


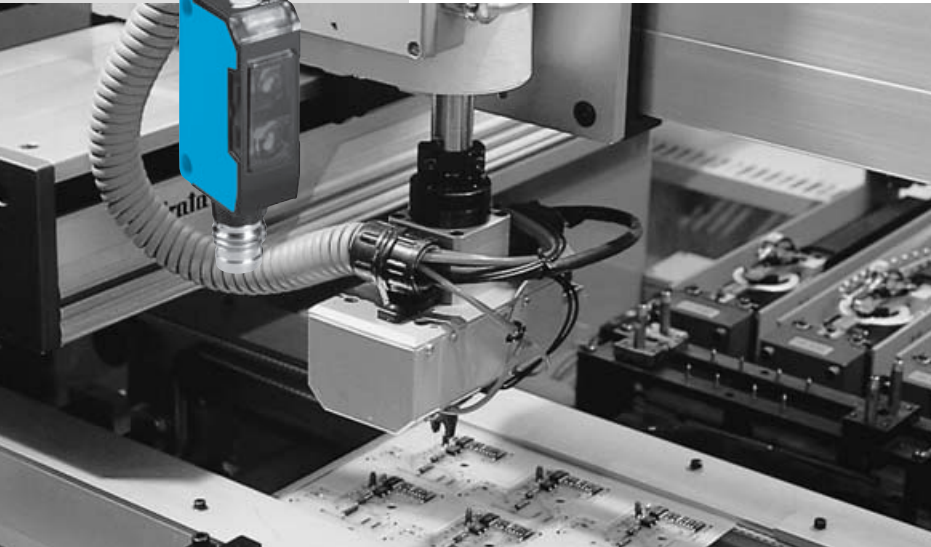



W150: Miniature photoelectric switch series with completely integrated electronics

	Photoelectric proximity switch BGS
	Photoelectric proximity switch energ.
	Photoelectric reflex switch



	Through-beam photoelectric switch
--	-----------------------------------

The W150 photoelectric switches provide the system data and features of standard photoelectric switches without restrictions. The high scanning ranges are a special focal point. W150 devices are always the right choice when little space is available for equipment mounting.

Consequently, they are especially successful in the typical application fields:

- Electronic components and printed circuit production,
- Packaging and graphic arts industries,
- Assembly and handling technologies,
- Special mechanical engineering tasks.

The W150 optics systems and their ranges:

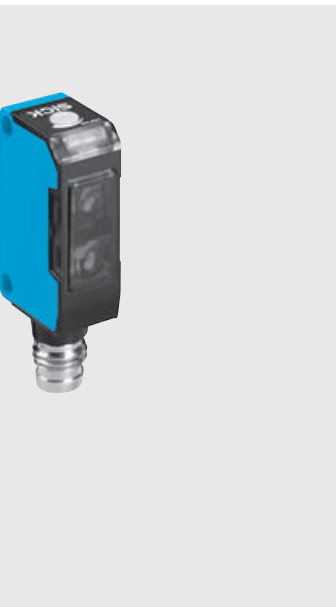
- WS/WE150 through-beam photoelectric switch: 4.4 m, slotted masks as accessory.
- WL150 photoelectric reflex switch: 2.4 m (PL80A), with polarizing filter.
- WL150 photoelectric reflex switch with increased sensitivity: 0.7 m, especially for detecting transparent objects such as glass and film.
- WT150 photoelectric proximity switch, energetic: scanning distance = 250 mm (90% reflectance), for standard scanning jobs. With background suppression: scanning distance = 100 mm, adjustable; for reliable operation even with otherwise interfering background influences.

All electrical and mechanical values fulfill the standard for adjustable potentiometers, IP 67, $V_S = 10 \dots 30$ V DC, PNP or NPN switching output, M8 plug or cable. The visible red light of the transmission LED simplifies handling additionally.

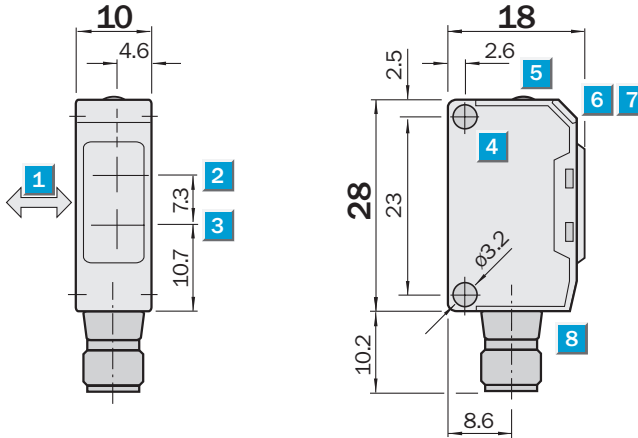
Scanning distance
2 ... 100 mm

Photoelectric proximity switch

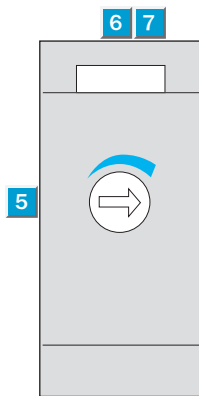
- With background suppression (BGS), consequently reliable detection of dark objects in front of a light background
- Switching point largely independent of object colour and surface
- Scanning distance can be adjusted stepless, scanning distance adjustment (5 revolutions)



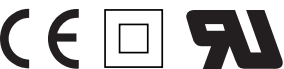
Dimensional drawing



Adjustments possible

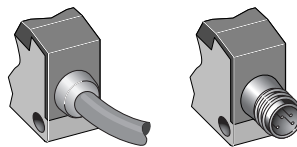


- 1 Standard direction of the material to be scanned
- 2 Centre of optical axis, receiver
- 3 Centre of optical axis, transmitter
- 4 Mounting hole \varnothing 3.2 mm
- 5 Scanning distance adjustment (5 turns)
- 6 LED indicator green: stability indicator
- 7 LED indicator orange: output active
- 8 Connector



