



Photoelectric Sensors

MultiTask photoelectric sensors, miniature photoelectric sensors, small photoelectric sensors, compact photoelectric sensors, cylindrical photoelectric sensors, fiber-optic sensors and fibers

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Typical applications

This chapter describes typical applications for photoelectric sensors. Arranged according to industry, you will find application examples with a brief description of the typical application as well as a direct product recommendation from our varied product portfolio.



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Typical applications

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Application overview

	MultiTask photoelectric sensors					Miniature photoelectric sensors								
	MultiLine Sensor	MultiPac	Reflex Array	TranspaTect	ZoneControl	G6	W2 Flat	W2S-2	W4-3	W4-3 Glass	W4S-3	W4S-3 Inox	W100 Laser	
Automotive and parts supplier														
Presence and type checking for seat underframe parts														
Part detection		■												
Part detection in a crossbar robot														
Vehicle protrusion monitoring														
Collision prevention at robot grippers														
Quality check using photoelectric sensors		■												
Robot guidance for installation of windshields														
Skid detection at the lift station entry			■											
Type check for car body parts														
Monitoring the feeder clips			■											
Print														
Presence monitoring and counting process									■		■			
Sheet presence and position monitoring									■		■			
Detection of paper edges									■		■			
Paper tear monitor									■		■			
Electronics														
Detecting circuit boards	■													
Device detection in gripper								■						
Object detection and intelligent identification														
Wire bonder automation solutions								■						
Beverage														
Detection of single trays				■										
Detecting PET cases		■												
W4S-3 Inox in a bottling plant												■		
Wine bottling plant: WLL180T determines the filling level														
Wood														
Board detection (application 1)														
Board detection (application 2)														
End of material detection														
Accurate and reliable leading edge detection of profile wood and pallets			■											
Rubber and plastics														
Checking presence and fill level in the singulation system														
Checking the presence and position of trays														
Controlling the conveying line														
Detecting parts in the gripper and the injection molding tool							■							

	Small photoelectric sensors						Compact photoelectric sensors		Cylindrical photoelectric sensors				Fiber-optic sensors and fibers	Page
	W9-3	W9L-3	W12-2 Laser	W12-3	W14-2	W18-3	W27-3	W280L-2 Long Range	GR18S	V18V	V180-2	W15	WL180T and LL3	
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	MultiTask photoelectric sensors					Miniature photoelectric sensors							
	MultiLine Sensor	MultiPac	Reflex Array	TranspaTest	ZoneControl	G6	W2 Flat	W2S-2	W4-3	W4-3 Glass	W4S-3	W4S-3 Inox	W100 Laser
Courier, express, postal and cargo													
Level control for slides/chutes						■							
Speed measurement with laser sensors													■
Empty detection													
Leading edge detection			■										
Retail and warehousing													
Tilt-tray sorter off load detection													
Detection of inhomogeneous containers			■										
Pallet detection			■										
Accumulation conveyor/retrofits					■								
Food													
Detection of highly reflective coffee packages	■												
V18V on a conveyor belt													
WTB4-3 for securing apertures									■		■		
Tire													
Automatic wheel separating on conveyor belts					■								
Tire detection		■											
Loop control: loop measurement		■											
Tire separating					■								
Solar													
Detection in harsh environment												■	
Smart wafer presence detection								■					
Glass panel overhang detection									■	■			
Double wafer detection													
Traffic													
Detection of persons for automatic door opening													
Detection of the direction of travel						■							
Separation in security gates													
Machine tools													
Automated parts infeed and outfeed													
Component detection in a crossbar robot													
Tracking the sheet roll													
Detection of assigned tool locations													
End of material detection													
Stamp breakage monitoring		■											
Optical inline quality checking													
Positioning of the sheet pallet													

	Small photoelectric sensors						Compact photoelectric sensors		Cylindrical photoelectric sensors				Fiber-optic sensors and fibers	Page
	W9-3	W9L-3	W12-2 Laser	W12-3	W14-2	W18-3	W27-3	W280L-2 Long Range	GR18S	V18V	V180-2	W15	WLL180T and LL3	
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E

Detecting, verifying, positioning, counting – photoelectric sensors from SICK

SICK's vast range of photoelectric sensors offer precise optics and advanced technology, creating market-leading solutions with sensor intelligence. By using the latest ASIC and LED technologies, these sensors offer the highest level of operational reliability regardless of any interference factors. Additional sensor information can be used to simplify modern production processes.

This extensive range of photoelectric sensors is used in many automation applications around the world.





E

MultiTask photoelectric sensors

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ZoneControl	E-106
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DeltaPac. E-114
Bridging the Gap



MultiLine Sensor E-124
Two is better than one



MultiPac. E-130
MultiPac – for extreme detection



Reflex Array E-134
The sensor with the light band: multifaceted and economical



TranspaTect E-142
One thing is clear – no reflector needed



ZoneControl E-148
Zero Pressure Accumulation made easy
R/IR E-148 ZLM E-164
WLR E-160

Overview of MultiTask photoelectric sensors

	Housing properties				Sensor properties										
	Material		Enclosure rating												
	Plastic	Metal	IP 66	IP 67	Photoelectric proximity sensor	Multi-background suppression	Background suppression	Foreground suppression	Photoelectric retro-reflective sensor	Reflex Array	MultiLine	MultiPac	IO-Link	AutoAdapt	
DeltaPac NEW															
WTD20															
MultiLine Sensor															
MultiLine															
MultiPac															
WTB27-3 MultiPac															
Reflex Array															
WL27-3 Reflex Array															
TranspaTest NEW															
WTF12G-3															
ZoneControl NEW															
R															
IR															
WLR210															
ZLM															

Photoelectric proximity sensors

			Maximum sensing range	Dimensions (W x H x D)	Page
					
DeltaPac			30 mm ... 40 mm	42 mm x 42 mm x 45 mm	E-114
MultiLine Sensor			5 mm ... 120 mm	16 mm x 39.5 mm x 12 mm	E-124
MultiPac			30 mm ... 500 mm	24.6 mm x 80.6 mm x 54.8 mm	E-130
TranspaTest			150 mm ... 700 mm	15.6 mm x 48.5 mm x 42 mm	E-142
R			60 mm ... 900 mm	20.6 mm x 99.2 mm x 48.9 mm	E-148
IR			60 mm ... 900 mm	59.9 mm x 151.9 mm x 48.9 mm	E-148
Reflex Array			0 m ... 4.5 m	24.6 mm x 80 mm x 54.2 mm	E-134

Optical properties								Special applications								Page
Type of light/Light sender		Light spot geometry		Technology												
LED infrared light	LED red light	PinPoint LED red light	Line-shaped light spot	Light array	SIRIC®	Delta-S-Technology®	ZoneControl	Detecting transparent objects	Detecting perforated objects	Detecting uneven, shiny objects	Detecting objects wrapped in film	Detecting objects with position tolerances	Zero gap detection			
		★	★	★												
		■			■	■							■			E-114
		■	■		■				■	■	■					E-124
		■			■					■	■					E-130
		■		■	■			■	■	■		■				E-134
		■						■		■	■					E-142
■					■		■									E-148
■					■		■									E-148
	■						■									E-160
							■									E-164

Photoelectric retro-reflective sensors

 	 Maximum sensing range	 Dimensions (W x H x D)	Page
WLR210	0 m ... 9 m	45 mm x 73.7 mm x 48.6 mm	E-160

Product family overview

			
	DeltaPac	MultiLine Sensor	
	Bridging the Gap	Two is better than one	
Technical data overview			
Dimensions (W x H x D)	42 mm x 42 mm x 45 mm	16 mm x 39.5 mm x 12 mm	
Sensing range max.			
Delta-S-Technology®	30 mm ... 40 mm	-	
Photoelectric proximity sensor	-	5 mm ... 120 mm	
Reflex Array	-	-	
Light source	PinPoint LED	PinPoint LED	
Type of light	Visible red light	Visible red light	
Enclosure rating	IP 67	IP 66, IP 67	
Housing material	Plastic	Plastic	
At a glance			
	• Delta-S-Technology®: four PinPoint emitters and two energy scales combined with SIRIC® and distance measurement technology • Direction-independent object contours with radius up to 20 mm • For conveyor speeds up to 3 m/s or production capacities up to 200.000 packages per hour • Pre-configured sensors and individual setting via IO-Link • Compact housing (42 mm x 42 mm x 45 mm) with an IP 67 enclosure rating	• Two logical and intelligently linked sensors with background suppression in one miniature housing offer the highest ruggedness for object detection • Consistent, reliable detection of structures and perforated objects such as e-cards • Consistent, reliable detection of reflective and irregular objects such as blister packs and soup sachets on conveyor belts • Maximum sensing range 120 mm • Simple adjustment via teach-in button	
Detailed information	→ E-114	→ E-124	

**MultiPac**

MultiPac – for extreme detection

**Reflex Array**

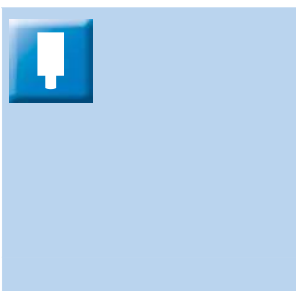
The sensor with the light band: multifaceted and economical

**TranspaTect**

One thing is clear – no reflector needed

	24.6 mm x 80.6 mm x 54.8 mm	24.6 mm x 80 mm x 54.2 mm	15.6 mm x 48.5 mm x 42 mm
	–	–	–
	30 mm ... 500 mm	–	150 mm ... 700 mm
	–	0 m ... 4.5 m	–
	HighPower LED	PinPoint LED	PinPoint LED
	Visible red light	Visible red light	Visible red light
	IP 66, IP 67	IP 67	IP 66, IP 67
	Plastic	Plastic	Metal
	• Two redundant receiver arrays from SICK • The newest SICK chip technology • Intense, visible red HighPower LED • Sensing distance up to 500 mm • Fast and precise commissioning thanks to the highly visible light spot	• Detects objects > 12 mm within a 50 mm light array, regardless of position • Sensing range for detection from 0 m to max. 4.5 m • Minimum distance of 0.5 m between sensor and reflector for all variants • PinPoint technology for intense red light • Automatic adjustment of the switching threshold when there is contamination	• High-performance SICK technology • No reflectors required • Existing machine parts are used as reference target • AutoAdapt for continuous threshold adaptation in contaminated conditions • PinPoint LED with bright and precise light spot • Easy-to-use teach-in button • Status LEDs visible from all sides • Rugged metal housing (PTFE coating available on request)
	→ E-130	→ E-134	→ E-142

Product family overview

	 ZoneControl	
	Zero Pressure Accumulation made easy	
Technical data overview		
Dimensions (W x H x D)	20.6 mm x 99.2 mm x 48.9 mm 50 mm x 147.4 mm x 48.9 mm 59.9 mm x 151.9 mm x 48.9 mm	
Light source	LED	
Type of light	Infrared light	
Enclosure rating	IP 67 / IP 65	
Housing material	Plastic	
At a glance		
	• Three mounting versions: between the rollers (IR/R), side frame mount (ZLM) and over the conveyor (WLR) • Three types of logic: single accumulation, single accumulation with sleep, block (slug) accumulation • Up to 50 ZoneControl solutions can be cascaded in one string • Fully animated simulation to ease selection and implementation • Standard zone lengths of 1m (3ft) or 2m (6 ft)	
Detailed information	→ E-148	

**WLR**

Zero Pressure Accumulation made easy

**ZLM**

Side-mounted conveyor module with zone control intelligence

45 mm x 73.7 mm x 48.6 mm

31 mm x 110 mm x 83 mm

30 mm x 110 mm x 70 mm

31 mm x 93 mm x 74 mm

31 mm x 105 mm x 74 mm

LED

-

Visible red light

-

IP 67

IP 40

Plastic

Plastic

- Connects to any 9.4 mm DIN valve
- Single or slug accumulation
- Ideal for pneumatic actuators or motor-driven rollers
- Daisy chain connection cables included for zone lengths of 1m (3 ft) and 2 m (6 ft)
- AC power options

→ E-160

- Connects to any discrete DC voltage sensor
- Single or slug accumulation
- Ideal for pneumatic actuators
- Daisy chain connection cable included for zone lengths of 1m (3ft) or 2m (6 ft)
- Bolt-on or clip-on installation into the conveyor's side frame

→ E-164

Bridging the Gap



Product description

For higher efficiency and quality in the packaging industry, the DeltaPac MultiTask photoelectric sensor utilizes Delta-S-Technology®, which combines four PinPoint emitters and two receivers with SIRIC® and distance measurement technology. The photoelectric sensor detects object contours with radii between 1 and 20 mm – independent of the direction and irrespective of the object's surface color – with the highest level of immunity to active and passive interference. The operating distance is between

30 and 40 mm to the front edge of the object. This means that packages do not need to be manually separated. Collisions are avoided. For better space and time utilization. The DeltaPac provides information about how many packages are present in the process for full production monitoring. The photoelectric sensor is available as a pre-configured device for fast and error-free commissioning. IO-Link, which is also available, enables tailored configuration and adaptation to match the desired application.

At a glance

- Delta-S-Technology®: four PinPoint emitters and two energy scales combined with SIRIC® and distance measurement technology
- Direction-independent object contours with radius up to 20 mm
- For conveyor speeds up to 3 m/s or production capacities up to 200.000 packages per hour
- Pre-configured sensors and individual setting via IO-Link
- Compact housing (42 mm x 42 mm x 45 mm) with an IP 67 enclosure rating

Your benefits

- Selective process optimization: information about the number of packages in the process enables better production monitoring
- Better space utilization: no mechanical devices are required to isolate packages, reducing the width of packaging systems and saving space
- Better time management: packages run in push-push mode, which prevents collisions and toppling, and reduces machine downtime
- Stable production for enhanced energy consumption
- Fast and intuitive commissioning due to pre-configuration
- Configuration via the IO-Link enables users to customize features based on the applications
- Space-saving mounting due to compact housing



Additional information

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→ www.mysick.com/en/DeltaPac

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

Sensor principle	Delta-S-Technology®
Dimensions (W x H x D)	42 mm x 42 mm x 45 mm
Housing design (light emission)	Rectangular
Sensing range max.	30 mm ... 40 mm ¹⁾ (depending on type)
Type of light	Visible red light
Light source ²⁾	PinPoint LED
Light spot size (distance)	4 x Ø 1 mm (30 mm)
Wave length	635 nm
Optimized parameterization for the following objects	Folding box or stacked empty packages / rounded, rounded out and prism shaped packaging, such as beverage cartons and soft packaging (depending on type)

¹⁾ The sensing range max. refers to the object leading edge. The individual object leading edges must be within the operating range.

²⁾ Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	≤ 5 V _{pp}
Power consumption	≤ 70 mA ³⁾ /≤ 160 mA (depending on type)
Output type	NPN/PNP (depending on type)
Output current I_{max.}	≤ 2 x 100 mA
Connection type	Cable, 2 m ⁴⁾ /Male connector, M12 (depending on type)
Circuit protection	A ⁵⁾ , B ⁶⁾ , C ⁷⁾
Protection class	III
Weight	130 g
IO-Link	-/✓ (COM2) (depending on type)
Housing material	Bayblend
Enclosure rating	IP 67
Ambient operating temperature	-40 °C ... +55 °C
Ambient storage temperature	-40 °C ... +75 °C
Productivity max.	≤ 40,000 Stk./h/≤ 200,000 Stk./h/≤ 54,000 Stk./h (depending on type)
Object speed max.	0.6 m/s/1.2 m/s/3 m/s (depending on type)
Radius of the object contour	1 mm ... 20 mm (depending on type)
Switching accuracy	≤ 2 x radius
Repeatability (T_a not constant)	Typ. < 1 mm
Object width min.	≥ 10 mm/≥ 30 mm/≥ 20 mm (depending on type)
Object height min.	30 mm /50 mm (depending on type)

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

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

³⁾ At 24 V.

⁴⁾ Do not bend below 0 °C.

⁵⁾ A = V_S connections reverse-polarity protected.

⁶⁾ B = inputs and output reverse-polarity protected.

⁷⁾ C = interference suppression.

Ordering information

Other models available at www.mysick.com/en/DeltaPac

WTD20E, for folded boxes

- Object speed max.: 0.6 m/s
- Productivity max.: ≤ 40,000 Stk./h
- Switch on delay Q_1 & Q_2 : ≤ 80 ms
- Time delay off Q_1 : ≤ 80 ms
- Pulse length (Q2): ≤ 20 ms
- Background suppression: ≥ 60 mm
- Object height min.: 30 mm (The object height min. is relevant only for the installation of DeltaPac above the conveyor belt.)
- Current consumption: ≤ 70 mA

Object width min.	Radius of the object contour	Key feature of the object	Sensing range	Output type	Connection	Connection diagram	Model name	Part no.
≥ 10 mm	1 mm ... 2 mm	Edge	30 +/- 2 mm	NPN	Cable, 4-wire, 2 m, PVC	Cd-242	WTD20E-W1145	1065773
				PNP	Connector M12, 4-pin	Cd-243	WTD20E-V2445	1065772

E

WTD20E, IO-Link for folded boxes

- Object speed max.: 0.6 m/s
- Productivity max.: ≤ 200,000 Stk./h
- Switch on delay Q_1 & Q_2 : 0 ms ... 255 ms
- Time delay off Q_1 : 0 ms ... 255 ms
- Pulse length (Q2): 0 ms ... 63 ms
- Background suppression: ≥ 60 mm
- Object height min.: 30 mm (The object height min. is relevant only for the installation of DeltaPac above the conveyor belt.)
- Current consumption: ≤ 70 mA

Object width min.	Radius of the object contour	Key feature of the object	Sensing range	Output type	Connection	Connection diagram	Model name	Part no.
≥ 10 mm	1 mm ... 2 mm	Edge	30 +/- 2 mm	PNP, IO-Link	Connector M12, 4-pin	Cd-244	WTD20EC-V2449	1064783

WTD20E, rounded, rounded out and prism shaped packaging

- Object speed max.: 1.2 m/s
- Productivity max.: ≤ 54,000 Stk./h
- Switch on delay Q_1 & Q_2 : ≤ 60 ms
- Time delay off Q_1 : ≤ 60 ms
- Pulse length (Q2): ≤ 20 ms
- Background suppression: ≥ 80 mm
- Object height min.: 50 mm (The object height min. is relevant only for the installation of DeltaPac above the conveyor belt.)

Object width min.	Radius of the object contour	Key feature of the object	Sensing range	Output type	Current consumption	Connection	Connection diagram	Model name	Part no.
≥ 30 mm	5 mm ... 20 mm	Rounded edges, rounded out body and prism shaped	30 mm ... 40 mm	NPN	≤ 70 mA	Cable, 4-wire, 2 m, PVC	Cd-242	WTD20E-W1114	1064779
≥ 20 mm	2 mm ... 5 mm		30 mm ... 40 mm	PNP	≤ 160 mA	Connector M12, 4-pin	Cd-243	WTD20E-V2414	1064778

WTD20E, IO-Link for rounded, rounded out and prism shaped packaging

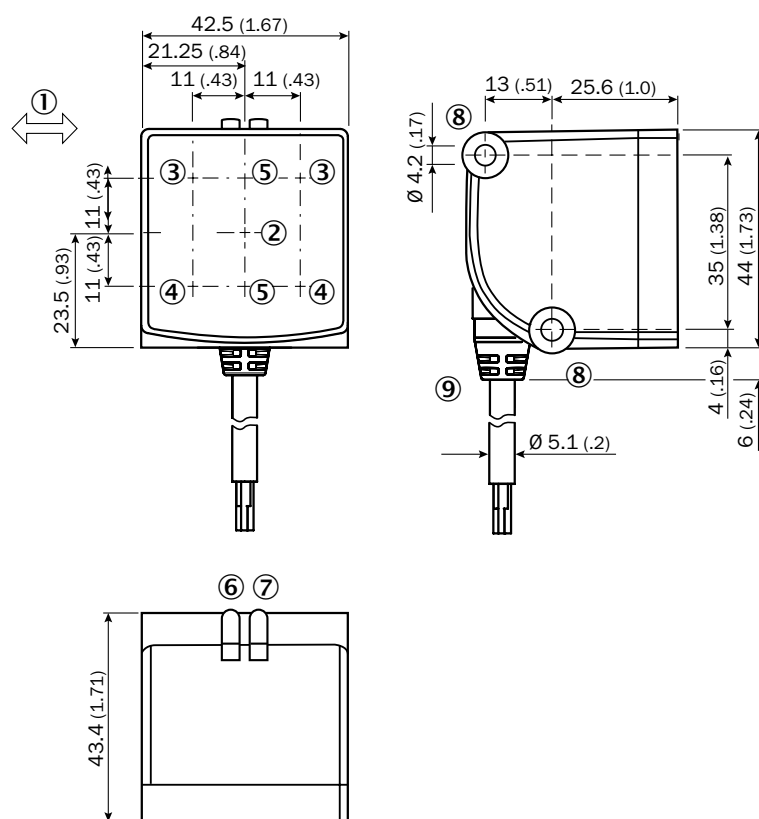
- Object speed max.: 3 m/s
- Productivity max.: ≤ 200,000 Stk./h
- Switch on delay Q_1 & Q_2 : 0 ms ... 255 ms
- Time delay off Q_1 : 0 ms ... 255 ms
- Pulse length (Q2): 0 ms ... 63 ms
- Background suppression: ≥ 80 mm
- Object height min.: 50 mm (The object height min. is relevant only for the installation of DeltaPac above the conveyor belt.)
- Current consumption: ≤ 70 mA

Object width min.	Radius of the object contour	Key feature of the object	Sensing range	Output type	Connection	Connection diagram	Model name	Part no.
≥ 20 mm	2 mm ... 20 mm	Rounded out body and prism shaped	30 mm ... 40 mm	PNP, IO-Link	Connector M12, 4-pin	Cd-244	WTD20EC-V2419	1064782

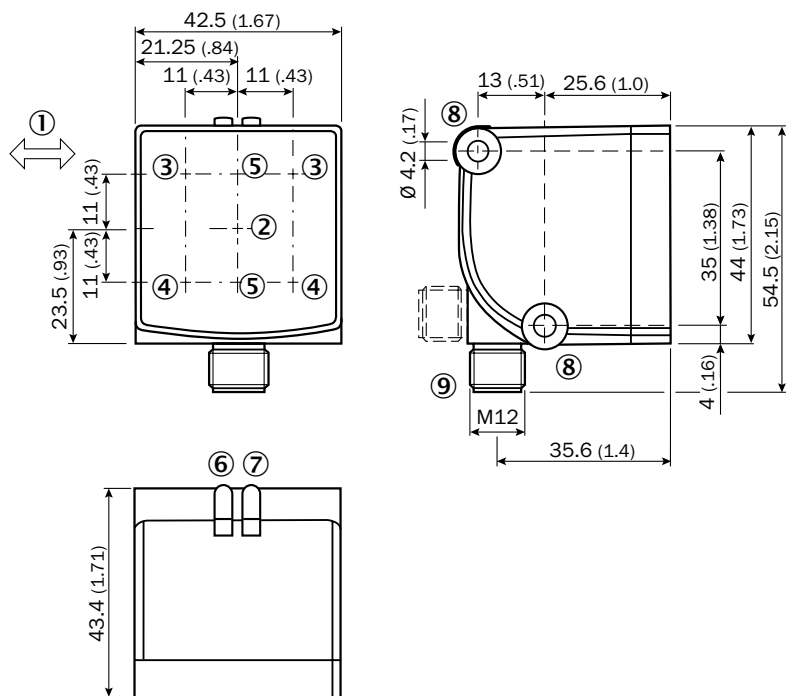
Dimensional drawings

Dimensions in mm (inch)

WTD20E-V, cable

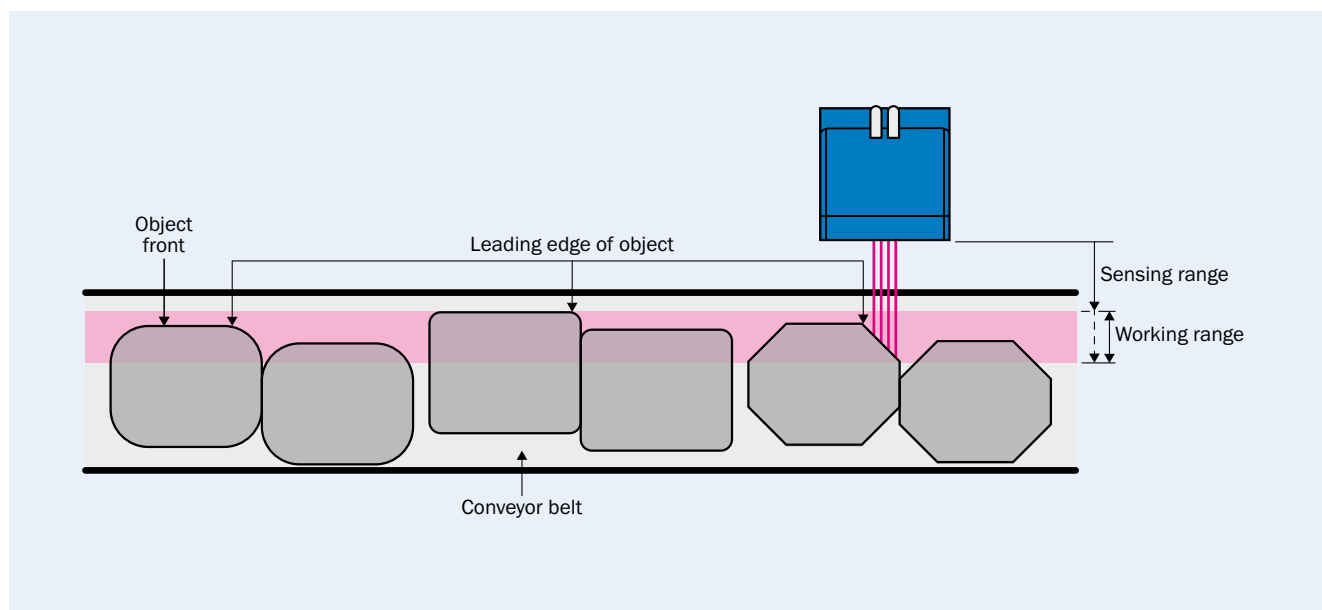


WTD20E-V/W11xx, connector



- ① Standard direction
- ② Center of optical axis, sender
- ③ Center of optical axis, receiver (first energy scale)
- ④ Center of optical axis, receiver (second energy scale)
- ⑤ Optical axis, receiver
- ⑥ LED indicator orange:
status of received light beam, presence signal Q1
- ⑦ Status indicator LED green: power on
- ⑧ Mounting hole
- ⑨ Connection (rotatable)

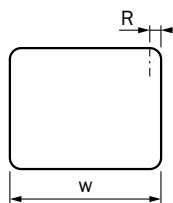
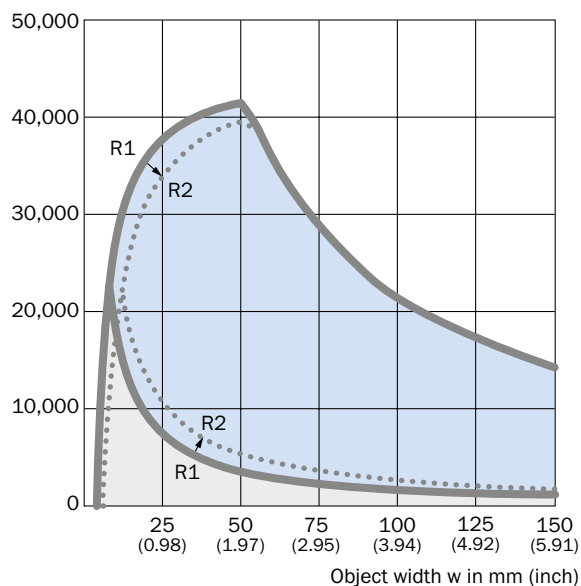
Sensing range in detail



Productivity key figures

WTD20E-V/Wxx4x, edge, productivity

Productivity P in pc/h

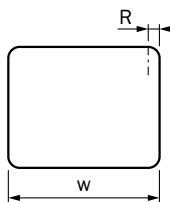
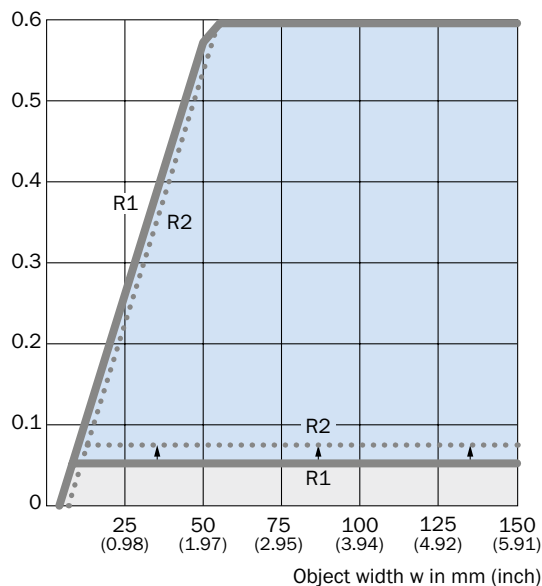


Parameter example, dimensions in mm (inch)

Object width	Object radii	Productivity min.	Productivity max.
25 (0.98)	1 (0.04)	7,500 pc/h	38,000 pc/h
75 (2.95)	2 (0.08)	3,500 pc/h	28,500 pc/h

WTD20E-V/Wxx4x, edge, speed

Object speed v in m/s



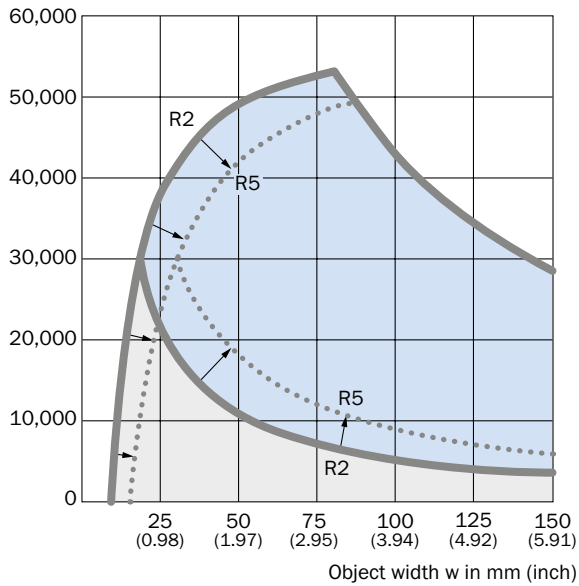
Parameter example, dimensions in mm (inch)

Object width	Object radii	Object speed min.	Object speed max.
25 (0.98)	1 (0.04)	0.05 m/s	0.26 m/s
75 (2.95)	2 (0.08)	0.08 m/s	0.6 m/s

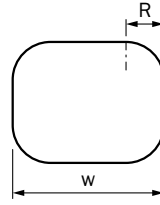
- Legend:
- = R1, Radii of 1 mm
 - = R2, Radii of 2 mm
 - = Working range
 - = Maximal working range

WTD20E-V/Wxx1x, rounded edges, productivity

Productivity P in pc/h



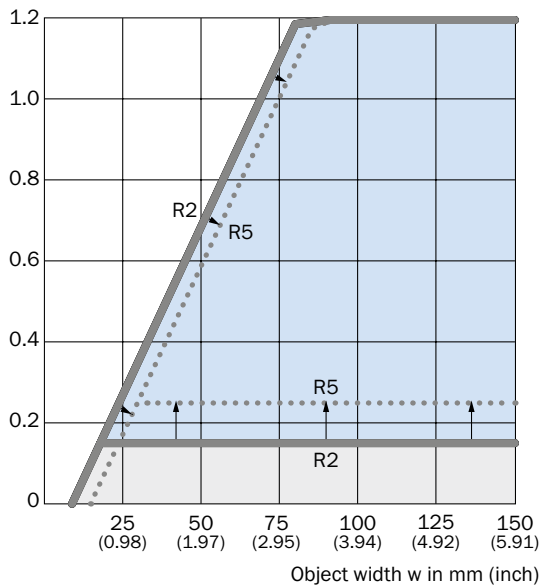
- = R2, Radii of 2 mm
- = R5, Radii of 5 mm
- = Working range
- = Maximal working range

**Parameter example, dimensions in mm (inch)**

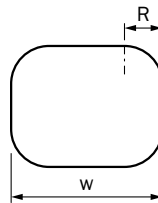
Object width	Object radii	Productivity min.	Productivity max.
75 (2.95)	2 (0.08)	7,000 pc/h	53,000 pc/h
125 (4.92)	5 (0.20)	7,000 pc/h	34,500 pc/h

WTD20E-V/Wxx1x, rounded edges, speed

Object speed v in m/s



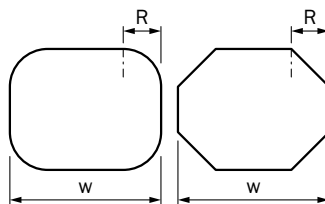
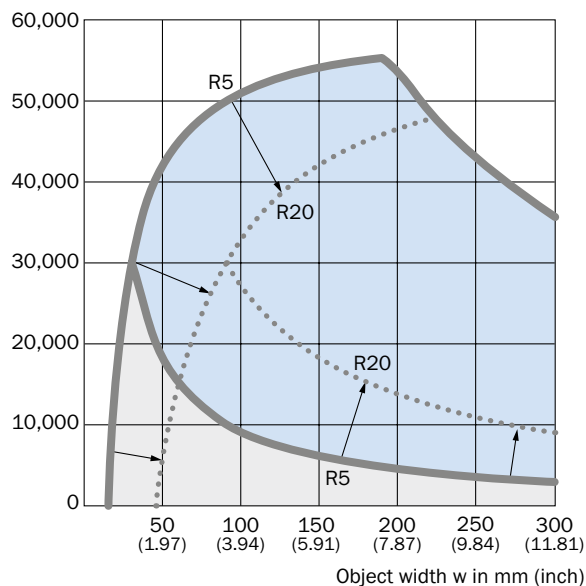
- = R2, Radii of 2 mm
- = R5, Radii of 5 mm
- = Working range
- = Maximal working range

**Parameter example, dimensions in mm (inch)**

Object width	Object radii	Object speed min.	Object speed max.
75 (2.95)	2 (0.08)	0.15 m/s	1.1 m/s
125 (4.92)	5 (0.20)	0.25 m/s	1.2 m/s

WTD20E-V/Wxx1x, rounded out body and prism shaped, productivity

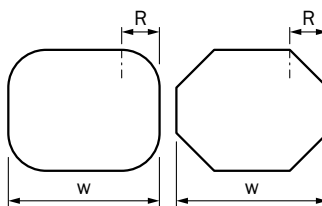
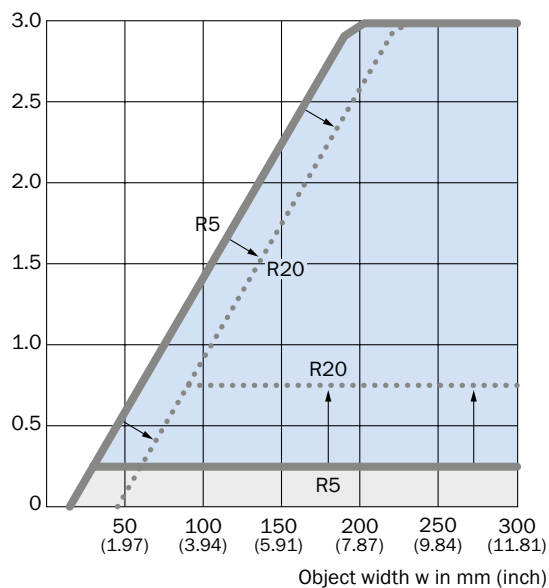
Productivity P in pc/h

**Parameter example, dimensions in mm (inch)**

Object width	Object radii	Productivity min.	Productivity max.
200 (7.87)	5 (0.20)	4,500 pc/h	53,500 pc/h
250 (9.84)	20 (0.79)	11,000 pc/h	43,000 pc/h

WTD20E-V/Wxx1x, rounded out body and prism shaped, productivity, speed

Object speed v in m/s

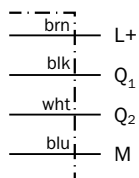
**Parameter example, dimensions in mm (inch)**

Object width	Object radii	Object speed min.	Object speed max.
200 (7.87)	5 (0.20)	0.25 m/s	3.0 m/s
250 (9.84)	20 (0.79)	0.75 m/s	3.0 m/s

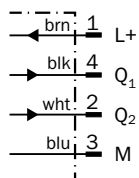
- = R5, Radii of 5 mm
- = R20, Radii of 20 mm
- = Working range
- = Maximal working range

Connection diagram

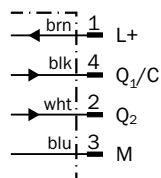
Cd-242



Cd-243



Cd-244



Recommended accessories

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

Connection cable (male-female connector)

- 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	Male connector, M12, 4-pin, straight	2 m, 4-wire	IP 67	DSL-1204-G02M	6022567
			5 m, 4-wire	IP 67	DSL-1204-G05M	6022569

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 N10 for universal clamp bracket	BEF-KHS-N11N	2071081

Test and monitoring tools

Dimensions	Model name	Part no.
1.0 – 7.0 mm	Radius gauge	5328155
7.0 – 15.0 mm	Radius gauge	5328157
15.5 – 25.0 mm	Radius gauge	5328158

Reference materials

Dimensions	Material	Model name	Part no.
10 mm x 55 mm x 40 mm	ABS	Demonstration target	4077622

Cleaning agent

Figure	Description	Model name	Part no.
	Plastic cleaner and care product, anti-static	Plastic cleaner	5600006
	35 cm x 35 cm	Lens cloth	4003553

→ For additional accessories, please see page L-861

Two is better than one



SIRIC®
optical ASIC
invented by SICK

ECOLAB®



Additional information

Detailed technical data.....	E-125
Ordering information.....	E-126
Dimensional drawings	E-126
Adjustments	E-126
Light spot diameter.....	E-127
Connection diagram	E-127
Recommended accessories.....	E-128

Product description

The MultiLine sensor: two sensors in one housing with an intelligent logical linking. The MultiLine sensor proves itself in

challenging situations as a rugged detector of flat and structured objects with an availability not achieved until now.

At a glance

- Two logical and intelligently linked sensors with background suppression in one miniature housing offer the highest ruggedness for object detection
- Consistent, reliable detection of structures and perforated objects such as e-cards
- Consistent, reliable detection of reflective and irregular objects such as blister packs and soup sachets on conveyor belts
- Maximum sensing range 120 mm
- Simple adjustment via teach-in button

Your benefits

- The MultiLine sensor facilitates faster production sequences since the distances between objects can be reduced
- The sensor position no longer needs to be modified for format changes since the sensor is able to detect objects independently of their position. This saves time and money
- The reliable signal of the sensor from the arriving to the departing edge places less demands on the control software since it no longer needs to be debounced or evaluated
- The MultiLine sensor offers high process reliability because all objects are detected independently of their structure, geometry and surface properties
- And placing the sensor into operation is as easy as pressing a button. A fast and reliable commissioning without complicated operating algorithms is thus given

→ www.mysick.com/en/MultiLine_Sensor

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

Sensor principle	Photoelectric proximity sensor
Detection principle	Multi-background suppression
Dimensions (W x H x D)	16 mm x 39.5 mm x 12 mm
Housing design (light emission)	Rectangular
Sensing range max.	5 mm ... 120 mm
Sensing range	15 mm ... 120 mm
Type of light	Visible red light
Light source ¹⁾	PinPoint LED
Light spot size (distance)	5 mm x 22 mm (40 mm)/3 mm x 25 mm (40 mm)/(depending on type)
Wave length	650 nm
Adjustment	Single teach-in button
Special feature	Detection of transparent objects

¹⁾ Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	< 5 V _{pp}
Power consumption ³⁾	≤ 30 mA
Output type	PNP/NPN (depending on type)
Output function	Complementary
Switching mode	Light switching /Light/dark-switching (depending on type)
Output current I_{max.}	≤ 100 mA
Response time ⁴⁾	< 1.2 ms
Switching frequency ⁵⁾	400 Hz
Connection type	Male connector ⁶⁾ /Cable, 2 m ⁶⁾ (depending on type)
Circuit protection	A ⁷⁾ , C ⁸⁾ , D ⁹⁾
Protection class	III
Weight	30 g
Housing material	ABS
Optics material	PMMA
Enclosure rating	IP 66, IP 67
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.

Ordering information

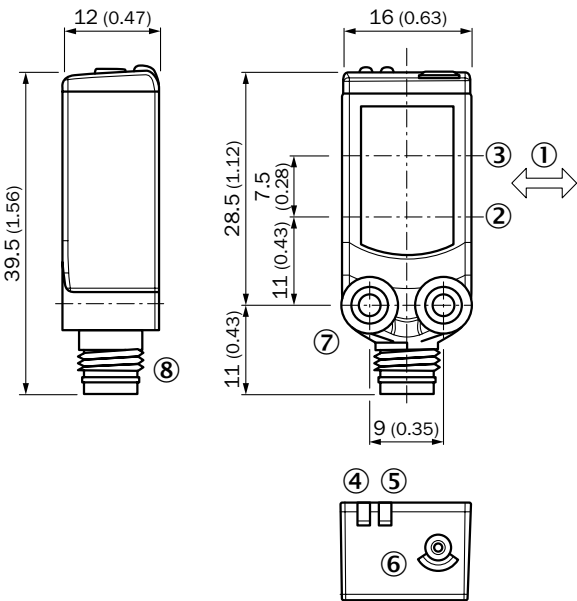
Other models available at www.mysick.com/en/MultiLine_Sensor

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** multi-background suppression
- **Sensing range max.:** 5 mm ... 120 mm
- **Adjustment:** single teach-in button

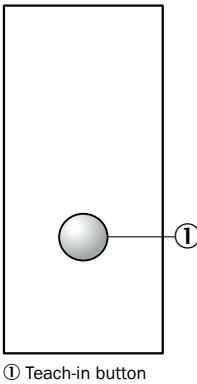
Sensing range max.	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
5 mm ... 120 m	5 mm x 22 mm (40 mm)	PNP	Light switching	Connector M8, 3-pin	Cd-043	WTB4-3P2192	1058268
			Light/dark-switching	Connector M8, 4-pin	Cd-084	WTB4-3P2292	1062850
	3 mm x 25 mm (40 mm)	NPN	Light/dark-switching	Cable, 4-wire, 2 m	Cd-094	WTB4-3N1192	1059272

Dimensional drawings

Dimensions in mm (inch)

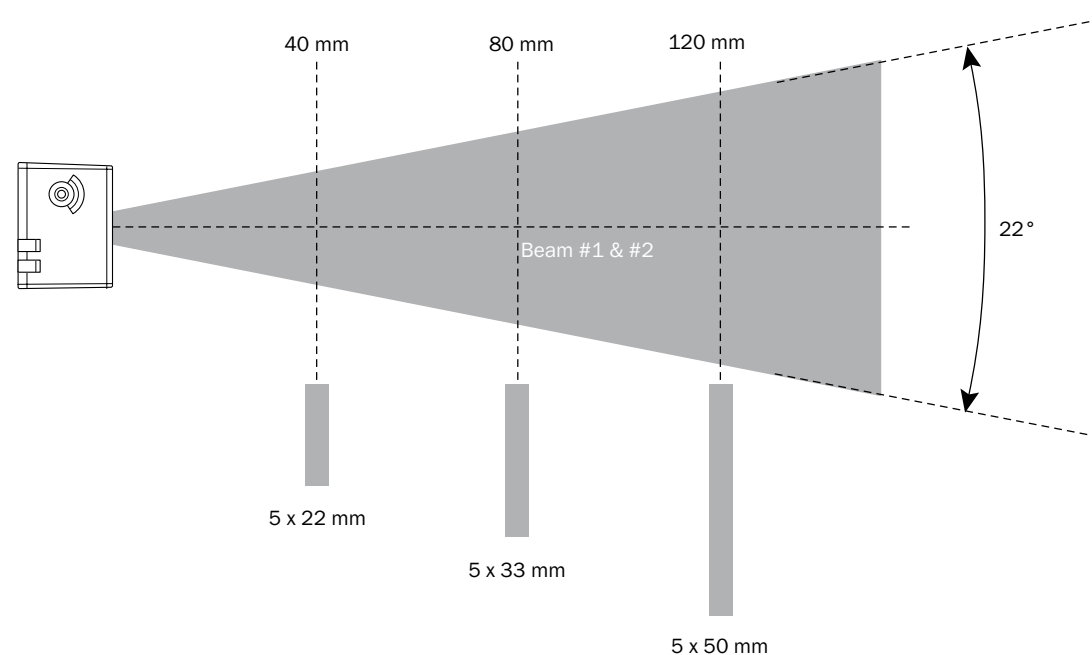
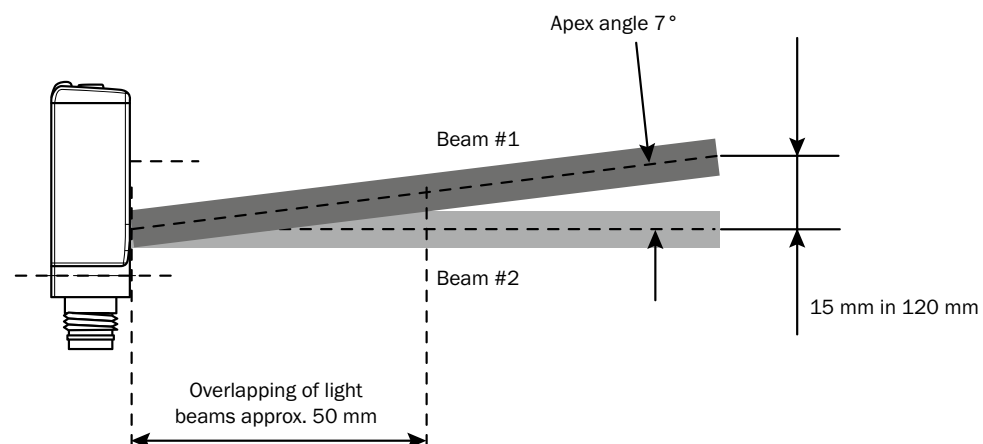


Adjustments



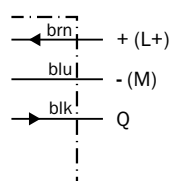
- ① Standard direction of the material being detected
- ② Optical axis sender
- ③ Optical axis receiver
- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Status indicator LED green: power on
- ⑥ Teach-in button
- ⑦ Threaded mounting hole M3
- ⑧ Connection

Light spot diameter

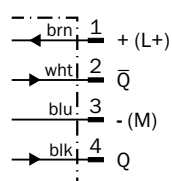


Connection diagram

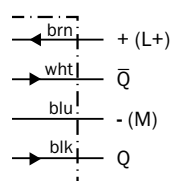
Cd-043



Cd-084



Cd-094



Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571	Mounting bracket for wall mounting	BEF-W4-A	2051628
		Mounting bracket for floor mounting	BEF-W4-B	2051630

Plug connectors and cables

Connecting cable (female connector-open)

- Cable material: PVC
- Description: IP 67, IP 69K

Figure	Connection type head A	Connection type head B	Connecting cable	Connector material	Model name	Part no.
	Female connector, M8, 3-pin, straight	Cable, open conductor heads	2 m, 3-wire	TPU	DOL-0803-G02M	6010785
			5 m, 3-wire	TPU	DOL-0803-G05M	6022009
	Female connector, M8, 3-pin, angled	Cable, open conductor heads	2 m, 3-wire	TPU	DOL-0803-W02M	6008489
			5 m, 3-wire	TPU	DOL-0803-W05M	6022010
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	PVC	DOL-0804-G02M	6009870
			5 m, 4-wire	PVC	DOL-0804-G05M	6009872
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	PVC	DOL-0804-W02M	6009871
			5 m, 4-wire	PVC	DOL-0804-W05M	6009873

Female connector (ready to assemble)

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0803-G	7902077
	Female connector, M8, 3-pin, angled	Pin penetration	PBT	IP 67	DOS-0803-W	7902078
	Female connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0804-G	6009974
	Female connector, M8, 4-pin, angled	Pin penetration	PBT	IP 67	DOS-0804-W	6009975

Male connector (ready to assemble)

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Male connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	STE-0803-G	6037322
	Male connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	STE-0804-G	6037323

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N05 for universal clamp bracket	BEF-KHS-N05	2051611
		Plate N08 for universal clamp bracket	BEF-KHS-N08	2051607

Terminal and alignment brackets**Alignment brackets**

Figure	Material	Description	Model name	Part no.
	Plastic	Ball clamp bracket	BEF-GH-MINI01	2023160

→ For additional accessories, please see page L-861

E

MultiPac – for extreme detection



Additional information

Detailed technical data.	E-131
Ordering information.	E-132
Dimensional drawings	E-132
Adjustments	E-132
Characteristic curves	E-132
Connection diagram	E-133
Recommended accessories.	E-133

Product description

The MultiPac photoelectric sensor is designed for challenging applications which require detection of very shiny and irregular targets. Some examples are PET Bottles, food & beverage packets, glass or metal surfaces. These surfaces redirect the emitted light away from the sensor causing signal interruption. Using two independent receivers coupled with the newest chip technology, the Multi-

Pac delivers reliable detection of these targets. Additionally, film wrapped pallets and other targets in the logistics branch can be detected using a higher angle of incidence. This removes the typical mounting restrictions associated with detecting these products. Thanks to its twin detection technology and flexible mounting, the MultiPac eliminates machine downtime due to loss of detection.

At a glance

- Two redundant receiver arrays from SICK
- The newest SICK chip technology
- Intense, visible red HighPower LED
- Sensing distance up to 500 mm
- Fast and precise commissioning thanks to the highly visible light spot

Your benefits

- Redundant receiver arrays provide reliable detection of shiny, gloss, dark, or irregular shaped objects without signal interruptions
- Products can be detected using a higher angle of incidence. This removes the typical mounting restrictions associated with detecting these products.
- In applications involving plastic wrapped bottles, the MultiPac replaces current solutions which require expensive mechanical height adjustment
- Allows overhead detection of product that is transported on a single conveyor belt but separated into multiple lanes

→ www.mysick.com/en/MultiPac

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

Sensor principle	Photoelectric proximity sensor
Detection principle	Background suppression
Dimensions (W x H x D)	24.6 mm x 80.6 mm x 54.8 mm
Housing design (light emission)	Rectangular
Sensing range max. ¹⁾	30 mm ... 500 mm
Sensing range	100 mm ... 500 mm
Type of light	Visible red light
Light source	PinPoint LED ²⁾
Light spot size (distance)	Ø 12 mm (500 mm)
Wave length	625 nm
Adjustment	Double teach-in button

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

²⁾ Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	≤ 5 V _{pp}
Power consumption ³⁾	≤ 55 mA
Output type	PNP/NPN (depending on type)
Output function	Complementary
Switching mode	Light/dark-switching
Signal voltage PNP HIGH/LOW	Approx. V _S – 2.5 V / 0 V
Signal voltage NPN HIGH/LOW	Approx. V _S / < 2.5 V
Output current I_{max.}	≤ 100 mA
Response time ⁴⁾	≤ 5 ms
Switching frequency ⁵⁾	100 Hz
Connection type	Male connector
Circuit protection	A ⁶⁾ , B ⁷⁾ , C ⁸⁾
Protection class ⁹⁾	II
Weight	150 g
Housing material	ABS
Optics material	PMMA
Enclosure rating	IP 66, IP 67
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⁾ A = V_S connections reverse-polarity protected.

⁷⁾ B = inputs and output reverse-polarity protected.

⁸⁾ C = interference suppression.

⁹⁾ Reference voltage: 50 V DC.

Ordering information

Other models available at www.mysick.com/en/MultiPac

WTB27-3 MultiPac

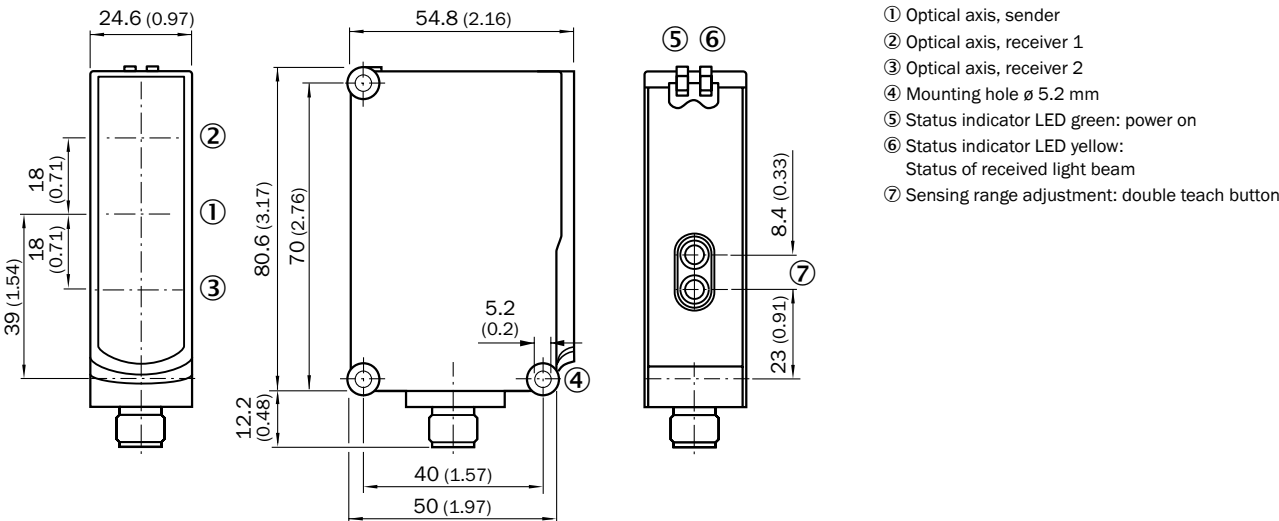
- **Connection:** connector M12, 4-pin

Sensing range max. ¹⁾	Output type	Connection diagram	Type	Part no.
30 mm ... 500 mm	PNP	Cd-083	WTB27-3P2483	1056384
	NPN	Cd-083	WTB27-3N2483	1056385

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

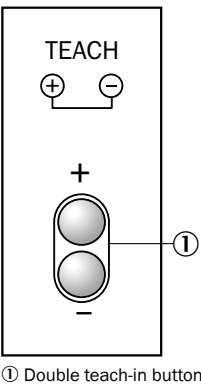
Dimensional drawings

Dimensions in mm (inch)



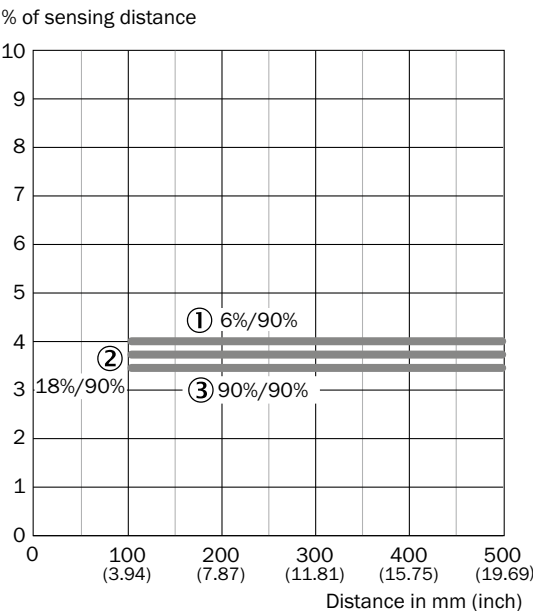
Adjustments

Double teach-in button



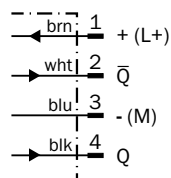
① Double teach-in button

Characteristic curves



Connection diagram

Cd-083



Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Mounting bracket with hinged arm	BEF-WN-W27	2009122

Terminal and alignment brackets

Figure	Material	Delivery	Model name	Part no.
	Steel, galvanised (plate) Zinc, die-cast (clamp)	Incl. universal bar clamp and mounting material	BEF-KHS-A01	2022458

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

Device protection (mechanical)

Protective housing/pipes

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

→ For additional accessories, please see page L-861

The sensor with the light band: multifaceted and economical



Product description

The Reflex Array is unique. The Multi-Task photoelectric sensor detects the leading edge of small, flat, transparent, or uneven objects within its light band, regardless of position. Perforated objects are reliably detected without multiple adjustments. This considerably reduces installation costs and speeds up commis-

sioning. The Reflex Array therefore offers major cost benefits over conventional solutions, which use several individual photoelectric sensors or a small light grid. The Reflex Array is available in four variants with varying detection heights and minimum object sizes.

At a glance

- Detects objects > 12 mm within a 50 mm light array, regardless of position
- Sensing range for detection from 0 m to max. 4.5 m
- Minimum distance of 0.5 m between sensor and reflector for all variants
- PinPoint technology for intense red light
- Automatic adjustment of the switching threshold when there is contamination

Your benefits

- Reduces the installation work required by up to 50% compared to light grids or multiple photoelectric sensors
- Detects objects > 12 mm within a 50 mm light array, regardless of position Three other variants are available for other objects.
- PinPoint technology and optical alignment procedure enables simple and quick commissioning
- Continuous Threshold Adjustment (AutoAdapt) ensures less downtime



Additional information

Detailed technical data.....	E-135
Ordering information.....	E-136
Dimensional drawings	E-137
Adjustments	E-139
Connection diagram	E-139
Recommended accessories.....	E-139

→ www.mysick.com/en/Reflex_Array

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

Sensor principle	Reflex Array
Dimensions (W x H x D)	24.6 mm x 80 mm x 54.2 mm
Housing design (light emission)	Rectangular
Sensing range max.	0 m ... 2 m ¹⁾ / 0 m ... 4.5 m ²⁾ (depending on type)
Sensing range	0 m ... 2 m ¹⁾ / 0 m ... 4.5 m ²⁾ (depending on type)
Type of light	Visible red light
Light source ³⁾	PinPoint LED
Distance sensor to reflector	0.5 m ... 4.5 m
Adjustment	Single teach-in button
Continuous threshold adaption	✓
Special feature	Light band

¹⁾ PL40A.

²⁾ PL80A.

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

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	≤ 5 V _{pp}
Power consumption ³⁾	≤ 35 mA
Output type	PNP
Output function	Complementary
Switching mode	Light/dark-switching
Signal voltage PNP HIGH/LOW	Approx. V _S – 2.5 V / 0 V
Output current I _{max.}	≤ 100 mA
Response time ⁴⁾	≤ 2.5 ms
Switching frequency ⁵⁾	200 Hz
Connection type	Cable with connector, M12, 270 mm ⁶⁾ / Cable, 2 m ⁶⁾ / Male connector, M12 (depending on type)
Circuit protection	A ⁷⁾ , B ⁸⁾ , C ⁹⁾
Protection class ¹⁰⁾	II
Weight	130 g
Housing material	ABS
Optics material	PMMA
Enclosure rating	IP 67
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⁾ B = inputs and output reverse-polarity protected.

⁹⁾ C = interference suppression.

¹⁰⁾ Reference voltage: 50 V DC.

Ordering information

Other models available at www.mysick.com/en/Reflex_Array

Detection height: 24 mm

- Output type: PNP
- Minimum distance sensor – Reflector: 0.5 m

Sensing range max. ¹⁾	Minimum object size	Connection	Connection diagram	Type	Part no.
0 m ... 1.5 m	≥ 5 mm	Cable with connector M12, 4-pin 270 mm PVC	Cd-083	WL27-3P3402S17	1051529

¹⁾ PL40A.

