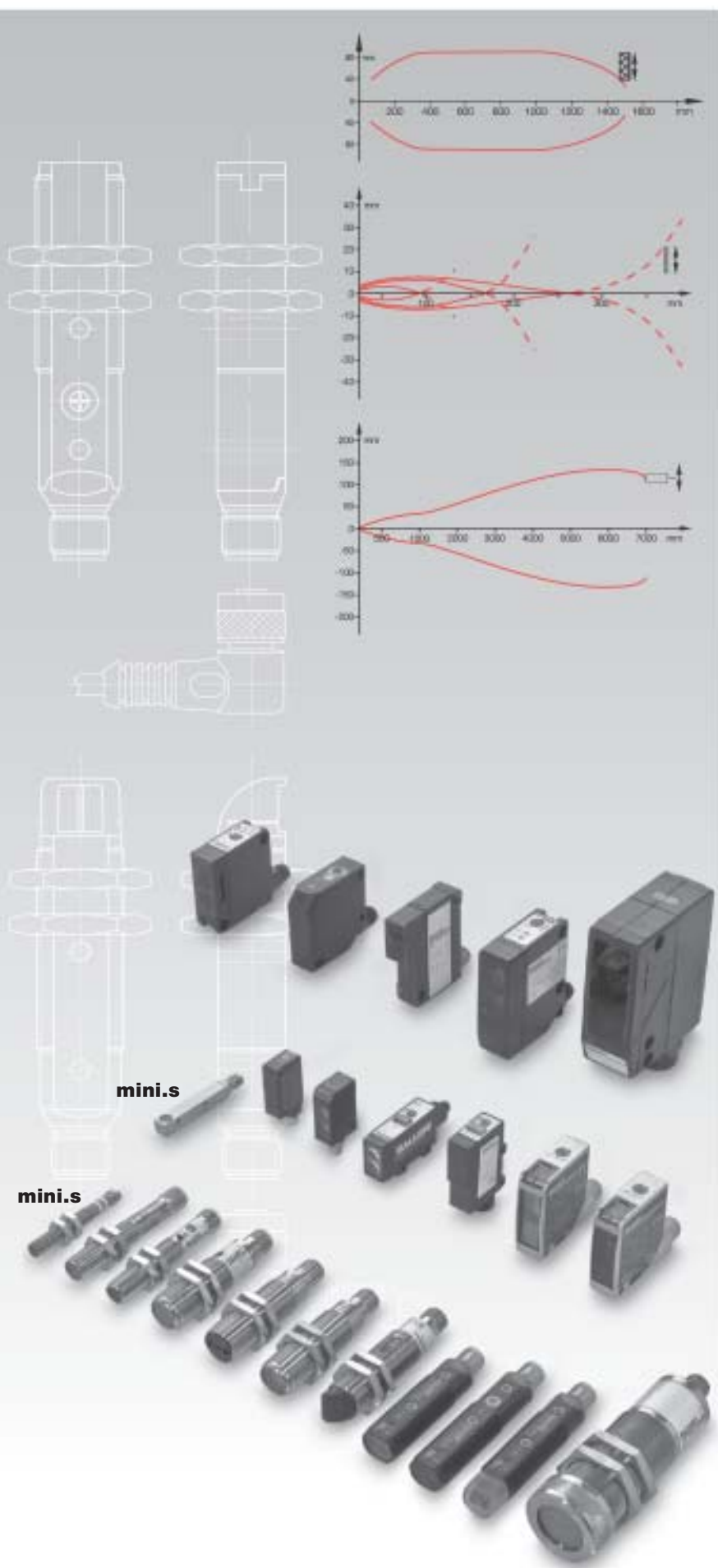


Photoelectric Sensors - Standard



- 2.1.2 **Tubular BOS 08M**
M8 metal
- 2.1.6 **BOS 12M**
M12 metal
- 2.1.14 **BOS 18M**
M18 metal
with potentiometer
Rugged
with teach-in
Laser
with AC
voltage
with angle head
- 2.1.36 **BOS 18E**
M18 stainless steel
- 2.1.42 **BOS 18KF**
M18 plastic
Laser
- 2.1.54 **BOS 18KW**
M18 plastic
with angle head
Laser
- 2.1.66 **BOS 30M**
M30 metal





- Block style**
- 2.1.70 **BOS Q08M**
mini.s
- 2.1.74 **BOS 5K**
mini.s
with potentiometer
- 2.1.82 **BOS 6K**
mini.s
with teach-in
Laser
- 2.1.90 **BOS 15K**
- 2.1.96 **BOS 21M**
Laser
- 2.1.108 **BOS 25K**
- 2.1.114 **BOS 26K**
Laser
- 2.1.122 **BOS 35K**
- 2.1.128 **BOS 36K**
- 2.1.134 **BOS 65K**

BOS 21M – a complete family in a compact, rugged metal housing. Comprehensive functionality, use of the most modern sensor technologies and innovative manufacturing technology leave nothing to be desired for versatile application in robotics and automation, packaging, assembly and handling.

