

Through-beam sensors are unsurpassed in their accuracy, ability to discriminate small parts and fine detail, as well as their operating reliability. The only disadvantages are in installation and setup. The goal of eliminating these objections has led to the concept of the slot sensor.

A full range of slot sensors with a variety of slot openings and dimensions ensures that virtually any sensing task can be handled while still using standard product.

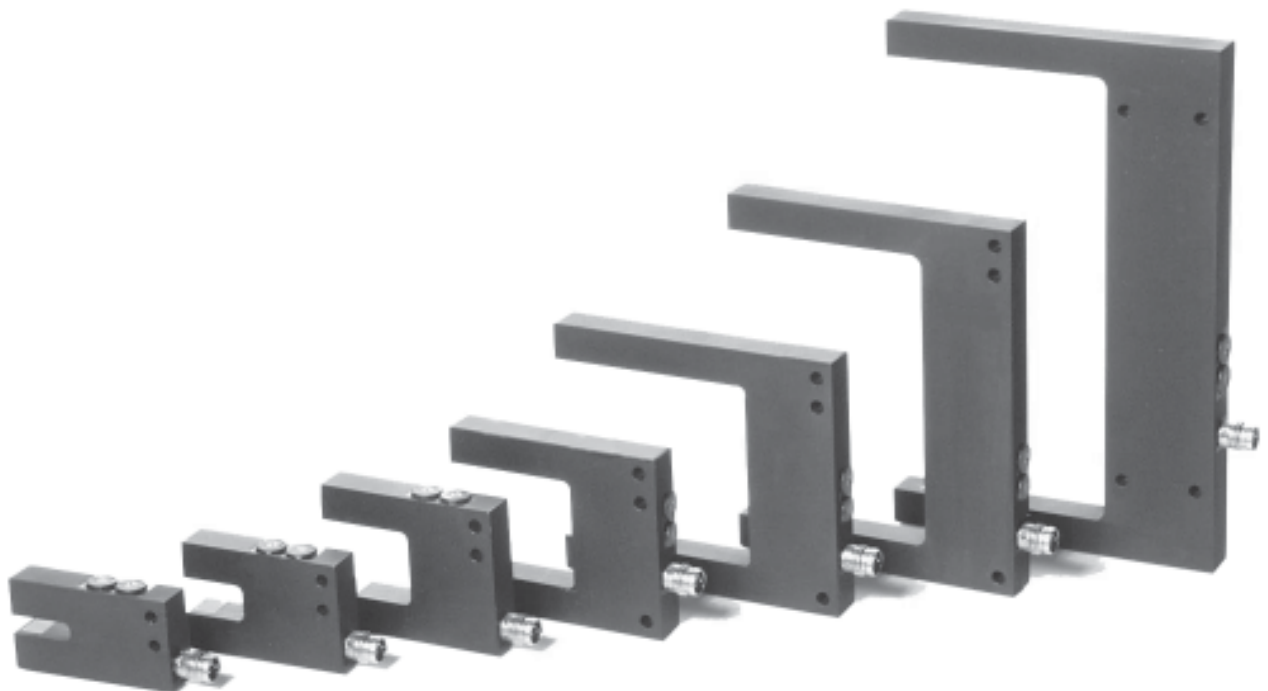
Laser slot sensors are the logical extension of this proven concept. They are unbeatable when it comes to accuracy, detail discrimination and operating reliability. Balluff laser slot sensors are ideal for precise positioning as well as reliable detection of fast-moving processes and small parts. This opens a vast range of applications in robotics and automation.


Features

- Integrated processing electronics
- Easy to use and adjust
- Only one cable connection needed
- Rugged metal housing
- Glass optical surface
- High switching frequency
- Adjustable sensitivity
- High resolution
- NO/NC toggle switch
- LED indicator 360° visible
- Choose from red or laser light
- Identical housing dimensions for both light versions
- Slot arm 10x10 mm, even for large slot openings

Applications

- Parts sensing on conveyor and feed belts
- Label sensing on transparent substrate
- Dimension checking
- Counting parts in assembly lines
- Tool break monitoring
- Position monitoring
- Feed control on automatic assembly equipment
- Checking for completeness (e.g. connector pins)
- Level monitoring of containers
- Handling and assembly



