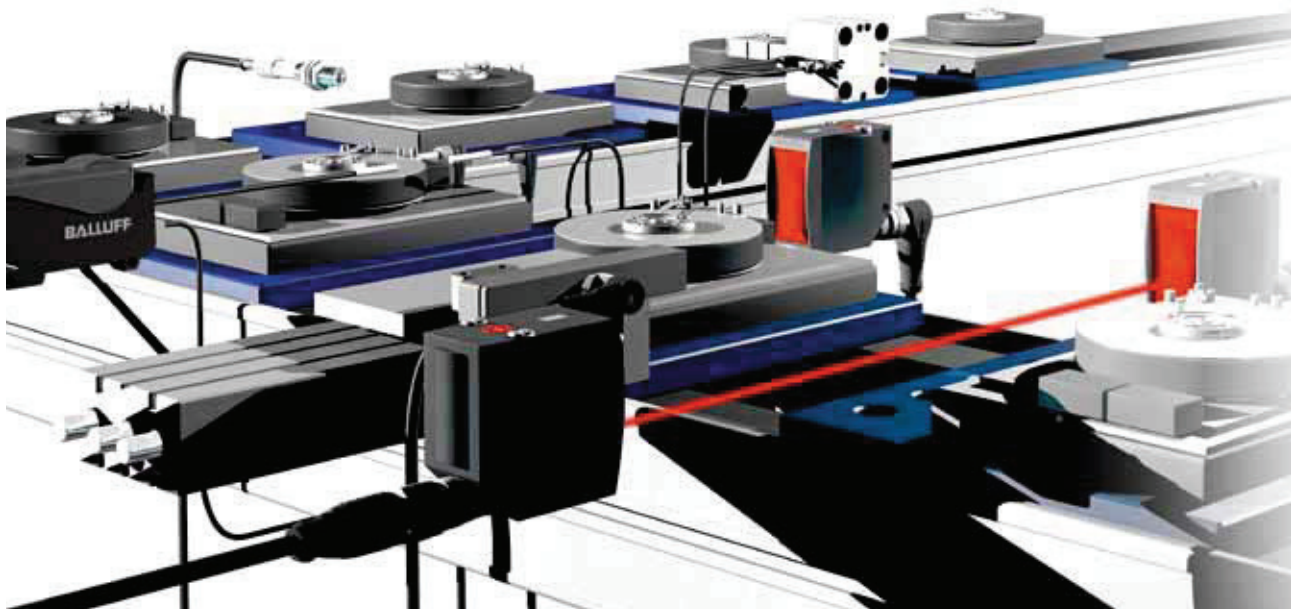


The new photoelectric series **BOS 23K** stands for precise switching behavior with exact positioning tasks. Its high ranges and compact design provide for great freedom in designing the system.

The laser variants are ideal for detecting small parts.

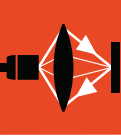
Additional Features

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



Photoelectric Sensors

BOS 23K



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

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

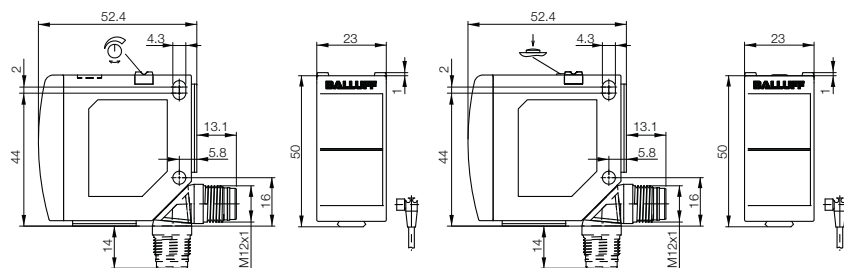
NPN on request



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

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

For wiring diagrams see page 207.



