

# 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.

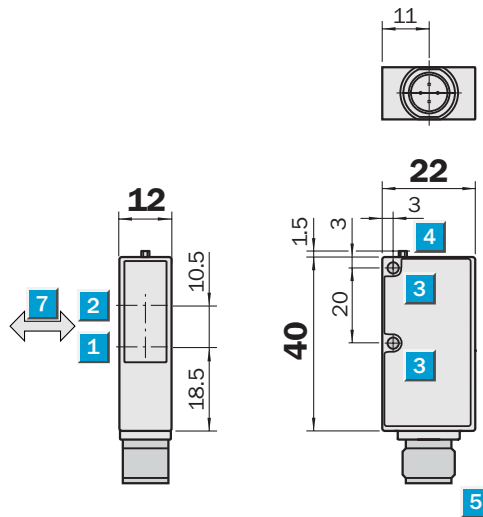
	<b>Photoelectric proximity switches HGA</b>
	<b>Photoelectric proximity switches ener.</b>
	<b>Photoelectric proximity switches V</b>
	<b>Photoelectric reflex switches</b>
	<b>Through-beam photoelectric switches</b>

**Scanning distance**  
30 ... 250 mm

Photoelectric proximity switches

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

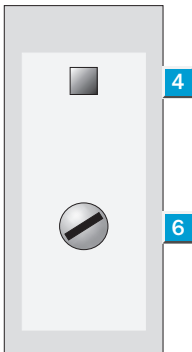
### Dimensional drawing



### Adjustments possible

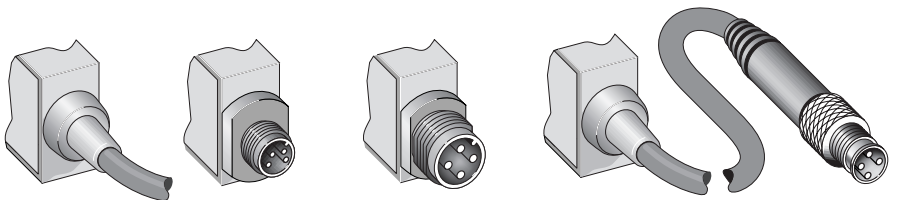
WT 9-2P 130	WT 9-2P 330
WT 9-2P 430	WT 9-2P 630
WT 9-2N 130	
WT 9-2N 430	

- 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 types

WT 9-2P 130	WT 9-2P 330	WT 9-2P 430	WT 9-2P 630
WT 9-2N 130		WT 9-2N 430	



### Accessories

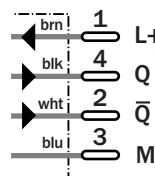
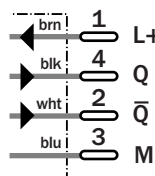
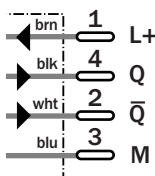
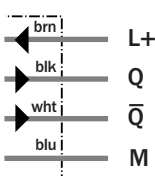
- Connectors
- Mounting systems

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	P 130	P 430	N 130	N 430	P 330	P 630				
<b>Scanning distance adjustable</b> <sup>4)</sup>	30 ... 250 mm											
Scanning range	5 ... 250 mm											
<b>Supply voltage V<sub>S</sub></b> <sup>2)</sup>	10 ... 30 VDC											
Ripple <sup>3)</sup>	≤ 5 V <sub>pp</sub>											
Current consumption <sup>4)</sup>	≤ 40 mA											
<b>Light source</b>	LED, visible red light <sup>5)</sup>											
Light spot diameter	15 x 15 mm at 200 mm											
<b>Switching outputs Q and <math>\bar{Q}</math></b>	PNP											
	NPN											
Signal voltage HIGH	V <sub>S</sub> - 2.9 V											
	V <sub>S</sub>											
Signal voltage LOW <sup>6)</sup>	Approx. 0 V											
	≤ 1.5 V											
<b>Output current I<sub>A</sub> max.</b>	≤ 100 mA											
<b>Response time</b> <sup>7)</sup>	≤ 333 μs											
<b>Switching frequency max.</b> <sup>8)</sup>	1500/s											
<b>Connection types</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>Enclosure rating</b>	IP 67											
<b>Circuit protection</b> <sup>10)</sup>	A, B, C											
<b>Ambient temperature T<sub>A</sub></b> <sup>11)</sup>	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											

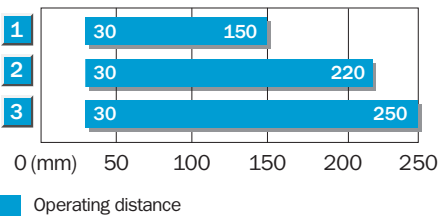
4) Object with 90% remission (referred to standard white DIN 5033)  
 2) Limit values  
 3) Must be within V<sub>S</sub> tolerances  
 4) Without load

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

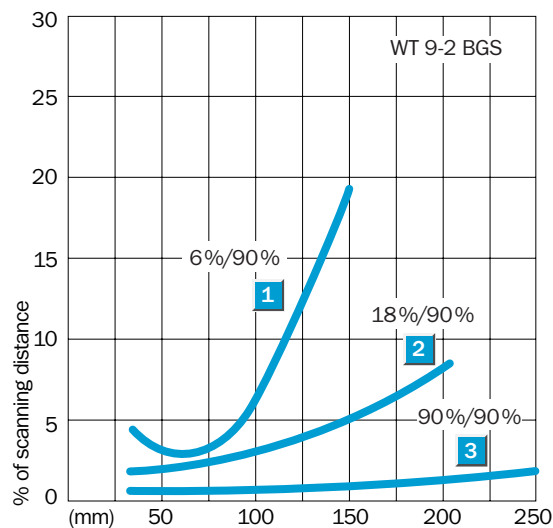
7) With resistive load  
 8) With light/dark ratio 1:1  
 9) Reference voltage 50 V

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

**Scanning distance**



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



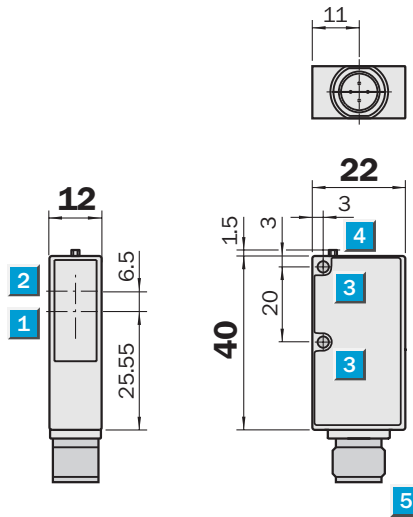
**Order information**

Type	Part no.
WT 9-2P 130	1 018 293
WT 9-2P 430	1 018 295
WT 9-2N 130	1 018 294
WT 9-2N 430	1 018 296
WT 9-2P 330	1 019 026
WT 9-2P 630	1 019 272

