

# W 12L-2: Laser photoelectric switches – long-sighted, certainly, and no need for extra safety precautions



photoelectric switch covers distances up to 80 m, while the WL 12L-2 reflex photoelectric switch can reach up to 18 m. Their integrated polarisation filter makes it possible to reliably detect shiny surfaces. The WT 12L-2 photoelectric proximity switch also covers a relatively long range: it is the right choice for scanning fixed distances of 20...50 mm, or offers precise background suppression that can be adjusted between 30 and 200 mm.

	<b>Photoelectric proximity switches, BGS</b>
	<b>Photoelectric reflex switches</b>
	<b>Through-beam photoelectric switches</b>


**T**he W 12L-2 series offers a complete range of photoelectric switches using innovative laser technology, contained in a rugged metal housing. Pulsed lasers are used to transmit light. Because they have in protection class 2, the machine operator does not need to take any extra safety or protective measures when using the sensors.

All the devices in this series are particularly “long-sighted”: the WS/WE 12L-2 through-beam

In addition to the scanning range, the small dimensions of the light spot generated on the object is a further advantage of laser technology. This makes it possible to detect even minute items of just 0.5 mm at maximum switching frequencies of 2,500/s.

W 12L-2 laser photoelectric switches – the best solution for millimetre precision, or even smaller!



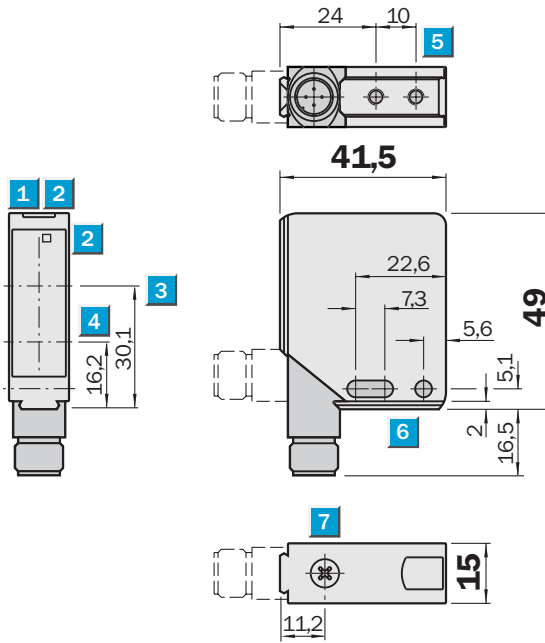

**Scanning distance**  
 30...200 mm

Photoelectric proximity switches

- Laser class 2
- 90° rotatable M 12 plug
- Adjustable and fixed background suppression



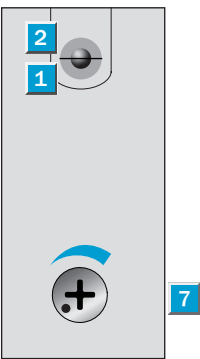
**Dimensional drawing**



**Adjustments possible**

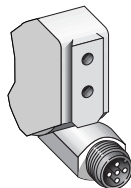
- WT 12L-2B 510\*
- WT 12L-2B 530
- WT 12L-2B 540
- WT 12L-2B 550

- 1 LED operating indicator, green
  - 2 LED reception indicator, yellow
  - 3 Optical axis, receiver
  - 4 Optical axis, sender
  - 5 M4 threaded mounting hole – 4 mm deep
  - 6 Mounting hole  $\varnothing$  4.2 mm
  - 7 Scanning distance control
- \* (not for fixed scanning distances)

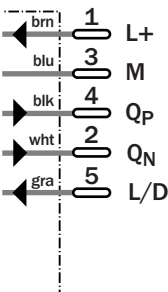


**Connection type**

- WT 12L-2B 510
- WT 12L-2B 530
- WT 12L-2B 540
- WT 12L-2B 550



5 pin, M 12



**Accessories**

- Connectors
- Mounting systems

Technical data		WT 12L-2	B510	B530	B540	B550
<b>Scanning distance, adjustable</b>	30...200 mm, 18 % remission					
	Focus 45 mm					
	Focus 80 mm					
	Focus 100 mm					
<b>Scanning range, fixed, 6 % remission</b>	20...50 mm, focus 45 mm					
<b>Light source<sup>1)</sup></b>	Laser 650 nm, pulsed					
Light spot diameter focal point	0.1 mm					
	0.2 mm					
<b>Supply voltage <math>V_S</math></b>	10...30 V DC <sup>2)</sup>					
Ripple <sup>3)</sup>	$\leq 5 V_{SS}$					
Current consumption <sup>4)</sup>	$\leq 55$ mA					
<b>Switching output <math>Q_N</math> and <math>Q_P</math></b>	PNP, NPN					
Signal voltage HIGH	$V_S - < 2$ V, $V_S$					
Signal voltage LOW <sup>5)</sup>	0 V, $\leq 1.5$ V					
Output current $I_A$ max.	100 mA					
Operating mode	Light- or dark-switching <sup>6)</sup>					
Control input L/D	0 V or open, light-switching					
Control input L/D	$V_S$ , dark-switching					
Response time max. <sup>7)</sup>	Typ. 200 $\mu$ s					
Max. switching frequency <sup>8)</sup>	2500/s					
<b>Laser class</b>	2 (IEC 825-1; EN 60825-1:97)					
<b>VDE protection class<sup>9)</sup></b>	<input type="checkbox"/>					
<b>Enclosure rating</b>	IP 67					
<b>Circuit protection<sup>10)</sup></b>	A, B, C					
<b>Ambient temperature <math>T_A</math></b>	Operation -10 °C...+50 °C					
	Storage -25 °C...+75 °C					
<b>Connection type</b>	M 12 plug, 5 pin					
<b>Weight</b>	Approx. 130 g with plug					

