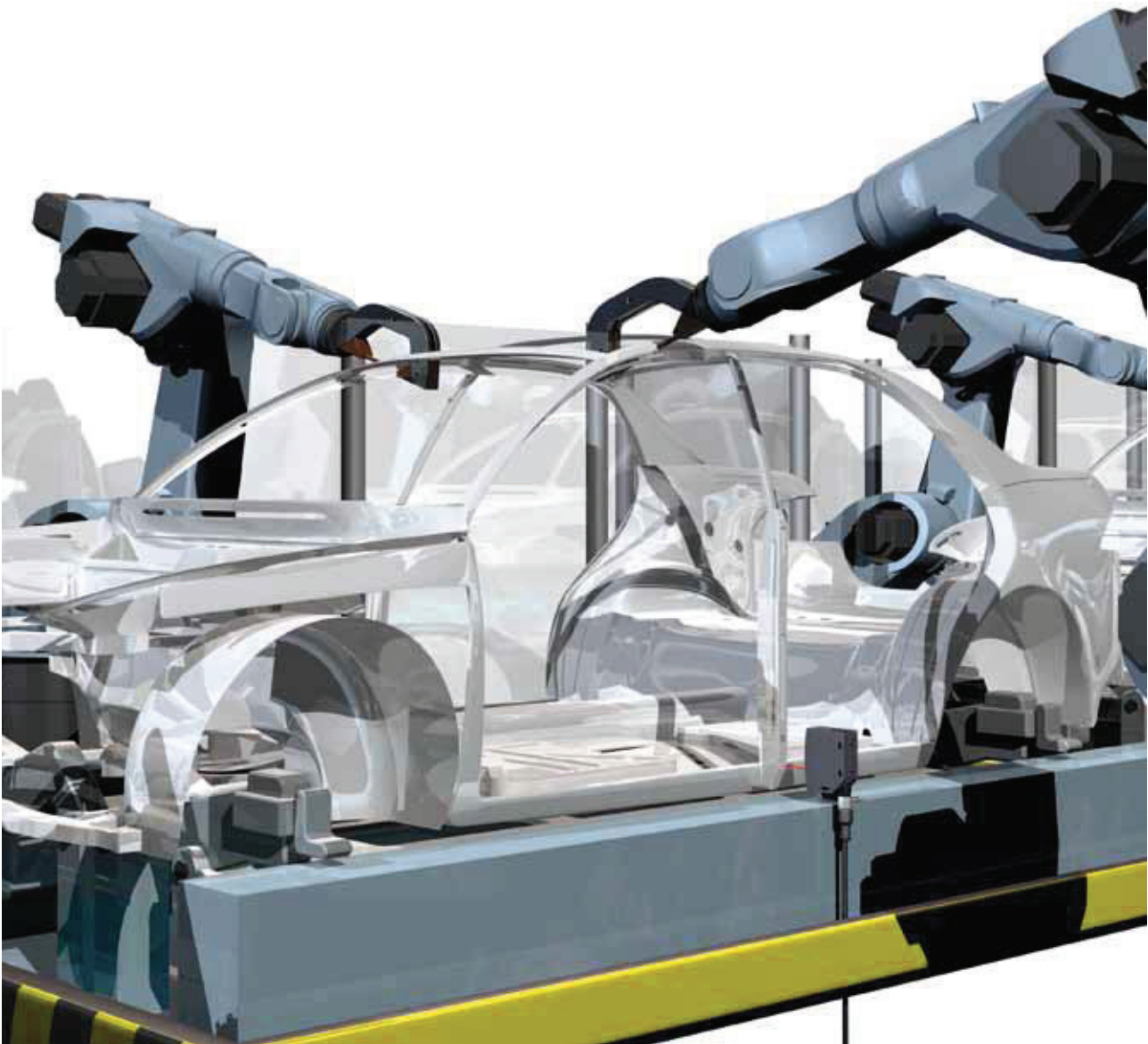


The new light barriers and diffuse sensors in the BOS 50K series combine top performance and compact dimensions. Thanks to their long range, these all-rounders are suitable for use in numerous sectors: from the automotive industry all the way to wood processing. The background suppression is particularly impressive with an almost color-independent detection of objects – and that at maximum sensing distance.