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

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

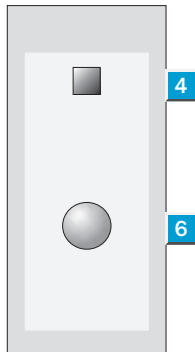
**Dimensional drawing**



**Adjustments possible**

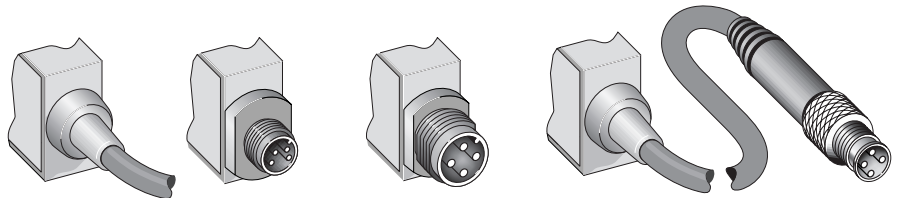
WT 9-2P 151	WT 9-2P 351
WT 9-2P 451	WT 9-2P 651
WT 9-2N 151	
WT 9-2N 451	

- 1 Axis of the receiver optics
- 2 Axis of the sender 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 Teach-in button



**Connection types**

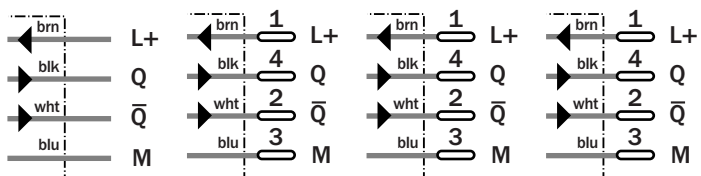
WT 9-2P 151	WT 9-2P 351	WT 9-2P 451	WT 9-2P 651
WT 9-2N 151		WT 9-2N 451	



**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		WT 9-2	P 151	P 451	N 151	N 451	P 351	P 651				
Scanning distance adjustable <sup>1)</sup>	10 ... 450 mm											
Supply voltage $V_S$ <sup>2)</sup>	10 ... 30 VDC											
Ripple <sup>3)</sup>	$\leq 5 V_{pp}$											
Current consumption <sup>4)</sup>	$\leq 30$ mA											
Light source	LED, visible red light <sup>5)</sup>											
Light spot diameter	80 x 80 mm at 500 mm											
Switching outputs Q and $\bar{Q}$	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											
Output current $I_A$ max.	$\leq 100$ mA											
Response time <sup>7)</sup>	$\leq 625$ $\mu$ s											
Switching frequency max. <sup>8)</sup>	800/s											
Connection types	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>9)</sup>	<input type="checkbox"/>											
VDE protection class M 8	III											
Enclosure rating	IP 67											
Circuit protection <sup>10)</sup>	A, B, C											
Ambient temperature $T_A$ <sup>11)</sup>	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) Object with 90% remission (referred to standard white DIN 5033)  
 2) Limit values  
 3) Must be within  $V_S$  tolerances  
 4) Without load

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

7) With resistive load  
 8) With light/dark ratio 1:1  
 9) Reference voltage 50 V

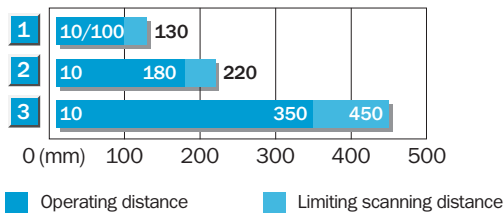
10) A = supply connections reverse polarity protected  
 B = outputs short-circuit protected  
 C = interference suppression  
 11) Do not bend below 0 °C

**Teach-in function**

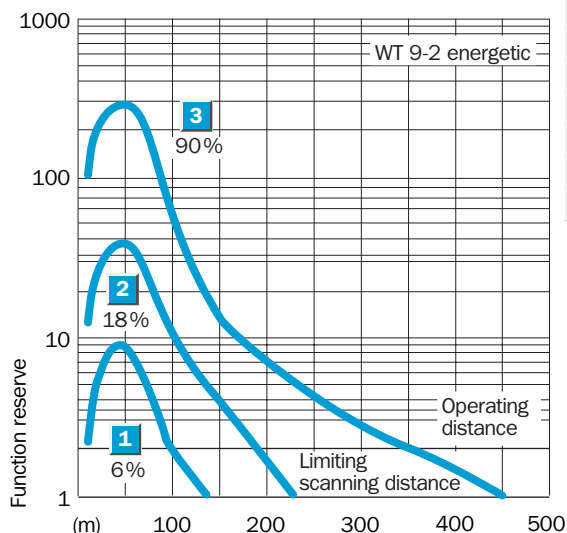
- **Programming via Teach-in button.**
- **Simple programming:**  
 Position object in the beam and push the button:  
 finished;  
 LED confirms the Teach-in procedure.
- **Teach-in values can be stored.**

- **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% remission
- 2 Scanning range on gray, 18% remission
- 3 Scanning range on white, 90% remission



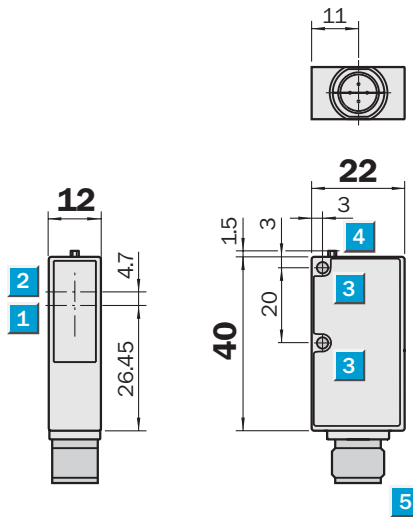
**Order information**

Type	Part no.
WT 9-2P 151	1 018 297
WT 9-2P 451	1 018 299
WT 9-2N 151	1 018 298
WT 9-2N 451	1 018 300
WT 9-2P 351	1 019 027
WT 9-2P 651	1 019 273

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

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

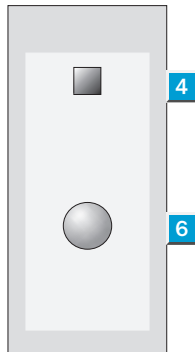
**Dimensional drawing**



**Adjustments possible**

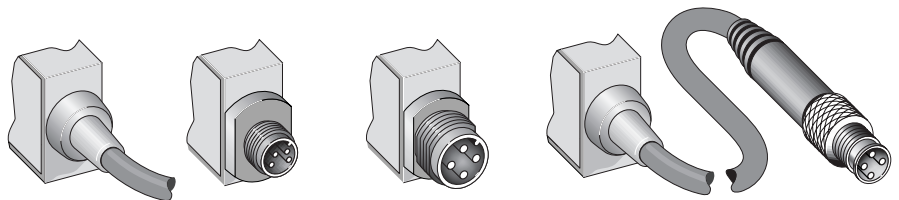
WT 9-2P 141	WT 9-2P 341
WT 9-2P 441	WT 9-2P 641
WT 9-2N 141	
WT 9-2N 441	

