

Photoelectric Standard Sensors

BOS 50K

Product overview



Photoelectric sensors

Photoelectric standard sensors
Cylinder designs

Block designs

Photoelectric special sensors

Photoelectric distance sensors for analog distance measurement

Special accessories for photoelectric sensors

Type	Sensing distance/ Range	Light type		Output			Switching type		Switching frequency	U _S	Connec-tion		Special features		Page
		Red light		PNP transistor	IO-Link	Contamination output	Light switching	Dark switching			10...30VDC	M12 connector, 4-pin	Polarizing filter	Teach-in	
Diffuse sensor with background suppression															
BOS018P	BOS 50K-PA-RH12-S4	200...2000 mm	■	■			■	■	500 Hz	■	■				224
BOS018N	BOS 50K-PS-RH12-S4	200...2000 mm	■	■			■		500 Hz	■	■				224
BOS0156	BOS 50K-PSV-RH12-S4	200...2000 mm	■	■	■		■		500 Hz	■	■				224
BOS018U	BOS 50K-POV-RH12-S4	200...2000 mm	■	■	■		■		500 Hz	■	■				224
Diffuse sensor															
BOS01CS	BOS 50K-PA-RD10-S4	1...2000 mm	■	■			■	■	400 Hz	■	■				225
BOS01CP	BOS 50K-PS-RD10-S4	1...2000 mm	■	■			■		400 Hz	■	■				225
BOS01J0	BOS 50K-PO-RD10-S4	1...2000 mm	■	■				■	400 Hz	■	■				225
BOS01JA	BOS 50K-PU-RD11-S4	1...3500 mm	■	■			■	■	200 Hz	■	■		■		225
BOS01JJ	BOS 50K-PI-RD11-S4	1...3500 mm	■	■	■		■	■	200 Hz	■	■		■		225
Retroreflective sensor															
BOS01CR	BOS 50K-PA-PR10-S4	0.1...18 m	■	■			■	■	400 Hz	■	■		■		226
BOS01CL	BOS 50K-PS-PR10-S4	0.1...18 m	■	■				■	400 Hz	■	■		■		226
BOS01HY	BOS 50K-PO-PR10-S4	0.1...18 m	■	■			■		400 Hz	■	■		■		226
Through-beam sensor Receiver															
BOS01CK	BOS 50K-PA-RE10-S4	0...60 m	■	■			■	■	400 Hz	■	■				227
BOS01CM	BOS 50K-PS-RE10-S4	0...60 m	■	■				■	400 Hz	■	■				227
BOS01HZ	BOS 50K-PO-RE10-S4	0...60 m	■	■			■		400 Hz	■	■				227
Through-beam sensor Emitter															
BOS01EU	BOS 50K-X-RS10-S4		■							■	■				227
BOS01CN	BOS 50K-XR-RS10-S4		■							■	■				227

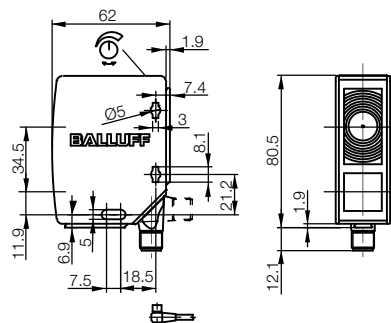
NPN on request



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 Switchable	Ordering code	
	Part number	
PNP NO/NC Switchable IO-Link	Ordering code	
	Part number	
PNP NO	Ordering code	BOS018N
	Part number	BOS 50K-PS-RH12-S4
PNP NC	Ordering code	
	Part number	
PNP NO with Error output	Ordering code	BOS0156
	Part number	BOS 50K-PSV-RH12-S4
PNP NC with Error output	Ordering code	BOS018U
	Part number	BOS 50K-POV-RH12-S4
Supply voltage U_B	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	

Diffuse sensor values referenced to 90% reflective Kodak gray card.

For wiring diagrams see page 229.



Photoelectric Standard Sensors

BOS 50K

Sensing distance 2 m, 3.5 m



Photoelectric sensors

Photoelectric standard sensors

Cylinder designs

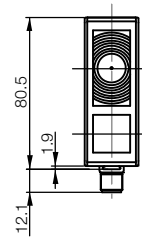
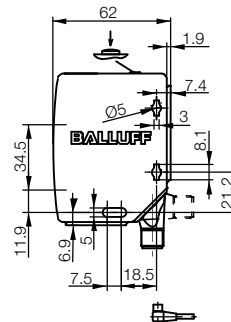
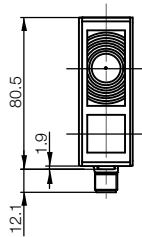
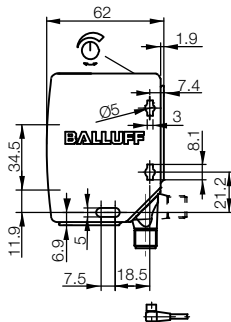
Block designs