Teach-in buttons and potentiometers assure fast startup, ease of use and economical operation of the sensor.

A wide range of accessories such as mounting brackets, stands, dovetail clamps etc. enable variable attachment of the products in any position.



Type	Range	Light type			Output		Output function		Switching frequency	U _B	Connection	Features				Page
		Red light	Infrared	Laser light	PNP-Transistor	NPN-Transistor	Light-on	Dark-on				10...30 V DC	M12 connector, 4-pin	Teach-in	Polarizing filter	
 Diffuse with HGA																
BOS 21M-PUS-RH12-S4	20...200 mm	■			■		■	■	1 kHz	■	■		■			2.1.98
BOS 21M-NUS-RH12-S4	20...200 mm	■				■	■	■	1 kHz	■	■		■			2.1.98
BOS 21M-PUS-LH12-S4	50...100 mm			■	■		■	■	1 kHz	■	■		■			2.1.102
BOS 21M-NUS-LH12-S4	50...100 mm			■		■	■	■	1 kHz	■	■		■			2.1.102
BOS 21M-PUS-RV13-S4	70...200 mm	■			■		■	■	1 kHz	■	■		■			2.1.99
BOS 21M-NUS-RV13-S4	70...200 mm	■				■	■	■	1 kHz	■	■		■			2.1.99
 Diffuse																
BOS 21M-PA-RD10-S4	0.01...1 m	■			■		■	■	500 Hz	■	■					2.1.99
BOS 21M-NA-RD10-S4	0.01...1 m	■				■	■	■	500 Hz	■	■					2.1.99
BOS 21M-PA-ID10-S4	0.05...2 m		■		■		■	■	500 Hz	■	■					2.1.99
BOS 21M-NA-ID10-S4	0.05...2 m		■			■	■	■	500 Hz	■	■					2.1.99
BOS 21M-PA-LD10-S4	0...600 mm			■	■		■	■	2 kHz	■	■					2.1.103
BOS 21M-NA-LD10-S4	0...600 mm			■		■	■	■	2 kHz	■	■					2.1.103
 Retroreflective																
BOS 21M-PA-PR10-S4	0.1...8 m	■			■		■	■	1 kHz	■	■		■			2.1.100
BOS 21M-NA-PR10-S4	0.1...8 m	■				■	■	■	1 kHz	■	■		■			2.1.100
BOS 21M-PA-LR10-S4	0.1...20 m			■	■		■	■	2 kHz	■	■		■			2.1.103
BOS 21M-NA-LR10-S4	0.1...20 m			■		■	■	■	2 kHz	■	■		■			2.1.103
BOS 21M-PA-PK10-S4	0...4 m	■			■		■	■	1 kHz	■	■		■	■		2.1.101
BOS 21M-NA-PK10-S4	0...4 m	■				■	■	■	1 kHz	■	■		■	■		2.1.101
BOS 21M-PA-PT10-S4	0...2 m	■			■		■	■	1 kHz	■	■		■	■	■	2.1.101
BOS 21M-NA-PT10-S4	0...2 m	■				■	■	■	1 kHz	■	■		■	■	■	2.1.101
 Through-beam																
BOS 21M-PA-IE10-S4	0...20 m		■		■		■	■	500 Hz	■	■					2.1.101
BOS 21M-NA-IE10-S4	0...20 m		■			■	■	■	500 Hz	■	■					2.1.101
BOS 21M-PA-LE10-S4	0...60 m			■	■		■	■	1.5 kHz	■	■					2.1.103
BOS 21M-NA-LE10-S4	0...60 m			■		■	■	■	1.5 kHz	■	■					2.1.103
BOS 21M-XT-IS11-S4	0...20 m		■							■	■					2.1.101
BOS 21M-XT-LS11-S4	0...60 m			■						■	■					2.1.103

2.1

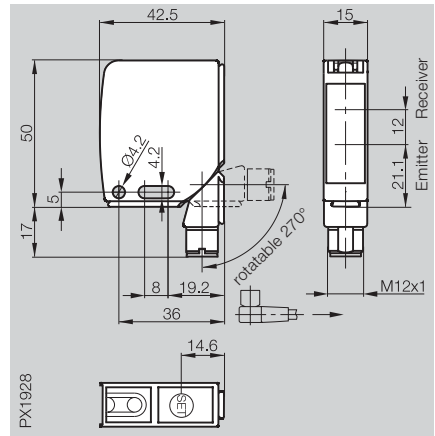
2.3

Photoelectric sensors accessories page 2.3.2 ...

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Connectors page 6.2 ...