Type	Slot opening	Resolution	Light type			Output		Output function		Switching frequency	U _B	Connection	Page
			Red light	Laser light	Red and green light	PNP-Transistor	NPN-Transistor	Light-on	Dark-on				
 Slot sensors													
BGL 5A-001-S49	5 mm	0.3 mm	■			■		■	■	3 kHz	■	■	2.2.64
BGL 5A-002-S49	5 mm	0.3 mm	■				■	■	■	3 kHz	■	■	2.2.64
BGL 10A-001-S49	10 mm	0.3 mm	■			■		■	■	3 kHz	■	■	2.2.64
BGL 10A-002-S49	10 mm	0.3 mm	■				■	■	■	3 kHz	■	■	2.2.64
BGL 20A-001-S49	20 mm	0.3 mm	■			■		■	■	1.5 kHz	■	■	2.2.65
BGL 20A-002-S49	20 mm	0.3 mm	■				■	■	■	1.5 kHz	■	■	2.2.65
BGL 30A-001-S49	30 mm	0.3 mm	■			■		■	■	1.5 kHz	■	■	2.2.65
BGL 30A-002-S49	30 mm	0.3 mm	■				■	■	■	1.5 kHz	■	■	2.2.65
BGL 30A-003-S49	30 mm	60 µm		■		■		■	■	3 kHz	■	■	2.2.68
BGL 30A-004-S49	30 mm	60 µm		■			■	■	■	3 kHz	■	■	2.2.68
BGL 50A-001-S49	50 mm	0.5 mm	■			■		■	■	1.5 kHz	■	■	2.2.65
BGL 50A-002-S49	50 mm	0.5 mm	■				■	■	■	1.5 kHz	■	■	2.2.65
BGL 50A-003-S49	50 mm	0.1 mm		■		■		■	■	3 kHz	■	■	2.2.69
BGL 50A-004-S49	50 mm	0.1 mm		■			■	■	■	3 kHz	■	■	2.2.69
BGL 80A-001-S49	80 mm	0.5 mm	■			■		■	■	1.5 kHz	■	■	2.2.66
BGL 80A-002-S49	80 mm	0.5 mm	■				■	■	■	1.5 kHz	■	■	2.2.66
BGL 80A-003-S49	80 mm	0.2 mm		■		■		■	■	3 kHz	■	■	2.2.69
BDL 80A-004-S49	80 mm	0.2 mm		■			■	■	■	3 kHz	■	■	2.2.69
BGL 120A-001-S49	120 mm	0.8 mm	■			■		■	■	1.5 kHz	■	■	2.2.67
BGL 120A-002-S49	120 mm	0.8 mm	■				■	■	■	1.5 kHz	■	■	2.2.67
BGL 120A-003-S49	120 mm	0.3 mm		■		■		■	■	3 kHz	■	■	2.2.69
BGL 120A-004-S49	120 mm	0.3 mm		■			■	■	■	3 kHz	■	■	2.2.69
BGL 180A-001-S49	180 mm	0.8 mm	■			■		■	■	1.5 kHz	■	■	2.2.67
BGL 180A-002-S49	180 mm	0.8 mm	■				■	■	■	1.5 kHz	■	■	2.2.67
BGL 220A-001-S49	220 mm	0.8 mm	■			■		■	■	1.5 kHz	■	■	2.2.67
BGL 220A-002-S49	220 mm	0.8 mm	■				■	■	■	1.5 kHz	■	■	2.2.67
BGL 21-AH	2 mm	0.5 mm			■	■	■	■	■	10 kHz	■	■	2.2.71

2.2

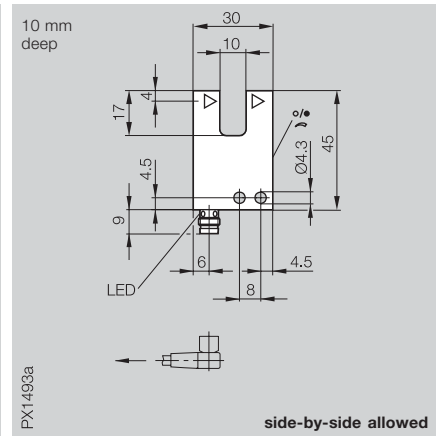
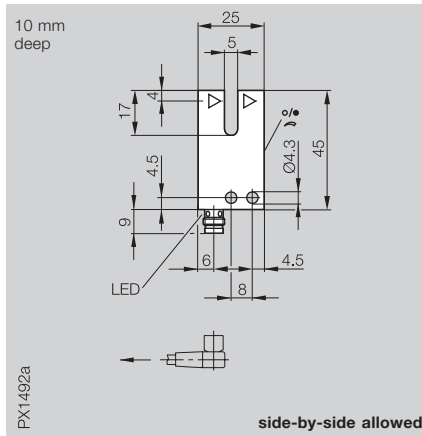
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Series	BGL	BGL
Slot opening	5 mm	10 mm
Slot depth	13 mm	13 mm



