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Reliable object detection for demanding applications



Product description

SICK's W18-3 photoelectric sensor series reliably detects objects under difficult application conditions. Different variants are available, including proximity sensors with high-precision background suppression, retro-reflective sensors with autocollimation and through-beam sensors with high operating reserves.

These sensors are immune to ambient light, background reflections and light absorbing objects, making them a reliable sensor solution. The W18-3 series can also be customized according to the customer's requirements in critical applications.

At a glance

- Best-in-class optical performance due to superior OES technology
- Autocollimation optics
- Background suppression with second sender LED
- Slim, durable plastic housing
- Operation via double teach-in push-button or potentiometer
- Wide variety of options for operation, connection, and optics

Your benefits

- Reliable object detection due to best-in-class background suppression and resistance to ambient light
- A wide range of product variants provides increased user flexibility
- Less downtime in industrial environments



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→ www.mysick.com/en/W18-3

For more information, just enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples and much more.



Detailed technical data

Features

	WT18-3	WT18-3 Ex	WL18-3	WL18-3 Ex	WS/WE18-3
Sensor principle	Photoelectric proximity sensor		Photoelectric retro-reflective sensor		Through-beam photoelectric sensor
Detection principle	Background suppression		Autocollimation		-
Dimensions (W x H x D)	17.6 mm x 75.5 mm x 33.5 mm				
Housing design (light emission)	Rectangular				
Sensing range max.	10 mm ... 1,000 mm ¹⁾ (depending on type)	10 mm ... 1,000 mm ¹⁾	0 m ... 7 m ²⁾		0 m ... 20 m
Sensing range	50 mm ... 1,000 mm ¹⁾ (depending on type)	50 mm ... 1,000 mm ¹⁾	0 m ... 5 m ²⁾		-
Type of light	Visible red light/ Infrared light (depending on type)	Infrared light	Visible red light		Visible red light/ Infrared light (depending on type)
Light source ³⁾	LED				
Wave length					
	Visible red light	675 nm	-	645 nm	
	Infrared light	870 nm	-	-	880 nm
Adjustment	Potentiometer, 4 turns Double teach-in button Single teach-in button (depending on type)	Potentiometer, 4 turns	Potentiometer, 1 turn		

¹⁾ Object with 9C % reflectance (referred to standard white, DIN 5033)

²⁾ PL80A.

³⁾ Average service life of 100,000 h at T_a = +25 °C.

Mechanics/electronics

	WT18-3	WT18-3 Ex	WL18-3	WL18-3 Ex	WS/WE18-3
Supply voltage ¹⁾	10 V DC ... 30 V DC				
Ripple ²⁾	< 5 V _{pp}				
Power consumption	40 mA ³⁾ ... 55 mA ³⁾	55 mA ³⁾	40 mA ³⁾		-
Power consumption, sender	-				< 45 mA ³⁾
Power consumption, receiver	-				< 35 mA ³⁾
Output type	PNP/NPN (depending on type)	PNP	PNP/NPN (depending on type)	PNP	PNP/NPN (depending on type)
Output function	Complementary				
Switching mode	Light/dark-switching				
Output current I_{max}	100 mA				
Response time ⁴⁾	< 700 µs		< 500 µs		
Switching frequency ⁵⁾	700 Hz		1,000 Hz		
Angle of reception					
	Visible red light	-	1,8°		1,5°
	Infrared light	-	-		4,5°