Diffuse with background suppression	Range	20...200 mm
Diffuse with foreground suppression	Range	
Diffuse	Range	



Diffuse

PNP	20...200 mm	HGA	BOS 21M-PUS-RH12-S4
NPN	20...200 mm	HGA	BOS 21M-NUS-RH12-S4
PNP	70...200 mm	VGA + HGA	
NPN	70...200 mm	VGA + HGA	
PNP	0.01...1 m		
NPN	0.01...1 m		
PNP	0.05...2 m		
NPN	0.05...2 m		

Electrical data

Supply voltage U_B	10...30 V DC
Ripple	≤ 2 V DC
No-load supply current I_0 max.	≤ 50 mA
Switching output	PNP- or NPN-Transistor
Output current	100 mA
Switching type	Light-/dark-on (selectable)
Voltage drop U_d at I_o	2 V
Settings	Teach-in

Optical data

Recommended range	20...200 mm
Emitter, light type	LED, red light
Wavelength	670 nm

Indicator

Output function indicator	LED yellow
Stability indicator	LED green/red

Time data

Response time	0.5 ms
Frequency of operating cycles f	1 kHz

Mechanical data

Dimensions	42.5×50×15 mm
Connection	M12 connector, 4-pin
Housing material	GD-Zn/Al
Optical surface	PMMA
Weight	76 g

Ambient data

Degree of protection per IEC 60529	IP 67
Polarity reversal protected	yes
Short circuit protected	yes
Ambient temperature range T_a	-10...+50 °C
Ambient light rejection	10 kLux

Diffuse values referenced to Kodak gray card 90% reflective.

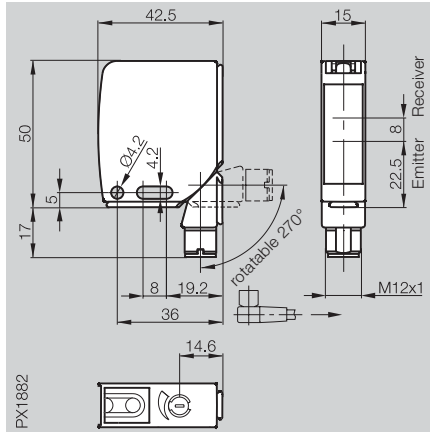
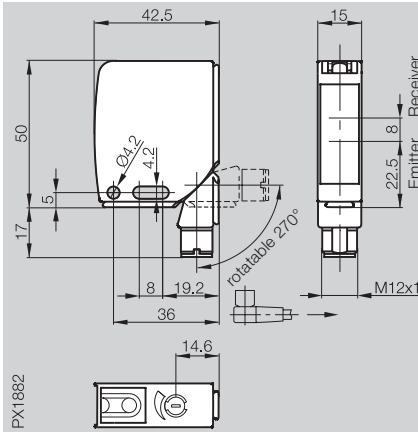
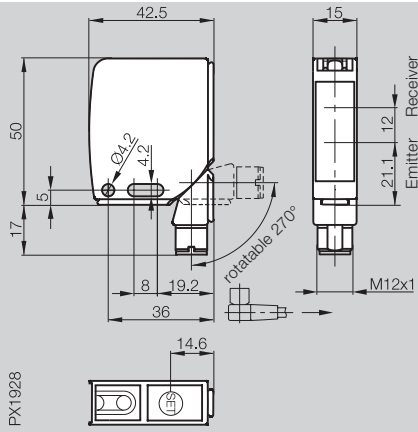
Wiring diagrams, characteristics and accessories see page 2.1.104 to 2.1.107.