- 1 Axis of the receiver 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 Teach-in button



**Connection types**

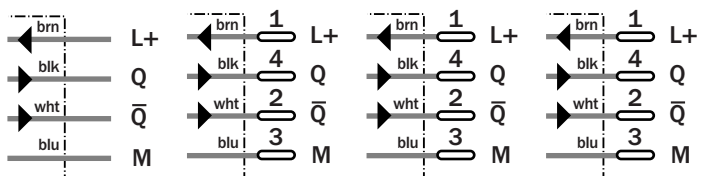
WT 9-2P 141	WT 9-2P 341	WT 9-2P 441	WT 9-2P 641
WT 9-2N 141		WT 9-2N 441	



**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		WT 9-2	P 141	P 441	N 141	N 441	P 341	P 641				
<b>Scanning distance adjustable</b> <sup>1)</sup>	10 ... 20 mm											
<b>Supply voltage</b> $V_s$ <sup>2)</sup>	10 ... 30 VDC											
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 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 types</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>Enclosure rating</b>	IP 67											
<b>Circuit protection</b> <sup>10)</sup>	A, B, C											
<b>Ambient temperature</b> $T_A$ <sup>11)</sup>	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											

<sup>1)</sup> Object with 90% remission (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  $T_A = + 25$  °C  
<sup>6)</sup> At  $T_A = + 25$  °C and 100 mA output current

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

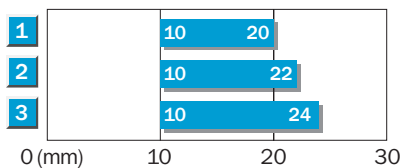
<sup>10)</sup> A = supply connections reverse polarity protected  
 B = outputs short-circuit protected  
 C = interference suppression  
<sup>11)</sup> Do not bend below 0 °C

**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.**

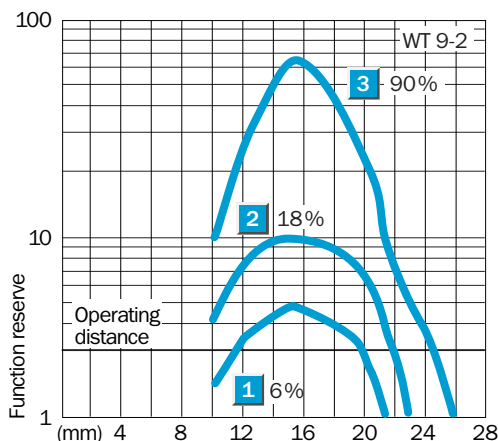
- **Two operating modes:**  
**Default setting:** short Teach-in time (< 8 s);  
for standard applications;  
approx. double reserve via switching threshold;  
LED lights continuously.  
**Precise setting:** long Teach-in time (> 8 s);  
for precise applications;  
small switching hysteresis;  
LED blinks.

**Scanning distance**



■ Scanning distance

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



**Order information**

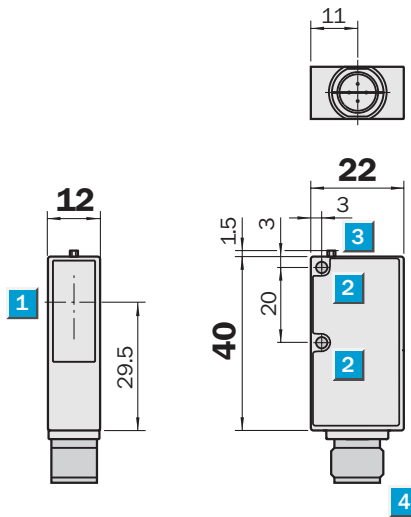
Type	Part no.
WT 9-2P 141	1 018 301
WT 9-2P 441	1 018 303
WT 9-2N 141	1 018 302
WT 9-2N 441	1 018 304
WT 9-2P 341	1 019 274
WT 9-2P 641	1 019 275

# WL 9-2 Photoelectric reflex switches, basic type

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

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

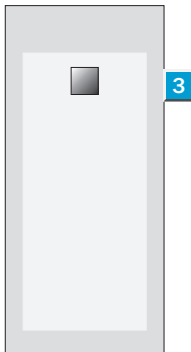
## Dimensional drawing



### No setting options

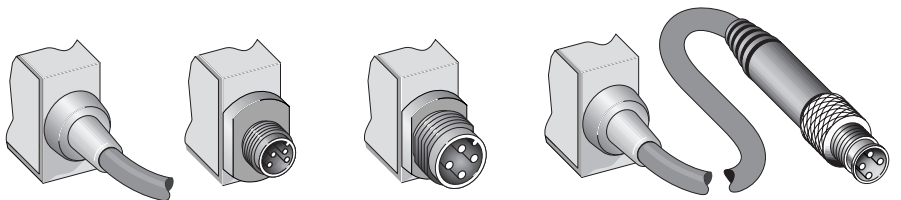
WL 9-2P 130	WL 9-2P 330
WL 9-2P 430	WL 9-2P 630
WL 9-2N 130	WL 9-2N 330
WL 9-2N 430	

- 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



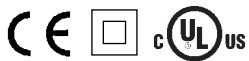
### Connection types

WL 9-2P 130	WL 9-2P 330	WL 9-2P 430	WL 9-2P 630
WL 9-2N 130	WL 9-2N 330	WL 9-2N 430	



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

Accessories
Connectors
Mounting systems
Reflectors





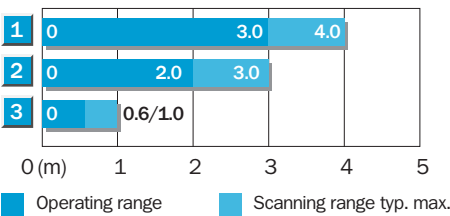
Technical data		WL 9-2	P 130	P 430	N 130	N 430	P 330	P 630	N 330
<b>Scanning range typ. max./on reflector</b>	4 m/PL 80 A								
<b>Supply voltage <math>V_S</math><sup>1)</sup></b>	10 ... 30 V DC								
Ripple <sup>2)</sup>	$\leq 5 V_{pp}$								
Current consumption <sup>3)</sup>	$\leq 30$ mA								
<b>Light source</b>	LED, visible red light <sup>4)</sup>								
Angle of dispersion	2.5°								
Light spot diameter	120 x 120 mm at 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 types</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>Enclosure rating</b>	IP 67								
<b>Circuit protection<sup>9)</sup></b>	A, B, C								
<b>Ambient temperature <math>T_A</math><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  $T_A = + 25$  °C

