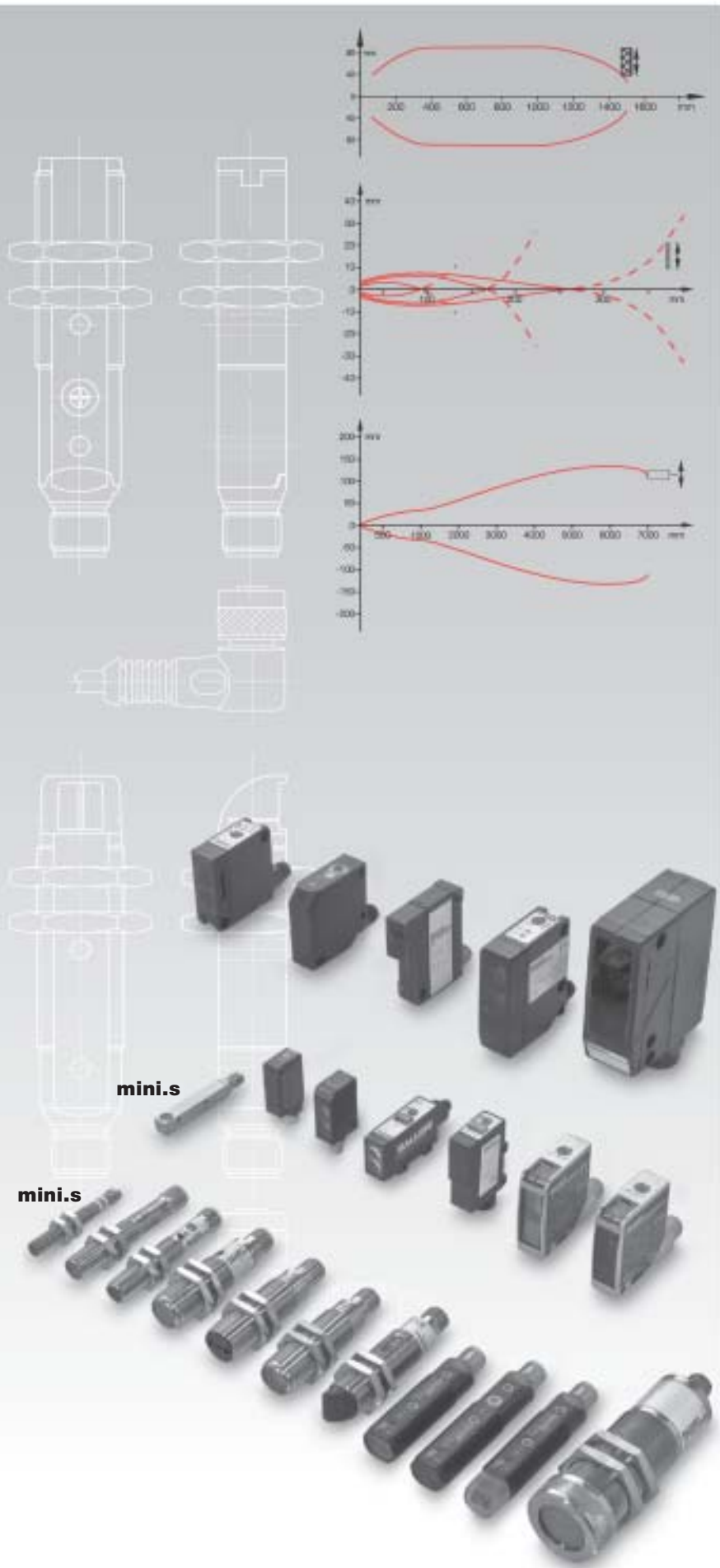


Photoelectric Sensors - Standard



- 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

- 2.1.70 **Block style 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**

Complex signal processing (background suppression, relays, lasers) and ease of use (numerical indicator, rotatable connector) are best realized in block style sensors.

Series **BOS 25K** and **BOS 26K** are mechanically compatible. With BOS 25K the emphasis was placed on as many standard applications as possible (e. g. DC or AC/DC power options with relay output).

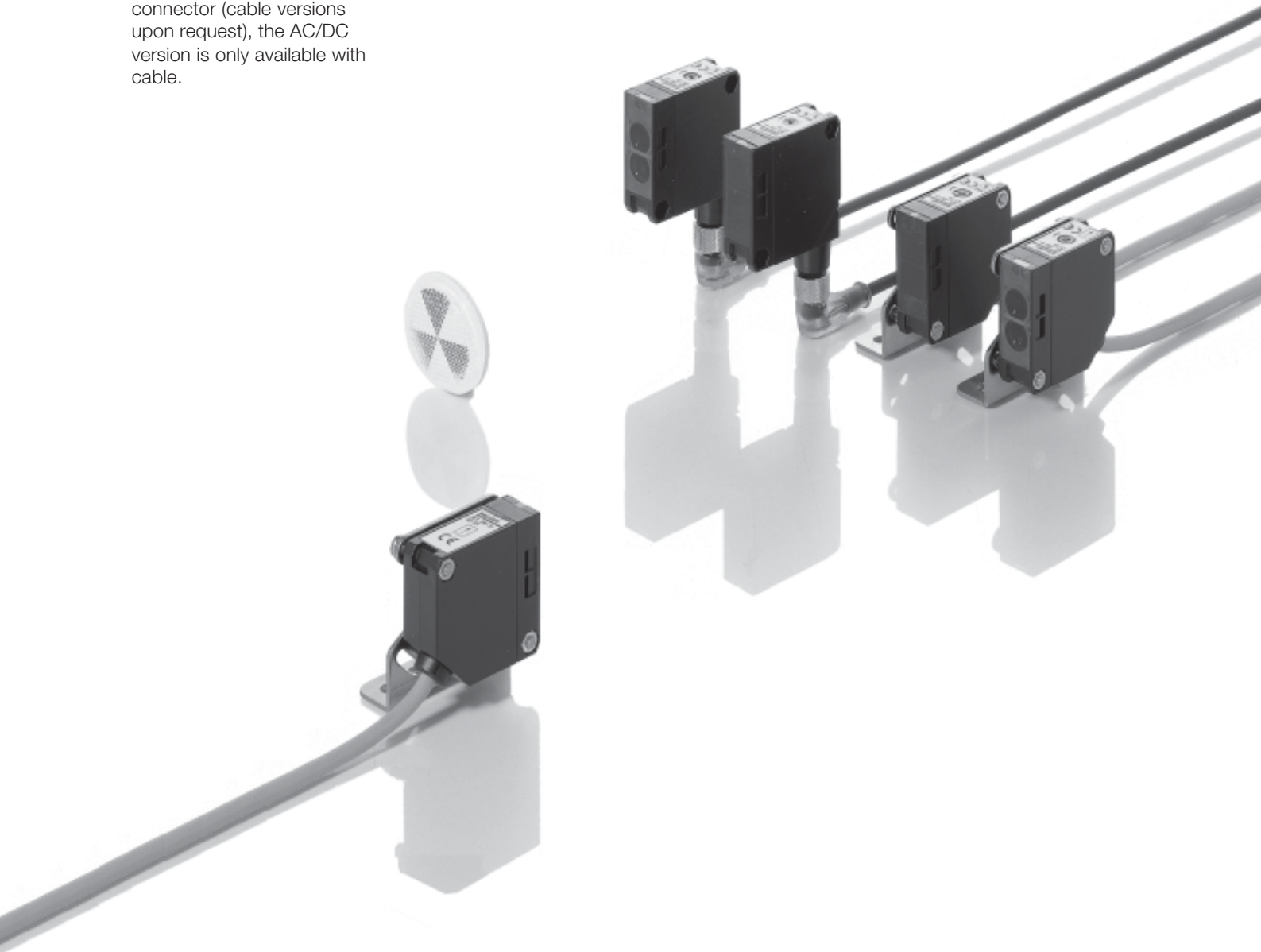
The complete series is available for DC (10...30 V) and AC/DC (15...275 V), with relay output. The DC version uses an M12 connector (cable versions upon request), the AC/DC version is only available with cable.





Features

- DC powered 10...30 V DC with PNP-Output
- All-current model 15...264 V AC/DC with relay output
- Light-/dark-on selectable
- Function indicator for output and stability
- Impact-resistant plastic housing
- Through-beam version with test input and alarm output
- High resistance to ambient light and noise spikes

Applications

- Conveying
- Packaging
- Elevators
- Machine tools
- Gate controls
- Robots
- Small parts recognition
- Parts counting
- Assembly and handling automation



Type	Range	Light type		Output		Output function		Switching frequency	U _B		Connection		Features		Page
		Red light	Infrared	PNP-Transistor	NPN-Transistor	Relay	Light-on		Dark-on	10...30 V DC	15...264 V AC/DC	M12 connector, 4-pin	Cable	Polarizing filter	
 Diffuse with HGA															
BOS 25K-5-M25-P-S4	50...250 mm		■	■			■	■	500 Hz	■		■			21.110
BOS 25K-5-M25-02	50...250 mm		■	■	■		■	■	500 Hz	■		■			21.111
 Diffuse															
BOS 25K-5-C90-P-S4	1...900 mm		■	■			■	■	500 Hz	■		■			21.110
BOS 25K-5-C90-02	1...900 mm		■	■	■		■	■	500 Hz	■		■			21.111
BOS 25K-1-C90-02	1...900 mm		■			■	■	■	2 Hz		■	■			21.111
 Retroreflective															
BOS 25K-R-B3-P-S4	0...4 m	■		■			■	■	500 Hz	■		■		■	21.110
BOS 25K-5-B3-02	0...4 m	■		■	■		■	■	500 Hz	■		■	■		21.111
BOS 25K-1-B3-02	0...4 m	■				■	■	■	2 Hz		■	■	■		21.111
 Through-beam															
BLE 25K-5-F5-P-S4	0...5 m		■	■			■	■	500 Hz	■		■			21.110
BLE 25K-5-F5-02	0...5 m		■	■	■		■	■	500 Hz	■		■		■	21.111
BLE 25K-1-F5-02	0...5 m		■			■	■	■	2 Hz		■	■		■	21.111
BLS 25K-5-G5-S4	0...5 m		■							■		■			21.110
BLS 25K-5-G5-02	0...5 m		■							■		■			21.111
BLS 25K-1-G5-02	0...5 m		■								■	■			21.111

2.1

2.3

Photoelectric sensors accessories page 2.3.2 ...

