

High-performance photoelectric sensors with application flexibility in industrial environments



Additional information

Detailed technical data.....G-493
 Ordering information.....G-494
 Dimensional drawingsG-496
 AdjustmentsG-497
 Characteristic curvesG-498
 Bar diagrams.....G-499
 Connection diagramG-500
 Recommended accessories.....G-501

Product description

The W11-2 photoelectric sensor family offers a complete technology with high-performance sensing capabilities for a wide range of automation applications. Whether for applications in material

handling or packaging, the W11-2 offers optimum performance in a small, rugged housing. These easy-to-use sensors provide dependable object detection and high reliability in industrial environments.

At a glance

- Uniform housing, mounting and connection systems
- Rugged sensors for industrial use
- PinPoint LED technology provides highly visible light spot
- Space-saving plastic housing in chemically, thermally or mechanically resistant designs
- Dovetail mounting – mounting holes and oblong holes
- Highly visible 360° status LEDs

Your benefits

- Reliable object detection due to superior ASIC technology with a high immunity to ambient light
- PinPoint technology provides a bright, small and precise light spot that enables quick and easy sensor alignment
- Precise switching characteristics ensure high performance even in changing application conditions
- Highly visible 360° status LEDs provide quick and easy setup
- Compact and rugged housing design easily fits in tight spaces
- Uniform housing, mounting and connection systems simplify installation
- Versatile mounting options, including dovetail, side mounting and standard mounting holes enable quick installation

→ www.mysick.com/en/W11-2

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.



Detailed technical data

Features

	WTB11-2	WTF11-2	WTE11-2	WL11-2	WSE11-2
Sensor principle	Photoelectric proximity sensor			Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Detection principle	Background suppression	Foreground suppression	Energetic	Standard optics	–
Dimensions (W x H x D)	15.6 mm x 48.5 mm x 42 mm				
Housing design (light emission)	Rectangular				
Sensing range max.	20 mm ... 1,100 mm ¹⁾ (depending on type)	35 mm ... 350 mm ¹⁾	40 mm ... 1,000 mm ¹⁾	0.05 m ... 10 m ²⁾ (depending on type)	0 m ... 20 m
Sensing range	20 mm ... 800 mm (depending on type)	35 mm ... 350 mm	40 mm ... 600 mm	0.05 m ... 8 m ²⁾ (depending on type)	0 m ... 15 m
Type of light	Visible red light				
Light source	LED ³⁾ PinPoint LED ³⁾ (depending on type)	LED ³⁾			
Angle of dispersion	–			Approx. 2.2°	Approx. 1.5°
Wave length	640 nm / 660 nm (depending on type)	640 nm	633 nm	640 nm	633 nm
Adjustment	Potentiometer, 5 turns		Single teach-in button		–

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

²⁾ PL80A.

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

Mechanics/electronics

	WTB11-2	WTF11-2	WTE11-2	WL11-2	WSE11-2
Supply voltage ¹⁾	10 V DC ... 30 V DC				
Ripple ²⁾	≤ 5 V _{pp}				
Power consumption	≤ 40 mA ³⁾	≤ 30 mA ³⁾	≤ 40 mA ³⁾	–	
Power consumption, sender	–			≤ 25 mA ³⁾	
Power consumption, receiver	–			≤ 20 mA ³⁾	
Output type	PNP/NPN (de- pending on type)	PNP	PNP/NPN (depending on type)		
Output function	Complementary				
Switching mode	Light/dark-switching				
Signal voltage PNP HIGH/LOW	U _v – 2.5 V / approx. 0 V				
Signal voltage NPN HIGH/LOW	Approx. V _g / < 2.5 V	–	Approx. V _S / < 2.5 V		
Output current I _{max.}	100 mA				
Response time ⁴⁾	≤ 2.5 ms				
Switching frequency ⁵⁾	200 Hz				
Connection type	Cable, 2 m ⁶⁾ Male connector, M12 (depending on type)	Male connector, M12	Cable, 2 m ⁶⁾ Male connector, M12 (depending on type)		
Circuit protection	A ^{7)/} C ^{8)/} D ⁹⁾				
Protection class	II			II ¹⁰⁾	II

	WTB11-2	WTF11-2	WTE11-2	WL11-2	WSE11-2
Weight					
Connector	120 g				
Cable	200 g	–	200 g		
Polarisation filter	–			✓	–
Housing material	ABS				
Optics material	PMMA				
Enclosure rating	IP 66/IP 67 /IP 69K		IP 66/IP 67	IP 66/IP 67/IP 69K	
Test input sender off	–				TE to 0 V
Ambient operating temperature	–30 °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⁾ Reference voltage DC 50 V.

