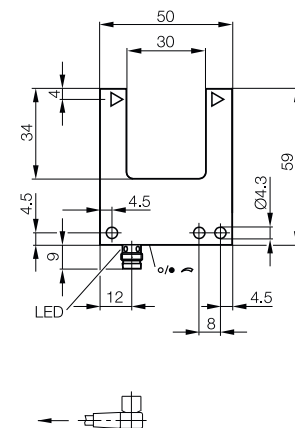
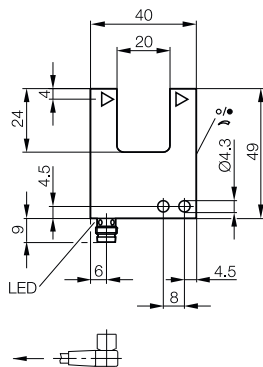
Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

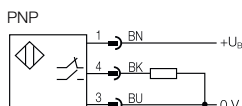


BGL 20 mm 24 mm BGL000Y	BGL 30 mm 34 mm BGL001F	BGL 50 mm 54 mm BGL001T
BGL 20A-007-S49	BGL 30A-007-S49	BGL 50A-007-S49
10...30 V DC	10...30 V DC	10...30 V DC
≤ 35 mA	≤ 35 mA	≤ 35 mA
200 mA	200 mA	200 mA
Light/dark switching (selectable)	Light/dark switching (selectable)	Light/dark switching (selectable)
Yes/Yes	Yes/Yes	Yes/Yes
Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°
Infrared	Infrared	Infrared
880 Nm	880 Nm	880 Nm
0.8 mm	0.8 mm	1 mm
0.1 mm	0.1 mm	0.12 mm
≤ 0.3 mm	≤ 0.3 mm	≤ 0.3 mm
Green LED	Green LED	Green LED
Yellow LED	Yellow LED	Yellow LED
0.25 ms	0.25 ms	0.25 ms
2 kHz	2 kHz	2 kHz
IP 67	IP 67	IP 67
-10...+60 °C	-10...+60 °C	-10...+60 °C
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
GD-Zn	GD-Zn	GD-Zn
Glass	Glass	Glass
M8 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin



Plug, LED output function indicator
Potentiometer light/dark switching
Potentiometer, sensitivity

Wiring diagram

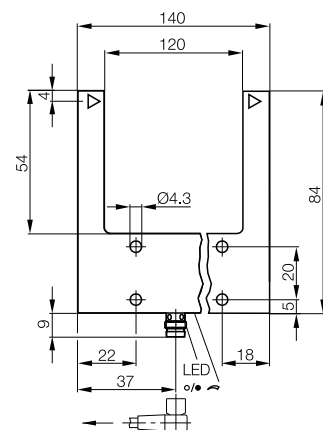
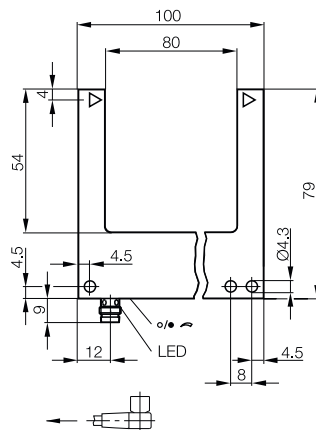


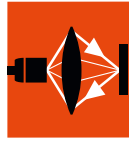


Series	BGL	BGL	
Fork opening	80 mm	120 mm	
Fork depth	54 mm	54 mm	
PNP NO/NC	Ordering code	BGL0029	BGL000F
	Part number	BGL 80A-007-S49	BGL 120A-007-S49
Supply voltage U_S	10...30 V DC	10...30 V DC	
No-load supply current I_0 max.	≤ 35 mA	≤ 35 mA	
Output current	200 mA	200 mA	
Switching type	Light/dark switching (selectable)	Light/dark switching (selectable)	
Polarity reversal/short-circuit protected	Yes/Yes	Yes/Yes	
Settings	Potentiometer, 270°	Potentiometer, 270°	
Emitter, light type	Infrared	Infrared	
Wavelength	880 Nm	880 Nm	
Resolution (smallest discernible part)	1.2 mm	1.5 mm	
Repeat accuracy	0.15 mm	0.2 mm	
Switching hysteresis	≤ 0.4 mm	≤ 0.5 mm	
Power-on indicator	Green LED	Green LED	
Output function indicator	Yellow LED	Yellow LED	
Response time	0.33 ms	0.5 ms	
Switching frequency	2 kHz	1 kHz	
Degree of protection as per IEC 60529	IP 67	IP 67	
Ambient temperature T_a	-10...+60 °C	-10...+60 °C	
Ambient light limit according to	EN 60947-5-2	EN 60947-5-2	
Material	Housing: GD-Zn Optical surface: Glass	GD-Zn Glass	
Connection	M8 connector, 3-pin	M8 connector, 3-pin	



Other fork openings on request.





Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

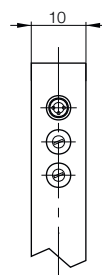
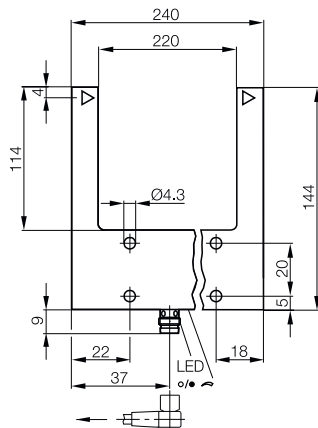
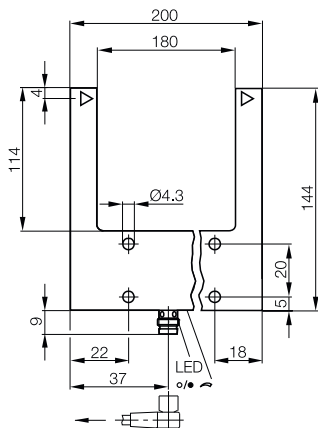
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

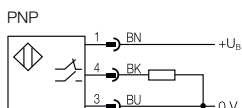


BGL 180 mm 114 mm BGL00N	BGL 220 mm 114 mm BGL0014	
BGL 180A-007-S49	BGL 220A-007-S49	
10...30 V DC	10...30 V DC	
≤ 35 mA	≤ 35 mA	
200 mA	200 mA	
Light/dark switching (selectable)	Light/dark switching (selectable)	
Yes/Yes	Yes/Yes	
Potentiometer, 270°	Potentiometer, 270°	
Infrared	Infrared	
880 Nm	880 Nm	
1.5 mm	1.5 mm	
0.2 mm	0.2 mm	
≤ 0.5 mm	≤ 0.5 mm	
Green LED	Green LED	
Yellow LED	Yellow LED	
0.25 ms	0.25 ms	
2 kHz	2 kHz	
IP 67	IP 67	
-10...+60 °C	-10...+60 °C	
EN 60947-5-2	EN 60947-5-2	
GD-Zn	GD-Zn	
Glass	Glass	
M8 connector, 3-pin	M8 connector, 3-pin	



- Plug, LED output function indicator
- Potentiometer light/dark switching
- Potentiometer, sensitivity

Wiring diagram

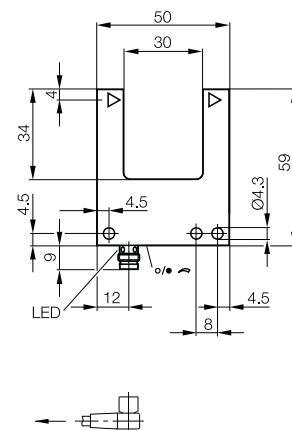




Series		BGL	
Fork opening		30 mm	
Fork depth		34 mm	
PNP	NO/NC	Ordering code	BGL0019
		Part number	BGL 30A-003-S49
PNP	NO/NC	Ordering code	
Transparency detection		Part number	
Supply voltage U_s			10...30 V DC
No-load supply current I_0 max.			≤ 20 mA
Output current			200 mA
Switching type			Light/dark switching (selectable)
Polarity reversal/short-circuit protected			Yes/Yes
Settings			Potentiometer, 270°
Emitter, light type			Laser, red light
Wavelength			650 Nm
Laser class			1
Resolution (smallest discernible part)			50 μ m
Repeat accuracy			10 μ m
Switching hysteresis			20 μ m
Output function indicator			Yellow LED
Response time			0.1 ms
Switching frequency			5 kHz
Degree of protection as per IEC 60529			IP 67
Ambient temperature T_a			-10...+60 °C
Ambient light limit according to			EN 60947-5-2
Material	Housing		GD-Zn
	Optical surface		Glass
Connection			M8 connector, 3-pin



Other fork openings on request.





Photoelectric Sensors

Fork sensors BGL



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

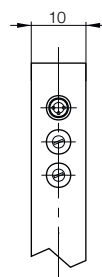
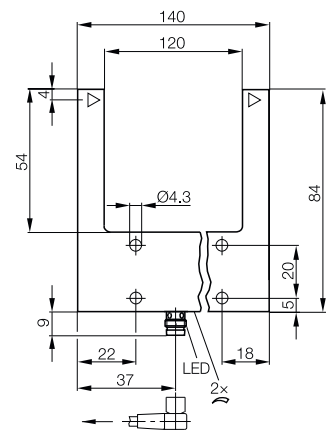
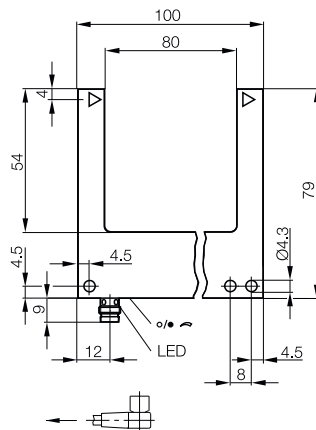
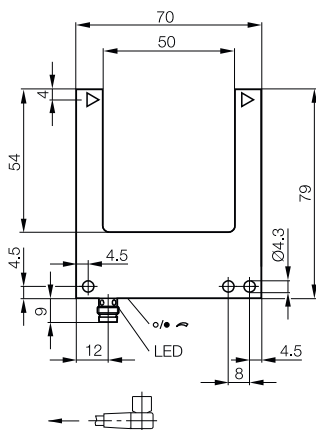
Photoelectric Distance Sensors

Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

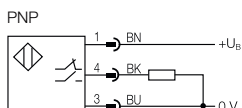


BGL	BGL	BGL
50 mm	80 mm	120 mm
54 mm	54 mm	54 mm
BGL001M	BGL0025	BGL0009
BGL 50A-003-S49	BGL 80A-003-S49	BGL 120A-003-S49
10...30 V DC	10...30 V DC	10...30 V DC
≤ 20 mA	≤ 20 mA	≤ 20 mA
200 mA	200 mA	200 mA
Light/dark switching (selectable)	Light/dark switching (selectable)	Light/dark switching (selectable)
Yes/Yes	Yes/Yes	Yes/Yes
Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°
Laser, red light	Laser, red light	Laser, red light
650 Nm	650 Nm	650 Nm
1	1	1
80 μm	0.1 mm	0.15 mm
10 μm	10 μm	10 μm
25 μm	30 μm	50 μm
Yellow LED	Yellow LED	Yellow LED
0.1 ms	0.1 ms	0.1 ms
5 kHz	5 kHz	5 kHz
IP 67	IP 67	IP 67
-10...+60 °C	-10...+60 °C	-10...+60 °C
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
GD-Zn	GD-Zn	GD-Zn
Glass	Glass	Glass
M8 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin



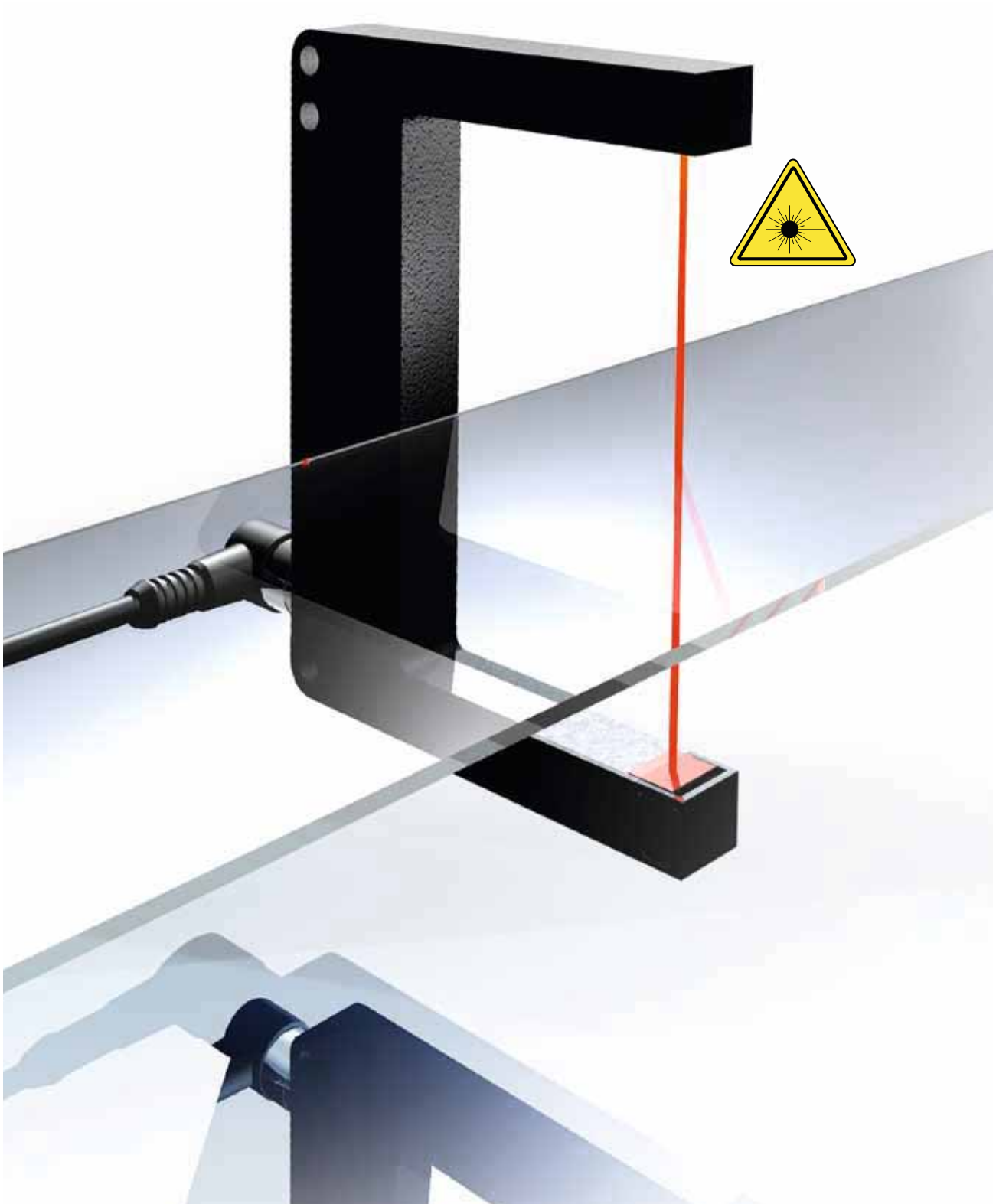
- Plug, LED output function indicator
- Potentiometer light/dark switching
- Potentiometer, sensitivity

Wiring diagram



**Reliable transparency detection with
Laser fork sensors BGL**

- No misalignment of emitter and receiver
- Easy, fast commissioning
- Reliable detection of transparent objects





Photoelectric Sensors

Photoelectric Sensors
Cylinder Designs
Block Designs
Fork Sensors
BGL

Angle Sensors
BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Series	BGL transparent detection	
Fork opening	80 mm	
Fork depth	54 mm	
PNP	NO/NC	Ordering code
Transparency detection	Part number	BGL002T
Supply voltage U_S	10...30 V DC	
No-load supply current I_0 max.	≤ 20 mA	
Output current	200 mA	
Switching type	Light/dark switching (selectable)	
Polarity reversal/short-circuit protected	Yes/Yes	
Settings	Potentiometer, 270°	
Special features	detects transparent objects	
Emitter, light type	Laser Class 1	
Wavelength	650 Nm	
Resolution (smallest discernible part)	50 μ m	
Repeat accuracy	10 μ m	
Switching hysteresis	30 μ m	
Power-on indicator	Yellow LED	
Response time	0.1 ms	
Switching frequency	5 kHz	
Degree of protection as per IEC 60529	IP 67	
Ambient temperature T_a	-10...+60 °C	
Ambient light limit according to	EN 60947-5-2	
Material	Housing	GD-Zn
	Optical surface	Glass
Connection	M8 connector, 3-pin	

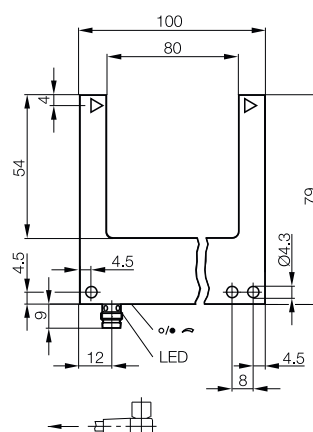


Other fork openings on request.

Maximum reliability – simple handling

Balluff BGL laser fork sensors ensure completely reliable detection of transparent objects.

They also provide the unsurpassed benefits of fork sensors: Emitters and receivers do not have to be aligned, and misalignment no longer occurs. BGL laser fork sensors are therefore characterized by simple and fast commissioning as well as maximum reliability.





Fluid detection

The photoelectric sensors with fork openings of 30 mm and 80 mm are suitable for detecting the level of clear, colored or turbid fluids with a water content > 15% through transparent container walls. Balluff offers a solution for applications where other sensors reach their limits. For example, this fork sensor can detect fluids containing water in small, transparent hoses with a diameter of ≤ 6 mm.

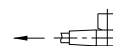
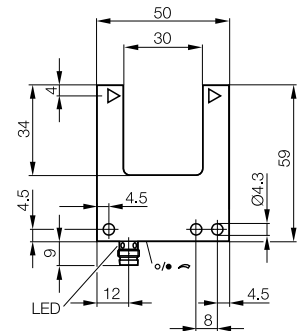
Dynamic Sensor Control (DSC)

provides high-quality information in addition to the sensor function. This lets users immediately detect whether increasing contamination has started impairing the accuracy of a sensor, and does so during ongoing operations. This enables immediate correction. Accordingly, DSC increases the productivity of systems and machines.

Series			BGL fluid detection
Fork opening			30 mm
Fork depth			34 mm
PNP	NO/NC	Ordering code	BGL003J
Fluid detection		Part number	BGL 30A-011-S49
PNP	NO/NC	Ordering code	
DSC (Dynamic Sensor Control)		Part number	
Supply voltage U_S			10...30 V DC
No-load supply current I_0 max.			≤ 35 mA
Output current			200 mA
Switching type			Light/dark switching (selectable)
Polarity reversal/short-circuit protected			Yes/Yes
Settings			Potentiometer, 270°
Special features			detects liquids with 15% or more water
Emitter, light type			Infrared
Wavelength			1480 Nm
Resolution (smallest discernible part)			0.6 mm
Repeat accuracy			0.1 mm
Switching hysteresis			≤ 0.2 mm
Power-on indicator			Green LED
Output function indicator			Yellow LED
Response time			0.25 ms
Switching frequency			2 kHz
Degree of protection as per IEC 60529			IP 67
Ambient temperature T_a			-10...+60 °C
Ambient light limit according to			EN 60947-5-2
Material	Housing		GD-Zn
	Optical surface		Glass
Connection			M8 connector, 3-pin



Other fork openings on request.



Suitable connectors
(please order separately)

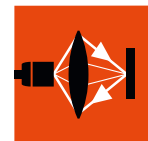


Size	Design	Cable material	Color	Length	Ordering code
M8, 3-pin	Straight	PUR	Black	2 m	BCC02M8
M8, 3-pin	Straight	PVC	Gray	2 m	BCC02NU
M8, 3-pin	Angled	PUR	Black	2 m	BCC02ML
M8, 3-pin	Angled	PVC	Gray	2 m	BCC02P5

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.

Mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line catalog**.



Photoelectric Sensors

Photoelectric Sensors
Cylinder Designs
Block Designs
Fork Sensors
BGL
Angle Sensors
BWL

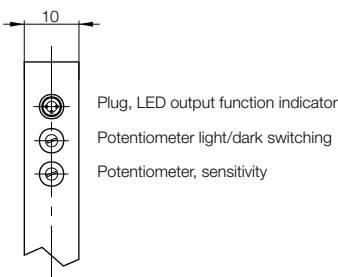
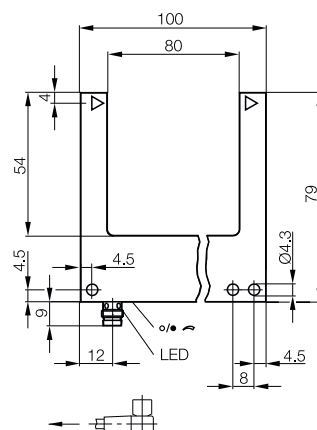
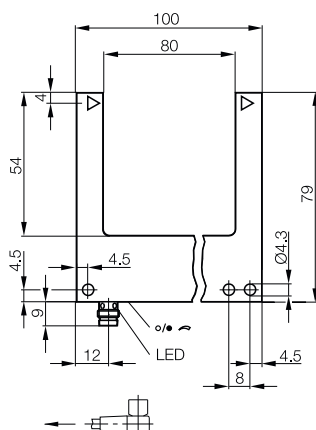
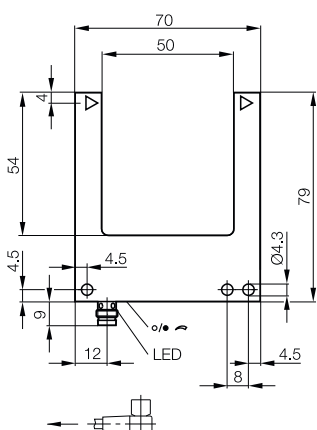
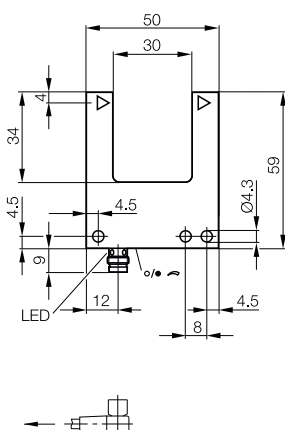
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

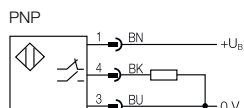
Accessories for Photoelectric Sensors



BGL with DSC 30 mm 34 mm	BGL with DSC 50 mm 54 mm	BGL fluid detection 80 mm 54 mm BGL003L BGL 80A-011-S49	BGL with DSC 80 mm 54 mm BGL003R BGL 80A-013-S49
BGL003N BGL 30A-013-S49	BGL003P BGL 50A-013-S49		BGL003R BGL 80A-013-S49
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
≤ 35 mA	≤ 35 mA	≤ 35 mA	≤ 35 mA
200 mA	200 mA	200 mA	200 mA
Light/dark switching (selectable)	Light/dark switching (selectable)	Light/dark switching (selectable)	Light/dark switching (selectable)
Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°
Contamination detection	Contamination detection	detects liquids with 15% or more water	Contamination detection
Infrared	Infrared	Infrared	Infrared
880 Nm	880 Nm	1480 Nm	880 Nm
0.8 mm	1 mm	0.8 mm	1.2 mm
0.1 mm	0.12 mm	0.1 mm	0.15 mm
≤ 0.3 mm	≤ 0.3 mm	≤ 0.2 mm	≤ 0.4 mm
Green LED	Green LED	Green LED	Green LED
Yellow LED	Yellow LED	Yellow LED	Yellow LED
2.5 ms	0.25 ms	0.25 ms	2.5 ms
200 Hz	200 Hz	2 kHz	200 Hz
IP 67	IP 67	IP 67	IP 67
-10...+60 °C	-10...+60 °C	-10...+60 °C	-10...+60 °C
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
GD-Zn	GD-Zn	GD-Zn	GD-Zn
Glass	Glass	Glass	Glass
M8 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin



Wiring diagram



The fork sensor BGL 21 is a photoelectric sensor using a microcontroller for the setup process and function monitoring. All the user needs to do is press a button to access all the data needed for configuring the sensor.

An adjustment aid on the top and bottom of the sensor specifies the object position during configuration.

The internal microcontroller monitors all settings to ensure optimum switching frequency, repeat accuracy and rejection of optical interference and ambient light. The **BGL 21-RG** has a red and green emitter diode, which is ideal for detecting colored markings on transparent backing material. Which color of emitter light is more appropriate for the particular task is automatically determined during setup.

The **BGL 21-IR** model with an infrared emitter makes it possible to scan labels or holes on backing material.

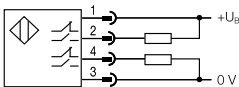
Features


- Fast, fully automatic sensor calibration
- User interface has just one button and two LEDs
- Very short response time and high repeat accuracy
- Very resistant to optical interference and ambient light
- NPN/PNP output on separate pins with overload protection
- M8 connector block can be rotated 90°
- Metal housing

Applications

- Detecting markings on backing material
- Label detection
- Monitoring web tracking
- Web break monitoring
- Hole checking in thin materials (< 2 mm)

Wiring diagram



 **Suitable connectors**
(please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M8, 4-pin	Straight	PUR	Black	2 m	BCC02N2
M8, 4-pin	Straight	PVC	Gray	2 m	BCC02PL
M8, 4-pin	Angled	PUR	Black	2 m	BCC02NC
M8, 4-pin	Angled	PVC	Gray	2 m	BCC02PZ

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.



Photoelectric Sensors

Photoelectric Sensors
Cylinder Designs
Block Designs
Fork Sensors BGL
Angle Sensors
BWL

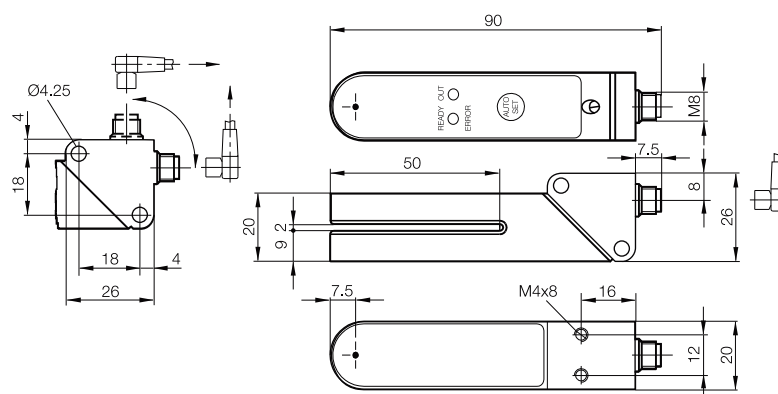
Photoelectric Sensors with Special Properties

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Accessories for Photoelectric Sensors

Series	BGL		BGL
Fork opening	2 mm		2 mm
Fork depth	50 mm		50 mm
PNP/NPN	NC/NO	Ordering code	BGL002L
		Part number	BGL 21-IR
			BGL002M
			BGL 21-RG
Supply voltage U_S	10...30 V DC		10...30 V DC
No-load supply current I_0 max.	≤ 55 mA		≤ 55 mA
Output current	100 mA		100 mA
Switching type	Light/dark switching (selectable)		Light/dark switching (selectable)
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes
Settings	Teach-in		Teach-in
Emitter, light type	Infrared		Red and green light
Wavelength	880 Nm		636 nm/536 nm
Resolution (smallest discernible part)	1 mm		0.5 mm
Repeat accuracy	80 μ m		80 μ m
Switching hysteresis	≤ 0.2 mm		≤ 0.2 mm
Output function indicator	Yellow LED		Yellow LED
Power/error indicator	Green/red LED		Green/red LED
Response time	20 μ s		20 μ s
Switching frequency	25 kHz		25 kHz
Degree of protection as per IEC 60529	IP 65		IP 65
Ambient temperature T_a	-20...+60 °C		-20...+60 °C
Ambient light limit according to	EN 60947-5-2		EN 60947-5-2
Material	Housing	Anodized aluminum	Anodized aluminum
	Optical surface	Glass	Glass
Connection	M8 connector, 4-pin		M8 connector, 4-pin

Connector orientation



Photoelectric Sensors Angle sensors **BWL**

Angle sensors are needed whenever space is too tight for fork sensors and you can no longer find a (simple) solution for applications. This is due to the fact that, with nearly identical specifications, the design of the Balluff angle sensors **BWL Standard** can be used to find a solution for even more applications. The design and beam geometry allow objects to be approached and scanned from almost any direction, while red light and laser variants ensure versatile use.

Applications

- Assembly and handling technology
- Robotic systems
- Position and location control

Benefits

- High accuracy
- Visible light spot for easy alignment
- Can be installed even in tight mounting conditions



The Balluff angle sensor **BWL Automotive** is a powerful photoelectric sensor designed for harsh industrial use. Its housing is tough and allows for variable mounting options. Objects are reliably detected, even under extremely difficult conditions.

A strong infrared emitter ensures a large function reserve and various designs allow for flexible use, allowing the creation of elegant solutions for a vast number of applications.

Applications

- Robotic systems
- Position and location control



Photoelectric Sensors

Angle sensors BWL

Product overview



Photoelectric Sensors

Photoelectric Sensors
Cylinder Designs
Block Designs
Fork Sensors
BGL

Angle Sensors BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

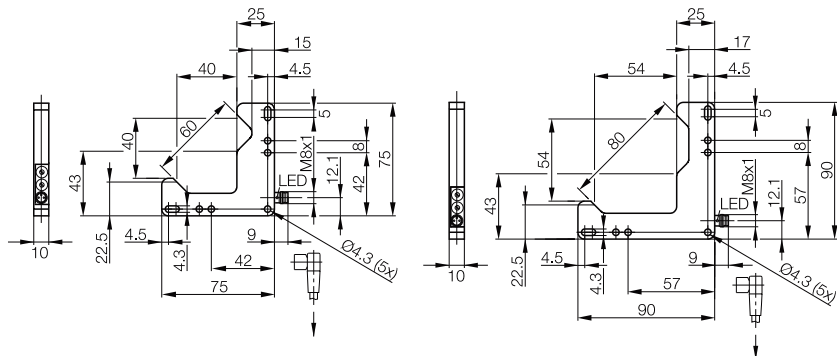
Type	Optical axis	Resolu- tion	Light type				Output	Switching type		Switch- ing fre- quency	U _s	Connec- tion		Page
			Infrared	Red light	Red light, pin point	Laser		PNP transistor	Light switching			Dark switching	10...30V DC	
Angle sensors Standard														
BWL000F	BWL 4040D-R011-S49	40/40 mm	0.4 mm	■			■		■	■	1.5 kHz	■	■	262
BWL000J	BWL 4040D-R013-S49	40/40 mm	0.3 mm		■		■		■	■	5 kHz	■	■	264
BWL000C	BWL 4040D-L011-S49	40/40 mm	80 µm				■		■	■	5 kHz	■	■	268
BWL0009	BWL 4040D-I011-S49	40/40 mm	1.0 mm	■			■		■	■	2 kHz	■	■	266
BWL000R	BWL 5454D-R011-S49	54/54 mm	0.4 mm	■			■		■	■	1.5 kHz	■	■	262
BWL000U	BWL 5454D-R013-S49	54/54 mm	0.4 mm		■		■		■	■	5 kHz	■	■	264
BWL000N	BWL 5454D-L011-S49	54/54 mm	100 µm				■		■	■	5 kHz	■	■	268
BWL000L	BWL 5454D-I011-S49	54/54 mm	1.2 mm	■			■		■	■	2 kHz	■	■	266
BWL0012	BWL 6868D-R011-S49	68/68 mm	0.5 mm	■			■		■	■	1.5 kHz	■	■	263
BWL001N	BWL 6868D-R013-S49	68/68 mm	0.4 mm		■		■		■	■	5 kHz	■	■	265
BWL0010	BWL 6868D-L011-S49	68/68 mm	120 µm				■		■	■	5 kHz	■	■	269
BWL000Y	BWL 6868D-I011-S49	68/68 mm	1.5 mm	■			■		■	■	2 kHz	■	■	267
BWL0019	BWL 9090D-R011-S49	90/90 mm	0.6 mm	■			■		■	■	1.5 kHz	■	■	263
BWL001C	BWL 9090D-R013-S49	90/90 mm	0.5 mm		■		■		■	■	5 kHz	■	■	265
BWL0017	BWL 9090D-L011-S49	90/90 mm	150 µm				■		■	■	5 kHz	■	■	269
BWL0015	BWL 9090D-I011-S49	90/90 mm	1.5 mm	■			■		■	■	1 kHz	■	■	267
BWL0005	BWL 110110D-R011-S49	110/110 mm	0.6 mm	■			■		■	■	1.5 kHz	■	■	263
BWL0007	BWL 110110D-R013-S49	110/110 mm	0.6 mm		■		■		■	■	5 kHz	■	■	265
BWL0003	BWL 110110D-L011-S49	110/110 mm	0.2 mm				■		■	■	5 kHz	■	■	269
BWL0001	BWL 110110D-I011-S49	110/110 mm	1.5 mm	■			■		■	■	2 kHz	■	■	267
Angle sensors Automotive														
BWL001F	BWL 2222B-001-S4	22/22 mm		■			■		■	■	1 kHz	■	■	270
BWL001H	BWL 2222C-001-S4	22/22 mm		■			■		■	■	1 kHz	■	■	270
BWL001J	BWL 4241A-001-S4	43/43 mm		■			■		■	■	1 kHz	■	■	271
BWL001K	BWL 4241A-001-S49	43/43 mm		■			■		■	■	1 kHz	■	■	271
BWL001L	BWL 4260A-001-S4	42/62 mm		■			■		■	■	1 kHz	■	■	271
BWL001M	BWL 4260A-001-S49	42/62 mm		■			■		■	■	1 kHz	■	■	271

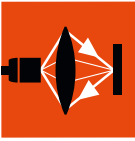
NPN on request



Series	BWL	BWL
Optical axis	40/40 mm	54/54
PNP NO/NC	BWL000F	BWL000R
Ordering code		
Part number	BWL 4040D-R011-S49	BWL 5454D-R011-S49
Supply voltage U_S	10...30 V DC	10...30 V DC
No-load supply current I_0 max.	≤ 35 mA	≤ 35 mA
Output current	200 mA	200 mA
Switching type	Light/dark switching (selectable)	Light/dark switching (selectable)
Polarity reversal/short-circuit protected	Yes/Yes	Yes/Yes
Settings	Potentiometer, 270°	Potentiometer, 270°
Emitter, light type	LED, red light	LED, red light
Wavelength	640 Nm	640 Nm
Resolution (smallest discernible part)	0.4 mm	0.4 mm
Repeat accuracy	40 μ m	60 μ m
Switching hysteresis	≤ 0.15 mm	≤ 0.2 mm
Output function indicator	Yellow LED	Yellow LED
Response time	0.33 ms	0.33 ms
Switching frequency	1.5 kHz	1.5 kHz
Degree of protection as per IEC 60529	IP 67	IP 67
Ambient temperature T_a	-10...+60 °C	-10...+60 °C
Ambient light limit according to	EN 60947-5-2	EN 60947-5-2
Material		
Housing	GD-Zn	GD-Zn
Optical surface	Glass	Glass
Connection	M8 connector, 3-pin	M8 connector, 3-pin

→ Connector orientation





Photoelectric Sensors

Photoelectric Sensors
Cylinder Designs
Block Designs
Fork Sensors
BGL

Angle Sensors
BWL

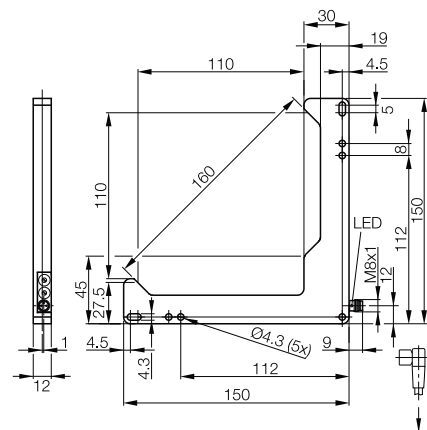
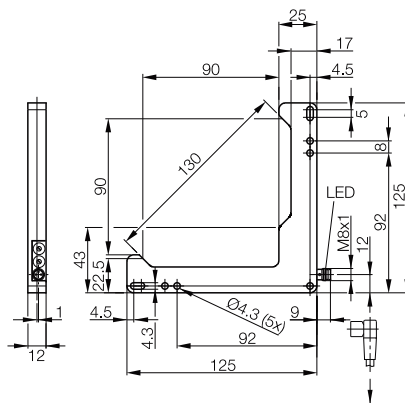
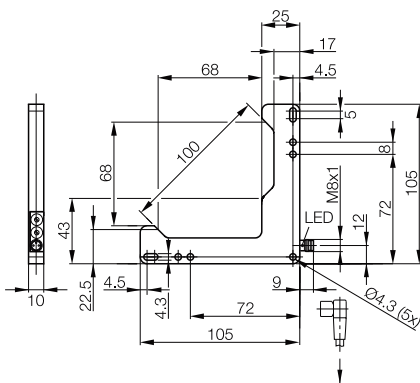
Photoelectric Sensors with Special Properties

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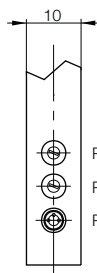
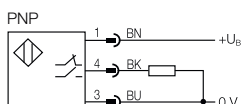
Accessories for Photoelectric Sensors



BWL 68/68 mm BWL0012	BWL 90/90 mm BWL0019	BWL 110/110 mm BWL0005
BWL 6868D-R011-S49	BWL 9090D-R011-S49	BWL 110110D-R011-S49
10...30 V DC	10...30 V DC	10...30 V DC
≤ 35 mA	≤ 35 mA	≤ 35 mA
200 mA	200 mA	200 mA
Light/dark switching (selectable)	Light/dark switching (selectable)	Light/dark switching (selectable)
Yes/Yes	Yes/Yes	Yes/Yes
Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°
LED, red light	LED, red light	LED, red light
640 Nm	640 Nm	640 Nm
0.5 mm	0.6 mm	0.6 mm
80 μm	80 μm	80 μm
≤ 0.2 mm	≤ 0.2 mm	≤ 0.2 mm
Yellow LED	Yellow LED	Yellow LED
0.33 ms	0.33 ms	0.33 ms
1.5 kHz	1.5 kHz	1.5 kHz
IP 67	IP 67	IP 67
-10...+60 °C	-10...+60 °C	-10...+60 °C
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
GD-Zn	GD-Zn	GD-Zn
Glass	Glass	Glass
M8 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin



Wiring diagram

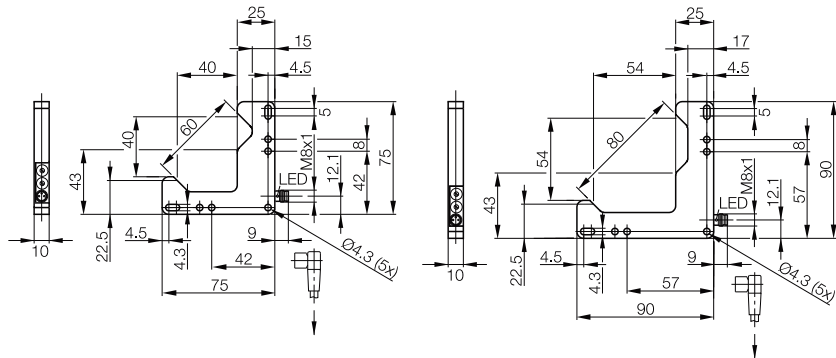


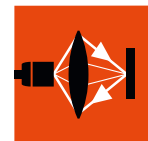
Potentiometer, sensitivity
Potentiometer light/dark switching
Plug, LED output function indicator



Series	BWL	BWL	
Optical axis	40/40 mm	54/54	
PNP NO/NC	Ordering code	BWL000J	BWL000U
	Part number	BWL 4040D-R013-S49	BWL 5454D-R013-S49
Supply voltage U_S	10...30 V DC	10...30 V DC	
No-load supply current I_0 max.	≤ 35 mA	≤ 35 mA	
Output current	200 mA	200 mA	
Switching type	Light/dark switching (selectable)	Light/dark switching (selectable)	
Polarity reversal/short-circuit protected	Yes/Yes	Yes/Yes	
Settings	Potentiometer, 270°	Potentiometer, 270°	
Emitter, light type	Red light, pin point	Red light, pin point	
Wavelength	640 Nm	640 Nm	
Resolution (smallest discernible part)	0.3 mm	0.4 mm	
Repeat accuracy	30 μ m	40 μ m	
Switching hysteresis	≤ 0.1 mm	≤ 0.15 mm	
Output function indicator	Yellow LED	Yellow LED	
Response time	0.1 ms	0.1 ms	
Switching frequency	5 kHz	5 kHz	
Degree of protection as per IEC 60529	IP 67	IP 67	
Ambient temperature T_a	-10...+60 °C	-10...+60 °C	
Ambient light limit according to	EN 60947-5-2	EN 60947-5-2	
Material	Housing: GD-Zn Optical surface: Glass	GD-Zn Glass	
Connection	M8 connector, 3-pin	M8 connector, 3-pin	

→ Connector orientation





Photoelectric Sensors

Photoelectric Sensors
Cylinder Designs
Block Designs
Fork Sensors
BGL

Angle Sensors
BWL

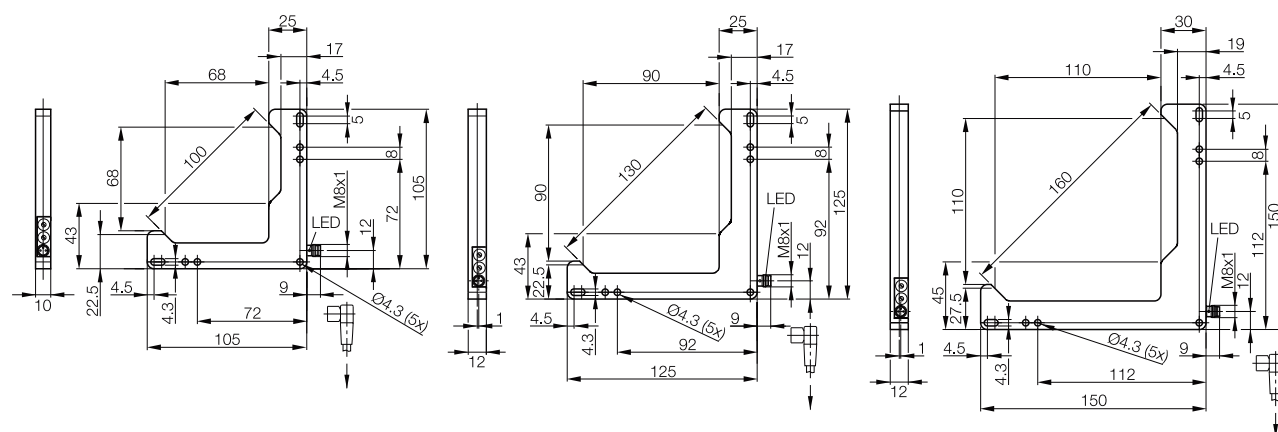
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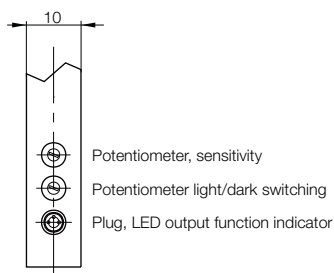
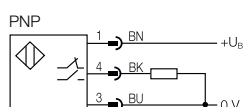
Accessories for Photoelectric Sensors



BWL 68/68 mm BWL001N	BWL 90/90 mm BWL001C	BWL 110/110 mm BWL0007
BWL 6868D-R013-S49	BWL 9090D-R013-S49	BWL 110110D-R013-S49
10...30 V DC	10...30 V DC	10...30 V DC
≤ 35 mA	≤ 35 mA	≤ 35 mA
200 mA	200 mA	200 mA
Light/dark switching (selectable)	Light/dark switching (selectable)	Light/dark switching (selectable)
Yes/Yes	Yes/Yes	Yes/Yes
Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°
Red light, pin point	Red light, pin point	Red light, pin point
640 Nm	640 Nm	640 Nm
0.4 mm	0.5 mm	0.6 mm
40 μm	50 μm	60 μm
≤ 0.15 mm	≤ 0.15 mm	≤ 0.2 mm
Yellow LED	Yellow LED	Yellow LED
0.1 ms	0.1 ms	0.1 ms
5 kHz	5 kHz	5 kHz
IP 67	IP 67	IP 67
-10...+60 °C	-10...+60 °C	-10...+60 °C
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
GD-Zn	GD-Zn	GD-Zn
Glass	Glass	Glass
M8 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin

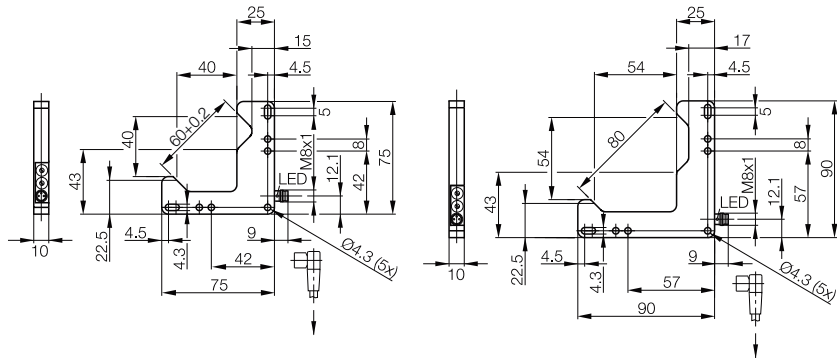


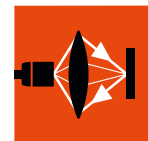
Wiring diagram





Series	BWL	BWL
Optical axis	40/40 mm	54/54 mm
PNP NO/NC	Ordering code	BWL0009
	Part number	BWL 4040D-I011-S49
		BWL000L
		BWL 5454D-I011-S49
Supply voltage U_S	10...30 V DC	10...30 V DC
No-load supply current I_0 max.	≤ 35 mA	≤ 35 mA
Output current	200 mA	200 mA
Switching type	Light/dark switching (selectable)	Light/dark switching (selectable)
Polarity reversal/short-circuit protected	Yes/Yes	Yes/Yes
Settings	Potentiometer, 270°	Potentiometer, 270°
Emitter, light type	Infrared	Infrared
Wavelength	880 Nm	880 Nm
Resolution (smallest discernible part)	1 mm	1.2 mm
Repeat accuracy	0.12 mm	0.15 mm
Switching hysteresis	≤ 0.3 mm	≤ 0.4 mm
Operating function indicator	Green LED	Green LED
Output function indicator	Yellow LED	Yellow LED
Response time	0.25 ms	0.25 ms
Switching frequency	2 kHz	2 kHz
Degree of protection as per IEC 60529	IP 67	IP 67
Ambient temperature T_a	-10...+60 °C	-10...+60 °C
Ambient light limit according to	EN 60947-5-2	EN 60947-5-2
Material		
Housing	GD-Zn	GD-Zn
Optical surface	Glass	Glass
Connection	M8 connector, 3-pin	M8 connector, 3-pin





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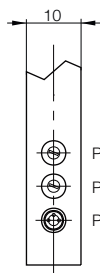
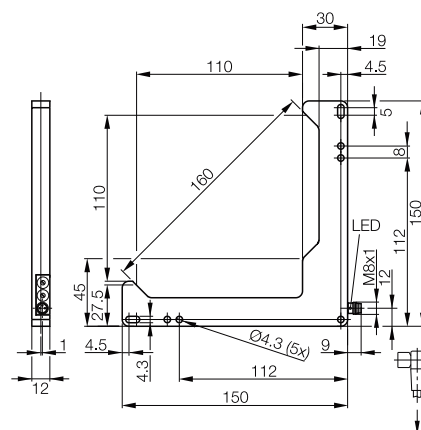
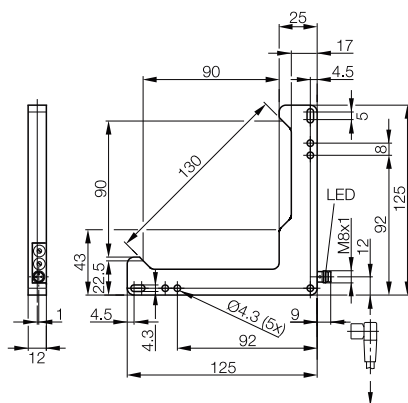
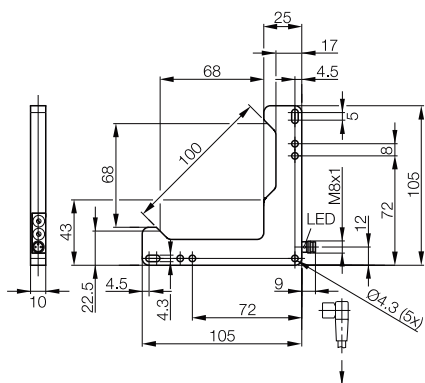
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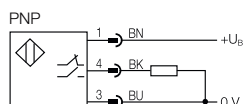
Accessories for Photoelectric Sensors



BWL 68/68 mm BWL000Y	BWL 90/90 mm BWL0015	BWL 110/110 mm BWL0001
BWL 6868D-I011-S49	BWL 9090D-I011-S49	BWL 110110D-I011-S49
10...30 V DC	10...30 V DC	10...30 V DC
≤ 35 mA	≤ 35 mA	≤ 35 mA
200 mA	200 mA	200 mA
Light/dark switching (selectable)	Light/dark switching (selectable)	Light/dark switching (selectable)
Yes/Yes	Yes/Yes	Yes/Yes
Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°
Infrared	Infrared	Infrared
880 Nm	880 Nm	880 Nm
1.5 mm	1.5 mm	1.5 mm
0.2 mm	0.2 mm	0.2 mm
≤ 0.5 mm	≤ 0.5 mm	≤ 0.5 mm
Green LED	Green LED	Green LED
Yellow LED	Yellow LED	Yellow LED
0.25 ms	0.33 ms	0.25 ms
2 kHz	1 kHz	2 kHz
IP 67	IP 67	IP 67
-10...+60 °C	-10...+60 °C	-10...+60 °C
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
GD-Zn	GD-Zn	GD-Zn
Glass	Glass	Glass
M8 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin



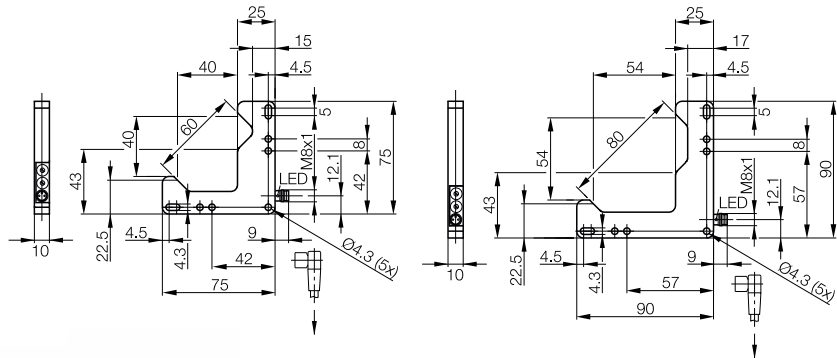
Wiring diagram





Series	BWL	BWL	
Optical axis	40/40 mm	54/54 mm	
PNP NO/NC	Ordering code	BWL000C	BWL000N
	Part number	BWL 4040D-L011-S49	BWL 5454D-L011-S49
Supply voltage U_S	10...30 V DC	10...30 V DC	
No-load supply current I_0 max.	≤ 20 mA	≤ 20 mA	
Output current	200 mA	200 mA	
Switching type	Light/dark switching (selectable)	Light/dark switching (selectable)	
Polarity reversal/short-circuit protected	Yes/Yes	Yes/Yes	
Settings	Potentiometer, 270°	Potentiometer, 270°	
Emitter, light type	Laser, red light	Laser	
Wavelength	640 Nm	640 Nm	
Laser class	1	1	
Resolution (smallest discernible part)	80 μ m	100 μ m	
Repeat accuracy	≤ 10 μ m	10 μ m	
Switching hysteresis	≤ 25 μ m	≤ 35 μ m	
Output function indicator	Yellow LED	Yellow LED	
Response time	0.1 ms	0.1 ms	
Switching frequency	5 kHz	5 kHz	
Degree of protection as per IEC 60529	IP 67	IP 67	
Ambient temperature T_a	-10...+60 °C	-10...+60 °C	
Ambient light limit according to	EN 60947-5-2	EN 60947-5-2	
Material	Housing: GD-Zn Optical surface: Glass	GD-Zn Glass	
Connection	M8 connector, 3-pin	M8 connector, 3-pin	

Connector orientation



Suitable connectors
(please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M8, 3-pin	Straight	PUR	Black	2 m	BCC02M8
M8, 3-pin	Straight	PVC	Gray	2 m	BCC02NU
M8, 3-pin	Angled	PUR	Black	2 m	BCC02ML
M8, 3-pin	Angled	PVC	Gray	2 m	BCC02P5

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.