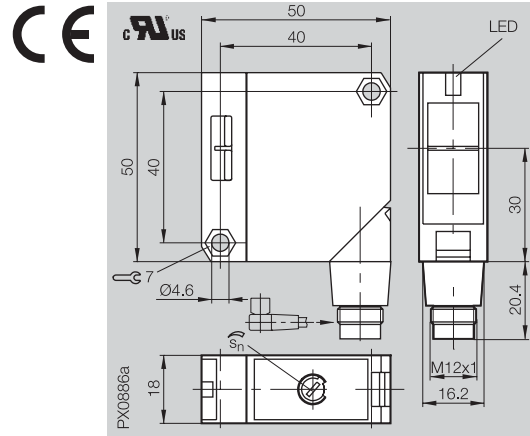
6

Connectors page 6.2 ...

Photoelectric Sensors

BOS 25K
Range 250 mm, 900 mm,
4 m, 5 m

Diffuse with background suppression	Range	50...250 mm
Diffuse	Range	1...900 mm
Retroreflective with polarizing filter	Range	0...4 m
Through-beam	Range	0...5 m



Diffuse

PNP/NPN, PNP	50...250 mm HGA	BOS 25K-5-M25-P-S 4
	900 mm	BOS 25K-5-C90-P-S 4
Relay	900 mm	



Retroreflective

PNP/NPN, PNP	4 m	Red light, polarizing filter	BOS 25K-5-B3-P-S 4
Relay	4 m	Red light, polarizing filter	



Through-beam

PNP/NPN, PNP	5 m	Receiver	BLE 25K-5-F5-P-S 4
	5 m	Emitter	BLS 25K-5-G5-S 4
Relay	5 m	Receiver	
	5 m	Emitter	

Electrical data

Supply voltage U_B	10...30 V DC
Ripple	2 V DC
No-load supply current I_0 max.	≤ 30 mA
Switching output	PNP-Transistor
Output current	≤ 100 mA
Switching type	Light-/dark-on (selectable)
Voltage drop U_d at I_e	≤ 1.5 V
Settings	Potentiometer 270° (BOS 25K-5-M25-... with spindle drive)

Indicator

Output function indicator	LED red
Stability indicator	LED green (only BOS 25K-5-M25-...)

Time data

Response time	≤ 1 ms
Frequency of operating cycles f	500 Hz

Mechanical data

Dimensions	50x50x18 mm
Connection	M12 connector, 4-pin
No. of wires x cross-section	
Housing material	ABS
Optical surface	PMMA
Weight	80 g

Ambient data

Degree of protection per IEC 60529	IP 65
Polarity reversal protected	yes
Short circuit protected	yes
Ambient temperature range T_a	-15...+55 °C
Ambient light rejection	3 kLux

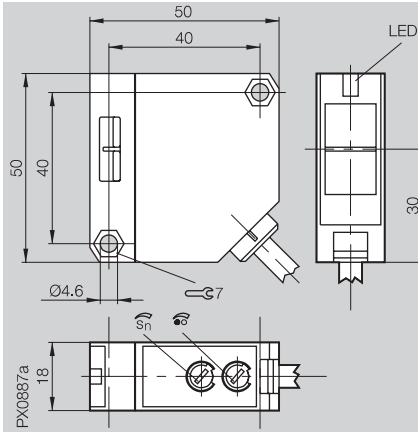
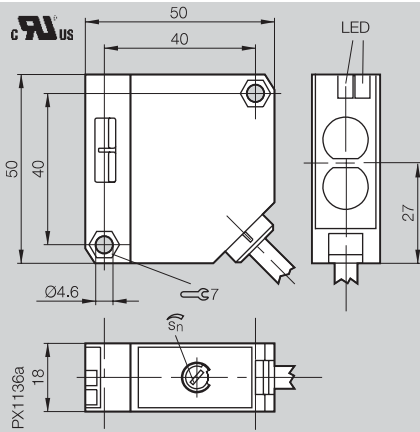
Diffuse values referenced to Kodak gray card 90% reflective.
Retroreflective values referenced to R10 reflector.

Wiring diagrams, characteristics and accessories see page 2.1.112 and 2.1.113.



50...250 mm
1...900 mm
0...4 m
0...5 m

1...900 mm
0...4 m
0...5 m



BOS 25K-5-M25-02
BOS 25K-5-C90-02

BOS 25K-1-C90-02

BOS 25K-5-B3-02

BOS 25K-1-B3-02

BLE 25K-5-F5-02
BLS 25K-5-G5-02

BLE 25K-1-F5-02
BLS 25K-1-G5-02

10...30 V DC

15...264 V AC/DC

2 V DC

2 V DC

≤ 30 mA

≤ 40 mA

PNP- and NPN-Transistor

Relay 3 A, 250 V AC, 1 changeover contact

≤ 100 mA

Light-/dark-on (selectable)

Light-/dark-on (selectable)

≤ 1.5 V

Potentiometer 270° (BOS 25K-5-M25-... with spindle drive)

Potentiometer 270°

LED red

LED red

LED green (only BOS 25K-5-M25-...)

no

≤ 1 ms

≤ 30 ms

500 Hz

2 Hz

50×50×18 mm

50×50×18 mm

2 m cable, PVC

2 m cable, PVC

5×0.34 mm² (4/2×0.34 mm² for BLE/BLS)

5×0.25 mm² (2×0.25 mm² for BLS)

ABS

ABS

PMMA

PMMA

160 g

160 g

IP 65

IP 65

yes

yes

yes

no

-15...+55 °C

-15...+55 °C

3 kLux

3 kLux

2.1

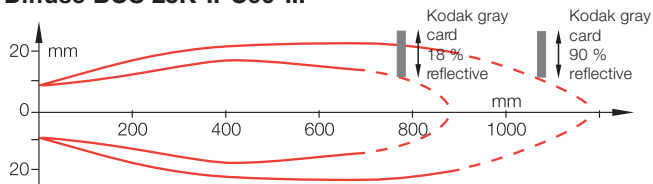
2.3

Photoelectric sensors accessories page 2.3.2 ...

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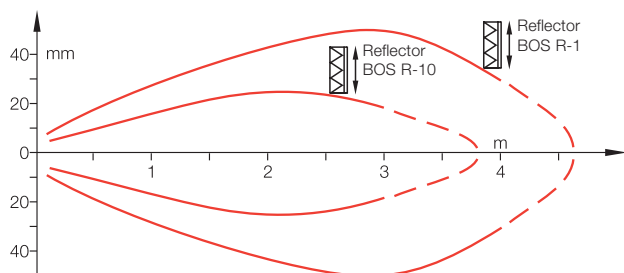
Connectors page 6.2 ...

Diffuse BOS 25K-...-C90-...



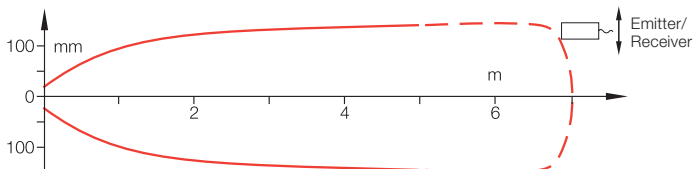
Range measured with side approach of Kodak gray card.

Retroreflective with polarizing filter BOS 25K-...-B3-...



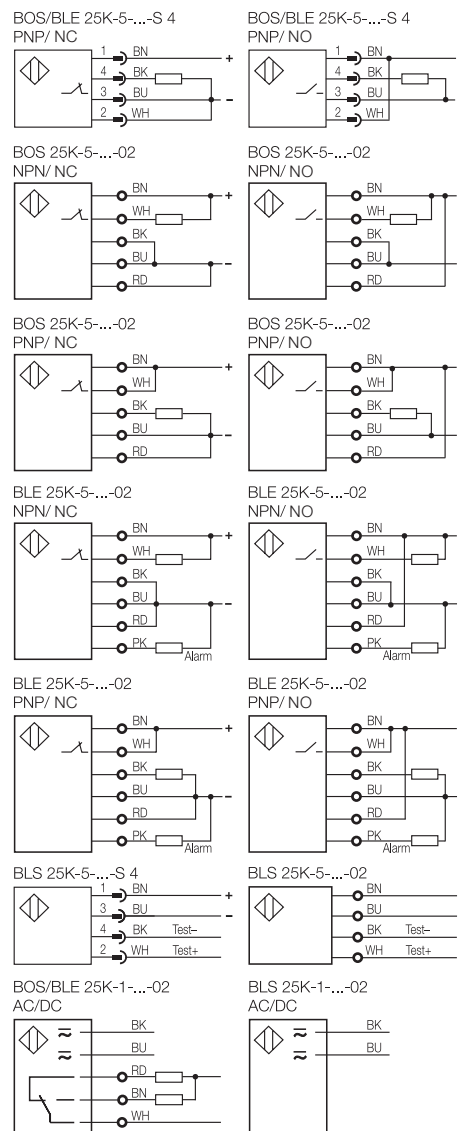
Range measured with side approach of reflector.

Through-beam BLE/BLS 25K-...



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

Wiring diagrams

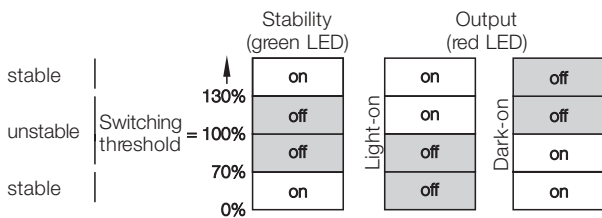


Green Stability indicator BOS 25K-5-M25-... only

The "threshold energy" at which a signal change on the output results is defined as 100 %. The switching state is considered stable when the input energy exceeds or falls below the "threshold energy" by 30 %.

Therefore you are within the "safe" range

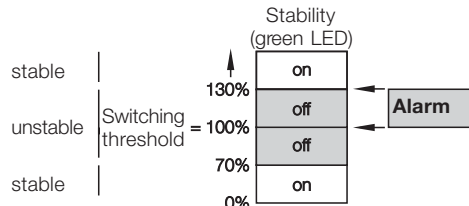
- if the input signal exceeds at least 130% of the threshold energy
- if the input signal falls below at least 70 % of the threshold energy.



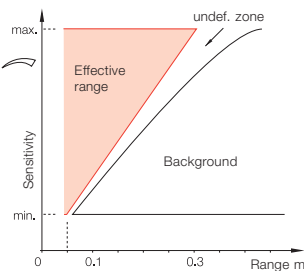
Alarm output for receiver (cable version only)

The receiver is equipped with an alarm output. This signal output (PNP open collector 30 mA) is used to generate a warning signal when malfunctions due to

contamination or mechanical maladjustment occur. The alarm output is activated if the receive signal remains in the alarm range for at least 3 s.



