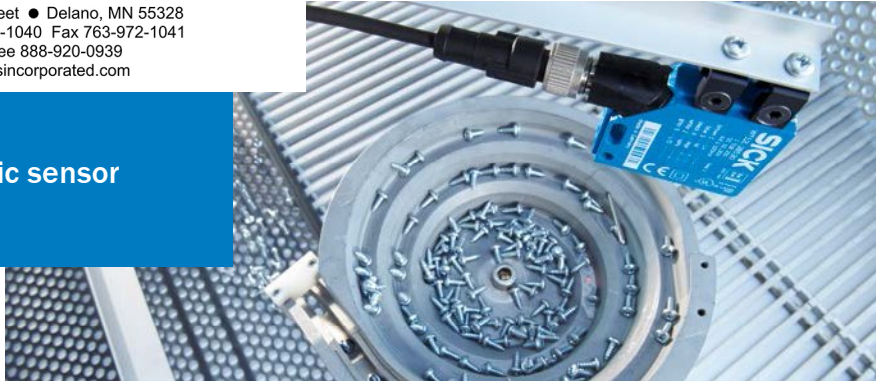


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High-performance photoelectric sensor family with laser optics



★ PTFE

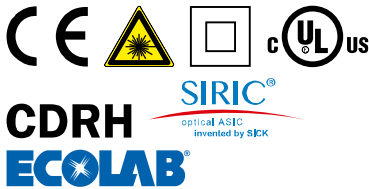
★ IP 69K

★ ≥ 2 kHz

★

SIRIC®

m/s



### Product description

The W12L-2 series of photoelectric sensors features laser technology that is optimally designed for individual applications. These sensors provide reliable ob-

ject detection, fast response times and are enclosed in a rugged metal housing, which is ideal for use in all types of industrial applications.

### At a glance

- Best-in-class retro-reflective laser performance in a metal housing
- High switching frequency of 2.5 kHz
- Teflon® coating available
- Connection via cable or rotatable connector
- Precise autocollimation optics
- Mounting options with through holes, blind holes, oblong holes and dovetail
- Adjustable focus on retro-reflective sensors
- Laser protection class 1 or 2

### Your benefits

- Reliable object detection of small objects due to superior ASIC (application-specific integrated circuit) technology combined with innovative laser technology
- Rugged metal housing (available with Teflon® coating) withstands harsh environments
- Red light laser technology provides quick and easy alignment of sensor
- Laser protection class 1 or 2 for eye safety
- Resistance to optical interference reduces false readings and downtime
- Rotatable connector provides easy installation

### Additional information

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Connection diagram.....G-517

Recommended accessories....G-518

→ [www.mysick.com/en/W12-2\\_Laser](http://www.mysick.com/en/W12-2_Laser)

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.

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## Detailed technical data

### Features

	WT12L-2	WL12L-2	WS/WE12L-2
<b>Sensor principle</b>	Photoelectric proximity sensor	Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
<b>Detection principle</b>	Background suppression	Autocollimation	-
<b>Dimensions (W x H x D)</b>	15 mm x 49 mm x 41.5 mm		
<b>Housing design (light emission)</b>	Rectangular		
<b>Sensing range max.</b>	20 mm ... 50 mm <sup>1)</sup> 30 mm ... 200 mm <sup>2)</sup> (depending on type)	0 m ... 18 m <sup>3)</sup> (depending on type)	0 m ... 80 m (depending on type)
<b>Focus</b>	45 mm ... 100 mm (depending on type)	-	
<b>Type of light</b>	Visible red light		
<b>Light source</b>	Laser <sup>4)</sup>		Laser <sup>4)</sup> /Laser <sup>4)</sup> <sup>5)</sup> (depending on type)
<b>Wave length</b>	650 nm		
<b>Laser class</b>	1/2 (depending on type)		
<b>Adjustment</b>	Potentiometer		

<sup>1)</sup> Object with 6 % reflectance (referred to standard white, DIN 5033)

<sup>2)</sup> Objects to be sensed with 18 % reflectivity (based on DIN 5033 white standard)

<sup>3)</sup> PL80A.