70...200 mm

0.01...1 m

0.05...2 m



BOS 21M-PUS-RV13-S4
BOS 21M-NUS-RV13-S4

BOS 21M-PA-RD10-S4
BOS 21M-NA-RD10-S4

BOS 21M-PA-ID10-S4
BOS 21M-NA-ID10-S4

10...30 V DC
≤ 2 V DC
≤ 50 mA

PNP- or NPN-Transistor
100 mA
Light-/dark-on (selectable)
2 V
Teach-in

70...200 mm
LED, red light
670 nm

LED yellow
LED green

0.5 ms
1 kHz

42.5×50×15 mm
M12 connector, 4-pin
GD-Zn/Al
PMMA
76 g

IP 67
yes
yes
-10...+50 °C
10 kLux

10...30 V DC
≤ 2 V DC
≤ 35 mA

PNP- or NPN-Transistor
100 mA
Light-/dark-on (push-pull)
2 V
Potentiometer 270°

0.01...1 m
LED, red light
650 nm

LED yellow
LED green

0.5 ms
1 kHz

42.5×50×15 mm
M12 connector, 4-pin
GD-Zn/Al
PMMA
76 g

IP 67
yes
yes
-25...+55 °C
10 kLux

10...30 V DC
≤ 2 V DC
≤ 35 mA

PNP- or NPN-Transistor
100 mA
Light-/dark-on (push-pull)
2 V
Potentiometer 270°

0.05...2 m
LED, infrared
880 nm

LED yellow
LED green

0.5 ms
1 kHz

42.5×50×15 mm
M12 connector, 4-pin
GD-Zn/Al
PMMA
76 g

IP 67
yes
yes
-25...+55 °C
10 kLux

2.1

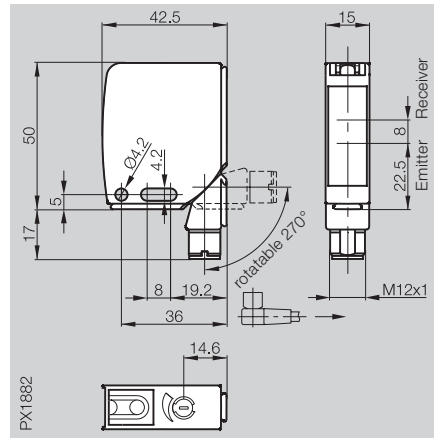
2.3

Photoelectric sensors accessories page 2.3.2 ...

6

Connectors page 6.2 ...

Retroreflective with polarizing filter	Range	0.1...8 m
Retroreflective Auto-collimation	Range	
Retroreflective for glass sensing	Range	
Through-beam	Range	



Retroreflective



PNP	0.1...8 m	Polarizing filter
NPN	0.1...8 m	Polarizing filter
PNP	4 m	Polarizing filter, auto-collimation
NPN	4 m	Polarizing filter, auto-collimation
PNP	2 m	Polarizing filter, auto-collimation, glass sensing
NPN	2 m	Polarizing filter, auto-collimation, glass sensing

BOS 21M-PA-PR10-S4
BOS 21M-NA-PR10-S4

Through-beam



PNP	20 m	Receiver
NPN	20 m	Receiver
	20 m	Emitter

Electrical data

Supply voltage U_B	10...30 V DC
Ripple	≤ 2 V DC
No-load supply current I_0 max.	≤ 35 mA
Switching output	PNP- or NPN-Transistor
Output current	100 mA
Switching type	Light-/dark-on (push-pull)
Voltage drop U_d at I_e	2 V
Settings	Potentiometer 270°

Optical data

Recommended range	0.1...8 m
Emitter, light type	LED, red light
Wavelength	650 nm

Indicator

Power-on indicator	
Output function indicator	LED yellow
Stability indicator	LED green

Time data

Response time	0.5 ms
Frequency of operating cycles f	1 kHz

Mechanical data

Dimensions	42.5x50x15 mm
Connection	M12 connector, 4-pin
Housing material	GD-Zn/Al
Optical surface	PMMA
Weight	76 g

Ambient data

Degree of protection per IEC 60529	IP 67
Polarity reversal protected	yes
Short circuit protected	yes
Ambient temperature range T_a	-25...+55 °C
Ambient light rejection	10 kLux

Diffuse values referenced to Kodak gray card 90% reflective.

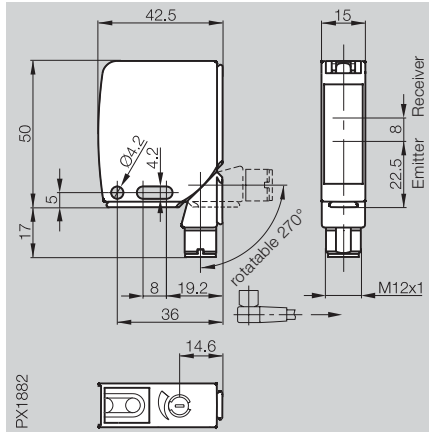
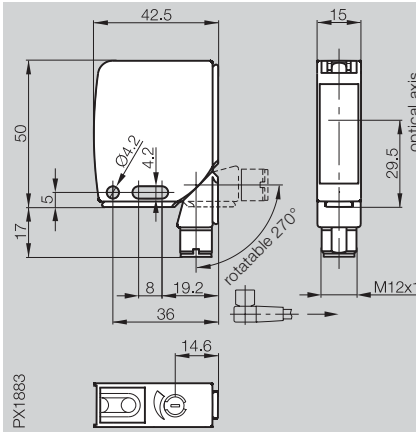
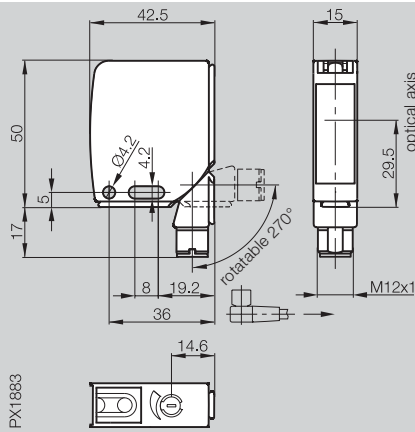
Wiring diagrams, characteristics and accessories see page 2.1.104 to 2.1.107.