Diffuse BOS 25K with background suppression



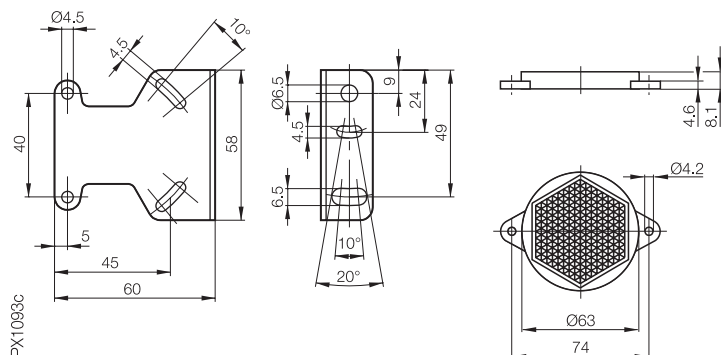
The "undefined zone" in the diffuse BOS 25K-5-M25-... is the zone between the effective range and the background. The sensing distance can be set between 50 mm and 250 mm using a spindle screw on the upper side of the unit. Remember that the "undefined zone" also changes proportionally to the sensing distance.

Test input for emitter

The test input for the emitter interrupts the light pulses from the emitter and allows the function of emitter and receiver to be checked. The receiver output must switch each time when a voltage of 10...30 V DC (Test+) or 0 V (Test-) is present on the test input.

Contamination or maladjustment on the optical axis causes the emitter signal to reach the receiver only weakly, if at all. Therefore the output will not switch even though the test input is activated. The test function provides a remote check of the thru-beam type and serves as a preventative measure.

Mounting bracket and Reflector BOS R-10 (included)



Recommended accessories please order separately



Connector BKS-_ 19/BKS-_ 20

2.1

2.3

Photoelectric sensors accessories page 2.3.2 ...

6

Connectors page 6.2 ...

The **BOS 26K** series with its 50 x 50 x 17 mm rectangular housings represents the logical development of an already successful design: a uniform housing for all sensor types used. This makes the BOS 26K series compatible with series BOS 25K and complements it with new kinds of sensors with special specifications and features:

- Laser sensors
- New, high-performance red light and infrared sensors
- Additional optical and mechanical functions.

The BOS 26K series is ideally suited wherever greater demands are made in terms of precision, handling, high sensing distance or range, as well as small-parts detection.

The retro-reflective models feature auto-collimation, i.e., the emitter and receiver

beam coincide geometrically.
Advantage: Exact switching points for any desired side-approaching object in the entire beam path

The diffuse model with background suppression **BOS 26K-..-1LHB** with its focused light beam can detect objects precisely in virtually any color between 30 and 150 mm. The focusing feature enables a spot size of just 0.1 mm at a distance of 80 mm.

Features

- Rotatable M12 connector
- Precise setting mechanism with two



- revolutions (720°)
- Clear character display for sensitivity setting
- Switching state and contamination display visible any direction
- Optimal design to resist contamination or the optics
- Complementary PNP or NPN output

- Detail checking
- Conveyor inspection (HGA)
- Conveyor technology
- Automation
- Handling equipment, robotics
- Machine building
- Specialty machines

Applications

- Precise small part detection
- Positioning tasks



Type	Range	Light type			Output		Output type		Switching frequency	U _B	Wiring	Help functions			Page
		Red light	Infrared	Laser	PNP- Transistor	NPN- Transistor	Light-on	Dark-on				10...30 V DC	M12 connector, 4-pin	Polarizing filter	
 Diffuse with HGA															
BOS 26K-PA-1LHB-S4-C	30...150 mm			■	■		■	■	2.5 kHz	■	■				2.1.118
BOS 26K-NA-1LHB-S4-C	30...150 mm			■		■	■	■	2.5 kHz	■	■				2.1.118
BOS 26K-PA-1HC-S4-C	30...300 mm	■			■		■	■	1 kHz	■	■				2.1.116
BOS 26K-NA-1HC-S4-C	30...300 mm	■				■	■	■	1 kHz	■	■				2.1.116
BOS 26K-PA-1LHC-S4-C	50...300 mm			■	■		■	■	2.5 kHz	■	■				2.1.119
BOS 26K-NA-1LHC-S4-C	50...300 mm			■		■	■	■	2.5 kHz	■	■				2.1.119
BOS 26K-PA-1IE-S4-C	150...600 mm		■		■		■	■	800 Hz	■	■				2.1.117
BOS 26K-NA-1IE-S4-C	150...600 mm		■			■	■	■	800 Hz	■	■				2.1.117
 Retro-reflective															
BOS 26K-PA-1LQB-S4-C	0...2.5 m			■	■		■	■	2.5 kHz	■	■		■	■	2.1.119
BOS 26K-PA-1QE-S4-C	0...5.5 m	■			■		■	■	1 kHz	■	■		■	■	2.1.117
BOS 26K-NA-1QE-S4-C	0...5.5 m	■				■	■	■	1 kHz	■	■		■	■	2.1.117
BOS 26K-PO-1QE-SA1-C	0...5.5 m	■			■		■		1 kHz	■	■		■	■	2.1.117
BOS 26K-PA-1LQK-S4-C	0...12 m			■	■		■	■	2.5 kHz	■	■		■	■	2.1.119
BOS 26K-NA-1LQK-S4-C	0...12 m			■		■	■	■	2.5 kHz	■	■		■	■	2.1.119

2.1

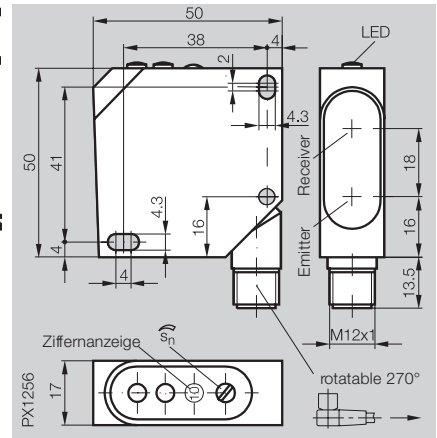
2.3

Photoelectric sensor accessories page 2.3.2 ...

6

Connectors page 6.2 ...

Diffuse with background suppression	Range	30...300 mm
Retro-reflective with polarizing filter	Range	



Diffuse



PNP	30...300 mm	HGA
NPN	30...300 mm	HGA
PNP	150...600 mm	HGA
NPN	150...600 mm	HGA

BOS 26K-PA-1HC-S 4-C
BOS 26K-NA-1HC-S 4-C

Retro-reflective



PNP	0...5.5 m	Auto-collimation
NPN	0...5.5 m	Auto-collimation

Electrical data

Supply voltage U_B	10...30 V DC
Ripple	10 %
No-load supply current I_0 max.	≤ 35 mA
Output	PNP- or NPN-Transistor
Output current	200 mA
Output function	Light-/dark-on (push-pull)
Voltage drop U_d at I_e	≤ 2.4 V
Settings	2-turn potentiometer with indicators

Optical data

Emitter, light type	LED, red light, pulsed
Wavelength	660 nm
Light spot diameter	approx. 8 mm at 200 mm
Distance hysteresis (18 %/18 %)	5 %
Gray value shift (90 %/18 %)	8 %

Indicators

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

Time data

Response time	0.5 ms
Frequency of operating cycles f	1 kHz

Mechanical data

Dimensions	50×50×17 mm
Connection	M12 connector, 4-pin
Housing material	Impact-resistant ABS
Optical surface	PMMA
Weight	35 g

Ambient data

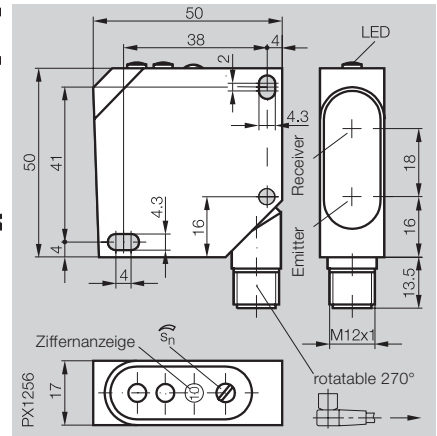
Degree of protection per IEC 60529	IP 67
Reverse polarity protected	yes
Short circuit protected	yes
Ambient operating temperature T_a	-20...+60 °C
Ambient light rejection per	EN 60947-5-2

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



Wiring diagrams, characteristics and accessories see page 2.1.120 and 2.1.121.

Diffuse with background suppression	Range	30...150 mm
Retro-reflective with polarizing filter	Range	



Diffuse

PNP 30...150 mm HGA	BOS 26K-PA-1LHB-S 4-C
NPN 30...150 mm HGA	BOS 26K-NA-1LHB-S 4-C
PNP 50...300 mm HGA	
NPN 50...300 mm HGA	



Retro-reflective

PNP 0...2.5 m Auto-collimation	
PNP 0...12 m Auto-collimation	
NPN 0...12 m Auto-collimation	

Electrical data

Supply voltage U_B	10...30 V DC
Ripple	10 %
No-load supply current I_0 max.	≤ 50 mA
Output	PNP- or NPN-Transistor
Output current	200 mA
Output function	Light-/dark-on (push-pull)
Voltage drop U_d at I_e	≤ 2.5 V
Settings	2-turn potentiometer with indicators

Optical data

Emitter, light type	Laser, red light
Wavelength	660 nm
Laser class	2
Light spot diameter	siehe Tabelle
Distance hysteresis (18 %/18 %)	5 %
Gray value shift (90 %/18 %)	8 %

Indicators

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

Time data

Response time	0.2 ms
Frequency of operating cycles f	2.5 kHz

Mechanical data

Dimensions	50x50x17 mm
Connection	M12 connector, 4-pin
Housing material	Impact-resistant ABS
Optical surface	PMMA
Weight	40 g

Ambient data

Degree of protection per IEC 60529	IP 67
Reverse polarity protected	yes
Short circuit protected	yes
Ambient operating temperature T_a	-15...+45 °C
Ambient light rejection	5 kLux

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

Light spot diameter [mm]

Range	30	60	80	100	150
Light spot \varnothing	1,8	0,7	0,1	1,1	2,5

Wiring diagrams, characteristics and accessories see page 2.1.120 and 2.1.121.