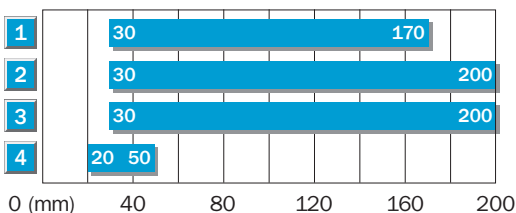
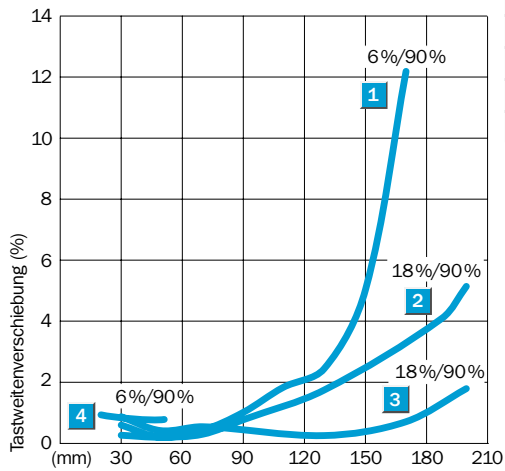
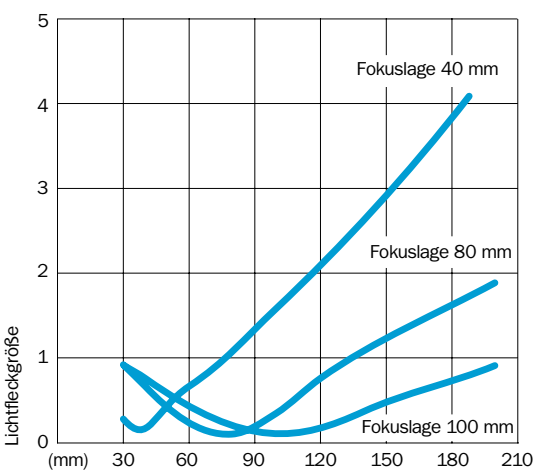
<sup>1)</sup> Average service life 50,000 h at  $T_A = +25$  °C  
<sup>2)</sup> Limit values

<sup>3)</sup> May not exceed or fall short of  $V_S$  tolerances  
<sup>4)</sup> Without load  
<sup>5)</sup> At  $T_A = +25$  °C and 100 mA output current

<sup>6)</sup> Reversible via control input L/D  
<sup>7)</sup> Signal transit time with resistive load  
<sup>8)</sup> At light/dark ratio 1:1  
<sup>9)</sup> Reference voltage 50 V DC

<sup>10)</sup> A =  $V_S$  connections reverse-polarity protected  
 B = Outputs protected against short-circuiting  
 C = Interference pulse suppression


**Scanning distance and light spot size**



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

**Order information**

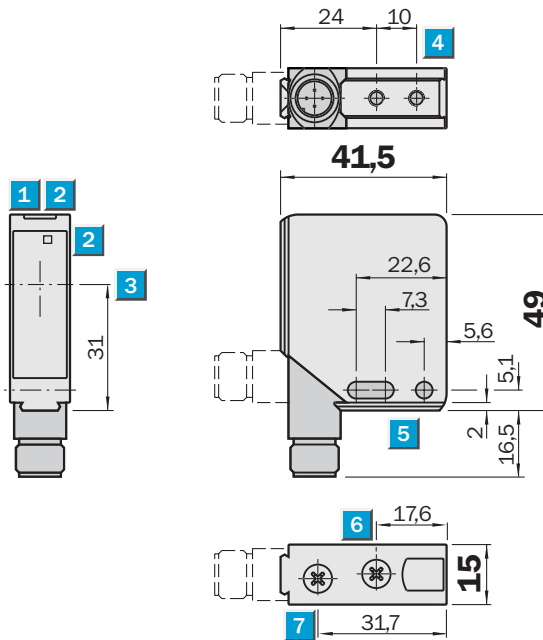
Type	Part no.
WT 12L-2B 510	1 017 959
WT 12L-2B 530	1 018 250
WT 12L-2B 540	1 018 251
WT 12L-2B 550	1 017 904


**Scanning range**  
**18 m**

Photoelectric reflex switches

- Laser class 2
- Adjustable focus
- 90° rotatable M 12 plug

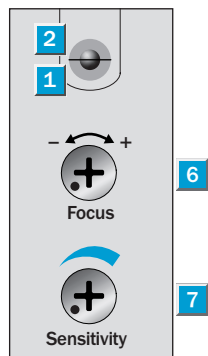
**Dimensional drawing**



**Adjustments possible**

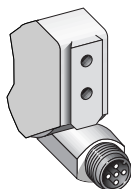
- WL 12L-2B 530
- WL 12L-2B 520

- 1 LED operating indicator, green
- 2 LED reception indicator, yellow
- 3 Centre of optical axis
- 4 M4 threaded mounting hole – 4 mm deep
- 5 Mounting hole  $\varnothing$  4.2 mm
- 6 Focal adjustment
- 7 Sensitivity adjustment

