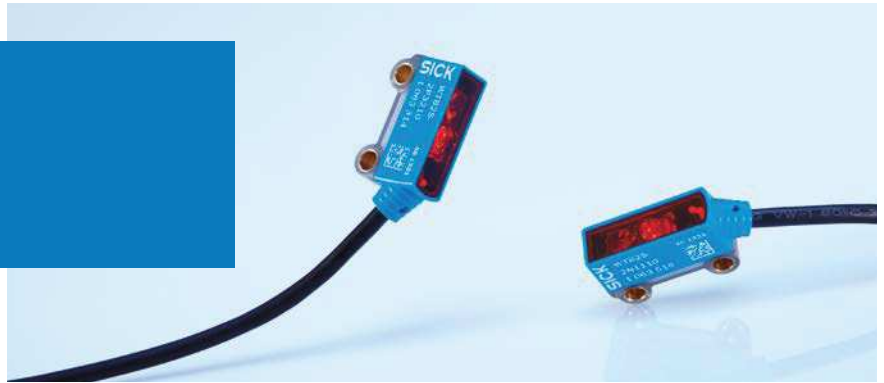


Incredibly small, yet powerful



F



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Product description

Developing lighter, more compact and more intelligent machines. The incredibly small, new-generation W2S-2 miniature photoelectric sensor offers completely new machine design possibilities. Intelligent features: the sensors feature background suppression that enables detection of black objects with a degree of reflection of 1%. The W2S-2 also offers world-class sensing distances in this housing size.

Whether it is used in machines in the pharmaceutical industry, in logistics handling applications or in automatic assembly equipment, the ultra-compact

W2S-2 offers optimal performance and high reliability in industrial environments. The latest automation innovation is already on board: both the sensing range as well as continuous monitoring are set via the controller. The W2S-2 reduces the load on the machine control by using a counter, timestamp and false tripping suppression functions.

Programmable sensors, adjustable via a 3-turn potentiometer, and sensors with fixed sensing distances of 15 mm, 30 mm, 45 mm and 60 mm are also available.

At a glance

- Sensor with background suppression and without any significant black/white shift
- PinPoint 2.0 LED with extended sensing distances and high operating reserves
- Clearly-defined laser-like or line-shaped light spots
- Detection of highly-transparent and reflective objects using sensors with V-optics
- Photoelectric retro-reflective sensor with autocollimation

Your benefits

- Machine design flexibility: the ultra-compact sensors offer above-average sensing distances and provide space-saving installation
- Remote setup: sensors installed in confined spaces can be set and monitored remotely via IO-Link.
- High operational reliability: black objects are detected with a degree of reflection of 1%
- Maximum reliability during object detection
- Quick and easy commissioning: the photoelectric retro-reflective sensor with autocollimation provides a clearly visible light spot for high process reliability
- Universal application options: wide range of models enclosed in a rugged housing

→ www.mysick.com/en/W2S-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

	WTB2S-2	WTV2S-2	WL2S-2	WSE2S-2
Sensor principle	Photoelectric proximity sensor		Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Detection principle	Background suppression		Autocollimation	–
Dimensions (W x H x D)	7.7 mm x 21.8 mm x 13.5 mm 7.7 mm x 27.5 mm x 13.5 mm (depending on type)	7.7 mm x 21.8 mm x 13.5 mm		
Housing design (light emission)	Rectangular			
Sensing range max.	1 mm ... 150 mm ¹⁾ (depending on type)	1 mm ... 36 mm ¹⁾	0 m ... 1.2 m ²⁾	0 m ... 2.5 m
Sensing range	3 mm ... 110 mm ¹⁾ (depending on type)	4 mm ... 30 mm ¹⁾	0 m ... 0.55 m ²⁾	0 m ... 2 m
Type of light	Visible red light			
Light source³⁾	PinPoint LED			
Wave length	640 nm			
Adjustment	Cable / potentiometer, 3 turns (depending on type)	–		
Special feature	Line-shaped light spot (depending on type)	–		

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

²⁾ P250F.

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

Mechanics/electronics

	WTB2S-2	WTV2S-2	WL2S-2	WSE2S-2
Supply voltage¹⁾	10 V DC ... 30 V DC			
Ripple²⁾	≤ 5 V _{pp}			
Power consumption³⁾	≤ 20 mA			
Output type	PNP / NPN ⁴⁾ (depending on type)			
Switching mode	Light switching / Dark-switching / Light/dark-switching ⁴⁾ (depending on type)			
Output current I_{max.}	< 50 mA			
Response time⁵⁾	< 0.4 ms / < 0.5 ms (depending on type)	< 0.4 ms	< 0.5 ms	< 0.4 ms
Switching frequency^{6) 7)}	1,000 Hz / 1,200 Hz (depending on type)	1,200 Hz	1,000 Hz	1,200 Hz
Connection type	Cable, 2 m ⁸⁾ / Cable with connector, M8, 200 mm ⁸⁾ (depending on type)			
Circuit protection	A ⁹⁾ , B ¹⁰⁾ , D ¹¹⁾			
Polarisation filter	–		✓	–
IO-Link	– / ✓ (COM2) (depending on type)	–	–	
Housing material	ABS/PC			

	WTB2S-2	WTV2S-2	WL2S-2	WSE2S-2
Optics material	PMMA			
Enclosure rating	IP 67			
Ambient operating temperature	-20 °C ... +50 °C			
Ambient storage temperature	-40 °C ... +75 °C			

- ¹⁾ Limit values.
- ²⁾ May not exceed or fall short of V_s tolerances.
- ³⁾ Without load.
- ⁴⁾ Parametrisable via IO-Link.
- ⁵⁾ Signal transit time with resistive load.
- ⁶⁾ With light/dark ratio 1:1.
- ⁷⁾ With light/dark ratio 1:1 in switching mode. Different values possible in COM2 mode.
- ⁸⁾ Do not bend below 0 °C.
- ⁹⁾ A = V_s connections reverse-polarity protected.
- ¹⁰⁾ B = output reverse-polarity protected.
- ¹¹⁾ D = outputs overcurrent and short-circuit protected.