Connection type

WT150-N162	WT150-N460
WT150-P162	WT150-P460

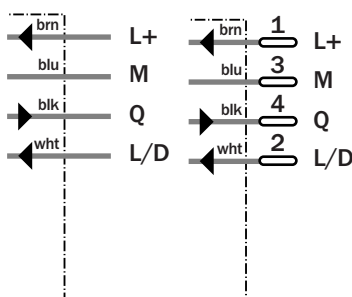


Accessories

Connector, M8, 4-pin

Mounting systems

4 x 0.18 mm² M8, 4-pin



Technical specifications		WT150-	N162	N460	P162	P460						
Scanning distance typ. max.	2 ... 100 mm ¹⁾											
Adjustment of operating distance	Potentiometer, 5 revolutions											
Light source, light type	LED, red light ²⁾											
Light spot diameter	Approx. 4 mm at 40 mm distance											
Angle of dispersion	Ca. 5 °											
Supply voltage V _s	DC 10 ... 30 V ³⁾											
Ripple	± 10 % ⁴⁾											
Power consumption	≤20 mA ⁵⁾											
Switching outputs	NPN: open collector: Q PNP: open collector: Q											
Switching mode	Light-/dark-switching via L/D control cable +V _s = light-switching 0 V = dark-switching ⁶⁾											
Output current I _a max	≤100 mA											
Response time	≤0.5 ms ⁷⁾											
Switching frequency	1,000 Hz ⁸⁾											
Connection type	Cable, PVC, 2 m ⁹⁾											
	Connector, M8, 4-pin											
VDE protection class	□ ¹⁰⁾											
Circuit protection	V _s connections reverse-polarity protected / In-/outputs short-circuit protected / Interference suppression / Outputs overcurrent and short-circuit protected											
Enclosure rating	IP 67											
Ambient temperature operation	-25 °C ... +55 °C											
Ambient temperature storage	-40 °C ... +75 °C											
Weight	Ca. 44 g											
	Ca. 7 g											
Housing material	ABS, PC											
Included with delivery	Mounting bracket BEF-W150-A											

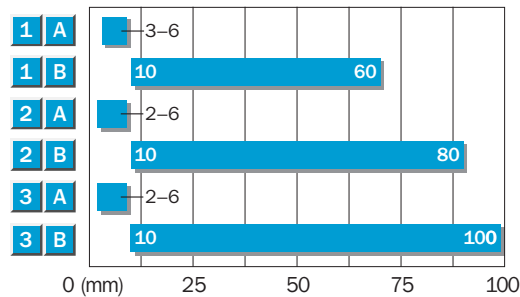
¹⁾ Object with 90 % remission (based on standard white to DIN 5033). Scanning distance control set to MAX
²⁾ Average service life 100,000 h at T_a = +25 °C

³⁾ Limit values
⁴⁾ May not exceed or fall short of V_s tolerances
⁵⁾ Without load
⁶⁾ Control wire must be connected

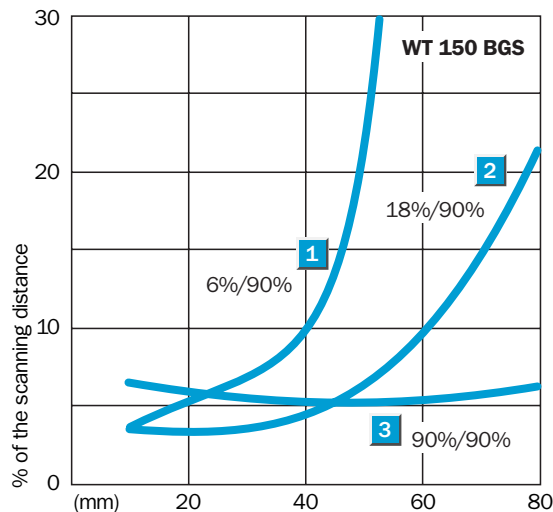
⁷⁾ Signal transit time with resistive load
⁸⁾ With light/dark ratio 1:1
⁹⁾ Do not bend below 0 °C
¹⁰⁾ Reference voltage 50 V DC

¹²⁾ Black = 6% remission, Grey = 18% remission, White = 90% remission

Scanning distance




- 1 Scanning distance on black¹²⁾/white background
- 2 Scanning distance on grey¹²⁾/white background
- 3 Scanning distance on white¹²⁾/white background
- A Scanning distance control set to MIN
- B Scanning distance control set to MAX



Ordering information

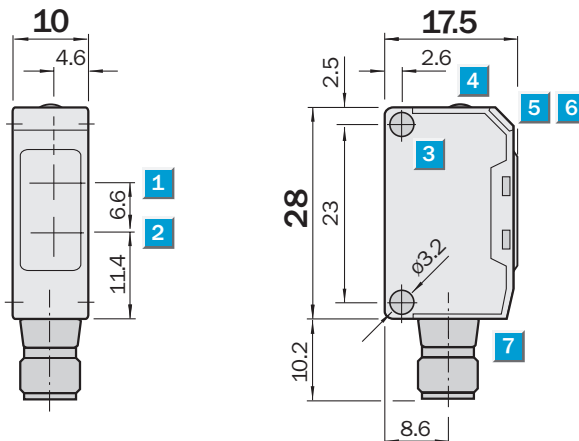
Type	Part Number
WT150-N162	6 011 045
WT150-N460	6 011 047
WT150-P162	6 011 048
WT150-P460	6 011 050


Scanning distance
10 ... 250 mm

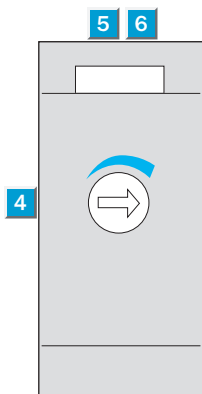
Photoelectric proximity switch

- Energetic photoelectric proximity switch for standard applications and simple contrast detection
- Adjustable switching point with sensitivity potentiometer

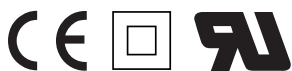
Dimensional drawing



Adjustments possible

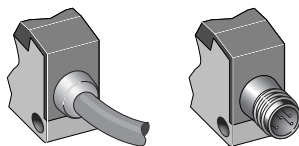


- 1 Centre of optical axis, receiver
- 2 Centre of optical axis, transmitter
- 3 Mounting hole \varnothing 3.2 mm
- 4 Scanning distance adjustment 270°
- 5 LED indicator green: stability indicator
- 6 LED indicator orange: output active
- 7 Connector