0...4 m

0...2 m

0...20 m



BOS 21M-PA-PK10-S4
BOS 21M-NA-PK10-S4

BOS 21M-PA-PT10-S4
BOS 21M-NA-PT10-S4

BOS 21M-PA-IE10-S4
BOS 21M-NA-IE10-S4
BOS 21M-XT-IS11-S4

10...30 V DC
≤ 2 V DC
≤ 35 mA
PNP- or NPN-Transistor
100 mA
Light-/dark-on (push-pull)
2 V
Potentiometer 270°

10...30 V DC
≤ 2 V DC
≤ 35 mA
PNP- or NPN-Transistor
100 mA
Light-/dark-on (push-pull)
2 V
Potentiometer 270°

10...30 V DC
≤ 2 V DC
≤ 35 mA
PNP- or NPN-Transistor
100 mA
Light-/dark-on (push-pull)
2 V
Potentiometer 270°
Test input (emitter)

0...4 m
LED, red light
650 nm

0...2 m
LED, red light
650 nm

0...20 m
LED, infrared
880 nm

LED yellow
LED green

LED yellow

LED green (emitter)
LED yellow (receiver)
LED green (receiver)

0.5 ms
1 kHz

0.5 ms
1 kHz

1 ms
500 Hz

42.5x50x15 mm
M12 connector, 4-pin
GD-Zn/Al

42.5x50x15 mm
M12 connector, 4-pin
GD-Zn/Al

42.5x50x15 mm
M12 connector, 4-pin
GD-Zn/Al

Glass
78 g

Glass
78 g

PMMA
75 g

IP 67
yes
yes

IP 67
yes
yes

IP 67
yes
yes

-25...+55 °C
10 kLux

-25...+55 °C
10 kLux

-25...+55 °C
10 kLux

2.1

2.3

Photoelectric sensors accessories page 2.3.2 ...

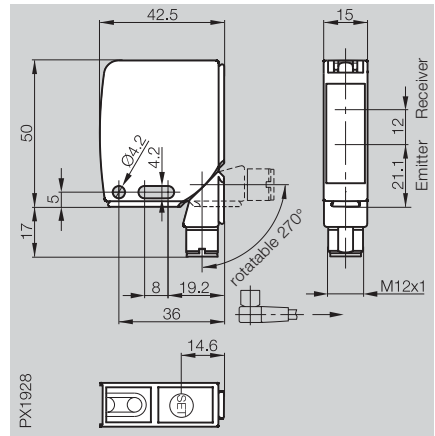
6

Connectors page 6.2 ...

Photoelectric Sensors

BOS 21M
Range 100 mm

Diffuse with background suppression	Range	50...100 mm
Diffuse	Range	
Retroreflective with polarizing filter	Range	
Through-beam	Range	



Diffuse

PNP	50...100 mm	HGA
NPN	50...100 mm	HGA
PNP	600 mm	
NPN	600 mm	



Retroreflective

PNP	0.1...20 m	Polarizing filter
NPN	0.1...20 m	Polarizing filter



Through-beam

PNP	60 m	Receiver
NPN	60 m	Receiver
	60 m	Emitter



Electrical data

Supply voltage U_B	10...30 V DC
Ripple	≤ 2 V DC
No-load supply current I_0 max.	60 mA
Switching output	PNP- or NPN-Transistor
Output current	100 mA
Switching type	Light-/dark-on (selectable)
Voltage drop U_d at I_0	2 V
Settings	teach-in

Optical data

Recommended range	50...100 mm
Emitter, light type	Laser, red light
Wavelength	650 nm
Laser class	1

Indicator

Power-on indicator	
Output function indicator	LED yellow
Stability indicator	LED green/red

Time data

Response time	0.5 ms
Frequency of operating cycles f	1 kHz

Mechanical data

Dimensions	42.5x50x15 mm
Connection	M12 connector, 4-pin
Housing material	GD-Zn/Al
Optical surface	PMMA
Weight	77 g

Ambient data

Degree of protection per IEC 60529	IP 67
Polarity reversal protected	yes
Short circuit protected	yes
Ambient temperature range T_a	-10...+50 °C
Ambient light rejection	5 kLux

