

	Photoelectric proximity switches, BGS
	Photoelectric reflex switches
	Through-beam photoelectric switches

## W 9 L: Laser photoelectric switches: small, light and reliable



- Temperature-compensated laser-protection electronics make constant performance of the laser possible in laser protection class 2.

Objects as small as hairs are detected just as reliably as fast operations are processed. Interference from external light sources is ignored, and cell phones are not detected. Innovative Teach-in technology means a simple push of a button for operating the W 9 Laser series.

To ensure that the W 9 Laser series can be used without problems in the whole world, we have complied with all regulations and fulfilled all standards, for example, CE and CDRH.

**T**he W 9 Laser series provides a complete series with innovative laser technology in compact plastic housing.

Because our devices are controlled using the most modern  $\mu$ P technology, we can provide a laser series that has excellent performance data in addition to its small size and slight weight.

- Proximity switch with background suppression, which can be set very precisely,
- Photoelectric switch with simple Teach-in operation,
- Through-beam photoelectric switch with simple Teach-in operation,

▼ ► Precise positioning of stacker cranes using the holes in the carriers.




▲ Detection of the leading edge of PCBs. Safely implemented using the small light spot and a precise switching point.



▲ Lid closed or open. An important issue for automatic wrapping. Two WL 9 lasers provide a reliable solution.

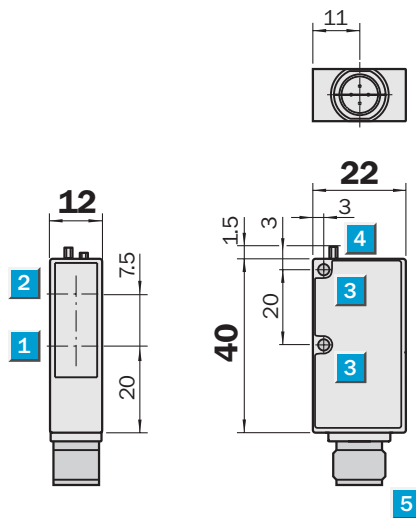



**Scanning distance**  
**150 mm**

Photoelectric proximity switches

- Laser red light, class 2
- Background suppression adjustable
- Switching frequency 1000/s
- Compact housing made of ABS

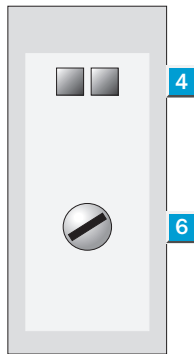
Dimensional drawing



Adjustments possible

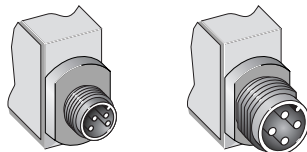
WT 9L-P330
WT 9L-P430
WT 9L-N330
WT 9L-N430

- 1 Centre of optical axis, sender
- 2 Centre of optical axis, receiver
- 3 Mounting hole  $\varnothing$  3.2 mm
- 4 Power indicator green;  
LED signal strength indicator yellow
- 5 Plug M12 or M8, 4-pin
- 6 Scanning distance adjustment

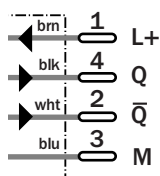


Connection types

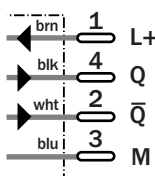
WT 9L-P330	WT 9L-P430
WT 9L-N330	WT 9L-N430