Photoelectric Sensors

Angle sensors BWL



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors BWL

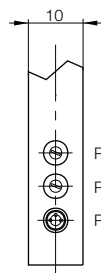
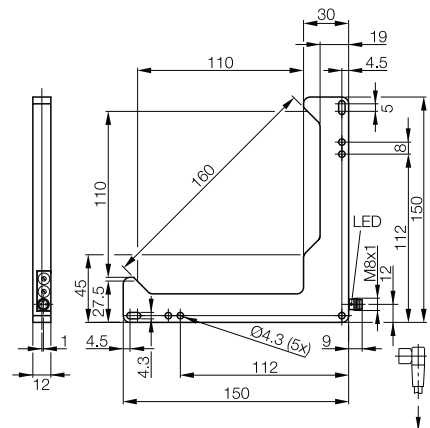
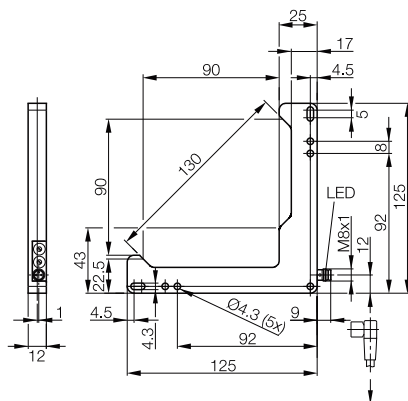
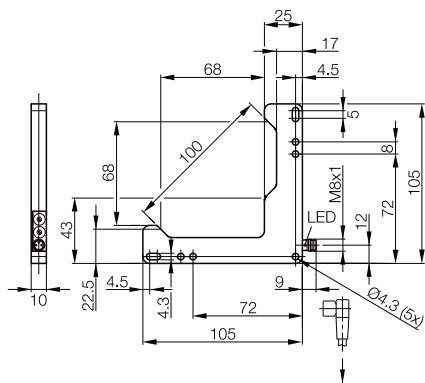
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

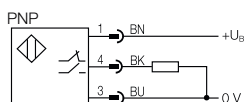
Accessories for Photoelectric Sensors



BWL 68/68 mm BWL0010	BWL 90/90 mm BWL0017	BWL 110/110 mm BWL0003
BWL 6868D-L011-S49	BWL 9090D-L011-S49	BWL 110110D-L011-S49
10...30 V DC	10...30 V DC	10...30 V DC
≤ 20 mA	≤ 20 mA	≤ 20 mA
200 mA	200 mA	200 mA
Light/dark switching (selectable)	Light/dark switching (selectable)	Light/dark switching (selectable)
Yes/Yes	Yes/Yes	Yes/Yes
Potentiometer, 270°	Potentiometer, 270°	Potentiometer, 270°
Laser	Laser	Laser
640 Nm	640 Nm	640 Nm
1	1	1
120 μm	150 μm	0.2 mm
≤ 15 μm	≤ 15 μm	≤ 20 μm
≤ 40 μm	≤ 50 μm	≤ 70 μm
Yellow LED	Yellow LED	Yellow LED
0.1 ms	0.1 ms	0.1 ms
5 kHz	5 kHz	5 kHz
IP 67	IP 67	IP 67
-10...+60 °C	-10...+60 °C	-10...+60 °C
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
GD-Zn	GD-Zn	GD-Zn
Glass	Glass	Glass
M8 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin

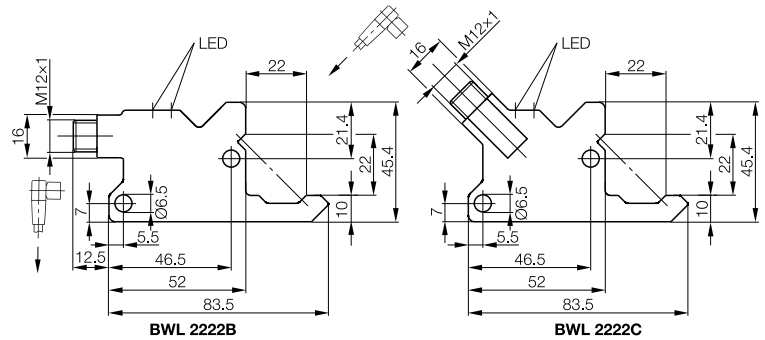


Wiring diagram





Series		BWL	BWL
Optical axis		22/22 mm	22/22 mm
PNP NO/NC	Ordering code	BWL001F	BWL001H
	Part number	BWL 2222B-001-S4	BWL 2222C-001-S4
Supply voltage U_S		10...30 V DC	10...30 V DC
No-load supply current I_0 max.		≤ 35 mA	≤ 35 mA
Output current		≤ 200 mA	≤ 200 mA
Switching type		Dark switching	Dark switching
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes
Emitter, light type		Infrared	Infrared
Wavelength		880 Nm	880 Nm
Power-on indicator		Green LED	Green LED
Output function indicator		Yellow LED	Yellow LED
Stand-by delay		100 ms	100 ms
Response time		≤ 0.5 ms	≤ 0.5 ms
Switching frequency		1 kHz	1 kHz
Degree of protection as per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-10...+60 °C	-10...+60 °C
Ambient light limit according to		EN 60947-5-2	EN 60947-5-2
Material	Housing	Corrosion-resistant steel	Corrosion-resistant steel
	Optical surface	PMMA	PMMA
Connection		M12 connector, 4-pin	M12 connector, 4-pin



Suitable connectors
(please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M8, 3-pin	Straight	PUR	Black	2 m	BCC02M8
M8, 3-pin	Straight	PVC	Gray	2 m	BCC02NU
M8, 3-pin	Angled	PUR	Black	2 m	BCC02ML
M8, 3-pin	Angled	PVC	Gray	2 m	BCC02P5

Connectors without LED are suitable for PNP and NPN sensors.



Suitable connectors
(please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.



Photoelectric Sensors

Photoelectric Sensors
Cylinder Designs
Block Designs
Fork Sensors
BGL

Angle Sensors
BWL

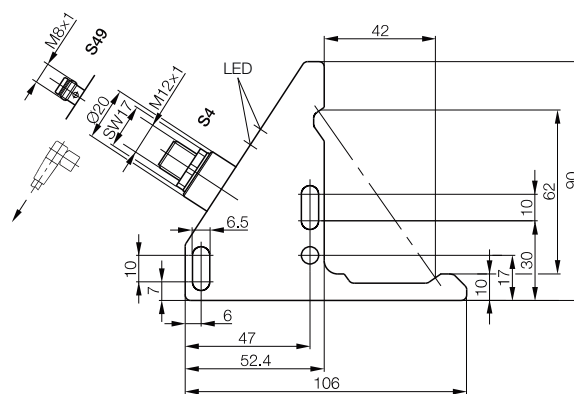
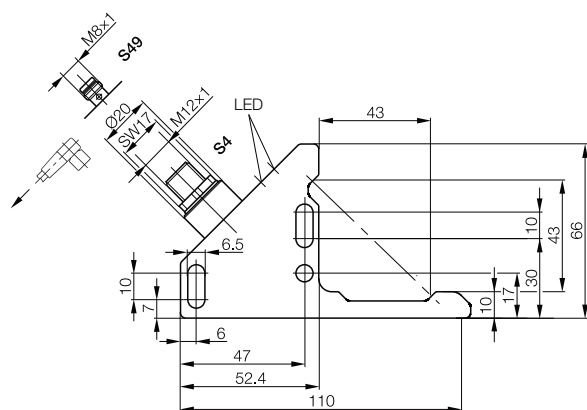
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

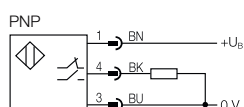
Accessories for Photoelectric Sensors

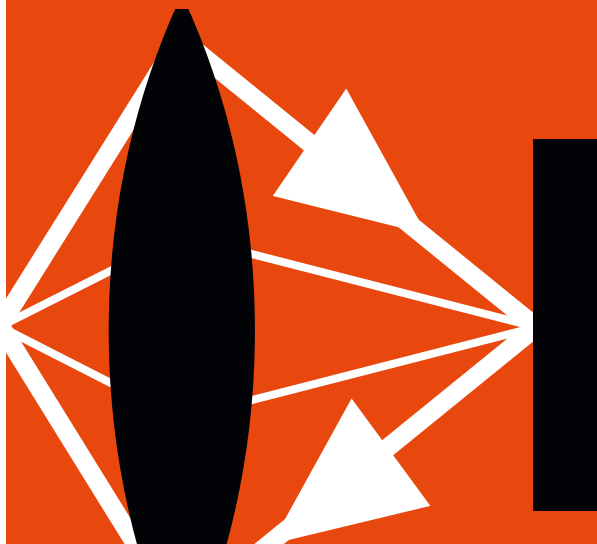


BWL 43/43 mm BWL001J	BWL 43/43 mm BWL001K	BWL 42/62 mm BWL001L	BWL 42/62 mm BWL001M
BWL 4241A-001-S4	BWL 4241A-001-S49	BWL 4260A-001-S4	BWL 4260A-001-S49
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
≤ 35 mA	≤ 35 mA	≤ 35 mA	≤ 35 mA
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
Dark switching	Dark switching	Dark switching	Dark switching
Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
Infrared	Infrared	Infrared	Infrared
880 Nm	880 Nm	880 Nm	880 Nm
Green LED	Green LED	Green LED	Green LED
Yellow LED	Yellow LED	Yellow LED	Yellow LED
100 ms	100 ms	100 ms	100 ms
≤ 0.5 ms	≤ 0.5 ms	≤ 0.5 ms	≤ 0.5 ms
1 kHz	1 kHz	1 kHz	1 kHz
IP 67	IP 67	IP 67	IP 67
-10...+60 °C	-10...+60 °C	-10...+60 °C	-10...+60 °C
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
Corrosion-resistant steel	Corrosion-resistant steel	Corrosion-resistant steel	Corrosion-resistant steel
PMMA	PMMA	PMMA	PMMA
M12 connector, 4-pin	M8 connector, 3-pin	M12 connector, 4-pin	M8 connector, 3-pin



Wiring diagram





Photoelectric Sensors

Photoelectric sensors with special properties

Certain applications require sensors with special properties. Balluff's photoelectric sensors with special properties. For instance, color sensors reliably detect even the slightest color differences. The first-class True Color Sensor is at home in quality control as well as sorting systems. Contrast sensors and luminescence sensors are perfectly suited for detection tasks, such as reading marks on packaging and sensing fill levels, determining contours, measuring thickness, etc.

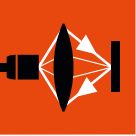
Our broad selection of fork sensors with various widths and light types allow optimal adaptation to many detection tasks. Angle sensors or optical window sensors are available as another alternative, in addition to light grids for packaging larger objects involving longer distances.

But even if it looks like there is no space for a photoelectric sensor, Balluff provides a solution: fiber optics in glass and plastic versions.



Photoelectric Sensors with Special Properties

Analog fork sensors BGL_C	274
Optical window sensors BOW	280
Light grids BLG	284
Color sensors BFS	288
Contrast sensors BKT	294
Luminescence sensors BLT	306
Optical fiber base units BFB/BOS	312
Plastic fiber optics BFO	326
Glass fiber optics BFO	344



Basic information and definitions can be found on page 934.

Photoelectric Sensors
with Special Properties
Analog fork sensors BGL_C

In-process correction

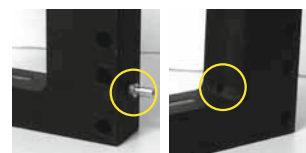
Thanks to their lighting strip, analog fork sensors not only detect objects with absolute reliability, they also determine their positions with complete accuracy. That means that readjustments can easily be made during a process, process reliability and product quality are significantly increased, and more efficiency becomes a welcome "side effect".

Technical highlights

- Analog signal proportional to the skin depth of the object
- Constant value, even in the event of height variations
- High degree of soiling resistance and compensation
- Fieldbus connection with IO-Link
- Ideal for web edge control



Integral air rinsing nozzle to prevent dust from accumulating on the emitter and receiver optics. Simple connection via standard pneumatic system.



Photoelectric Sensors with Special Properties

Analog fork sensors BGL_C

Product overview



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/ BOS

Plastic Fiber Optics BFO

Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

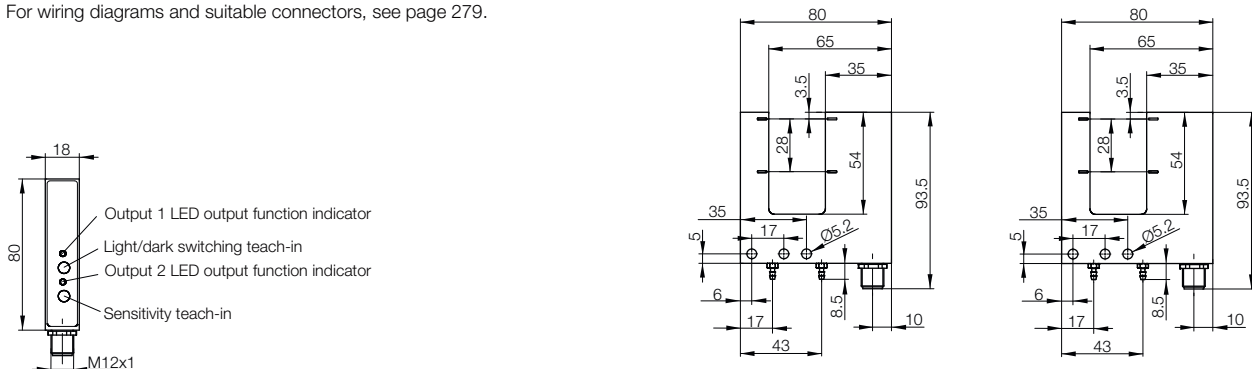
Type	Fork opening	Resolution	Light type		Output						Switching type		Switching frequency	U _s	Con- nection	Page	
			Red light		0-10 V	4-20 mA	1 × PNP transistor	2 × PNP transistor	DSC (Dynamic Sensor Control)	IO-Link	Light switching	Dark switching					
Fork sensors																	
BGL002Z BGL 30C-001-S4	30 mm	80 μm	■					■				■	■	500 Hz	■	■	276
BGL0031 BGL 30C-003-S4	30 mm	80 μm	■			■	■					■	■	500 Hz	■	■	276
BGL0033 BGL 30C-005-S4	30 mm	80 μm	■		■		■					■	■	500 Hz	■	■	277
BGL0036 BGL 30C-009-S4	30 mm	80 μm	■					■	■			■	■	500 Hz	■	■	276
BGL0037 BGL 50C-001-S4	50 mm	80 μm	■					■				■	■	500 Hz	■	■	277
BGL0039 BGL 50C-003-S4	50 mm	80 μm	■			■	■					■	■	500 Hz	■	■	277
BGL003C BGL 50C-005-S4	50 mm	80 μm	■		■		■					■	■	500 Hz	■	■	277
BGL003H BGL 50C-009-S4	50 mm	80 μm	■					■	■			■	■	500 Hz	■	■	277
Fork sensors with IO-Link																	
BGL0035 BGL 30C-007-S4	30 mm	80 μm	■							■					■	■	278
BGL003F BGL 50C-007-S4	50 mm	80 μm	■							■					■	■	278

NPN on request



Series			BGL analog	BGL analog	
Fork opening			30 mm	30 mm	
Fork depth			54 mm	54 mm	
PNP 2 switching outputs	NC/NO	Ordering code	BGL002Z		
		Part number	BGL 30C-001-S4		
PNP 1 analog and 1 switching/ error output	NC/NO	Ordering code		BGL0031	
		Part number		BGL 30C-003-S4	
PNP 2 switching outputs with DSC	NC/NO	Ordering code	BGL0036		
		Part number	BGL 30C-009-S4		
Supply voltage U_s			18...30 V DC	18...30 V DC	
No-load supply current I_0 max.			≤ 20 mA	≤ 20 mA	
Output current			100 mA	100 mA	
Analog output				4...20 mA	
Switching type			Light/dark switching (selectable)	Light/dark switching (selectable)	
Polarity reversal/short-circuit protected			Yes/Yes	Yes/Yes	
Settings			Teach-in	Teach-in	
Emitter, light type			Red light	Red light	
Wavelength			633 Nm	633 Nm	
Resolution (smallest discernible part)			≤ 80 μ m	≤ 80 μ m	
Repeat accuracy			0.15 mm	0.15 mm	
Switching hysteresis			< 0.4 mm	< 0.4 mm	
Output function indicator			2x yellow LED	2x yellow LED	
Response time			2 ms	2 ms	
Switching frequency			500 Hz	500 Hz	
Measurement field length			28 mm	28 mm	
Degree of protection as per IEC 60529			IP 67	IP 67	
Ambient temperature T_a			-5...+55°C	-5...+55°C	
Ambient light limit according to			EN 60947-5-2	EN 60947-5-2	
Material	Housing		Anodized aluminum	Anodized aluminum	
	Optical surface		PMMA	PMMA	
Connection			M12 connector, 4-pin	M12 connector, 4-pin	

For wiring diagrams and suitable connectors, see page 279.



Photoelectric Sensors with Special Properties

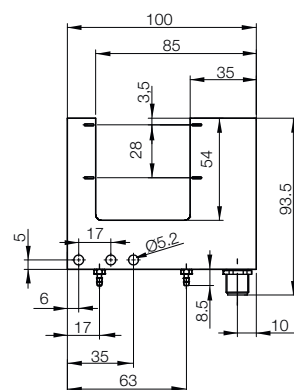
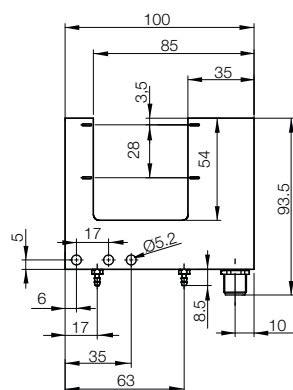
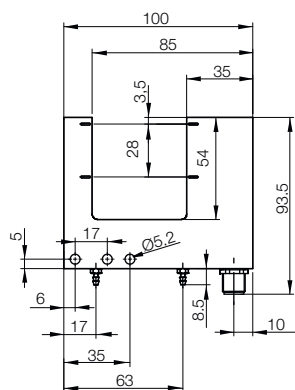
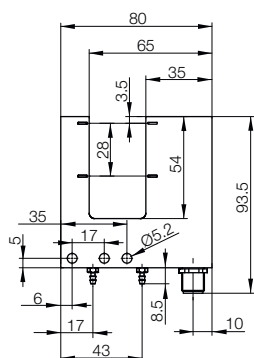
Analog fork sensors BGL_C



Photoelectric Sensors

Photoelectric Sensors

	BGL analog 30 mm 54 mm	BGL analog 50 mm 54 mm BGL0037 BGL 50C-001-S4	BGL analog 50 mm 54 mm BGL0039 BGL 50C-003-S4	BGL analog 50 mm 54 mm BGL003C BGL 50C-005-S4	
	BGL0033 BGL 30C-005-S4	BGL003H BGL 50C-009-S4			
	18...30 V DC ≤ 20 mA 100 mA 0...10 V DC Light/dark switching (selectable) Yes/Yes Teach-in Red light 633 Nm ≤ 80 μm 0.15 mm < 0.4 mm 2x yellow LED 2 ms 500 Hz 28 mm IP 67 -5...+55°C EN 60947-5-2 Anodized aluminum PMMA M12 connector, 4-pin	18...30 V DC ≤ 20 mA 100 mA Light/dark switching (selectable) Yes/Yes Teach-in Red light 633 Nm ≤ 80 μm 0.15 mm < 0.4 mm 2x yellow LED 2 ms 500 Hz 28 mm IP 67 -5...+55°C EN 60947-5-2 Anodized aluminum PMMA M12 connector, 4-pin	18...30 V DC ≤ 20 mA 100 mA 4...20 mA Light/dark switching (selectable) Yes/Yes Teach-in Red light 633 Nm ≤ 80 μm 0.15 mm < 0.4 mm 2x yellow LED 2 ms 500 Hz 28 mm IP 67 -5...+55°C EN 60947-5-2 Anodized aluminum PMMA M12 connector, 4-pin	18...30 V DC ≤ 20 mA 100 mA 0...10 V DC Light/dark switching (selectable) Yes/Yes Teach-in Red light 633 Nm ≤ 80 μm 0.15 mm < 0.4 mm 2x yellow LED 2 ms 500 Hz 28 mm IP 67 -5...+55°C EN 60947-5-2 Anodized aluminum PMMA M12 connector, 4-pin	Photoelectric Sensors with Special Properties Analog Fork Sensors BGL_C Optical Window Sensors BOW Light Grids BLG Color Sensors BFS Contrast Sensors BKT Luminescence Sensors BLT Optical Fiber Base Units FBF/BOS Plastic Fiber Optics BFO Glass Fiber Optics BFO Photoelectric Distance Sensors for Analog Distance Measurement Accessories for Photoelectric Sensors



Photoelectric Sensors with Special Properties

Fork sensors BGL with IO-Link

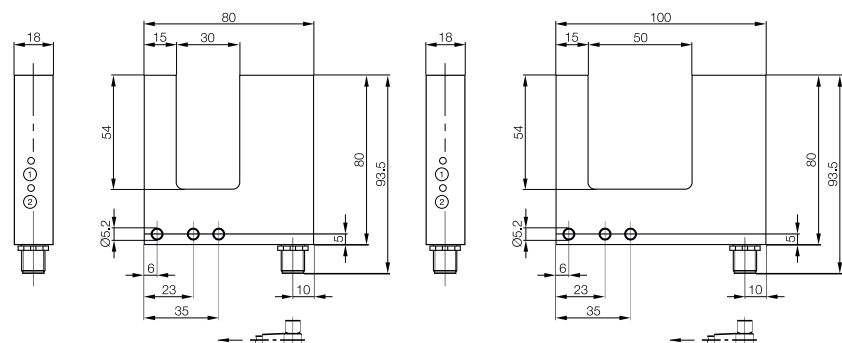
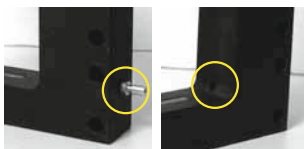


Series	BGL analog, Series C Premium		BGL analog, Series C Premium
Fork opening	30 mm		50 mm
Fork depth	54 mm		54 mm
PNP	With IO-Link	Ordering code	BGL0035
		Part number	BGL 30C-007-S4
			BGL003F
			BGL 50C-007-S4
Supply voltage U_S	18...30 V DC		18...30 V DC
No-load supply current I_0 max.	≤ 20 mA		≤ 20 mA
Output current	Max. 100 mA per output		Max. 100 mA per output
Analog output	4...20 mA		4...20 mA
Switching type	Light/dark switching (selectable)		Light/dark switching (selectable)
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes
Response time	≤ 1 ms		≤ 1 ms
Settings	2× teach button		2× teach button
Emitter, light type	Red light		Red light
Wavelength	633 Nm		633 Nm
Resolution	0.1 mm		0.1 mm
Repeat accuracy	0.15 mm		0.15 mm
Switching hysteresis	< 0.4 mm		< 0.4 mm
Hysteresis	±0.8 %		±0.8 %
Output function indicator	2× yellow LED		2× yellow LED
Response time	2 ms		2 ms
Switching frequency	500 Hz		500 Hz
Measurement field length	28 mm		28 mm
Degree of protection as per IEC 60529	IP 67		IP 67
Ambient temperature T_a	-5...+55°C		-5...+55°C
Ambient light limit according to	EN 60947-5-2		EN 60947-5-2
Material	Housing	Anodized aluminum	Anodized aluminum
	Optical surface	PMMA	PMMA
Connection	M12 connector, 4-pin, A-coded		M12 connector, 4-pin, A-coded

IO-Link

Mode	COM 2	COM 2
Transfer rate	38.4 kbaud	38.4 kbaud
IO-Link process data length	2 input bytes	2 input bytes
Value range	000 H...03FF H	000 H...03FF H
Diagnostics	Contamination	Contamination
Parameters	Switching points/switching range, button disable, NO/NC switch, analog value characteristics	Switching points/switching range, button disable, NO/NC switch, analog value characteristics

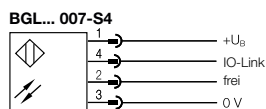
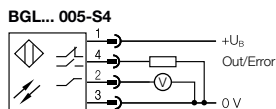
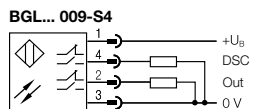
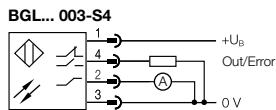
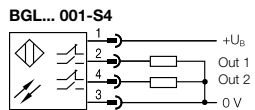
Integral air rinsing nozzle to prevent dust from accumulating on the emitter and receiver optics. Simple connection via standard pneumatic system.



Photoelectric Sensors with Special Properties

Fork sensors BGL Connection, accessories

Wiring diagrams



Suitable connectors
(please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Photoelectric Sensors with Special Properties

Optical window sensors BOW

The ideal use for optical window sensors BOW is when objects do not just have to be scanned in some places, but throughout an entire area (window) instead. Thanks to their multitude of beams arranged in parallel, they can detect objects in a broad window. A constant, high resolution is ensured at each location in the window in the process.

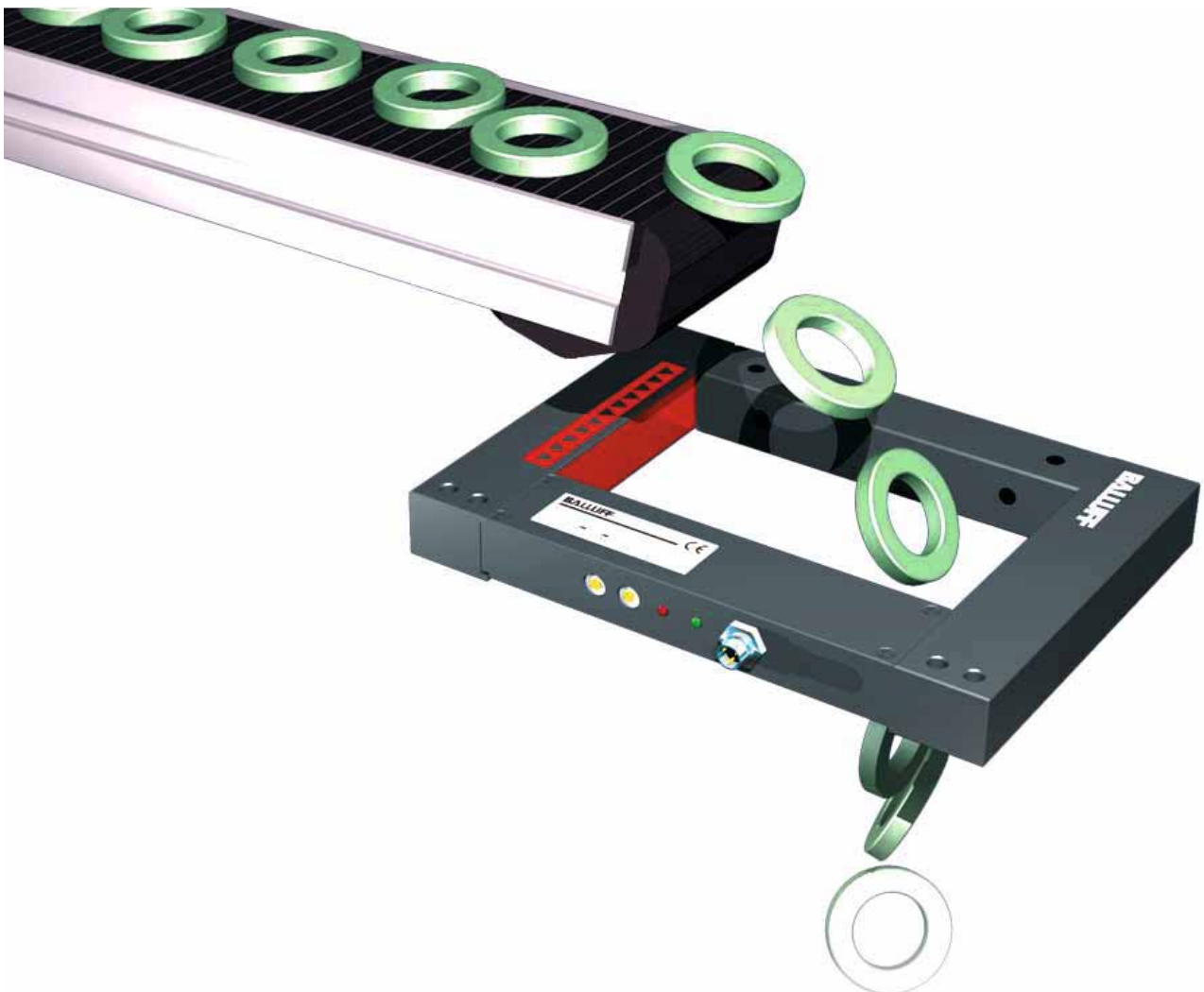
BOW sensors are dynamic, which means that parts are detected in the active area when they are moving.

Features

- Constant, high resolution
- Dynamic operation
- Only moving objects are detected, so feed trays and the like do not affect the measurement
- Detects small parts down to 1 mm
- Adjustable output signal length
- Adjustable sensitivity
- Three window sizes
- Standard M8 connector

Applications

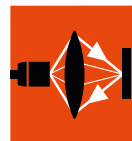
- Compressed air feeding of small parts
- Thread break monitoring
- Eject monitoring
- Counting/separating parts



Photoelectric Sensors with Special Properties

Optical window sensors BOW

Product overview



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type

■ Ordering code

■ Part number

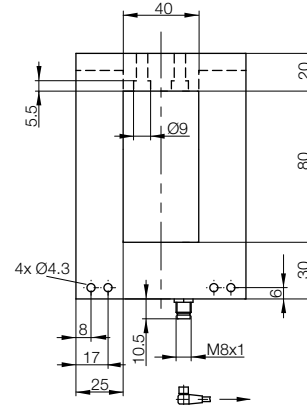


Optical window sensors

Type		Active area	Resolution	Light type		Output		Switching type		Principle	U _s	Connec-tion	Page
				Infrared		PNP transistor		Dark switching					
BOW001A	BOW A-0408-PS-C-S49	40×80 mm	1 mm	■		■		■		Dynamic	10...30V DC	M8 plug, 3-pin	282
BOW001J	BOW A-0808-PS-C-S49	80×80 mm	1 mm	■		■		■		Dynamic	10...30V DC	M8 plug, 3-pin	283
BOW0012	BOW A-1208-PS-C-S49	120×80 mm	1.2 mm	■		■		■		Dynamic	10...30V DC	M8 plug, 3-pin	283



Series	BOW	
Active area	40×80 mm	
PNP NC/NO	Ordering code	BOW001A
	Part number	BOW A-0408-PS-C-S49
Supply voltage U_S	10...30 V DC	
No-load supply current I_0 max.	≤ 40 mA	
Output current	200 mA	
Switching type	Dark switching	
Polarity reversal/short-circuit protected	Yes/Yes	
Settings	2× Potentiometer, 270°	
Emitter, light type	LED, infrared	
Wavelength	880 Nm	
Resolution (smallest discernible part)	1.0 mm	
Power-on indicator	Green LED	
Output function indicator	Red LED	
Turn-on delay	0.2 ms	
Signal duration for pulse stretching	10...300 ms adjustable	
Switching frequency	3...100 Hz dyn.	
Degree of protection as per IEC 60529	IP 67	
Ambient temperature T_a	-10...+55 °C	
Ambient light limit according to	EN 60947-5-2	
Material	Housing	Anodized aluminum
	Optical surface	PMMA
Connection	M8 connector, 3-pin	



Suitable connectors
(please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M8, 3-pin	Straight	PUR	Black	2 m	BCC02M8
M8, 3-pin	Straight	PVC	Gray	2 m	BCC02NU
M8, 3-pin	Angled	PUR	Black	2 m	BCC02ML
M8, 3-pin	Angled	PVC	Gray	2 m	BCC02P5

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.

Photoelectric Sensors with Special Properties

Optical window sensors BOW



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

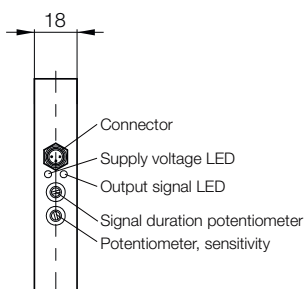
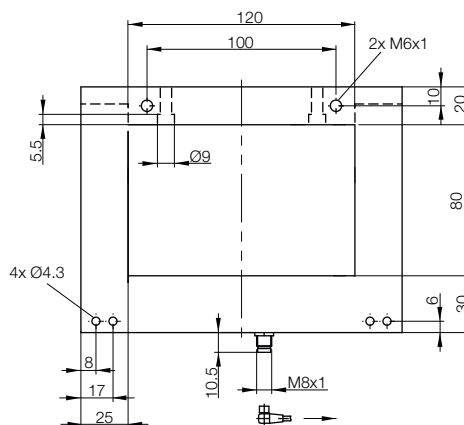
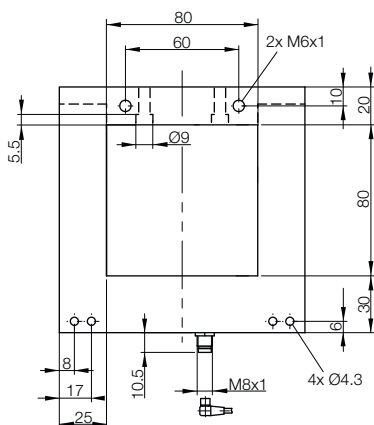
Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

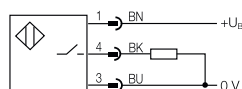
Accessories for Photoelectric Sensors



BOW	BOW
80x80 mm	120x80 mm
BOW001J	BOW0012
BOW A-0808-PS-C-S49	BOW A-1208-PS-C-S49
10...30 V DC	10...30 V DC
≤ 45 mA	≤ 60 mA
200 mA	200 mA
Dark switching	Dark switching
Yes/Yes	Yes/Yes
2x Potentiometer, 270°	2x Potentiometer, 270°
LED, infrared	LED, infrared
880 Nm	880 Nm
1.0 mm	1.2 mm
Green LED	Green LED
Red LED	Red LED
0.2 ms	0.2 ms
10...300 ms adjustable	10...300 ms adjustable
3...100 Hz dyn.	3...100 Hz dyn.
IP 67	IP 67
-10...+55 °C	-10...+55 °C
EN 60947-5-2	EN 60947-5-2
Anodized aluminum	Anodized aluminum
PMMA	PMMA
M8 connector, 3-pin	M8 connector, 3-pin



Wiring diagram



When installing with exposure to ambient light, make sure that the receiver is located on the connector side.

Photoelectric Sensors with Special Properties

Light grids BLG

Light grids BLG are normally used for reliably detecting wide and very large objects. BLG sensors are available in various measurement field heights of 100, 150 and 300 mm and allow both large and small ranges. Light grids with a measurement field height of 100 and 150 mm can be ordered with low or high resolution.

The light grid can be simply and quickly installed using the supplied mounting bracket. Setup and installation are user friendly and easy to accomplish.

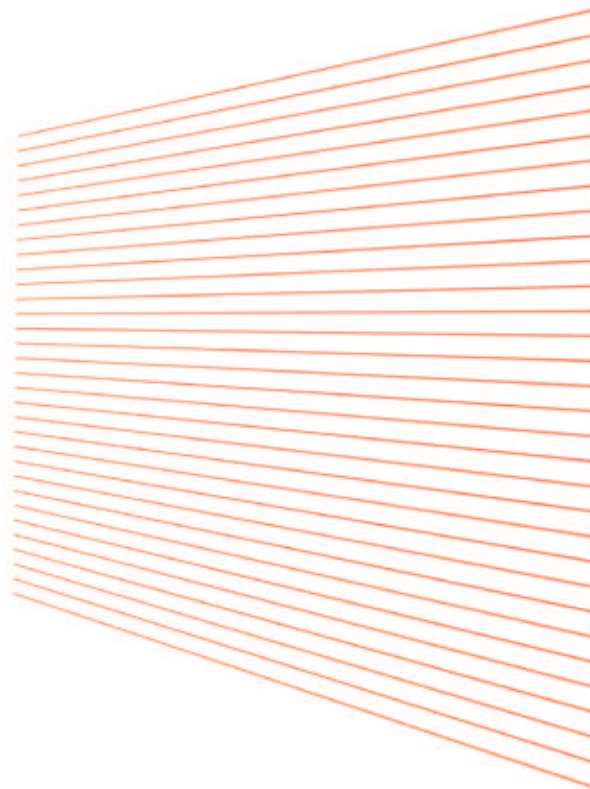
The system features an analog voltage output for outputting the height or width of an object directly. An additional switching output indicates whether the object is within the monitored range.

Features

- Easy to connect
- Easy to install
- Ready for operation immediately
- No cumbersome configuration of parameters
- Ranges 150 mm...2.1 m
- Measurement field heights 100, 150, 300 mm
- Analog output

Applications

- Counting parts
- Height measurement and height checking
- Presence verification
- Slack and position checking
- Pallet checking
- Web monitoring
- Position and material monitoring



Photoelectric Sensors with Special Properties

Light grids BLG Product overview



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type

■ Ordering code

■ Part number

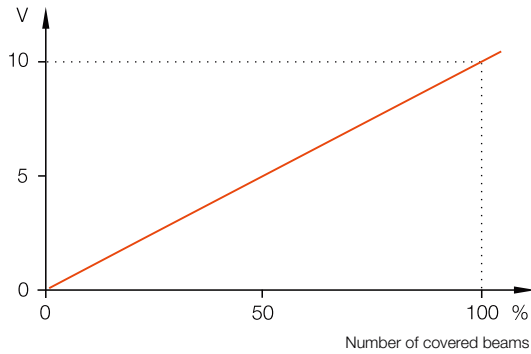


Light grids

Type		Measuring field height	Range		Resolution		Light type		Output		Switching type		U _s	Connec-tion		Page
				0.15...2.1 m	5 mm	7 mm	Infrared		PNP transistor	Analog 0...10 V	Dark switching			24 V DC	M12 plug	
BLG0001	BLG 1-010-210-050-PV01-SX	100 mm	■		■		■		■	■	■		■	■		287
BLG0002	BLG 1-010-210-070-PV01-SX	100 mm	■			■	■		■	■	■		■	■		287
BLG0003	BLG 1-015-210-050-PV01-SX	150 mm	■		■		■		■	■	■		■	■		287
BLG0004	BLG 1-015-210-070-PV01-SX	150 mm	■			■	■		■	■	■		■	■		287
BLG0005	BLG 1-030-210-070-PV01-SX	300 mm	■			■	■		■	■	■		■	■		287

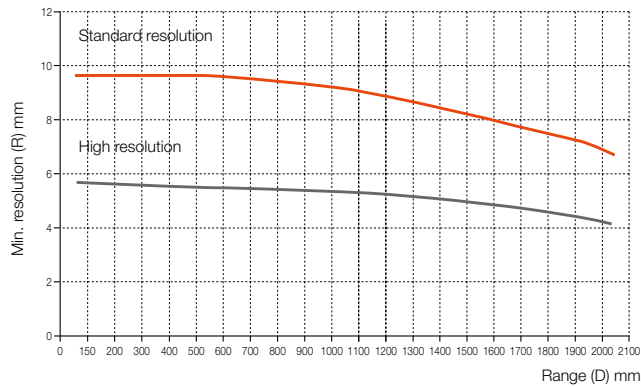
Photoelectric Sensors
with Special Properties
Light grids BLG

Analog output



Resolution diagram

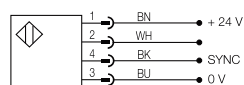
Range 0.15...2.1 m



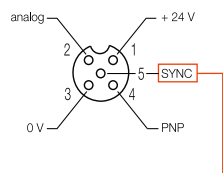
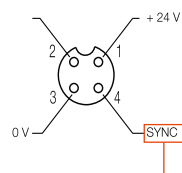
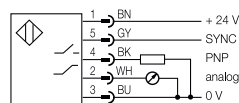
Series		
Measurement field height		
PNP NO Resolution 5 mm	Ordering code	
	Part number	
PNP NO Resolution 7 mm	Ordering code	
	Part number	
Supply voltage U_s		
No-load supply current I_0 max.	Emitter	
	Receiver	
Output current		
Switching type		
Short-circuit protected		
Analog output		
Settings		
Emitter, light type		
Wavelength		
Power-on indicator	Emitter/Receiver	
Output function indicator		
Degree of protection as per IEC 60529		
Ambient temperature T_a		
Material	Housing	
	Optical surface	
Connection	Emitter	
	Receiver	

Wiring diagrams

Emitter



Receiver



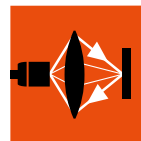
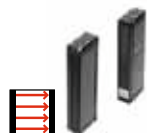
Recommended accessories
(please order separately)



Mounting bracket
(included)

Photoelectric Sensors with Special Properties

Light grids BLG



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

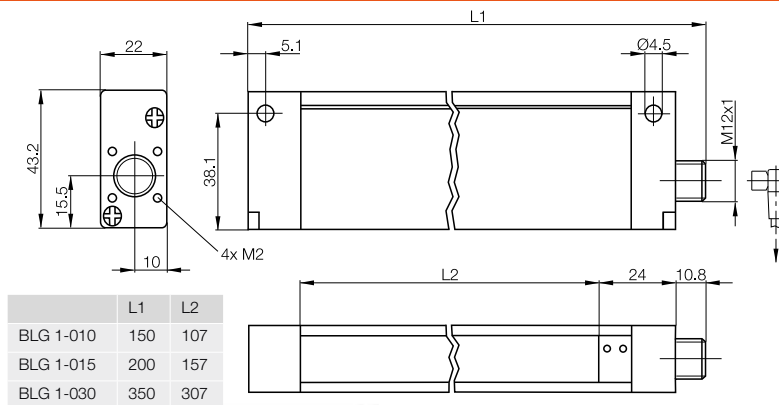
Glass Fiber Optics BFO

Photoelectric Distance Sensors

Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

BLG 100 mm	BLG 150 mm	BLG 300 mm
BLG0001	BLG0003	
BLG 1-010-210-050-PV01-SX	BLG 1-015-210-050-PV01-SX	
BLG0002	BLG0004	BLG0005
BLG 1-010-210-070-PV01-SX	BLG 1-015-210-070-PV01-SX	BLG 1-030-210-070-PV01-SX
24 V DC	24 V DC	24 V DC
≤ 150 mA	≤ 150 mA	≤ 150 mA
≤ 50 mA no load	≤ 50 mA no load	≤ 50 mA no load
100 mA	100 mA	100 mA
Dark switching	Dark switching	Dark switching
Yes	Yes	Yes
0...10 V	0...10 V	0...10 V
Fixed	Fixed	Fixed
LED, infrared	LED, infrared	LED, infrared
880 Nm	880 Nm	880 Nm
Green LED	Green LED	Green LED
Yellow LED	Yellow LED	Yellow LED
IP 65	IP 65	IP 65
0...+55 °C	0...+55 °C	0...+55 °C
Black anodized aluminum	Black anodized aluminum	Black anodized aluminum
PMMA	PMMA	PMMA
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin
M12 connector, 5-pin	M12 connector, 5-pin	M12 connector, 5-pin



Suitable connectors
(please order separately)



Suitable connectors
(please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M12, 5-pin	Straight	PUR	Black	5 m	BCC098C
M12, 5-pin	Angled	PUR	Black	5 m	BCC08FC

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.

Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N

Use the plug connector without an LED!

Photoelectric Sensors with Special Properties

Color sensors BFS

Applications

Color sensors open up a wide range of various applications, such as in the packaging industry, robotics, automation, quality assurance or in the process industry.

Automated processes can be simplified and accelerated using the versatile color sensors for detecting color nuances in carpets and textiles or for color markings on packagings or labels.

The **BFS 26K** and **BFS 27K** series of color sensors operate using pulsed white light, making them particularly insensitive to ambient light. The light reflected back from the object is received and processed by three different receivers (red, green, blue).

The various light spot geometry configurations of the respective sensors (round, rectangular or square) can reliably detect even the smallest color markings.

Numerous special functions such as color scanning, pulse expansion and blanking input provide additional application flexibility.

Features

- Microcontroller-based
- Pulsed white light
- Various light spot geometries
- 3 different colors can be identified at the same time
- 5-stage adjustable color tolerance

The **BFS 27K** with a clearly organized operating panel and large display enables various colors and the selection of all functions to be taught in easily using teach-in.

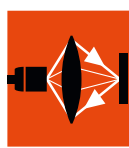
Modes C (color type) and C+I (color type + intensity) as well as 10 tolerance levels can be set separately for all 3 channels. Pulse extension of 0...40 ms can also be selected and is applied to all channels. Balluff Sensorware allows the set functions to be visualized over the RS485 interface.

- Display
- Autocollimation
- Versions with high switching frequency or for dark colors
- Color type or color type + intensity operating modes
- Serial RS485 interface



Photoelectric Sensors with Special Properties

Color sensors BFS Product overview



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type	Sensing distance/Range	Light type	Output				U _s			Connection			Page	
			3×PNP transistor	3×Push-pull	IO-Link	RS 232 interface	12...28 V DC	18...30 V DC	24 V	M12 plug, 8-pin	M12 plug, 5-pin	Cable		Color scan
True color sensor														
BFS000L BFS 33M-GSS-F01-PU-02	400 mm	■	■	■	■			■			■		■	291
Color sensors														
BFS0001 BFS 26K-PS-L01-S115	12...32 mm	■	■					■			■		■	293
BFS0002 BFS 26K-PS-L02-S115-C	15...30 mm	■	■					■			■		■	293
BFS0003 BFS 26K-PS-L03-S115-C	18...22 mm	■	■					■			■		■	293
BFS000F BFS 26K-GI-L04-S92	12...32 mm	■		■				■	■		■			293



Photoelectric Sensors with Special Properties
True Color sensor BFS 33M

For distinguishing between the smallest of color nuances at the highest level

The True Color sensor BFS 33M is in a completely different league to conventional RGB sensors. Thanks to its high resolution, it not only detects colors but can also reliably distinguish between nuances. The True Color sensor thus detects, for instance minimal color deviations in injection molded parts. And it can also tell if a metal enters production polished or unpolished. Faded colors or poor print quality are detected in an instant and separated. It thus opens up completely new dimensions in quality control. The sensor uses three digital outputs and a serial interface to perform evaluations. The lab color space values are transmitted directly via this interface.

Features

- Detection of and distinguishing between a random number of colors
- Reliably distinguishes between the smallest of color nuances
- Large sensing distance up to 400 mm
- Simple configuration and visualization using software
- Robust metal housing

Industries

- Automotive industry
- Plastics processing
- Packaging industry
- Handling and assembly
- Printing industry
- Wood processing



+ Recommended accessories
(please order separately)

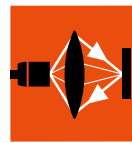
Description	Ordering code
① Optical fiber M4 (coaxial), 2 m long	BFO00C9
② Optics (short-range), 7 mm, screwed onto M4 optical fiber	BAM00NT
③ Optical fiber M6 (coaxial), 1 m long	BFO00FP
④ Optical fiber M6 (coaxial), 2 m long	BFO00C4
⑤ Optical fiber M6 (coaxial), 5 m long	BFO00FN
⑥ Optics (adjustable), 200 mm sensing distance, screwed onto M6 optical fiber	BAM01U2
⑦ Optics (long-range), 400 mm sensing distance, screwed onto M6 optical fiber	BAM01PA
⑧ Interface cable (shielded)	BCC0ARP
⑨ RS232/USB interface converter	BAE009A



More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Photoelectric Sensors with Special Properties

True Color sensor BFS 33M



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/ BOS

Plastic Fiber Optics BFO

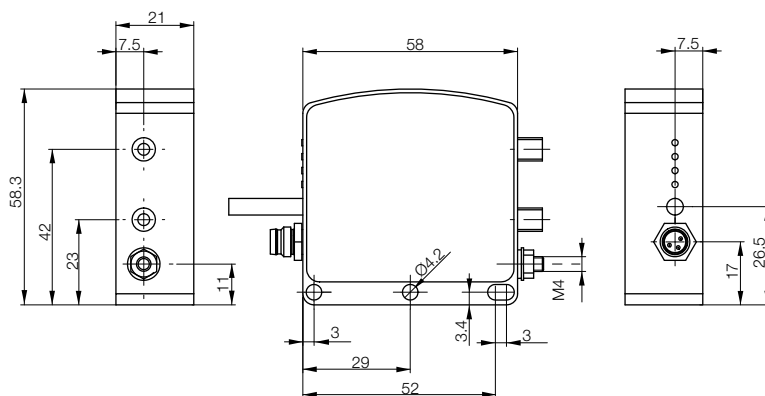
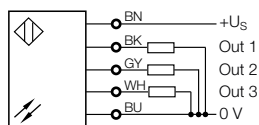
Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Series	BFS 33M
Working range	400 mm (with long-range optics)
3× Push-pull	Ordering code BFS000L
RS 232 interface	Part number BFS 33M-GSS-F01-PU-02
Supply voltage U _S	24 V DC ±10%
No-load supply current I ₀ max.	40 mA
Output current	30 mA
Polarity reversal/short-circuit protected	Yes/Yes
Settings	via software
Emitter, light type	LED, white light
Color space	CIE Lab
Light spot diameter	Depends on the fiber optics
Color resolution tolerance	Adjustable (software)
Resolution	8 amplifier stages of 12 bits each
Color resolution	< 0.5 dE
Repeat accuracy	< 1 dE
Ready indicator	Green LED
Output function indicator	3× Yellow LED (binary encoding)
Response time	0.33 ms
Switching frequency	1.5 kHz
Degree of protection as per IEC 60529	IP 54
Ambient temperature T _a	+10...+55 °C
Permissible ambient light	EN 60947-5-2
Housing material	Al coated
Connection	2 m PUR cable, 5×0.25 mm ²

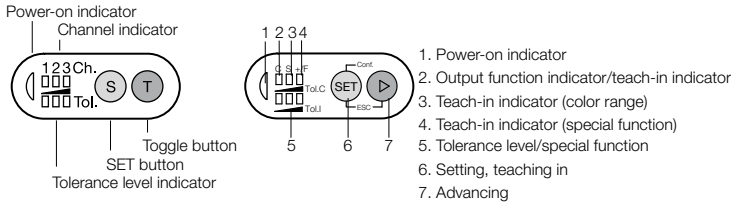
Wiring diagram



Photoelectric Sensors with Special Properties

Color sensors **BFS 26K**

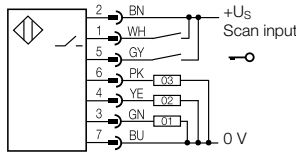
Indicators and operating elements



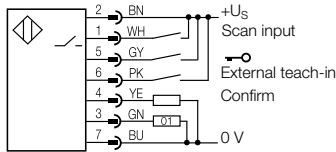
Wiring diagrams

BFS 26K-PS...

Two modes are available.
1. Normal mode "factory setting"

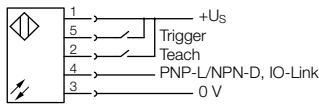


2. External teach-in setting using "special functions"

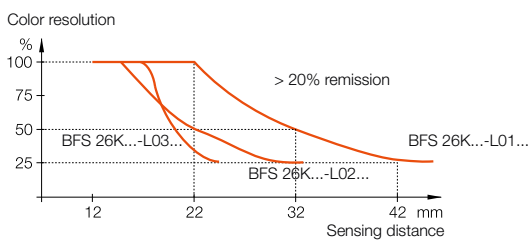


Disabling input:
> 12 V = Buttons locked,
< 3 V = Buttons not locked

BFS 26K-GI...



Color resolution/sensing distance diagram



Recommended accessories
(please order separately)

Description	Ordering code
Mounting bracket	BAM00TK



More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Series	
Light spot diameter	
Diffuse mode working range	
Retroreflective working range	
3x PNP	Ordering code
	Part number
1x Push-pull, IO-Link	Ordering code
	Part number
Supply voltage U_S	
No-load supply current I_0 max.	
Output current	
Switching type	
Polarity reversal/short-circuit protected	
Settings	
Emitter, light type	
Light spot geometry	
Sensing distance tolerance	
Color resolution tolerance	
Ready indicator	
Output function indicator Ch. 1...Ch. 3	
Output function indicator Tol. 1...Tol. 5	
Stand-by delay	
Response time	
Switching frequency	
Time function	
Degree of protection as per IEC 60529	
Ambient temperature T_a	
Permissible ambient light	
Material	Housing
	Optical surface
Connection	

Suitable connectors
(please order separately)



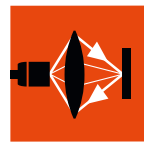
Size	Design	Cable material	Color	Length	Ordering code
M12, 8-pin	Straight	PUR	Black	5 m	BCC0995
M12, 8-pin	Angled	PUR	Black	5 m	BCC06K5

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.

Photoelectric Sensors with Special Properties

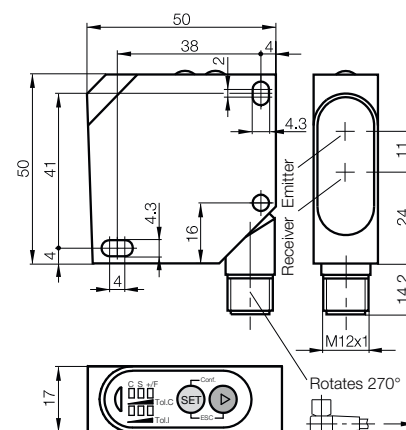
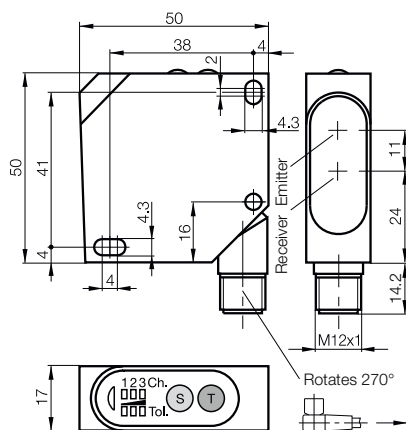
Color sensors BFS 26K



Photoelectric Sensors

Photoelectric Sensors

	BFS 26K	BFS 26K	BFS 26K	BFS 26K	
	Ø 4 mm at 22 mm sensing distance	2x2 mm at 22 mm sensing distance	5x1 mm at 22 mm sensing distance	Ø 4 mm at 22 mm sensing distance	Photoelectric Sensors with Special Properties
	12...32 mm	15...30 mm	18...22 mm	12...32 mm	Analog Fork Sensors BGL_C
	50...200 mm				Optical Window Sensors BOW
	BFS0001	BFS0002	BFS0003		Light Grids BLG
	BFS 26K-PS-L01-S115	BFS 26K-PS-L02-S115-C	BFS 26K-PS-L03-S115-C	BFS000F	Color Sensors BFS
				BFS 26K-GI-L04-S92	Contrast Sensors BKT
	12...28 V DC	12...28 V DC	12...28 V DC	18...30 V DC	Luminescence Sensors BLT
	≤ 40 mA	≤ 40 mA	≤ 40 mA	≤ 40 mA	Optical Fiber Base Units BFB/ BOS
	100 mA	100 mA	100 mA	100 mA	Plastic Fiber Optics BFO
	Light switching	Light switching	Light switching	Light/dark switching (selectable)	Glass Fiber Optics BFO
	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes	
	Teach-in	Teach-in	Teach-in	Teach-in	Photoelectric Distance Sensors for Analog Distance Measurement
	Pulsed white light	Pulsed white light	Pulsed white light	Pulsed white light	
	Round	Square	Rectangular	Round	Accessories for Photoelectric Sensors
	±6 mm at Tol.3	±5 mm at Tol.3	±2 mm at Tol.3	±6 mm at Tol C3 and Tol I2	
	Adjustable in 5 levels	Adjustable in 5 levels	Adjustable in 5 levels		
	Green LED	Green LED	Green LED		
	3xYellow LED	3xYellow LED	3xYellow LED		
	3xRed LED	3xRed LED	3xRed LED		
	300 ms	300 ms	300 ms	300 ms	
	1 ms	1 ms	1 ms		
	500 Hz	500 Hz	500 Hz	500 Hz (SIO mode)	
	50 ms release delay selectable	50 ms release delay selectable	50 ms release delay selectable	50 ms release delay selectable	
	IP 67	IP 67	IP 67	IP 67	
	-10...+55 °C	-10...+55 °C	-10...+55 °C	-10...+55 °C	
	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	
	Impact-resistant ABS	Impact-resistant ABS	Impact-resistant ABS	Impact-resistant ABS	
	PMMA	PMMA	PMMA	PMMA	
	M12 connector, 8-pin	M12 connector, 8-pin	M12 connector, 8-pin	M12 connector, 5-pin	



Photoelectric Sensors with Special Properties

Contrast sensors BKT

Contrast sensors are high-resolution diffuse sensors that distinguish objects based on their gray values.

Color, brightness and reflectivity have a strong effect on the measurement result.

The measuring distance should be kept constant when gray values differ only slightly. The resolution of the sensor decreases with increasing sensing distance.

Multiple series with various light types and functions are available for the multitude of uses for sensors.

Applications

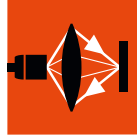
- Sensing markings on packaging material
- Synchronizing cutting or separating processes
- Checking for adhesive, ink and color
- Position checking of printing templates
- Sensing objects based on contrast



Photoelectric Sensors with Special Properties

Contrast sensors BKT

Product overview



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/ BOS

Plastic Fiber Optics BFO

Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Accessories for Photoelectric Sensors

Accessories for Photoelectric Sensors

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Accessories for Photoelectric Sensors

Accessories for Photoelectric Sensors

Accessories for Photoelectric Sensors

Accessories for Photoelectric Sensors

Type	Sensing distance	Light type			Output			Switching type		Switching frequency	U _s	Connection				Page
		White light	Red, green and blue light	Laser light	PNP transistor	NPN transistor	Analog output	Light switching	Dark switching			10...30 V DC	M8 plug, 4-pin	M12 plug, 4-pin	M12 plug, 5-pin	
Contrast sensors																
BKT000A	BKT 6K-001-P-S75	40...150 mm			■	■			■	■	1 kHz	■	■			297
BKT0008	BKT 6K-001-N-S75	40...150 mm			■		■		■	■	1 kHz	■	■			297
BKT0009	BKT 6K-001-P-02	40...150 mm			■	■			■	■	1 kHz	■			■	297
BKT0007	BKT 6K-001-N-02	40...150 mm			■		■		■	■	1 kHz	■			■	297
BKT000H	BKT 18KF-001-P-S4	10 mm	■			■			■	■	5 kHz	■		■		299
BKT000F	BKT 18KF-001-P-02	10 mm	■			■			■	■	5 kHz	■			■	299
BKT000Y	BKT 21M-002-P-S4	19 mm	■			■			■	■	5 kHz	■		■		301
BKT000W	BKT 21M-002-N-S4	19 mm	■				■		■	■	5 kHz	■		■		301
BKT0001	BKT 67M-001-U-S92	9 mm*	■			■	■	■	■	■	15 kHz	■			■	303
BKT0002	BKT 67M-002-U-S92	9 mm*	■			■	■	■	■	■	15 kHz	■			■	303
BKT0003	BKT 67M-003-U-S92	9 mm*	■			■	■	■	■	■	25 kHz	■			■	303
BKT0004	BKT 67M-004-U-S92	9 mm*	■			■	■	■	■	■	25 kHz	■			■	303
BKT0005	BKT 67M-005-U-S92	9 mm*	■			■	■	■	■	■	30 kHz	■			■	303
BKT0006	BKT 67M-006-U-S92	9 mm*	■			■	■	■	■	■	30 kHz	■			■	303

*Longer sensing distances using interchangeable optics

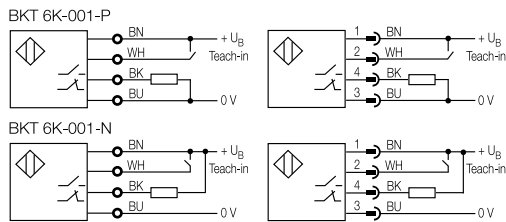
Photoelectric Sensors with Special Properties

Laser contrast sensor BKT 6K

The laser contrast sensor **BKT 6K** is designed to reliably detect small areas of contrast variances. Even the narrowest lines can be detected reliably in the optimum working range of 70...100 mm. Larger areas are capable of being detected outside this range.

Programming the sensor is easy using its teach-in button or a control line.

Wiring diagrams



Recommended accessories (please order separately)

Description	Ordering code
Mounting bracket	BAM00UH



You can find special accessories for diffuse sensors, such as **reflectors, apertures, lenses, filters and deflection heads**, in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Suitable connectors (please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M8, 4-pin	Straight	PUR	Black	2 m	BCC02N2
M8, 4-pin	Straight	PVC	Gray	2 m	BCC02PL
M8, 4-pin	Angled	PUR	Black	2 m	BCC02NC
M8, 4-pin	Angled	PVC	Gray	2 m	BCC02PZ

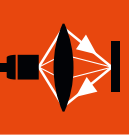
Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.



Photoelectric Sensors with Special Properties

Laser contrast sensor BKT 6K



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/ BOS

Plastic Fiber Optics BFO

Glass Fiber Optics BFO

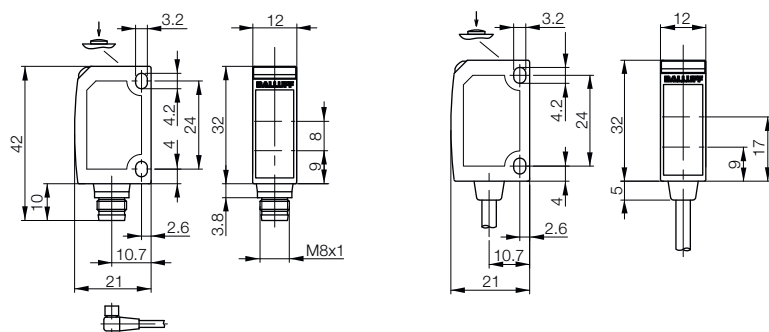
Photoelectric Distance Sensors

for Analog Distance Measurement

Accessories for Photoelectric Sensors

Series	BKT 6K		BKT 6K	
Working distance	40...150 mm*		40...150 mm*	
PNP NC/NO	Ordering code	BKT000A	BKT0009	
	Part number	BKT 6K-001-P-S75	BKT 6K-001-P-02	
NPN NC/NO	Ordering code	BKT0008	BKT0007	
	Part number	BKT 6K-001-N-S75	BKT 6K-001-N-02	
Supply voltage U_s	10...30 V DC		10...30 V DC	
No-load supply current I_0 max.	≤ 25 mA		≤ 25 mA	
Output current	100 mA		100 mA	
Switching type	Light/dark switching (selectable)		Light/dark switching (selectable)	
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes	
Settings	Teach-in		Teach-in	
Emitter, light type	Laser, red light		Laser, red light	
Wavelength	650 Nm		650 Nm	
Laser class	2		2	
Light spot diameter	0.7 mm at the focus (85 mm \pm 15 mm)		0.7 mm at the focus (85 mm \pm 15 mm)	
Output function indicator	Yellow LED		Yellow LED	
Stability indicator	Green LED		Green LED	
Response time	0.5 ms		0.5 ms	
Switching frequency	1 kHz		1 kHz	
Degree of protection as per IEC 60529	IP 67		IP 67	
Ambient temperature T_a	$-20...+60$ °C		$-20...+60$ °C	
Permissible ambient light	EN 60947-5-2		EN 60947-5-2	
Material	Housing	Impact-resistant ABS	Impact-resistant ABS	
	Optical surface	PMMA	PMMA	
Connection	M8 connector, 4-pin		2 m PVC cable, 4x0.14 mm ²	

*Optimum working range for small markings:
70...100 mm.



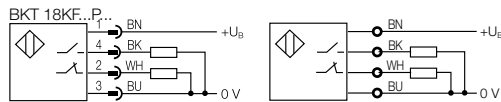
Photoelectric Sensors with Special Properties

Contrast sensor BKT 18KF

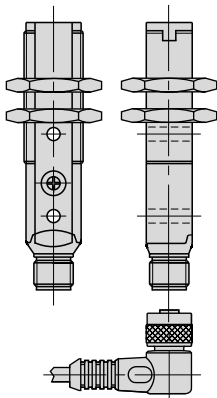
The contrast sensor **BKT 18KF** operates with white light and draws attention with its ability to be configured simply at just the press of a button. It detects colored markings as well as gray levels on various surfaces. In the standard setting the sensor operates using dark switching.

Precise configuration is available for slight contrast differences. The switching type can also be selected in this setting.

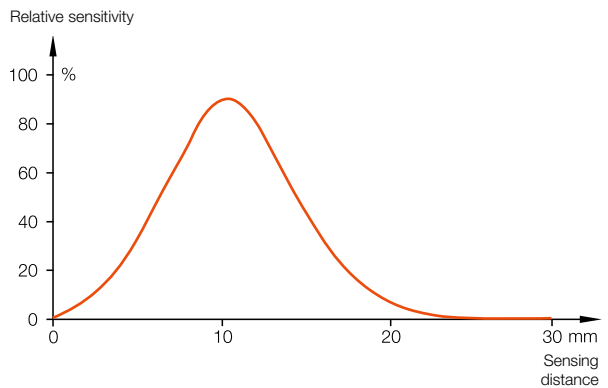
Wiring diagrams



Connector orientation



Function diagram



Recommended accessories (please order separately)

Description	Ordering code
① Mounting bracket	BAM00RY
② Mounting clamp	BAM00T3



You can find special accessories for diffuse sensors, such as **reflectors, apertures, lenses, filters and deflection heads**, in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Suitable connectors (please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N



Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.

Photoelectric Sensors with Special Properties

Contrast sensor BKT 18KF



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

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Photoelectric Distance Sensors for Analog Distance Measurement

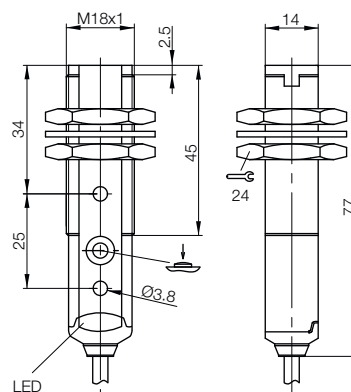
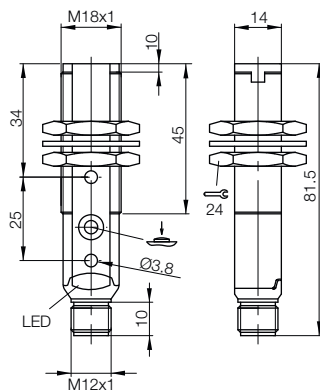
Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

Series	BKT		BKT	
Working distance	10 mm±2 mm		10 mm±2 mm	
PNP	NC/NO	Ordering code	BKT000H	BKT000F
		Part number	BKT 18KF-001-P-S4	BKT 18KF-001-P-02
Supply voltage U _S	10...30 V DC		10...30 V DC	
No-load supply current I ₀ max.	≤ 25 mA		≤ 25 mA	
Output current	100 mA		100 mA	
Switching type	Light and dark switching		Light and dark switching	
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes	
Settings	Teach-in		Teach-in	
Emitter, light type	LED, white light		LED, white light	
Wavelength	400...700 nm		400...700 nm	
Light spot diameter	ca. 4.5 mm 10 mm		ca. 4.5 mm 10 mm	
Output function indicator	Yellow LED		Yellow LED	
Power/error indicator	Green/red LED		Green/red LED	
Response time	100 μs		100 μs	
Switching frequency	5 kHz		5 kHz	
Degree of protection as per IEC 60529	IP 67		IP 67	
Ambient temperature T _a	-25...+55 °C		-25...+55 °C	
Permissible ambient light	EN 60947-5-2		EN 60947-5-2	
Material	Housing	PBT	Housing	PBT
	Optical surface	PMMA	Optical surface	PMMA
Connection	M12 connector, 4-pin		2 m PVC cable, 4×0.14 mm ²	



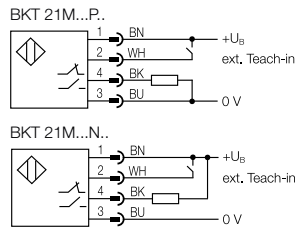
Photoelectric Sensors with Special Properties

Contrast sensors BKT 21M

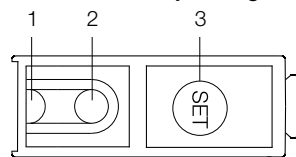
The **BKT 21M** contrast sensor uses white light and can be programmed at the push of a button. It detects colored markings as well as gray levels on various surfaces. In its standard setting the sensor is dark switching (markings with less light intensity are detected as the background).

Precise configuration is available for slight contrast differences. The switching type can also be selected in this setting.

Wiring diagrams

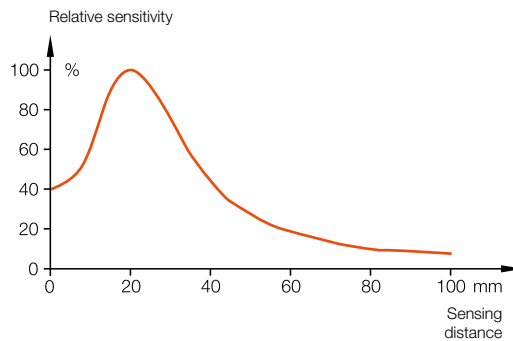


Indicators and operating elements



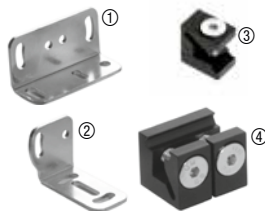
- 1 Output function indicator (yellow)
- 2 Power-/error indicator (green/red)
- 3 SET- button

Function diagram



Recommended accessories (please order separately)

Description	Ordering code
① Mounting bracket	BAM00T9
② Mounting bracket	BAM00TA
③ Clamping holders	BAM00TF
④ Clamping holders	BAM00TH



Suitable connectors (please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N

Connectors without LED are suitable for PNP and NPN sensors.

You can find special accessories for diffuse sensors, such as **reflectors, apertures, lenses, filters and deflection heads**, in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.

Photoelectric Sensors with Special Properties

Contrast sensors BKT 21M



Photoelectric Sensors

Photoelectric Sensors



Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

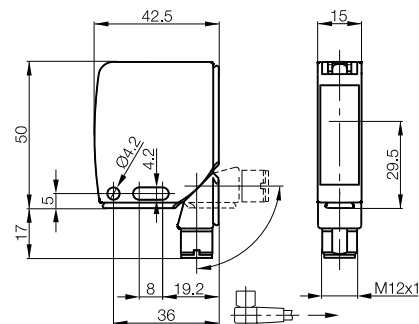
Plastic Fiber Optics BFO

Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Series			BKT
Working distance			19 mm±2 mm
PNP	NC/NO	Ordering code	BKT000Y
		Part number	BKT 21M-002-P-S4
NPN	NC/NO	Ordering code	BKT000W
		Part number	BKT 21M-002-N-S4
Supply voltage U _S			10...30 V DC
No-load supply current I ₀ max.			≤ 30 mA
Output current			100 mA
Switching type			Light/dark switching (adjustable in precise mode)
Polarity reversal/short-circuit protected			Yes/Yes
Settings			Teach-in
Emitter, light type			LED, white light
Wavelength			400...700 nm
Light spot diameter			ca. 3.5 mm 19 mm
Output function indicator			Yellow LED
Power/error indicator			Green/red LED
Response time			0.1 ms
Switching frequency			5 kHz
Time function			20 ms off-delay
Degree of protection as per IEC 60529			IP 67
Ambient temperature T _a			-25...+55 °C
Permissible ambient light			EN 60947-5-2
Material	Housing		GD-Zn/Al
	Optical surface		Glass
Connection			M12 connector, 4-pin



Photoelectric Sensors
with Special Properties
Contrast sensors BKT 67M

Specially designed for print mark detection

- Three models for any application complexity
- Red, green or blue light emission for unique color identification
- Rugged aluminum housing
- Greatest freedom in equipment design with optional front or bottom light exit



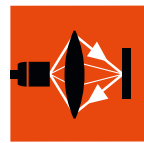
Series		
Working distance		
PNP and NPN transistor (selectable)	Ordering code	
Vertical light spot	Part number	
PNP and NPN transistor (selectable)	Ordering code	
Horizontal light spot	Part number	
Supply voltage U_S		
No-load supply current I_0 max.		
Output current		
Switching type		
Analog output		
Polarity reversal/short-circuit protected		
Settings		
Additional function		
Emitter, light type		
Wavelength		
Light spot diameter		
Output function indicator		
Power/error indicator		
Time function display		
Response time		
Switching frequency		
Time function		
Degree of protection as per IEC 60529		
Ambient temperature T_a		
Permissible ambient light		
Material	Housing	
	Optical surface	
Connection		

*Longer sensing distance using interchangeable optics



Photoelectric Sensors with Special Properties

Contrast sensors BKT 67M



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

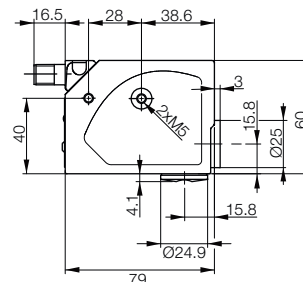
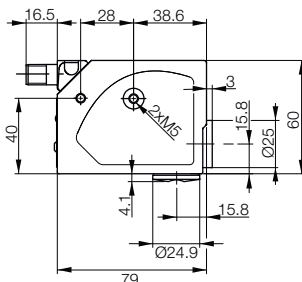
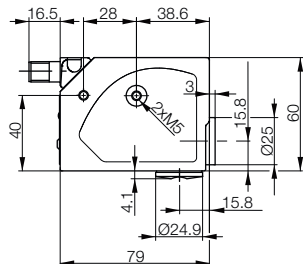
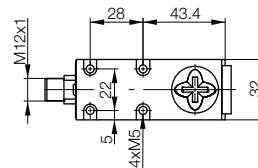
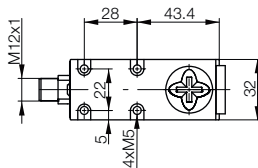
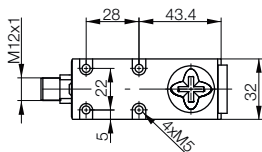
Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



BKT 9 mm* ± 3 mm BKT0001	BKT 9 mm* ± 3 mm BKT0003	BKT 9 mm* ± 3 mm BKT0005
BKT 67M-001-U-S92	BKT 67M-003-U-S92	BKT 67M-005-U-S92
BKT0002	BKT0004	BKT0006
BKT 67M-002-U-S92	BKT 67M-004-U-S92	BKT 67M-006-U-S92
10...30 V DC	10...30 V DC	10...30 V DC
≤ 50 mA	≤ 85 mA	≤ 35 mA
100 mA	100 mA	100 mA
Light/Dark (automatic)	Light/Dark (automatic)	Light/Dark (automatic)
1...3 V	1...3 V	1...3 V
Yes/Yes	Yes/Yes	Yes/Yes
Teach-in button	3 teach-in buttons	3 teach-in buttons
	Segment display	4-digit display
Red, green and blue light	Red, green and blue light	Red, green and blue light
630 nm/520 nm/465 nm	630 nm/520 nm/465 nm	630 nm/520 nm/465 nm
1.5x5 mm	1.5x5 mm	1.5x5 mm
Yellow LED	Yellow LED	Yellow LED
Green LED	Green LED	Green LED
33 μs	25 μs	17 μs
15 kHz	20 kHz	30 kHz
IP 67	IP 67	IP 67
-10...+55 °C	-10...+55 °C	-10...+55 °C
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
Al	Al	Al
PMMA	PMMA	PMMA
M12 connector, 5-pin	M12 connector, 5-pin	M12 connector, 5-pin

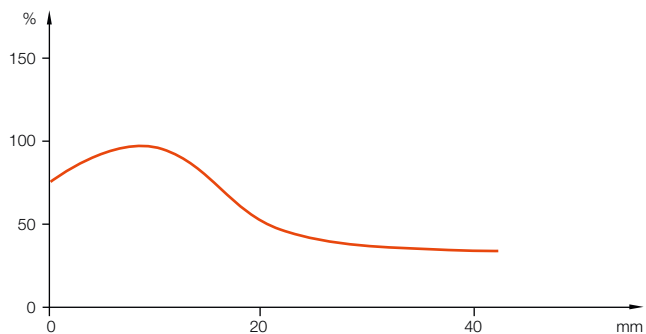


Photoelectric Sensors
with Special Properties

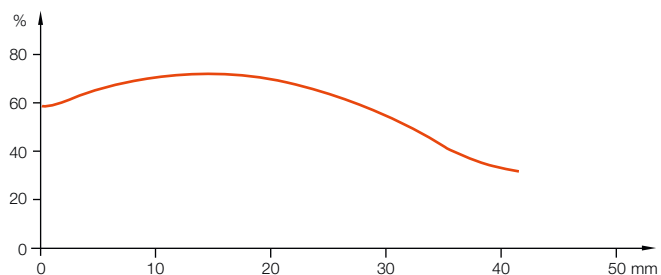
Contrast sensors BKT 67M

Function diagrams

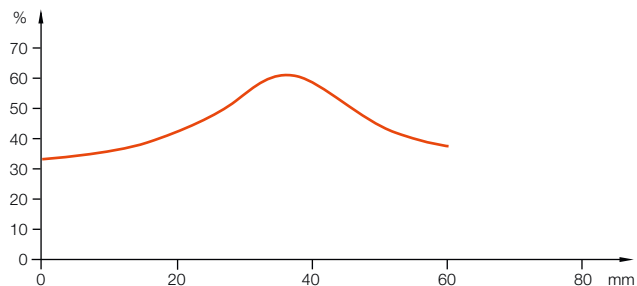
**BKT 67M with BKT M-PK-2 (standard lens)
BKT M-PK-4**



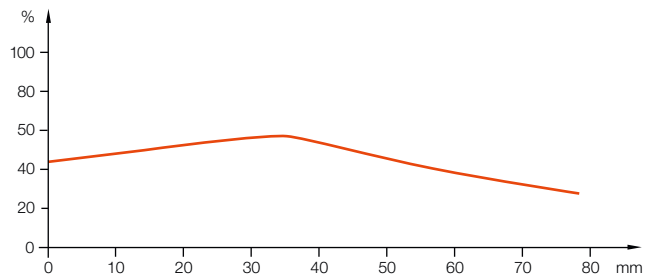
BKT 67M with BKT M-PK-1



BKT 67M with BKT M-PK-3



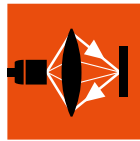
BKT 67M with BKT M-PK-5



Photoelectric Sensors with Special Properties

Contrast sensors BKT 67M

Connection, accessories



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

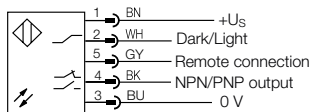
Plastic Fiber Optics BFO

Glass Fiber Optics BFO

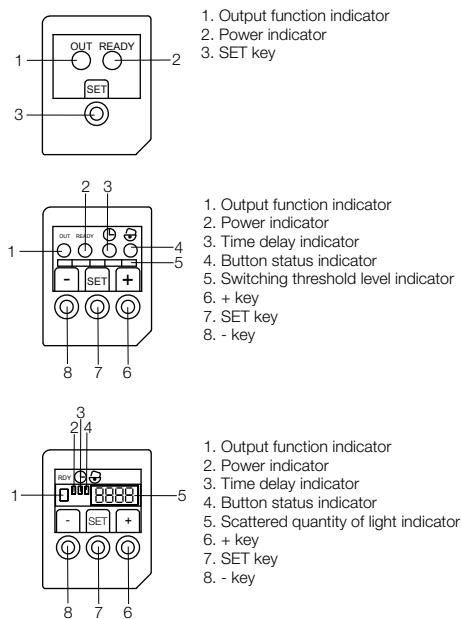
Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Wiring diagram



Indicators and operating elements



Recommended accessories (please order separately)

Description	Focal length/focus	Ordering code
① Lens	18 mm	BAM0120
② Lens	9 mm	BAM0121
③ Lens	28 mm	BAM0122
④ Lens	50 mm	BAM00P3
⑤ Intermediate ring		BAM00P2



You can find special accessories for diffuse sensors, such as **reflectors, apertures, lenses, filters and deflection heads**, in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Suitable connectors (please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M12, 5-pin	Straight	PUR	Black	5 m	BCC098C
M12, 5-pin	Angled	PUR	Black	5 m	BCC08FC

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.

Photoelectric Sensors with Special Properties

Luminescence sensors BLT

Photoelectric sensors usually detect the target or the desired target features themselves. If that is not possible, the object can be marked with fluorescent substances. These markings are invisible to the human eye, but are detected by luminescence sensors with their UV light.

Luminescence sensors detect any kind of fluorescent substance, even if markings are applied lightly.

Applications

- Logistics (marking, selecting)
- Assembly (guiding, monitoring, sorting)
- Packaging machines (to monitor cutting, folding)
- Ceramics industry (e.g. positioning parts)
- Wood industry (e.g. checking the glue bead)
- Pharmaceuticals (control tasks in the manufacturing process)
- Textiles (e.g. guiding cuts)
- Food industry



Photoelectric Sensors with Special Properties

Luminescence sensors BLT Product overview



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type

■ Ordering code

■ Part number



Luminescence sensors

Type		Sensing distance	Light type		Output		Switching type		Switching frequency	U _s	Connec-tion		Page
			UV light		PNP	NPN	Light switching	Dark switching			M12 plug, 4-pin	Cable	
BLT0004	BLT 18KF-001-P-S4	8...20 mm	■		■		■	■	1 kHz	■			309
BLT0003	BLT 18KF-001-P-02	8...20 mm	■		■		■	■	1 kHz	■		■	309
BLT0009	BLT 21M-001-P-S4	0...40 mm	■		■		■	■	2 kHz	■	■		311
BLT0008	BLT 21M-001-N-S4	0...40 mm	■			■	■	■	2 kHz	■	■		311

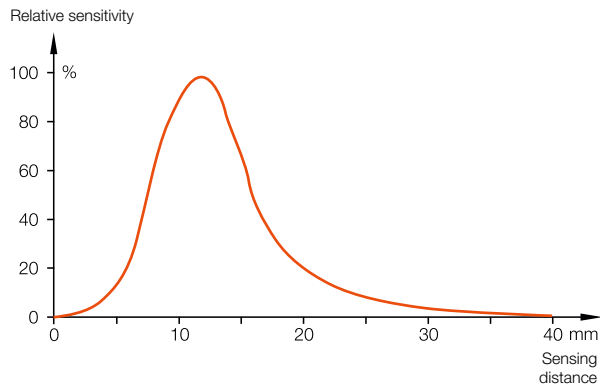
Photoelectric Sensors with Special Properties

Luminescence sensors BLT 18KF

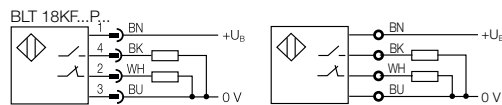
The luminescence sensor **BLT 18KF** detects any type of luminescent markings on any surface and automatically adjusts to ambient conditions. The sensor is calibrated with the simple push of a button. (Markings with a luminescence greater than the background are detected.)

A precise setting is available for slightly luminescent markings. The switching type can be freely selected in this case.

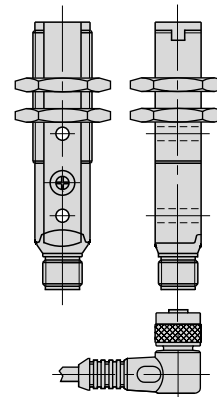
Function diagram



Wiring diagrams



Connector orientation



Recommended accessories (please order separately)

Description	Ordering code
① Mounting bracket	BAM00RY
② Mounting clamp	BAM00T3



You can find special accessories for diffuse sensors, such as **reflectors, apertures, lenses, filters and deflection heads**, in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Suitable connectors (please order separately)



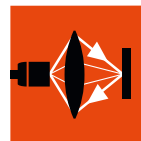
Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.

Photoelectric Sensors with Special Properties

Luminescence sensors BLT 18KF



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

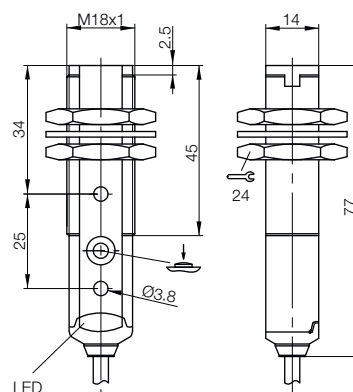
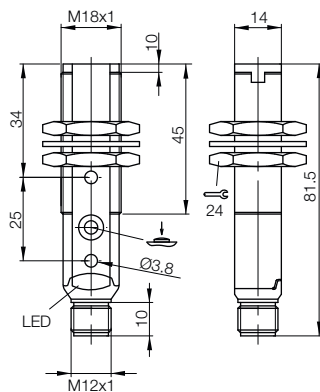
Plastic Fiber Optics BFO

Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Series	BLT		BLT
Working range	8...20 mm		8...20 mm
PNP NC/NO	Ordering code		BLT0003
	Part number	BLT 18KF-001-P-S4	BLT 18KF-001-P-02
Supply voltage U_S	10...30 V DC		10...30 V DC
No-load supply current I_0 max.	≤ 25 mA		≤ 25 mA
Output current	100 mA		100 mA
Switching type	Light and dark switching		Light and dark switching
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes
Settings	Teach-in		Teach-in
Emitter, light type	LED, UV		LED, UV
Wavelength	370 Nm		370 Nm
Light spot diameter	approx. 3 mm at 20 mm		approx. 3 mm at 20 mm
Output function indicator	Yellow LED		Yellow LED
Power/error indicator	Green/red LED		Green/red LED
Response time	0.5 ms		0.5 ms
Switching frequency	1 kHz		1 kHz
Degree of protection as per IEC 60529	IP 67		IP 67
Ambient temperature T_a	$-25...+55$ °C		$-25...+55$ °C
Permissible ambient light	EN 60947-5-2		EN 60947-5-2
Material	Housing	PBT	PBT
	Optical surface	PMMA	PMMA
Connection	M12 connector, 4-pin		2 m PVC cable, 4x0.14 mm ²



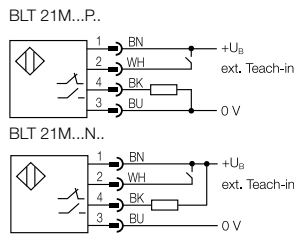
Photoelectric Sensors with Special Properties

Luminescence sensors BLT 21M

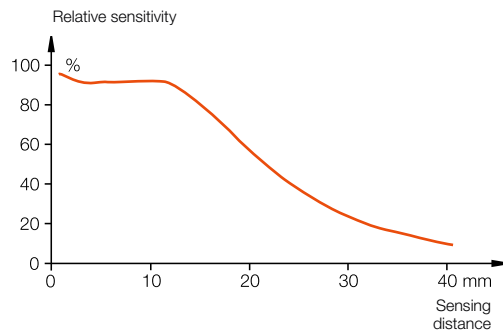
The luminescence sensor **BLT 21M** detects any type of luminescent markings on any surface and automatically adjusts to ambient conditions. The sensor is calibrated with the simple push of a button. (Markings with a luminescence greater than the background are detected.)

A precise setting is available for slightly luminescent markings. The switching type can be freely selected in this case.

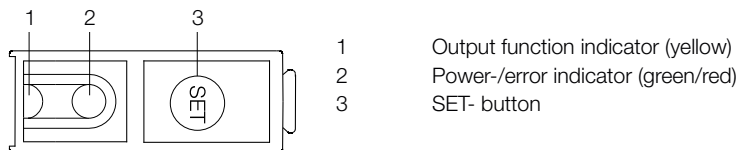
Wiring diagrams



Function diagram

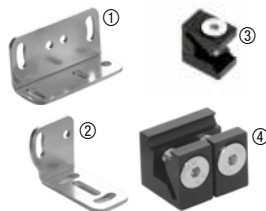


Indicators and operating elements




Recommended accessories (please order separately)

Description	Ordering code
① Mounting bracket	BAM00T9
② Mounting bracket	BAM00TA
③ Clamping holders	BAM00TF
④ Clamping holders	BAM00TH



Suitable connectors (please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M8, 4-pin	Straight	PUR	Black	2 m	BCC02N2
M8, 4-pin	Straight	PVC	Gray	2 m	BCC02PL
M8, 4-pin	Angled	PUR	Black	2 m	BCC02NC
M8, 4-pin	Angled	PVC	Gray	2 m	BCC02PZ

Connectors without LED are suitable for PNP and NPN sensors.

You can find special accessories for diffuse sensors, such as **reflectors, apertures, lenses, filters and deflection heads**, in this catalog starting on page 376.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.