Detection height: 30 mm

- Output type: PNP
- Minimum distance sensor – Reflector: 0.5 m

Sensing range max.	Minimum object size	Connection	Connection diagram	Type	Part no.
0 m ... 4.5 m ¹⁾	≥ 8 mm	Cable with connector M12, 4-pin 270 mm PVC	Cd-083	WL27-3P3402S20	1060755

¹⁾ PL80A.

Detection height: 45 mm

- Output type: PNP
- Minimum distance sensor – Reflector: 0.5 m

Sensing range max. ¹⁾	Minimum object size	Connection	Connection diagram	Type	Part no.
0 m ... 3.5 m	≥ 10 mm	Cable with connector M12, 4-pin 270 mm PVC	Cd-083	WL27-3P3402S19	1056382

¹⁾ PL80A.

Detection height: 50 mm

- Output type: PNP
- Minimum distance sensor – Reflector: 0.5 m

Sensing range max.	Minimum object size	Connection	Connection diagram	Type	Part no.
0 m ... 4.5 m ¹⁾ 0 m ... 2 m ²⁾	≥ 12 mm	Cable, 4-wire 2 m PVC	Cd-094	WL27-3P1102S16	1050825
		Connector M12, 4-pin	Cd-083	WL27-3P2402S18	1051577
		Cable with connector M12, 4-pin 270 mm PVC	Cd-083	WL27-3P3402S13	1046538
	≥ 16 mm	Cable with connector M12, 4-pin 270 mm PVC	Cd-083	WL27-3P3402S15	1048230

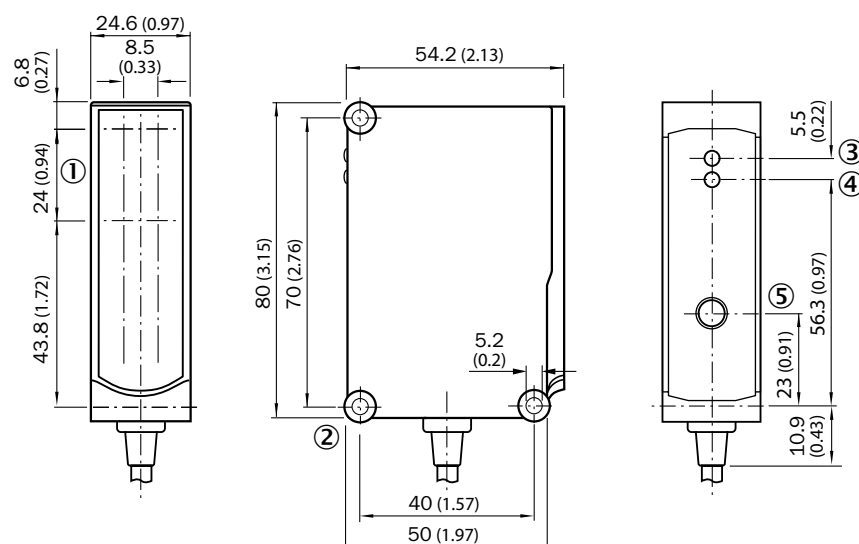
¹⁾ PL80A.

²⁾ PL40A.

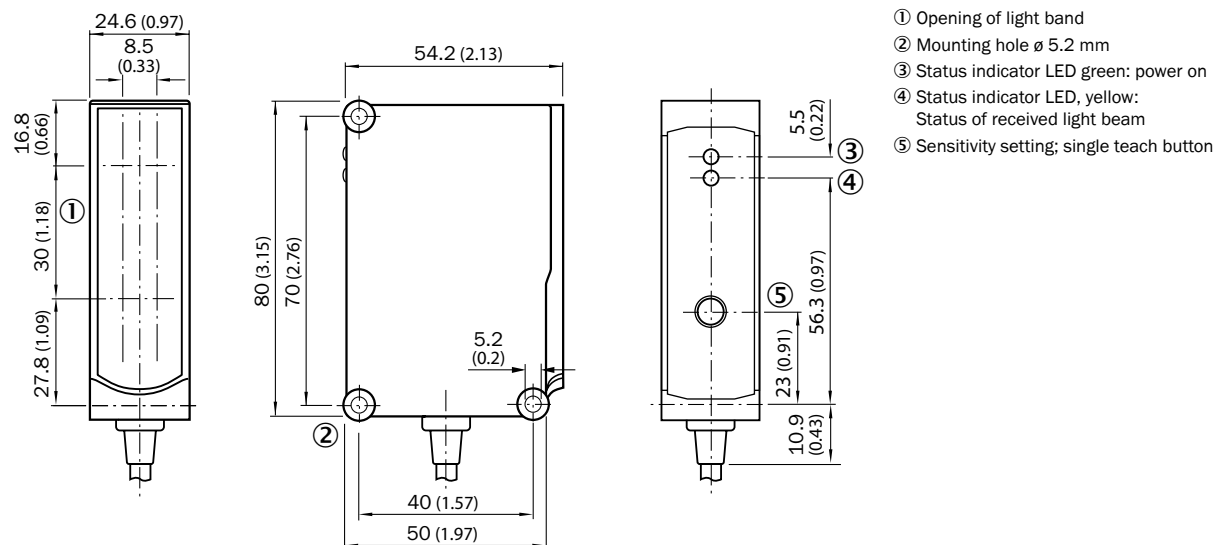
Dimensional drawings

Dimensions in mm (inch)

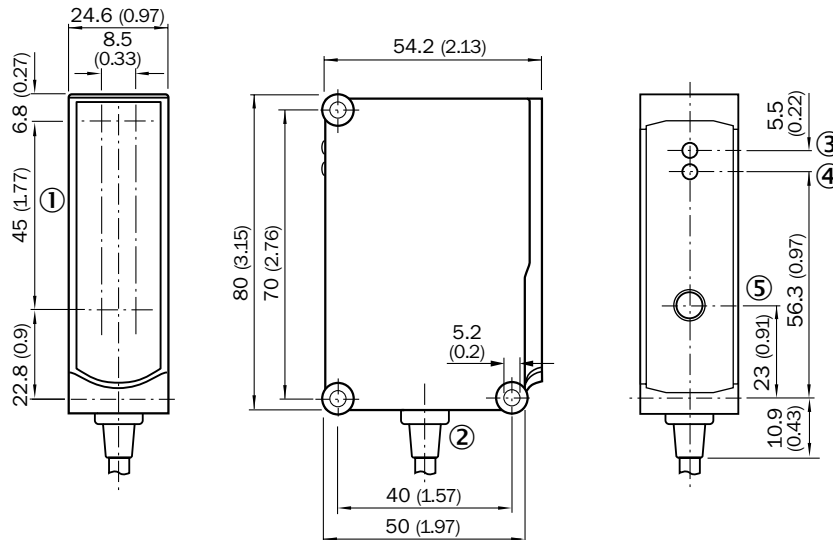
Detection height: 24 mm



Detection height: 30 mm

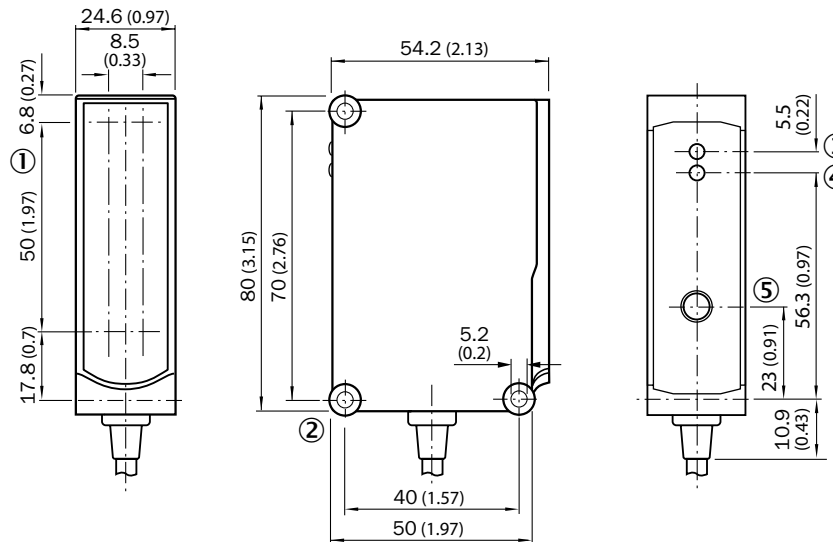


Detection height: 45 mm



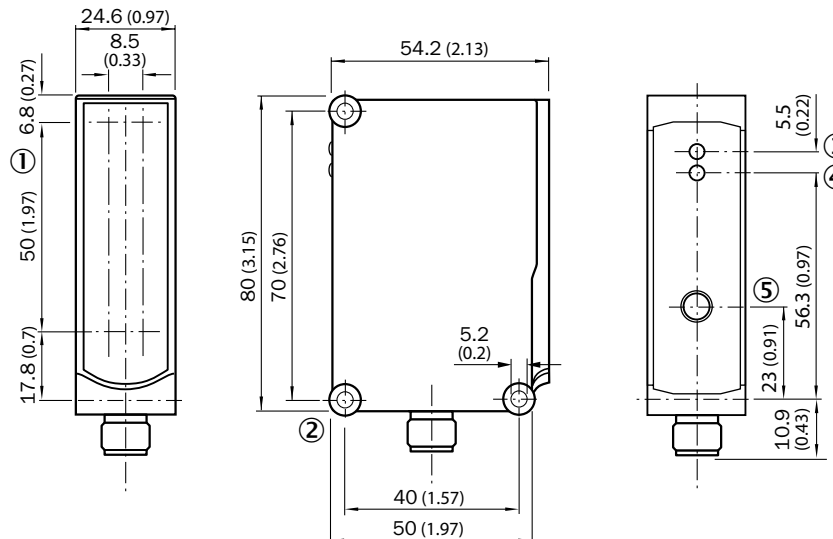
- ① Opening of light band
- ② Mounting hole $\varnothing$ 5.2 mm
- ③ Status indicator LED green: power on
- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Sensitivity setting; single teach button

Detection height: 50 mm, cable



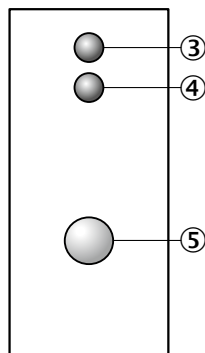
- ① Opening of light band
- ② Mounting hole $\varnothing$ 5.2 mm
- ③ Status indicator LED green: power on
- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Sensitivity setting; single teach button

Detection height: 50 mm, connector



- ① Opening of light band
- ② Mounting hole $\varnothing$ 5.2 mm
- ③ Status indicator LED green: power on
- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Sensitivity setting; single teach button

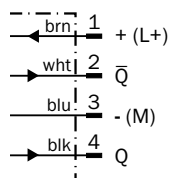
Adjustments



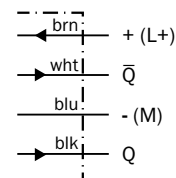
- ③ Status indicator LED green: power on
- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Sensitivity setting; single teach button

Connection diagram

Cd-083



Cd-094



Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Mounting bracket with hinged arm for W11-2, W27, Dx50	BEF-WN-MULTI	2064469
		Mounting bracket with hinged arm	BEF-WN-W27	2009122

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
			10 m, 4-wire	IP 67	DOL-1204-G10M	6010543
	Female connector, M12, 4-pin, angled, with 3 LEDs	Cable, open conductor heads	2 m, 4-wire	IP 67	DOL-1204-L02M	6027945
			10 m, 4-wire	IP 67	DOL-1204-L10M	6027946
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67	DOL-1204-W02M	6009383
			10 m, 4-wire	IP 67	DOL-1204-W10M	6010541

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 N04 for universal clamp bracket	BEF-KHS-N04	2051610
		Plate N07 with threat and screws (P250, PL40A)	BEF-KHS-N07	2051613

E**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-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, 37 mm x 56 mm	PL40A	1012720
		Rectangular, screw connection, 80 mm x 80 mm	PL80A	1003865
		Rectangular, screw connection, 175 mm x 34 mm	PL180E01	1013289

→ For additional accessories, please see page L-861



One thing is clear – no reflector needed



Product description

Thanks to new technologies from SICK, TranspaTect MultiTask photoelectric sensors are now able to detect transparent and semitransparent trays and bottles without the need for reflectors, a frequent source of errors. In these applications, the reference surface is provided by a stable matte background. Sensitivity is taught in simply by pressing the teach-

in button. Even high-gloss, reflective, or uneven surfaces can be detected reliably. Combined with AutoAdapt, SICK's function for continuous threshold adaptation, TranspaTect sensors provide a cost-effective and reliable detection solution in packaging processes in the food and beverage, and pharmaceuticals industries.

At a glance

- High-performance SICK technology
- No reflectors required
- Existing machine parts are used as reference target
- AutoAdapt for continuous threshold adaptation in contaminated conditions
- PinPoint LED with bright and precise light spot
- Easy-to-use teach-in button
- Status LEDs visible from all sides
- Rugged metal housing (PTFE coating available on request)

Your benefits

- Reliable detection of transparent and semitransparent objects without a reflector
- Reliable detection of objects regardless of color or surface qualities
- Freedom of machine design: no mounting system for the installation of a reflector required
- Quick commissioning: there is no need to mount a reflector or precisely adjust the sensor
- High operational safety: if the background becomes contaminated, object detection will continue uninterrupted
- Machine downtime is minimized: the integrated AutoAdapt function extends the time between cleanings
- Heightened productivity: mechanical and chemical ruggedness due to the metal housing



Additional information

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Adjustments	E-144
Characteristic curves	E-145
Connection diagram	E-145
Recommended accessories.....	E-146

→ www.mysick.com/en/TranspaTect

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

Sensor principle	Photoelectric proximity sensor
Detection principle	Foreground suppression
Dimensions (W x H x D)	15.6 mm x 48.5 mm x 42 mm
Housing design (light emission)	Rectangular
Sensing range max. ¹⁾	150 mm ... 700 mm (adjustment range background)
Sensing range ¹⁾	0 mm ... 400 mm (detection range transparent objects) ²⁾
Type of light	Visible red light
Light source ³⁾	PinPoint LED
Light spot size (distance)	Ø 8 mm (300 mm)
Wave length	660 nm
Adjustment	Single teach-in button
Continuous threshold adaption	✓

¹⁾ Referring to the background with 90 % remission (based on glass-bead blasted stainless steel, equivalent to standard white DIN 5033)

²⁾ 0 mm ... 550 mm detection range non-transparent objects.

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

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	≤ 5 V _{pp}
Power consumption ³⁾	≤ 55 mA
Output type	PNP/NPN (depending on type)
Output function	Complementary
Switching mode	Light/dark-switching
Signal voltage PNP HIGH/LOW	> U _v – 2,5 V / ca. 0 V
Signal voltage NPN HIGH/LOW	Approx. V _S / < 2.5 V
Output current I_{max.}	100 mA
Response time ⁴⁾	2 ms
Switching frequency ⁵⁾	250 Hz
Connection type	Male connector, M12
Circuit protection	A ⁶⁾ , C ⁷⁾ , D ⁸⁾
Protection class	II
Weight	120 g
Enclosure rating	IP 66/IP 67
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⁾ A = V_S connections reverse-polarity protected.

⁷⁾ C = interference suppression.

⁸⁾ D = outputs overcurrent and short-circuit protected.

Ordering information

Other models available at www.mysick.com/en/TranspaTect

WTF12G-3, clear material detection

- **Switching mode:** light/dark-switching
- **Adjustment:** single teach-in button
- **Light spot size (distance):** Ø 8 mm (300 mm)

Sensing range max. ¹⁾	Sensing range ¹⁾	Output type	Connection	Connection diagram	Model name	Part no.
150 mm ... 700 mm ²⁾	0 mm ... 400 mm ³⁾	PNP	Connector M12, 4-pin	Cd-084	WTF12G-3P2432	1065719
	0 mm ... 550 mm ⁴⁾	NPN	Connector M12, 4-pin	Cd-084	WTF12G-3N2432	1066279

¹⁾ Referring to the background with 90 % remission (based on glass-bead blasted stainless steel, equivalent to standard white DIN 5033)

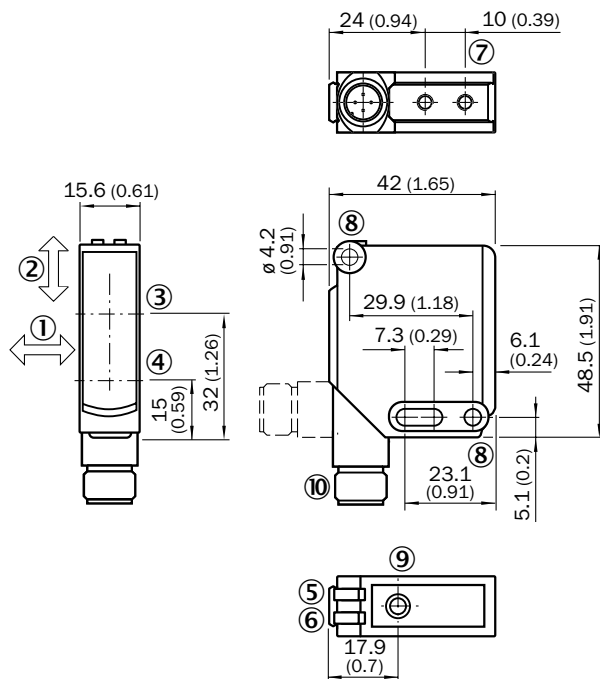
²⁾ Adjustment range background

³⁾ Detection range transparent objects

⁴⁾ Detection range non-transparent objects

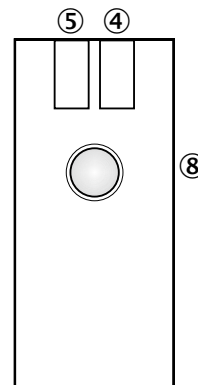
Dimensional drawings

Dimensions in mm (inch)



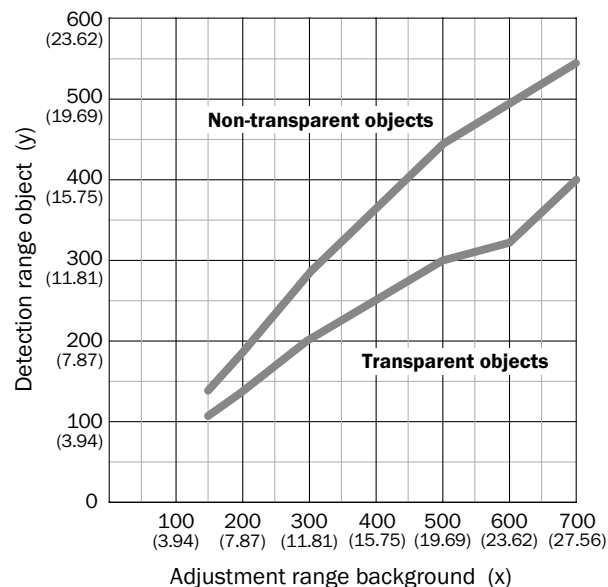
- ① Recommended installation for the detection of transparent trays
- ② Recommended installation for the detection of transparent bottles
- ③ Optical axis, receiver
- ④ Optical axis, sender
- ⑤ Status indicator LED green: power on
- ⑥ Status indicator LED, yellow: Status of received light beam
- ⑦ M4 threaded mounting hole, 4 mm deep
- ⑧ Mounting hole, Ø 4.2 mm
- ⑨ Adjustment sensing range: single teach button
- ⑩ Connection

Adjustments



- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑧ Adjustment sensing range: single teach button

Characteristic curves



Legend:

- x: Sensing range max. in mm (adjustment range background)
= Distance sensor / background
- y: Sensing range in mm (detection range object)
= Maximum distance sensor / front edge of the object

Minimum distance sensor / background : 150 mm*

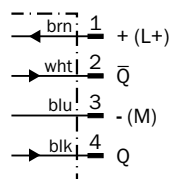
*) Referring to the background with 90 % remission equivalent to standard white DIN 5033 (i.e. glass-bead blasted stainless steel).
The use of a shiny background can increase the minimum distance to the background (i.e. brushed and pickled stainless steel, minimum distance sensor to background: 300 mm).

How to use this diagram:

Measure the distance from the sensor to the metal surface in the background.
This is the value for x (adjustment range background). If this is 500 mm for example,
the maximum distance between the sensor and the leading edge of a transparent object is 300 mm.

Connection diagram

Cd-084



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

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

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

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

→ For additional accessories, please see page L-861



Zero Pressure Accumulation made easy



Additional information

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Product description

Just as traffic lights handle the flow of cars in big cities, SICK ZoneControl solutions control product traffic on a conveyor without any other PLC or other external control. SICK ZoneControl is made up of three product families designed to control this traffic, known as Zero Pressure Accumulation (ZPA). Installation of ZoneControl solutions – via plug and play – is incredibly simple: daisy chain the ZoneControl products to one another, install the sensor, and connect the pneumatic line or connection to motor rollers.

No programming of a PLC, no laptop, and no expensive wiring is required. Each of these products creates one of two types of accumulation logic: Single Accumulation (with/without sleep) and Block (Slug) Accumulation, depending on what the application requires. To accommodate various mounting requirements, there are three different versions with different mounting configurations: between the rollers (R/IR), side frame mount (ZLM) and over the conveyor (WLR).

At a glance

- Three mounting versions: between the rollers (IR/R), side frame mount (ZLM) and over the conveyor (WLR)
- Three types of logic: single accumulation, single accumulation with sleep, block (slug) accumulation
- Up to 50 ZoneControl solutions can be cascaded in one string
- Fully animated simulation to ease selection and implementation
- Standard zone lengths of 1m (3ft) or 2m (6 ft)

Your benefits

- Largest Zero Pressure Accumulation portfolio on the market gives users a wide variety of choices for their application
- SICK ZoneControl solutions control the flow of packages on a conveyor without a PLC or other external control.
- Quick setup since no programming, no laptop, and no PLC interfacing are required
- With 20 years of ZoneControl experience and personal support from SICK experts, all application and product issues are quickly addressed
- Quick expansion or modification of the conveyor due to the modular design

→ www.mysick.com/en/ZoneControl

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

	R DC	R AC/DC	IR DC
Sensor principle	Photoelectric proximity sensor		
Detection principle	Background suppression		
Actuator	–		Pneumatic, valve on board Pneumatic, valve supplied separately Electrical (depending on type)
Max. number of sensors	Approx. 30 ¹⁾ /Approx. 50 ²⁾		
Logical principle of operation	–		Single accumulation/single accumulation with sleep (depending on type)
Type of Release	–		Single release/block (slug) release/single release (depending on type)
Dimensions (W x H x D)	20.6 mm x 99.2 mm x 48.9 mm		50 mm x 147.4 mm x 48.9 mm 59.9 mm x 151.9 mm x 48.9 mm 20.6 mm x 99.2 mm x 48.9 mm (depending on type)
Housing design (light emission)	Fitting roller spacings		
Sensing range	60 mm ... 900 mm		
Type of light	Infrared light		
Light source ³⁾	LED		
Light spot size (distance)	Ø 20 mm (500 mm)		
Angle of dispersion	7°		
Adjustment	Potentiometer, 9 turns		
Time type	Switch on delay/time delay off (depending on type)	Time delay off/switch on delay (depending on type)	–
Delay time	0 s ... 5 s		–

¹⁾ When power from the end of the IR daisy chain.

²⁾ When power from center of the IR daisy chain.

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

Mechanics/electronics

	R DC	R AC/DC	IR DC
Supply voltage ¹⁾	10 V DC ... 30 V DC	≤ 250 V AC/DC	10 V DC ... 30 V DC
Ripple ²⁾	< 5 V _{pp}		
Power consumption ³⁾	< 20 mA	< 100 mA	< 20 mA
Output type	NPN, PNP	FET switch	Valve/PNP
Switching mode	Light switching Dark-switching Light/dark-switching ⁴⁾ (depending on type)	Light switching Dark-switching (depending on type)	Dark-switching
Signal voltage PNP HIGH/LOW	Approx. V _S – 0.5 V / 0 V	–	Approx. V _S – 0.5 V / 0 V
Signal voltage NPN HIGH/LOW	Approx. V _S / < 2.0 V	–	–
Output current I _{max.}	≤ 100 mA		
Response time	2 ms		
Switching frequency	± 250 Hz		

	R DC	R AC/DC	IR DC
Connection type	Male connector, M12 ⁵⁾ Cable, 2 m ⁵⁾ (depending on type)	Cable, 2 m ⁵⁾	Male connector, M12 ⁵⁾
Connection type for daisy chain	–		Cable with connector M12, 4-pin
Circuit protection	A ⁶⁾ , C ⁷⁾ , D ⁸⁾		
Protection class	III		
Weight	175 g	–	175 g
Housing material	ABS		
Enclosure rating	IP 67		IP 65
Shock/vibration	According to IEC 68		
Ambient operating temperature	–40 °C ... +60 °C (depending on type)	+10 °C ... +55 °C	–40 °C ... +60 °C (depending on type)
Ambient storage temperature	–40 °C ... +75 °C		

¹⁾ Limit values.

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

³⁾ Without load and valve deenergized.

⁴⁾ Selectable via light/dark rotary switch.

⁵⁾ Do not bend below 0 °C.

⁶⁾ A = V_S connections reverse-polarity protected.

⁷⁾ C = interference suppression.

⁸⁾ D = outputs overcurrent and short-circuit protected.

Pneumatic

	R DC	R AC/DC	IR DC
Coil ratings			
Valve, metric	–		24 V DC 1 W
Valve, imperial	–		24 V DC 1 W
Medium for valves	–		Compressed air or neutral gases filtered, non-lubricated or lubricated
Design solenoid valve	–		3/2-way valve
Connection type solenoid valve			
Valve, metric	–		Compressed air 2 x 8 mm diameter, output line 4 mm diameter
Valve, imperial	–		Control line 1/4 " diameter, compressed air 2x 3/8 " diameter: output line 2 x 1/4 " diameter, compressed air 2x 3/8 " diameter (depending on type)
Without magnetic valve	–		Cable with 9.4 mm DIN valve connector
Air flow rate			
Valve, metric	–		Approx. 20 NI/min
Valve, imperial	–		Approx. 1.4 SCFM
Ventilation capacity			
Valve, metric	–		Approx. 130 NI/min
Valve, imperial	–		Approx. 1.4 SCFM
Operating pressure range			
Valve, metric	–		2 bar ... 8 bar
Valve, imperial	–		0 psi ... 65 psi

Ordering information

Other models available at www.mysick.com/en/ZoneControl

R DC

Switching mode	Output type	Time type	Connection	Connection diagram	Type	Part no.
Light switching	PNP, NPN	–	Connector M12, 4-pin	Cd-256	RT-B1221	1063174
			Cable, 4-wire, 2 m	Cd-251	RT-B1117	1063153
Dark-switching	PNP, NPN	–	Connector M12, 4-pin	Cd-261	RT-B2221	1063175
			Cable, 4-wire, 2 m	Cd-252	RT-B2117	1063178
Light/dark-switching	PNP	–	Cable, 4-wire, 2 m	Cd-249	RT-P3117	1063179
			Connector M12, 4-pin	Cd-255	RT-P3221	1063129
		Switch on delay	Connector M12, 4-pin	Cd-255	RTN-P3221	1063172
			Cable, 4-wire, 2 m	Cd-249	RTN-P3117	1063182
		Time delay off	Cable, 4-wire, 2 m	Cd-249	RTF-P3117	1063181
			Connector M12, 4-pin	Cd-255	RTF-P3221	1063171
	NPN	–	Connector M12, 4-pin	Cd-255	RT-N3221	1063162
			Cable, 4-wire, 2 m	Cd-249	RT-N3117	1063180
Light/dark-switching ¹⁾	PNP	–	Connector M12, 4-pin	Cd-258	RTQ-P4221	1063173
			Cable, 4-wire, 2 m	Cd-250	RTQ-P4117	1063183
	PNP, NPN	–	Connector M12, 4-pin	Cd-256	RTQ-B1221	1063177
			Cable, 4-wire, 2 m	Cd-251	RTQ-B1117	1063184

¹⁾ Selectable via light/dark rotary switch.

R AC/DC

Switching mode	Output type	Time type	Connection	Connection diagram	Type	Part no.
Light switching	FET switch	–	Cable, 4-wire, 2 m	Cd-247	RT-M1117	1063194
		Time delay off	Cable, 4-wire, 2 m	Cd-247	RTF-M1117	1063195
		Switch on delay	Cable, 4-wire, 2 m	Cd-247	RTN-M1117	1063196
Dark-switching		–	Cable, 4-wire, 2 m	Cd-248	RT-M2117	1063197
		Time delay off	Cable, 4-wire, 2 m	Cd-248	RTF-M2117	1063198
		Switch on delay	Cable, 4-wire, 2 m	Cd-248	RTN-M2117	1063199

IR DC Air to Drive (NC)

- **Actuator:** pneumatic, valve on board
- **Switching mode:** dark-switching
- **Output type:** valve
- **Connection:** Connector M12, 4-pin

Type of output	Connection type solenoid valve	Connection type for daisy chain	Connection diagram	Type	Part no.
Valve, metric	Compressed air 2 x 8 mm diameter, output line 4 mm diameter	Cable with connector M12, 4-pin 2 m	Cd-265	IRT-P212E40	1063108
Valve, imperial	Control line 1/4 " diameter, compressed air 2x 3/8 " diameter	Cable with connector M12, 4-pin 1.2 m	Cd-265	IRT-P211A10	1063117
		Cable with connector M12, 4-pin 2 m	Cd-265	IRT-P212A10	1063123

IR DC Air to Brake (NO)

- **Actuator:** pneumatic, valve on board
- **Switching mode:** dark-switching
- **Output type:** valve
- **Connection:** Connector M12, 4-pin

Type of output	Connection type solenoid valve	Connection type for daisy chain	Connection diagram	Type	Part no.
Valve, metric	Compressed air 2 x 8 mm diameter, output line 4 mm diameter	Cable with connector M12, 4-pin 1.2 m	Cd-265	IRT-P211E41	1063107
		Cable with connector M12, 4-pin 2 m	Cd-265	IRT-P212E41	1063109
Valve, imperial	Output line 2 x 1/4 " diameter, compressed air 2x 3/8 " diameter	Cable with connector M12, 4-pin 1.2 m	Cd-265	IRT-P211A11	1063118
	Control line 1/4 " diameter, compressed air 2x 3/8 " diameter	Cable with connector M12, 4-pin 2 m	Cd-265	IRT-P212A11	1063124

IR DC HIGH to Drive

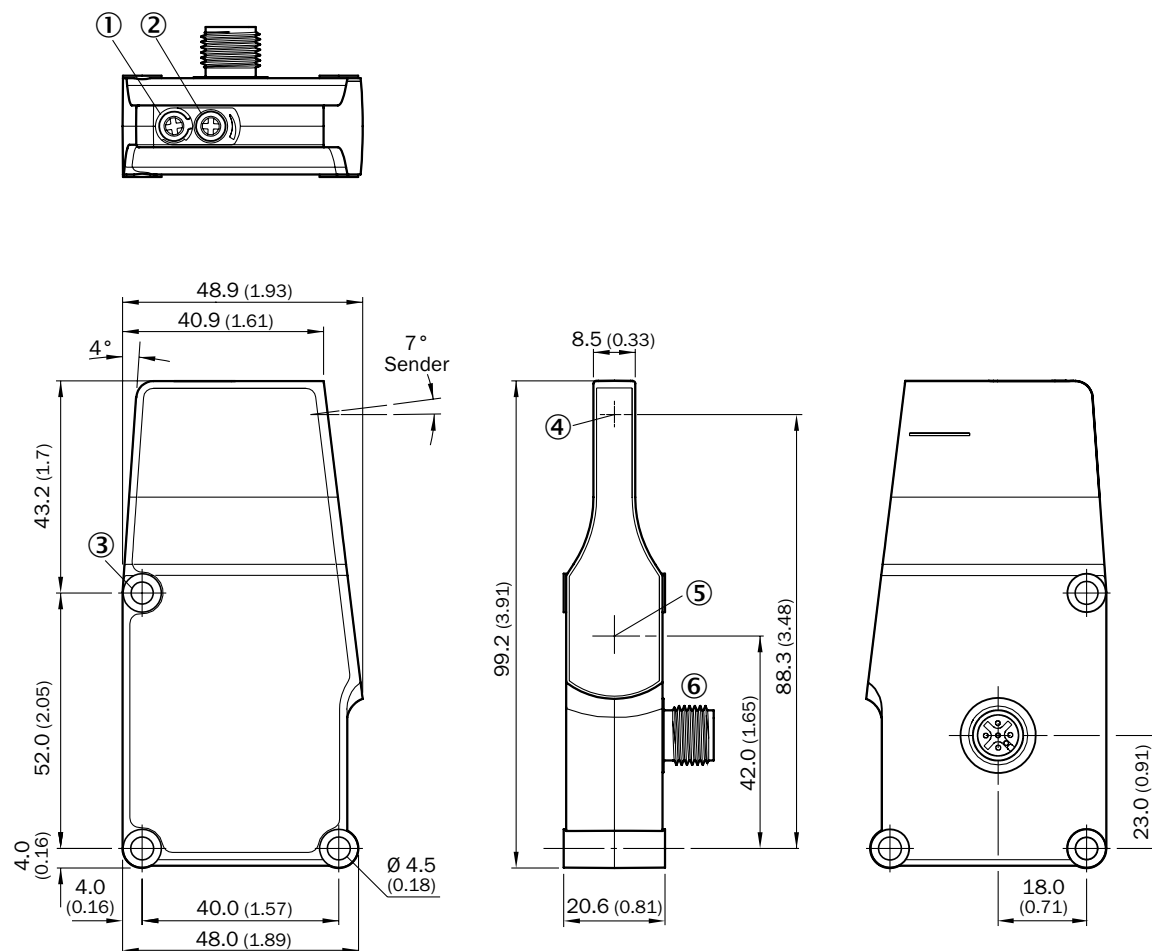
- **Switching mode:** dark-switching
- **Output type:** valve / PNP
- **Connection:** connector M12, 4-pin

Type of output	Actuator	Connection type solenoid valve	Connection type for daisy chain	Connection diagram	Type	Part no.
Without magnetic valve	Pneumatic, valve supplied separately	Cable with 9.4 mm DIN valve connector	Cable with connector M12, 4-pin 1.2 m	Cd-265	IRT-P211C63	1063127
			Cable with connector M12, 4-pin 2 m	Cd-265	IRT-P212C63	1063116
For Motor Driven Rollers (MDR)	Electrical	-	Cable with connector M12, 4-pin 1.2 m	Cd-266	IRT-P231C83	1063101
			Cable with connector M12, 4-pin 2 m	Cd-266	IRT-P232C83	1063100

Dimensional drawings

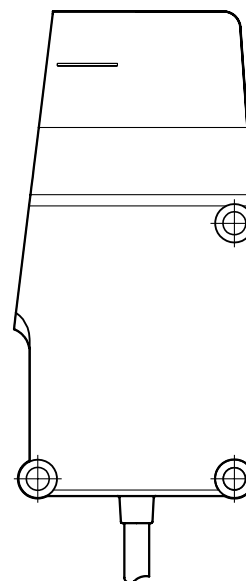
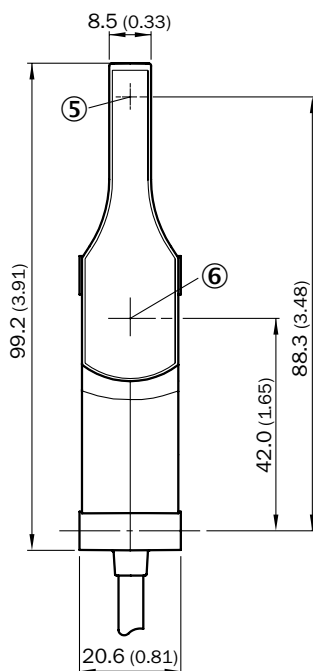
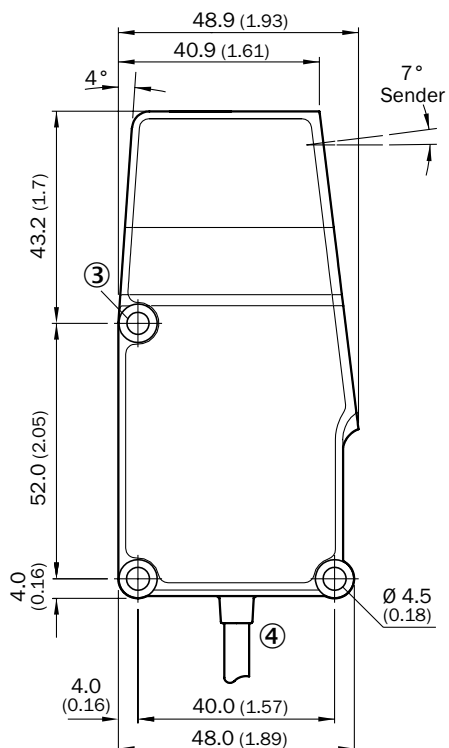
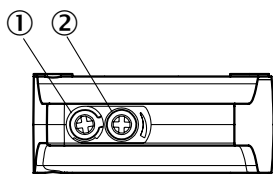
Dimensions in mm (inch)

R / IR without valve



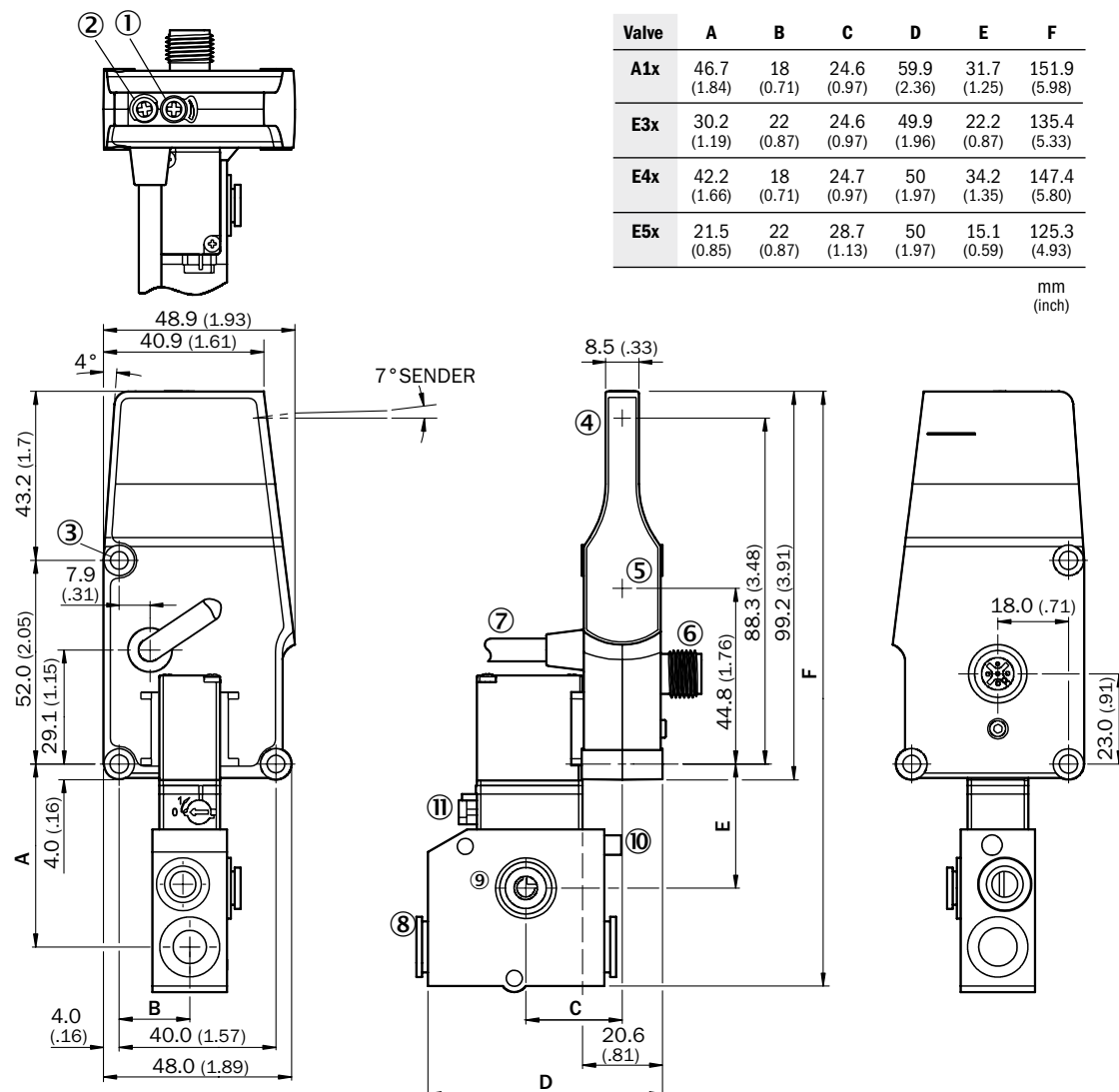
- ① LED
- ② Potentiometer
- ③ Mounting hole
- ④ Center of optical axis, sender
- ⑤ Center of optical axis, receiver
- ⑥ Connector M12, 4-pin

R cable



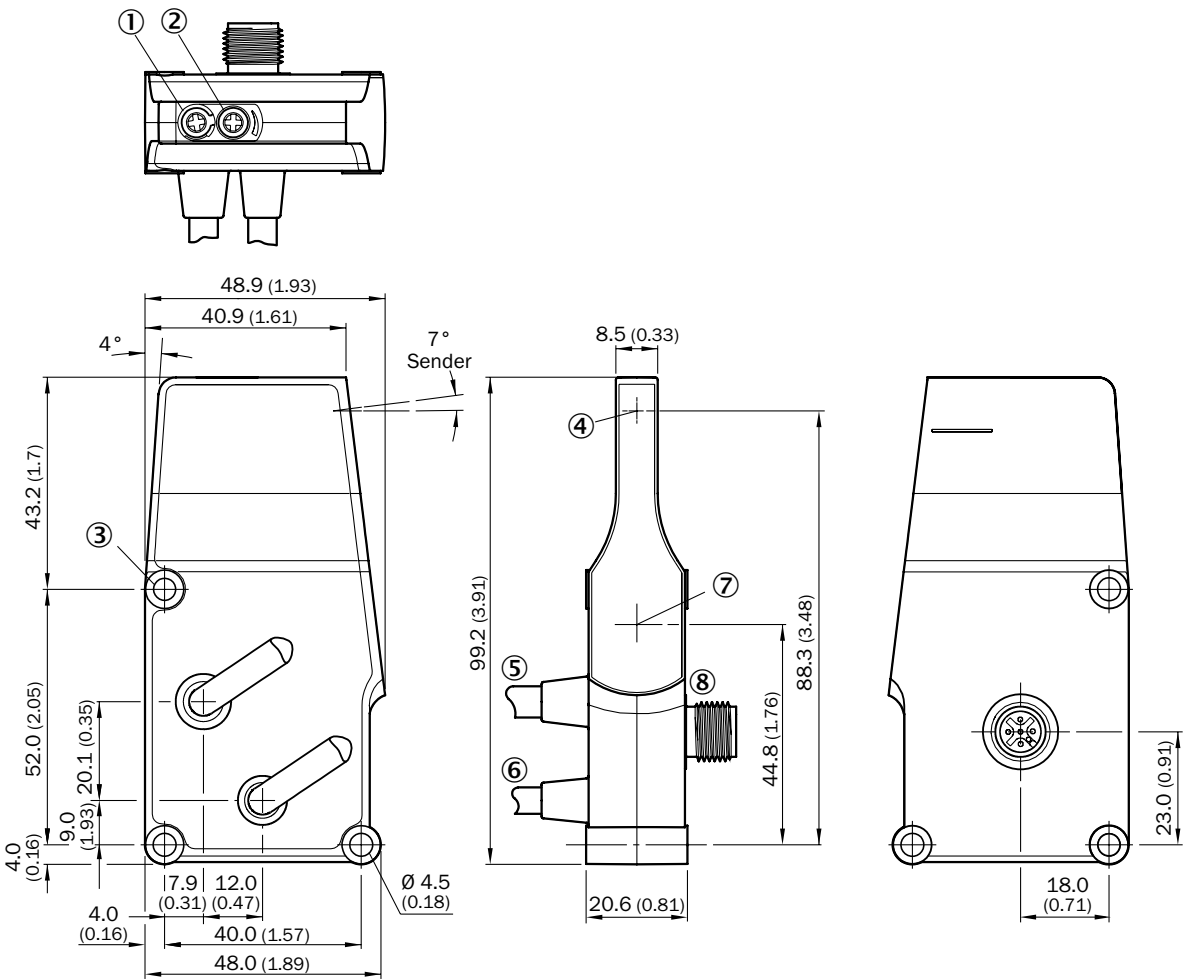
- ① LED
- ② Potentiometer
- ③ Mounting hole
- ④ Cable
- ⑤ Center of optical axis, sender
- ⑥ Center of optical axis, receiver

IR, valve metric/imperial



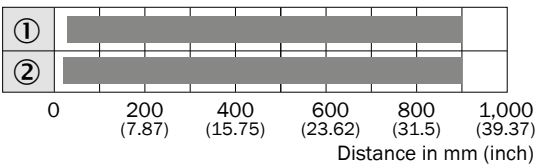
- ① Potentiometer
- ② LED
- ③ Mounting hole
- ④ Center of optical axis, sender
- ⑤ Center of optical axis, receiver
- ⑥ Connector M12, 4-pin
- ⑦ Daisy chain, cable with female connector

IR, for Motor Driven Rollers (MDR)



- ① LED
- ② Potentiometer
- ③ Mounting hole
- ④ Center of optical axis, sender
- ⑤ Daisy chain, cable with female connector
- ⑥ Connection for motor
- ⑦ Center of optical axis, receiver
- ⑧ Connector M12, 4-pin

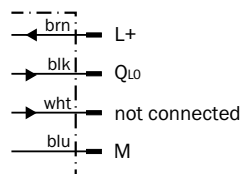
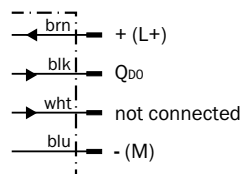
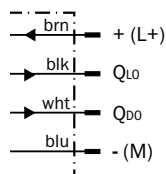
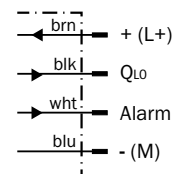
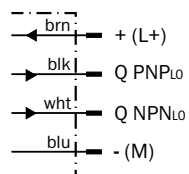
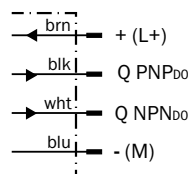
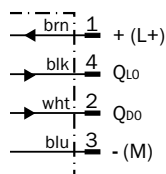
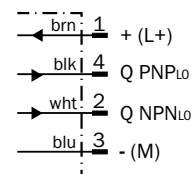
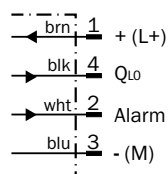
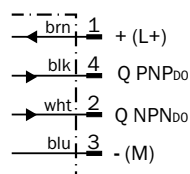
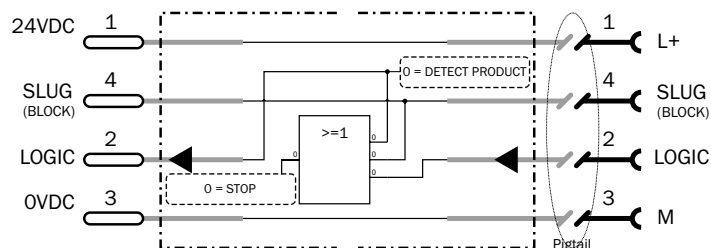
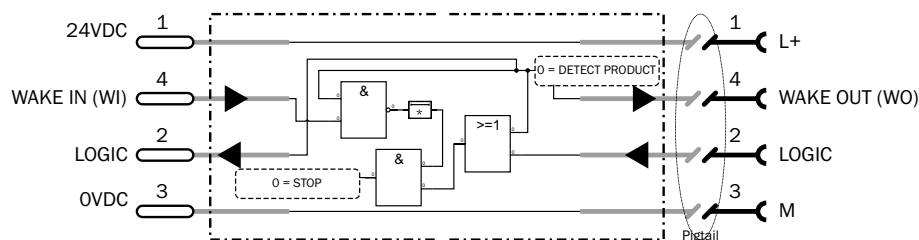
Bar diagrams



■ Sensing range max.

- ① Sensing range on black, 5 % remission
- ② Sensing range on white, 90 % remission

Connection diagram

Cd-247**Cd-248****Cd-249****Cd-250****Cd-251****Cd-252****Cd-255****Cd-256****Cd-258****Cd-261****Cd-265****Cd-266**

*After 9 s of no product, sensor goes into sleep.
Wake In input only active when sensor sleeping.

Recommended accessories

Adapters/distributors

T-junctions

Figure	Connecting cable	Connector material	Locking nut material	Description	Model name	Part no.
	0.3 m	TPU	CuZn, nickel-plated brass	Signal interrogation and logic interrupt	DSL-1104-T0M3	6011683
				Signal interrogation	DSL-1204-T0M4	6011682

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Mounting bracket	BEF-WK-WTR	2051786

→ For additional accessories, please see page L-861

E



Zero Pressure Accumulation made easy



Product description

Just as traffic lights handle the flow of cars in big cities, SICK ZoneControl solutions control product traffic on a conveyor without any other PLC or other external control. SICK ZoneControl is made up of three product families designed to control this traffic, known as Zero Pressure Accumulation (ZPA). Installation of ZoneControl solutions – via plug and play – is incredibly simple: daisy chain the ZoneControl products to one another, install the sensor, and connect the pneumatic line or connection to motor rollers.

No programming of a PLC, no laptop, and no expensive wiring is required. Each of these products creates one of two types of accumulation logic: Single Accumulation (with/without sleep) and Block (Slug) Accumulation, depending on what the application requires. To accommodate various mounting requirements, there are three different versions with different mounting configurations: between the rollers (R/IR), side frame mount (ZLM) and over the conveyor (WLR).

At a glance

- Connects to any 9.4 mm DIN valve
- Single or slug accumulation
- Ideal for pneumatic actuators or motor-driven rollers
- Daisy chain connection cables included for zone lengths of 1m (3 ft) and 2 m (6 ft)
- AC power options

Your benefits

- Attach your choice of actuator to complete the ZoneControl Solution
- Linear polarized retro-reflective sensing technology eliminates false detection of shiny or plastic-wrapped objects
- The Daisy Chain means that last minute changes or adding a zone is a matter of minutes
- A sealed IP67 housing to withstand harsh environments and washdown
- Single or Block (slug) Accumulation Logic to maximize product throughput
- Output cable for connection to electric motor control or pneumatic valve



Additional information

Detailed technical data. E-161
 Ordering information. E-162
 Dimensional drawings E-162
 Connection diagram E-163

→ www.mysick.com/en/WLR

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

	Single accumulation	Block (slug) accumulation
Sensor principle	Photoelectric retro-reflective sensor	
Logical principle of operation	Single accumulation	Block (slug) accumulation
Type of Release	Single release, block (slug) release	Block (slug) release
Dimensions (W x H x D)	45 mm x 73.7 mm x 48.6 mm	
Housing design (light emission)	Rectangular	
Sensing range ¹⁾	0 m ... 9 m	
Type of light	Visible red light	
Light source ²⁾	LED	
Light spot size (distance)	Ø 205 mm (9 m)	

¹⁾ PL80A.

²⁾ Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

Ripple ¹⁾	< 5 V _{pp}
Power consumption ²⁾	≤ 40 mA
Switching mode	Light switching
Response time	1 ms
Switching frequency	500 Hz
Connection type	Cable with connector, M12, 300 mm
Connection type for daisy chain	Cable with receptacle, M12, 4-pin
Circuit protection	A ³⁾ , C ⁴⁾ , D ⁵⁾
Protection class	II
Housing material	ABS
Enclosure rating	IP 67
Shock/vibration	According to IEC 68
Ambient operating temperature	-25 °C ... +55 °C
Ambient storage temperature	-40 °C ... +70 °C

¹⁾ Of V_S.

²⁾ Without load and valve deenergized.

³⁾ A = V_S connections reverse-polarity protected.

⁴⁾ C = interference suppression.

⁵⁾ D = outputs overcurrent and short-circuit protected.

Pneumatic

	Single accumulation	Block (slug) accumulation
Connection type solenoid valve	Spade, 1 m: spade, 2 m cable, 1 m, with 9.4 mm DIN valve connector cable, 2m, with 9.4 mm DIN valve connector (depending on type)	Cable, 1 m, with 9.4 mm DIN valve connector: cable, 2m, with 9.4 mm DIN valve connector (depending on type)

Ordering information

Other models available at www.mysick.com/en/WLR

Single accumulation

- **Switching mode:** light switching
- **Connection to sensor:** cable with connector M12, 4-pin 300 mm

Connection type for daisy chain	Connection type solenoid valve	Connection diagram	Model name	Part no.
Cable with receptacle, M12, 4-pin, 1 m	Spade, 1 m	Cd-246	WLR2100-D1311	7027185
	Cable, 1 m, with 9.4 mm DIN valve connector	Cd-246	WLR2100-D2311	7027808
Cable with receptacle, M12, 4-pin, 2 m	Spade, 2 m	Cd-246	WLR2100-D1312	7027753
	Cable, 2m, with 9.4 mm DIN valve connector	Cd-246	WLR2100-D2312	7027811

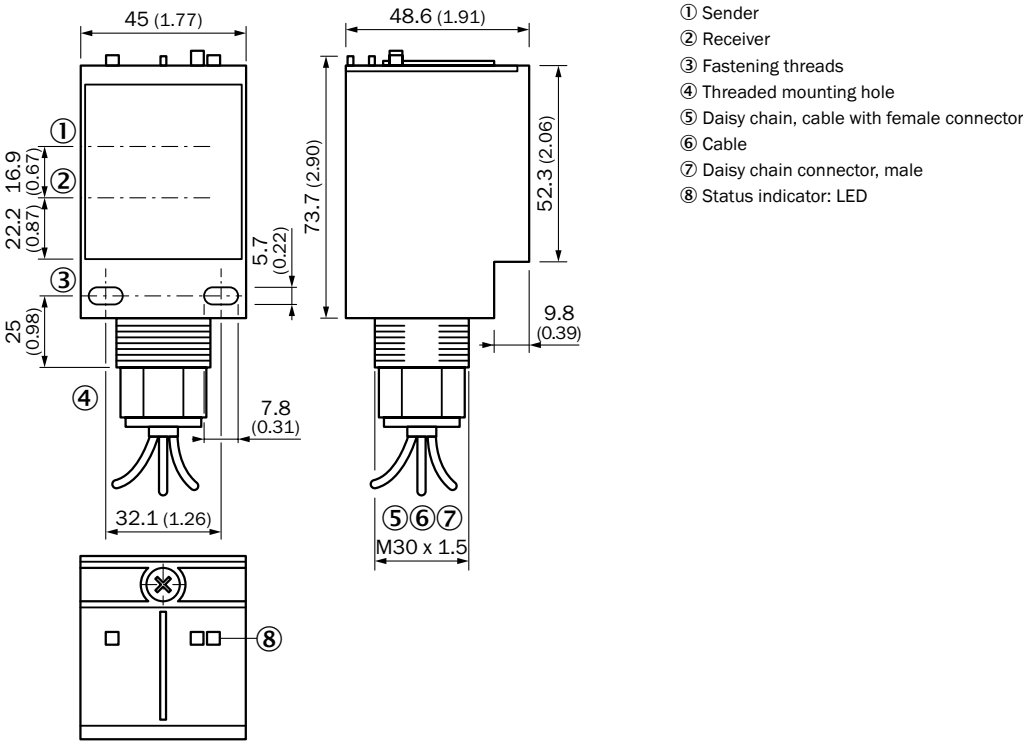
Block (slug) accumulation

- **Switching mode:** light switching
- **Connection to sensor:** cable with connector M12, 4-pin 300 mm

Connection type for daisy chain	Connection type solenoid valve	Connection diagram	Model name	Part no.
Cable with receptacle, M12, 4-pin, 1 m	Cable, 1 m, with 9.4 mm DIN valve connector	Cd-246	WLR2100-D1321	7027754
	Cable, 1 m, with 9.4 mm DIN valve connector	Cd-246	WLR2100-D2321	7027809
Cable with receptacle, M12, 4-pin, 2 m	Cable, 2m, with 9.4 mm DIN valve connector	Cd-246	WLR2100-D1322	7027755
	Cable, 2m, with 9.4 mm DIN valve connector	Cd-246	WLR2100-D2322	7027810

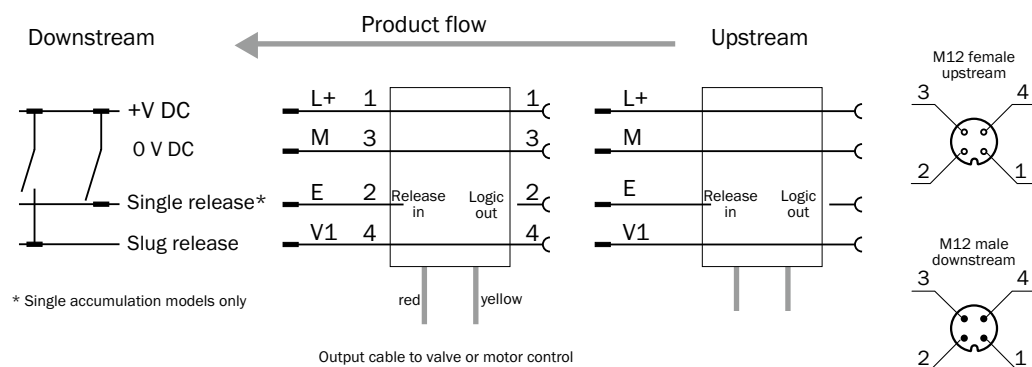
Dimensional drawings

Dimensions in mm (inch)



Connection diagram

Cd-246



Side-mounted conveyor module with zone control intelligence



Product description

Just as traffic lights handle the flow of cars in big cities, SICK ZoneControl solutions control product traffic on a conveyor without any other PLC or other external control. SICK ZoneControl is made up of three product families designed to control this traffic, known as Zero Pressure Accumulation (ZPA). Installation of ZoneControl solutions – via plug and play – is incredibly simple: daisy chain the ZoneControl products to one another, install the sensor, and connect the pneumatic line or connection to motor rollers.

No programming of a PLC, no laptop, and no expensive wiring is required. Each of these products creates one of two types of accumulation logic: Single Accumulation (with/without sleep) and Block (Slug) Accumulation, depending on what the application requires. To accommodate various mounting requirements, there are three different versions with different mounting configurations: between the rollers (R/IR), side frame mount (ZLM) and over the conveyor (WLR).