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

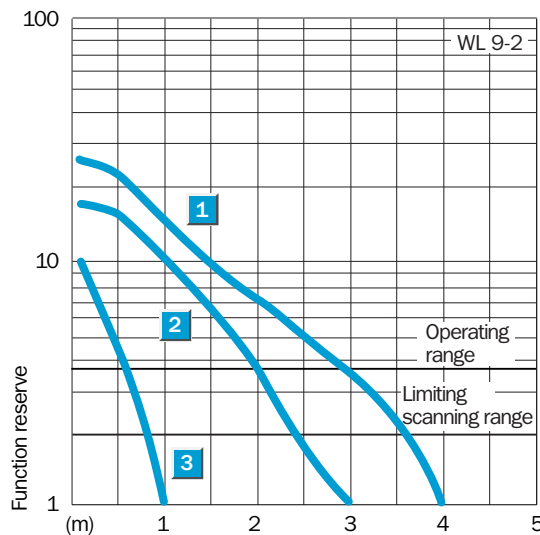
9) A = supply connections reverse polarity protected  
 B = outputs short-circuit protected  
 C = interference suppression  
 10) Do not bend below 0 °C

**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>



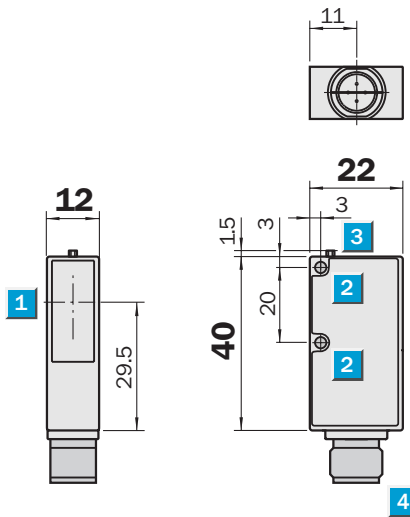
**Order information**

Type	Part no.
WL 9-2P 130	1 018 281
WL 9-2P 430	1 018 283
WL 9-2N 130	1 018 282
WL 9-2N 430	1 018 284
WL 9-2P 330	1 019 024
WL 9-2P 630	1 019 268
WL 9-2N 330	1 019 511

	<b>Scanning range</b> <b>0 ... 4 m</b>
Photoelectric reflex switches	

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

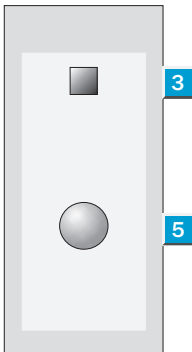
### Dimensional drawing



### Adjustments possible

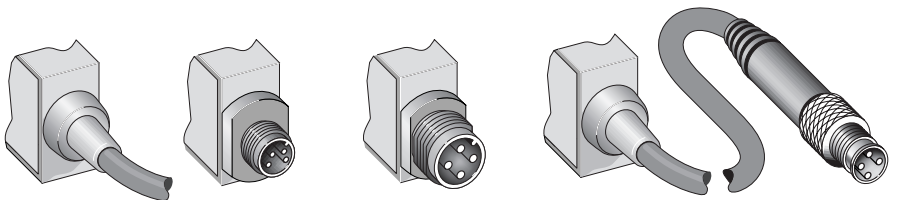
WL 9-2P 131	WL 9-2P 331
WL 9-2P 431	WL 9-2P 631
WL 9-2N 131	
WL 9-2N 431	

- 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 types

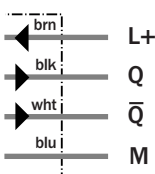
WL 9-2P 131	WL 9-2P 331	WL 9-2P 431	WL 9-2P 631
WL 9-2N 131		WL 9-2N 431	



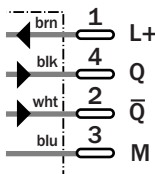
### Accessories

Connectors
Mounting systems
Reflectors

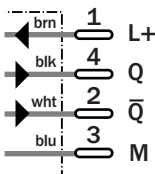
### 4 x 0.14 mm<sup>2</sup>



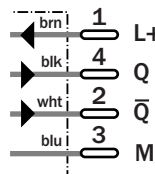
### 4-pin, M 8



### 4-pin, M 12



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



Technical data		WL 9-2	P 131	P 431	N 131	N 431	P 331	P 631				
<b>Scanning range typ. max./on reflector</b>	4 m/PL 80 A											
<b>Supply voltage <math>V_s</math><sup>1)</sup></b>	10 ... 30 VDC											
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 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 types</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>Enclosure rating</b>	IP 67											
<b>Circuit protection<sup>9)</sup></b>	A, B, C											
<b>Ambient temperature <math>T_A</math><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											

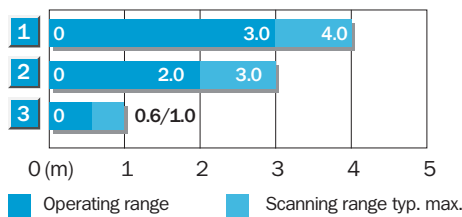
1) Limit values  
 2) Must be within  $V_s$  tolerances  
 3) Without load  
 4) Average service life at room temperature 100,000 h at  $T_A = + 25$  °C  
 5) At  $T_A = + 25$  °C and 100 mA output current  
 6) With resistive load  
 7) With light/dark ratio 1:1  
 8) Reference voltage 50 V  
 9) A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

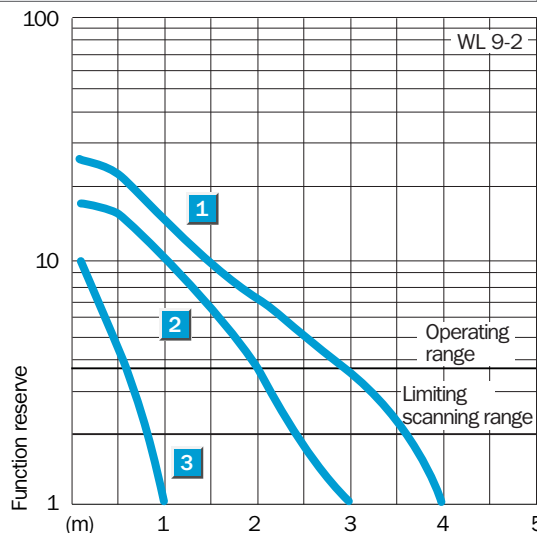
- **Two operating modes:**  
**Default setting:** short Teach-in time (< 8 s); for standard applications;  
 approx. double reserve via switching threshold;  
 LED lights continuously.  
**Precise setting:** long Teach-in time (> 8 s); for precise applications;  
 small switching hysteresis;  
 LED blinks.

