

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.

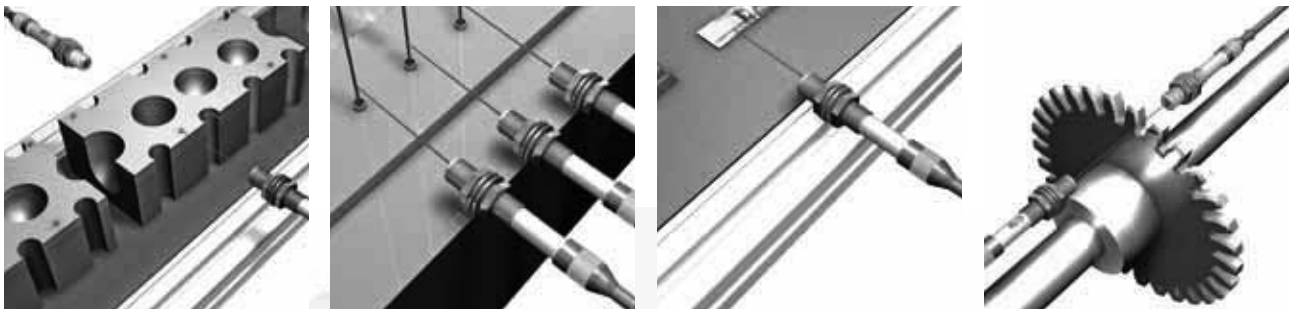
For long ranges or for detecting small parts, laser through-beam light sensors are available in two different designs.

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

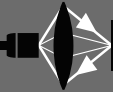
- General automation tasks
- Assembly and handling technology
- Machine tool building
- Packaging industry
- Robots
- Machine tool building



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

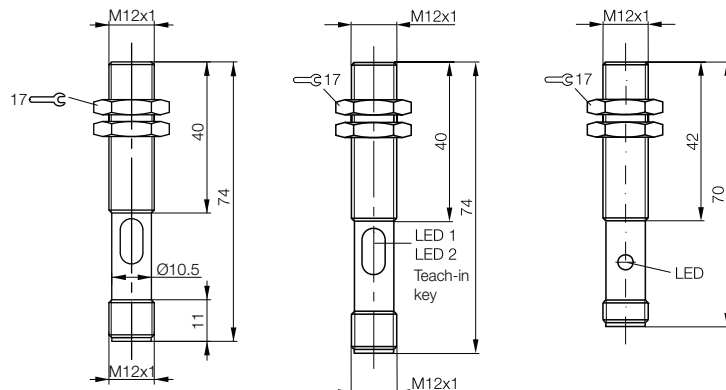
NPN on request



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.



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Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

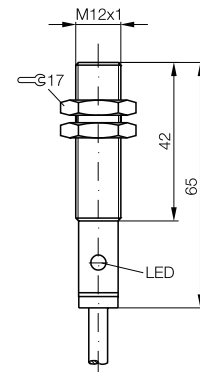
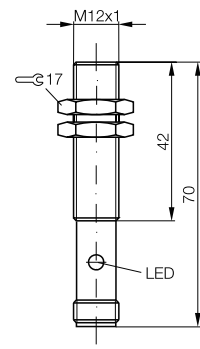
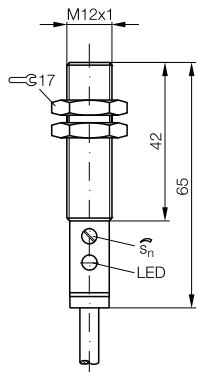
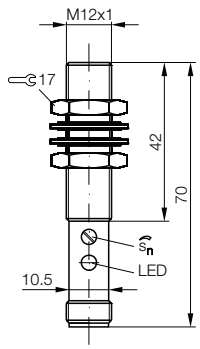
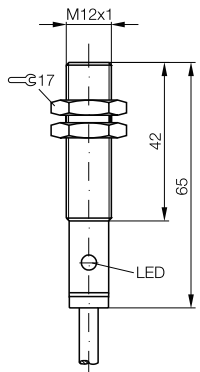
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Diffuse sensor 1...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	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA
≤ 20 mA	≤ 20 mA	≤ 20 mA	≤ 20 mA	≤ 20 mA
Light or dark switching	Light switching	Light switching	Light or dark switching	Light or dark switching
Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
Fixed	Potentiometer, 270°	Potentiometer, 270°	Fixed	Fixed
LED, red light 660 Nm	LED, infrared light 880 Nm	LED, infrared light 880 Nm	LED, red light 660 Nm	LED, red light 660 Nm
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
2.5 ms	2.5 ms	2.5 ms	2.5 ms	2.5 ms
200 Hz	200 Hz	200 Hz	200 Hz	200 Hz
IP 67	IP 67	IP 67	IP 67	IP 67
-15...+55 °C	-5...+55 °C	-5...+55 °C	-15...+55 °C	-15...+55 °C
5 klx	5 klx	5 klx	5 klx	5 klx
Nickel-plated CuZn	Nickel-plated CuZn	Nickel-plated CuZn	Nickel-plated CuZn	Nickel-plated CuZn
PMMA	PMMA	PMMA	PMMA	PMMA
3 m PVC cable, 3x0.34 mm ²	M12 connector, 4-pin	3 m PVC cable, 3x0.34 mm ²	M12 connector, 4-pin	3 m PVC cable, 3x0.34 mm ²