<sup>4)</sup> Average service life 50,000 h at T<sub>A</sub> = +25 °C.

<sup>5)</sup> Parallel light beam.

### Mechanics/electronics

	WT12L-2	WL12L-2	WS/WE12L-2
<b>Supply voltage</b> <sup>1)</sup>	10 V DC ... 30 V DC		
<b>Ripple</b> <sup>2)</sup>	≤ 5 V <sub>pp</sub>		
<b>Power consumption</b> <sup>3)</sup>	≤ 55 mA		-
<b>Power consumption, sender</b>	-		≤ 45 mA <sup>3)</sup>
<b>Power consumption, receiver</b>	-		≤ 15 mA <sup>3)</sup>
<b>Output type</b>	PNP, NPN		PNP/NPN (depending on type)
<b>Switching mode</b>	Light switching, Dark-switching		-
<b>Switching mode selector</b>	Selectable via L/D control wire, 0 V or not connected, light-switching, U <sub>v</sub> , dark-switching		Selectable via L/D control wire
<b>Signal voltage PNP HIGH/LOW</b>	U <sub>v</sub> - < 2 V, U <sub>v</sub> /0 V, ≤ 1.5 V	U <sub>v</sub> - < 2.9 V, U <sub>v</sub> V/0 V ≤ 1.5 V	
<b>Signal voltage NPN HIGH/LOW</b>	U <sub>v</sub> - < 2 V, U <sub>v</sub> /0 V, ≤ 1.5 V	U <sub>v</sub> - < 2.9 V, U <sub>v</sub> V/0 V ≤ 1.5 V	
<b>Output current I<sub>max.</sub></b>	100 mA		
<b>Response time</b>	≤ 200 μs <sup>4)</sup>	≤ 500 μs <sup>4)</sup> /≤ 200 μs <sup>4)</sup> (depending on type)	
1.000 Hz <sup>5)</sup>	-	≤ 500 μs	
2.500 Hz <sup>5)</sup>	≤ 200 μs		
<b>Connection type</b>	Male connector, M12	Male connector, M12 Cable, 2 m (depending on type)	Male connector, M12
<b>Circuit protection</b>	A <sup>6)</sup> , C <sup>7)</sup> , D <sup>8)</sup>		
<b>Protection class</b>	II		
<b>Weight</b>	130 g		260 g



	WT12L-2	WL12L-2	WS/WE12L-2
Polarisation filter	-	✓	-
Enclosure rating	IP 67/IP 69K		
Ambient operating temperature	-10 °C ... +50 °C		
Ambient storage temperature	-25 °C ... +75 °C		

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

<sup>2)</sup> May not exceed or fall short of  $V_s$  tolerances.

<sup>3)</sup> Without load.

<sup>4)</sup> Signal transit time with resistive load.

<sup>5)</sup> With light/dark ratio 1:1.

<sup>6)</sup> A =  $V_s$  connections reverse-polarity protected.

<sup>7)</sup> C = interference suppression.

<sup>8)</sup> D = outputs overcurrent and short-circuit protected.

## Ordering information

Other models available at [www.mysick.com/en/W12-2\\_Laser](http://www.mysick.com/en/W12-2_Laser)

### WT12L-2, fixed sensing range, 6% remission

- **Adjustment:** potentiometer
- **Switching mode:** light-switching, dark-switching

Laser class	Sensing range max. <sup>1)</sup>	Switching frequency	Focus	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
2	20 mm ... 50 mm	2,500 Hz	45 mm	Ø 0.1 mm (45 mm)	PNP, NPN	Connector M12, 5-pin	Cd-145	WT12L-2B510	1017959

<sup>1)</sup> Object with 6% reflectance (referred to standard white, DIN 5033)

### WT12L-2

- **Adjustment:** potentiometer
- **Switching mode:** light-switching, dark-switching
- **Connection diagram:** cd-145