Connection type

WT150-N132	WT150-N430
WT150-P132	WT150-P430

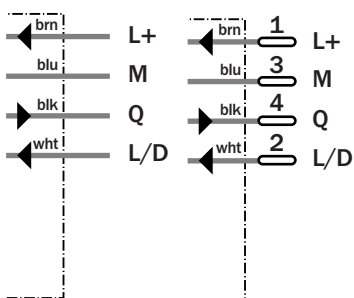


Accessories

Connector, M8, 4-pin

Mounting systems

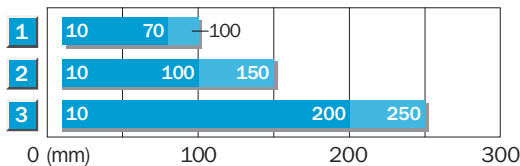
4 x 0.18 mm² M8, 4-pin



Technical specifications		WT150-	N132	N430	P132	P430						
Scanning distance typ. max.	10 ... 250 mm ¹⁾											
Operating distance	10 ... 200 mm ¹⁾											
Adjustment of operating distance	Potentiometer, 270°											
Light source, light type	LED, red light ²⁾											
Light spot diameter	Approx. 20 mm at 200 mm distance											
Angle of dispersion	Ca. 6 °											
Supply voltage V _s	DC 10 ... 30 V ³⁾											
Ripple	± 10 % ⁴⁾											
Power consumption	≤20 mA ⁵⁾											
Switching outputs	NPN: open collector: Q PNP: open collector: Q											
Switching mode	Light-/dark-switching via L/D control cable +V _s = light-switching 0 V = dark-switching ⁶⁾											
Output current I _a max	100 mA											
Response time	≤0.5 ms ⁷⁾											
Switching frequency	1,000 Hz ⁸⁾											
Connection type	Cable, PVC, 2 m ⁹⁾											
	Connector, M8, 4-pin											
VDE protection class	□ ¹⁰⁾											
Circuit protection	V _s connections reverse-polarity protected / In-/outputs short-circuit protected / Interference suppression / Outputs overcurrent and short-circuit protected											
Enclosure rating	IP 67											
Ambient temperature operation	-25 °C ... +55 °C											
Ambient temperature storage	-40 °C ... +70 °C											
Weight	Ca. 44 g											
	Ca. 7 g											
Housing material	ABS, PC											
Included with delivery	Mounting bracket BEF-W150-A											

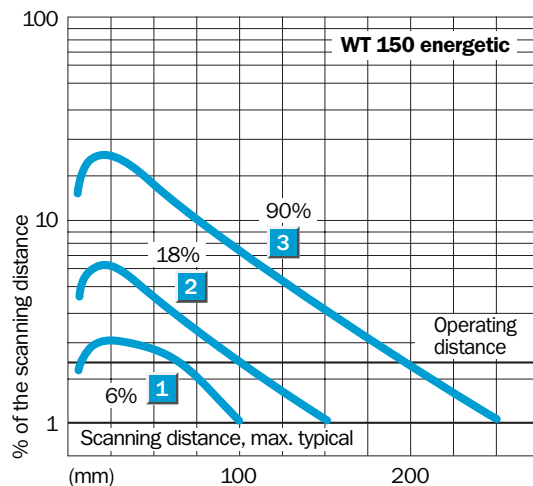
¹⁾ Object with 90 % remission (based on standard white to DIN 5033) at T_a = +25 °C
²⁾ Average service life 100,000 h
³⁾ Limit values
⁴⁾ May not exceed or fall short of
⁵⁾ V_s tolerances
⁶⁾ Without load
⁷⁾ Signal transit time with resistive load
⁸⁾ With light/dark ratio 1:1
⁹⁾ Do not bend below 0 °C
¹⁰⁾ Reference voltage 50 V DC

Scanning distance



■ Operating distance ■ Scanning distance max. typical

- 1 Scanning distance on black, 6 % remission
- 2 Scanning distance on grey, 18 % remission
- 3 Scanning distance on white, 90 % remission



Ordering information

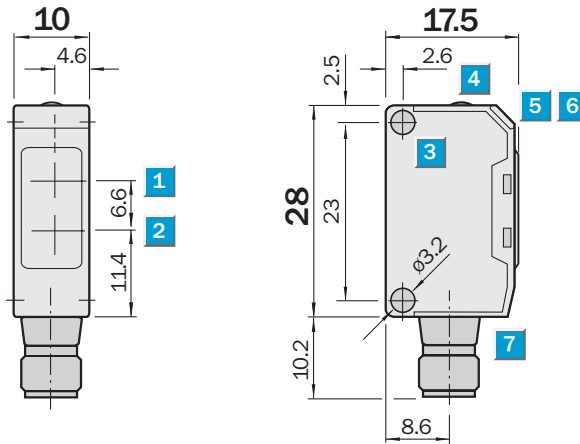
Type	Part Number
WT150-N132	6 011 039
WT150-N430	6 011 041
WT150-P132	6 011 042
WT150-P430	6 011 044

Scanning range
0 ... 2.4 m

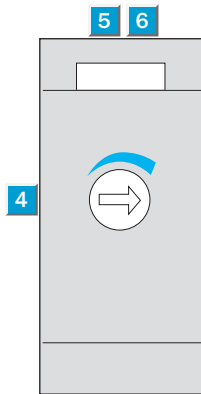
Photoelectric reflex switch

- Polarizing filter, consequently reliable detection of objects even with shiny surfaces
- Also suitable for "Diamond Grade" reflecting tape
- Adjustable sensitivity

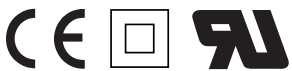
Dimensional drawing



Adjustments possible

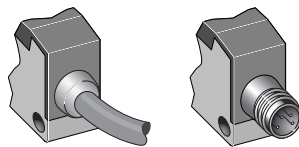


- 1 Centre of optical axis, receiver
- 2 Centre of optical axis, transmitter
- 3 Mounting hole \varnothing 3.2 mm
- 4 Sensitivity adjustment 270°
- 5 LED indicator green: stability indicator
- 6 LED indicator orange: output active
- 7 Connector