**The most important features at a glance**

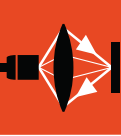
- Reliable object detection even at large distances
- Real background suppression for a sensing distance of up to 2 m even on dark objects
- Simple alignment due to bright, clearly visible beam spot
- Simple and fast setting with potentiometer
- Through-beam sensor with test input for function check
- Varied and time-saving assembly options



# Photoelectric Sensors

## BOS 50K

### Product overview



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type	Sensing distance/Range	Light type	Output			Switching type		Switching frequency	U <sub>S</sub>	Connec-tion	Special features		Page
			PNP transistor	IO-Link	Contamination output	Light switching	Dark switching				Polarizing filter	Teach-in	
Diffuse sensor with background suppression		Red light							10...30 V DC	M12 connector, 4-pin			
<b>BOS018P</b> BOS 50K-PA-RH12-S4	200...2000 mm	■	■			■	■	500 Hz	■	■			220
<b>BOS018N</b> BOS 50K-PS-RH12-S4	200...2000 mm	■	■			■		500 Hz	■	■			220
<b>BOS0156</b> BOS 50K-PSV-RH12-S4	200...2000 mm	■	■	■		■		500 Hz	■	■			220
<b>BOS018U</b> BOS 50K-POV-RH12-S4	200...2000 mm	■	■	■		■		500 Hz	■	■			220
Diffuse sensor													
<b>BOS01CS</b> BOS 50K-PA-RD10-S4	1...2000 mm	■	■			■	■	400 Hz	■	■			221
<b>BOS01CP</b> BOS 50K-PS-RD10-S4	1...2000 mm	■	■			■		400 Hz	■	■			221
<b>BOS01J0</b> BOS 50K-PO-RD10-S4	1...2000 mm	■	■				■	400 Hz	■	■			221
<b>BOS01JA</b> BOS 50K-PU-RD11-S4	1...3500 mm	■	■			■	■	200 Hz	■	■	■		221
<b>BOS01JJ</b> BOS 50K-PI-RD11-S4	1...3500 mm	■	■	■		■	■	200 Hz	■	■	■		221
Retroreflective sensor													
<b>BOS01CR</b> BOS 50K-PA-PR10-S4	0.1...18 m	■	■			■	■	400 Hz	■	■	■		222
<b>BOS01CL</b> BOS 50K-PS-PR10-S4	0.1...18 m	■	■				■	400 Hz	■	■	■		222
<b>BOS01HY</b> BOS 50K-PO-PR10-S4	0.1...18 m	■	■			■		400 Hz	■	■	■		222
Through-beam sensor Receiver													
<b>BOS01CK</b> BOS 50K-PA-RE10-S4	0...60 m	■	■			■	■	400 Hz	■	■			223
<b>BOS01CM</b> BOS 50K-PS-RE10-S4	0...60 m	■	■				■	400 Hz	■	■			223
<b>BOS01HZ</b> BOS 50K-PO-RE10-S4	0...60 m	■	■			■		400 Hz	■	■			223
Through-beam sensor Emitter													
<b>BOS01EU</b> BOS 50K-X-RS10-S4		■							■	■			223
<b>BOS01CN</b> BOS 50K-XR-RS10-S4		■							■	■			223

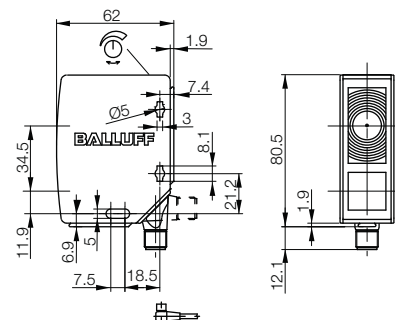
NPN on request



Type	<b>Diffuse sensor with background suppression</b>	
Detection range	<b>200...2000 mm</b>	
PNP Complementary	<b>Ordering code</b>	<b>BOS018P</b>
	Part number	BOS 50K-PA-RH12-S4
PNP NO/NC Switchable	<b>Ordering code</b>	
	Part number	
PNP NO/NC Switchable IO-Link	<b>Ordering code</b>	
	Part number	
PNP NO	<b>Ordering code</b>	<b>BOS018N</b>
	Part number	BOS 50K-PS-RH12-S4
PNP NC	<b>Ordering code</b>	
	Part number	
PNP NO with Error output	<b>Ordering code</b>	<b>BOS0156</b>
	Part number	BOS 50K-PSV-RH12-S4
PNP NC with Error output	<b>Ordering code</b>	<b>BOS018U</b>
	Part number	BOS 50K-POV-RH12-S4
Supply voltage $U_s$	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	

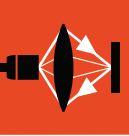
Reference object: white, 90% reflection, 200×200 mm

For wiring diagrams see page 227.