Ordering information

Other models available at www.mysick.com/en/W2S-2

WTB2S-2

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression

Sensing range max. ¹⁾	Light spot size (distance)	Adjustment	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
1 mm ... 18 mm	Ø 2 mm (8 mm)	-	PNP	Light switching	Cable, 3-wire, 2 m	Cd-044	WTB2S-2P1310	1064393
					Cable with connector M8, 3-pin, 200 mm	Cd-045	WTB2S-2P3110	1064395
				Dark-switching	Cable, 3-wire, 2 m	Cd-044	WTB2S-2F1310	1064394
			Cable with connector M8, 3-pin, 200 mm		Cd-045	WTB2S-2F3110	1064396	
			Light/dark-switching	Cable with connector M8, 4-pin, 200 mm	Cd-084	WTB2S-2P3210	1063314	
				NPN	Light switching	Cable, 3-wire, 2 m	Cd-044	WTB2S-2N1310
Dark-switching	Cable, 3-wire, 2 m	Cd-044	WTB2S-2E1310		1064397			
1 mm ... 36 mm	Ø 3 mm (15 mm)	-	PNP	Light switching	Cable, 3-wire, 2 m	Cd-044	WTB2S-2P1330	1064573
					Cable with connector M8, 3-pin, 200 mm	Cd-045	WTB2S-2P3130	1064575
				Dark-switching	Cable, 3-wire, 2 m	Cd-044	WTB2S-2F1330	1064574
			Cable with connector M8, 3-pin, 200 mm		Cd-045	WTB2S-2F3130	1064576	
			Light/dark-switching	Cable with connector M8, 4-pin, 200 mm	Cd-084	WTB2S-2P3230	1063517	
				NPN	Light switching	Cable, 3-wire, 2 m	Cd-044	WTB2S-2N1330
			Dark-switching		Cable, 3-wire, 2 m	Cd-044	WTB2S-2E1330	1064580
			Light/dark-switching		Cable, 4-wire, 2 m	Cd-095	WTB2S-2N1130	1063321
				Cable with connector M8, 4-pin, 200 mm	Cd-084	WTB2S-2N3230	1064581	

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



Sensing range max. ¹⁾	Light spot size (distance)	Adjustment	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
1 mm ... 66 mm	Ø 4.5 mm (40 mm)	-	PNP	Light switching	Cable, 3-wire, 2 m	Cd-044	WTB2S-2P1360	1064605
					Cable with connector M8, 3-pin, 200 mm	Cd-045	WTB2S-2P3160	1064607
				Dark-switching	Cable, 3-wire, 2 m	Cd-044	WTB2S-2F1360	1064606
					Cable with connector M8, 3-pin, 200 mm	Cd-045	WTB2S-2F3160	1064608
			Light/dark-switching	Cable with connector M8, 4-pin, 200 mm	Cd-084	WTB2S-2P3260	1063545	
			NPN	Light switching	Cable, 3-wire, 2 m	Cd-044	WTB2S-2N1360	1064609
4 mm ... 110 mm	Ø 4.4 mm (100 mm)	Cable	PNP	Light switching	Cable, 4-wire, 2 m	Cd-093	WTB2S-2P1145	1064614
					Cable with connector M8, 4-pin, 200 mm	Cd-092	WTB2S-2P3245	1064615
			NPN	Light switching	Cable, 4-wire, 2 m	Cd-093	WTB2S-2N1145	1063552
1 mm ... 150 mm	Ø 3.5 mm (50 mm)	Potentiometer, 3 turns	PNP	Light/dark-switching	Cable, 4-wire, 2 m	Cd-095	WTB2S-2P1151	1066110
					Cable with connector M8, 4-pin, 200 mm	Cd-084	WTB2S-2P3251	1066111
			NPN	Light/dark-switching	Cable, 4-wire, 2 m	Cd-095	WTB2S-2N1151	1066113
					Cable with connector M8, 4-pin, 200 mm	Cd-084	WTB2S-2N3251	1066114

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

WTB2S-2, line-shaped light spot

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Switching frequency:** 1,000 Hz (with light/dark ratio 1:1 in switching mode. Different values possible in COM2 mode.)

Sensing range max. ¹⁾	Light spot size (distance)	Adjustment	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
4 mm ... 90 mm	2.2 mm x 9 mm (45 mm)	Cable	NPN	Light switching	Cable, 4-wire, 2 m	Cd-093	WTB2S-2P1175	1064621
			PNP	Light switching	Cable with connector M8, 4-pin, 200 mm	Cd-092	WTB2S-2P3275	1064620

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

WTB2S-2, IO-Link

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Switching mode:** light switching (Parametrisable via IO-Link.)
- **Switching frequency:** 1,000 Hz (with light/dark ratio 1:1 in switching mode. Different values possible in COM2 mode.)

Sensing range max. ¹⁾	Light spot size (distance)	Adjustment	Output type	IO-Link	Connection	Connection diagram	Model name	Part no.
4 mm ... 110 mm	Ø 4.4 mm (60 mm)	Cable	PNP	Standard functions	Cable with connector M8, 4-pin, 200 mm	Cd-098	WTB2SC-2P3244	1063550

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

WTB2S-2, IO-Link, line-shaped light spot

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Switching mode:** light switching (Parametrisable via IO-Link.)
- **Switching frequency:** 1,000 Hz (with light/dark ratio 1:1 in switching mode. Different values possible in COM2 mode.)

Sensing range max. ¹⁾	Light spot size (distance)	Adjustment	Output type	IO-Link	Connection	Connection diagram	Model name	Part no.
4 mm ... 90 mm	2.2 mm x 9 mm (45 mm)	Cable	PNP	Standard functions	Cable with connector M8, 4-pin, 200 mm	Cd-098	WTB2SC-2P3274	1063646

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

WTV2S-2, V-optics

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Switching frequency:** 1,200 Hz (With light/dark ratio 1:1.)

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
1 mm ... 36 mm	∅ 2 mm (15 mm)	PNP	Light switching	Cable, 3-wire, 2 m	Cd-044	WTV2S-2P1320	1064660
				Cable with connector M8, 3-pin, 200 mm	Cd-045	WTV2S-2P3120	1064662
			Light/dark-switching	Cable with connector M8, 4-pin, 200 mm	Cd-084	WTV2S-2P3220	1064661

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

WL2S-2

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation
- **Switching frequency:** 1,000 Hz (With light/dark ratio 1:1.)