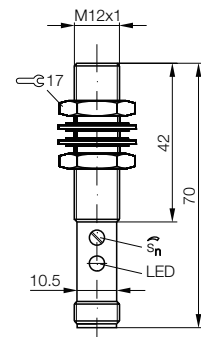
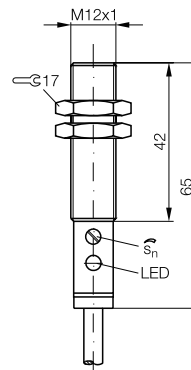
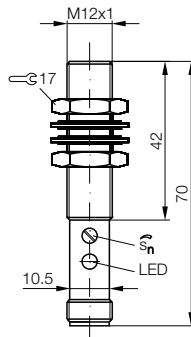




Type		Diffuse sensor	Diffuse sensor	Retroreflective sensor
Detection range		1...400 mm	1...400 mm	0...1.5 m
PNP NO	Ordering code	BOS0045	BOS000Y	
	Part number	BOS 12M-PS-1PD-S4-C	BOS 12M-PS-1PD-B0-C-03	
PNP NC	Ordering code	BOS0044	BOS000L	
	Part number	BOS 12M-PO-1PD-S4-C	BOS 12M-PO-1PD-B0-C-03	
PNP 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

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Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

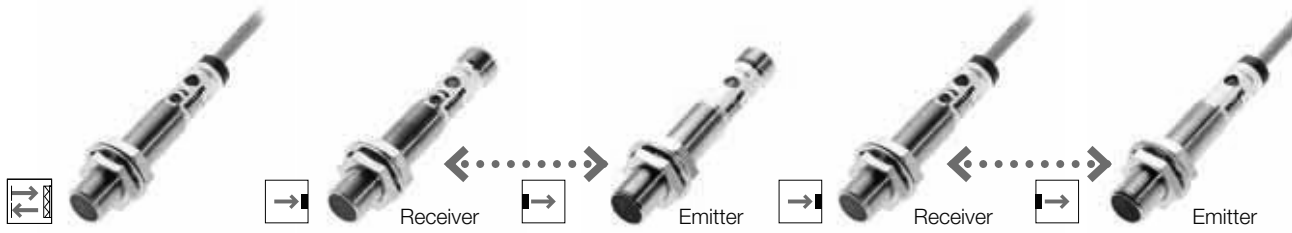
Angle Sensors

BWL

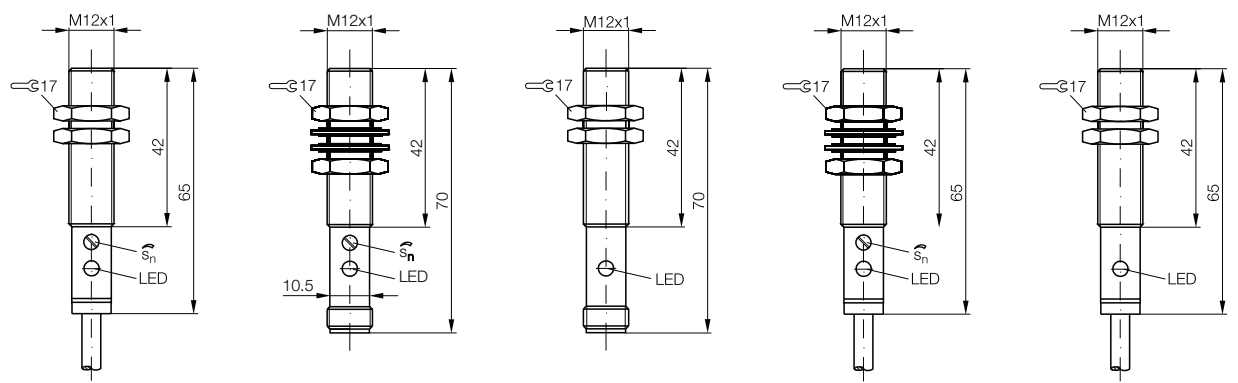
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

