

Due to its high performance, the **BOS 6K** can be used almost anywhere. When space is at a premium, it is particularly advantageous. This is because its small size allows better integration of the sensors into the machine. Red light and background suppression make the sensor extremely user-friendly.

Additionally, there are multiple varieties of lasers for an "absolute" detection of small parts, so that even objects smaller than 1 mm can be accurately measured.

Calibration using the control lines means the sensor can be installed at virtually inaccessible locations. Dynamic teach-in in running operation means less attention needs to be paid to the sensors.

Features

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

Applications

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



Photoelectric Sensors

BOS 6K

Product Overview



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

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Photoelectric Distance Sensors for Analog Distance Measurement

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

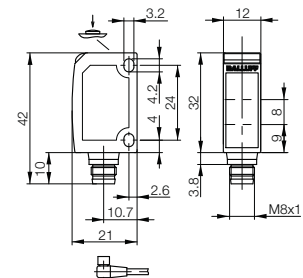
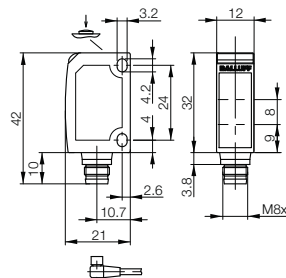
NPN on request



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

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

For wiring diagrams see page 180.



Photoelectric Sensors

BOS 6K



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

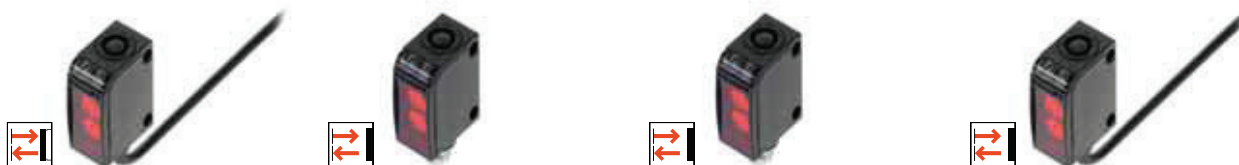
Angle Sensors

BWL

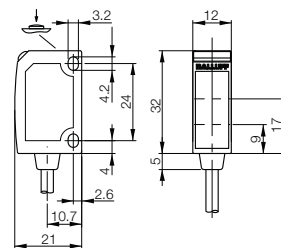
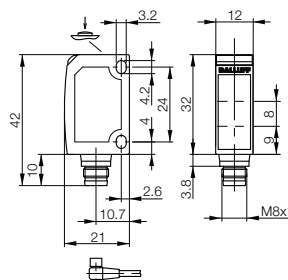
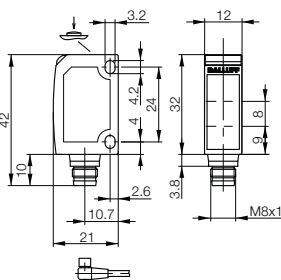
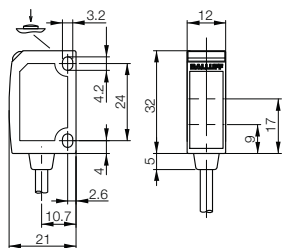
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



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

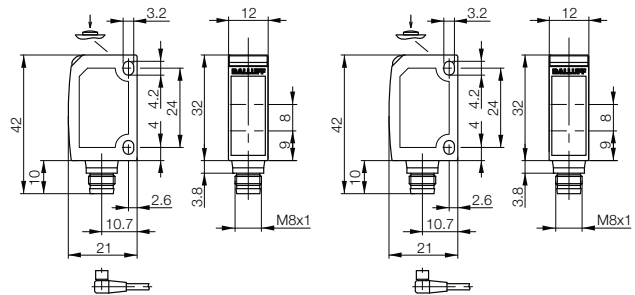




Type	Retroreflective sensor		Retroreflective sensor	
Detection range	50...700 mm		50...700 mm	
PNP NC/NO	Polarizing filter, Glass detection	Ordering code	BOS00AE	BOS00AC
		Part number	BOS 6K-PU-1QA-S75-C	BOS 6K-PU-1QA-S49-C
PNP NC/NO	Polarizing filter	Ordering code		
		Part number		
Supply voltage U_s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

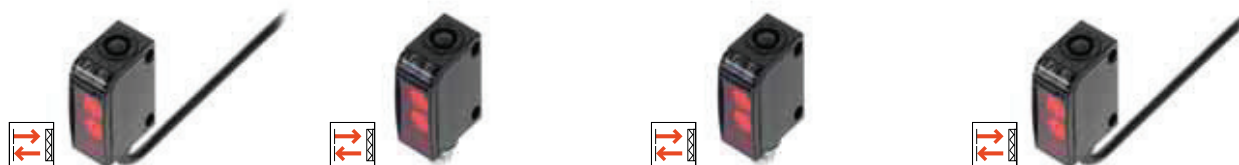
Reference reflector: BOS R-9

For wiring diagrams see page 180.