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0 m ... 1.2 m	∅ 12 mm (250 mm)	PNP	Light switching	Cable, 3-wire, 2 m	Cd-044	WL2S-2P1330	1064590
				Cable with connector M8, 3-pin, 200 mm	Cd-045	WL2S-2P3130	1064592
			Dark-switching	Cable, 3-wire, 2 m	Cd-044	WL2S-2F1330	1064591
				Cable with connector M8, 3-pin, 200 mm	Cd-045	WL2S-2F3130	1064593
			Light/dark-switching	Cable with connector M8, 4-pin, 200 mm	Cd-084	WL2S-2P3230	1063572
				Cable with connector M8, 4-pin, 200 mm	Cd-110	WL2S-2K3230 2)	1064594
		NPN	Light switching	Cable, 3-wire, 2 m	Cd-044	WL2S-2N1330	1064595
			Dark-switching	Cable, 3-wire, 2 m	Cd-044	WL2S-2E1330	1064596
			Light/dark-switching	Cable, 4-wire, 2 m	Cd-095	WL2S-2N1130	1063571

¹⁾ P250F.

²⁾ Pin 2 and 4 swapped.



WSE2S-2

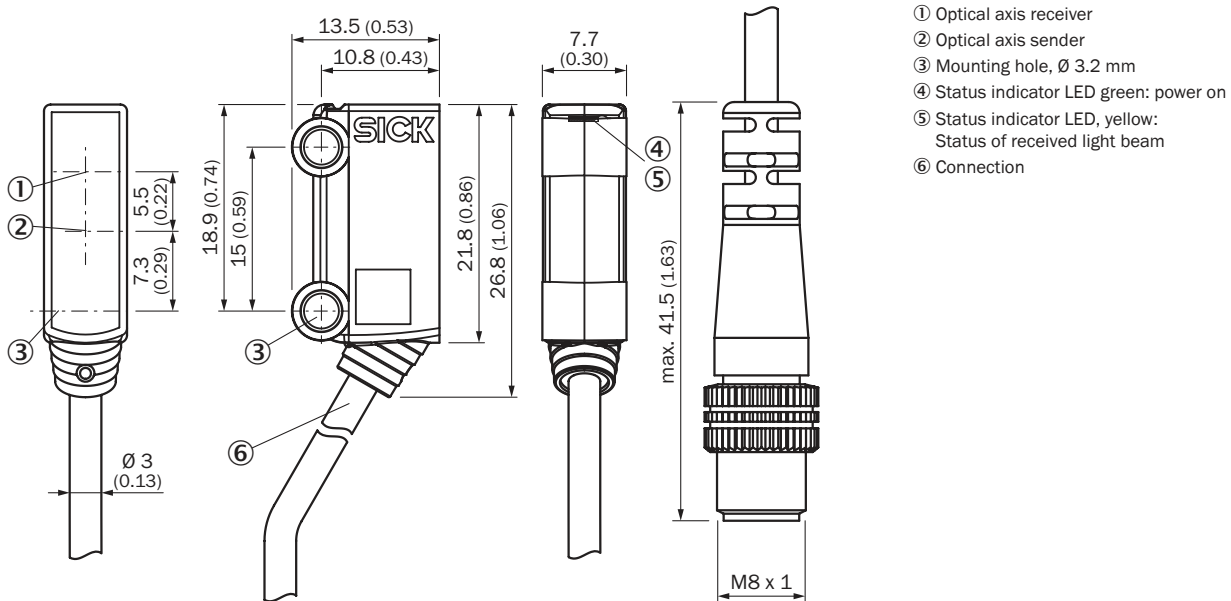
- **Sensor principle:** through-beam photoelectric sensor
- **Switching frequency:** 1,200 Hz (With light/dark ratio 1:1.)

Sensing range max.	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0 m ... 2.5 m	Ø 65 mm (1,500 mm)	PNP	Light switching	Cable, 3-wire, 2 m	Cd-049	WSE2S-2P1330	1065940
				Cable with connector M8, 3-pin, 200 mm	Cd-051	WSE2S-2P3130	1063521
			Dark-switching	Cable, 3-wire, 2 m	Cd-049	WSE2S-2F1330	1965941
				Cable with connector M8, 3-pin, 200 mm	Cd-051	WSE2S-2F3130	1063523
			Light/dark-switching	Cable with connector M8, 4-pin, 200 mm	Cd-085	WSE2S-2P3230	1063650
			NPN	Light switching	Cable, 3-wire, 2 m	Cd-049	WSE2S-2N1330
		Dark-switching		Cable, 3-wire, 2 m	Cd-049	WSE2S-2E1330	1064586
				Cable with connector M8, 3-pin, 200 mm	Cd-051	WSE2S-2E3130	1064588
		Light/dark-switching	Cable, 4-wire, 2 m	Cd-085	WSE2S-2N1130	1063660	

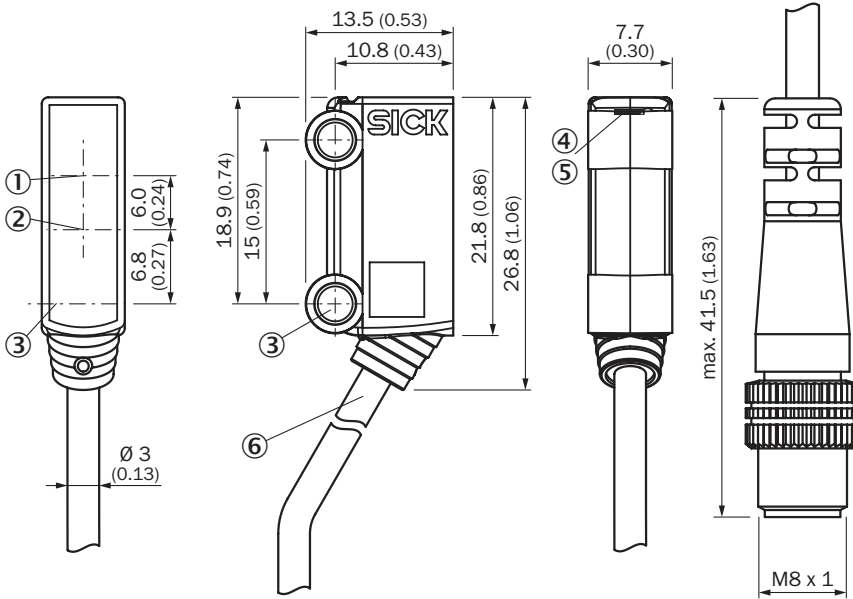
Dimensional drawings

Dimensions in mm (inch)

