

# W 9-2: A Versatile, Complete and Compact Series



Depending on the job, the most suitable sensor can be selected from the W 9-2 series.

- Overview of the sensors:
- WT 9-2, with adjustable background suppression, max. scanning distance 250 mm,
  - WT 9-2, energetic, max. scanning distance 450 mm,
  - WT 9-2, V model, max. scanning distance 20 mm,
  - WL 9-2, basic model, max. scanning range 4 m,
  - WL 9-2, Teach-In model, max. scanning range 4 m,
  - WL 9-2, focus, max. scanning range 0.4 m,
  - WS/WE 9-2, max. scanning range 7 m.

**T**he W 9-2 series is as versatile as the tasks in automation. The standardized, compact housing model makes it possible to use high-performance sensors that operate reliably even in cramped mounting conditions. All W 9-2 models have red light transmitters as a standard feature. The sensor can be aligned on the object quickly and precisely using the visible light spot. In the models with Teach-In function, the sensor optimizes its sensitivity automatically to the given operating conditions at the push of a button.

There are multifaceted applications in the targeted main branches thanks to this great variety of products:

- Storage and handling engineering
- Packaging industry
- Electronics industry
- Elevator construction.

	<b>Photoelectric proximity switches HGA</b>
	<b>Photoelectric proximity switches ener.</b>
	<b>Photoelectric proximity switches V</b>
	<b>Photoelectric reflex switches</b>
	<b>Through-beam photoelectric switches</b>

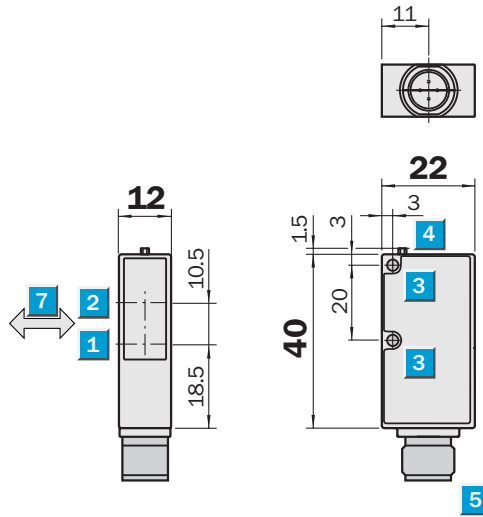


# WT 9-2 Photoelectric Proximity Switch with Background Suppression

**Scanning distance**  
 30 ... 250 mm  
**Photoelectric proximity switch**

- LED light source, visible red light
- Background suppression
- Scanning distance adjustable
- Switching frequency 1500/s
- Outputs short-circuit protected

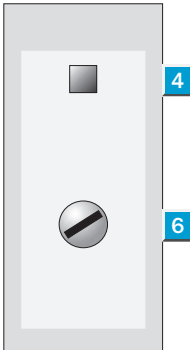
## Dimension illustration



## Setting options

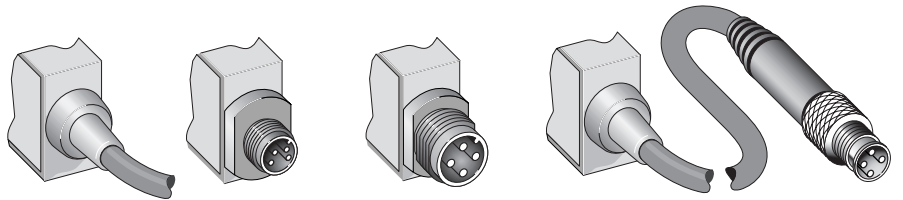
WT 9-2P130	WT 9-2P330
WT 9-2P430	WT 9-2P630
WT 9-2N130	
WT 9-2N430	

- 1 Axis of the sender optics
- 2 Axis of the receiver optics
- 3 Mounting hole  $\varnothing$  3.2 mm
- 4 LED signal strength indicator
- 5 Plug M 12 or M 8, 4 pin, 2 m connection cable or 120 mm cable with plug M 12, 4 pin
- 6 Scanning distance adjuster
- 7 Standard direction of the material to be scanned



## Connection type

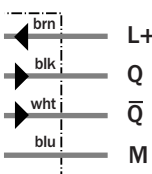
WT 9-2P130	WT 9-2P330	WT 9-2P430	WT 9-2P630
WT 9-2N130		WT 9-2N430	



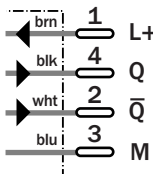
## Accessories

- Connectors
- Mounting systems

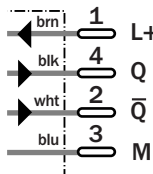
### 4 x 0.14 mm<sup>2</sup>



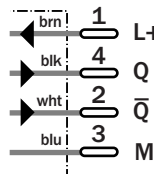
### 4 pin, M 8



### 4 pin, M 12



### 4 pin, M 12 with 120 mm cable



Technical data		WT 9-2	P130	P430	N130	N430	P330	P630				
<b>Scanning distance adjustable</b> <sup>1)</sup>	30 ... 250 mm											
Scanning range	5 ... 250 mm											
<b>Supply voltage</b> $V_S$ <sup>2)</sup>	DC 10 ... 30 V											
Ripple <sup>3)</sup>	$\leq 5 V_{PP}$											
Current consumption <sup>4)</sup>	$\leq 40$ mA											
<b>Light source</b>	LED, visible red light <sup>5)</sup>											
Light spot diameter	15 x 15 mm at a distance of 200 mm											
<b>Switching outputs Q and <math>\bar{Q}</math></b>	PNP											
	NPN											
Signal voltage HIGH	$V_S - 2.9$ V											
	$V_S$											
Signal voltage LOW <sup>6)</sup>	Approx. 0 V											
	$\leq 1.5$ V											
<b>Output current</b> $I_A$ max.	$\leq 100$ mA											
<b>Response time</b> <sup>7)</sup>	$\leq 333$ $\mu$ s											
<b>Switching frequency</b> max. <sup>8)</sup>	1500/s											
<b>Connection technology</b>	Connection cable, 2 m											
	Cable, 120 mm, with plug M 12, 4 pin											
	Plug M 12, 4 pin											
	Plug M 8, 4 pin											
<b>VDE protection class M 12</b> <sup>9)</sup>	<input type="checkbox"/>											
<b>VDE protection class M 8</b>	III											
<b>Protection type</b>	IP 67											
<b>Protection circuits</b> <sup>10)</sup>	A, B, C											
<b>Ambient temperature</b> <sup>11)</sup>	Operation $-40 \dots +60$ °C											
	Storage $-40 \dots +75$ °C											
<b>Weight</b>												
with connection cable 2 m/120 mm	Approx. 80 g											
with equipment plug M 12/M 8, 4 pin	Approx. 20 g											

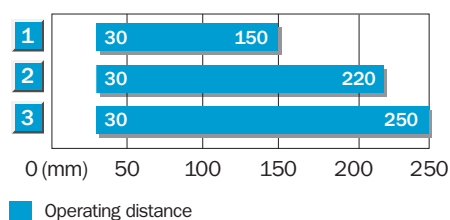
<sup>1)</sup> Object with 90% reflectance (referred to standard white DIN 5033)  
<sup>2)</sup> Limit values  
<sup>3)</sup> Must be within  $V_S$  tolerances  
<sup>4)</sup> Without load

<sup>5)</sup> Average service life at room temperature 100,000 h at  $T_U = +25$  °C  
<sup>6)</sup> At  $T_U = +25$  °C and 100 mA output current

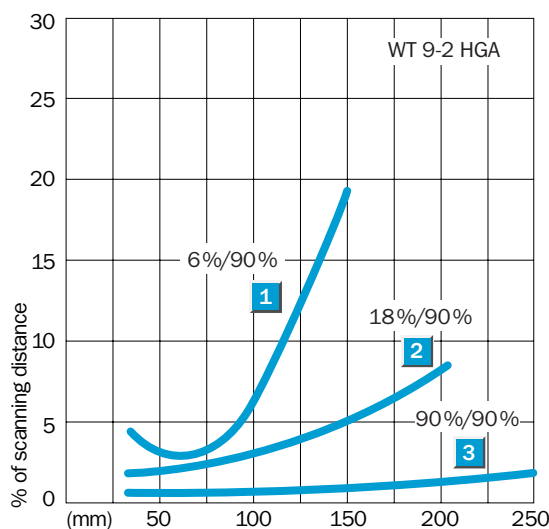
<sup>7)</sup> With resistive load  
<sup>8)</sup> With light/dark ratio 1:1  
<sup>9)</sup> Withstand voltage 50 V

<sup>10)</sup> A = supply connections reverse polarity protected  
 B = outputs short-circuit protected  
 C = interference suppression  
<sup>11)</sup> Do not distort cable below 0 °C

**Scanning distance**



- 1 Scanning range on black, 6 % reflectance
- 2 Scanning range on gray, 18 % reflectance
- 3 Scanning range on white, 90 % reflectance