Laser class	Sensing range max. <sup>1)</sup>	Switching frequency	Focus	Light spot size (distance)	Output type	Connection	Housing material	Model name	Part no.
1	30 mm ... 200 mm	2,500 Hz	100 mm	Ø 0.2 mm (100 mm)	PNP, NPN	Connector M12, 5-pin	Metal	WT12L-2B551	1047958
2	30 mm ... 200 mm	2,500 Hz	45 mm	Ø 0.1 mm (45 mm)	PNP, NPN	Connector M12, 5-pin	Metal	WT12L-2B530	1018250
			80 mm	Ø 0.2 mm (80 mm)	PNP, NPN	Connector M12, 5-pin	Metal	WT12L-2B540	1018251
			100 mm	Ø 0.2 mm (100 mm)	PNP, NPN	Connector M12, 5-pin	Metal	WT12L-2B550	1017904
							PTFE	WT12L-2B550T01	1018582

<sup>1)</sup> Objects to be sensed with 18% reflectivity (based on DIN 5033 white standard)

### WL12L-2

- **Adjustment:** potentiometer
- **Switching mode:** light-switching, dark-switching

Laser class	Sensing range max. <sup>1)</sup>	Switching frequency	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.		
1	0 m ... 18 m	1,500 Hz	Ø 0.8 mm (300 mm)	PNP, NPN	Connector M12, 5-pin	Cd-145	WL12L-2B531	1047959		
2	0 m ... 18 m	2,500 Hz	Ø 0.8 mm (300 mm)	PNP, NPN	Connector M12, 5-pin	Cd-145	WL12L-2B520	1018253		
							Cable, 4-wire 2 m	Cd-089	WL12L-2P130	1022041
							Connector M12, 5-pin	Cd-145	WL12L-2B530	1018252

<sup>1)</sup> PL80A.

WS/WE12L-2

- **Connection:** connector M12, 4-pin

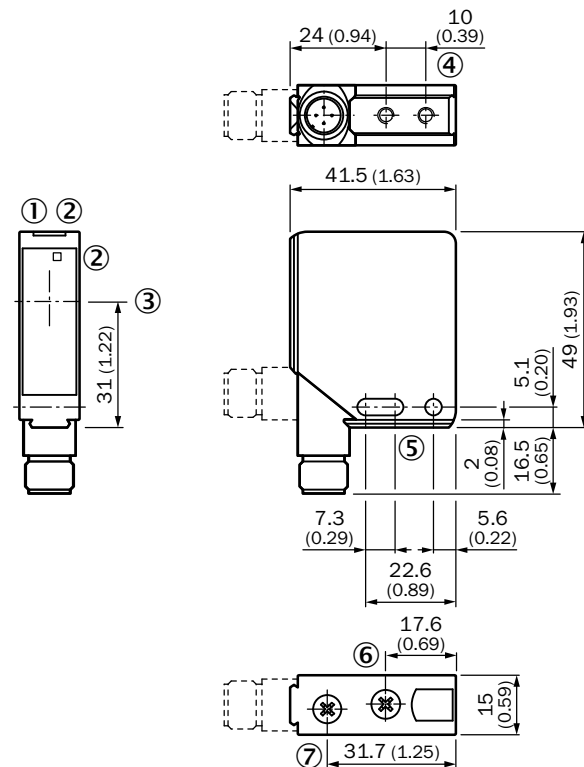
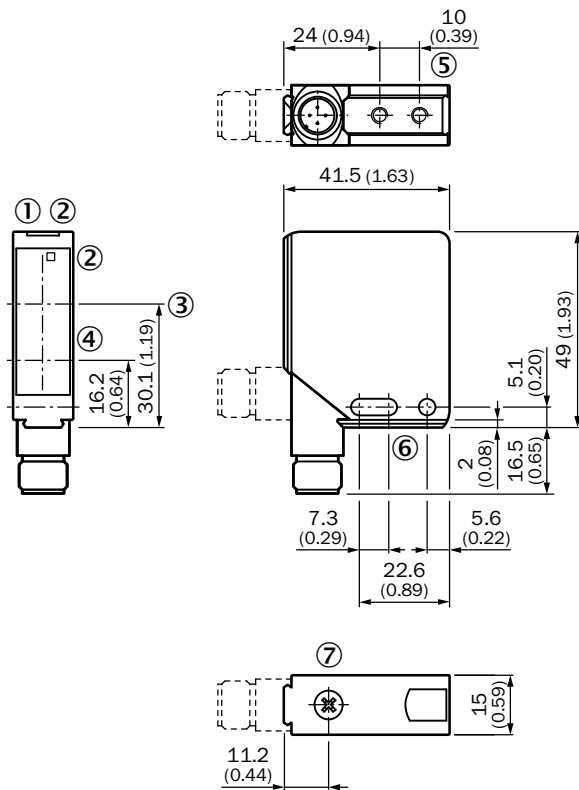
Laser class	Sensing range max.	Switching frequency	Light spot size (distance)	Output type	Adjustment	Connection diagram	Model name	Part no.
1	0 m ... 80 m	1,000 Hz	Ø 150 mm (60 m)	PNP	-	Cd-077	WS/WE12L-2P431	1047960
2	0 m ... 10 m	2,500 Hz	Ø 1 mm (1 m)	PNP	Potentiometer	Cd-077	WS/WE12L-2P410	1018256
				NPN	Potentiometer	Cd-077	WS/WE12L-2N410	1018257
	0 m ... 80 m	2,500 Hz	Ø 150 mm (60 m)	PNP	-	Cd-077	WS/WE12L-2P430	1018254
				NPN	-	Cd-077	WS/WE12L-2N430	1018255

