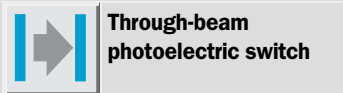
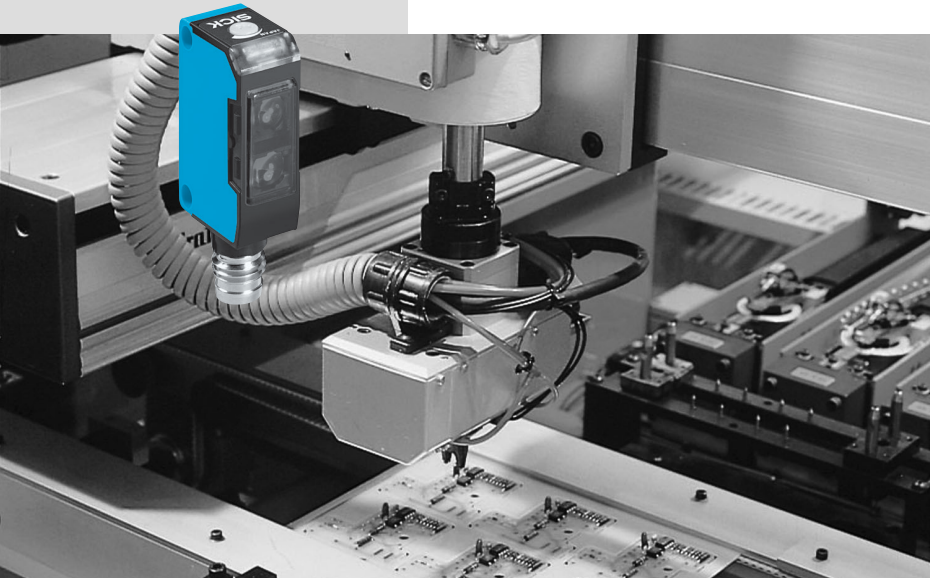
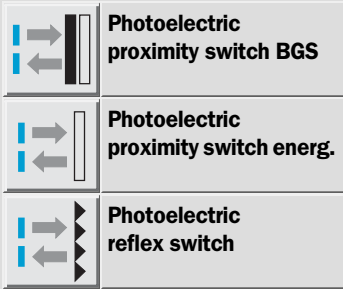


W150: Miniature photoelectric switch series with completely integrated electronics



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.

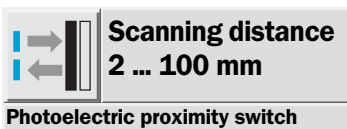
Consequently, they are especially successful in the typical application fields:

- 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:

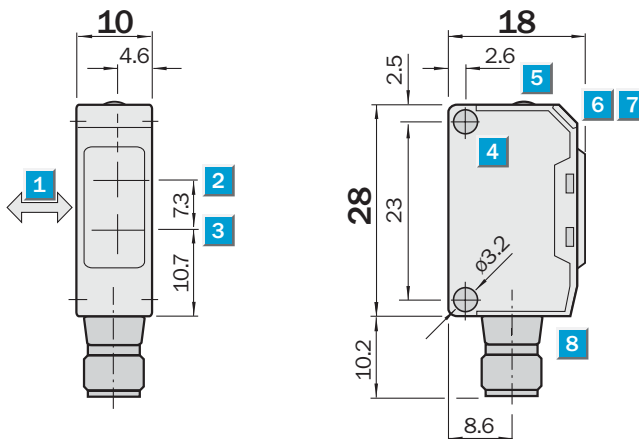
- WS/WE150 through-beam photoelectric switch: 4.4 m, slotted masks as accessory.
- WL150 photoelectric reflex switch: 2.4 m (PL80A), with polarizing filter.
- WL150 photoelectric reflex switch with increased sensitivity: 0.7 m, especially for detecting transparent objects such as glass and film.
- WT150 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.