	WT18-3	WT18-3 Ex	WL18-3	WL18-3 Ex	WS/WE18-3
Connection type	Cable, 2 m ⁶⁾ Male connector, M12 (depending on type)	Cable with con- nector, M12 ⁶⁾	Cubic connector Cable ⁶⁾ Male connector, M12 (depending on type)	Cable with con- nector, M12 ⁶⁾	Cubic connector Cable ⁶⁾ Male connector, M12 (depending on type)
Circuit protection	A ⁷⁾ , C ⁸⁾ , D ⁹⁾				
Weight					
Cubic connector	-	-	70 g	-	70 g
Connector	-	-	40 g	-	40 g
Cable with connector	-	300 g	-	300 g	-
Cable, 4-wire	120 g/260 g	-	120 g	-	120 g
Cable, 5-wire	-	-	170 g	-	-
Polarisation filter	-				
Housing material	ABS				
Optics material	PMMA				
Enclosure rating	IP 67		IP 67/IP 65 (de- pending on type)	IP 67	IP 67/IP 65 (de- pending on type)
Test input sender off	-		TE to 0 V/ TE to V _S (de- pending on type)	-	TE to 0 V
ATEX marking	-	EX II 3D IP67 T70 °C, EX II 3G EEx nA II T4 X ¹⁰⁾	-	EX II 3D IP67 T70 °C, Ex II 3G EEx nA II T4 X ¹⁰⁾	-
Hazardous area category	-	3D, 3G	-	3D, 3G	-
Test input	-				
Ambient operating temperature	-40 °C ... +60 °C				
Ambient storage temperature	-40 °C ... +75 °C				

¹⁾ Limit values, operation in short-circuit protected network max. 8 A.

²⁾ May not exceed or fall short of V_S tolerances.

³⁾ Without load.

⁴⁾ Signal transit time with resistive load.

⁵⁾ With light/dark ratio 1:1.

⁶⁾ Do not bend below 0 °C.

⁷⁾ A = V_S connections reverse-polarity protected.

⁸⁾ C = interference suppression.

⁹⁾ D = outputs overcurrent and short-circuit protected.

¹⁰⁾ Conformity with directives. Explosion prevention: Directive 94/9/EC.

Ordering information

Other models available at www.mysick.com/en/W18-3

WT18-3

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Switching mode:** light/dark-switching

Type of light	Sensing range max. ¹⁾	Light spot size (distance)	Output type	Adjustment	Connection	Connection diagram	Model name	Part no.
Visible red light	10 mm ... 600 mm	Ø 15 mm (300 mm)	PNF	Potentiometer, 4 turns	Cable, 4-wire 2 m PVC	Cd-094	WT18-3P130	1025895
					Cable, 4-wire 5 m PVC	Cd-094	WT18-3P230	1026559
				Connector M12, 4-pin	Cd-083	WT18-3P430	1025896	
				Double teach-in button	Cable, 4-wire 2 m PVC	Cd-094	WT18-3P131	1026034
					Connector M12, 4-pin	Cd-083	WT18-3P431	1026032
					Cable, 4-wire 2 m PVC	Cd-094	WT18-3N130	1025897
Infrared light	10 mm ... 700 mm	Ø 20 mm (400 mm)	NPN	Potentiometer, 4 turns	Connector M12, 4-pin	Cd-083	WT18-3N430	1025898
					Cable, 4-wire 2 m PVC	Cd-094	WT18-3N131	1028040
				Connector M12, 4-pin	Cd-083	WT18-3N431	1026035	
				Double teach-in button	Cable, 4-wire 2 m PVC	Cd-094	WT18-3P110	1025887
					Cable, 4-wire 5 m PVC	Cd-094	WT18-3P210	1025888
					Connector M12, 4-pin	Cd-083	WT18-3P410	1025889
Infrared light	10 mm ... 1,000 mm	Ø 30 mm (600 mm)	PNF	Potentiometer, 4 turns	Cable, 4-wire 2 m PVC	Cd-094	WT18-3P111	1026033
					Connector M12, 4-pin	Cd-083	WT18-3P411	1026031
				Double teach-in button	Cable, 4-wire 2 m PVC	Cd-094	WT18-3N110	1025891
					Cable, 4-wire 5 m PVC	Cd-094	WT18-3N210	1025892
					Connector M12, 4-pin	Cd-083	WT18-3N410	1025893
					Cable, 4-wire 2 m PVC	Cd-094	WT18-3P120	1025904
		Potentiometer, 4 turns	Connector M12, 4-pin	Cd-083	WT18-3P420	1025905		
		Double teach-in button	Connector M12, 4-pin	Cd-102	WT18-3K420	1061203		
			Connector M12, 4-pin	Cd-083	WT18-3P421	1026383		