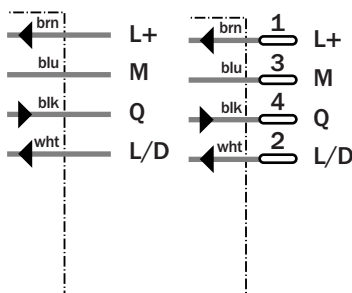


Connection type

WL150-N132	WL150-N430
WL150-P132	WL150-P430



4 x 0.18 mm² M8, 4-pin



Accessories

Connector, M8, 4-pin
Mounting systems
Reflectors

Technical specifications		WL150-	N132	N430	P132	P430						
Scanning range typ. max.	0 ... 2.4 m											
Scanning range, recommended	0.01 ... 2 m											
Relating to	Reflector PL80A											
Sensitivity adjustment	Potentiometer, 270°											
Light source, light type	LED, red light ¹⁾											
Light spot diameter	Approx. 150 mm at 1.5 m distance											
Angle of dispersion	Ca. 6 °											
Polarisation filter	✓											
Supply voltage V _s	DC 10 ... 30 V ²⁾											
Ripple	± 10 % ³⁾											
Power consumption	≤20 mA ⁴⁾											
Switching outputs	NPN: open collector: Q PNP: open collector: Q											
Switching mode	Light-/dark-switching via L/D control cable +V _s = light-switching 0 V = dark-switching ⁵⁾											
Output current I _a max	100 mA											
Response time	≤0.5 ms ⁶⁾											
Switching frequency	1,000 Hz ⁷⁾											
Connection type	Cable, PVC, 2 m ⁸⁾											
	Connector, M8, 4-pin											
VDE protection class	□ ⁹⁾											
Circuit protection	V _s connections reverse-polarity protected / In-/outputs short-circuit protected / Interference suppression / Outputs overcurrent and short-circuit protected											
Enclosure rating	IP 67											
Ambient temperature operation	-25 °C ... +55 °C											
Ambient temperature storage	-40 °C ... +75 °C											
Weight	Ca. 44 g Ca. 7 g											
Housing material	ABS, PMMA											
Included with delivery	Mounting bracket BEF-W150-A and reflector PL20A											

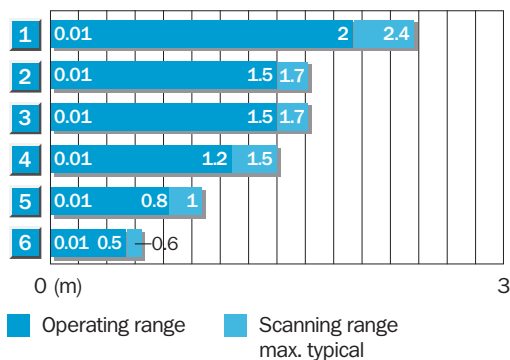
¹⁾ Average service life 100,000 h
at T_a = +25 °C
²⁾ Limit values

³⁾ May not exceed or fall short of
V_s tolerances
⁴⁾ Without load

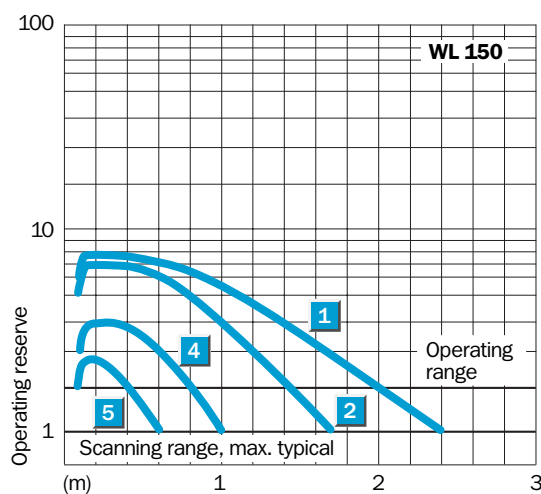
⁵⁾ Control wire must be connected
⁶⁾ Signal transit time with resistive load
⁷⁾ With light/dark ratio 1:1

⁸⁾ Do not bend below 0 °C
⁹⁾ Reference voltage 50 V DC

Scanning range and operating reserve



Reflector type	Operating range
1 PL 80 A	0.01 ... 2 m
2 P 250	0.01 ... 1.5 m
3 PL 50 A or PL 40 A	0.01 ... 1.5 m
4 PL 30 A or PL 31 A	0.01 ... 1.2 m
5 PL 20 A	0.01 ... 0.8 m
6 Reflect. tape «Diamond Grade»	0.01 ... 0.5 m



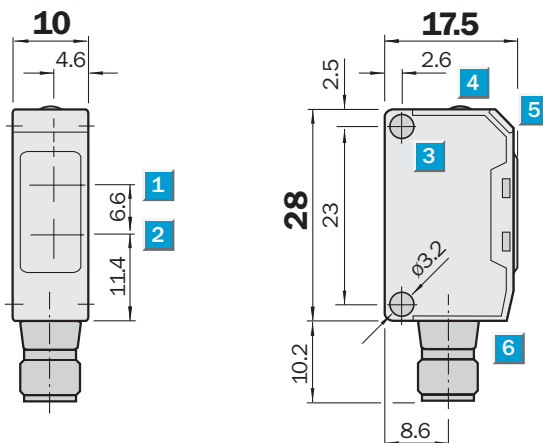
Ordering information	
Type	Part Number
WL150-N132	6 011 033
WL150-N430	6 011 035
WL150-P132	6 011 036
WL150-P430	6 011 038

Scanning range
0.01 ... 0.7 m

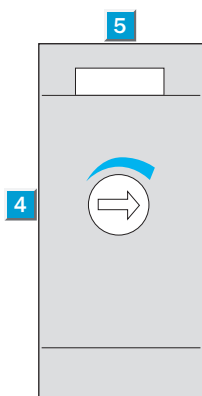
Photoelectric reflex switch

- Ideal for detecting glass, transparent film or small parts
- Detection reliability: attenuation min. 20 %; transmission change min. 15 %
- Adjustable sensitivity