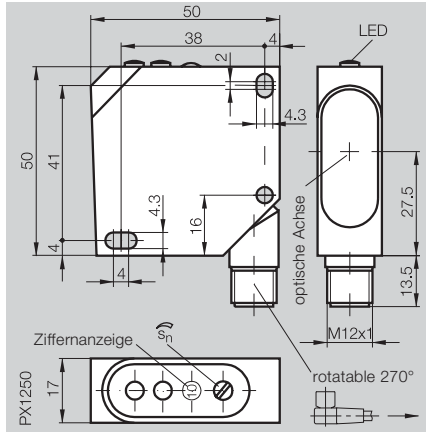
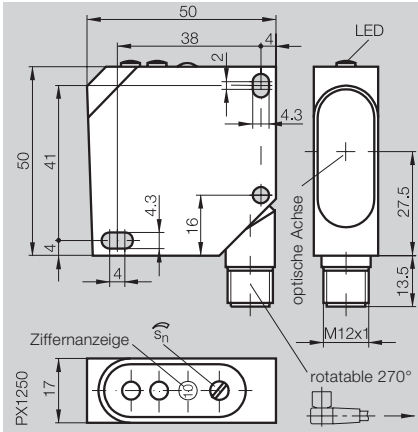
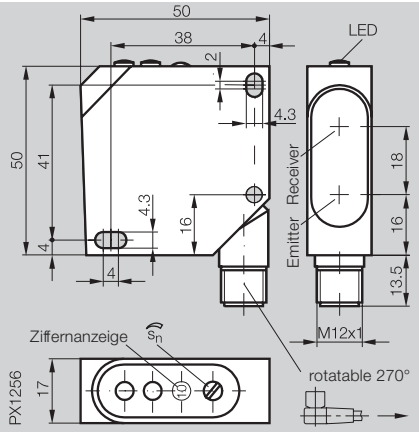


50...300 mm

0...2.5 m

for precise small parts detection

0...12 m



BOS 26K-PA-1LHC-S4-C
BOS 26K-NA-1LHC-S4-C

BOS 26K-PA-1LQB-S 4-C

BOS 26K-PA-1LQK-S 4-C
BOS 26K-NA-1LQK-S 4-C

10...30 V DC

10 %

≤ 50 mA

PNP- or NPN-Transistor

200 mA

Light-/dark-on (push-pull)

≤ 2.4 V

2-turn potentiometer with indicators

Laser, red light

670 nm

2

3×1 mm at 300 mm

2 %

5 %

LED green

LED yellow

LED red

0.2 ms

2.5 kHz

50×50×17 mm

M12 connector, 4-pin

Impact-resistant ABS

PMMA

40 g

IP 67

yes

yes

-20...+45 °C

5 kLux

10...30 V DC

10 %

≤ 40 mA

PNP- or NPN-Transistor

200 mA

Light-/dark-on (push-pull)

≤ 2.5 V

2-turn potentiometer with indicators

Laser, red light

670 nm

2

1 mm in 500 mm

LED green

LED yellow

LED red

0.2 ms

2.5 kHz

50×50×17 mm

M12 connector, 4-pin

Impact-resistant ABS

PMMA

40 g

IP 67

yes

yes

-15...+45 °C

5 kLux

10...30 V DC

10 %

≤ 40 mA

PNP- or NPN-Transistor

200 mA

Light-/dark-on (push-pull)

≤ 2.5 V

2-turn potentiometer with indicators

Laser, red light

670 nm

2

15 mm in 8 m

LED green

LED yellow

LED red

0.2 ms

2.5 kHz

50×50×17 mm

M12 connector, 4-pin

Impact-resistant ABS

PMMA

40 g

IP 67

yes

yes

-15...+45 °C

5 kLux

Light spot diameter [mm]

Range	50	100	200
Light spot Ø	5×1,8	4×1,5	3,8×1,2

For use only with special laser reflectors
BOS R-12, BOS R-13 and BOS R-16 see
page 2.3.4

2.1

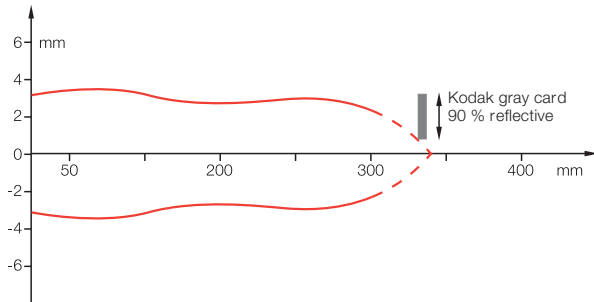
2.3

Photoelectric
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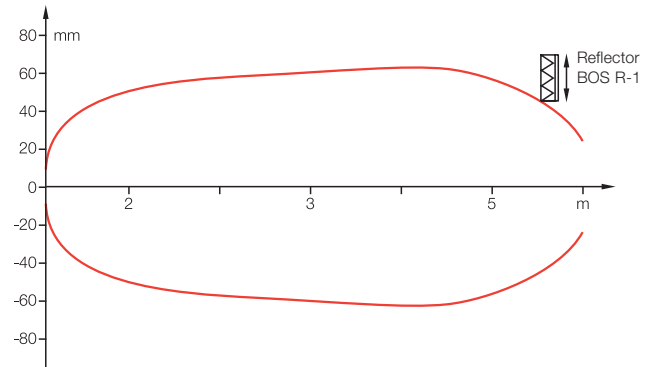
Connectors
page 6.2 ...

Diffuse BOS 26K-...-1HC-...



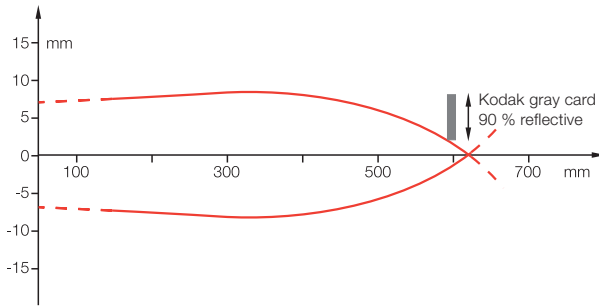
Range measured with side approach of Kodak gray card.

Retro-reflective BOS 26K-...-1QE-...



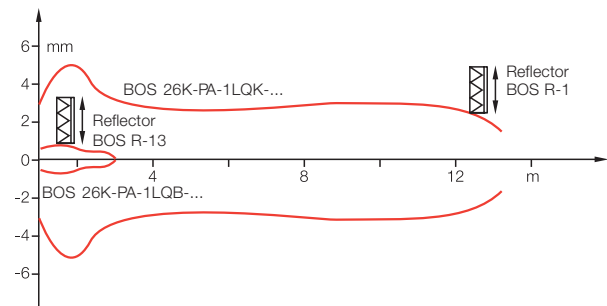
Range measured with side approach of reflector.

Diffuse BOS 26K-...-1IE-...



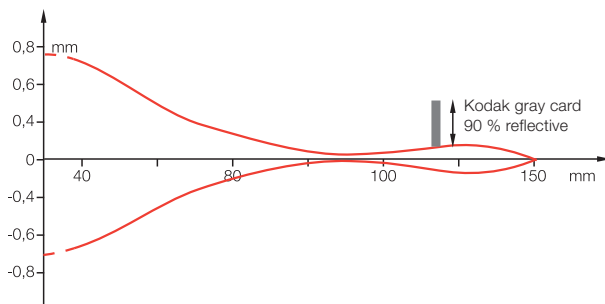
Range measured with side approach of Kodak gray card

Retro-reflective BOS 26K-...-1LQK/1LQB-...



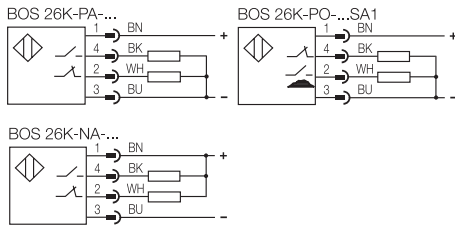
Range measured with side approach of reflector.

Diffuse BOS 26K-...-1LHB-...



Range measured with side approach of Kodak gray card

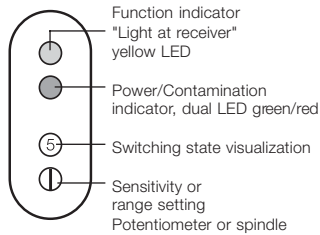
Wiring Diagrams



Contamination indicator

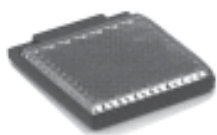
The BOS 26K has 2 display LED's: one yellow for function indicating and a green/red for status and contamination indication. Should the received light drop below a certain level, this will be indicated by a red LED. This permits contamination or maladjustment to be detected early.

Indicators and operating elements



Recommended accessories

Please order separately



Reflector
BOS R-9



Reflector
BOS R-1



Reflector
BOS R-12



Reflector
BOS R-13



Mounting
bracket
BOS 26-HW-1



Connector
BKS-_ 19/BKS-_ 20

The **BOS 35K** series offers ruggedness and imperviousness which is unequalled among block style sensors. These characteristics are achieved by the special housing design and full potting of the electronics. The connector is always particularly exposed in harsh applications. The BOS 35K fitting is made of stainless steel and anchored tightly in the housing.

The BOS 35K series consists of diffuse sensors with fixed (200 mm) and adjustable sensing distance (400 mm). Retroreflective versions with or without polarizing filter as well as thru-beam types round out this impressive line.