¹⁾ Object with 90 % reflectance (referred to standard white, DIN 5033)

WT18-3 Ex

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Switching mode:** light/dark-switching
- **Type of light:** visible red light
- **Connection:** cable with connector M12, 4-pin 0.29 m PVC

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Adjustment	Hazardous area category	Connection diagram	Model name	Part no.
10 mm ... 1,000 mm	Ø 30 mm (600 mm)	PNF	Potentiometer, 4 turns	3D, 3G	Cd-083	WT18X-3P920	1029901

¹⁾ Object with 90 % reflectance (referred to standard white, DIN 5033)

WL18-3

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation
- **Switching mode:** light/dark-switching
- **Type of light:** visible red light
- **Polarisation filter:** ✓

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Adjustment	Test Input	Connection	Connection diagram	Model name	Part no.
0 m ... 7 m	Ø 40 mm (2 m)	PNP	Potentiometer, 1 turn	-	Cable, 4-wire 2 m PVC	Cd-094	WL18-3P130	1025909
				-	Connector M12, 4-pin	Cd-083	WL18-3P430	1025911
				✓	Cubic connector, 6-pin	Cd-178	WL18-3P630	1025912
		-		Cable, 5-wire 2 m PVC	Cd-141	WL18-3P730	1026029	
		-		Cable, 4-wire 2 m PVC	Cd-094	WL18-3N130	1025913	
		✓		Connector M12, 4-pin	Cd-083	WL18-3N430	1025915	
		NPN		✓	Cubic connector, 6-pin	Cd-178	WL18-3N630	1025916
				✓	Cable, 5-wire 2 m PVC	Cd-141	WL18-3N730	1026030

¹⁾ PL80A.

WL18-3 Ex

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation
- **Switching mode:** light/dark-switching
- **Type of light:** visible red light
- **Polarisation filter:** ✓
- **Connection:** cable with connector M12, 4-pin 0.29 m PVC

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Adjustment	Hazardous area category	Connection diagram	Model name	Part no.
0 m ... 7 m	Ø 40 mm (2 m)	PNP	Potentiometer, 1 turn	3D, 3G	Cd-083	WL18X-3P930	1029902

¹⁾ PL80A.

WS/WE18-3

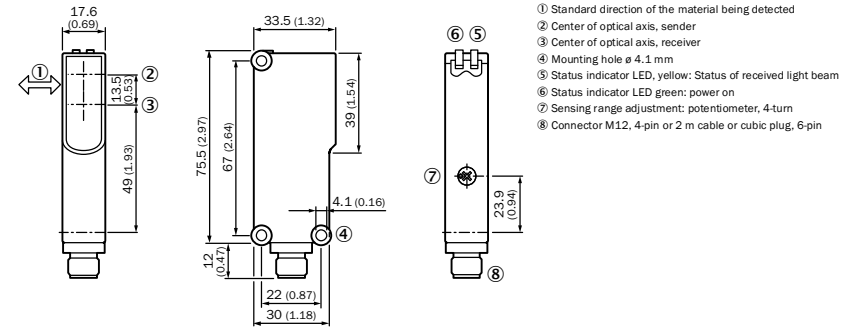
- **Sensor principle:** through-beam photoelectric sensor
- **Switching mode:** light/dark-switching

Type of light	Sensing range max.	Light spot size (distance)	Output type	Adjustment	Connection	Connection diagram	Model name	Part no.
Visible red light	0 m ... 20 m	Ø 450 mm (15 m)	PNP	Potentiometer, 1 turn	Cable, 4-wire 2 m PVC	Cd-074	WS/WE18-3P130	1025922
					Connector M12, 4-pin	Cd-072	WS/WE18-3P430	1025923
					Cubic connector, 6-pin	Cd-075	WS/WE18-3P630	1025924
Infrared light	0 m ... 20 m	Ø 950 mm (15 m)	NPN	Potentiometer, 1 turn	Cable, 4-wire 2 m PVC	Cd-074	WS/WE18-3N130	1025925
					Cubic connector, 6-pin	Cd-075	WS/WE18-3N630	1025926
					Cable, 4-wire 2 m PVC	Cd-074	WS/WE18-3P110	1025928
					Connector M12, 4-pin	Cd-072	WS/WE18-3P410	1025927