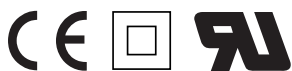
Dimensional drawing



Adjustments possible

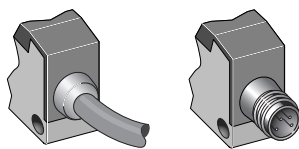


- 1 Centre of optical axis, receiver
- 2 Centre of optical axis, transmitter
- 3 Mounting hole \varnothing 3.2 mm
- 4 Sensitivity adjustment 270°
- 5 LED indicator orange: output active
- 6 Connector

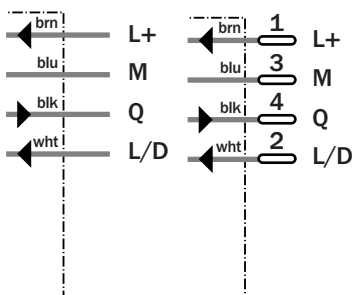


Connection type

WL150-N122	WL150-N420
WL150-P122	WL150-P420



4 x 0.18 mm² M8, 4-pin



Accessories

Connector, M8, 4-pin
Mounting systems
Reflectors

Technical specifications		WL150-	N122	N420	P122	P420						
Detection of transparent objects	✓											
Attenuation along light beam	≥ 20 %											
Attenuation difference along light beam	≥ 15 %											
Attenuation difference of object	≥ 7.5 %											
Scanning range typ. max.	0.01 ... 0.7 m											
Scanning range, recommended	0.01 ... 0.6 m											
Relating to	Reflector PL80A											
Sensitivity adjustment	Potentiometer, 270°											
Light source, light type	LED, red light ¹⁾											
Light spot diameter	Approx. 40 mm at 0.3 m distance											
Angle of dispersion	Ca. 7.5 °											
Supply voltage V_s	DC 10 ... 30 V ²⁾											
Ripple	± 10 % ³⁾											
Power consumption	≤30 mA ⁴⁾											
Switching outputs	NPN: open collector: Q											
	PNP: open collector: Q											
Switching mode	Light-/dark-switching via L/D control cable +V _s = light-switching 0 V = dark-switching ⁵⁾											
Output current I _a max	100 mA											
Response time	≤0.5 ms ⁶⁾											
Switching frequency	1,000 Hz ⁷⁾											
Connection type	Cable, PVC, 2 m ⁸⁾											
	Connector, M8, 4-pin											
VDE protection class	□ ⁹⁾											
Circuit protection	V _s connections reverse-polarity protected / In-/outputs short-circuit protected / Interference suppression / Outputs overcurrent and short-circuit protected											
Enclosure rating	IP 67											
Ambient temperature operation	-25 °C ... +55 °C											
Ambient temperature storage	-40 °C ... +75 °C											
Weight	Ca. 44 g											
	Ca. 7 g											
Housing material	ABS, PC											
Included with delivery	Mounting bracket BEF-W150-A and reflector PL20A											

¹⁾ Average service life 100,000 h at T_a = +25 °C

²⁾ Limit values

³⁾ May not exceed or fall short of V_s tolerances

⁴⁾ Without load

⁵⁾ Control wire must be connected

⁶⁾ Signal transit time with resistive load

⁷⁾ With light/dark ratio 1:1

⁸⁾ Do not bend below 0 °C

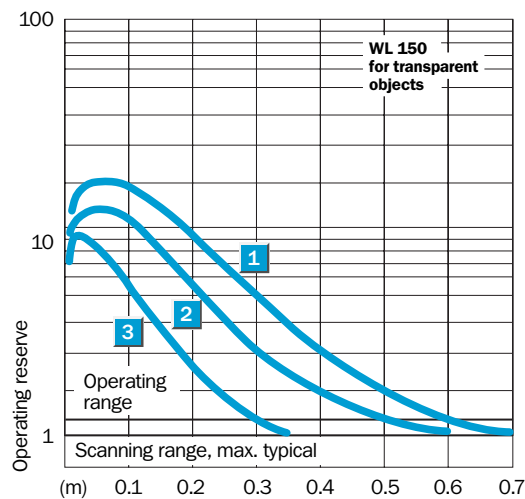
⁹⁾ Reference voltage 50 V DC

Scanning range and operating reserve



■ Operating range ■ Scanning range, max. typical

Reflector type	Operating range
1 PL 80 A	0.01 ... 0.6 m
2 P 250	0.01 ... 0.5 m
3 PL 20 A	0.01 ... 0.3 m



Ordering information

Type	Part Number
WL150-N122	6 020 683
WL150-N420	6 020 685
WL150-P122	6 020 686
WL150-P420	6 020 688

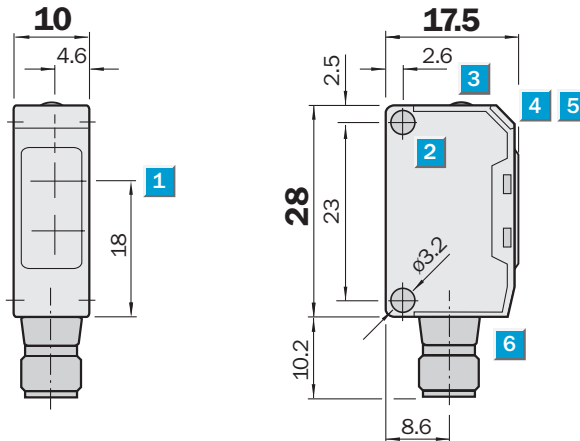


Scanning range
0 ... 4.4 m

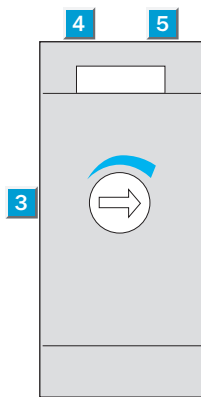
Through-beam photoelectric switch

- Slotted masks (0.5 mm, 1 mm and 2 mm) for detecting small parts or for positioning
- Adjustable sensitivity
- Direct voltage supply 10 ... 30 V DC