WTB2S-2, 15 mm, 30 mm, WTV2S-2



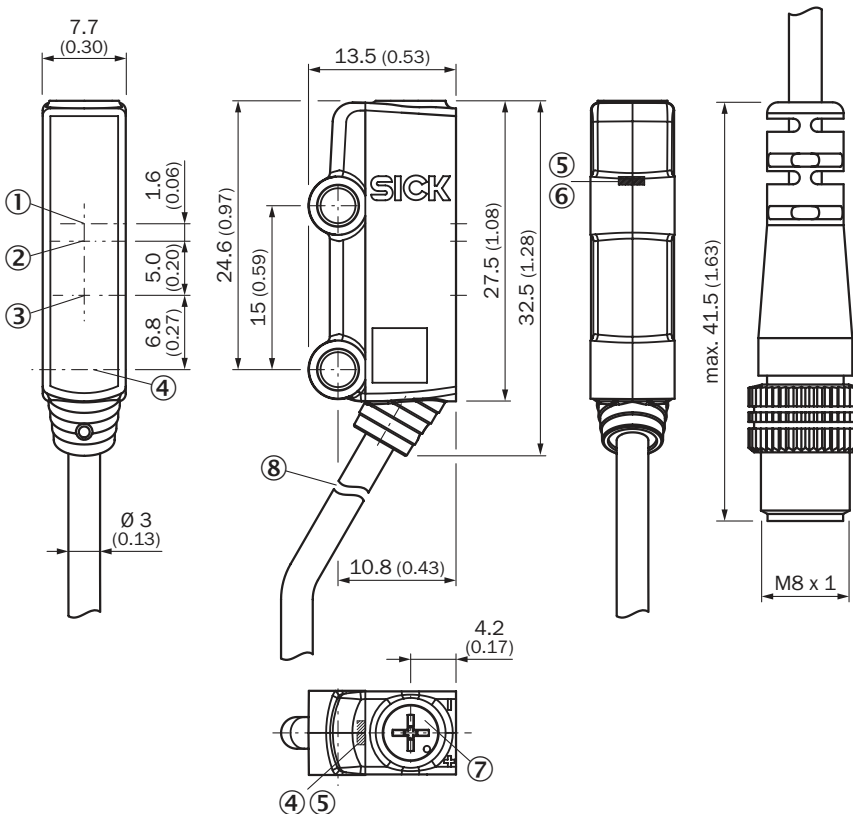
WTB2S-2, 60 mm, 80 mm



- ① Optical axis, receiver
- ② Optical axis, sender
- ③ Middle axis fixing hole \varnothing 3.2 mm
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Connection

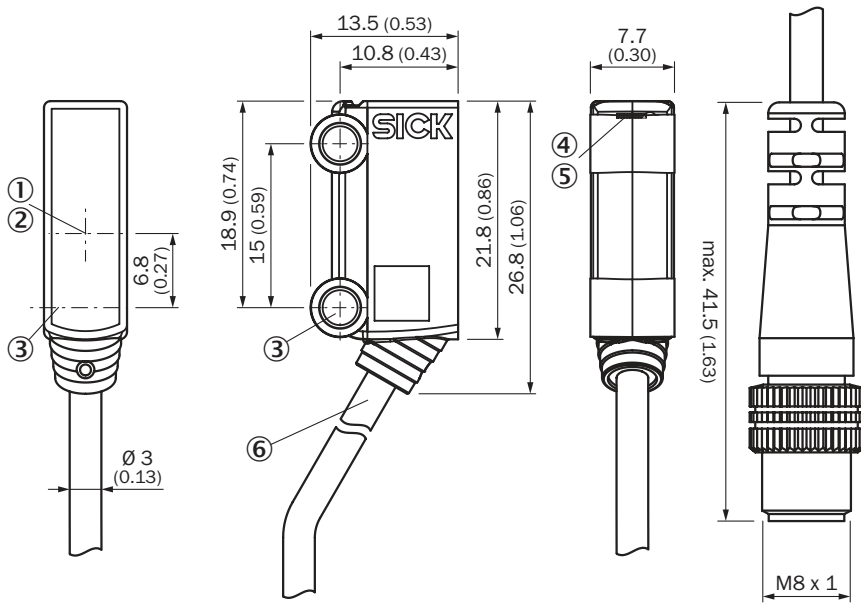
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WTB2S-2, 150 mm



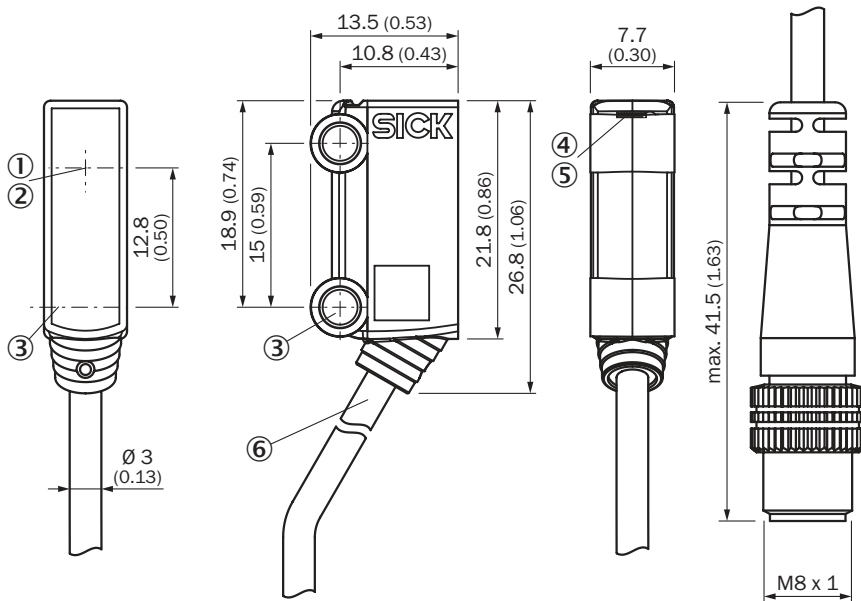
- ① Optical axis, receiver (sensing range min.)
- ② Optical axis, receiver (sensing range max.)
- ③ Optical axis, sender
- ④ Fixing hole \varnothing 3.2 mm
- ⑤ Status indicator LED green: power on
- ⑥ Status indicator LED, yellow: Status of received light beam
- ⑦ Sensing range adjustment: potentiometer, 3 turns
- ⑧ Connection