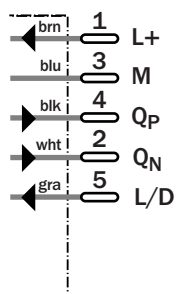


**Connection type**

- WL 12L-2B 530
- WL 12L-2B 520



5 pin, M 12



Accessories
Connectors
Mounting systems
Reflectors

Technical data		WL 12L-2	B530	B520										
<b>Scanning range,</b>	18 m/PL 80 A													
max. typical/on reflector	15 m/PL 80 A													
<b>Light source<sup>1)</sup></b>	Laser 650 nm, pulsed													
Light spot diameter	min. 0.8 mm													
in focal range	300 mm to ∞													
	150 mm to 450 mm													
<b>Supply voltage V<sub>S</sub></b>	10 ... 30 V DC <sup>2)</sup>													
Ripple <sup>3)</sup>	≤ 5 V <sub>SS</sub>													
Current consumption <sup>4)</sup>	≤ 55 mA													
<b>Switching output Q<sub>N</sub> and Q<sub>P</sub></b>	PNP, NPN													
Signal voltage HIGH	V <sub>S</sub> - < 2.9 V, V <sub>S</sub>													
Signal voltage LOW <sup>5)</sup>	0 V, ≤ 1.5 V													
Output current I <sub>A</sub> max.	100 mA													
Operating mode	Light- or dark-switching <sup>6)</sup>													
Control input L/D	0 V or open, light-switching													
Control input L/D	V <sub>S</sub> , dark-switching													
Response time max. <sup>7)</sup>	Typ. 200 μs													
Max. switching frequency <sup>8)</sup>	2500/s													
<b>Laser class</b>	2 (IEC 825-1; EN 60825-1:97)													
<b>VDE protection class<sup>9)</sup></b>	□													
<b>Enclosure rating</b>	IP 67													
<b>Circuit protection<sup>10)</sup></b>	A, B, C													
<b>Ambient temperature T<sub>A</sub></b>	Operation - 10 °C...+ 50 °C													
	Storage - 25 °C...+ 75 °C													
<b>Connection type</b>	M 12 plug, 5 pin													
<b>Weight</b>	Approx. 130 g with plug													

<sup>1)</sup> Average service life 50,000 h at T<sub>A</sub> = + 25 °C  
<sup>2)</sup> Limit values

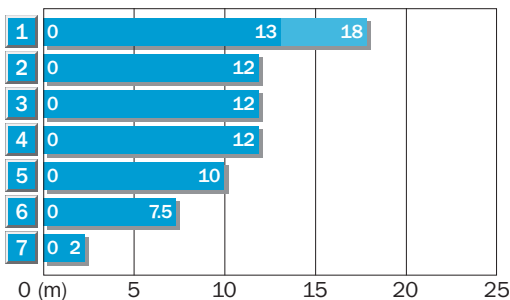
<sup>3)</sup> May not exceed or fall short of V<sub>S</sub> tolerances  
<sup>4)</sup> Without load  
<sup>5)</sup> At T<sub>A</sub> = + 25 °C and 100 mA output current

<sup>6)</sup> Reversible via control input L/D  
<sup>7)</sup> Signal transit time with resistive load  
<sup>8)</sup> At light/dark ratio 1:1  
<sup>9)</sup> Reference voltage 50 V DC

<sup>10)</sup> A = V<sub>S</sub> connections reverse-polarity protected  
 B = Outputs protected against short-circuiting  
 C = Interference pulse suppression

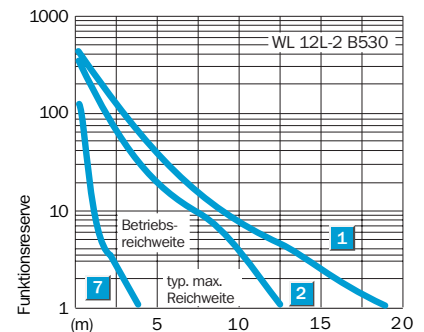
**Scanning range and operating reserve**

WL 12L-2 B530

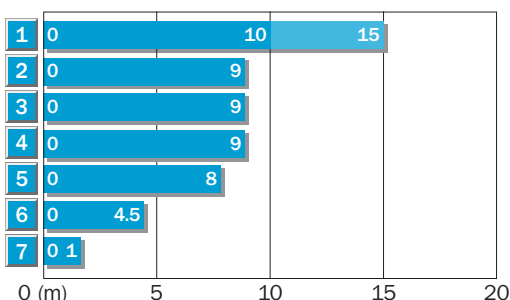


Reflector type	Operating range
1 PL 80 A	0 ... 13.0 m
2 PL 50 A	0 ... 12.0 m
3 PL 40 A	0 ... 12.0 m
4 P 250	0 ... 12.0 m
5 PL 30 A	0 ... 10.0 m
6 PL 20 A	0 ... 7.5 m
7 Reflective tape	0 ... 2.0 m