At a glance

- Connects to any discrete DC voltage sensor
- Single or slug accumulation
- Ideal for pneumatic actuators
- Daisy chain connection cable included for zone lengths of 1m (3ft) or 2m (6 ft)
- Bolt-on or clip-on installation into the conveyor's side frame

Your benefits

- Sensor cable integrated for you to attach nearly any sensor
- SICK's most compact ZoneControl solution, you won't even know it's there
- Single or Block (slug) Accumulation Logic to maximize product throughput
- The Daisy Chain means that last minute changes or adding a zone is a matter of minutes



Additional information

Detailed technical data. E-165
 Ordering information. E-166
 Dimensional drawings E-168
 Connection diagram E-168

→ www.mysick.com/en/ZLM

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

	ZLM-B	ZLM-C
Actuator	Pneumatic, valve on board	
Max. number of sensors	Approx. 30 ¹⁾ /Approx. 50 ²⁾	
Logical principle of operation	Single accumulation / block (slug) accumulation (depending on type)	
Type of Release	Single release / block (slug) release / block (slug) release (depending on type)	
Dimensions (W x H x D)	31 mm x 110 mm x 83 mm 31 mm x 93 mm x 74 mm 31 mm x 105 mm x 74 mm (depending on type)	30 mm x 110 mm x 70 mm
Housing design (light emission)	Bolt-on mounting	Clip-on mounting
Time type	Time delay off	–
Delay time	0 s ... 2 s	–

¹⁾ When power from the end of the IR daisy chain.

²⁾ When power from center of the IR daisy chain.

Mechanics/electronics

	ZLM-B	ZLM-C
Supply voltage	≥ 21.6 V DC ¹⁾	≥ 21.6 V DC ²⁾
Ripple	< 5 V _{pp}	
Power consumption ³⁾	< 60 mA	
Output type	PNP	
Signal voltage PNP HIGH/LOW	Approx. V _S – 0.5 V / 0 V	
Output current I_{max.}	100 mA	
Response time	2.5 ms	
Switching frequency	200 Hz	
Connection type	Cable with receptacle ⁴⁾	
Connection type for daisy chain	Cable with connector M12, 4-pin / Cable with push-on connector M12, 4-pin (depending on type)	Cable with push-on connector M12, 4-pin / Cable with connector M12, 4-pin (depending on type)
Circuit protection	A ⁵⁾ , C ⁶⁾ , D ⁷⁾	
Protection class	III ⁸⁾	
Housing material	ABS	
Enclosure rating	IP 40	
Shock/vibration	According to IEC 68	
Ambient operating temperature	–10 °C ... +55 °C	
Ambient storage temperature	–40 °C ... +75 °C (depending on type)	–40 °C ... +75 °C
Mounting system type	Side-Frame-Mount	

¹⁾ Limit values.

²⁾ Limit values, the device may connect only to protected extra low voltage.

³⁾ Without load and valve deenergized.

⁴⁾ Do not bend below 0 °C.

⁵⁾ A = V_S connections reverse-polarity protected.

⁶⁾ C = interference suppression.

⁷⁾ D = outputs overcurrent and short-circuit protected.

⁸⁾ Reference voltage: 50 V DC.

Pneumatic

		ZLM-B	ZLM-C
Coil ratings	Valve, imperial	24 V DC 1 W	
	Valve, metric	24 V DC 2 W	–
		24 V DC 1 W (depending on type)	
Medium for valves		Compressed air or neutral gases filtered, non-lubricated or lubricated	
Design solenoid valve ¹⁾		3/2-way valve	
Connection type solenoid valve			
	Valve, imperial	Compressed air 3/8 “ diameter, control line 1/4 “ diameter	
	Valve, metric	Compressed air 2 x 8 mm diameter, output line 4 mm diameter	–
Air flow rate			
	Valve, imperial	40 NI/min	
	Valve, metric ²⁾	Approx. 20 NI/min	–
Ventilation capacity			
	Valve, imperial	40 NI/min	
	Valve, metric	Approx. 100 NI/min / approx. 130 NI/min (depending on type)	–
Operating pressure range			
	Valve, imperial	0 bar ... 4.5 bar	
	Valve, metric	0.5 bar ... 8 bar ³⁾ (depending on type)	–
Response time solenoid valve		Partially open 10 ms Open 23 ms Close 21 ms	

¹⁾ Other valve types available on request.

²⁾ P – A.

³⁾ In combination with cylinders with small air volume we recommend tests.

Ordering information

Other models available at www.mysick.com/en/ZLM

Bolt-on mounting, Air to Drive (NC)

- Connection diagram: Cd-263

Type of output	Logical principle of operation	Ventilation capacity	Operating pressure range	Connection to sensor	Connection type for daisy chain	Model name	Part no.
Valve, imperial	Single accumulation	40 NI/min	0 bar ... 4.5 bar	Cable with receptacle, M12, 4-pin 0.5 m	Cable with connector M12, 4-pin 1.2 m	ZLM1-B1111A10	7027768
					Cable with connector M12, 4-pin 2 m	ZLM1-B1211A10	7027784
				Cable with receptacle, M12 push-on, 4-pin 0.5 m	Cable with push-on connector M12, 4-pin 1.2 m	ZLM1-B1451A10	1052126
	Block (slug) accumulation	40 NI/min	0 bar ... 4.5 bar	Cable with receptacle, M12, 4-pin 0.5 m	Cable with connector M12, 4-pin 1.2 m	ZLM1-B2111A10	7027770
					Cable with connector M12, 4-pin 2 m	ZLM1-B2211A10	7027786
Valve, metric	Single accumulation	Approx. 130 NI/min	2 bar ... 8 bar ¹⁾	Cable with receptacle, M12, 4-pin 1.1 m PVC	Cable with connector M12, 4-pin 1.2 m	ZLM1-B1612E42	7028842

¹⁾ In combination with cylinders with small air volume we recommend tests.

Bolt-on mounting, Air to Brake (NO)

- **Connection diagram:** Cd-263

Type of output	Logical principle of operation	Ventilation capacity	Operating pressure range	Connection to sensor	Connection type for daisy chain	Model name	Part no.
Valve, imperial	Single accumulation	40 NI/min	0 bar ... 4.5 bar	Cable with receptacle, M12, 4-pin 0.5 m	Cable with connector M12, 4-pin 1.2 m	ZLM1-B1111A11	7027769
					Cable with connector M12, 4-pin 2 m	ZLM1-B1211A11	7027785
	Block (slug) accumulation	40 NI/min	0 bar ... 4.5 bar	Cable with receptacle, M12, 4-pin 0.5 m	Cable with connector M12, 4-pin 2 m	ZLM1-B2211A11	7027787
					Cable with connector M12, 4-pin 1.2 m	ZLM1-B2111A11	7027771
Valve, metric	Single accumulation	Approx. 100 NI/min	0.5 bar ... 8 bar ¹⁾	Cable with receptacle, M12, 4-pin 1.1 m PVC	Cable with connector M12, 4-pin	ZLM1-B5612E41	7028428
		Approx. 130 NI/min	2 bar ... 8 bar ¹⁾	Cable with receptacle, M12, 4-pin 1.1 m PVC	Cable with connector M12, 4-pin	ZLM1-B1612E43	7028843

¹⁾ In combination with cylinders with small air volume we recommend tests.

Clip-on mounting, Air to Drive (NC)

- **Type of output:** valve, imperial
- **Ventilation capacity:** 40 NI/min
- **Operating pressure range:** 0 bar ... 4.5 bar
- **Connection diagram:** Cd-263

Logical principle of operation	Connection to sensor	Connection type for daisy chain	Model name	Part no.
Single accumulation	Cable with receptacle, M12 push-on, 4-pin 0.5 m	Cable with push-on connector M12, 4-pin 1.2 m	ZLM1-C1451A10	7029987
	Cable with receptacle, M12, 4-pin 0.5 m	Cable with connector M12, 4-pin 1.2 m	ZLM1-C1111A10	7027764
		Cable with connector M12, 4-pin 2 m	ZLM1-C1211A10	7027780
Block (slug) accumulation	Cable with receptacle, M12, 4-pin 0.5 m	Cable with connector M12, 4-pin 2 m	ZLM1-C2211A10	7027782

Clip-on mounting, Air to Brake (NO)

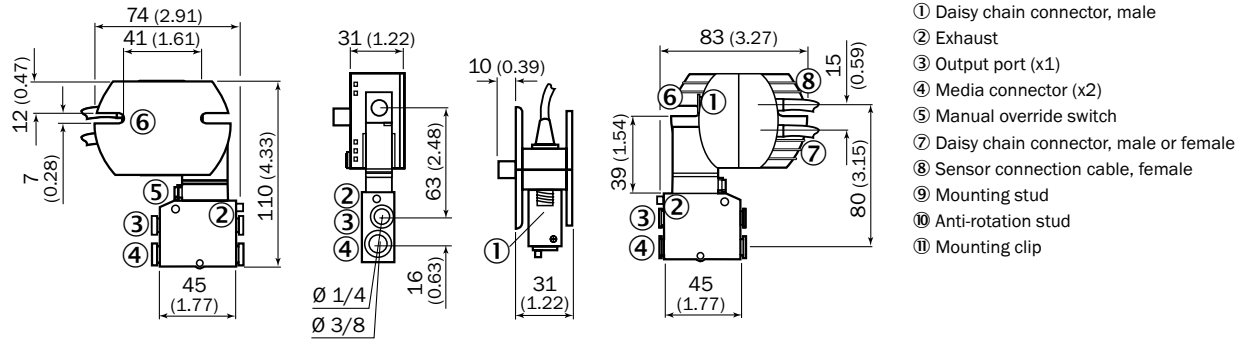
- **Type of output:** valve, imperial
- **Ventilation capacity:** 40 NI/min
- **Operating pressure range:** 0 bar ... 4.5 bar
- **Connection diagram:** Cd-263

Logical principle of operation	Connection to sensor	Connection type for daisy chain	Model name	Part no.
Single accumulation	Cable with receptacle, M12, 4-pin 0.5 m	Cable with connector M12, 4-pin 2 m	ZLM1-C1211A11	7027781
		Cable with connector M12, 4-pin 1.2 m	ZLM1-C1111A11	7027765
	Cable with receptacle, M12 push-on, 4-pin 0.5 m	Cable with push-on connector M12, 4-pin 1.2 m	ZLM1-C1451A11	7029988
Block (slug) accumulation	Cable with receptacle, M12, 4-pin 0.5 m	Cable with connector M12, 4-pin 1.2 m	ZLM1-C2111A11	7027767
		Cable with connector M12, 4-pin 2 m	ZLM1-C2211A11	7027783

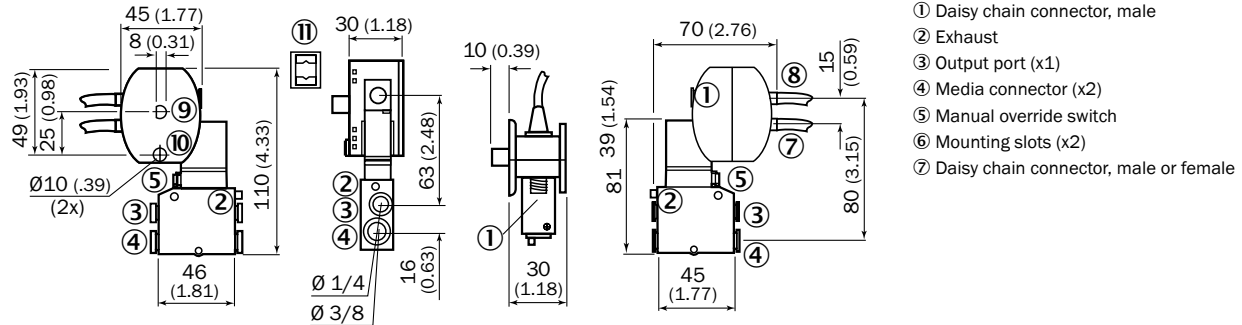
Dimensional drawings

Dimensions in mm (inch)

ZLM-B

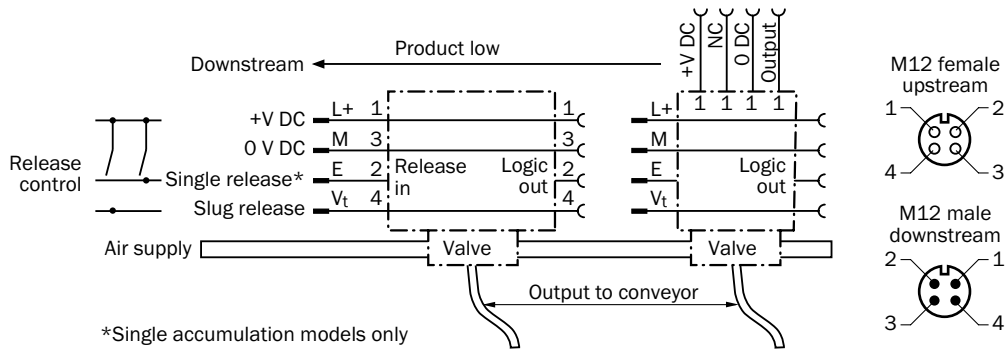


ZLM-C



Connection diagram

Cd-263





F

Best-in-class – minimum size for the toughest requirements

Providing maximum performance in minimum space requirements is no problem for SICK's miniature sensor technology. Tiny machines, intricate and complicated systems, the toughest ambient conditions, and targets of any kind – SICK can provide the solution for a combination of requirements. The latest PinPoint LEDs, SIRIC® and IO-Link technologies are packed into rugged, ultra compact housings and supplemented with practical accessories. These sensors are ideal for nearly all applications and installation conditions.

Your benefits

- The widest range in automation technology – we stock miniature photoelectric sensors for all requirements
- We meet the needs of all industries – from the world's smallest background suppression sensor to the most rugged stainless steel sensor for extreme applications in the food and beverage industry
- Virtually our entire miniature line comes with PinPoint technology, enabling the fast and safe alignment of photoelectric sensors. Even jet-black objects like car tires, textiles and carpets are reliably detected
- Flexible operation every time, whether preset at the factory, via a potentiometer, teach-in button or external teach via cable and IO-Link





F

Miniature photoelectric sensors

Product selection	F-172
Product family overview	F-178



G2S F-186
No space is too small



G6 F-196
Global sensor – the economic way to business class performance



W2 Flat F-208
One of the smallest photoelectric sensor families in the world



W2S-2 F-216
W2S-2 F-216 W2SG-2 F-232



W4-3 F-238
W4-3 F-238 W4-3 Glass F-254
W4-3 PTFE F-250



W4S-3 F-260
W4S-3 F-260 W4S-3 Glass F-272



W4SL-3 F-278
W4SL-3 F-278 W4SLG-3 F-290



W4S-3 Inox F-298
W4S-3 Inox F-298 W4S-3 Inox Hygiene F-320
W4S-3 Inox Glass F-312 W4S-3 Inox Hygiene Glass F-334



W4SL-3V/H F-342
W4SL-3V F-342 W4SL-3H F-358
W4SLG-3V F-350 W4SLG-3H F-364



W8 F-372
W8 F-372 W8 Inox F-386
W8G F-380 W8 Laser F-398



W100-2 F-404
Miniature photoelectric sensors for standard applications



W100 Laser F-412
Miniature photoelectric laser sensor provides precise detection of objects in standard applications

Overview of miniature photoelectric sensors

	Housing properties							Sensor properties											
	Material			Enclosure rating															
	Stainless steel	Plastic	PTFE coating 	IP 66	IP 67	IP 68	IP 69K 	Photoelectric proximity sensor	Energetic	Background suppression	Foreground suppression	Photoelectric retro-reflective sensor	Autocollimation	Standard optics	Through-beam photoelectric sensor	IO-Link	AutoAdapt 	Switching frequency ≥ 2 kHz 	
G2S																			
G2S 																			
G6																			
G6																			
W2																			
W2 Flat																			
W2S-2 																			
W2SG-2 																			
W4																			
W4-3																			
W4-3 PTFE																			
W4-3 Glass																			
W4S-3																			
W4S-3 Glass																			
W4SL-3 																			
W4SLG-3 																			
W4 Inox																			
W4S-3 Inox																			
W4S-3 Inox Glass																			
W4S-3 Inox Hygiene																			
W4S-3 Inox Hyg. Glass																			
W4SL-3V 																			
W4SLG-3V 																			
W4SL-3H 																			
W4SLG-3H 																			

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	Housing properties							Sensor properties											
	Material			Enclosure rating															
	Stainless steel	Plastic	PTFE coating 	IP 66	IP 67	IP 68	IP 69K 	Photoelectric proximity sensor	Energetic	Background suppression	Foreground suppression	Photoelectric retro-reflective sensor	Autocollimation	Standard optics	Through-beam photoelectric sensor	IO-Link	AutoAdapt 	Switching frequency ≥ 2 kHz 	
W8																			
W8																			
W8G																			
W8 Inox																			
W8 Laser																			
W100																			
W100-2 																			
W100 Laser																			

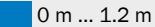
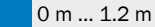
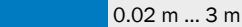
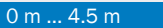
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Photoelectric proximity sensors

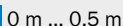
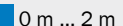
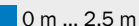
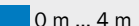
		Maximum sensing range		Dimensions (W x H x D)	Page
W2 Flat		1 mm ... 115 mm		12 mm x 20 mm x 3.5 mm	F-208
G2S		1 mm ... 120 mm		7.7 mm x 27.5 mm x 13.5 mm	F-186
W4-3 PTFE		4 mm ... 120 mm		22 mm x 42 mm x 21.8 mm	F-250
W2S-2		1 mm ... 150 mm		7.7 mm x 21.8 mm x 13.5 mm	F-216
W4-3		3 mm ... 150 mm		16 mm x 39.5 mm x 12 mm	F-238
W4S-3		4 mm ... 180 mm		12.2 mm x 41.8 mm x 17.3 mm	F-260
G6		5 mm ... 300 mm		12 mm x 31.5 mm x 21 mm	F-196
W8		5 mm ... 300 mm		11 mm x 31 mm x 20 mm	F-372
W8 Laser		5 mm ... 300 mm		11 mm x 31 mm x 20 mm	F-398
W4SL-3		25 mm ... 300 mm		12.2 mm x 41.8 mm x 17.3 mm	F-278
W4SL-3H		25 mm ... 300 mm		15.3 mm x 63.2 mm x 22.2 mm	F-358
W4SL-3V		25 mm ... 300 mm		15.3 mm x 55.4 mm x 22.2 mm	F-342
W100 Laser		0 mm ... 450 mm		11 mm x 31 mm x 20 mm	F-412
W4S-3 Inox		4 mm ... 500 mm		15.3 mm x 55.4 mm x 22.2 mm	F-298
W4S-3 Inox Hygiene		4 mm ... 500 mm		15.3 mm x 63.2 mm x 22.15 mm	F-320
W8 Inox		0 mm ... 950 mm		11 mm x 21 mm x 33.3 mm	F-386
W100-2		0 mm ... 1,000 mm		11 mm x 31 mm x 20 mm	F-404

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Photoelectric retro-reflective sensors

		Maximum sensing range		Dimensions (W x H x D)	Page
W2S-2		0 m ... 1.2 m		7.7 mm x 21.8 mm x 13.5 mm	F-216
W2SG-2		0 m ... 1.2 m		7.7 mm x 21.8 mm x 13.5 mm	F-232
G2S		0.02 m ... 3 m		7.7 mm x 21.8 mm x 13.5 mm	F-186
W8G		0 m ... 3 m		11 mm x 31 mm x 20 mm	F-380
W8		0 m ... 4 m		11 mm x 31 mm x 20 mm	F-372
W4-3		0.01 m ... 4.5 m		16 mm x 39.5 mm x 12 mm	F-238
W4-3 Glass		0.01 m ... 4.5 m		16 mm x 39.5 mm x 12 mm	F-254
W4SLG-3		0 m ... 4.5 m		12.2 mm x 41.8 mm x 17.3 mm	F-290
W4SLG-3H		0 m ... 4.5 m		15.3 mm x 63.2 mm x 22.2 mm	F-364
W4SLG-3V		0 m ... 4.5 m		15.3 mm x 55.4 mm x 22.2 mm	F-350
W4S-3		0 m ... 5 m		12.2 mm x 41.8 mm x 17.3 mm	F-260
W4S-3 Glass		0.01 m ... 5 m		12.2 mm x 41.8 mm x 17.3 mm	F-272
W4S-3 Inox		0 m ... 5 m		15.3 mm x 55.4 mm x 22.2 mm	F-298
W4S-3 Inox Glass		0 m ... 5 m		15.3 mm x 55.4 mm x 22.2 mm	F-312
W4S-3 Inox Hygiene		0 m ... 5 m		15.3 mm x 63.2 mm x 22.15 mm	F-320
W4S-3 Inox Hygiene Glass		0 m ... 5 m		15.3 mm x 63.2 mm x 22.15 mm	F-334
G6		0 m ... 6 m		12 mm x 31.5 mm x 21 mm	F-196
W8 Inox		0.01 m ... 6.5 m		11 mm x 21 mm x 33.3 mm	F-386
W100-2		0.01 m ... 7.5 m		11 mm x 31 mm x 20 mm	F-404
W4SL-3		0 m ... 12 m		12.2 mm x 41.8 mm x 17.3 mm	F-278
W100 Laser		0.08 m ... 12 m		11 mm x 31 mm x 20 mm	F-412

Through-beam photoelectric sensors

		Maximum sensing range		Dimensions (W x H x D)	Page
W2 Flat		0 m ... 0.5 m		12 mm x 20 mm x 3.5 mm	F-208
G2S		0 m ... 2 m		7.7 mm x 21.8 mm x 13.5 mm	F-186
W2S-2		0 m ... 2.5 m		7.7 mm x 21.8 mm x 13.5 mm	F-216
W4-3 PTFE		0 m ... 3 m		22 mm x 42 mm x 21.8 mm	F-250
W4-3		0 m ... 4 m		16 mm x 39.5 mm x 12 mm	F-238
W4S-3		0 m ... 5 m		12.2 mm x 41.8 mm x 17.3 mm	F-260
W4S-3 Inox		0 m ... 5 m		15.3 mm x 55.4 mm x 22.2 mm	F-298
W4S-3 Inox Hygiene		0 m ... 5 m		15.3 mm x 63.2 mm x 22.15 mm	F-320
G6		0 m ... 15 m		12 mm x 31.5 mm x 21 mm	F-196
W100-2		0 m ... 30 m		11 mm x 31 mm x 20 mm	F-404
W100 Laser		0 m ... 35 m		11 mm x 31 mm x 20 mm	F-412
W8 Inox		0 m ... 45 m		11 mm x 21 mm x 33.3 mm	F-386
W4SL-3		0 m ... 60 m		12.2 mm x 41.8 mm x 17.3 mm	F-278
W4SL-3V		0 m ... 60 m		15.3 mm x 55.4 mm x 22.2 mm	F-342

Product family overview

				
	G2S	G6	W2 Flat	
	No space is too small	Beyond the standard: Global sensor – the economic way to business class performance	One of the smallest photoelectric sensor families in the world	
Technical data overview				
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	12 mm x 31.5 mm x 21 mm	12 mm x 20 mm x 3.5 mm	
Sensing range max.				
Photoelectric proximity sensor	1 mm ... 120 mm	5 mm ... 300 mm	1 mm ... 115 mm	
Photoelectric retro-reflective sensor	0.02 m ... 3 m	≤ 6 m	–	
Through-beam photoelectric sensor	0 m ... 2 m	0 m ... 15 m	0 m ... 0.5 m	
Light source	PinPoint LED	PinPoint LED	LED	
Type of light	Visible red light	Visible red light	Visible red light	
Enclosure rating	IP 67	IP 67	IP 67	
Housing material	Plastic	Plastic	Plastic	
At a glance				
	• Complete product family of photoelectric sensors in a tried-and-tested sensor design • Adjustable BGS photoelectric proximity sensor with an sensing range up to 120 mm • Optical performance data that exceeds market standards for sensing range and housing design • Reliable detection of jet-black, poorly reflective and highly reflective objects • PinPoint LED ensures high sensing ranges and reliable object detection	• PinPoint LED for a bright, precise light spot • Durable metal threaded inserts • SICK ASIC technology – the result of decades of experience in photoelectric sensors • Large, user-friendly potentiometer • Large, bright indicator LEDs • IP 67 enclosure rating	• One of the smallest photoelectric sensors in the world • No external amplifier required • Variant designed to detect transparent and glossy objects • Rugged housing with metal-reinforced fixing holes	
Detailed information	→ F-186	→ F-196	→ F-208	

 W2S-2	 W2SG-2	 W4-3	 W4-3 PTFE
Incredibly small, yet powerful	Powerful clear material detection in an ultra-compact housing	Best-in-class sensing performance in a miniature housing	Teflon-coated photoelectric sensors withstand the harshest environments
7.7 mm x 21.8 mm x 13.5 mm	7.7 mm x 21.8 mm x 13.5 mm	16 mm x 39.5 mm x 12 mm	22 mm x 42 mm x 21.8 mm
1 mm ... 150 mm 0 m ... 1.2 m	– 0 m ... 1.2 m	3 mm ... 150 mm 0.01 m ... 4.5 m	4 mm ... 120 mm –
0 m ... 2.5 m	–	0 m ... 4 m	0 m ... 3 m
PinPoint LED	PinPoint LED	PinPoint LED	PinPoint LED
Visible red light	Visible red light	Visible red light / Infrared light	Visible red light
IP 67	IP 67	IP 66, IP 67	IP 68, IP 69K
Plastic	Plastic	Plastic	PTFE
• All variants with M8, 3- and 4-pin pigtail • Proximity sensor with precise background suppression and fixed focusing • IP 67 enclosure rating • Two sensing ranges with either a 15 mm or a 30 mm range are available	• All variants with M8, 3- and 4-pin pigtail • Proximity sensor with precise background suppression and fixed focusing • IP 67 enclosure rating • Two sensing ranges with either a 15 mm or a 30 mm range are available	• Best-in-class background suppression, reliable detection of critical objects and a high immunity to ambient light • Quick and easy setup using a precise 5-turn potentiometer, control wire or teach function • Best background suppression in its class • PinPoint LED for brightest light spot in its class	• Sensor and cable have a rugged Teflon coating for use in the most aggressive environments • Suitable for use in the food and beverage industry • Sensing range adjustment via teach wire • Background suppression and through-beam types available
→ F-216	→ F-232	→ F-238	→ F-250

Product family overview

				
	W4-3 Glass	W4S-3	W4S-3 Glass	
	Reliable detection of transparent objects	Photoelectric sensor family with best-in-class performance	Slim photoelectric sensors reliably detect transparent objects	
Technical data overview				
Dimensions (W x H x D)	16 mm x 39.5 mm x 12 mm	12.2 mm x 41.8 mm x 17.3 mm	12.2 mm x 41.8 mm x 17.3 mm	
Housing design	–	–	–	
Sensing range max.				
Photoelectric proximity sensor	–	4 mm ... 180 mm	–	
Photoelectric retro-reflective sensor	0.01 m ... 4.5 m	0 m ... 5 m	0.01 m ... 5 m	
Through-beam photoelectric sensor	–	0 m ... 5 m	–	
Light source	PinPoint LED	PinPoint LED	PinPoint LED	
Type of light	Visible red light	Visible red light	Visible red light	
Enclosure rating	IP 66, IP 67	IP 66, IP 67	IP 66, IP 67	
Housing material	Plastic	Plastic	Plastic	
At a glance				
	• Fast and reliable setup via teach-in pushbutton • Continuous threshold adaptation (AutoAdapt) technology to detect objects in changing conditions such as temperature, contamination and reflector wear • Versions without polarizing filters to better detect depolarizing objects such as PET bottles, CD sleeves and shrink-wrapped, glossy objects	• Best background suppression sensor in its class • Universal use of PinPoint LED technology in all models • BGS proximity sensor with laser-like light spot for precise detection tasks • Reliable setting via 5-turn potentiometer, teach-in pushbutton, teach-in via cable or IO-Link • Flexible sensor settings, monitoring, advanced diagnostics, and visualization thanks to IO-Link	• Continuous threshold adaption (AutoAdapt) of the switching threshold compensates for environmental changes • Single-lens autocollimation optics • Simple setting either via teach-in pushbutton, cable or IO-Link • PinPoint LED technology with a small, highly visible, well-defined light spot enables high reserve levels when using small reflectors • Flexible sensor settings, monitoring, advanced diagnostics, and visualization thanks to IO-Link	
Detailed information	→ F-254	→ F-260	→ F-272	

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 W4SL-3	 W4SLG-3	 W4S-3 Inox	 W4S-3 Inox Glass
Laser precision for very small or transparent objects	Detect all objects with one device – Change mode via teach button	Highest reliability, maximum resistance and endless possibilities	Reliable detection of transparent objects
12.2 mm x 41.8 mm x 17.3 mm	12.2 mm x 41.8 mm x 17.3 mm	15.3 mm x 55.4 mm x 22.2 mm	15.3 mm x 55.4 mm x 22.2 mm
–	–	Washdown	Washdown
25 mm ... 300 mm	–	4 mm ... 500 mm	–
0 m ... 12 m	0 m ... 4.5 m	0 m ... 5 m	0 m ... 5 m
0 m ... 60 m	–	0 m ... 5 m	–
Laser	Laser	PinPoint LED	PinPoint LED
Visible red light	Visible red light	Visible red light	Visible red light
IP 66, IP 67	IP 66, IP 67	IP 66, IP 67, IP 68, IP 69K	IP 66, IP 67, IP 68, IP 69K
Plastic	Plastic	Stainless steel	Stainless steel
• Precise laser light spot, laser class 1 • Teach-in pushbutton can be switched between detection of transparent and non-transparent objects • Sensing ranges between 25 mm and 60 m • Latest SIRIC® and laser technologies with second emitter LED to provide outstanding background suppression and ambient light immunity • Choice of adjustment via teach-in button, potentiometer, cable, or IO-Link	• Precise laser light spot, laser class 1 • Teach-in button can be switched between detection of transparent and smallest non-transparent objects • Continuous threshold adaptation (AutoAdapt) provides automatic adjustment to changes in light conditions • Sensing ranges up to 4.5 m • Autocollimation optics prevent blind spots • Choice of adjustment via teach-in button, potentiometer, cable, or IO-Link	• WashDown rated for fluid tightness (IP 66, IP 67, IP 68 and IP 69K) and Ecolab certified • Tough stainless steel housing (316L/1.4404) • Resistant to a variety of common cleaning and disinfection agents • Highly visible laser-like light spot due to PinPoint LED • Teach-in via stainless steel pushbutton with a metal membrane	• IP 66, IP 67, IP 68 and IP 69K enclosure rating and Ecolab certified • Tough stainless steel housing (316L/1.4404) • Resistant to a variety of common cleaning and disinfection agents • Modern electrical connection available – M12 connector with pin casting • PinPoint LED technology provides a highly visible laser-like light spot • Teach-in via stainless steel pushbutton with a metal membrane • Continuous threshold adaptation (AutoAdapt) technology reliably detects objects in changing conditions
→ F-278	→ F-290	→ F-298	→ F-312

Product family overview

				
	W4S-3 Inox Hygiene	W4S-3 Inox Hygiene Glass	W4SL-3V	
	Highest reliability, maximum resistance and endless possibilities	Reliable detection of transparent objects	The new standard for optical and mechanical ruggedness	
Technical data overview				
Dimensions (W x H x D)	15.25 mm x 63.2 mm x 22.15 mm	15.25 mm x 63.2 mm x 22.15 mm	15.3 mm x 55.4 mm x 22.2 mm	
Housing design	Hygiene	Hygiene	Washdown	
Sensing range max.				
Photoelectric proximity sensor	4 mm ... 500 mm	–	25 mm ... 300 mm	
Photoelectric retro-reflective sensor	0 m ... 5 m	0 m ... 5 m	–	
Through-beam photoelectric sensor	0 m ... 5 m	–	0 m ... 60 m	
Light source	PinPoint LED	PinPoint LED	Laser	
Type of light	Visible red light	Visible red light	Visible red light	
Enclosure rating	IP 66, IP 67, IP 68, IP 69K	IP 66, IP 67, IP 68, IP 69K	IP 66, IP 67, IP 68, IP 69K	
Housing material	Stainless steel	Stainless steel	Stainless steel	
At a glance				
	• Smooth stainless steel housing (316L/1.4404) • Hygienic mounting using M12-adapter thread or D12-adapter shaft • IP 66, IP 67, IP 68 and IP 69K enclosure rating and Ecolab certified • Resistant to a variety of common cleaning and disinfection agents • Highly visible laser-like light spot due to PinPoint LED • Teach-in via stainless steel pushbutton with a metal membrane	• Hygienic designed stainless steel housing and accessories (316L/1.4404) • Hygienic mounting using M12-adapter thread or D12-adapter shaft • IP 66, IP 67, IP 68 and IP 69K enclosure rating and Ecolab certified • Resistant to a variety of common cleaning and disinfection agents • PinPoint LED technology provides a highly visible laser-like light spot • Teach-in stainless steel metal membrane or external teach-in	• Precise laser light spot, laser class 1 • Stainless steel housing with washdown design • Latest SIRIC® and laser technologies for outstanding background suppression and ambient light immunity • Teach-in pushbutton can be switched between detection of transparent and tiny non-transparent objects • ECOLAB certified, tested to IP 66, IP 67, IP 68 and IP 69K enclosure rating • IO-Link (optional)	
Detailed information	→ F-320	→ F-334	→ F-342	

F

**W4SLG-3V**

Detect all transparent objects with one device
– Change mode via teach button

**W4SL-3H**

Laser technology and stainless steel hygienically combined

**W4SLG-3H**

Detect all transparent objects with one device
– Change mode via teach button

	15.3 mm x 55.4 mm x 22.2 mm	15.3 mm x 63.2 mm x 22.2 mm	15.3 mm x 63.2 mm x 22.2 mm
	Washdown	Hygiene	Hygiene
	–	25 mm ... 300 mm	–
	0 m ... 4.5 m	–	0 m ... 4.5 m
	–	–	–
	Laser	Laser	Laser
	Visible red light	Visible red light	Visible red light
	IP 66, IP 67, IP 68, IP 69K	IP 66, IP 67, IP 68, IP 69K	IP 66, IP 67, IP 68, IP 69K
	Stainless steel	Stainless steel	Stainless steel
	• Precise laser light spot, laser class 1, no blind spots • Stainless steel housing with wash-down design • Latest SIRIC® and laser technologies for very good background suppression and ambient light immunity • ECOLAB certified, tested to IP66, IP67, IP68 and IP69K enclosure rating • Teach-in pushbutton can be switched between detection of transparent and tiny non-transparent objects • IO-Link (optional)	• Precise laser light spot, laser class 1 • Stainless steel housing with wash down design • Latest SIRIC® and laser technologies for outstanding background suppression and ambient light immunity • Teach-in pushbutton can be switched between detection of transparent and tiny non-transparent objects • ECOLAB certified, tested to IP 66, IP 67, IP 68 and IP 69K enclosure rating • IO-Link (optional)	• Precise laser light spot, laser class 1 • Stainless steel housing with hygienic design • Latest SIRIC® and laser technologies for outstanding background suppression and ambient light immunity • Teach-in pushbutton can be switched between detection of transparent and tiny non-transparent objects • ECOLAB certified, tested to IP 66, IP 67, IP 68 and IP 69K enclosure rating • IO-Link (optional)
	→ F-350	→ F-358	→ F-364

Product family overview

	 W8	 W8G	 W8 Inox	
	High-performance object detection at close range	Photoelectric sensor detects transparent objects at close range	Compact, high-performance INOX sensors for harsh wash down environments	
Technical data overview				
Dimensions (W x H x D)	11 mm x 31 mm x 20 mm	11 mm x 31 mm x 20 mm	11 mm x 21 mm x 33.3 mm	
Sensing range max.				
Photoelectric proximity sensor	5 mm ... 300 mm	-	0 mm ... 950 mm	
Photoelectric retro-reflective sensor	0 m ... 4 m	0 m ... 3 m	0.01 m ... 6.5 m	
Through-beam photoelectric sensor	-	-	0 m ... 45 m	
Light source	LED	LED	LED	
Type of light	Visible red light	Visible red light	Visible red light	
Enclosure rating	IP 67	IP 67	IP 69K	
Housing material	Plastic	Plastic	Stainless steel	
At a glance				
	• Miniature housing with M3 threaded mounting holes • Switching frequency up to 2 kHz • Stainless steel mounting bracket (1.4301/304) BEF-W100-A included with delivery	• Autocollimation • Standard miniature housing with M3 threaded mounting holes • Light/dark switching selectable via rotary switch • Adjustable sensing range • All necessary accessories (BEF-W100-A and P250) are included with delivery	• Rugged IP 69K stainless steel housing 1.4404/316L • Front screen made of high-performance PPSU plastic that is resistant to heat and chemicals • Potentiometer made of mechanically stable high-performance PEEK (polyether ketone) plastic • Constructed with FDA-approved materials • Well-defined, highly visible light spot • M3 threaded mounting holes and stainless steel mounting bracket (1.4301/304) included with delivery	
Detailed information	→ F-372	→ F-380	→ F-386	

**W8 Laser**

Laser photoelectric proximity sensor with background suppression for close-range applications

**W100-2**

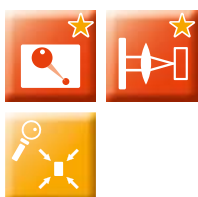
Miniature photoelectric sensors for standard applications

**W100 Laser**

Miniature photoelectric laser sensor provides precise detection of objects in standard applications

	11 mm x 31 mm x 20 mm	11 mm x 31 mm x 20 mm	11 mm x 31 mm x 20 mm
	5 mm ... 300 mm	0 mm ... 1,000 mm	0 mm ... 450 mm
	–	0.01 m ... 7.5 m	0.08 m ... 12 m
	–	0 m ... 30 m	0 m ... 35 m
	Laser	LED	Laser
	Visible red light	Visible red light	Visible red light
	IP 67	IP 67	IP 65
	Plastic	Plastic	Plastic
	• Laser class 1 • Background suppression • Standard miniature housing with M3 threaded mounting holes • Switching frequency up to 2 kHz • Light/dark switching via rotary switch • Mounting bracket BEF-W100-A is included with delivery	• Reliable detection behavior, rugged housing and immunity to ambient light • WT100-2 photoelectric proximity sensor (energetic or with background blanking) • WL100-2 photoelectric retro-reflective sensor; variant available for detecting transparent objects • WS/WE100-2 through-beam photoelectric sensor • Various connection types available (standard: 2 m cable; M8 male connector, 3-pin; M8 male connector, 4-pin; male cable connector available on request) • Light/dark switching and sensitivity adjustment possible • Wide range of accessories	• Standard miniature housing with M3 threaded mounting holes • Long sensing range • Light/dark switching and sensitivity adjustment via rotary switch possible • Various versions are available, including through-beam, retro-reflective and energetic • Wide variety of accessories available • Laser emitter LED, class 1
	→ F-398	→ F-404	→ F-412

No space is too small



Additional information

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Connection diagram.....	F-193
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Product description

Machines and systems are becoming more compact while the space available for sensors is shrinking. Sub-miniature sensors in the G2S product family feature a rugged, compact housing that

can be integrated into various applications with limited space. These sensors feature a long sensing range with reliable object detection.

At a glance

- Complete product family of photoelectric sensors in a tried-and-tested sensor design
- Adjustable BGS photoelectric proximity sensor with an sensing range up to 120 mm
- Optical performance data that exceeds market standards for sensing range and housing design
- Reliable detection of jet-black, poorly reflective and highly reflective objects
- PinPoint LED ensures high sensing ranges and reliable object detection

Your benefits

- Reliable object detection in confined environments helps cut costs and save space
- Sub-miniature housing enables seamless integration and creates opportunities for new machine designs
- Tried-and-tested, rugged housing design can be easily integrated into compact machines and systems
- Complete, ultra-small product family with operating functions for every application
- The 45-degree tilted cable entry offers maximum installation flexibility with additional soft rubber bearings to absorb vibrations and tensile loads

→ www.mysick.com/en/G2S

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

	GTB2S ,fix	GTB2S, adjustable	GL2S	GSE2S
Sensor principle	Photoelectric proximity sensor		Photoelectric retro-reflective sensor	Through-beam photo-electric sensor
Detection principle	Background suppression		Standard optics	–
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	7.7 mm x 21.8 mm x 13.5 mm	
Housing design (light emission)	Rectangular			
Sensing range max.	1 mm ... 36 mm ¹⁾ (depending on type)	2 mm ... 120 mm ¹⁾	0.02 m ... 3 m ²⁾	0 m ... 2 m
Sensing range	4 mm ... 30 mm ³⁾ (depending on type)	25 mm ... 90 mm ³⁾	0.03 m ... 2.5 m ²⁾	0 m ... 1.5 m
Background suppression typ. from	20 mm / 38 mm (depending on type)	–		
Type of light	Visible red light			
Light source ⁴⁾	PinPoint LED			
Wave length	640 nm			
Adjustment	–	Potentiometer, 3 turns	–	

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

²⁾ PL40A.

³⁾ Object with 6 % remission.

⁴⁾ Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

	GTB2S, fix	GTB2S, adjustable	GL2S	GSE2S
Supply voltage ¹⁾	10 V DC ... 30 V DC			
Ripple ²⁾	≤ 5 V _{pp}			
Power consumption ³⁾	≤ 20 mA			
Output type	PNP / NPN (depending on type)			
Switching mode	Light switching / Dark-switching (depending on type)			
Output current I_{max.}	< 50 mA			
Response time ⁴⁾	< 0.6 ms			
Switching frequency ⁵⁾	800 Hz			
Connection type	Cable, 2 m ⁶⁾ / Cable with connector, M8, 200 mm ⁶⁾ (depending on type)			
Circuit protection	A ⁷⁾ , C ⁸⁾ , D ⁹⁾			
Polarisation filter	–		✓	–
Housing material	ABS			
Optics material	PMMA			
Enclosure rating	IP 67			
Ambient operating temperature	–20 °C ... +50 °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.

Ordering information

Other models available at www.mysick.com/en/G2S

GTB2S

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

Sensing range max. ¹⁾	Light spot size (distance)	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-043	GTB2S-P1311	1064345
				Cable with connector M8, 3-pin 200 mm	Cd-045	GTB2S-P5311	1062872
			Dark-switching	Cable, 3-wire 2 m	Cd-043	GTB2S-F1311	1064346
				Cable with connector M8, 3-pin 200 mm	Cd-045	GTB2S-F5311	1064347
		NPN	Light switching	Cable, 3-wire 2 m	Cd-043	GTB2S-N1311	1062840
			Dark-switching	Cable with connector M8, 3-pin 200 mm	Cd-045	GTB2S-N5311	1064349
1 mm ... 36 mm	Ø 3 mm (15 mm)	PNP	Light switching	Cable, 3-wire 2 m	Cd-043	GTB2S-P1331	1064351
				Cable with connector M8, 3-pin 200 mm	Cd-045	GTB2S-P5331	1062930
			Dark-switching	Cable, 3-wire 2 m	Cd-043	GTB2S-F1331	1064352
				Cable with connector M8, 3-pin 200 mm	Cd-045	GTB2S-F5331	1064353
		NPN	Light switching	Cable, 3-wire 2 m	Cd-043	GTB2S-N1331	1062929
			Dark-switching	Cable, 3-wire 2 m	Cd-043	GTB2S-E1331	1064354
2 mm ... 120 mm	Ø 3.5 mm (50 mm)	PNP	Light switching	Cable, 3-wire 2 m	Cd-043	GTB2S-P1451	1060205
				Cable with connector M8, 3-pin 200 mm	Cd-045	GTB2S-P5451	1060204
			Dark-switching	Cable, 3-wire 2 m	Cd-043	GTB2S-F1451	1064341
				Cable with connector M8, 3-pin 200 mm	Cd-045	GTB2S-F5451	1064341
		NPN	Light switching	Cable, 3-wire 2 m	Cd-043	GTB2S-N1451	1060203
			Dark-switching	Cable with connector M8, 3-pin 200 mm	Cd-045	GTB2S-N5451	1064343
				Cable, 3-wire 2 m	Cd-043	GTB2S-E1451	1064342
				Cable with connector M8, 3-pin 200 mm	Cd-045	GTB2S-E5451	1064344

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

GL2S

- **Sensor principle:** Photoelectric retro-reflective sensor
- **Detection principle:** Standard optics

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0.02 m ... 3 m	Ø 11 mm (250 mm)	PNP	Light switching	Cable with connector M8, 3-pin 200 mm	Cd-045	GL2S-P5311	1064359
			Dark-switching	Cable, 3-wire 2 m	Cd-043	GL2S-F1311	1064358
				Cable with connector M8, 3-pin 200 mm	Cd-045	GL2S-F5311	1063008
		NPN	Light switching	Cable, 3-wire 2 m	Cd-043	GL2S-N1311	1064360
			Dark-switching	Cable, 3-wire 2 m	Cd-043	GL2S-N1312	1064423
				Cable, 3-wire 2 m	Cd-043	GL2S-E1311	1063009
				Cable, 3-wire 2 m	Cd-043	GL2S-E1312	1064424

¹⁾ PL40A.

GSE2S

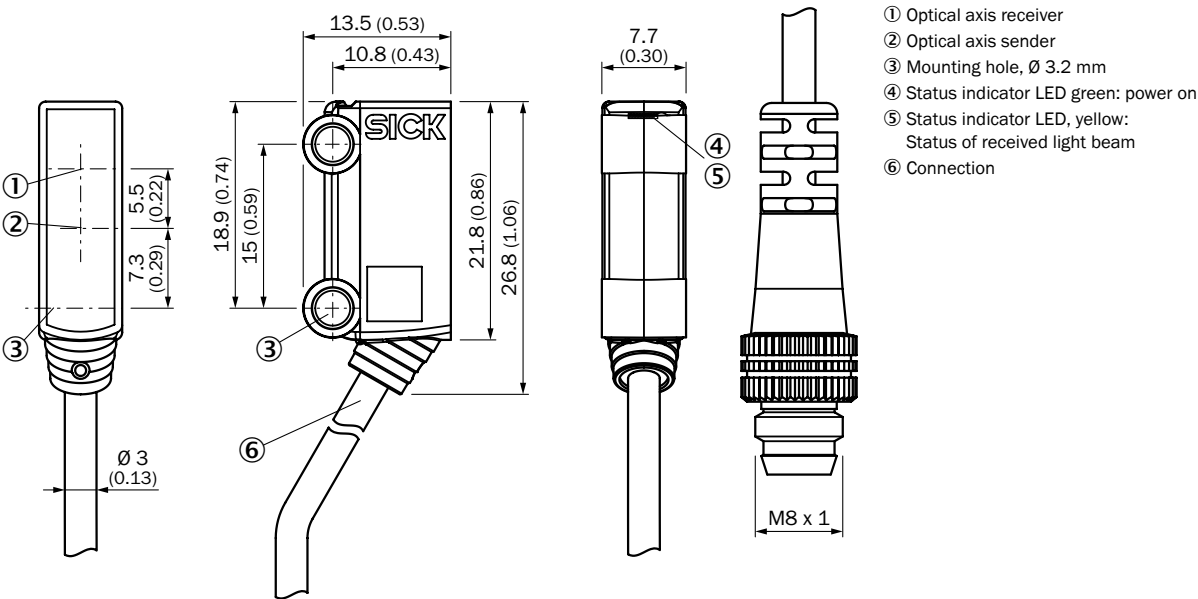
- **Sensor principle:** through-beam photoelectric sensor

Sensing range max.	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0 m ... 2 m	Ø 23 mm (500 mm)	PNP	Light switching	Cable with connector M8, 3-pin 200 mm	Cd-051	GSE2S-P5311	1064364
			Dark-switching	Cable, 3-wire 2 m	Cd-049	GSE2S-F1311	1064363
				Cable with connector M8, 3-pin 200 mm	Cd-051	GSE2S-F5311	1063072
		NPN	Light switching	Cable, 3-wire 2 m	Cd-049	GSE2S-N1311	1064365
			Dark-switching	Cable, 3-wire 2 m	Cd-049	GSE2S-E1311	1063070

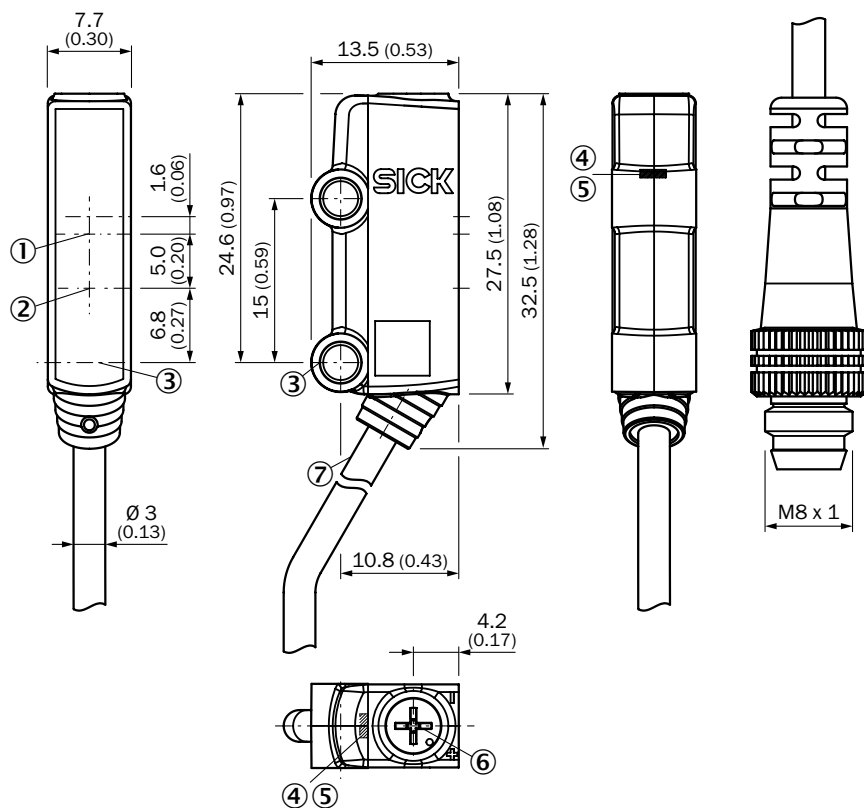
Dimensional drawings

Dimensions in mm (inch)

GTB2S, 15 mm, 30 mm

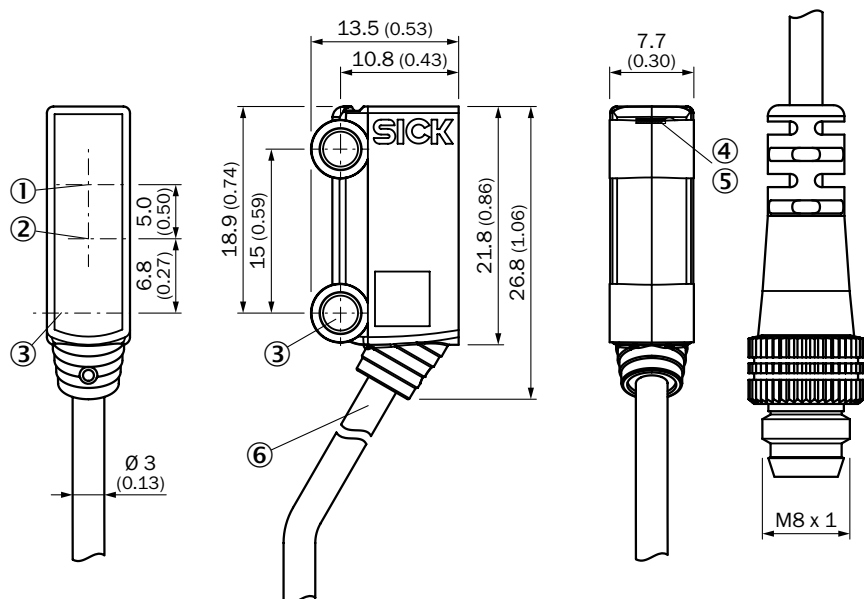


GTB2S, 120 mm



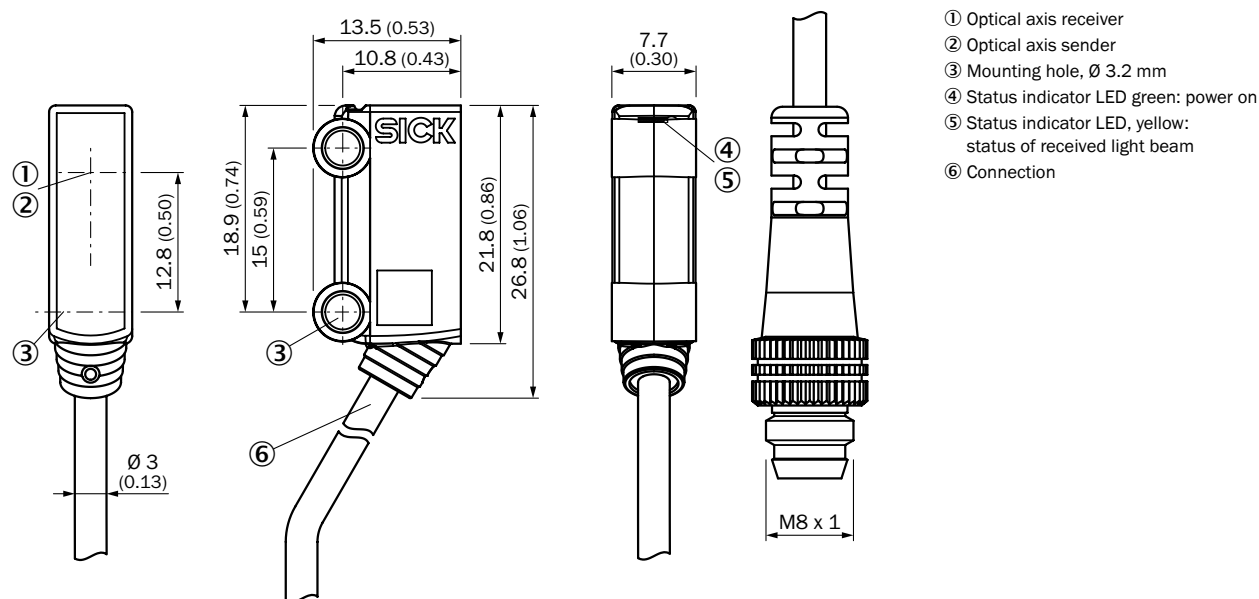
- ① Optical axis receiver
- ② Optical axis sender
- ③ Mounting hole, Ø 3.2 mm
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: status of received light beam
- ⑥ Potentiometer
- ⑦ Connection

GL2S



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

GSE2S

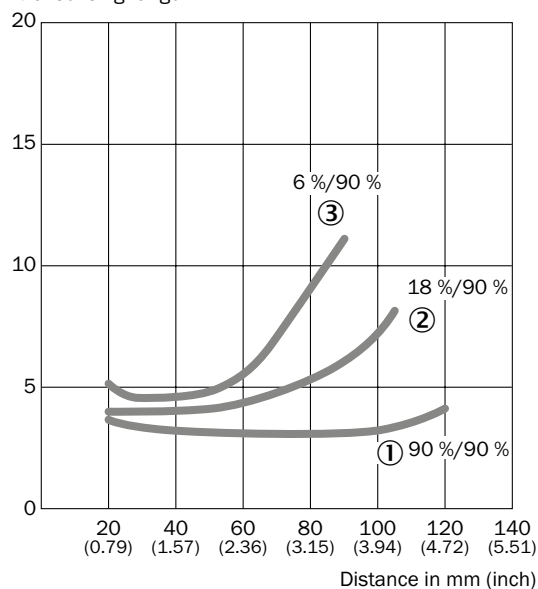


Characteristic curves

Black-white shift

GTB2S, 120 mm

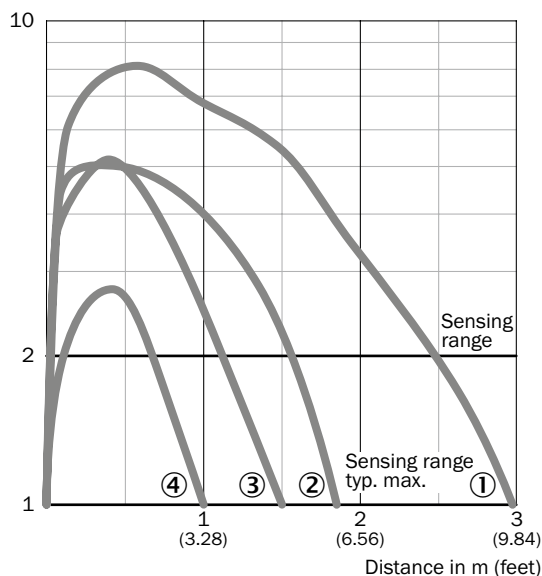
% of sensing range



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

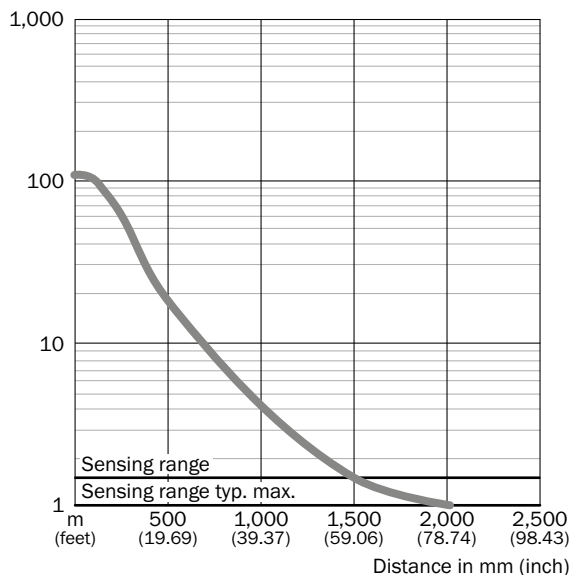
Operating reserve

GL2S



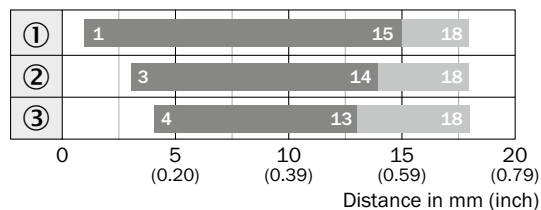
GSE2S

Functional reserve



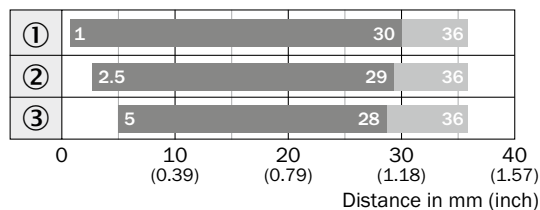
Bar diagrams

GTB2S, 15 mm



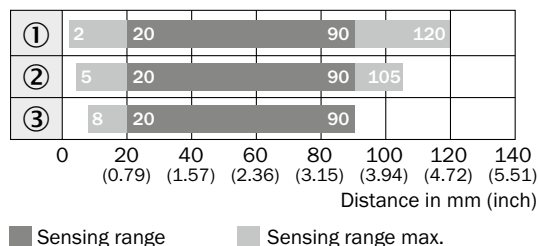
- ① Sensing range on white, 90 % remission
② Sensing range on gray, 18 % remission
③ Sensing range on black, 6 % remission

GTB2S, 30 mm



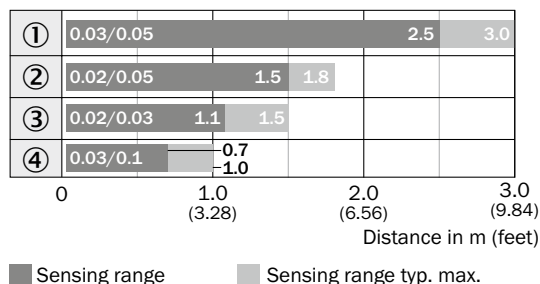
- ① Sensing range on white, 90 % remission
② Sensing range on gray, 18 % remission
③ Sensing range on black, 6 % remission

GTB2S, 120 mm



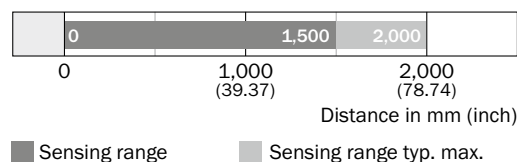
- ① Sensing range on white, 90 % remission
② Sensing range on gray, 18 % remission
③ Sensing range on black, 6 % remission

GL2S



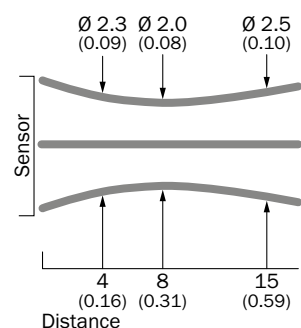
- ① PL40A
② PL20A
③ PL10F
④ IREF6000 (REF-IRF-56)

GSE2S

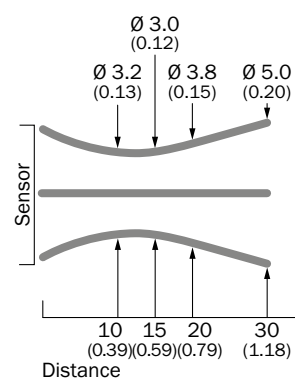


Light spot diameter

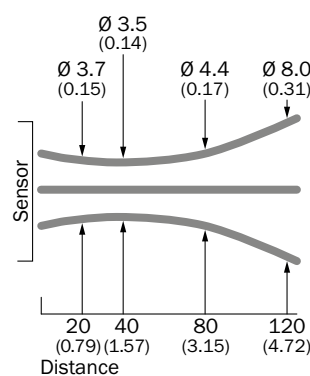
GTB2S, 15 mm



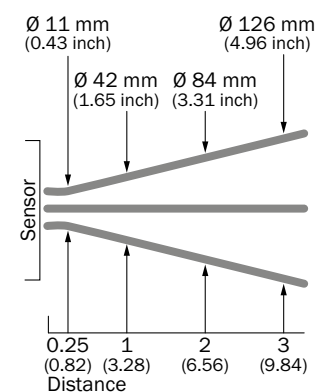
GTB2S, 30 mm



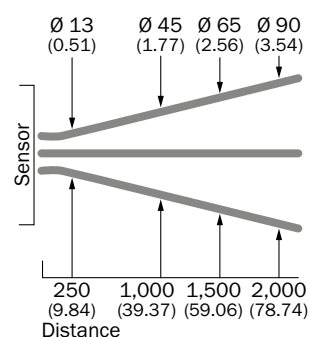
GTB2S, 120 mm



GL2S

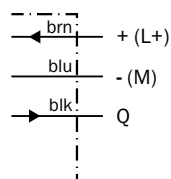


GSE2S

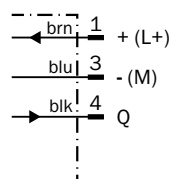


Connection diagram

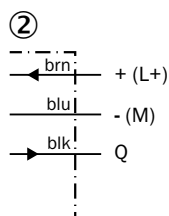
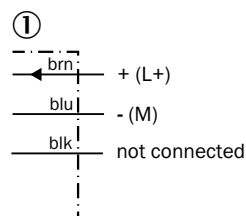
Cd-043



Cd-045

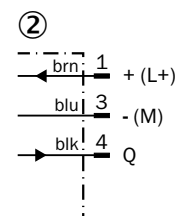
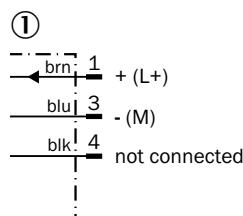


Cd-049



① Sender
② Receiver

Cd-051



① Sender
② Receiver

Recommended accessories

Plug connectors and cables

Connecting cable (female connector-open), PUR, halogen-free

- Cable material: PUR, halogen-free
- 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 65, IP 68, IP 69K	DOL-0803-G02MC	6025888
	Female connector, M8, 3-pin, angled	Cable, open conductor heads	2 m, 3-wire	IP 65, IP 68, IP 69K	DOL-0803-W02MC	6025891
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	IP 65, IP 68, IP 69K	DOL-0804-G02MC	6025894
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 65, IP 68, IP 69K	DOL-0804-W02MC	6025897

Connecting cable (female connector-open), 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
	Female connector, M8, 3-pin, angled	Cable, open conductor heads	2 m, 3-wire	IP 67	DOL-0803-W02M	6008489
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	IP 67	DOL-0804-G02M	6009870
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67	DOL-0804-W02M	6009871

Female connector (ready to assemble) M8, 3-pin

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0803-G	7902077
	Female connector, M8, 3-pin, angled	Pin penetration	PBT	IP 67	DOS-0803-W	7902078

Male connector (ready to assemble) M8, 3-pin

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Male connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	STE-0803-G	6037322

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

Round

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Round, plugable for metal plates	PL22-3	1004488

→ For additional accessories, please see page L-861

Global sensor – the economic way to business class performance



Additional information

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Adjustments	F-202
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Connection diagram	F-205
Recommended accessories.....	F-205

Product description

The G6 Global photoelectric sensor is enclosed in a miniature housing and provides an optimal price-performance ratio. This sensor provides outstanding sensing performance using a standard 1-inch hole distance. With PinPoint LEDs,

metal inserts for mounting, large indicator LEDs, large user-friendly adjustment potentiometers, an IP 67 enclosure rating and the very latest SICK ASIC technology, this is truly a high performance sensor in a small package.

