

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.



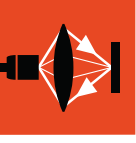
Photoelectric Distance Sensors

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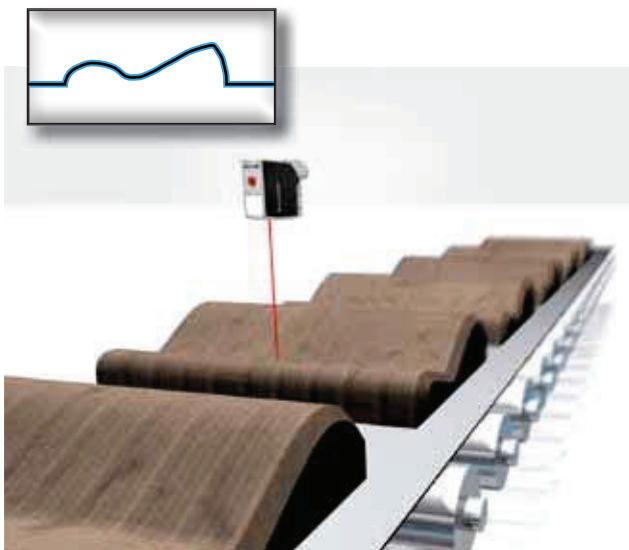
Basic information and definitions can be found on page 934.



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.

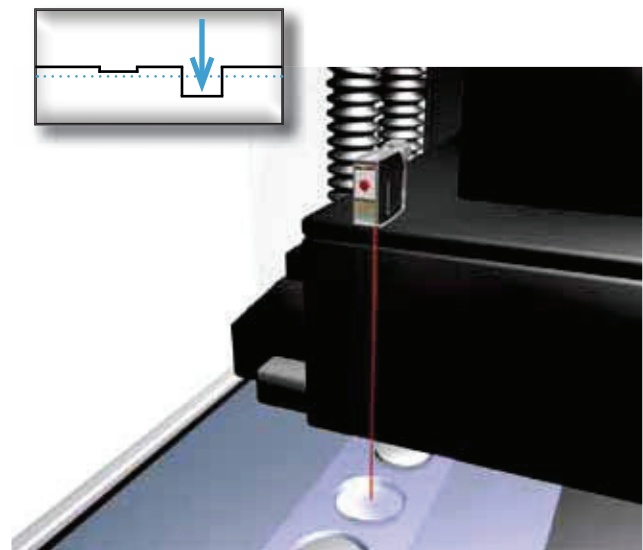
Applications

- Control tasks
- Sensing
- Object positioning
- Level detection



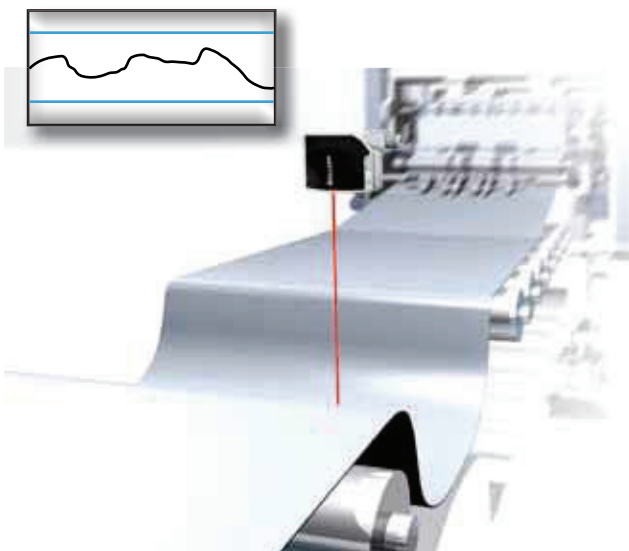
Contour checking

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.



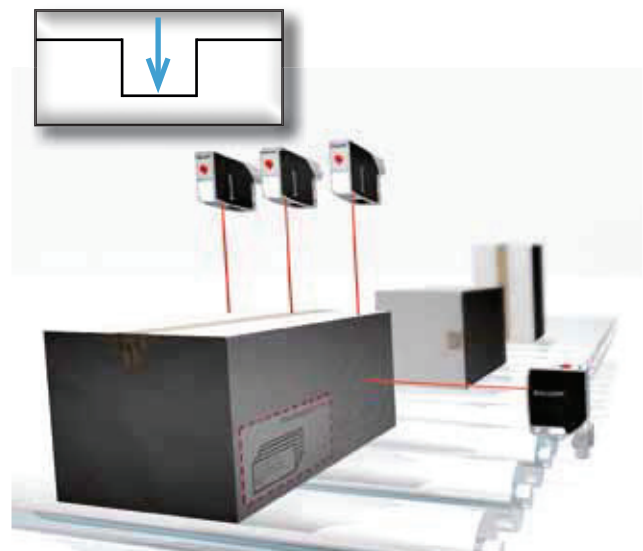
Blister packaging

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.

Photoelectric Distance Sensors

Product overview



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Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Block Designs

Accessories for Photoelectric Sensors

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!

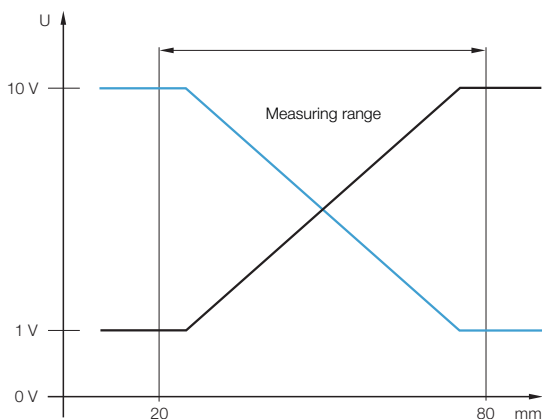
The new generation of BOD 6K sensors with a resolution of 20 μm is a real alternative for short-range measurement tasks! The new **BOD 6K** provides a distance-proportional analog output signal with falling voltage over an adjustable measuring range of 20 to 80 mm. With a switching output adjustable using teach-in, the sensor can also be used as a sensing device with background suppression.