4-pin, M8



4-pin, M12



See chapter Accessories

Cables and connectors

Mounting systems

Technical data		WT 9L-	P330	P430	N330	N430						
Scanning distance <sup>1)</sup>	30 ... 150 mm, adjustable											
Supply voltage $V_S$	10 ... 30 V DC <sup>2)</sup>											
Ripple <sup>3)</sup>	< 5 V <sub>pp</sub>											
Current consumption <sup>4)</sup>	< 35 mA											
Light source <sup>5)</sup> , light type	Laser, red light; class 2											
Focusing position/light spot diameter	60 mm/< 0.5 mm											
Switching outputs Q and $\bar{Q}$	PNP											
	NPN											
PNP; signal voltage HIGH	$V_S - 2 V$											
PNP; signal voltage LOW	Approx. 0 V											
NPN; signal voltage HIGH	$V_S$											
NPN; signal voltage LOW <sup>6)</sup>	$V_S < 2 V$											
Output current $I_A$ max.	< 100 mA											
Response time <sup>7)</sup>	< 0.6 ms											
Max. switching frequency <sup>8)</sup>	1000/s											
Connection types	Plug M12, 4-pin											
	Plug M8, 4-pin											
VDE protection class <sup>9)</sup>	□ (plug M12)											
	III (plug M8)											
Enclosure rating	IP 67											
Circuit protection <sup>10)</sup>	A, B, C											
Ambient temperature $T_A$ <sup>11)</sup>	Operation - 10 ... + 50 °C											
	Storage - 25 ... + 70 °C											
Weight with plug	Approx. 20 g											
Housing material	ABS											

- 1) Object with 90 % remission (based on standard white DIN 5033)
- 2) Limit values
- 3) May not exceed or fall short of  $V_S$  tolerances
- 4) Without load

- 5) Average service life 50,000 h at  $T_A = + 25 °C$
- 6) At  $T_A = + 25 °C$  and 100 mA output current
- 7) Signal transit time with resistive load
- 8) With light/dark ratio 1:1

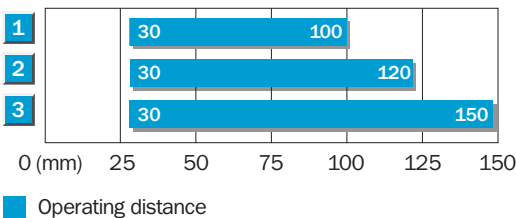
- 9) Reference voltage 50 V
- 10) A =  $V_S$  connections reverse-polarity protected
- B = Outputs reverse-polarity protected
- C = Interference pulse suppression

- 11) Do not stack devices

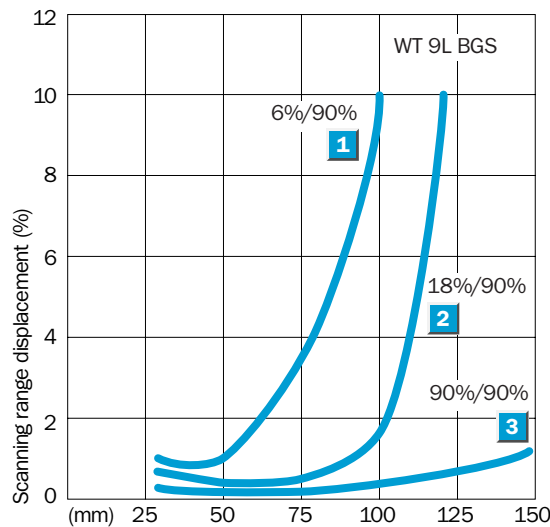
**Laser protection**

EN 60825-1, class 2  
CDRH 1040.10, class 2

**Scanning distance**




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



**Order information**

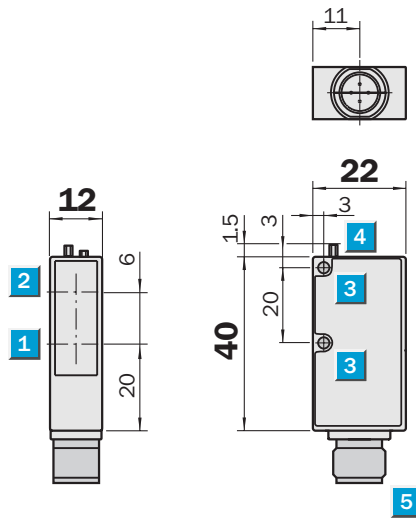
Type	Order no.
WT 9L-P330	1 023 977
WT 9L-P430	1 023 959
WT 9L-N330	1 023 991
WT 9L-N430	1 023 990


**Scanning range**  
**12 m**

Photoelectric reflex switches

- Laser red light, class 2
- Teach-in
- Switching frequency 1000/s
- Polarising filter
- Compact housing made of ABS