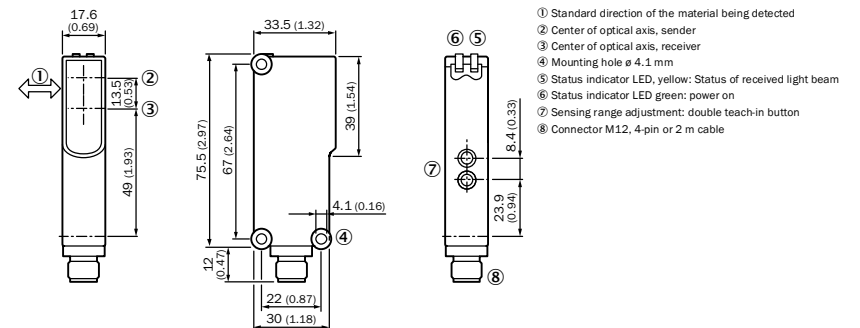
Dimensional drawings

Dimensions in mm (inch)

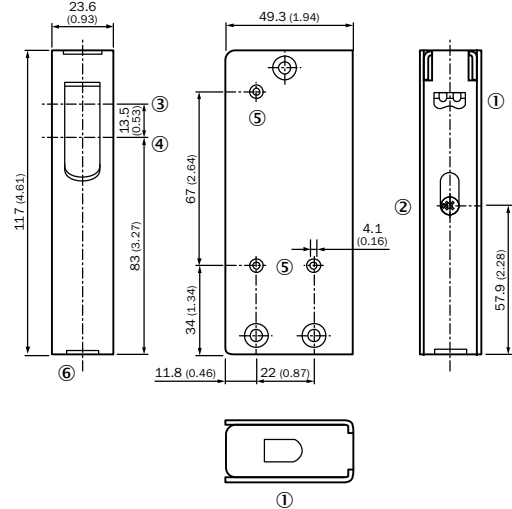
WT18-3, potentiometer



WTB18-3, double teach-in button

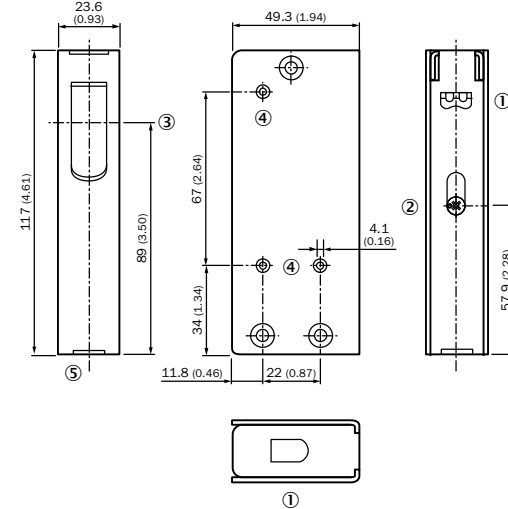


WT18-3 Ex



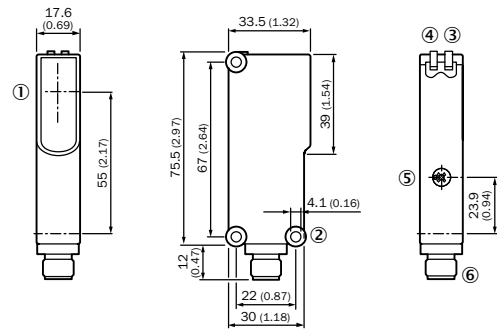
- ① LED indicator
- ② Sensing range adjustment
- ③ Center of optical axis, sender
- ④ Center of optical axis, receiver
- ⑤ Mounting hole ø 4.1 mm
- ⑥ Connection

WL18-3 Ex



- ① LED indicator
- ② Sensing range adjustment
- ③ Center of optical axis, sender
- ④ Center of optical axis, receiver
- ⑤ Mounting hole ø 4.1 mm
- ⑥ Connection