Photoelectric special sensors

Photoelectric distance sensors for analog distance measurement

Special accessories for photoelectric sensors

Diffuse sensor 1...2000 mm BOS01CS BOS 50K-PA-RD10-S4	Diffuse sensor 1...3500 mm BOS01JA BOS 50K-PU-RD11-S4 BOS01JJ IO-Link BOS 50K-PI-RD101-S4
BOS01CP BOS 50K-PS-RD10-S4	
BOS01J0 BOS 50K-PO-RD10-S4	
10...30 V DC 100 mA ≤ 50 mA Light/dark switching Yes/Yes Potentiometer, 270° LED, red light 630 nm 50x50 mm at 2 m	10...30 V DC 100 mA ≤ 50 mA Light/dark switching Yes/Yes Teach-in LED, red light 630 nm 80x80 mm at 3.5 m
Green LED Yellow LED Yellow LED, flashes	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	2.5 ms 200 Hz IP 67 -5...+55°C 10 klx ABS/PC Glass M12 connector, 4-pin

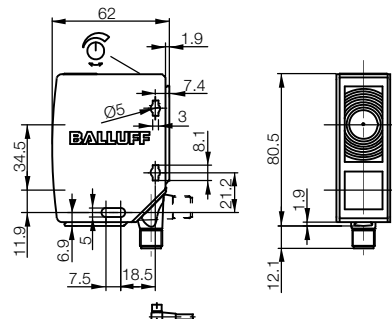




Type	Retroreflective sensor		
Detection range	0.1...18 m		
PNP NO/NC	Polarizing filter	Ordering code	BOS01CR
		Part number	BOS 50K-PA-PR10-S4
PNP NO	Polarizing filter	Ordering code	BOS01CL
		Part number	BOS 50K-PS-PR10-S4
PNP NC	Polarizing filter	Ordering code	BOS01HY
		Part number	BOS 50K-PO-PR10-S4
Emitter	Test input	Ordering code	
		Part number	
Emitter		Ordering code	
		Part number	
Supply voltage U_B	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		

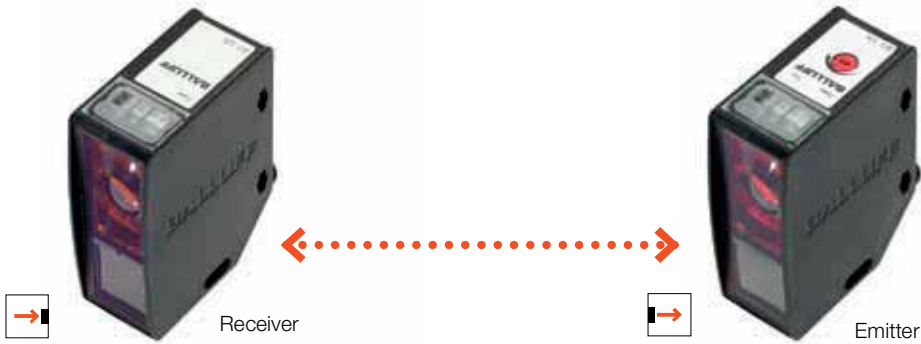
Retroreflective sensor values referenced to R1 reflector.

For wiring diagrams see page 229.