**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>



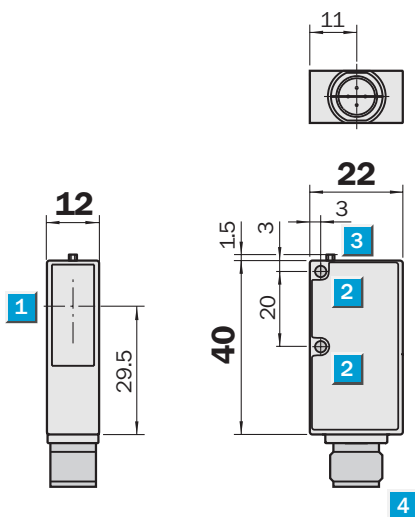
**Order information**

Type	Part no.
WL 9-2P 131	1 018 285
WL 9-2P 431	1 018 287
WL 9-2N 131	1 018 286
WL 9-2N 431	1 018 288
WL 9-2P 331	1 019 025
WL 9-2P 631	1 019 269

	<b>Scanning range</b> 0 ... 0.4 m
Photoelectric reflex switches	

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

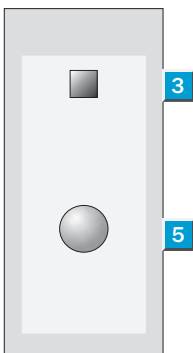
**Dimensional drawing**



**Adjustments possible**

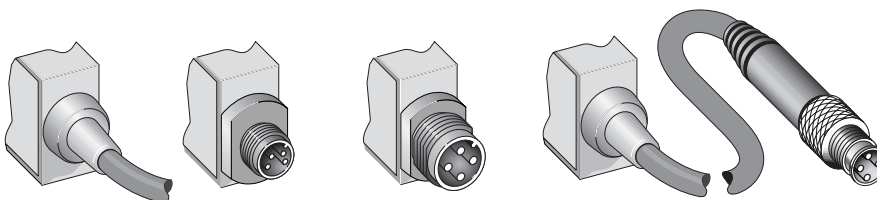
WL 9-2P 121	WL 9-2P 321
WL 9-2P 421	WL 9-2P 621
WL 9-2N 121	
WL 9-2N 421	

- 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



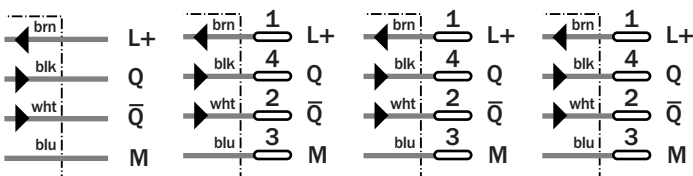
**Connection types**

WL 9-2P 121	WL 9-2P 321	WL 9-2P 421	WL 9-2P 621
WL 9-2N 121		WL 9-2N 421	



<b>Accessories</b>
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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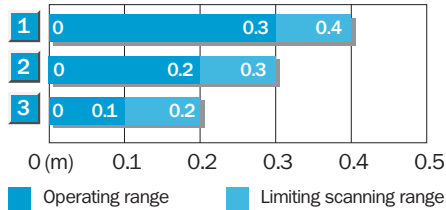
Technical data		WL 9-2	P 121	P 421	N 121	N 421	P 321	P 621				
<b>Scanning range typ. max./on reflector</b>	0.4 m/PL 80 A											
<b>Supply voltage <math>V_s</math><sup>1)</sup></b>	10 ... 30 VDC											
Ripple <sup>2)</sup>	$\leq 5 V_{pp}$											
Current consumption <sup>3)</sup>	$\leq 30$ mA											
<b>Light source</b>	LED, visible red light <sup>4)</sup>											
Light spot diameter	1.5 x 1.5 mm at 35 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>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 types</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>Enclosure rating</b>	IP 67											
<b>Circuit protection<sup>9)</sup></b>	A, B, C											
<b>Ambient temperature <math>T_A</math><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  $T_A = + 25$  °C  
 5) At  $T_A = + 25$  °C and 100 mA output current  
 6) With resistive load  
 7) With light/dark ratio 1:1  
 8) Reference voltage 50 V  
 9) A = supply connections reverse polarity protected  
 B = outputs short-circuit protected  
 C = interference suppression  
 10) Do not bend below 0 °C

**Teach-in function**

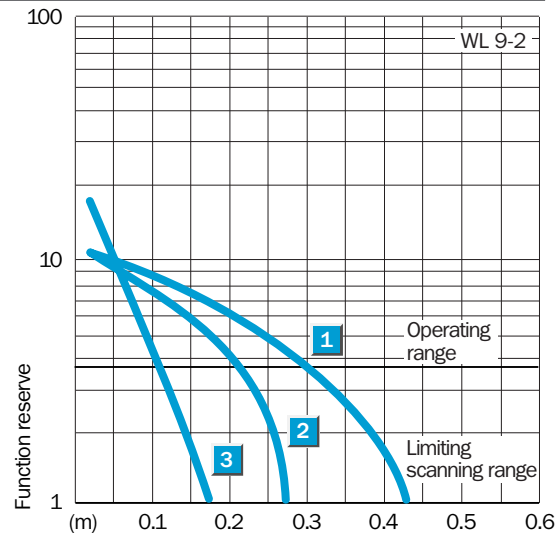
- Programming via Teach-in button.**
- Simple programming:**  
 Position reflector in the beam and push the button:  
 finished;  
 LED confirms the Teach-in procedure.
- Teach-in values can be stored.**
- Two operating modes:**  
**Default setting:** short Teach-in time (< 8 s);  
 for standard applications;  
 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>



**Order information**

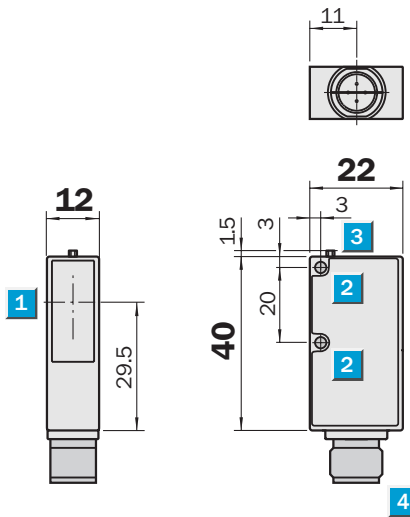
Type	Part no.
WL 9-2P 121	1 018 289
WL 9-2P 421	1 018 291
WL 9-2N 121	1 018 290
WL 9-2N 421	1 018 292
WL 9-2P 321	1 019 270
WL 9-2P 621	1 019 271

**Scanning range**  
7 m

Through-beam photoelectric switches

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

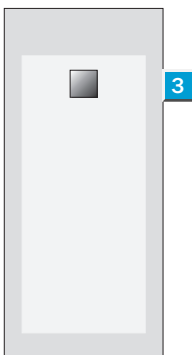
### Dimensional drawing



### No setting options

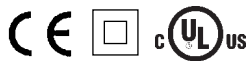
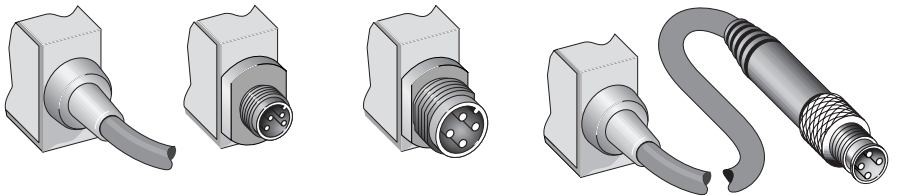
WS/WE 9-2P130	WS/WE 9-2P330
WS/WE 9-2P430	WS/WE 9-2P630
WS/WE 9-2N130	
WS/WE 9-2N430	