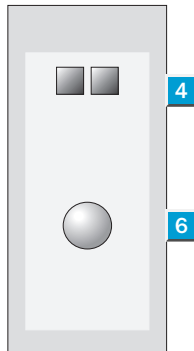
### Dimensional drawing



### Adjustments possible

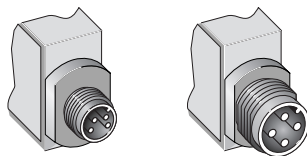
- WL 9L-P330
- WL 9L-P430
- WL 9L-N330
- WL 9L-N430

- 1 Centre of optical axis, sender
- 2 Centre of optical axis, receiver
- 3 Mounting hole  $\varnothing$  3.2 mm
- 4 Power indicator green;  
LED signal strength indicator yellow
- 5 Plug M12 or M8, 4-pin
- 6 Teach-in button

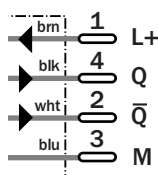


### Connection types

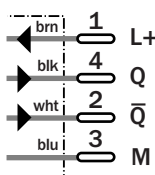
- |            |            |
|------------|------------|
| WL 9L-P330 | WL 9L-P430 |
| WL 9L-N330 | WL 9L-N430 |



#### 4-pin, M8



#### 4-pin, M12



### See chapter Accessories

- Cables and connectors
- Mounting systems

Technical data	WL 9L-	P330	P430	N330	N430						
Scanning range, max. typ./on Reflector	0.1–12 m/PL 80 A										
Supply voltage $V_S$	10 ... 30 V DC <sup>4)</sup>										
Ripple <sup>2)</sup>	< 5 V <sub>pp</sub>										
Current consumption <sup>3)</sup>	< 35 mA										
Light source <sup>4)</sup> , light type	Laser 650 nm, red, class 2										
Focusing position/light spot diameter	∞/min. < 1 mm										
Switching outputs Q and $\bar{Q}$	PNP										
	NPN										
PNP; signal voltage HIGH	$V_S - 2$ V										
PNP; signal voltage LOW	Approx. 0 V										
NPN; signal voltage HIGH	$V_S$										
NPN; signal voltage LOW <sup>5)</sup>	$V_S - 2$ V										
Output current $I_A$ max.	< 100 mA										
Response time <sup>6)</sup>	< 0.6 ms										
Max. switching frequency <sup>7)</sup>	1000/s										
Connection types	Plug M12, 4-pin										
	Plug M8, 4-pin										
VDE protection class <sup>8)</sup>	□ (plug M12)										
	III (plug M8)										
Enclosure rating	IP 67, IP 69 K										
Circuit protection <sup>9)</sup>	A, B, C										
Ambient temperature $T_A$ <sup>10)</sup>	Operation - 10 ... + 50 °C										
	Storage - 25 ... + 75 °C										
Weight with plug	Approx. 20 g										
Housing material	ABS										

- 1) Limit values
- 2) May not exceed or fall short of  $V_S$  tolerances
- 3) Without load

- 4) Average service life 50,000 h at  $T_A = + 25$  °C
- 5) At  $T_A = + 25$  °C and 100 mA output current

- 6) Signal transit time with resistive load
- 7) With light/dark ratio 1:1
- 8) Reference voltage 50 V

- 9) A =  $V_S$  connections reverse-polarity protected
- B = Outputs reverse-polarity protected
- C = Interference pulse suppression
- 10) Do not stack devices

**Teach-in function standard**

1. Align the photoelectric switch with the reflector. LED yellow/green = on.
2. Press Teach-in button > 2 s. LED green = off/on. Teach-in is initiated. LED yellow/green = blinking.
3. The signal is stored permanently after you release the button. The switching threshold is set to standard sensitivity.

