

Cost-effective photoelectric sensors for demanding applications



optical ASIC  
invented by SICK

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**Product description**

The W14-2 series of photoelectric sensors from SICK offers reliable object detection at a cost-effective price for typical conveyor, packaging and automation applications. These sensors include features that help to simplify mounting and installation, which helps increase ease of use. Proximity, retro-reflective and through-beam versions are available with different options (mounting,

LED, and technology) to suit application requirements. Variants with PinPoint LED technology, for example, have a bright, focused light spot that permits quick and easy alignment of the sensor to the detected object. An extensive range of accessories is available, including mounting systems, sensor protection equipment, reflectors, and connection systems.

**At a glance**

- Outstanding background suppression with OES3 technology
- Highly visible and precise light spot due to PinPoint LED in selected products
- Slim, durable plastic housing
- Complete sensor family with proximity, retro-reflective and through-beam variants

**Your benefits**

- Reliable object detection at a cost-effective price
- PinPoint LED technology provides a highly visible red light that enables quick and easy setup
- Broad product range gives users a variety of choices to fit their application
- Rugged plastic housing in a slim design simplifies installation
- Quick and easy installation using SICK accessories saves time

→ [www.mysick.com/en/W14-2](http://www.mysick.com/en/W14-2)

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

	WT14-2	WL14-2	WS/WE14-2
<b>Sensor principle</b>	Photoelectric proximity sensor	Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
<b>Detection principle</b>	Background suppression/energetic (depending on type)	Standard optics	–
<b>Dimensions (W x H x D)</b>	17.6 mm x 75.5 mm x 33.5 mm		
<b>Housing design (light emission)</b>	Rectangular		
<b>Sensing range max.</b>	20 mm ... 1,500 mm <sup>1)</sup> (depending on type)	0,15 m ... 17 m <sup>2)</sup> (depending on type)	0 m ... 15 m
<b>Sensing range</b>	50 mm ... 1,500 mm <sup>1)</sup> (depending on type)	0,15 m ... 12 m <sup>2)</sup> (depending on type)	0 m ... 10 m
<b>Type of light</b>	Visible red light/Infrared light (depending on type)	Visible red light	
<b>Light source</b>	LED <sup>3)</sup> /PinPoint-LED <sup>3)</sup> (depending on type)		LED <sup>3)</sup>
<b>Angle of dispersion</b>	–	Approx. 2° / approx. 0.9° (depending on type)	–
<b>Wave length</b>			
Visible red light	675 nm/637 nm (depending on type)	645 nm/637 nm (depending on type)	645 nm
Infrared light	870 nm	–	
<b>Adjustment</b>	Potentiometer, 4 turns Single teach-in button (depending on type)	Single teach-in button	–
<b>Special feature</b>	Line-shaped light spot (depending on type)	–	

<sup>1)</sup> Object with 90 % reflectance (referred to standard white, DIN 5033)

<sup>2)</sup> PL80A.

<sup>3)</sup> Average service life of 100,000 h at T<sub>A</sub> = +25 °C.

### Mechanics/electronics

	WT14-2	WL14-2	WS/WE14-2
<b>Supply voltage <sup>1)</sup></b>	10 V DC ... 30 V DC		
<b>Ripple <sup>2)</sup></b>	5 V <sub>pp</sub>		
<b>Power consumption</b>	≤ 25 mA <sup>3)</sup> ... ≤ 55 mA <sup>3)</sup> (depending on type)	≤ 35 mA <sup>3)</sup>	–
<b>Power consumption, sender</b>	–		35 mA <sup>3)</sup>
<b>Power consumption, receiver</b>	–		25 mA <sup>3)</sup>
<b>Output type</b>	PNP/NPN (depending on type)		
<b>Output function</b>	Complementary		
<b>Switching mode</b>	Light/dark-switching		
<b>Output current I<sub>max.</sub></b>	≤ 100 mA		
<b>Response time <sup>4)</sup></b>	≤ 2,5 ms		
<b>Switching frequency <sup>5)</sup></b>	200 Hz		
<b>Connection type</b>	Cable, 2 m <sup>6)</sup> Male connector, M12 (depending on type)	Cable, 2 m <sup>6)</sup> Male connector, M12 Cable with connector, M12 <sup>6)</sup> (depending on type)	Cable, 2 m <sup>6)</sup> Male connector, M12 (depending on type)
<b>Circuit protection</b>	A <sup>7)</sup> , C <sup>8)</sup> , D <sup>9)</sup>		