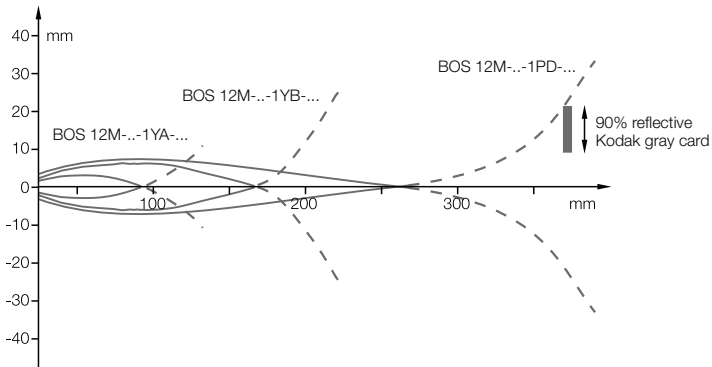
Accessories for Photoelectric Sensors



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

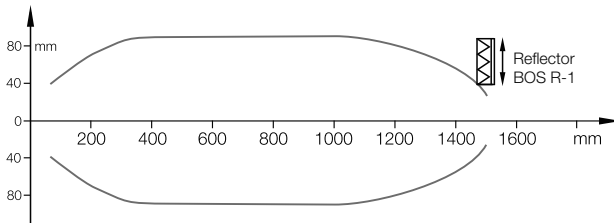


Diffuse sensor BOS 12M-..-1YA/1YB/1PD-...



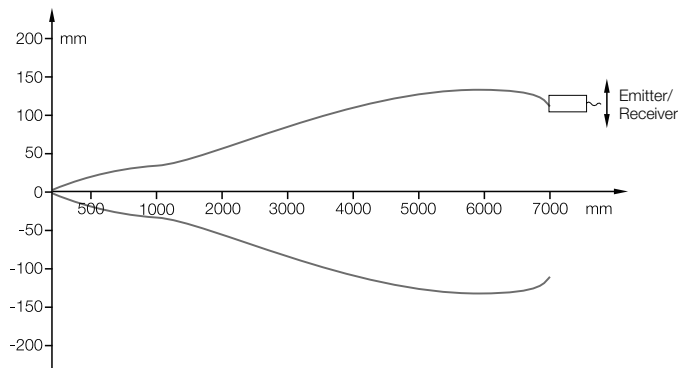
Sensing distance measured with side approach of Kodak gray card.

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



Range measured with side approach with reflector.

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

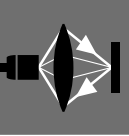


The maximum possible offset between the emitter and receiver is measured for the through-beam sensor.

Photoelectric Sensors

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Accessories, Connection



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Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

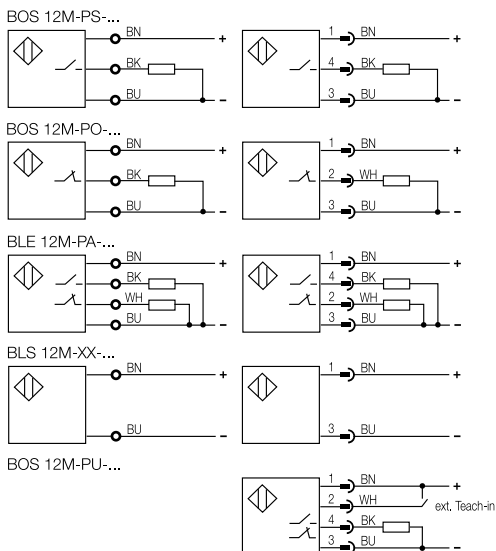
Orientation aid

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.

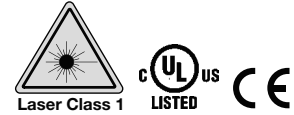
More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessories Line** catalog.

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.