«Diamond Grade»

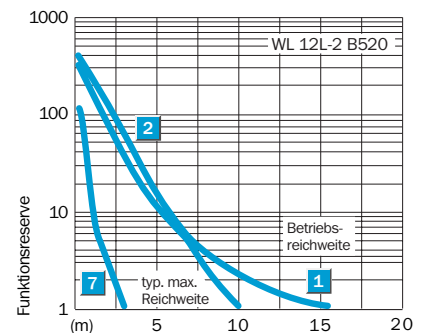


WL 12L-2 B520




Reflector type	Operating range
1 PL 80 A	0 ... 10.0 m
2 PL 50 A	0 ... 9.0 m
3 PL 40 A	0 ... 9.0 m
4 P 250	0 ... 9.0 m
5 PL 30 A	0 ... 8.0 m
6 PL 20 A	0 ... 4.5 m
7 Reflective tape	0 ... 1.0 m

«Diamond Grade»



Order information	
Type	Part no.
WL 12L-2B 530	1 018 252
WL 12L-2B 520	1 018 253

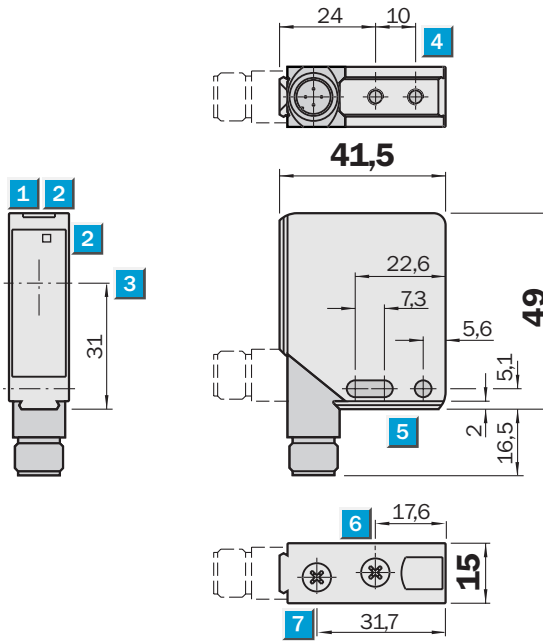
 **Scanning range**  
80 m

Through-beam photoelectric switches

- Laser class 2
- Adjustable focus and sensitivity
- 90° rotatable M 12 plug



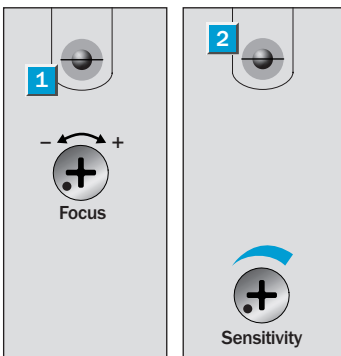
**Dimensional drawing**



**Adjustments possible**

WS/WE 12L-2P 430	WS/WE 12L-2P 410
WS/WE 12L-2N 430	WS/WE 12L-2N 410

Sender WS      Receiver WE

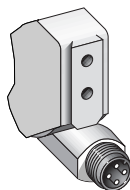


- 1 LED operating indicator (WS above only)
- 2 LED reception indicator (WE)
- 3 Centre of optical axis
- 4 M 4 threaded mounting hole – 4 mm deep
- 5 Mounting drill hole  $\phi$  4.2 mm
- 6 Focal adjustment (WS)
- 7 Sensitivity adjustment (WE)



**Connection type**

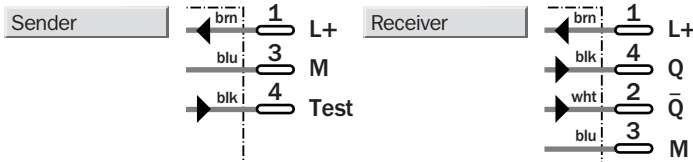
WS/WE 12L-2P 430
WS/WE 12L-2N 430
WS/WE 12L-2P 410
WS/WE 12L-2N 410