	WT14-2	WL14-2	WS/WE14-2
<b>Weight</b>	Connector M12, 4-pin	40 g	
	Cable/cable with connector	120 g	
<b>Polarisation filter</b>	-	✓	-
<b>Housing material</b>	ABS		
<b>Optics material</b>	PMMA		
<b>Enclosure rating</b>	IP 67		
<b>Ambient operating temperature</b>	-30 °C ... +60 °C	-25 °C ... +60 °C	
<b>Ambient storage temperature</b>	-40 °C ... +70 °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<sub>S</sub> 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> Do not bend below 0 °C.

<sup>7)</sup> A = V<sub>S</sub> connections reverse-polarity protected.

<sup>8)</sup> C = interference suppression.

<sup>9)</sup> D = outputs overcurrent and short-circuit protected.

## Ordering information

Other models available at [www.mysick.com/en/W14-2](http://www.mysick.com/en/W14-2)

### WT14-2

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

Detection principle	Type of light	Sensing range max. <sup>1)</sup>	Light spot size (distance)	Output type	Adjustment	Connection	Connection diagram	Model name	Part no.
Background suppression	Visible red light	20 mm ... 250 mm	Ø 10 mm (250 mm)	PNP	Potentiometer, 4 turns	Cable, 4-wire 2 m PVC	Cd-094	WT14-2P132	1026055
						Connector M12, 4-pin	Cd-083	WT14-2P432	1026056
				NPN	Potentiometer, 4 turns	Cable, 4-wire 2 m PVC	Cd-094	WT14-2N132	1026072
						Connector M12, 4-pin	Cd-083	WT14-2N432	1026057
	Visible red light (PinPoint LED)	20 mm ... 1,300 mm	Ø 7 mm (300 mm)	PNP	Potentiometer, 4 turns	Connector M12, 4-pin	Cd-083	WT14-2P432S08	1045104
						Infrared light	20 mm ... 500 mm	Ø 14 mm (300 mm)	PNP
	Connector M12, 4-pin	Cd-083	WT14-2P422	1026052					
	NPN	Potentiometer, 4 turns	Cable, 4-wire 2 m PVC	Cd-094	WT14-2N122				1026053
Connector M12, 4-pin			Cd-083	WT14-2N422	1026054				
Energetic	Infrared light	50 mm ... 1,500 mm	Ø 56 mm (1,000 mm)	PNP	Single teach-in button	Cable, 4-wire 2 m PVC	Cd-094	WT14-2P111	1026058
						Connector M12, 4-pin	Cd-083	WT14-2P411	1026059
				NPN	Single teach-in button	Cable, 4-wire 2 m PVC	Cd-094	WT14-2N111	1026060
						Connector M12, 4-pin	Cd-083	WT14-2N411	1026062

<sup>1)</sup> Object with 90 % reflectance (referred to standard white, DIN 5033)



### WT14-2, line-shaped light spot

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

Type of light	Sensing range max. <sup>1)</sup>	Output type	Adjustment	Connection	Connection diagram	Model name	Part no.
Infrared light	20 mm ... 500 mm	PNP	Potentiometer, 4 turns	Connector M12, 4-pin	Cd-083	WT14-2P422S03	1041679

<sup>1)</sup> Object with 90 % reflectance (referred to standard white, DIN 5033)

### WL14-2

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Switching mode:** light/dark-switching
- **Polarisation filter:** ✓

Type of light	Sensing range max. <sup>1)</sup>	Light spot size (distance)	Output type	Adjustment	Connection	Connection diagram	Model name	Part no.
Visible red light (LED)	0.15 m ... 6 m	Ø 140 mm (4 m)	PNP	-	Cable, 4-wire 2 m PVC	Cd-094	WL14-2P130	1026050
					Connector M12, 4-pin	Cd-083	WL14-2P430	1026049
			NPN		Cable, 4-wire 2 m PVC	Cd-094	WL14-2N130	1026047
					Connector M12, 4-pin	Cd-083	WL14-2N430	1026048
Visible red light (PinPoint LED)	0.15 m ... 17 m	Ø 30 mm (2 m)	PNP	Single teach-in button	Connector M12, 4-pin	Cd-083	WL14-2P431	1050271

<sup>1)</sup> PL80A.