Photoelectric Sensors with Special Properties

Luminescence sensors BLT 21M



Photoelectric Sensors

Photoelectric Sensors



Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/ BOS

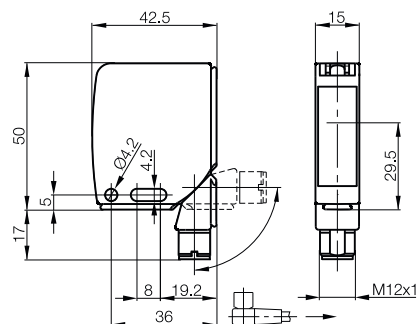
Plastic Fiber Optics BFO

Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Series	BLT	
Working range	0...40 mm	
PNP NC/NO	Ordering code	BLT009
	Part number	BLT 21M-001-P-S4
NPN NC/NO	Ordering code	BLT008
	Part number	BLT 21M-001-N-S4
Supply voltage U_s	10...30 V DC	
No-load supply current I_0 max.	≤ 30 mA	
Output current	100 mA	
Switching type	Light and dark switching (adjustable in precise mode)	
Polarity reversal/short-circuit protected	Yes/Yes	
Settings	Teach-in	
Emitter, light type	LED, UV	
Wavelength	370 Nm	
Light spot diameter	ca. 1.5 mm at 10 mm	
Output function indicator	Yellow LED	
Power/error indicator	Green/red LED	
Response time	250 μs	
Switching frequency	2 kHz	
Time function	20 ms off-delay	
Degree of protection as per IEC 60529	IP 67	
Ambient temperature T_a	-10...+55 °C	
Permissible ambient light	EN 60947-5-2	
Material	Housing	GD-Zn/Al
	Optical surface	Glass
Connection	M12 connector, 4-pin	



Photoelectric Sensors with Special Properties Optical fiber base units BFB/BOS

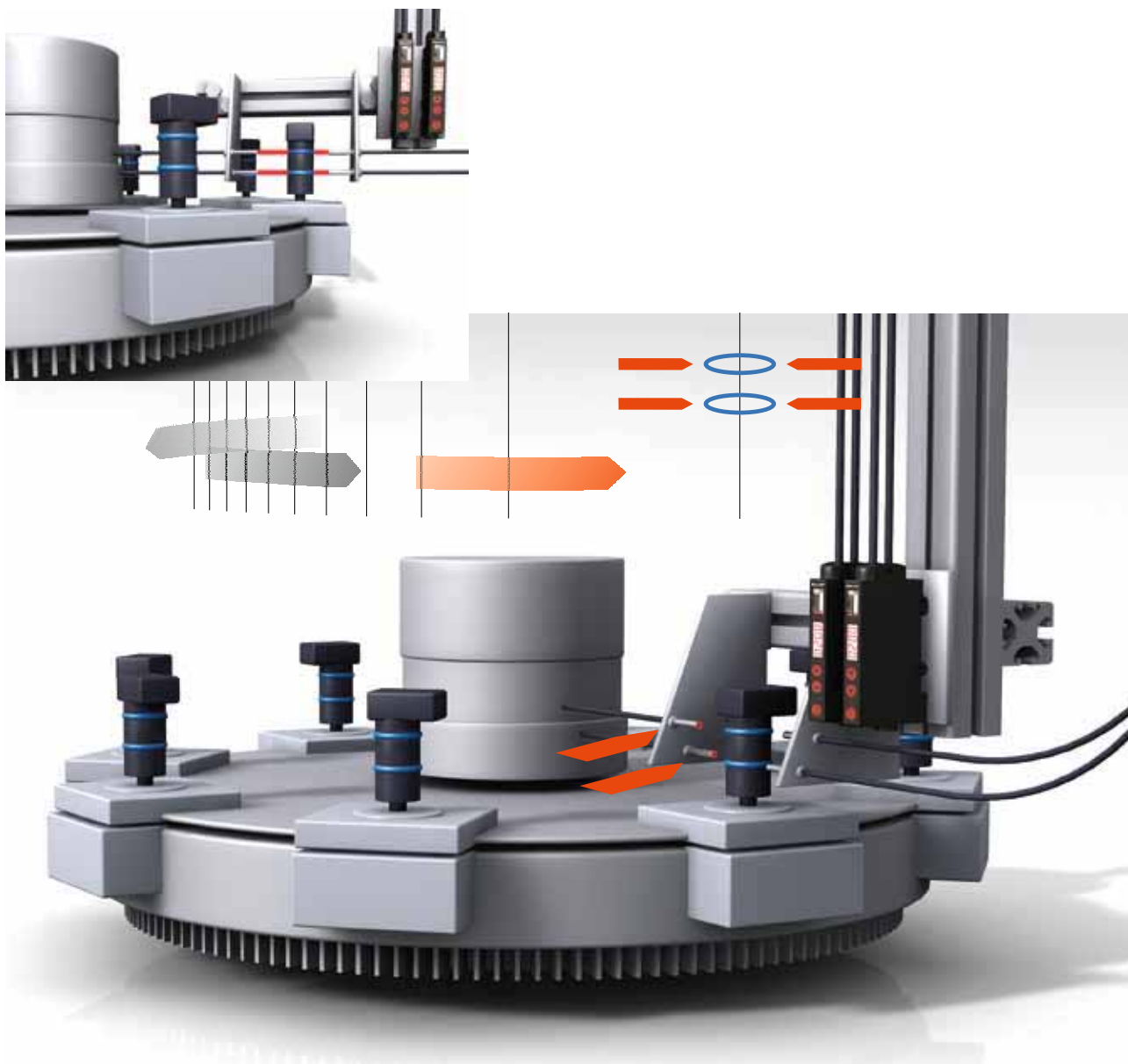
Fiber optics are needed whenever there is not enough space for a photoelectric sensor.

Plastic fiber optics are the right choice if the requirements for toughness, ambient temperature or chemical resistance are not very high. A wide range of special base units with different outputs and various functions is available when using these fiber optics: from the simple version with a potentiometer to the high-end unit with a display. The base units generally operate using red light.

The base units for glass fiber optics find use in harsh environments thanks to their powerful infrared light. Temperatures of up to 250 °C and oil mist are not a problem thanks to the various models of glass fiber optics.

Applications

- Small parts detection
- Suitable for tight mounting conditions
- Inspecting parts features
- Counting (e.g. counting drops)
- Precise parts positioning
- Assembly and handling technology
- Robotics



Photoelectric Sensors with Special Properties

Optical fiber base units BFB/BOS

Product overview



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

Glass Fiber Optics BFO

Photoelectric Distance Sensors

for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type	Light type		Output				Switching type		Switching frequency	U _s		Connection				Special features		Page
	Red light	Infrared light	PNP	NPN	Analog output	Alarm output	Light switching	Dark switching		10...30V DC	11...26V DC	M8 plug, 3-pin	M8 plug, 4-pin	M12 plug, 4-pin	Cable	Teach-in	Display	
Base units for plastic optical fibers																		
BFB0004	BFB 75K-001-P-S75	■		■				■	■	1.5 kHz	■			■			■	315
BFB0002	BFB 75K-001-N-S75	■			■			■	■	1.5 kHz	■			■			■	315
BFB0003	BFB 75K-001-P-02	■		■				■	■	1.5 kHz	■				■	■		315
BFB0001	BFB 75K-001-N-02	■			■			■	■	1.5 kHz	■				■	■		315
BFB0006	BFB 75K-002-P-S75	■		■				■	■	8 kHz	■			■			■	317
BFB0005	BFB 75K-002-N-S75	■			■			■	■	8 kHz	■			■			■	317
BFB0008	BFB 75K-003-P-02	■		■		■		■	■	8 kHz	■				■	■	■	317
BFB0007	BFB 75K-003-N-02	■			■	■		■	■	8 kHz	■				■	■	■	317
BOS003K	BOS 73K-PU-1FR-C-02	■		■			■	■	■	1 kHz		■		■			■	319
BOS003L	BOS 73K-PU-1FR-C-S75-00,1	■		■			■	■	■	1 kHz		■			■	■	■	319
BOS014L	BOS 73K-PU-1FR-C-S49-00,3	■		■			■	■	■	1 kHz		■	■				■	319
BOS009R	BOS 6K-PU-1FR-S75-C	■		■				■	■	1 kHz	■			■			■	321
BOS009P	BOS 6K-PU-1FR-C-02	■		■				■	■	1 kHz	■				■	■		321
BOS008W	BOS 6K-NU-1FR-S75-C	■			■			■	■	1 kHz	■			■			■	321
BOS008U	BOS 6K-NU-1FR-C-02	■			■			■	■	1 kHz	■				■	■		321
BOS00JJ	BOS 18KF-PA-1FR-S4-C	■		■				■	■	1 kHz	■			■				323
BOS00JH	BOS 18KF-PA-1FR-C-02	■		■				■	■	1 kHz	■				■			323
BOS00HL	BOS 18KF-NA-1FR-S4-C	■			■			■	■	1 kHz	■			■				323
BOS00HK	BOS 18KF-NA-1FR-C-02	■			■			■	■	1 kHz	■				■			323
Base units for glass optical fibers																		
BOS0049	BOS 18M-PA-1PD-E5-C-S4		■	■				■	■	100 Hz	■				■			324
BOS0080	BOS 18M-PU-1PD-SA5-C		■	■				■	■	1 kHz	■				■			324
BOS001P	BOS 18M-PA-1PF-E5-C-S4		■	■				■	■	200 Hz	■				■			325
BOS007U	BOS 18M-GU-1PF-S4-Y		■	■	■			■	■	1 kHz	■				■			325
BOS0134	BOS 30M-GA-1PH-S4-C		■	■	■			■	■	100 Hz	■				■			325

Photoelectric Sensors with Special Properties

Optical fiber base units BFB 75K

Base Units for Plastic Optical Fibers



The **BFB 75K-001...**

is ideal for any kind of standard application. This affordable sensor is installed on DIN rails and makes a great entry-level model. Ease of setting using a teach-in procedure on the sensor or via an external teach line make the sensor especially user-friendly.

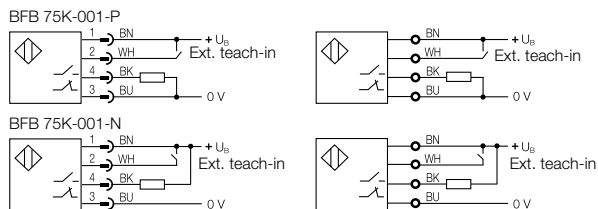
Features

- Red light
- Teach-in
- Connector and cable versions

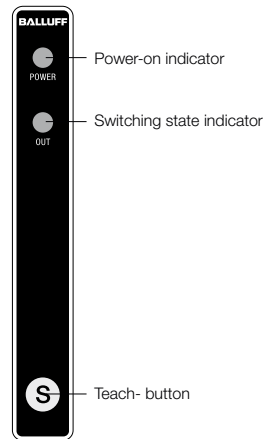
Mounting notes for fiber optics


The resistance of the sealing ring must be overcome when connecting the fiber optics to the base unit.

Wiring diagrams




Operating panel



 **Suitable connectors**
(please order separately)



 **Recommended accessories**
(please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M8, 4-pin	Straight	PUR	Black	2 m	BCC02N2
M8, 4-pin	Straight	PVC	Gray	2 m	BCC02PL
M8, 4-pin	Angled	PUR	Black	2 m	BCC02NC
M8, 4-pin	Angled	PVC	Gray	2 m	BCC02PZ

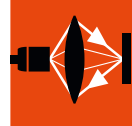
Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.

Suitable fiber optics can be found on page 343 and in our **Accessories** catalog.

Photoelectric Sensors with Special Properties

Optical fiber base units BFB 75K



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

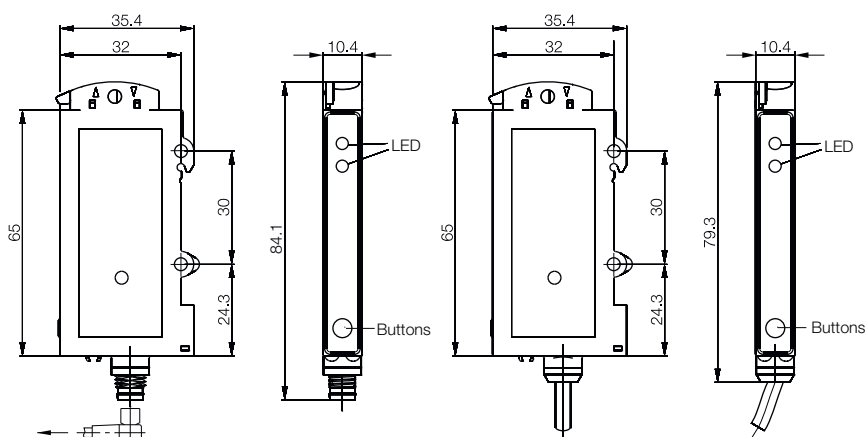
Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Series	BFB 75K		BFB 75K	
Plastic fiber optic base unit	for plastic fiber optics with an outside diameter of 2.2 mm		for plastic fiber optics with an outside diameter of 2.2 mm	
PNP	NC/NO	Ordering code	BFB0004	BFB0003
		Part number	BFB 75K-001-P-S75	BFB 75K-001-P-02
NPN	NC/NO	Ordering code	BFB0002	BFB0001
		Part number	BFB 75K-001-N-S75	BFB 75K-001-N-02
Supply voltage U_s			10...30 V DC	10...30 V DC
Output current			100 mA	100 mA
No-load supply current I_0 max.			≤ 20 mA	≤ 20 mA
Switching type			Light/dark switching (selectable)	Light/dark switching (selectable)
Polarity reversal/short-circuit protected			Yes/Yes	Yes/Yes
Settings			Teach-in	Teach-in
Emitter, light type			LED, red light	LED, red light
Wavelength			660 Nm	660 Nm
Light spot diameter			Depends on the fiber optics	Depends on the fiber optics
Power-on indicator			Green LED	Green LED
Switching state indicator			Yellow LED	Yellow LED
Switching frequency f			1.5 kHz	1.5 kHz
Degree of protection as per IEC 60529			IP 64	IP 64
Ambient temperature T_a			-20...+60 °C	-20...+60 °C
Permissible ambient light per			EN 60947-5-2	EN 60947-5-2
Material	Housing		ABS	ABS
	Optical surface		Depends on fiber optics	Depends on fiber optics
Connection			M8 connector, 4-pin	2 m PVC cable, 4x0.14 mm ²

Connector orientation



Photoelectric Sensors with Special Properties

Optical fiber base units BFB 75K

The BFB 75K-002...

The high-end amplifier offers perfect performance with 12-bit resolution, a 4-digit display and a switching frequency up to 8 kHz.

Various operating modes such as Fine or High Distance allow the sensor to be better adapted to the respective application.

Several sensors can be installed next to each other. Up to four sensors installed adjacent to each other are synchronized to avoid mutual interference in an application. They are synchronized automatically after the supply voltage is turned on.

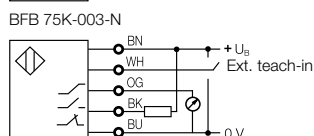
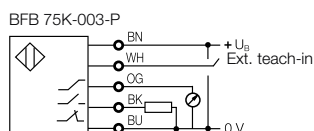
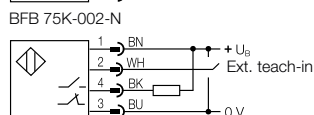
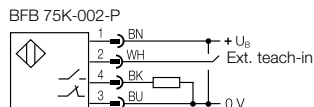
Adjustable time functions, window programming and fine-tuning for the switching point expand its range of application options.

An additional analog output makes the BFB 75K-003... version a great all-rounder. The output signal is in proportion to the remission or to the distance of the target object. All of the functions of the BFB 75K-02 variant are included.

Features

- Display
- 4 operating modes
- No mutual interference
- Variant with analog output

Wiring diagrams



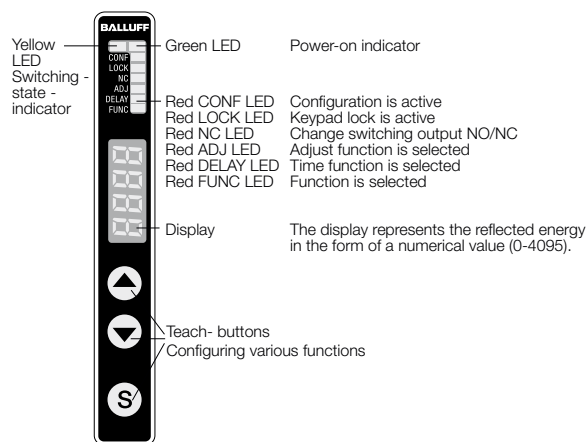
Mounting notes for fiber optics

The resistance of the sealing ring must be overcome when connecting the fiber optics to the base unit.

Operating mode	Standard	High Resolution	High switching frequency	High Range size
Sensing distance*	150 mm	70 mm	70 mm	300 mm
Switching frequency	1 kHz	125 Hz	8 kHz	125 Hz

*Depending on fiber optics used

Operating panel



Suitable connectors
(please order separately)



Recommended accessories
(please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M8, 4-pin	Straight	PUR	Black	2 m	BCC02N2
M8, 4-pin	Straight	PVC	Gray	2 m	BCC02PL
M8, 4-pin	Angled	PUR	Black	2 m	BCC02NC
M8, 4-pin	Angled	PVC	Gray	2 m	BCC02PZ

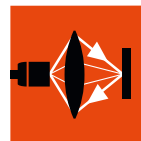
Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.

Suitable fiber optics can be found **on page 343** and in our **Accessories** catalog.

Photoelectric Sensors with Special Properties

Optical fiber base units BFB 75K



Photoelectric Sensors

Photoelectric Sensors

Series	BFB 75K		BFB 75K	
Plastic fiber optic base unit	for plastic fiber optics with an outside diameter of 2.2 mm		for plastic fiber optics with an outside diameter of 2.2 mm	
PNP NC/NO	Ordering code	BFB0006	BFB0008	
	Part number	BFB 75K-002-P-S75	BFB 75K-003-P-02	
NPN NC/NO	Ordering code	BFB0005	BFB0007	
	Part number	BFB 75K-002-N-S75	BFB 75K-003-N-02	
Supply voltage U_s	10...30 V DC		10...30 V DC	
Output current	100 mA		100 mA	
No-load supply current I_0 max.	≤ 25 mA		≤ 20 mA	
Analog output			0...10 V (max. 2 mA)	
Switching type	Light/dark switching (selectable)		Light/dark switching (selectable)	
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes	
Settings	Teach-in		Teach-in	
Emitter, light type	LED, red light		LED, red light	
Wavelength	630 Nm		630 Nm	
Light spot diameter	Depends on the fiber optics		Depends on the fiber optics	
Power-on indicator	Green LED		Green LED	
Switching state indicator	Yellow LED		Yellow LED	
Status indicator	6x red LEDs		6x red LEDs	
Display	4-digit		4-digit	
Switching frequency f	Standard	1.5 kHz	1.5 kHz	
	Fast Mode	8 kHz	8 kHz	
Time function	Adjustable 1...2000 ms delay for switching on and/or off		Adjustable 1...2000 ms delay for switching on and/or off	
Degree of protection as per IEC 60529	IP 64		IP 64	
Ambient temperature T_a	-20...+60 °C		-20...+60 °C	
Permissible ambient light per	EN 60947-5-2		EN 60947-5-2	
Material	Housing	ABS	ABS	
	Optical surface	Depends on fiber optics	Depends on fiber optics	
Connection	M8 connector, 4-pin		2 m PVC cable, 5x0.14 mm ²	

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

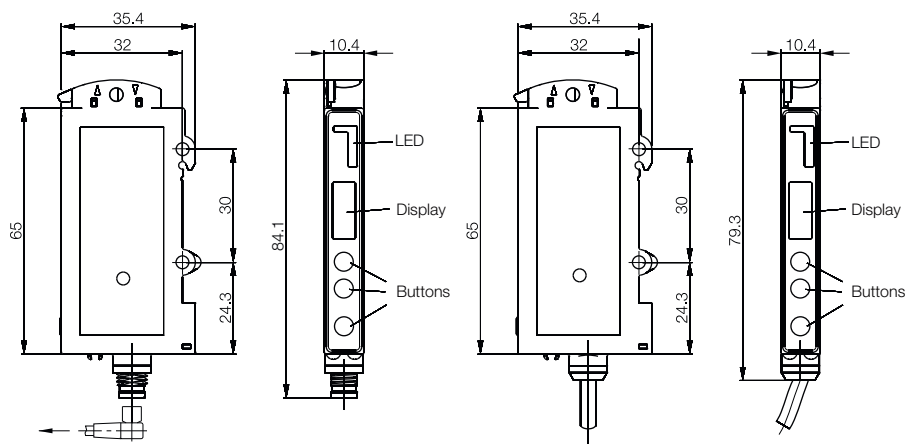
Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Photoelectric Sensors with Special Properties

Optical fiber base units BOS 73K

Base Units for Plastic Optical Fibers



The **BOS 73K** with display simplifies sensor handling and provides a precise overview of its settings.

The display shows sensitivity, signal strength as well as additional functions.

The switching point and hysteresis can be acquired automatically or set manually. The powerful red light emitter permits very long sensing distances and ranges.

A switching- and alarm output is also provided as an output and time functions can also be set.

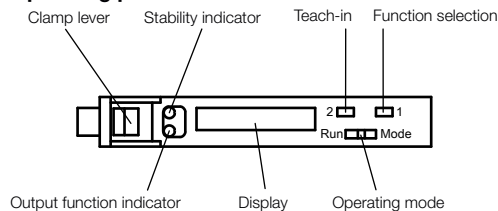
Multiple sensors can be used without them interfering with each other thanks to two transmission channels.



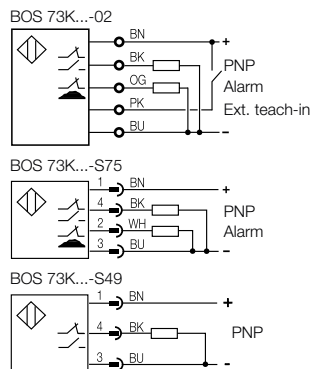
Features

- LCD display with backlighting
- Settings via teach-in
- Powerful red light emitter for long ranges
- Contamination output
- All time functions can be set from 10...120 ms
- Two transmission channels

Operating panel

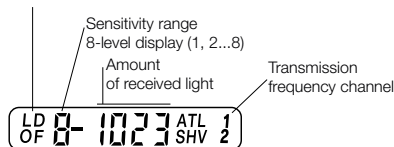


Wiring diagrams



Display

Operating mode
 L: Light switching
 D: Dark switching
 O: Switch-on delay
 F: switch-off delay



Functions
 Sensor functions
 A: Automatic Detection
 T: Teach-in
 L: Lock
 Additional functions
 S: Manual sensitivity setting/switch-on point
 H: Manual hysteresis setting (switch-off point)
 V: Signal strength fluctuation and absolute value display

Series		Plastic fiber optic base unit	
PNP	NC/NO	Ordering code	
		Part number	
Supply voltage U_S			
Switching frequency f		Switching output	Alarm output
No-load supply current I_0 max.			
Switching type			
Polarity reversal/short-circuit protected			
Settings			
Emitter, light type			
Wavelength			
Light spot diameter			
Output function indicator			
Stability indicator			
Display			
Response time			
Switching frequency f		Standard	
Time function			
Degree of protection as per IEC 60529			
Ambient temperature T_a			
Permissible ambient light			
Material		Housing	
		Optical surface	
Connection			

Mounting materials included!



Suitable connectors
 (please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M8, 4-pin	Straight	PUR	Black	2 m	BCC02N2
M8, 4-pin	Straight	PVC	Gray	2 m	BCC02PL
M8, 4-pin	Angled	PUR	Black	2 m	BCC02NC
M8, 4-pin	Angled	PVC	Gray	2 m	BCC02PZ

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.



Suitable connectors
 (please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M8, 3-pin	Straight	PUR	Black	2 m	BCC02M8
M8, 3-pin	Straight	PVC	Gray	2 m	BCC02NU
M8, 3-pin	Angled	PUR	Black	2 m	BCC02ML
M8, 3-pin	Angled	PVC	Gray	2 m	BCC02P5

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.

Photoelectric Sensors with Special Properties

Optical fiber base units BOS 73K



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

Glass Fiber Optics BFO

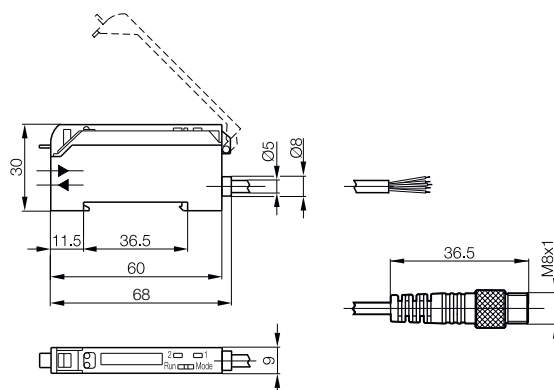
Photoelectric Distance Sensors

for Analog Distance Measurement

Accessories for Photoelectric Sensors



BOS 73K for plastic fiber optics with an outside diameter of 2.2 mm	BOS 73K for plastic fiber optics with an outside diameter of 2.2 mm	BOS 73K for plastic fiber optics with an outside diameter of 2.2 mm
BOS003K	BOS003L	BOS014L
BOS 73K-PU-1FR-C-02	BOS 73K-PU-1FR-C-S75-00,1	BOS 73K-PU-1FR-C-S49-00,3
11...26 V DC	11...26 V DC	11...26 V DC
100 mA	100 mA	100 mA
50 mA	50 mA	50 mA
≤ 50 mA	≤ 50 mA	≤ 50 mA
Light/dark switching (selectable)	Light/dark switching (selectable)	Light/dark switching (selectable)
Yes/Yes	Yes/Yes	Yes/Yes
Teach-in/Manually using buttons	Teach-in/Manually using buttons	Teach-in/Manually using buttons
LED, red light	LED, red light	LED, red light
660 Nm	660 Nm	660 Nm
Depends on the fiber optics	Depends on the fiber optics	Depends on the fiber optics
Orange LED	Orange LED	Orange LED
Green LED	Green LED	Green LED
Backlit LCD	Backlit LCD	Backlit LCD
Channel 1: 0.5 ms	Channel 1: 0.5 ms	Channel 1: 0.5 ms
Channel 2: 0.6 ms	Channel 2: 0.6 ms	Channel 2: 0.6 ms
Channel 1: 1 kHz	Channel 1: 1 kHz	Channel 1: 1 kHz
Channel 2: 833 Hz	Channel 2: 833 Hz	Channel 2: 833 Hz
On/off delay	On/off delay	On/off delay
10...120 ms selectable	10...120 ms selectable	10...120 ms selectable
IP 54	IP 54	IP 54
-25...+55 °C	-25...+55 °C	-25...+55 °C
Artificial light ≤ 10 klx, Sunlight ≤ 20 klx	Artificial light ≤ 10 klx, Sunlight ≤ 20 klx	Artificial light ≤ 10 klx, Sunlight ≤ 20 klx
ABS	ABS	ABS
Depends on fiber optics	Depends on fiber optics	Depends on fiber optics
2 m PVC cable, 5x0.2 mm ²	Pigtail 10 cm, M8 connector, 4-pin	Pigtail 30 cm, M8 connector, 3-pin



+ Recommended accessories
(please order separately)

Suitable fiber optics can be found on page 343
and in our **Accessories** catalog.

Photoelectric Sensors with Special Properties

Optical fiber base units BOS 6K

Base Units for Plastic Optical Fibers

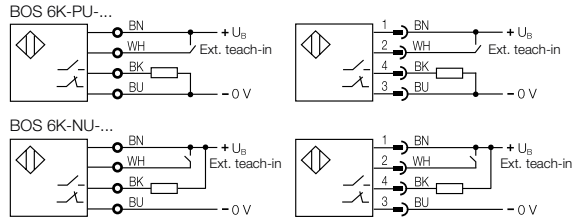


The **BOS 6K** series also offers a optical fiber base unit that is easy to teach in externally using a button or control line. Together with the BFO series of fiber optics, an enclosure rating of IP 67 is provided.

Features

- Teach-in
- Contamination indicator
- Control line for external teach-in
- Disable buttons

Wiring diagrams



Recommended accessories (please order separately)

Description	Ordering code
Mounting bracket	BAM00UH



Suitable fiber optics can be found **on page 343** and in our **Accessories** catalog.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Suitable connectors (please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M8, 4-pin	Straight	PUR	Black	2 m	BCC02N2
M8, 4-pin	Straight	PVC	Gray	2 m	BCC02PL
M8, 4-pin	Angled	PUR	Black	2 m	BCC02NC
M8, 4-pin	Angled	PVC	Gray	2 m	BCC02PZ

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.

Photoelectric Sensors with Special Properties

Optical fiber base units BOS 6K



Photoelectric Sensors

Photoelectric Sensors



Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

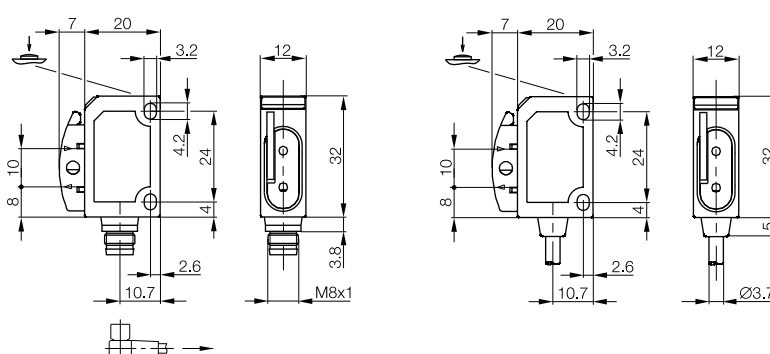
Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Series	BOS 6K		BOS 6K	
Plastic fiber optic base unit	for plastic fiber optics with an outside diameter of 2.2 mm		for plastic fiber optics with an outside diameter of 2.2 mm	
PNP NC/NO	Ordering code	BOS009R	BOS009P	
	Part number	BOS 6K-PU-1FR-S75-C	BOS 6K-PU-1FR-C-02	
NPN NC/NO	Ordering code	BOS008W	BOS008U	
	Part number	BOS 6K-NU-1FR-S75-C	BOS 6K-NU-1FR-C-02	
Supply voltage U_s	10...30 V DC		10...30 V DC	
Output current	100 mA		100 mA	
No-load supply current I_0 max.	≤ 25 mA		≤ 25 mA	
Switching type	Light/dark switching (selectable)		Light/dark switching (selectable)	
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes	
Settings	Teach-in		Teach-in	
Emitter, light type	LED, red light		LED, red light	
Wavelength	660 Nm		660 Nm	
Light spot diameter	Depends on range/sensing distance		Depends on range/sensing distance	
Output function indicator	Yellow LED		Yellow LED	
Stability indicator	Green LED		Green LED	
Response time	0.5 ms		0.5 ms	
Switching frequency f	1 kHz		1 kHz	
Number of conductors \times conductor cross-section			4 \times 0.14 mm ²	
Degree of protection as per IEC 60529	IP 67		IP 67	
Ambient temperature T_a	-20...+60 °C		-20...+60 °C	
Permissible ambient light	EN 60947-5-2		EN 60947-5-2	
Material	Housing	ABS		ABS
	Optical surface	Depends on fiber optics		Depends on fiber optics
Connection	M8 connector, 4-pin		2 m PVC cable	

Connector orientation



Photoelectric Sensors with Special Properties

Optical fiber base units BOS 18KF

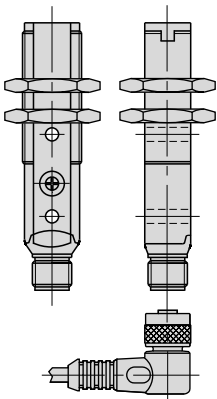
Base Units for Plastic Optical Fibers

The optical fiber base unit **BOS 18KF** is a highlight far away from DIN rail installation, distinguishing itself with simple operation and installation.

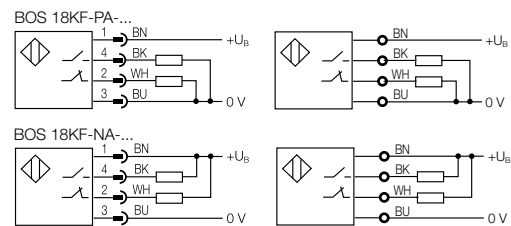
Features

- Sensitivity setting using 270°- potentiometer
- Cap nut for adapting optical fibers

Connector orientation



Wiring diagrams



Recommended accessories (please order separately)

Description	Ordering code
Mounting bracket	BAM00RY



Suitable fiber optics can be found **on page 343** and in our **Accessories** catalog.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Suitable connectors (please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.

Photoelectric Sensors with Special Properties

Optical fiber base units BOS 18KF



Photoelectric Sensors

Photoelectric Sensors



Series	BOS 18KF		BOS 18KF	
Plastic fiber optic base unit	for plastic fiber optics with an outside diameter of 2.2 mm		for plastic fiber optics with an outside diameter of 2.2 mm	
PNP NC/NO	Ordering code	BOS00JJ	BOS00JH	
	Part number	BOS 18KF-PA-1FR-S4-C	BOS 18KF-PA-1FR-C-02	
NPN NC/NO	Ordering code	BOS00HL	BOS00HK	
	Part number	BOS 18KF-NA-1FR-S4-C	BOS 18KF-NA-1FR-C-02	
Supply voltage US	10...30 V DC		10...30 V DC	
No-load supply current I0 max.	≤ 35 mA		≤ 35 mA	
Output current	100 mA		100 mA	
Switching type	Light and dark switching		Light and dark switching	
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes	
Settings	Potentiometer, 270°		Potentiometer, 270°	
Emitter, light type	LED, red light		LED, red light	
Wavelength	660 Nm		660 Nm	
Light spot diameter	Depends on range/sensing distance		Depends on range/sensing distance	
Output function indicator	Yellow LED		Yellow LED	
Stability indicator	Green LED		Green LED	
Response time	0.5 ms		0.5 ms	
Switching frequency f	1 kHz		1 kHz	
Degree of protection as per IEC 60529	IP 67		IP 67	
Ambient temperature Ta	-25...+55 °C		-25...+55 °C	
Permissible ambient light	EN 60947-5-2		EN 60947-5-2	
Material	Housing	PBT	PBT	
	Optical surface	Depends on fiber optics	Depends on fiber optics	
Connection	M12 connector, 4-pin		2 m PVC cable, 4x0.14 mm ²	

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

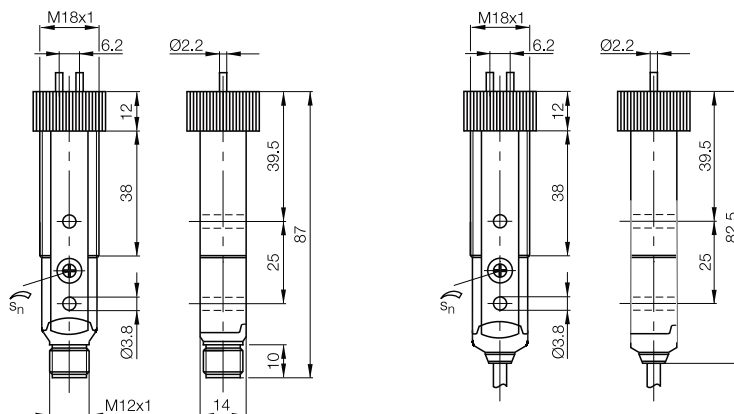
Optical Fiber Base Units BFB/BOS

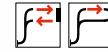
Plastic Fiber Optics BFO

Glass Fiber Optics BFO

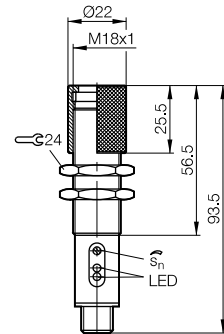
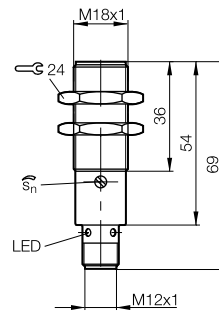
Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors





Type	BOS 18M for glass fiber optics		BOS 18M for glass fiber optics	
PNP	NC/NO	Ordering code	BOS0049	BOS0080
		Part number	BOS 18M-PA-1PD-E5-C-S4	BOS 18M-PU-1PD-SA5-C
PNP/NPN	NC/NO	Ordering code		
		Part number		
Supply voltage U_s			10...30 V DC	10...30 V DC
Output current			200 mA	200 mA
No-load supply current I_0 max.			≤ 20 mA	≤ 25 mA
Switching type			Light/dark switching (complementary)	Light/dark switching (selectable)
Polarity reversal/short-circuit protected			Yes/Yes	Yes/Yes
Settings			Potentiometer, 270°	18-turn potentiometer
Emitter, light type			LED, infrared	LED, infrared
Wavelength			880 Nm	880 Nm
Response time			5 ms	5 ms
Switching frequency f			100 Hz	1 kHz
Degree of protection as per IEC 60529			IP 67	IP 67
Ambient temperature T_a			-5...+55 °C	-20...+60 °C
Permissible ambient light			5 klx	2 klx
Material	Housing		Nickel-plated CuZn	Nickel-plated CuZn
	Optical surface		PMMA	Glass
Connection			M12 connector, 4-pin	M12 connector, 4-pin



Recommended accessories
(please order separately)

Description	Ordering code
Mounting bracket	BAM00RY



Suitable fiber optics can be found **on page 343**
and in our **Accessories** catalog.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

Suitable connectors
(please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	BCC032F
M12, 4-pin	Straight	PVC	Gray	2 m	BCC0367
M12, 4-pin	Angled	PUR	Black	2 m	BCC032Y
M12, 4-pin	Angled	PVC	Gray	2 m	BCC036N

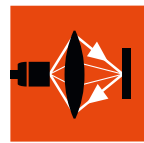


Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.

Photoelectric Sensors with Special Properties

Optical fiber base units BOS



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

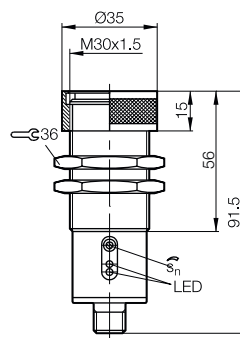
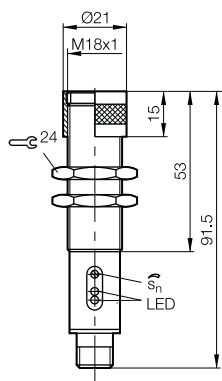
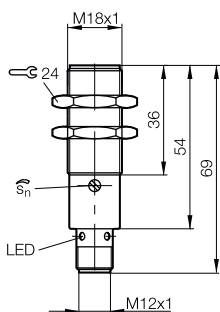
Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

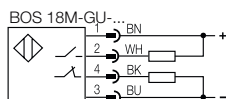
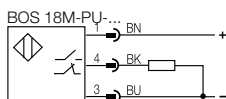
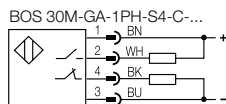
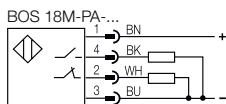
Accessories for Photoelectric Sensors



BOS 18M for glass fiber optics	BOS 18M for glass fiber optics	BOS 30M for glass fiber optics	
BOS001P			
BOS 18M-PA-1PF-E5-C-S4			
	BOS007U	BOS0134	
	BOS 18M-GU-1PF-S4-Y	BOS 30M-GA-1PH-S4-C	
10...30 V DC	11...30 V DC	10...30 V DC	
200 mA	200 mA	200 mA	
≤ 20 mA	≤ 25 mA	≤ 40 mA	
Light/dark switching (complementary)	Light/dark switching (selectable)	Light/dark switching (complementary)	
Yes/Yes	Yes/Yes	Yes/Yes	
Potentiometer, 270°	18-turn potentiometer	18-turn potentiometer	
LED, infrared	LED, infrared	LED, infrared	
880 Nm	880 Nm	880 Nm	
2.5 ms	0.5 ms	5 ms	
200 Hz	1 kHz	100 Hz	
IP 67	IP 65	IP 65	
-5...+55 °C	-20...+60 °C	-20...+60 °C	
5 klx	1 klx	1 klx	
Nickel-plated CuZn	Nickel-plated CuZn	Nickel-plated CuZn	
PMMA	Glass	Glass	
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	



Wiring diagrams



Photoelectric Sensors with Special Properties

Plastic fiber optics BFO

Fiber optics are generally available in a diffuse sensor or through-beam design.

The diffuse sensors have an integrated emitter and receiver fiber at the optical head; the through-beam sensors use two separate optical fibers.

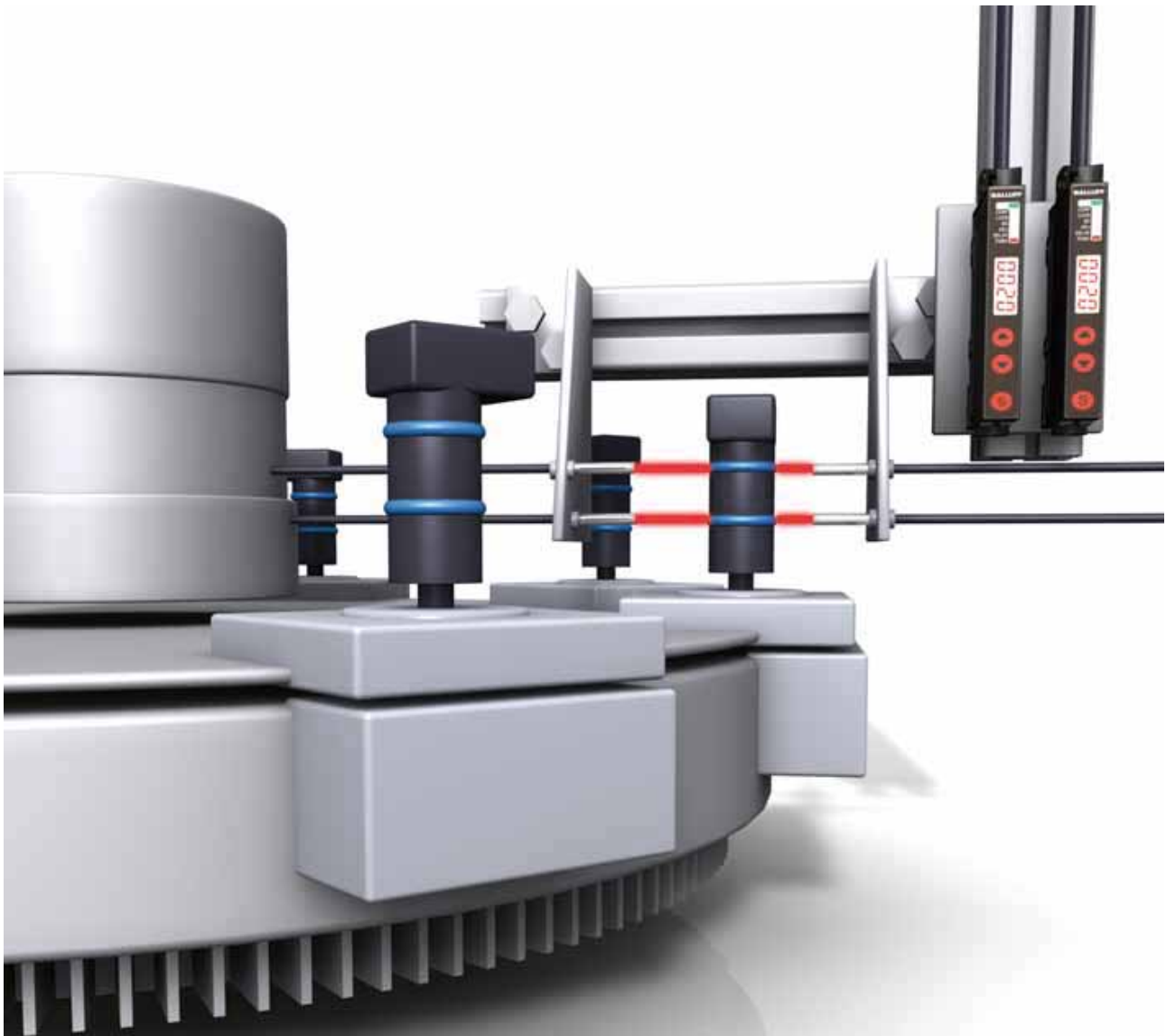
It is easy to see why optical fibers are so commonly used: The variety of end configurations, with straight or angled light exit, flexible optical head or coaxial fiber arrangement, the various fiber diameters and the ability to trim them to the desired length.

Another plus

For full flexibility there are also the user-fabricated fiber optics: Their duplex cable can be cut to length and combined with various end pieces at will.

Applications

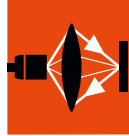
- Small parts detection
- For tight mounting conditions
- Inspecting parts features
- Counting (e.g. counting drops)
- Precise parts positioning
- Handling and assembly technology
- Robotics



Photoelectric Sensors with Special Properties

Plastic fiber optics BFO

Product overview



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Measurement

Photoelectric Distance Sensors for Analog Measurement

Photoelectric Distance Sensors for Analog Measurement

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Photoelectric Distance Sensors for Analog Measurement

Photoelectric Distance Sensors for Analog Measurement

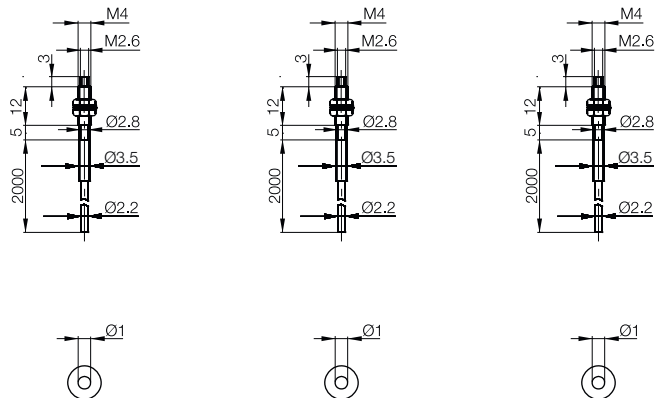
Type	Optical head	Light exit		Fiber arrangement			Core diameter				Features			Page
		Straight	90°	Standard	Coaxial	Light grids	1.5 mm	1.0 mm	0.5 mm	0.25 mm	Bendable optical tip	Extended temperature range	Highly flexible	
Through-beam fiber optics														
BF0005M	BFO D22-LA-KB-EAK-10-02	M4	■	■				■						328
BF0005T	BFO D22-LAH-KB-EAK-10-02	M4	■	■				■					■	328
BF0005W	BFO D22-LAT-KB-EAK-10-02	M4	■	■				■				■		328
BF0005U	BFO D22-LAP-KB-EAK-15-02	M4	■	■			■							329
BF00002	BFO D22-LA-TB-EAK-10-02	M4	■	■				■				■		329
BF0005N	BFO D22-LA-NB-PZK-10-02	M4	■	■				■				■		329
BF000AW	BFO D22-LAH-BK-EAK-10-02	M4	■	■	■			■					■	329
BF0005R	BFO D22-LA-RB-EAK-10-02	M3	■	■				■						330
BF0000C	BFO N22-LA-FB-EAK-05-01	M2	■	■					■					330
BF000AY	BFO D22-LAT-YB-EAK-10-0,5	Ø3		■	■			■				■		330
BF0005P	BFO D22-LA-QB-PAK-05-02	Ø3		■	■			■						331
BF00056	BFO D13-LA-QB-EAK-05-02	Ø3		■	■				■					331
BF00051	BFO D10-LA-CB-EAK-05-02	Ø2	■	■					■					331
BF00057	BFO D13-LA-WB-EAK-05-02	Ø2	■	■	■			■						331
BF000AP	BFO D22-LA-GD-EAK-52-02	10×10	■			■					■			332
BF0005H	BFO D22-LA-AD-EAK-52-02	20×10	■			■					■			332
BF0005K	BFO D22-LA-BD-EAK-52-02	15×15		■		■					■			332
BF00067	BFO D25-LA-CD-EAK-110-02	19×25	■			■					■			333
BF000C5	BFO D25-LA-ED-EAK-250-0,5	19×38		■		■					■			333
BF00068	BFO D25-LA-ED-EAK-250-02	19×38		■		■					■			333
BFB00C8	BFO D25 LA-HD-EAK-465-02	23×55		■		■					■			333
BF00058	BFO D13-LG-05-EAK-30-02	15×41		■		■					■			334
BF00059	BFO D13-LG-10-EAK-30-02	20×32		■		■					■			334
BF0000E	BFO D22-LAH-ZB-EAK-10-02	5×4	■	■				■					■	334
BF000C6	BFO D10-LAH-CK-EAK-05-02	11×6		■	■				■				■	335
BF000C7	BFO D10-LAH-DK-EAK-05-02	13×7		■	■				■				■	335
Diffuse sensor fiber optics														
BF00061	BFO D22-XA-LB-EAK-20-02	M6	■		■			■						336
BF00063	BFO D22-XAH-LB-EAK-20-02	M6	■		■			■					■	336
BF00065	BFO D22-XAT-LB-EAK-20-02	M6	■		■			■				■		336
BF00064	BFO D22-XAP-LB-EAK-30-02	M6	■		■		■							337
BF00066	BFO D22-XB-LB-EAK-15-02	M6	■			■		■						337
BF00007	BFO D22-XBF-LB-EAK-15-02	M6	■		■			■					■	337
BF00004	BFO D22-XA-SB-EAK-20-02	M6	■		■			■			■			337
BF00005	BFO D22-XA-UB-EAK-20-02	M4	■		■			■						338
BF00006	BFO D22-XB-UB-EAK-15-02	M4	■		■			■						338
BF00055	BFO D10-XAH-KB-EAK-10-02	M4	■		■			■					■	338
BF0005C	BFO D13-XB-KB-EAK-10-02	M4	■		■				■					339
BF00053	BFO D10-XA-HB-EAK-10-02	M4	■		■				■		■			339
BF00054	BFO D10-XA-RB-EAK-10-02	M3	■		■				■					339
BF0005E	BFO D13-XB-RB-EAK-10-02	M3	■		■				■					339
BF000C3	BFO D10-XA-VB-EAK-10-02	M3	■		■			■			■			339
BF00052	BFO D10-XA-GB-EAK-10-02	M3	■		■				■		■			340
BF0005A	BFO D13-XA-JB-EAK-20-02	Ø3	■		■			■						340
BF00062	BFO D22-XA-MB-PAK-10-02	Ø3		■	■				■					340
BF000AT	BFO D13-XB-AB-EAK-10-01	Ø2.5	■		■			■						341
BF000AR	BFO D13-XV-AK-EAK-50-02	13×20		■				■						341
BF0005Z	BFO D22-XA-CD-EAK-110-02	19×25	■			■					■			341
BF00060	BFO D22-XA-ED-EAK-250-02	19×38		■		■					■			341



Optical head		M4 thread	M4 thread	M4 thread
Features		Standard	Highly flexible	Temperature rated
Straight light exit	Ordering code	BFO005M	BFO005T	BFO005W
	Part number	BFO D22-LA-KB-EAK-10-02	BFO D22-LAH-KB-EAK-10-02	BFO D22-LAT-KB-EAK-10-02
90° light exit	Ordering code			
	Part number			
Sheathing Ø		2.2 mm	2.2 mm	2.2 mm
Core Ø		1 mm	1 mm	1 mm
Fiber length		2 m	2 m	2 m
Fiber bending radius		≥ 25 mm	≥ 2 mm	≥ 25 mm
Head bending radius				
Temperature range		-55...+70 °C	-40...+70 °C	-55...+105 °C
Range	with BFB 75K-001	500 mm	300 mm	600 mm
	with BFB 75K-002*	500 mm	300 mm	600 mm
	with BFB 73K	500 mm	300 mm	500 mm
	with BFB 6K	220 mm	200 mm	230 mm
	with BFB 18KF	120 mm	90 mm	120 mm

Packaging unit: 2 pcs.