Features

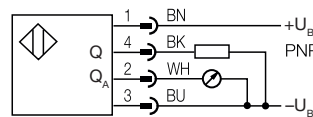
- Adjustable measuring range between 20...80 mm
- Analog output 1...10 V
- Adjustable background suppression
- Switching output PNP, NO/NC selection
- Teach-in (measuring range and switching output can be adjusted independently of each other)
- Disable buttons
- Connector or cable version
- 20 μm resolution
- 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

ECOLAB



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

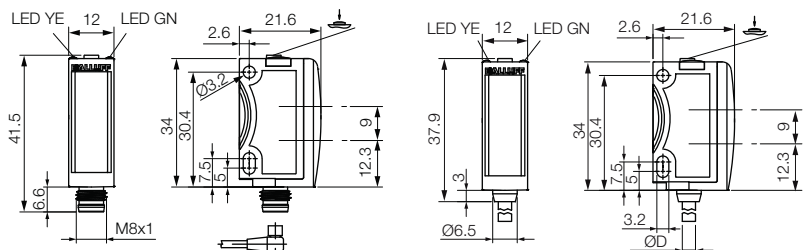
Block Designs

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	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



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.

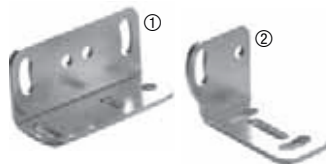


Series	BOD 21M		BOD 21M
Working range	25...45 mm		25...45 mm
Measuring range	20 mm		20 mm
2x PNP NO/NC	Ordering code	BOD000L	BOD000P
	Part number	BOD 21M-LA01-S92	BOD 21M-LB01-S92
Supply voltage U _S	18...30 V DC		18...30 V DC
Analog output	1...10 V (max. 3 mA)		4...20 mA
Settings	Teach-in (rotary switch)		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

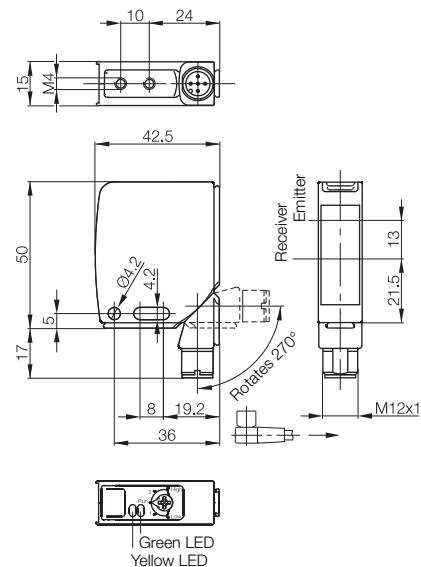


You can find special accessories for photoelectric sensors in our **Object Detection** catalog.

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

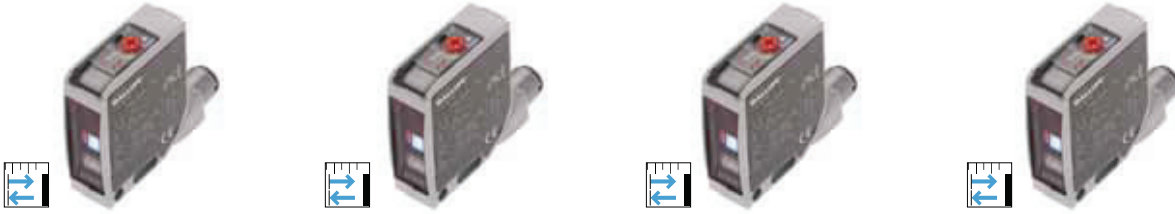
Photoelectric Sensors

Photoelectric Sensors with Special Properties

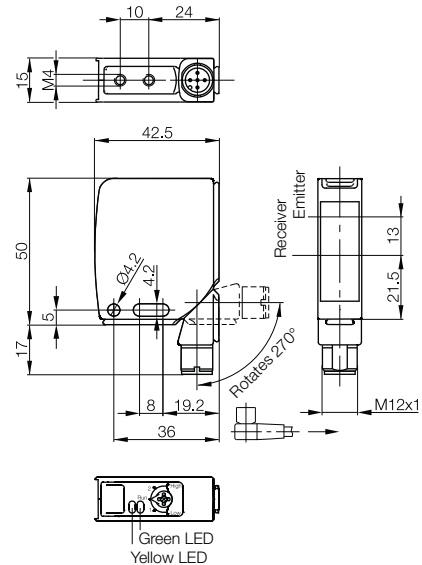
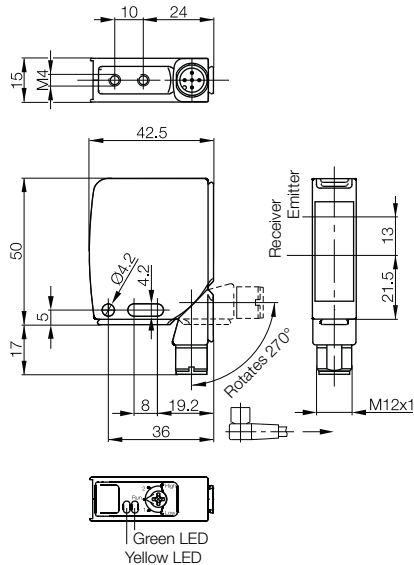
Photoelectric Distance Sensors for Analog Distance Measurement