# Photoelectric Sensors

## BOS 50K



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

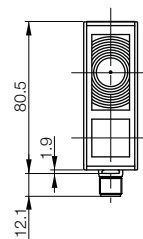
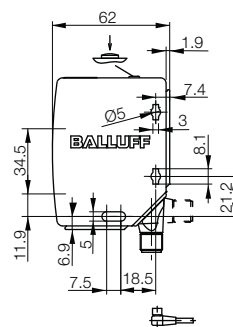
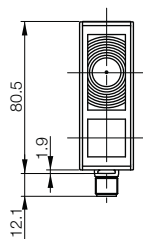
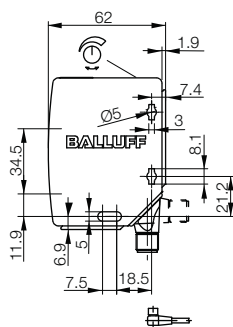
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Diffuse sensor 1...2000 mm <b>BOS01CS</b> BOS 50K-PA-RD10-S4	Diffuse sensor 1...3500 mm <b>BOS01JA</b> BOS 50K-PU-RD11-S4 <b>BOS01JJ</b> <b>IO-Link</b> BOS 50K-PI-RD11-S4
<b>BOS01CP</b> BOS 50K-PS-RD10-S4	
<b>BOS01J0</b> 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

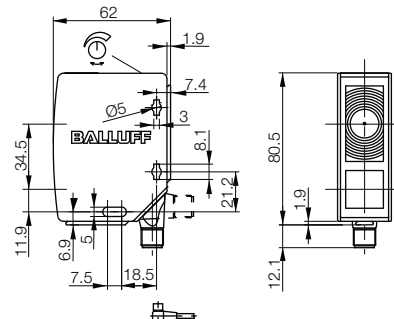




Type	<b>Retroreflective sensor</b>		
Detection range	<b>0.1...18 m</b>		
PNP NO/NC	Polarizing filter	<b>Ordering code</b>	<b>BOS01CR</b>
		Part number	BOS 50K-PA-PR10-S4
PNP NO	Polarizing filter	<b>Ordering code</b>	<b>BOS01CL</b>
		Part number	BOS 50K-PS-PR10-S4
PNP NC	Polarizing filter	<b>Ordering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

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

For wiring diagrams see page 227.



# Photoelectric Sensors

## BOS 50K



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

Block Designs

Fork Sensors

BGL

Angle Sensors

BWL

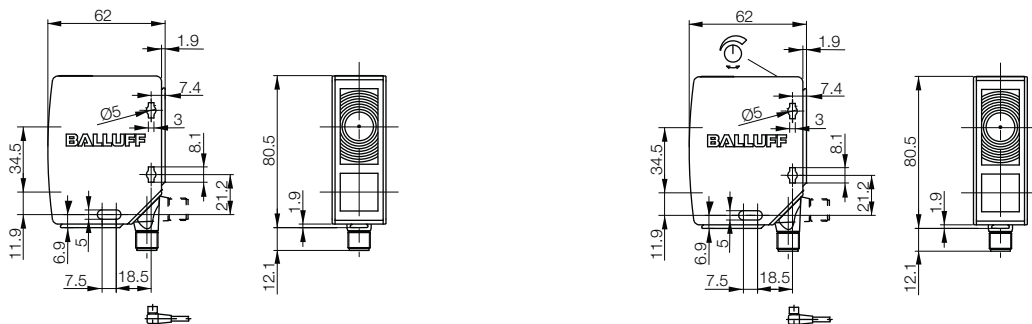
Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



Through-beam sensor 0...60 m	Through-beam sensor 0...60 m
<b>BOS01CK</b>	
BOS 50K-PA-RE10-S4	
<b>BOS01CM</b>	
BOS 50K-PS-RE10-S4	
<b>BOS01HZ</b>	
BOS 50K-PO-RE10-S4	
	<b>BOS01CN</b>
	BOS 50K-XT-RS10-S4
	<b>BOS01EU</b>
	BOS 50K-X-RS10-S4
10...30 V DC	10...30 V DC
100 mA	≤ 50 mA
≤ 35 mA	
Light/dark	Yes/Yes
Yes/Yes	Potentiometer, 270°
Fixed	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