4 pin, M 12

**Accessories**

Connectors
Mounting systems

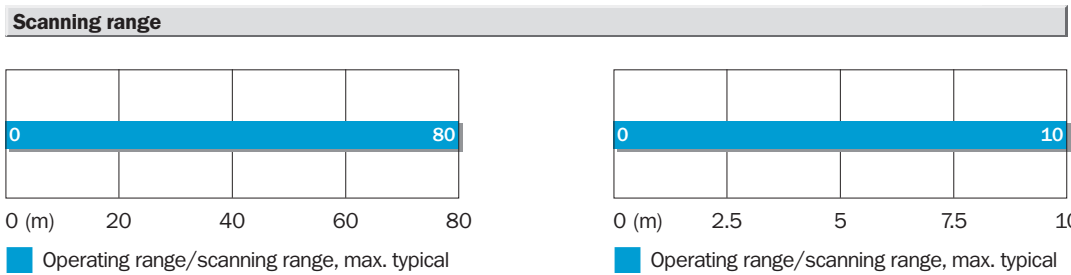


Technical data		WS/WE 12L-2	P430	N430	P410	N410						
<b>Scanning range</b> , max. typical	80 m											
	10 m											
Recommended operating range	80 m											
	10 m											
Focus adjustable	300 mm...∞											
	Fixed parallel light beam											
<b>Light source</b> <sup>1)</sup>	Laser 650 nm, pulsed											
Light spot diameter	150 mm at 60 m											
	1.0 mm at 1 m											
<b>Supply voltage</b> $V_S$	10...30 V DC <sup>2)</sup>											
Ripple <sup>3)</sup>	$\leq 5 V_{SS}$											
Current consumption <sup>4)</sup>	WS $\leq 45$ mA, WE $\leq 15$ mA											
<b>Switching outputs</b> Q and $\bar{Q}$	PNP											
	NPN											
Signal voltage HIGH	$V_S - < 2.9 V, V_S$											
Signal voltage LOW <sup>5)</sup>	Approx. $0 V, \leq 1.5 V$											
Output current $I_A$ max.	100 mA											
Response time max. <sup>6)</sup>	Typ. 200 $\mu s$											
Max. switching frequency <sup>7)</sup>	2500/s											
<b>Input "TE" system test</b>	$V_S$ or open: sender active											
	0 V: sender inactive											
<b>VDE protection class</b> <sup>8)</sup>	<input type="checkbox"/>											
<b>Laser class</b>	2 (IEC 825-1; EN 60825-1:97)											
<b>Enclosure rating</b>	IP 67											
<b>Circuit protection</b> <sup>9)</sup>	A, B, C											
<b>Ambient temperature</b> $T_A$	Operation $-10$ °C...+ 50 °C											
	Storage $-25$ °C...+ 75 °C											
<b>Connection type</b>	M 12 plug, 4 pin											
<b>Weight</b> (WS + WE)	Approx. 260 g											

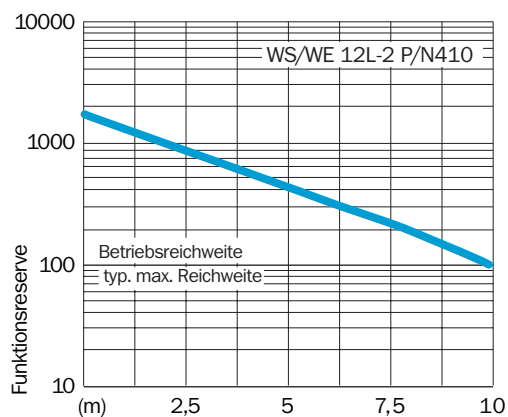
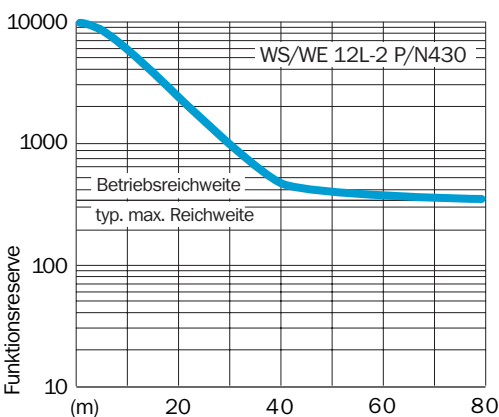
1) Average service life 50,000 h at  $T_A = +25$  °C  
 2) Limit values  
 3) May not exceed or fall short of  $V_S$  tolerances

4) Without load  
 5) At  $T_A = +25$  °C and 100 mA output current  
 6) Signal transit time with resistive load  
 7) At light/dark ratio 1:1

8) Reference voltage 50 V DC  
 9) A =  $V_S$  connections reverse-polarity protected  
 B = Outputs protected against short-circuiting  
 C = Interference pulse suppression



Order information	
Type	Part no.
WS/WE 12L-2P430	1 018 254
WS/WE 12L-2N430	1 018 255
WS/WE 12L-2P410	1 018 256
WS/WE 12L-2N410	1 018 257

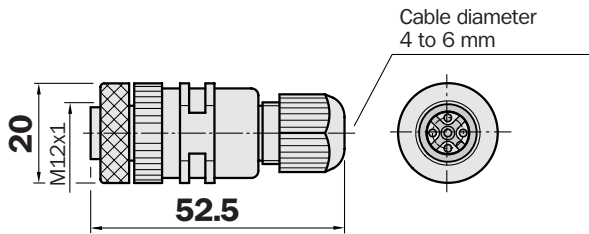


Dimension illustrations and ordering information

SENSICK circular screwing system M 12, 4/5 pin, enclosure rating IP 67

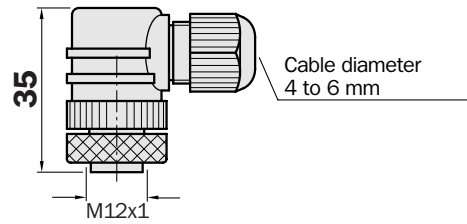
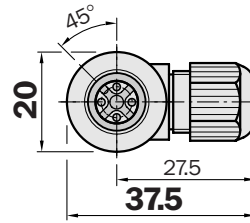
M 12 cable receptacles, 4/5 pin, straight