Block Designs

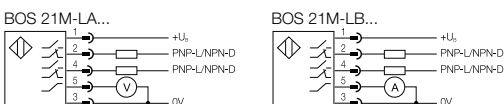
Accessories for Photoelectric Sensors



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

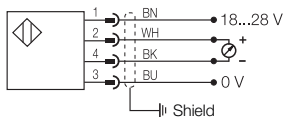
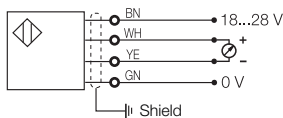
BOD 26K-LA Laser

Features

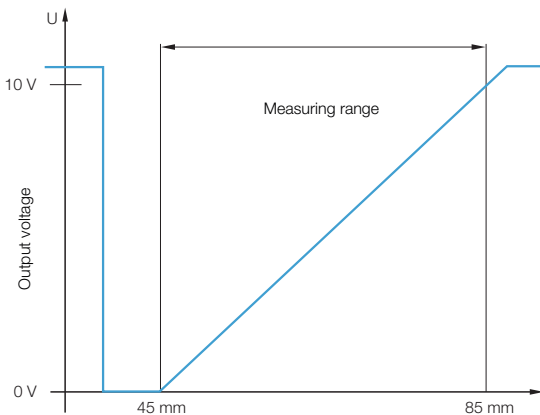
- Fixed measuring range between 45...85 mm
- Analog output 0...10 V
- 20 µm or 80 µm resolution
- Connector or cable version



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

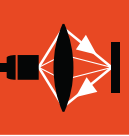
Connectors without LED are suitable for PNP and NPN sensors.

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

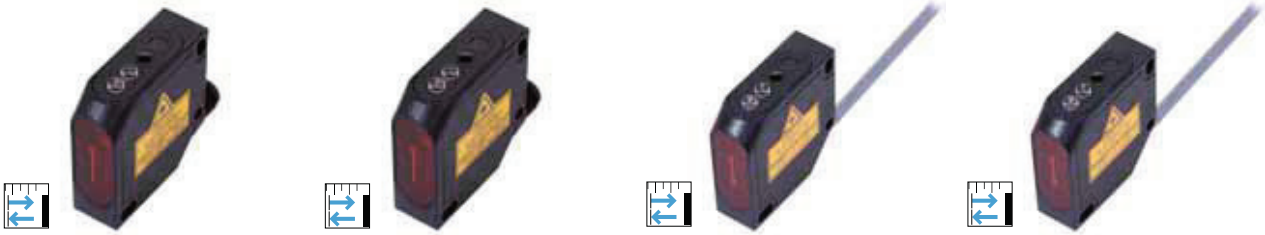
Photoelectric Sensors

Photoelectric Sensors with Special Properties

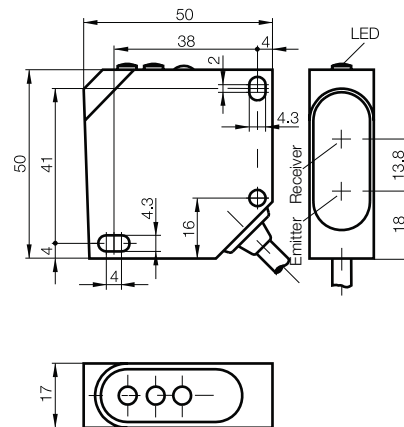
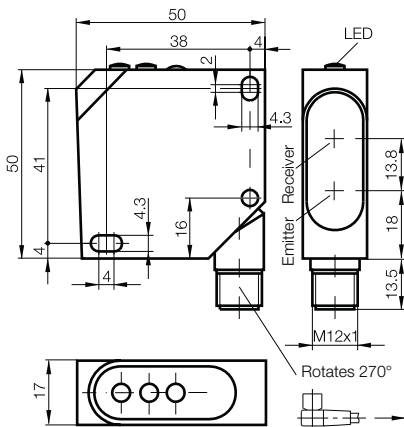
Photoelectric Distance Sensors for Analog Distance Measurement

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



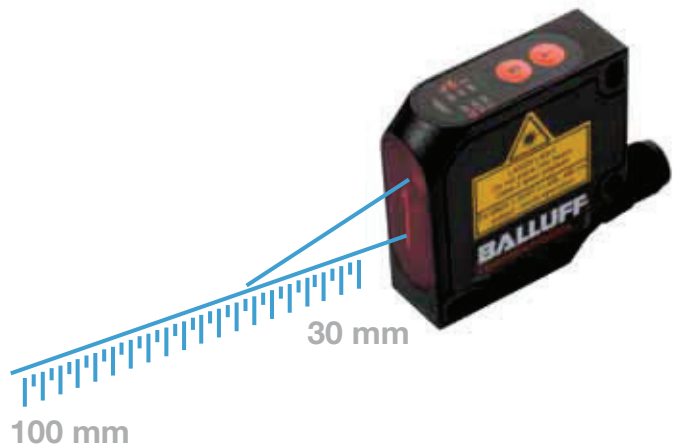
Photoelectric Distance Sensors

Distance sensors BOD 26K-LB Laser

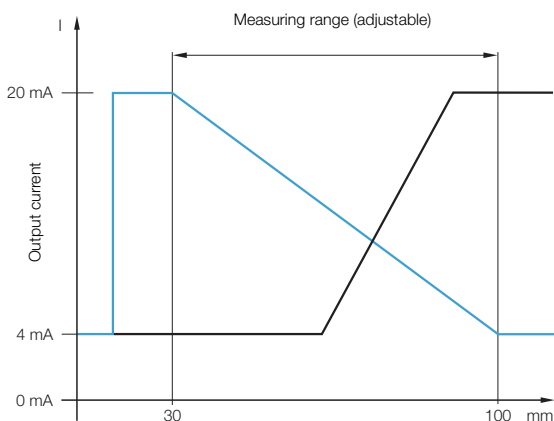
BOD 26K-LB Laser

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



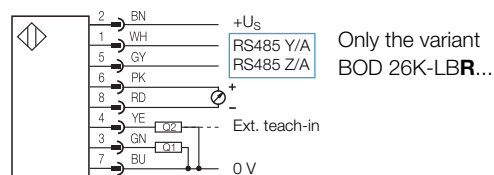
Analog output BOD 26K-LB(R)04...