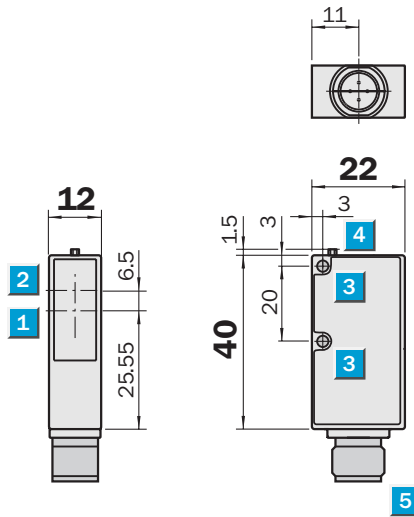
**Ordering information**

Type	Order no.
WT 9-2P130	1 018 293
WT 9-2P430	1 018 295
WT 9-2N130	1 018 294
WT 9-2N430	1 018 296
WT 9-2P330	1 019 026
WT 9-2P630	1 019 272

**Scanning distance**  
**10 ... 450 mm**  
 Photoelectric proximity switch

- Red-light emitter LED as alignment aid
- Scanning distance adjustable
- Switching frequency 800/s
- Outputs short-circuit protected
- Sensitivity adjustment using the Teach-In procedure

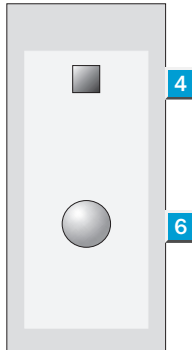
**Dimension illustration**



**Setting options**

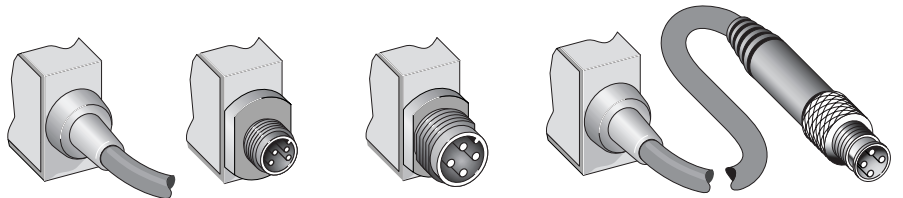
WT 9-2P151	WT 9-2P351
WT 9-2P451	WT 9-2P651
WT 9-2N151	
WT 9-2N451	

- 1 Axis of the receiver optics
- 2 Axis of the sender optics
- 3 Mounting hole Ø 3.2 mm
- 4 LED signal strength indicator
- 5 Plug M 12 or M 8, 4 pin, 2 m connection cable or 120 mm cable with plug M 12, 4 pin
- 6 Teach-In button



**Connection type**

WT 9-2P151	WT 9-2P351	WT 9-2P451	WT 9-2P651
WT 9-2N151		WT 9-2N451	



**Accessories**

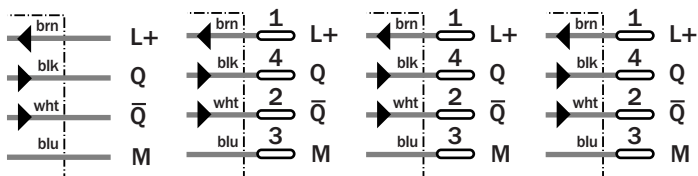
Connectors
Mounting systems

4 x 0.14 mm<sup>2</sup>

4 pin, M 8

4 pin, M 12

4 pin, M 12 with 120 mm cable



Technical data		WT 9-2	P151	P451	N151	N451	P351	P651				
<b>Scanning distance adjustable</b> <sup>1)</sup>	10 ... 450 mm											
<b>Supply voltage</b> $V_S$ <sup>2)</sup>	DC 10 ... 30 V											
Ripple <sup>3)</sup>	$\leq 5 V_{PP}$											
Current consumption <sup>4)</sup>	$\leq 30$ mA											
<b>Light source</b>	LED, visible red light <sup>5)</sup>											
Light spot diameter	80 x 80 mm at a distance of 500 mm											
<b>Switching outputs Q and <math>\bar{Q}</math></b>	PNP											
	NPN											
Signal voltage HIGH	$V_S - 2.9$ V											
	$V_S$											
Signal voltage LOW <sup>6)</sup>	Approx. 0 V											
	$\leq 2.9$ V											
<b>Output current</b> $I_A$ max.	$\leq 100$ mA											
<b>Response time</b> <sup>7)</sup>	$\leq 625$ $\mu$ s											
<b>Switching frequency</b> max. <sup>8)</sup>	800/s											
<b>Connection technology</b>	Connection cable, 2 m											
	Cable, 120 mm, with plug M 12, 4 pin											
	Plug M 12, 4 pin											
	Plug M 8, 4 pin											
<b>VDE protection class M 12</b> <sup>9)</sup>	<input type="checkbox"/>											
<b>VDE protection class M 8</b>	III											
<b>Protection type</b>	IP 67											
<b>Protection circuits</b> <sup>10)</sup>	A, B, C											
<b>Ambient temperature</b> <sup>11)</sup>	Operation $-40 \dots +60$ °C											
	Storage $-40 \dots +75$ °C											
<b>Weight</b>												
with connection cable 2 m/120 mm	Approx. 80 g											
with equipment plug M 12/M 8, 4 pin	Approx. 20 g											

<sup>1)</sup> Object with 90% reflectance (referred to standard white DIN 5033)  
<sup>2)</sup> Limit values  
<sup>3)</sup> Must be within  $V_S$  tolerances  
<sup>4)</sup> Without load

<sup>5)</sup> Average service life at room temperature 100,000 h at  $T_U = +25$  °C  
<sup>6)</sup> At  $T_U = +25$  °C and 100 mA output current

<sup>7)</sup> With resistive load  
<sup>8)</sup> With light/dark ratio 1:1  
<sup>9)</sup> Withstand voltage 50 V

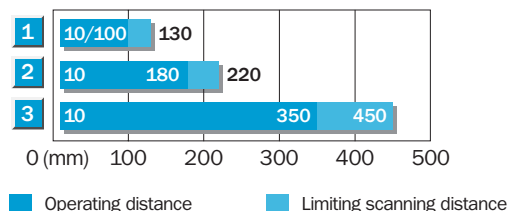
<sup>10)</sup> A = supply connections reverse polarity protected  
 B = outputs short-circuit protected  
 C = interference suppression  
<sup>11)</sup> Do not distort cable below 0 °C

**Teach-In function**

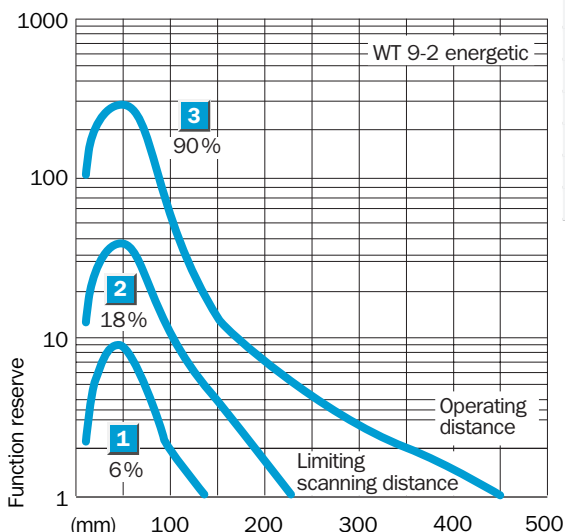
- **Programming via Teach-In button.**
- **Simple programming:**  
Position object in the beam and push the button: finished;  
LED confirms the Teach-In procedure.
- **Teach-In values can be stored.**

- **Two operating modes:**  
**Default setting:** short Teach-In time (< 8 s); for standard applications; approx. double reserve via switching threshold; LED lights continuously.  
**Precise setting:** long Teach-In time (> 8 s); for precise applications; small switching hysteresis; LED blinks.

**Scanning distance**



- 1 Scanning range on black, 6% reflectance
- 2 Scanning range on gray, 18% reflectance
- 3 Scanning range on white, 90% reflectance



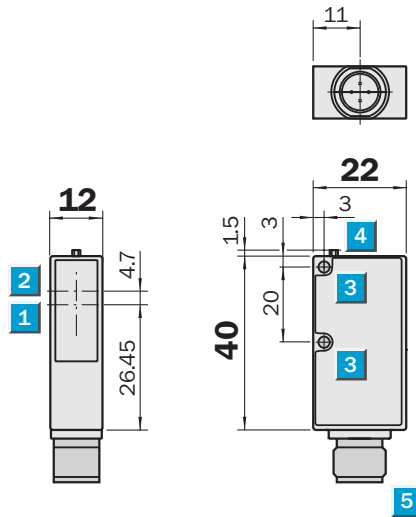
**Ordering information**

Type	Order no.
WT 9-2P151	1 018 297
WT 9-2P451	1 018 299
WT 9-2N151	1 018 298
WT 9-2N451	1 018 300
WT 9-2P351	1 019 027
WT 9-2P651	1 019 273

**Scanning distance**  
 10 ... 20 mm  
 Photoelectric proximity switch

- Red-light emitter LED as alignment aid
- Scanning distance adjustable
- Switching frequency 800/s
- Outputs short-circuit protected
- Sensitivity adjustment using the Teach-In procedure