Photoelectric Standard Sensors

BOS 50K Range 60 m



Photoelectric sensors

Photoelectric standard sensors

Cylinder designs

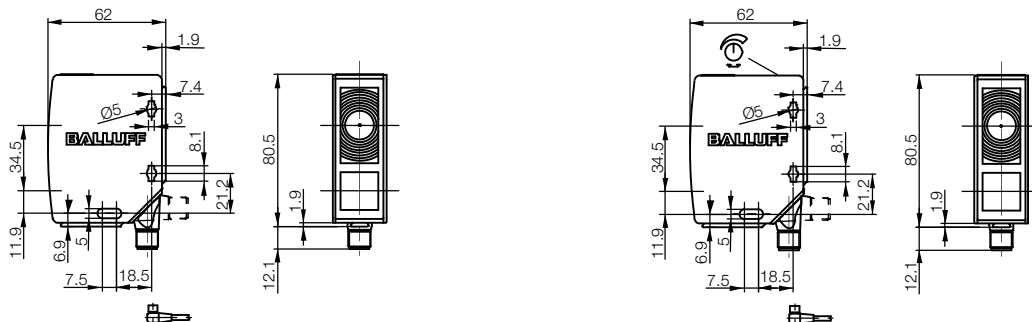
Block designs

Photoelectric special sensors

Photoelectric distance sensors for analog distance measurement

Special accessories for photoelectric sensors

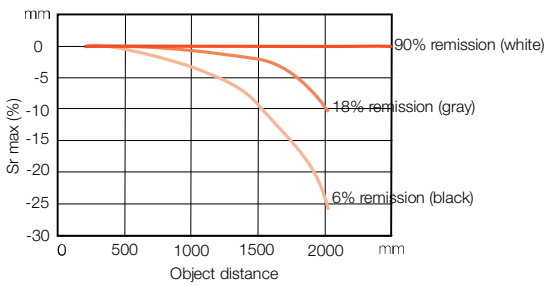
Through-beam sensor 0...60 m	Through-beam sensor 0...60 m
BOS01CK	
BOS 50K-PA-RE10-S4	
BOS01CM	
BOS 50K-PS-RE10-S4	
BOS01H2	
BOS 50K-PO-RE10-S4	
	BOS01CN
	BOS 50K-XT-RS10-S4
	BOS01EU
	BOS 50K-X-RS10-S4
10...30 V DC	10...30 V DC
100 mA	
≤ 35 mA	≤ 50 mA
Light/dark	
Yes/Yes	Yes/Yes
Fixed	Potentiometer, 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	IP 67
-5...+55°C	-5...+55°C
10 klx	10 klx
ABS/PC	ABS/PC
Glass	Glass
M12 connector, 4-pin	M12 connector, 4-pin



BOS 50K

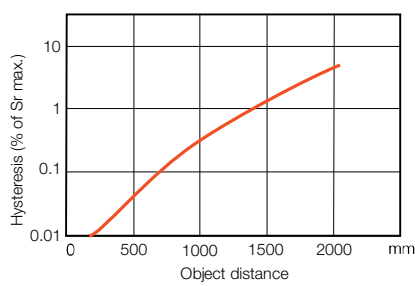
Function diagrams

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



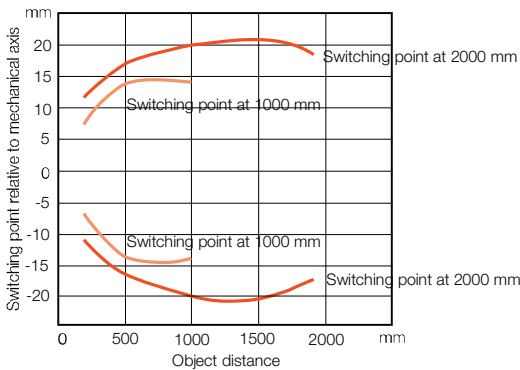
Switching distance deviation depending on object distance
 With differing level of remission

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



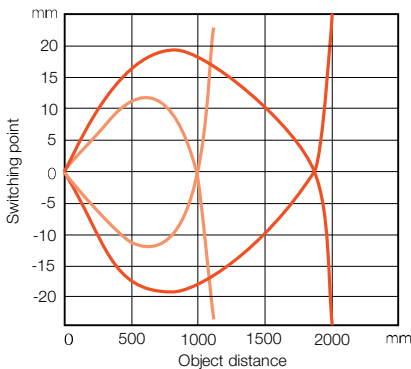
Switching hysteresis depending on object distance

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



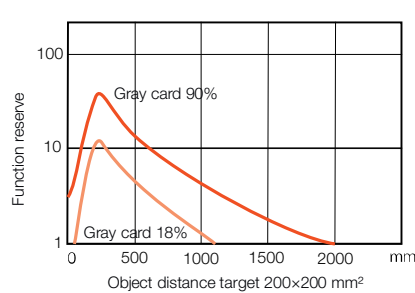
Response curve with switch-on point from left and right side