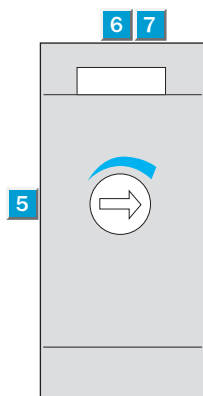


- With background suppression (BGS), consequently reliable detection of dark objects in front of a light background
- Switching point largely independent of object colour and surface
- Scanning distance can be adjusted stepless, scanning distance adjustment (5 revolutions)

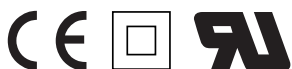
Dimensional drawing



Adjustments possible

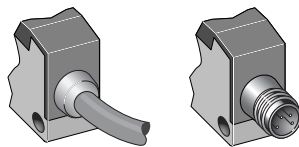


- 1 Standard direction of the material to be scanned
- 2 Optics centre, receiver
- 3 Optics centre, transmitter
- 4 Mounting hole $\varnothing$ 3.2 mm
- 5 Scanning distance adjustment (5 turns)
- 6 LED indicator green: stability indicator
- 7 LED indicator orange: output active
- 8 Connector



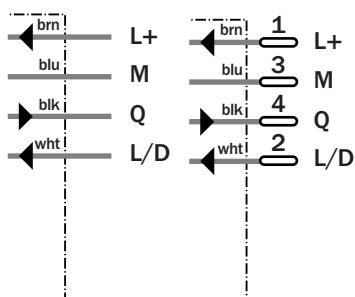
Connection type

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



4 x 0.18 mm²

M8, 4-pin



Accessories

Connector, M8, 4-pin

Mounting systems

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

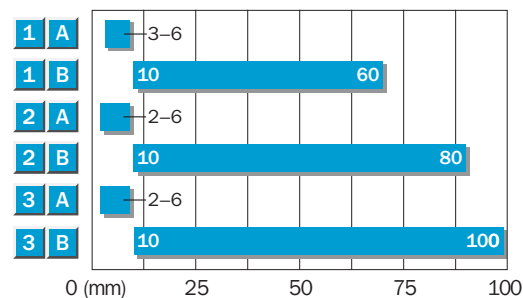
⁸⁾ With light/dark ratio 1:1

⁹⁾ Do not bend below 0 °C

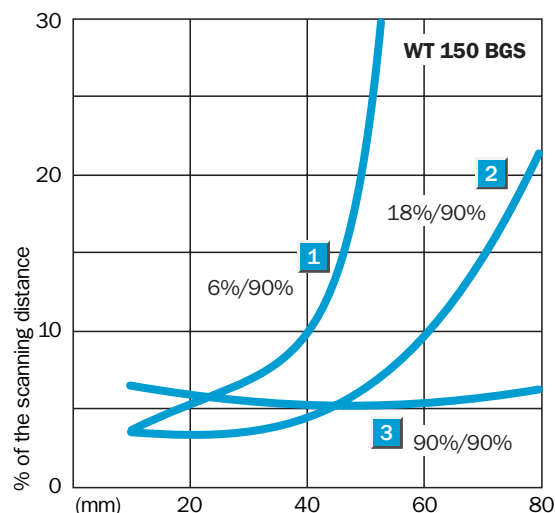
¹⁰⁾ Reference voltage 50 V DC

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

Scanning distance

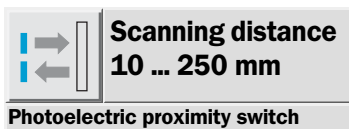


- 1 Scanning distance on black¹²⁾/white background
- 2 Scanning distance on grey¹²⁾/white background
- 3 Scanning distance on white¹²⁾/white background
- A Scanning distance control set to MIN
- B Scanning distance control set to MAX