Photoelectric Sensors

BOS 23K



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

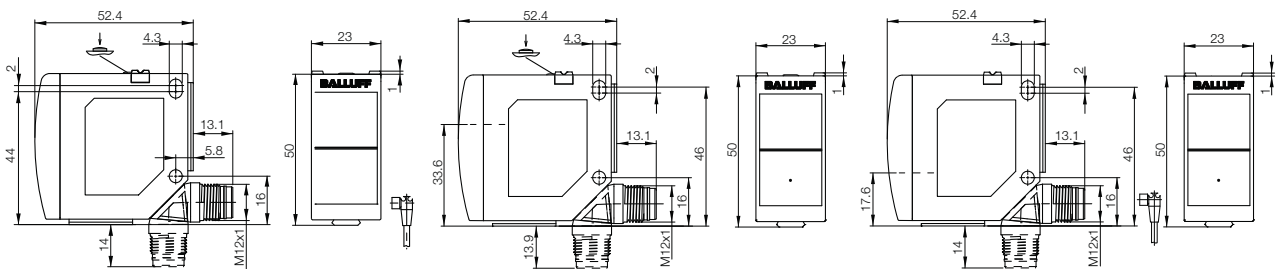
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



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





Laser Class 1

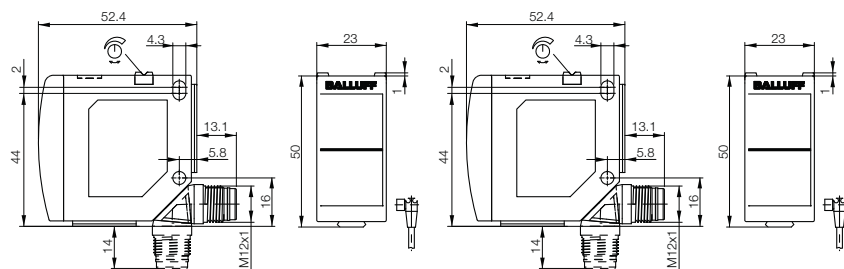


Laser Class 2

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

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

For wiring diagrams see page 207.





Photoelectric Sensors

BOS 23K Laser



Photoelectric Sensors

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

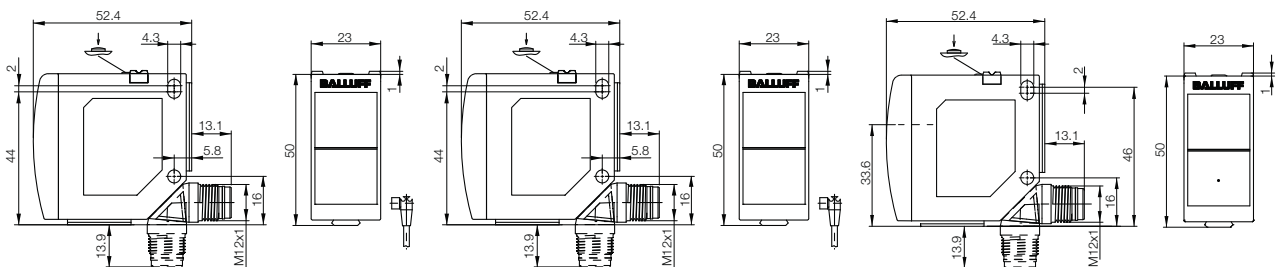
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