At a glance

- PinPoint LED for a bright, precise light spot
- Durable metal threaded inserts
- SICK ASIC technology – the result of decades of experience in photoelectric sensors
- Large, user-friendly potentiometer
- Large, bright indicator LEDs
- IP 67 enclosure rating

Your benefits

- Easy alignment and precise object detection due to a highly visible PinPoint LED
- Quick and easy mounting and high durability due to threaded metal inserts
- SICK ASIC technology provides high performance and excellent reliability
- Easy to adjust due to large, user-friendly potentiometers
- Easy to monitor due to large, bright indicator LEDs
- Easy installation with SICK accessories

→ www.mysick.com/en/G6

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

	GTE6	GTB6	GL6	GL6G	GSE6
Sensor principle	Photoelectric proximity sensor		Photoelectric retro-reflective sensor		Through-beam photoelectric sensor
Detection principle	Energetic	Background suppression	Standard optics		–
Dimensions (W x H x D)	12 mm x 31.5 mm x 21 mm				
Housing design (light emission)	Rectangular				
Sensing range max.	≤ 300 mm ¹⁾	5 mm ... 250 mm ¹⁾	≤ 6 m ²⁾		0 m ... 15 m
Sensing range	≤ 250 mm	35 mm ... 140 mm	≤ 5 m ²⁾		0 m ... 10 m
Type of light	Visible red light				
Light source ³⁾	PinPoint LED				
Wave length	650 nm				
Adjustment	Mechanical spindle, 5 turns		Potentiometer, 270 °		
Special feature	–			Detection of transparent objects	–

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.

F

Mechanics/electronics

	GTE6	GTB6	GL6	GL6G	GSE6
Supply voltage ¹⁾	10 V DC ... 30 V DC				
Ripple ²⁾	± 10 %				
Power consumption ³⁾	≤ 30 mA				
Output type	PNP, open collector / NPN, open collector				
Switching mode	Light/dark-switching (selectable via light/dark selector)				
Signal voltage PNP HIGH/LOW	V _s – (<=3 V) / approx. 0 V				
Signal voltage NPN HIGH/LOW	Approx. V _s / <= 3 V				
Output current I _{max.} ⁴⁾	≤ 100 mA				
Response time ⁵⁾	< 1,250 ms	< 625 μs			< 500 μs
Switching frequency ⁶⁾	500 Hz	1,000 Hz			
Attenuation along light beam	–			> 20 %	–
Connection type	Cable, 2 m ⁷⁾ Male connector, M8 Cable with connector, M8, 300 mm ⁷⁾ Cable with connector, M12, 300 mm ⁷⁾ (depending on type)				
Circuit protection	A ⁸⁾ , B ⁹⁾ , D ¹⁰⁾				
Protection class	III				
Weight					
Connector	20 g			40 g	
Cable/Cable with connector	60 g			170 g	
Polarisation filter	–		✓	–	
Housing material	ABS/PC				

	GTE6	GTB6	GL6	GL6G	GSE6
Optics material	PMMA				
Enclosure rating	IP 67				
Items supplied	Stainless steel mounting bracket (1.4301/304) BEF-W100-A		Stainless steel mounting bracket (1.4301/304) BEF-W100-A, Reflector P250		Stainless steel mounting bracket (1.4301/304) BEF-W100-A
Ambient operating temperature ¹¹⁾	-25 °C ... +55 °C				
Ambient storage temperature	-40 °C ... +70 °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⁾ At $V_S > 24\text{ V}$, I_A max = 50 mA.

⁵⁾ Signal transit time with resistive load.

⁶⁾ With light/dark ratio 1:1.

⁷⁾ Do not bend below 0 °C.

⁸⁾ A = V_S connections reverse-polarity protected.

⁹⁾ B = inputs and output reverse-polarity protected.

¹⁰⁾ D = outputs overcurrent and short-circuit protected.

¹¹⁾ Temperature stability after adjustment +/-10 °C.

Ordering information

Other models available at www.mysick.com/en/G6

GTE6

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** energetic
- **Light spot size (distance):** Ø 7 mm (90 mm)
- **Switching mode:** light/dark-switching

Sensing range max. ¹⁾	Output type	Adjustment	Connection	Connection diagram	Items supplied	Model name	Part no.
≤ 300 mm	PNP	Mechanical spindle, 5 turns	Cable, 3-wire, 2 m, PVC	Cd-043	–	GTE6-P1211	1050712
					Stainless steel mounting bracket BEF-W100-A	GTE6-P1212	1051783
			Connector M8, 4-pin	Cd-066	–	GTE6-P4211	1050710
					Stainless steel mounting bracket BEF-W100-A	GTE6-P4212	1051781
			Cable with connector M12, 4-pin, 300 mm, PVC	Cd-066	–	GTE6-P7211	1053589
					Stainless steel mounting bracket BEF-W100-A	GTE6-P7212	1053628
	NPN	Mechanical spindle, 5 turns	Cable, 3-wire, 2 m, PVC	Cd-043	–	GTE6-N1211	1050713
					Stainless steel mounting bracket BEF-W100-A	GTE6-N1212	1051784
			Connector M8, 4-pin	Cd-066	–	GTE6-N4211	1050711
					Stainless steel mounting bracket BEF-W100-A	GTE6-N4212	1051782

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

GTB6

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Light spot size (distance):** Ø 6 mm (100 mm)
- **Switching mode:** light/dark-switching

Sensing range max. ¹⁾	Output type	Adjustment	Connection	Connection diagram	Items supplied	Model name	Part no.
5 mm ... 250 mm	PNP	Mechanical spindle, 5 turns	Cable, 3-wire, 2 m, PVC	Cd-043	–	GTB6-P1211	1052440
					Stainless steel mounting bracket BEF-W100-A	GTB6-P1212	1052444
			Connector M8, 4-pin	Cd-066	–	GTB6-P4211	1052438
					Stainless steel mounting bracket BEF-W100-A	GTB6-P4212	1052442
			Cable with connector M8, 3-pin, 300 mm	Cd-043	–	GTB6-P5211	1059333
			Cable with connector M8, 4-pin, 300 mm	Cd-066	–	GTB6-P6211	1059320
			Cable with connector M12, 4-pin, 300 mm	Cd-066	–	GTB6-P7211	1057705
	NPN		Cable, 3-wire, 2 m, PVC	Cd-043	–	GTB6-N1211	1052441
					Stainless steel mounting bracket BEF-W100-A	GTB6-N1212	1052445
			Connector M8, 4-pin	Cd-066	–	GTB6-N4211	1052439
					Stainless steel mounting bracket BEF-W100-A	GTB6-N4212	1052443
			Cable with connector M8, 4-pin, 300 mm	Cd-066	–	GTB6-N6211	1058774
					Stainless steel mounting bracket BEF-W100-A	GTB6-N6212	1058769

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

GL6

- **Sensor principle:** photoelectric retro-reflective sensor
- **Light spot size (distance):** Ø 8 mm (350 mm)
- **Switching mode:** light/dark-switching

Sensing range max. ¹⁾	Output type	Adjustment	Connection	Connection diagram	Items supplied	Model name	Part no.
≤ 6 m	PNP	–	Cable, 3-wire, 2 m, PVC	Cd-043	– Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6-P1111	1050708
			Connector M8, 4-pin	Cd-066	– Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6-P1112	1051779
					– Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6-P4111	1050706
			Cable with connector M8, 4-pin, 300 mm, PVC	Cd-066	– Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6-P4112	1051777
					– Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6-P6111	1060234
			Connector M12, 4-pin, 300 mm, PVC	Cd-066	– Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6-P6112	1060235
					– Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6-P7111	1052966
			Connector M12, 4-pin, 300 mm, PVC	Cd-066	– Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6-P7112	1053590
		Potentiometer, 270 °	Cable, 3-wire, 2 m, PVC	Cd-043	Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6-P1212	1060815
			Connector M8, 4-pin	Cd-066	–	GL6-P4211	1059241
			Cable with connector M8, 4-pin, 300 mm, PVC	Cd-066	– Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6-P6211	1058851
					– Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6-P6212	1062753
	NPN	–	Cable, 3-wire, 2 m, PVC	Cd-043	– Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6-N1111	1050709
			Connector M8, 4-pin	Cd-066	– Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6-N1112	1051780
					– Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6-N4112	1051778
		Potentiometer, 270 °	Cable, 3-wire, 2 m, PVC	Cd-043	Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6-N1212	1060814
			Connector M8, 4-pin	Cd-066	–	GL6-N4211	1059631
			Cable with connector M8, 4-pin, 300 mm, PVC	Cd-066	Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6-N6212	1062588

¹⁾ PL80A.

GL6G, clear material detection

- **Sensor principle:** photoelectric retro-reflective sensor
- **Light spot size (distance):** Ø 8 mm (350 mm)
- **Switching mode:** light/dark-switching

Sensing range max. ¹⁾	Output type	Adjustment	Connection	Connection diagram	Items supplied	Model name	Part no.
≤ 6 m	PNP	Potentiometer, 270 °	Cable, 3-wire, 2 m, PVC	Cd-043	–	GL6G-P1211	1059924
					Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6G-P1212	1060812
		Connector M8, 4-pin	Cd-066	–	GL6G-P4211	1059632	
				Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6G-P4212	1060810	
	NPN	Potentiometer, 270 °	Cable, 3-wire, 2 m, PVC	Cd-043	–	GL6G-N1211	1059925
					Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6G-N1212	1060811
		Connector M8, 4-pin	Cd-066	–	GL6G-N4211	1059633	
				Stainless steel mounting bracket BEF-W100-A, Reflector P250	GL6G-N4212	1060809	

¹⁾ PL80A.

GSE6

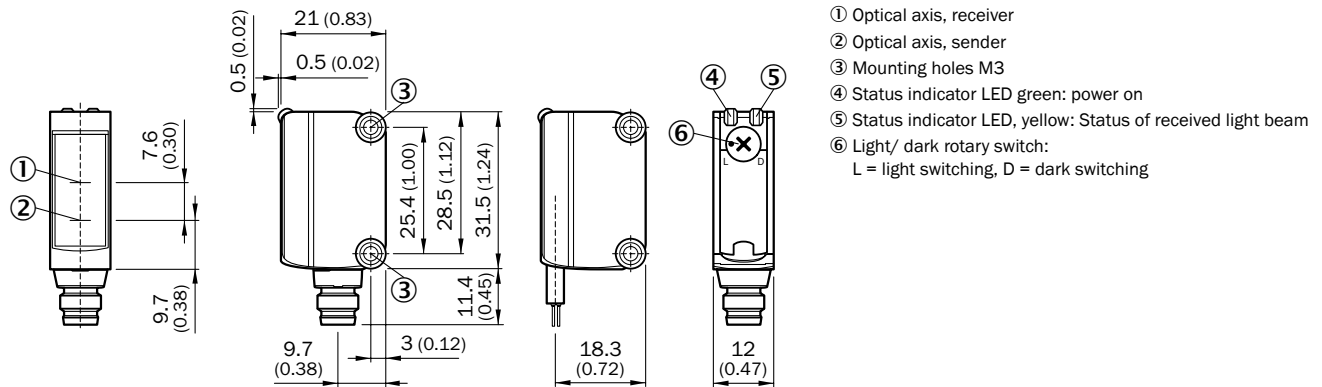
- **Sensor principle:** through-beam photoelectric sensor
- **Light spot size (distance):** Ø 375 mm (12 m)
- **Switching mode:** light/dark-switching

Sensing range max.	Output type	Adjustment	Connection	Connection diagram	Items supplied	Model name	Part no.
0 m ... 15 m	PNP	-	Cable, 3-wire, 2 m, PVC	Cd-049	-	GSE6-P1111	1052448
					Stainless steel mounting bracket BEF-W100-A	GSE6-P1112	1052452
			Connector M8, 4-pin	Cd-057	-	GSE6-P4111	1052446
					Stainless steel mounting bracket BEF-W100-A	GSE6-P4112	1052450
			Cable with connector M12, 4-pin, 300 mm, PVC	Cd-057	-	GSE6-P7111	1054830
					Stainless steel mounting bracket BEF-W100-A	GSE6-P7112	1054831
			Cable with connector M8, 4-pin, 300 mm, PVC	Cd-057	-	GSE6-P6111	1054848
					Stainless steel mounting bracket BEF-W100-A	GSE6-P6112	1054850
		Potentiometer, 270 °	Cable, 3-wire, 2 m, PVC	Cd-049	-	GSE6-P1211	1060792
					Stainless steel mounting bracket BEF-W100-A	GSE6-P1212	1061398
			Connector M8, 4-pin, PVC	Cd-057	-	GSE6-P4211	1061394
					Stainless steel mounting bracket BEF-W100-A	GSE6-P4212	1061396
0 m ... 15 m	NPN	-	Cable, 3-wire, 2 m, PVC	Cd-049	-	GSE6-N1111	1052449
					Stainless steel mounting bracket BEF-W100-A	GSE6-N1112	1052453
			Connector M8, 4-pin	Cd-057	-	GSE6-N4111	1052447
					Stainless steel mounting bracket BEF-W100-A	GSE6-N4112	1052451
			Cable with connector M12, 4-pin, 300 mm, PVC	Cd-057	-	GSE6-N7111	1054833
					Stainless steel mounting bracket BEF-W100-A	GSE6-N7112	1054835
			Cable with connector M8, 4-pin, 300 mm, PVC	Cd-057	-	GSE6-N6111	1054849
					Stainless steel mounting bracket BEF-W100-A	GSE6-N6112	1054852
		Potentiometer, 270 °	Cable, 3-wire, 2 m, PVC	Cd-049	-	GSE6-N1211	1060791

F

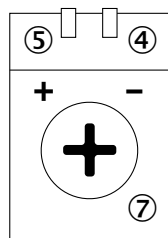
Dimensional drawings

Dimensions in mm (inch)



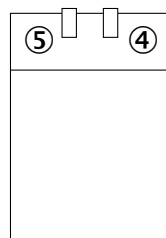
Adjustments

Adjustment possibility



- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: status of received light beam
- ⑦ Sensitivity adjustment: poti

No adjustment possibility



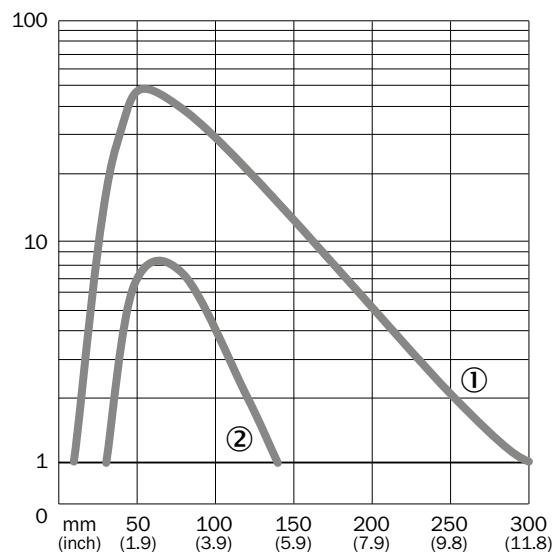
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: status of received light beam

F

Characteristic curves

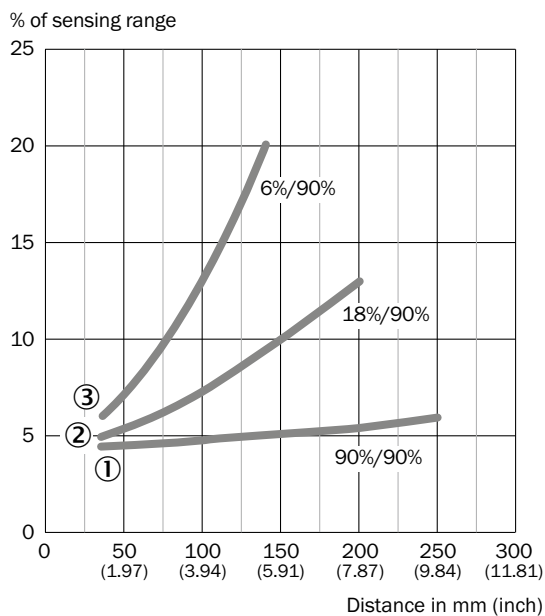
Black-white shift

GTE6



- ① Object with 90% remission (referred to standard white DIN 5033)
- ② Sensing range on gray, 18 % remission

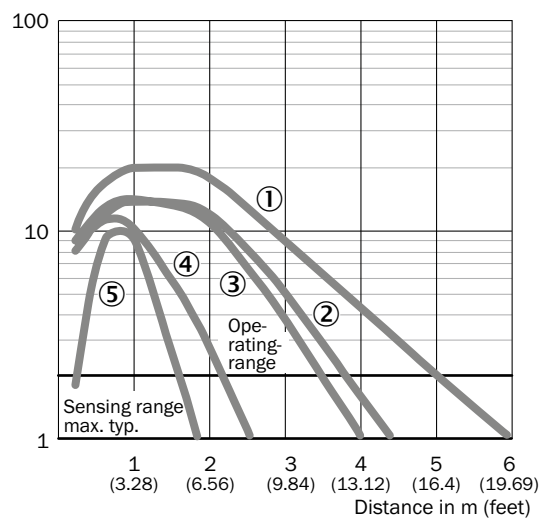
GTB6



- ① Object with 90% remission (referred to standard white DIN 5033)
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on black, 6 % remission

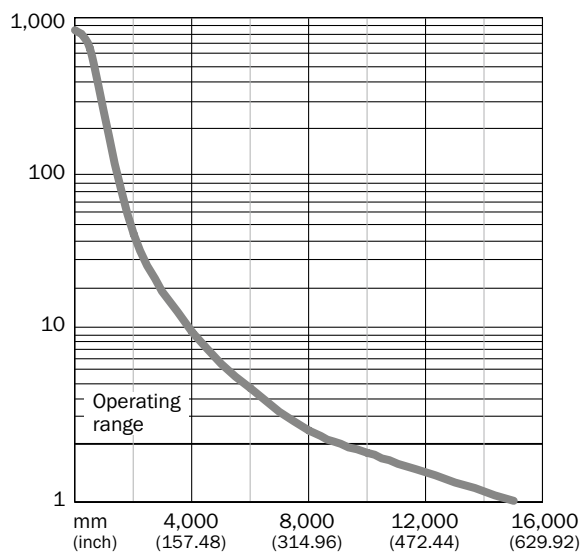
Operating reserve

GL6



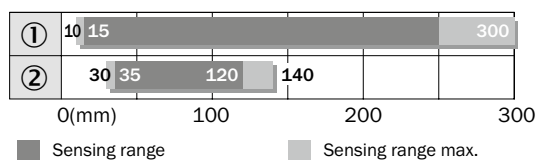
- ① PL80A
- ② PL40A
- ③ P250
- ④ PL20A
- ⑤ REF-IRF-56

GSE6



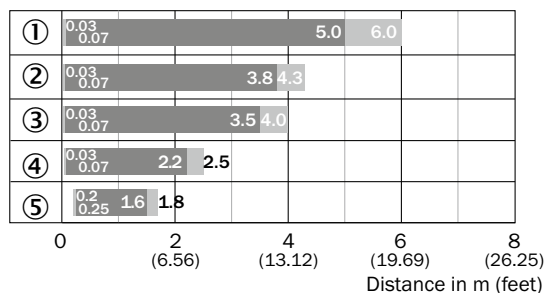
Bar diagrams

GTE6



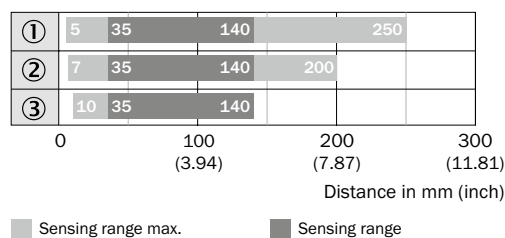
- ① Object with 90% remission (referred to standard white DIN 5033)
 ② Sensing range on gray, 18 % remission

GL6, GL6G



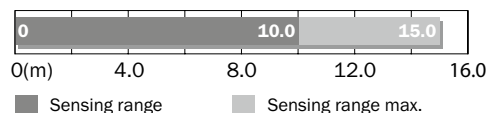
- ① PL80A
 ② PL40A
 ③ P250
 ④ PL20A
 ⑤ REF-IRF-56

GTB6



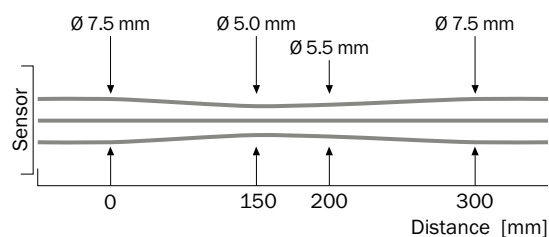
- ① Object with 90% remission (referred to standard white DIN 5033)
 ② Sensing range on gray, 18 % remission
 ③ Sensing range on black, 6 % remission

GSE6

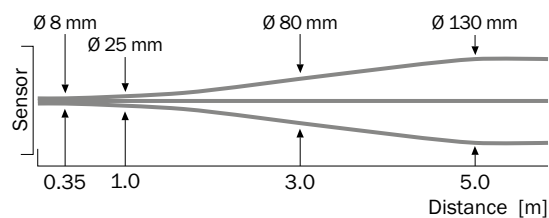


Light spot diameter

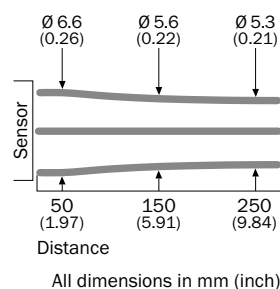
GTE6



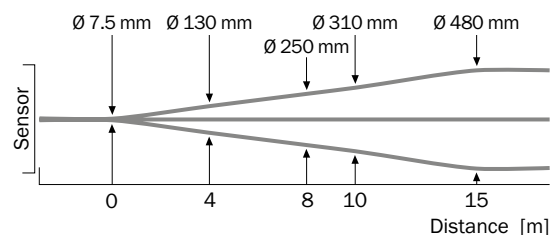
GL6, GL6G



GTB6

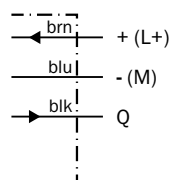


GSE6

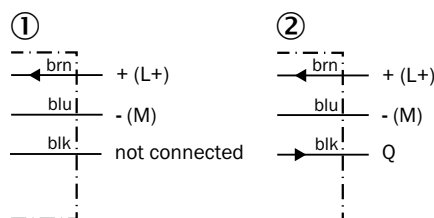


Connection diagram

Cd-043

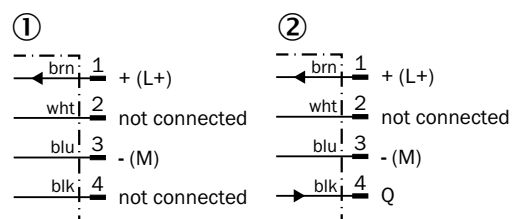


Cd-049



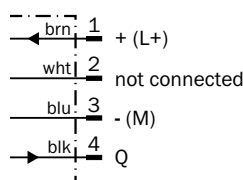
① Sender
② Receiver

Cd-057



① Sender
② Receiver

Cd-066



Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Stainless steel	Mounting bracket for wall mounting	BEF-W100-A	5311520
	Steel, zinc coated	Mounting bracket for floor mounting	BEF-W100-B	5311521

Plug connectors and cables

Connecting cable (female connector-open)

- Cable material: PVC

Figure	Connection type head A	Connection type head B	Connecting cable	Enclosure rating	Model name	Part no.
	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
	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

Device protection (mechanical)

Protective housing/tubes

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571	Safety bracket for floor mounting	BEF-SW-W4S	2051497

Reflectors

Angular

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Rectangular, screw connection, 47 mm x 47 mm	P250	5304812
		Rectangular, screw connection, 56 mm x 28 mm	PL30A	1002314
		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, screw connection, suitable for laser sensors, 18 mm x 18 mm	PL10F	5311210
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
	PMMA/ABS	Fine triple, screw connection, suitable for laser sensors, 38 mm x 16 mm	PL20F	5308844
	Plastic	Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089
	PMMA/ABS	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
	Self-adhesive, 50 mm x 60 mm	REF-IRF-56	5314244

Round

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Round, plugable for metal plates	PL22-3	1004488

→ For additional accessories, please see page L-861

One of the smallest photoelectric sensor families in the world



Product description

The W2 Flat photoelectric sensor family is enclosed in a housing only 3.5 mm high, enabling it to fit in nearly all machine parts for reliable object detection. These sensors, which are one of the smallest photoelectric sensor families in the world, enable thin and compact

machine designs. Their rugged housing includes metal-reinforced fixing holes that simplify machine integration. This flat design enables even a milling recess to be used to integrate the sensor safely in the machine.

At a glance

- One of the smallest photoelectric sensors in the world
- No external amplifier required
- Variant designed to detect transparent and glossy objects
- Rugged housing with metal-reinforced fixing holes

Your benefits

- High-performance solutions for very tight spaces provide increased application flexibility
- Fast response times with a high level of accuracy and precise switching points
- The high enclosure rating and the rugged housing offer a long service life that withstands harsh environmental conditions
- Quick and easy installation since sensors can be mounted directly on machine parts



Additional information

Detailed technical data.....	F-209
Ordering information.....	F-210
Dimensional drawings	F-211
Characteristic curves	F-212
Bar diagrams.....	F-213
Connection diagram	F-214
Recommended accessories.....	F-214

→ www.mysick.com/en/W2_Flat

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

	WT2 Flat	WS/WE2 Flat
Sensor principle	Photoelectric proximity sensor	Through-beam photoelectric sensor
Detection principle	Energetic	–
Dimensions (W x H x D)	14 mm x 19.5 mm x 3.5 mm	12 mm x 20 mm x 3.5 mm
Housing design (light emission)	Rectangular	
Sensing range max.	1 mm ... 115 mm ¹⁾ (depending on type)	0 m ... 0.5 m
Sensing range	1 mm ... 115 mm ¹⁾ (depending on type)	0 m ... 0.4 m
Type of light	Visible red light	
Light source ²⁾	LED	
Light spot size (distance)	–	Ø 10 mm (100 mm)
Wave length	660 nm	

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

²⁾ Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

Supply voltage ¹⁾	12 V DC ... 24 V DC
Ripple ²⁾	≤ 5 V _{pp}
Output type	PNP / NPN (depending on type)
Switching mode	Light switching / Dark-switching (depending on type)
Signal voltage PNP HIGH/LOW	Approx. V _S – 1.8 V / 0 V
Signal voltage NPN HIGH/LOW	Approx. V _S / < 1.8 V
Output current I_{max}	≤ 50 mA
Response time ³⁾	≤ 0.5 ms
Switching frequency ⁴⁾	1,000 Hz
Connection type	Cable, 2 m ⁵⁾ / Cable with connector, M8, 200 mm ⁵⁾ (depending on type)
Circuit protection	A ⁶⁾ , C ⁷⁾ , D ⁸⁾
Weight	20 g
Reverse polarity protection	✓
Short-circuit protection	✓
Housing material	PC
Optics material	PC
Enclosure rating	IP 67
Ambient operating temperature	–20 °C ... +55 °C
Ambient storage temperature	–40 °C ... +75 °C

¹⁾ ± 10 %.

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

³⁾ Signal transit time with resistive load.

⁴⁾ With light/dark ratio 1:1.

⁵⁾ Do not bend below 0 °C.

⁶⁾ A = V_S connections reverse-polarity protected.

⁷⁾ C = interference suppression.

⁸⁾ D = outputs overcurrent and short-circuit protected.

Ordering information

Other models available at www.mysick.com/en/W2_Flat

WT2 Flat

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** energetic

Sensing range max. ¹⁾	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
1 mm ... 9 mm	PNP	Light switching	Cable, 3-wire, 2 m, PVC	Cd-043	WT2F-P170	6030588
			Cable with connector M8, 3-pin, 200 mm, PVC	Cd-045	WT2F-P270	6030589
			Cable with connector M8, 4-pin, 200 mm, PVC	Cd-066	WT2F-P470	6030590
2 mm ... 18 mm	PNP	Light switching	Cable, 3-wire, 2 m, PVC	Cd-043	WT2F-N170	6030587
			Cable, 3-wire, 2 m, PVC	Cd-043	WT2F-P140	6030584
			Cable with connector M8, 3-pin, 200 mm, PVC	Cd-045	WT2F-P240	6030585
2 mm ... 34 mm	PNP	Light switching	Cable with connector M8, 4-pin, 200 mm, PVC	Cd-066	WT2F-P440	6030586
	NPN	Light switching	Cable, 3-wire, 2 m, PVC	Cd-043	WT2F-N140	6030583
			Cable, 3-wire, 2 m, PVC	Cd-043	WT2F-P150	6030580
2 mm ... 34 mm	PNP	Light switching	Cable with connector M8, 3-pin, 200 mm, PVC	Cd-045	WT2F-P250	6030581
	NPN	Light switching	Cable with connector M8, 4-pin, 200 mm, PVC	Cd-066	WT2F-P450	6030582
			Cable, 3-wire, 2 m, PVC	Cd-043	WT2F-N150	6030576
4 mm ... 115 mm	PNP	Light switching	Cable, 3-wire, 2 m, PVC	Cd-043	WT2F-E150	6043902
	NPN	Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-043	WT2F-P180	6030573
			Cable with connector M8, 3-pin, 200 mm, PVC	Cd-045	WT2F-P280	6030574
4 mm ... 115 mm	PNP	Light switching	Cable with connector M8, 4-pin, 200 mm, PVC	Cd-066	WT2F-P480	6030575
	NPN	Light switching	Cable, 3-wire, 2 m, PVC	Cd-043	WT2F-N180	6030572

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

WS/WE2 Flat

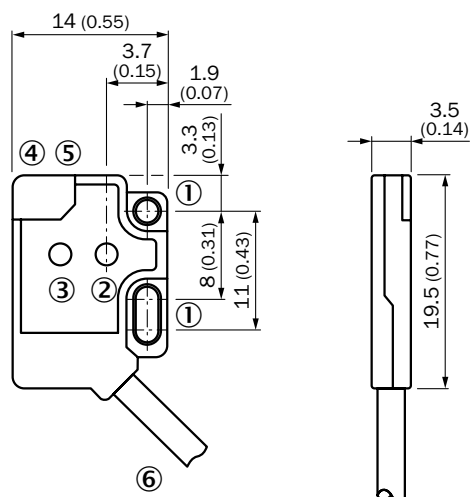
- **Sensor principle:** through-beam photoelectric sensor

Sensing range max.	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0 m ... 0.5 m	PNP	Light switching	Cable, 3-wire, 2 m, PVC	Cd-049	WS/WE2F-P110	6049355
			Cable with connector M8, 3-pin, 200 mm, PVC	Cd-051	WS/WE2F-P210	6030566
		Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-049	WS/WE2F-F110	6030569
			Cable with connector M8, 3-pin, 200 mm, PVC	Cd-051	WS/WE2F-F210	6030570
	NPN	Dark-switching	Cable with connector M8, 4-pin, 200 mm, PVC	Cd-057	WS/WE2F-F410	6030571
			Cable, 3-wire, 2 m, PVC	Cd-049	WS/WE2F-N110	6030540
		Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-049	WS/WE2F-E110	6030554

Dimensional drawings

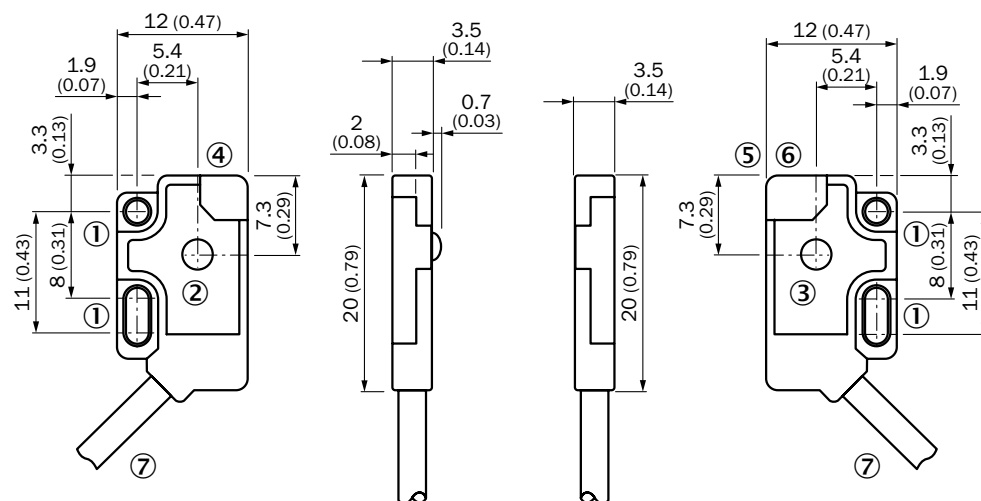
Dimensions in mm (inch)

WT2F



- ① Mounting holes, $\varnothing$ 2.1 mm
- ② Optical axis, sender
- ③ Optical axis, receiver
- ④ LED indicator orange: switching output active
- ⑤ LED indicator green: strength indicator
- ⑥ Connection

WS/WE2F

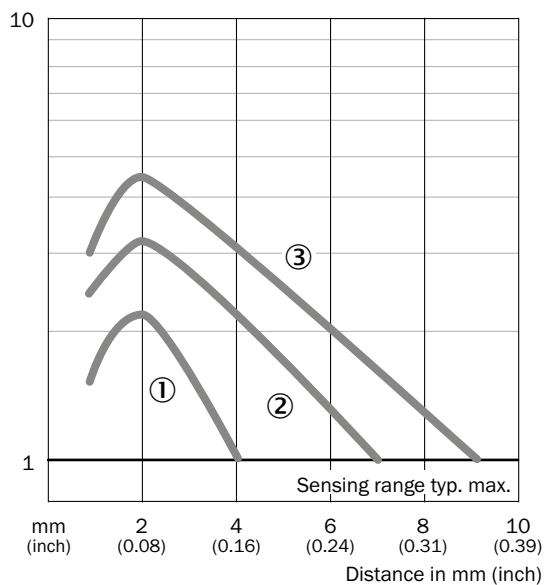


- ① Mounting holes, $\varnothing$ 2.1 mm
- ② Optical axis, receiver
- ③ Optical axis, sender
- ④ LED indicator green
- ⑤ LED indicator orange
- ⑥ LED indicator green
- ⑦ Connection

Characteristic curves

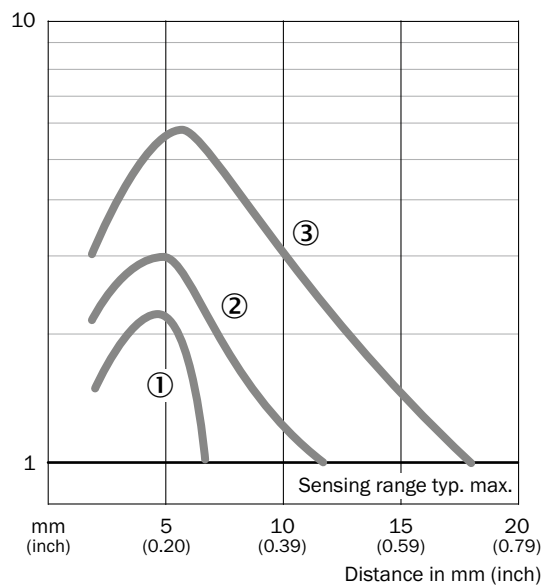
Black-white shift

WT2F, 9 mm



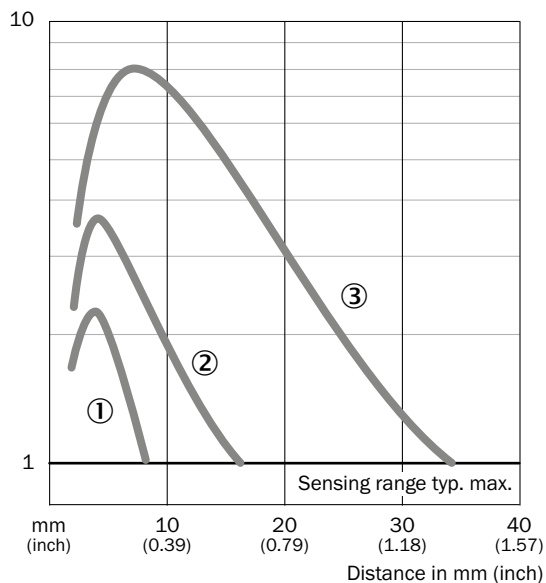
- ① Sensing range on black, 6 % remission
 ② Sensing range on gray, 18 % remission
 ③ Sensing range on white, 90 % remission

WT2F, 18 mm



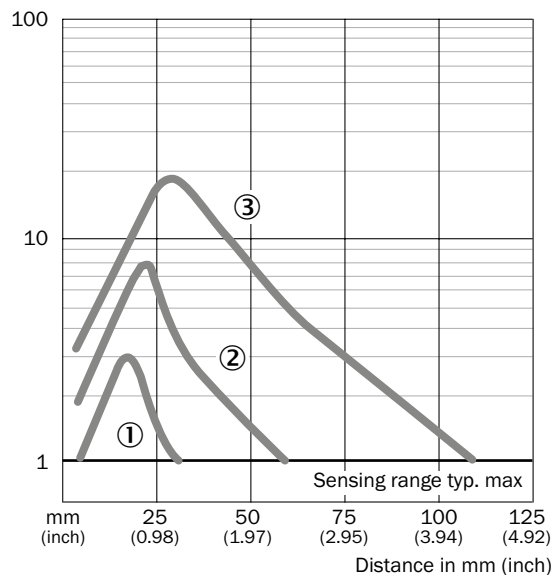
- ① Sensing range on black, 6 % remission
 ② Sensing range on gray, 18 % remission
 ③ Sensing range on white, 90 % remission

WT2F, 34 mm



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

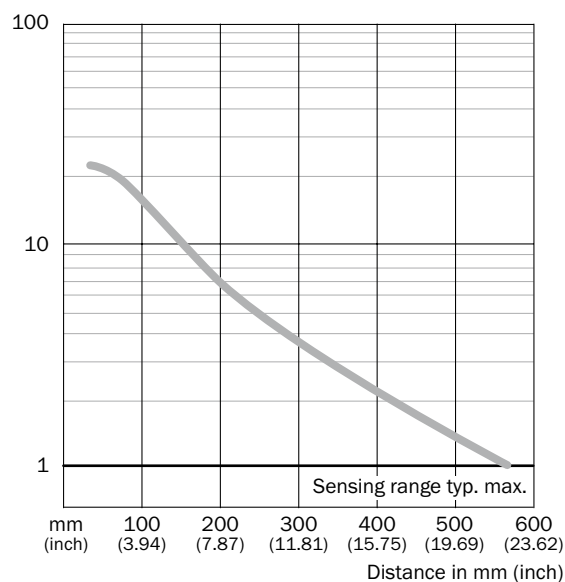
WT2F, 115 mm



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

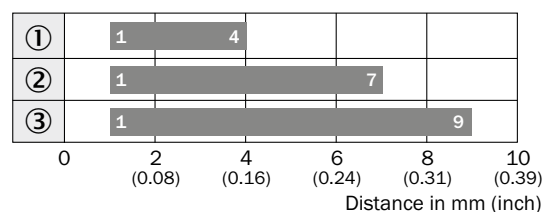
Operating reserve

WS/WE2F



Bar diagrams

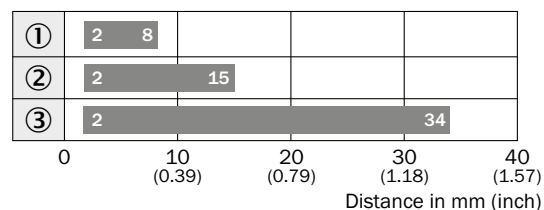
WT2F, 9 mm



■ Sensing range

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

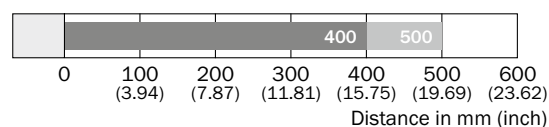
WT2F, 34 mm



■ Sensing range

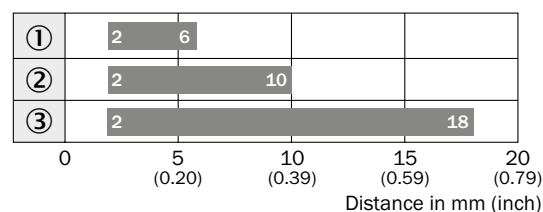
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WS/WE2F



■ Sensing range ■ Sensing range typ. max.

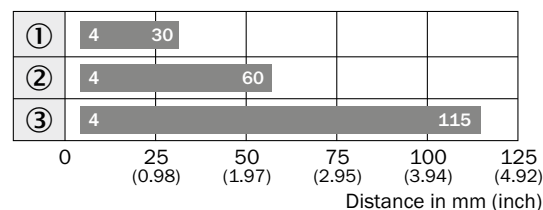
WT2F, 18 mm



■ Sensing range

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

WT2F, 115 mm

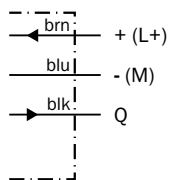


■ Sensing range

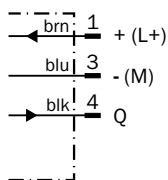
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

Connection diagram

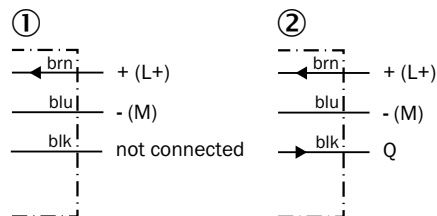
Cd-043



Cd-045

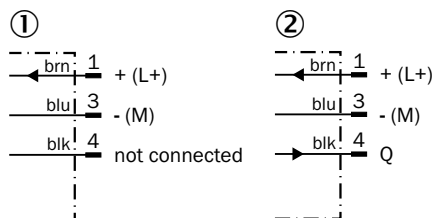


Cd-049



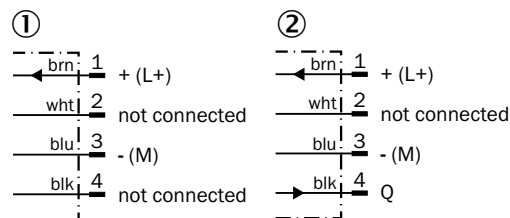
① Sender
② Receiver

Cd-051



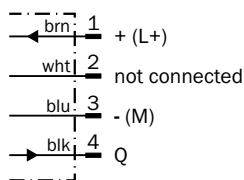
① Sender
② Receiver

Cd-057



① Sender
② Receiver

Cd-066



Recommended accessories

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, 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

Female connector (ready to assemble)

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0803-G	7902077
	Female connector, M8, 3-pin, angled	Pin penetration	PBT	IP 67	DOS-0803-W	7902078
	Female connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0804-G	6009974
	Female connector, M8, 4-pin, angled	Pin penetration	PBT	IP 67	DOS-0804-W	6009975

Male connector (ready to assemble)

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Male connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	STE-0803-G	6037322
	Male connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	STE-0804-G	6037323

→ For additional accessories, please see page L-861

F

Incredibly small, yet powerful



Additional information

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Light spot size	F-230
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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 source ³⁾	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 voltage ¹⁾	10 V DC ... 30 V DC			
Ripple ²⁾	≤ 5 V _{pp}			
Power consumption ³⁾	≤ 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 time ⁵⁾	< 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			

F

	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
			NPN	Light/dark-switching	Cable with connector M8, 4-pin, 200 mm	Cd-084	WTB2S-2P3210	1063314
				Light switching	Cable, 3-wire, 2 m	Cd-044	WTB2S-2N1310	1064249
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
			NPN	Light/dark-switching	Cable with connector M8, 4-pin, 200 mm	Cd-084	WTB2S-2P3230	1063517
				Light switching	Cable, 3-wire, 2 m	Cd-044	WTB2S-2N1330	1064578
				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
			NPN	Light/dark-switching	Cable with connector M8, 4-pin, 200 mm	Cd-084	WTB2S-2P3260	1063545
				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	Ø 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	Ø 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

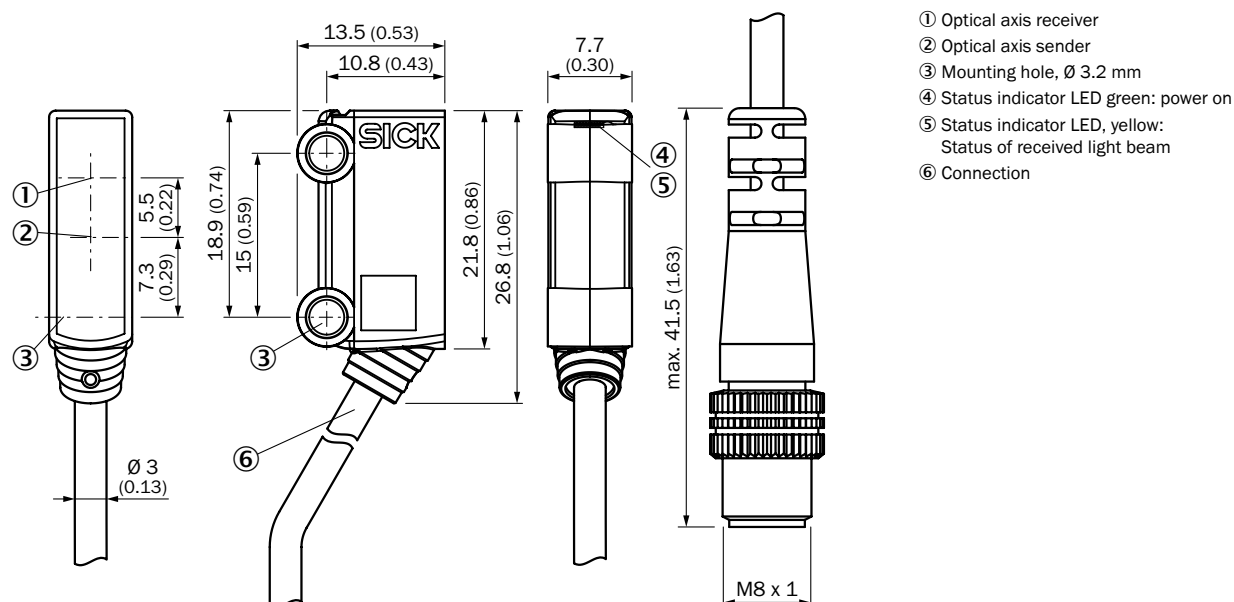
- **Sensor principle:** through-beam photoelectric sensor
- **Switching frequency:** 1,200 Hz (With light/dark ratio 1:1.)