Dimensional drawings

Dimensions in mm (inch)

WT12L-2

WL12L-2, WS/WE12L-2



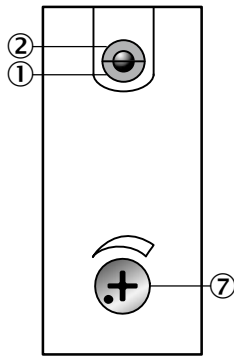
- ① Operating indicator, green
- ② LED reception indicator, yellow
- ③ Optical axis, receiver
- ④ Optical axis, sender
- ⑥ Mounting hole, Ø 4.2 mm
- ⑦ Sensing range adjustment

- ① Operating indicator, green
- ② LED reception indicator, yellow
- ③ Center of optical axis
- ⑤ Mounting hole, Ø 4.2 mm
- ⑥ Focal adjustment
- ⑦ Sensitivity adjustment



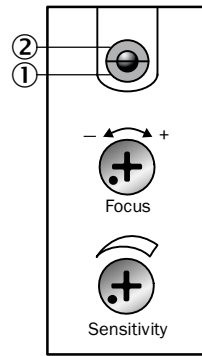
### Adjustments

#### WT12L-2



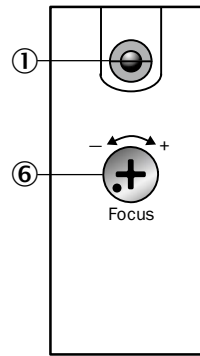
- ① Operating indicator, green
- ② LED reception indicator, yellow
- ⑦ Sensing range adjustment

#### WL12L-2



- ① Operating indicator, green
- ② LED reception indicator, yellow
- ⑥ Focal adjustment
- ⑦ Sensitivity adjustment

#### WS/WE12L-2

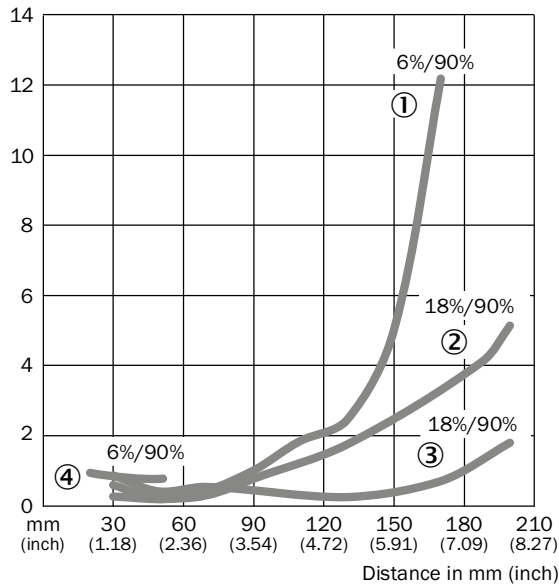


- ① Operating indicator (WS above only)
- ⑥ Focal adjustment (WS)