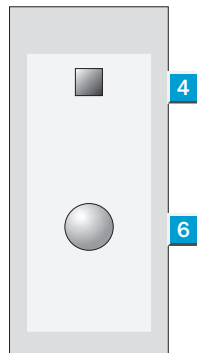
**Dimension illustration**



**Setting options**

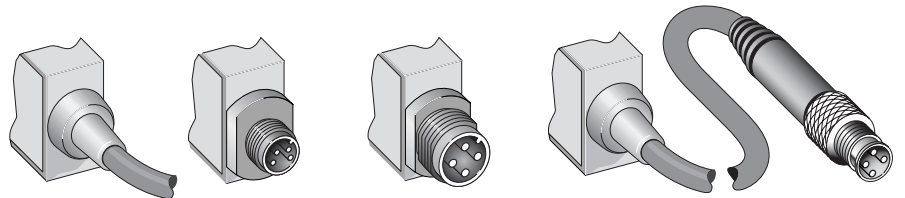
WT 9-2P141	WT 9-2P341
WT 9-2P441	WT 9-2P641
WT 9-2N141	
WT 9-2N441	

- 1 Axis of the receiver optics
- 2 Axis of the receiver optics
- 3 Mounting hole Ø 3.2 mm
- 4 LED signal strength indicator
- 5 Plug M 12 or M 8, 4 pin, 2 m connection cable or 120 mm cable with plug M 12, 4 pin
- 6 Teach-In button



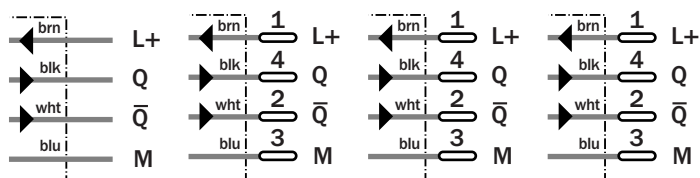
**Connection type**

WT 9-2P141	WT 9-2P341	WT 9-2P441	WT 9-2P641
WT 9-2N141		WT 9-2N441	



<b>Accessories</b>
Connectors
Mounting systems

4 x 0.14 mm <sup>2</sup>	4 pin, M 8	4 pin, M 12	4 pin, M 12 with 120 mm cable
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Technical data		WT 9-2	P141	P441	N141	N441	P341	P641				
<b>Scanning distance adjustable</b> <sup>1)</sup>	10 ... 20 mm											
<b>Supply voltage</b> $V_s$ <sup>2)</sup>	DC 10 ... 30 V											
Ripple <sup>3)</sup>	$\leq 5 V_{pp}$											
Current consumption <sup>4)</sup>	$\leq 30$ mA											
<b>Light source</b>	LED, visible red light <sup>5)</sup>											
Light spot diameter	3 mm at a distance of 20 mm											
<b>Switching outputs Q and <math>\bar{Q}</math></b>	PNP											
	NPN											
Signal voltage HIGH	$V_s - 2.9$ V											
	$V_s$											
Signal voltage LOW <sup>6)</sup>	Approx. 0 V											
	$\leq 2.9$ V											
<b>Output current</b> $I_A$ max.	$\leq 100$ mA											
<b>Response time</b> <sup>7)</sup>	$\leq 625$ $\mu$ s											
<b>Switching frequency</b> max. <sup>8)</sup>	800/s											
<b>Connection technology</b>	Connection cable, 2 m											
	Cable, 120 mm, with plug M 12, 4 pin											
	Plug M 12, 4 pin											
	Plug M 8, 4 pin											
<b>VDE protection class M 12</b> <sup>9)</sup>	<input type="checkbox"/>											
<b>VDE protection class M 8</b>	III											
<b>Protection type</b>	IP 67											
<b>Protection circuits</b> <sup>10)</sup>	A, B, C											
<b>Ambient temperature</b> <sup>11)</sup>	Operation $-40 \dots +60$ °C											
	Storage $-40 \dots +75$ °C											
<b>Weight</b>												
with connection cable 2 m/120 mm	Approx. 80 g											
with equipment plug M 12/M 8, 4 pin	Approx. 20 g											

<sup>1)</sup> Object with 90% reflectance (referred to standard white DIN 5033)  
<sup>2)</sup> Limit values  
<sup>3)</sup> Must be within  $V_s$  tolerances  
<sup>4)</sup> Without load

<sup>5)</sup> Average service life at room temperature 100,000 h at  $T_U = +25$  °C  
<sup>6)</sup> At  $T_U = +25$  °C and 100 mA output current

<sup>7)</sup> With resistive load  
<sup>8)</sup> With light/dark ratio 1:1  
<sup>9)</sup> Withstand voltage 50 V

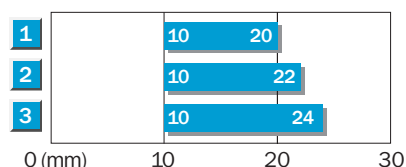
<sup>10)</sup> A = supply connections reverse polarity protected  
 B = outputs short-circuit protected  
 C = interference suppression  
<sup>11)</sup> Do not distort cable below 0 °C

**Teach-In function**

- Programming via Teach-In button.**
- Simple programming:**  
Position object in the beam and push the button: finished;  
LED confirms the Teach-In procedure.
- Teach-In values can be stored.**

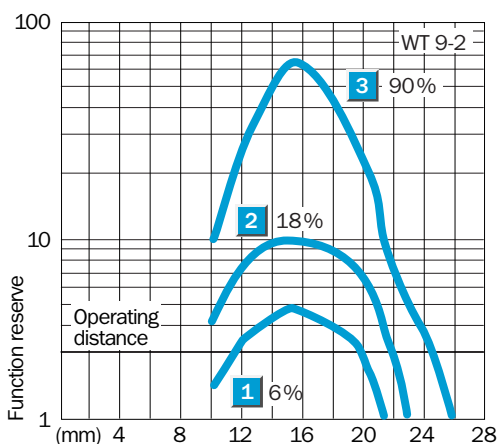
- Two operating modes:**  
**Default setting:** short Teach-In time (< 8 s); for standard applications;  
 approx. double reserve via switching threshold;  
 LED lights continuously.  
**Precise setting:** long Teach-In time (> 8 s); for precise applications;  
 small switching hysteresis;  
 LED blinks.

**Scanning distance**



Scanning distance

- 1 Scanning range on black, 6 % reflectance
- 2 Scanning range on gray, 18 % reflectance
- 3 Scanning range on white, 90 % reflectance



**Ordering information**

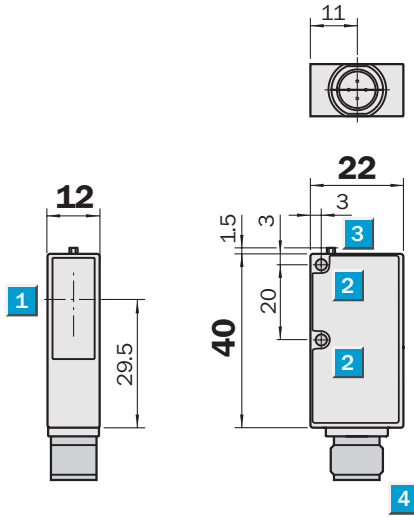
Type	Order no.
WT 9-2P141	1 018 301
WT 9-2P441	1 018 303
WT 9-2N141	1 018 302
WT 9-2N441	1 018 304
WT 9-2P341	1 019 274
WT 9-2P641	1 019 275

# WL 9-2 Photoelectric Reflex Switch, Basic Type

**Scanning range**  
**0 ... 4 m**  
 Photoelectric reflex switch

- Red-light emitter LED as alignment aid
- Switching frequency 800/s
- Outputs short-circuit protected

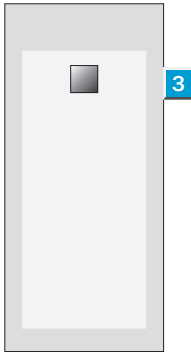
## Dimension illustration



### Without setting options

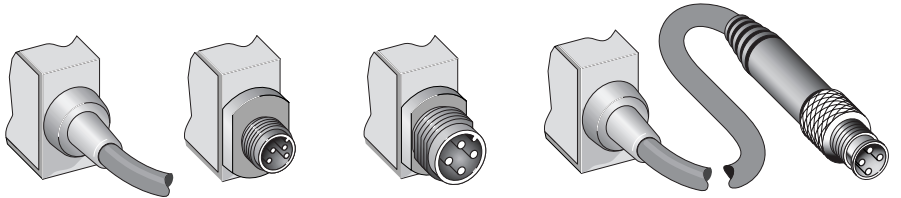
WL 9-2P130	WL 9-2P330
WL 9-2P430	WL 9-2P630
WL 9-2N130	WL 9-2N330
WL 9-2N430	

- 1 Middle of optic axis
- 2 Mounting hole  $\varnothing$  3.2 mm
- 3 LED signal strength indicator
- 4 Plug M 12 or M 8, 4 pin, 2 m connection cable or 120 mm cable with plug M 12, 4 pin