### WL14-2, detecting objects wrapped in film

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Switching mode:** light/dark-switching
- **Polarisation filter:** ✓

Type of light	Sensing range max. <sup>1)</sup>	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
Visible red light	0.5 m ... 5 m	Ø 140 mm (4 m)	PNP	Cable with connector M12, 4-pin 0.29 m PVC	Cd-101	WL14-2K930S11	1046864
				Cable with connector M12, 4-pin 0.1 m PVC	Cd-083	WL14-2P030S13	1051200
				Connector M12, 4-pin	Cd-083	WL14-2P430S03	1029850

<sup>1)</sup> PL80A.

### WS/WE14-2

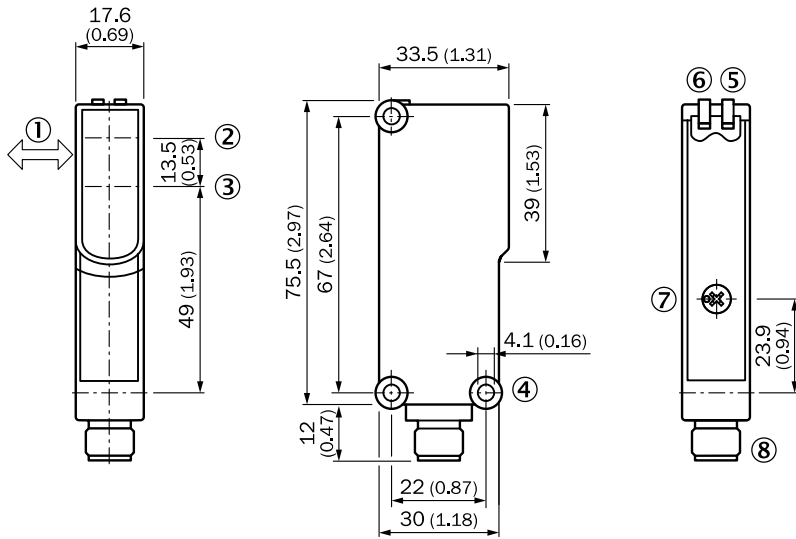
- **Sensor principle:** through-beam photoelectric sensor
- **Switching mode:** light/dark-switching

Type of light	Sensing range max.	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
Visible red light	0 m ... 15 m	Ø 300 mm (10 mm)	PNP	Cable, 4-wire 2 m PVC	Cd-074	WS/WE14-2P130	1026430
				Connector M12, 4-pin	Cd-072	WS/WE14-2P430	1026431
			NPN	Cable, 4-wire 2 m PVC	Cd-074	WS/WE14-2N130	1026432
				Connector M12, 4-pin	Cd-072	WS/WE14-2N430	1026433

Dimensional drawings

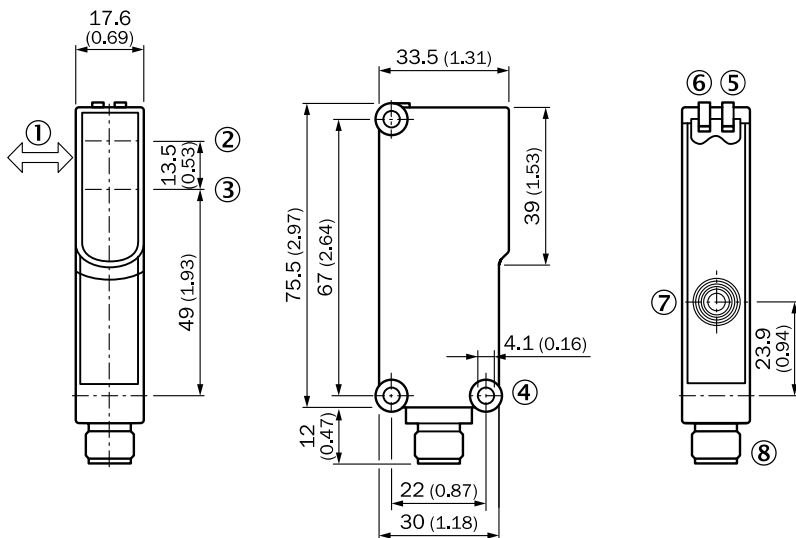
Dimensions in mm (inch)

WT14-2, potentiometer



- ① Standard direction of the material being detected
- ② Center of optical axis, sender
- ③ Center of optical axis, receiver
- ④ Mounting hole  $\varnothing$  4.1 mm
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Status indicator LED green: power on
- ⑦ Potentiometer
- ⑧ Connector M12, 4-pin or 2 m cable