WL2S-2



- ① Optical axis, receiver
- ② Optical axis, sender
- ③ Middle axis fixing hole $\varnothing 3.2$ mm
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Connection

WSE2S-2

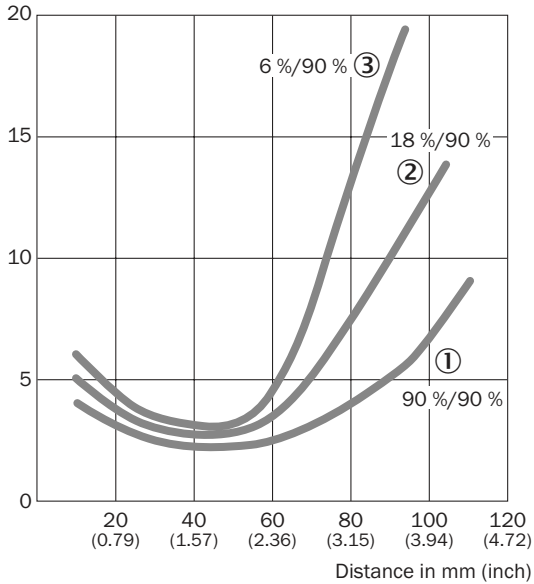


- ① Optical axis, receiver
- ② Optical axis, sender
- ③ Middle axis fixing hole $\varnothing 3.2$ mm
- ④ LED indicator green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Connection

Characteristic curves

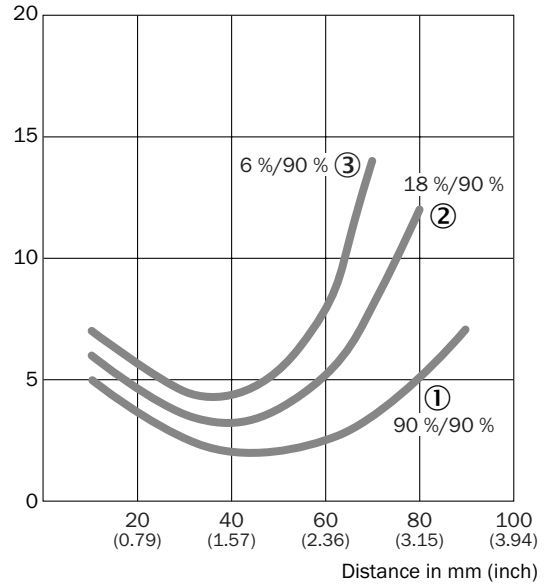
Black-white shift

WTB2S-2, 110 mm



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

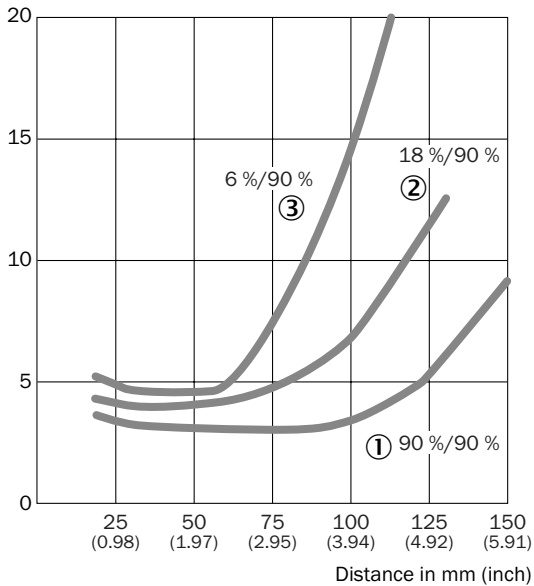
WTB2S-2, 90 mm, line-shaped light spot



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

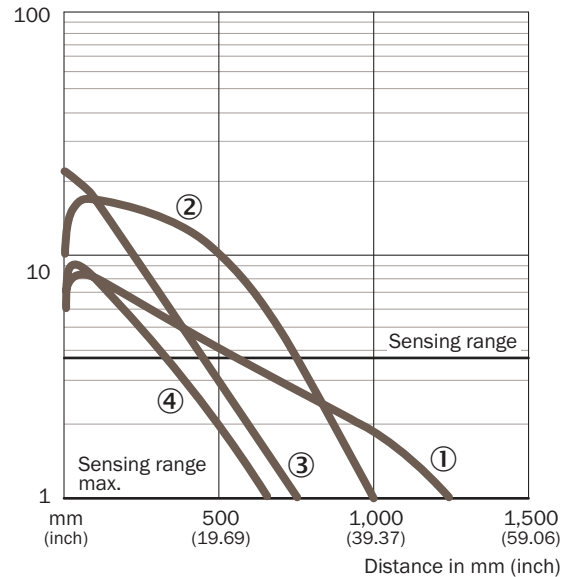
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WTB2S-2, 150 mm



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

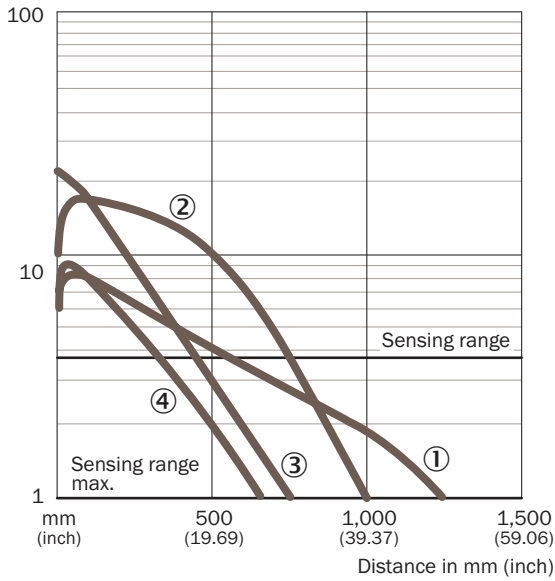
WL2S-2



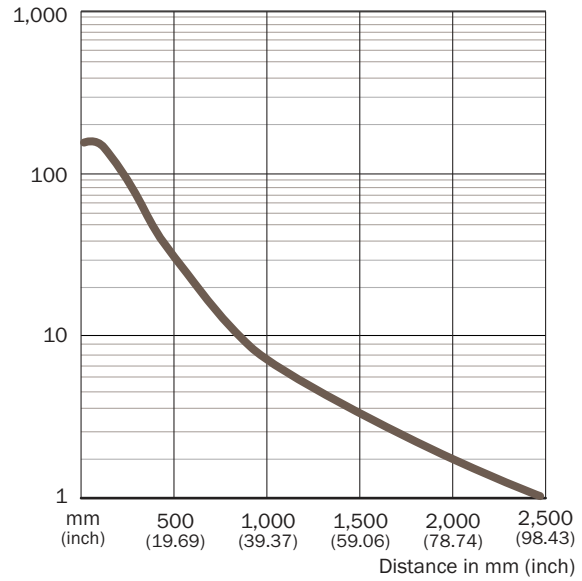
- ① P250F
- ② PL20A
- ③ REF-AC1000
- ④ PL10F