Features

- Rugged, tightly sealed
- Fully potted (epoxy)
- Protection isolated
- Stainless steel connector
- Versions with fixed or adjustable sensing distance

Applications

- Automobile industry
- Bottle and can filling
- Machine tool industry
- Conveying and warehousing
- Transport vehicles
- Harsh ambient conditions



Type	Range	Light type		Output	Output type		Switching frequency	U _B	Wiring	Help functions	Page
		Red light	Infrared	PNP-Transistor	Light-on	Dark-on					
 Diffuse								10...30 V DC	M12 connector, 4-pin	Polarizing filter	
BOS 35K-PS-1XB-S4-C	0...200 mm		■	■		■	100 Hz	■	■		2.1.124
BOS 35K-PO-1XB-S4-C	0...200 mm		■	■		■	100 Hz	■	■		2.1.124
BOS 35K-PS-1PD-S4-C	0...400 mm		■	■		■	100 Hz	■	■		2.1.125
BOS 35K-PO-1PD-S4-C	0...400 mm		■	■		■	100 Hz	■	■		2.1.125
 Retro-reflective											
BOS 35K-PS-1UD-S4-C	0...4 m	■		■		■	100 Hz	■	■	■	2.1.125
BOS 35K-PO-1UD-S4-C	0...4 m	■		■		■	100 Hz	■	■	■	2.1.125
BOS 35K-PS-1RH-S4-C	0.25...8 m	■		■		■	100 Hz	■	■		2.1.125
 Through-beam											
BLE 35K-PS-1H-S4-C	0...8 m		■	■		■	100 Hz	■	■		2.1.125
BLE 35K-PO-1H-S4-C	0...8 m		■	■		■	100 Hz	■	■		2.1.125
BLS 35K-XX-1H-S4-L	0...8 m		■					■	■		2.1.125

2.1

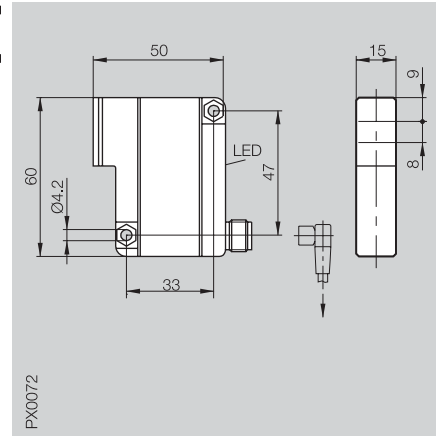
2.3

Photoelectric sensor accessories page 2.3.2 ...

6

Connectors. page 6.2 ...

Diffuse	Range	0...200 mm
Retro-reflective	Range	
Ambient light rejection	Range	



	Diffuse				
	PNP, light-on	200 mm		BOS 35K-PS-1XB-S 4-C	
	PNP, dark-on	200 mm		BOS 35K-PO-1XB-S 4-C	
	PNP, light-on	400 mm	Poti		
	PNP, dark-on	400 mm	Poti		
	Retro-reflective				
	PNP, dark-on	4 m	Polarizing filter		
	PNP, light-on	4 m	Polarizing filter		
	PNP, dark-on	8 m			
	Through-beam				
	PNP, dark-on	8 m	Receiver		
	PNP, light-on	8 m	Receiver		
		8 m	Emitter		
Electrical data					
Supply voltage U_B				10...30 V DC	
Ripple				15 %	
No-load supply current I_0 max.				≤ 20 mA	
Output				PNP-Transistor	
Output current				200 mA	
Output function				Light- or dark-on	
Voltage drop U_d at I_e				≤ 2.5 V	
Settings				Fixed	
Optical data					
Emitter, light type				LED, infrared	
Wavelength				880 nm	
Indicators					
Power-on indicator					
Output function indicator				LED yellow	
Time data					
Response time				5 ms	
Frequency of operating cycles f				100 Hz	
Mechanical data					
Dimensions				50×60×15 mm	
Connection				M12 connector, 4-pin	
Housing material				PA 12	
Optical surface				PMMA	
Weight				40 g	
Ambient data					
Degree of protection per IEC 60529				IP 67	
Reverse polarity protected				yes	
Short circuit protected				yes	
Ambient operating temperature T_a				-5...+55 °C	
Ambient light rejection				5 kLux	

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

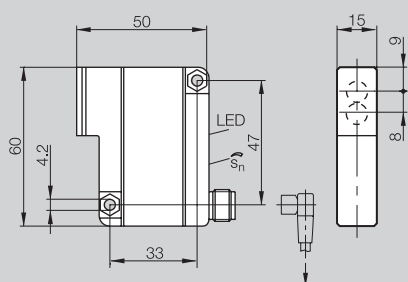


Wiring diagrams, characteristics and accessories see page 2.1.126 and 2.1.127.

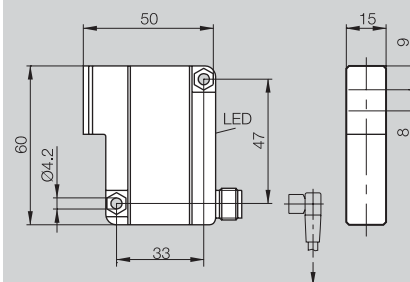
0...400 mm

0...4 m/0.25...8 m

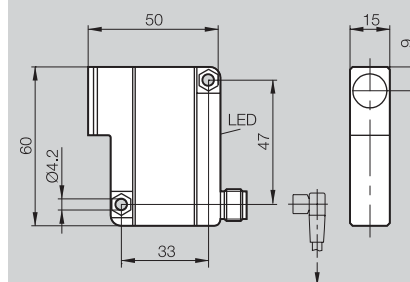
0...8 m



PX0073



PX0072



PX0071

BOS 35K-PS-1PD-S 4-C
BOS 35K-PO-1PD-S 4-C

BOS 35K-PS-1UD-S 4-C
BOS 35K-PO-1UD-S 4-C
BOS 35K-PS-1RH-S 4-C

BLE 35K-PS-1H-S 4-C
BLE 35K-PO-1H-S 4-C
BLS 35K-XX-1H-S 4-L

10...30 V DC
15 %
≤ 20 mA
PNP-Transistor
≤ 200 mA
Light- or dark-on
≤ 2.5 V
Potentiometer 270°

10...30 V DC
15 %
≤ 20 mA
PNP-Transistor
200 mA
Light- or dark-on
≤ 2.5 V
Fixed

10...30 V DC
15 %
BLE ≤ 20 mA/BLS ≤ 40 mA
PNP-Transistor
200 mA
Light- or dark-on
≤ 2.5 V
Fixed

LED, infrared
880 nm

LED, red light
660 nm

LED, infrared
880 nm

LED yellow

LED yellow

LED green for BLS
LED yellow

5 ms
100 Hz

5 ms
100 Hz

5 ms
100 Hz

50×60×15 mm
M12 connector, 4-pin
PA 12
PMMA
40 g

50×60×15 mm
M12 connector, 4-pin
PA 12
PMMA
40 g

50×60×15 mm
M12 connector, 4-pin
PA 12
PMMA
40 g

IP 67
yes
yes
-5...+55 °C
2 kLux

IP 67
yes
yes
-5...+55 °C
2 kLux

IP 67
yes
yes
-5...+55 °C
2 kLux

2.1

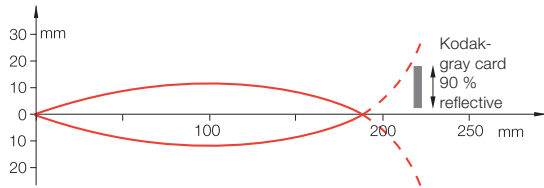
2.3

Photoelectric sensor accessories page 2.3.2 ...

6

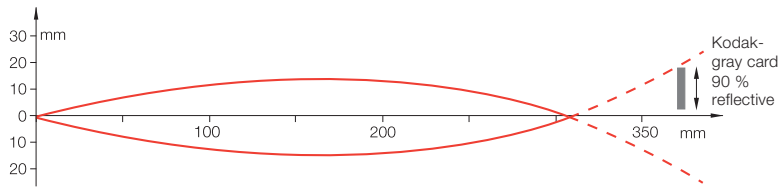
Connectors page 6.2 ...

Diffuse BOS 35K-...-1XB-...



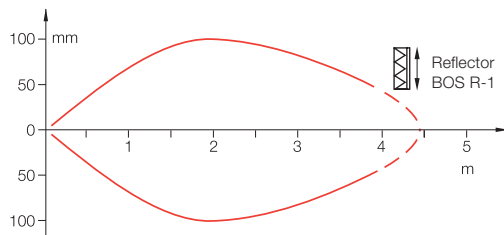
Range measured with side approach of Kodak gray card

Diffuse BOS 35K-...-1PD-...



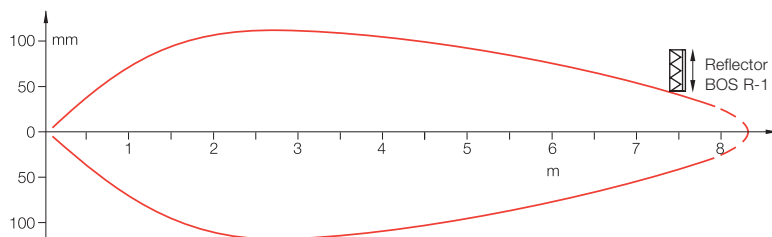
Range measured with side approach of Kodak gray card

Retro-reflective BOS 35K-...-1UD-...



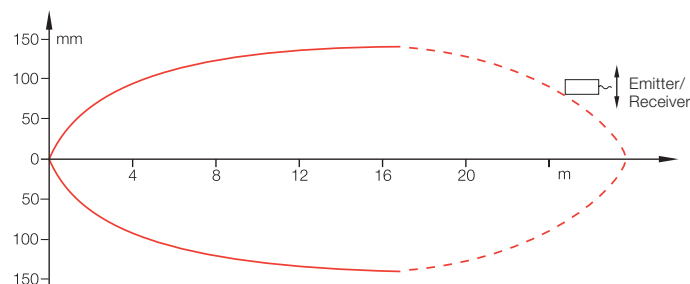
Range measured with side approach of reflector.

Retro-reflective BOS 35K-...-1RH-...



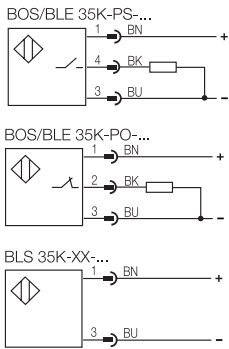
Range measured with side approach of reflector.

Through-beam BLE/BLS 35K-...



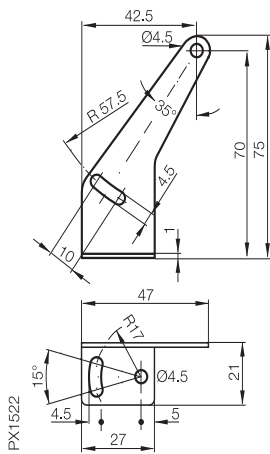
For the through-beam the maximum possible offset between emitter and receiver is measured.

Wiring Diagrams



Mounting bracket

Supplied, but can also be ordered separately



Recommended accessories

Please order separately



Reflector BOS R-1



Connector
BKS-S 20E
stainless steel



Connector
BKS-19/BKS-20

2.1

2.3

Photoelectric sensor accessories page 2.3.2 ...

6

Connectors page 6.2 ...

The **BOS 36K** series is ergonomic, compact (55x65x20 mm), and the connector is rotatable. The performance data are outstanding for a sensor this size. An easily accessible potentiometer is used for setting the sensitivity. The diffuse model with background suppression uses teach-in and visible red light to prevent incorrect settings.