Ordering information

Other models available at www.mysick.com/en/W11-2

WTB11-2

- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer, 5 turns

Sensing range max. ¹⁾	Light source	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
20 mm ... 350 mm	LED	Ø 6 mm (200 mm)	PNP	Cable, 4-wire, 2 m, PVC	Cd-094	WTB11-2P1131	1041377
				Connector M12, 4-pin	Cd-083	WTB11-2P2431	1041376
			NPN	Cable, 4-wire, 2 m, PVC	Cd-094	WTB11-2N1131	1041379
				Connector M12, 4-pin	Cd-083	WTB11-2N2431	1041378
30 mm ... 1,100 mm	PinPoint-LED	Ø 6 mm (200 mm)	PNP	Connector M12, 4-pin	Cd-083	WTB11-2P2461	1044442
			NPN	Connector M12, 4-pin	Cd-083	WTB11-2N2461	1051818

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

WTF11-2

- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer, 5 turns

Sensing range max. ¹⁾	Light source	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
35 mm ... 350 mm	LED	Ø 6 mm (200 mm)	PNP	Connector M12, 4-pin	Cd-083	WTF11-2P2431	1041380

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

WTE11-2

- **Switching mode:** light/dark-switching
- **Adjustment:** single teach-in button

Sensing range max. ¹⁾	Light source	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
40 mm ... 1,000 mm	LED	Ø 90 mm (600 mm)	PNP	Cable, 4-wire, 2 m, PVC	Cd-094	WTE11-2P1132	1041382
				Connector M12, 4-pin	Cd-083	WTE11-2P2432	1041381
			NPN	Cable, 4-wire, 2 m, PVC	Cd-094	WTE11-2N1132	1041384
				Connector M12, 4-pin	Cd-083	WTE11-2N2432	1041383

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

WL11-2

- **Switching mode:** light/dark-switching
- **Polarisation filter:** ✓

Sensing range max. ¹⁾	Light source	Light spot size (distance)	Output type	Adjustment	Connection	Connection diagram	Model name	Part no.
0.15 m ... 10 m	LED	Ø 50 mm (3 m)	PNP	–	Cable, 4-wire, 2 m, PVC	Cd-094	WL11-2P1130	1041386
					Connector M12, 4-pin	Cd-083	WL11-2P2430	1041385
				Single teach-in button	Connector M12, 4-pin	Cd-083	WL11-2P2432	1048542
			NPN	–	Cable, 4-wire, 2 m, PVC	Cd-094	WL11-2N1130	1041388
					Connector M12, 4-pin	Cd-083	WL11-2N2430	1041387

¹⁾ PL80A

WL11-2, detecting objects wrapped in film

- **Switching mode:** light/dark-switching
- **Polarisation filter:** ✓

Sensing range max. ¹⁾	Light source	Light spot size (distance)	Output type	Adjustment	Connection	Connection diagram	Model name	Part no.
0.05 m ... 3 m	LED	Ø 50 mm (3 m)	PNP	–	Connector M12	Cd-083	WL11-2P2430S05	1056080

¹⁾ PL80A

WSE11-2

- **Switching mode:** light/dark-switching
- **Adjustment:** –

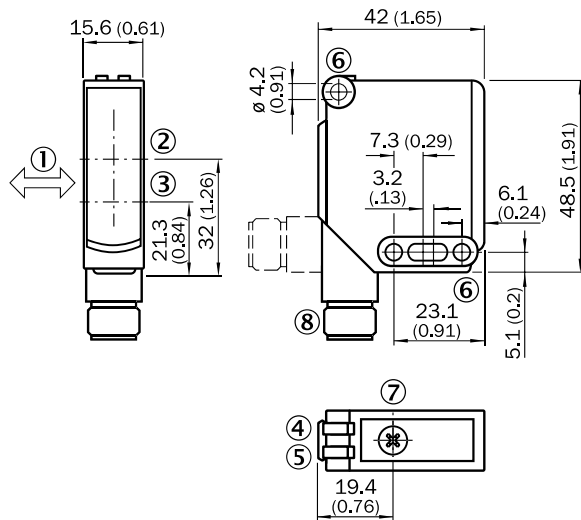
Sensing range max. ¹⁾	Light source	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
0 m ... 20 m	LED	Ø 220 mm (15 m)	PNP	Cable, 4-wire, 2 m, PVC	Cd-088	WSE11-2P1130	1057572
				Connector M12, 4-pin	Cd-084	WSE11-2P2430	1057571
			NPN	Cable, 4-wire, 2 m, PVC	Cd-088	WSE11-2N1130	1057574
				Connector M12, 4-pin	Cd-084	WSE11-2N2430	1057573