- 1 Middle of optic axis
- 2 Mounting hole  $\varnothing$  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



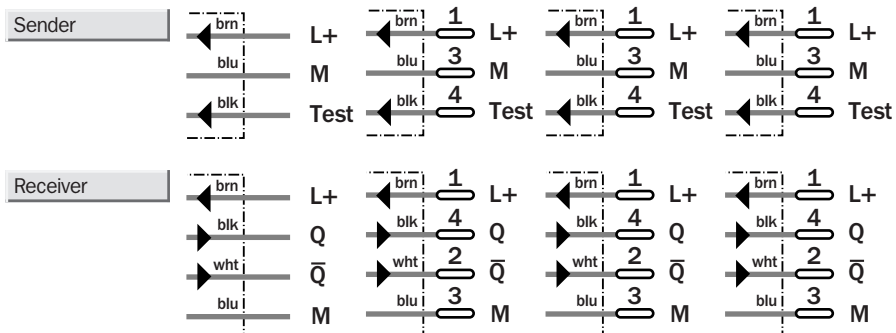
### Connection types

WS/WE 9-2P 130	WS/WE 9-2P 330	WS/WE 9-2P 430	WS/WE 9-2P 630
WS/WE 9-2N 130		WS/WE 9-2N 430	



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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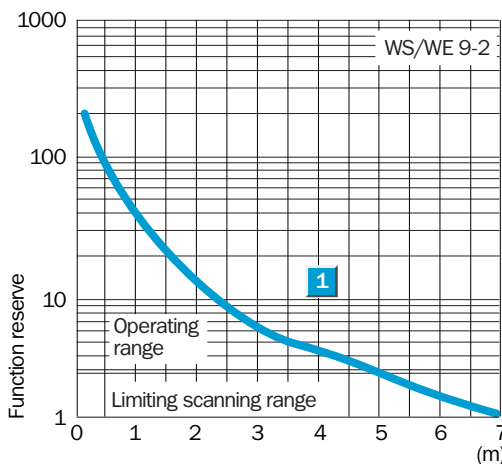
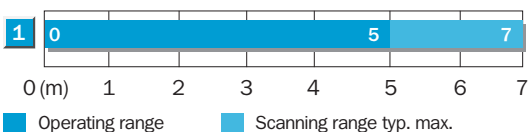
Technical data		WS/WE 9-2	P 130	P 430	N 130	N 430	P 330	P 630				
<b>Scanning range typ. max.</b>	7 m											
<b>Suggested operating range</b>	5 m											
<b>Supply voltage <math>V_s</math><sup>1)</sup></b>	10 ... 30 VDC											
Ripple <sup>2)</sup>	$\leq 5 V_{pp}$											
Current consumption <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 types</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>Enclosure rating</b>	IP 67											
<b>Circuit protection<sup>9)</sup></b>	A, B, C											
<b>Ambient temperature <math>T_A</math><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

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

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

**Scanning range**



**Ordering Information**

Type	Part no.
WS/WE 9-2P 130	1 019 259
WS/WE 9-2P 430	1 019 261
WS/WE 9-2N 130	1 019 260
WS/WE 9-2N 430	1 019 262
WS/WE 9-2P 330	1 019 383
WS/WE 9-2P 630	1 019 382

Dimensional drawings and order information

SENSICK screw-in system M 12, 4-pin, enclosure rating IP 67

Female connector M 12, 4-pin, straight

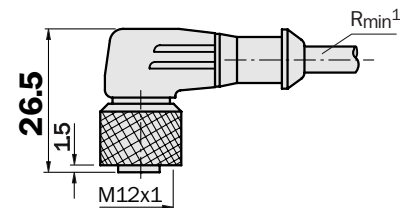
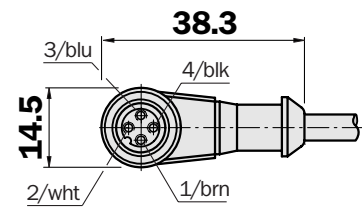
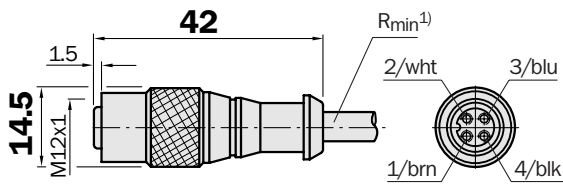
Cable diameter 5 mm, 4 x 0.25 mm<sup>2</sup>, sheath PVC

Type	Part no.	Contacts	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

Female connector M 12, 4-pin, right angle

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

Type	Part no.	Contacts	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

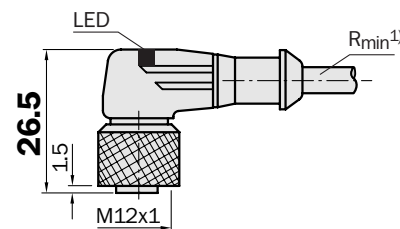
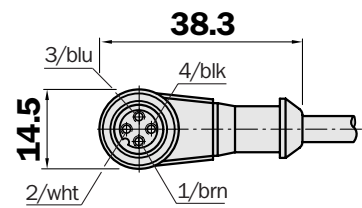


Female connector M 12, 4-pin, right angle

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

With built-in LED-operation and function indicators, PNP complementary<sup>2)</sup>

Type	Part no.	Contacts	Cable length
DOL-1204-W05ME	6 020 398	4	5 m



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

<sup>2)</sup> Not suitable for sender in through-beam photoelectric switches

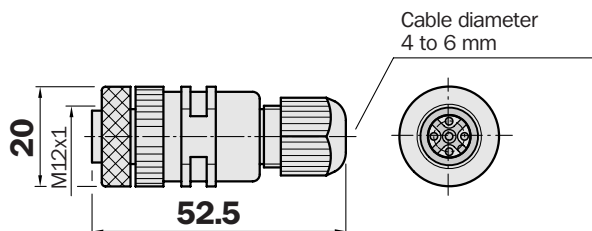


Dimensional drawings and order information

SENSICK screw-in system M 12, 4-pin, enclosure rating IP 67

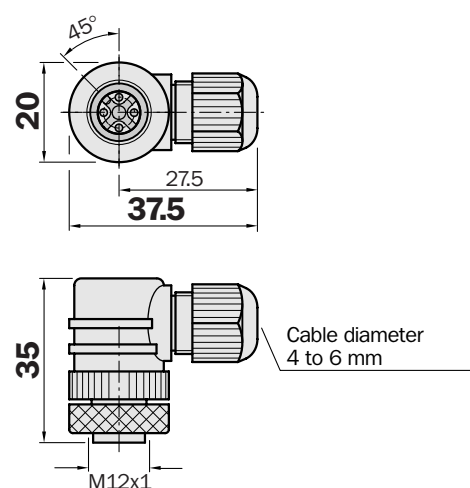
Female connector M 12, 4-pin, straight

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



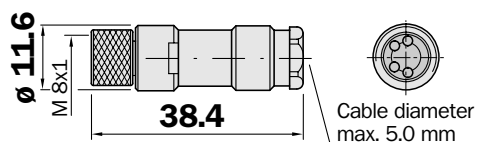
Female connector M 12, 4-pin, right angle