Connector diagram



Wiring diagram



Recommended accessories:
(please order separately)

Description	Ordering code
Mounting bracket	BAM00TK



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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.

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

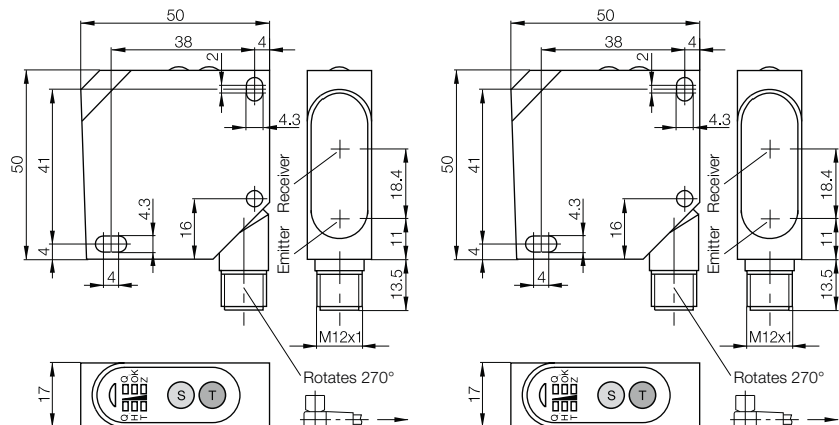
Accessories for Photoelectric Sensors

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 BOD0005	Ordering code BOD000C
Part number	BOD 26K-LB04-S115-C	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 \times 3.25 mm at 100 mm	1.5 mm \times 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.

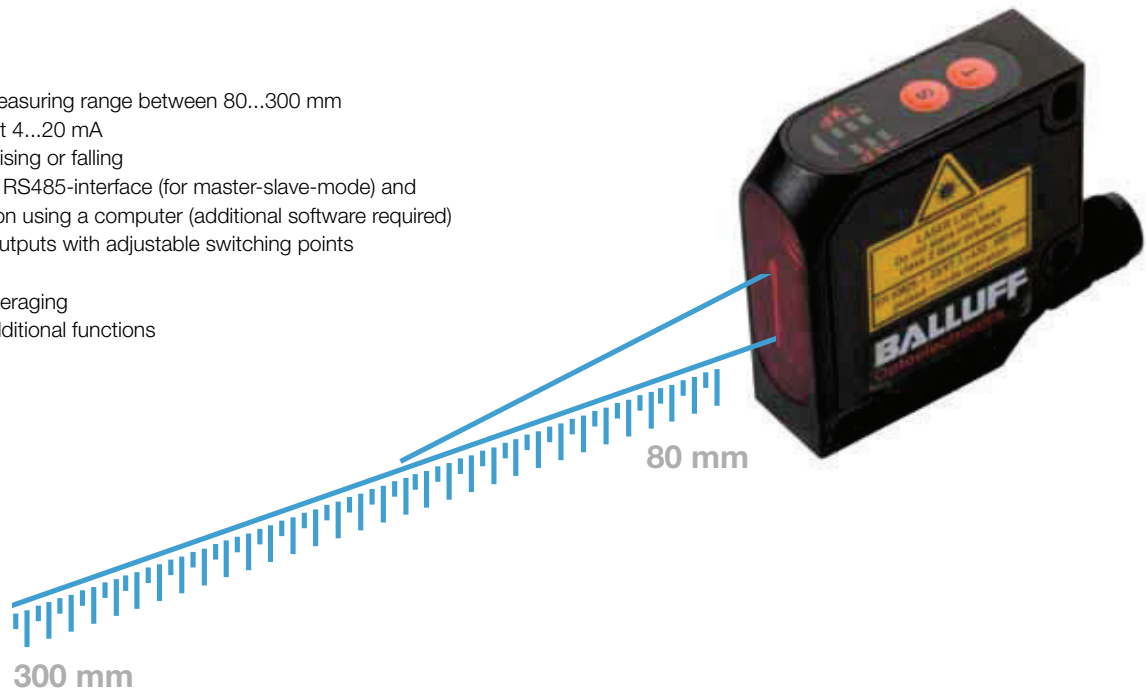


Connector orientation

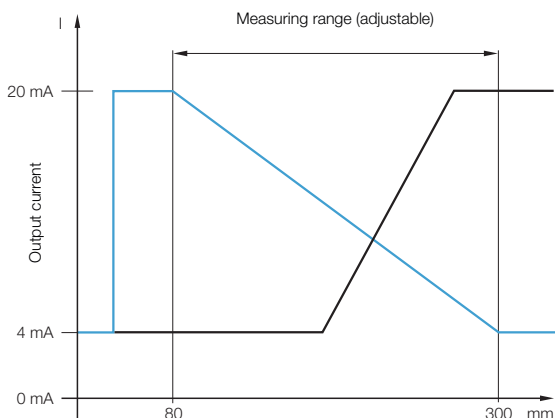


Features

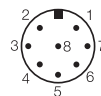
- Adjustable measuring range between 80...300 mm
- Analog output 4...20 mA
Adjustable: Rising or falling
- Optional with RS485-interface (for master-slave-mode) and for visualization using a computer (additional software required)
- 2 switching outputs with adjustable switching points
- Teach-in
- Adjustable averaging
- Numerous additional functions



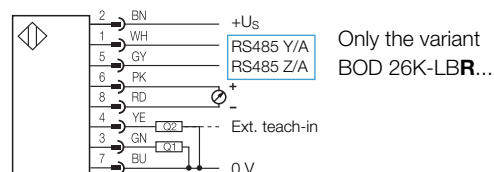
Analog output BOD 26K-LB(R)05...