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



Photoelectric Sensors

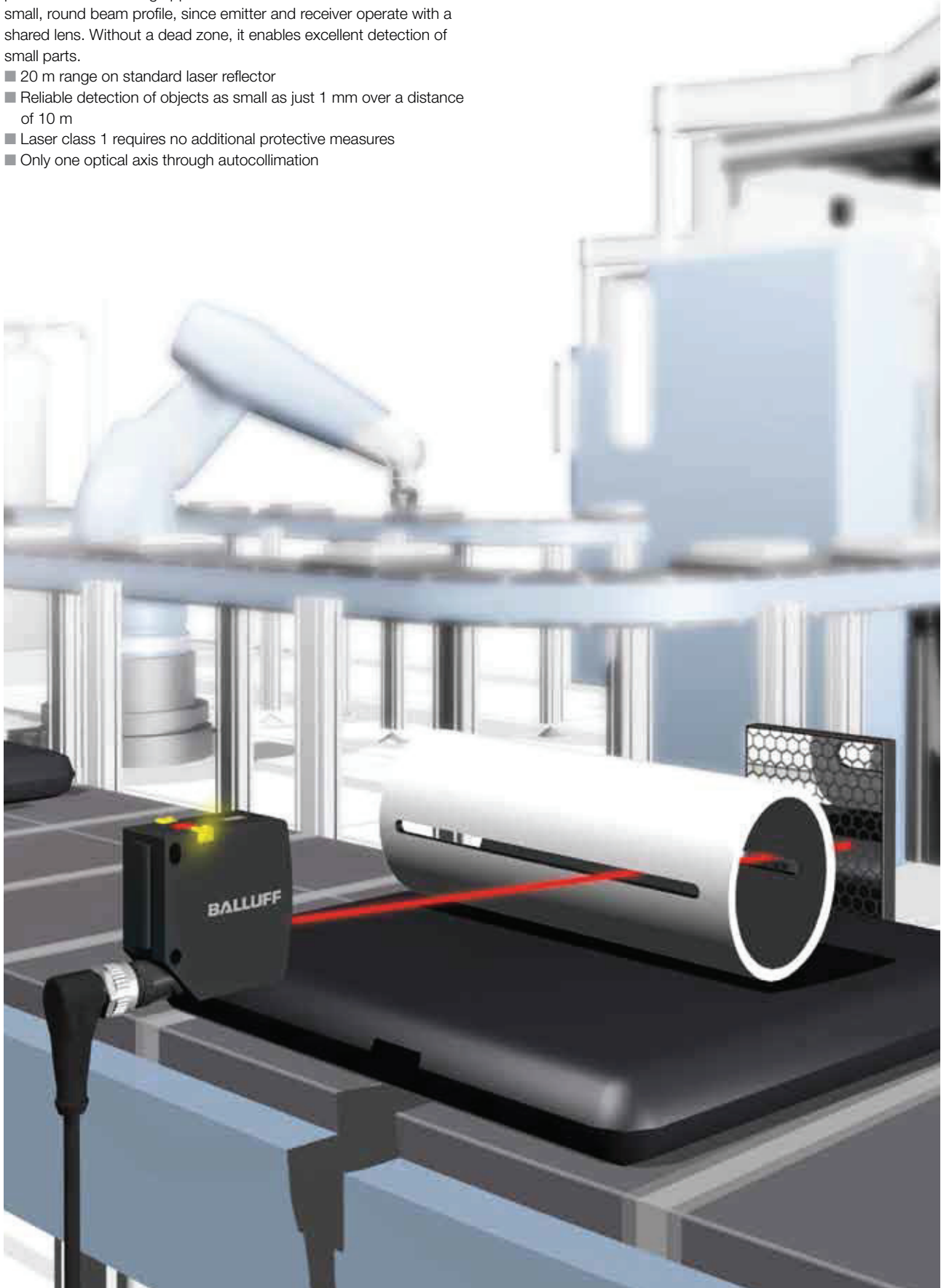
BOS 23K Laser retroreflective sensor with autocollimation

BOS 23K Laser

BOS 23K – ideal for detecting small parts

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

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





Photoelectric Sensors

BOS 23K Laser retroreflective sensor with autocollimation



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric 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

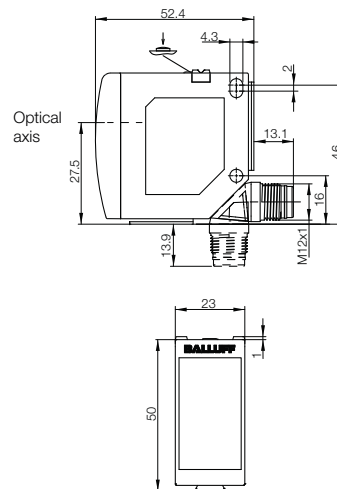
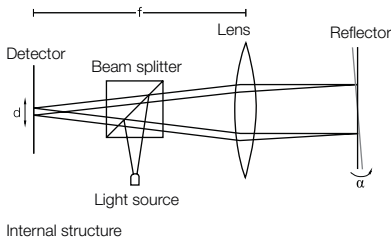
Photoelectric Distance Sensors for Analog Distance Measurement

Photoelectric Distance Sensors for Analog Distance Measurement

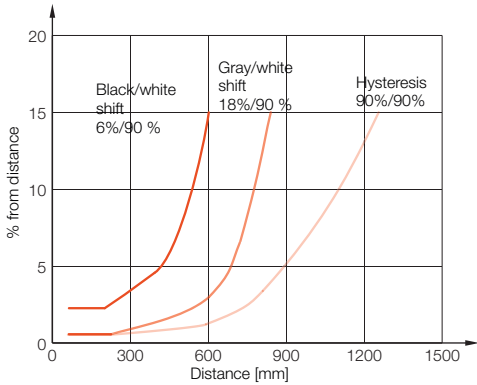
Type	Retroreflective sensor	
Detection range	0.1...20 m	
2×PNP complementary	Ordering code	BOS01NC
	Part number	BOS 23K-PA-LK10-S4
Supply voltage U_s	10...30 V DC	
Output current	100 mA	
No-load supply current I_0 max.	≤ 30 mA	
Switching type	Light/dark	
Polarity reversal/short-circuit protected	Yes/Yes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