*Max. range in standard mode



Photoelectric Sensors with Special Properties

Plastic fiber optics BFO

Through-beam principle



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

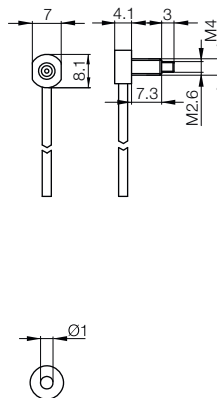
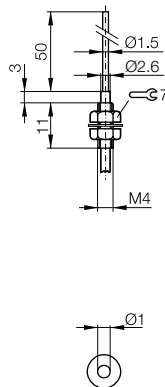
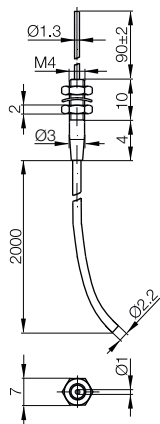
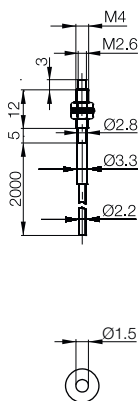
Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



	M4 thread Long range BFO005U	M4 thread Bendable optical tip BFO0002	M4 thread Bendable optical tip BFO005N	M4 thread Highly flexible BFO00AW	
	BFO D22-LAP-KB-EAK-15-02	BFO D22-LA-TB-EAK-10-02	BFO D22-LA-NB-PZK-10-02	BFO D22-LAH-BK-EAK-10-02	
	2.2 mm	2.2 mm	2.2 mm	2.2 mm	
	1.5 mm	1 mm	1 mm	1 mm	
	2 m	2 m	2 m	2 m	
	≥ 40 mm	≥ 25 mm	≥ 25 mm	≥ 2 mm	
	-55...+70 °C	-30...+60 °C	-55...+70 °C	-40...+70 °C	
	800 mm	450 mm	500 mm	250 mm	
	800 mm	450 mm	500 mm	250 mm	
	800 mm	400 mm	500 mm	250 mm	
	500 mm	200 mm	250 mm	170 mm	
	250 mm	110 mm	120 mm	80 mm	

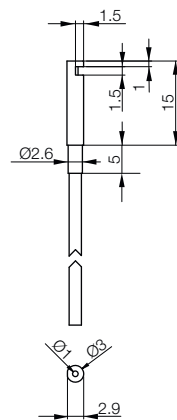
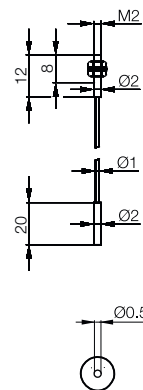
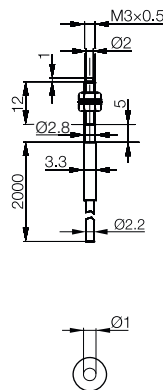




Optical head		M3 thread	M2 thread	Ø 3
Features		Standard	Precision	Temperature rated
Straight light exit	Ordering code	BFO005R	BFO000C	
	Part number	BFO D22-LA-RB-EAK-10-02	BFO N22-LA-FB-EAK-05-01	
90° light exit	Ordering code			BFO00AY
	Part number			BFO D22-LAT-YB-EAK-10-0,5
Sheathing Ø		2.2 mm	1 mm	2.2 mm
Core Ø		1 mm	0.5 mm	1 mm
Fiber length		2 m	2 m	0.5 m
Fiber bending radius		≥ 25 mm	≥ 10 mm	≥ 25 mm
Head bending radius				
Temperature range		-55...+70 °C	-30...+60 °C	-55...+70 °C
Range	with BFB 75K-001	500 mm	140 mm	600 mm
	with BFB 75K-002*	500 mm	140 mm	600 mm
	with BFB 73K	450 mm	130 mm	500 mm
	with BFB 6K	220 mm	50 mm	230 mm
	with BFB 18KF	100 mm	20 mm	120 mm

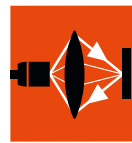
Packaging unit: 2 pcs.

*Max. range in standard mode



Photoelectric Sensors with Special Properties

Plastic fiber optics BFO Through-beam principle



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/ BOS

Plastic Fiber Optics BFO

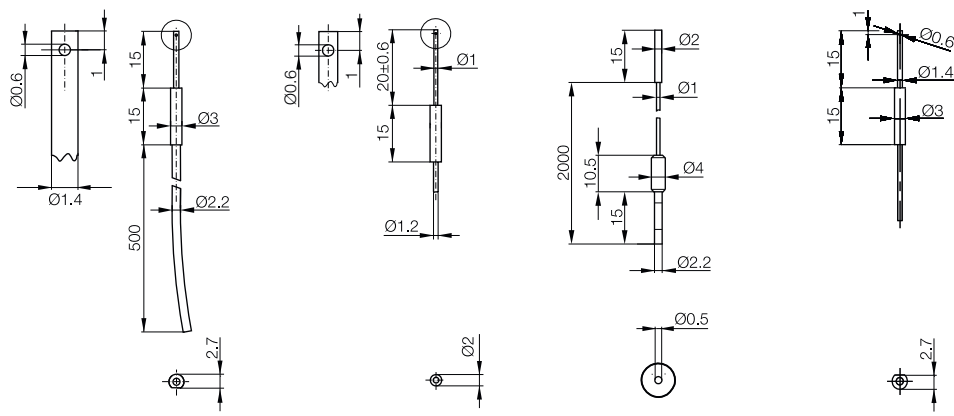
Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Ø 3 Light exit on side	Ø 3 Light exit on side	Ø 2 Precision BFO0051	Ø 2 Standard BFO0057
		BFO D10-LA-CB-EAK-05-02	
BFO005P BFO D22-LA-QB-PAK-05-02	BFO0056 BFO D13-LA-QB-EAK-05-02		BFO0057 BFO D13-LA-WB-EAK-05-02
2.2 mm	1.3 mm	1 mm	1.3 mm
1 mm	0.5 mm	0.5 mm	1 mm
2 m	2 m	2 m	2 m
≥ 25 mm	≥ 15 mm	≤ 15 m	≥ 25 mm
-40...+70 °C	-35...+65 °C	-55...+70 °C	-40...+70 °C
120 mm	110 mm	130 mm	75 mm
120 mm	110 mm	130 mm	75 mm
115 mm	105 mm	120 mm	70 mm
65 mm	-	-	-
35 mm	25 mm	-	20 mm

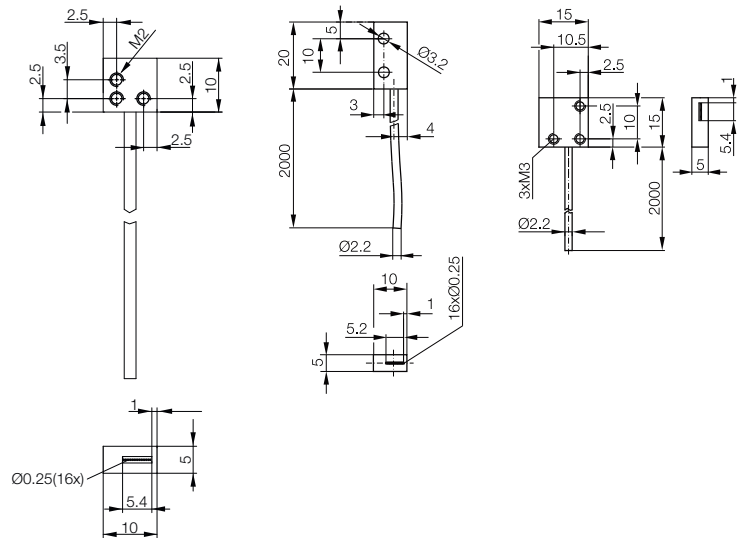




Optical head		10x10 mm	20x10 mm	15x15 mm
Features		Light grids	Light grids	Light grids
Straight light exit	Ordering code	BFO00AP	BFO005H	
	Part number	BFO D22-LA-GD-EAK-52-02	BFO D22-LA-AD-EAK-52-02	
90° light exit	Ordering code			BFO005K
	Part number			BFO D22-LA-BD-EAK-52-02
Sheathing Ø		2.2 mm	2.2 mm	2.2 mm
Core Ø		16x0.25 mm	16x0.25 mm	16x0.25 mm
Fiber length		2 m	2 m	2 m
Fiber bending radius		≥ 25 mm	≥ 25 mm	≥ 25 mm
Temperature range		-55...+70 °C	-35...+65 °C	-55...+70 °C
Range	with BFB 75K-001	600 mm	450 mm	400 mm
	with BFB 75K-002*	600 mm	450 mm	400 mm
	with BFB 73K	600 mm	400 mm	350 mm
	with BFB 6K	350 mm	220 mm	180 mm
	with BFB 18KF	230 mm	130 mm	110 mm

Packaging unit: 2 pcs.

*Max. range in standard mode



Photoelectric Sensors with Special Properties

Plastic fiber optics BFO Through-beam principle



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

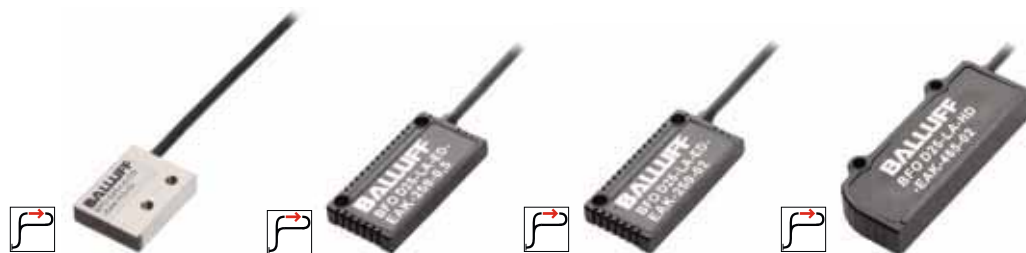
Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

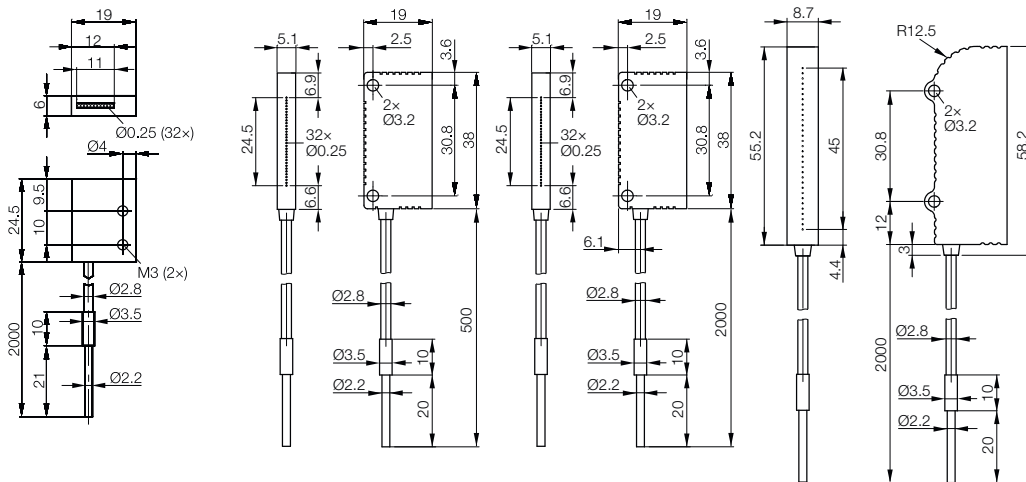
Glass Fiber Optics BFO

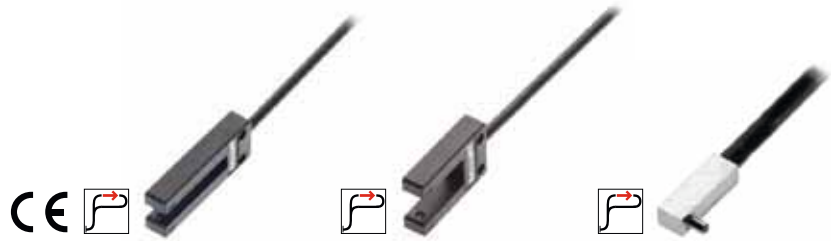
Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



	19x25 mm	19x38 mm	19x38 mm	23x55 mm	
	Light grids	Light grids	Light grids	Light grids	
	BFO0067				
	BFO D25-LA-CD-EAK-110-02				
		BFO00C5	BFO0068	BFO00C8	
		BFO D25-LA-ED-EAK-250-0,5	BFO D25-LA-ED-EAK-250-02	BFO D25 LA-HD-EAK-465-02	
	2.8 mm	2.8 mm	2.8 mm	2.8 mm	
	32x0.25 mm	32x0.25 mm	32x0.25 mm	32x0.25 mm	
	2 m	0.5 m	2 m	2 m	
	≥ 10 mm	≥ 60 mm	≥ 60 mm	≥ 60 mm	
	-55...+70 °C	-55...+70 °C	-55...+70 °C	-55...+70 °C	
	600 mm	550 mm	550 mm	550 mm	
	600 mm	550 mm	550 mm	550 mm	
	600 mm	550 mm	550 mm	550 mm	
	350 mm	360 mm	360 mm	360 mm	
	230 mm	210 mm	210 mm	210 mm	

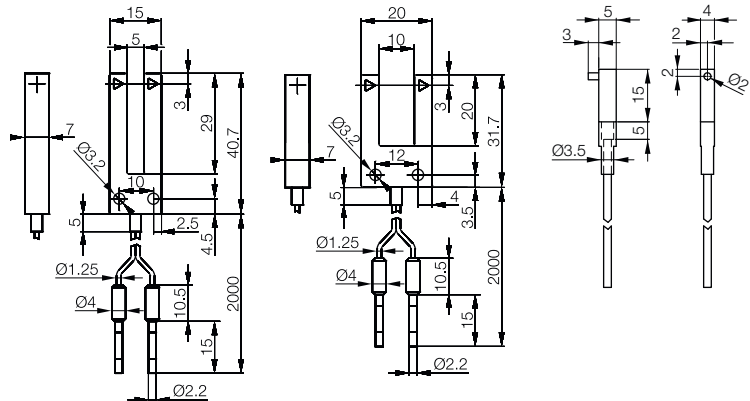




Optical head		15x41 mm	20x32 mm	5x4 mm	
Features		Fork	Fork	Highly flexible	
Straight light exit	Ordering code				
	Part number				
90° light exit	Ordering code	BFO0058	BFO0059	BFO000E	
	Part number	BFO D13-LG-05-EAK-30-02	BFO D13-LG-10-EAK-30-02	BFO D22-LAH-ZB-EAK-10-02	
Sheathing Ø		2x1.25 mm	2x1.25 mm	2.2 mm	
Core Ø		2x0.25 mm	2x0.25 mm	1 mm	
Fiber length		2 m	2 m	2 m	
Fiber bending radius		≥ 10 mm	≥ 10 mm	≥ 2 mm	
Temperature range		-55...+70 °C	-55...+70 °C	-55...+70 °C	
Range	with BFB 75K-001	5 mm	10 mm	300 mm	
	with BFB 75K-002*	5 mm	10 mm	300 mm	
	with BFB 73K	5 mm	10 mm	300 mm	
	with BFB 6K	5 mm	10 mm	200 mm	
	with BFB 18KF	5 mm	10 mm	90 mm	

Packaging unit: 2 pcs.

*Max. range in standard mode



Photoelectric Sensors with Special Properties

Plastic fiber optics BFO Through-beam principle



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

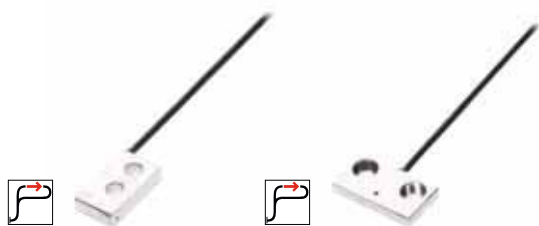
Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

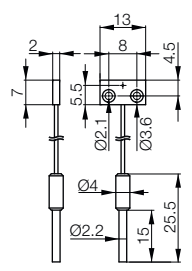
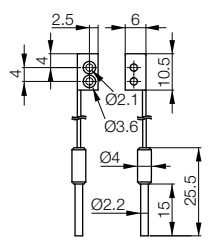
Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



	11x6 mm Highly flexible	13x7 mm Highly flexible			
	BFO00C6	BFO00C7			
	BFO D10-LAH-CK-EAK-05-02	BFO D10-LAH-DK-EAK-05-02			
	1 mm	1 mm			
	0.5 mm	0.5 mm			
	2 m	2 m			
	≥ 1 mm	≥ 1 mm			
	-40...+70 °C	-40...+70 °C			
	55 mm	50 mm			
	55 mm	50 mm			
	45 mm	40 mm			
	-	-			
	20 mm	20 mm			



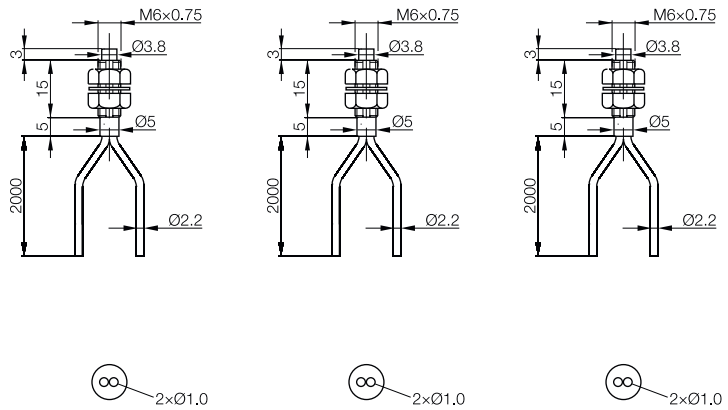
Photoelectric Sensors with Special Properties

Plastic fiber optics BFO Sensor principle



Optical head		M6 thread Standard	M6 thread Highly flexible	M6 thread Temperature rated	
Features					
Straight light exit	Ordering code	BFO0061	BFO0063	BFO0065	
	Part number	BFO D22-XA-LB-EAK-20-02	BFO D22-XAH-LB-EAK-20-02	BFO D22-XAT-LB-EAK-20-02	
Sheathing Ø		2x2.2 mm	2x2.2 mm	2x2.2 mm	
Core Ø		2x1 mm	2x1 mm	2x1 mm	
Fiber bending radius		≥ 25 mm	≥ 2 mm	≥ 25 mm	
Head bending radius					
Temperature range		-55...+70 °C	-40...+70 °C	-55...+115 °C	
Range	with BFB 75K-001	150 mm	120 mm	130 mm	
	with BFB 75K-002*	150 mm	120 mm	130 mm	
	with BFB 73K	150 mm	120 mm	130 mm	
	with BFB 6K	100 mm	70 mm	90 mm	
	with BFB 18KF	50 mm	30 mm	50 mm	

*Max. range in standard mode



Photoelectric Sensors with Special Properties

Plastic fiber optics BFO

Sensor principle



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/ BOS

Plastic Fiber Optics BFO

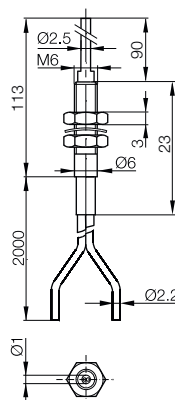
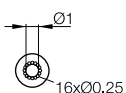
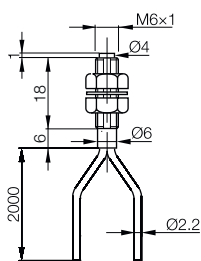
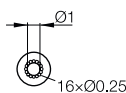
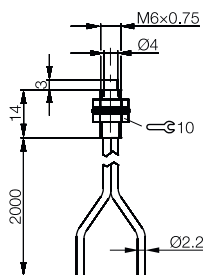
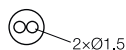
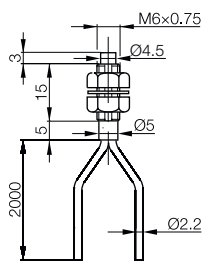
Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



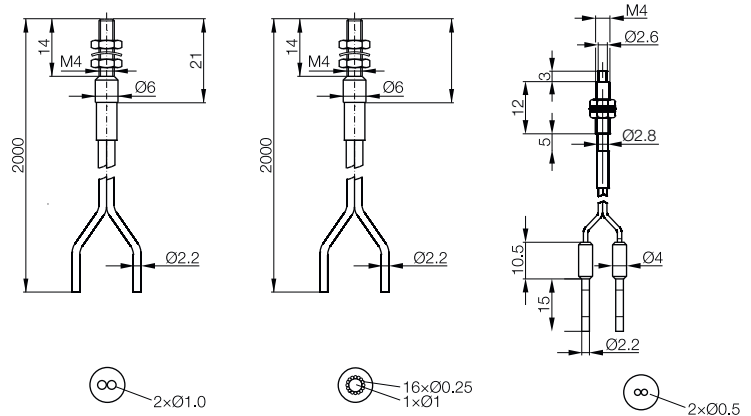
M6 thread	M6 thread	M6 thread	M6 thread	
Long range	Coaxial	Coaxial, flexible	Bendable optical tip	
BFO0064	BFO0066	BFO0007	BFO0004	
BFO D22-XAP-LB-EAK-30-02	BFO D22-XB-LB-EAK-15-02	BFO D22-XBF-LB-EAK-15-02	BFO D22-XA-SB-EAK-20-02	
2x2.2 mm	2x2.2 mm	2x2.2 mm	2x2.2 mm	
2x1.5 mm	1x1 mm/16x0.25 mm	1x1 mm/16x0.25 mm	2x1 mm	
≥ 40 mm	≥ 25 mm	≥ 5 mm	≥ 25 mm	
-55...+70 °C	-55...+70 °C	-40...+60 °C	-35...+65 °C	
180 mm	120 mm	110 mm	130 mm	
180 mm	120 mm	110 mm	130 mm	
180 mm	120 mm	120 mm	130 mm	
130 mm	80 mm	70 mm	90 mm	
100 mm	50 mm	30 mm	40 mm	





Optical head		M4 thread	M4 thread	M4 thread
Features		Standard	Coaxial	Highly flexible
Straight light exit	Ordering code	BFO0005	BFO0006	BFO0055
	Part number	BFO D22-XA-UB-EAK-20-02	BFO D22-XB-UB-EAK-15-02	BFO D10-XAH-KB-EAK-10-02
Sheathing Ø		2x2.2 mm	2x2.2 mm	2x1 mm
Core Ø		2x1 mm	1x1 mm/16x0.25 mm	2x0.5 mm
Fiber bending radius		≥ 25 mm	≥ 25 mm	≥ 1 mm
Head bending radius				
Temperature range		-35...+65 °C	-40...+60 °C	-40...+70 °C
Range	with BFB 75K-001	120 mm	130 mm	40 mm
	with BFB 75K-002*	120 mm	130 mm	40 mm
	with BFB 73K	120 mm	130 mm	30 mm
	with BFB 6K	80 mm	90 mm	-
	with BFB 18KF	40 mm	50 mm	10 mm

*Max. range in standard mode



Photoelectric Sensors with Special Properties

Plastic fiber optics BFO

Sensor principle



Photoelectric Sensors

Photoelectric Sensors

M4 thread	M4 thread	M3 thread	M3 thread	M3 thread
Coaxial	Bendable optical tip	Standard	Coaxial	Bendable optical tip
BFO005C	BFO0053	BFO0054	BFO005E	BFO00C3
BFO D13-XB-KB-EAK-10-02	BFO D10-XA-HB-EAK-10-02	BFO D10-XA-RB-EAK-10-02	BFO D13-XB-RB-EAK-10-02	BFO D10-XA-VB-EAK-10-02
2x1.25 mm	2x1 mm	2x1 mm	2x1.25 mm	2x1 mm
1x0.5 mm/9x0.25 mm	2x0.5 mm	2x0.5 mm	1x0.5 mm/9x0.25 mm	2x0.5 mm
≥ 15 mm	≥ 15 mm	≥ 15 mm	≥ 15 mm	≥ 15 mm
-55...+70 °C	-55...+70 °C	-55...+70 °C	-40...+60 °C	-55...+70 °C
60 mm	50 mm	50 mm	60 mm	50 mm
60 mm	50 mm	50 mm	60 mm	50 mm
60 mm	40 mm	40 mm	-	40 mm
-	-	-	-	-
20 mm	10 mm	10 mm	20 mm	10 mm

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

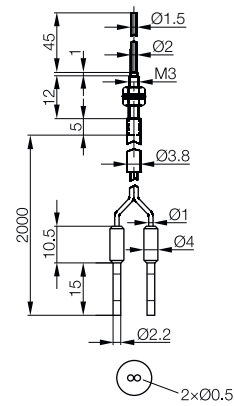
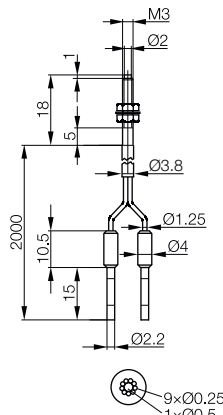
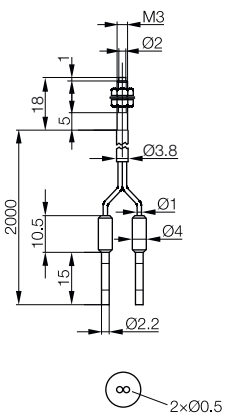
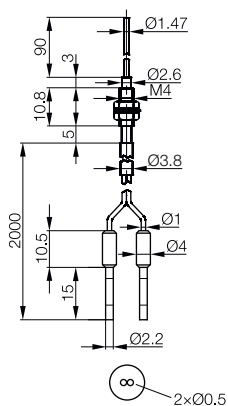
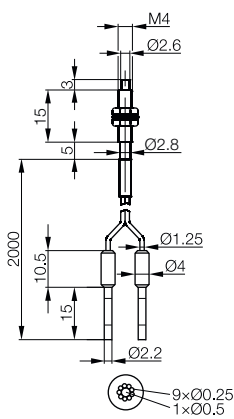
Optical Fiber Base Units BFB/ BOS

Plastic Fiber Optics BFO

Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

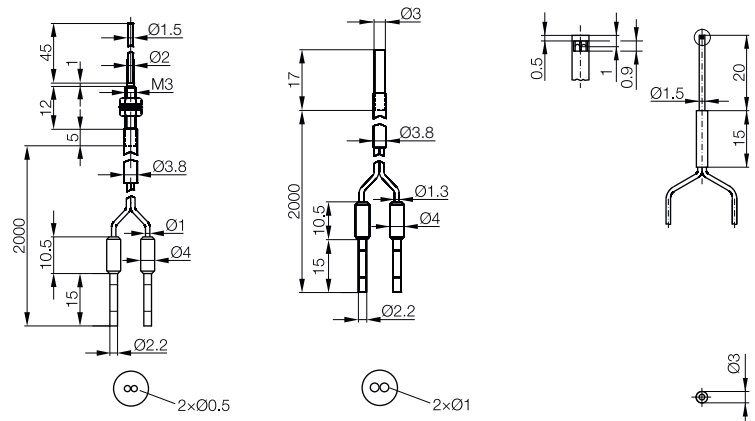
Accessories for Photoelectric Sensors





Optical head		M3 thread	Ø 3 mm	Ø 3 mm
Features		Standard	Standard	Standard
Straight light exit	Ordering code	BFO0052	BFO005A	
	Part number	BFO D10-XA-GB-EAK-10-02	BFO D13-XA-JB-EAK-20-02	
90° light exit	Ordering code			BFO0062
	Part number			BFO D22-XA-MB-PAK-10-02
Sheathing Ø		2x1 mm	2x1.3 mm	2x1 mm
Core Ø		2x0.5 mm	2x1 mm	2x0.5 mm
Fiber bending radius		≥ 15 mm	≥ 25 mm	≥ 25 mm
Head bending radius		≥ 10 mm		
Temperature range		-55...+70 °C	-55...+70 °C	-40...+70 °C
Range	with BFB 75K-001	50 mm	130 mm	35 mm
	with BFB 75K-002*	50 mm	130 mm	35 mm
	with BFB 73K	40 mm	130 mm	25 mm
	with BFB 6K	-	-	-
	with BFB 18KF	10 mm	50 mm	-

*Max. range in standard mode



Photoelectric Sensors with Special Properties

Plastic fiber optics BFO

Sensor principle



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

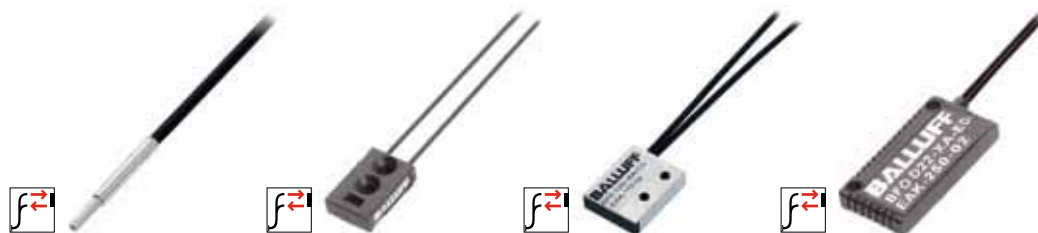
Optical Fiber Base Units BFB/ BOS

Plastic Fiber Optics BFO

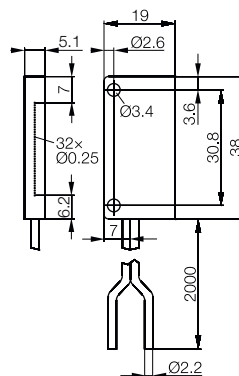
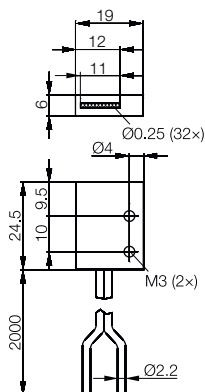
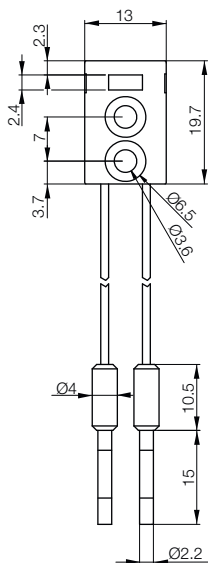
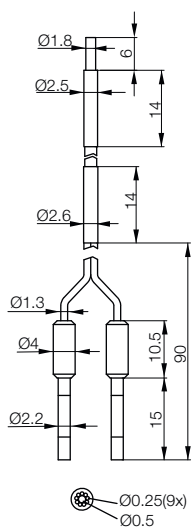
Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



	Ø 2.5 mm	13x20 mm	19x25 mm	19x38 mm	
	Coaxial	Standard	Light grids	Light grids	
	BFO00AT		BFO005Z		
	BFO D13-XB-AB-EAK-10-01		BFO D22-XA-CD-EAK-110-02		
		BFO00AR		BFO0060	
		BFO D13-XV-AK-EAK-50-02		BFO D22-XA-ED-EAK-250-02	
	2x1.3 mm	2x1.3 mm	2.2 mm	2.2 mm	
	1x0.5 mm/9x0.25 mm	2x1 mm	32x0.25 mm	32x0.25 mm	
	≥ 15 mm	≥ 25 mm	≥ 25 mm	≥ 25 mm	
	-55...+70 °C	-55...+70 °C	-55...+70 °C	-55...+70 °C	
	50 mm	1...6 mm	100 mm	90 mm	
	50 mm	1...6 mm	100 mm	90 mm	
	40 mm	1...6 mm	100 mm	90 mm	
	-	-	70 mm	60 mm	
	10 mm	-	40 mm	30 mm	



Photoelectric Sensors with Special Properties

Plastic fiber optics BFO Can be fabricated

Customized solutions with plastic fiber optics for user assembly

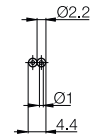
If you are not satisfied with "off-the-shelf" solutions, we have a better suggestion here.

Optical fibers can be user-cut to the desired length from a 20 m roll. This way you only use as much plastic optical fiber as you actually need. Considerable savings, especially if multiple sensors are used. For simple applications you may not need an end piece. A simple clamp will suffice. Or for convenience and flexibility, select from among the available end pieces. The plastic optical fiber is simply crimped into the end piece. Tedious gluing is eliminated. The end piece can be removed at any time.



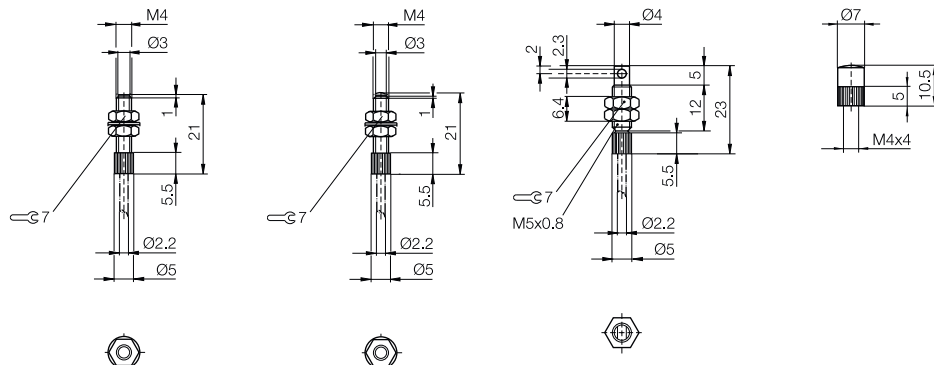
Size	2.2x4.4 mm duplex cable
Through-beam sensor range with L = 2 m	150 mm
Cable length	20 m
Ordering code	BFO005Y
Part number	BFO D22-LD-EAK-10-20
Sheathing Ø	2x1 mm
Core Ø	2.2 mm
Ambient temperature Ta	-40...+85 °C
Tension on optical fiber and connection parts at 20 °C	6 N

Cutting tool BFO CT is included.



Size	M4	M4	Ø 4 mm/M5	Ø 7 mm
Features	End piece without lens	End piece with lens	90° end piece	Adapter lens
Used with	BFO D22-LD-EAK-10-..	BFO D22-LD-EAK-10-..	BFO D22-LD-EAK-10-..	BFO D22-LD-BC-10
Range	150 mm	450 mm	150 mm	1500 mm
Ordering code	BFO005J	BFO005L	BFO005F	BAM00NW
Part number	BFO D22-LA-BC-10	BFO D22-LA-CC-30	BFO D22-LA-AC-20	BFO D22-LA-AC-20
Material	Optical surface: Plastic (fibers)	Glass	Glass	Glass
	Threaded tube: Stainless steel	Stainless steel	Stainless steel	Stainless steel
Packaging unit	1 pc.	1 pc.	1 pc.	1 pc.

Range when used with 2 m plastic fiber cable.



Photoelectric Sensors with Special Properties

Adapter lens, deflection head, focus lens, adapter, cutting tool



Photoelectric
Sensors

Photoelectric
Sensors

Photoelectric
Sensors with
Special Proper-
ties

Analog Fork
Sensors BGL_C

Optical Window
Sensors BOW

Light Grids BLG

Color Sensors
BFS

Contrast Sensors
BKT

Luminescence
Sensors BLT

Optical Fiber
Base Units BFB/
BOS

**Plastic
Fiber Optics
BFO**

Glass Fiber
Optics
BFO

Photoelectric
Distance
Sensors
for Analog
Distance
Measurement

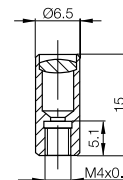
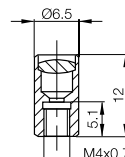
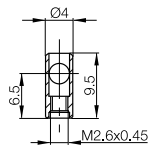
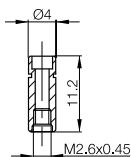
Accessories for
Photoelectric
Sensors



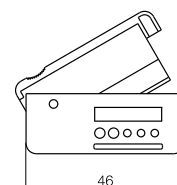
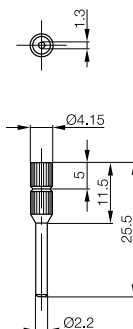
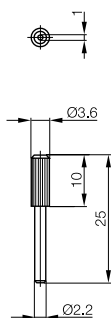
Adapter lens, deflection head, focus lens,
adapter and cutting tool are assigned to
accessories, which we mark in gray.



Description	Adapter lens	90° deflection head	Focus lens	Focus lens
Use	For through-beam optical fibers M2.6x0.45	For through-beam optical fibers M2.6x0.45	For coaxial diffuse sensor optical fibers M4x0.7	For coaxial diffuse sensor optical fibers M4x0.7
Ordering code	BAM00NN	BAM00NP	BAM00NR	BAM00NT
Part number	BFO 02-PK-1	BFO 02-UK-1	BFO 04-FL-1	BFO 04-FL-2
Sensing distance/range distance with corresponding fiber optics	x10	x0.7	19 mm±2 mm	7 mm±2 mm
Packaging unit	2 pcs.	2 pcs.	1 pc.	1 pc.



Description	Adapter	Adapter	Cutting tool
Use	For plastic fiber optics Ø 1 mm for connecting to fiber optic base units	For plastic fiber optics Ø 1.3 mm for connecting to fiber optic base units	For trimming plastic fiber optics Ø 1 mm or Ø 2.2 mm
Ordering code	BAM000J	BAM00P1	BAM000E
Part number	BFO D10-LA-DC-10	BFO D13-LA-EC-10	BFO CT
Packaging unit	2 pcs.	2 pcs.	1 pc.



Photoelectric Sensors with Special Properties

Glass fiber optics BFO 18

The BFO 18 series of glass fiber optics are designed for series BOS 18M cylindrical sensors and are used wherever a high level of function reserve or chemical resistance is required. Likewise, temperatures over 200 °C pose no problem.

Various straight or right-angle versions are available with a polyurethane jacket, corrugated metal armor or silicon protective jacket.

UZG type

- Polyurethane jacket
- Strain relief
- Glass optical fiber bundle
- Flexible
- Excellent chemical resistance
- Does not become brittle from oils and cooling emulsions
- Temperature resistance -20...+85 °C

MZG type

- Corrugated metal armor
- Strain relief
- Glass optical fiber bundle
- Resistant to high temperatures -20...+170 °C (up to +250 °C for a fixed installation)
- Flexible
- Crush-resistant
- Resistant to hot swarf

SMG type

- Silicon protection jacket
- Corrugated metal armor with glass optical fiber bundle strain relief
- Extended temperature range
- -40...+150 °C
- Highly flexible
- Crush-resistant



Photoelectric Sensors with Special Properties

Glass fiber optics BFO 18

Product overview



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

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Accessories for Photoelectric Sensors

Accessories for Photoelectric Sensors

Type

Ordering code

Part number



Through-beam fiber optics

Type	Max. sensing distance	Version		Light exit		Auto-motive approval	Page
		Through-beam	Buttons	Straight	Angled		
BF0001Z BFO 18A-LGG-MZG-10-0,5	400 mm	■		■			346
BF00020 BFO 18A-LGG-MZG-10-1	400 mm	■		■			346
BF00023 BFO 18A-LGG-SMG-10-0,5	400 mm	■		■			346
BF00024 BFO 18A-LGG-SMG-10-1	400 mm	■		■			346
BF0001P BFO 18A-LFF-MZG-10-0,5	400 mm	■			■		346
BF0001R BFO 18A-LFF-MZG-10-1	400 mm	■			■		346
BF0001U BFO 18A-LFF-SMG-10-0,5	400 mm	■			■		346
BF0001W BFO 18A-LFF-SMG-10-1	400 mm	■			■		346
BF0000M BFO 18A-LAA-UZG-20-0,5	700 mm	■		■			347
BF0000N BFO 18A-LAA-UZG-20-1	700 mm	■		■			347
BF0000F BFO 18A-LAA-MZG-20-0,5	700 mm	■		■			347
BF0000H BFO 18A-LAA-MZG-20-1	700 mm	■		■			347
BF0000Z BFO 18A-LCC-UZG-20-1	700 mm	■		■			347
BF0000U BFO 18A-LCC-SMG-20-0,5	700 mm	■		■			347
BF0000W BFO 18A-LCC-SMG-10-1	700 mm	■		■			347
BF0001N BFO 18A-LEE-UZG-20-0,5	700 mm	■			■		347
BF0001H BFO 18A-LEE-UZG-20-1	700 mm	■			■		347
BF00013 BFO 18A-LEE-MZG-20-0,5	700 mm	■			■		347
BF00014 BFO 18A-LEE-MZG-20-1	700 mm	■			■		347
BF00019 BFO 18A-LEE-SMG-20-0,5	700 mm	■			■		347
BF0001A BFO 18A-LEE-SMG-20-1	700 mm	■			■		347
BF0003Y BFO 18V-LCC-MZG-23-0,5	2000 mm	■		■		■	347
BF00042 BFO 18V-LCC-SMG-23-0,5	2000 mm	■		■		■	347
BF0004C BFO 18V-LDD-SMG-23-0,5	2000 mm	■			■	■	347
BF0004F BFO 18V-LDD-SMG-23-1	2000 mm	■			■	■	347



Diffuse sensor fiber optics

BF0003R BFO 18A-XAG-MZG-15-0,5	50 mm		■	■			348
BF0003T BFO 18A-XAG-MZG-15-1	50 mm		■	■			348
BF0003H BFO 18A-XAF-MZG-15-0,5	50 mm		■		■		348
BF0003J BFO 18A-XAF-MZG-15-1	50 mm		■		■		348
BF0003M BFO 18A-XAF-SMG-15-0,5	50 mm		■		■		348
BF0003N BFO 18A-XAF-SMG-15-1	50 mm		■		■		348
BF0002M BFO 18A-XAA-UZG-30-0,5	100 mm		■	■			349
BF0002N BFO 18A-XAA-UZG-30-1	100 mm		■	■			349
BF00026 BFO 18A-XAA-MZG-30-0,5	100 mm		■	■			349
BF00027 BFO 18A-XAA-MZG-30-1	100 mm		■	■			349
BF0002F BFO 18A-XAA-SMG-30-0,5	100 mm		■	■			349
BF0002H BFO 18A-XAA-SMG-30-1	100 mm		■	■			349
BF0002W BFO 18A-XAC-SMG-30-1	100 mm		■	■			349
BF0002U BFO 18A-XAC-SMG-30-0,5	100 mm		■	■			349
BF0003C BFO 18A-XAE-UZG-30-0,5	100 mm		■		■		349
BF0003E BFO 18A-XAE-UZG-30-1	100 mm		■		■		349
BF00031 BFO 18A-XAE-MZG-30-0,5	100 mm		■		■		349
BF00037 BFO 18A-XAE-SMG-30-0,5	100 mm		■		■		349
BF00038 BFO 18A-XAE-SMG-30-1	100 mm		■		■		349
BF0004M BFO 18V-XAC-MZG-30-0,5	200 mm		■	■		■	349
BF0004P BFO 18V-XAC-SMG-30-0,5	200 mm		■	■		■	349
BF0004R BFO 18V-XAC-SMG-30-1	200 mm		■	■		■	349
BF0004U BFO 18V-XAD-MZG-30-0,5	200 mm		■		■	■	349
BF0004Y BFO 18V-XAD-SMG-30-0,5	200 mm		■		■	■	349
BF0004Z BFO 18V-XAD-SMG-30-1	200 mm		■		■	■	349

Photoelectric Sensors with Special Properties

Glass fiber optics BFO 18 Through-beam principle



Through-beam sensor with	BOS 18M-...-PD-... BOS 18M-...-1PF-... BOS 30M-...	Range Range Range	100 mm 400 mm	100 mm 400 mm	
UZG type		Ordering code			
0.5 m		Part number			
UZG type		Ordering code			
1 m		Part number			
MZG type		Ordering code	BFO001Z	BFO001P	
0.5 m		Part number	BFO 18A-LGG-MZG-10-0,5	BFO 18A-LFF-MZG-10-0,5	
MZG type		Ordering code	BFO0020	BFO001R	
1 m		Part number	BFO 18A-LGG-MZG-10-1	BFO 18A-LFF-MZG-10-1	
SMG type		Ordering code	BFO0023	BFO001U	
0.5 m		Part number	BFO 18A-LGG-SMG-10-0,5	BFO 18A-LFF-SMG-10-0,5	
SMG type		Ordering code	BFO0024	BFO001W	
1 m		Part number	BFO 18A-LGG-SMG-10-1	BFO 18A-LFF-SMG-10-1	
Glass optical fiber bundle diameter			1 mm	1 mm	
Max. tension on optical fibers and connection parts			80 N	80 N	
Min. bending radius			60 mm	60 mm	
Can be used with	BOS 18M-PA-1PD...		Yes	Yes	
	BOS 18M-PU-1PD-SA1.../-SA4.../-SA5...		Yes (remove adapter disk)	Yes (remove adapter disk)	
	BOS 18M-GU-1PF-...		Yes (remove adapter disk)	Yes (remove adapter disk)	
	BOS 18M-PA-1PF-...		Yes	Yes	
	BOS 30M-... (use BFO 30-A1 adapter)		No	No	

Additional lengths available (in 0.5 m increments)! Please submit an inquiry.

Please append the desired length L of the fiber optics cable to the ordering code. Adjustments from 0.5 m to max. 2 m possible.

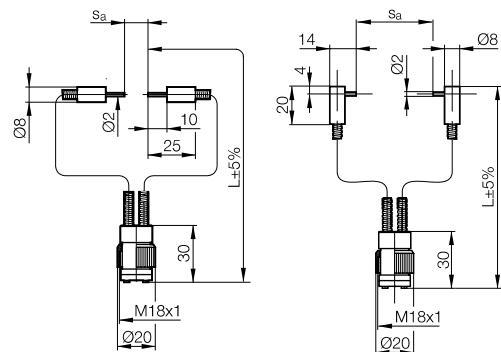
Example:

BFO 18...-30-**0,5** for **0.5 m** fiber length

BFO 18...-30-**2** for **2 m** fiber length

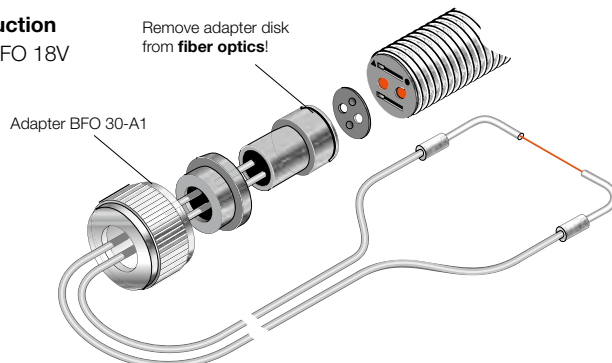
Important!

With a fiber optic through-beam sensor, the base unit's normally open signal switches to a normally closed signal!