Connector diagram



Wiring diagram



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

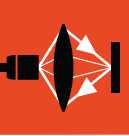
Connectors without LED are suitable for PNP and NPN sensors.

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

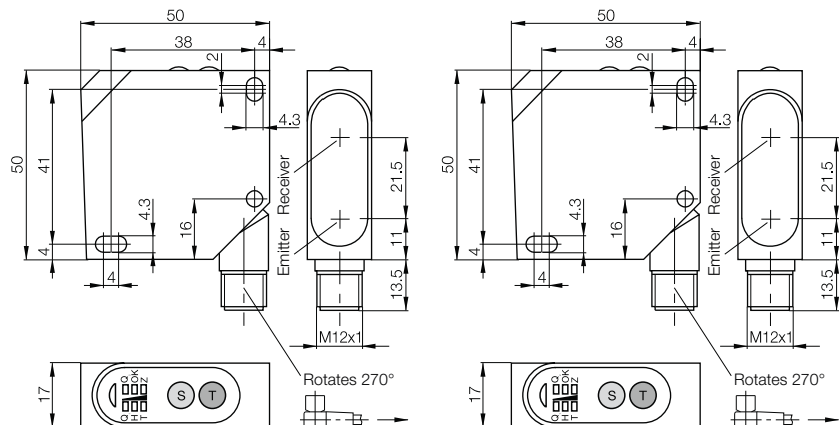
Photoelectric Distance Sensors for Analog Distance Measurement

Block Designs

Accessories for Photoelectric Sensors

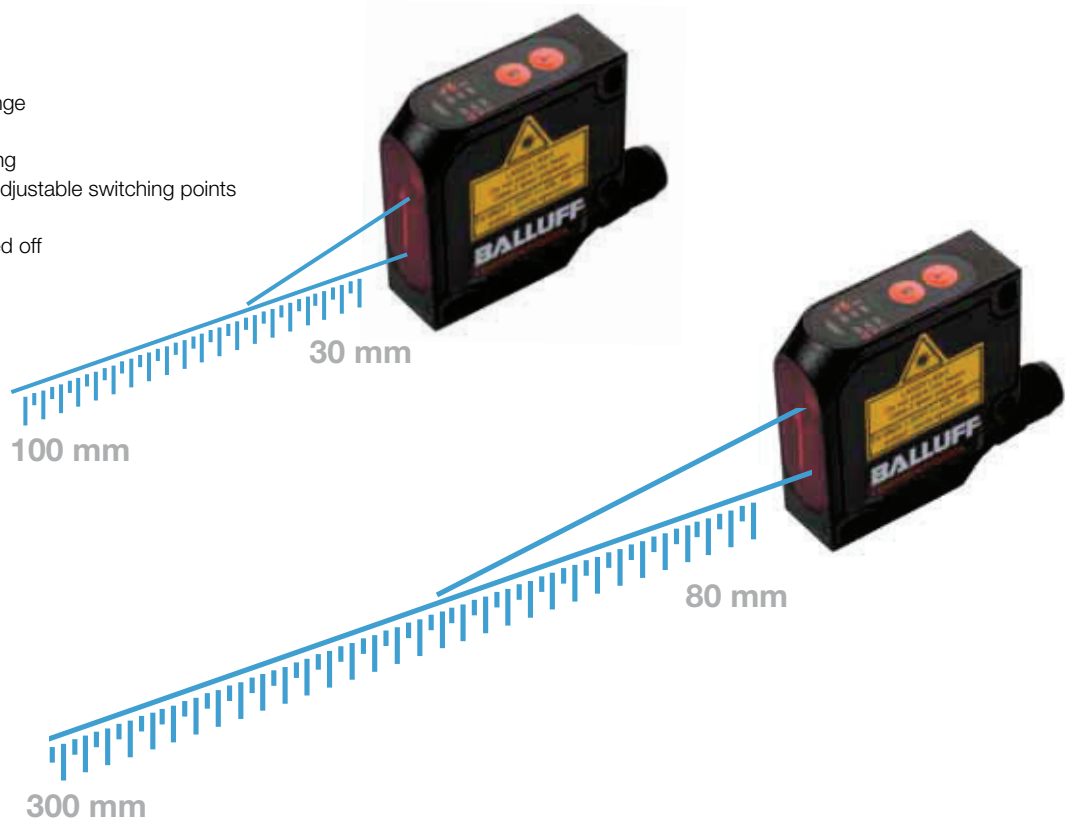
Series	BOD 26K	BOD 26K
Working range	80...300 mm	80...300 mm
Measuring range	adjustable max. 220 mm	adjustable max. 220 mm
2x PNP NO/NC	Ordering code Part number	Ordering code Part number
	BOD0006 BOD 26K-LB05-S115-C	BOD000E BOD 26K-LBR05-S115-C
Supply voltage U_S	18...30 V DC	18...30 V DC
Analog output	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

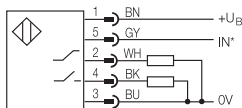
- Adjustable measuring range
- Analog output 4...20 mA
Adjustable: Rising or falling
- 1 switching output with adjustable switching points
- Teach-in
- Laser beam can be turned off