Slot sensor

PNP	BGL 5A-001-S 49	BGL 10A-001-S 49
NPN	BGL 5A-002-S 49	BGL 10A-002-S 49

Electrical data

Supply voltage U_B	10...30 V DC	10...30 V DC
Ripple	10 %	10 %
No-load supply current I_0 max.	< 35 mA	< 35 mA
Switching output	PNP- or NPN-Transistor	PNP- or NPN-Transistor
Output current	Light-/dark-on (selectable)	Light-/dark-on (selectable)
Switching type	200 mA	200 mA
Voltage drop U_d at I_e	≤ 3 V (PNP)/≤ 2.5 V (NPN)	≤ 3 V (PNP)/≤ 2.5 V (NPN)
Settings	Potentiometer 270°	Potentiometer 270°

Optical data

Emitter, light type	LED, red light	LED, red light
Wavelength	640 nm	640 nm
Resolution (smallest discernible part)	0.3 mm	0.3 mm
Repeat accuracy	20 μm	20 μm
Switching hysteresis	≤ 0.1 mm	≤ 0.1 mm

Time data

Response time	0.2 ms	0.2 ms
Switching frequency f	3 kHz	3 kHz

Indicator

Output function indicator	LED red	LED red
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Mechanical data

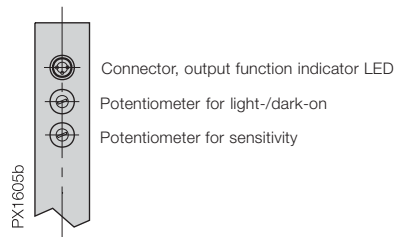
Dimensions	25×45×10 mm	30×45×10 mm
Connection	M8 connector, 3-pin	M8 connector, 3-pin
Housing material	Al anodized	Al anodized
Optical surface	Glass	Glass
Weight	20 g	23 g

Ambient data

Degree of protection per IEC 60529	IP 67	IP 67
Polarity reversal protected	yes	yes
Short circuit protected	yes	yes
Ambient temperature range T_a	-10...+60 °C	-10...+60 °C
Ambient light rejection	EN 60947-5-2	EN 60947-5-2



Wiring diagrams



Slot Sensors

Photoelectric Sensors

BGL Slot Sensors

BGL 20 mm 20 mm	BGL 30 mm 30 mm	BGL 50 mm 54 mm
BGL 20A-001-S 49 BGL 20A-002-S 49	BGL 30A-001-S 49 BGL 30A-002-S 49	BGL 50A-001-S 49 BGL 50A-002-S 49
10...30 V DC	10...30 V DC	10...30 V DC
10 %	10 %	10 %
< 35 mA	< 35 mA	≤ 35 mA
PNP- or NPN-Transistor Light-/dark-on (selectable)	PNP- or NPN-Transistor Light-/dark-on (selectable)	PNP- or NPN-Transistor Light-/dark-on (selectable)
200 mA	200 mA	200 mA
≤ 3 V (PNP)/≤ 2.5 V (NPN)	≤ 3 V (PNP)/≤ 2.5 V (NPN)	≤ 3 V (PNP), ≤ 2.5 V (NPN)
Potentiometer 270°	Potentiometer 270°	Potentiometer 270°
LED, red light	LED, red light	LED, red light
640 nm	640 nm	640 nm
0.3 mm	0.3 mm	0.5 mm
20 µm	20 µm	40 µm
≤ 0.1 mm	≤ 0.1 mm	≤ 0.15 mm
0.33 ms	0.33 ms	0.33 ms
1.5 kHz	1.5 kHz	1.5 kHz
LED red	LED red	LED red
40×49×10 mm	50×59×10 mm	70×79×10 mm
M8 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin
Al anodized	Al anodized	Al anodized
Glass	Glass	Glass
28 g	36 g	107 g
IP 67	IP 67	IP 67
yes	yes	yes
yes	yes	yes
-10...+60 °C	-10...+60 °C	-10...+60 °C
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2

2.2

2.3

Photoelectric sensors accessories page 2.3.2 ...