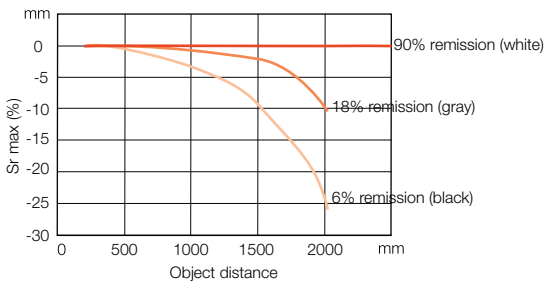


## Photoelectric Sensors

### BOS 50K

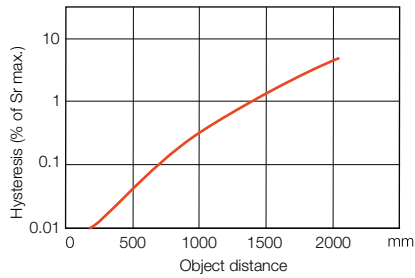
#### Function diagrams

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



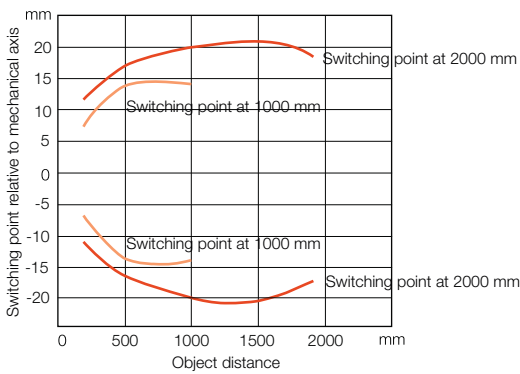
Switching distance deviation depending on object distance  
With differing level of remission

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



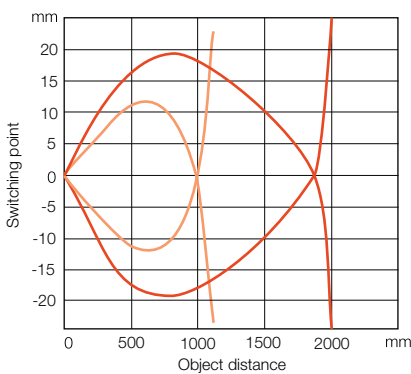
Switching hysteresis depending on object distance

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



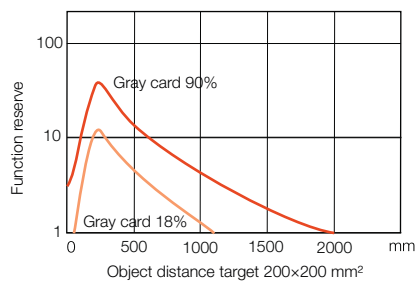
Response curve with switch-on point from left and right side

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



Response curve depending on distance

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

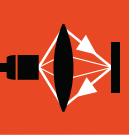


Function reserve depending on distance

# Photoelectric Sensors

## BOS 50K

### Function diagrams



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

**Block Designs**

Fork Sensors

BGL

Angle Sensors

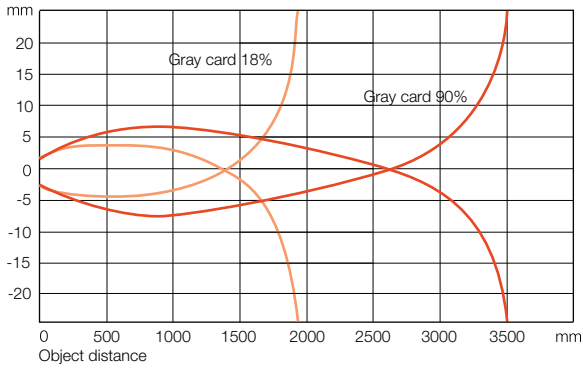
BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