Connector diagram

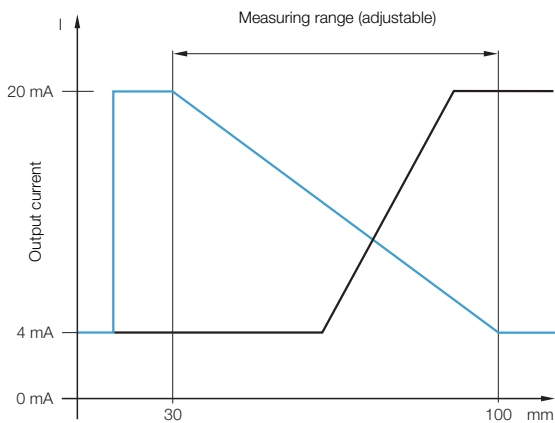


Wiring diagram

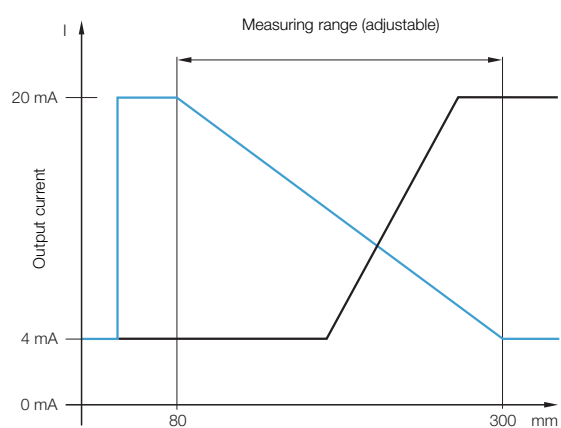


*Laser shut-off (+U_B)
Key disable (0 V)

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

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**.

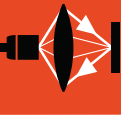
Connectors without LED are suitable for PNP and NPN sensors.

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 26K-LB Laser



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

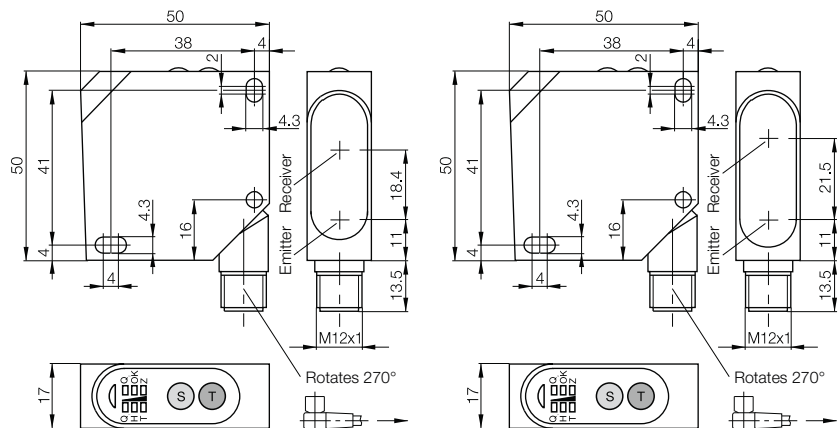
Block Designs

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	BOD0007	BOD0008
		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.

 → Connector orientation



Photoelectric Distance Sensors

Distance sensors BOD 63M Laser



Laser class

The emitter meets Laser 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.

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**.

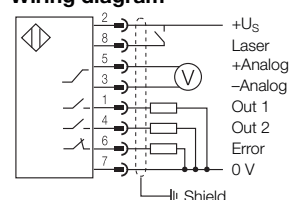


Series	
Working range	
Measuring range	
2x PNP NO	Ordering code
	Part number
Supply voltage U_S	
Analog output	
No-load supply current I_0 max.	
Switching type	
Switching points	
Polarity reversal/short-circuit protected	
Settings	
Emitter, light type	
Wavelength	
Laser class	
Light spot diameter	
Resolution	
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	

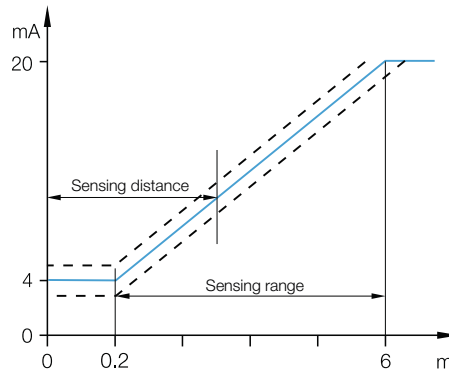
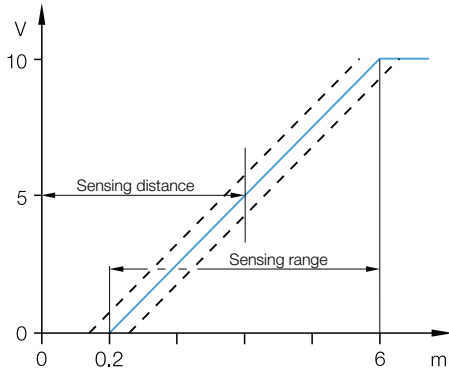
Measured values referenced to Kodak gray card 90% reflective.