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

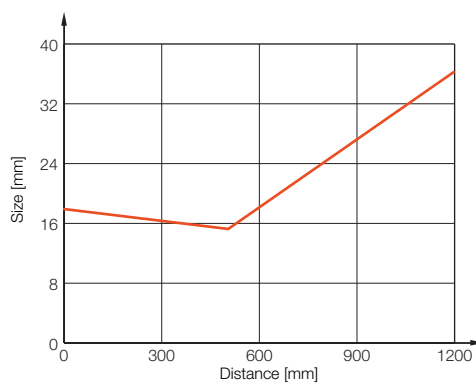
For wiring diagrams see page 207.



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



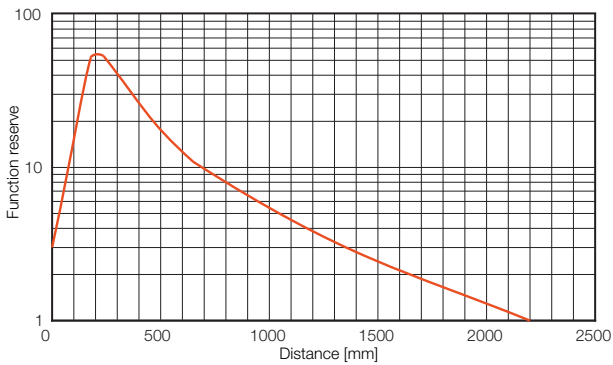
**Diffuse sensor with background suppression BOS 23K-...-RH10-...
Light spot size**



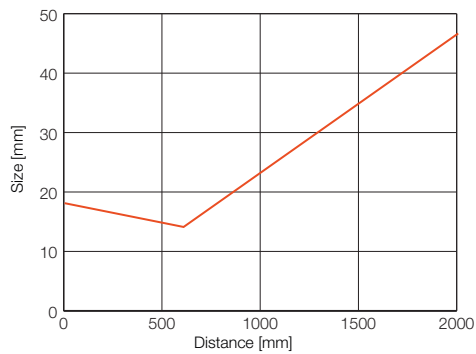
Detection range BOS 23K-...-RH10-...

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

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



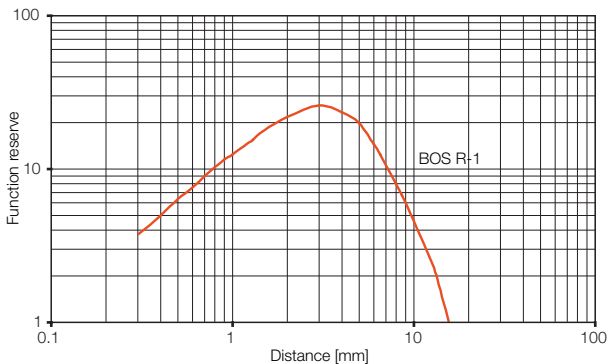
**Diffuse sensor BOS 23K-...-RD10-...
Light spot size**



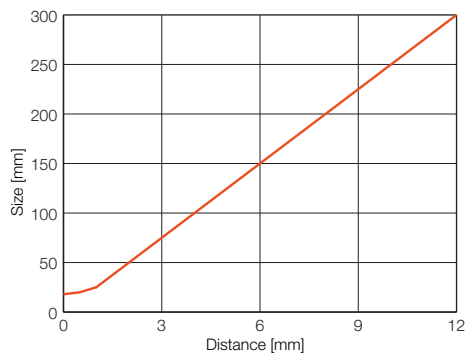
Detection range BOS 23K-...-RD10-...

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

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



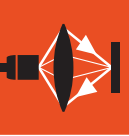
**Retroreflective sensor BOS 23K-...-RR10-...
Light spot diameter**



Photoelectric Sensors

BOS 23K

Function diagrams



Photoelectric Sensors

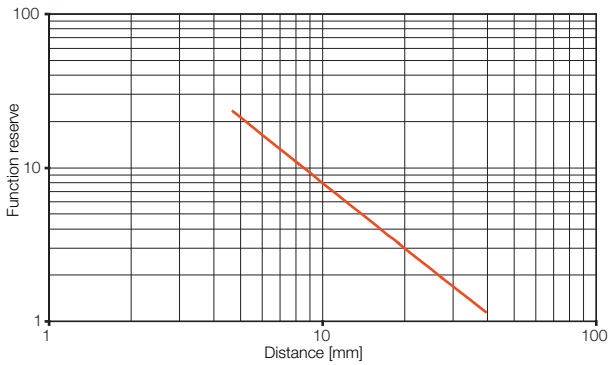
Photoelectric Sensors
Cylinder Designs
Block Designs
Fork Sensors
BGL
Angle Sensors
BWL