Recommended accessories
please order separately

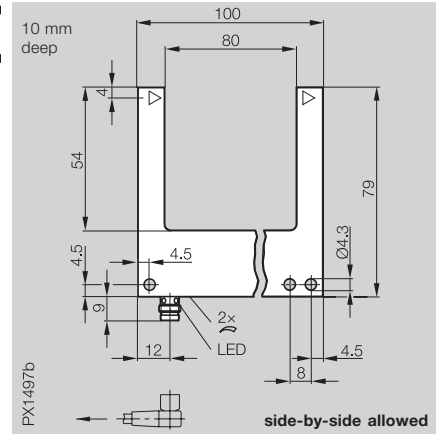
Connector
BKS- 48/BKS- 49



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Connectors page 6.2 ...

Series	BGL
Slot opening	80 mm
Slot depth	54 mm



Slot sensor

PNP	BGL 80A-001-S 49
NPN	BGL 80A-002-S 49

Electrical data

Supply voltage U_B	10...30 V DC
Ripple	10 %
No-load supply current I_0 max.	≤ 35 mA
Switching output	PNP- or NPN-Transistor
Output current	Light-/dark-on (selectable)
Switching type	200 mA
Voltage drop U_d at I_e	≤ 3 V (PNP), ≤ 2.5 V (NPN)
Settings	Potentiometer 270°

Optical data

Emitter, light type	LED, red light
Wavelength	640 nm
Resolution (smallest discernible part)	0.5 mm
Repeat accuracy	60 μ m
Switching hysteresis	≤ 0.2 mm

Time data

Response time	0.33 ms
Switching frequency f	1.5 kHz

Indicator

Output function indicator	LED red
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Mechanical data

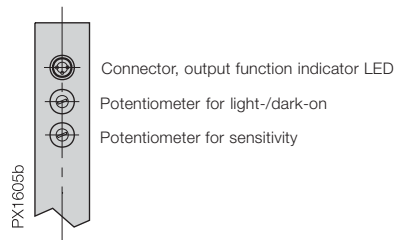
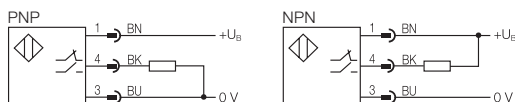
Dimensions	100x79x10 mm
Connection	M8 connector, 3-pin
Housing material	GD-Zn
Optical surface	Glass
Weight	140 g

Ambient data

Degree of protection per IEC 60529	IP 67
Polarity reversal protected	yes
Short circuit protected	yes
Ambient temperature range T_a	-10...+60 °C
Ambient light rejection	EN 60947-5-2



Wiring diagrams



Slot Sensors

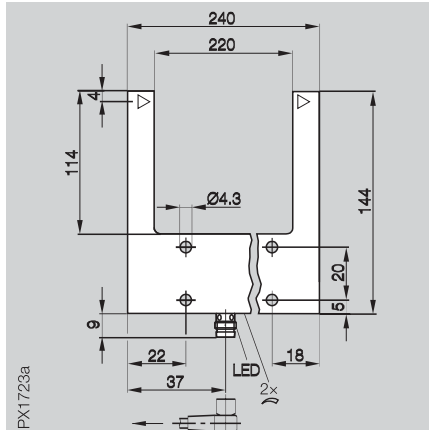
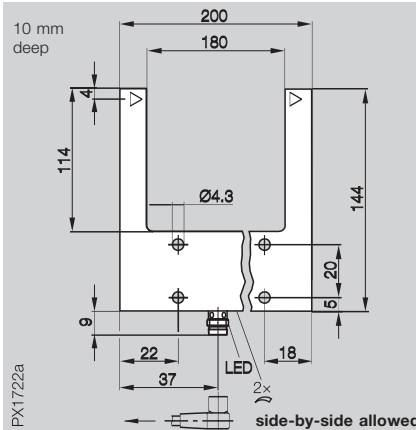
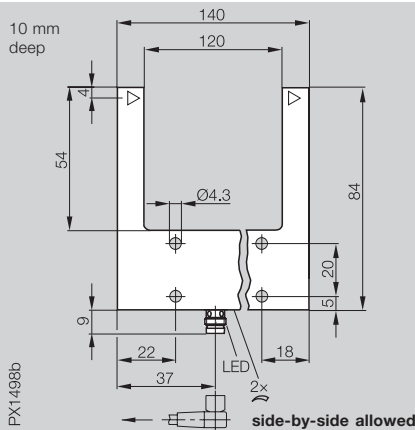
Photoelectric Sensors