Operating reserve

WL2S-2



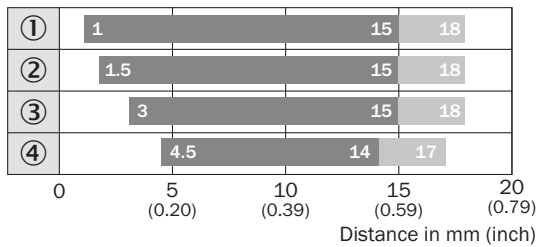
WSE2S-2



- ① P250F
- ② PL20A
- ③ REF-AC1000
- ④ PL10F

Bar diagrams

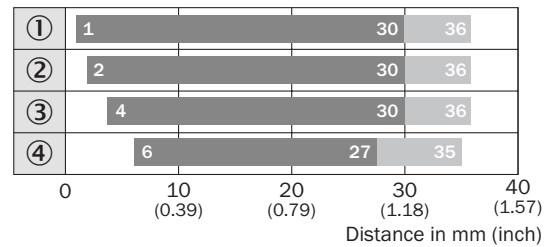
WTB2S-2, 15 mm



■ Sensing range ■ Sensing range max.

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

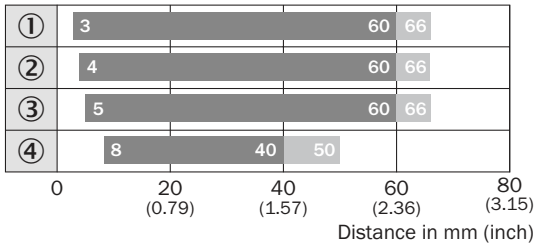
WTB2S-2, 30 mm



■ Sensing range ■ Sensing range max.

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

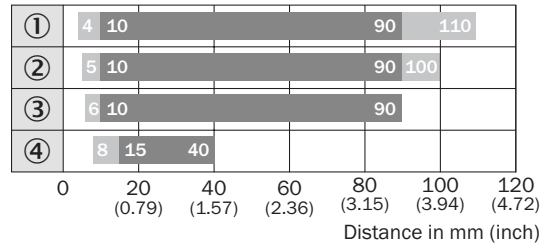
WTB2S-2, 60 mm



■ Sensing range ■ Sensing range max.

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

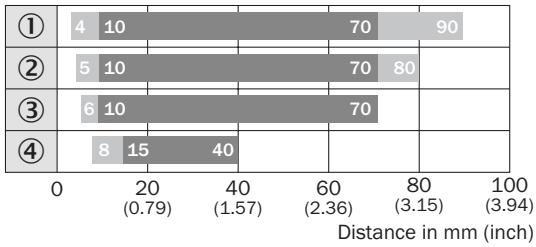
WTB2S-2, 110 mm



■ Sensing range ■ Sensing range max.

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

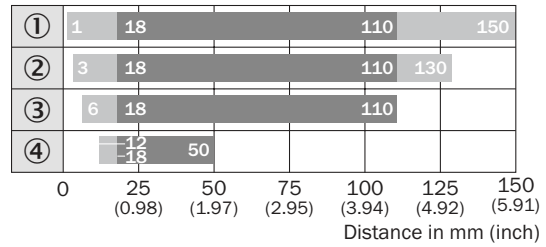
WTB2S-2, 90 mm, line-shaped light spot



■ Sensing range ■ Sensing range max.

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

WTB2S-2, 150 mm

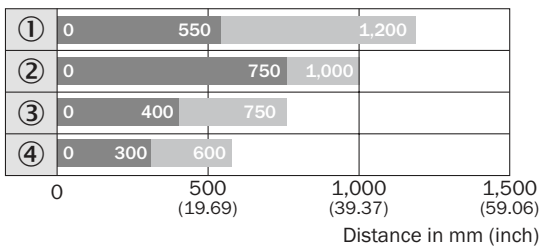


■ Sensing range ■ Sensing range max.

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

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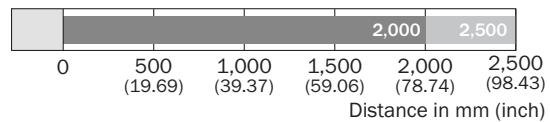
WL2S-2



■ Sensing range ■ Sensing range max.

- ① P250F
- ② PL20A
- ③ REF-AC1000
- ④ PL10F

WSE2S-2

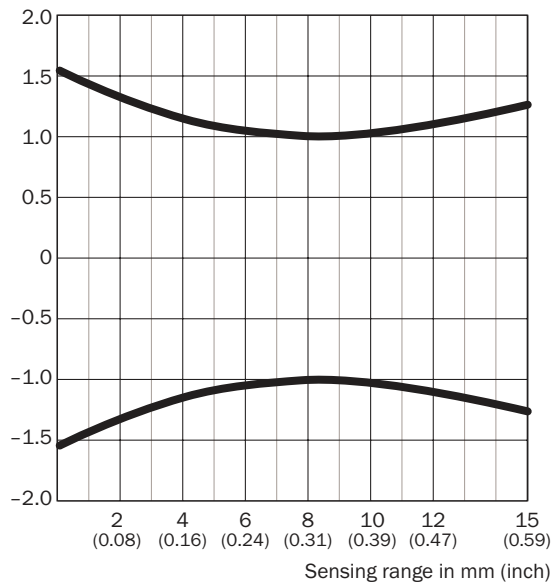


■ Sensing range ■ Sensing range max.