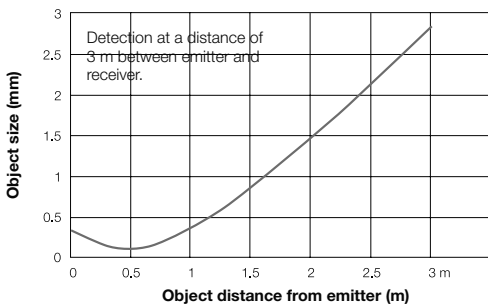
The **LS12** version is not focused and is used for long ranges up to 30 m. The receivers can be PNP or NPN, and any emitter can be combined with any receiver.

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

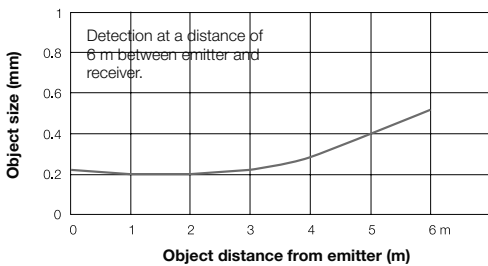


Small parts detection

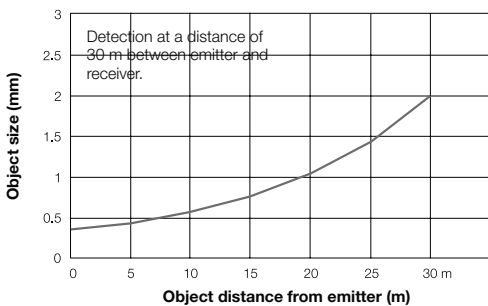
BOS 12M-XT-**LS11**-..



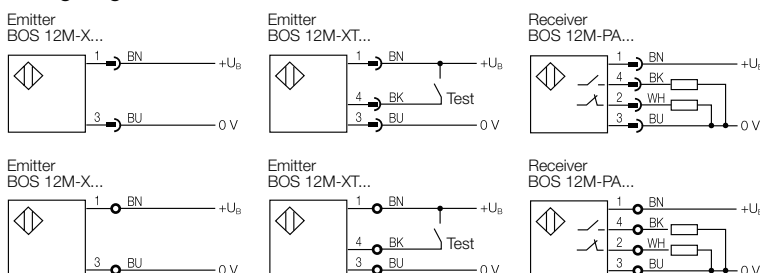
BOS 12M-XT-**LS12**-..



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



Wiring diagrams

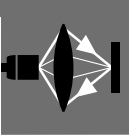


Type	
Detection range	
Emitter	Ordering code
50 µm high resolution	Part number
Emitter	Ordering code
Long range 30 m	Part number
PNP	Ordering code
NO/NC	Part number
Receiver	Part number
Supply voltage U _S	
Output current	
No-load supply current I ₀ max.	
Switching type	
Polarity reversal/short-circuit 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



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Block Designs

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Angle Sensors

BWL

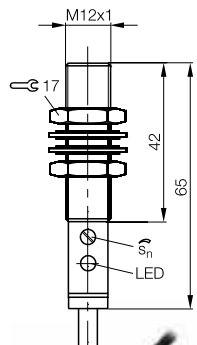
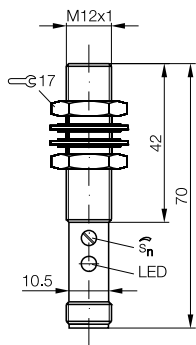
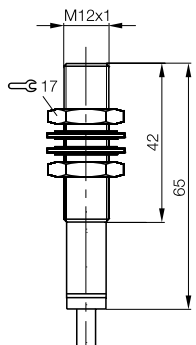
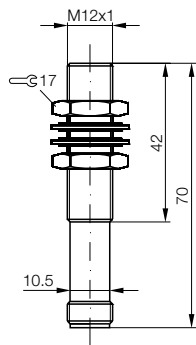
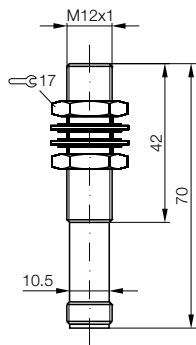
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Laser through-beam light sensor 0...3 m/0...30 m BOS00WH BOS12M-X-LS11-S4 BOS00WJ BOS12M-X-LS12-S4	Laser through-beam light sensor 0...3 m/0...30 m BOS00WL BOS 12M-XT-LS11-S4 BOS00WN BOS 12M-XT-LS12-S4	Laser through-beam light sensor 0...3 m/0...30 m BOS00WK BOS 12M-XT-LS11-03 BOS00WM BOS 12M-XT-LS12-03	Laser through-beam light sensor BOS00WF BOS 12M-PA-LE10-S4	Laser through-beam light sensor BOS00WE 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.