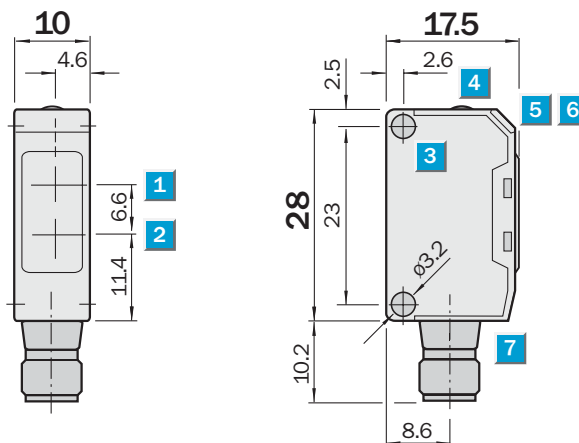
Ordering information

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

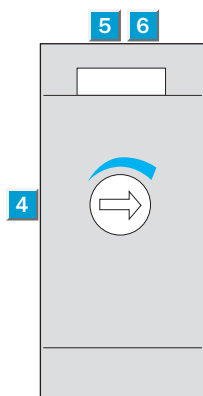


- Energetic photoelectric proximity switch for standard applications and simple contrast detection
- Adjustable switching point with sensitivity potentiometer

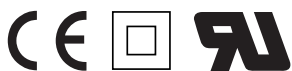
Dimensional drawing



Adjustments possible

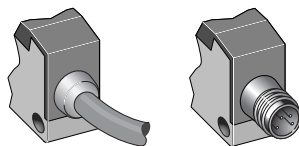


- 1 Optics centre, receiver
- 2 Optics centre, transmitter
- 3 Mounting hole $\varnothing$ 3.2 mm
- 4 Scanning distance adjustment 270°
- 5 LED indicator green: stability indicator
- 6 LED indicator orange: output active
- 7 Connector



Connection type

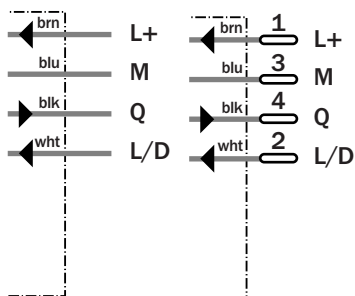
WT150-N132	WT150-N430
WT150-P132	WT150-P430



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)

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

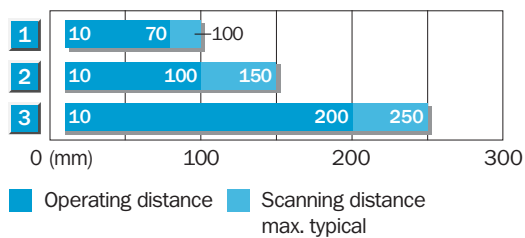
⁷⁾ Signal transit time with resistive load

⁸⁾ With light/dark ratio 1:1

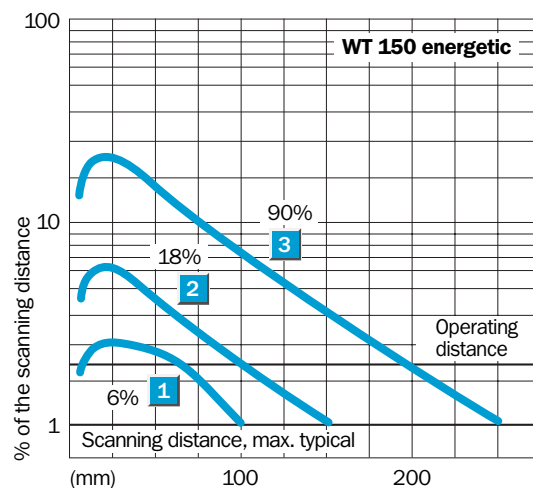
⁹⁾ Do not bend below 0 °C

¹⁰⁾ Reference voltage 50 V DC

Scanning distance

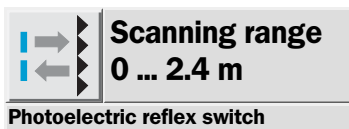


- 1 Scanning distance on black, 6 % remission
- 2 Scanning distance on grey, 18 % remission
- 3 Scanning distance on white, 90 % remission