### Characteristic curves

#### Black-white shift

#### WT12L-2

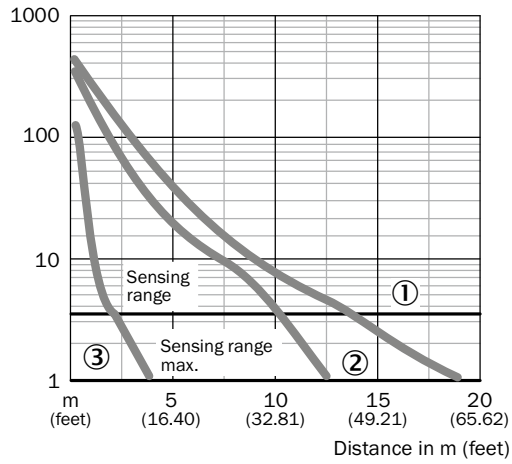


- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission
- ④ Sensing range on black, 6 % remission, fix

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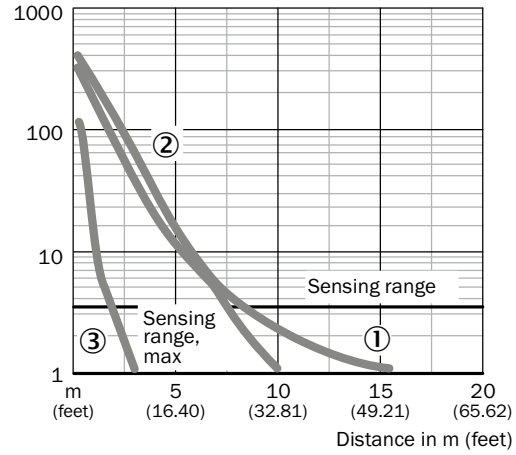
Operating reserve

**WL12L-2, 18 m**



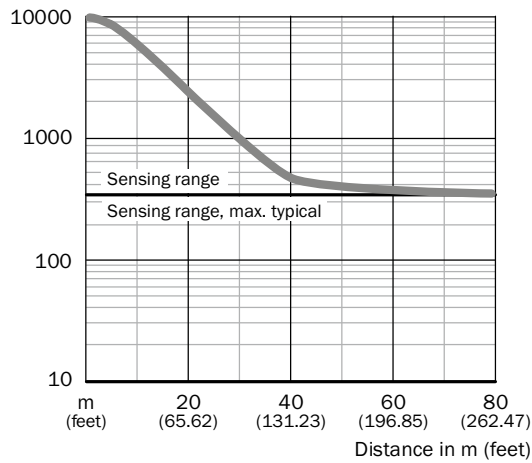
- ① PL80A
- ② PL50A
- ③ Reflective tape Diamond Grade