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

Dimensional drawings

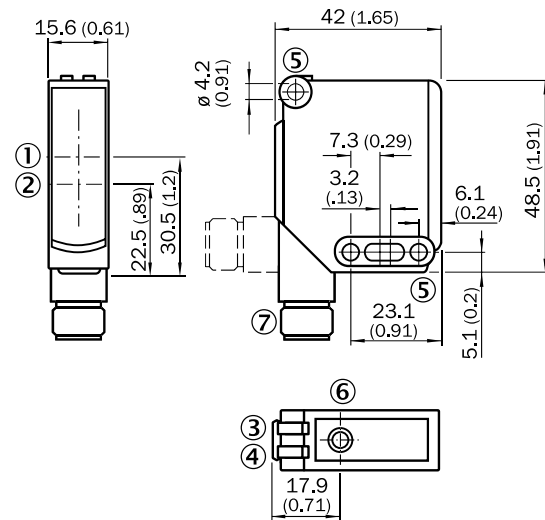
Dimensions in mm (inch)

WTB11-2, WTF11-2



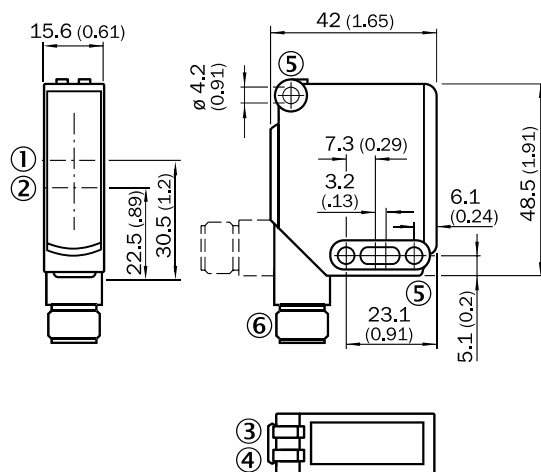
- ① Standard direction of the material being detected
- ② Optical axis, receiver
- ③ Optical axis, sender
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Mounting hole \varnothing 4.2 mm
- ⑦ Sensing range adjustment: potentiometer
- ⑧ Connection

WTE11-2



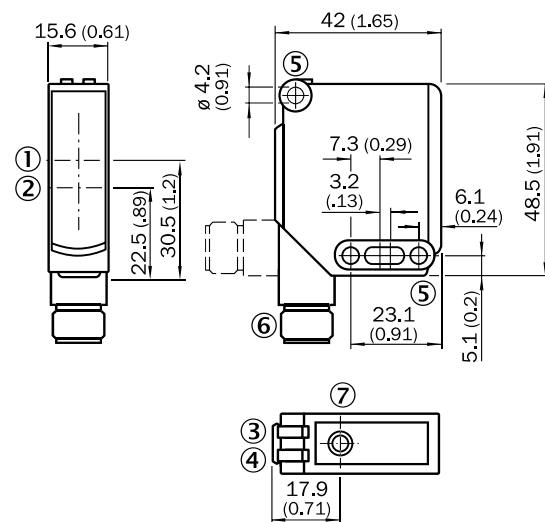
- ① Optical axis, sender
- ② Optical axis, receiver
- ③ Status indicator LED green: power on
- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Mounting hole \varnothing 4.2 mm
- ⑥ Sensitivity setting: single teach-in button
- ⑦ Connector M12 or cable

WL11-2



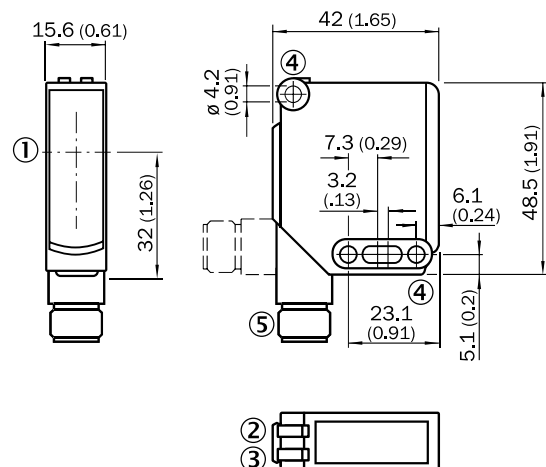
- ① Optical axis, sender
- ② Optical axis, receiver
- ③ Status indicator LED green: power on
- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Mounting hole \varnothing 4.2 mm
- ⑥ M12 connector, 4-pin or cable