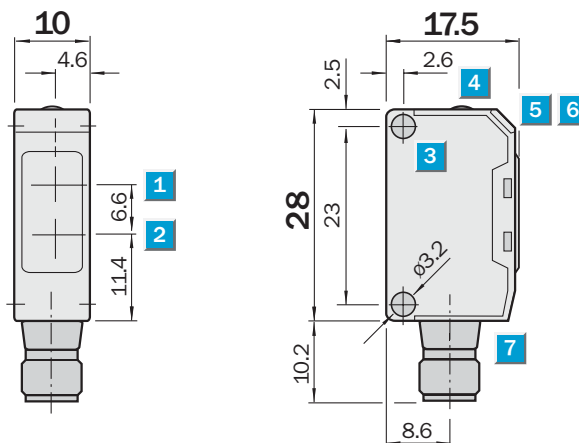
Ordering information

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

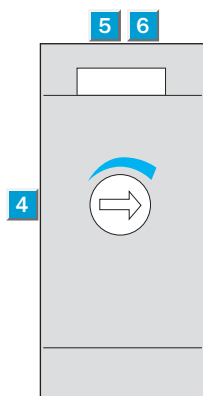


- Polarizing filter, consequently reliable detection of objects even with shiny surfaces
- Also suitable for "Diamond Grade" reflecting tape
- Adjustable sensitivity

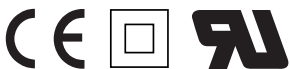
Dimensional drawing



Adjustments possible

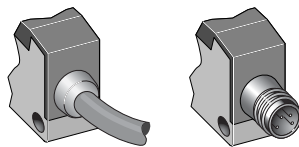


- 1 Optics centre, receiver
- 2 Optics centre, transmitter
- 3 Mounting hole $\varnothing$ 3.2 mm
- 4 Sensitivity adjustment 270°
- 5 LED indicator green: stability indicator
- 6 LED indicator orange: output active
- 7 Connector



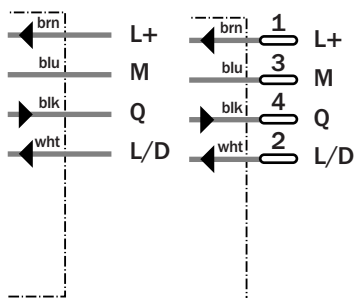
Connection type

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

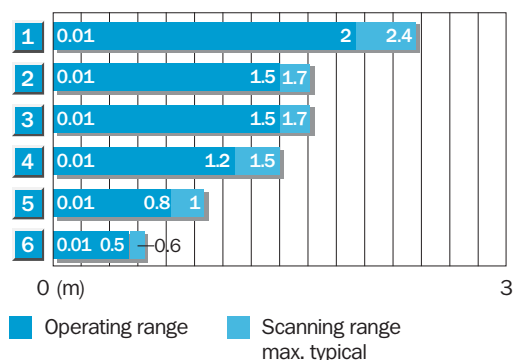
⁶⁾ Signal transit time with resistive load