**WL12L-2, 15 m**

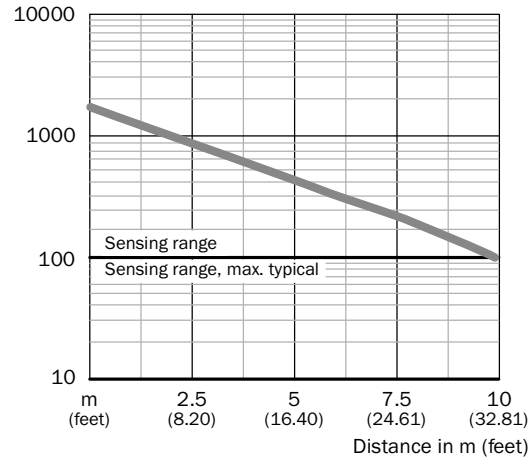


- ① PL80A
- ② PL50A
- ③ Reflective tape Diamond Grade

**WS/WE12L-2, 80 m**



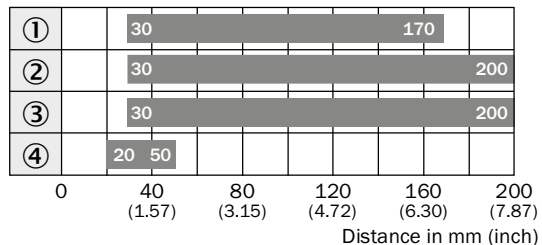
**WS/WE12L-2, 10 m**



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Bar diagrams

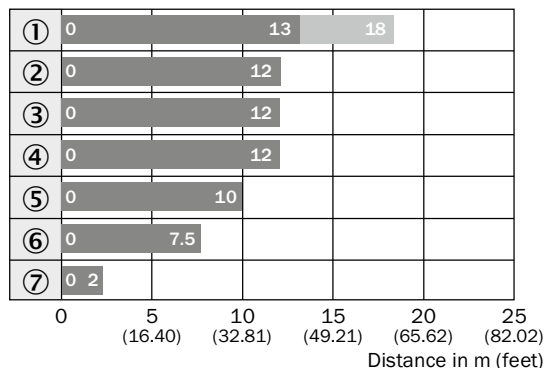
WT12L-2



■ Sensing range

- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission
- ④ Sensing range on black, 6 % remission, fix

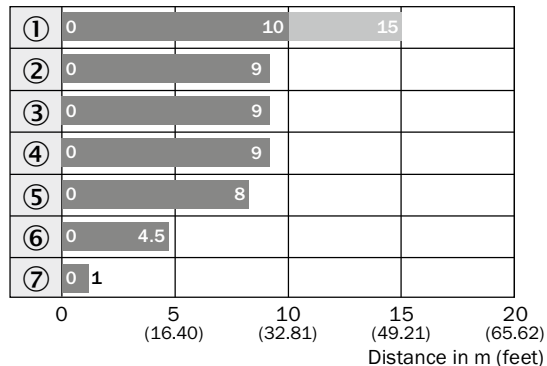
WL12L-2, 18 m



■ Sensing range      ■ Sensing range typ. max.

- ① PL80A
- ② PL50A
- ③ PL40A
- ④ P250
- ⑤ PL30A
- ⑥ PL20A
- ⑦ Reflective tape Diamond Grade

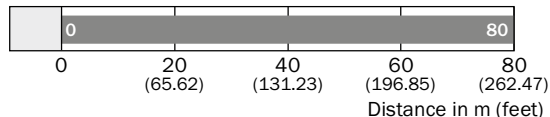
WL12L-2, 15 m



■ Sensing range      ■ Sensing range typ. max.

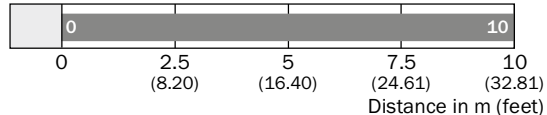
- ① PL80A
- ② PL50A
- ③ PL40A
- ④ P250
- ⑤ PL30A
- ⑥ PL20A
- ⑦ Reflective tape Diamond Grade

WS/WE12L-2, 80 m



■ Sensing range/sensing range typ. max.

WS/WE12L-2, 10 m

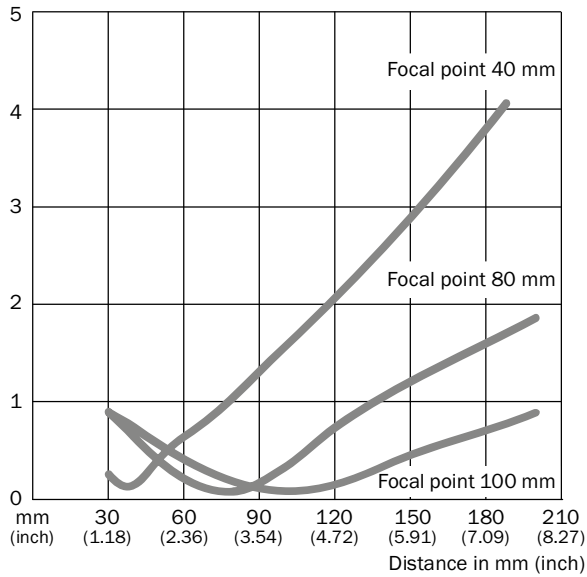


■ Sensing range/sensing range typ. max.