Mounting instruction

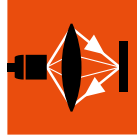
BOS 30M with BFO 18V



Photoelectric Sensors with Special Properties

Glass fiber optics BFO 18

Through-beam principle



Photoelectric Sensors

Photoelectric Sensors

	200 mm 700 mm	200 mm 700 mm	200 mm 700 mm	200 mm 2000 mm	200 mm 2000 mm
	BFO000M BFO 18A-LAA-UZG-20-0,5		BFO001N BFO 18A-LEE-UZG-20-0,5		
	BFO000N BFO 18A-LAA-UZG-20-1	BFO000Z BFO 18A-LCC-UZG-20-1	BFO001H BFO 18A-LEE-UZG-20-1		
	BFO000F BFO 18A-LAA-MZG-20-0,5		BFO0013 BFO 18A-LEE-MZG-20-0,5	BFO003Y BFO 18V-LCC-MZG-23-0,5	
	BFO000H BFO 18A-LAA-MZG-20-1		BFO0014 BFO 18A-LEE-MZG-20-1		
		BFO000U BFO 18A-LCC-SMG-20-0,5	BFO0019 BFO 18A-LEE-SMG-20-0,5	BFO0042 BFO 18V-LCC-SMG-23-0,5	BFO004C BFO 18V-LDD-SMG-23-0,5
		BFO000W BFO 18A-LCC-SMG-10-1	BFO001A BFO 18A-LEE-SMG-20-1		BFO004F BFO 18V-LDD-SMG-23-1
	2 mm	2 mm	2 mm	2 mm	2 mm
	80 N	80 N	80 N	80 N	80 N
	60 mm	60 mm	60 mm	60 mm	60 mm
	Yes	Yes	Yes	No	No
	Yes (remove adapter disk)	Yes (remove adapter disk)	Yes (remove adapter disk)	Yes (remove adapter disk)	Yes (remove adapter disk)
	Yes (remove adapter disk)	Yes (remove adapter disk)	Yes (remove adapter disk)	No	No
	Yes	Yes	Yes	No	No
	No	No	No	Yes (remove adapter disk)	Yes (remove adapter disk)

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

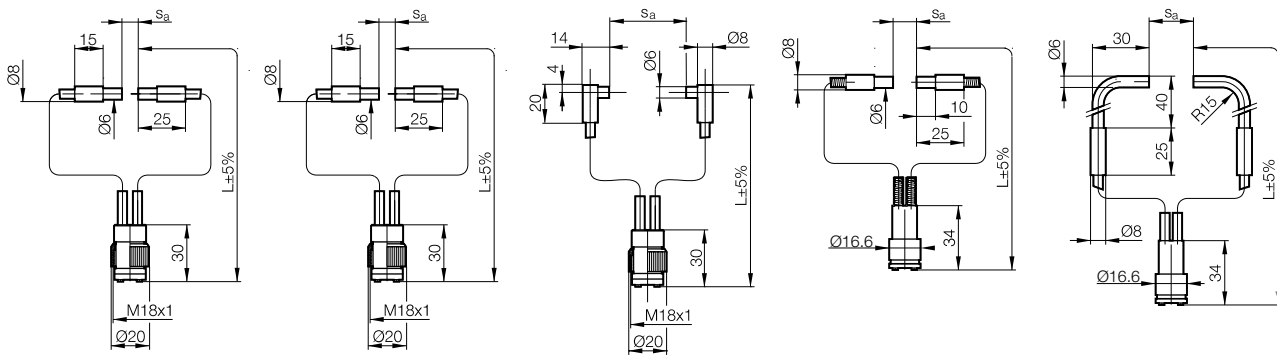
Optical Fiber Base Units BFB/BOS

Plastic Fiber Optics BFO

Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



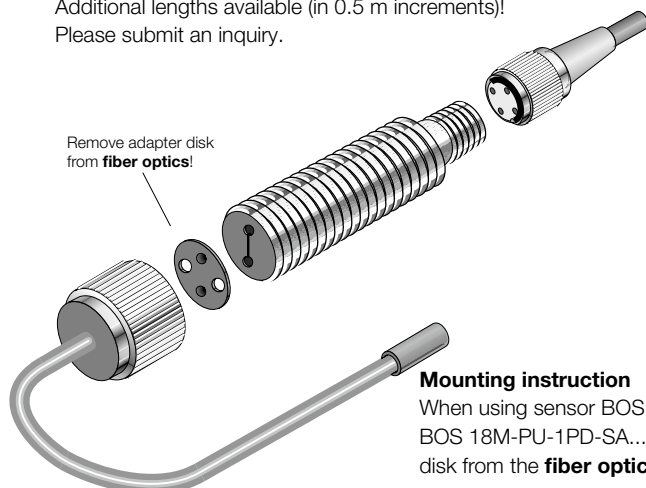
Photoelectric Sensors with Special Properties

Glass fiber optics BFO 18 Buttons



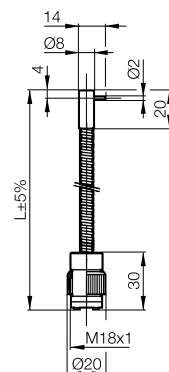
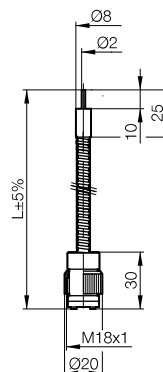
Diffuse sensor with	BOS 18M-...-PD-.../BOS 18M-...-1PF-... BOS 30M-...	10 mm/50 mm	10 mm/50 mm	
Retroreflective sensor with	BOS 18M-...-PD-.../BOS 18M-...-1PF-... BOS 30M-...	300 mm/1000 mm	300 mm/1000 mm	
UZG type	Ordering code			
0.5 m	Part number			
UZG type	Ordering code			
1 m	Part number			
MZG type	Ordering code	BFO003R	BFO003H	
0.5 m	Part number	BFO 18A-XAG-MZG-15-0,5	BFO 18A-XAF-MZG-15-0,5	
MZG type	Ordering code	BFO003T	BFO003J	
1 m	Part number	BFO 18A-XAG-MZG-15-1	BFO 18A-XAF-MZG-15-1	
SMG type	Ordering code		BFO003M	
0.5 m	Part number		BFO 18A-XAF-SMG-15-0,5	
SMG type	Ordering code		BFO003N	
1 m	Part number		BFO 18A-XAF-SMG-15-1	
Glass optical fiber bundle diameter		1.5 mm	1.5 mm	
Max. tension on optical fibers and connection parts		80 N	80 N	
Min. bending radius		60 mm	60 mm	
Can be used with	BOS 18M-PA-1PD...	Yes	Yes	
	BOS 18M-PU-1PD-SA1.../-SA4.../-SA5...	Yes (remove adapter disk)	Yes (remove adapter disk)	
	BOS 18M-GU-1PF-...	Yes (remove adapter disk)	Yes (remove adapter disk)	
	BOS 18M-PA-1PF-...	Yes	Yes	
	BOS 30M-...	No	No	
Sensing distance with	BOS 18M-PA-1PD...	10 mm	10 mm	
	BOS 18M-PU-1PD-SA1.../-SA4.../-SA5...	10 mm	10 mm	
	BOS 18M-...-1PF-...	50 mm	50 mm	
	BOS 30M-...			
Range with	BOS 18M-PA-1PD...	300 mm	300 mm	
	BOS 18M-PU-1PD-SA1.../-SA4.../-SA5...	300 mm	300 mm	
	BOS 18M-...-1PF-...	1000 mm	1000 mm	
	BOS 30M-...			

Additional lengths available (in 0.5 m increments)!
Please submit an inquiry.



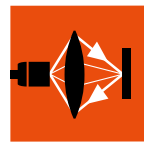
Mounting instruction

When using sensor BOS18M-GU-1PF-S4-Y or BOS 18M-PU-1PD-SA..., please remove the adapter disk from the **fiber optics**.



Photoelectric Sensors with Special Properties

Glass fiber optics BFO 18 Buttons



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/ BOS

Plastic Fiber Optics BFO

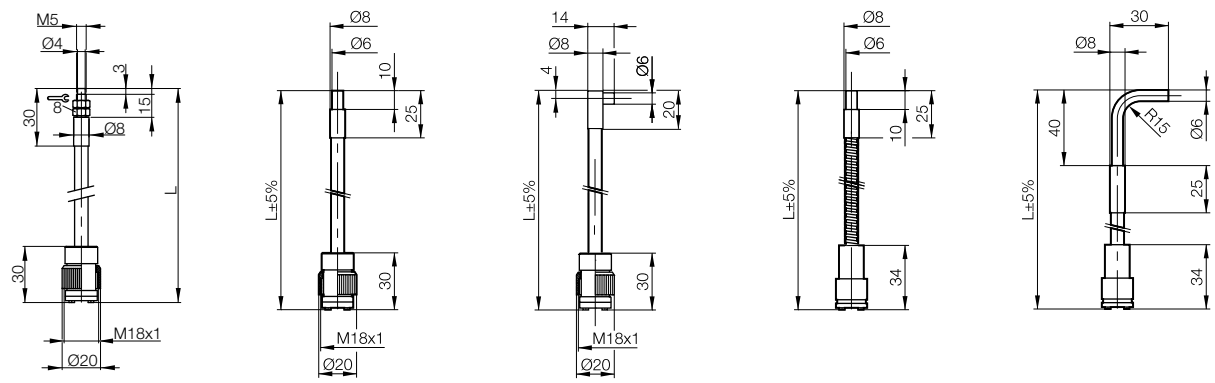
Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

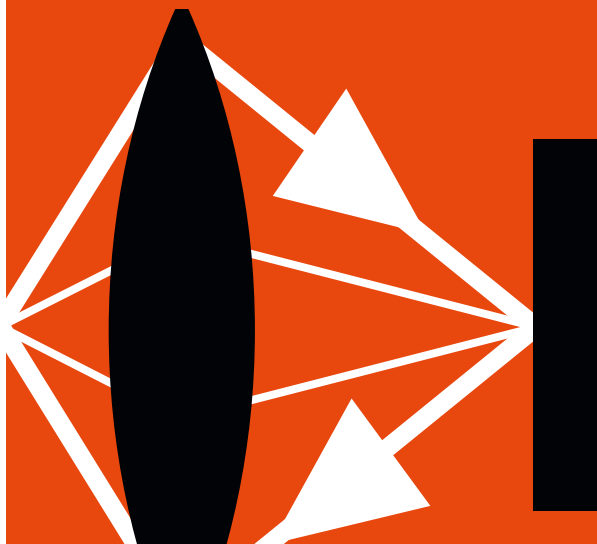


	20 mm/100 mm	20 mm/100 mm	20 mm/100 mm	20 mm 200 mm 500 mm 2000 mm	20 mm 200 mm 500 mm 2000 mm
	500 mm/1000 mm	500 mm/1000 mm	500 mm/1000 mm		
	BFO002M BFO 18A-XAA-UZG-30-0,5		BFO003C BFO 18A-XAE-UZG-30-0,5		
	BFO002N BFO 18A-XAA-UZG-30-1		BFO003E BFO 18A-XAE-UZG-30-1		
	BFO0026 BFO 18A-XAA-MZG-30-0,5		BFO0031 BFO 18A-XAE-MZG-30-0,5	BFO004M BFO 18V-XAC-MZG-30-0,5	BFO004U BFO 18V-XAD-MZG-30-0,5
	BFO0027 BFO 18A-XAA-MZG-30-1				
	BFO002F BFO 18A-XAA-SMG-30-0,5	BFO002U BFO 18A-XAC-SMG-30-0,5	BFO0037 BFO 18A-XAE-SMG-30-0,5	BFO004P BFO 18V-XAC-SMG-30-0,5	BFO004Y BFO 18V-XAD-SMG-30-0,5
	BFO002H BFO 18A-XAA-SMG-30-1	BFO002W BFO 18A-XAC-SMG-30-1	BFO0038 BFO 18A-XAE-SMG-30-1	BFO004R BFO 18V-XAC-SMG-30-1	BFO004Z BFO 18V-XAD-SMG-30-1
	3 mm	3 mm	3 mm	3 mm	3 mm
	80 N	80 N	80 N	80 N	80 N
	60 mm	60 mm	60 mm	60 mm	60 mm
	Yes	Yes	Yes	No	No
	Yes (remove adapter disk)	Yes (remove adapter disk)	Yes (remove adapter disk)	Yes (remove adapter disk)	Yes (remove adapter disk)
	Yes (remove adapter disk)	Yes (remove adapter disk)	Yes (remove adapter disk)	No	No
	Yes	Yes	Yes	No	No
	No	No	No	Yes (remove adapter disk)	Yes (remove adapter disk)
	20 mm	20 mm	20 mm	20 mm	20 mm
	20 mm	20 mm	20 mm	20 mm	20 mm
	100 mm	100 mm	100 mm	200 mm	200 mm
	500 mm	500 mm	500 mm	500 mm	500 mm
	500 mm	500 mm	500 mm	500 mm	500 mm
	1000 mm	1000 mm	1000 mm	2000 mm	2000 mm



Sensing distances referenced to a 90% reflective Kodak gray card.
 Diffuse sensor with glass fiber optics as a retroreflective light sensor:
 Ranges are referenced to BOS R-1 reflector.

When being used as a retroreflective sensor, twice the switching distance must be used as the object dead zone.



Photoelectric Sensors

Photoelectric distance sensors for analog distance measurement

Photoelectric distance sensors are used when distances to objects need to be measured or monitored or their precise position is to be determined. They support positioning tasks, material flow controls and level detections in the most diverse of applications – also across large distances.

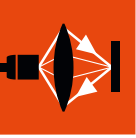
Users have a wide range of output signals available. Depending on the type, these include analog current and voltage outputs or serial interfaces. However, variants with IO-Link are available for a simple and efficient connection to higher-level control systems.



Block Designs

Product overview
BOD 6K
BOD 21M
BOD 26K
BOD 63M
BOD 66M

353
354
356
358
366
370



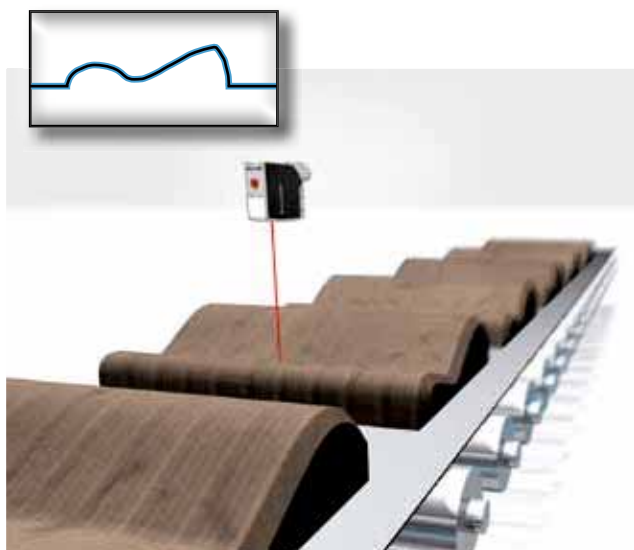
Basic information
and definitions
can be found
on page 934.



Optical distance sensors are used when distances of objects need to be measured or monitored with precise position determination. Distance measurement is based on the triangulation principle, where light travel time is measured. PSD-elements or CCD-arrays are used for the receiving elements, with the emitter consisting of a red light- or laser light source. Analog current and voltage values, serial interfaces and digital outputs are available to the user.

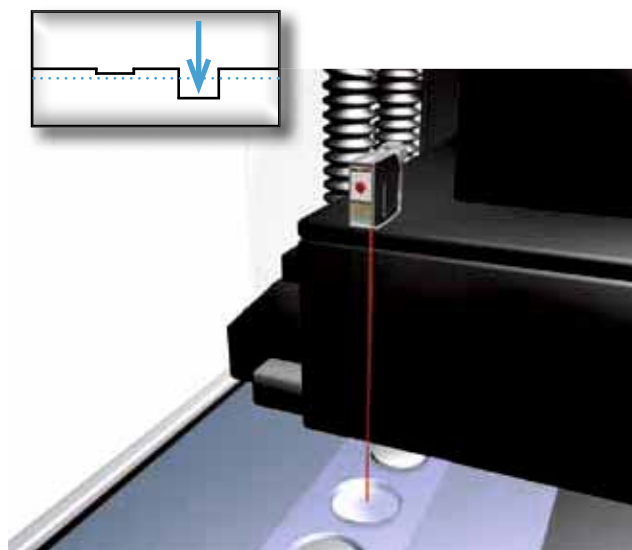
Applications

- Control tasks
- Sensing
- Object positioning
- Level detection



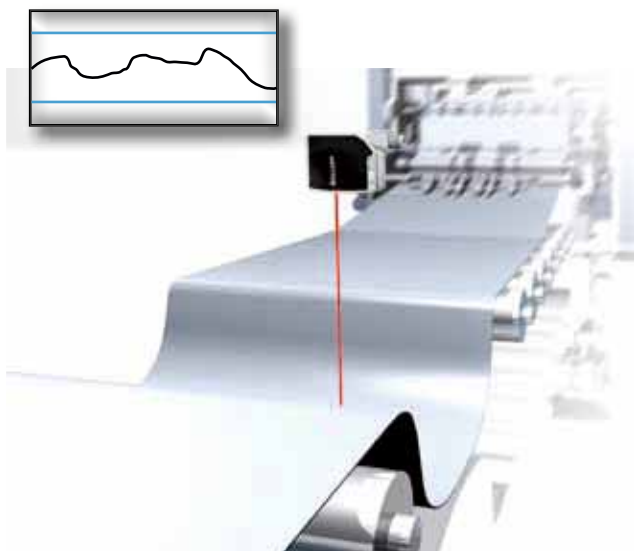
Contour checking

Optical distance sensors continuously detect dimensions or contours on tongue and groove boards. Analog sensing detects individual defects and gradual deviations directly for permanent monitoring of the production process.



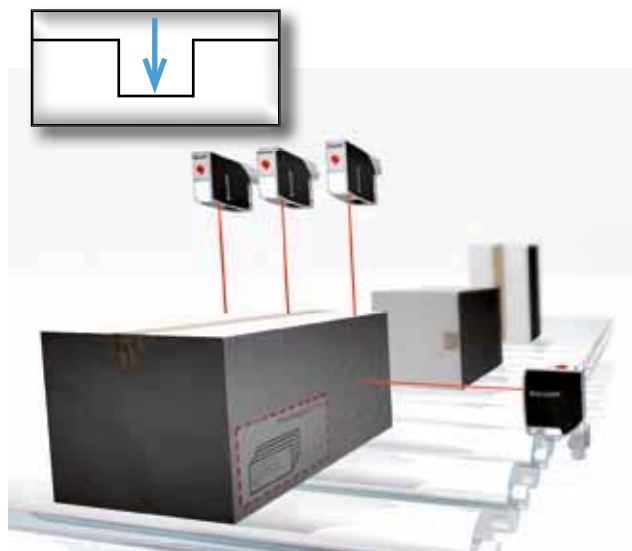
Blister packaging

Optical distance sensors monitor the packaging process, optimize product filling and increase system productivity. Before foil packaging is closed up, a BOD 21M checks the individual compartments and detects missing or extra items.



Sag monitoring

Film and web material has to be transported at a uniform speed in order to be processed with precision. Tension-free material transport succeeds using the BOD 21M, which dynamically detects the height of the sag section.

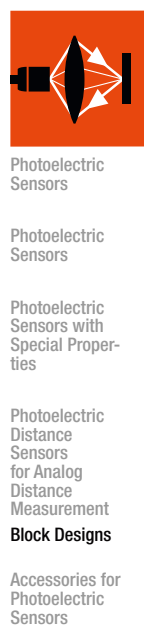


Adaptive feed

Multiple optical distance sensors measure components, assembled units and packages on a conveying line. BOD 21M sensors evaluate the outer dimension and contour so that these various parts can be transported to the next appropriate process steps. The rugged metal housing guarantees long service life of the installation.

Type	Working range	Resolution	Light type		Analog output			Output				U _s	Connection				Page		
			Red light	Laser light	0...10 V	1...10 V	4...20 mA	RS485 interface	PNP transistor	IO-Link	2× PNP transistor		Alarm output	Push-pull PNP/NPN	15...30 V DC	18...30 V DC		M8 connector, 4-pin	M12 connector, 4-pin
Distance sensor																			
BOD001L	BOD 6K-RA02-S75	20...80 mm	20 µm	■		■			■			■		■					355
BOD001M	BOD 6K-RA02-02	20...80 mm	20 µm	■		■			■			■						■	355
BOD000L	BOD 21M-LA01-S92	25...45 mm	30 µm	■		■				■		■					■		356
BOD000P	BOD 21M-LB01-S92	25...45 mm	30 µm	■			■			■		■					■		356
BOD000M	BOD 21M-LA02-S92	20...200 mm	100...200 µm	■		■				■		■					■		357
BOD000R	BOD 21M-LB02-S92	20...200 mm	100...200 µm	■			■			■		■					■		357
BOD000N	BOD 21M-LA04-S92	20...500 mm	100...500 µm	■		■				■		■					■		357
BOD000T	BOD 21M-LB04-S92	20...500 mm	100...500 µm	■			■			■		■					■		357
BOD0002	BOD 26K-LA01-S4-C	45...85 mm	80 µm	■	■							■						■	359
BOD0004	BOD 26K-LA02-S4-C	45...85 mm	20 µm	■	■							■						■	359
BOD0001	BOD 26K-LA01-C-06	45...85 mm	80 µm	■	■							■						■	359
BOD0003	BOD 26K-LA02-C-06	45...85 mm	20 µm	■	■							■						■	359
BOD0005	BOD 26K-LB04-S115-C	30...100 mm	0.1% of Wh	■			■			■		■					■		361
BOD000C	BOD 26K-LBR04-S115-C	30...100 mm	0.1% of Wh	■				■		■		■					■		361
BOD0006	BOD 26K-LB05-S115-C	80...300 mm	0.1% of Wh	■			■			■		■					■		363
BOD000E	BOD 26K-LBR05-S115-C	80...300 mm	0.1% of Wh	■				■		■		■					■		363
BOD0007	BOD 26K-LB06-S92-C	30...100 mm	0.1% of Wh-WI	■			■		■			■					■		365
BOD0008	BOD 26K-LB07-S92-C	80...300 mm	0.1% of Wh-WI	■				■		■		■					■		365
BOD0012	BOD 63M-LI06-S4	200...6000 mm	1 mm	■	■					■							■		367
BOD000U	BOD 63M-LA02-S115	200...2000 mm	1 mm	■	■					■	■	■					■		367
BOD0010	BOD 63M-LB02-S115	200...2000 mm	1 mm	■			■			■	■	■					■		367
BOD000W	BOD 63M-LA04-S115	200...6000 mm	1 mm	■	■					■	■	■					■		369
BOD0011	BOD 63M-LB04-S115	200...6000 mm	1 mm	■			■			■	■	■					■		369
BOD001H	BOD 66M-RA11-S92	100...600 mm	100...500 µm	■		■						■	■				■		371
BOD001C	BOD 66M-RB11-S92	100...600 mm	100...500 µm	■			■					■	■				■		371
BOD001J	BOD 66M-RA12-S92	100...800 mm	100...800 µm	■		■						■	■				■		373
BOD001K	BOD 66M-LB12-S92	100...800 mm	100...800 µm	■			■					■	■				■		373
BOD001E	BOD 66M-LA14-S92	150...2000 mm	1...3 mm	■		■						■	■				■		373
BOD001F	BOD 66M-LB14-S92	150...2000 mm	1...3 mm	■			■					■	■				■		373

NPN on request



Photoelectric Distance Sensors

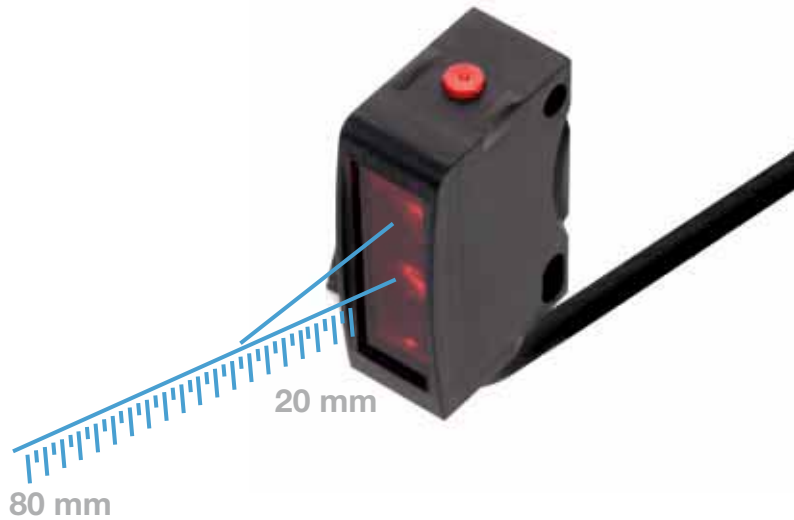
BOD 6K distance sensors

The New
Generation!

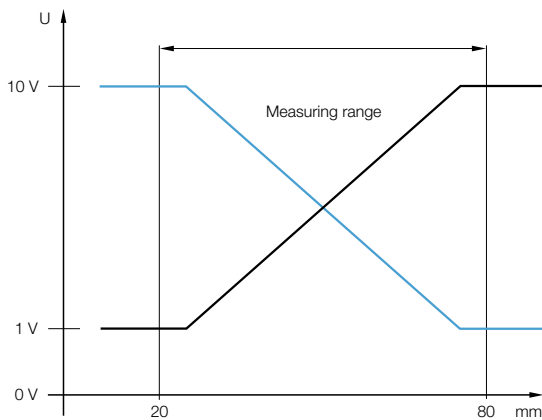
The new generation of BOD 6K sensors with a resolution of 20 μm is a real alternative for short-range measurement tasks! The new **BOD 6K** provides a distance-proportional analog output signal with falling voltage over an adjustable measuring range of 20 to 80 mm. With a switching output adjustable using teach-in, the sensor can also be used as a sensing device with background suppression.

Features

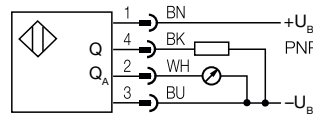
- Adjustable measuring range between 20...80 mm
- Analog output 1...10 V
- Adjustable background suppression
- Switching output PNP, NO/NC selection
- Teach-in (measuring range and switching output can be adjusted independently of each other)
- Disable buttons
- Connector or cable version
- 20 μm resolution
- Invertable analog characteristic
- IP 69K/IP 67



Analog output BOD 6K-RA0...



Wiring diagram



Recommended accessories:
(please order separately)

Description	Ordering code
Mounting bracket	BAM00UH



Special accessories for photoelectric sensors, such as **reflectors, apertures, lenses, filters and deflection heads** can be found in our **Object Detection** catalog.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories catalog**.

Suitable connectors:
(please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M8, 4-pin	Straight	PUR	Black	5 m	BCC02N3
M8, 4-pin	Angled	PUR	Black	5 m	BCC02NE



Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.

Photoelectric Distance Sensors

BOD 6K distance sensors



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

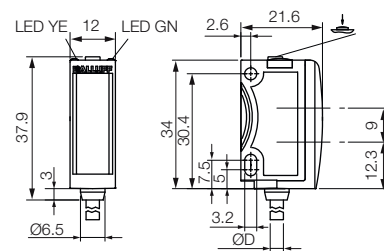
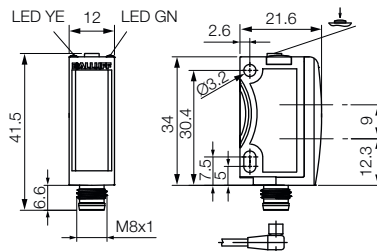
Block Designs

Accessories for Photoelectric Sensors

Series	BOD 6K	BOD 6K
Working range	20...80 mm	20...80 mm
Measuring range	60 mm	60 mm
PNP NO/NC	Ordering code BOD001L	Ordering code BOD001M
	Part number BOD 6K-RA02-S75	Part number BOD 6K-RA02-02
Supply voltage U_S	13...30 V DC	13...30 V DC
Analog output	1...10 V (max. 3 mA)	1...10 V (max. 3 mA)
No-load supply current I_0 max.	≤ 30 mA at 24 V DC	≤ 30 mA at 24 V DC
Output current	≤ 100 mA	≤ 100 mA
Switching type	Light/dark switching (selectable)	Light/dark switching (selectable)
Polarity reversal/short-circuit protected	Yes/Yes	Yes/Yes
Settings	Teach-in	Teach-in
Emitter, light type	LED, red light	LED, red light
Wavelength	632 Nm	632 Nm
Light spot diameter	5×5 mm at 50 mm	5×5 mm at 50 mm
Resolution	20 μm	20 μm
Linearity	±0.4 mm	±0.4 mm
Repeat accuracy	< 0.4 mm	< 0.4 mm
Temperature drift	0.1 mm/°K	0.1 mm/°K
Power-on indicator	Green LED	Green LED
Output function indicator	Yellow LED	Yellow LED
Switching frequency f	≤ 1000 Hz	≤ 1000 Hz
Degree of protection as per IEC 60529	IP 67/IP 69K	IP 67/IP 69K
Ambient temperature T_a	-20...+60 °C	-20...+60 °C
Permissible ambient light	5 klx	5 klx
Material	Housing: ABS Optical surface: PMMA	Housing: ABS Optical surface: PMMA
Connection	M8 connector, 4-pin	2 m PVC cable, 4×0.14 mm ²

Measurement values referenced to 100×100 mm, 90% reflective Kodak gray card.

Connector orientation



Photoelectric Distance Sensors

BOD 21M laser distance sensors

BOD 21M
Laser

The BOD 21M is connected using a 5-pin M12 plug. The connector orientation can be set over a range of 270°, allowing the BOD 21M to be attached in any position.



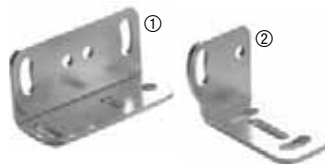
Series	BOD 21M		BOD 21M
Working range	25...45 mm		25...45 mm
Measuring range	20 mm		20 mm
2x PNP	NO/NC	Ordering code	BOD000L
		Part number	BOD000P
			BOD 21M-LA01-S92
			BOD 21M-LB01-S92
Supply voltage U _S	18...30 V DC		18...30 V DC
Analog output	1...10 V (max. 3 mA)		4...20 mA
Settings	Teach-in (rotary switch)		Teach-in (rotary switch)
Switching type	Light/dark switching		Light/dark switching
Emitter, light type	Laser, pulsed red light		Laser, pulsed red light
Wavelength	630 Nm		630 Nm
Laser class	2		2
Light spot diameter	Ø 1 mm at 45 mm		Ø 1 mm at 45 mm
Temperature drift	≤ 0.2 %/°K		≤ 0.2 %/°K
Resolution	30 µm		30 µm
Linearity	±0.5 %		±0.5 %
Stand-by delay	≤ 300 ms		≤ 300 ms
On/off delay	≤ 7 ms		≤ 7 ms
Switching frequency f	≤ 70 Hz		≤ 70 Hz
Power-on indicator	Green LED		Green LED
Output function indicator	Yellow LED		Yellow LED
Degree of protection as per IEC 60529	IP 67		IP 67
Polarity reversal/short-circuit protected	Yes		Yes
Permissible ambient light	5 klx		5 klx
Ambient temperature T _a	-10...+50 °C		-10...+50 °C
Material	Housing	GD-Zn	GD-Zn
	Optical surface	Glass	Glass
Connection	M12 connector, 5-pin		M12 connector, 5-pin

Measured values referenced to Kodak gray card 90% reflective.

☞ -- Connector orientation

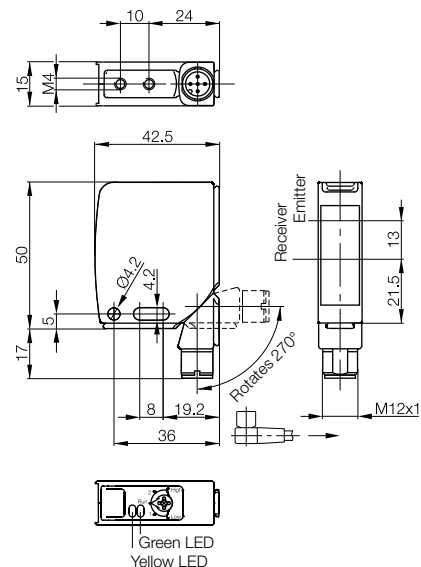
Recommended accessories:
(please order separately)

Description	Ordering code
① Mounting bracket	BAM00T9
② Mounting bracket	BAM00TA



You can find special accessories for photoelectric sensors in our **Object Detection** catalog.

Suitable connectors:
(please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M12, 5-pin	Straight	PUR	Black	5 m	BCC098C

Connectors without LED are suitable for PNP and NPN sensors.



Photoelectric Distance Sensors

BOD 21M laser distance sensors



Photoelectric Sensors

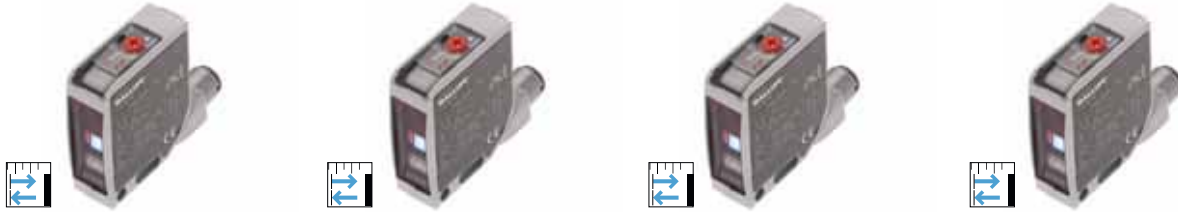
Photoelectric Sensors

Photoelectric Sensors with Special Properties

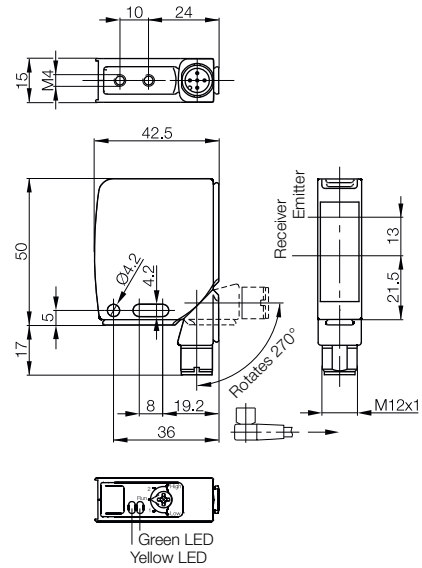
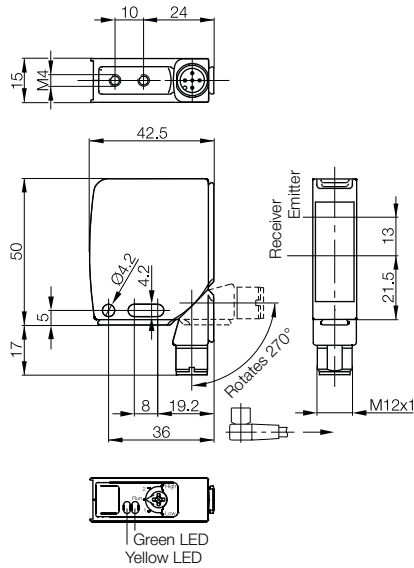
Photoelectric Distance Sensors for Analog Distance Measurement

Block Designs

Accessories for Photoelectric Sensors



BOD 21M 20...200 mm 180 mm BOD000M	BOD 21M 20...200 mm 180 mm BOD000R	BOD 21M 20...500 mm 480 mm BOD000N	BOD 21M 20...500 mm 480 mm BOD000T
BOD 21M-LA02-S92	BOD 21M-LB02-S92	BOD 21M-LA04-S92	BOD 21M-LB04-S92
18...30 V DC	18...30 V DC	18...30 V DC	18...30 V DC
1...10 V (max. 3 mA)	4...20 mA	1...10 V (max. 3 mA)	4...20 mA
Teach-in (rotary switch)	Teach-in (rotary switch)	Teach-in (rotary switch)	Teach-in (rotary switch)
Light/dark switching	Light/dark switching	Light/dark switching	Light/dark switching
Laser, pulsed red light	Laser, pulsed red light	Laser, pulsed red light	Laser, pulsed red light
630 Nm	630 Nm	630 Nm	630 Nm
2	2	2	2
Ø 1 mm at 200 mm	Ø 1 mm at 200 mm	1×6 mm at 500 mm	1×6 mm at 500 mm
≤ 0.2 %/°K	≤ 0.2 %/°K	≤ 0.2 %/°K	≤ 0.2 %/°K
100...200 µm	100...200 µm	100...500 µm	100...500 µm
±1 %	±1 %	±1% (to 200 mm) ±3% (200...500 mm)	±1% (to 200 mm) ±3% (200...500 mm)
≤ 300 ms	≤ 300 ms	≤ 300 ms	≤ 300 ms
≤ 7 ms	≤ 7 ms	≤ 7 ms	≤ 7 ms
≤ 70 Hz	≤ 70 Hz	≤ 70 Hz	≤ 70 Hz
Green LED	Green LED	Green LED	Green LED
Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67
Yes	Yes	Yes	Yes
5 klx	5 klx	5 klx	5 klx
-10...+50 °C	-10...+50 °C	-10...+50 °C	-10...+50 °C
GD-Zn	GD-Zn	GD-Zn	GD-Zn
Glass	Glass	Glass	Glass
M12 connector, 5-pin	M12 connector, 5-pin	M12 connector, 5-pin	M12 connector, 5-pin



Wiring diagrams



Photoelectric Distance Sensors

Distance sensors BOD 26K-LA Laser

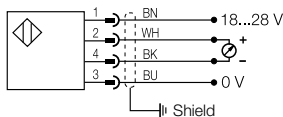
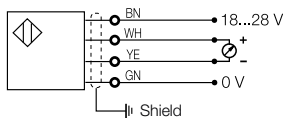
BOD 26K-LA **DEXYI**
Laser

Features

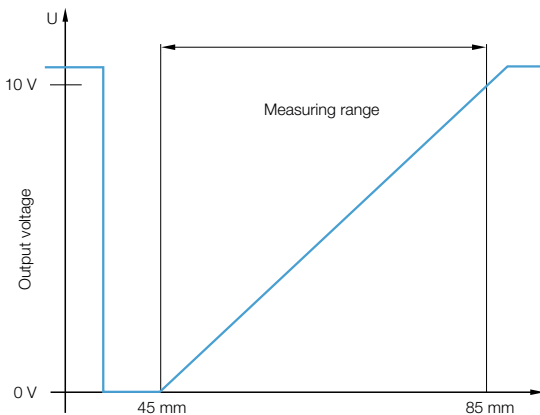
- Fixed measuring range between 45...85 mm
- Analog output 0...10 V
- 20 µm or 80 µm resolution
- Connector or cable version



Wiring diagrams



Analog output BOD 26K-LA0...



Recommended accessories:
(please order separately)

Description	Ordering code
Mounting bracket	BAM00TK



Special accessories for photoelectric sensors, such as **reflectors, apertures, lenses, filters and deflection heads** can be found in our **Object Detection** catalog.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories catalog**.

Series	
Working range	
Measuring range	
Ordering code	
Part number	
Supply voltage U_S	
Analog output	
No-load supply current I_0 max.	
Output current	
Polarity reversal/short-circuit protected	
Settings	
Emitter, light type	
Wavelength	
Laser class	
Light spot diameter	
Temperature drift	
Resolution	
Linearity	
Power-on indicator	
Contamination indicator	
Cutoff frequency	
Rise time (from 10% to 90%)	
Fall-off time (from 90% to 10%)	
Degree of protection as per IEC 60529	
Ambient temperature T_a	
Permissible ambient light	
Material	Housing Optical surface
Connection	

Measured values referenced to Kodak gray card 90% reflective.



Connector orientation



Suitable connectors:
(please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	5 m	BCC032L

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.



Photoelectric Distance Sensors

Distance sensors BOD 26K-LA Laser



Photoelectric Sensors

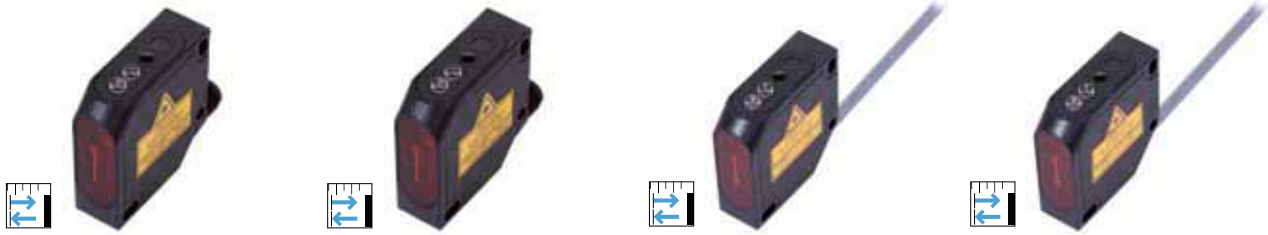
Photoelectric Sensors

Photoelectric Sensors with Special Properties

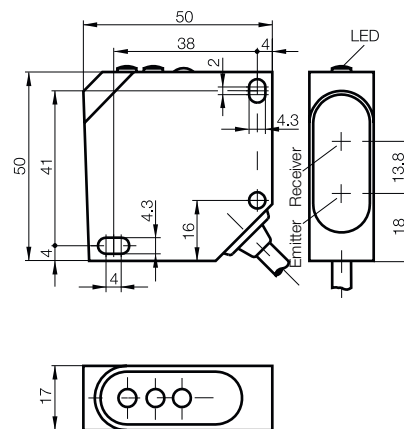
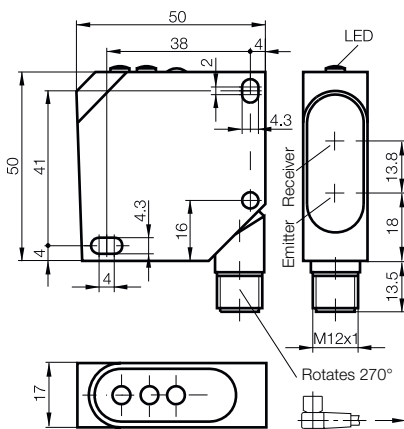
Photoelectric Distance Sensors for Analog Distance Measurement

Block Designs

Accessories for Photoelectric Sensors



BOD 26K 45...85 mm 40 mm BOD0002	BOD 26K 45...85 mm 40 mm BOD0004	BOD 26K 45...85 mm 40 mm BOD0001	BOD 26K 45...85 mm 40 mm BOD0003
BOD 26K-LA01-S4-C	BOD 26K-LA02-S4-C	BOD 26K-LA01-C-06	BOD 26K-LA02-C-06
18...28 V DC	18...28 V DC	18...28 V DC	18...28 V DC
0...10 V (max. 3 mA)	0...10 V (max. 3 mA)	0...10 V (max. 3 mA)	0...10 V (max. 3 mA)
35 mA	35 mA	35 mA	35 mA
100 mA	100 mA	100 mA	100 mA
Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
Fixed	Fixed	Fixed	Fixed
Laser, red light	Laser, red light	Laser, red light	Laser, red light
670 Nm	670 Nm	670 Nm	670 Nm
2	2	2	2
Ø 0.8 mm at 65 mm	Ø 0.8 mm at 65 mm	Ø 0.8 mm	Ø 0.8 mm
18 µm/K	18 µm/K	18 µm/K	18 µm/K
80 µm	20 µm	80 µm	20 µm
≤ 1 % of Wh	≤ 1 % of Wh	≤ 1 % of Wh	≤ 1 % of Wh
Green LED	Green LED	Green LED	Green LED
Red LED	Red LED	Red LED	Red LED
400 Hz	40 Hz	400 Hz	40 Hz
3 ms	30 ms	3 ms	30 ms
2 ms	20 ms	2 ms	20 ms
IP 67	IP 67	IP 67	IP 67
0...+45 °C	0...+45 °C	0...+45 °C	0...+45 °C
3000 Lux	3000 Lux	3000 Lux	3000 Lux
Impact-resistant ABS	Impact-resistant ABS	Impact-resistant ABS	Impact-resistant ABS
PMMA	PMMA	PMMA	PMMA
M12 connector, 4-pin	M12 connector, 4-pin	6 m PVC cable, 4x0.25 mm ²	6 m PVC cable, 4x0.25 mm ²



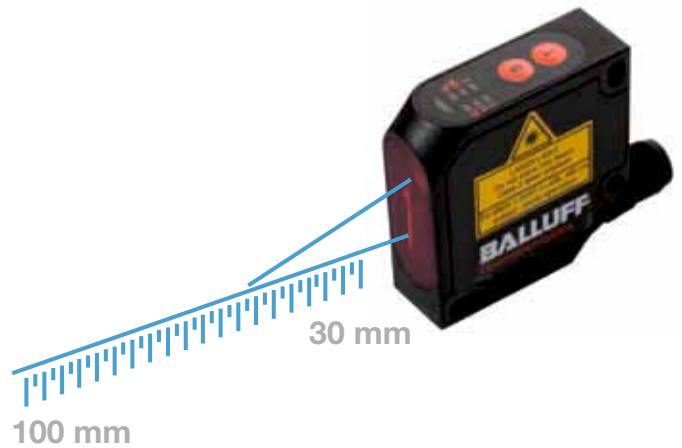
Photoelectric Distance Sensors

Distance sensors BOD 26K-LB Laser

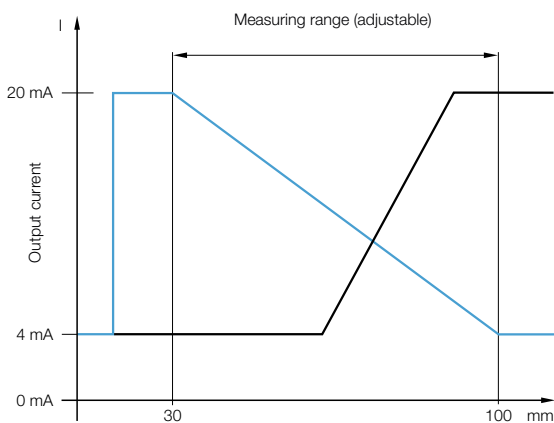
BOD 26K-LB **DEXYI**
Laser

Features

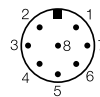
- Adjustable measuring range between 30...100 mm
- Adjustable analog output 4...20 mA: Rising or falling
- Optional with RS485-interface (for master-slave-mode) and for visualization using a computer (additional software required)
- 2 switching outputs with adjustable switching points
- Teach-in
- Adjustable averaging
- Numerous additional functions



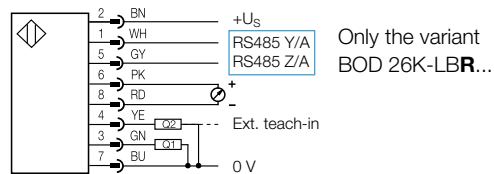
Analog output BOD 26K-LB(R)04...



Connector diagram



Wiring diagram



Recommended accessories:
(please order separately)

Description	Ordering code
Mounting bracket	BAM00TK



Special accessories for photoelectric sensors, such as **reflectors, apertures, lenses, filters and deflection heads** can be found in our **Object Detection** catalog.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories** catalog.

Suitable connectors:
(please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M12, 8-pin	Straight	PVC	Gray	5 m	BCC0995
M12, 8-pin	Angled	PVC	Gray	5 m	BCC0998

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.