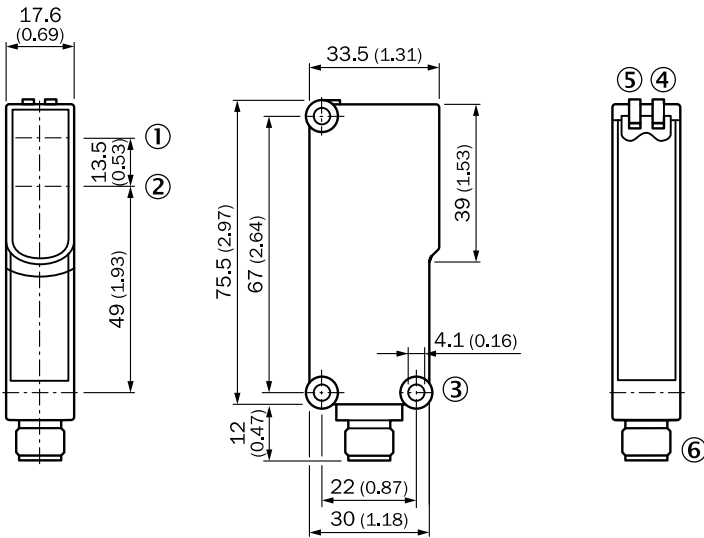
WT14-2, single teach-in button



- ① Standard direction of the material being detected
- ② Center of optical axis, sender
- ③ Center of optical axis, receiver
- ④ Mounting hole  $\varnothing$  4.1 mm
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Status indicator LED green: power on
- ⑦ Teach-in button
- ⑧ Connector M12, 4-pin or 2 m cable

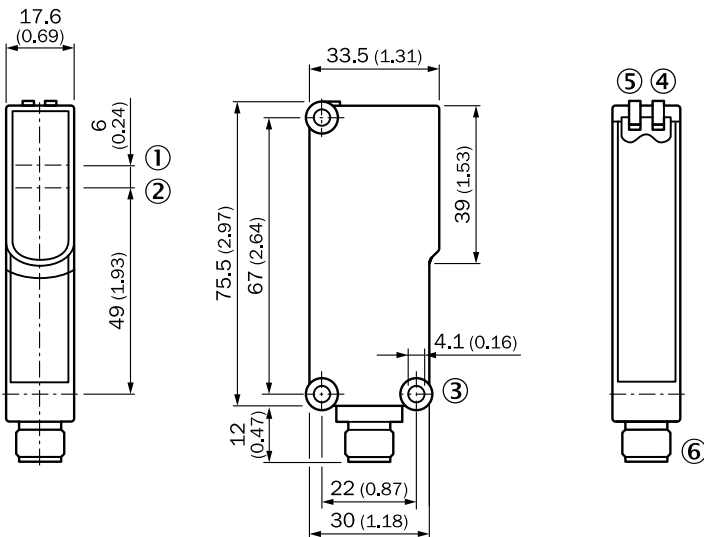


**WL14-2**



- ① Center of optical axis, sender
- ② Center of optical axis, receiver
- ③ Mounting hole  $\varnothing$  4.1 mm
- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Status indicator LED green: power on
- ⑥ Connector M12, 4-pin or 2 m cable

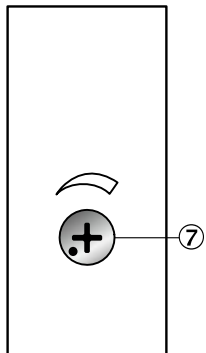
**WS/WE14-2**



- ① Optical axis, sender
- ② Optical axis, receiver
- ③ Mounting hole  $\varnothing$  4.1 mm
- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Status indicator LED green: power on
- ⑥ Connector M12, 4-pin or 2 m cable