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
		NPN	Light/dark-switching	Cable with connector M8, 4-pin, 200 mm	Cd-085	WSE2S-2P3230	1063650
			Light switching	Cable, 3-wire, 2 m	Cd-049	WSE2S-2N1330	1064584
				Cable, 3-wire, 2 m	Cd-049	WSE2S-2E1330	1064586
			Dark-switching	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

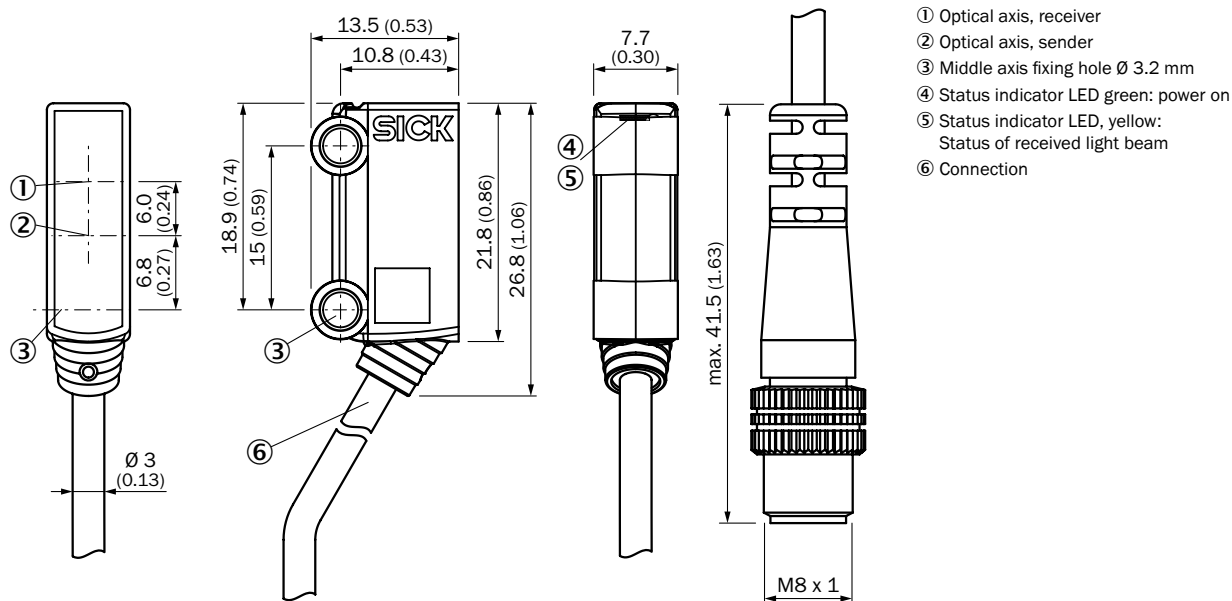
Dimensional drawings

Dimensions in mm (inch)

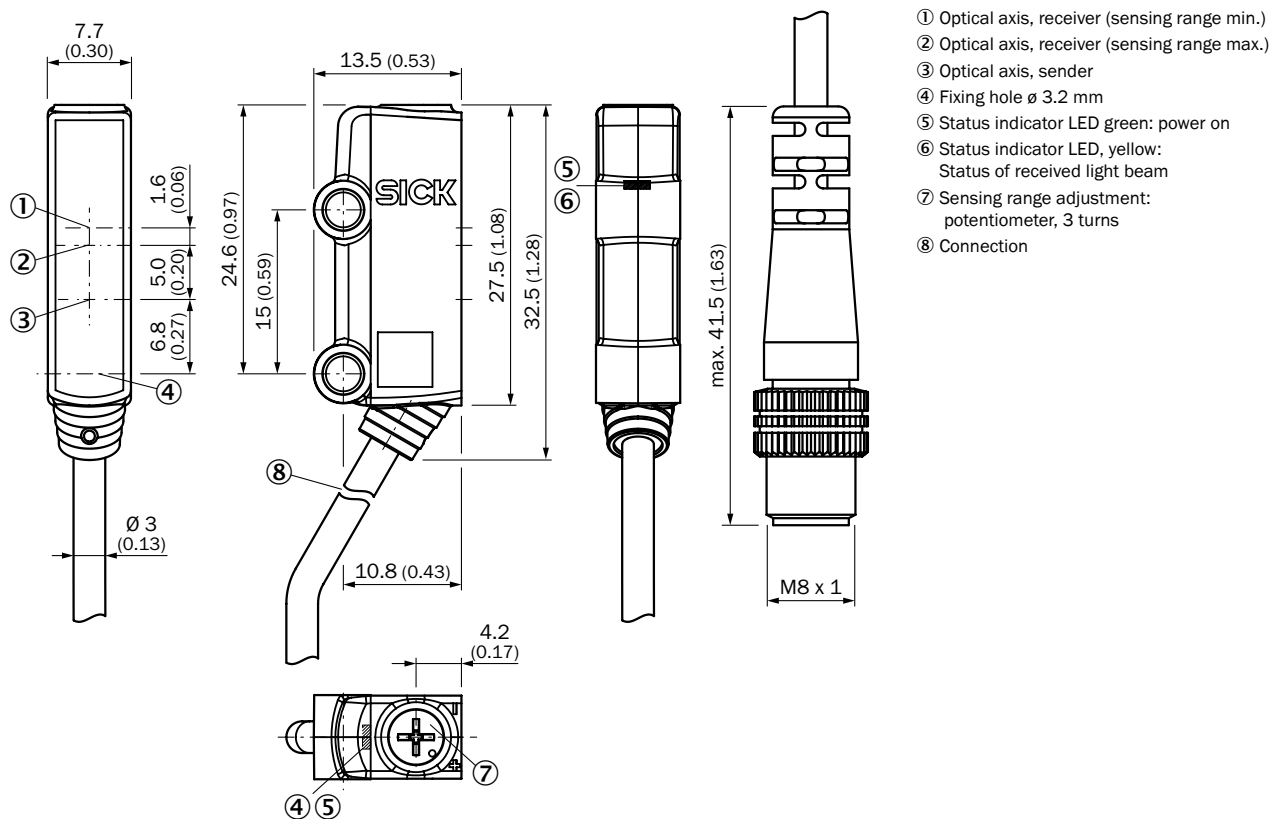
WTB2S-2, 15 mm, 30 mm, WTV2S-2



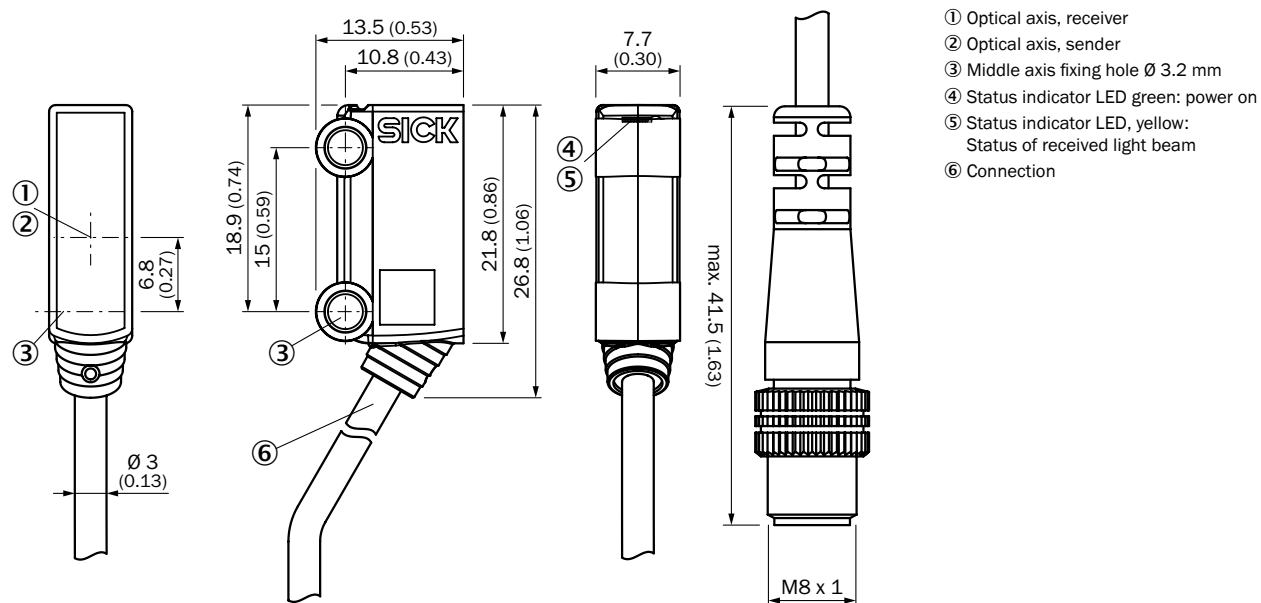
WTB2S-2, 60 mm, 80 mm



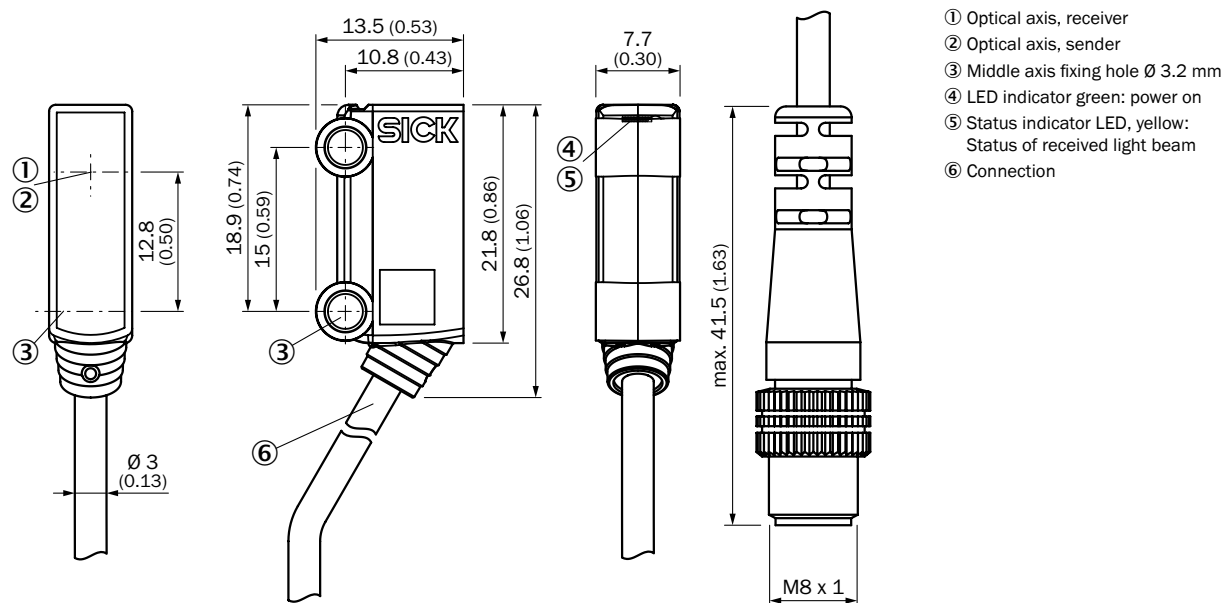
WTB2S-2, 150 mm



WL2S-2



WSE2S-2

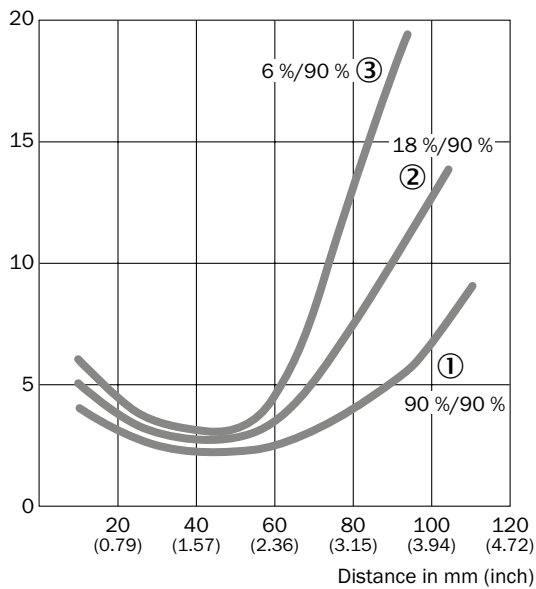


F

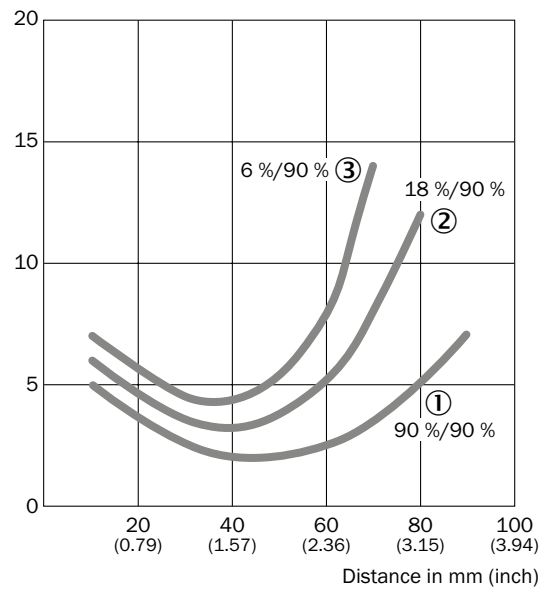
Characteristic curves

Black-white shift

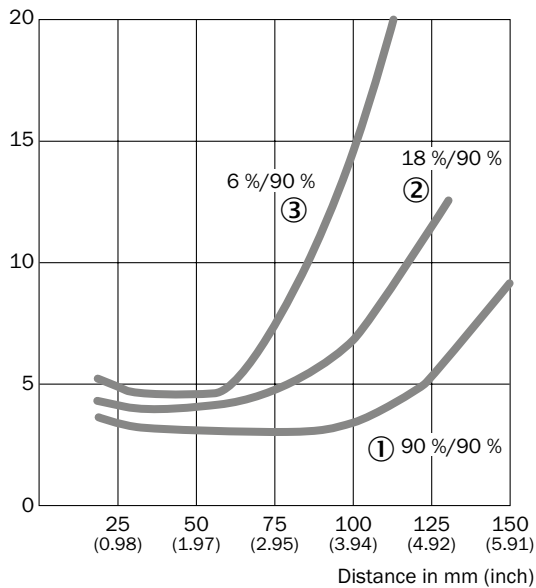
WTB2S-2, 110 mm



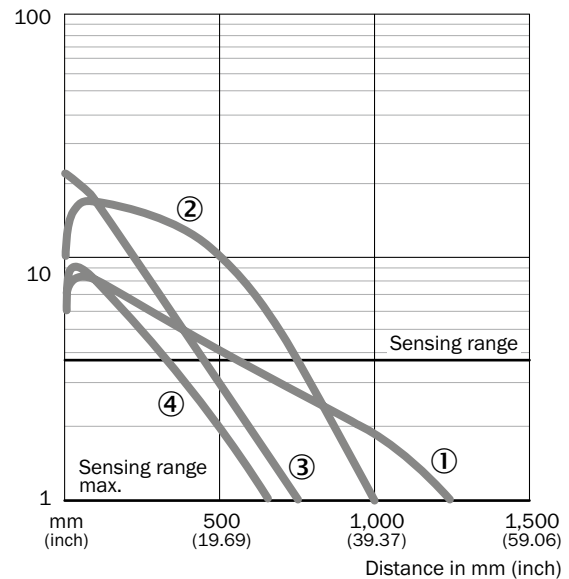
WTB2S-2, 90 mm, line-shaped light spot



WTB2S-2, 150 mm

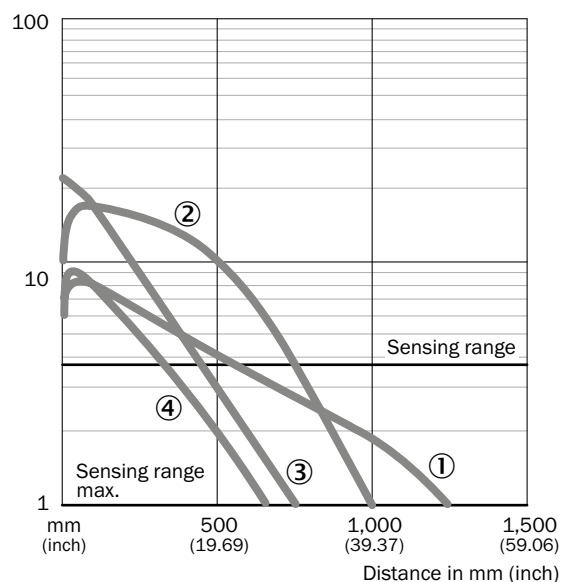


WL2S-2



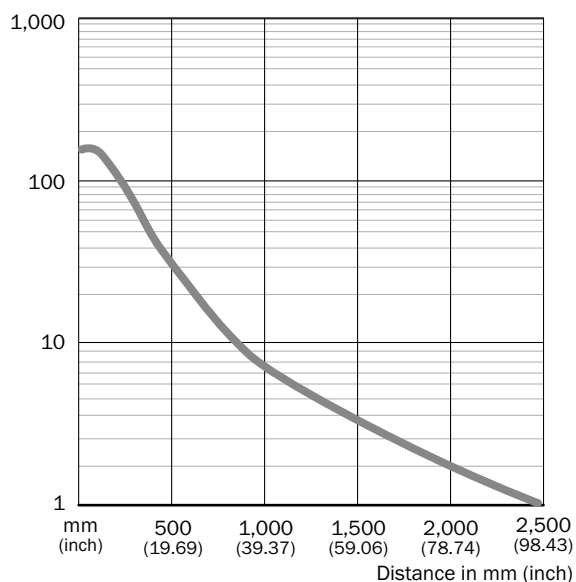
Operating reserve

WL2S-2



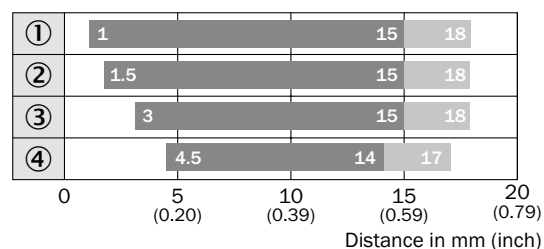
- ① P250F
- ② PL20A
- ③ REF-AC1000
- ④ PL10F

WSE2S-2



Bar diagrams

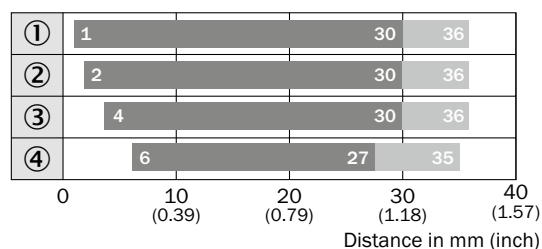
WTB2S-2, 15 mm



■ Sensing range ■ Sensing range max.

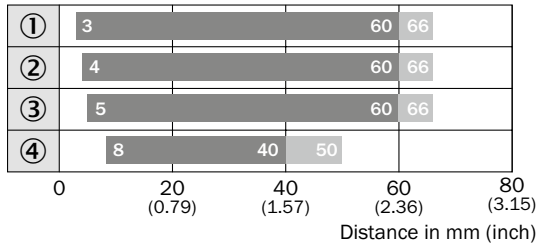
- ① Sensing range on white, 90 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on black, 6 % remission
- ④ Sensing range on ultrablack, 1 % remission

WTB2S-2, 30 mm



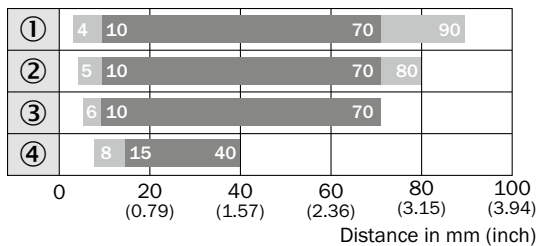
■ Sensing range ■ Sensing range max.

- 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

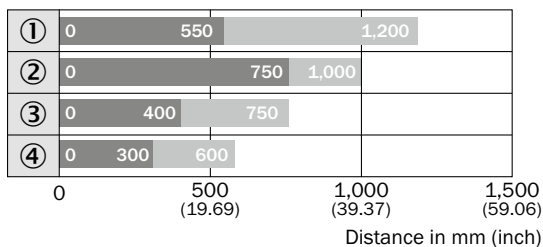
■ Sensing range ■ Sensing range max.

- 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, 90 mm, line-shaped light spot

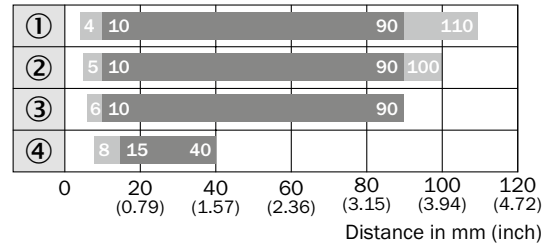
■ Sensing range ■ Sensing range max.

- 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

WL2S-2

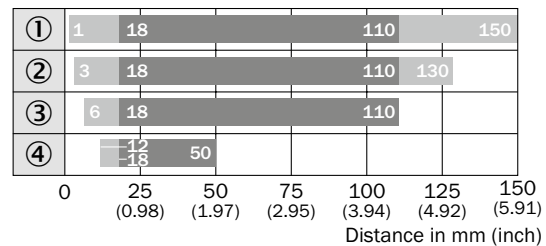
■ Sensing range ■ Sensing range max.

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

WTB2S-2, 110 mm

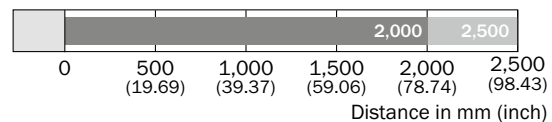
■ Sensing range ■ Sensing range max.

- 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, 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

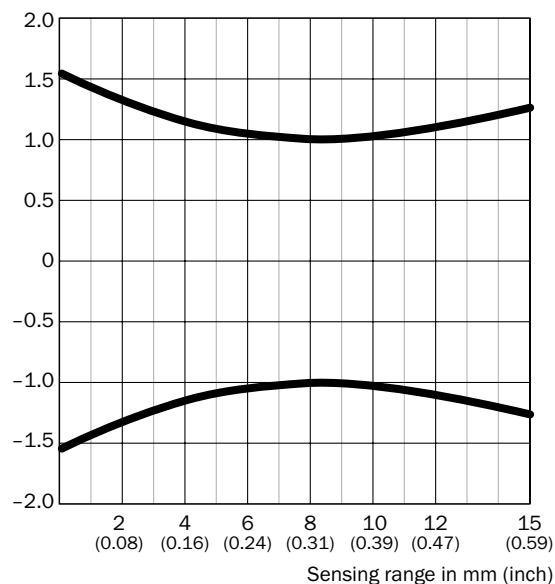
WSE2S-2

■ Sensing range ■ Sensing range max.

Light spot diameter

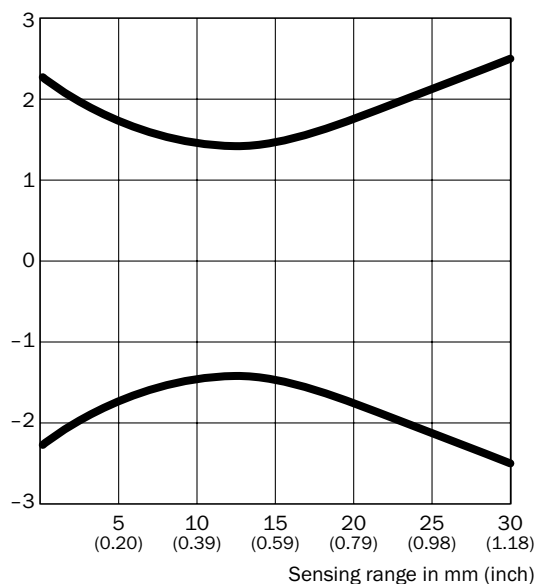
WTB2S-2, 15 mm

Spot diameter in mm (inch)



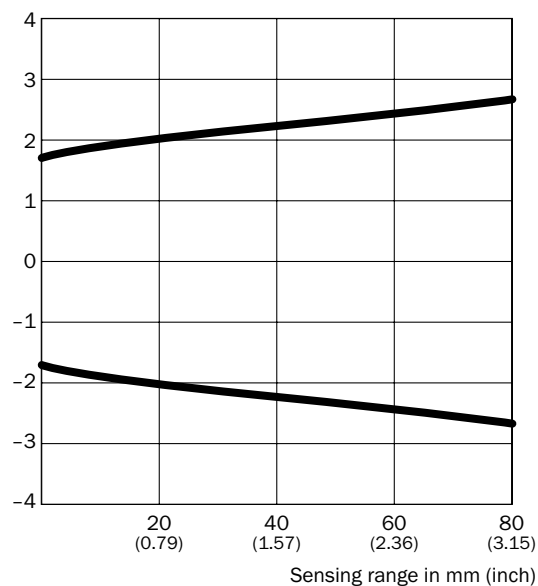
WTB2S-2, 30 mm

Spot diameter in mm (inch)



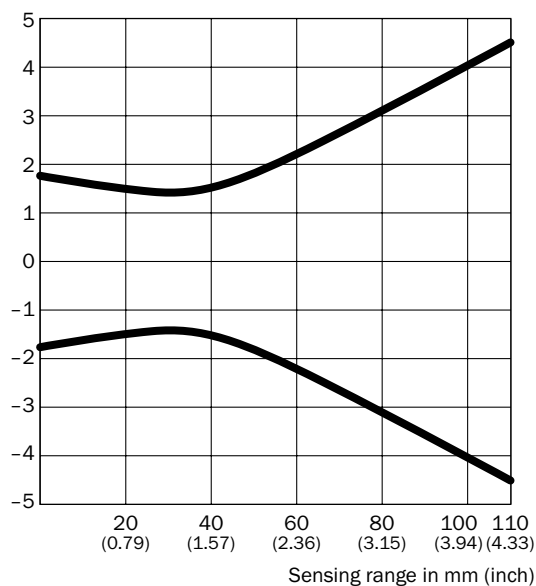
WTB2S-2, 60 mm

Spot diameter in mm (inch)



WTB2S-2, 110 mm

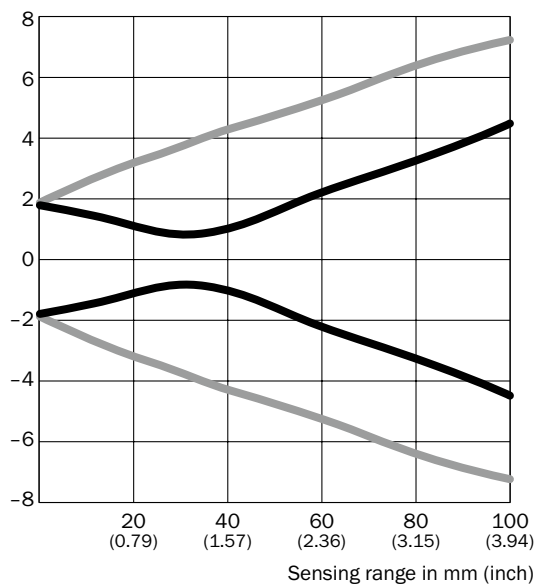
Spot diameter in mm (inch)



F

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

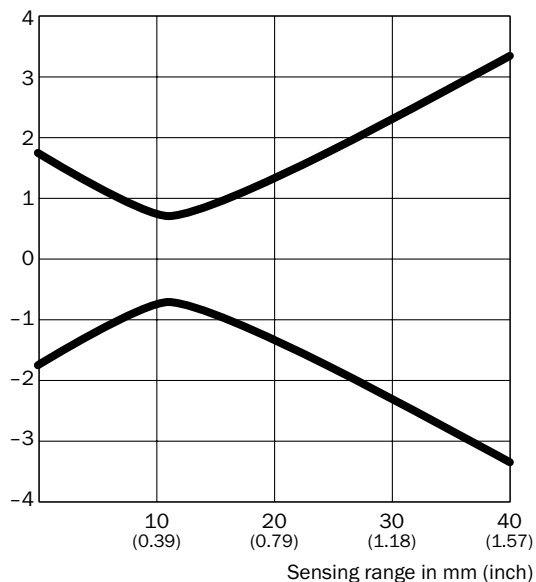
Spot diameter in mm (inch)



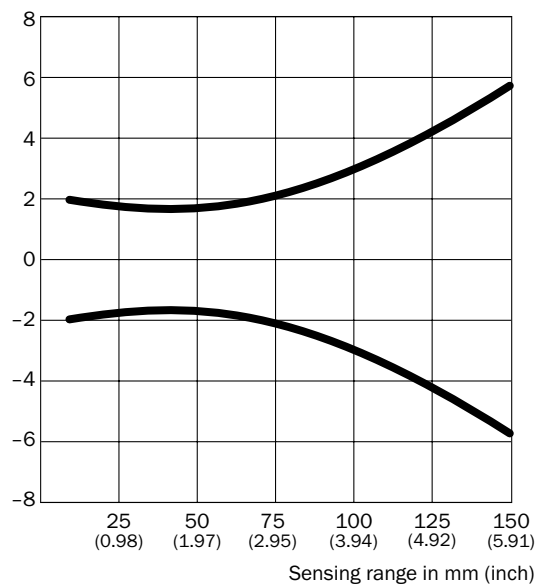
— Vertical
— Horizontal

WTV2S-2

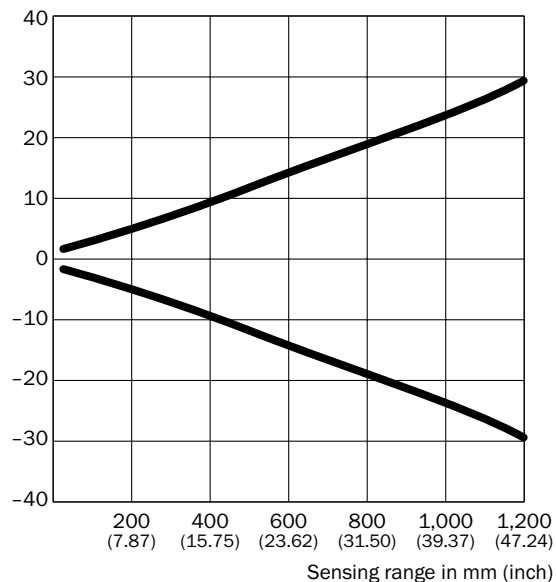
Spot diameter in mm (inch)

**WTB2S-2, 150 mm**

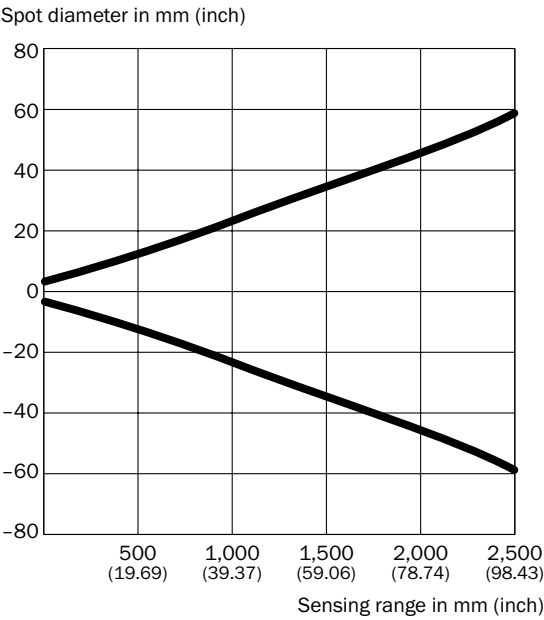
Spot diameter in mm (inch)

**WL2S-2**

Spot diameter in mm (inch)

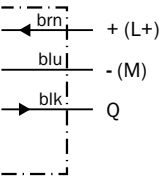


WSE2S-2

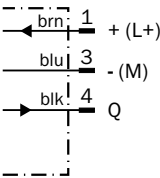


Connection diagram

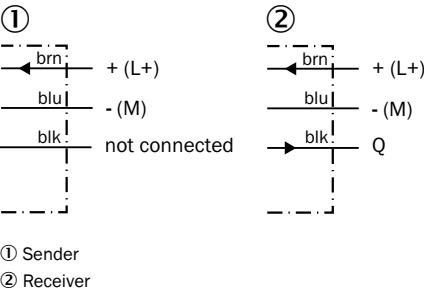
Cd-044



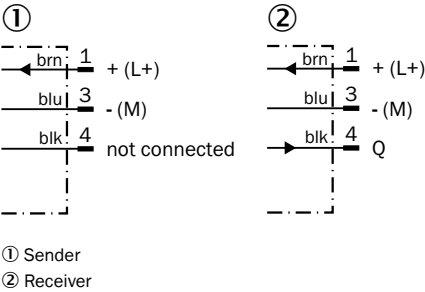
Cd-045



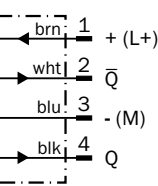
Cd-049

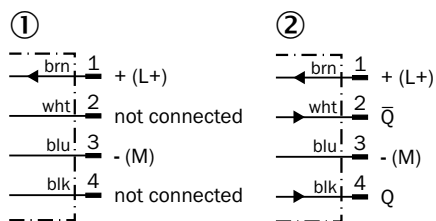
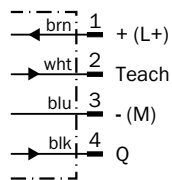
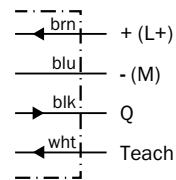
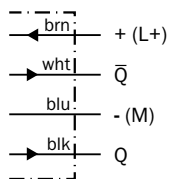
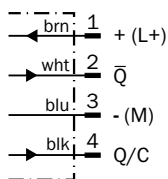
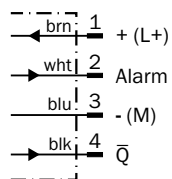
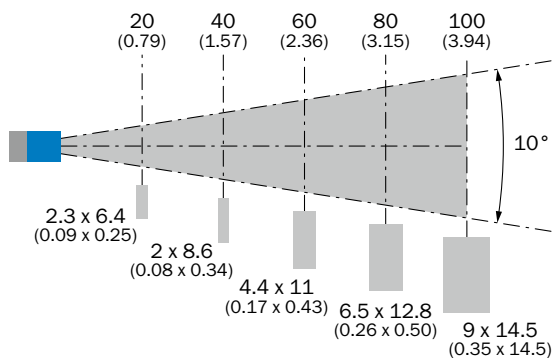


Cd-051



Cd-084



Cd-085**Cd-092****Cd-093****Cd-095****Cd-098****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

Powerful clear material detection in an ultra-compact housing



Additional information

Detailed technical data.....	F-233
Ordering information.....	F-234
Dimensional drawings	F-234
Characteristic curves	F-235
Bar diagrams.....	F-235
Light spot diameter.....	F-235
Connection diagram	F-235
Recommended accessories.....	F-236

Product description

New possibilities in machine construction: the ultra-compact WL2SG-2 miniature photoelectric sensor for detecting transparent objects offers features that were previously only available with much larger sensors. Ampules, foil and glass are reliably detected in the most confined of spaces.

The WL2SG-2 is adaptable: dust on the reflector or wear is compensated for in the same way as temperature changes and changes in light intensity. The WL2SG-2 is not only adaptable with regard to harsh industrial environments

– settings for the respective application can also be selected via IO-Link.

Special operating modes for gaps in the bottle flow or for foil tear monitoring are available for extreme operating conditions. The W2S-2 offers optimal performance with an ultra-compact design for use in both pharmaceutical and automatic assembly machines.

The newest automation innovation is already on board. Configuration and diagnostics are set via the control in the same way as continuous monitoring.

At a glance

- Extremely high sensor size to sensing distance ratio
- High switching point accuracy
- Teach-in functions enable reliable settings
- Continuous threshold adaption (AutoAdapt)
- Single-lens autocollimation for visibility through apertures and drill holes
- Flexible sensor settings, monitoring, advanced diagnostics, and display thanks to IO-Link

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 and system throughput: all familiar, highly-transparent objects are reliably detected
- Reliable object detection: precise switching characteristics and a high detection quality
- Universal use: conventional mounting and housing design
- The precise light spot of the Pin-Point^{2.0} LED enables the use of very small reflectors and reflector surfaces

→ www.mysick.com/en/W2SG-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

Sensor principle	Photoelectric retro-reflective sensor
Detection principle	Autocollimation
Dimensions (W x H x D)	7.7 mm x 21.8 mm x 13.5 mm
Housing design (light emission)	Rectangular
Sensing range max. ¹⁾	0 m ... 1.2 m
Sensing range ¹⁾	0 m ... 0.55 m
Type of light	Visible red light
Light source ²⁾	PinPoint LED
Light spot size (distance)	Ø 12 mm (250 mm)
Wave length	640 nm
Adjustment	Cable
Continuous threshold adaption (AutoAdapt)	✓
Special feature	Detection of transparent objects

¹⁾ P250F.

²⁾ Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	≤ 5 V _{pp}
Power consumption ³⁾	≤ 20 mA
Output type	PNP / NPN (depending on type)
Switching mode	Light switching / Dark-switching / Light/dark-switching (depending on type)
Output current I _{max.}	< 50 mA
Response time ⁴⁾	< 0.5 ms
Switching frequency ⁵⁾	1,000 Hz
Connection type	Cable with connector, 200 mm ⁶⁾ / Cable, 2 m ⁶⁾ (depending on type)
Circuit protection	A ⁷⁾ , B ⁸⁾ , D ⁹⁾
Polarisation filter	✓
IO-Link	-/✓ (COM2) (depending on type)
Housing material	ABS/PC
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⁾ 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⁾ B = output reverse-polarity protected.

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

Ordering information

Other models available at www.mysick.com/en/W2SG-2

WL2SG-2, clear material detection

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation

Sensing range max. ¹⁾	Adjustment	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0 m ... 1.2 m	Cable	PNP	Light switching	Cable with connector M8, 4-pin, 200 mm	Cd-093	WL2SG-2P3235	1065929
			Dark-switching	Cable with connector M8, 4-pin, 200 mm	Cd-093	WL2SG-2F3235	1063647
		NPN	Light switching	Cable, 4-wire, 2 m	Cd-093	WL2SG-2N1135	1065934
			Dark-switching	Cable, 4-wire, 2 m	Cd-093	WL2SG-2E1135	1065930

¹⁾ P250F.

WL2SG-2, IO-Link

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation
- **Switching mode:** light/dark-switching

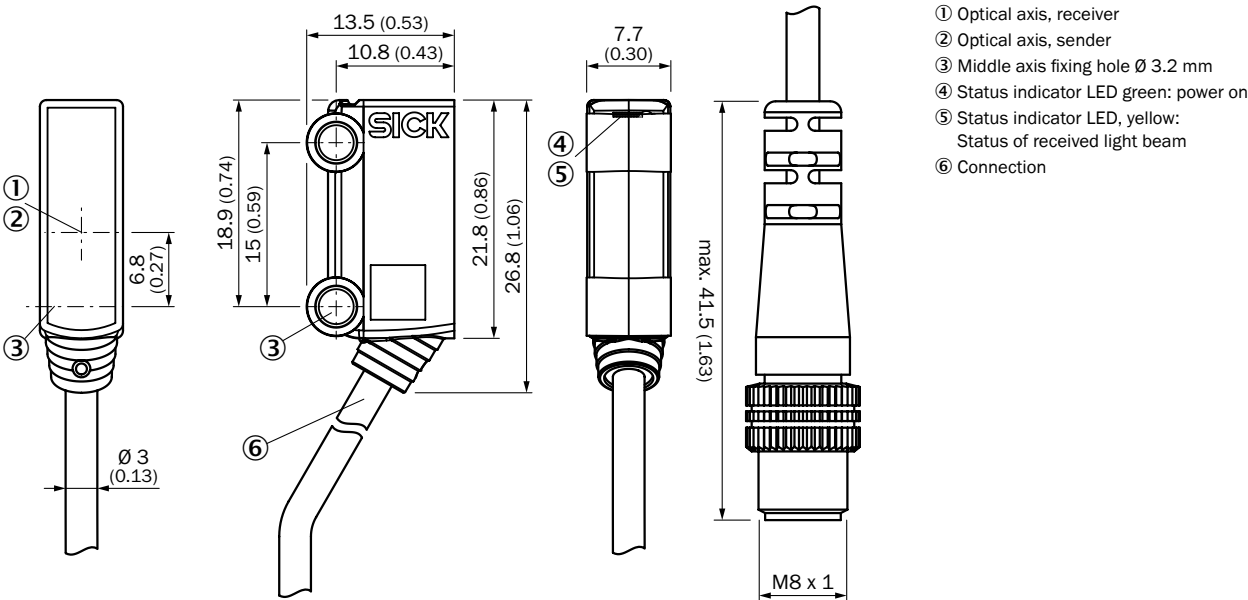
Sensing range max. ¹⁾	Adjustment	Output type	IO-Link	Connection	Connection diagram	Model name	Part no.
0 m ... 1.2 m	Cable	PNP	Standard functions	Cable with connector M8, 4-pin, 200 mm	Cd-098	WL2SGC-2P3234	1063648

¹⁾ P250F.

F

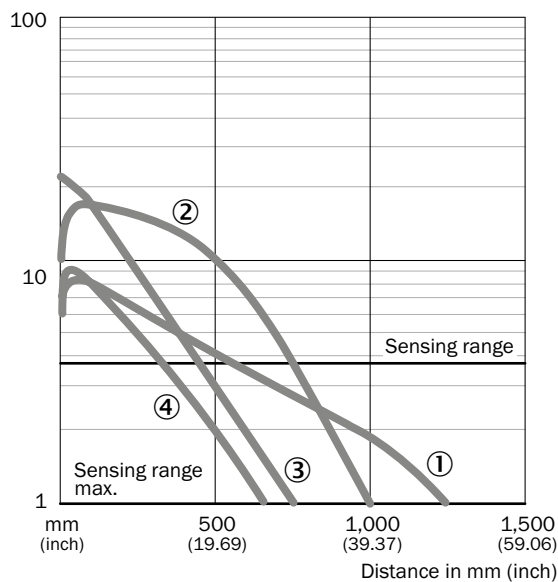
Dimensional drawings

Dimensions in mm (inch)



Characteristic curves

WL2SG-2

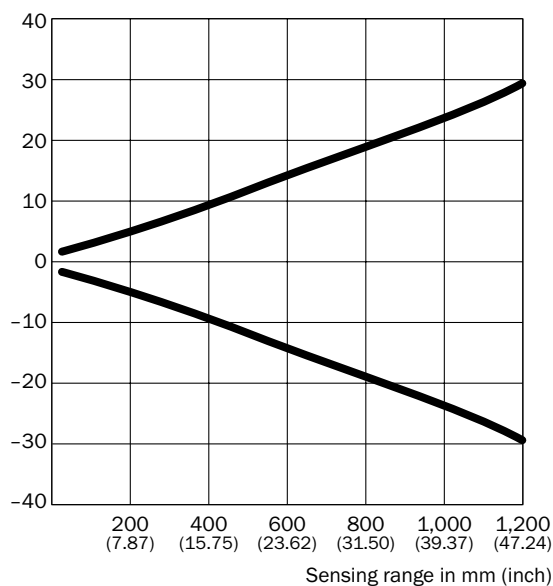


- ① P250F
- ② PL20A
- ③ REF-AC1000
- ④ PL10F

Light spot diameter

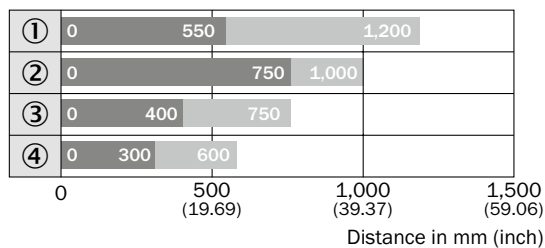
WL2SG-2

Spot diameter in mm (inch)



Bar diagrams

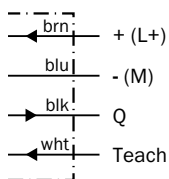
WL2SG-2



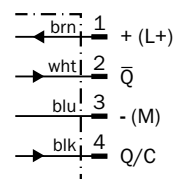
- Sensing range
- Sensing range max.
- ① P250F
- ② PL20A
- ③ REF-AC1000
- ④ PL10F

Connection diagram

Cd-093



Cd-098



Recommended accessories

Plug connectors and cables

Connecting cable (female connector-open), PVC

Figure	Connection type head A	Connection type head B	Connecting cable	Enclosure rating	Model name	Part no.
	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, 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, screw connection, suitable for laser sensors, 18 mm x 18 mm	PL10F	5311210
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
	PMMA/ABS	Fine triple, screw connection, suitable for laser sensors, 38 mm x 16 mm	PL20F	5308844
	Plastic	Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089
	PMMA/ABS	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

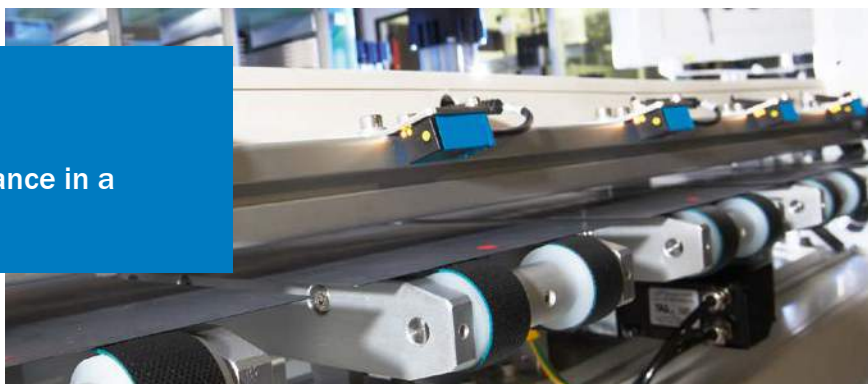
Figure	Description	Model name	Part no.
	Suitable for laser sensors, self-adhesive, cut, see alignment note, 56.3 mm x 56.3 mm	REF-AC1000-56	4063030

Special reflectors

Figure	Material	Description	Model name	Part no.
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adapter shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adapter thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

→ For additional accessories, please see page L-861

Best-in-class sensing performance in a miniature housing



SIRIC®
optical ASIC
invented by SICK

ECOLAB®



Additional information

Detailed technical data..... F-239
Ordering information..... F-240
Dimensional drawings F-243
Characteristic curves F-244
Bar diagrams..... F-245
Light spot diameter..... F-246
Minimum detectable object F-246
Connection diagram F-247
Recommended accessories..... F-248

Product description

The W4-3 family of photoelectric sensors offers best-in-class performance in a miniature housing design. Using the latest SIRIC® and PinPoint LED technologies, these sensors provide reliable object detection of transparent and

glossy objects like blisters, e-cards and aluminum cans. Optical axes on the flat side enable simple, space-saving integration in machine environments – even without mounting brackets.

At a glance

- Best-in-class background suppression, reliable detection of critical objects and a high immunity to ambient light
- Quick and easy setup using a precise 5-turn potentiometer, control wire or teach function
- Best background suppression in its class
- PinPoint LED for brightest light spot in its class

Your benefits

- Low-cost integration due to optimal machine integration in areas with limited space
- Application versatility due to reliable detection of shiny or jet-black objects
- Rugged mounting system with M3 threaded metal inserts reduces maintenance costs due to a long service life
- High immunity to ambient light reduces downtime caused by false trips
- Clearly visible light spot simplifies alignment

→ www.mysick.com/en/W4-3

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

	WTB4-3	WTV4-3	WL4-3	WSE4-3
Sensor principle	Photoelectric proximity sensor		Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Detection principle	Background suppression		Standard optics	–
Dimensions (W x H x D)	16 mm x 39.5 mm x 12 mm			
Housing design (light emission)	Rectangular			
Sensing range max.	4 mm ... 150 mm ¹⁾	3 mm ... 50 mm ¹⁾ (depending on type)	0.01 m ... 4.5 m ²⁾	0 m ... 4 m
Sensing range	15 mm ... 150 mm ¹⁾	5 mm ... 50 mm ¹⁾ (depending on type)	0.02 m ... 3.5 m ²⁾	0 m ... 3.5 m
Type of light	Visible red light	Visible red light / Infrared light (depending on type)	Visible red light	
Light source ³⁾	PinPoint LED ^{2,0}			
Wave length				
Visible red light	650 nm / 660 nm (depending on type)	650 nm		
Infrared light	–	880 nm	–	
Adjustment	Potentiometer, 5 turns Cable Single teach-in button (depending on type)	Potentiometer, 5 turns	–	
Special feature	Line-shaped light spot	V-optics / line-shaped light spot (depending on type)	–	

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

	WTB4-3	WTV4-3	WL4-3	WSE4-3
Supply voltage	10 V DC ... 30 V DC ¹⁾			
Ripple ²⁾	< 5 V _{pp}			
Power consumption	≤ 20 mA ³⁾			≤ 20 mA ⁴⁾
Output type	PNP / NPN (depending on type)			
Switching mode	Light switching / Dark-switching / Light/dark-switching (depending on type)			
Output current I _{max.}	≤ 100 mA			
Response time ⁵⁾	< 0.5 ms			
With IO-Link light ⁷⁾	< 0.65 ms	–		
Switching frequency ⁶⁾	1,000 Hz			
Connection type	Cable, 2 m ⁸⁾ / Male connector, M8 / Cable with connector, M12, 150 mm ⁸⁾ (depending on type)			
Circuit protection	A ⁹⁾ , C ¹⁰⁾ , D ¹¹⁾			
Protection class	III			
Weight	30 g			60 g
Polarisation filter	–		✓	–
Housing material	ABS			
Optics material	PMMA			
Enclosure rating	IP 66 / IP 67			

	WTB4-3	WTV4-3	WL4-3	WSE4-3
Test input sender off	–			“Test” to 0 V
Ambient operating temperature	–40 °C ... +60 °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⁾ Sender.

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⁾ C = interference suppression.

¹¹⁾ D = outputs overcurrent and short-circuit protected.

Ordering information

Other models available at www.mysick.com/en/W4-3

WTB4-3

- **Supply voltage:** 10 V DC ... 30 V DC (Limit values.)
- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Type of light:** visible red light
- **Light spot size (distance):** Ø 7 mm (50 mm)

Sensing range max. ¹⁾	Output type	Switching mode	Adjustment	Connection	Connection diagram	Model name	Part no.
4 mm ... 150 mm	PNP	Light switching	Potentiometer, 5 turns	Cable, 3-wire, 2 m, PVC	Cd-043	WTB4-3P1361	1028094
				Connector M8, 3-pin	Cd-045	WTB4-3P2161	1028099
			Single teach-in button	Cable, 3-wire, 2 m, PVC	Cd-043	WTB4-3P1362	1028081
				Connector M8, 3-pin	Cd-045	WTB4-3P2162	1028084
		Dark-switching	Cable, Single teach-in button ²⁾	Cable, 4-wire, 5 m, PVC	Cd-093	WTB4-3P1264	1041890
			Potentiometer, 5 turns	Cable, 3-wire, 2 m, PVC	Cd-043	WTB4-3F1361	1028105
		Light/dark-switching		Connector M8, 3-pin	Cd-045	WTB4-3F2161	1028107
			Potentiometer, 5 turns	Connector M8, 4-pin	Cd-083	WTB4-3P2261	1028100
				Cable, 4-wire, 2 m, PVC	Cd-094	WTB4-3P1161	1028096
			Single teach-in button	Connector M8, 4-pin	Cd-083	WTB4-3P2262	1028085
	NPN	Light switching	Potentiometer, 5 turns	Cable, 3-wire, 5 m, PVC	Cd-043	WTB4-3N1461	1057301
				Connector M8, 3-pin	Cd-045	WTB4-3N2161	1028104
			Single teach-in button	Cable, 3-wire, 2 m, PVC	Cd-043	WTB4-3N1362	1028087
				Connector M8, 3-pin	Cd-045	WTB4-3N2162	1028088
		Dark-switching	Cable, Single teach-in button ²⁾	Cable, 4-wire, 2 m, PVC	Cd-093	WTB4-3N1164	1028090
			Potentiometer, 5 turns	Cable, 3-wire, 2 m, PVC	Cd-043	WTB4-3E1361	1028108
		Light/dark-switching		Connector M8, 3-pin	Cd-045	WTB4-3E2161	1028110
			Potentiometer, 5 turns	Cable, 4-wire, 2 m, PVC	Cd-094	WTB4-3N1161	1028102

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

²⁾ External teach-in: pulse > 2 s with voltage U_v with PNP and M with NPN.

WTB4-3, line-shaped light spot

- **Supply voltage:** 10 V DC ... 30 V DC (Limit values.)
- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Type of light:** visible red light
- **Light spot size (distance):** 5 mm x 28 mm (50 mm)

Sensing range max. ¹⁾	Output type	Switching mode	Adjustment	Connection	Connection diagram	Model name	Part no.
4 mm ... 150 mm	PNP	Light switching	Potentiometer, 5 turns	Cable, 3-wire, 2 m, PVC	Cd-043	WTB4-3P1371	1028121
		Light/dark-switching		Connector M8, 3-pin	Cd-045	WTB4-3P2171	1028123
				Connector M8, 4-pin	Cd-083	WTB4-3P2271	1042190
	NPN	Light switching	Potentiometer, 5 turns	Cable, 3-wire, 2 m, PVC	Cd-043	WTB4-3N1371	1028125
				Connector M8, 3-pin	Cd-045	WTB4-3N2171	1028126

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

WTV4-3, V-optics, line-shaped light spot

- **Supply voltage:** 10 V DC ... 30 V DC (Limit values.)
- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Type of light:** visible red light
- **Light spot size (distance):** 3 mm x 20 mm (40 mm)

Sensing range max. ¹⁾	Output type	Switching mode	Adjustment	Connection	Connection diagram	Model name	Part no.
3 mm ... 50 mm	PNP	Light switching	Potentiometer, 5 turns	Connector M8, 4-pin	Cd-083	WTV4-3P2271	1046644
	NPN	Light switching	Potentiometer, 5 turns	Cable, 4-wire, 2 m, PVC	Cd-083	WTV4-3N1171	1046898

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

WTV4-3, V-optics

- **Supply voltage:** 10 V DC ... 30 V DC (Limit values.)
- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Light spot size (distance):** Ø 10 mm (40 mm)
- **Adjustment:** potentiometer, 5 turns

Type of light	Sensing range max. ¹⁾	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
Visible red light	4 mm ... 50 mm	PNP	Light switching	Cable, 3-wire, 2 m, PVC	Cd-043	WTV4-3P1341	1028111
				Connector M8, 3-pin	Cd-045	WTV4-3P2141	1028113
			Light/dark-switching	Connector M8, 4-pin	Cd-083	WTV4-3P2241	1028114
		NPN	Light switching	Cable, 3-wire, 2 m, PVC	Cd-043	WTV4-3N1341	1028115
				Connector M8, 3-pin	Cd-045	WTV4-3N2141	1028116
Infrared light	4 mm ... 50 mm	PNP	Light switching	Cable, 3-wire, 2 m, PVC	Cd-043	WTV4-3P1321	1029888
		NPN	Light switching	Cable, 3-wire, 2 m, PVC	Cd-043	WTV4-3N1321	1029885
			Light/dark-switching	Connector M8, 4-pin	Cd-083	WTV4-3N2221	1048995

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

WL4-3

- **Supply voltage:** 10 V DC ... 30 V DC (Limit values.)
- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Type of light:** visible red light
- **Light spot size (distance):** Ø 75 mm (1.5 m)

Sensing range max. ¹⁾	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0.01 m ... 4.5 m	PNP	Light switching	Cable, 3-wire, 2 m, PVC	Cd-043	WL4-3P1330	1028143
			Connector M8, 3-pin	Cd-045	WL4-3P2130	1028146
		Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-043	WL4-3F1330	1028152
			Connector M8, 3-pin	Cd-045	WL4-3F2130	1028155
	NPN	Light switching	Connector M8, 4-pin	Cd-083	WL4-3P2230	1028147
			Cable, 3-wire, 2 m, PVC	Cd-043	WL4-3N1330	1028148
		Dark-switching	Connector M8, 3-pin	Cd-045	WL4-3N2130	1028151
			Cable, 3-wire, 2 m, PVC	Cd-043	WL4-3E1330	1028156
			Connector M8, 3-pin	Cd-045	WL4-3E2130	1028158

¹⁾ PL80A.

WSE4-3

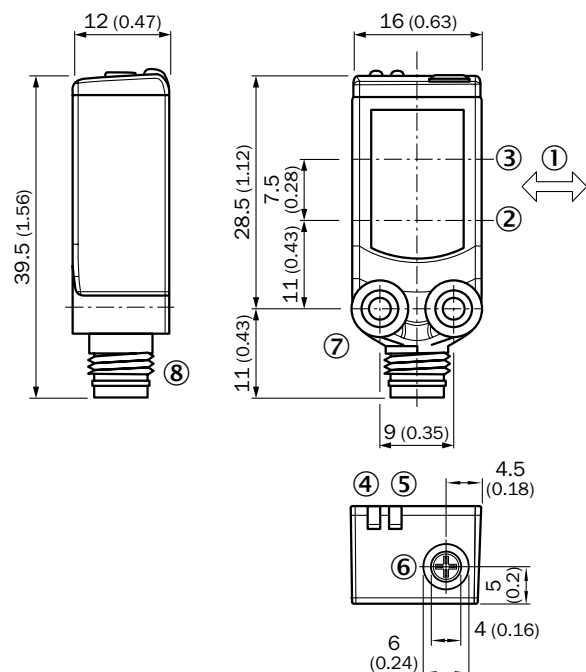
- **Supply voltage:** 10 V DC ... 30 V DC (Limit values.)
- **Sensor principle:** through-beam photoelectric sensor
- **Type of light:** visible red light
- **Light spot size (distance):** Ø 210 mm (2 m)

Sensing range max.	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0 m ... 4 m	PNP	Light switching	Cable, 3-wire, 2 m, PVC	Cd-061	WSE4-3P1330	1028159
			Cable, 3-wire, 5 m, PVC	Cd-061	WSE4-3P1430	1029645
			Connector M8, 3-pin	Cd-069	WSE4-3P2130	1028163
		Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-061	WSE4-3F1330	1028168
			Connector M8, 3-pin	Cd-069	WSE4-3F2130	1028171
	NPN	Light switching	Connector M8, 4-pin	Cd-072	WSE4-3P2230	1028160
			Cable, 3-wire, 2 m, PVC	Cd-061	WSE4-3N1330	1028164
		Dark-switching	Connector M8, 3-pin	Cd-069	WSE4-3N2130	1028167
			Cable, 3-wire, 2 m, PVC	Cd-061	WSE4-3E1330	1028172
			Connector M8, 3-pin	Cd-069	WSE4-3E2130	1028175

Dimensional drawings

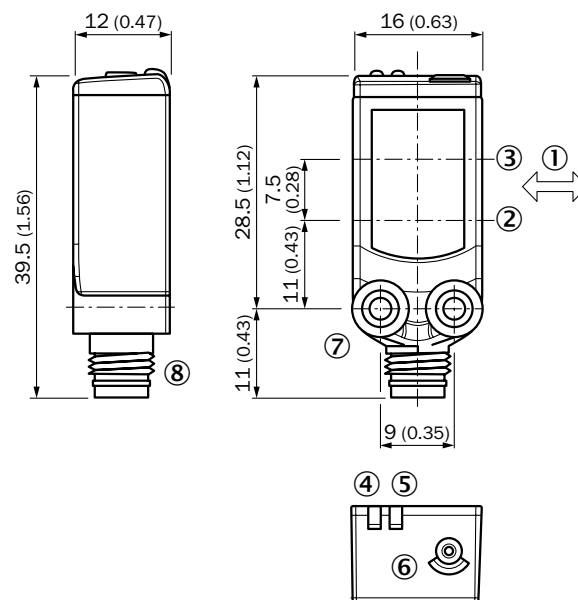
Dimensions in mm (inch)

WTB4-3, WTV4-3, potentiometer

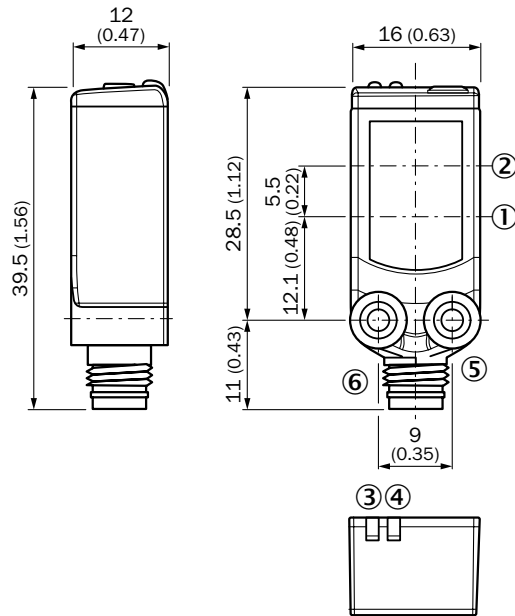


- ① Standard direction of the material being detected
- ② Optical axis, sender
- ③ Optical axis, receiver
- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Status indicator LED green: power on
- ⑥ Potentiometer
- ⑦ Threaded mounting hole M3
- ⑧ Connection

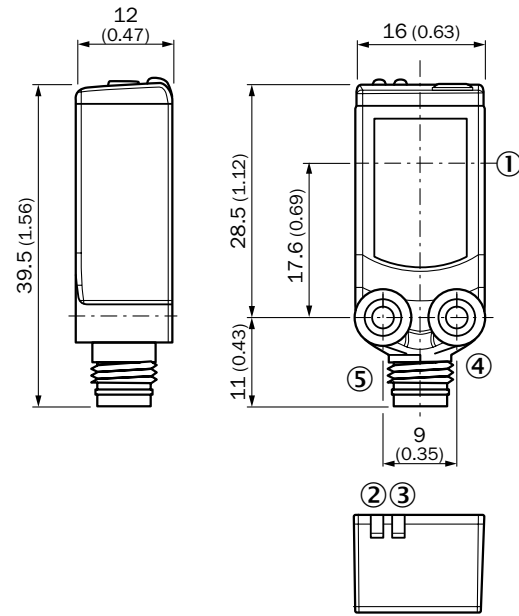
WTB4-3, WTV4-3, single teach button



- ① Standard direction of the material being detected
- ② Optical axis, sender
- ③ Optical axis, receiver
- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Status indicator LED green: power on
- ⑥ Teach-in button
- ⑦ Threaded mounting hole M3
- ⑧ Connection

WL4-3

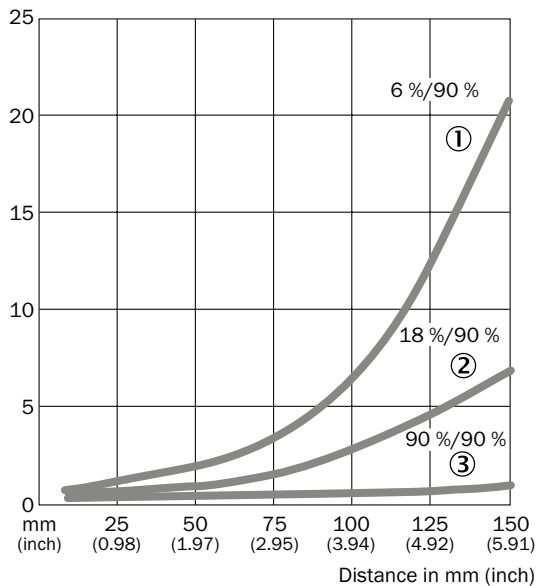
- ① Center of optical axis, sender
- ② Center of optical axis, receiver
- ③ LED indicator orange: status of received light beam
- ④ Status indicator LED green: power on
- ⑤ Threaded mounting hole M3
- ⑥ Connection

WSE4-3

- ① Center of optical axis
- ② LED indicator orange: status of received light beam
- ③ Status indicator LED green: power on
- ④ Threaded mounting hole M3
- ⑤ Connection

Characteristic curves**Black-white shift****WTB4-3**

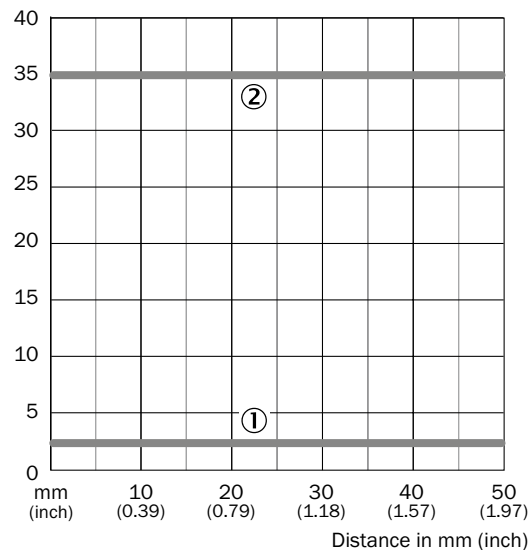
% of sensing distance



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

WTV4-3, V-optics

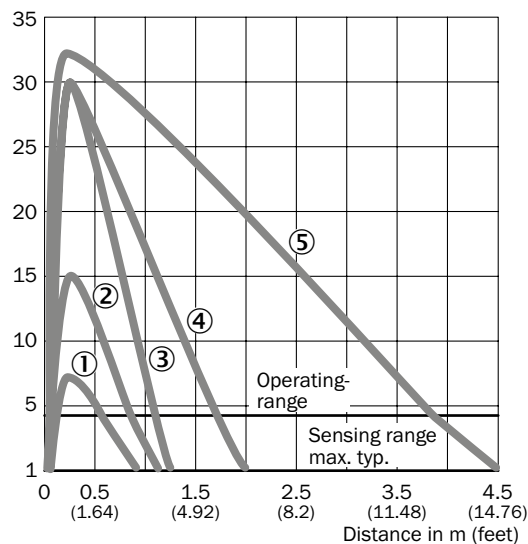
Background



- ① Black-white shift 90% / 6%
- ② Distance to the background with transparent objects

WL4-3

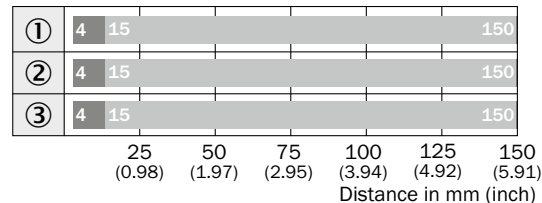
Operating reserve in %



- ① REF-IRF-56
- ② PL10F
- ③ PL20A
- ④ PL40A
- ⑤ PL80A

Bar diagrams

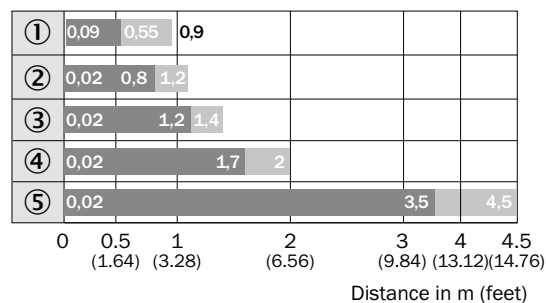
WTB4-3



■ Sensing range max. ■ Sensing range

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

WLG4-3 with polarisation filter

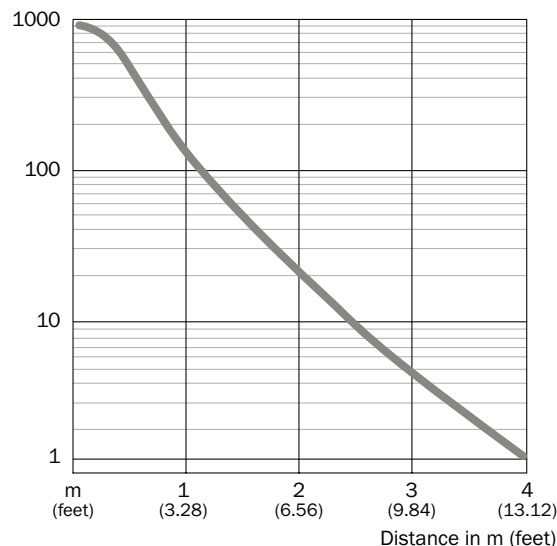


■ Sensing range ■ Sensing range max.