Light spot diameter

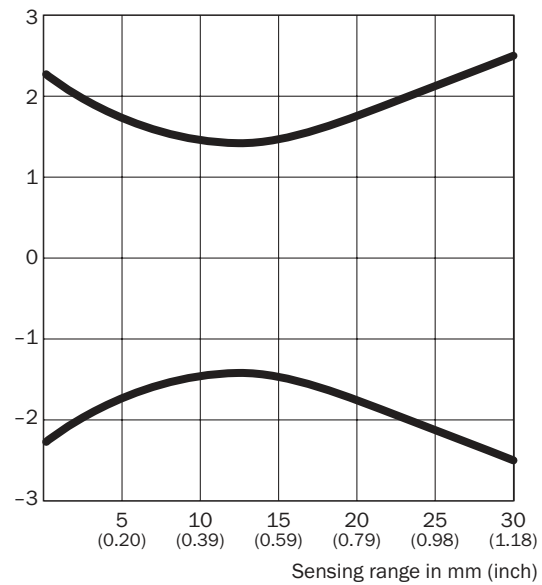
WTB2S-2, 15 mm

Spot diameter in mm (inch)



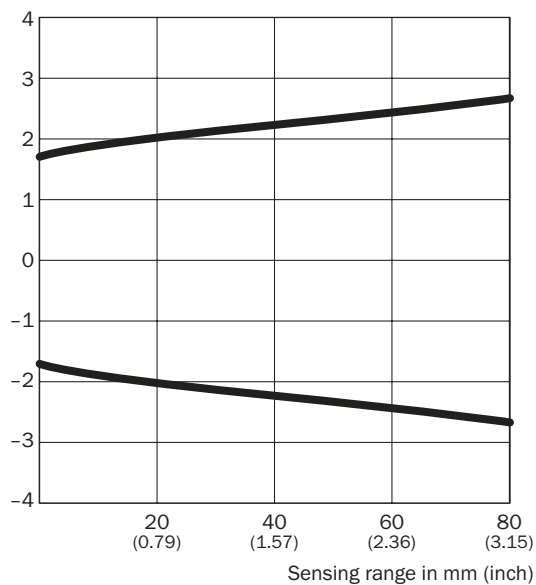
WTB2S-2, 30 mm

Spot diameter in mm (inch)



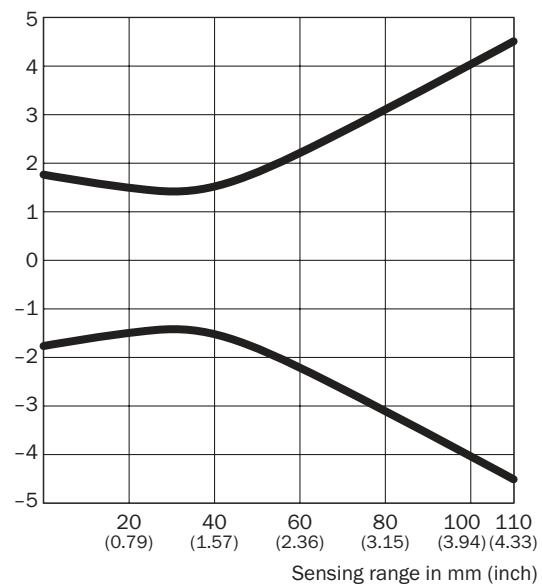
WTB2S-2, 60 mm

Spot diameter in mm (inch)



WTB2S-2, 110 mm

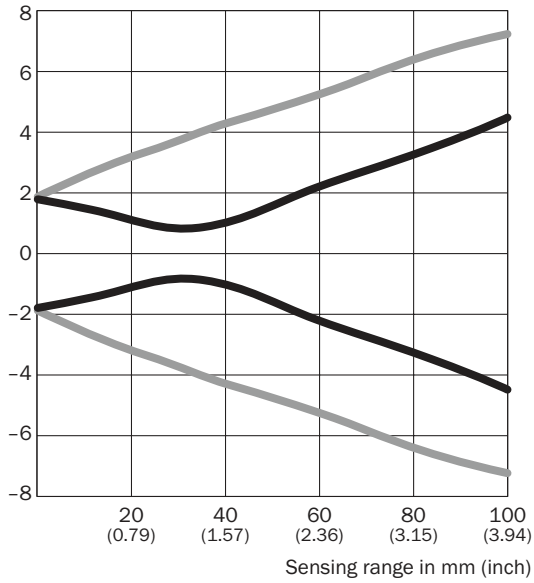
Spot diameter in mm (inch)



F

WTB2S-2, 90 mm, line-shaped light spot

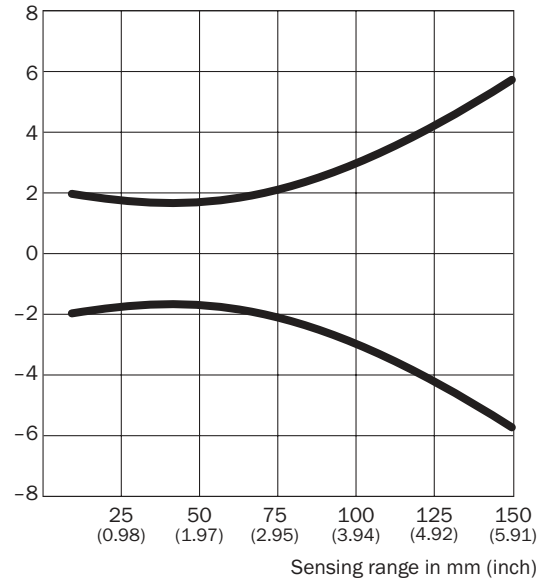
Spot diameter in mm (inch)



— Vertical
— Horizontal

WTB2S-2, 150 mm

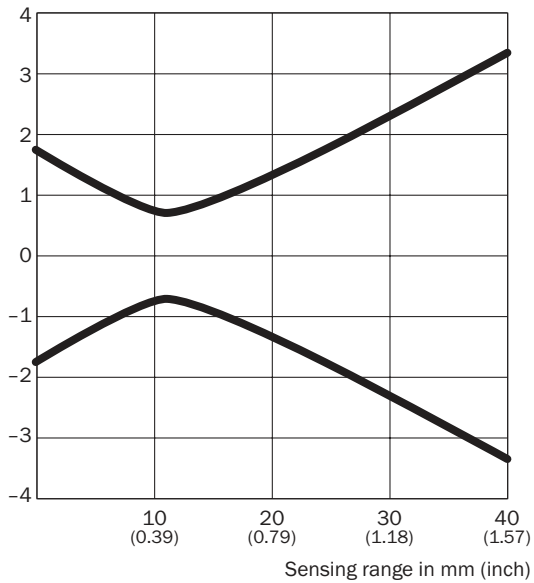
Spot diameter in mm (inch)