Type	Order no.	Pins
DOS-1204-G	6 007 302	4
DOS-1205-G	6 009 719	5



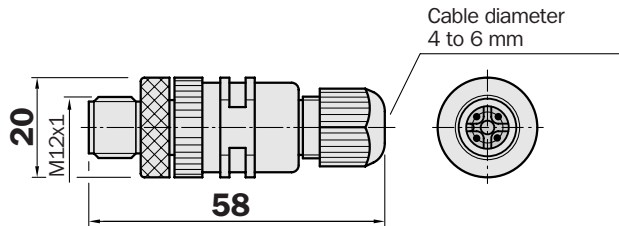
M 12 cable receptacles, 4/5 pin, angled

Type	Order no.	Pins
DOS-1204-W	6 007 303	4
DOS-1205-W	6 009 720	5



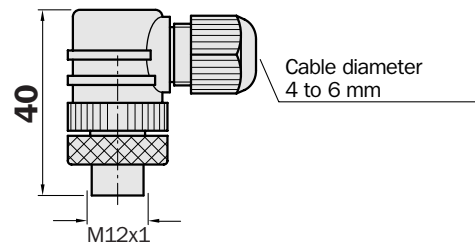
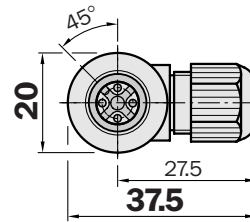
M 12 cable plug, 4/5 pin, straight

Type	Order no.	Pins
STE-1204-G	6 009 932	4
STE-1205-G	6 022 083	5



M 12 cable plug, 5 pin, angled

Type	Order no.	Pins
STE-1205-W	6 022 082	5





Dimension illustrations and ordering information

SENSICK circular screwing system M 12, 4/5 pin, enclosure rating IP 67

M 12 cable receptacles, 4/5 pin, straight

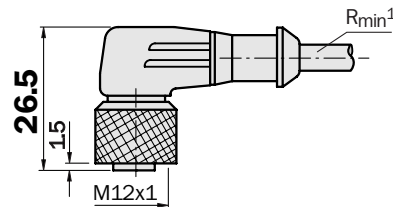
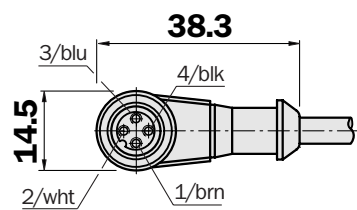
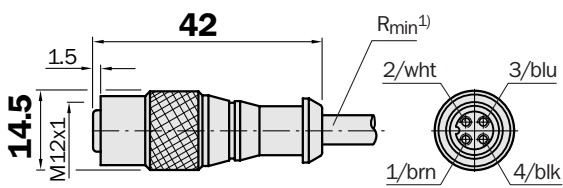
Cable diameter 5 mm, 4 x 0.25 mm<sup>2</sup>, PVC coating

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
DOL-1205-G02M	6 008 899	5	2 m
DOL-1205-G05M	6 009 868	5	5 m
DOL-1205-G10M	6 010 544	5	10 m

M 12 cable receptacles, 4/5 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
DOL-1205-W02M	6 008 900	5	2 m
DOL-1205-W05M	6 009 869	5	5 m
DOL-1205-W10M	6 010 542	5	10 m

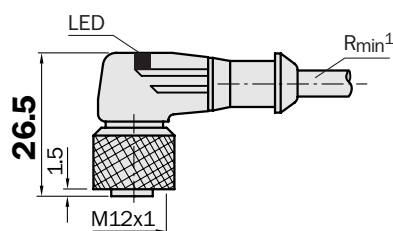
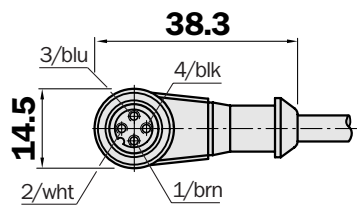


M 12 cable receptacles, 4 pin, angled

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

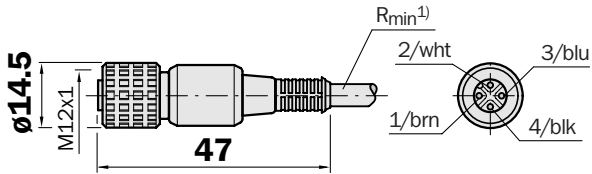
Dimension illustrations and ordering information

SENSICK circular screwing system M 12, 4/5 pin, enclosure rating IP 67

M 12 cable receptacles, 4 pin, straight

Cable diameter 4.5 mm, 4 x 0.34 mm<sup>2</sup>, PUR coating

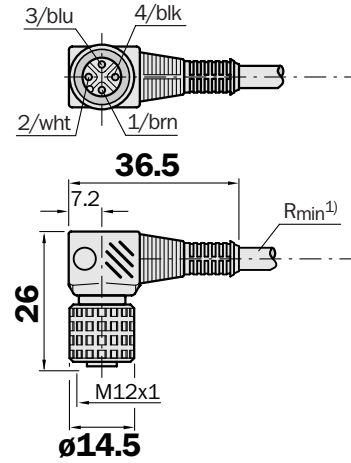
Type	Order no.	Cable length
DOL-1204-G05MB	7 902 084	5 m