BGL Slot Sensors

BGL
120 mm
54 mm

BGL
180 mm
114 mm

BGL
220 mm
114 mm



BGL 120A-001-S 49
BGL 120A-002-S 49

BGL 180A-001-S 49
BGL 180A-002-S 49

BGL 220A-001-S 49
BGL 220A-002-S 49

10...30 V DC
10 %
≤ 35 mA

PNP- or NPN-Transistor
Light-/dark-on (selectable)

200 mA
≤ 3 V (PNP), ≤ 2.5 V (NPN)
Potentiometer 270°

LED, red light
640 nm
0.8 mm
80 μm
≤ 0.2 mm

0.33 ms
1.5 kHz

LED red

140x84x10 mm
M8 connector, 3-pin
Al anodized
Glass
118 g

IP 67
yes
yes
-10...+60 °C
EN 60947-5-2

10...30 V DC
10 %
≤ 35 mA

PNP- or NPN-Transistor
Light-/dark-on (selectable)

200 mA
≤ 3 V (PNP), ≤ 2.5 V (NPN)
Potentiometer 270°

LED, red light
640 nm
0.8 mm
80 μm
≤ 0.2 mm

0.33 ms
1.5 kHz

LED red

200x144x10 mm
M8 connector, 3-pin
Al anodized
Glass
190 g

IP 67
yes
yes
-10...+60 °C
EN 60947-5-2

10...30 V DC
10 %
≤ 35 mA

PNP- or NPN-Transistor
Light-/dark-on (selectable)

200 mA
≤ 3 V (PNP), ≤ 2.5 V (NPN)
Potentiometer 270°

LED, red light
640 nm
0.8 mm
80 μm
≤ 0.2 mm

0.33 ms
1.5 kHz

LED red

240x144x10 mm
M8 connector, 3-pin
Al anodized
Glass
220 g

IP 67
yes
yes
-10...+60 °C
EN 60947-5-2

2.2

2.3

Photoelectric sensors accessories page 2.3.2 ...

Recommended accessories
please order separately

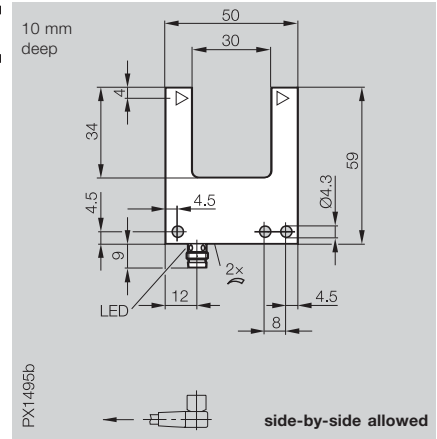
Connector
BKS-_ 48/BKS-_ 49



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Connectors page 6.2 ...

Series	BGL
Slot opening	30 mm
Slot depth	34 mm



Slot sensor

PNP	BGL 30A-003-S 49
NPN	BGL 30A-004-S 49

Electrical data

Supply voltage U_B	10...30 V DC
Ripple	10 %
No-load supply current I_0 max.	≤ 35 mA
Switching output	PNP- or NPN-Transistor
Output current	200 mA
Switching type	Light-/dark-on (selectable)
Voltage drop U_d at I_e	≤ 3 V (PNP), ≤ 2.5 V (NPN)
Settings	Potentiometer 270°

Optical data

Emitter, light type	LED, red light
Wavelength	650 nm
Laser class	2
Resolution (smallest discernible part)	60 μ m
Repeat accuracy	15 μ m
Switching hysteresis	≤ 20 μ m

Time data

Response time	0.16 ms
Switching frequency f	3 kHz

Indicator

Output function indicator	LED red
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Mechanical data