Diffuse sensor
BOS 50K-...-RD10-S4



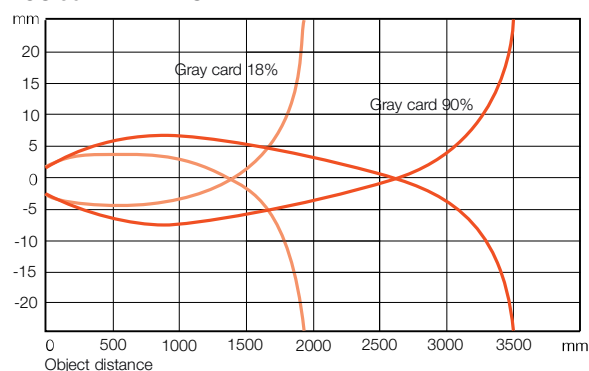
Response curve depending on distance

Diffuse sensor
BOS 50K-...-RD10-S4



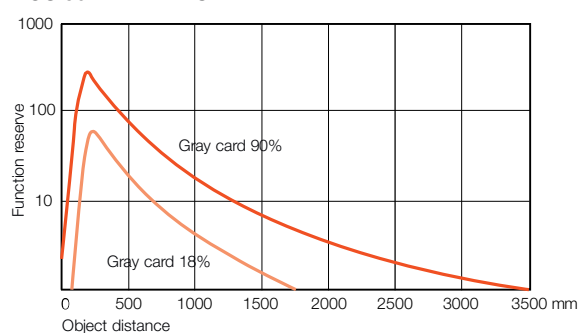
Function reserve depending on distance

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



Response curve depending on object distance

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



Function reserve depending on object distance

Photoelectric Standard Sensors

BOS 50K

Function diagrams, connection, accessories



Photoelectric sensors

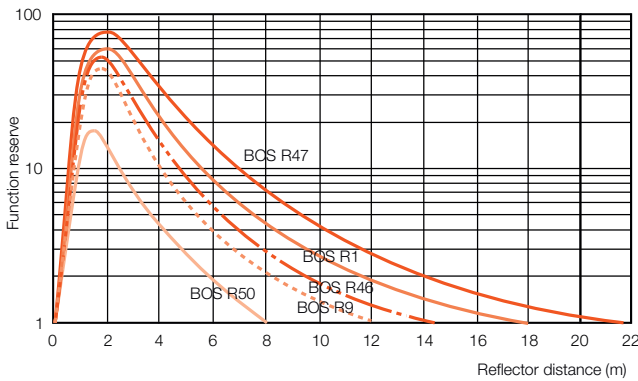
Photoelectric standard sensors
Cylinder designs
Block designs

Photoelectric special sensors

Photoelectric distance sensors for analog distance measurement

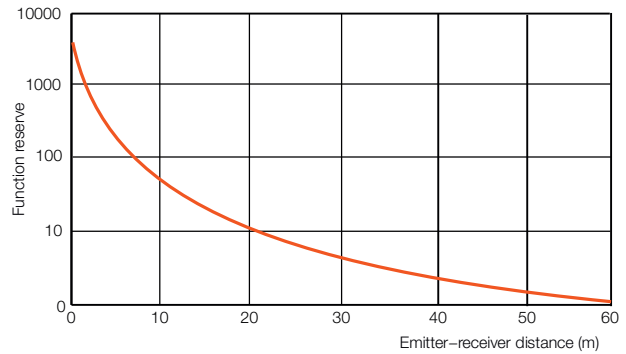
Special accessories for photoelectric sensors

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



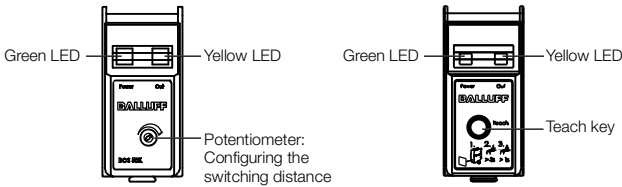
Function reserve depending on distance between sensor and reflector

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

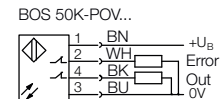
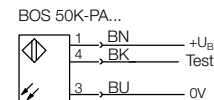
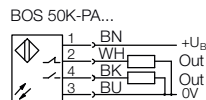
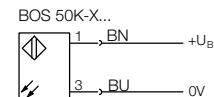
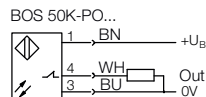
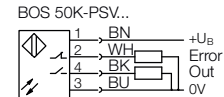
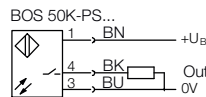


Function reserve depending on distance between emitter and receiver

Indicators and operating elements



Connection button



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 connector (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.