M 12 cable receptacles, 4 pin, angled

Cable diameter 4.5 mm, 4 x 0.34 mm<sup>2</sup>, PUR coating

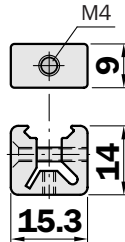
Type	Order no.	Cable length
DOL-1204-W05MB	7 902 085	5 m



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

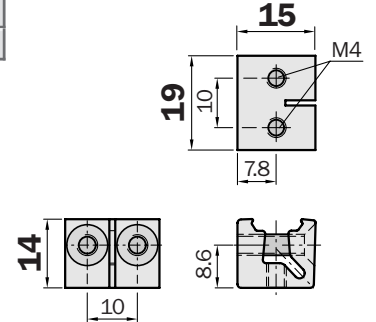
Clamp

Type	Order no.
BEF-KH-W12	2 013 285



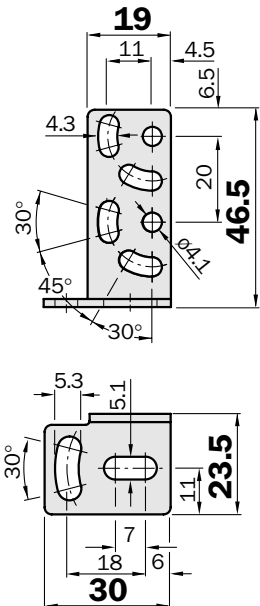
Double clamp

Type	Order no.
BEF-DKH-W12	2 013 947



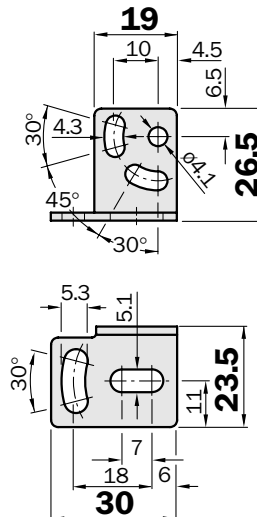
Mounting brackets, big

Type	Order no.	For equipment type
BEF-WG-W12	2 013 942	W 11, W 12-2, W 12L-2, KT 2



Mounting brackets, small

Type	Order no.	For equipment type
BEF-WK-W12	2 012 938	W 11, W 12-2, W 12L-2, KT 2