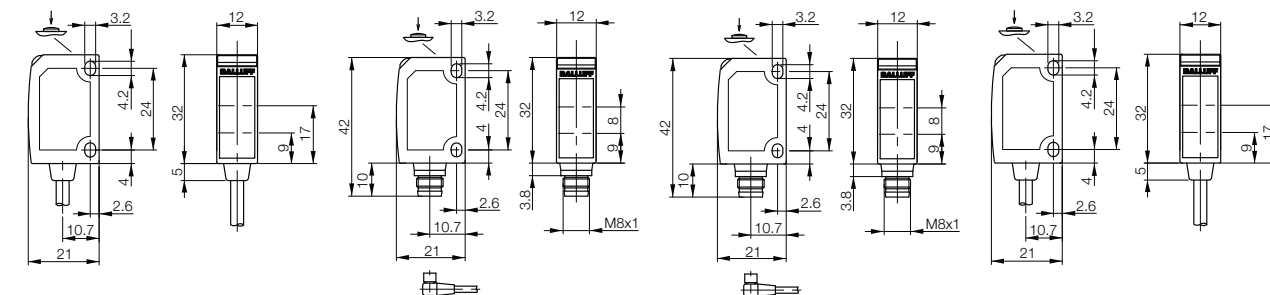


Photoelectric Sensors

BOS 6K



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



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

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Angle Sensors

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Photoelectric Sensors with Special Properties

Photoelectric

Distance

Sensors for Analog

Distance

Measurement

Accessories for

Photoelectric

Sensors



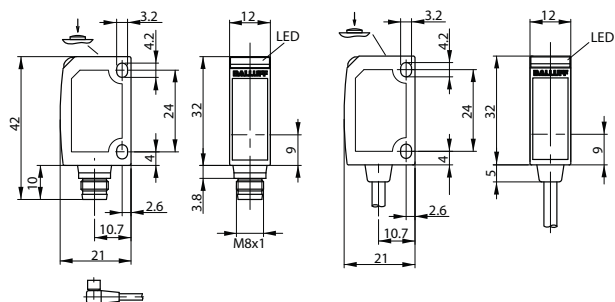
Type			Retroreflective light sensor with autocollimation	Retroreflective light sensor with autocollimation
Detection range			0...500 mm	0...500 mm
PNP NC/NO	Polarizing filter, glass detection, autocollimation	Ordering code	BOS00AL	BOS00AK
		Part number	BOS 6K-PU-1TA-S75-C	BOS 6K-PU-1TA-C-02
PNP NC/NO	Receiver	Ordering code		
		Part number		
	Emitter	Ordering code		
		Part number		
Supply voltage U_s			10...30 V DC	10...30 V DC
Output current			100 mA	100 mA
No-load supply current I_0 max.			≤ 25 mA	≤ 25 mA
Switching type			Light/dark switching (selectable)	Light/dark switching (selectable)
Polarity reversal/short-circuit protected			Yes/Yes	Yes/Yes
Settings			Teach-in	Teach-in
Emitter, light type			LED, red light	LED, red light
Wavelength			660 Nm	660 Nm
Light spot diameter			20x20 mm up to 500 mm	20x20 mm up to 500 mm
Switching state indicator			Yellow LED	Yellow LED
Stability indicator			Green LED	Green LED
Response time			0.5 ms	0.5 ms
Switching frequency f			1 KHz	1 KHz
Degree of protection as per IEC 60529			IP 67	IP 67
Ambient temperature T_a			-20...+60 °C	-20...+60 °C
Permissible ambient light per			5 klx	5 klx
Material	Housing		Impact-resistant ABS	Impact-resistant ABS
	Optical surface		PMMA	PMMA
Connection			M8 connector, 4-pin	2 m cable PCV, 4x0.14 mm ²

Reference reflector: BOS R-22

For wiring diagrams see page 180.