### Connection type

WL 9-2P130	WL 9-2P330	WL 9-2P430	WL 9-2P630
WL 9-2N130	WL 9-2N330	WL 9-2N430	



Accessories
Connectors
Mounting systems
Reflectors

4 x 0.14 mm <sup>2</sup>	4 pin, M 8	4 pin, M 12	4 pin, M 12 with 120 mm cable



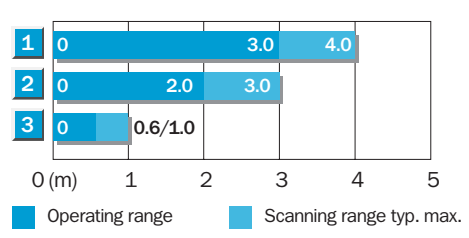
Technical data		WL 9-2	P130	P430	N130	N430	P330	P630	N330			
<b>Scanning range typ. max./on reflector</b>	4 m/PL 80 A											
<b>Supply voltage <math>V_s</math><sup>1)</sup></b>	DC 10 ... 30 V											
Ripple <sup>2)</sup>	$\leq 5 V_{pp}$											
Current consumption <sup>3)</sup>	$\leq 30 \text{ mA}$											
<b>Light source</b>	LED, visible red light <sup>4)</sup>											
Angle of dispersion	2.5°											
Light spot diameter	120 x 120 mm at a distance of 3 m											
<b>Switching outputs Q and <math>\bar{Q}</math></b>	PNP											
	NPN											
Signal voltage HIGH	$V_s - 2.9 \text{ V}$											
	$V_s$											
Signal voltage LOW <sup>5)</sup>	Approx. 0 V											
	$\leq 2.9 \text{ V}$											
<b>Output current <math>I_A</math> max.</b>	$\leq 100 \text{ mA}$											
<b>Response time<sup>6)</sup></b>	$\leq 625 \mu\text{s}$											
<b>Max. switching frequency<sup>7)</sup></b>	800/s											
<b>Connection technology</b>	Connection cable, 2 m											
	Cable, 120 mm, with plug M 12, 4 pin											
	Plug M 12, 4 pin											
	Plug M 8, 4 pin											
<b>VDE protection class M 12<sup>8)</sup></b>	<input type="checkbox"/>											
<b>VDE protection class M 8</b>	III											
<b>Protection type</b>	IP 67											
<b>Protection circuits<sup>9)</sup></b>	A, B, C											
<b>Ambient temperature<sup>10)</sup></b>	Operation $-40 \dots +60 \text{ }^\circ\text{C}$											
	Storage $-40 \dots +75 \text{ }^\circ\text{C}$											
<b>Weight</b>												
with connection cable 2 m/120 mm	Approx. 80 g											
with equipment plug M 12/M 8, 4 pin	Approx. 20 g											

1) Limit values  
 2) Must be within  $V_s$  tolerances  
 3) Without load  
 4) Average service life at room temperature 100,000 h at  $T_U = +25 \text{ }^\circ\text{C}$

5) At  $T_U = +25 \text{ }^\circ\text{C}$  and 100 mA output current  
 6) With resistive load  
 7) With light/dark ratio 1:1  
 8) Withstand voltage 50 V

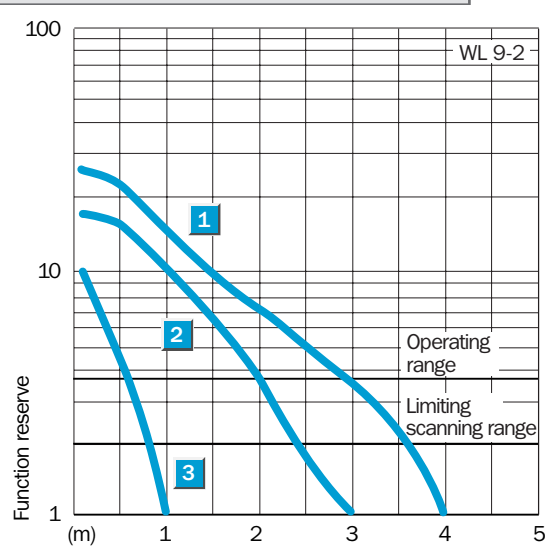
9) A = supply connections reverse polarity protected  
 B = outputs short-circuit protected  
 C = interference suppression  
 10) Do not distort cable below  $0 \text{ }^\circ\text{C}$

**Scanning range**



Reflector type	Operating range
1 PL 80 A	0 ... 3 m
2 PL 40 A	0 ... 2 m
3 Reflective tape Diamond Grade*	0 ... 0.6 m

\* 100 x 100 mm<sup>2</sup>



**Ordering information**

Type	Order no.
WL 9-2P130	1 018 281
WL 9-2P430	1 018 283
WL 9-2N130	1 018 282
WL 9-2N430	1 018 284
WL 9-2P330	1 019 024
WL 9-2P630	1 019 268
WL 9-2N330	1 019 511

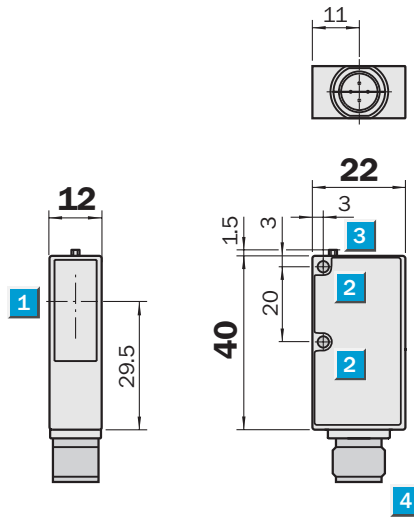
# WL 9-2 Photoelectric Reflex Switch, Teach-In

**Scanning range**  
**0 ... 4 m**

Photoelectric reflex switch

- Red-light emitter LED as alignment aid
- Switching frequency 800/s
- Outputs short-circuit protected
- Sensitivity adjustment using the Teach-In procedure

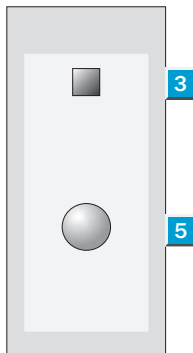
## Dimension illustration



## Setting options

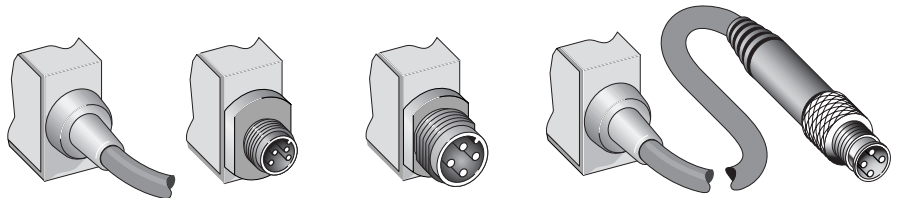
WL 9-2P131	WL 9-2P331
WL 9-2P431	WL 9-2P631
WL 9-2N131	
WL 9-2N431	

- 1 Middle of optic axis
- 2 Mounting hole  $\varnothing$  3.2 mm
- 3 LED signal strength indicator
- 4 Plug M 12 or M 8, 4 pin, 2 m connection cable or 120 mm cable with plug M 12, 4 pin
- 5 Teach-In button



## Connection type

WL 9-2P131	WL 9-2P331	WL 9-2P431	WL 9-2P631
WL 9-2N131		WL 9-2N431	



## Accessories

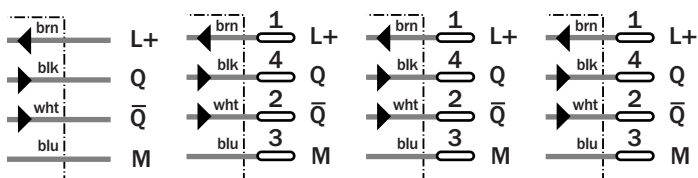
Connectors
Mounting systems
Reflectors

4 x 0.14 mm<sup>2</sup>

4 pin, M 8

4 pin, M 12

4 pin, M 12 with 120 mm cable



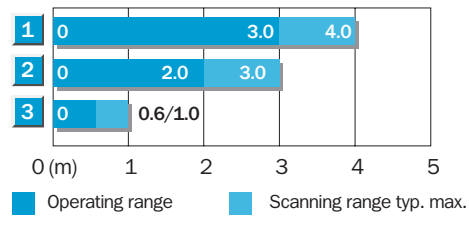
Technical data		WL 9-2	P131	P431	N131	N431	P331	P631				
<b>Scanning range typ. max./on reflector</b>	4 m/PL 80 A											
<b>Supply voltage <math>V_s</math><sup>1)</sup></b>	DC 10 ... 30 V											
Ripple <sup>2)</sup>	$\leq 5 V_{pp}$											
Current consumption <sup>3)</sup>	$\leq 30$ mA											
<b>Light source</b>	LED, visible red light <sup>4)</sup>											
Angle of dispersion	2.5°											
Light spot diameter	120 x 120 mm at a distance of 3 m											
<b>Switching outputs Q and <math>\bar{Q}</math></b>	PNP											
	NPN											
Signal voltage HIGH	$V_s - 2.9$ V											
	$V_s$											
Signal voltage LOW <sup>5)</sup>	Approx. 0 V											
	$\leq 2.9$ V											
<b>Output current <math>I_A</math> max.</b>	$\leq 100$ mA											
<b>Response time<sup>6)</sup></b>	$\leq 625$ $\mu$ s											
<b>Max. switching frequency<sup>7)</sup></b>	800/s											
<b>Connection technology</b>	Connection cable, 2 m											
	Cable, 120 mm, with plug M 12, 4 pin											
	Plug M 12, 4 pin											
	Plug M 8, 4 pin											
<b>VDE protection class M 12<sup>8)</sup></b>	<input type="checkbox"/>											
<b>VDE protection class M 8</b>	III											
<b>Protection type</b>	IP 67											
<b>Protection circuits<sup>9)</sup></b>	A, B, C											
<b>Ambient temperature<sup>10)</sup></b>	Operation -40 ... +60 °C											
	Storage -40 ... +75 °C											
<b>Weight</b>												
with connection cable 2 m/120 mm	Approx. 80 g											
with equipment plug M 12/M 8, 4 pin	Approx. 20 g											