⁷⁾ With light/dark ratio 1:1

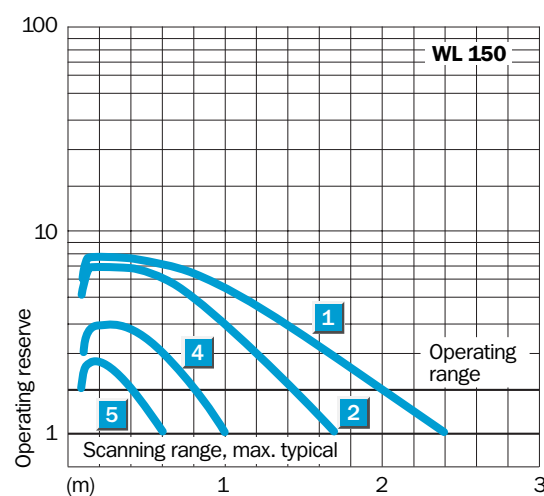
⁸⁾ Do not bend below 0 °C

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



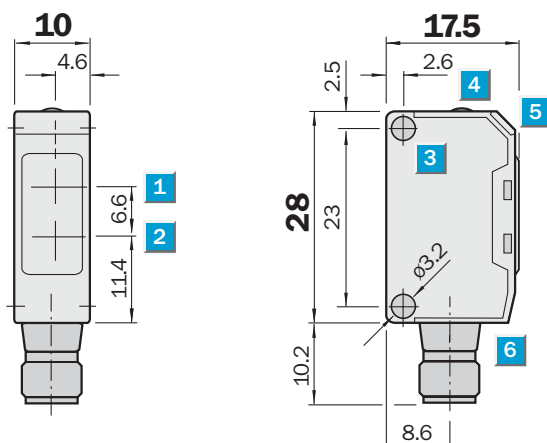
Ordering information

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

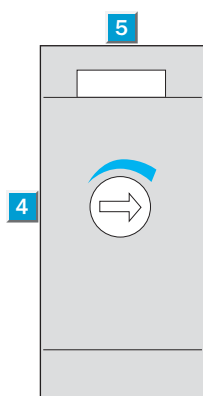
	Scanning range 0.01 ... 0.7 m
Photoelectric reflex switch	

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

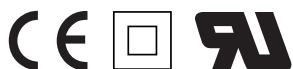
Dimensional drawing



Adjustments possible

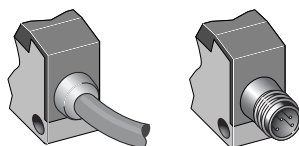


- 1 Optics centre, receiver
- 2 Optics centre, transmitter
- 3 Mounting hole Ø 3.2 mm
- 4 Sensitivity adjustment 270°
- 5 LED indicator orange: output active
- 6 Connector



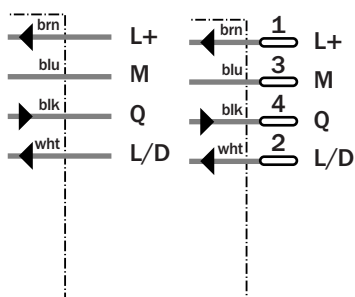
Connection type

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

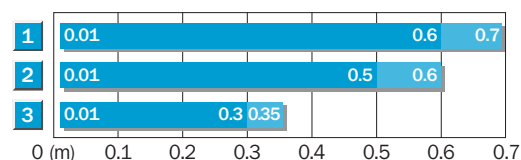
⁶⁾ Signal transit time with resistive load