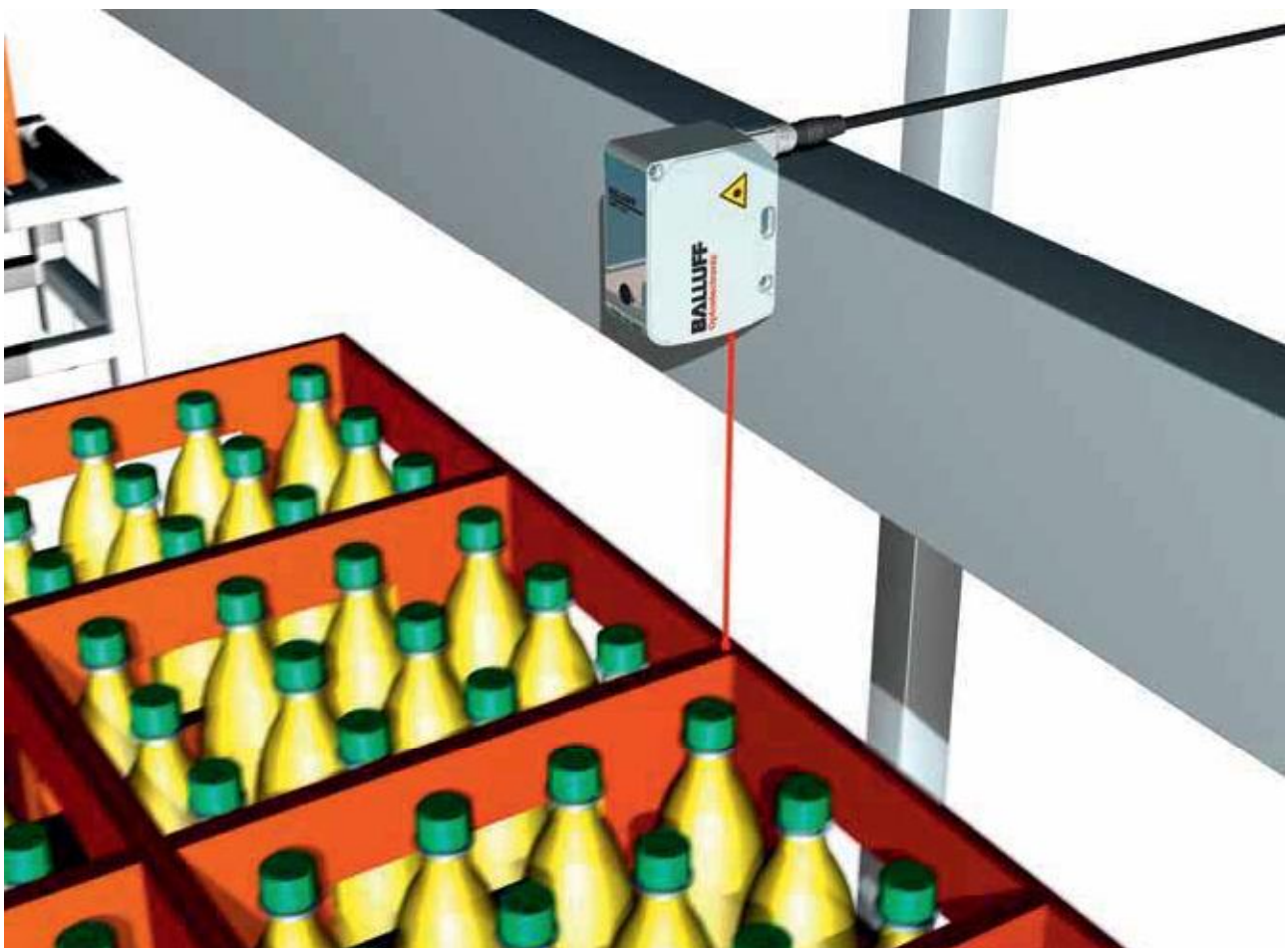
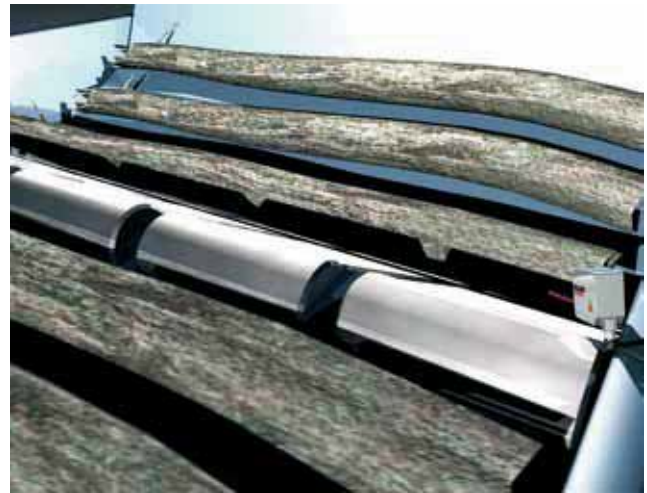
You can find special accessories for photoelectric sensors, such as **reflectors, apertures, lenses, filters, and deflection heads**, in this catalog starting on page 379.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets, or the Balluff mounting system (BMS) in our **Accessory Product 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 **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 Standard Sensors


BOS 63M

Product overview

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
	Laser	2× PNP transistor	Light switching		15...30 VDC	M12 connector, 4-pin		
BOS019J BOS 63M-PS-LH13-S4	■	■	■	250 Hz	■	■		233

NPN on request



Photoelectric sensors

Photoelectric standard sensors

Cylinder designs

Block designs

Block designs

Photoelectric special sensors

Photoelectric distance sensors for analog distance measurement

Special accessories for photoelectric sensors

Photoelectric special sensors

Photoelectric distance sensors for analog distance measurement

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Special accessories for photoelectric sensors

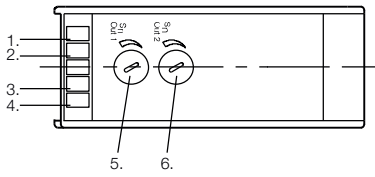
Photoelectric distance sensors for analog distance measurement