Features

- Push-pull output 200 mA, short circuit protected
- Function and stability indicators
- Enclosure rating IP 66
- Compact plastic housing (ABS)
- Red light (HGA and Retro-reflective)
- Teach-in (button HGA)
- Wiring M12 connector, rotatable

Applications

- Wherever higher performance is needed
- Conveying and warehousing
- Packaging machines
- Access control
- Lift-type vehicles (not for safety applications)
- Wood industry
- Ceramics industry
- Automobile industry
- Gate and door control



Type	Range	Light type		Output		Output type		Switching frequency	U _B	Wiring	Features			Page
		Red light	Infrared	PNP-Transistor	NPN-Transistor	Light-on	Dark-on				M12 connector, 4-pin	Cable	Polarizing filter	
 Diffuse with HGA														
BOS 36K-PA-1HD-S4-C	100...500 mm	■		■		■	■	500 Hz	■	■			■	2.1.130
 Diffuse														
BOS 36K-PA-1PH-S4-C	10...2000 mm		■	■		■	■	500 Hz	■	■				2.1.131
 Retro-reflective														
BOS 36K-PA-1QH-S4-C	0.1...8 m	■		■		■	■	500 Hz	■	■		■		2.1.131
 Through-beam														
BLE 36K-PA-1PT-S4-C	0...50 m		■	■		■	■	500 Hz	■	■				2.1.131
BLS 36K-XX-1T-S4-C	0...50 m		■						■	■			■	2.1.131

2.1

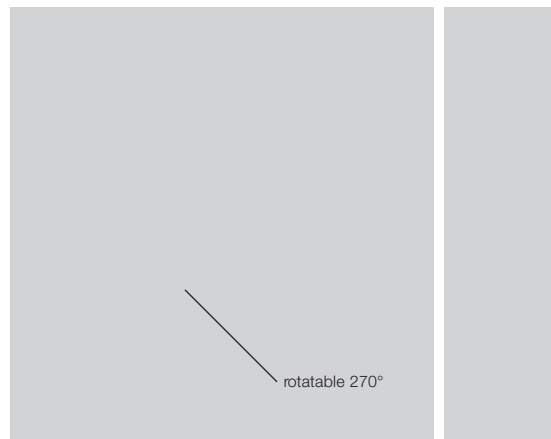
2.3

Photoelectric sensor accessories page 2.3.2 ...

6

Connectors page 6.2 ...

Diffuse with background suppression	Range	100...500 mm
Diffuse	Range	
Retro-reflective with polarizing filter	Range	
Through-beam	Range	



Diffuse

PNP	100...500 mm	HGA, red light, Teach-in
PNP	10...2000 mm	Infrared light

BOS 36K-PA-1HD-S 4-C



Retro-reflective

PNP	0.1...8 m	Polarizing filter, red light
-----	-----------	------------------------------

Through-beam



PNP	0...50 m	Receiver, infrared light
	0...50 m	Emitter

Electrical data

Supply voltage U_B	10...30 V DC
Ripple	2 V DC
No-load supply current I_0 max.	≤ 50 mA
Output	PNP-Transistor
Output current	200 mA
Output function	Light-/dark-on (push-pull)
Voltage drop U_d at I_e	≤ 2 V
Settings	Teach-in
Help function	

Optical data

Emitter, light type	LED, red light
Wavelength	660 nm
Light spot diameter	approx. 15 mm at 250 mm
Distance hysteresis (18 %/18 %)	20 %
Gray value shift (90 %/18 %)	8 %

Indicators

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

Time data

Response time	1 ms
Frequency of operating cycles f	500 Hz

Mechanical data

Dimensions	55×65×20 mm
Connection	M12 connector, 4-pin
Housing material	Impact-resistant ABS
Optical surface	PMMA
Weight	50 g

Ambient data

Degree of protection per IEC 60529	IP 66
Reverse polarity protected	yes
Short circuit protected	yes
Ambient operating temperature T_a	-10...+55 °C
Ambient light rejection	5 kLux

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

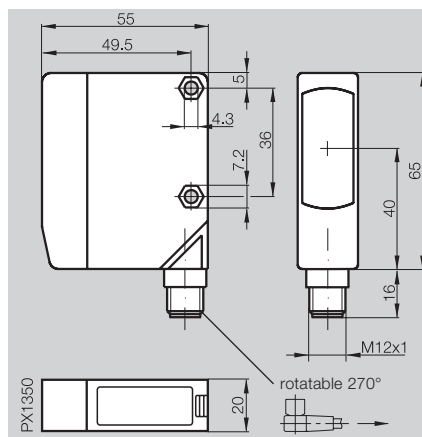
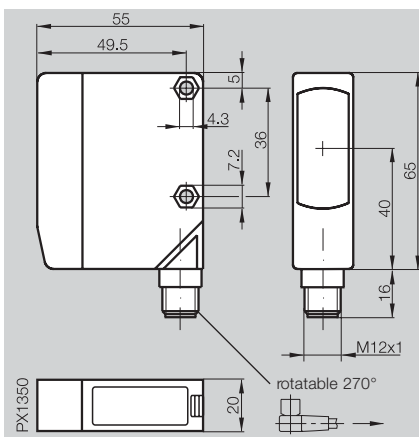
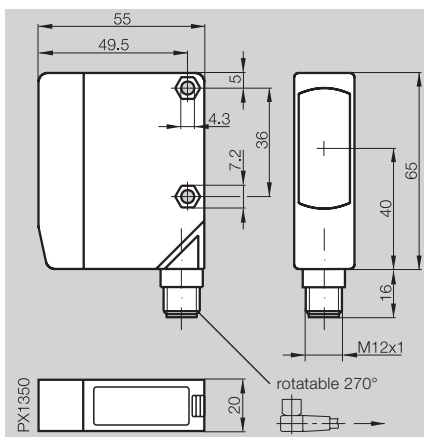


Wiring diagrams, characteristics and accessories see page 2.1.132 and 2.1.133.

0.01...2 m

0.1...8 m

0...50 m



BOS 36K-PA-1PH-S 4-C

BOS 36K-PA-1QH-S 4-C

BLE 36K-PA-1PT-S 4-C
BLS 36K-XX-1T-S 4-C

10...30 V DC
2 V DC
≤ 40 mA
PNP-Transistor
200 mA
Light-/dark-on (push-pull)
≤ 2 V
Potentiometer 270°

10...30 V DC
2 V DC
≤ 40 mA
PNP-Transistor
200 mA
Light-/dark-on (push-pull)
≤ 2 V
Potentiometer 270°

10...30 V DC
2 V DC
≤ 40 mA
PNP-Transistor
200 mA
Light-/dark-on (push-pull)
≤ 2 V
Potentiometer 270°
Test input (BLS)

LED, infrared
880 nm

LED, red light
660 nm

LED, infrared
880 nm

LED yellow
LED green

LED yellow
LED green

LED green (BLS)
LED yellow (BLE)
LED green (BLE)

1 ms
500 Hz

1 ms
500 Hz

1 ms
500 Hz

55×65×20 mm
M12 connector, 4-pin
Impact-resistant ABS

55×65×20 mm
M12 connector, 4-pin
Impact-resistant ABS

55×65×20 mm
M12 connector, 4-pin
Impact-resistant ABS

PMMA
50 g

PMMA
50 g

PMMA
50 g

IP 66
yes
yes
-25...+55 °C
5 kLux

IP 66
yes
yes
-25...+55 °C
5 kLux

IP 66
yes
yes
-25...+55 °C
5 kLux

2.1

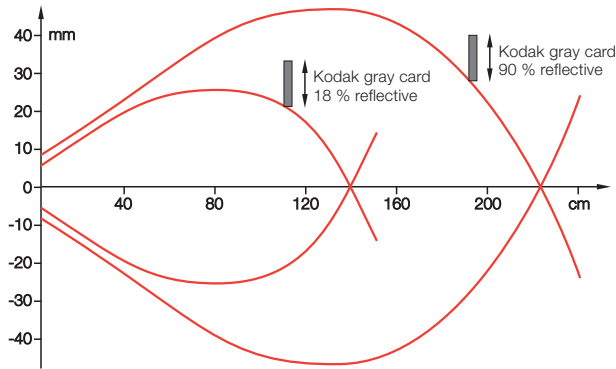
2.3

Photoelectric sensor accessories page 2.3.2 ...

6

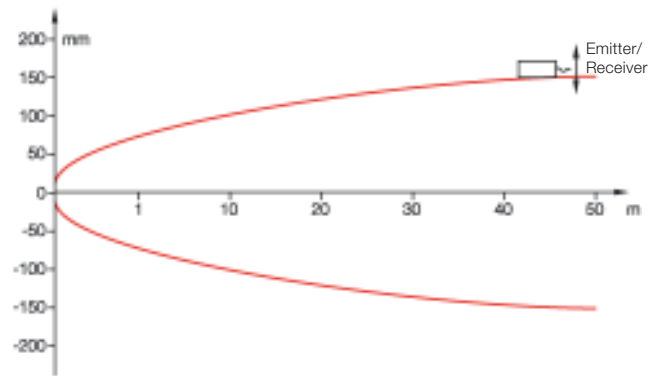
Connectors page 6.2 ...

Diffuse BOS 36K-PA-1PH-S 4-C



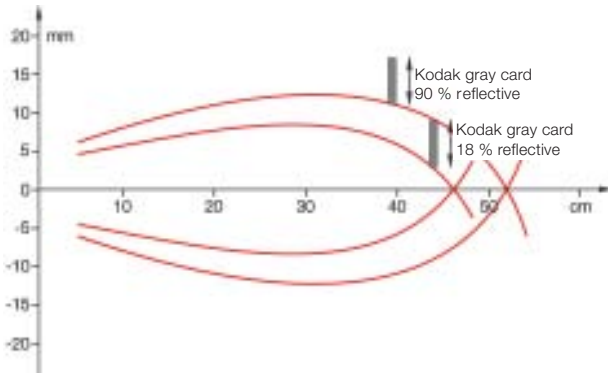
Range measured with side approach of Kodak gray card

Through-beam BLE/BLS 36K-...