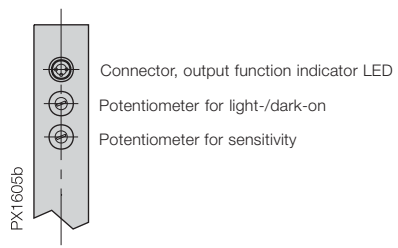
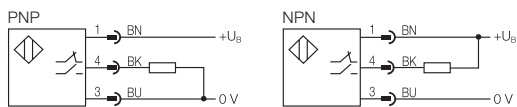
Dimensions	50x59x10 mm
Connection	M8 connector, 3-pin
Housing material	Al anodized
Optical surface	Glass
Weight	36 g

Ambient data

Degree of protection per IEC 60529	IP 67
Polarity reversal protected	yes
Short circuit protected	yes
Ambient temperature range T_a	-10...+60 °C
Ambient light rejection	10 kLux



Wiring diagrams

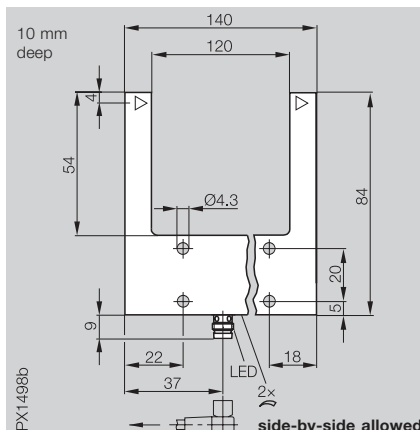
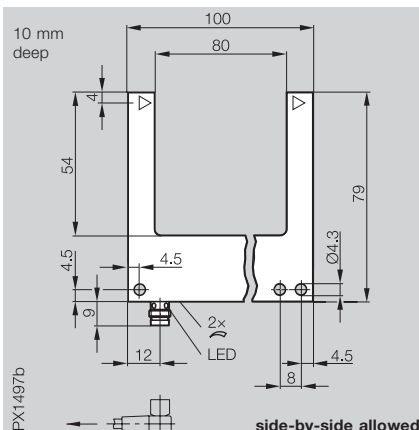
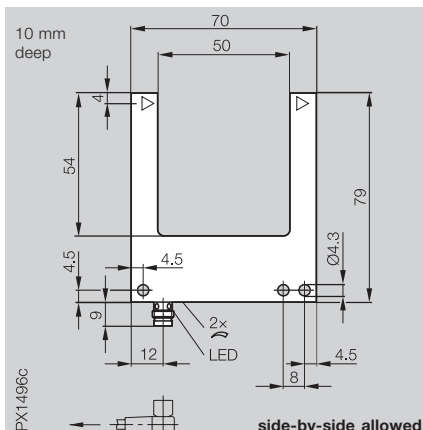




BGL
50 mm
54 mm

BGL
80 mm
54 mm

BGL
120 mm
54 mm



BGL 50A-003-S 49
BGL 50A-004-S 49

BGL 80A-003-S 49
BGL 80A-004-S 49

BGL 120A-003-S 49
BGL 120A-004-S 49

10...30 V DC
10 %
≤ 35 mA
PNP- or NPN-Transistor
200 mA

10...30 V DC
10 %
≤ 35 mA
PNP- or NPN-Transistor
200 mA

10...30 V DC
10 %
≤ 35 mA
PNP- or NPN-Transistor
200 mA

Light-/dark-on (selectable)
≤ 3 V (PNP), ≤ 2.5 V (NPN)
Potentiometer 270°

Light-/dark-on (selectable)
≤ 3 V (PNP), ≤ 2.5 V (NPN)
Potentiometer 270°

Light-/dark-on (selectable)
≤ 3 V (PNP), ≤ 2.5 V (NPN)
Potentiometer 270°

LED, red light
650 nm
2
0.1 mm
15 µm
≤ 20 µm

LED, red light
650 nm
2
0.2 mm
15 µm
≤ 20 µm

LED, red light
650 nm
2
0.3 mm
15 µm
≤ 20 µm

0.16 ms
3 kHz

0.16 ms
3 kHz

0.16 ms
3 kHz

LED red

LED red

LED red

70×79×10 mm
M8 connector, 3-pin
Al anodized

100×79×10 mm
M8 connector, 3-pin
Al anodized

140×84×10 mm
M8 connector, 3-pin
Al anodized

Glass
54 g

Glass
77 g

Glass
118 g

IP 67
yes
yes

IP 67
yes
yes

IP 67
ja
ja

-10...+60 °C
10 kLux

-10...+60 °C
10 kLux

-10...+60 °C
10 kLux

Recommended accessories
please order separately

Connector
BKS_- 48/BKS_- 49



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Photoelectric sensors accessories page 2.3.2 ...