1) Limit values  
 2) Must be within  $V_s$  tolerances  
 3) Without load  
 4) Average service life at room temperature 100,000 h at  $T_U = +25$  °C  
 5) At  $T_U = +25$  °C and 100 mA output current  
 6) With resistive load  
 7) With light/dark ratio 1:1  
 8) Withstand voltage 50 V  
 9) A = supply connections reverse polarity protected  
 B = outputs short-circuit protected  
 C = interference suppression  
 10) Do not distort cable below 0 °C

**Teach-In function**

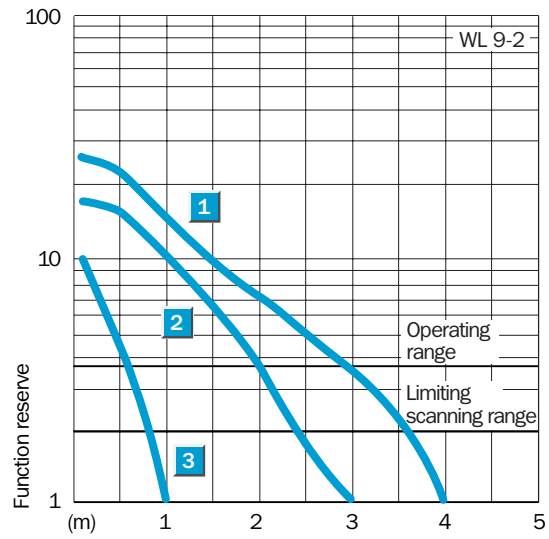
- **Programming via Teach-In button.**
- **Simple programming:**  
 Position reflector in the beam and push the button: finished;  
 LED confirms the Teach-In procedure.
- **Teach-In values can be stored.**
- **Two operating modes:**  
**Default setting:** short Teach-In time (< 8 s); for standard applications;  
 approx. double reserve via switching threshold;  
 LED lights continuously.  
**Precise setting:** long Teach-In time (> 8 s); for precise applications;  
 small switching hysteresis;  
 LED blinks.

**Scanning range**




Reflector type	Operating range
1 PL 80 A	0 ... 3 m
2 PL 40 A	0 ... 2 m
3 Reflective tape Diamond Grade*	0 ... 0.6 m

\* 100 x 100 mm<sup>2</sup>



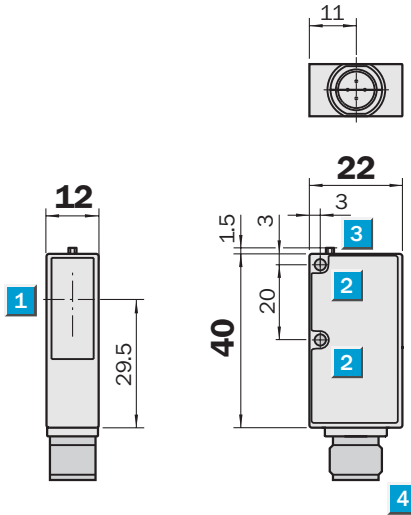
**Ordering information**

Type	Order no.
WL 9-2P131	1 018 285
WL 9-2P431	1 018 287
WL 9-2N131	1 018 286
WL 9-2N431	1 018 288
WL 9-2P331	1 019 025
WL 9-2P631	1 019 269


**Scanning range**  
**0 ... 0.4 m**  
 Photoelectric reflex switch

- LED light source, visible red light
- Switching frequency 800/s
- Outputs short-circuit protected
- Sensitivity adjustment using the Teach-In procedure

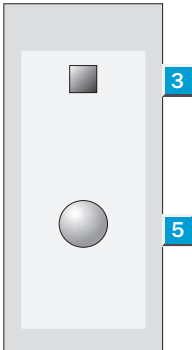
**Dimension illustration**



**Setting options**

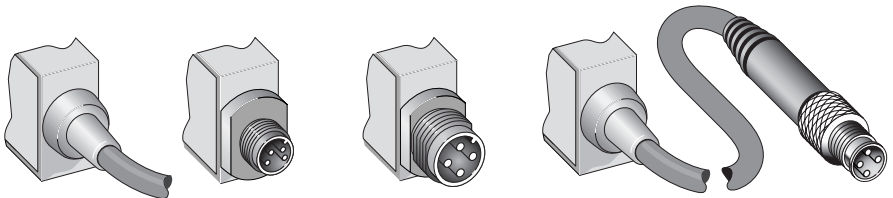
WL 9-2P121	WL 9-2P321
WL 9-2P421	WL 9-2P621
WL 9-2N121	
WL 9-2N421	

- 1 Middle of optic axis
- 2 Mounting hole  $\varnothing$  3.2 mm
- 3 LED signal strength indicator
- 4 Plug M 12 or M 8, 4 pin, 2 m connection cable or 120 mm cable with plug M 12, 4 pin
- 5 Teach-In button



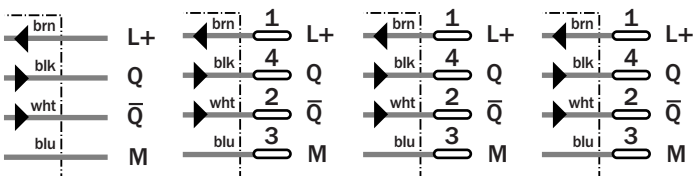
**Connection type**

WL 9-2P121	WL 9-2P321	WL 9-2P421	WL 9-2P621
WL 9-2N121		WL 9-2N421	



Accessories	
Connectors	
Mounting systems	
Reflectors	

4 x 0.14 mm <sup>2</sup>	4 pin, M 8	4 pin, M 12	4 pin, M 12 with 120 mm cable
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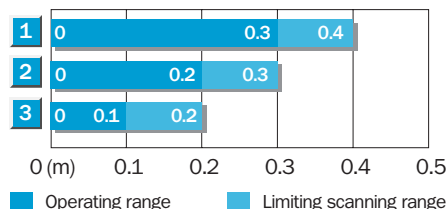
Technical data		WL 9-2	P121	P421	N121	N421	P321	P621				
Scanning range typ. max./on reflector	0.4 m/PL 80 A											
Supply voltage $V_s$ <sup>1)</sup>	DC 10 ... 30 V											
Ripple <sup>2)</sup>	$\leq 5 V_{pp}$											
Current consumption <sup>3)</sup>	$\leq 30$ mA											
Light source	LED, visible red light <sup>4)</sup>											
Light spot diameter	1.5 x 1.5 mm at a distance of 35 mm											
Switching outputs Q and $\bar{Q}$	PNP											
	NPN											
Signal voltage HIGH	$V_s - 2.9$ V											
	$V_s$											
Signal voltage LOW <sup>5)</sup>	Approx. 0 V											
	$\leq 2.9$ V											
Output current $I_A$ max.	$\leq 100$ mA											
Response time <sup>6)</sup>	$\leq 625$ $\mu$ s											
Max. switching frequency <sup>7)</sup>	800/s											
Connection technology	Connection cable, 2 m											
	Cable, 120 mm, with plug M 12, 4 pin											
	Plug M 12, 4 pin											
	Plug M 8, 4 pin											
VDE protection class M 12 <sup>8)</sup>	<input type="checkbox"/>											
VDE protection class M 8	III											
Protection type	IP 67											
Protection circuits <sup>9)</sup>	A, B, C											
Ambient temperature <sup>10)</sup>	Operation $-40 \dots +60$ °C											
	Storage $-40 \dots +75$ °C											
Weight												
with connection cable 2 m/120 mm	Approx. 80 g											
with equipment plug M 12/M 8, 4 pin	Approx. 20 g											

- 1) Limit values
- 2) Must be within  $V_s$  tolerances
- 3) Without load
- 4) Average service life at room temperature 100,000 h at  $T_U = +25$  °C
- 5) At  $T_U = +25$  °C and 100 mA output current
- 6) With resistive load
- 7) With light/dark ratio 1:1
- 8) Withstand voltage 50 V
- 9) A = supply connections reverse polarity protected  
B = outputs short-circuit protected  
C = interference suppression
- 10) Do not distort cable below 0 °C

**Teach-In function**

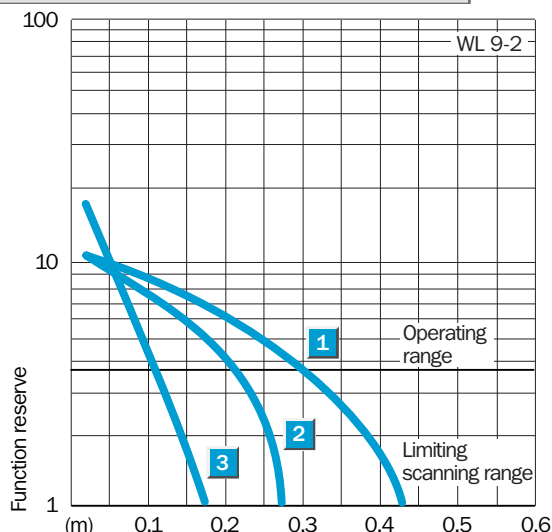
- **Programming via Teach-In button.**
- **Simple programming:**  
Position reflector in the beam and push the button: finished;  
LED confirms the Teach-In procedure.
- **Teach-In values can be stored.**
- **Two operating modes:**  
**Default setting:** short Teach-In time (< 8 s); for standard applications; approx. double reserve via switching threshold; LED lights continuously.  
**Precise setting:** long Teach-In time (> 8 s); for precise applications; small switching hysteresis; LED blinks.