Photoelectric Sensors with Special Properties

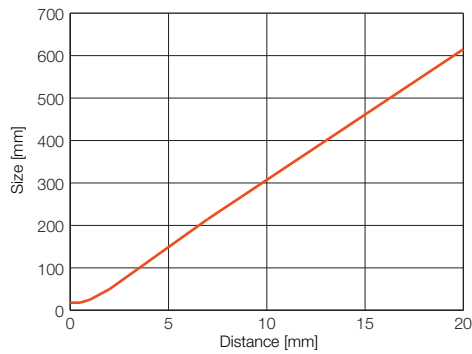
Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

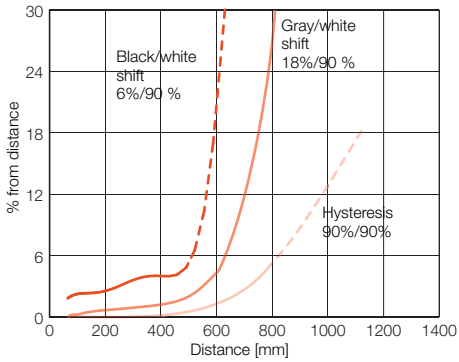
Through-beam sensor BOS 23K-...-RS../RE
Function reserve



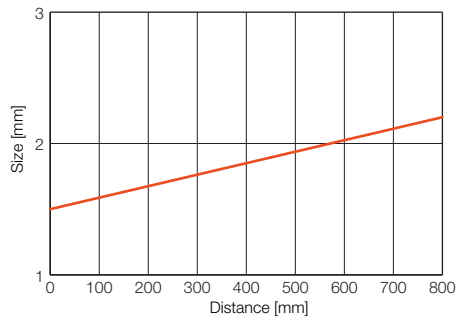
Through-beam sensor BOS 23K-...-RS../RE
Light spot size



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



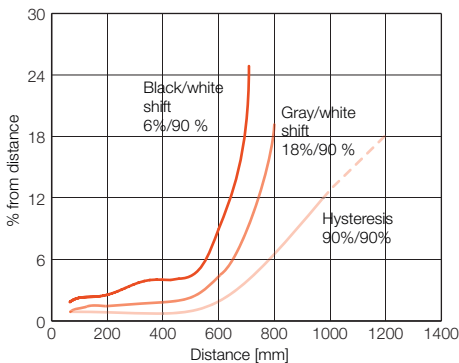
Laser diffuse sensor with background suppression BOS 23K-...-LH10-...
Light spot size



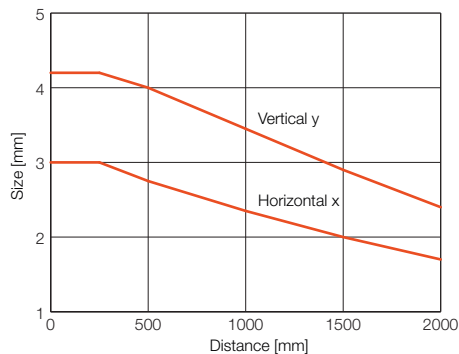
Detection range BOS 23K-...-LH10-...

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

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



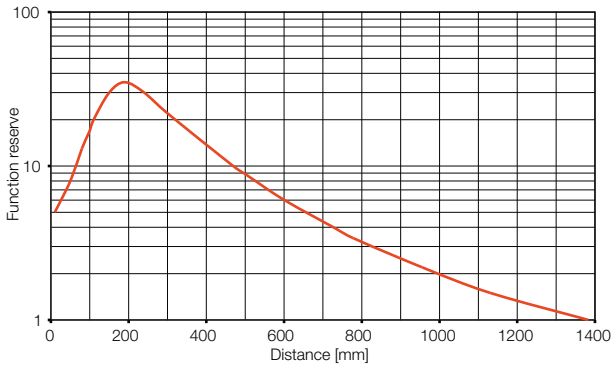
Laser diffuse sensor with background suppression BOS 23K-...-LH20-...
Light spot size



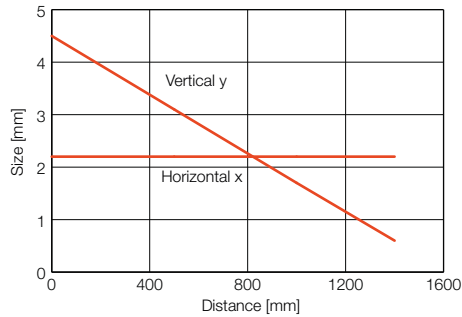
Detection range BOS 23K-...-LH20-...