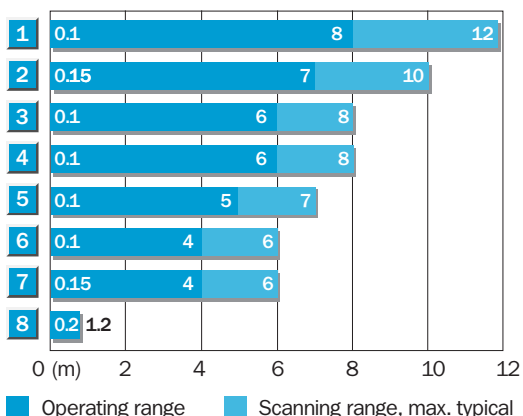
**Precise setting:**

1. Align the photoelectric switch with the reflector. LED yellow/green = on.
2. Press Teach-in button > 5 s. LED green = off/on. Teach-in is initiated. LED yellow/green = blinking.
3. The signal is stored permanently after you release the button. The switching threshold is set to a low degree of sensitivity (detection of transparent objects is possible).

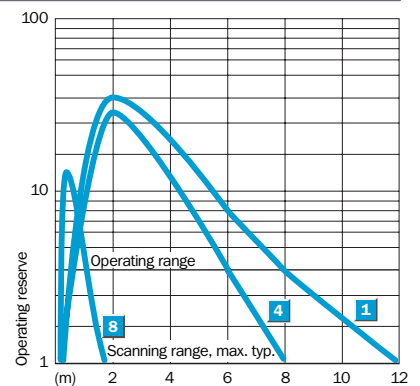
**Laser protection**

EN 60825-1, class 2  
CDRH 1040.10, class 2

**Scanning range**



Reflector type	Operating range	
1	PL 80 A	0 – 8.0 m
2	PL 250 F	0 – 7.0 m
3	PL 50 A	0 – 6.0 m
4	PL 40 A	0 – 6.0 m
5	PL 30 A	0 – 5.0 m
6	PL 20 A	0 – 4.0 m
7	PL 20 F	0 – 4.0 m
8	Reflective tape	0 – 1.2 m



**Order information**

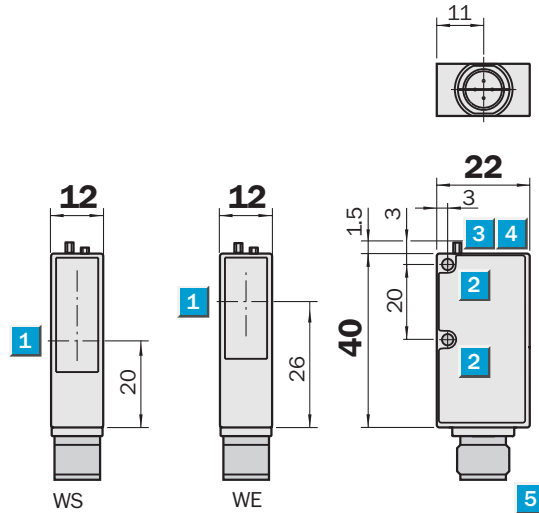
Type	Order no.
WL 9L-P330	1 023 976
WL 9L-P430	1 023 958
WL 9L-N330	1 023 989
WL 9L-N430	1 023 988

**Scanning range**  
0 ... 50 m

Through-beam photoelectric switches

- Laser red light, class 2
- Teach-in
- Switching frequency 1000/s
- Compact housing made of ABS

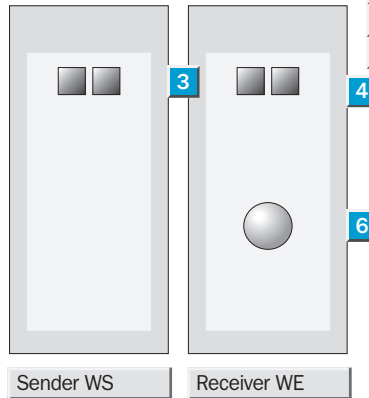
**Dimensional drawing**



**Adjustments possible**

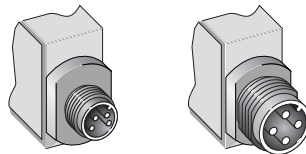
WS/WE 9L-P330	WS/WE 9L-N330
WS/WE 9L-P430	WS/WE 9L-N430

- 1 Centre of optical axis
- 2 Mounting hole  $\varnothing$  3.2 mm
- 3 Power indicator green, WS in operation
- 4 LED signal strength indicator yellow
- 5 Plug M12 or M8, 4-pin
- 6 Teach-in button