**Scanning range**



Reflector type	Operating range
1 PL 80 A	0 ... 0.3 m
2 PL 40 A	0 ... 0.2 m
3 Reflective tape Diamond Grade*	0 ... 0.1 m

\* 100 x 100 mm<sup>2</sup>



**Ordering information**

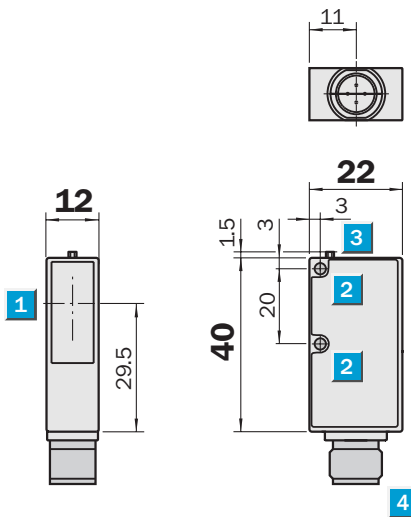
Type	Order no.
WL 9-2P121	1 018 289
WL 9-2P421	1 018 291
WL 9-2N121	1 018 290
WL 9-2N421	1 018 292
WL 9-2P321	1 019 270
WL 9-2P621	1 019 271

**Scanning range**  
7 m

Through-beam photoelectric switch

- Red-light emitter LED as alignment aid
- Switching frequency 200/s
- Outputs short-circuit protected
- Test input

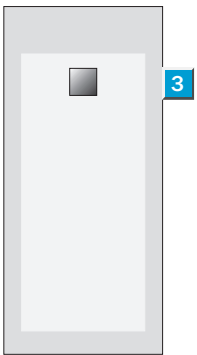
### Dimension illustration



**No setting options**

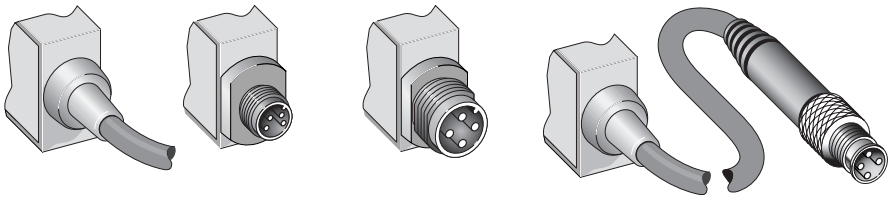
WS/WE 9-2P130	WS/WE 9-2P330
WS/WE 9-2P430	WS/WE 9-2P630
WS/WE 9-2N130	
WS/WE 9-2N430	

- 1 Middle of optic axis
- 2 Mounting hole Ø 3.2 mm
- 3 LED signal strength indicator
- 4 Plug M 12 or M 8, 4 pin, 2 m connection cable or 120 mm cable with plug M 12, 4 pin



### Connection type

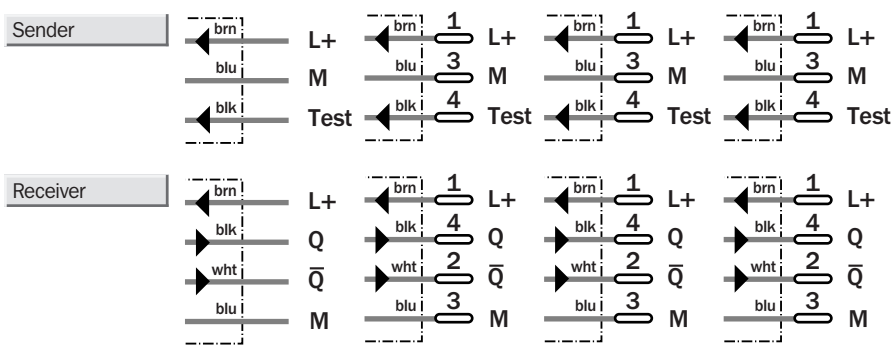
WS/WE 9-2P130	WS/WE 9-2P330	WS/WE 9-2P430	WS/WE 9-2P630
WS/WE 9-2N130		WS/WE 9-2N430	



**Accessories**

Connectors
Mounting systems

4 x 0.14 mm <sup>2</sup>	4 pin, M 8	4 pin, M 12	4 pin, M 12 with 120 mm cable
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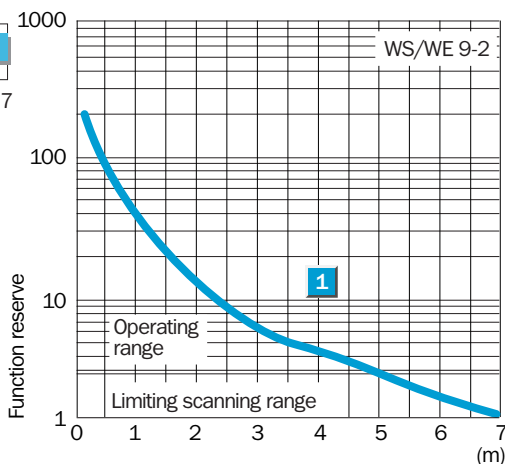
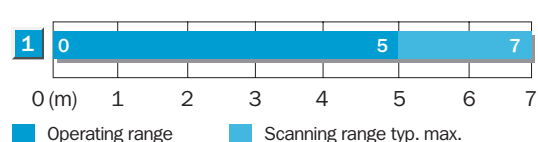
Technical data		WS/WE 9-2	P130	P430	N130	N430	P330	P630				
<b>Scanning range typ. max.</b>	7 m											
<b>Suggested operating range</b>	5 m											
<b>Supply voltage <math>V_S</math><sup>4)</sup></b>	DC 10 ... 30 V											
Ripple <sup>2)</sup>	$\leq 5 V_{pp}$											
Current consumption <sup>3)</sup>	$\leq 15$ mA (WE); $\leq 60$ mA (WS)											
<b>Light source</b>	LED, visible red light <sup>4)</sup>											
Angle of dispersion	15°											
Angle of reception	6°											
Light spot diameter	1000 mm at a distance of 5 m											
<b>Switching outputs Q and <math>\bar{Q}</math></b>	PNP											
	NPN											
Signal voltage HIGH	$V_S - 2.9$ V											
	$V_S$											
Signal voltage LOW <sup>5)</sup>	Approx. 0 V											
	$\leq 2.9$ V											
<b>Output current <math>I_A</math> max.</b>	$\leq 100$ mA											
<b>Response time<sup>6)</sup></b>	$\leq 2.5$ ms											
<b>Max. switching frequency<sup>7)</sup></b>	200/s											
Test input TE	$V_S$ or unswitched, sender active											
	0 V, sender inactive											
<b>Connection technology</b>	Connection cable, 2 m											
	Cable, 120 mm, with plug M 12, 4 pin											
	Plug M 12, 4 pin											
	Plug M 8, 4 pin											
<b>VDE protection class M 12<sup>8)</sup></b>	<input type="checkbox"/>											
<b>VDE protection class M 8</b>	III											
<b>Protection type</b>	IP 67											
<b>Protection circuits<sup>9)</sup></b>	A, B, C											
<b>Ambient temperature<sup>10)</sup></b>	Operation $-40 \dots +60$ °C											
	Storage $-40 \dots +75$ °C											
<b>Weight</b>												
with connection cable 2 m/120 mm	Approx. 80 g											
with equipment plug M 12/M 8, 4 pin	Approx. 20 g											

1) Limit values  
 2) Must be within  $V_S$  tolerances  
 3) Without load  
 4) Average service life at room temperature 100,000 h

5) At  $T_U = +25$  °C and 100 mA output current  
 6) With resistive load  
 7) With light/dark ratio 1:1  
 8) Withstand voltage 50 V

9) A = supply connections reverse polarity protected  
 B = outputs short-circuit protected  
 C = interference suppression  
 10) Do not distort cable below 0 °C

**Scanning range**



**Ordering Information**

Type	Order no.
WS/WE 9-2P130	1 019 259
WS/WE 9-2P430	1 019 261
WS/WE 9-2N130	1 019 260
WS/WE 9-2N430	1 019 262
WS/WE 9-2P330	1 019 383
WS/WE 9-2P630	1 019 382

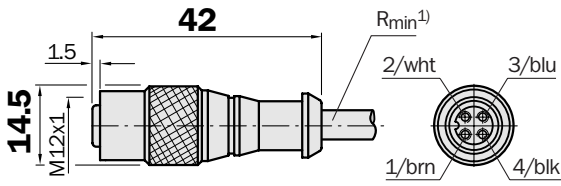
Dimension illustrations and ordering information