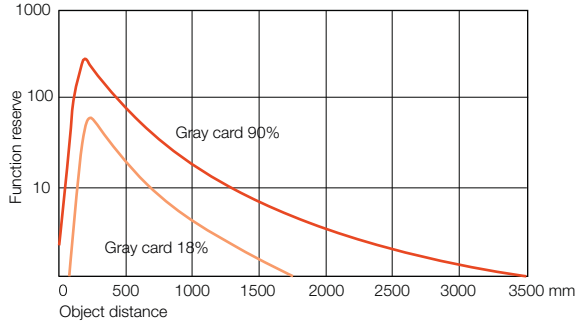
Accessories for Photoelectric Sensors

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



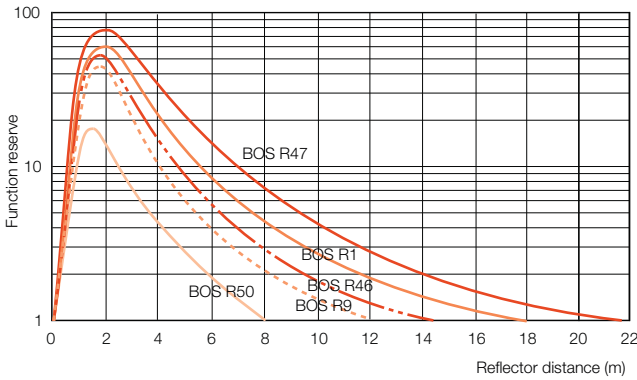
Response curve depending on object distance

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



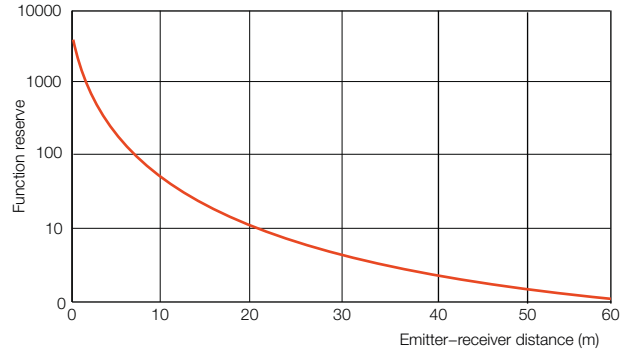
Function reserve depending on object distance

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



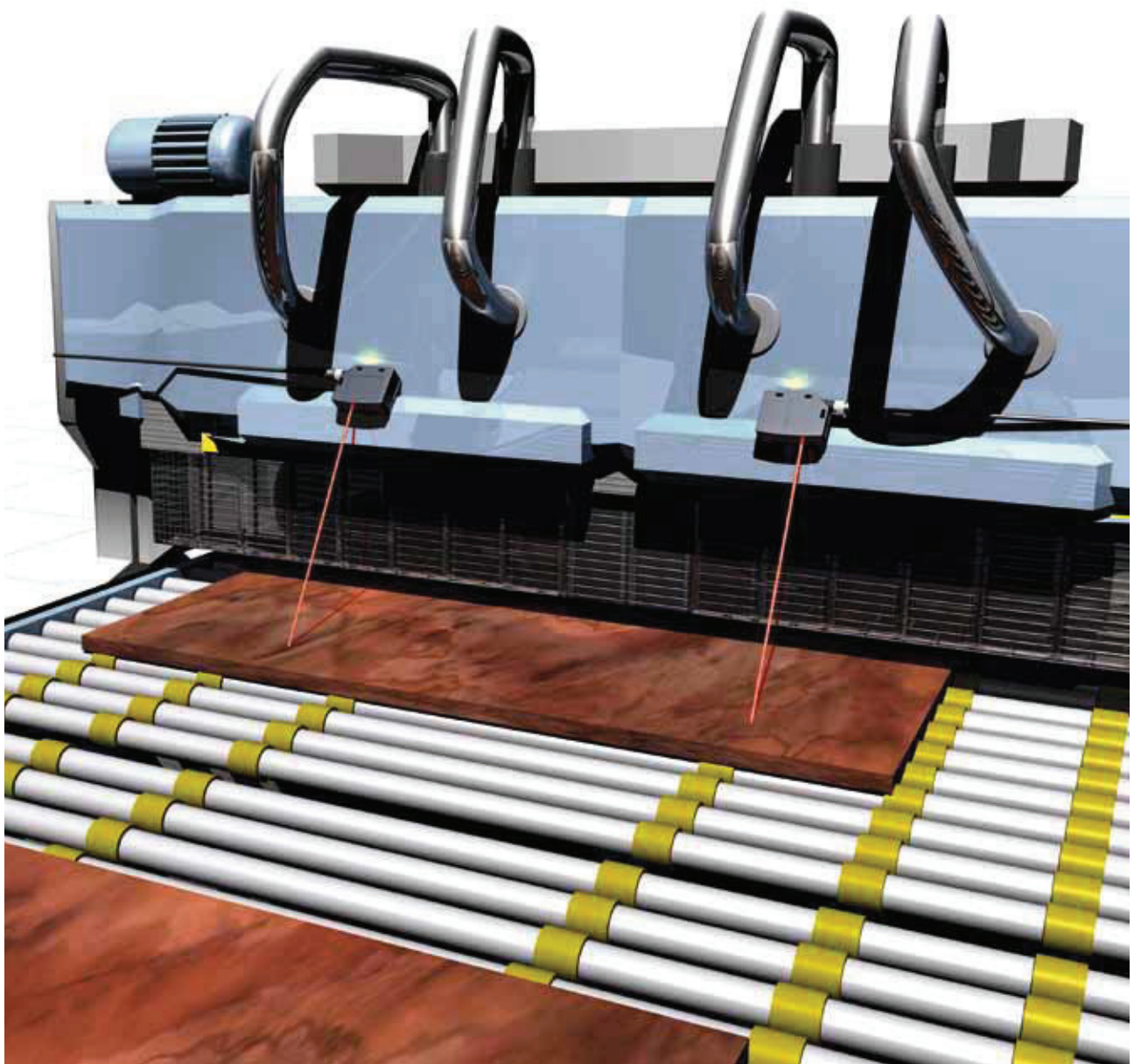
Function reserve depending on distance between sensor and reflector