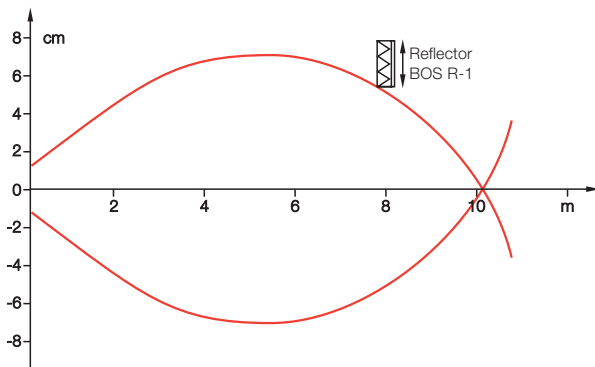
For the through-beam the maximum possible offset between emitter and receiver is measured.

Diffuse BOS 36K-PA-1HD-S 4-C



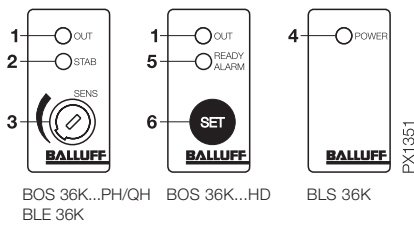
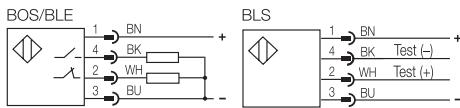
Range measured with side approach of Kodak gray card

Retro-reflective BOS 36K-PA-1QH-S 4-C



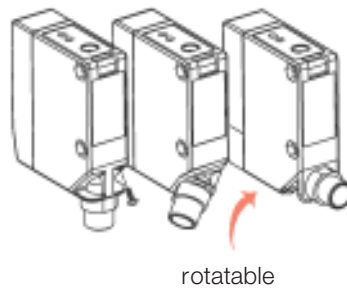
Range measured with side approach of reflector.

Wiring Diagrams



Indicators and operating elements

- 1 Output** (yellow LED)
Yellow LED indicates output function.
- 2 Contamination display** (green LED)
The green LED indicates when the received signal is 30 % above the switching threshold needed for switching.
- 3 Potentiometer for sensitivity setting**
- 4 Power indicator** (green LED)
- 5 READY/ALARM** (2-color green/red LED)
- 6 SET** (setting button)



Recommended accessories

Please order separately



Reflector
BOS R-1



Mounting
bracket
BOS 36-HW-1



Connector
BKS-_ 19/BKS-_ 20

2.1

2.3

Photoelectric
sensor
accessories
page 2.3.2 ...

6

Connectors
page 6.2 ...

When in doubt – more power! This is especially true under harsh conditions. This is why our **BOS 65K** has a 3 A output at 264 V AC/DC and a very long sensing range. It also comes with setup help, test input, alarm output, time functions, and adjustable background suppression up to 1 m. The same rugged plastic housing series with large wiring chamber is offered with each of the following optical types:

- Thru-beam
- Retroreflective with polarizing filter
- Diffuse
- Diffuse with background suppression

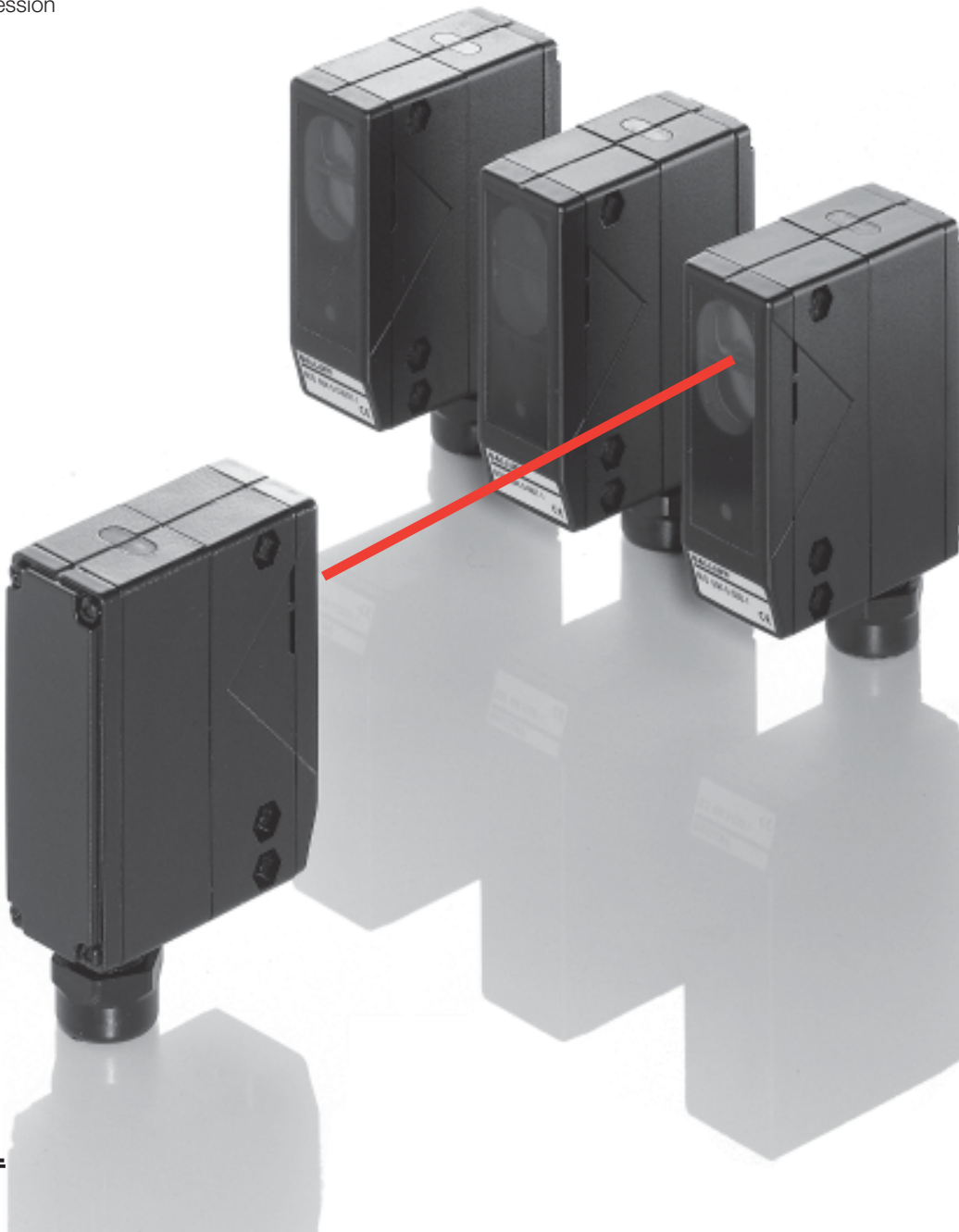
The supply voltage can be 10...30 V DC or 17...264 V AC/DC in the universal version. All DC versions come standard with PNP and NPN transistor outputs, and have an alarm output and test input. The universal voltage versions have a relay output. The retro- and thru-beam versions use both visible red and infrared light.





Features

- Universal voltage model 17...264 V AC/DC with relay output
- DC 10...30 V with transistor output (PNP/NPN)
- Light-on/dark-on
- DC version standard with alarm output and test input
- Version with various time functions (2 times settable)
- Wiring chamber with PG 11 cord seal

Applications

- Conveying
- Machine tools
- Packaging
- Assembly and handling automation
- Gate controls
- Inventory control



Type	Range	Light type		Output		Output type		Switching frequency	U _B		Wiring	Help functions			Page	
		Red light	Infrared	PNP-Transistor	NPN-Transistor	Relay	Light-on		Dark-on	10...30 V DC		17...264 V AC	M12 connector, 4-pin	Wiring chamber		Polarizing filter
 Diffuse with HGA																
BOS 65K-5-M110T-1	200...1100 mm		■	■	■		■	■	500 Hz	■		■		■	■	21.137
BOS 65K-5-M110T-2P-S4	200...1100 mm		■	■			■	■	500 Hz	■	■			■		21.137
BOS 65K-1-M110T-1	200...1100 mm		■			■	■	■	10 Hz		■	■				21.137
 Diffuse																
BOS 65K-5-C200T-1	50...2000 mm		■	■	■		■	■	500 Hz	■		■		■	■	21.137
BOS 65K-5-C200T-2P-S4	50...2000 mm		■	■			■	■	500 Hz	■	■			■		21.137
BOS 65K-1-C200T-1	50...2000 mm		■			■	■	■	10 Hz		■	■				21.137
 Retro-reflective																
BOS 65K-5-B8T-1	0.3...8 m	■		■	■		■	■	500 Hz	■		■	■	■	■	21.137
BOS 65K-5-B8T-2P-S4	0.3...8 m	■		■			■	■	500 Hz	■	■		■	■		21.137
BOS 65K-1-B8T-1	0.3...8 m	■				■	■	■	10 Hz		■	■	■			21.137
 Through-beam																
BLE 65K-5-F50T-1	0...50 m		■	■	■		■	■	500 Hz	■		■		■		21.137
BLE 65K-5-F50T-2P-S4	0...50 m		■	■	■		■	■	500 Hz	■	■			■		21.137
BLE 65K-1-F50T-1	0...50 m		■			■	■	■	10 Hz		■	■				21.137
BLS 65K-5-G50-1	0...50 m		■							■		■			■	21.137
BLS 65K-5-G50-2-S4	0...50 m		■							■	■				■	21.137
BLS 65K-1-G50-1	0...50 m		■								■	■			■	21.137

2.1

2.3

Photoelectric sensor accessories page 2.3.2 ...

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Connectors page 6.2 ...