Photoelectric Distance Sensors

Distance sensors BOD 26K-LB Laser



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

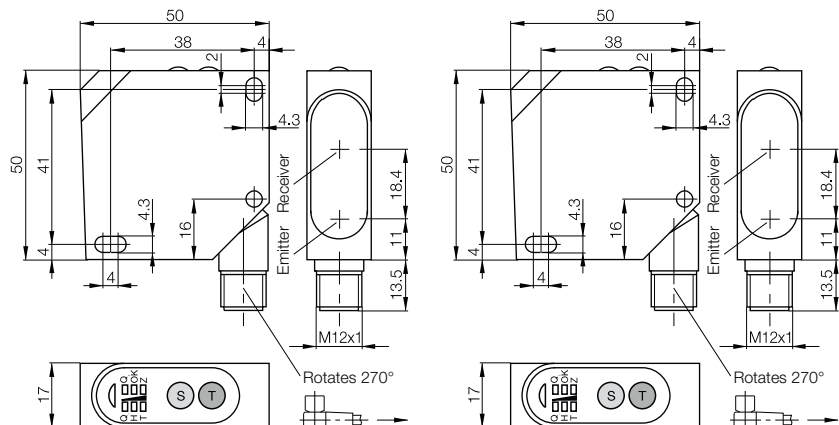
Photoelectric Distance Sensors for Analog Distance Measurement

Block Designs

Accessories for Photoelectric Sensors

Series	BOD 26K	BOD 26K
Working range	30...100 mm	30...100 mm
Measuring range	adjustable max. 70 mm	adjustable max. 70 mm
2x PNP NO/NC	Ordering code Part number	Ordering code Part number
	BOD0005 BOD 26K-LB04-S115-C	BOD000C BOD 26K-LBR04-S115-C
Supply voltage U_S	18...30 V DC	18...30 V DC
Analog output	4...20 mA	4...20 mA
No-load supply current I_0 max.	≤ 40 mA	≤ 40 mA
Output current max.	100 mA	100 mA
Switching type	Light/dark switching	Light/dark switching
Interface		RS485
Polarity reversal/short-circuit protected	Yes/Yes	Yes/Yes
Settings	Teach-in	Teach-in
Additional function		Master-slave mode
Emitter, light type	Laser, red light	Laser, red light
Wavelength	650 Nm	650 Nm
Laser class	2	2
Light spot diameter	1.5 mm × 3.25 mm at 100 mm	1.5 mm × 3.25 mm at 100 mm
Resolution	< 0.1 % of Wh	< 0.1 % of Wh
Linearity	< 0.25 % of Wh	< 0.25 % of Wh
Power-on indicator	Green LED	Green LED
Output function indicator	Yellow LED	Yellow LED
Switching frequency	1 kHz	1 kHz
Time function	50 ms pulse extension	50 ms pulse extension
Degree of protection as per IEC 60529	IP 67	IP 67
Ambient temperature T_a	-10...+60 °C	-10...+60 °C
Permissible ambient light	5000 Lux	5000 Lux
Material	Housing: Impact-resistant ABS Optical surface: PMMA	Impact-resistant ABS PMMA
Connection	M12 connector, 8-pin	M12 connector, 8-pin

Measured values referenced to Kodak gray card 90% reflective.



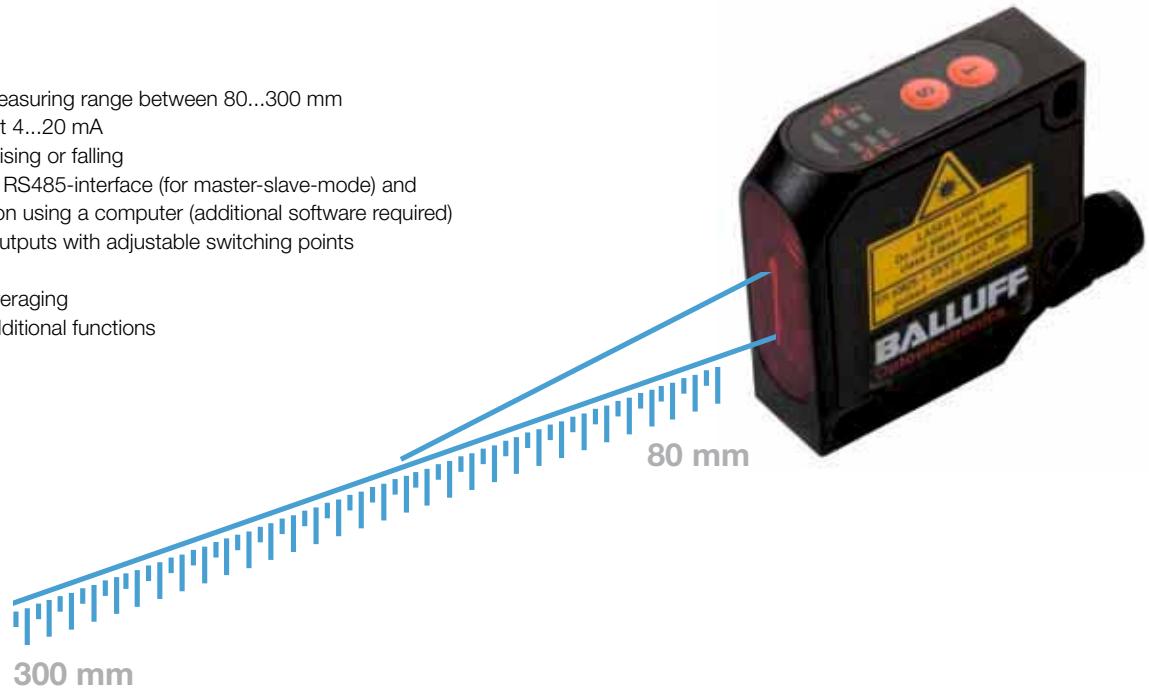
Photoelectric Distance Sensors

Distance sensors BOD 26K-LB Laser

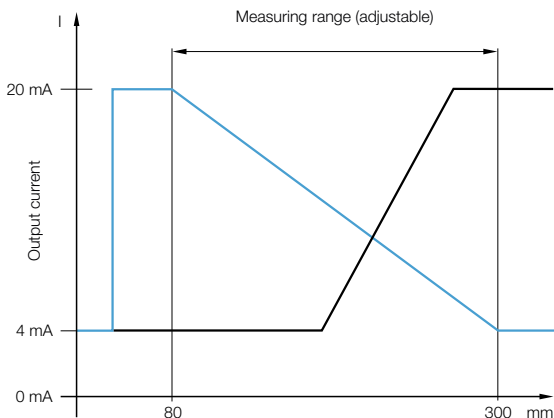
BOD 26K-LB **DEXYI**
Laser

Features

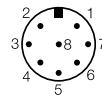
- Adjustable measuring range between 80...300 mm
- Analog output 4...20 mA
Adjustable: Rising or falling
- Optional with RS485-interface (for master-slave-mode) and for visualization using a computer (additional software required)
- 2 switching outputs with adjustable switching points
- Teach-in
- Adjustable averaging
- Numerous additional functions



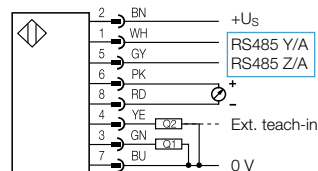
Analog output BOD 26K-LB(R)05...



Connector diagram



Wiring diagram



Only the variant
BOD 26K-LBR...



Recommended accessories:
(please order separately)

Description	Ordering code
Mounting bracket	BAM00TK



Special accessories for photoelectric sensors, such as **reflectors, apertures, lenses, filters and deflection heads** can be found in our **Object Detection** catalog.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories catalog**.



Suitable connectors:
(please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M12, 8-pin	Straight	PVC	Gray	5 m	BCC0995
M12, 8-pin	Angled	PVC	Gray	5 m	BCC0998

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.



Photoelectric Distance Sensors

Distance sensors BOD 26K-LB Laser



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

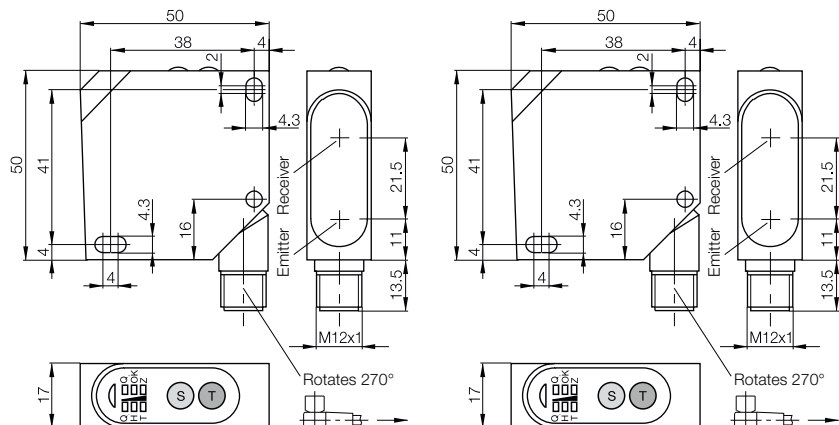
Block Designs

Accessories for Photoelectric Sensors



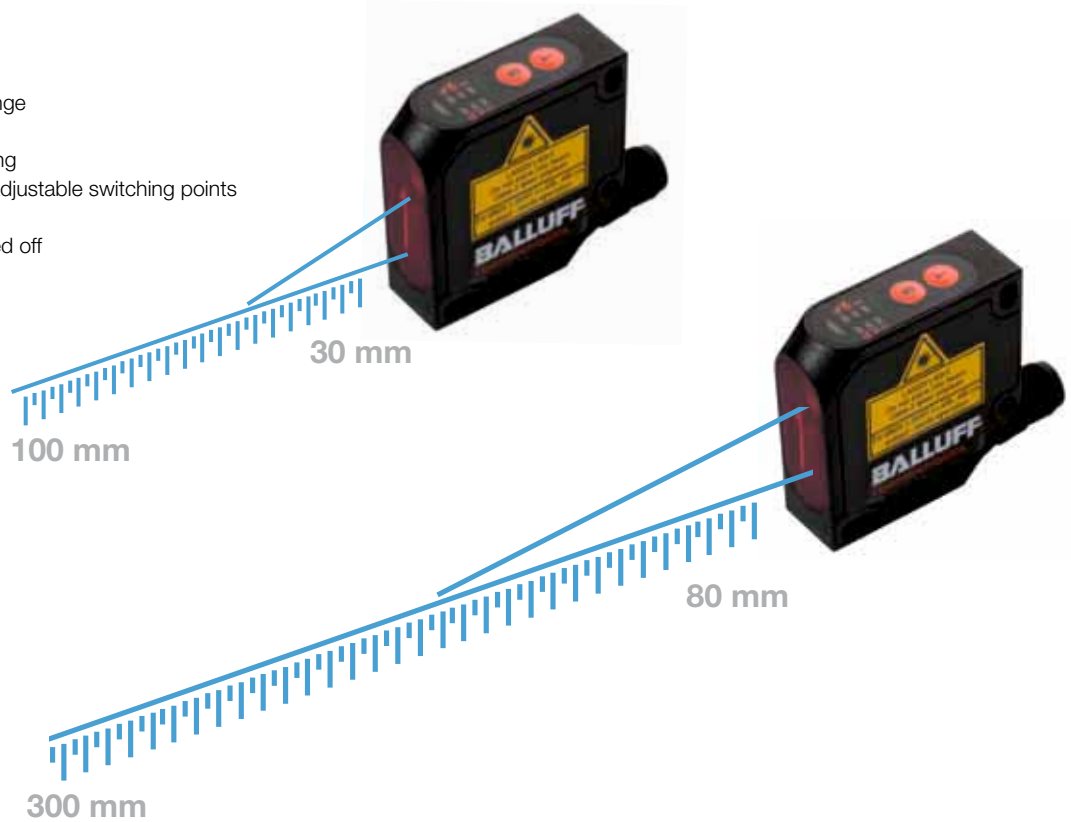
Series	BOD 26K	BOD 26K
Working range	80...300 mm	80...300 mm
Measuring range	adjustable max. 220 mm	adjustable max. 220 mm
2x PNP NO/NC	Ordering code BOD0006	Ordering code BOD000E
	Part number BOD 26K-LB05-S115-C	Part number BOD 26K-LBR05-S115-C
Supply voltage U _S	18...30 V DC	18...30 V DC
Analog output	4...20 mA	4...20 mA
No-load supply current I ₀ max.	≤ 40 mA	≤ 40 mA
Output current	100 mA	100 mA
Switching type	Light/dark switching	Light/dark switching
Interface		RS485
Polarity reversal/short-circuit protected	Yes/Yes	Yes/Yes
Settings	Teach-in	Teach-in
Additional function		Master-slave mode
Emitter, light type	Laser, red light	Laser, red light
Wavelength	650 Nm	650 Nm
Laser class	2	2
Light spot diameter	2 mm × 4.5 mm at 300 mm	2 mm × 4.5 mm at 300 mm
Resolution	< 0.1 % of Wh	< 0.1 % of Wh
Linearity	< 0.25 % of Wh	< 0.25 % of Wh
Power-on indicator	Green LED	Green LED
Output function indicator	Yellow LED	Yellow LED
Switching frequency	1 kHz	1 kHz
Time function	50 ms pulse extension	50 ms pulse extension
Degree of protection as per IEC 60529	IP 67	IP 67
Ambient temperature T _a	-10...+60 °C	-10...+60 °C
Permissible ambient light	5000 Lux	5000 Lux
Material	Housing: Impact-resistant ABS Optical surface: PMMA	Impact-resistant ABS PMMA
Connection	M12 connector, 8-pin	M12 connector, 8-pin

Measured values referenced to Kodak gray card 90% reflective.



Features

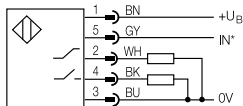
- Adjustable measuring range
- Analog output 4...20 mA
Adjustable: Rising or falling
- 1 switching output with adjustable switching points
- Teach-in
- Laser beam can be turned off



Connector diagram

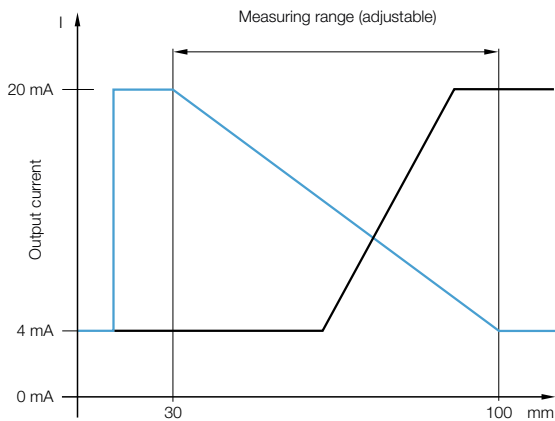


Wiring diagram

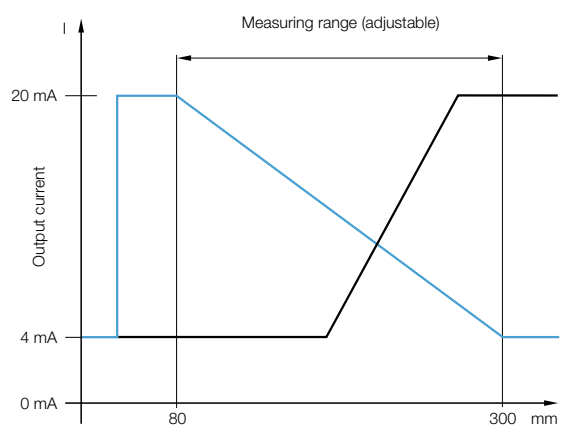


*Laser shut-off (+U_B)
Key disable (0 V)

Analog output BOD 26K-LB06...



Analog output BOD 26K-LB07...



Recommended accessories:
(please order separately)

Description	Ordering code
Mounting bracket	BAM00TK



Suitable connectors:
(please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M12, 5-pin	Straight	PUR	Black	5 m	BCC098C
M12, 5-pin	Angled	PUR	Black	5 m	BCC08FC

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More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories** catalog.

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity** catalog.



Photoelectric Distance Sensors

Distance sensors BOD 26K-LB Laser



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

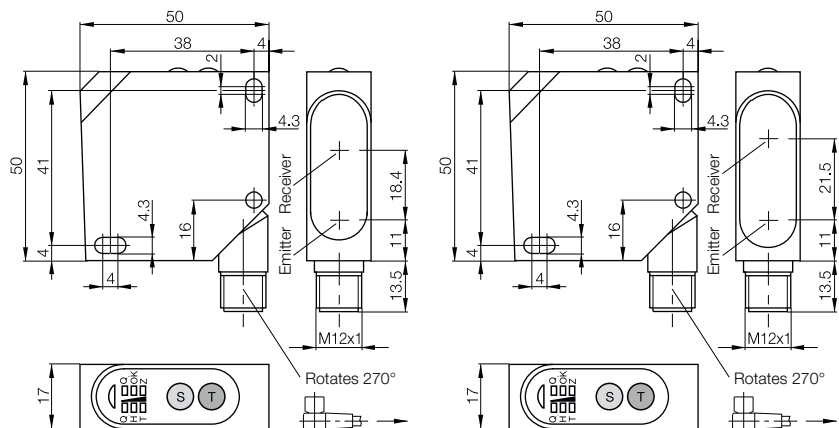
Block Designs

Accessories for Photoelectric Sensors



Series	BOD 26K		BOD 26K	
Working range	30...100 mm		80...300 mm	
Measuring range	adjustable max. 70 mm		adjustable max. 220 mm	
PNP NO/NC	Ordering code		Ordering code	
	BOD0007		BOD0008	
	Part number		Part number	
	BOD 26K-LB06-S92-C		BOD 26K-LB07-S92-C	
Supply voltage U_S	18...30 V DC		18...30 V DC	
Analog output	4...20 mA		4...20 mA	
No-load supply current I_0 max.	≤ 40 mA		≤ 40 mA	
Output current	100 mA		100 mA	
Switching type	Light/dark switching		Light/dark switching	
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes	
Settings	Teach-in		Teach-in	
Emitter, light type	Laser, red light		Laser, red light	
Wavelength	650 Nm		650 Nm	
Laser class	2		2	
Light spot diameter	1.5 mm × 3.25 mm at 100 mm		2 mm × 4.5 mm at 300 mm	
Resolution	< 0.1 % of (Wh-Wl)		< 0.1 % of (Wh-Wl)	
Linearity	< 0.25 % of (Wh-Wl)		< 0.25 % of (Wh-Wl)	
Power-on indicator	Green LED		Green LED	
Output function indicator	Yellow LED		Yellow LED	
Switching frequency	1 kHz		1 kHz	
Time function	50 ms pulse extension		50 ms pulse extension	
Degree of protection as per IEC 60529	IP 67		IP 67	
Ambient temperature T_a	-10...+60 °C		-10...+60 °C	
Permissible ambient light	5000 Lux		5000 Lux	
Material	Housing	Impact-resistant ABS	Housing	Impact-resistant ABS
	Optical surface	PMMA	Optical surface	PMMA
Connection	M12 connector, 5-pin		M12 connector, 8-pin	

Measured values referenced to Kodak gray card 90% reflective.



Photoelectric Distance Sensors

Distance sensors BOD 63M Laser



Laser class

The emitter meets Laser Class 1 per EN 60825-1:2001-11. This means no additional safety measures are necessary. Install the device so that the laser warning label is easily visible.



The **BOD 63M** in a robust metal housing has a working range of 200...2000/6000 mm. It has adjustable background suppression and an analog output with 0...10 V or 4...20 mA. Speed of light measurement enables longer ranges than using triangulation or energetic light scanners.


The switching outputs are set using a multi-turn-potentiometer. This innovative sensor technology is used in applications where traditional methods meet either technological or economical limits. Such applications include detecting small objects at large distances and operating in difficult conditions, such as if sensing must be performed "outside" of processes with high temperatures or in robotic cells.

Features

- Small laser spot for detecting small objects over large distances
- Virtually independent of the reflective properties of the target object within a specific sensing distance
- Background suppression across the entire working range
- Analog, switching and alarm output
- Laser beam can be turned off

Applications


- Exact detection tasks over long distances (e.g. due to design limitations or heat at the target location)
- Detecting objects with changing colors, shiny surfaces or unfavorable angles to the light beam
- Flexible solutions for position detection, level measurement and monitoring, distance and height measurement, quality assurance applications

 **Recommended accessories:**
(please order separately)

Description	Ordering code
Mounting bracket	BAM00P6



More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories catalog**.

 **Suitable connectors:**
(please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M12, 8-pin	Straight	PVC	Gray	5 m	BCC0995
M12, 8-pin	Angled	PVC	Gray	5 m	BCC0998

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.



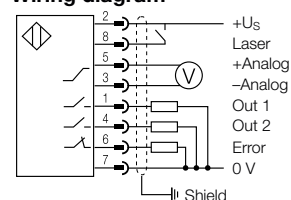
Series	
Working range	
Measuring range	
2x PNP NO	Ordering code
	Part number
Supply voltage U_S	
Analog output	
No-load supply current I_0 max.	
Switching type	
Switching points	
Polarity reversal/short-circuit protected	
Settings	
Emitter, light type	
Wavelength	
Laser class	
Light spot diameter	
Resolution	
Gray value shift	
Repeat accuracy per BWN	
Temperature drift	
Output curve deviation	
Switching hysteresis	
On/off delay	
Stand-by delay	
Switching frequency	
Power-on indicator	
Switching output	
Stability indicator	
Response time	
Degree of protection as per IEC 60529	
Ambient temperature T_a	
Permissible ambient light	
Material	Housing
	Optical surface
Connection	
IO-Link	
Mode	
Transfer rate	
Value range analog	
Diagnostics	
Parameters	

Measured values referenced to Kodak gray card 90% reflective.



→ Connector orientation

Wiring diagram





Photoelectric Distance Sensors

Distance sensors BOD 63M Laser



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

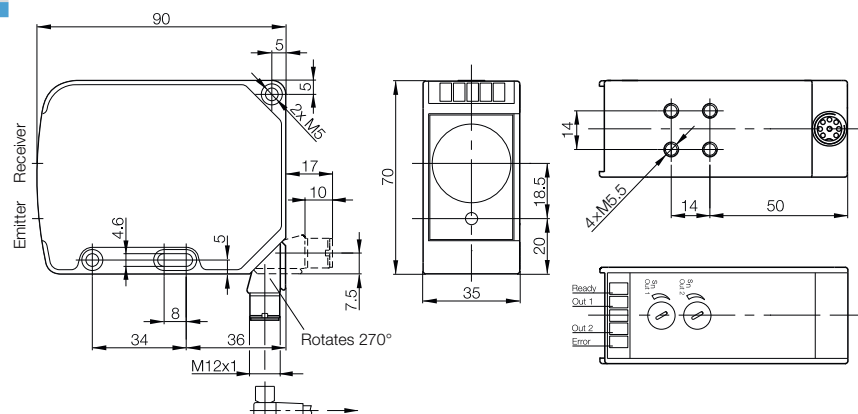
Block Designs

Accessories for Photoelectric Sensors

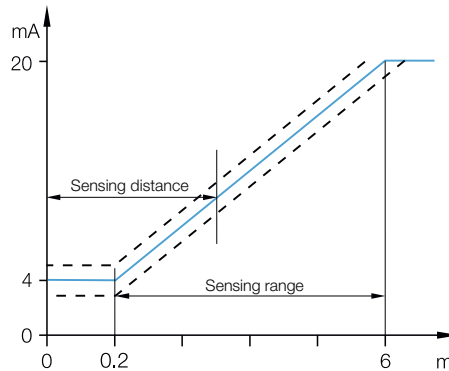
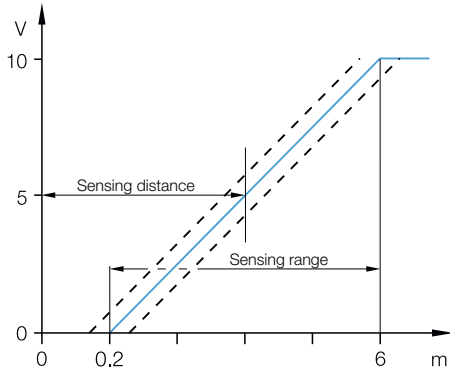


BOD 63M 200...6000 mm 5800 mm BOD0012	BOD 63M 200...2000 mm 1800 mm BOD000U	BOD 63M 200...2000 mm BOD0010
BOD 63M-LI06-S4	BOD 63M-LA02-S115	BOD 63M-LB02-S115
18...30 V DC	15...30 V DC	15...30 V DC
90 mA	0...10 V ≤ 75 mA	4...20 mA ≤ 75 mA
Light switching	Light switching	Light switching
2		
Yes/Yes	Yes/Yes	Yes/Yes
Teach-in	Potentiometer, 4 revolutions	Potentiometer, 4 revolutions
Laser, red light	Laser, red light	Laser, red light
660 Nm	660 Nm	660 Nm
2 per EN 60825	2 per EN 60825	2 per EN 60825
5 mm at 3 m, 10 mm at 6 m	9 mm at 2000 mm	9 mm at 2000 mm
1 mm	≤ 1 mm	≤ 1 mm
≤ 1.5%	≤ 2 %	≤ 2 %
≤ ±4 mm	≤ ±3 mm	≤ ±3 mm
≤ 1.5 mm/K	≤ 0.6 mm/K	≤ 0.6 mm/K
≤ ±1 % of Wh	≤ ±2 % of Wh	≤ ±2 % of Wh
≤ 15 mm	≤ 10 mm	≤ 10 mm
≤ 3.3 ms		
≤ 20 ms	≤ 20 ms	≤ 20 ms
150 Hz	250 Hz	250 Hz
Green LED	Green LED	Green LED
Yellow LED	2× yellow LED	2× yellow LED
Red LED	Red LED	Red LED
	≤ 2 ms	≤ 2 ms
IP 67	IP 67	IP 67
-10...+60 °C	-10...+60 °C	-10...+60 °C
≤ 10 klx	≤ 10 klx	≤ 10 klx
Anodized aluminum	Anodized aluminum	Anodized aluminum
Glass	Glass	Glass
M12 connector, 4-pin	M12 connector, 8-pin	M12 connector, 8-pin

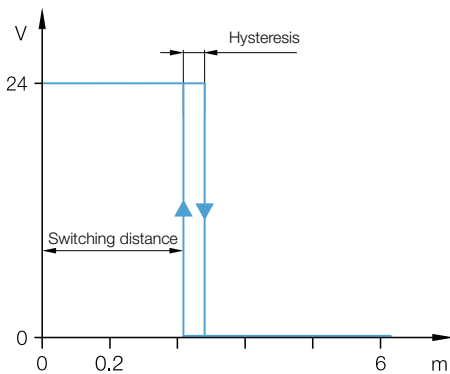
COM 2
38.4 kbaud
00C8 H...1770 H for W ₁ ...W _n
Stability indicator
Switching points, laser on/off, button disable



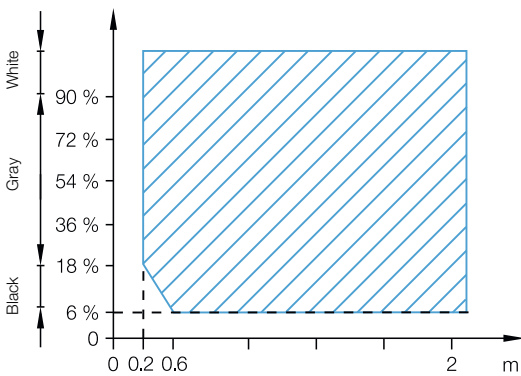
Analog output



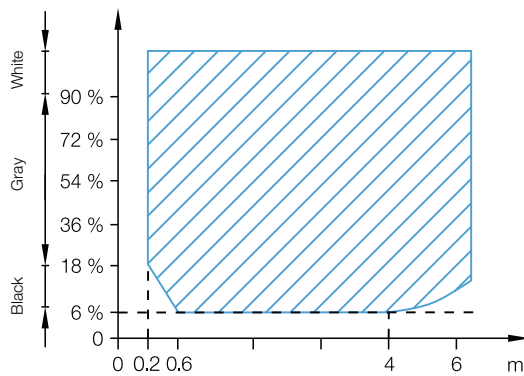
Switching output



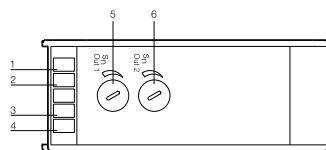
**Measuring range BOD 63M-LA/LB02...
depending on object reflection**



**Measuring range BOD 63M-LA/LB04...
depending on object reflection**

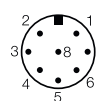


Indicators and operating elements



- 1 Supply voltage (green)
- 2 Switching output Out 1 (yellow)
- 3 Switching output Out 2 (yellow)
- 4 Stability indicator (red)
- 5 Potentiometer Out 1, 4 revolutions
- 6 Potentiometer Out 2, 4 revolutions

Connector diagram



Pin-assignment	Cable color	
1	White	Out 1
2	Brown	+U _S
3	Green	-Analog output
4	Yellow	Out 2
5	Gray	+Analog output
6	pink	Stability indicator
7	Blue	0 V
8	Red	Laser shut-off
Knurled nut	Braided shield	Shield

Distance measurements with high resolution are achieved using triangulation and modern CCD technology.

The **BOD 66M-R_01** with analog voltage- or current output and an additional switching output can measure or monitor distance and, at the same time, operate as a light sensor with background suppression for object detection.

The BOD 66M-R_01 uses red light over a measuring range of 100...600 mm at a resolution of 0.5 mm.

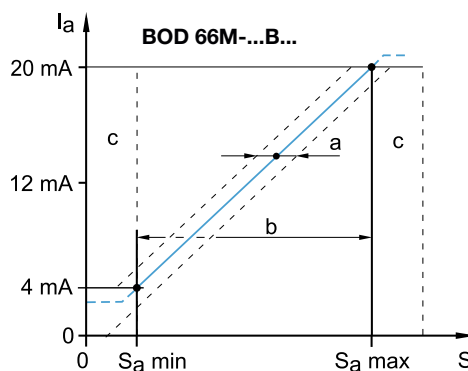
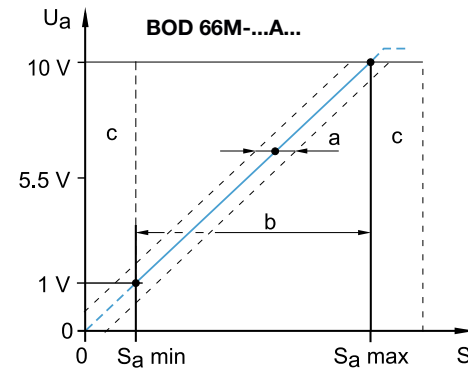
Features

- Extremely color and ambient light insensitive
- Working range 100...600 mm
- Resolution 0.1...0.5 mm
- Analog output with voltage (1...10 V) or current (4...20 mA)
- Robust metal housing with display and keyboard
- Scratch-resistant glass optics
- Inverted characteristic
- Extensive configuration using OLED display and membrane keyboard

Applications

- Fill-level monitoring
- Positioning tasks
- Winding diameter detection
- Profile measurement
- Sag control

Analog output BOD 66M-R...

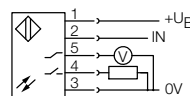


a = Linearity
 b = Working range of analog output
 c = Non-defined range

Connector diagram



Wiring diagram



Recommended accessories:
 (please order separately)

Description	Ordering code
Mounting bracket	BAM00P9

Suitable connectors:
 (please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M12, 5-pin	Straight	PUR	Black	5 m	BCC098C
M12, 5-pin	Angled	PUR	Black	5 m	BCC08FC

Special accessories for photoelectric sensors, such as **reflectors, apertures, lenses, filters and deflection heads** can be found in our **Object Detection** catalog.

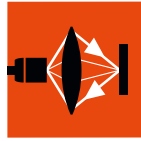
More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories catalog**.

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.

Photoelectric Distance Sensors

Distance sensors BOD 66M-R



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

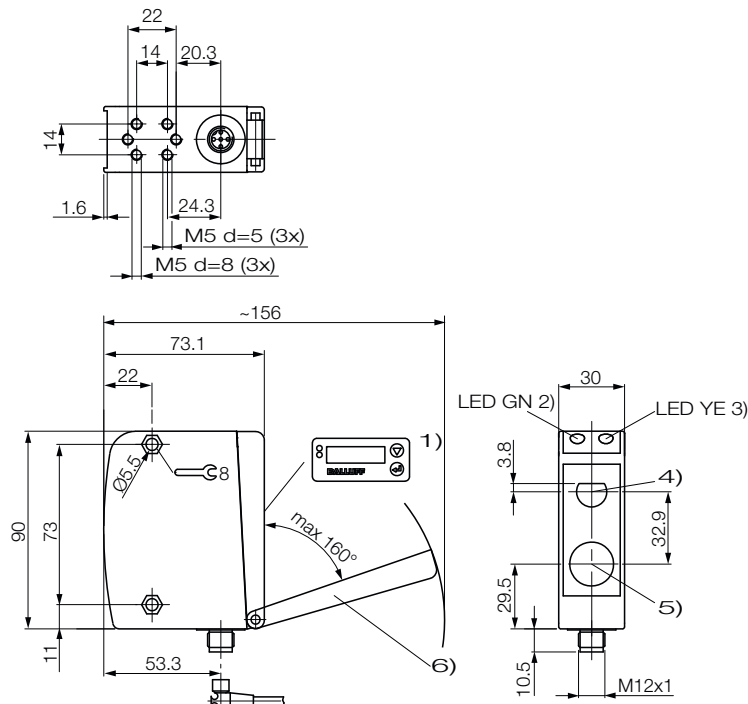
Block Designs

Accessories for Photoelectric Sensors



Series	BOD 66M		BOD 66M	
Working range	100...600 mm		100...600 mm	
Measuring range	500 mm, adjustable		500 mm, adjustable	
PNP/NPN	Ordering code	BOD001H	BOD001C	
NO/NC	Part number	BOD 66M-RA11-S92	BOD 66M-RB11-S92	
Supply voltage U_S	18...30 V DC		18...30 V DC	
Analog output	1...10 V		4...20 mA	
No-load supply current I_0 max.	150 mA		150 mA	
Switching type	NO/NC		NO/NC	
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes	
Settings	Display/keyboard		Display/keyboard	
Emitter, light type	LED, red light		LED, red light	
Wavelength	655 Nm		655 Nm	
Laser class	2		2	
Light spot diameter	Ø 15 mm at 600 nm		Ø 15 mm at 600 nm	
Resolution	100...500 µm		100...500 µm	
Reproducibility max.	±0.5% of Wh		±0.5% of Wh	
Output curve deviation	±1.5% of W		±1.5% of W	
Temperature drift	0.04 %/°K (% of W)		0.04 %/°K (% of W)	
Power-on indicator	LED		LED	
Output function indicator	LED		LED	
Response time max.	15 ms		15 ms	
Switching frequency	200...1000 Hz		200...1000 Hz	
Degree of protection as per IEC 60529	IP 65		IP 65	
Ambient temperature T_a	-20...+50 °C		-20...+50 °C	
Permissible ambient light	5000 Lux		5000 Lux	
Material	Housing	GD-Zn	GD-Zn	
	Optical surface	Glass	Glass	
Connection	Connector, M12x1-S92		Connector, M12x1-S92	

→ Connector orientation



Photoelectric Distance Sensors

Distance sensors BOD 66M-L Laser

The **BOD 66M-L_04** features an analog as well as an additional switching output. It measures the object position across a range from 150...2000 mm. In addition, it allows the switching output (background suppression) to be configured in the same range using teach-in. Forward-looking laser- and CCD-technology ensure accuracy and reliability.

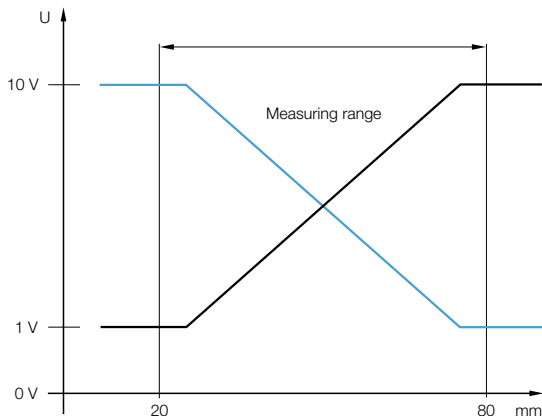
Features

- Expansion of the measuring ranges: 150...800 mm and 150...2000 mm
- Small light spot over the entire range
- Extremely color and ambient light insensitive
- Teachable analog and switching outputs
- Optimized resolution
- Configuration using display and membrane keyboard
- Rugged metal housing
- Optimized switching frequency distance, suitable for highly dynamic applications

Applications

- Background suppression up to 2 m
- Analog measuring at up to 2 m target distance
- Positioning tasks

Analog output BOD 66M-L...



Laser class

The emitter meets Laser Protection Class 2 per EN 60825-1:2001-11. This means no additional safety measures are necessary. Install the device so that the laser warning label is easily visible.

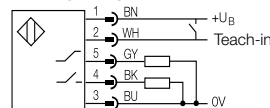


Series	
Working range	
Measuring range	
PNP/NPN	Ordering code
NO/NC	Part number
Supply voltage U_S	
Analog output	
No-load supply current I_0 max.	
Switching type	
Polarity reversal/short-circuit protected	
Settings	
Emitter, light type	
Wavelength	
Laser class	
Light spot diameter	
Resolution	
Reproducibility max.	
Characteristic deviation max.	
Temperature drift	
Absolute measuring accuracy	
Power-on indicator	
Output function indicator	
Response time	
Switching frequency	
Degree of protection as per IEC 60529	
Ambient temperature T_a	
Permissible ambient light	
Material	Housing
	Optical surface
Connection	

Connector diagram



Wiring diagram



Recommended accessories:
(please order separately)

Description	Ordering code
Mounting bracket	BAM00P9

Suitable connectors:
(please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M12, 5-pin	Straight	PUR	Black	5 m	BCC098C
M12, 5-pin	Angled	PUR	Black	5 m	BCC08FC

Special accessories for photoelectric sensors, such as **reflectors, apertures, lenses, filters and deflection heads** can be found in our **Object Detection** catalog.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories catalog**.

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.



Photoelectric Distance Sensors

Distance sensors BOD 66M-L Laser



Photoelectric Sensors

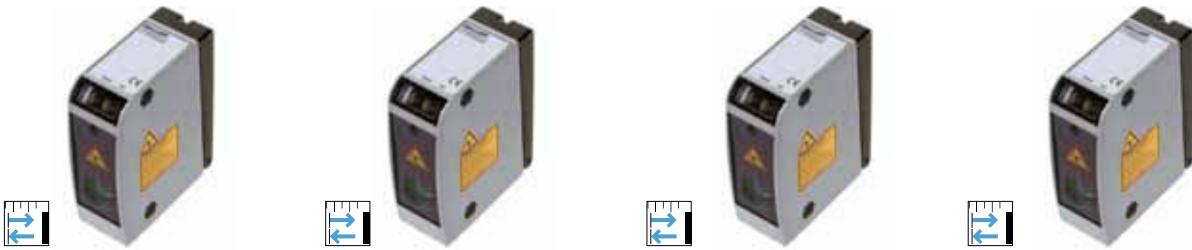
Photoelectric Sensors

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

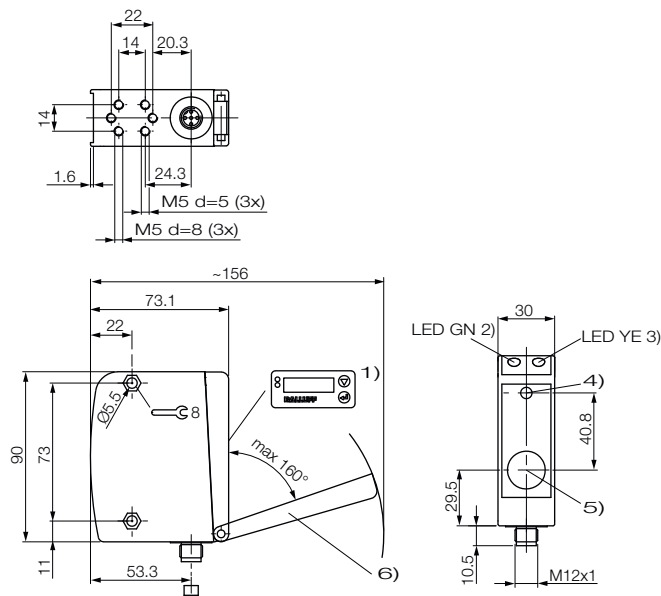
Block Designs

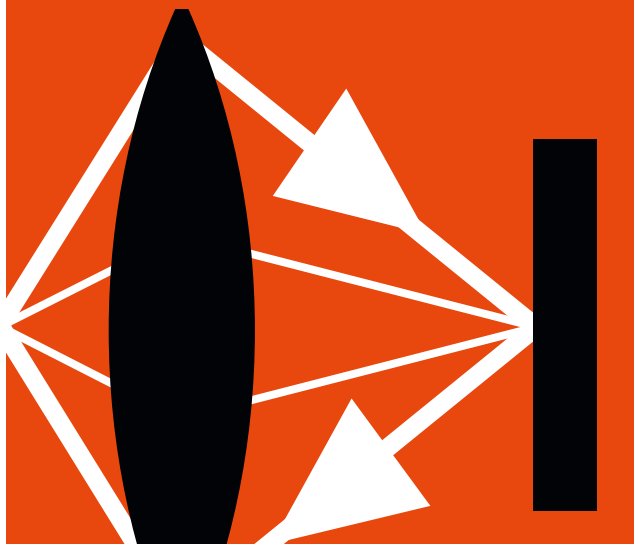
Accessories for Photoelectric Sensors



BOD 66M 150...800 mm 650 mm, adjustable BOD001J	BOD 66M 150...800 mm 650 mm, adjustable BOD001K	BOD 66M 150...2000 mm 1850 mm, adjustable BOD001E	BOD 66M 150...2000 mm 1850 mm, adjustable BOD001F
BOD 66M-LA12-S92	BOD 66M-LB12-S92	BOD 66M-LA14-S92	BOD 66M-LB14-S92
18...30 V DC	18...30 V DC	18...30 V DC	18...30 V DC
1...10 V	4...20 mA	1...10 V	4...20 mA
150 mA	150 mA	150 mA	150 mA
NO/NC	NO/NC	NO/NC	NO/NC
Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
Display/keyboard	Display/keyboard	Display/keyboard	Display/keyboard
Laser, red light	Laser, red light	Laser, red light	Laser, red light
655 Nm	655 Nm	655 Nm	655 Nm
2	2	2	2
Ø 1 mm at 800 mm	Ø 1 mm at 800 mm	2 mm × 6 mm at 2000 mm	2 mm × 6 mm at 2000 mm
100...800 µm	100...800 µm	1...3 mm	1...3 mm
±0.5 % of Wh	±0.5 % of Wh	±0.5 % of Wh	±0.5 % of Wh
±1.5 % of W	±1.5 % of W	±1.5 % of W	±1.5 % of W
0.04 %/K (% of W)	0.04 %/K (% of W)	0.04 %/K (% of W)	0.04 %/K (% of W)
±2% (at the measuring distance)	±2% (at the measuring distance)	±2% (at the measuring distance)	±2% (at the measuring distance)
LED	LED	LED	LED
LED	LED	LED	LED
15 ms	15 ms	15 ms	15 ms
200...1000 Hz	200...1000 Hz	200...1000 Hz	200...1000 Hz
IP 65	IP 65	IP 65	IP 65
-20...+50 °C	-20...+50 °C	-20...+50 °C	-20...+50 °C
5000 Lux	5000 Lux	5000 Lux	5000 Lux
GD-Zn	GD-Zn	GD-Zn	GD-Zn
Glass	Glass	Glass	Glass
Connector, M12×1-S92	Connector, M12×1-S92	Connector, M12×1-S92	Connector, M12×1-S92

→ Connector orientation

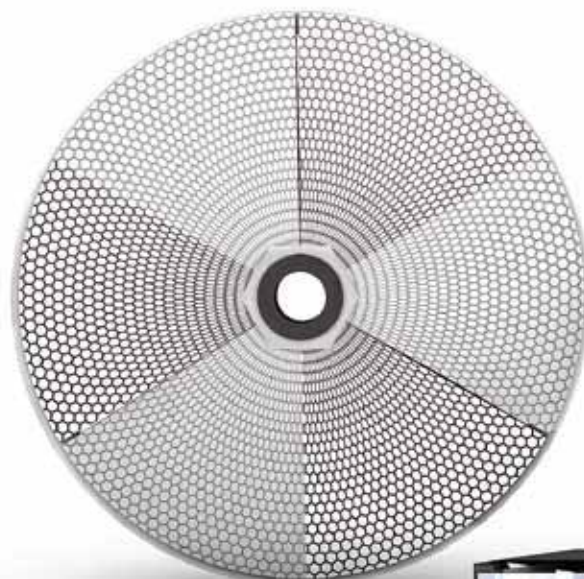




Photoelectric Sensors

Accessories for photoelectric sensors

Complete optical accessories – from mounting brackets, reflectors, lenses and holding systems etc. for standard applications and applications under more difficult ambient conditions.





Reflectors

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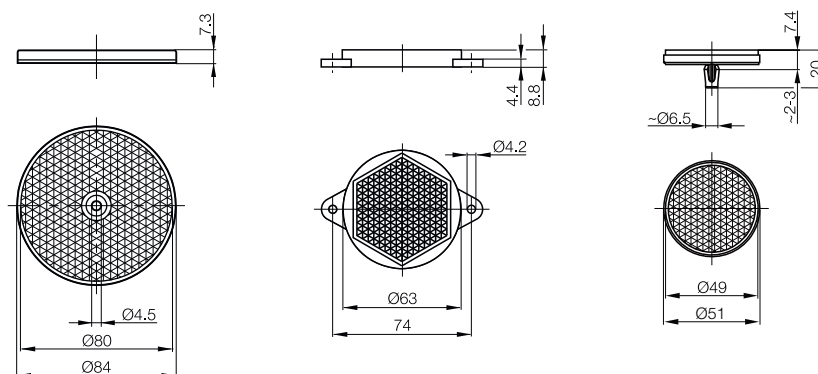
Basic information and definitions can be found on [page 934](#).