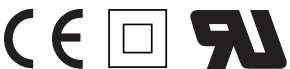
Dimensional drawing



Adjustments possible



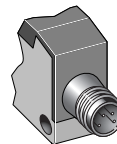
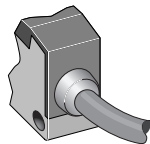
- 1 Centre of optical axis, transmitter (WS)
- Centre of optical axis, receiver (WE)
- 2 Mounting hole \varnothing 3.2 mm
- 3 Sensitivity adjustment 270° (WE only)
- 4 LED indicator green: stability indicator (WE only)
- 5 LED indicator orange: output active (WE only)
- 6 Connector



Connection type

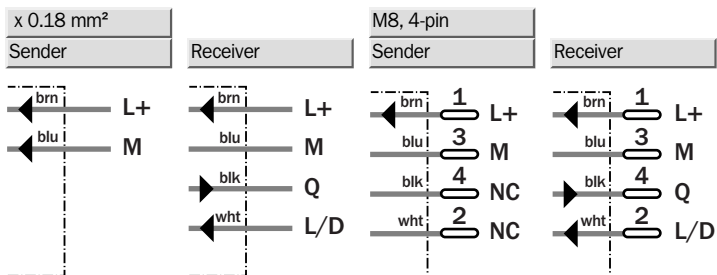
WS/WE150-N132
WS/WE150-P132

WS/WE150-N430
WS/WE150-P430



Accessories

- Connector, M8, 4-pin
- Masks
- Mounting systems



Technical specifications		WS/WE150-	N132	N430	P132	P430							
Scanning range typ. max.	0 ... 4.4 m												
Scanning range, recommended	0 ... 4 m												
Relating to	Without slotted mask												
Sensitivity adjustment	Potentiometer, 270°												
Light source, light type	LED, red light ¹⁾												
Light spot diameter	Approx. 400 mm at 4 m distance												
Angle of dispersion	Ca. 6 °												
Angle of reception	Ca. 15 °												
Supply voltage V_s	DC 10 ... 30 V ²⁾												
Ripple	± 10 % ³⁾												
Power consumption, sender	≤15 mA ⁴⁾												
Power consumption, receiver	≤20 mA ⁴⁾												
Switching outputs	NPN: open collector: Q												
	PNP: open collector: Q												
Switching mode	Light-/dark-switching via L/D control cable +V _s = light-switching 0 V = dark-switching ⁵⁾												
Output current I _a max	100 mA												
Response time	≤0.5 ms ⁶⁾												
Switching frequency	1,000 Hz ⁷⁾												
Connection type	Cable, PVC, 2 m ⁸⁾												
	Connector, M8, 4-pin												
VDE protection class	□ ⁹⁾												
Circuit protection	V _s connections reverse-polarity protected / In-/outputs short-circuit protected / Interference suppression (receiver only) / Outputs overcurrent and short-circuit protected (receiver only)												
Enclosure rating	IP 67												
Ambient temperature operation	-25 °C ... +55 °C												
Ambient temperature storage	-40 °C ... +70 °C												
Weight	Ca. 44 g												
	Ca. 7 g												
Housing material	ABS, PC												
Included with delivery	Mounting bracket BEF-W150-A												

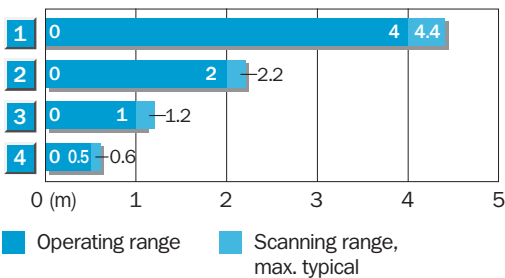
¹⁾ Average service life 100,000 h at T_a = +25 °C
²⁾ Limit values

³⁾ May not exceed or fall short of V_s tolerances
⁴⁾ Without load

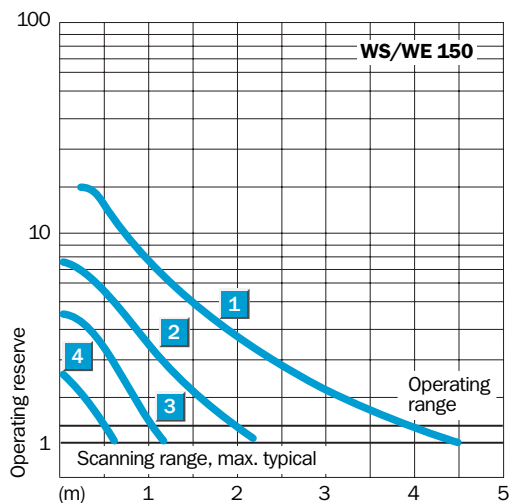
⁵⁾ Control wire must be connected
⁶⁾ Signal transit time with resistive load
⁷⁾ With light/dark ratio 1:1

⁸⁾ Do not bend below 0 °C
⁹⁾ Reference voltage 50 V DC

Scanning range and operating reserve



Reduction in scanning range with slotted masks	
1	Without slotted mask
2	Mask aperture width 2.0 mm
3	Mask aperture width 1.0 mm
4	Mask aperture width 0.5 mm



Ordering information	
Type	Part Number
WS/WE150-N132	6 011 027
WS/WE150-N430	6 011 029
WS/WE150-P132	6 011 030
WS/WE150-P430	6 011 032

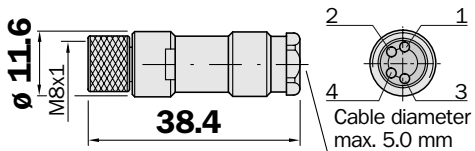
Dimensional drawings and order information