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



Function reserve depending on distance between emitter and receiver

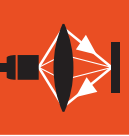




# Photoelectric Sensors

## BOS 50K

### Light spot sizes, function diagrams, connection, accessories



Photoelectric Sensors

Photoelectric Sensors

Cylinder Designs

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Fork Sensors

BGL

Angle Sensors

BWL

Photoelectric Sensors with Special Properties

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

#### Light spot sizes

##### BOS 50K...RD10...

Distance	Light spot Ø
0.5 m	25×25 mm
1 m	30×30 mm
2 m	45×45 mm

##### BOS 50K...PR10...

Distance	Light spot Ø
0.5 m	25×25 mm
1 m	30×30 mm
2 m	45×45 mm
3 m	65×65 mm
4 m	85×85 mm

##### BOS 50K...PS10...

Distance	Light spot Ø
10 m	200×200 mm

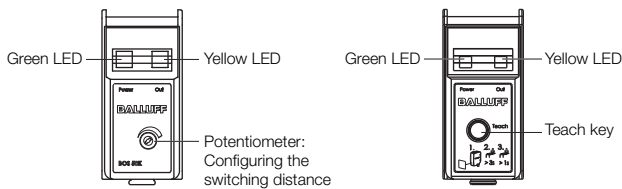
##### BOS 50K...RD11...

Distance	Light spot Ø
0.5 m	25×25 mm
1 m	30×30 mm
2 m	45×45 mm
3 m	65×65 mm
3.5 m	75×75 mm

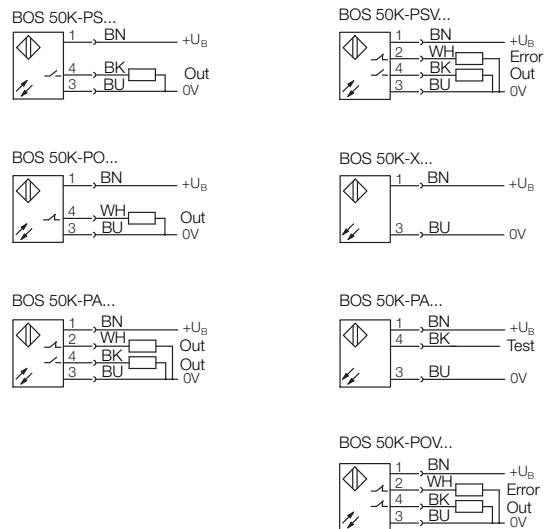
##### BOS 50K...RH1210...

Distance	Light spot Ø
200 mm	22×22 mm
2000 mm	80×80 mm

#### Indicators and operating elements



#### Wiring diagrams



#### Recommended accessories (please order separately)

Description	Ordering code
① Reflector	<b>BAM00UK</b>
② Reflector	<b>BAM00WL</b>
③ Reflector	<b>BAM01JN</b>
④ Reflector	<b>BAM01JP</b>
⑤ Reflective tape	<b>BAM01JM</b>
⑥ Mounting bracket	<b>BAM01E8</b>
⑦ Weld protection	<b>BAM01U6</b>



#### Suitable connectors (please order separately)

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

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.