WL11-2, teach-in button



- ① Optical axis, sender
- ② Optical axis, receiver
- ③ Status indicator LED, yellow: Status of received light beam
- ④ Status indicator LED green: power on
- ⑤ Mounting hole \varnothing 4.2 mm
- ⑥ Connector M12, 4-pin

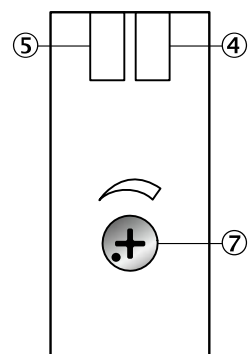
WSE11-2



- ① Center of optical axis
- ② Status indicator LED green: power on
- ③ Status indicator LED, yellow: Status of received light beam
- ④ Mounting hole \varnothing 4.2 mm
- ⑤ M12 connector, 4-pin or cable

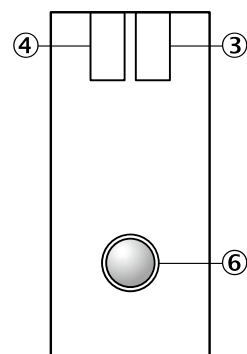
Adjustments

WTB11-2, WTF11-2



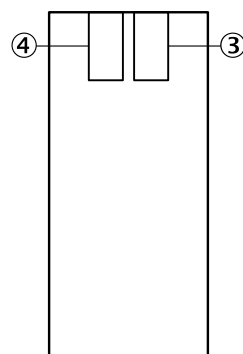
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑦ Sensing range adjustment: potentiometer

WTE11-2, WSE11-2



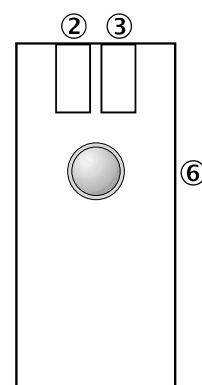
- ③ Status indicator LED green: power on
- ④ Status indicator LED, yellow: Status of received light beam
- ⑥ Adjustment sensing range: single teach-in button

WL11-2



- ③ Status indicator LED green: power on
- ④ Status indicator LED, yellow: Status of received light beam

WL11-2, teach-in button

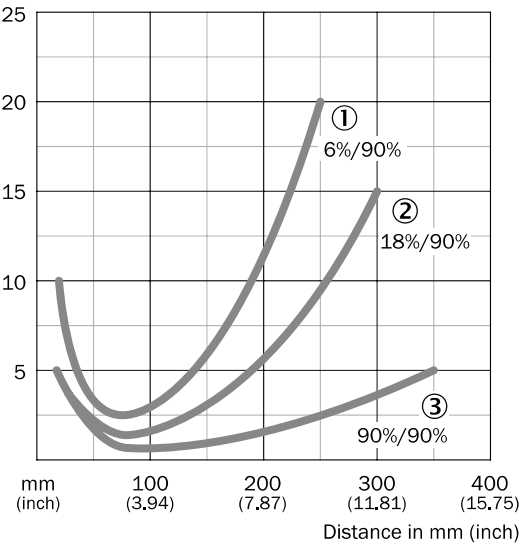


- ② LED indicator yellow: Light received
- ③ LED indicator, green: power on, teach-in mode I, LED indicator, blue: teach-in mode II
- ⑥ Single teach-in button, Function 1: teach-in sensitivity on reflector, Function 2: change operation/teach-in mode