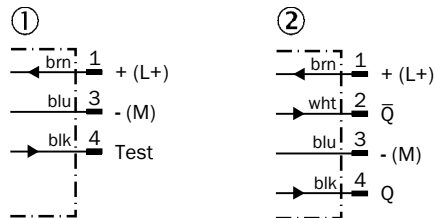
## Light spot diameter

### WT12L-2



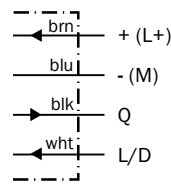
## Connection diagram

### Cd-077

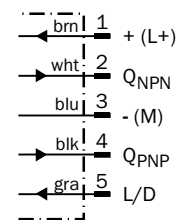


① Sender  
② Receiver

### Cd-089



### Cd-145



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### Recommended accessories

#### Mounting brackets/plates





##### Mounting brackets

Figure	Material	Description	Model name	Part no.
	Stainless steel	Mounting bracket, large	BEF-WG-W12	2013942
		Mounting bracket, small	BEF-WK-W12	2012938

#### 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
			10 m, 4-wire	IP 67	DOL-1204-W10M	6010541
	Female connector, M12, 5-pin, straight	Cable, open conductor heads	2 m, 5-wire	IP 67	DOL-1205-G02M	6008899
			5 m, 5-wire	IP 67	DOL-1205-G05M	6009868
	Female connector, M12, 5-pin, angled	Cable, open conductor heads	2 m, 5-wire	IP 67	DOL-1205-W02M	6008900
			5 m, 5-wire	IP 67	DOL-1205-W05M	6009869


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##### Female connector (ready to assemble)

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M12, 4-pin, straight	Screw-type terminals	PBT	IP 67	DOS-1204-G	6007302
	Female connector, M12, 4-pin, angled	Screw-type terminals	PBT	IP 67	DOS-1204-W	6007303
	Female connector, M12, 5-pin, straight	Screw-type terminals	PBT	IP 67	DOS-1205-G	6009719
	Female connector, M12, 5-pin, angled	Screw-type terminals	PBT	IP 67	DOS-1205-W	6009720

#### Terminal and alignment brackets

##### Terminal brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Clamping block for dovetail mounting	BEF-KH-W12	2013285

Universal bar clamp systems








Figure	Material	Description	Model name	Part no.
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate NO2 for universal clamp bracket	BEF-KHS-NO2	2051608
		Plate NO3 for universal clamp bracket	BEF-KHS-NO3	2051609

Reflectors

Angular


Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Rectangular, screw connection, 80 mm x 80 mm	PL80A	1003865

Fine triple reflectors

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Fine triple, screw connection, suitable for laser sensors, 47 mm x 47 mm	P250F	5308843
		Fine triple, self-adhesive, suitable for laser sensors, Ø 23 mm	P25F-1	5319385
		Reflector with microprismatic reflex tape REF-AC1000, suitable for laser sensors, see alignment note, 23 mm x 23 mm	P41F	5315128
		Fine triple, screw connection, suitable for laser sensors, 18 mm x 18 mm	PL10F	5311210
		Fine triple, screw connection, suitable for laser sensors, 38 mm x 16 mm	PL20F	5308844
		Fine triple, screw connection, suitable for laser sensors, 56 mm x 28 mm	PL30F	5326523
		Fine triple, screw connection, suitable for laser sensors, 76 mm x 45 mm	PL81-1F	5325060



Reflective tape

Figure	Description	Model name	Part no.
	Suitable for laser sensors, self-adhesive, cut, see alignment note, 56.3 mm x 56.3 mm	REF-AC1000-56	4063030

→ For additional accessories, please see page L-861