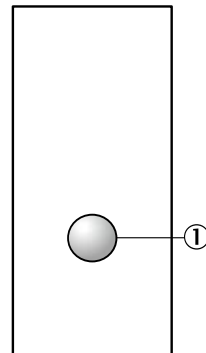
**Adjustments**

**Potentiometer**



⑦ Sensing range adjustment: potentiometer, 4-turn

**Single teach-in button**

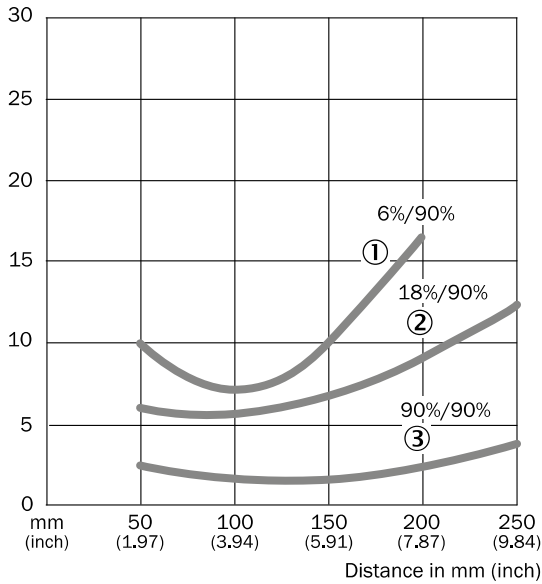


① Teach-in button

Characteristic curves

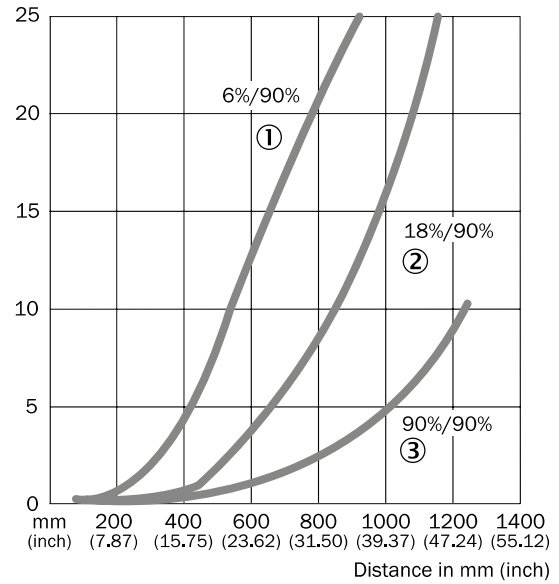
Black-white shift

WT14-2, red light, 250 mm



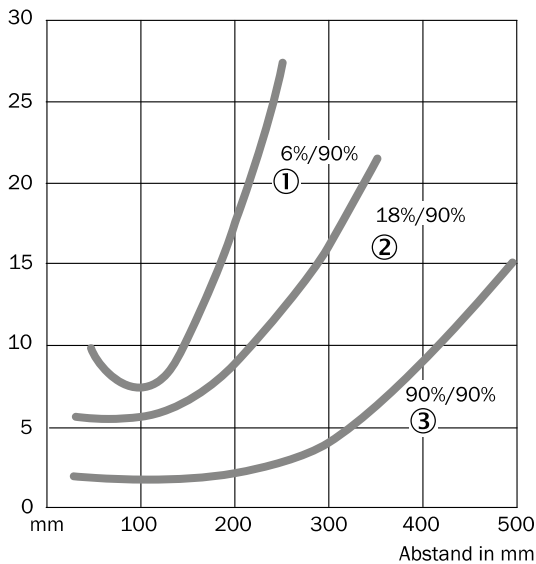
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WT14-2, red light, 1300 mm



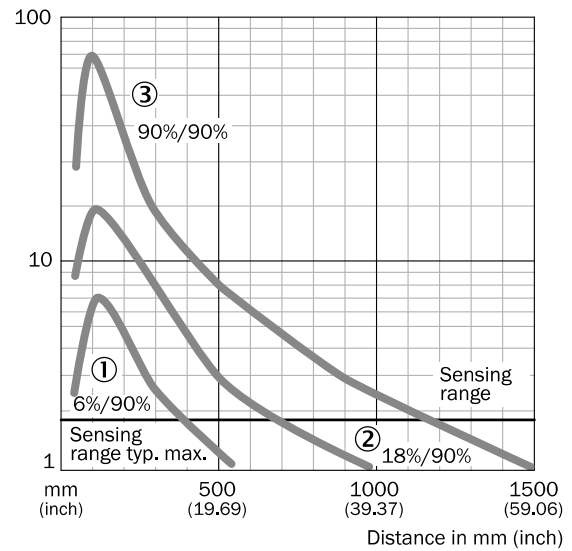
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WT14-2, infrared light, 500 mm