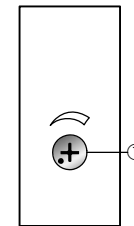
WL18-3, WS/WE18-3



- ① Center of optical axis
- ② Mounting hole ø 4.1 mm
- ③ Status indicator LED, yellow: Status of received light beam
- ④ Status indicator LED green: power on
- ⑤ Sensitivity control, Potentiometer 270° on WE
- ⑥ Connector M12, 4-pin or 2 m cable or cubic plug, 6-pin

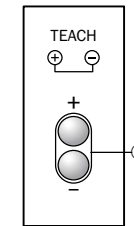
Adjustments

Potentiometer



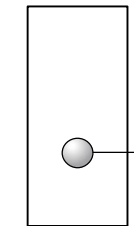
① Sensing range adjustment: potentiometer, 4-turn

Double teach-in button



① Sensing range adjustment: double teach-in button

Single teach-in button

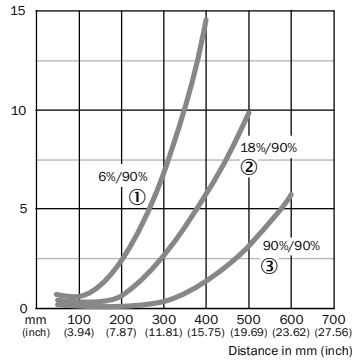


① Teach-in button

Characteristic curves

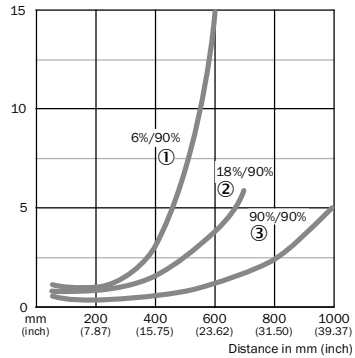
Black-white shift

WT18-3, red light



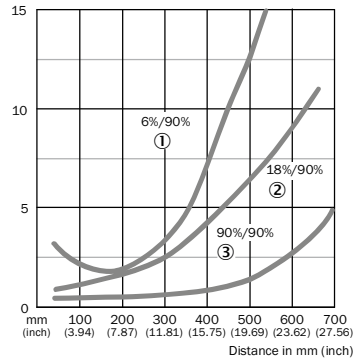
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WT18-3 (Ex), Infrared, 1,000 mm



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

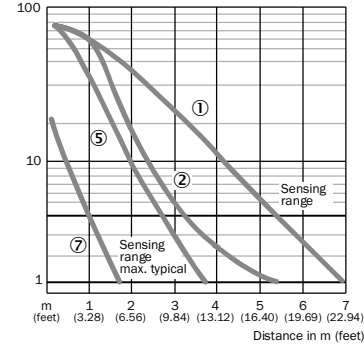
WT18-3, Infrared, 700 mm



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

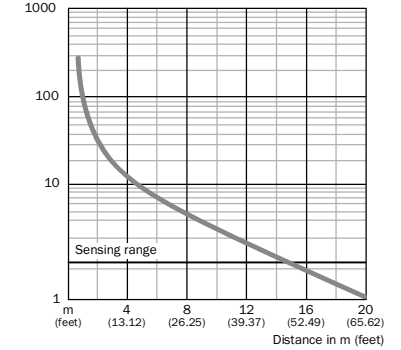
Operating reserve

WL18-3, WL18-3 Ex



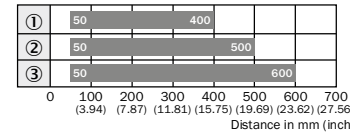
- ① PL80A
- ② C110A
- ⑦ Reflective tape Diamond Grade

WS/WE18-3



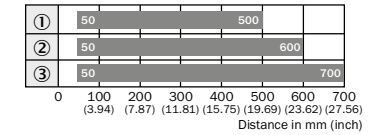
Bar diagrams

WT18-3, red light



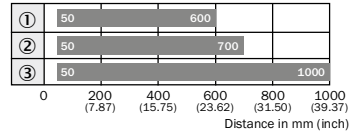
- Sensing range
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WT18-3, Infrared, 700 mm