Connectors

SENSICK circular screwing system, M8 plug, 4 pin, enclosure rating IP 67

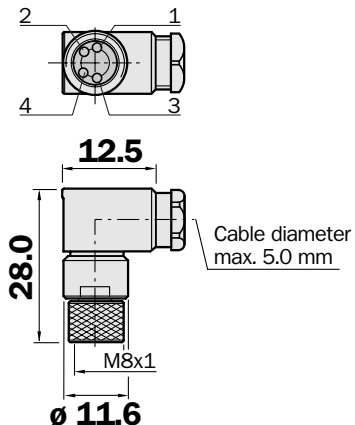
M8 cable receptacle, 4 pin, straight

Type	Order no.
DOS-0804-G	6009974



M8 cable receptacles, 4 pin, angled

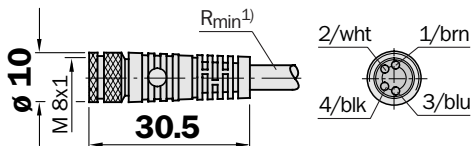
Type	Order no.
DOS-0804-W	6009975



M8 cable receptacle, 4 pin, straight

Cable diameter 5 mm, 4 x 0.25 mm², PVC coating

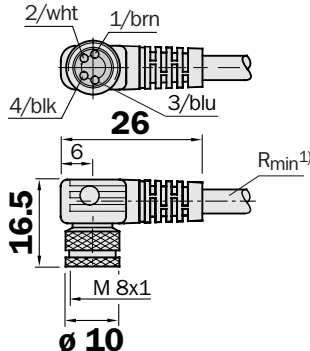
Type	Order no.	Cable length
DOL-0804-G02M	6009870	2 m
DOL-0804-G05M	6009872	5 m
DOL-0804-G10M	6010754	10 m



M8 cable receptacles, 4 pin, angled

Cable diameter 5 mm, 4 x 0.25 mm², PVC coating

Type	Order no.	Cable length
DOL-0804-W02M	6009871	2 m
DOL-0804-W05M	6009873	5 m
DOL-0804-W10M	6010755	10 m



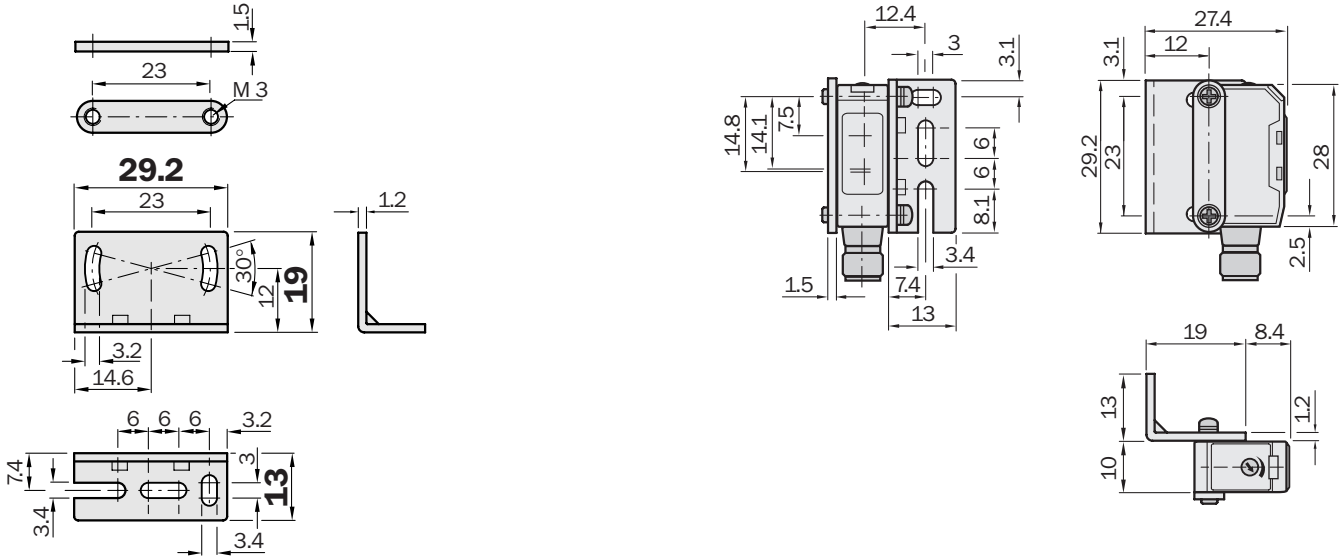
1) Minimum bending radius with dynamic use
 $R_{min} = 20 \times \text{cable diameter}$

Dimensional drawings and order information

Mounting systems*

Mounting brackets, horizontal

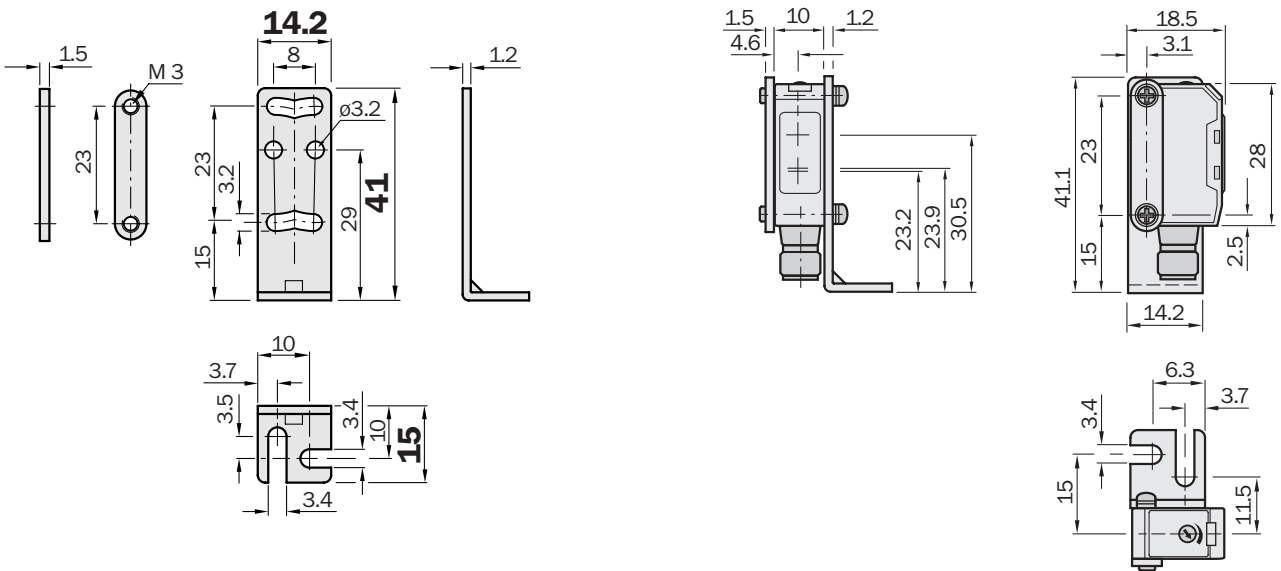
Type	Order no.
BEF-W150-A	5306217



* Supplied with W150 standard types.