Accessories for Photoelectric Sensors

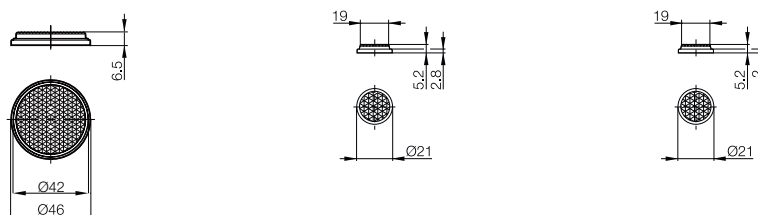
Round reflectors



Size	Reflector Ø 84 mm	Reflector Ø 62 mm	Reflector Ø 51 mm
Fasteners	M4 screw	Two M4 screws	Rivet with mounting tabs
Ordering code	BAM00UK	BAM0126	BAM00UP
Part number	BOS R-1	BOS R-10	BOS R-14
Material	PMMA/ABS	PMMA/ABS	PC
Triple size	4 mm	4 mm	4 mm
Mounting accessories	BOS 21-AD-1		
Special features			More chemical resistant
Temperature range	-20...+60 °C	-20...+60 °C	0...+100 °C



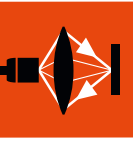
Size	Reflector Ø 46 mm	Reflector Ø 21 mm	Reflector Ø 21 mm
Fasteners	Glue	Glue	Glue
Ordering code	BAM00UW	BAM00W4	BAM00UR
Part number	BOS R-2	BOS R-3	BOS R-15
Material	PMMA/ABS	PMMA/ABS	PC
Triple size	2.5 mm	2 mm	2 mm
Special features			More chemical resistant
Temperature range	-20...+60 °C	-20...+60 °C	-20...+99 °C





Accessories for Photoelectric Sensors

Block-shaped reflectors



Photoelectric Sensors

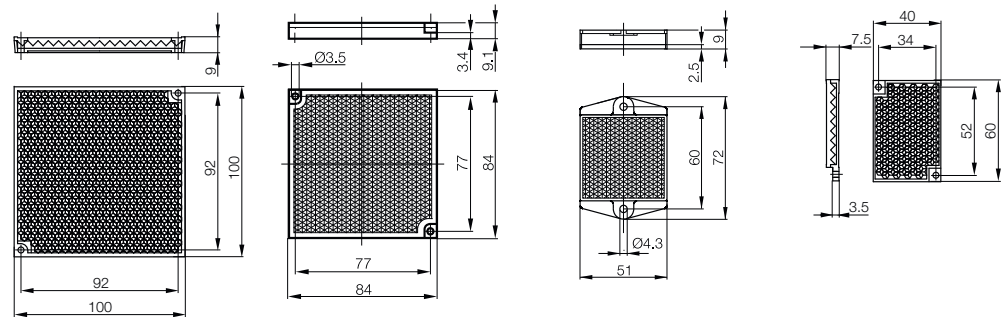
Photoelectric Sensors

Photoelectric Sensors with Special Properties

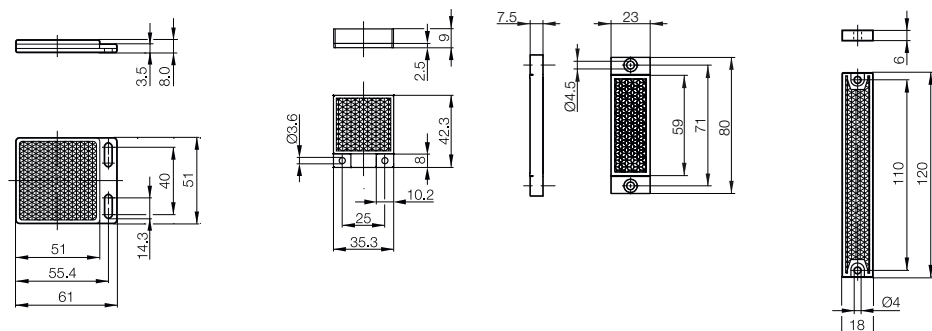
Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors
Reflectors
 Sensor Accessories
 Fasteners

Size	Reflector 100×100 mm	Reflector 84×84 mm	Reflector 51×72 mm	Reflector 60×40 mm
Fasteners	Two M3 screws	Two M3 screws	Two M4 screws	Two M3 screws
Ordering code	BAM01JN	BAM00UL	BAM00UZ	BAM01JP
Part number	BOS R-47	BOS R-11	BOS R-25	BOS R-46
Material	PMMA/ABS	PMMA/ABS	PMMA	PMMA/ABS
Triple size	4 mm	4 mm	4 mm	4 mm
Temperature range	-20...+60 °C	-20...+60 °C	0...+50 °C	-20...+60 °C



Size	Reflector 51×61 mm	Reflector 35×42 mm	Reflector 23×80 mm	Reflector 18×120 mm
Fasteners	Two M4 screws	Two M3 screws	Two M4 screws	Two M4 screws
Ordering code	BAM00WL	BAM00W0	BAM01LA	BAM00WA
Part number	BOS R-9	BOS R-26	BOS R-48	BOS R-5
Material	PMMA/ABS	PMMA	PMMA/ABS	PMMA/ABS
Triple size	4 mm	4 mm	4 mm	4 mm
Mounting accessories		BOS 5-HW-5		
Temperature range	-20...+60 °C	0...+50 °C	-20...+60 °C	-20...+60 °C

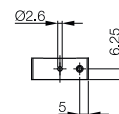
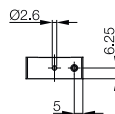
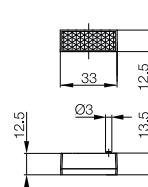
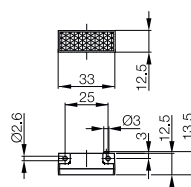
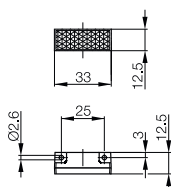


Accessories for Photoelectric Sensors

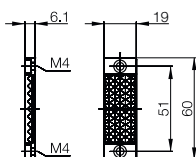
Block-shaped reflectors

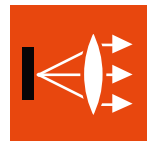


Size	Reflector 33×12 mm	Reflector 33×12 mm	Reflector 33×12 mm
Fasteners	Side screws	Rear and side screws	Rear screws
Ordering code	BAM00W3	BAM00W1	BAM00W2
Part number	BOS R-29	BOS R-27	BOS R-28
Material	PMMA	PMMA	PMMA
Triple size	2.3 mm	2.3 mm	2.3 mm
Mounting accessories	BOS 5-HW-1/2	BOS 5-HW-1/2	
Temperature range	0...+50 °C	0...+50 °C	0...+50 °C



Size	Reflector 18×60 mm		
Fasteners	Two M4 screws		
Ordering code	BAM00W7		
Part number	BOS R-33		
Material	PMMA/ABS		
Triple size	4 mm		
Temperature range	-20...+60 °C		





Photoelectric Sensors

Photoelectric Sensors

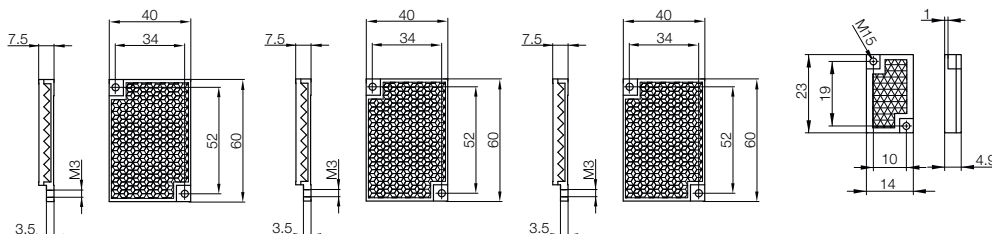
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

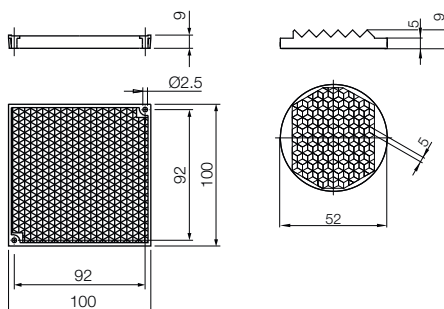
Accessories for Photoelectric Sensors

Reflectors
Sensor Accessories
Fasteners

Size	Reflector 60×40 mm	Reflector 60×40 mm	Reflector 60×40 mm	Reflector 14×23 mm
Fasteners	Two M3 screws	Two M3 screws	Two M3 screws	Two M1.5 screws
Ordering code	BAM00W8	BAM01CM	BAM01HE	BAM01NH
Part number	BOS R-34	BOS R-36	BOS R-44	BOS R-49
Material	Hot thermoplastic	PMMA/ABS	Solidchem	Hot thermoplastic
Triple size	4 mm	4 mm	4 mm	0.9 mm
Special features	Heat-resistant	Anti-fogging	Chemical-resistant	Heat-resistant; For laser applications
Temperature range	-20...+150 °C	-20...+60 °C	-20...+140 °C	-20...+110 °C



Size	Cubic corner 100×100 mm	Reflector Ø 52 mm		
Fasteners	Screw M3	Clamps		
Ordering code	BAM01CN	BAM01H6		
Part number	BOS R-37	BOS R-31		
Material	PC	Borosilicate		
Triple size	4 mm	4 mm		
Special features		Glass reflector		
Temperature range	-20...+100 °C	-20...+500 °C		

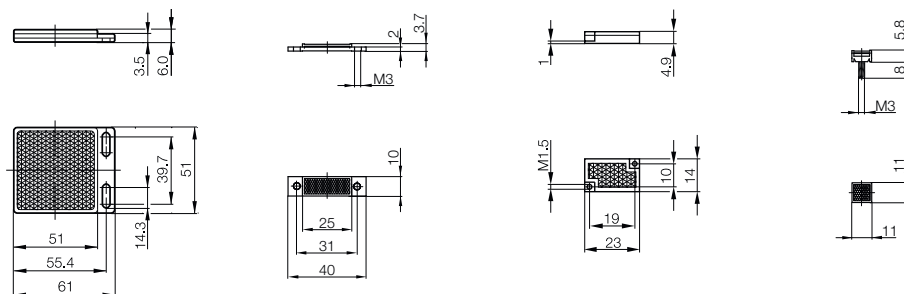


Accessories for Photoelectric Sensors

Reflectors for laser retroreflective light sensors



Size	Reflector 51×62 mm	Reflector 40×10 mm	Reflector 14×23 mm	Reflector 11×11 mm	
Fasteners	Two M4 screws	Two M3 screws	Two M1.5 screws	M3 screw	
Ordering code	BAM00UY	BAM01H9	BAM00UM	BAM01H8	
Part number	BOS R-22	BOS R-41	BOS R-12	BOS R-39	
Material	PMMA/ABS	PMMA/ABS	PMMA/ABS	PMMA/ABS	
Triple size	1.2 mm	1.2 mm	0.9 mm	0.9 mm	
Mounting accessories	BOS 5-HW-6				
Temperature range	-20...+60 °C	-20...+60 °C	-20...+60 °C	-20...+60 °C	





Accessories for Photoelectric Sensors

Reflectors for laser retroreflective light sensors



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

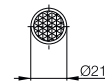
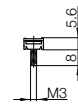
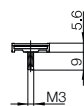
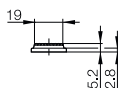
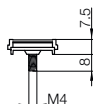
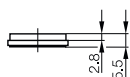
Accessories for Photoelectric Sensors

Reflectors

Sensor Accessories Fasteners



	Reflector Ø 25 mm	Reflector Ø 25 mm	Reflector Ø 21 mm	Reflector Ø 19 mm	Reflector Ø 10 mm
	Glue	M4 screw	Glue	M3 screw	M3 screw
	BAM00UN	BAM01HC	BAM00UT	BAM01HA	BAM01H7
	BOS R-13	BOS R-43	BOS R-16	BOS R-42	BOS R-38
	PMMA/ABS	PMMA/ABS	PMMA/ABS	PMMA/ABS	PMMA/ABS
	1.2 mm	1.2 mm	1.2 mm	0.9 mm	0.9 mm
	-20...+60 °C	-20...+60 °C	-20...+60 °C	-20...+60 °C	-20...+60 °C

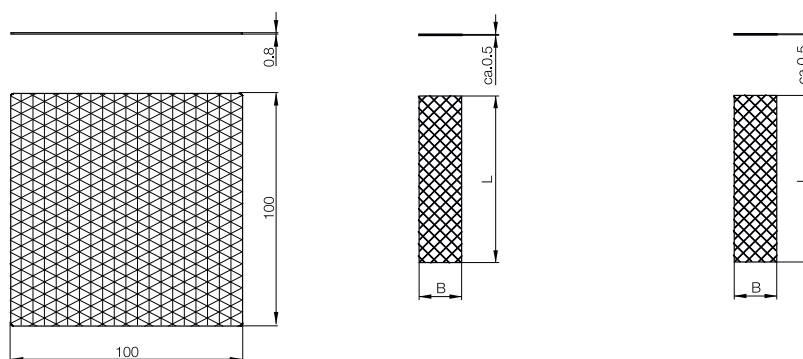


Accessories for Photoelectric Sensors

Reflective foils



Description	Reflective foils (standard)	Reflective foils (standard)	Reflective foils (standard) (not for polarized light)
Fasteners	Self-adhesive	Self-adhesive	Self-adhesive
50 mm × 45 m	Ordering code Part number		BAM00WE BOS R-6-45
50 mm × 22 m	Ordering code Part number	BAM00WH BOS R-7-22	
25 mm × 22 m	Ordering code Part number	BAM00WK BOS R-8-22	
50 mm × 25 cm	Ordering code Part number	BAM00WF BOS R-7-0,25	BAM00WC BOS R-6-0,25
25 mm × 25 cm	Ordering code Part number	BAM00WJ BOS R-8-0,25	
300 × 200 mm	Ordering code Part number		
200 × 200 mm	Ordering code Part number		BAM00W9 BOS R-35
100 × 100 mm	Ordering code Part number	BAM01JM BOS R-50	
90 × 50 mm	Ordering code Part number	BAM00W6 BOS R-32-0,40	
100 × 50 mm	Ordering code Part number		
40 × 35 mm	Ordering code Part number		
Material	PMMA	PMMA	PMMA
Special features			Not for polarized light
Temperature range	-20...+60 °C	-20...+60 °C	-20...+60 °C



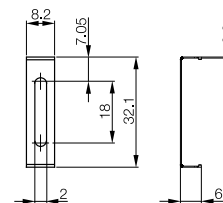
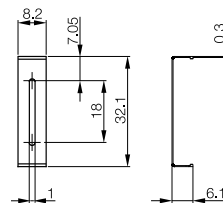
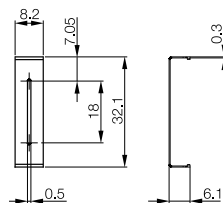
Accessories for Photoelectric Sensors

Slit apertures

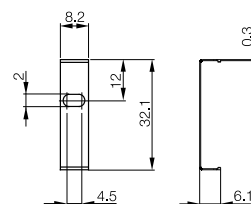
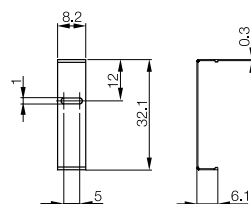
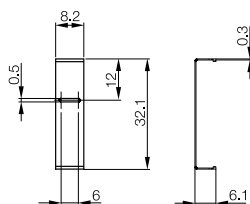


Description	Vertical slit aperture	Vertical slit aperture	Vertical slit aperture
Use	For BOS 5K through-beam sensors	For BOS 5K through-beam sensors	For BOS 5K through-beam sensors
Ordering code	BAM00TU	BAM00TW	BAM00TY
Part number	BOS 5-BL-1	BOS 5-BL-2	BOS 5-BL-3
Aperture size	0.5 mm, vertical	1 mm, vertical	2 mm, vertical
Range*	1.0 (2.5 m)	1.5 (3.5 m)	3.5 (6 m)
Min. object*	0.5 (7 mm)	1.0 (7 mm)	2.0 (7 mm)
Packaging unit	2 pcs.	2 pcs.	2 pcs.

*Values in brackets apply to slit apertures on one side



Description	Horizontal slit aperture	Horizontal slit aperture	Horizontal slit aperture
Use	For BOS 5K through-beam sensors	For BOS 5K through-beam sensors	For BOS 5K through-beam sensors
Ordering code	BAM00TZ	BAM00U0	BAM00U1
Part number	BOS 5-BL-4	BOS 5-BL-5	BOS 5-BL-6
Aperture size	0.5 mm horizontal	1 mm horizontal	2 mm horizontal
Range	0.7 (2 m)	1.5 (3 m)	3.0 (5.5 m)
Min. object	0.4 (7 mm)	0.7 (7 mm)	1.5 (7 mm)
Packaging unit	2 pcs.	2 pcs.	2 pcs.





Photoelectric Sensors

Photoelectric Sensors

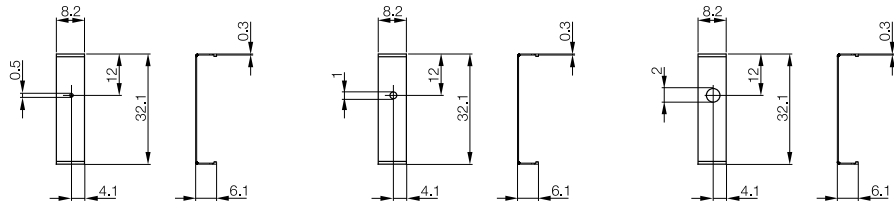
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors
Reflectors
Sensor Accessories
Fasteners



Description	Round aperture	Round aperture	Round aperture
Use	For BOS 5K through-beam sensors	For BOS 5K through-beam sensors	For BOS 5K through-beam sensors
Ordering code	BAM00U2	BAM00U3	BAM00U4
Part number	BOS 5-BL-7	BOS 5-BL-8	BOS 5-BL-9
Aperture size	0.5 mm Ø	1 mm Ø	2 mm Ø
Range	0.08 (0.8 m)	0.3 (1.5 m)	1.2 (2.5 m)
Min. object	0.3 (5 mm)	0.6 (5 mm)	1.5 (7 mm)
Packaging unit	2 pcs.	2 pcs.	2 pcs.

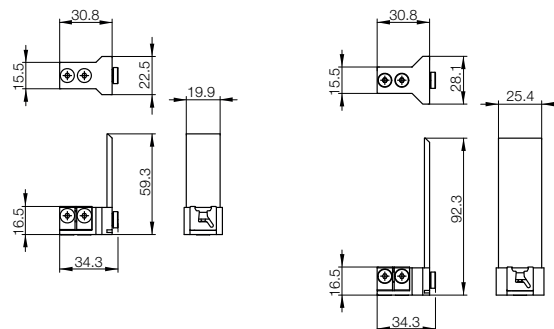


Sensor not included in the standard scope of delivery!



Sensor not included in the standard scope of delivery!

Description	Weld protection	Weld protection	
Use	For BOS 23K	For BOS 50K	
Ordering code	BAM01L8	BAM01U6	
Part number	BAM PC-XO-006-23K-1	BAM PC-XO-006-50K-1	



Spare glass panes for weld protection BAM01L8 and BAM01U6

Ordering code	BAM01YL	BAM01YM
Part number	BAM PC-XO-006-23K-G/RK	BAM PC-XO-006-50K-G/RK

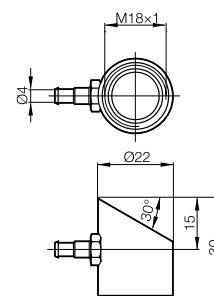
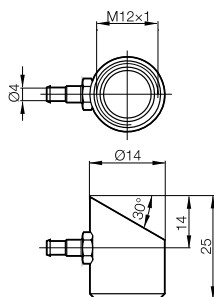
Accessories for Photoelectric Sensors

Air shield

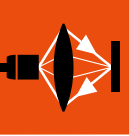


Description		Air shield	Air shield
Use		For BOS 12 and tube with 4 mm inner diameter	For BOS 18 and tube with 4 mm inner diameter
Focal length/focus			
Ordering code		BAM00PY	BAM00R9
Part number		BOS 12-LT-1	BOS 18-LT-1
Material	Lens	Glass	Glass
	Mount	Al	Al

The air shield with a compressed air source prevents premature contamination of the optics.



Description		Air blow
Type		For clamping cylinders
Use		For blowing clear sensors and reflectors (minimum pressure 8 bar)
Ordering code		BAM0041
Part number		BMS CZ-M-D12-I-001
Material		Anodized aluminum



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

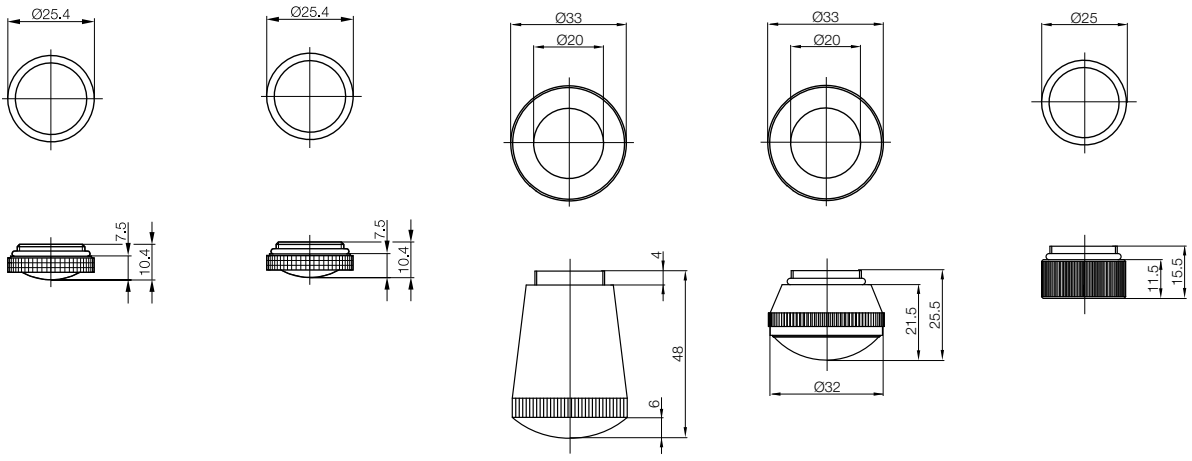
Reflectors

Sensor Accessories

Fasteners



	Lens	Lens	Lens	Lens	Intermediate ring
	For BKT 67 for increasing the sensing range (light spot 2x7 mm)	For BKT 67 standard lenses (light spot 1.5x4 mm)	For BKT 67 for increasing the sensing range (light spot 2x8 mm)	For BKT 67 for increasing the sensing range (light spot 2.5x11 mm)	Intermediate ring with lens for increased resolution for BKT 67 in combination with M-PK-2. It is screwed in between the sensor and the 9 mm lens.
	18 mm	9 mm	28 mm	50 mm	
	BAM0120	BAM0121	BAM0122	BAM00P3	BAM00P2
	BKT M-PK-1	BKT M-PK-2	BKT M-PK-3	BKT M-PK-5	BKT M-PK-4
	Glass	Glass	Glass	Glass	Glass
	Al	Al	Al	Al	Al

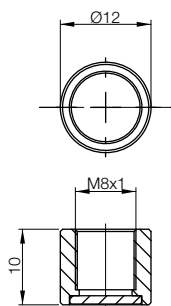


Accessories for Photoelectric Sensors

Protective nuts

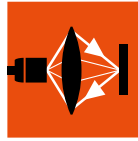


Description	M8 protective end cap		M12 protective end cap	
Use	For BOS 08		For BOS 12	
Ordering code	BAM01Y5		BAM01Y6	
Part number	BAM PC-X0-005-08M-4		BOS PC-X0-005-12M-4	
Material	Mount	Stainless steel	Stainless steel	
	Disk	Glass	Glass	



The protective end cap (cap nut) is made with tempered glass and can be used with all M12 photoelectric sensors.

The protective glass is used to protect the optics from mechanical or thermal damage, such as weld spatter.



Photoelectric Sensors

Photoelectric Sensors

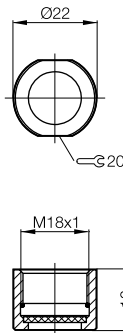
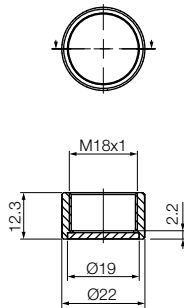
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors
 Reflectors
 Sensor Accessories
 Fasteners



M18 protective end cap	Cover nut	
For BOS 18 with flat front surface	For BOS 18	
BAM01NC	BAM00RL	
BAM PC-XO-005-18M-4	BOS 18-SM-1	
Stainless steel	POM	
Glass	Glass	



The protective cap can be used in combination with all BOS 18M and BOS 18K sensors. It protects the sensor optics from external effects, such as welding spatter. For increased protection, the BOS 18-SM-2 is made of metal, providing even better protection for the sensor optics. The heat-protecting glass closes off flush with the front surface of the cover nut. This prevents dust deposits from forming, which can impact the range.

A ring between the sensor and protective glass makes sure the system is sealed.

The protective end cap is made with tempered glass and can be used with all M18 photoelectric sensors.

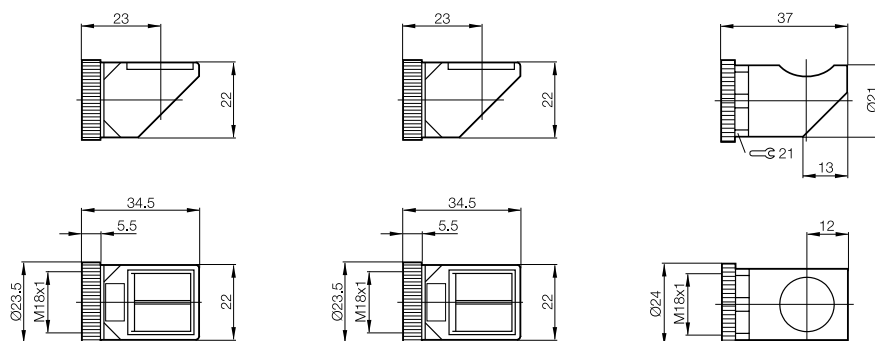
The protective glass is used to protect the optics from mechanical or thermal damage, such as weld spatter.

Accessories for Photoelectric Sensors

Deflection heads



Description	90° deflection head	90° deflection head	90° deflection head
Use	For diffuse, retroreflective and through-beam sensors BOS 18 (except laser)	For diffuse, retroreflective and through-beam sensors BOS 18 (except laser)	For diffuse, retroreflective and through-beam sensors BOS 18
Ordering code	BAM00RP	BAM00RT	BAM00RR
Part number	BOS 18-UK-1	BOS 18-UK-2	BOS 18-UK-10

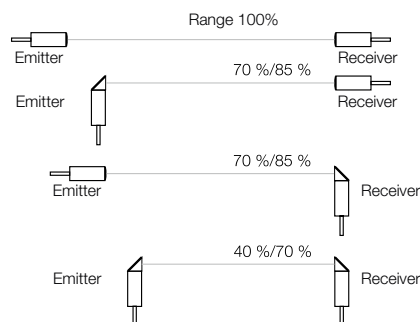


	BOS 18-UK-1	BOS 18-UK-2	BOS 18-UK-10
Diffuse sensor			
BOS 18...-XA-...100 mm	RF = 45 %		RF = 50 %
BOS 18...-XB-...200 mm	RF = 25 %		RF = 50 %
BOS 18...-PB-...200 mm	RF = 25 %		RF = 50 %
BOS 18...-XD-...400 mm		RF = 25 %	RF = 30 %
BOS 18...-PD-...400 mm		RF = 25 %	RF = 30 %
Retroreflective sensor			
BOS 18...-RB-...2 m		RF = 20 %	RF = 20 %
BOS 18...-RD-...4 m		RF = 20 %	RF = 20 %
Through-beam sensor			
BLE 18...-P-...16 m		RF = 15 %	RF = 30 %
BLS 18...-XX-...16 m		RF = 15 %	RF = 30 %

Deflection heads, suitable combinations

All BOS 18 photoelectric sensors can be equipped with a 90° deflection head.

The table shows the appropriate deflection head for each switch type and indicates the corresponding reduction factor (RF) to apply to the range. With a through-beam sensor, the emitter and the receiver can be equipped with a 90° deflection head. Each deflection head reduces the range by approx. 15% ... 50%.





Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Reflectors

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 Fasteners



Diagonal mirror

For diffuse and through-beam sensors BOS 12

BAM00R0

BOS 12-WS-1

Diagonal mirror

For laser through-beam sensors BOS 12

BAM00R1

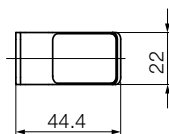
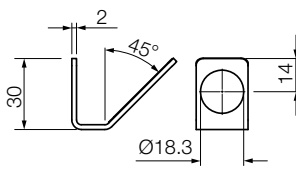
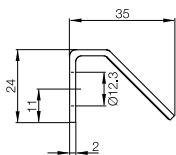
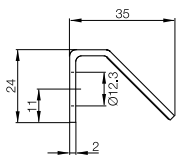
BOS 12-WS-2

Deflector

For Series 18M
 For Series 18K

BAM00RU

BOS 18-WS-1



When using the angled mirror, the sensing range is reduced by 30% for the M12 diffuse and M12 through-beam sensors. Not suitable for retroreflective sensors.

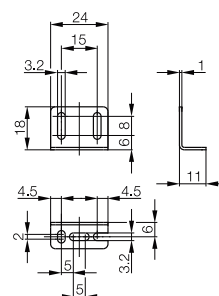
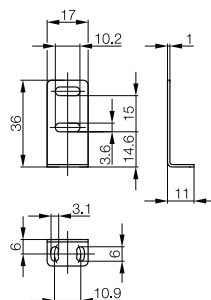
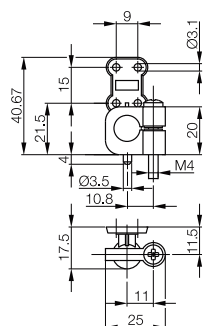
Accessories for Photoelectric Sensors

Mounting bracket

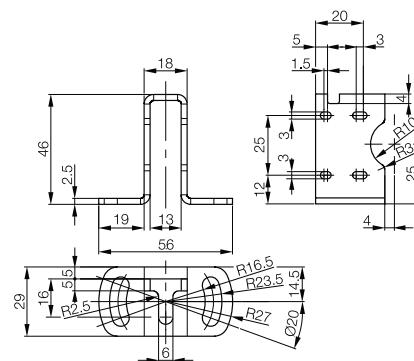
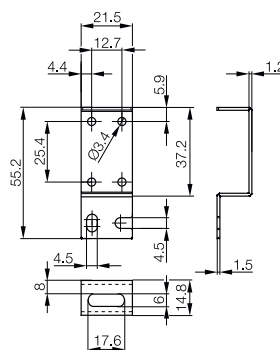
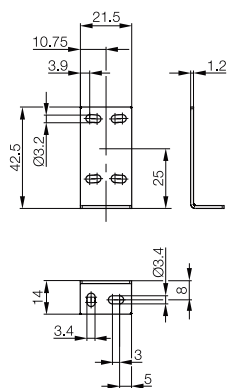
BOS 2, BOS 5



Description	Mounting bracket	Mounting bracket	Mounting bracket
Use	For BOS 2K	For BOS 2K	For BOS 2K
Ordering code	BAM00T4	BAM00T6	BAM00T5
Part number	BOS 2-HW-1	BOS 2-HW-2	BOS 2-HW-3



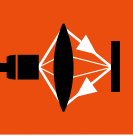
Description	Mounting bracket	Mounting bracket	Mounting bracket
Use	For BOS 5K	For BOS 5K	For BOS 5K
Ordering code	BAM00U5	BAM00U6	BAM00U7
Part number	BOS 5-HW-1	BOS 5-HW-2	BOS 5-HW-3





Accessories for Photoelectric Sensors

Mounting bracket BOS 6, BOS 18



Photoelectric Sensors

Photoelectric Sensors

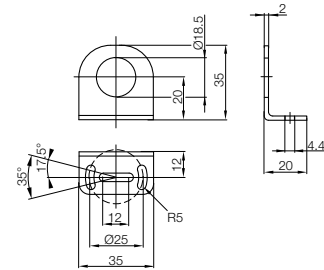
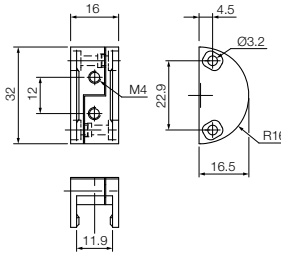
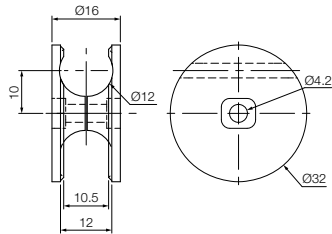
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

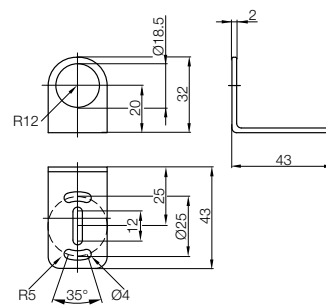
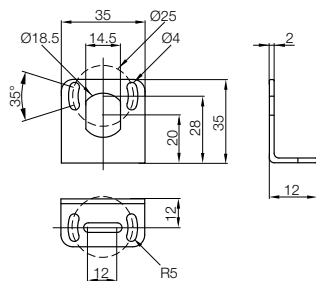
Accessories for Photoelectric Sensors
Reflectors
Sensor Accessories
Fasteners



Description	Mounting brackets	Mounting brackets	Mounting bracket
Use	For Series 6K For M12 rods	for BOS 6K	For BOS 18
Ordering code	BAM022C	BAM022A	BAM00RY
Part number	BAM CS-M-D12-S6K-00	BAM MC-XO-030-6K-4	BOS 18,0-HW-1
Material	Stainless steel	Stainless steel	



Description	Mounting bracket	Mounting bracket	
Use	For BOS 18K, BOS 18KW	For BOS 18	
Ordering code	BAM00RZ	BAM00T0	
Part number	BOS 18,0-HW-2	BOS 18,0-HW-3	

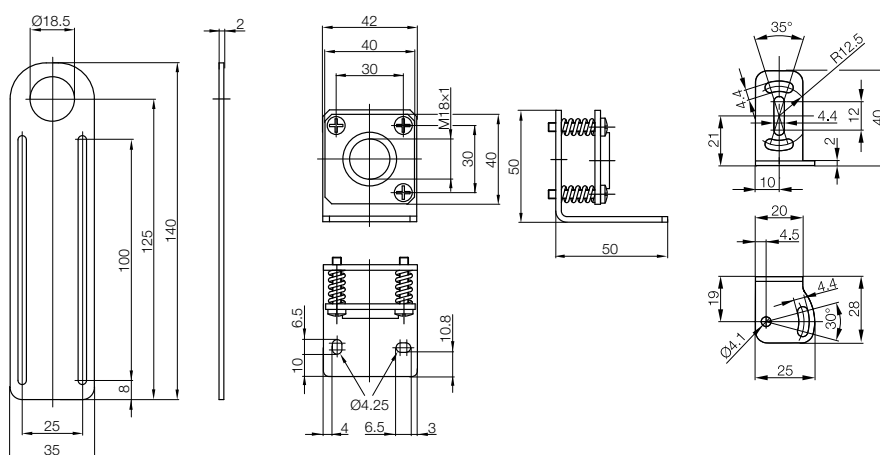


Accessories for Photoelectric Sensors

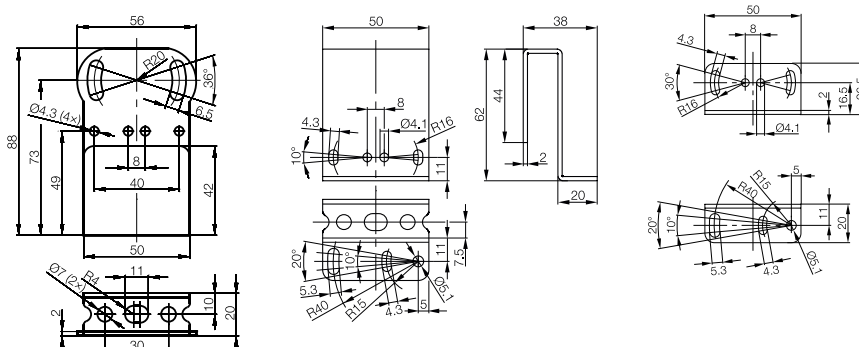
Mounting bracket BOS 18, BOS 21



Description	Mounting bracket	Mounting bracket	Mounting bracket
Use	For BOS 18	For BOS 18 laser sensors	for BOS 21M
Ordering code	BAM00T1	BAM00T2	BAM00TA
Part number	BOS 18,0-HW-4	BOS 18,0-HW-6	BOS 21-HW-2



Description	Mounting bracket	Mounting bracket	Mounting bracket
Use	for BOS 21M	for BOS 21M	for BOS 21M
Ordering code	BAM00TE	BAM00TC	BAM00T9
Part number	BOS 21-HW-4	BOS 21-HW-3	BOS 21-HW-1
Material			Stainless steel



Accessories for Photoelectric Sensors

Mounting bracket

BOS 23, BOS 36, BOS 65, BOS 66, BOS 74



Photoelectric Sensors

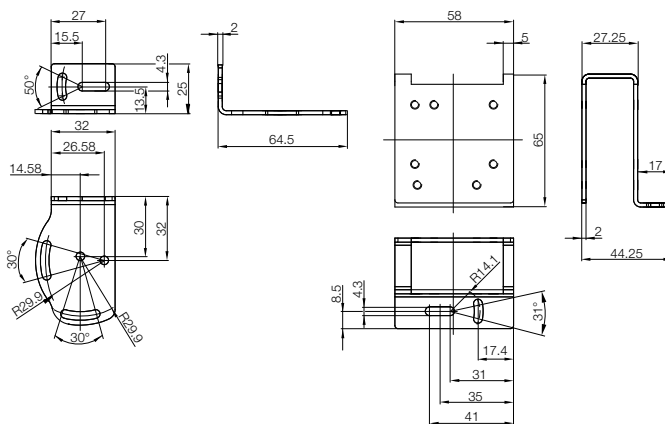
Photoelectric Sensors

Photoelectric Sensors with Special Properties

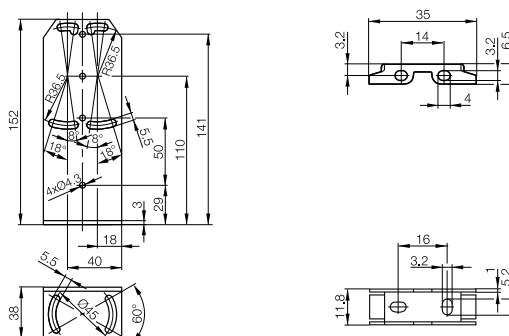
Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors
Reflectors
Sensor Accessories
Fasteners

Description	Mounting bracket	Mounting bracket	
Use	For BOS 23	For BOS 23K	
Ordering code	BAM01FM	BAM01FK	
Part number	BAM MB-X0-007-B05-4	BAM MB-X0-006-B05-4	
Material	Stainless steel	Stainless steel	



Description	Mounting bracket	Mounting bracket
Use	For BOD 66M	For BOS 74K
Ordering code	BAM00P9	BAM00UJ
Part number	BOD 66-HW-1	BOS 74-HW-1
Material	Stainless steel	

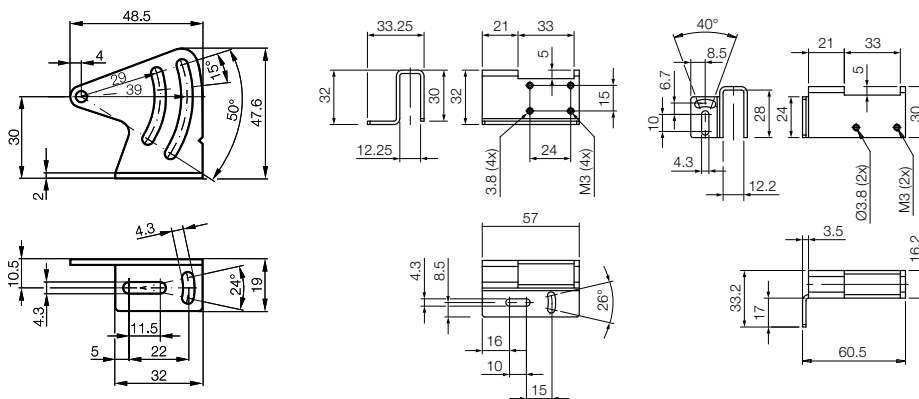


Accessories for Photoelectric Sensors

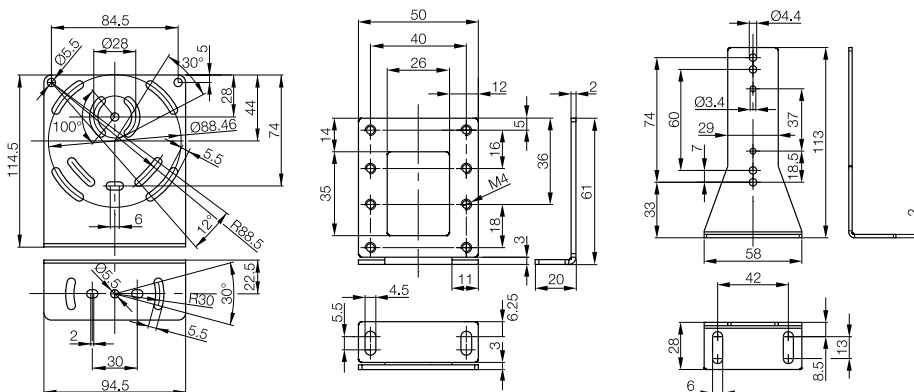
Mounting brackets BOS Mix



Description	Mounting bracket	Mounting brackets	Mounting brackets
Use	For BOS 26K, BOS 21M	For BOS 23K, BOS 26K, BOS R06	For BOS 26K, BOS 50K, BOS R06
Ordering code	BAM00TK	BAM0225	BAM0226
Part number	BOS 26-HW-1	BAM MB-XO-014-B10-4-RRR	BAM MB-XO-014-B10-4-BRR
Material		Stainless steel	Stainless steel



Description	Mounting bracket	Mounting bracket	Mounting bracket
Use	For BOS 63M, BOD 63M	For reflectors BOS R-9 and BOS R-22	For reflectors BOS R-10 and BOS R-25
Ordering code	BAM00P6	BAM00UA	BAM00U8
Part number	BOS 63-HW-1	BOS 5-HW-6	BOS 5-HW-4
Material	Stainless steel		





Accessories for Photoelectric Sensors

Mounting brackets

BOS Mix



Photoelectric Sensors

Photoelectric Sensors

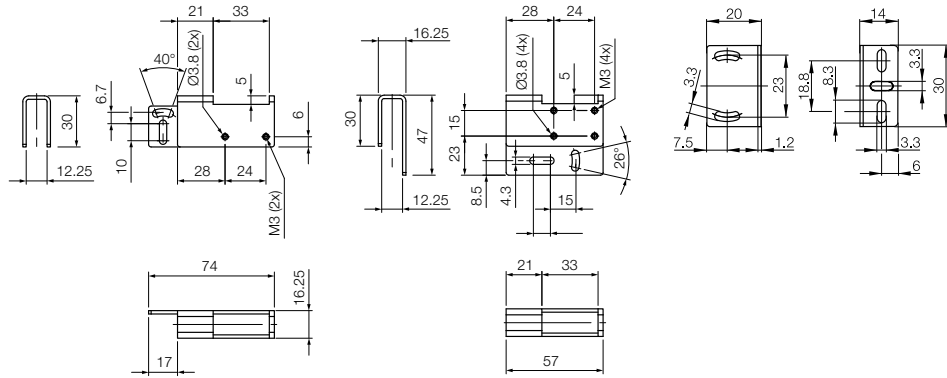
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

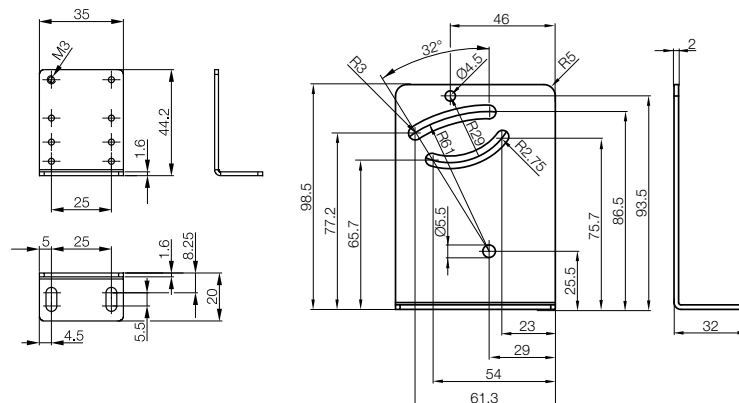
Accessories for Photoelectric Sensors
Reflectors
Sensor Accessories
Fasteners



Description	Mounting brackets	Mounting brackets	Mounting bracket
Use	For BOS 23K, BOS 26K, BUS R06	For BOS 23K, BOS 26K, BUS R06	For BOS 6K and BOS 21M
Ordering code	BAM0227	BAM0228	BAM00UH
Part number	BAM MB-XO-014-B10-4-BLS	BAM MB-XO-014-B10-4-RLS	BOS 6-HW-1
Material	Stainless steel	Stainless steel	Stainless steel



Description	Mounting bracket	Mounting bracket	
Use	For BOS 50K/23K	For BOS R-26 reflectors	
Ordering code	BAM01E8	BAM00U9	
Part number	BAM MB-XO-005-B04-4	BOS 5-HW-5	
Material	Stainless steel		



Accessories for Photoelectric Sensors

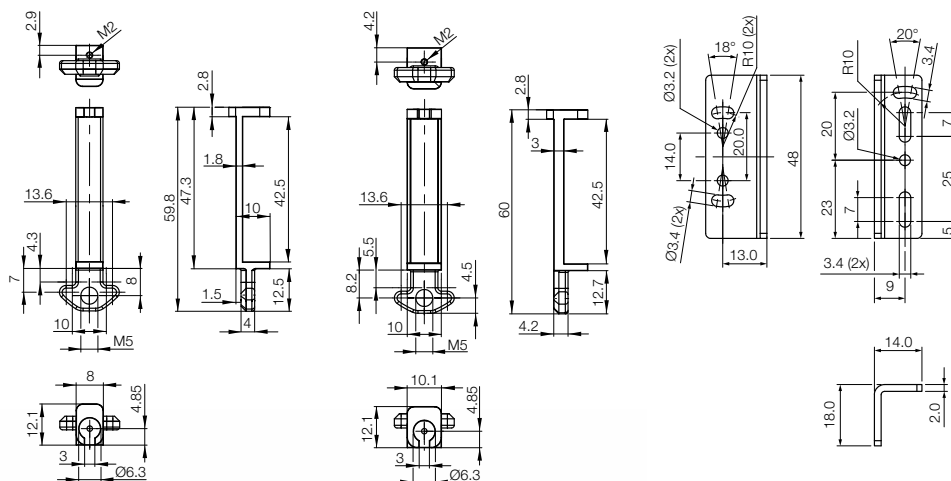
Sensor holder for Q08, mounting bracket



Description	8x8 mm sensor holder	8x8 mm sensor holder	Mounting brackets
Use	For sensors BOS and BES Q08 in ITEM profiles with 8 mm groove	For sensors BOS and BES Q08 in Bosch profiles with 10 mm groove	For BOS Q08M-...
Ordering code	BAM00NJ	BAM01AU	BAM01YW
Part number	BES Q08-KH-2	BES Q08-KH-3	BAM MB-XA-013-Q08-4
Material	CuBe 2	CuBe 2	Stainless steel

Sensor installation could hardly be easier.

Just lay the sensor in the holder and screw it in securely. Afterward, the sensor can be inserted directly from above into the profile groove – in whatever position you would like. The holder accepts all inductive and optical 8x8 cable sensors. These sensors are mainly used in handling and conveyor technology.



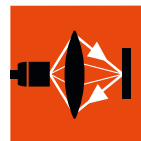
Your added bonus

A patented mounting concept ensures flush installation in aluminum profiles.



Accessories for Photoelectric Sensors

Holding system



Photoelectric Sensors

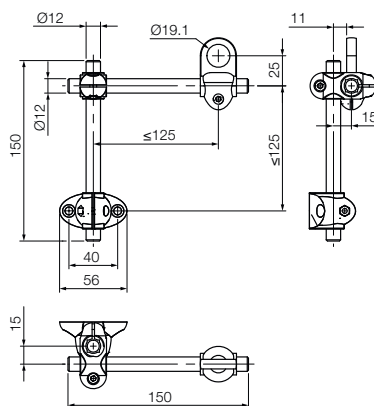
Photoelectric Sensors

Photoelectric Sensors with Special Properties

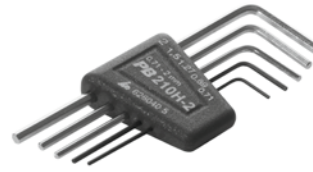
Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors
Reflectors
Sensor Accessories
Fasteners

Description	Starter set - plastic	
Use	For flexible mounting; for all cylindrical sensors with M18 external thread. May be combined with other Balluff accessories.	
Ordering code	SET011L	
Part number	BAV BP-PH-00064-01	



The mounting rods are knurled full-length.
This prevents any position change.



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Reflectors
Sensor Accessories

Fasteners

Description	BMF hex key	Hex key set 0.7-2.0
Type	Folding Allen key set, with additional blades, 8-piece	
Use	Tool set for all BMF sensors and BMF mounting brackets as well as for sensors having a potentiometer, e.g. BOS, BCS, BUS, etc.	Tool set for BMF sensors and BMF angle brackets
Material No.	139868	123264
Material	Blade: chrome vanadium steel, fully hardened, galvanically treated. Handle: ergonomic, fiberglass-reinforced housing, 55 mm long.	



0.7		
0.9		
1.3		
1.5		
2.0		
2.5		
		3.0
	PH00	



0.71
0.89
1.27
1.5
2.0

Application

Practical folding holder for Allen keys to prevent them from getting lost. Especially good for turning very small screws, for example, for tightening down or accurately adjusting sensors.

Sturdy housing with release button for easily selecting the right blade. Eyelet with matching carabiner hook. Self-service packaging for Euro hole display.