SENSICK circular screwing system M 12, 4 pin, enclosure rating IP 67

M 12 cable receptacles, 4 pin, straight

Cable diameter 5 mm, 4 x 0.25 mm<sup>2</sup>, PVC coating

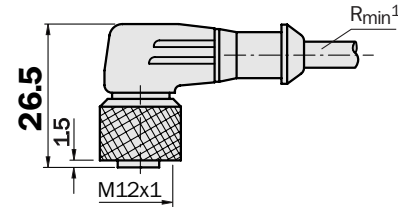
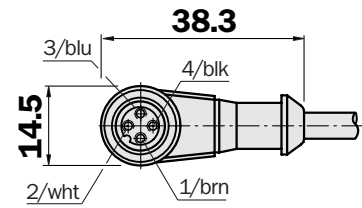
Type	Order no.	Pins	Cable length
DOL-1204-G02M	6 009 382	4	2 m
DOL-1204-G05M	6 009 866	4	5 m
DOL-1204-G10M	6 010 543	4	10 m
DOL-1204-G15M	6 010 753	4	15 m



M 12 cable receptacles, 4 pin, angled

Cable diameter 5 mm, 4 x 0.25 mm<sup>2</sup>, PVC coating

Type	Order no.	Pins	Cable length
DOL-1204-W02M	6 009 383	4	2 m
DOL-1204-W05M	6 009 867	4	5 m
DOL-1204-W10M	6 010 541	4	10 m

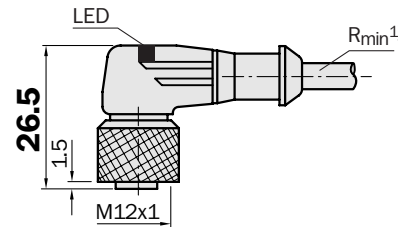
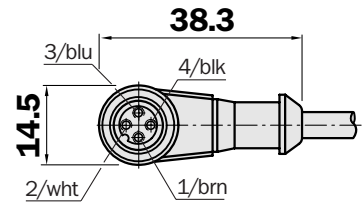


M 12 cable receptacles, 4 pin, angled

Cable diameter 5 mm, 4 x 0.34 mm<sup>2</sup>, PUR/PVC coating

With LED for power and status indicators, PNP complementary<sup>2)</sup>

Type	Order no.	Pins	Cable length
DOL-1204-W05ME	6 020 398	4	5 m



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

<sup>2)</sup> Remark: Not suitable for sender in through-beam systems

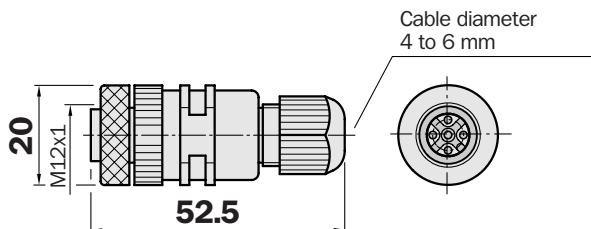


Dimension illustrations and ordering information

SENSICK circular screwing system M 12, 4 pin, enclosure rating IP 67

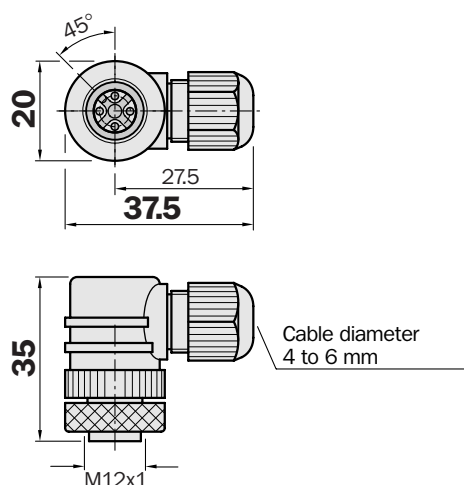
M 12 cable receptacles, 4 pin, straight

Type	Order no.	Pins	Can be self-made for cables Ø 4.5 to 6.5 mm
DOS-1204-G	6 007 302	4	



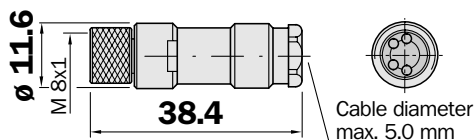
M 12 cable receptacles, 4 pin, angled

Type	Order no.	Pins	Can be self-made for cables Ø 4.5 to 6.5 mm
DOS-1204-W	6 007 303	4	



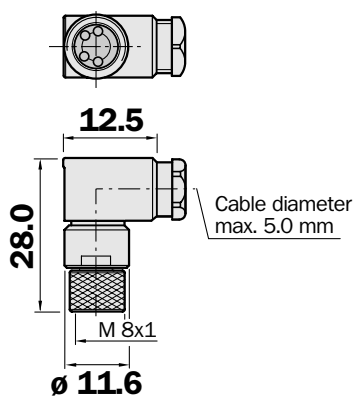
M 8 cable receptacle, 4 pin, straight

Type	Order no.
DOS-0804-G	6 009 974



M 8 cable receptacles, 4 pin, angled

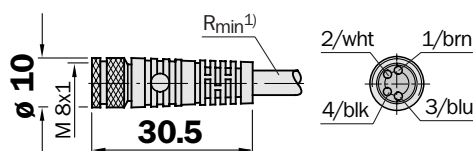
Type	Order no.
DOS-0804-W	6 009 975



M 8 cable receptacle, 4 pin, straight

Cable diameter 5 mm, 4 x 0.25 mm<sup>2</sup>, PVC coating

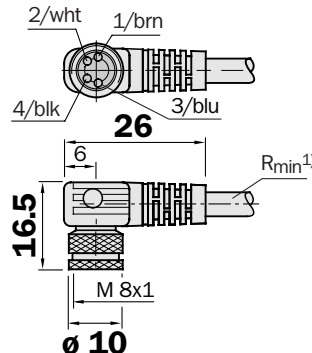
Type	Order no.	Cable length
DOL-0804-G02M	6 009 870	2 m
DOL-0804-G05M	6 009 872	5 m
DOL-0804-G10M	6 010 754	10 m



M 8 cable receptacles, 4 pin, angled

Cable diameter 5 mm, 4 x 0.25 mm<sup>2</sup>, PVC coating

Type	Order no.	Cable length
DOL-0804-W02M	6 009 871	2 m
DOL-0804-W05M	6 009 873	5 m
DOL-0804-W10M	6 010 755	10 m



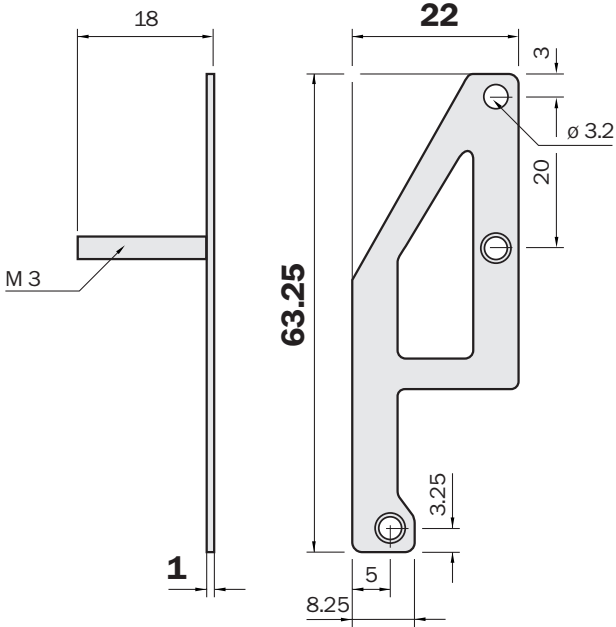
1) Minimum bending radius with dynamic use  
R<sub>min</sub> = 20x cable diameter