Special accessories for photoelectric sensors

BOS 63M

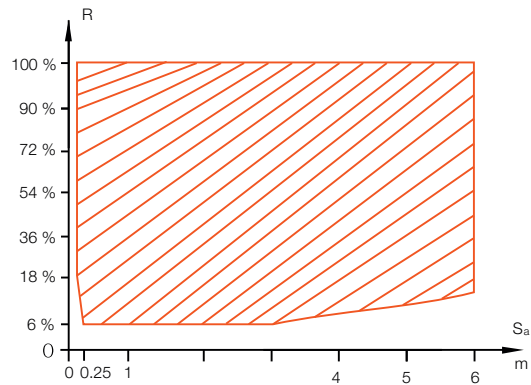
Function diagram, connection, accessories

Indicators and operating elements

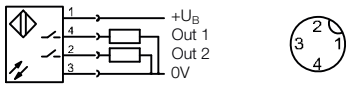


- 1. Power indicator (green)
- 2. Output function indicator Out 1 (yellow)
- 3. Output function indicator Out 2 (yellow)
- 4. Error indicator (red)
- 5. 4-turn potentiometer for switching distance 1
- 6. 4-turn potentiometer for switching distance 2

Working range as a function of object reflectivity



Wiring diagram



Recommended accessories
(please order separately)

Description	Ordering code
Mounting bracket	BAM00P6



You can find special accessories for photoelectric sensors, such as **reflectors, apertures, lenses, filters, and deflection heads**, in this catalog starting on page 379.

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

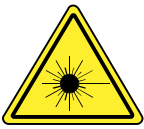
Suitable connector
(please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M12, 8-pin	Straight	PUR	Black	5 m	BCC06K2
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 Standard Sensors

BOS 63M

Sensing distance 6 m



Photoelectric sensors

Photoelectric standard sensors

Block designs

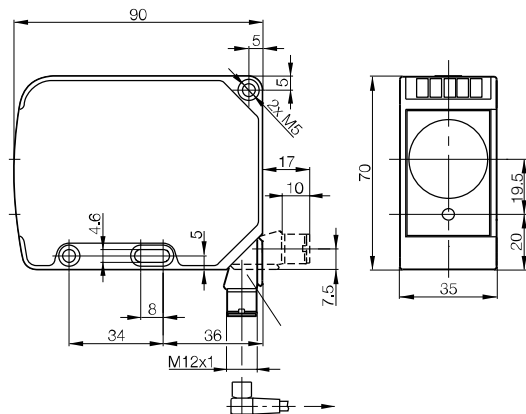
Photoelectric special sensors

Photoelectric distance sensors for analog distance measurement

Special accessories for photoelectric sensors

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_B	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	

Diffuse sensor values referenced to 90% reflective Kodak gray card, 400x400 mm.



High-performance sensors are particularly in demand for harsh applications. This is why our BOS 65K has a 3 A output at 264 V AC and a very long sensing distance and range. Additionally, it provides an adjustment aid and time functions.

The following variants with a robust plastic housing and large terminal compartment can be delivered:

- Diffuse sensor
- Diffuse sensor with background suppression
- Retroreflective sensor with polarizing filter
- Through-beam sensor

The sensors have a relay output.

The photoelectric sensors operate with alternating light in the visible red and infrared light range.

Features

- Universal voltage model 17...264 V AC with relay output
- Light/dark switching
- Version with various time functions (2 times can be set)
- Wiring compartment with cable gland PG 11

Applications

- Conveyor technology
- Machine tool building
- Packaging technology
- Assembly and handling automation
- Gate controls
- Warehouse technology



Photoelectric Standard Sensors

BOS 65K (AC)

Product overview



Photoelectric sensors




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Photoelectric distance sensors for analog distance measurement

Special accessories for photoelectric sensors

Type	Sensing distance/ Range	Light type		Out-put	Switching type		Switching frequency	U _s	Connection		Features	Page
		Red light	Infrared		Light switching	Dark switching			Wiring chamber	Polarizing filter		
 Diffuse sensor with background suppression												
BOS00N2 BOS 65K-1-M110T-1	0.2...1.1 m	■		■		■	■	10 Hz	■	■		236
 Diffuse sensor												
BOS00N1 BOS 65K-1-C200T-1	0.05...2 m			■		■	■	10 Hz	■	■		236
 Retroreflective sensor												
BOS00N0 BOS 65K-1-B8T-1	0.3...8 m	■				■	■	10 Hz	■	■	■	237
 Through-beam sensor Receiver												
BOS00E4 BLE 65K-1-F50T-1	0...50 m			■		■	■	10 Hz	■	■		237
 Through-beam sensor Emitter												
BOS00F4 BLS 65K-1-G50-1	0...50 m			■					■	■		237

- Ordering code
- Part number

Photoelectric Standard Sensors

BOS 65K (AC)