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



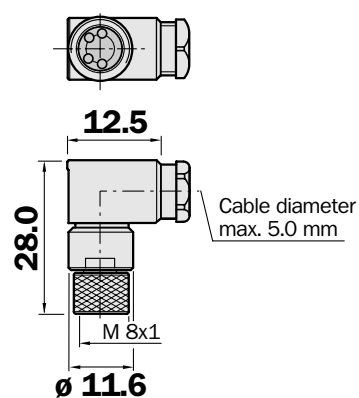
Female cable connector M 8, 4-pin, straight

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



Female cable connector M 8, 4-pin, right angle

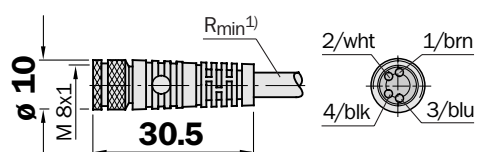
Type	Part no.
DOS-0804-W	6 009 975



Female cable connector M 8, 4-pin, straight

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

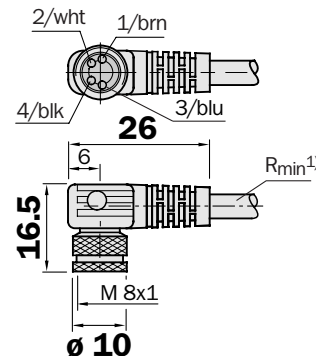
Type	Part no.	Cable length
DOL-0804-G02M	6 009 870	2 m
DOL-0804-G05M	6 009 872	5 m
DOL-0804-G10M	6 010 754	10 m



Female cable connector M 8, 4-pin, right angle

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

Type	Part 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



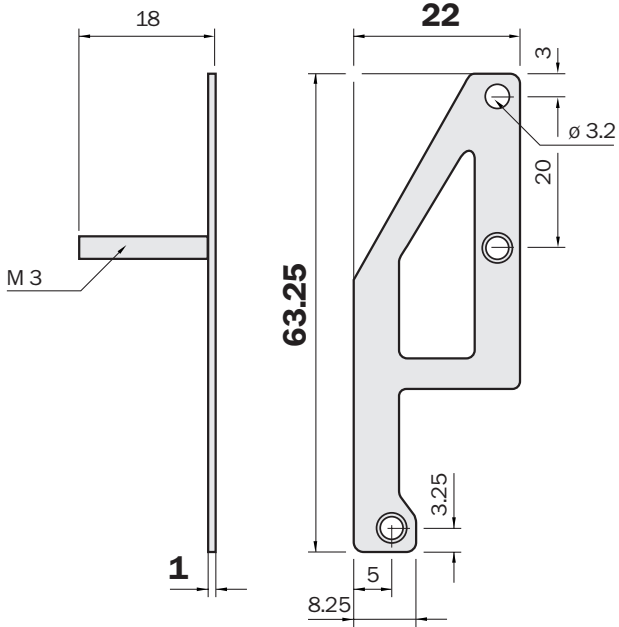
<sup>1)</sup> Minimum bend radius in dynamic use  
R<sub>min</sub> = 20 x cable diameter

Dimensional drawings and order information

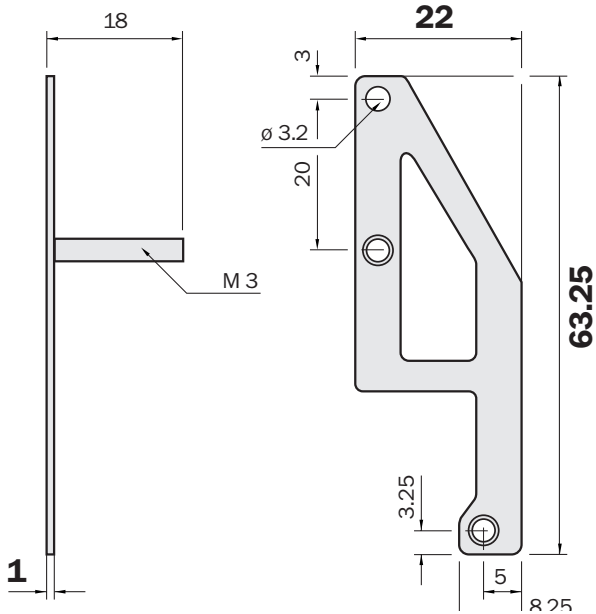
Dimensional drawing adapter plate

Adapter set

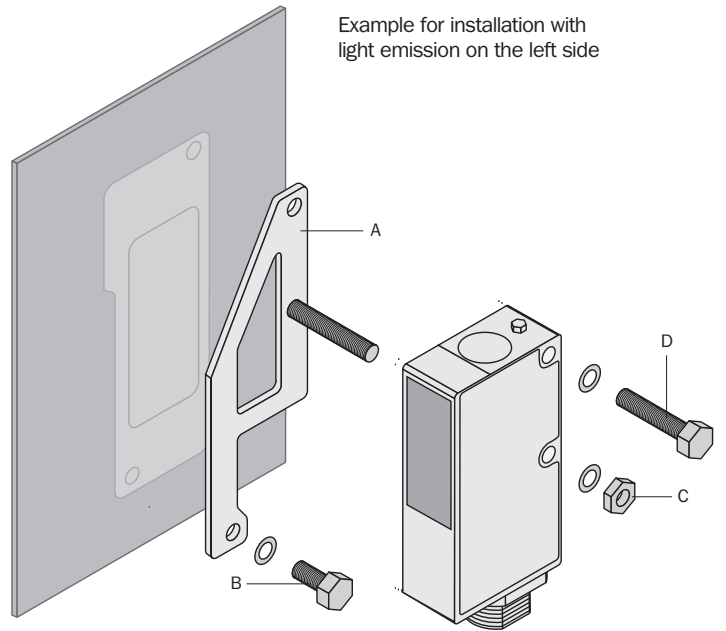
Type	Part no.
BEF-AP-W9	2 022 734



Adapter plate for light emission on the left side



Adapter plate for light emission on right side



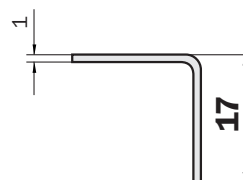
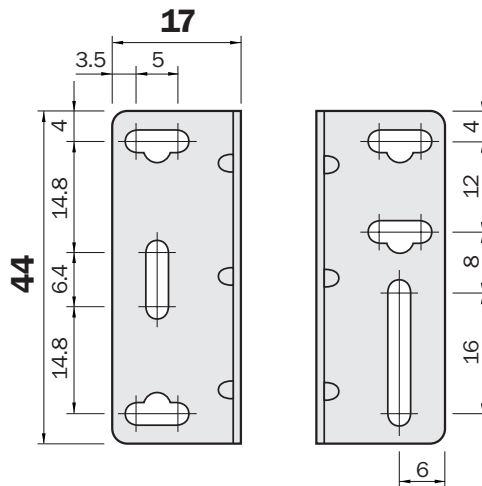
1. Gradual elimination of the old W 9.
2. Chose relevant adapter plate.
3. Align adapter angle "A" to existing hole pattern and attach angle attachment with screw "B".
4. Attach W 9-2 onto pre-mounted adapter angle.
5. Complete mounting of the W 9-2 with the screw "D" and the counter-nut "C".