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

WT14-2, infrared light, 1500 mm

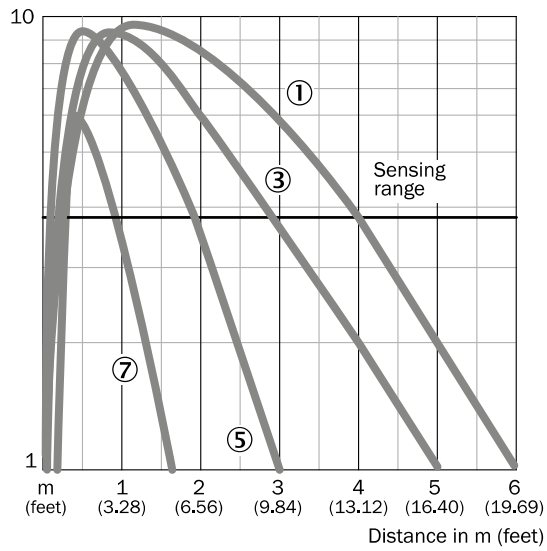


- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission



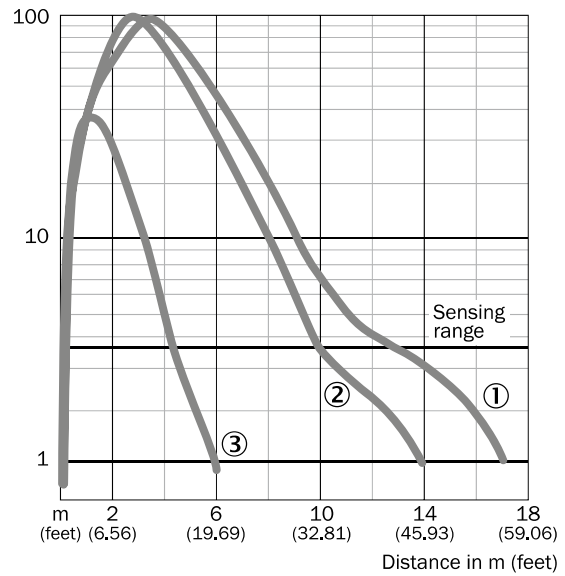
Operating reserve

**WL14-2, 6 m**



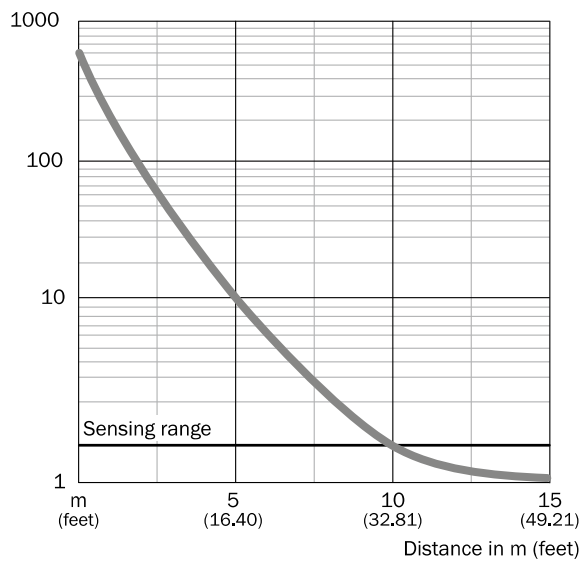
- ① PL80A
- ③ PL40A
- ⑤ PL20A
- ⑦ Reflective tape Diamond Grade