can only be used with reflector BOS R-22

can only be used with reflector BOS R-22



Photoelectric Sensors

BOS 6K



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



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

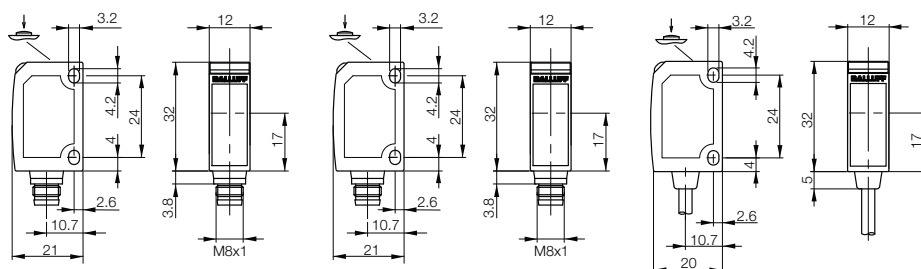
Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

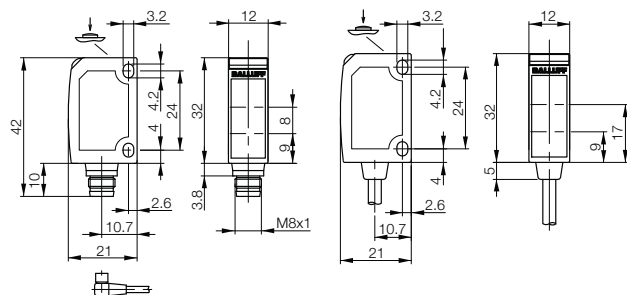




Type			Diffuse sensor with background suppression	Diffuse sensor with background suppression
Detection range			20...60 mm	20...60 mm
PNP	NC/NO	Ordering code	BOS00A0	BOS009Z
Part number			BOS 6K-PU-1LHA-S75-C	BOS 6K-PU-1LHA-C-02
PNP	NC/NO	Polarizing filter	Ordering code	
Part number				
Supply voltage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

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

For wiring diagrams see page 180.

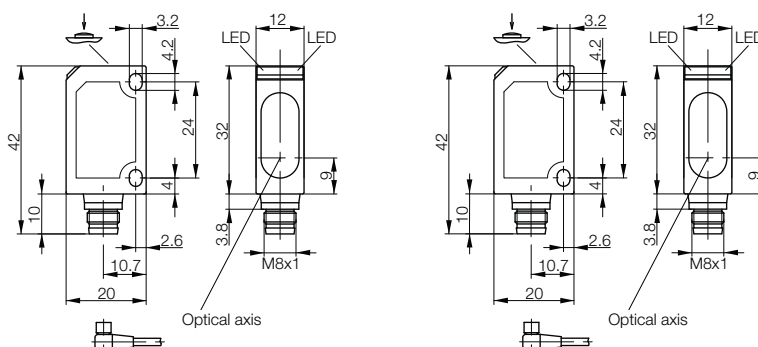




Type	Retroreflective light sensor with autocollimation		BOS01CH	Retroreflective light sensor with autocollimation		BOS01HH
Detection range			0...4 m			0...4 m
PNP	Polarizing filter	Ordering code	BOS01CH			BOS01HH
		Part number	BOS 6K-PU-1LQD-S75-C			BOS 6K-PU-1LQD-S49-C
Supply voltage U_S			10...30 V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