**Connection types**

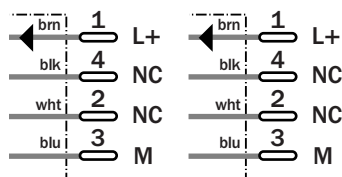
WS/WE 9L-P330	WS/WE 9L-P430
WS/WE 9L-N330	WS/WE 9L-N430



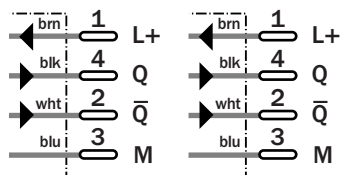
**4-pin, M8**

**4-pin, M12**

**Sender**



**Receiver**



See chapter Accessories  
Cables and connectors  
Mounting systems



Technical data		WS/WE 9L-	P330	P430	N330	N430						
Scanning range, max. typ.	50 m											
Supply voltage $V_S$	10 ... 30 V DC <sup>1)</sup>											
Ripple <sup>2)</sup>	< 5 V <sub>pp</sub>											
Current consumption <sup>3)</sup>	< 25 mA (WE), < 35 mA (WS)											
Light source <sup>4)</sup> , light type	Laser, red, class 2											
Focusing position/light spot diameter	500 mm/< 0.5 mm											
Switching outputs Q and $\bar{Q}$	PNP											
	NPN											
PNP; signal voltage HIGH	$V_S - 2$ V											
PNP; signal voltage LOW	Approx. 0 V											
NPN; signal voltage HIGH	$V_S$											
NPN; signal voltage LOW <sup>5)</sup>	$V_S - 2$ V											
Output current $I_A$ max.	< 100 mA											
Response time <sup>6)</sup>	< 0.6 ms											
Max. switching frequency <sup>7)</sup>	1000/s											
Connection types	Plug M12, 4-pin											
	Plug M8, 4-pin											
VDE protection class <sup>8)</sup>	II (plug M12)											
	III (plug M8)											
Enclosure rating	IP 67											
Circuit protection <sup>9)</sup>	A, B, C											
Ambient temperature $T_A$ <sup>10)</sup>	Operation - 10 ... + 50 °C											
	Storage - 25 ... + 70 °C											
Weight with plug	Approx. 20 g											
Housing material	ABS											

1) Limit values  
 2) May not exceed or fall short of  $V_S$  tolerances  
 3) Without load

4) Average service life 50,000 h at  $T_A = + 25$  °C  
 5) At  $T_A = + 25$  °C and 100 mA output current

6) Signal transit time with resistive load  
 7) With light/dark ratio 1:1  
 8) Reference voltage 50 V

9) A =  $V_S$  connections reverse-polarity protected  
 B = Outputs reverse-polarity protected  
 C = Interference pulse suppression  
 10) Do not stack devices

**Teach-in function standard**

- Align the sender and receiver with respect to each other. Receiver LED yellow/green = on.
- Press Teach-in button > 2 s. LED green = off/on. Teach-in is initiated. LED yellow/green = blinking.
- The signal is stored permanently after you release the button. The switching threshold is set to standard sensitivity.

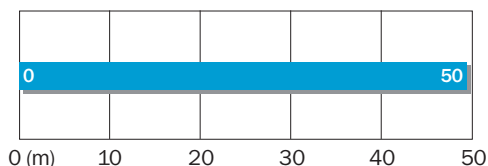
**Precise setting:**

- Align the sender and receiver with respect to each other. Receiver LED yellow/green = on.
- Press Teach-in button > 5 s. LED green = off/on. Teach-in is initiated. LED yellow/green = blinking.
- The signal is stored permanently after you release the button. The switching threshold is set to a low degree of sensitivity (detection of transparent objects is possible).

**Laser protection**

EN 60825-1, class 2  
 CDRH 1040.10, class 2

**Scanning range**



■ Operating range/Scanning range, max. typical

**Order information**

Type	Order no.
WS/WE 9L-P330	1 023 993
WS/WE 9L-P430	1 023 992
WS/WE 9L-N330	1 023 995
WS/WE 9L-N430	1 023 994