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

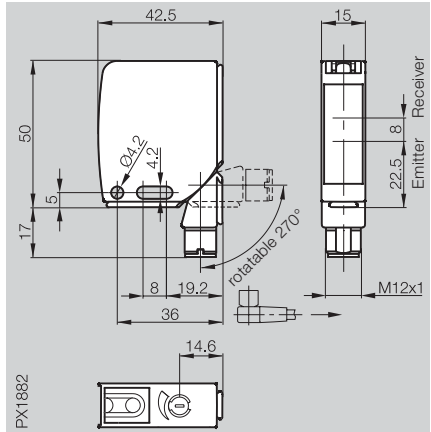
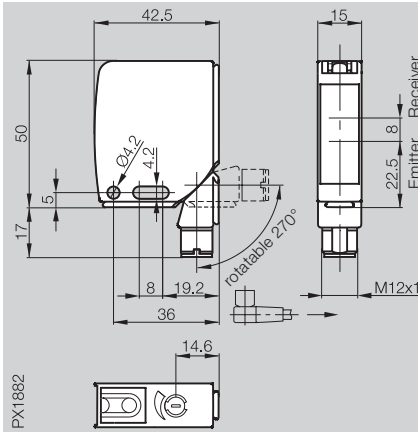
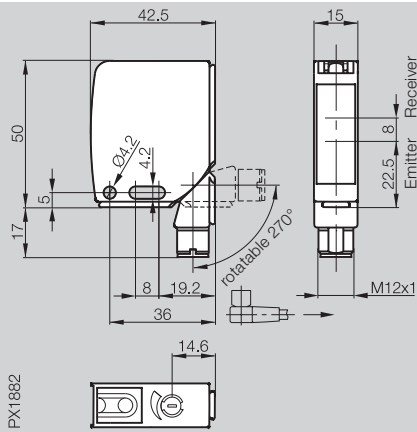




0...600 mm

0.1...20 m

0...60 m



BOS 21M-PA-LD10-S4
BOS 21M-NA-LD10-S4

BOS 21M-PA-LR10-S4
BOS 21M-NA-LR10-S4

BOS 21M-PA-LE10-S4
BOS 21M-NA-LE10-S4
BOS 21M-XT-LS11-S4

10...30 V DC
≤ 2 V DC
35 mA
PNP- or NPN-Transistor
100 mA
Light-/dark-on (push-pull)
2 V
Potentiometer 270°

10...30 V DC
≤ 2 V DC
35 mA
PNP- or NPN-Transistor
100 mA
Light-/dark-on (push-pull)
2 V
Potentiometer 270°

10...30 V DC
≤ 2 V DC
35 mA
PNP- or NPN-Transistor
100 mA
Light-/dark-on (push-pull)
2 V
Potentiometer 270°
Test input (emitter)

0...600 mm
Laser, red light
650 nm
1

0.1...20 m
Laser, red light
650 nm
1

0...60 mm
Laser, red light
650 nm
1

LED green
LED yellow

LED green
LED yellow

LED green
LED yellow

0.25 ms
2 kHz

0.25 ms
2 kHz

0.33 ms
1.5 kHz

42.5x50x15 mm
M12 connector, 4-pin
GD-Zn/Al
PMMA
77 g

42.5x50x15 mm
M12 connector, 4-pin
GD-Zn/Al
PMMA
77 g

42.5x50x15 mm
M12 connector, 4-pin
GD-Zn/Al
PMMA
76 g

IP 67
yes
yes
-10...+50 °C
5 kLux

IP 67
yes
yes
-10...+50 °C
5 kLux

IP 67
yes
yes
-10...+50 °C
5 kLux

2.1

2.3

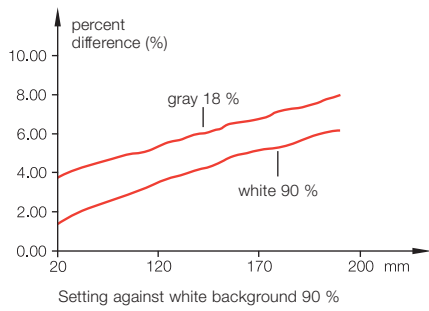
Photoelectric sensors accessories page 2.3.2 ...

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Connectors page 6.2 ...

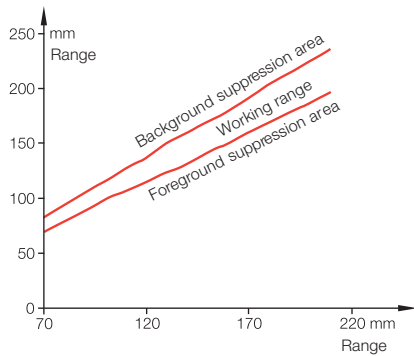
Wiring diagrams, characteristics and accessories see page 2.1.104 to 2.1.107.