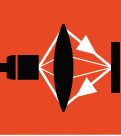
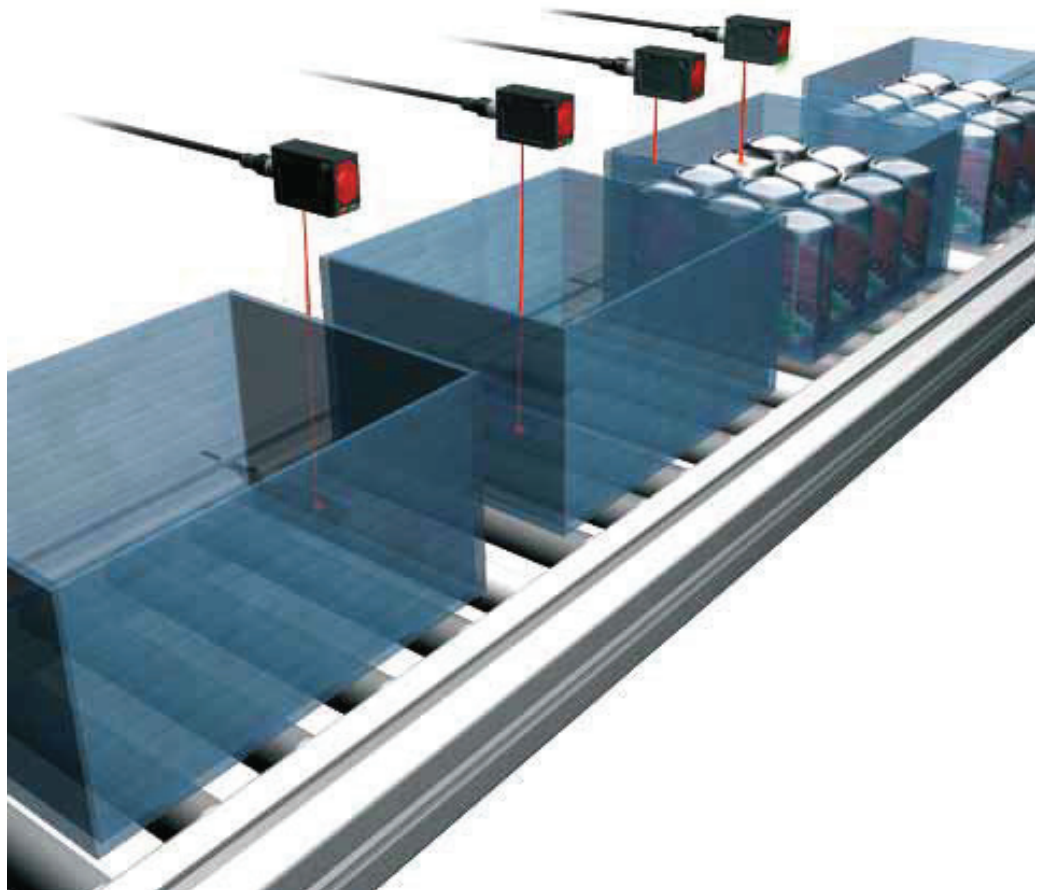
Reference reflector: BOS R-22

Wiring diagrams on page 176.





Photoelectric Sensors BOS 6K Laser



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

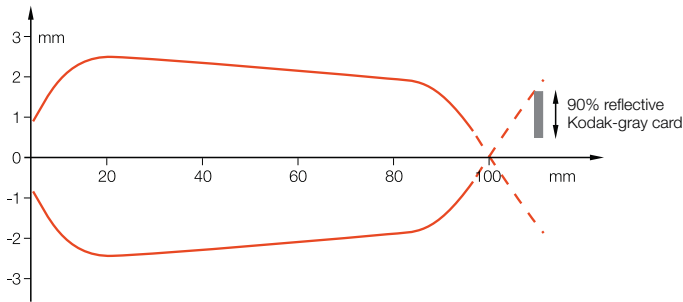
BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

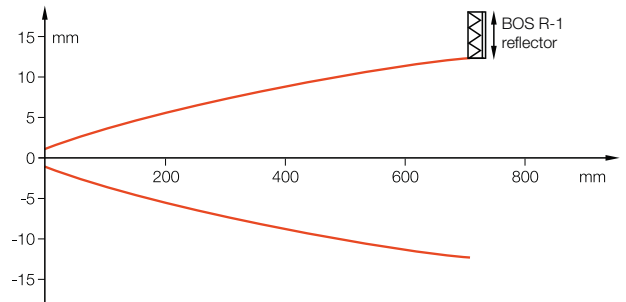
Accessories for Photoelectric Sensors

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



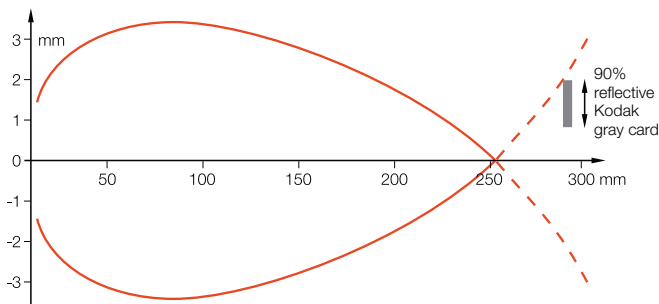
Sensing distance with side approach of Kodak-gray card.

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



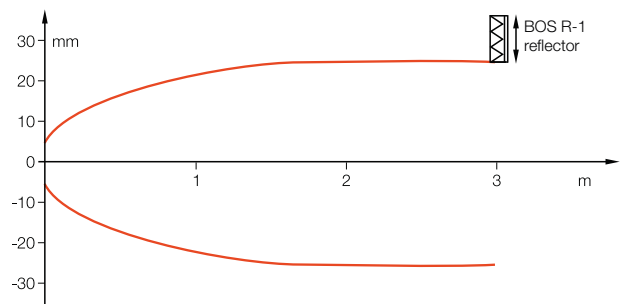
Range measured with side approach with reflector.