⁷⁾ With light/dark ratio 1:1

⁸⁾ Do not bend below 0 °C

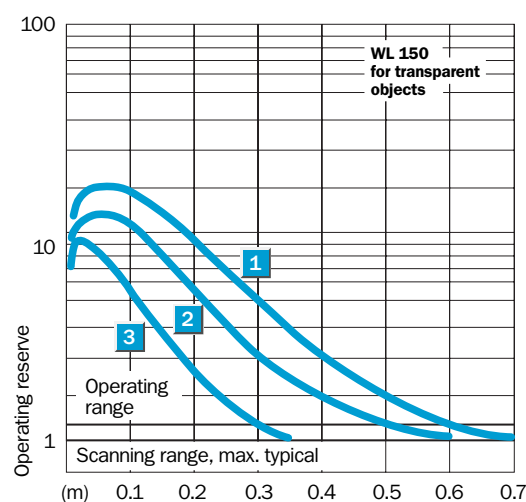
⁹⁾ Reference voltage 50 V DC

Scanning range and operating reserve



■ Operating range ■ Scanning range, max. typical

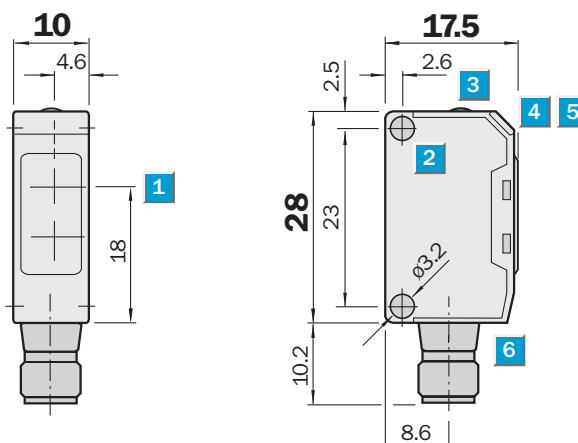
Reflector type	Operating range
1 PL 80 A	0.01 ... 0.6 m
2 P 250	0.01 ... 0.5 m
3 PL 20 A	0.01 ... 0.3 m



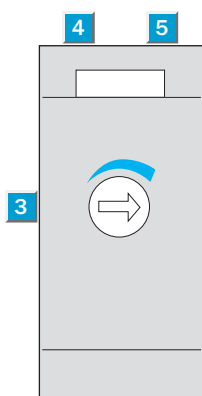
Ordering information

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

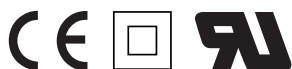
- ## Dimensional drawing



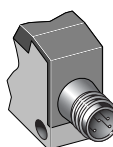
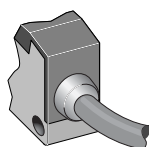
Adjustments possible



-

**Connection type**

WS/WE150-N132	WS/WE150-N430
WS/WE150-P132	WS/WE150-P430



Accessories

Connector, M8, 4-pin

Masks

Mounting systems

The diagram illustrates the wiring for two different cable types. On the left, a 2-core cable (x 0.18 mm²) is shown with a brown wire connected to L+ and a blue wire connected to M. On the right, a 4-core cable (M8, 4-pin) is shown with a brown wire connected to 1 (L+), a blue wire connected to 3 (M), a black wire connected to 4 (NC), and a white wire connected to 2 (NC). Each side has a 'Sender' and 'Receiver' box.

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

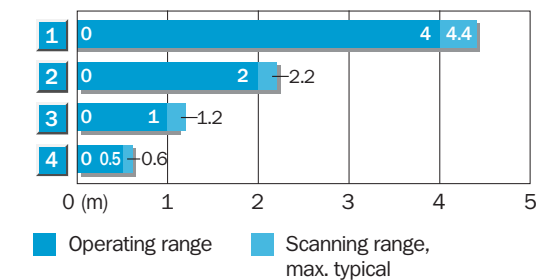
⁶⁾ Signal transit time with resistive load

⁷⁾ With light/dark ratio 1:1

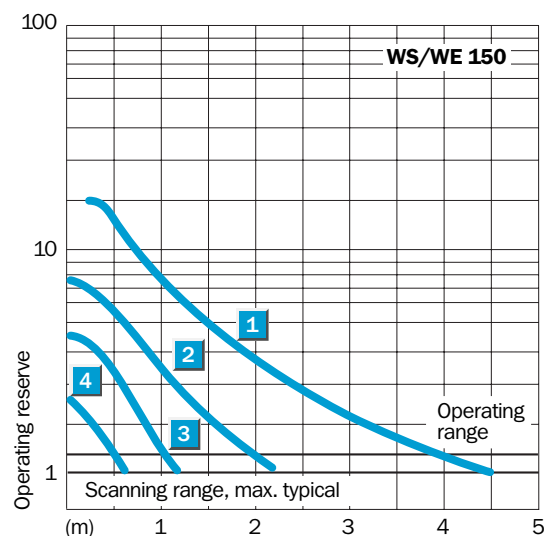
⁸⁾ Do not bend below 0 °C

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