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	Part no.
BEF-WN-W9-2	2 022 855

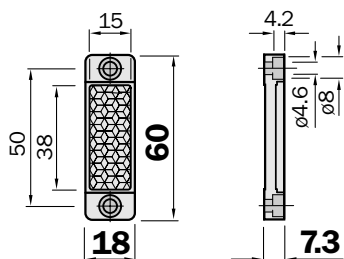


Dimensional drawings and order information

Plastic design for temperatures up to 65 °C

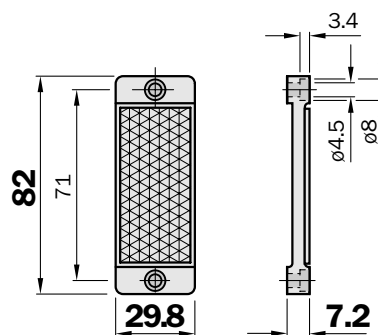
Reflector, 20 x 40 mm

Type	Part no.
PL 20 A	1 012 719



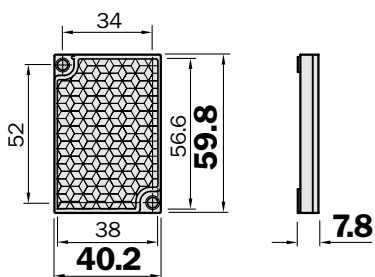
Reflector, 30 x 50 mm

Type	Part no.
PL 30 A	1 002 314



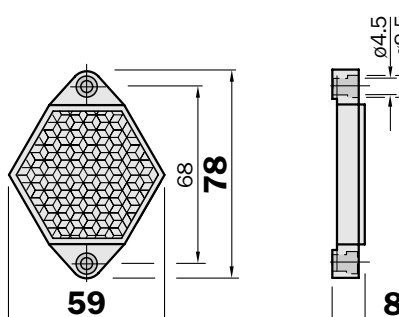
Reflector, 40 x 60 mm

Type	Part no.
PL 40 A	1 012 720



Reflector, 6-sided, width across flats 48 mm

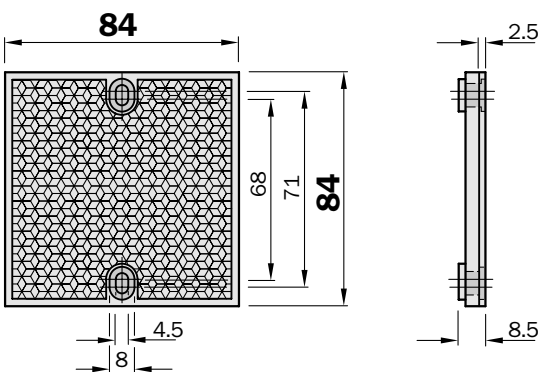
Type	Part no.
PL 50 A	1 000 132



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

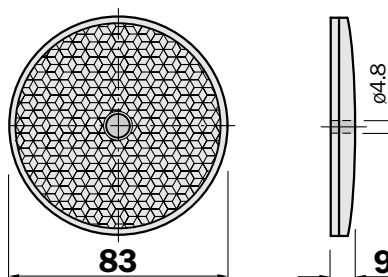
Reflector, 80 x 80 mm

Type	Part no.
PL 80 A	1 003 865



Reflector, Ø 83 mm, centre hole mounting

Type	Part no.
C 110	5 304 549



Reflective tape "Diamond Grade"

Type	Part no.	
REF-DG-K	4 019 634	cut to size
REF-DG	5 304 334	sheet 749 x 914 mm



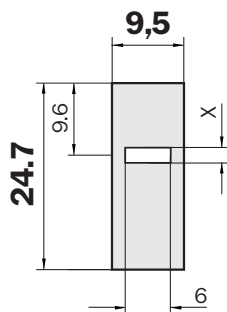
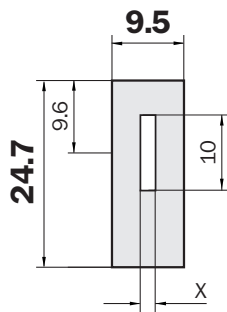
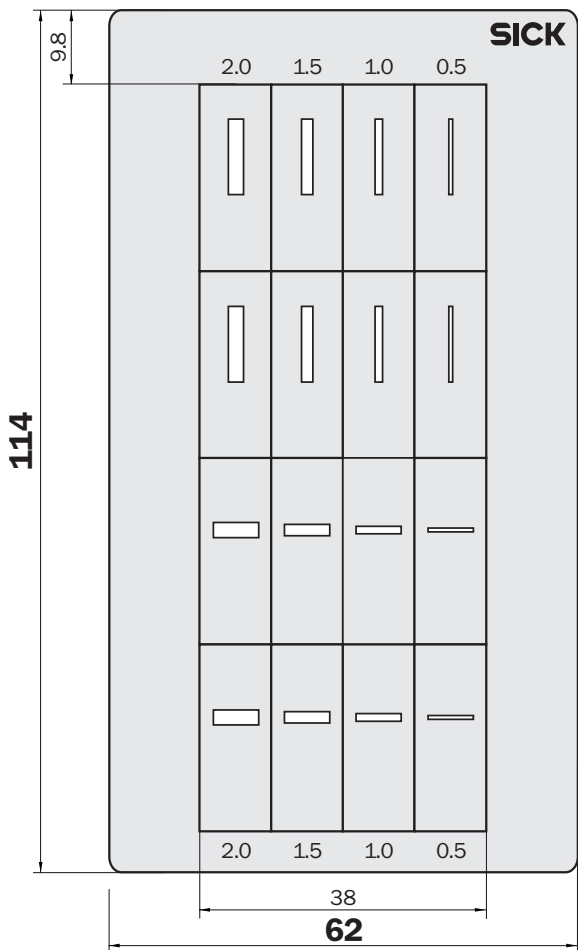
Dimensional drawings and order information

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	Part no.
BL-9-2	4 033 253



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