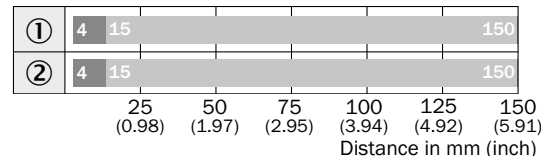
- ① REF-IRF-56
- ② PL10F
- ③ PL20A
- ④ PL40A
- ⑤ PL80A

WSE4-3

Operating reserve



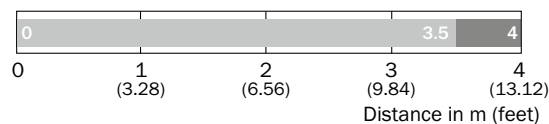
WTB4-3, line-shaped light spot



■ Sensing range max. ■ Sensing range

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

WSE4-3

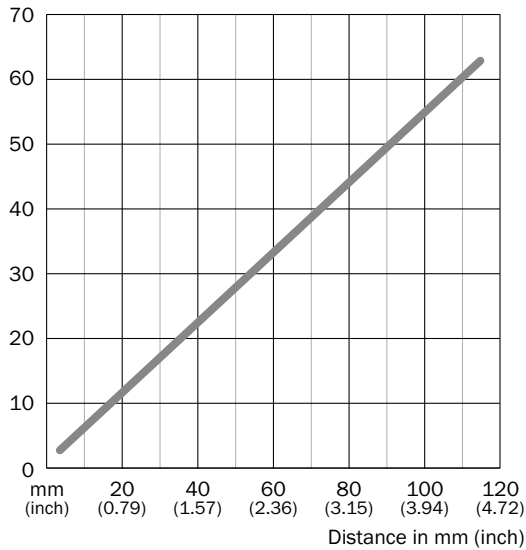


■ Sensing range typ. max ■ Sensing range

Light spot diameter

WTB4-3, line-shaped light spot

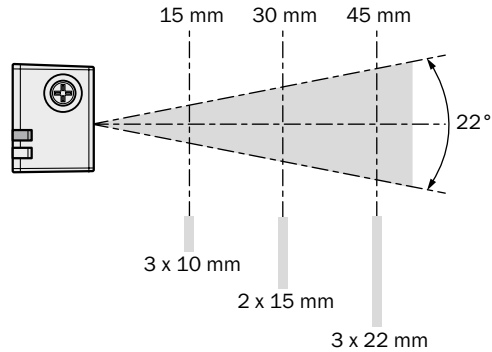
Lightspot: line width



WTV4-3, V-optics, line-shaped light spot



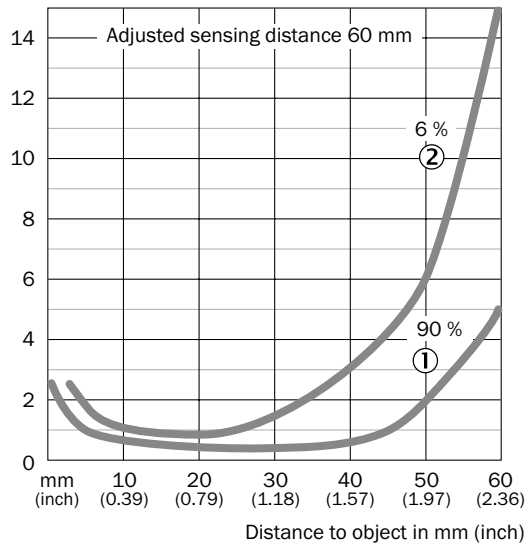
Apex angle 8°



Minimum detectable object

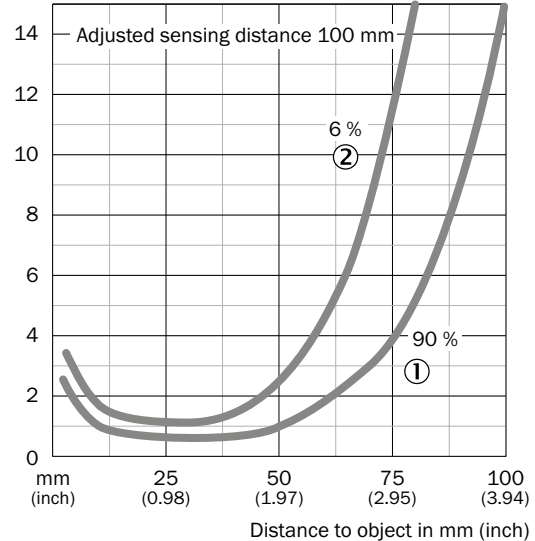
WTB4-3, line-shaped light spot

Width of object



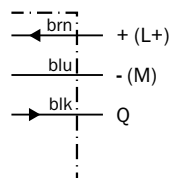
WTB4-3, line-shaped light spot

Width of object

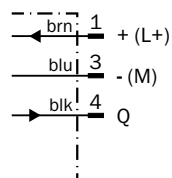


Connection diagram

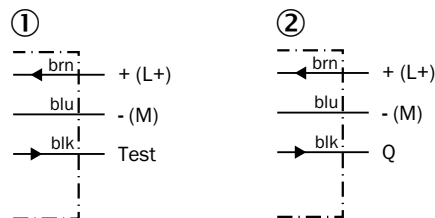
Cd-043



Cd-045

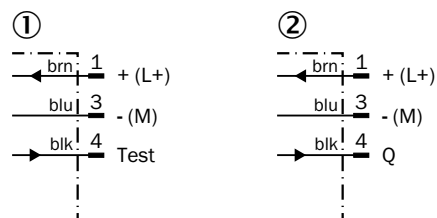


Cd-061



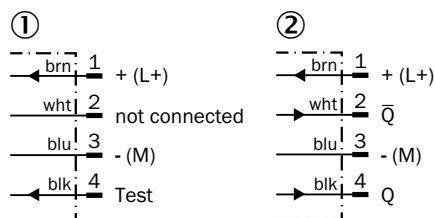
① Sender
② Receiver

Cd-069



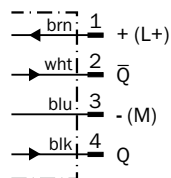
① Sender
② Receiver

Cd-072

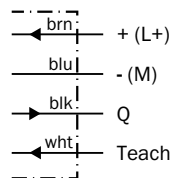


① Sender
② Receiver

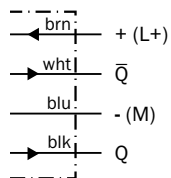
Cd-083



Cd-093



Cd-094



F

Recommended accessories

Plug connectors and cables

Connecting cable (female connector-open), 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

Female connector (ready to assemble)

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0803-G	7902077
	Female connector, M8, 3-pin, angled	Pin penetration	PBT	IP 67	DOS-0803-W	7902078
	Female connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0804-G	6009974
	Female connector, M8, 4-pin, angled	Pin penetration	PBT	IP 67	DOS-0804-W	6009975

Male connector (ready to assemble)M8, 3-pin

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Male connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	STE-0803-G	6037322
	Male connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	STE-0804-G	6037323

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N08 for universal clamp bracket	BEF-KHS-N08	2051607

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

Round

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Round, plugable for metal plates	PL22-3	1004488

→ For additional accessories, please see page L-861

PTFE-coated photoelectric sensors withstand the harshest environments



SIRIC®
optical ASIC
Invented by SICK

ECOLAB®



Additional information

Detailed technical data.....	F-251
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Dimensional drawings	F-252
Characteristic curves	F-252
Bar diagrams.....	F-253
Connection diagram	F-253
Recommended accessories.....	F-253

Product description

The W4-3 photoelectric sensors in a Teflon® shell coating are resistant to harsh chemicals. Both the housing and cable

are Teflon coated, making them ideal for wet, harsh environments in the food and beverage industry.

At a glance

- Sensor and cable have a rugged Teflon coating for use in the most aggressive environments
- Suitable for use in the food and beverage industry
- Sensing range adjustment via teach wire
- Background suppression and through-beam types available

Your benefits

- High cost savings since neither the sensor nor the cable requires a protective barrier
- Less machine downtime due to a long sensor life that withstands all cleaning and process agents

→ www.mysick.com/en/W4-3_PTFE

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

	WT4-3 PTFE	WSE4-3 PTFE
Sensor principle	Photoelectric proximity sensor	Through-beam photoelectric sensor
Detection principle	Background suppression	–
Dimensions (W x H x D)	22 mm x 42 mm x 21.8 mm	
Housing design (light emission)	Rectangular	
Sensing range max.	4 mm ... 120 mm ¹⁾	0 m ... 3 m
Sensing range	15 mm ... 120 mm ¹⁾	0 m ... 2.5 m
Type of light	Visible red light	
Light source ²⁾	PinPoint LED	
Light spot size (distance)	Ø 7 mm (50 mm)	Ø 210 mm (2 m)
Wave length	650 nm	
Adjustment	Cable, Single teach-in button	–

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

²⁾ Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

	WT4-3 PTFE	WSE4-3 PTFE
Supply voltage ¹⁾	10 V DC ... 30 V DC	
Ripple ²⁾	< 5 V _{pp}	
Power consumption	≤ 20 mA ³⁾	≤ 20 mA ^{4) 5)}
Output type	PNP / NPN (depending on type)	
Switching mode	Light switching	Light switching / Dark-switching (depending on type)
Output current I_{max.}	≤ 100 mA	
Response time ⁶⁾	< 0.5 ms	
Switching frequency ⁷⁾	1,000 Hz	
Connection type ⁸⁾	Cable, 4-wire, 5 m, PVC/PTFE coating	
Circuit protection	A ⁹⁾ , C ¹⁰⁾ , D ¹¹⁾	
Protection class	III	
Weight	30 g	
Housing material	PTFE	
Optics material	PMMA	
Enclosure rating	IP 68 / IP 69K	
Test input sender off	–	“TEST” to 0 V
Ambient operating temperature	–40 °C ... +60 °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⁾ Sender.

⁵⁾ Receiver.

⁶⁾ Signal transit time with resistive load.

⁷⁾ With light/dark ratio 1:1.

⁸⁾ Do not bend below 0 °C.

⁹⁾ A = V_S connections reverse-polarity protected.

¹⁰⁾ C = interference suppression.

¹¹⁾ D = outputs overcurrent and short-circuit protected.

Ordering information

Other models available at www.mysick.com/en/W4-3_PTFE

WT4-3 PTFE

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Adjustment:** cable, single teach-in button
- **Connection:** cable, 4-wire, 5 m, PVC/PTFE coating

Sensing range max. ¹⁾	Output type	Switching mode	Connection diagram	Model name	Part no.
4 mm ... 120 mm	PNP	Light switching	Cd-093	WTB4T-3P1264	1028091
	NPN	Light switching	Cd-093	WTB4T-3N1264	1028092

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

WSE4-3 PTFE

- **Sensor principle:** through-beam photoelectric sensor
- **Connection:** cable, 3-wire, 5 m, PVC/PTFE coating

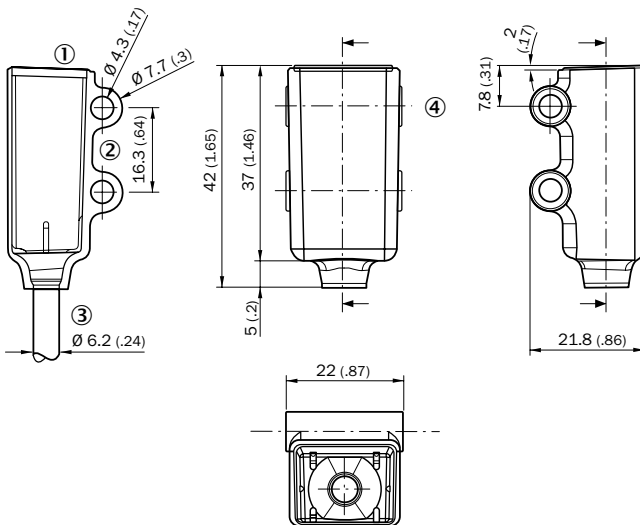
Sensing range max.	Output type	Switching mode	Connection diagram	Model name	Part no.
0 m ... 3 m	PNP	Light switching	Cd-061	WSE4T-3P1430	1029646
		Dark-switching	Cd-061	WSE4T-3F1430	1029647
	NPN	Dark-switching	Cd-061	WSE4T-3E1430	1029648

F

Dimensional drawings

Dimensions in mm (inch)

WTB4T-3, PTFE

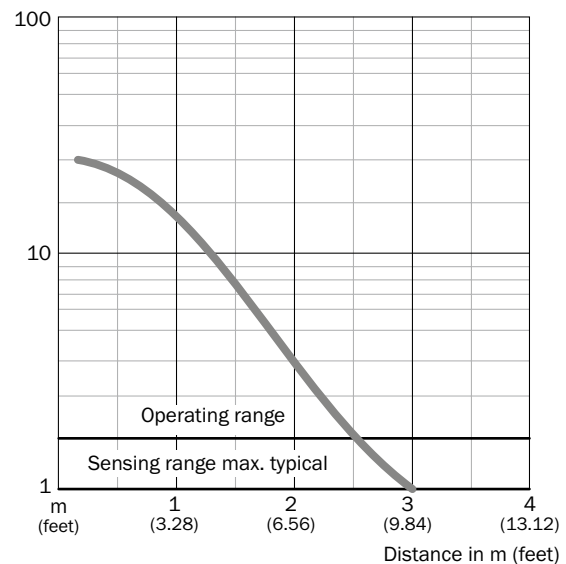


- ① LED signal
- ② Mounting hole, Ø 4.3 mm
- ③ Cable 5 m, Ø 3.4 mm, 2 m Teflon coated Ø 6.2 mm
- ④ Optical axis, receiver
- ⑤ Optical axis, sender

Characteristic curves

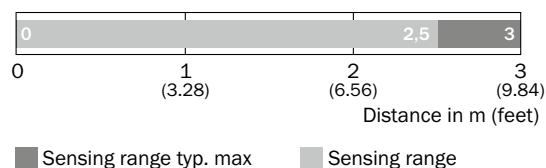
WSE4T-3 PTFE

Operating reserve



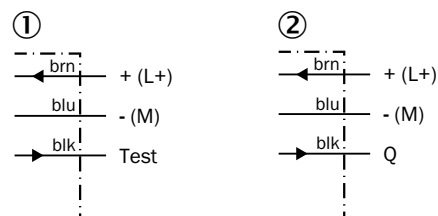
Bar diagrams

WSE4T-3 PTFE

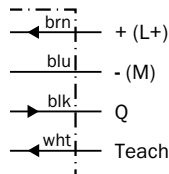


Connection diagram

Cd-061



Cd-093



Recommended accessories

Plug connectors and cables

Female connector (ready to assemble)

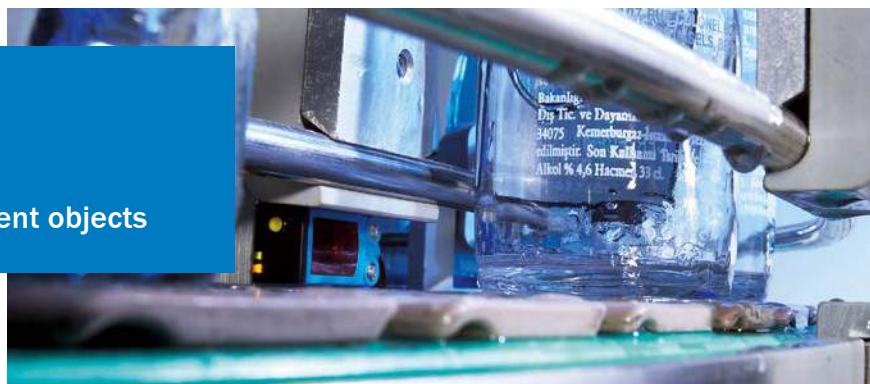
Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0803-G	7902077
	Female connector, M8, 3-pin, angled	Pin penetration	PBT	IP 67	DOS-0803-W	7902078
	Female connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0804-G	6009974
	Female connector, M8, 4-pin, angled	Pin penetration	PBT	IP 67	DOS-0804-W	6009975

Male connector (ready to assemble) M8, 3-pin

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Male connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	STE-0803-G	6037322
	Male connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	STE-0804-G	6037323

→ For additional accessories, please see page L-861

Reliable detection of transparent objects



Additional information

Detailed technical data.....	F-255
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Product description

The WL4-3 photoelectric retro-reflective sensor reliably detects transparent objects such as glass. Its small size is ideal for applications with limited mounting space. Adjusting these sensors can

be done with the click of an easy-to-use teach-in pushbutton. Plus, these sensors don't require any brackets, making them easy to mount directly to the machine – even in tight spaces.

At a glance

- Fast and reliable setup via teach-in pushbutton
- Continuous threshold adaptation (AutoAdapt) technology to detect objects in changing conditions such as temperature, contamination and reflector wear
- Versions without polarizing filters to better detect depolarizing objects such as PET bottles, CD sleeves and shrink-wrapped, glossy objects

Your benefits

- Reliable and quick setting via the push of a button
- Flat housing design eliminates alignment or mounting brackets, which saves time and money
- Low-cost machine integration due to small dimensions that enable mounting in areas with space restrictions
- Quick and easy setup due to highly visible intensive light spot
- The PinPoint LED's well-defined, intense light spot simplifies alignment
- Nearly all transparent objects can be reliably detected

→ www.mysick.com/en/W4-3_Glass

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

Sensor principle	Photoelectric retro-reflective sensor
Dimensions (W x H x D)	16 mm x 39.5 mm x 12 mm
Housing design (light emission)	Rectangular
Sensing range max. ¹⁾	0.01 m ... 4.5 m
Sensing range ¹⁾	0.02 m ... 3.5 m
Type of light	Visible red light
Light source ²⁾	PinPoint LED
Light spot size (distance)	Ø 75 mm (1.5 m)
Wave length	650 nm
Adjustment	Cable, Single teach-in button / Single teach-in button (depending on type)
Continuous threshold adaption (AutoAdapt)	✓
Special feature	Detection of transparent objects

¹⁾ PL80A.

²⁾ Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	< 5 V _{pp}
Power consumption ³⁾	≤ 20 mA
Output type	PNP / NPN (depending on type)
Switching mode	Light switching / Dark-switching (depending on type)
Output current I_{max.}	≤ 100 mA
Response time ⁴⁾	< 0.5 ms
Switching frequency ⁵⁾	1,000 Hz
Angle of reception	Approx. 30 °
Attenuation along light beam	> 8 %
Connection type	Cable, 2 m ⁶⁾ / Male connector, M8 / Cable with connector, M12, 150 mm ⁶⁾ (depending on type)
Circuit protection	A ⁷⁾ , C ⁸⁾ , D ⁹⁾
Protection class	III
Weight	30 g
Polarisation filter	✓
Housing material	ABS
Optics material	PMMA
Enclosure rating	IP 66, IP 67
Ambient operating temperature	-40 °C ... +60 °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⁾ 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.

Ordering information

Other models available at www.mysick.com/en/W4-3_Glass

WLG4-3 with polarisation filter

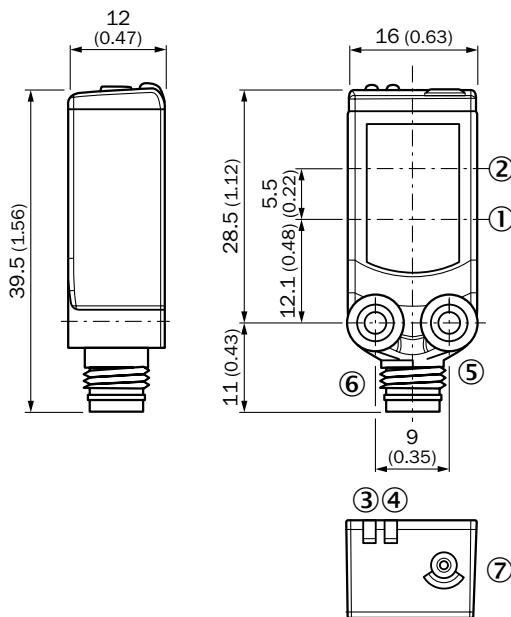
- **Polarisation filter: ✓**

Sensing range max. ¹⁾	Output type	Switching mode	Adjustment	Connection	Connection diagram	Model name	Part no.	
0.01 m ... 4.5 m	PNP	Light switching	Single teach-in button	Cable, 3-wire, 2 m, PVC	Cd-043	WLG4-3P1332	1042844	
				Connector M8, 3-pin	Cd-045	WLG4-3P2132	1029567	
		Dark-switching	Cable, Single teach-in button	Single teach-in button	Connector M8, 3-pin	Cd-045	WLG4-3F2132	1028127
				Connector M8, 4-pin	Cd-092	WLG4-3F2234	1028130	
				Cable with connector M12, 4-pin, 150 mm, PVC	Cd-092	WLG4-3F3434	1043683	
	NPN	Dark-switching	Single teach-in button	Cable, 3-wire, 2 m, PVC	Cd-043	WLG4-3E1332	1028131	
				Connector M8, 3-pin	Cd-045	WLG4-3E2132	1028132	

1) PL80A.

Dimensional drawings

Dimensions in mm (inch)

WLG4-3

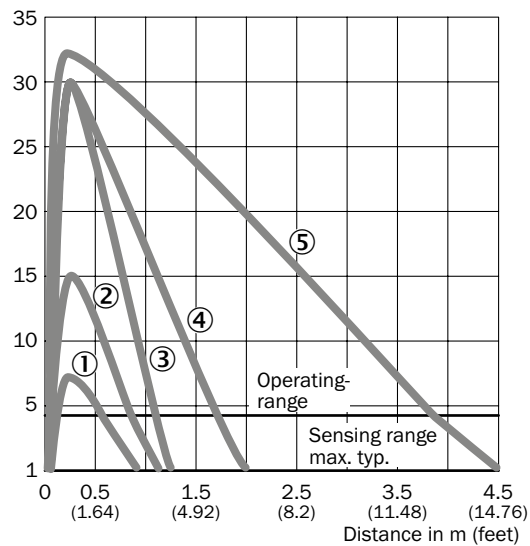
- ① Center of optical axis, sender
- ② Center of optical axis, receiver
- ③ LED indicator orange: status of received light beam
- ④ Status indicator LED green: power on
- ⑤ Threaded mounting hole M3
- ⑥ Connection
- ⑦ Teach-in button

Characteristic curves

Operating reserve

WLG4-3

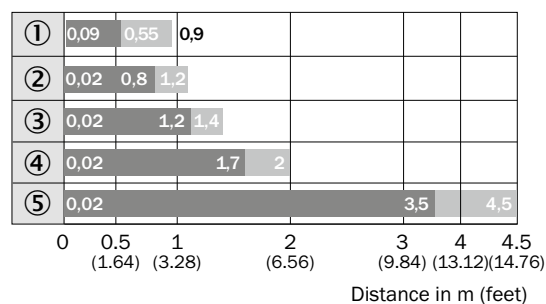
Operating reserve in %



- ① REF-IRF-56
- ② PL10F
- ③ PL20A
- ④ PL40A
- ⑤ PL80A

Bar diagrams

WLG4-3

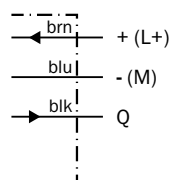


■ Sensing range ■ Sensing range max.

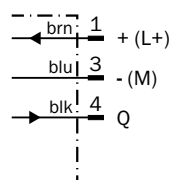
- ① REF-IRF-56
- ② PL10F
- ③ PL20A
- ④ PL40A
- ⑤ PL80A

Connection diagram

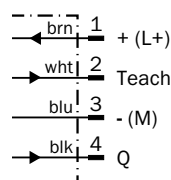
Cd-043



Cd-045



Cd-092



Recommended accessories

Plug connectors and cables

Connecting cable (female connector-open), PVC

- Cable material: PVC

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
	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, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0803-G	7902077
	Female connector, M8, 3-pin, angled	Pin penetration	PBT	IP 67	DOS-0803-W	7902078
	Female connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0804-G	6009974
	Female connector, M8, 4-pin, angled	Pin penetration	PBT	IP 67	DOS-0804-W	6009975
	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, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	STE-0803-G	6037322
	Male connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	STE-0804-G	6037323
	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 N08 for universal clamp bracket	BEF-KHS-N08	2051607
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N08N for universal clamp bracket	BEF-KHS-N08N	2051616

Reflectors

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
		Fine triple, screw connection, suitable for laser sensors, 38 mm x 16 mm	PL20F	5308844
	Plastic	Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089
	PMMA/ABS	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

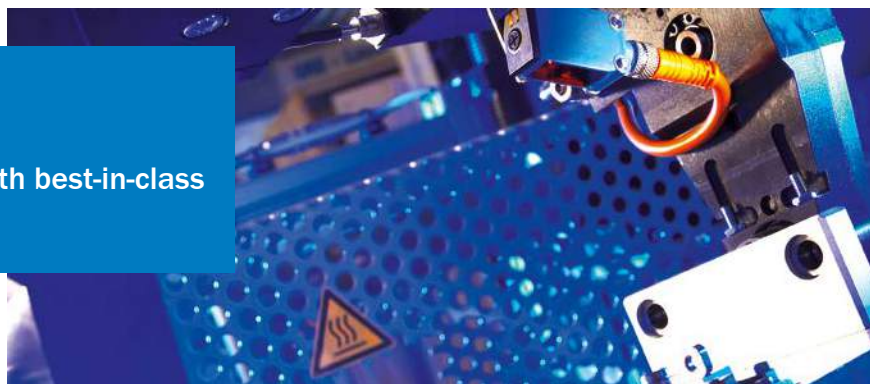
Figure	Description	Model name	Part no.
	Suitable for laser sensors, self-adhesive, cut, see alignment note, 56.3 mm x 56.3 mm	REF-AC1000-56	4063030

Special reflectors

Figure	Material	Description	Model name	Part no.
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adapter shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adapter thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

→ For additional accessories, please see page L-861

Photoelectric sensor family with best-in-class performance



Product description

The W4S-3 family of photoelectric sensors offers best-in-class performance in a slim housing design. Universal use of the latest SIRIC® and PinPoint LED technologies provide maximum reliability in the detection of all objects, including

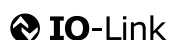
transparent and shiny objects like blisters, e-cards and aluminum cans. Optical axes on the flat side enable simple, space-saving integration in the machine environment – even without separate mounting brackets.

At a glance

- Best background suppression sensor in its class
- Universal use of PinPoint LED technology in all models
- BGS proximity sensor with laser-like light spot for precise detection tasks
- Reliable setting via 5-turn potentiometer, teach-in pushbutton, teach-in via cable or IO-Link
- Flexible sensor settings, monitoring, advanced diagnostics, and visualization thanks to IO-Link

Your benefits

- Application versatility due to reliable detection of shiny, transparent or jet-black objects
- Very quick and easy alignment due to the highly visible, intense PinPoint LED light spot
- Rugged mounting system with M3 threaded metal inserts reduces maintenance costs due to a long service life
- Background suppression sensors with a laser-like light spot reduce costs and installation of additional protective measures by replacing laser sensors
- IO-Link provides easy data access from the PLC
- Quick and easy configuration
- Quick and easy integration using function blocks



Additional information

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→ www.mysick.com/en/W4S-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

	WTB4S-3	WL4S-3	WSE4S-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)	12.2 mm x 41.8 mm x 17.3 mm		
Housing design (light emission)	Rectangular		
Sensing range max.	4 mm ... 180 mm ¹⁾ (depending on type)	0 m ... 5 m ²⁾ (depending on type)	0 m ... 5 m
Sensing range	10 mm ... 180 mm ¹⁾ (depending on type)	0 m ... 3 m ²⁾ (depending on type)	0 m ... 4.5 m
Type of light	Visible red light		
Light source ³⁾	PinPoint LED ^{2,0}		
Wave length	650 nm / 660 nm (depending on type)	650 nm	
Adjustment	Potentiometer, 5 turns, Cable, Single teach-in button (depending on type)	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

	WTB4S-3	WL4S-3	WSE4S-3
Supply voltage ¹⁾	10 V DC ... 30 V DC		
Ripple ²⁾	< 5 V _{pp}		
Power consumption	≤ 20 mA ³⁾		≤ 20 mA ^{4) 5)}
Output type	PNP / NPN (depending on type)		
Output function	Complementary		–
Switching mode	Light switching / Dark-switching / Light/dark-switching (depending on type)		
Output current I _{max.}	≤ 100 mA		
Response time ⁶⁾	< 0.5 ms		
With IO-Link ⁸⁾	< 0.65 ms	–	
Switching frequency ⁷⁾	1,000 Hz		
Connection type	Cable, 2 m ⁹⁾ / Male connector, M8 / Cable with connector, M12, 150 mm ⁹⁾ (depending on type)		
Circuit protection	A ¹⁰⁾ , C ¹¹⁾ , D ¹²⁾		
Protection class	III		
Weight	30 g		40 g
Polarisation filter	–	✓	–
IO-Link	–/✓ (COM2)	–	
Housing material	ABS		
Optics material	PMMA		

	WTB4S-3	WL4S-3	WSE4S-3
Enclosure rating	IP 66, IP 67		
Test input sender off	–		“Test” to 0 V
Ambient operating temperature	–40 °C ... +60 °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⁾ Sender.

⁵⁾ Receiver.

⁶⁾ Signal transit time with resistive load.

⁷⁾ With light/dark ratio 1:1.

⁸⁾ With light/dark ratio 1:1 in switching mode. Different values possible in COM2 mode.

⁹⁾ Do not bend below 0 °C.

¹⁰⁾ A = V_S connections reverse-polarity protected.

¹¹⁾ C = interference suppression.

¹²⁾ D = outputs overcurrent and short-circuit protected.

Ordering information

Other models available at www.mysick.com/en/W4S-3

WTB4S-3

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

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Adjustment	Switching mode	Connection	Con- nection diagram	Model name	Part no.
4 mm ... 120 mm	Ø 2.5 mm (50 mm)	PNP	Potentiometer, 5 turns	Light switching	Cable, 3-wire, 2 m, PVC	Cd-043	WTB4S-3P1331	1042059
					Connector M8, 3-pin	Cd-045	WTB4S-3P2131	1042056
				Dark-switching	Connector M8, 3-pin	Cd-045	WTB4S-3F2131	1042060
			Single teach-in button	Light/dark- switching	Connector M8, 4-pin	Cd-083	WTB4S-3P2231	1042057
				Light switching	Cable, 3-wire, 2 m, PVC	Cd-043	WTB4S-3P1332	1052284
					Connector M8, 3-pin	Cd-045	WTB4S-3P2132	1042053
		NPN	Potentiometer, 5 turns	Light/dark- switching	Connector M8, 4-pin	Cd-083	WTB4S-3P2232	1054282
				Light switching	Connector M8, 4-pin	Cd-092	WTB4S-3P2234	1042050
				Light switching	Cable, 3-wire, 2 m, PVC	Cd-043	WTB4S-3N1331	1042062
			Single teach-in button		Connector M8, 3-pin	Cd-045	WTB4S-3N2131	1042061
				Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-043	WTB4S-3E1331	1042064
				Light/dark- switching	Cable, 4-wire, 2 m, PVC	Cd-094	WTB4S-3N1131	1042063
			Single teach-in button	Light switching	Cable, 3-wire, 2 m, PVC	Cd-043	WTB4S-3N1332	1042055
					Cable, 4-wire, 2 m, PVC	Cd-094	WTB4S-3N1132	1051563
				Light switching	Cable, 4-wire, 2 m, PVC	Cd-093	WTB4S-3N1134	1042052
			Single teach-in button	Light/dark- switching	Connector M8, 4-pin	Cd-083	WTB4S-3N2232	1051872

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

²⁾ External teach-in: pulse > 2 s with voltage U_v with PNP and M with NPN.

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Adjustment	Switching mode	Connection	Con- nection diagram	Model name	Part no.
4 mm ... 180 mm	Ø 6.5 mm (150 mm)	PNP	Potentiometer, 5 turns	Light switching	Cable, 3-wire, 2 m, PVC	Cd-043	WTB4S-3P1361	1042043
					Connector M8, 3-pin	Cd-045	WTB4S-3P2161	1042040
				Dark-switching	Connector M8, 3-pin	Cd-045	WTB4S-3F2161	1042044
					Connector M8, 4-pin	Cd-083	WTB4S-3P2261	1042041
		NPN	Potentiometer, 5 turns	Light switching	Cable, 3-wire, 2 m, PVC	Cd-043	WTB4S-3N1361	1042046
					Connector M8, 3-pin	Cd-045	WTB4S-3N2161	1042045
				Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-043	WTB4S-3E1361	1042047

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

²⁾ External teach-in: pulse > 2 s with voltage U_v with PNP and M with NPN.

WTB4S-3 health output

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

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Adjustment	Switching mode	Connection	Con- nection diagram	Model name	Part no.
4 mm ... 120 mm	Ø 2.5 mm (50 mm)	NPN	Potentiometer, 5 turns	Light switching	Cable, 3-wire, 2 m, PVC	Cd-043	WTB4S-3W1331	1050573

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


WTB4SC-3 IO-Link

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Light spot size (distance):** Ø 6.5 mm (150 mm)
- **Output type):** PNP
- **Switching mode:** light/dark-switching (parametrisable via IO-Link)

Sensing range max. ¹⁾	Adjust- ment	IO-Link	Advanced functions	Connection	Con- nection diagram	Model name	Part no.
4 mm ... 180 mm	Cable, Single teach-in button	Standard functions	–	Connector M8, 4-pin	Cd-098	WTB4SC-3P2262	1042033
		Standard functions, advanced function	Timer, False Tripping Suppression (Debouncing)			WTB4SC-3P2262A70	1067756
			High-Speed Counter, False Tripping Suppression (Debouncing)			WTB4SC-3P2262A71	1067757
			Time Stamp, False Tripping Suppression (Debouncing)			WTB4SC-3P2262A91	1067758

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

WL4S-3

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Adjustment	Switching mode	Connection	Con- nection diagram	Model name	Part no.
0 m ... 4 m	Ø 45 mm (1.5 m)	PNP	–	Light switching	Connector M8, 3-pin	Cd-045	WL4S-3P2130	1042069
				Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-043	WL4S-3F1330	1042068
					Connector M8, 3-pin	Cd-045	WL4S-3F2130	1042065
				Light/dark-switching	Connector M8, 4-pin	Cd-083	WL4S-3P2230	1042066
		NPN	–	Light switching	Cable, 3-wire, 2 m, PVC	Cd-043	WL4S-3N1330	1042073
				Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-043	WL4S-3E1330	1042072
					Connector M8, 3-pin	Cd-045	WL4S-3E2130	1042071
0 m ... 5 m	Ø 45 mm (1.5 m)	PNP	Single teach-in button	Light switching	Connector M8, 3-pin	Cd-045	WL4S-3P2132	1042077
				Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-043	WL4S-3F1332	1042076
					Connector M8, 3-pin	Cd-045	WL4S-3F2132	1042074
				Light/dark-switching	Connector M8, 4-pin	Cd-083	WL4S-3P2232	1042078
		NPN	Single teach-in button	Light switching	Cable, 3-wire, 2 m, PVC	Cd-043	WL4S-3N1332	1042082
				Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-043	WL4S-3E1332	1042081
					Connector M8, 3-pin	Cd-045	WL4S-3E2132	1042080
					Cable, 4-wire, 2 m, PVC	Cd-107	WL4S-3W1132	1042083

¹⁾ PL80A.

WL4S-3 IO-Link

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation
- **Light spot size:** Ø 2 mm (20 mm)
- **Output type:** PNP
- **Switching mode:** light/dark-switching
- **Switching frequency:** 2,000 Hz
- **Response time:** 0.25 ms

Sensing range max. ¹⁾	Adjust- ment	IO-Link	Advanced functions	Connection	Con- nection diagram	Model name	Part no.
0 mm ... 70 mm	Cable, single teach-in button	Standard functions	–	Connector M8, 4-pin	Cd-098	WL4SC-3P2232	1065315
		Standard functions, Advanced functions	Timer, False Tripping Suppression (Debouncing)			WL4SC-3P2232A70	1067760
			High-Speed Counter, False Tripping Suppression (Debouncing)			WL4SC-3P2232A71	1067761
			Time Stamp, False Tripping Suppression (Debouncing)			WL4SC-3P2232A91	1067762

¹⁾ PL80A.

WL4S-3 health output

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Adjustment	Switching mode	Connection	Con- nection diagram	Model name	Part no.
0 m ... 5 m	Ø 45 mm (1.5 m)	PNP	Single teach-in button	Dark-switching	Connector M8, 4-pin	Cd-107	WL4S-3V2232	1042079

¹⁾ PL80A.

WSE4S-3

- **Sensor principle:** through-beam photoelectric sensor

Sensing range max.	Light spot size (distance)	Output type	Switching mode	Connection	Con- nection diagram	Model name	Part no.
0 m ... 5 m	Ø 50 mm (2 m)	PNP	Light switching	Connector M8, 3-pin	Cd-069	WSE4S-3P2130	1052892
			Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-061	WSE4S-3F1330	1052879
				Connector M8, 3-pin	Cd-069	WSE4S-3F2130	1052890
		NPN	Light switching	Cable, 3-wire, 2 m, PVC	Cd-061	WSE4S-3N1330	1052872
			Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-061	WSE4S-3E1330	1052867
				Connector M8, 3-pin	Cd-069	WSE4S-3E2130	1052876



WSE4S-3, IO-Link

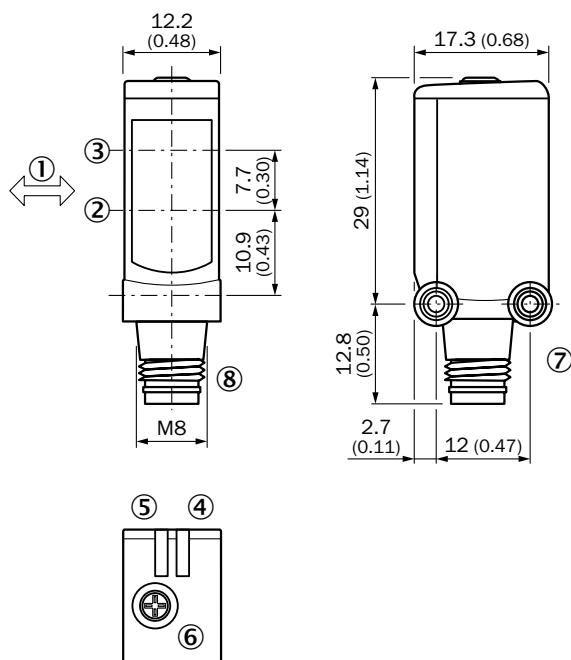
- **Sensor principle:** through-beam photoelectric sensor
- **Light spot size:** Ø 50 mm (2 m)
- **Output type:** PNP
- **Switching mode:** light/dark-switching
- **Connection:** connector M8, 4-pin

Sensing range max.	IO-Link	Advanced functions	Connection	Con- nection diagram	Model name	Part no.
0 m ... 5 m	Standard functions	–	Connector M8, 4-pin	Cd-268	WSE4SC-3P2230	1067767
	Standard functions, Advanced functions	Timer, False Tripping Suppression (Debouncing)			WSE4SC-3P2230A70	1067768
		High-Speed Counter, False Tripping Suppression (Debouncing)			WSE4SC-3P2230A71	1067769
		Time Stamp, False Tripping Suppression (Debouncing)			WSE4SC-3P2230A91	1067770

Dimensional drawings

Dimensions in mm (inch)

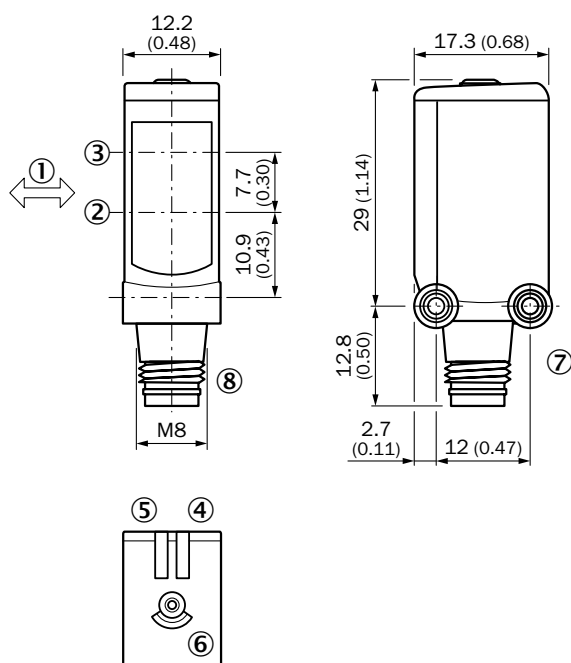
WTB4S-3, potentiometer



- 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 Potentiometer
- ⑦ Threaded mounting hole M3
- ⑧ Connection

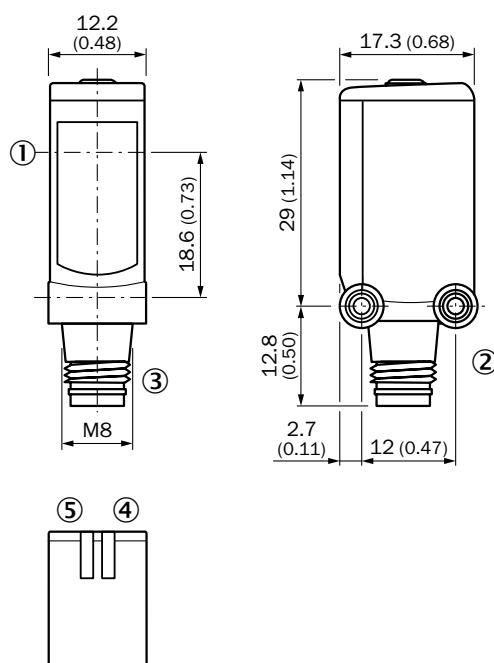
F

WTB4S-3, Single teach-in button



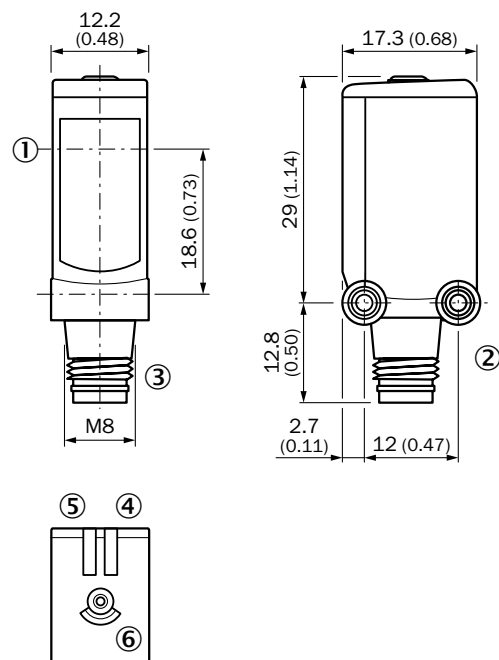
- ① Standard direction of the material being detected
- ② Optical axis receiver
- ③ Optical axis sender
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Teach-in button
- ⑦ Threaded mounting hole M3
- ⑧ Connection

WL4S-3, WSE4S-3, potentiometer



- ① Center of optical axis
- ② Threaded mounting hole M3
- ③ Connection
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam

WL4S-3, WLG4S-3, single teach-in button



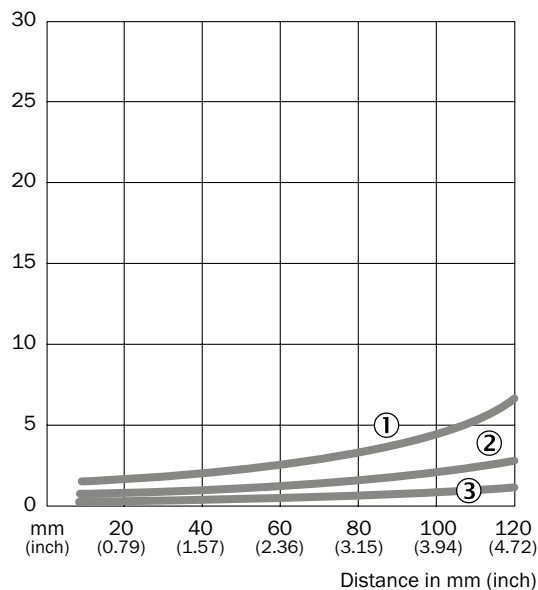
- ① Center of optical axis
- ② Threaded mounting hole M3
- ③ Connection
- ④ Status indicator LED green: power on
- ⑤ LED indicator orange: status of received light beam
- ⑥ Teach-in button

Characteristic curves

Black-white shift

WTB4S-3, 120 mm

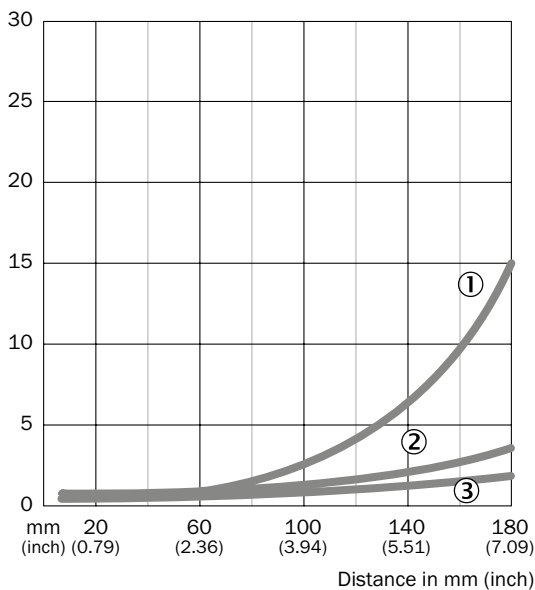
% of sensing distance



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

WTB4S-3, 180 mm

% of sensing distance

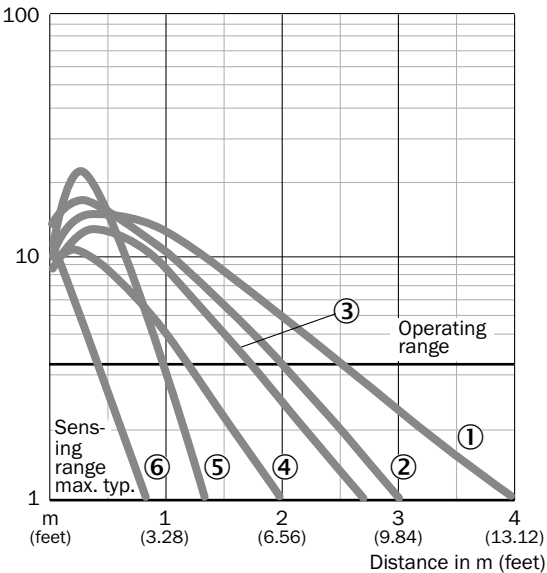


- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

Operating reserve

WL4S-3

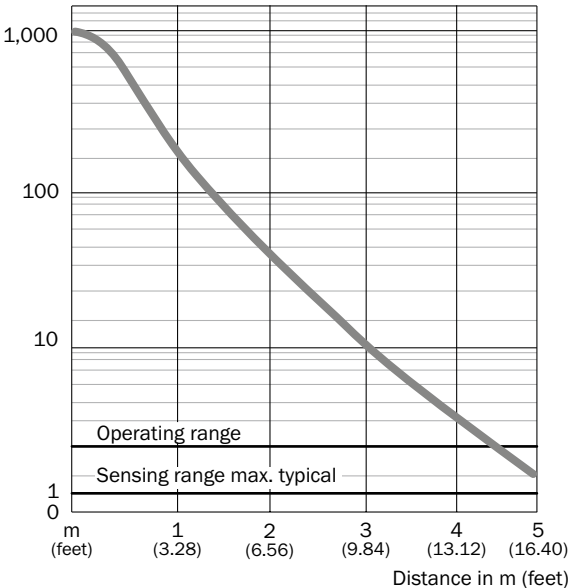
Operating reserve



- ① PL80A
- ② P250F
- ③ PL40A
- ④ PL20F
- ⑤ PL10F
- ⑥ REF-IRF-56

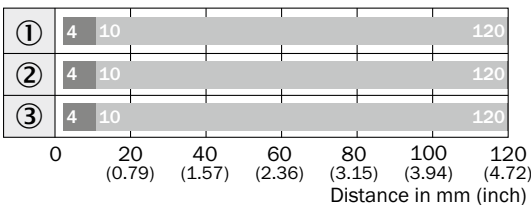
WSE4S-3

Operating reserve



Bar diagrams

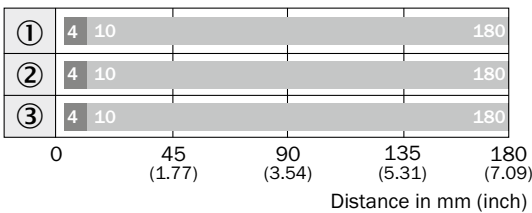
WTB4S-3, 120 mm



■ Sensing range max. ■ Sensing range

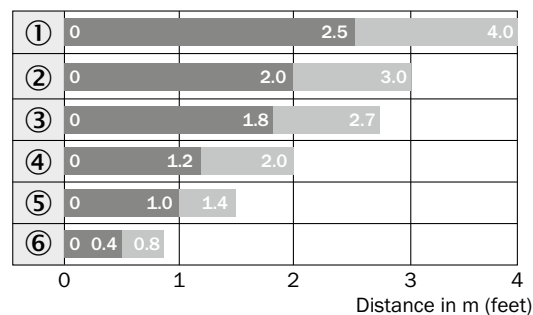
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WTB4S-3, 180 mm



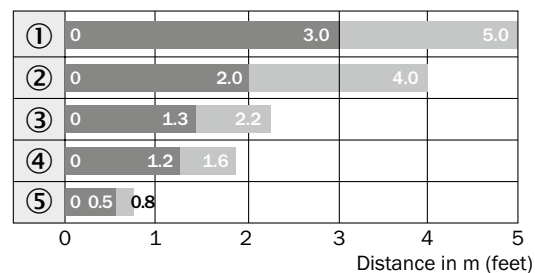
■ Sensing range max. ■ Sensing range

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

WL4S-3, 4 m


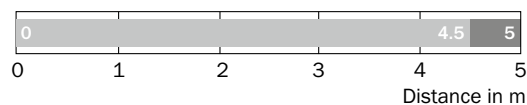
■ Sensing range ■ Sensing range max.

- ① PL80A
- ② P250F
- ③ PL40A
- ④ PL20F
- ⑤ PL10F
- ⑥ REF-IRF-56

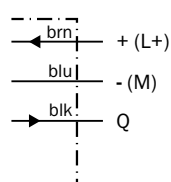
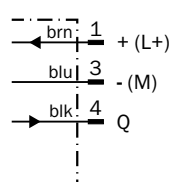
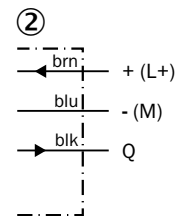
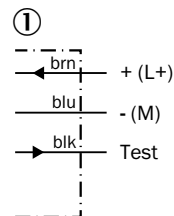
WL4S-3, 5 m


■ Sensing range ■ Sensing range max.

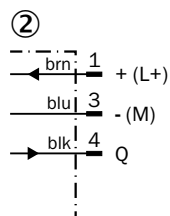
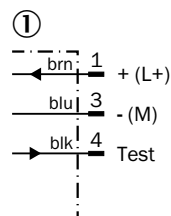
- ① PL80A
- ② PL40A
- ③ PL20A
- ④ PL10F
- ⑤ REF-IRF-56

WSE4S-3


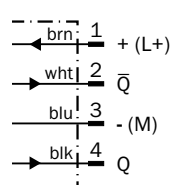
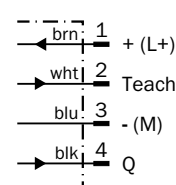
■ Sensing range typ. max ■ Sensing range

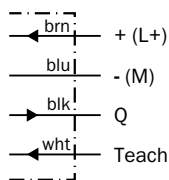
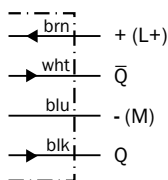
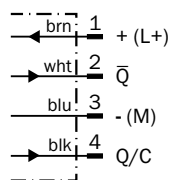
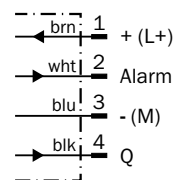
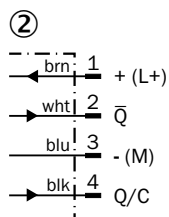
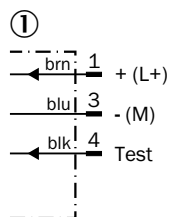
Connection diagram
Cd-043

Cd-045

Cd-061


- ① Sender
- ② Receiver

Cd-069


- ① Sender
- ② Receiver

Cd-083

Cd-092


Cd-093**Cd-094****Cd-098****Cd-107****Cd-268**

- ① Sender
② Receiver

Recommended accessories**Plug connectors and cables****Connecting cable (female connector-open), 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
	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 plated steel (sheet), Diecast zinc (clamp)	Plate N08 for universal clamp bracket	BEF-KHS-N08	2051607

Device protection (mechanical)

Protective housing/tubes

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571	Safety bracket for floor mounting	BEF-SW-W4S	2051497

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

Round

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Round, plugable for metal plates	PL22-3	1004488

→ For additional accessories, please see page L-861

Slim photoelectric sensors reliably detect transparent objects



Additional information

Detailed technical data.....	F-273
Ordering information.....	F-274
Dimensional drawings	F-275
Characteristic curves	F-275
Bar diagrams.....	F-275
Connection diagram	F-276
Recommended accessories.....	F-276

Product description

The WLG4S-3 is a retro-reflective sensor enclosed in a slim housing that reliably detects transparent objects. Even small gaps between objects, highly transparent thin films, and vials with flow marks and severe lens defects can be reliably detected. Setting the sensor requires a single press of the teach-in pushbutton. The sensor reliably adjusts for any change

es to environmental conditions such as temperature, dust or dirt. The single-lens autocollimation system “sees” through even the smallest of openings. The Pin-Point LED’s small but intense light spot enables quick and easy alignment even when using the smallest reflectors. Plus, variants with IO-Link provide continuous diagnostics data.

At a glance

- Continuous threshold adaption (AutoAdapt) of the switching threshold compensates for environmental changes
- Single-lens autocollimation optics
- Simple setting either via teach-in pushbutton, cable or IO-Link
- PinPoint LED technology with a small, highly visible, well-defined light spot enables high reserve levels when using small reflectors
- Flexible sensor settings, monitoring, advanced diagnostics, and visualization thanks to IO-Link

Your benefits

- Optimal detection of any kind of transparent object
- Quick and easy operation via the push of a button – automatic setting of the correct switching threshold
- Less downtime due to a Continuous threshold adaption (AutoAdapt) which compensates for changing environmental conditions, including temperature, dust and drift effects
- The well-defined, highly visible intense light spot provides quick and reliable alignment
- IO-Link provides easy data access from the PLC
- Quick and easy configuration
- Quick and easy integration using function blocks
- Easy device replacement and identification

→ www.mysick.com/en/W4S-3_Glass

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

Sensor principle	Photoelectric retro-reflective sensor
Detection principle	Autocollimation
Dimensions (W x H x D)	12.2 mm x 41.8 mm x 17.3 mm
Housing design (light emission)	Rectangular
Sensing range max. ¹⁾	0.01 m ... 5 m
Sensing range ¹⁾	0 m ... 3 m
Type of light	Visible red light
Light source ²⁾	PinPoint LED
Light spot size (distance)	Ø 45 mm (1.5 m)
Wave length	650 nm
Adjustment	Cable, Single teach-in button / Single teach-in button (depending on type)
Continuous threshold adaption (AutoAdapt)	✓
Special feature	Detection of transparent objects

¹⁾ PL80A.

²⁾ Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	< 5 V _{pp}
Power consumption	≤ 20 mA ³⁾
With IO-Link	≤ 30 mA ³⁾
Output type	PNP / NPN (depending on type)
Switching mode	Light switching / Dark-switching / Light/dark-switching (depending on type)
Output current I _{max.}	≤ 100 mA
Response time ⁴⁾	< 0.5 ms
Switching frequency ⁵⁾	1,000 Hz
Angle of reception	30°
Attenuation along light beam	> 8 %
Connection type	Male connector, M8 / Cable, 2 m ⁶⁾ (depending on type)
Circuit protection	A ⁷⁾ , C ⁸⁾ , D ⁹⁾
Protection class	III
Weight	30 g
Polarisation filter	✓
IO-Link	✓
Housing material	ABS
Optics material	PMMA
Enclosure rating	IP 66, IP 67
Ambient operating temperature	-40 °C ... +60 °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⁾ 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.

Ordering information

Other models available at www.mysick.com/en/W4S-3_Glass

WLG4S-3

- **Detection principle:** autocollimation
- **Polarisation filter:** ✓

Sensing range max. ¹⁾	Output type	Switching mode	Adjustment	Connection	Connection diagram	Model name	Part no.
0.01 m ... 5 m	PNP	Light switching	Cable, Single teach-in button	Connector M8, 4-pin	Cd-092	WLG4S-3P2234	1052999
		Dark-switching	Cable, Single teach-in button	Connector M8, 4-pin	Cd-092	WLG4S-3F2234	1042084
		Light/dark-switching	Single teach-in button	Connector M8, 4-pin	Cd-083	WLG4S-3P2232	1044186
	NPN	Light switching	Single teach-in button	Cable, 3-wire, 2 m, PVC	Cd-044	WLG4S-3N1332	1046111
		Dark-switching	Cable, Single teach-in button	Cable, 4-wire, 2 m, PVC	Cd-044	WLG4S-3E1134	1042085

¹⁾ PL80A.

WLG4S-3 Alarm output

- **Detection principle:** autocollimation
- **Polarisation filter:** ✓

Sensing range max. ¹⁾	Output type	Switching mode	Adjustment	Connection	Connection diagram	Model name	Part no.
0.01 m ... 5 m	PNP	Dark-switching	Single teach-in button	Cable, 4-wire, 2 m, PVC	Cd-107	WLG4S-3V1132	1055895
				Connector M8, 4-pin	Cd-107	WLG4S-3V2232	1042087
	NPN	Dark-switching	Single teach-in button	Cable, 4-wire, 2 m, PVC	Cd-107	WLG4S-3W1132	1042086

¹⁾ PL80A.