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

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



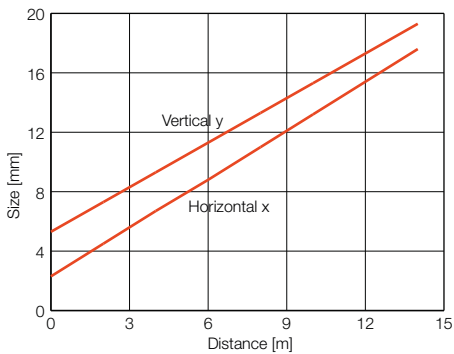
**Laser diffuse sensor BOS 23K-...LD20-...
 Light spot size**



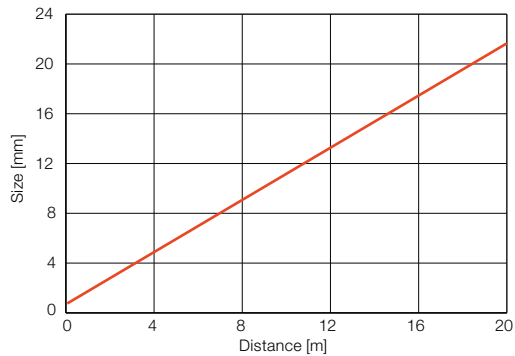
Detection range BOS 23K-...LD20-...

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

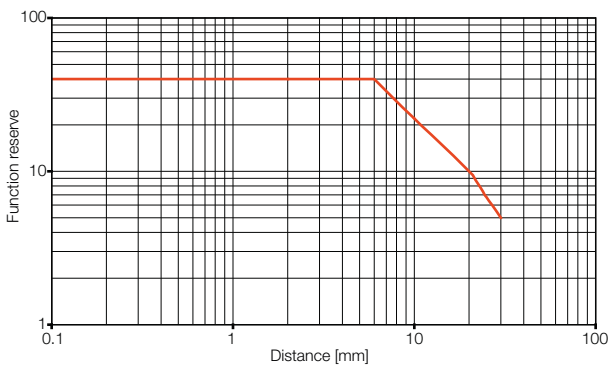
**Laser retroreflective sensor BOS 23K-...LR10-...
 Light spot size**



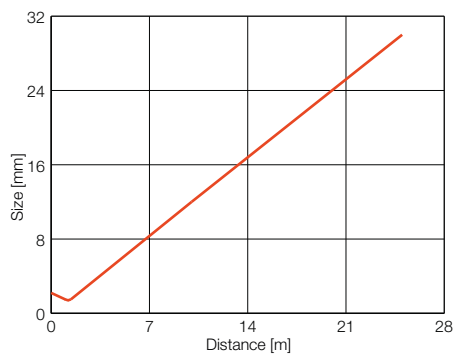
**Laser light sensor with autocollimation,
 BOS 23K-PA-LK10-S4, light spot size**



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



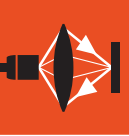
**Laser through-beam sensor BOS 23K-...LE../LS-...
 Light spot size**



Photoelectric Sensors

BOS 23K

Connection, accessories



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

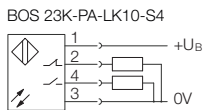
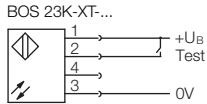
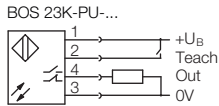
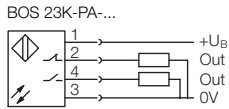
BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

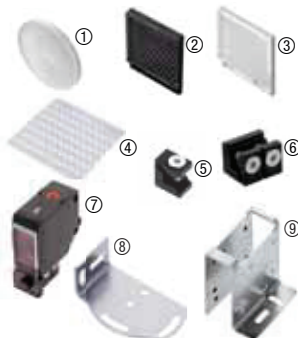
Accessories for Photoelectric Sensors

Wiring diagrams



Recommended accessories (please order separately)

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



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

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

Suitable connectors (please order separately)

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

Connectors without LED are suitable for PNP and NPN sensors.



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