Mounting brackets, vertical

Type	Order no.
BEF-W150-B	5306279

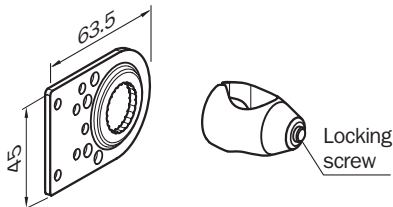


Dimensional drawings and order information

Mounting systems

Mounting plate for universal bar clamp

Type	Order no.	Mounting plate
BEF-KHS-L01	2023057	L



L

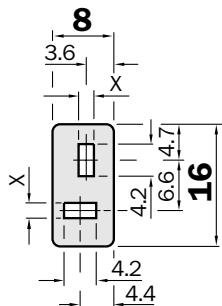
Masks

Slotted masks* for WS/WE150

Slot width X: 0.5 mm/1.0 mm/2.0 mm

Type	Order no.
BL-150-10	5306216

* Two pieces each

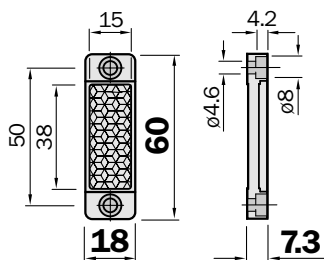


3 pairs with slot widths A, B and C are supplied with equipment.
 Mounting by self-adhesive back.
 Stick mask on red optics body of WS 150 and WE 150.
 For detecting smaller objects or increasing the switching accuracy.
 Only for WS/WE150.
 Changed operating ranges:
 A) Slot width 2.0 mm: OR = 2.0 m
 B) Slot width 1.0 mm: OR = 1.0 m
 C) Slot width 0.5 mm: OR = 0.5 m

Reflectors, plastic model for temperatures up to 65 °C

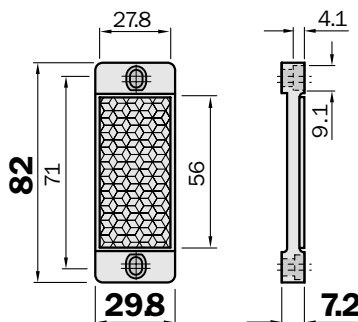
Reflector 15 x 38 mm*

Type	Order no.
PL20A	1012719



Reflector 30 x 50 mm

Type	Order no.
PL30A	1002314



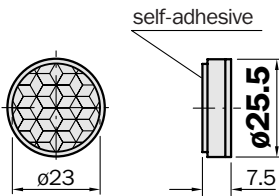
* Supplied with WL150 standard types.

Dimensional drawings and order information

Reflectors, plastic model for temperatures up to 65 °C

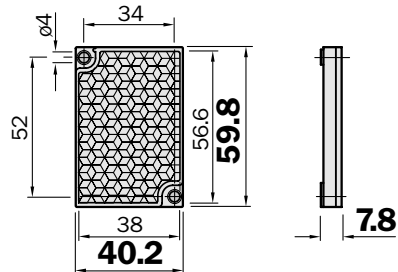
Reflector, ø 23 mm

Self-adhesive	
Type	Order no.
PL30A	1002314



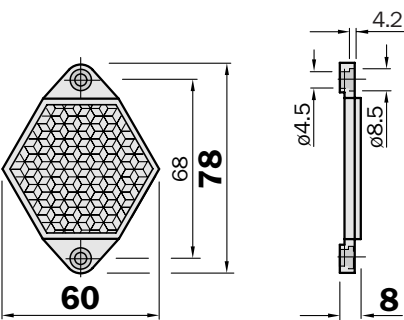
Reflector 40 x 60 mm

Type	Order no.
PL40A	1012720



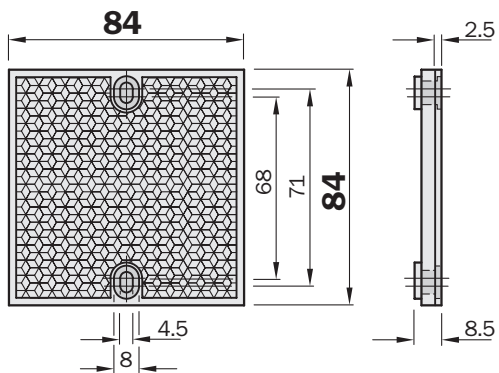
Reflector, hexagonal

Opening width 48 mm	
Type	Order no.
PL50A	1000132



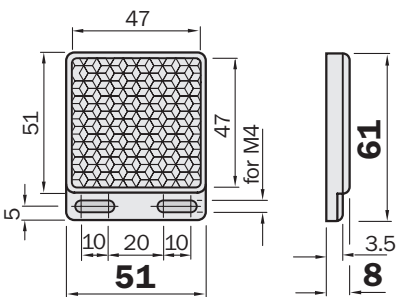
Reflector 80 x 80 mm

Type	Order no.
PL80A	1003865



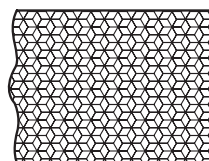
Reflector 47 x 47 mm

Type	Order no.
P250	5304812



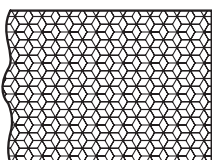
Reflective tape "Diamond Grade"

Self-adhesive		
Type	Order no.	
REF-DG-K	4019634	Ready-made
REF-DG	5320565	Sheet 70 x 90 mm



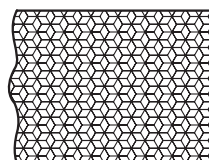
Reflective tape, self-adhesive, length of roll 22,8 m

Type	Order no.	Width
REF-PLUS-R25	5319929	25 mm
REF-PLUS-R50	5319981	50 mm



Reflective tape, self-adhesive, cut to size

Type	Order no.	Width
REF-PLUS-R25-K	4051184	25 mm
REF-PLUS-R50	4051185	50 mm



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