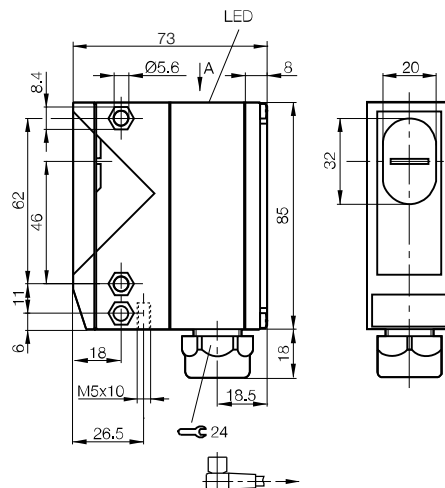
Sensing distance 1.1 m, 2 m



Type	Diffuse sensor with background suppression		Diffuse sensor
Detection range	0.2...1.1 m		0.05...2 m
Relay 3A, 250 V AC	Time function	Ordering code BOS00N2	Ordering code BOS00N1
		Part number BOS 65K-1-M110T-1	Part number BOS 65K-1-C200T-1
Relay 3A, 250 V AC	Time function	Ordering code	
	Polarizing filter, red light	Part number	
Relay 3A, 250 V AC	Time function	Ordering code	
	Receiver	Part number	
Relay 3A, 250 V AC	Time function	Ordering code	
	Emitter	Part number	
Supply voltage U_B	17...264 V AC		17...264 V AC
Switching type	Light and dark (switchable)		Light and dark (switchable)
Polarity reversal/short-circuit protected	Yes/No		Yes/No
Settings	Potentiometer, 270°		Potentiometer, 270°
Power-on indicator			
Output function indicator	Red LED		Red LED
Stability indicator	Green LED		Green LED
Response time	20 ms		20 ms
Switching frequency f	10 Hz		10 Hz
Degree of protection as per IEC 60529	IP 67		IP 67
Ambient temperature T_a	-20...+55°C		-20...+55°C
Permissible ambient light	3 klx		3 klx
Material	Housing	PC	PC
	Optical surface	PMMA	PMMA
Connection	Wiring chamber		Wiring chamber
Max. conductor cross-section	0.75 mm ²		0.75 mm ²

Diffuse sensor values referenced to 90% reflective Kodak gray card.
Retroreflective sensor values referenced to R1 reflector.

For wiring diagrams see page 238.



Photoelectric Standard Sensors

BOS 65K (AC)

Range 8 m, 50 m



Photoelectric sensors

Photoelectric standard sensors

Cylinder designs
Block designs

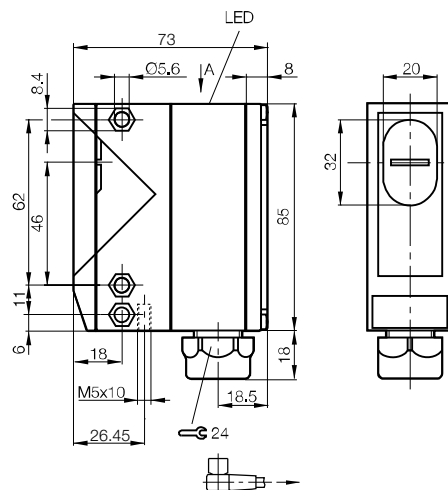
Photoelectric special sensors

Photoelectric distance sensors for analog distance measurement

Special accessories for photoelectric sensors



Retroreflective sensor 0.3...8 m	Through-beam sensor 0...50 m	Through-beam sensor 0...50 m	
BOS00N0 BOS 65K-1-B8T-1	BOS00E4 BLE 65K-1-F50T-1	BOS00F4 BLS 65K-1-G50-1	
17...264 V AC	17...264 V AC	17...264 V AC	
Light and dark (switchable)	Light and dark (switchable)		
Yes/No	Yes/No	Yes/No	
Potentiometer, 270°	Potentiometer, 270°		
Red LED	Red LED	Green LED	
Green LED	Green LED	Red LED	
20 ms	20 ms		
10 Hz	10 Hz		
IP 67	IP 67	IP 67	
-20...+55°C	-20...+55°C	-20...+55°C	
3 klx	3 klx		
PC	PC	PC	
PMMA	PMMA	PMMA	
Wiring chamber	Wiring chamber	Wiring chamber	
0.75 mm ²	0.75 mm ²	0.75 mm ²	

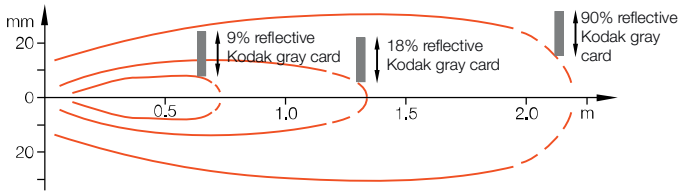


Photoelectric Standard Sensors

BOS 65K (AC)