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Connectors page 6.2 ...

The **BGL 21 slot sensor** is a photoelectric sensor using a microcontroller for the setup process and function monitoring. All the user needs to do is press a button to acquire all the data needed for the sensor setting. These data are stored in an EEPROM, so that the set process only has to be repeated if new conditions arise. The Autoset button is located on the top side of the sensor along with the function indicators: a yellow LED for indicating the output state of the sensor, and a two-color LED (red/green) for indicating function readiness or an error condition. Both the top and bottom side of the sensor have an adjustment aid printed for indicating the position in which the object must be located.

The internal microcontroller monitors all settings to ensure optimum switching frequency, repeat accuracy and rejection of optical interference and ambient light.

The BGL 21-AH has red and green emitter diodes which are advantageous for detecting colored markings. Which color of emitter light is more appropriate for the particular task is automatically determined during setup.

The block with the mounting holes and M8 connector can be rotated by 90° to accommodate any installation requirements.

Features

- Fast, fully automatic sensor calibration
- Control panel has just one button and two LED's
- Very short response time and high repeat accuracy
- High rejection of mutual optical interference and ambient light
- NPN/PNP output on separate pins with overload protection
- M8 connector block can be rotated 90°
- Metal housing

Applications

- Detecting color markings on transparent substrate
- Label detection
- Monitoring web tracking
- Belt break monitoring
- Gap/sag monitoring
- Hole checking in thin materials (< 2 mm)

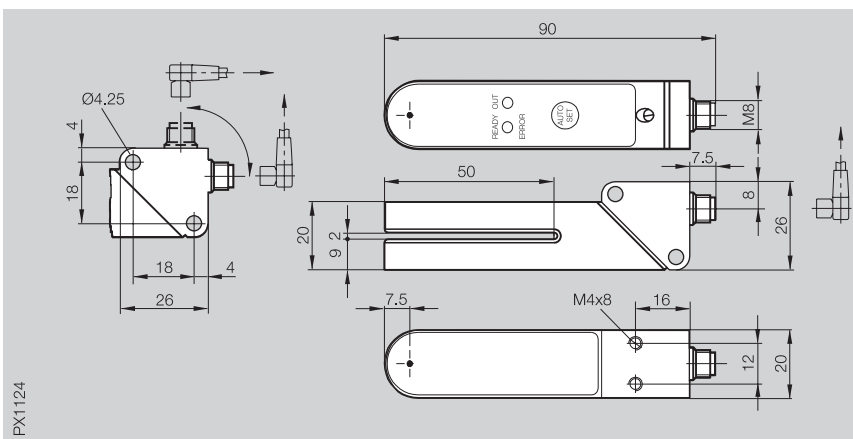


Slot Sensor for label detection

Photoelectric
Sensors

BGL 21
Slot Sensors

Series	BGL
Slot opening	2 mm
Slot depth	50 mm



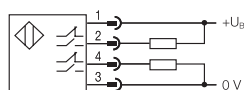
Slot sensor

PNP/NPN	BGL 21-AH
Electrical data	
Supply voltage U_B	10...30 V DC
Ripple	2 V
No-load supply current I_0 max.	≤ 55 mA
Switching output	PNP- and NPN-Transistor (on separate pins)
Output current	Light-/dark-on (selectable)
Switching type	100 mA
Voltage drop U_d at I_e	≤ 1.2 V
Settings	teach-in
Optical data	
Emitter, light type	LED, red light/green light
Wavelength	635 nm/535 nm
Resolution (smallest discernible part)	0.5 mm
Time data	
Response time	133 μ s
Switching frequency f	7.5 kHz
Indicator	
Output function indicator	LED yellow
Function ready/error indicator	LED red/green
Mechanical data	
Dimensions	90x26x20 mm
Connection	M8 connector, 4-pin
Housing material	Al anodized
Optical surface	Glas
Weight	100 g
Ambient data	
Degree of protection per IEC 60529	IP 65
Polarity reversal protected	yes
Short circuit protected	yes
Ambient temperature range T_a	0...+55 °C
Ambient light rejection	3 kLux (artificial light)/10 kLux (sunlight)



→ Connector orientation

Wiring diagram



Recommended accessories

please order separately

Connector
BKS-S 74/BKS-S 75



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2.3

Photoelectric
sensors
accessories
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