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

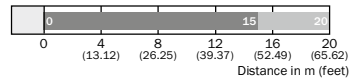
WT18-3 (Ex), Infrared, 1,000 mm



■ Sensing range

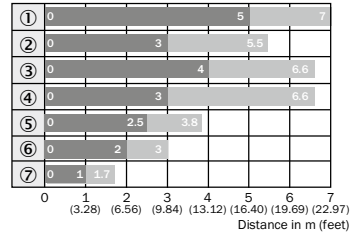
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WS/WE18-3



■ Sensing range ■ Sensing range typ. max.

WL18-3, WL18-3 Ex

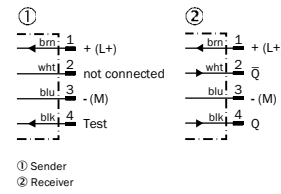


■ Sensing range ■ Sensing range max.

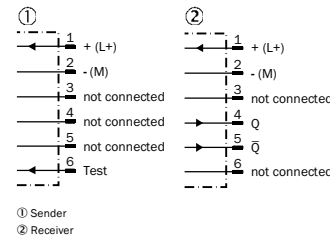
- ① PL80A
- ② C110A
- ③ PL50A
- ④ PL40A
- ⑤ PL30A
- ⑥ PL20A
- ⑦ Reflective tape Diamond Grade

Connection diagram

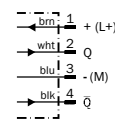
Cd-072



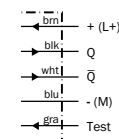
Cd-075



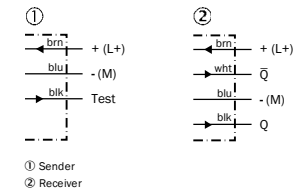
Cd-102



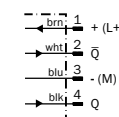
Cd-141



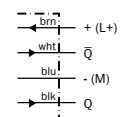
Cd-074



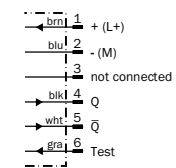
Cd-083



Cd-094



Cd-178



Recommended accessories

Mounting brackets/plates



Mounting brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Mounting bracket	BEF-WN-W14	2019084
		Mounting bracket with hinged arm	BEF-WN-W18	2009317

Plug connectors and cables

Connecting cable (female connector-open)

- Cable material: PVC
- Connector material: TPU

Figure	Connection type head A	Connection type head B	Connecting cable	Enclosure rating	Model name	Part no.
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	IP 67	DOL-1204-G02M	6009382
			5 m, 4-wire	IP 67	DOL-1204-G05M	6009866
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67	DOL-1204-W02M	6009383
			5 m, 4-wire	IP 67	DOL-1204-W05M	6009867

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Zinc diecast	Universal bar clamp for mounting bars with 12 mm diameter	BEF-KHS-KH3	5322626
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N03 for universal clamp bracket	BEF-KHS-N03	2051609
		Plate N04 for universal clamp bracket	BEF-KHS-N04	2051610






Device protection (mechanical)

Protective housing/tubes

Figure	Material	Description	Model name	Part no.
	Zinc plated steel (protective housing), Diecast zinc (clamp)	Protective housing for universal clamp	BEF-SG-W14	2058124
			BEF-SG-W27	2039601

Reflectors

Angular

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Rectangular, screw connection, 47 mm x 47 mm	P250	5304812
		Rectangular, screw connection, 38 mm x 15 mm	PL20A	1012719
		Rectangular, screw connection, 56 mm x 28 mm	PL30A	1002314
		Rectangular, screw connection, 37 mm x 56 mm	PL40A	1012720
		Rectangular, screw connection, 80 mm x 80 mm	PL80A	1003865

Reflective tape

Figure	Description	Model name	Part no.
	Self-adhesive, 50 mm x 60 mm	REF-IRF-56	5314244

Round

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Round, screw connection	C110A	5304549

→ For additional accessories, please see page L-861.