Diffuse with background suppression
BOS 21M-SS-RH12-S4



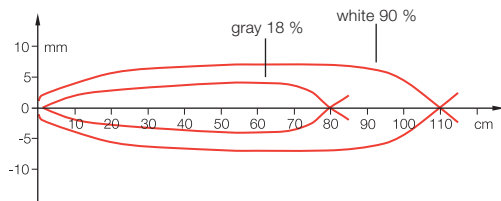
Detection range

Diffuse with fore- and background suppression
BOS 21M-SS-RV13-S4

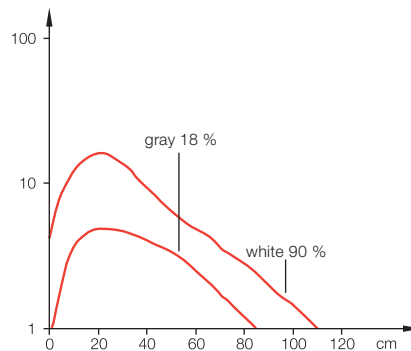


Detection range

Diffuse
BOS 21M-A-RD10-S4

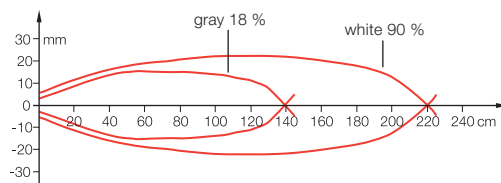


Detection range

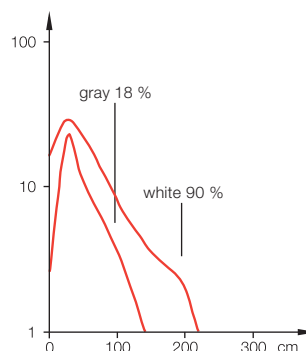


Function reserve

Diffuse long range
BOS 21M-A-ID10-S4

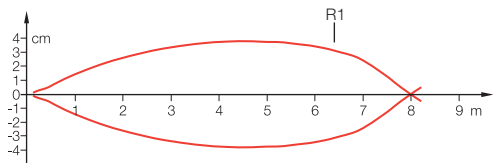


Detection range

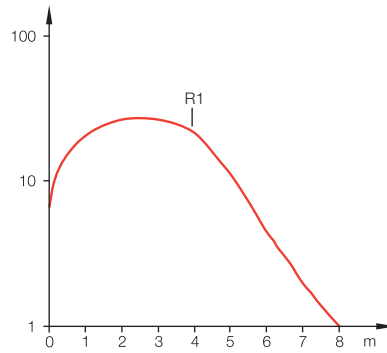


Function reserve

**Retroreflective polarized
BOS 21M- A-PR10-S4**

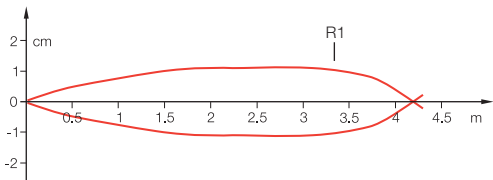


Detection range

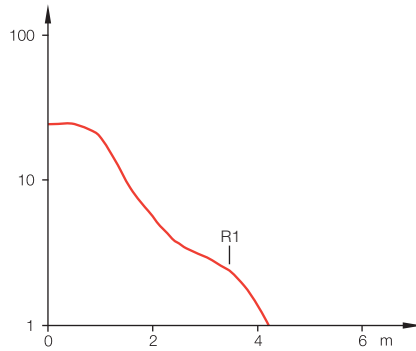


Function reserve

**Retroreflective auto-collimation
BOS 21M- A-PK10-S4**

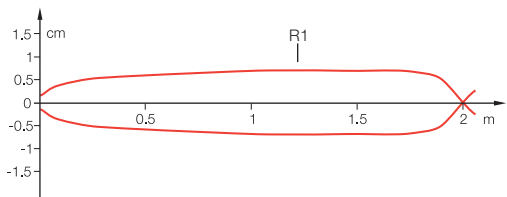


Detection range

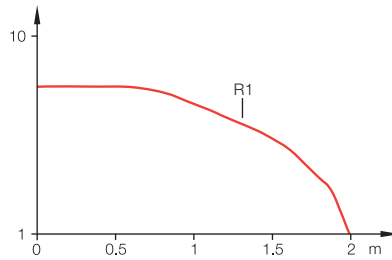


Function reserve

**Retroreflective glass sensing
BOS 21M- A-PT10-S4**

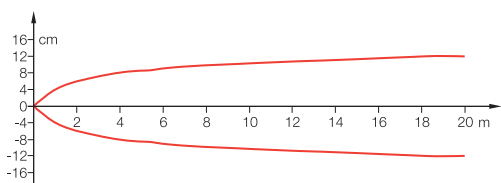


Detection range

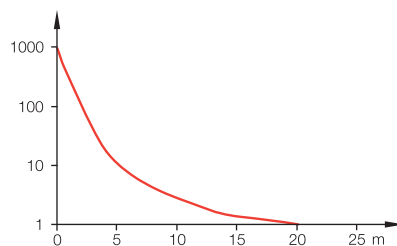


Resolution

**Through-beam
BOS 21M- A-IE10-S4**



Detection range



Function reserve

2.1

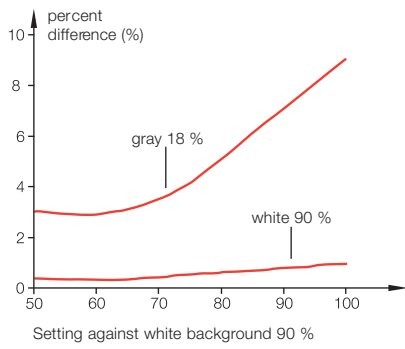
2.3

Photoelectric sensors
accessories
page 2.3.2 ...