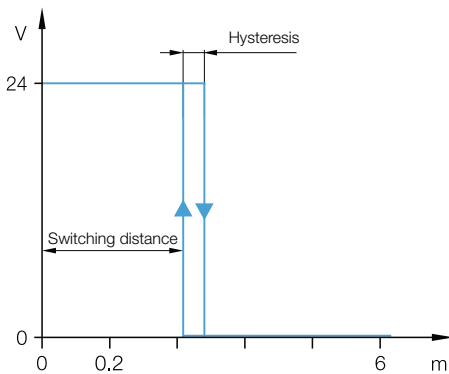
Wiring diagram



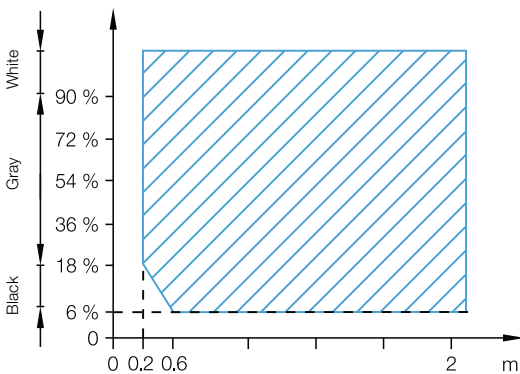
Analog output



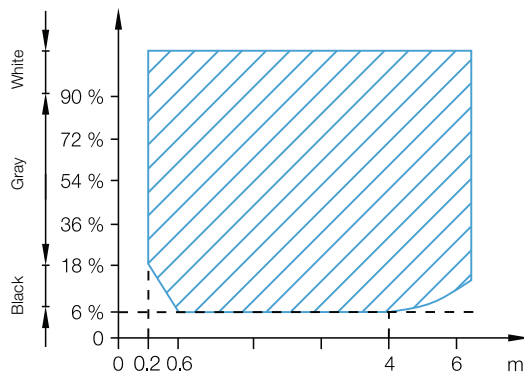
Switching output



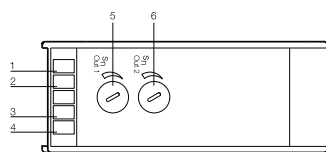
Measuring range BOD 63M-LA/LB02...
depending on object reflection



Measuring range BOD 63M-LA/LB04...
depending on object reflection

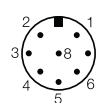


Indicators and operating elements



- 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

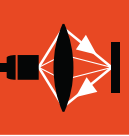


Pin-assignment	Cable color	
1	White	Out 1
2	Brown	+U _S
3	Green	-Analog output
4	Yellow	Out 2
5	Gray	+Analog output
6	pink	Stability indicator
7	Blue	0 V
8	Red	Laser shut-off
Knurled nut	Braided shield	Shield



Photoelectric Distance Sensors

Distance sensors BOD 63M Laser



Photoelectric Sensors

Photoelectric Sensors

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

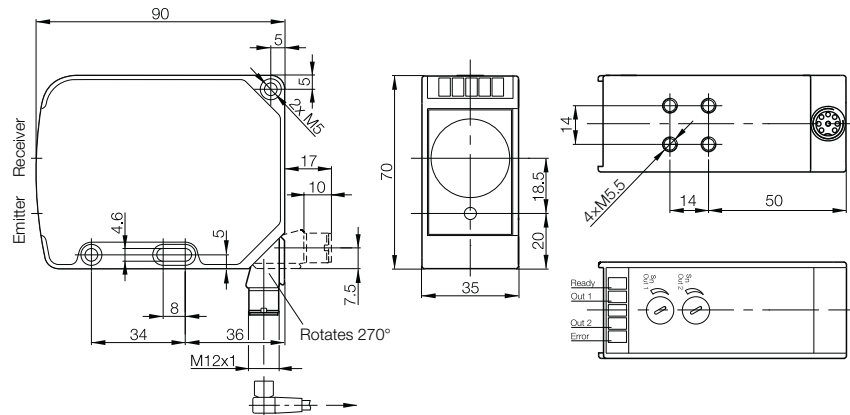
Block Designs

Accessories for Photoelectric Sensors

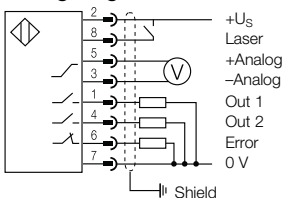


Series	BOD 63M	BOD 63M
Working range	200...6000 mm	200...6000 mm
Measuring range	5800 mm	5800 mm
2x PNP NO	Ordering code Part number	Ordering code Part number
	BOD 63M-LA04-S115	BOD 63M-LB04-S115
Supply voltage U_S	15...30 V DC	15...30 V DC
Analog output	0...10 V	4...20 mA
No-load supply current I_0 max.	≤ 75 mA	≤ 75 mA
Output current	200 mA	200 mA
	Switching output	200 mA
	Error output	200 mA
Switching type	Light switching	Light switching
Polarity reversal/short-circuit protected	Yes/Yes	Yes/Yes
Settings	Potentiometer, 4 revolutions	Potentiometer, 4 revolutions
Emitter, light type	Laser, red light	Laser, red light
Wavelength	660 Nm	660 Nm
Laser class	2 per EN 60825	2 per EN 60825
Light spot diameter	10 mm at 6000 mm	10 mm at 6000 mm
Resolution	1 mm	1 mm
Gray value shift	$\leq 1.5\%$	$\leq 1.5\%$
Repeat accuracy per BWN	$\leq \pm 4$ mm	$\leq \pm 4$ mm
Temperature drift	≤ 1.5 mm/K	≤ 1.5 mm/K
Output curve deviation	$\leq \pm 1\%$ of Wh	$\leq \pm 1\%$ of Wh
Switching hysteresis	≤ 15 mm	≤ 15 mm
Power-on indicator	Green LED	Green LED
Switching output	2x yellow LED	2x yellow LED
Stability indicator	Red LED	Red LED
Stand-by delay	≤ 20 ms	≤ 20 ms
Response time	≤ 2 ms	≤ 2 ms
Switching frequency	250 Hz	250 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	≤ 10 klx	≤ 10 klx
Material	Housing: Anodized aluminum Optical surface: Glass	Anodized aluminum Glass
Connection	M12 connector, 8-pin	M12 connector, 8-pin

Measured values referenced to Kodak gray card 90% reflective.



Wiring diagram



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.