Dimension illustrations and ordering information

Universal bracket for rod mounting

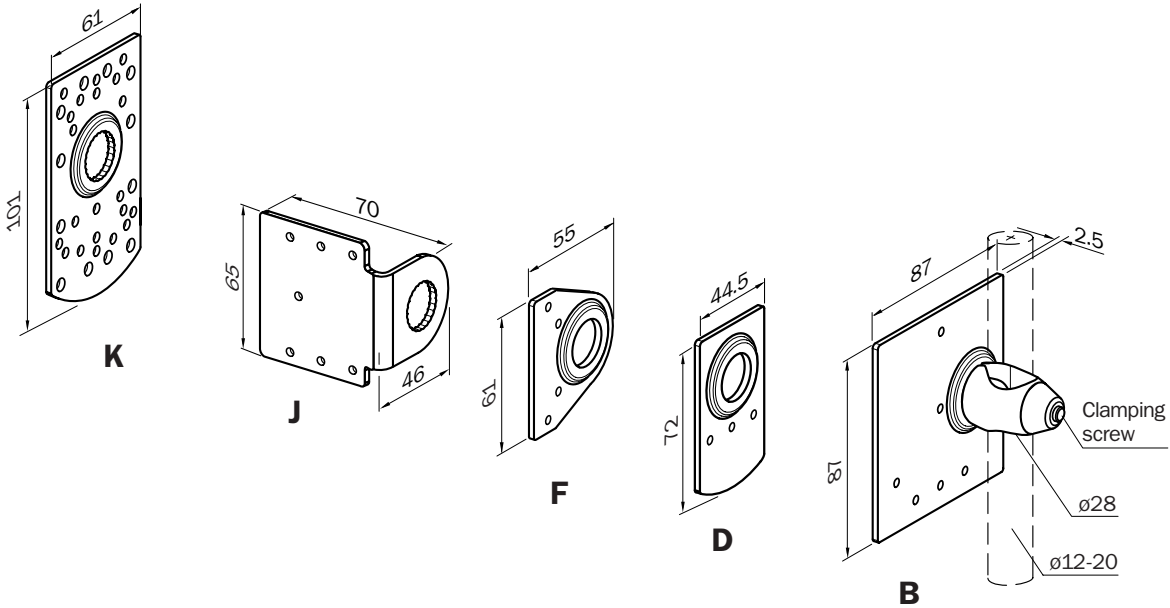


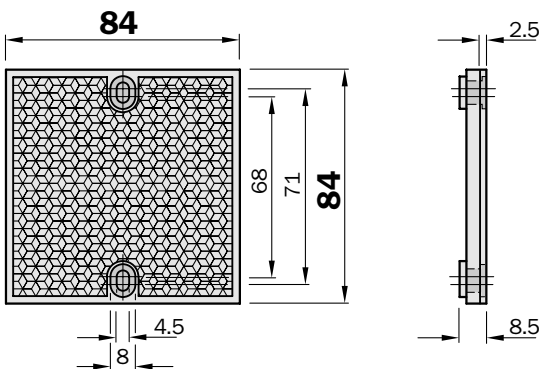
Plate	Type	Order no. <sup>1)</sup>	Sensors/reflectors
<b>B</b>	BEF-KHS-B01	2 022 459	P 250, PL 30 A, PL 40 A, PL 50 A, PL 80 A, C 110
<b>D</b>	BEF-KHS-D01	2 022 461	W 11, W 12-2, W 12L-2, KT 2
<b>F</b>	BEF-KHS-F01	2 022 463	W 260, PL 20 A, P 250
<b>J</b>	BEF-KHS-J01	2 022 719	PL 20 A, PL 40 A, PL 50 A, P 250, C 110
<b>K</b>	BEF-KHS-K01	2 022 718	W 11, W 12-2, W 12L-2, W 14, W 18-2, W 23, W 24-2, W 27-2, W 30, W 32, W 34, W 36, KT 2, KT 5, KT 10, CS, LUT 3, DS 60, PL 20 A, PL 30 A, PL 40 A, PL 50 A, PL 80 A, P 250, C 110

<sup>1)</sup> Universal bracket and mounting screws included

Plastic model for temperatures up to 65 °C

Reflector 80 x 80

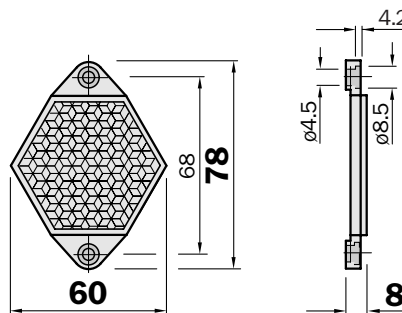
Type	Order no.
PL 80 A	1 003 865



Reflector, hexagonal

Opening width 48 mm

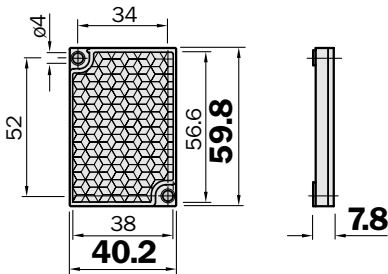
Type	Order no.
PL 50 A	1 000 132



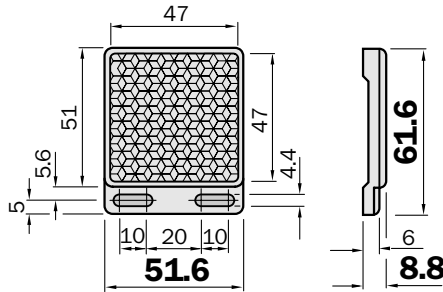
Dimension illustrations and ordering information

Plastic model for temperatures up to 65 °C

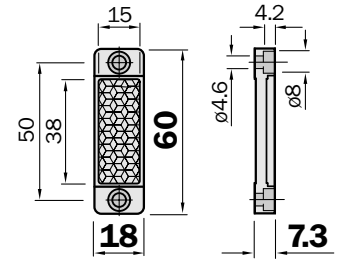
Reflector 40 x 60 mm	
Type	Order no.
PL 40 A	1 012 720



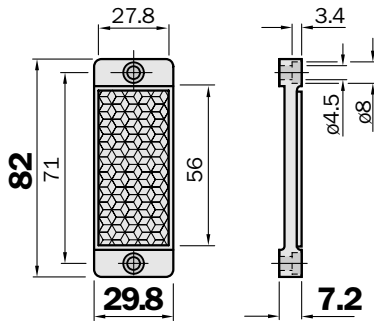
Reflector 47 x 47 mm	
Type	Order no.
P 250	5 304 812



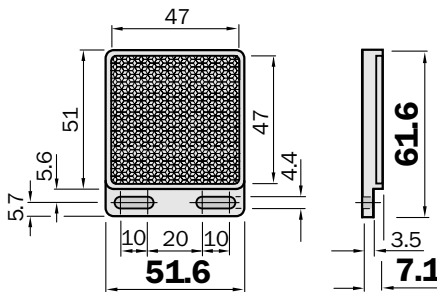
Reflector 20 x 40 mm	
Type	Order no.
PL 20 A	1 012 719



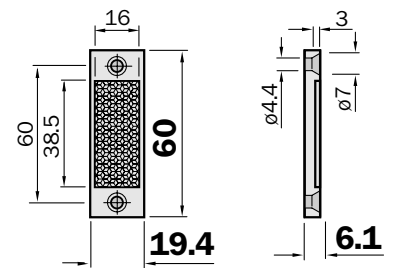
Reflector 30 x 50 mm	
Type	Order no.
PL 30 A	1 002 314



Reflector 47 x 47 mm	
Type	Order no.
P 250 F	5 308 843



Reflector 20 x 40 mm	
Type	Order no.
PL 20 F	5 308 849



Self-adhesive reflective tape for photoelectric switches with polarizing filter

Reflective tape, width 7.6 cm	
Roll length 4.57 m, ready-made	
Type	Order no.
REF-3290-K	4 018 696



Reflective tape, width 7.6 cm	
Roll length 4.57 m, ready-made	
Type	Order no.
REF-5870-K	4 018 616



Reflective tape, width 61 cm	
Roll length 4.57 m, ready-made	
Type	Order no.
REF-7610-K	4 018 617



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