WLG4S-3 IO-Link

- **Detection principle:** autocollimation
- **Output type:** PNP
- **Switching mode:** light/dark-switching
- **Polarisation filter:** ✓

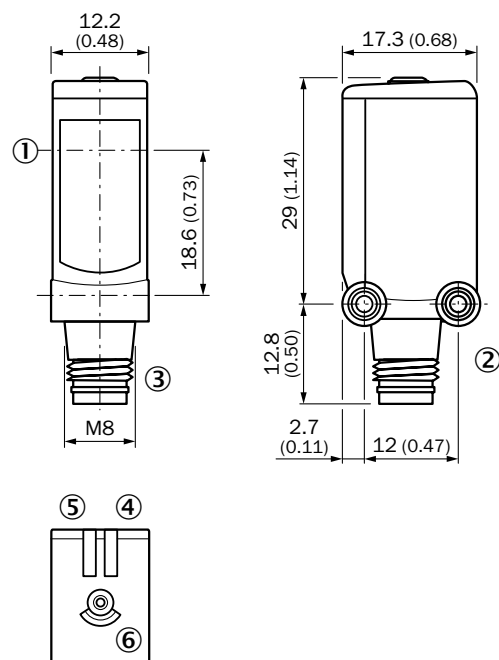
Sensing range max. ¹⁾	Adjustment	IO-Link	Advanced functions	Connection	Connection diagram	Model name	Part no.
0.01 m ... 5 m	Single teach-in button	Standard functions	–	Connector M8, 4-pin	Cd-098	WLG4SC-3P2232	1057177
		Standard functions, Advanced functions	Timer, False Tripping Suppression (Debouncing)			WLG4SC-3P2232A70	1067763
			High-Speed Counter, False Tripping Suppression (Debouncing)			WLG4SC-3P2232A71	1067765
			Time Stamp, False Tripping Suppression (Debouncing)			WLG4SC-3P2232A91	1067766

¹⁾ PL80A.

Dimensional drawings

Dimensions in mm (inch)

WLG4S-3, single teach-in button

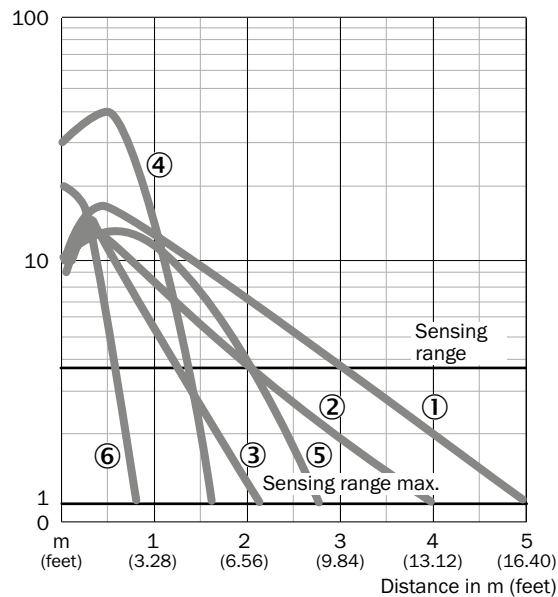


- ① Center of optical axis
- ② Threaded mounting hole M3
- ③ Connection
- ④ Status indicator LED green: power on
- ⑤ LED indicator orange: status of received light beam
- ⑥ Teach-in button

Characteristic curves

WLG4S-3, 5 m

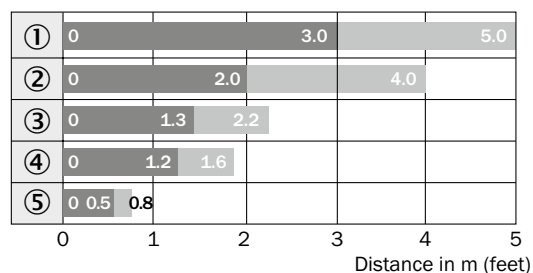
Operating reserve



- ① PL80A
- ② PL40A
- ③ PL20A
- ④ PL10F
- ⑤ P250 CHEM
- ⑥ REF-IRF-56

Bar diagrams

WLG4S-3, 5 m

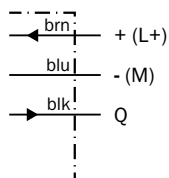


Sensing range Sensing range max.

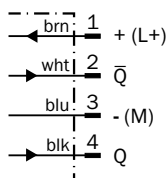
- ① PL80A
- ② PL40A
- ③ PL20A
- ④ PL10F
- ⑤ REF-IRF-56

Connection diagram

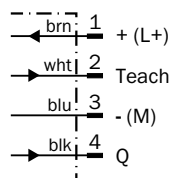
Cd-044



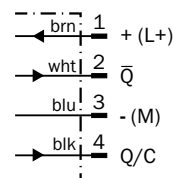
Cd-083



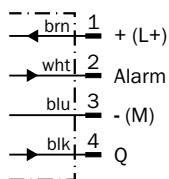
Cd-092



Cd-098



Cd-107



Recommended accessories

Plug connectors and cables

Connecting cable (female connector-open)M8, 4-pin, PVC

- Cable material: PVC
- Connector material: PVC

Figure	Connection type head A	Connection type head B	Connecting cable	Enclosure rating	Model name	Part no.
	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

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
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N02N for universal clamp bracket	BEF-KHS-N02N	2051618
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N08 for universal clamp bracket	BEF-KHS-N08	2051607
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N08N for universal clamp bracket	BEF-KHS-N08N	2051616

Device protection (mechanical)

Protective housing/tubes

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571	Safety bracket for floor mounting	BEF-SW-W4S	2051497

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, screw connection, suitable for laser sensors, 18 mm x 18 mm	PL10F	5311210
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
	PMMA/ABS	Fine triple, screw connection, suitable for laser sensors, 38 mm x 16 mm	PL20F	5308844
	Plastic	Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089
	PMMA/ABS	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

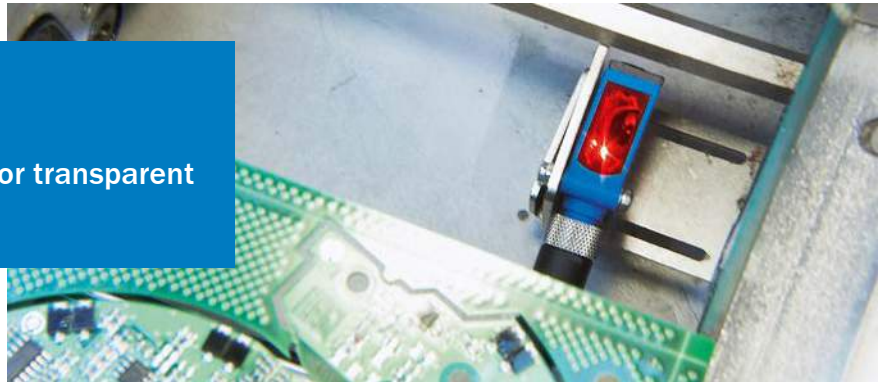
Figure	Description	Model name	Part no.
	Suitable for laser sensors, self-adhesive, cut, see alignment note, 56.3 mm x 56.3 mm	REF-AC1000-56	4063030

Special reflectors

Figure	Material	Description	Model name	Part no.
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adaptor shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adaptor thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

→ For additional accessories, please see page L-861

Laser precision for very small or transparent objects



Additional information

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Product description

Maximum performance for handling demanding detection tasks involving tiny objects. With its precise laser light spot, the W4SL-3 miniature product family sets new standards by providing high optical light immunity from undesired background reflections and immunity to ambient light – even from modern energy-saving lamps. The combination of SICK's proprietary laser and SIRIC®

technologies reduces incorrect switching to minimize machine downtime, reducing the variety of devices and saving on storage costs. The photoelectric sensors also provide an IO-Link interface for initial system performance diagnostics. Furthermore, IO-Link permits the integration of additional functions such as meters directly into the sensor. There is no need for complex control programming.

At a glance

- Precise laser light spot, laser class 1
- Teach-in pushbutton can be switched between detection of transparent and non-transparent objects
- Sensing ranges between 25 mm and 60 m
- Latest SIRIC® and laser technologies with second emitter LED to provide outstanding background suppression and ambient light immunity
- Choice of adjustment via teach-in button, potentiometer, cable, or IO-Link

Your benefits

- Precise laser light spot for highly accurate switching behavior
- High optical ambient light immunity reduces incorrect switching and thus machine downtime, even when modern energy-saving lamps are used
- The highest degree of machine design flexibility BGS (background suppression) eliminates the effect of undesired background reflections. In addition, autocollimation allows detection through small drilled holes
- One device for detecting both transparent objects and the smallest non-transparent objects, thus reducing the variety of sensors and saving on storage costs
- IO-Link facilitates initial system performance diagnostics and uses additional sensor functions (optional) to reduce complex control programming

→ www.mysick.com/en/W4SL-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

	WTB4SL-3		WL4SL-3	WSE4SL-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)	12.2 mm x 41.8 mm x 17.3 mm			
Housing design (light emission)	Rectangular			
Mounting hole	M3			
Sensing range max.	25 mm ... 300 mm ¹⁾	0 m ... 12 m ²⁾		0 m ... 60 m
Sensing range	25 mm ... 300 mm ¹⁾	0 m ... 8 m ²⁾		0 m ... 50 m
Type of light	Visible red light			
Light source ³⁾	Laser			
Light spot size (distance)	Ø 1 mm (170 mm)	Ø 1 mm (500 mm)		
Wave length	650 nm			
Laser class ⁴⁾	1			
Adjustment	Potentiometer, 5 turns	Single teach-in button / Cable, Single teach-in button ⁵⁾ (depending on type)		Single teach-in button
Special feature	–	IO-Link		–

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

²⁾ PL80A.

³⁾ Average service life 50,000 h at T_A = +25 °C.

⁴⁾ EN60825-1:2008-05 & IEC 60825-1:2007-03 / CDRH 21 CFR 1040.10 & 1040.11

⁵⁾ Adjustment via cable (ET): white cable or PIN2 according to the desired sensitivity > 2 ... < 8 s or put > 8 s on L+ (PNP) or on M (NPN)

Mechanics/electronics

	WTB4SL-3	WL4SL-3	WSE4SL-3
Supply voltage ¹⁾	10 V DC ... 30 V DC		
Ripple ²⁾	< 5 V _{pp}		
Power consumption ³⁾	≤ 30 mA		
Output type	PNP / NPN (depending on type)		
Output function	Complementary		
Switching mode	Light/dark-switching ⁴⁾ / Dark-switching ⁵⁾ (depending on type)		
Output current I _{max.}	≤ 100 mA		
Response time ⁶⁾	≤ 0.5 ms		
Switching frequency ⁷⁾	1,000 Hz		
Connection type	Cable, 2 m ⁸⁾ / Male connector, M8 / Cable with connector, M8, 120 mm ⁸⁾ (depending on type)		
Circuit protection	A ⁹⁾ , B ¹⁰⁾ , C ¹¹⁾		
Protection class	III		
Weight	100 g		
Polarisation filter	–	✓	–
IO-Link	–	–/✓ (COM2) (depending on type)	–
Housing material	Bayblend		
Optics material	PMMA		

	WTB4SL-3	WL4SL-3	WSE4SL-3
Enclosure rating	IP 66, IP 67		
Ambient operating temperature	-10 °C ... +50 °C		
Ambient operating temperature extended ^{12) 13)}	-30 °C ... +55 °C		
Ambient storage temperature	-30 °C ... +70 °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⁾ Q = light-switching.

⁵⁾ Q = dark-switching.

⁶⁾ Signal transit time with resistive load.

⁷⁾ With light/dark ratio 1:1.

⁸⁾ Do not bend below 0 °C.

⁹⁾ A = V_s connections reverse-polarity protected.

¹⁰⁾ B = inputs and output reverse-polarity protected.

¹¹⁾ C = interference suppression.

¹²⁾ As of $T_a = 50$ °C, a max. supply voltage $V_{max} = 24$ V and a max. load current $I_{max} = 50$ mA is permitted.

¹³⁾ Using the sensor below $T_a = -10$ °C is possible, if the sensor is turned on at $T_a > -10$ °C, then the environment cools down and the sensor is not disconnected from the supply voltage during the whole time. It is not allowed to turn on the sensor below $T_a = -10$ °C.

Ordering information

Other models available at www.mysick.com/en/W4SL-3

WTB4SL-3

- **Sensor principle:** photoelectric proximity sensor

Sensing range max. ¹⁾	Output type	Switching mode	Adjustment	Connection	Connection diagram	Model name	Part no.
25 mm ... 300 mm	PNP	Light/dark-switching ²⁾	Potentiometer, 5 turns	Cable, 4-wire, 2 m, PVC	Cd-094	WTB4SL-3P1161	1058239
				Connector M8, 4-pin	Cd-083	WTB4SL-3P2261	1058237
				Cable with connector M8, 4-pin, 120 mm, PVC	Cd-083	WTB4SL-3P3261	1058238
	NPN	Light/dark-switching ²⁾	Potentiometer, 5 turns	Cable, 4-wire, 2 m, PVC	Cd-094	WTB4SL-3N1161	1058242
				Connector M8, 4-pin	Cd-083	WTB4SL-3N2261	1058240
				Cable with connector M8, 4-pin, 120 mm, PVC	Cd-083	WTB4SL-3N3261	1058241

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

²⁾ Q = light-switching.

WL4SL-3

- **Sensor principle:** photoelectric retro-reflective sensor

Sensing range max. ¹⁾	Output type	Switching mode	Adjustment	Connection	Connection diagram	Model name	Part no.
0 m ... 12 m	PNP	Light/dark-switching ²⁾	Single teach-in button	Connector M8, 4-pin	Cd-083	WL4SL-3P2232	1061561
				Cable with connector M8, 4-pin, 120 mm, PVC	Cd-083	WL4SL-3P3232	1061563
		Dark-switching ³⁾	Cable, Single teach-in button ⁴⁾	Connector M8, 4-pin	Cd-195	WL4SL-3F2234	1061562
				Cable with connector M8, 4-pin, 120 mm, PVC	Cd-195	WL4SL-3F3234	1061564
	NPN	Light/dark-switching ²⁾	Single teach-in button	Cable, 4-wire, 2 m, PVC	Cd-094	WL4SL-3N1132	1061565
		Dark-switching ³⁾	Cable, Single teach-in button ⁴⁾	Cable, 4-wire, 2 m, PVC	Cd-212	WL4SL-3E1134	1061566

¹⁾ PL80A.

²⁾ Q = light-switching.

³⁾ Q = dark-switching.

⁴⁾ Adjustment via cable (ET): white cable or PIN2 according to the desired sensitivity > 2 ... < 8 s or put > 8 s on L+ (PNP) or on M (NPN)

WL4SL-3, IO-Link

- **Sensor principle:** photoelectric retro-reflective sensor

Sensing range max. ¹⁾	Output type	Switching mode	Adjustment	IO-Link	Connection	Connection diagram	Model name	Part no.
0 m ... 12 m	PNP	Light/dark-switching ²⁾	Single teach-in button	✓	Connector M8, 4-pin	Cd-083	WL4SLC-3P2232	1061569

¹⁾ PL80A.

²⁾ Q = light-switching.

WSE4SL-3

- **Sensor principle:** through-beam photoelectric sensor

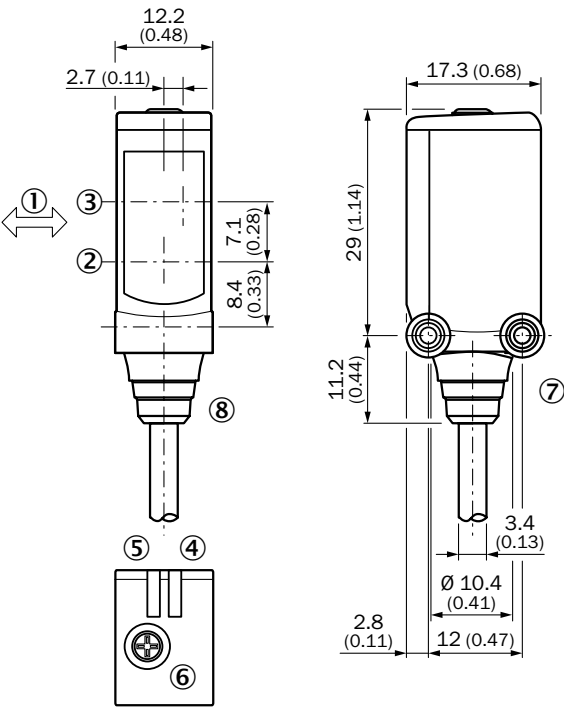
Sensing range max.	Output type	Switching mode	Adjustment	Connection	Connection diagram	Model name	Part no.
0 m ... 60 m	PNP	Light/dark-switching ¹⁾	Single teach-in button	Connector M8, 4-pin	Cd-232	WSE4SL-3P2237	1058249
	NPN			Cable, 4-wire, 2 m, PVC	Cd-231	WSE4SL-3N1137	1058250

¹⁾ Q = light-switching.

Dimensional drawings

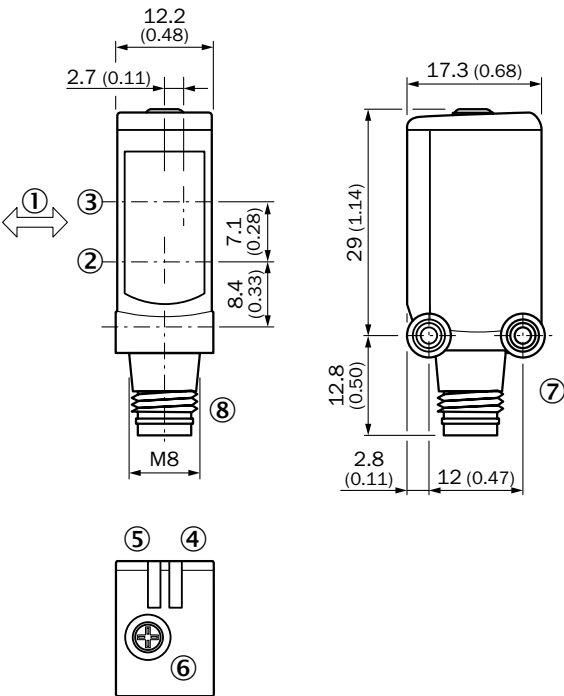
Dimensions in mm (inch)

WTB4SL-3, cable

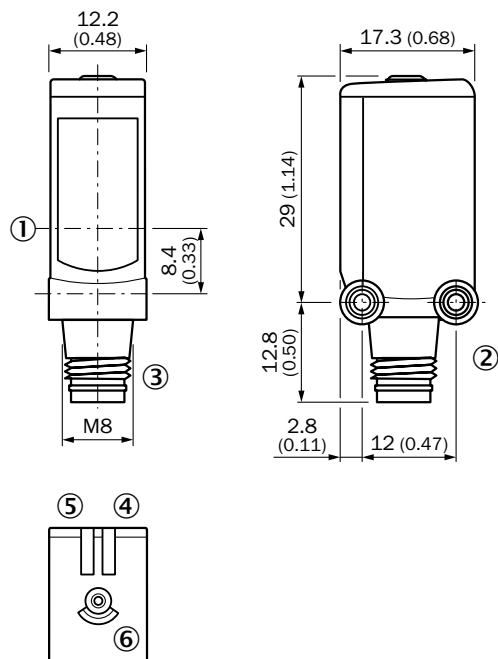


- ① Standard direction of the material being detected
- ② Center of optical axis, sender
- ③ Center of optical axis, receiver
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Potentiometer
- ⑦ Threaded mounting hole M3
- ⑧ Connection

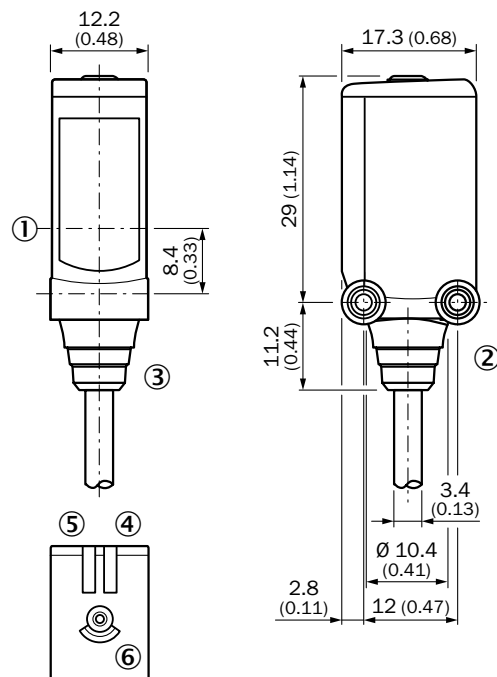
WTB4SL-3, plug



- ① Standard direction of the material being detected
- ② Center of optical axis, sender
- ③ Center of optical axis, receiver
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Potentiometer
- ⑦ Threaded mounting hole M3
- ⑧ Connection

WL4SL-3, WL4SLG-3, WSE4SL-3, plug

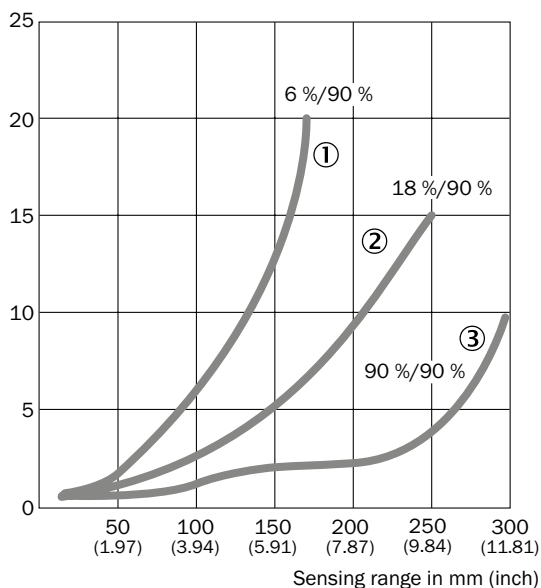
- ① Center of optical axis
- ② Threaded mounting hole M3
- ③ Connection
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Single teach-in button

WL4SL-3, WL4SLG-3, WSE4SL-3, cable

- ① Center of optical axis
- ② Threaded mounting hole M3
- ③ Connection
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Single teach-in button

Characteristic curves**Black-white shift****WTB4SL-3, laser class 1**

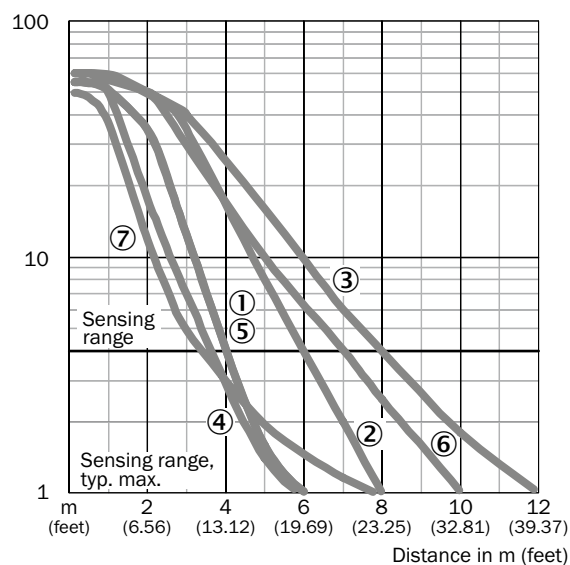
% of sensing range



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

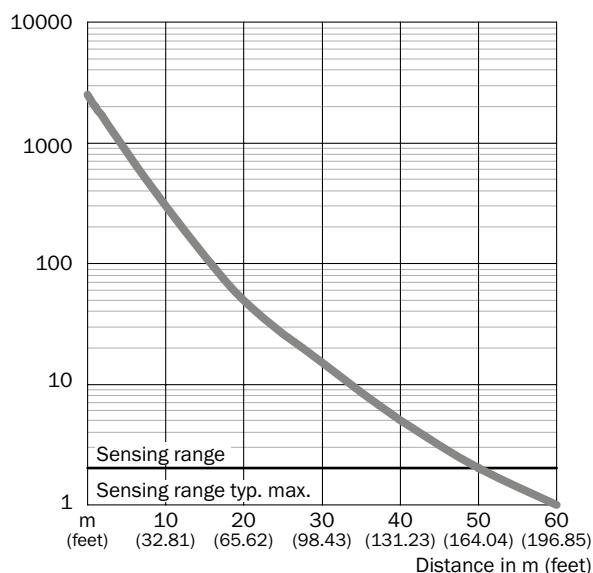
Operating reserve

WL4SL-3



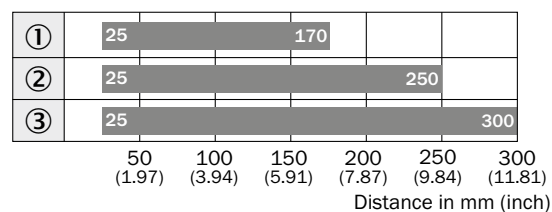
- ① PL20A
- ② PL40A
- ③ PL80A
- ④ PL10F
- ⑤ PL20F
- ⑥ P250F
- ⑦ REF-AC1000

WSE4SL-3



Bar diagrams

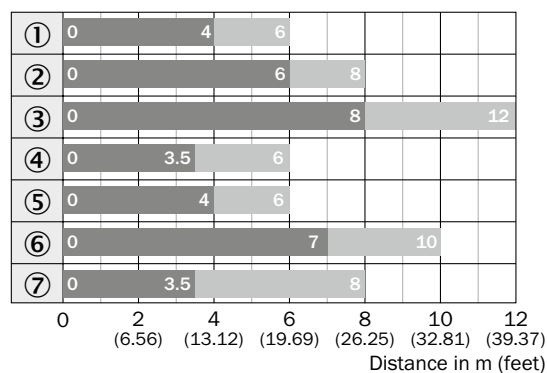
WTB4SL-3, laser class 1



■ 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

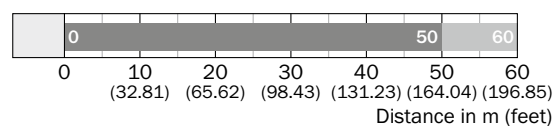
WL4SL-3



■ Sensing range ■ Sensing range typ. max.

- ① PL20A
- ② PL40A
- ③ PL80A
- ④ PL10F
- ⑤ PL20F
- ⑥ P250F
- ⑦ REF-AC1000

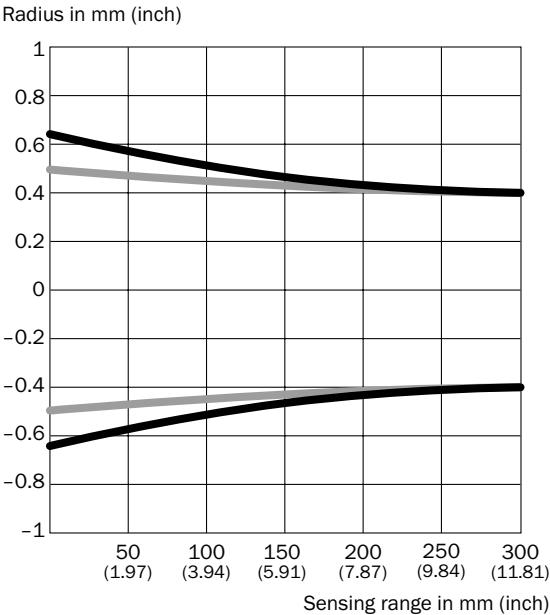
WSE4SL-3



■ Sensing range ■ Sensing range typ. max.

Light spot diameter

WTB4SL-3, laser class 1



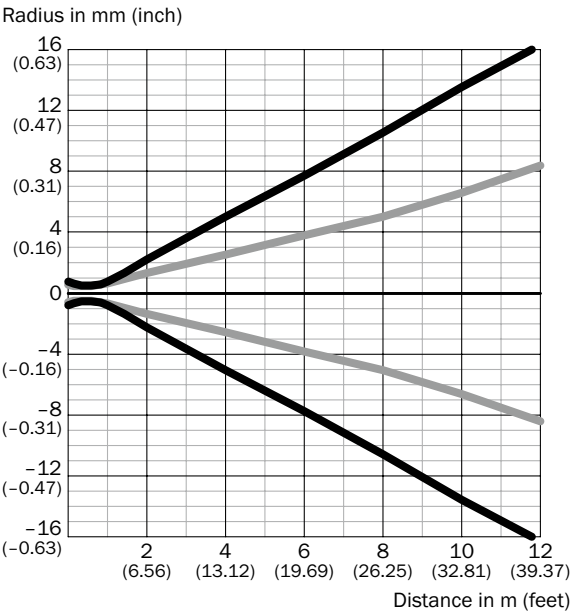
Dimensions in mm (inch)

Sensing range	Vertical	Horizontal
50 mm (1.97)	1.2 (0.05)	1.0 (0.04)
100 mm (3.94)	1.1 (0.04)	1.0 (0.04)
200 mm (7.87)	0.9 (0.04)	0.9 (0.04)
300 mm (11.81)	0.8 (0.03)	0.8 (0.03)

— Vertical
— Horizontal

F

WL4SL-3, Overview

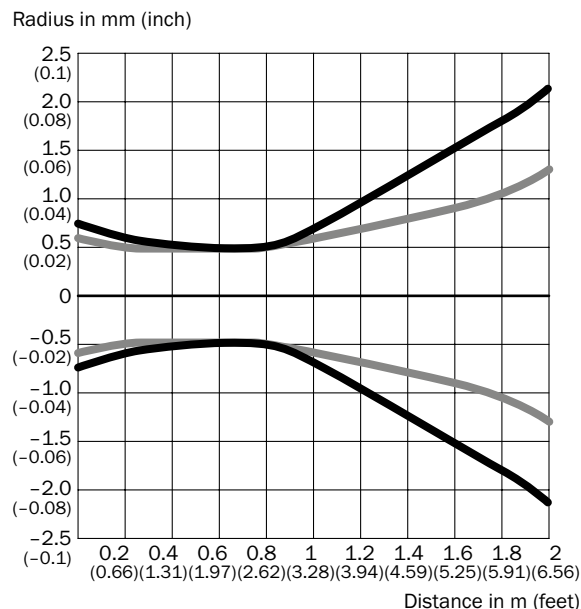


Dimensions in mm (inch)

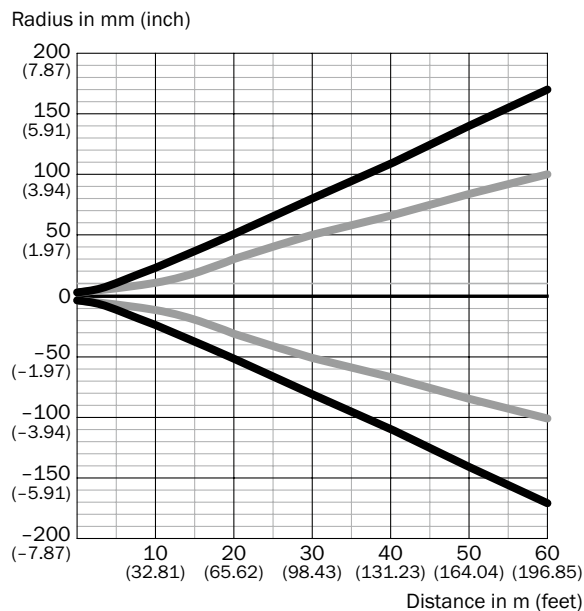
Sensing range	Vertical	Horizontal
0.5 m (1.64 feet)	< 1.0 (0.04)	< 1.0 (0.04)
1 m (3.28 feet)	1.5 (0.06)	1.2 (0.05)
6 m (19.69 feet)	15.2 (0.60)	7.6 (0.30)
12 m (39.37 feet)	32.4 (1.28)	16.4 (0.65)

— Vertical
— Horizontal

WL4SL-3, detailed view, close up



WSE4SL-3, overview

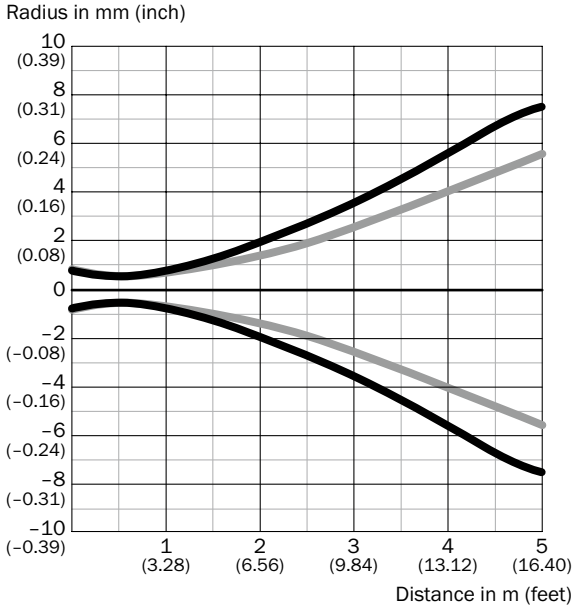


Dimensions in mm (inch)

Sensing range	Vertical	Horizontal
0.5 m (1.64 feet)	< 1.0 (0.04)	< 1.0 (0.04)
1 m (3.28 feet)	1.5 (0.06)	1.2 (0.05)
5 m (16.40 feet)	15 (0.59)	11 (0.43)
10 m (32.81 feet)	45 (1.77)	28 (1.10)
60 m (196.85 feet)	336 (13.23)	200 (7.87)

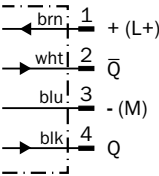
— Vertical
— Horizontal

WSE4SL-3, detailed view, close up

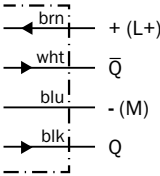


Connection diagram

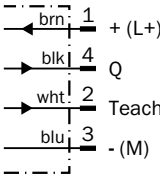
Cd-083



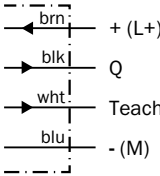
Cd-094



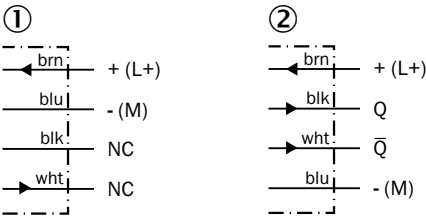
Cd-195



Cd-212

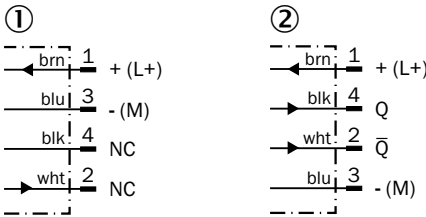


Cd-231



① Sender
② Receiver

Cd-232



① Sender
② Receiver

Recommended accessories

Plug connectors and cables

Connecting cable (female connector-open)

- Cable material: PVC
- Connector material: PVC

Figure	Connection type head A	Connection type head B	Connecting cable	Enclosure rating	Model name	Part no.
	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

Female connector (ready to assemble)

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0804-G	6009974
	Female connector, M8, 4-pin, angled	Pin penetration	PBT	IP 67	DOS-0804-W	6009975

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 N08 for universal clamp bracket	BEF-KHS-N08	2051607

Device protection (mechanical)

Protective housing/tubes

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571	Safety bracket for floor mounting	BEF-SW-W4S	2051497

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

F**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



Detect all objects with one device – Change mode via teach button



Product description

The WL4SLG-3 detects all types of objects, including transparent vials, PET bottles, metallic needles, and wires, thus reducing the variety of sensors and their storage costs. The precise, highly visible laser light spot ensures a high level of detection quality and facilitates sensor alignment. Autocollimation technology ensures that the sensor reliably detects objects at close range and through small drilled holes. The sensor uses continu-

ous threshold adaptation (AutoAdapt) to adjust automatically to changing light conditions, helping ensure maintenance-free system operation. The photoelectric sensors also provide an IO-Link interface to allow performing initial system performance diagnostics. Furthermore, IO-Link permits the integration of additional functions such as meters directly into the sensor. There is no need for complex control programming.

At a glance

- Precise laser light spot, laser class 1
- Teach-in button can be switched between detection of transparent and smallest non-transparent objects
- Continuous threshold adaptation (AutoAdapt) provides automatic adjustment to changes in light conditions
- Sensing ranges up to 4.5 m
- Autocollimation optics prevent blind spots
- Choice of adjustment via teach-in button, potentiometer, cable, or IO-Link

Your benefits

- One device for detecting both transparent objects and the smallest non-transparent objects at sensing ranges up to 4.5 m, thus reducing the variety of sensors and saving on storage costs
- Highly visible, even laser light spot with a sharp contour to facilitate alignment
- The highest degree of machine design flexibility. Autocollimation permits detection even through small drilled holes
- High-quality sensor manufacturing and testing reduce maintenance costs
- Established and proven housing design for easy installation
- IO-Link facilitates initial system performance diagnostics and uses additional sensor functions to reduce complex control programming



Additional information

Detailed technical data.....	F-291
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Dimensional drawings	F-293
Characteristic curves	F-293
Light spot diameter.....	F-294
Connection diagram	F-294
Recommended accessories.....	F-295

→ www.mysick.com/en/W4SLG-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

Sensor principle	Photoelectric retro-reflective sensor
Detection principle	Autocollimation
Dimensions (W x H x D)	12.2 mm x 41.8 mm x 17.3 mm
Housing design (light emission)	Rectangular
Mounting hole	M3
Sensing range max. ¹⁾	0 m ... 4.5 m
Sensing range ¹⁾	0 m ... 2 m
Type of light	Visible red light
Light source ²⁾	Laser
Light spot size (distance)	Ø 1 mm (500 mm)
Wave length	650 nm
Laser class ³⁾	1
Adjustment	Single teach-in button / Cable, Single teach-in button ⁴⁾ (depending on type)
Special feature	Detection of transparent objects

¹⁾ REF-AC1000.

²⁾ Average service life 50,000 h at T_A = +25 °C.

³⁾ EN60825-1:2008-05 & IEC 60825-1:2007-03 / CDRH 21 CFR 1040.10 & 1040.11

⁴⁾ Adjustment via cable (ET): white cable or PIN2 according to the desired sensitivity > 2 ... < 8 s or put > 8 s on L+ (PNP) or on M (NPN)

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	< 5 V _{pp}
Power consumption ³⁾	≤ 30 mA
Output type	PNP / NPN (depending on type)
Output function	Complementary
Switching mode	Light/dark-switching ⁴⁾ / Dark-switching ⁵⁾ (depending on type)
Output current I _{max}	≤ 100 mA
Response time ⁶⁾	≤ 0.5 ms
Switching frequency ⁷⁾	1,000 Hz
Connection type	Male connector, M8 Cable, 2 m ⁸⁾ Cable with connector, M8, 120 mm ⁸⁾ (depending on type)
Circuit protection	A ⁹⁾ , B ¹⁰⁾ , C ¹¹⁾
Protection class	III
Weight	100 g
Polarisation filter	✓
Housing material	Bayblend
Optics material	PMMA

F

Enclosure rating	IP 66, IP 67
Ambient operating temperature	-10 °C ... +50 °C
Ambient operating temperature extended ¹²⁾ ¹³⁾	-30 °C ... +55 °C
Ambient storage temperature	-30 °C ... +70 °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⁾ Q = light-switching.

⁵⁾ Q = dark-switching.

⁶⁾ Signal transit time with resistive load.

⁷⁾ With light/dark ratio 1:1.

⁸⁾ Do not bend below 0 °C.

⁹⁾ A = V_s connections reverse-polarity protected.

¹⁰⁾ B = inputs and output reverse-polarity protected.

¹¹⁾ C = interference suppression.

¹²⁾ As of $T_a = 50$ °C, a max. supply voltage $V_{max.} = 24$ V and a max. load current $I_{max.} = 50$ mA is permitted.

¹³⁾ Using the sensor below $T_a = -10$ °C is possible, if the sensor is turned on at $T_a > -10$ °C, then the environment cools down and the sensor is not disconnected from the supply voltage during the whole time. It is not allowed to turn on the sensor below $T_a = -10$ °C.

Ordering information

Other models available at www.mysick.com/en/W4SLG-3

WL4SLG-3

- **Sensor principle:** photoelectric retro-reflective sensor

Sensing range max. ¹⁾	Output type	Switching mode	Adjustment	Connection	Connection diagram	Model name	Part no.
0 m ... 4.5 m	PNP	Light/dark-switching ²⁾	Single teach-in button	Connector M8, 4-pin	Cd-083	WL4SLG-3P2232	1058243
				Cable with connector M8, 4-pin, 120 mm, PVC	Cd-083	WL4SLG-3P3232	1058245
		Dark-switching ³⁾	Cable, Single teach-in button ⁴⁾	Connector M8, 4-pin	Cd-195	WL4SLG-3F2234	1058244
				Cable with connector M8, 4-pin, 120 mm, PVC	Cd-195	WL4SLG-3F3234	1058246
	NPN	Light/dark-switching ²⁾	Single teach-in button	Cable, 4-wire, 2 m, PVC	Cd-094	WL4SLG-3N1132	1058247
		Dark-switching ³⁾	Cable, Single teach-in button ⁴⁾	Cable, 4-wire, 2 m, PVC	Cd-212	WL4SLG-3E1134	1058248

¹⁾ REF-AC1000.

²⁾ Q = light-switching.

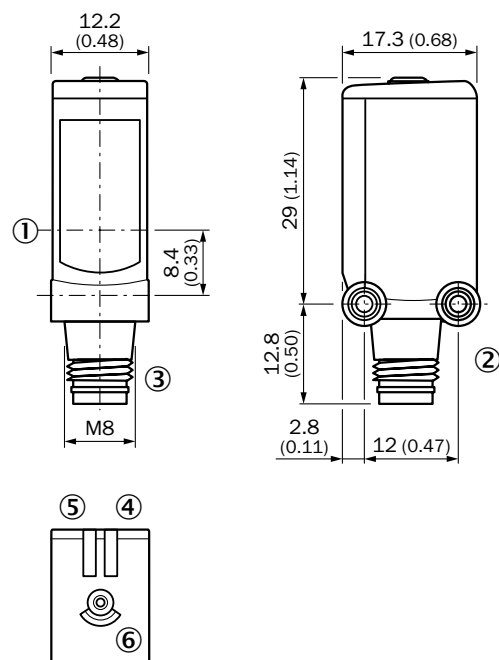
³⁾ Q = dark-switching.

⁴⁾ Adjustment via cable (ET): white cable or PIN2 according to the desired sensitivity > 2 ... < 8 s or put > 8 s on L+ (PNP) or on M (NPN)

Dimensional drawings

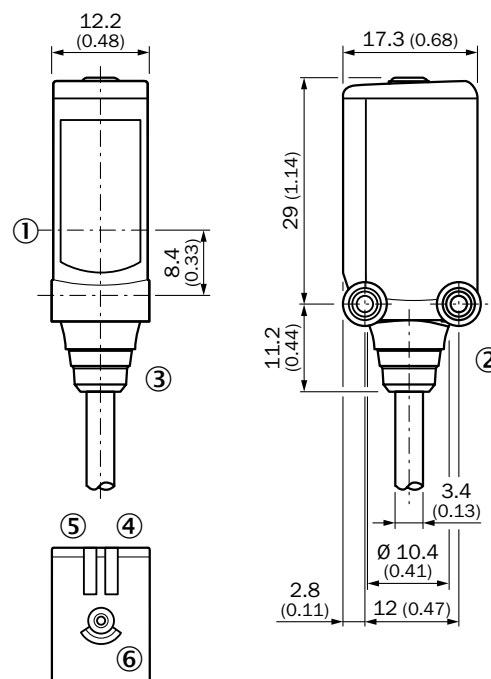
Dimensions in mm (inch)

WL4SLG-3, plug



- ① Center of optical axis
- ② Threaded mounting hole M3
- ③ Connection
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Single teach-in button

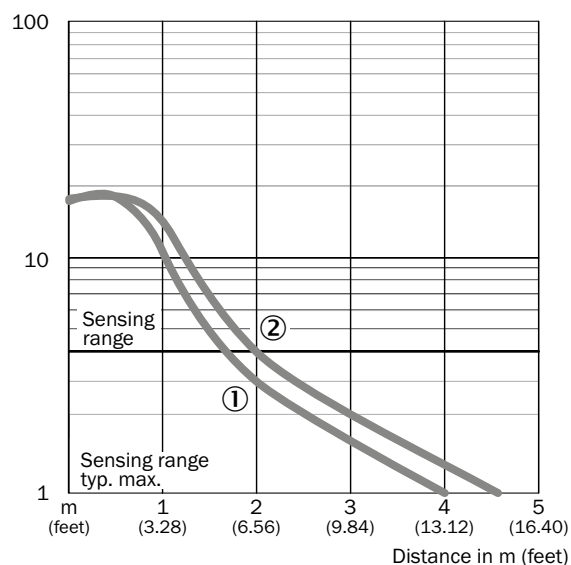
WL4SLG-3, cable



- ① Center of optical axis
- ② Threaded mounting hole M3
- ③ Connection
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Single teach-in button

Characteristic curves

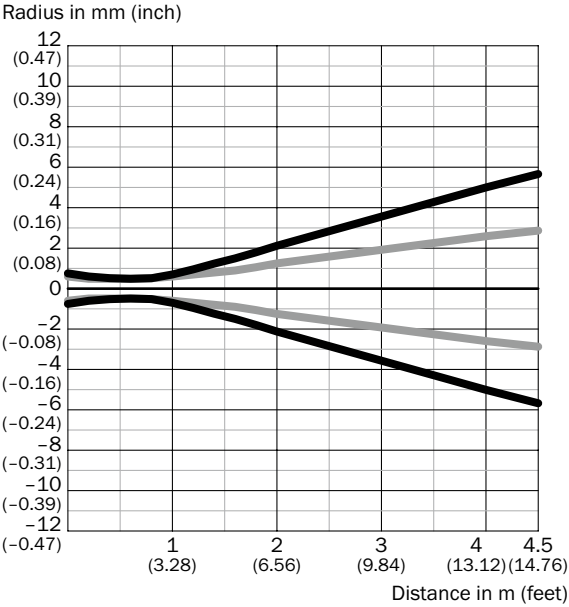
WL4SLG-3



- ① PLV14-A / PLH25-M12 / PLH25-D12
- ② P41F / REF-AC1000

Light spot diameter

WL4SLG-3, Overview

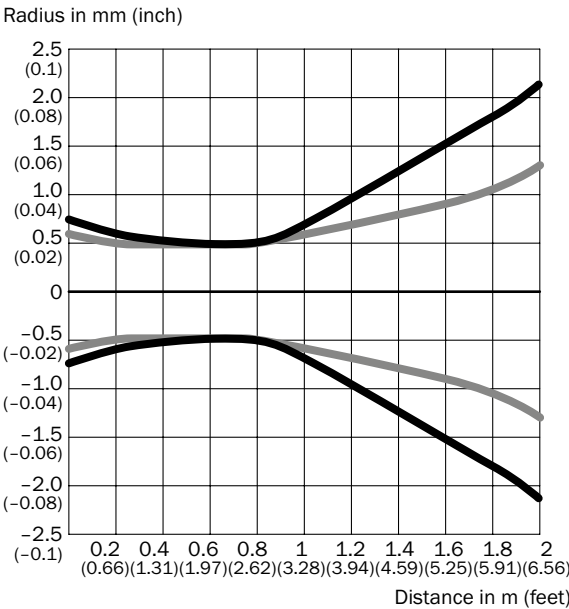


Dimensions in mm (inch)

Sensing range	Vertical	Horizontal
0.5 m (1.64 feet)	< 1.0 (0.04)	< 1.0 (0.04)
1 m (3.28 feet)	1.5 (0.06)	1.2 (0.05)
2 m (6.56 feet)	4.3 (0.17)	2.6 (0.10)
4.5 m (14.76 feet)	11.3 (0.44)	5.6 (0.22)

— Vertical
— Horizontal

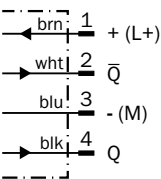
WL4SLG-3, detail, close up



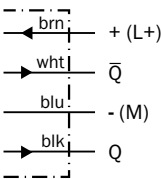
— Vertical
— Horizontal

Connection diagram

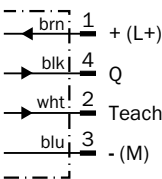
Cd-083



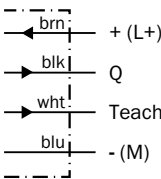
Cd-094



Cd-195



Cd-212



Recommended accessories

Plug connectors and cables

Connecting cable (female connector-open), PVC

- Cable material: PVC
- Connector material: PVC

Figure	Connection type head A	Connection type head B	Connecting cable	Enclosure rating	Model name	Part no.
	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

Female connector (ready to assemble)M8, 4-pin

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0804-G	6009974
	Female connector, M8, 4-pin, angled	Pin penetration	PBT	IP 67	DOS-0804-W	6009975

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
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N02N for universal clamp bracket	BEF-KHS-N02N	2051618
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N08 for universal clamp bracket	BEF-KHS-N08	2051607
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N08N for universal clamp bracket	BEF-KHS-N08N	2051616

Device protection (mechanical)

Protective housing/tubes

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571	Safety bracket for floor mounting	BEF-SW-W4S	2051497

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, screw connection, suitable for laser sensors, 18 mm x 18 mm	PL10F	5311210
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
	PMMA/ABS	Fine triple, screw connection, suitable for laser sensors, 38 mm x 16 mm	PL20F	5308844
	Plastic	Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089
	PMMA/ABS	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

F**Reflective tape**

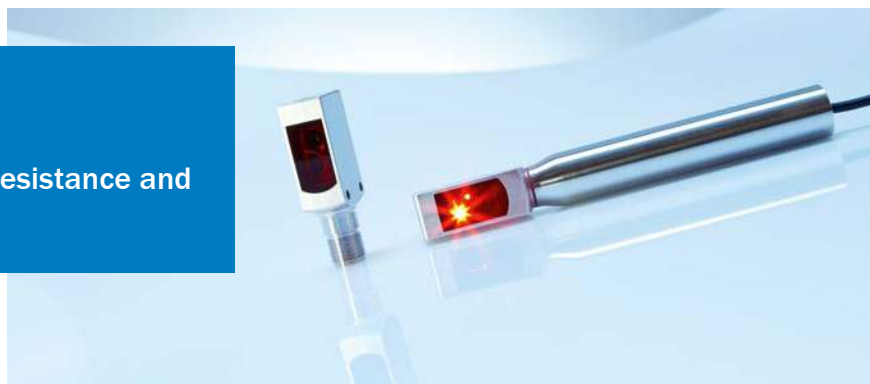
Figure	Description	Model name	Part no.
	Suitable for laser sensors, self-adhesive, cut, see alignment note, 56.3 mm x 56.3 mm	REF-AC1000-56	4063030

Special reflectors

Figure	Material	Description	Model name	Part no.
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adaptor shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adaptor thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

→ For additional accessories, please see page L-861

Highest reliability, maximum resistance and
endless possibilities



Product description

The W4S-3 INOX photoelectric sensor series in WashDown-Design combines a rugged and water tight IP 69K stainless steel housing with “best-in-class” optical functionality. This product family features a compact design that saves space and ensures high plant availability due to

water tight teach-in pushbutton with a metal membrane and pin casting M12-connector. The stainless steel housing withstands stringent cleaning procedures in food and beverage, pharmaceutical, solar and semiconductor industries.

At a glance

- WashDown rated for fluid tightness (IP 66, IP 67, IP 68 and IP 69K) and Ecolab certified
- Tough stainless steel housing (316L/1.4404)
- Resistant to a variety of common cleaning and disinfection agents
- Highly visible laser-like light spot due to PinPoint LED
- Teach-in via stainless steel pushbutton with a metal membrane

Your benefits

- Long service life in harsh conditions ensures less downtime and fewer replacement costs
- Quick and easy alignment due to highly visible PinPoint emitter LED
- Easy adjustment via a stainless steel metal membrane teach-in pushbutton



Additional information

Detailed technical data. F-299
Ordering information. F-300
Dimensional drawings F-303
Characteristic curves F-305
Bar diagrams. F-307
Connection diagram F-308
Recommended accessories. . . . F-309

→ www.mysick.com/en/W4S-3_Inox

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

	WTB4S-3V	WTF4S-3V	WL4S-3V	WSE4S-3V
Sensor principle	Photoelectric proximity sensor		Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Detection principle	Background suppression	Foreground suppression	Autocollimation	–
Dimensions (W x H x D)	15.25 mm x 49.2 mm x 22.2 mm (depending on type)			15.25 mm x 48.6 mm x 22.2 mm (depending on type)
Housing design	Washdown			
Housing design (light emission)	Rectangular			
Sensing range max.	4 mm ... 500 mm ¹⁾ (depending on type)	20 mm ... 200 mm ¹⁾	0 m ... 5 m ²⁾ (depending on type)	0 m ... 5 m
Sensing range	10 mm ... 350 mm ¹⁾ (depending on type)	–	0 m ... 3 m ²⁾ (depending on type)	0 m ... 4.5 m
Type of light	Visible red light			
Light source ³⁾	PinPoint LED			
Wave length	650 nm			
Adjustment	Cable ⁴⁾ / Single teach-in button (depending on type)		Single teach-in button	–
Alarm output	–		✓ (depending on type)	–
Special feature	–	Detection of transparent objects	–	

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.

⁴⁾ External teach-in: pulse > 2 s with voltage U_v with PNP and M with NPN.

Mechanics/electronics

	WTB4S-3V	WTF4S-3V	WL4S-3V	WSE4S-3V
Supply voltage ¹⁾	10 V DC ... 30 V DC			
Ripple ²⁾	< 5 V _{pp}			
Power consumption ³⁾	≤ 30 mA			
Power consumption, sender	–			≤ 20 mA ³⁾
Power consumption, receiver	–			≤ 20 mA ³⁾
Output type	PNP / NPN (depending on type)	PNP	PNP / NPN (depending on type)	
Output function	Complementary			–
Switching mode	Light switching / Dark-switching / Light/dark-switching (depending on type)			
Output current I_{max}	≤ 100 mA			
Response time ⁴⁾	< 0.5 ms			
Switching frequency ⁵⁾	1,000 Hz			
Connection type	Cable, 2 m ⁷⁾ / Male connector, M8 ⁶⁾ / Male connector, M12 ^{7) 8)} (depending on type)			
Circuit protection	A ⁹⁾ , B ¹⁰⁾ , C ¹¹⁾			
Protection class	III			
Weight				
Cable, 4-wire	80 g	–	80 g	
Connector M8	40 g			
Connector M8, 4-pin	45 g	–	60 g	

	WTB4S-3V	WTF4S-3V	WL4S-3V	WSE4S-3V
Polarisation filter	–		✓	–
Housing material	Stainless steel 316L			
Enclosure rating	IP 66, IP 67, IP 68, IP 69K ¹²⁾			
Test input sender off	–			“Test” to 0 V
Ambient operating temperature	–30 °C ... +70 °C ¹³⁾ –30 °C ... +60 °C			–30 °C ... +70 °C ¹³⁾
Ambient storage temperature	–30 °C ... +75 °C			

¹⁾ Limit values, reverse-polarity protected, 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⁾ Tightening torque, max.: 0.6 Nm.

⁷⁾ Do not bend below 0 °C.

⁸⁾ Tightening torque, max.: 0.7 Nm.

⁹⁾ A = V_s connections reverse-polarity protected.

¹⁰⁾ B = inputs and output reverse-polarity protected.

¹¹⁾ C = interference suppression.

¹²⁾ Only in case of correctly mounted IP 69K connecting cable.

¹³⁾ At $UV \leq 24$ V and $IA < 30$ mA.

Ordering information

Other models available at www.mysick.com/en/W4S-3_Inox

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WTB4S-3V

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

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Adjustment	Connection	Con- nection diagram	Model name	Part no.	
4 mm ... 120 mm	Ø 2.5 mm (50 mm)	PNP	Light switching	Single teach-in button	Connector M8, 3-pin	Cd-045	WTB4S-3P2132V	1046397	
					Connector M12, 4-pin	Cd-083	WTB4S-3P2432V	1054672	
				Cable ²⁾	Connector M8, 4-pin	Cd-092	WTB4S-3P2235V	1045093	
			Dark-switching	Single teach-in button	Connector M8, 3-pin	Cd-045	WTB4S-3F2132V	1046404	
		Light/dark-switching	Single teach-in button	Cable, 4-wire, 2 m, PVC	Cd-094	WTB4S-3P1132V	1046402		
			NPN	Light switching	Single teach-in button	Connector M8, 3-pin	Cd-045	WTB4S-3N2132V	1046405
					Cable, 3-wire, 2 m, PVC	Cd-044	WTB4S-3N1332V	1046406	
				Light/dark-switching	Single teach-in button	Connector M12, 4-pin	Cd-083	WTB4S-3N2432V	1054674
4 mm ... 280 mm	Ø 2.5 mm (100 mm)	PNP	Light switching	Cable, Single teach-in button ²⁾	Connector M8, 4-pin	Cd-092	WTB4S-3P2204VS02	1047652	
					Connector M8, 4-pin	Cd-092	WTB4S-3F2234VS08	1053075	
				Cable ²⁾	Connector M8, 4-pin	Cd-092	WTB4S-3P2205VS01	1046214	
				Single teach-in button ²⁾	Connector M8, 4-pin	Cd-092	WTB4S-3P2234VS05	1050833	
			Light/dark-switching	Cable	Connector M12, 4-pin	Cd-098	WTB4S-3P2402VS09	1054706	
				Single teach-in button					

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

²⁾ External teach-in: pulse > 2 s with voltage U_v with PNP and M with NPN.

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Adjustment	Connection	Con- nection diagram	Model name	Part no.
4 mm ... 500 mm	Ø 6.5 mm (150 mm)	PNP	Light switching	Single teach-in button	Connector M8, 3-pin	Cd-045	WTB4S-3P2162V	1046384
			Dark-switching	Single teach-in button	Connector M8, 3-pin	Cd-045	WTB4S-3F2162V	1046389
			Light/dark-switching	Single teach-in button	Connector M8, 4-pin	Cd-083	WTB4S-3P2262V	1046383
		NPN	Light/dark-switching	Single teach-in button	Connector M12, 4-pin	Cd-083	WTB4S-3P2462V	1054675
					Cable, 4-wire, 2 m, PVC	Cd-094	WTB4S-3N1162V	1046391
					Connector M12, 4-pin	Cd-083	WTB4S-3N2462V	1054703

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

²⁾ External teach-in: pulse > 2 s with voltage U_v with PNP and M with NPN.

WTF4S-3V, Detection of transparent objects

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

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Adjustment	Connection	Con- nection diagram	Model name	Part no.
20 mm ... 200 mm	Ø 6.5 mm (150 mm)	PNP	Light switching	Cable ²⁾	Connector M8, 4-pin	Cd-083	WTF4S-3P2265V	1045094
			Light/dark-switching	Single teach-in button	Connector M8, 4-pin	Cd-083	WTF4S-3P2262V	1046410

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

²⁾ External teach-in: pulse > 2 s with voltage U_v with PNP and M with NPN.