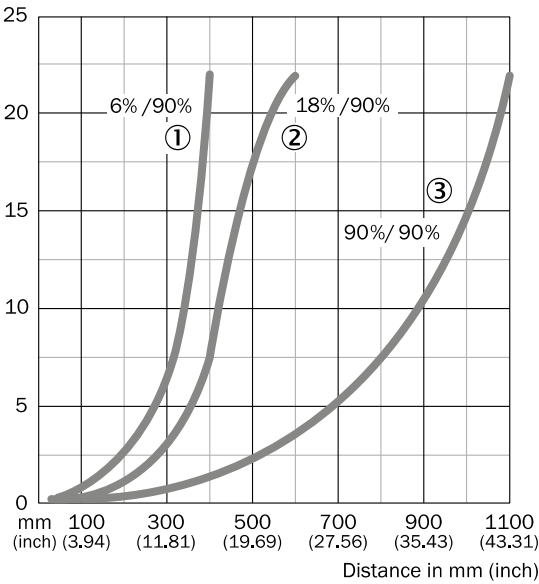
Characteristic curves

Black-white shift

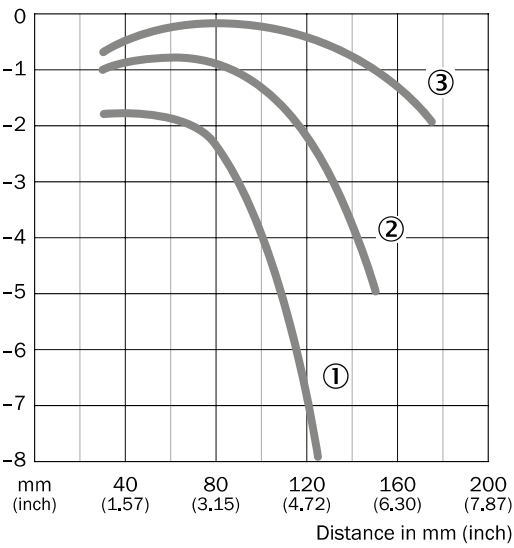
WTB11-2, 350 mm



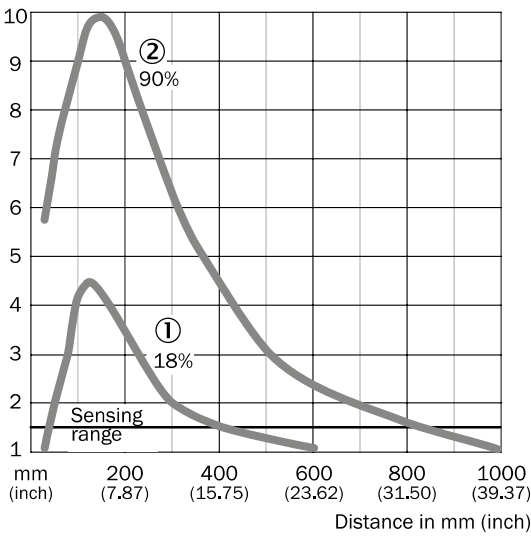
WTB11-2, 1,100 mm



WTF11-2

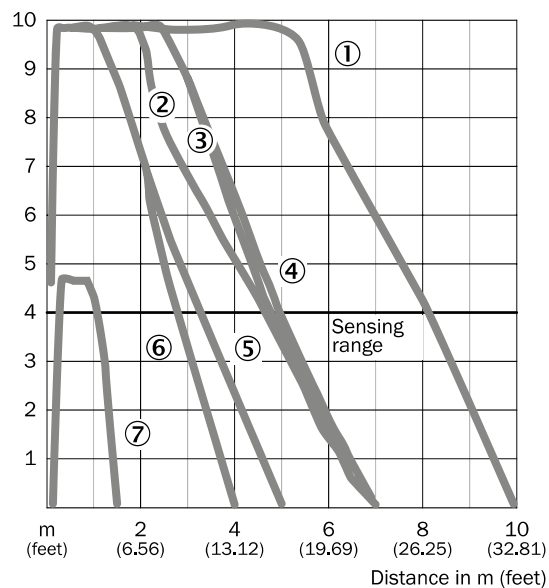


WTE11-2



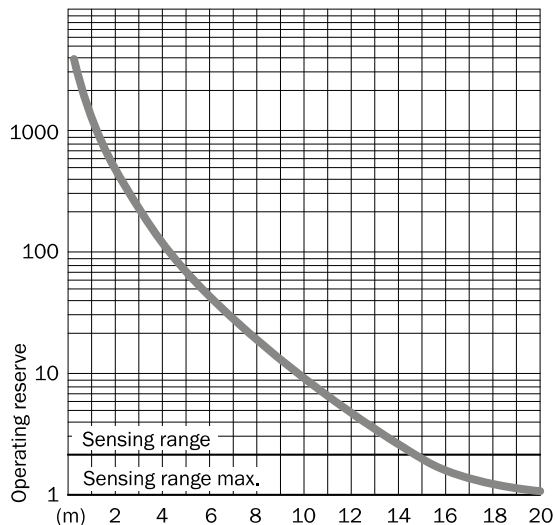
Operating reserve

WL11-2



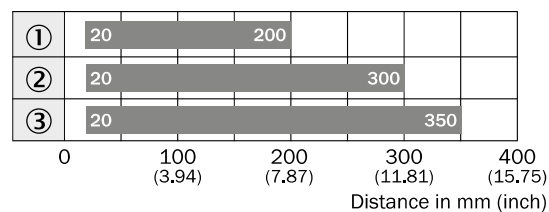
- ① PL80A
- ② C110A
- ③ PL50A
- ④ PL40A
- ⑤ PL30A
- ⑥ PL20A
- ⑦ Reflective tape Diamond Grade