**WL14-2, 17 m**



- ① PL80A
- ② PL40A
- ③ Reflective tape REF-IRF-56

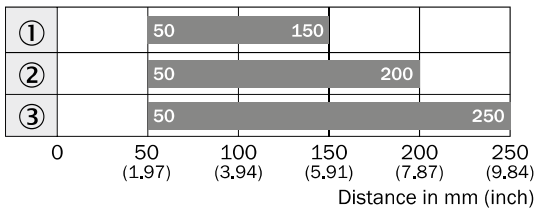
**WS/WE14-2**





Bar diagrams

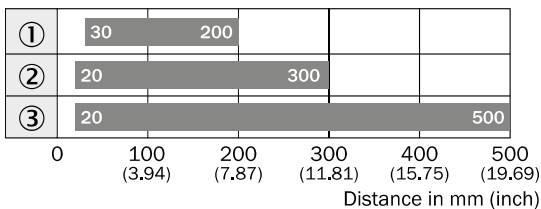
WT14-2, red light, 250 mm



■ Sensing range

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

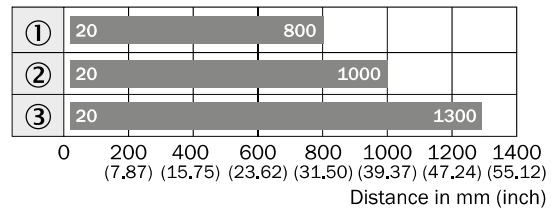
WT14-2, infrared light, 500 mm



■ Sensing range

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

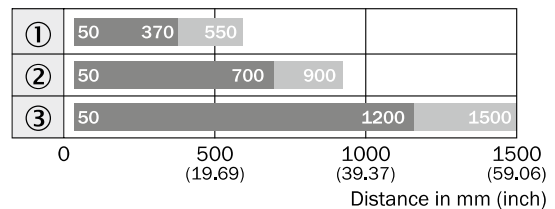
WT14-2, red light, 1300 mm



■ Sensing range

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

WT14-2, infrared light, 1500 mm



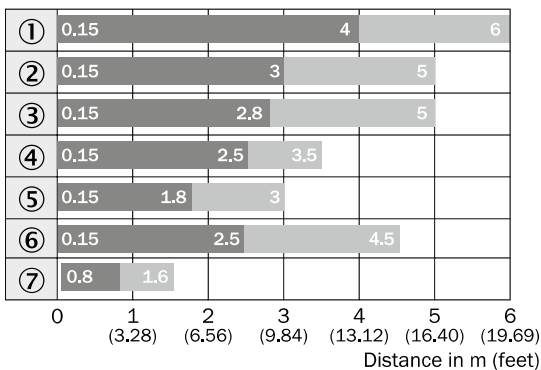
■ Sensing range

■ Sensing range typ. max.

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



WL14-2, 6 m

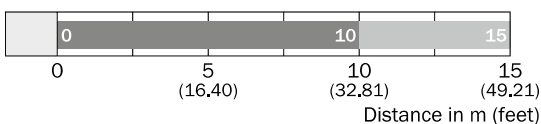


■ Sensing range

■ Sensing range max.

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

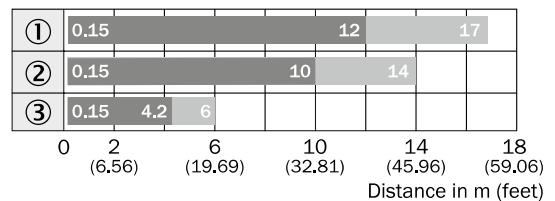
WS/WE14-2



■ Sensing range

■ Sensing range typ. max.

WL14-2, 17 m



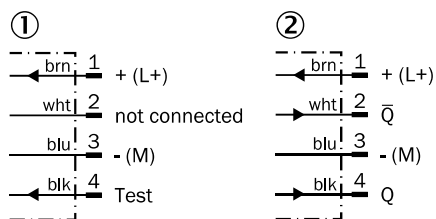
■ Sensing range

■ Sensing range max.

- ① PL80A
- ② PL40A
- ③ Reflective tape REF-IRF-56

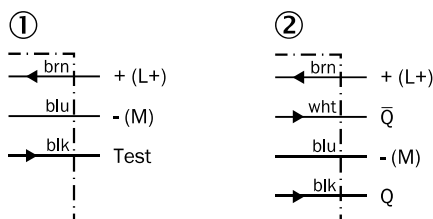
## Connection diagram

### Cd-072



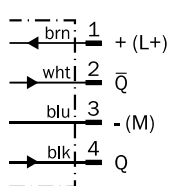
① Sender  
② Receiver

### Cd-074

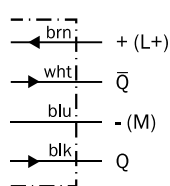


① Sender  
② Receiver

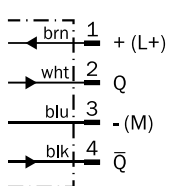
### Cd-083



### Cd-094





### Cd-101



## 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

**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



**Male connector (ready to assemble)**

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Male connector, M12, 4-pin, straight	Screw-type terminals	PBT	IP 67	STE-1204-G	6009932
	Male connector, M12, 4-pin, angled	Screw-type terminals	PBT	IP 67	STE-1204-W	6022084

**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