Dimension illustrations and ordering information

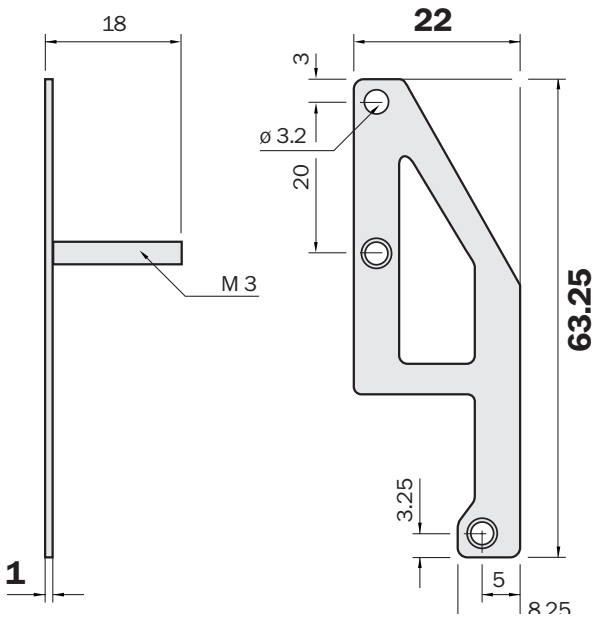
Dimension illustration adapter plate

Adapter set

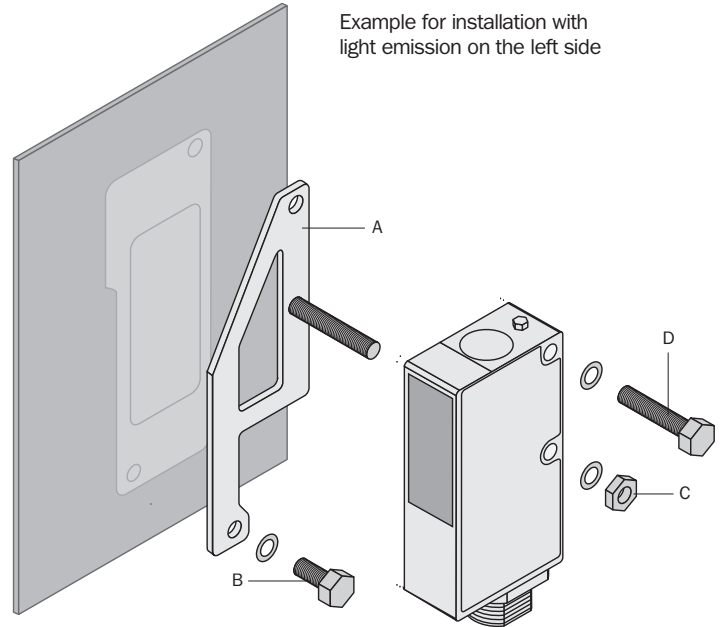
Type	Order no.
BEF-AP-W9	2 022 734



Adapter plate for light emission on the left side



Adapter plate for light emission on right side



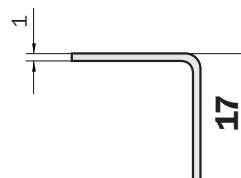
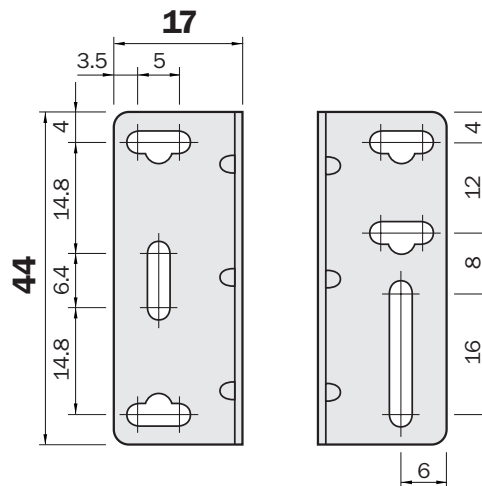
1. Gradual elimination of the old W 9.
2. Chose relevant adapter plate.
3. Align adapter angle "A" to existing hole pattern and attach angle attachment with screw "B".
4. Attach W 9-2 onto pre-mounted adapter angle.
5. Complete mounting of the W 9-2 with the screw "D" and the counter-nut "C".

If a device is to be replaced, we recommend using a W 9-2 with 120 mm cable with a sprayed M 12 plug.

Attachment material is supplied with the adapter set angle.

Mounting bracket

Type	Order no.
BEF-WN-W9-2	2 022 855

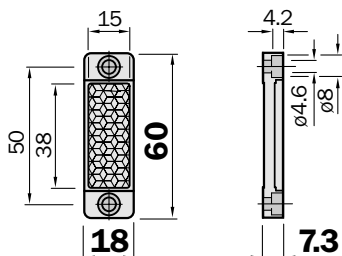


Dimension illustrations and ordering information

Plastic model for temperatures up to 65 °C

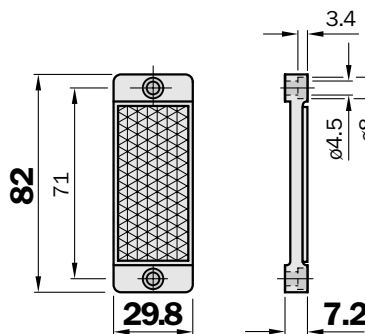
Reflector 20 x 40 mm

Type	Order no.
PL 20 A	1 012 719



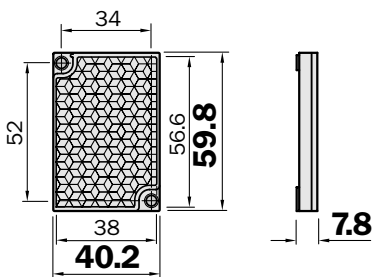
Reflector 30 x 50 mm

Type	Order no.
PL 30 A	1 002 314



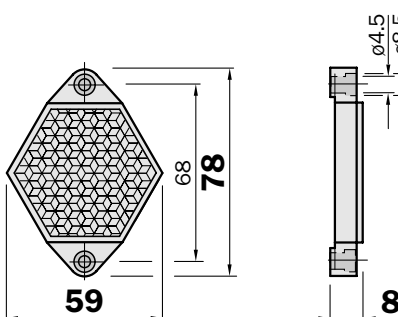
Reflector 40 x 60 mm

Type	Order no.
PL 40 A	1 012 720



Reflector hexagonal, SW 48 mm

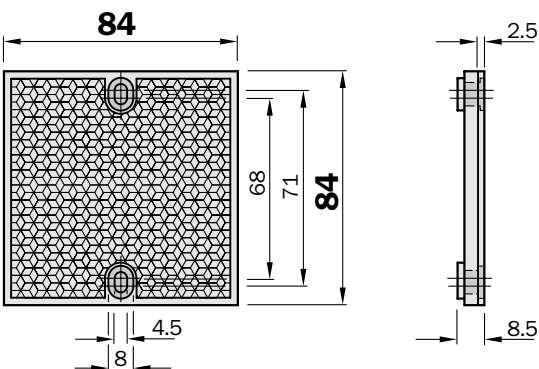
Type	Order no.
PL 50 A	1 000 132



Also available as heatable model:  
 Continuous heating: PL 50HK,  
 Order no. 1 001 545  
 Regulated heating: PL 50HS,  
 Order no. 1 009 871

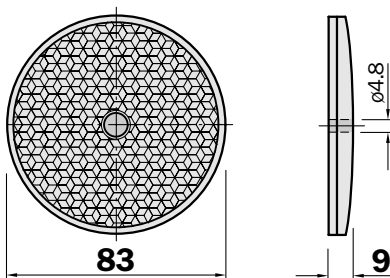
Reflector 80 x 80 mm

Type	Order no.
PL 80 A	1 003 865



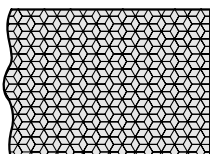
Reflector ø 83 mm, center hole mounting

Type	Order no.
C 110	5 304 549



Reflective tape

Type	Order no.	
REF-DG-K	4 019 634	fabricated
REF-DG	5 304 334	sheet 749 x 914 mm



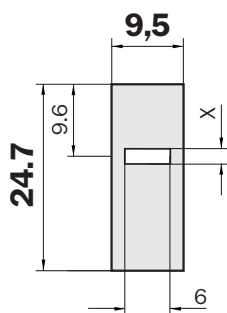
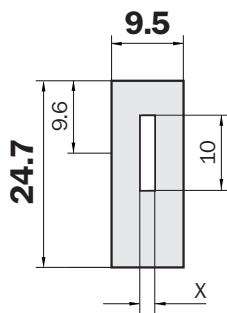
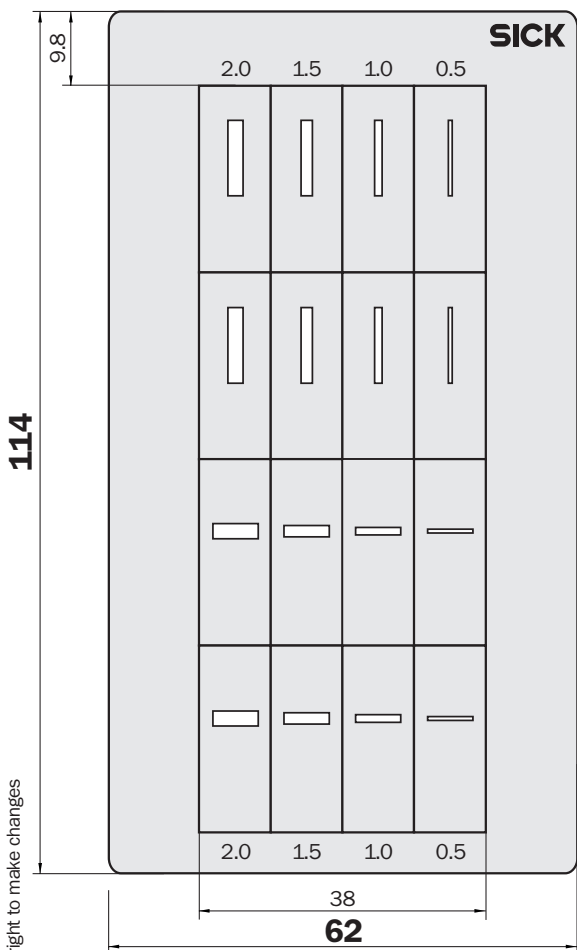
Dimension illustrations and ordering information

Slotted mask card

Slotted mask card for WS/WE 9-2

Slot width X: 0.5 mm/1.0 mm/1.5 mm/2.0 mm

Type	Order no.
BL-9-2	4 033 253



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