WSE11-2



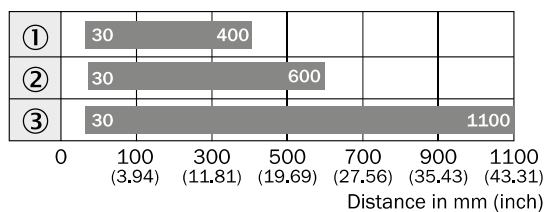
Bar diagrams

WTB11-2, 350 mm



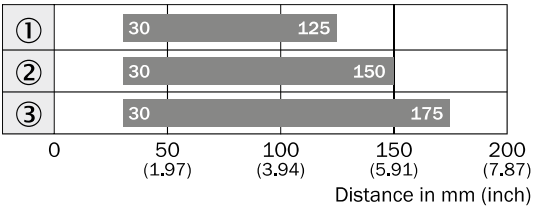
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WTB11-2, 1,100 mm



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

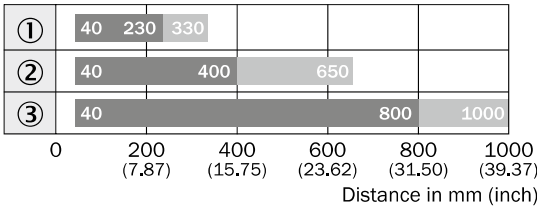
WTF11-2



■ Sensing range

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

WTE11-2

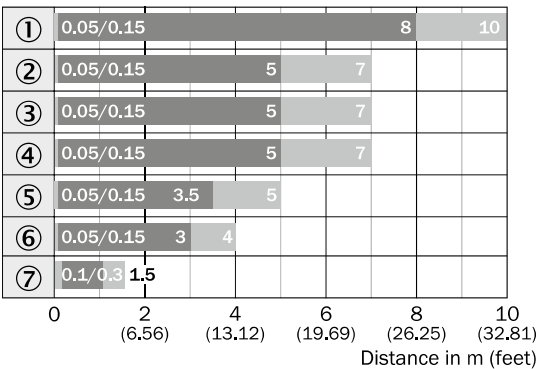


■ Sensing range

■ 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

WL11-2



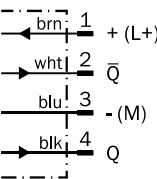
■ Sensing range

■ Sensing range typ. max.

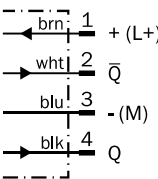
- ① PL80A
- ② C110A
- ③ PL50A
- ④ PL40A
- ⑤ PL30A
- ⑥ PL20A
- ⑦ Reflective tape Diamond Grade

Connection diagram

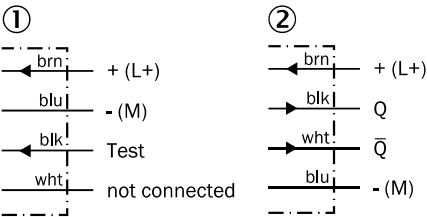
Cd-083



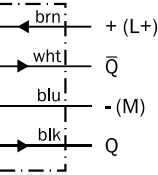
Cd-084



Cd-088



Cd-094




- ① Sender
- ② Receiver

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
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67	DOL-1204-W02M	6009383
	Female connector, M12, 5-pin, straight	Cable, open conductor heads	2 m, 5-wire	IP 67	DOL-1205-G02M	6008899
	Female connector, M12, 5-pin, angled	Cable, open conductor heads	2 m, 5-wire	IP 67	DOL-1205-W02M	6008900

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 plated steel (sheet), Diecast zinc (clamp)	Plate N02 for universal clamp bracket	BEF-KHS-N02	2051608
		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-W12-3	2045175

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

Terminal and alignment brackets

Terminal brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Double clamp bracket for dovetail mounting	BEF-DKH-W12	2013947
		Clamping block for dovetail mounting	BEF-KH-W12	2013285

→ For additional accessories, please see page L-861