6

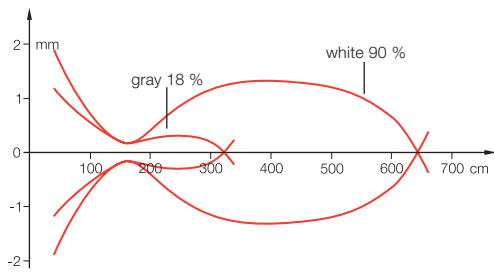
Connectors
page 6.2 ...

Laser diffuse with background suppression
BOS 21M-SS-LH12-S4

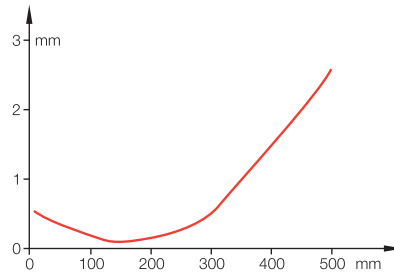


Tolerance with standard setting

Laser diffuse
BOS 21M-A-LD10-S4

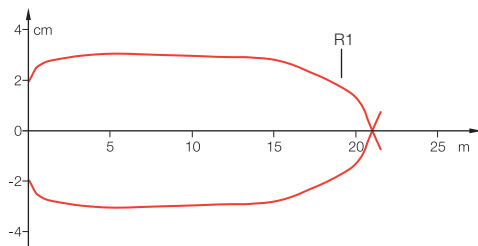


Detection range

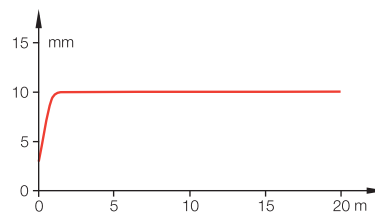


Resolution

Laser retroreflective polarized
BOS 21M-A-LR10-S4

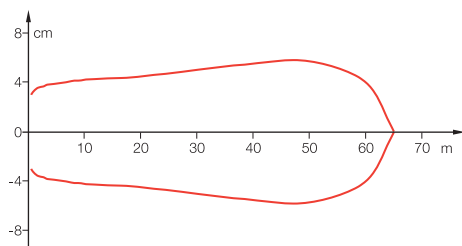


Detection range

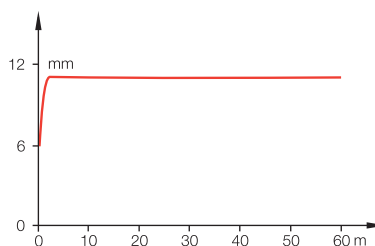


Resolution

Laser through-beam
BOS 21M-A-LE10-S4

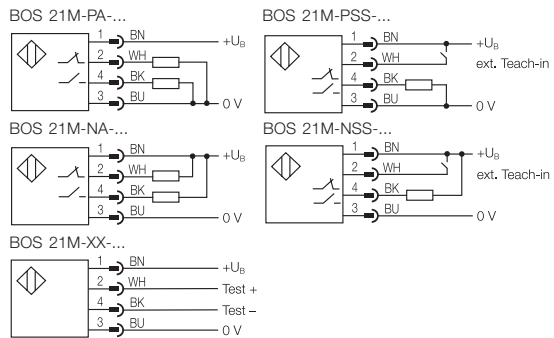


Detection range



Resolution

Wiring diagrams



Recommended accessories

please order separately



Clamp
BOS 21-KH-1



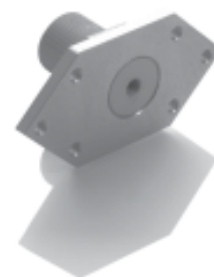
Clamp
BOS 21-KH-2



Mounting bracket
BOS 21-HW-1



Mounting bracket
BOS 21-HW-2



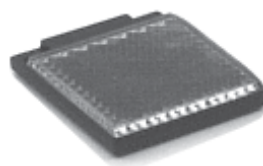
Adapter plate
BOS 21-AD-1



Holding system
BOS 21-HS-1



Reflector
BOS R-1



Reflector
BOS R-9



Connector
BKS-_19/BKS-_20

2.1

2.3

Photoelectric
sensors
accessories
page 2.3.2 ...

6

Connectors
page 6.2 ...