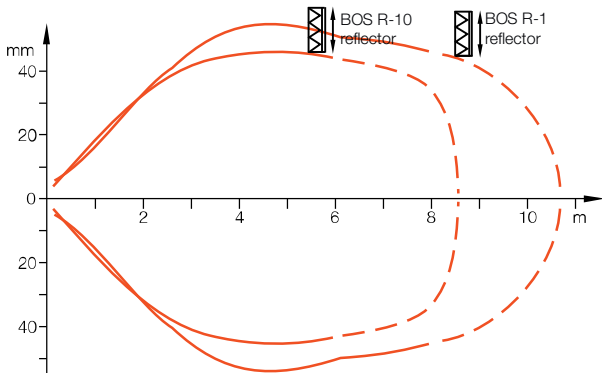
Function diagrams, connection

Diffuse sensor BOS 65K--C200T...



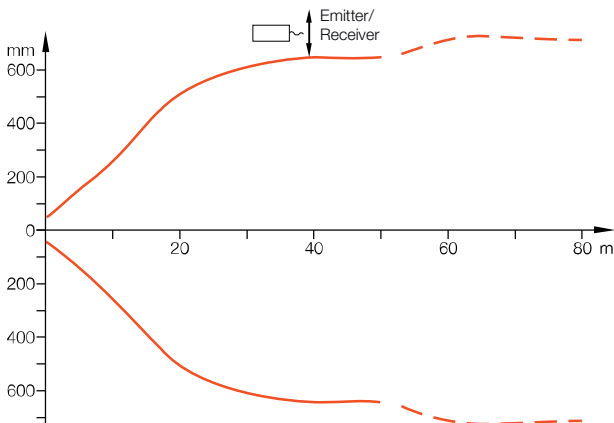
Sensing distance with side approach of Kodak gray card.

Retroreflective sensor with polarizing filter BOS 65K--B8T...



Range measured with side approach of reflector.

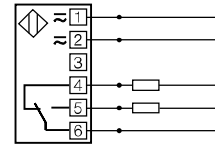
Through-beam sensor BLE/BLS 65K-...



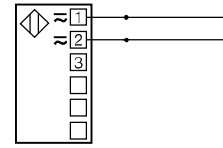
For a through-beam sensor, the maximum possible offset between the emitter and receiver is measured.

Wiring diagrams

BOS/BLE 65K-1-...
AC, screw terminals



BLS 65K-1-...
AC, screw terminals

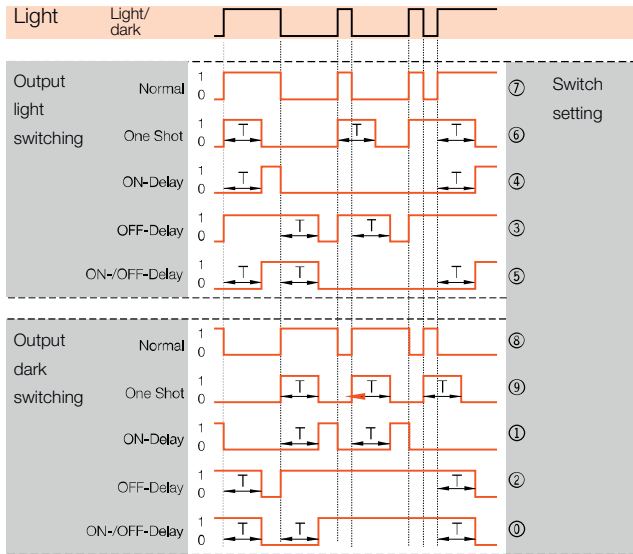


Photoelectric Standard Sensors

BOS 65K (AC)

Definitions, accessories

Programmable time functions



Green indicates stability

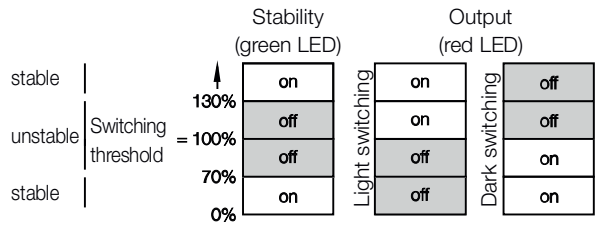
The threshold energy, which triggers a signal change at the output, is defined as 100%.

A switching state is stable if the input energy exceeds or falls below the threshold energy by 30%.

(The green LED illuminates.)

Thus the safe range arises if the input signal

- exceeds at least 130% of the threshold energy, or
- falls below at least 70% of the threshold energy.



Recommended accessories

(please order separately)

Description	Ordering code
① Reflector	BAM00UK
② Mounting bracket	BAM0125



You can find special accessories for photoelectric sensors, such as **reflectors, apertures, lenses, filters, and deflection heads**, in this catalog starting on page 379.

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



Photoelectric sensors

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Cylinder designs
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Special accessories for photoelectric sensors