F

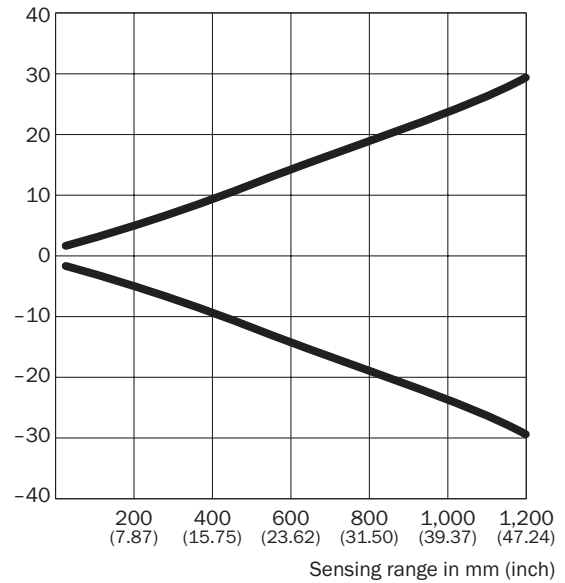
WTV2S-2

Spot diameter in mm (inch)



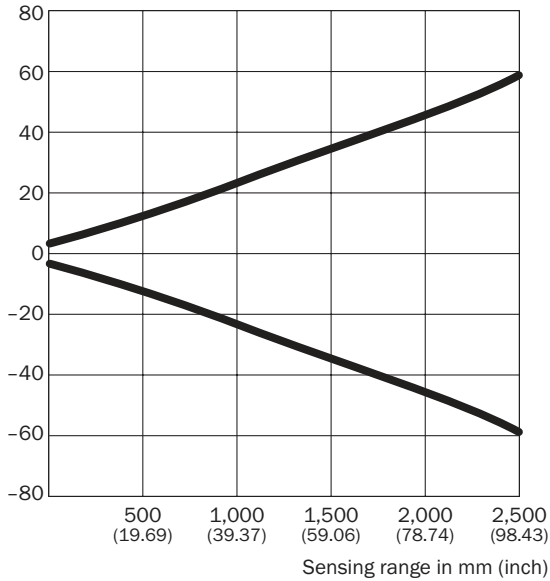
WL2S-2

Spot diameter in mm (inch)



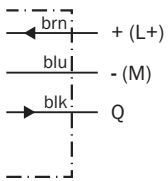
WSE2S-2

Spot diameter in mm (inch)

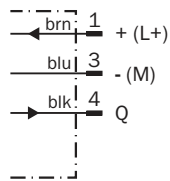


Connection diagram

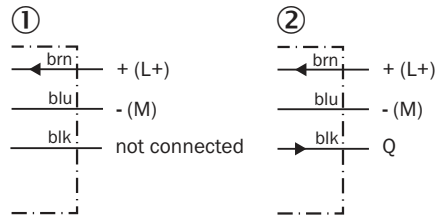
Cd-044



Cd-045

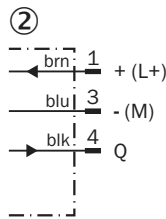
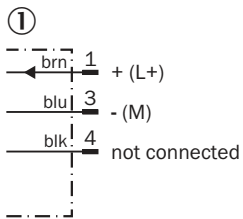


Cd-049



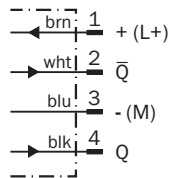
① Sender
② Receiver

Cd-051

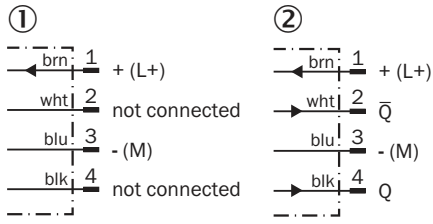


① Sender
② Receiver

Cd-084

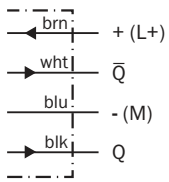


Cd-085

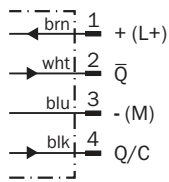


① Sender
② Receiver

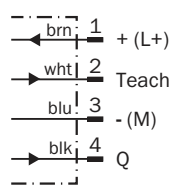
Cd-095



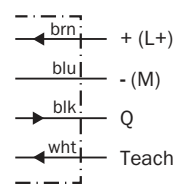
Cd-098



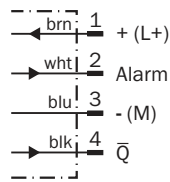
Cd-092



Cd-093

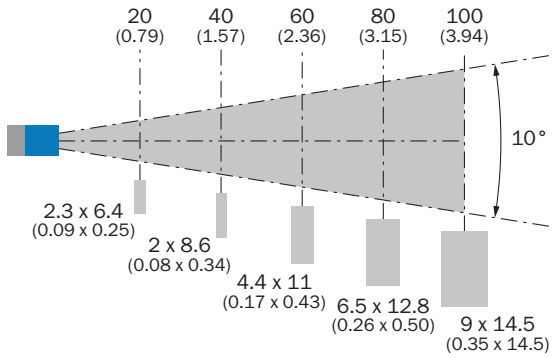


Cd-110



Light spot size

WTB2S-2, 90 mm, line-shaped light spot



Recommended accessories

Plug connectors and cables

Connecting cable (female connector-open)M8, 3-pin, PVC

- 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, M8, 3-pin, straight	Cable, open conductor heads	2 m, 3-wire	IP 67	DOL-0803-G02M	6010785
			5 m, 3-wire	IP 67	DOL-0803-G05M	6022009
	Female connector, M8, 3-pin, angled	Cable, open conductor heads	2 m, 3-wire	IP 67	DOL-0803-W02M	6008489
			5 m, 3-wire	IP 67	DOL-0803-W05M	6022010
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	IP 67	DOL-0804-G02M	6009870
			5 m, 4-wire	IP 67	DOL-0804-G05M	6009872
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67	DOL-0804-W02M	6009871
			5 m, 4-wire	IP 67	DOL-0804-W05M	6009873

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

Fine triple reflectors

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Fine triple, screw connection, suitable for laser sensors, 18 mm x 18 mm	PL10F	5311210

Reflective tape

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

→ For additional accessories, please see page L-861