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



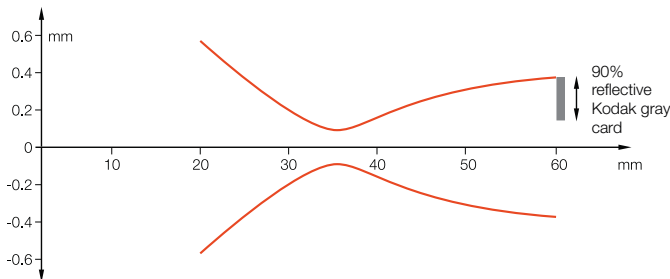
Sensing distance with side approach of Kodak-gray card.

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



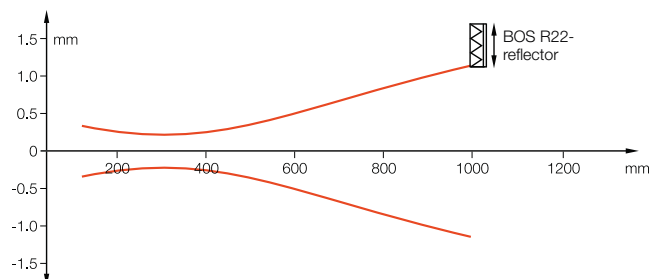
Range measured with side approach with reflector.

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



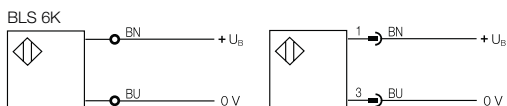
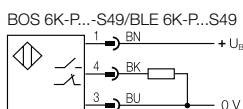
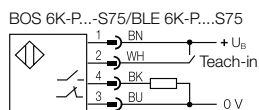
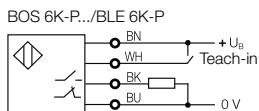
Sensing distance with side approach of Kodak-gray card.

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



Range measured with side approach with reflector.

Wiring diagrams

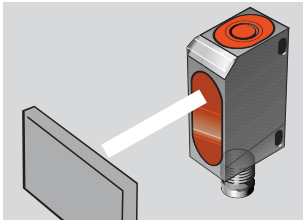


Photoelectric Sensors

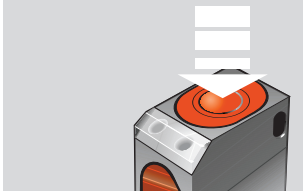
BOS 6K

Configuration notes, accessories

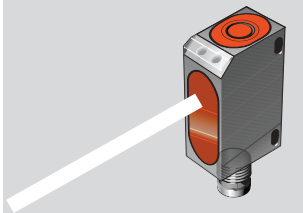
Diffuse sensor



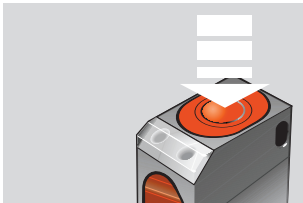
Direct sensor at object.



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

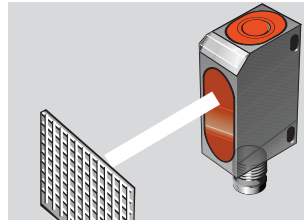


Remove object from beam path.

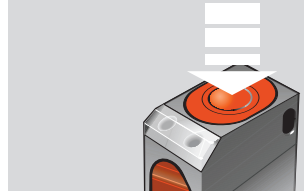


Hold down button for 1 sec. Green LED flashes briefly and then stays on. The sensor is ready. If both LEDs blink at the same time, reconfigure your settings.

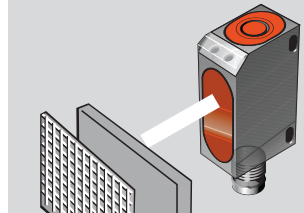
Retroreflective/through-beam



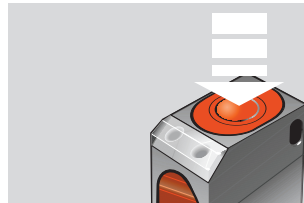
Direct sensor at reflector/receiver.



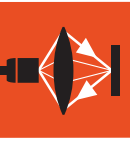
Press button for approx. 3 sec. until both LEDs flash at the same time.



Bring objects into detection range.



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



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Recommended accessories (please order separately)

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



Suitable connectors (please order separately)



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

Connectors without LED are suitable for PNP and NPN sensors.

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

Connectors without LED are suitable for PNP and NPN sensors.

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

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

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