Diffuse with background suppression	Range
Diffuse	Range
Retro-reflective	Range
Through-beam	Range



Diffuse



PNP/NPN	200...1100 mm	HGA, time function
	50...2000 mm	Time function
Relay	200...1100 mm	time function
	50...2000 mm	Time function

Retro-reflective



PNP/NPN	0.3...8 m	Polarizing filter, red light, time function
Relay	0.3...8 m	Polarizing filter, red light, time function

Through-beam



PNP/NPN	50 m	Receiver, time function
	50 m	Emitter
Relay	50 m	Receiver, time function
	50 m	Emitter

Electrical data

Supply voltage U_B
No-load supply current I_0 max.
Output
Output current
Output function
Voltage drop U_d at I_e
Alarm output
Settings
Help function

Indicators

Power-on indicator
Output function indicator
Stability indicator

Time data

Response time
Frequency of operating cycles f

Mechanical data

Dimensions
Connection
max. conductor cross-section
Housing material
Optical surface
Weight

Ambient data

Degree of protection per IEC 60529
Reverse polarity protected
Short circuit protected
Ambient operating temperature T_a
Ambient light rejection

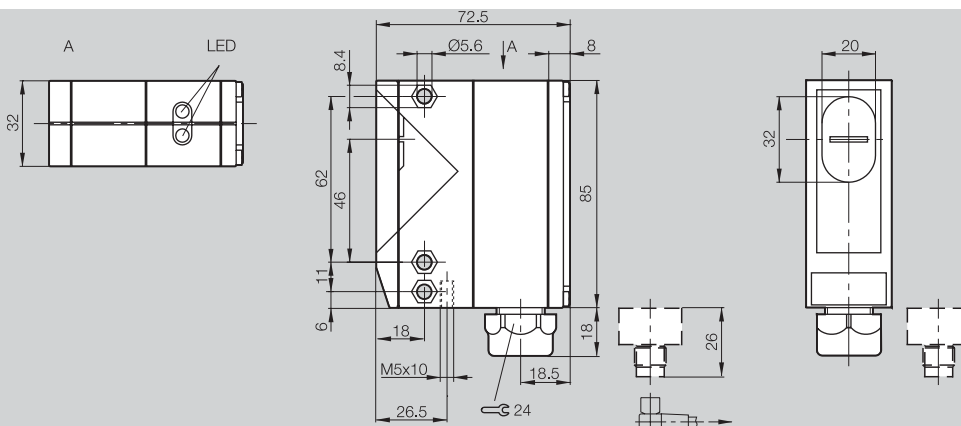
Diffuse values referenced to Kodak gray card 90 % reflective..
Retro-reflective values referenced to R1 reflector.

Wiring diagrams, characteristics and accessories see page 2.1.138 and 2.1.139.

0.2...1.1 m
0.05...2 m
0.3...8 m
0...50 m

0.2...1.1 m
0.05...2 m
0.3...8 m
0...50 m

0.2...1.1 m
0.05...2 m
0.3...8 m
0...50 m



PX0689b

BOS 65K-5-M110T-1
BOS 65K-5-C200T-1

BOS 65K-5-M110T-2P-S 4
BOS 65K-5-C200T-2P-S 4

BOS 65K-1-M110T-1
BOS 65K-1-C200T-1

BOS 65K-5-B8T-1

BOS 65K-5-B8T-2P-S 4

BOS 65K-1-B8T-1

BLE 65K-5-F50T-1
BLS 65K-5-G50-1

BLE 65K-5-F50T-2P-S 4
BLS 65K-5-G50-2-S 4

BLE 65K-1-F50T-1
BLS 65K-1-G50-1

10...30 V DC
≤ 40 mA
PNP- and NPN-Transistor
200 mA

Light- and dark-on (selectable)
≤ 2 V
PNP-Transistor, 200 mA
Potentiometer 270°
Test input (except BLE)

LED green (only for BLS)
LED red
LED green

1 ms
500 Hz

72.5×85×32 mm
Wiring chamber
0.75 mm²

PC
PMMA
160 g

IP 67
yes
yes
-20...+55 °C
3 kLux

10...30 V DC
≤ 40 mA
PNP-Transistor
200 mA

Light- and dark-on (selectable)
≤ 1.5 V
PNP-Transistor, 200 mA
Potentiometer 270°
Test input (for BLS)

LED green (only for BLS)
LED red
LED green

1 ms
500 Hz

72.5×85×32 mm
M12 connector, 4-pin

PC
PMMA
180 g

IP 67
yes
yes
-20...+55 °C
3 kLux

17...264 V AC/DC
Relay 3A, 250 V AC/24 V DC

Light- and dark-on (selectable)
0 V

Potentiometer 270°

LED green (only for BLS)
LED red
LED green

20 ms
10 Hz

72.5×85×32 mm
Wiring chamber
0.75 mm²

PC
PMMA
160 g

IP 67
yes
no
-20...+55 °C
3 kLux



Connector orientation

2.1

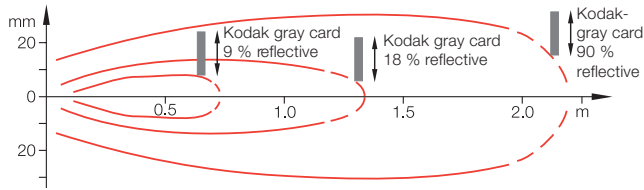
2.3

Photoelectric sensor accessories page 2.3.2 ...

6

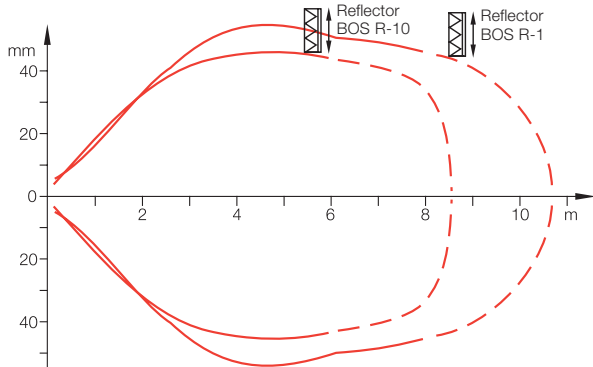
Connectors page 6.2 ...

Diffuse BOS 65K--C200T-...



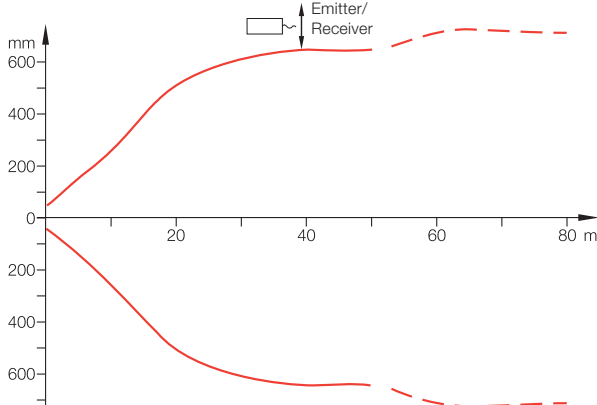
Range measured with side approach of Kodak gray card

Retro-reflective with polarizing filter BOS 65K--B8T-...



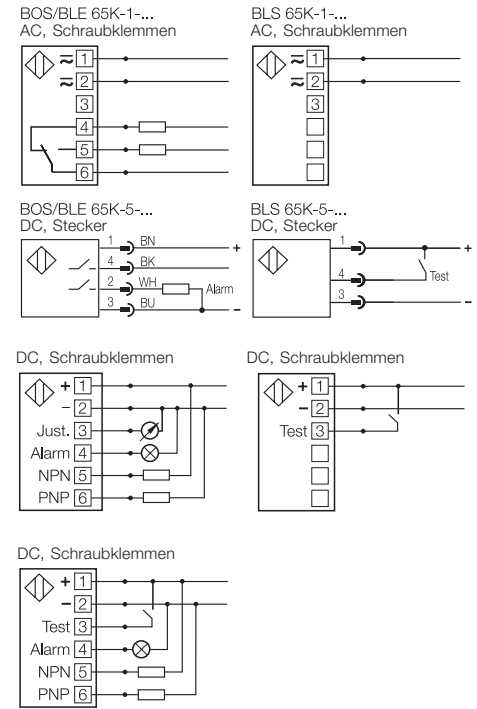
Range measured with side approach of reflector.

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



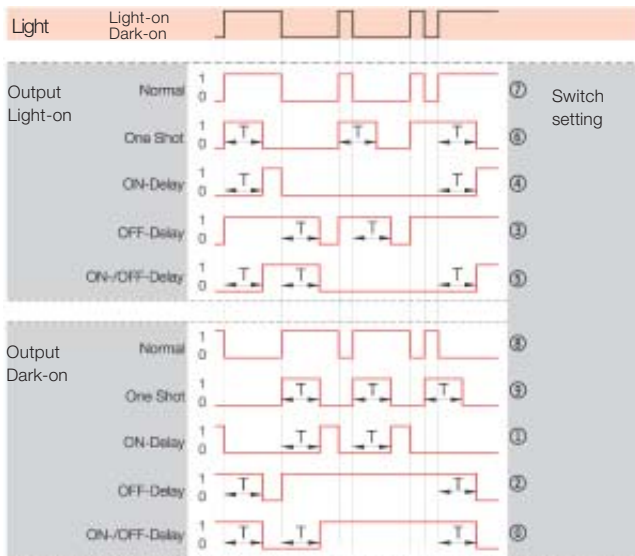
For the through-beam the maximum possible offset between emitter and receiver is measured.

Wiring Diagrams



Access to the operating elements by removing the cover (rear).

Programmable time functions

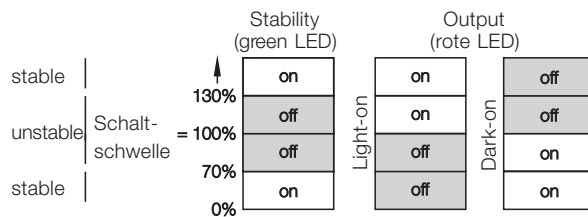


Green stability indicator

The "threshold energy" at which a signal change on the output is caused is defined as 100 %. The switching state is considered stable when the input energy is over or under the "threshold energy" by 30%. The green LED comes on.

The "safe range is then

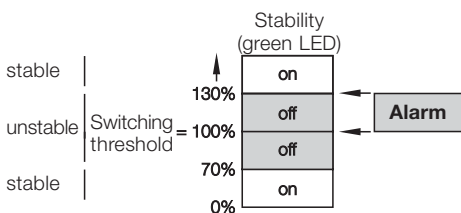
- when the input signal exceeds at least 130 % of the threshold energy
- the input signal falls below at least 70 % of the threshold energy.



Alarm output for receiver, diffuse and retro-reflective (DC)

maladjustment. The alarm output is activated if the receive signal remains in the alarm range for at least 3 sec.

The alarm output (PNP 200 ma) for DC versions generates a warning signal for malfunctions due to contamination or mechanical



Test input for emitter, diffuse and retroreflective (DC)

The test input interrupts the light pulses from the emitter and thereby allows it to be tested for function. When using the test input the input must see 10...30 V. The output must switch everytime there is 10...30 V DC on the test input. Contamination or maladjustment on the optical

axis causes the emitter signal to reach the receiver only weakly, if at all. Therefore the output will not switch even though the test input is activated. The test function provides a remote check of the thru-beam type and serves as a preventative measure.

Recommended accessories

Please order separately



Reflector
BOS R-1



Mounting
bracket
BOS 65-HW-1



Connector
BKS-19/BKS-20

2.1

2.3

Photoelectric
sensor
accessories
page 2.3.2 ...

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Connectors
page 6.2 ...