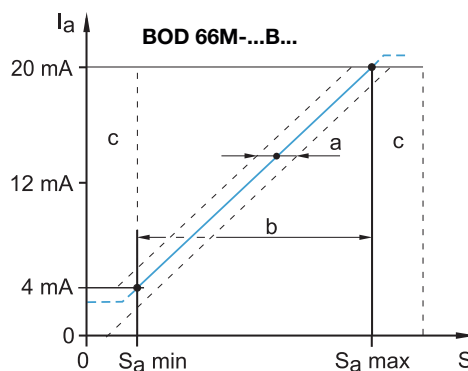
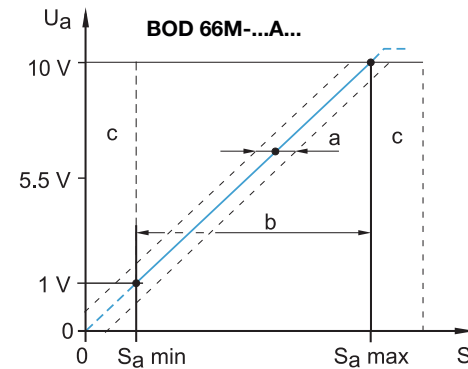
Features

- 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...

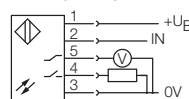


a = Linearity
b = Working range of analog output
c = Non-defined range


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

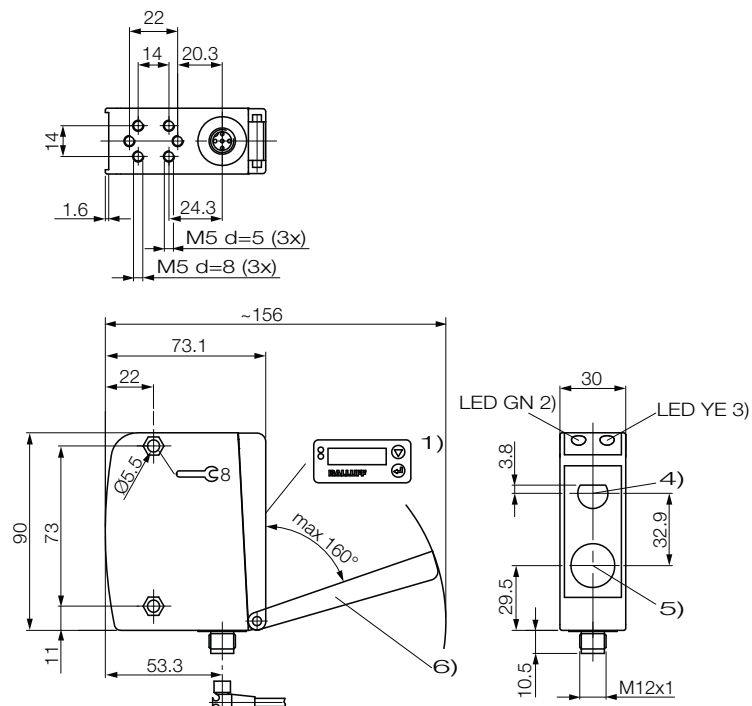
Photoelectric Distance Sensors for Analog Distance Measurement

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

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.

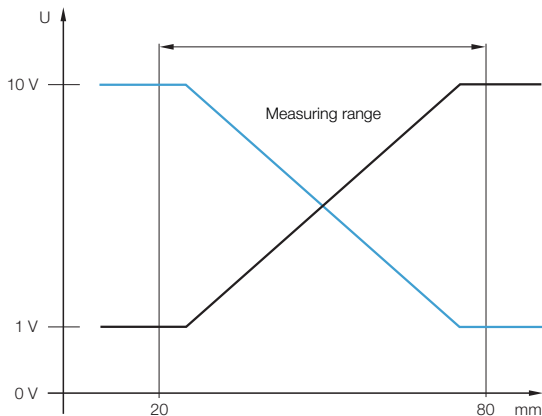
Features

- 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.

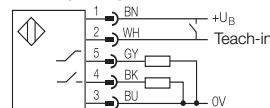


Series	
Working range	
Measuring range	
PNP/NPN	Ordering code
NO/NC	Part number
Supply voltage U_S	
Analog output	
No-load supply current I_0 max.	
Switching type	
Polarity reversal/short-circuit protected	
Settings	
Emitter, light type	
Wavelength	
Laser class	
Light spot diameter	
Resolution	
Reproducibility 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

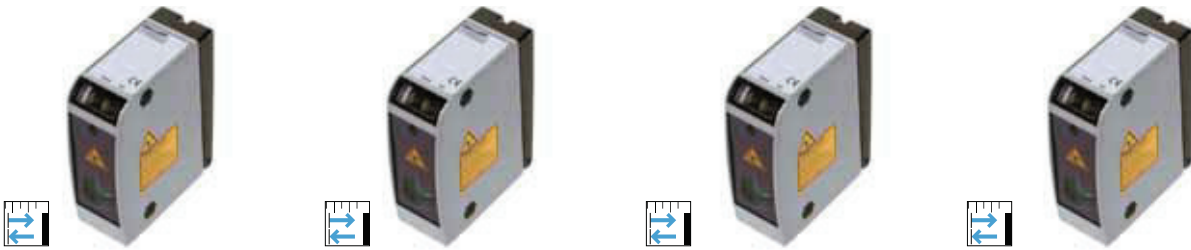
Photoelectric Sensors

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Block Designs

Accessories for Photoelectric Sensors



BOD 66M	BOD 66M	BOD 66M	BOD 66M
150...800 mm	150...800 mm	150...2000 mm	150...2000 mm
650 mm, adjustable	650 mm, adjustable	1850 mm, adjustable	1850 mm, adjustable
BOD001J	BOD001K	BOD001E	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, M12x1-S92	Connector, M12x1-S92	Connector, M12x1-S92	Connector, M12x1-S92

 → Connector orientation