F

WL4S-3V

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Adjustment	Connection	Con- nection diagram	Model name	Part no.
0 m ... 4 m	Ø 45 mm (1.5 m)	PNP	Light switching	–	Cable, 3-wire, 2 m, PVC	Cd-044	WL4S-3P1330V	1048044
			Dark-switching	–	Connector M8, 3-pin	Cd-045	WL4S-3F2130V	1045096
			Light/dark-switching	–	Connector M8, 4-pin	Cd-083	WL4S-3P2230V	1045095
		NPN	Dark-switching	–	Cable, 3-wire, 2 m, PVC	Cd-044	WL4S-3E1330V	1046420
					Connector M8, 3-pin	Cd-045	WL4S-3E2130V	1045097
0 m ... 5 m	Ø 45 mm (1.5 m)	PNP	Light switching	Single teach-in button	Cable, 3-wire, 2 m, PVC	Cd-044	WL4S-3P1332V	1046427
					Connector M8, 3-pin	Cd-045	WL4S-3P2132V	1046424
			Dark-switching	Single teach-in button	Cable, 3-wire, 2 m, PVC	Cd-044	WL4S-3F1332V	1046430
					Connector M8, 3-pin	Cd-045	WL4S-3F2132V	1046428
			Light/dark-switching	Single teach-in button	Connector M8, 4-pin	Cd-083	WL4S-3P2232V	1046421
					Connector M12, 4-pin, PVC	Cd-083	WL4S-3P2432V	1054715
		NPN	Light switching	Single teach-in button	Connector M8, 3-pin	Cd-045	WL4S-3N2132V	1046432
			Dark-switching	Single teach-in button	Connector M8, 3-pin	Cd-045	WL4S-3E2132V	1046435
			Light/dark-switching	Single teach-in button	Connector M12, 4-pin, PVC	Cd-083	WL4S-3N2432V	1054722

¹⁾ PL80A.

WL4S-3V, Alarm output

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Adjustment	Connection	Con- nection diagram	Model name	Part no.
0 m ... 5 m	Ø 45 mm (1.5 m)	PNP	Dark-switching	Single teach-in button	Connector M8, 4-pin	Cd-107	WL4S-3V2232V	1046422

¹⁾ PL80A.

WSE4S-3V

- **Sensor principle:** through-beam photoelectric sensor

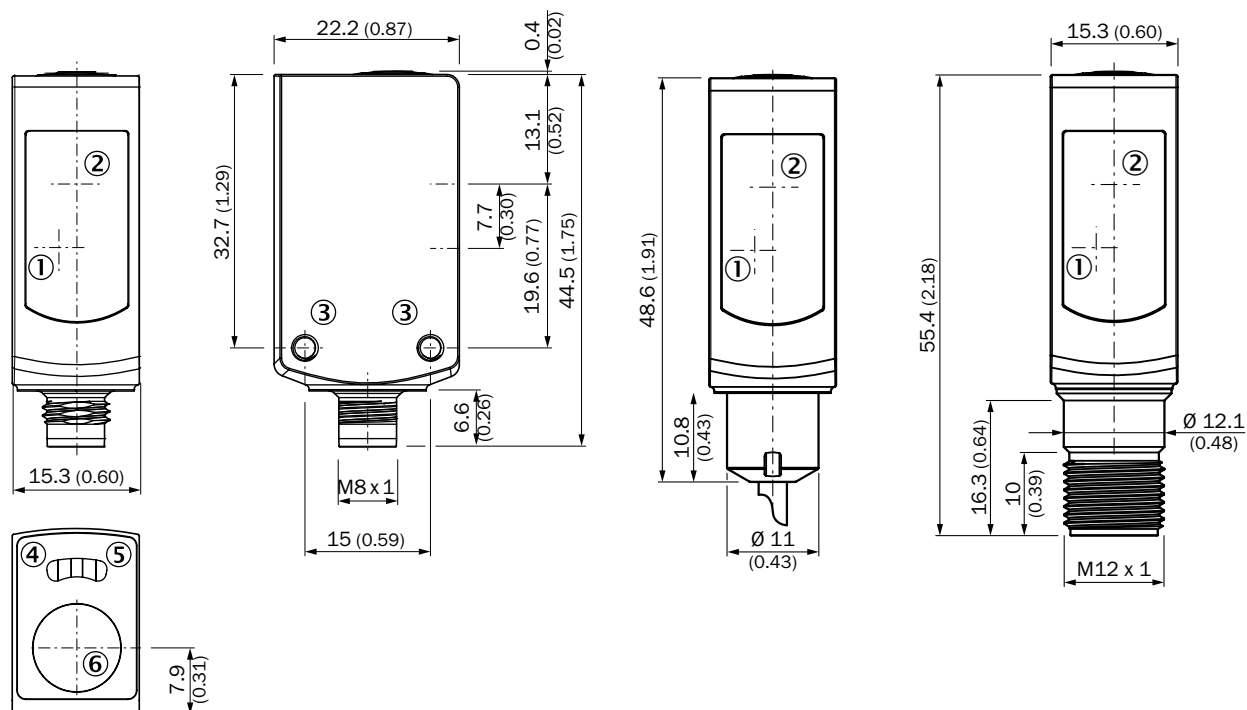
Sensing range max.	Light spot size (distance)	Output type	Switching mode	Connection	Con- nection diagram	Model name	Part no.
0 m ... 5 m	Ø 40 mm (2 m)	PNP	Light switching	Cable, 3-wire, 2 m, PVC	Cd-061	WSE4S-3P1330V	1052887
				Connector M8, 3-pin	Cd-069	WSE4S-3P2130V	1052893
			Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-061	WSE4S-3F1330V	1052880
				Connector M8, 3-pin	Cd-069	WSE4S-3F2130V	1052891
		NPN	Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-061	WSE4S-3E1330V	1052869
				Connector M8, 3-pin	Cd-069	WSE4S-3E2130V	1052877
			Light switching	Cable, 3-wire, 2 m, PVC	Cd-061	WSE4S-3N1330V	1052874
				Connector M8, 3-pin	Cd-069	WSE4S-3N2130V	1052878



Dimensional drawings

Dimensions in mm (inch)

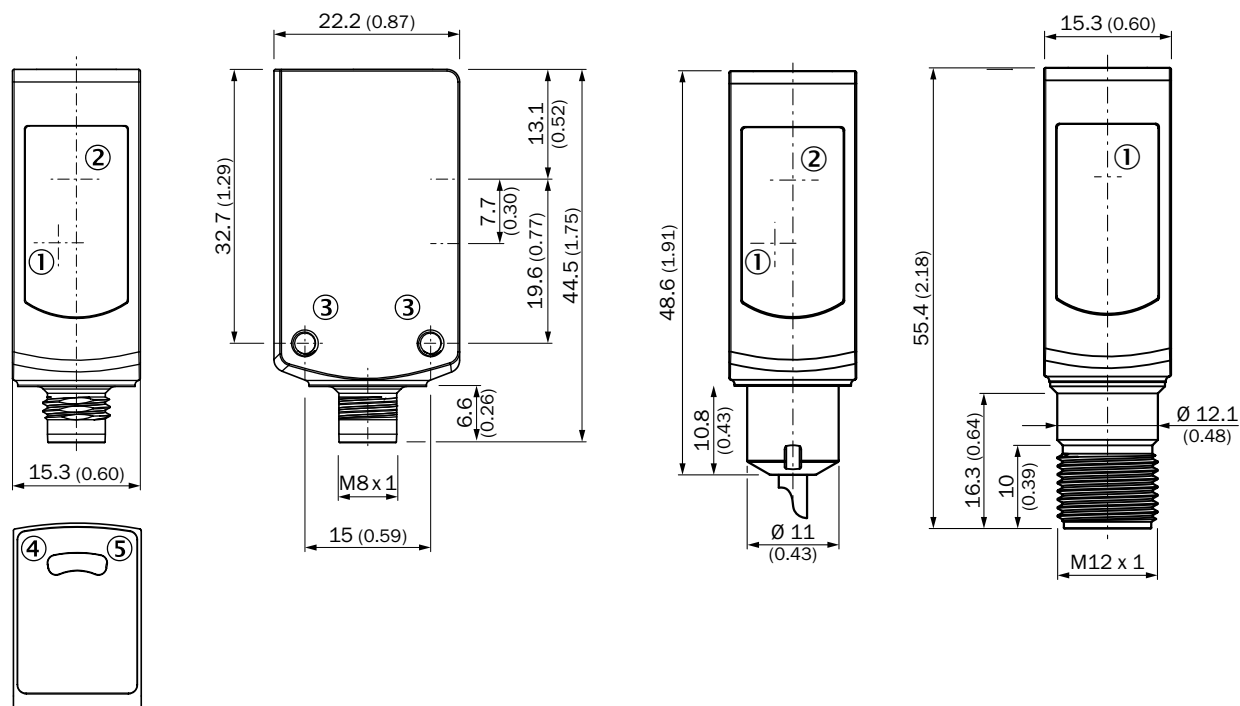
WTB4S-3V, WTF4S-3V, Single teach-in button



- ① Center of optical axis, receiver
- ② Center of optical axis, sender
- ③ Threaded mounting hole M3

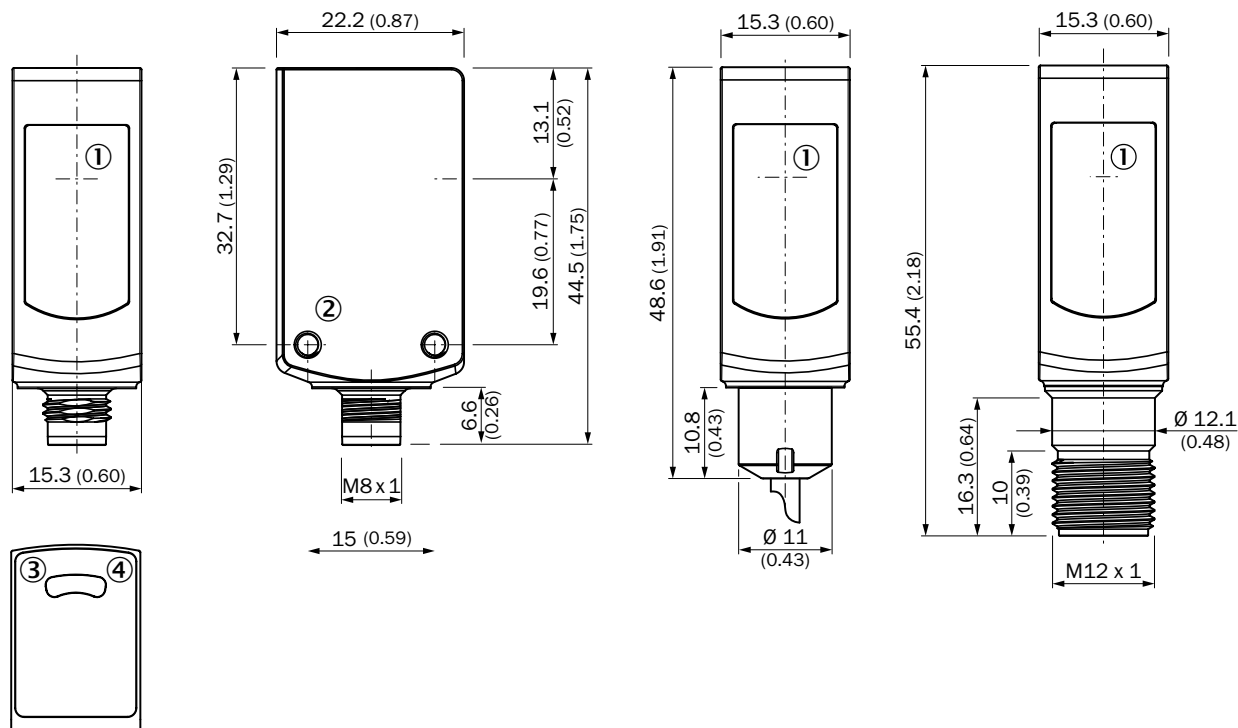
- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Status indicator LED green: power on
- ⑥ Teach-in button

WTB4S-3V, WTF4S-3V, without single teach-in button

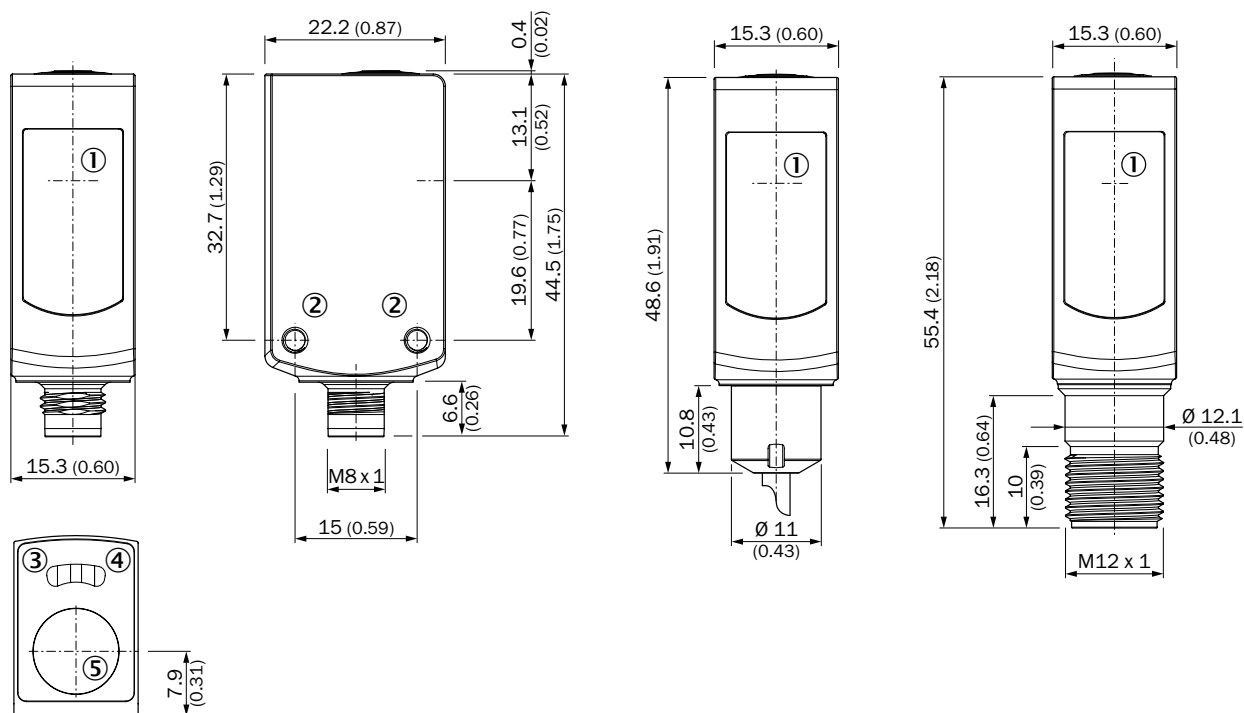


- ① Center of receiver's optical axis
- ② Center of optical axis, sender
- ③ Threaded mounting hole M3

- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Status indicator LED green: power on

WL4S-3V, WSE4S-2V, without single teach-in button

- ① Center of optical axis
 ② Threaded mounting hole M3
 ③ Status indicator LED, yellow: Status of received light beam
 ④ Status indicator LED green: power on

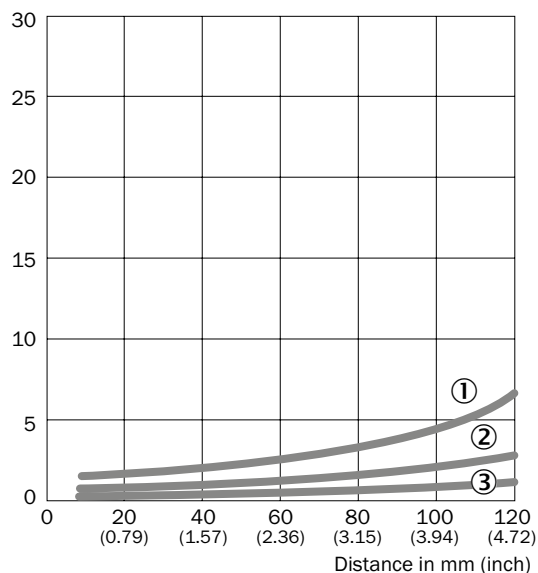
WL4S-3V, with single teach-in button

- ① Center of optical axis
 ② Threaded mounting hole M3
 ③ Status indicator LED, yellow: Status of received light beam
 ④ Status indicator LED green: power on
 ⑤ Teach-in button

Characteristic curves

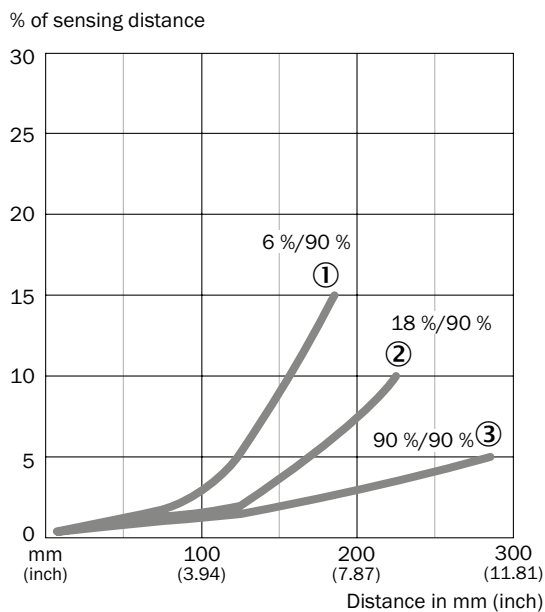
Black-white shift

WTB4S-3, 120 mm

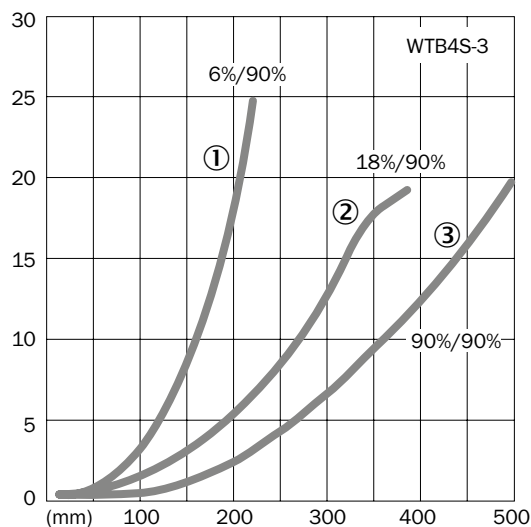


- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WTB4S-3, 280 mm



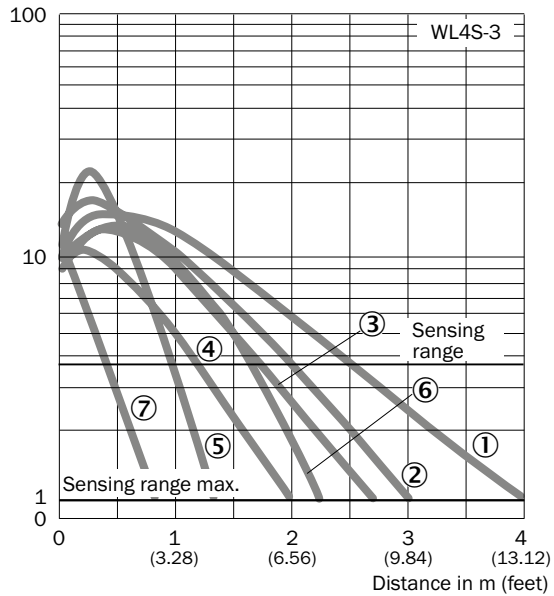
WTB4S-3, 500 mm



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

F

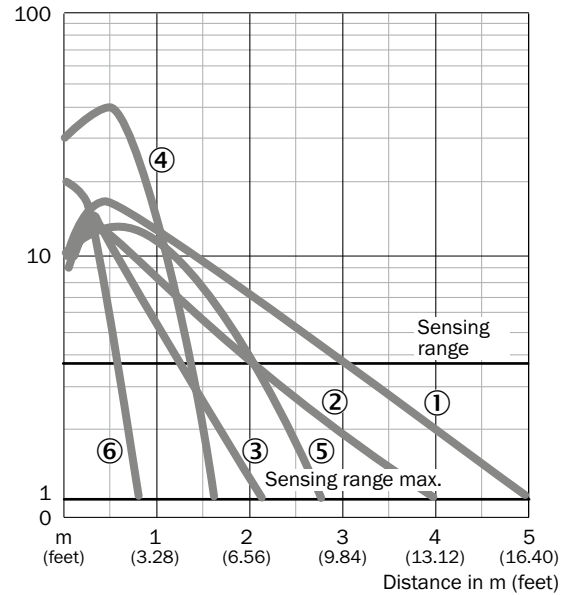
Operating reserve

WL4S-3, 4 m

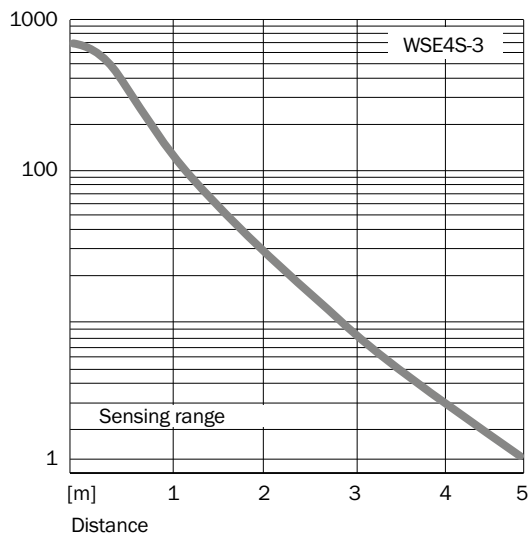
- ① PL80A
- ② P250F
- ③ PL40A
- ④ PL20A
- ⑤ PL10F
- ⑥ P250 CHEM
- ⑦ REF-IRF-56

WL4S-3, 5 m

Operating reserve



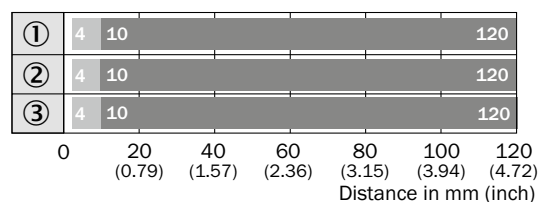
- ① PL80A
- ② PL40A
- ③ PL20A
- ④ PL10F
- ⑤ P250 CHEM
- ⑥ REF-IRF-56

WSE4S-3V, WSE4S-3H

F

Bar diagrams

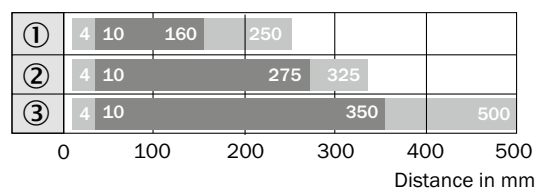
WTB4S-3, 120 mm



■ Sensing range ■ Sensing range max.

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

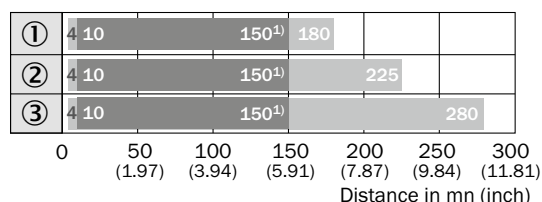
WTB4S-3, 500 mm



■ Sensing range ■ Sensing range max.

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

WTB4S-3, 280 mm

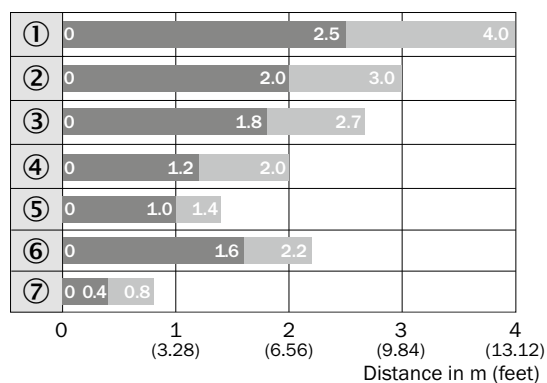


■ Operating distance ■ Sensing distance typ. max.

- ① Sensing distance on black, 6 % remission
- ② Sensing distance on grey, 18 % remission
- ③ Sensing distance on whitw, 90 % remission

⁴⁾ Due to the focus of the light spot at 100 mm (3.94 inch)

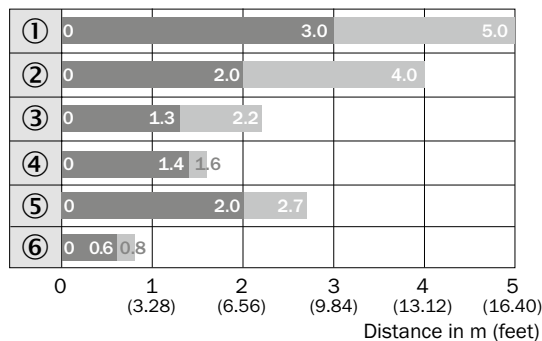
WL4S-3, 4 m



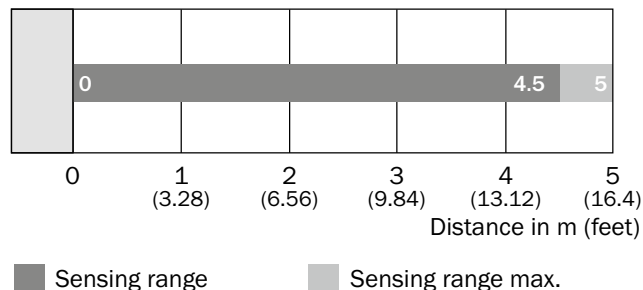
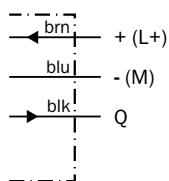
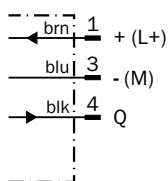
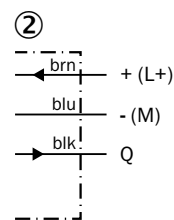
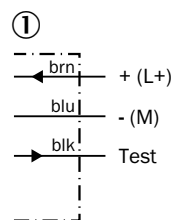
■ Sensing range ■ Sensing range max.

- ① PL80A
- ② P250F
- ③ PL40A
- ④ PL20A
- ⑤ PL10F
- ⑥ P250 CHEM
- ⑦ REF-IRF-56

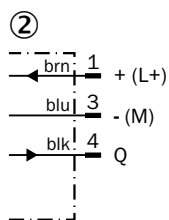
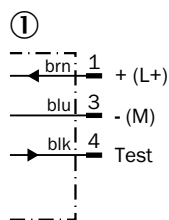
F

WL4S-3, 5 m

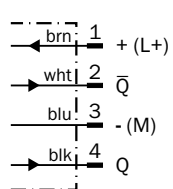
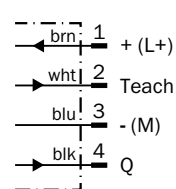
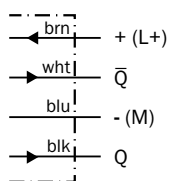
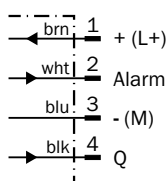
- ① PL80A
② PL40A
③ PL20A
④ PL10F
⑤ P250 CHEM
⑥ REF-IRF-56

WSE4S-3**Connection diagram****Cd-044****Cd-045****Cd-061**

- ① Sender
② Receiver

Cd-069

- ① Sender
② Receiver

Cd-083**Cd-092****Cd-094****Cd-107**

Recommended accessories

Plug connectors and cables

Connecting cable (female connector-open), hygienic systems

- Cable material: PVC
- Connector material: PVC

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, IP 69K	DOL-0803-G02MN	6033664
			5 m, 3-wire	IP 67, IP 69K	DOL-0803-G05MN	6033665
	Female connector, M8, 3-pin, angled	Cable, open conductor heads	2 m, 3-wire	IP 67, IP 69K	DOL-0803-W02MN	6033667
			5 m, 3-wire	IP 67, IP 69K	DOL-0803-W05MN	6033668
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-0804-G02MN	6033670
			5 m, 4-wire	IP 67, IP 69K	DOL-0804-G05MN	6033671
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-0804-W02MN	6033673
			5 m, 4-wire	IP 67, IP 69K	DOL-0804-W05MN	6033674
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-1204-G02MN	6028128
			5 m, 4-wire	IP 67, IP 69K	DOL-1204-G05MN	6028130
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-1204-W02MN	6028129
			5 m, 4-wire	IP 67, IP 69K	DOL-1204-W05MN	6028131

Female connector (ready to assemble)

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0803-G	7902077
	Female connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0804-G	6009974
	Female connector, M12, 4-pin, straight	Screw-type terminals	PBT	IP 67	DOS-1204-GN	6028357

Male connector (ready to assemble)

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Male connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	STE-0803-G	6037322
	Male connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	STE-0804-G	6037323
	Male connector, M12, 4-pin, straight	Screw-type terminals	PBT	IP 67	STE-1204-GN	6028359

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N02N for universal clamp bracket	BEF-KHS-N02N	2051618

Reflectors

Angular

Figure	Material	Description	Model name	Part no.
	Plastic	Chemically resistant, screw connection, 47 mm x 47 mm	P250 CHEM	5321097
	PMMA/ABS	Rectangular, screw connection, 80 mm x 80 mm	PL80A	1003865

Fine triple reflectors

Figure	Material	Description	Model name	Part no.
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
		Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089

Reflective tape

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

Special reflectors

Figure	Material	Description	Model name	Part no.
	Plastic	Chemically resistant, screw connection, 38 mm x 15 mm	PL20 CHEM	5321089
	PMMA/ABS	Antifog, for prevention of moisture fogging on the reflection area, screw connection, 56 mm x 37 mm	PL40A Antifog	5322011
	Plastic	Rectangular, screw connection M3, countersunk screw head, chemical resistant, 56 mm x 37 mm	PL40B-CHEM	5326088

Figure	Material	Description	Model name	Part no.
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adaptor shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adaptor thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

→ For additional accessories, please see page L-861

Reliable detection of transparent objects



Additional information

Detailed technical data.....	F-313
Ordering information.....	F-314
Dimensional drawings	F-315
Characteristic curves	F-316
Bar diagrams.....	F-316
Connection diagram	F-316
Recommended accessories.....	F-317

Product description

The WLG4S-3 Inox is a photoelectric retro-reflective sensor designed to detect transparent objects. The WashDown-Design combines a rugged and water tight IP 69K stainless steel housing with “best-in-class” optical functionality. The continuous threshold adaptation (AutoAdapt) of the switching threshold enables reliable transparent object detection and reduces the frequency that the sensor or reflector needs. This prod-

uct family features a compact design that saves space and ensures high plant availability due to water tight teach-in pushbutton with a metal membrane and pin casting M12-connector. The stainless steel housing withstands stringent cleaning procedures in food and beverage, pharmaceutical, solar and semiconductor industries. Especially for this harsh environment chemically resistant reflectors are available as accessories.

At a glance

- IP 66, IP 67, IP 68 and IP 69K enclosure rating and Ecolab certified
- Tough stainless steel housing (316L/1.4404)
- Resistant to a variety of common cleaning and disinfection agents
- Modern electrical connection available – M12 connector with pin casting
- PinPoint LED technology provides a highly visible laser-like light spot
- Teach-in via stainless steel pushbutton with a metal membrane
- Continuous threshold adaptation (AutoAdapt) technology reliably detects objects in changing conditions

Your benefits

- Long service life in harsh conditions ensures less downtime and fewer replacement costs
- Reliable detection of all materials, including transparent objects in the pharmaceutical, packaging, and food and beverage industries
- Easy adjustment via a stainless steel metal membrane teach-in pushbutton
- Quick and easy alignment due to highly visible PinPoint emitter LED
- Remote monitoring and quick diagnostics via IO-Link (optional)

→ www.mysick.com/en/W4S-3_Inox_Glass

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

Sensor principle	Photoelectric retro-reflective sensor
Detection principle	Autocollimation
Dimensions (W x H x D)	15.25 mm x 49.2 mm x 22.2 mm
Housing design	Washdown
Housing design (light emission)	Rectangular
Sensing range max. ¹⁾	0 m ... 5 m
Sensing range ¹⁾	0 m ... 3 m
Type of light	Visible red light
Light source ²⁾	PinPoint LED
Light spot size (distance)	Ø 45 mm (1.5 m)
Wave length	650 nm
Adjustment	Cable ³⁾ / Cable, Single teach-in button ³⁾ / Single teach-in button (depending on type)
Continuous threshold adaption (AutoAdapt)	✓
Special feature	Detection of transparent objects

¹⁾ PL80A.

²⁾ Average service life of 100,000 h at T_A = +25 °C.

³⁾ External teach-in: pulse > 2 s with voltage U_v with PNP and M with NPN.

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	< 5 V _{pp}
Power consumption ³⁾	≤ 30 mA
Output type	PNP / NPN (depending on type)
Output function	Complementary
Switching mode	Dark-switching / Light/dark-switching (depending on type)
Output current I _{max.}	≤ 100 mA
Response time ⁴⁾	< 0.5 ms
Switching frequency ⁵⁾	1,000 Hz
Connection type	Male connector, M8 ⁶⁾ / Male connector, M12 ⁷⁾ ⁸⁾ / Cable, 2 m ⁷⁾ (depending on type)
Circuit protection	A ⁹⁾ , B ¹⁰⁾ , C ¹¹⁾
Protection class	III
Weight	
Connector M8, 4-pin	40 g
Connector M12, 4-pin	45 g
Cable, 4-wire	80 g
Polarisation filter	✓

F

Housing material	Stainless steel 316L
Enclosure rating	IP 66, IP 67, IP 68, IP 69K ¹²⁾
Ambient operating temperature	-30 °C ... +60 °C / -30 °C ... +70 °C ¹³⁾
Ambient storage temperature	-30 °C ... +75 °C

¹⁾ Limit values, reverse-polarity protected, 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⁾ Tightening torque, max.: 0.6 Nm.

⁷⁾ Do not bend below 0 °C.

⁸⁾ Tightening torque, max.: 0.7 Nm.

⁹⁾ A = V_s connections reverse-polarity protected.

¹⁰⁾ B = inputs and output reverse-polarity protected.

¹¹⁾ C = interference suppression.

¹²⁾ Only in case of correctly mounted IP 69K connecting cable.

¹³⁾ At $UV \leq 24$ V and $IA < 30$ mA.

Ordering information

Other models available at www.mysick.com/en/W4S-3_Inox_Glass

WLG4S-3V

Sensing range max. ¹⁾	Output type	Switching mode	Adjustment	Connection	Connection diagram	Model name	Part no.
0 m ... 5 m	PNP	Dark-switching	Cable ²⁾	Connector M8, 4-pin	Cd-092	WLG4S-3F2235V	1045098
			Cable, Single teach-in button ²⁾	Connector M8, 4-pin	Cd-092	WLG4S-3F2234V	1047653
		Light/dark-switching	Single teach-in button	Connector M12, 4-pin, PVC	Cd-092	WLG4S-3F2434V	1054727
				Cable, 4-wire, 2 m, PVC	Cd-093	WLG4S-3P1132V	1055044
				Connector M8, 4-pin	Cd-083	WLG4S-3P2232V	1046446
				Connector M12, 4-pin, PVC	Cd-083	WLG4S-3P2432V	1054725
	NPN	Dark-switching	Cable ²⁾	Cable, 4-wire, 2 m, PVC	Cd-093	WLG4S-3E1135V	1046438
			Cable, Single teach-in button ²⁾	Cable, 4-wire, 2 m, PVC	Cd-093	WLG4S-3E1134V	1048027
		Light/dark-switching	Single teach-in button	Cable, 4-wire, 2 m, PVC	Cd-093	WLG4S-3N1132V	1046450
				Connector M12, 4-pin, PVC	Cd-083	WLG4S-3N2432V	1054728

¹⁾ PL80A.

²⁾ External teach-in: pulse > 2 s with voltage U_v with PNP and M with NPN.

WLG4S-3V Alarm output

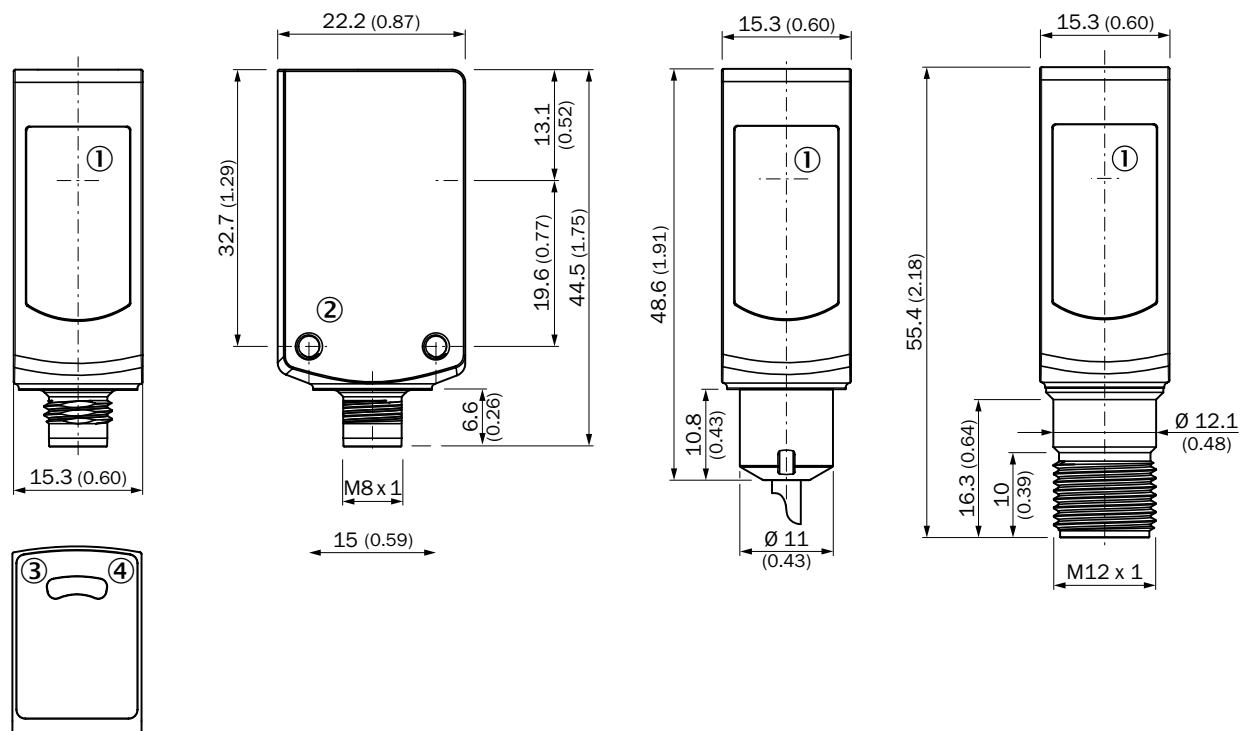
Sensing range max. ¹⁾	Output type	Switching mode	Adjustment	Connection	Connection diagram	Model name	Part no.
0 m ... 5 m	PNP	Dark-switching	Single teach-in button	Connector M8, 4-pin	Cd-107	WLG4S-3V2232V	1046447

¹⁾ PL80A.

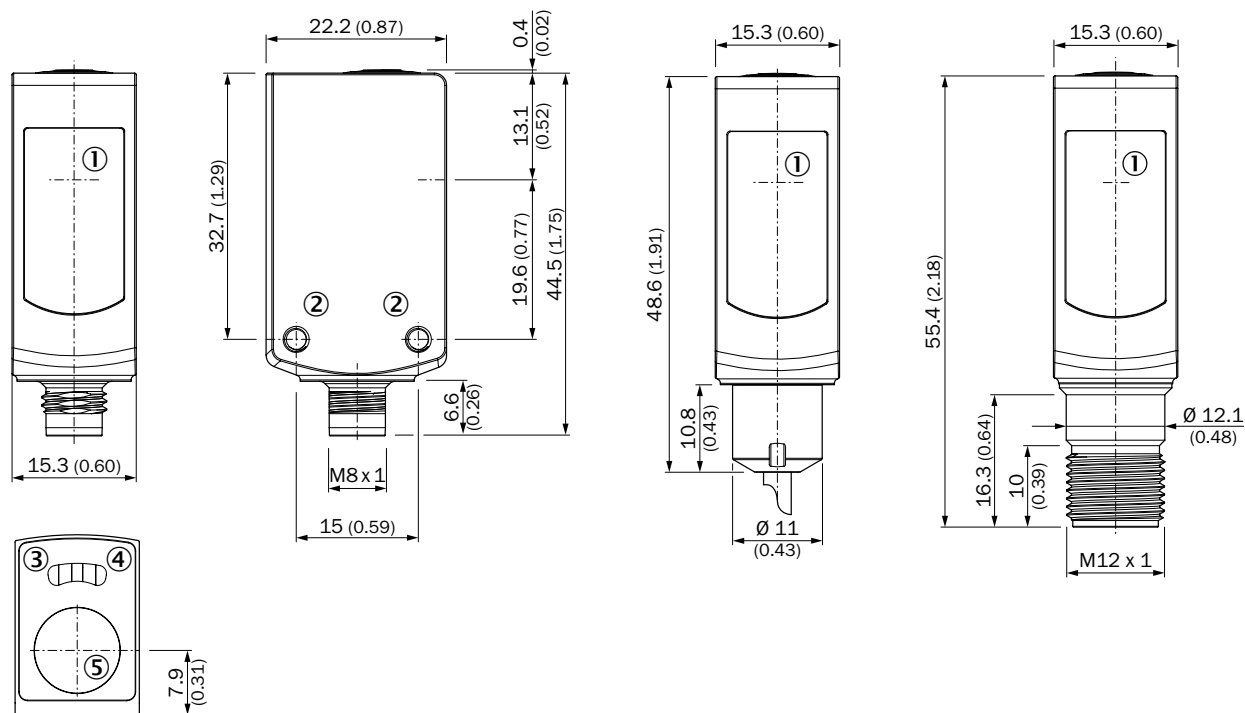
Dimensional drawings

Dimensions in mm (inch)

WL4S-3V, without single teach-in button

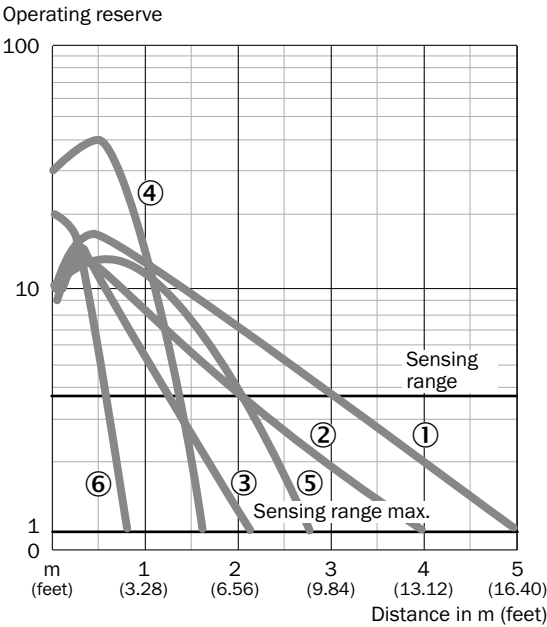


WL4S-3V, with single teach-in button



Characteristic curves

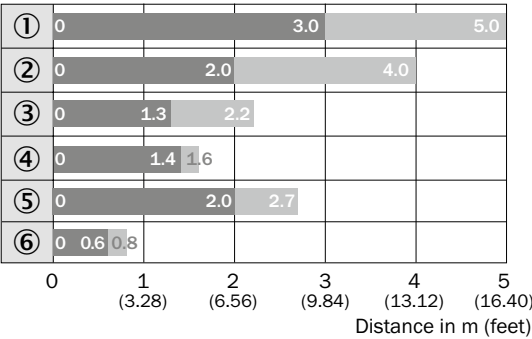
WLG4S-3, 5 m



- ① PL80A
- ② PL40A
- ③ PL20A
- ④ PL10F
- ⑤ P250 CHEM
- ⑥ REF-IRF-56

Bar diagrams

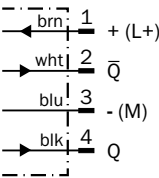
WLG4S-3, 5 m



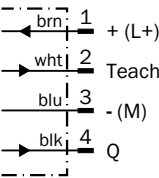
- Sensing range
- Sensing range max.
- ① PL80A
- ② PL40A
- ③ PL20A
- ④ PL10F
- ⑤ P250 CHEM
- ⑥ REF-IRF-56

Connection diagram

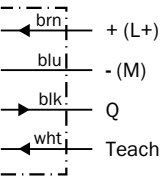
Cd-083



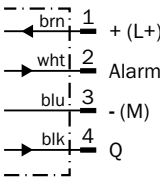
Cd-092



Cd-093



Cd-107

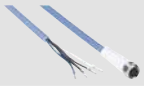
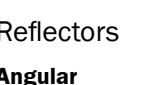


Recommended accessories

Plug connectors and cables

Connecting cable (female connector-open), hygienic systems

- Cable material: PVC
- Connector material: PVC

Figure	Connection type head A	Connection type head B	Connecting cable	Enclosure rating	Model name	Part no.
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-0804-G02MN	6033670
			5 m, 4-wire	IP 67, IP 69K	DOL-0804-G05MN	6033671
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-0804-W02MN	6033673
			5 m, 4-wire	IP 67, IP 69K	DOL-0804-W05MN	6033674
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-1204-G02MN	6028128
			5 m, 4-wire	IP 67, IP 69K	DOL-1204-G05MN	6028130
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-1204-W02MN	6028129
			5 m, 4-wire	IP 67, IP 69K	DOL-1204-W05MN	6028131

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N02N for universal clamp bracket	BEF-KHS-N02N	2051618

Reflectors

Angular

Figure	Material	Description	Model name	Part no.
	Plastic	Chemically resistant, screw connection, 47 mm x 47 mm	P250 CHEM	5321097
	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
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
		Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	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

Special reflectors

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Antifog, for prevention of moisture fogging on the reflection area, screw connection, 56 mm x 37 mm	PL40A Antifog	5322011
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adapter shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adapter thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

→ For additional accessories, please see page L-861



Highest reliability, maximum resistance and endless possibilities



Additional information

Detailed technical data.....	F-321
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Recommended accessories.....	F-331

Product description

The W4S-3 Inox Hygiene series of photoelectric sensors combines hygienic requirements based on EHEDG with best-in-class performance. These sensors are completely enclosed in a stainless steel housing and can be taught via a stainless steel teach button with a metal membrane. With built in protec-

tion for the sensor cable, no additional mounting brackets or mounting holes are required for in-process machine integration. These sensors are designed for a completely hygienic sensor solution that is a necessity for the most hygienic machines.

At a glance

- Smooth stainless steel housing (316L/1.4404)
- Hygienic mounting using M12-adaptor thread or D12-adaptor shaft
- IP 66, IP 67, IP 68 and IP 69K enclosure rating and Ecolab certified
- Resistant to a variety of common cleaning and disinfection agents
- Highly visible laser-like light spot due to PinPoint LED
- Teach-in via stainless steel pushbutton with a metal membrane

Your benefits

- Smooth hygienic housing and accessories with no grooves or crevices eliminates the potential for bacteria to grow, providing a more hygienic solution.
- Long service life in harsh conditions ensures less downtime and fewer replacement costs
- Easy adjustment via a stainless steel metal membrane teach-in pushbutton
- Quick and easy alignment due to highly visible PinPoint emitter LED

→ www.mysick.com/en/W4S-3_Inox_Hygiene

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

	WTB4S-3H	WTF4S-3H	WL4S-3H	WSE4S-3H
Sensor principle	Photoelectric proximity sensor		Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Detection principle	Background suppression	Foreground suppression	Autocollimation	–
Dimensions (W x H x D)	15.25 mm x 48.6 mm x 22.15 mm / 15.25 mm x 63.2 mm x 22.15 mm (depending on type)			
Housing design	Hygiene			
Housing design (light emission)	Rectangular			
Sensing range max.	4 mm ... 500 mm ¹⁾ (depending on type)	20 mm ... 200 mm ¹⁾	0 m ... 5 m ²⁾ (depending on type)	0 m ... 5 m
Sensing range	10 mm ... 350 mm ¹⁾ (depending on type)	–	0 m ... 3 m ²⁾ (depending on type)	0 m ... 4.5 m
Type of light	Visible red light			
Light source ³⁾	PinPoint LED			
Wave length	650 nm			
Adjustment	Cable ⁴⁾ / Single teach-in button / Cable, Single teach-in button ⁴⁾ (depending on type)	Cable, Single teach-in button ⁴⁾	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.

⁴⁾ External teach-in: pulse > 2 s with voltage U_v with PNP and M with NPN.

Mechanics/electronics

	WTB4S-3H	WTF4S-3H	WL4S-3H	WSE4S-3H
Supply voltage ¹⁾	10 V DC ... 30 V DC			
Ripple ²⁾	< 5 V _{pp}			
Power consumption	≤ 30 mA ³⁾			≤ 20 mA ⁴⁾
Output type	PNP / NPN (depending on type)			
Output function	Complementary	–	Complementary	
Switching mode	Light switching / Light/dark-switching (depending on type)	Light switching	Light/dark-switching	Light switching Dark-switching Light/dark-switching (depending on type)
Output current I _{max.}	≤ 100 mA			
Response time ⁵⁾	< 0.5 ms			
Switching frequency ⁶⁾	1,000 Hz			
Connection type	Cable, 2 m ⁷⁾ / Male connector, M8 ⁸⁾ / Cable with connector, M8, 150 mm ^{7) 8)} (depending on type)			
Mechanical connection	M12 adapter thread / D12 adapter shaft (depending on type)	M12 adapter thread	M12 adapter thread / D12 adapter shaft (depending on type)	
Circuit protection	A ⁹⁾ , B ¹⁰⁾ , C ¹¹⁾			
Protection class	III			
Weight				
Cable ⁷⁾	80 g	–	80 g	–
Connector ⁸⁾	140 g	50 g	40 g	140 g
Cable with connector ^{7) 8)}	50 g			

	WTB4S-3H	WTF4S-3H	WL4S-3H	WSE4S-3H
Polarisation filter	–		✓	–
Housing material	Stainless steel 316L			
Enclosure rating	IP 66, IP 67, IP 68, IP 69K			
Test input sender off	–			“Test” to 0 V
Ambient operating temperature	–30 °C ... +60 °C / –30 °C ... +70 °C ¹²⁾			
Ambient storage temperature	–30 °C ... +75 °C			

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

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

³⁾ Without load.

⁴⁾ Sender.

⁵⁾ Signal transit time with resistive load.

⁶⁾ With light/dark ratio 1:1.

⁷⁾ Do not bend below 0 °C.

⁸⁾ Tightening torque, max.: 0.6 Nm.

⁹⁾ A = V_s connections reverse-polarity protected.

¹⁰⁾ B = inputs and output reverse-polarity protected.

¹¹⁾ C = interference suppression.

¹²⁾ At UV ≤ 24 V and IA < 30 mA.

Ordering information

Other models available at www.mysick.com/en/W4S-3_Inox_Hygiene

WTB4S-3H

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

Sensing range max. ¹⁾	Light spot size (distance)	Mechanical connection	Output type	Switching mode	Adjustment	Connection	Con- nection diagram	Model name	Part no.
4 mm ... 120 mm	Ø 2.5 mm (50 mm)	M12 adapter thread	PNP	Light switching	Cable ²⁾	Cable with connector M8, 4-pin, 150 mm, PVC	Cd-092	WTB4S-3P3235H	1048100
				Light/dark-switching	Single teach-in button		Cd-083	WTB4S-3P3232H	1048096
			NPN	Light switching	Cable ²⁾	Cable, 4-wire, 2 m, PVC	Cd-093	WTB4S-3N1135H	1048101
				Light/dark-switching	Single teach-in button	Cable, 4-wire, 2 m, PVC	Cd-094	WTB4S-3N1132H	1048098
		D12 adapter shaft	PNP	Light/dark-switching	Single teach-in button	Connector M8, 4-pin	Cd-083	WTB4S-3P5232H	1054864
				Light switching	Cable, Single teach-in button ²⁾	Connector M8, 4-pin	Cd-083	WTB4S-3P5204HS02	1054865
4 mm ... 500 mm	Ø 6.5 mm (150 mm)	M12 adapter thread	PNP	Light switching	Cable, Single teach-in button	Cable, 4-wire, 2 m, PVC	Cd-094	WTB4S-3P1162H	1051983
				Light/dark-switching	Single teach-in button	Cable with connector M8, 4-pin, 150 mm, PVC	Cd-092	WTB4S-3P3265H	1048102
			NPN	Light/dark-switching	Single teach-in button	Cable with connector M8, 4-pin, 150 mm, PVC	Cd-083	WTB4S-3P3262H	1048094
				Light switching	Cable ²⁾	Cable, 4-wire, 2 m, PVC	Cd-093	WTB4S-3N1165H	1048107
				Light/dark-switching	Single teach-in button	Cable, 4-wire, 2 m, PVC	Cd-094	WTB4S-3N1162H	1048095

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

²⁾ External teach-in: pulse > 2 s with voltage Uv with PNP and M with NPN.

WTF4S-3H

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

Sensing range max. ¹⁾	Light spot size (distance)	Mechanical connection	Output type	Switching mode	Adjustment ²⁾	Connection	Con- nection diagram	Model name	Part no.
20 mm ... 200 mm	Ø 6.5 mm (150 mm)	M12 adapter thread	PNP	Light switching	Cable, Single teach-in button	Cable with con- nector M8, 4-pin, 150 mm, PVC	Cd-092	WTF4S-3P3264H	1048109

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

²⁾ External teach-in: pulse > 2 s with voltage U_v with PNP and M with NPN.

WL4S-3H

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation

Sensing range max. ¹⁾	Light spot size (distance)	Mechanical connection	Output type	Switching mode	Adjustment	Connection	Con- nection diagram	Model name	Part no.
0 m ... 4 m	Ø 45 mm (1,5 mm)	M12 adapter thread	PNP	Light/dark- switching	–	Cable with con- nector M8, 4-pin, 150 mm, PVC	Cd-083	WL4S-3P3230H	1048115
			NPN	Light/dark- switching	–	Cable, 4-wire, 2 m, PVC	Cd-094	WL4S-3N1130H	1048116
		D12 adapter shaft	PNP	Light/dark- switching	–	Connector M8, 4-pin	Cd-083	WL4S-3P5230H	1057052
0 m ... 5 m	Ø 45 mm (1,5 mm)	M12 adapter thread	PNP	Light/dark- switching	Single teach-in button	Cable with con- nector M8, 4-pin, 150 mm, PVC	Cd-083	WL4S-3P3232H	1048117
			NPN	Light/dark- switching	Single teach-in button	Cable, 4-wire, 2 m, PVC	Cd-094	WL4S-3N1132H	1048119

¹⁾ PL80A.

WL4S-3H, Alarm output

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation

Sensing range max. ¹⁾	Light spot size (distance)	Mechanical connection	Output type	Switching mode	Adjustment	Connection	Con- nection diagram	Model name	Part no.
0 m ... 5 m	Ø 45 mm (1,5 mm)	M12 adapter thread	PNP	Light/dark- switching	Single teach-in button	Cable with con- nector M8, 4-pin, 150 mm, PVC	Cd-107	WL4S-3V3232H	1048118

¹⁾ PL80A.

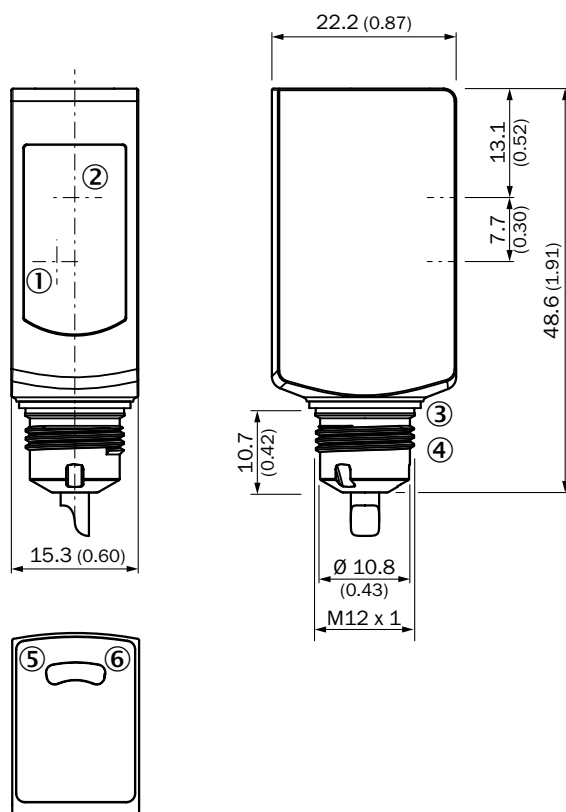
WSE4S-3H

- **Sensor principle:** through-beam photoelectric sensor

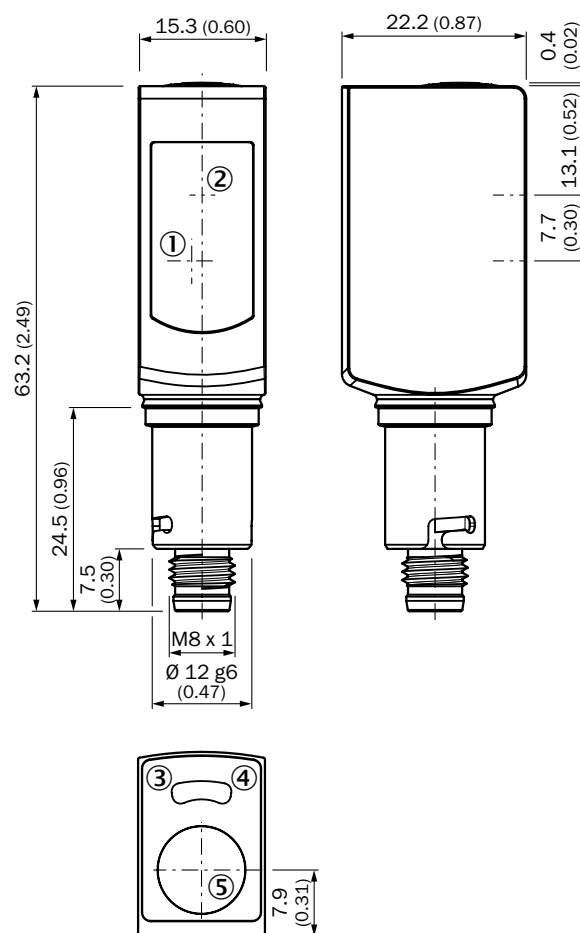
Sensing range max.	Light spot size (distance)	Mechanical connection	Output type	Switching mode	Connection	Con- nection diagram	Model name	Part no.
0 m ... 5 m	Ø 50 mm (2 mm)	M12 adapter thread	PNP	Light switching	Cable with connector M8, 3-pin, 150 mm, PVC	Cd-069	WSE4S-3P3130H	1052888
				Dark-switching		Cd-069	WSE4S-3F3130H	1052882
			NPN	Light switching	Cable, 3-wire, 2 m, PVC	Cd-061	WSE4S-3N1330H	1052873
				Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-055	WSE4S-3N1330H	1048129
					Cable, 3-wire, 2 m, PVC	Cd-055	WSE4S-3E1330H	1048130
					Cable with connector M8, 3-pin, 150 mm, PVC	Cd-069	WSE4S-3E1330H	1052870
		D12ada- pter shaft	PNP	Light/dark- switching	Cable, 3-wire, 2 m, PVC	Cd-061	WSE4S-3E1330H	1052868
					Cable with connector M8, 4-pin, 150 mm, PVC	Cd-072	WSE4S-3P5230H	1054896

Dimensional drawings

Dimensions in mm (inch)

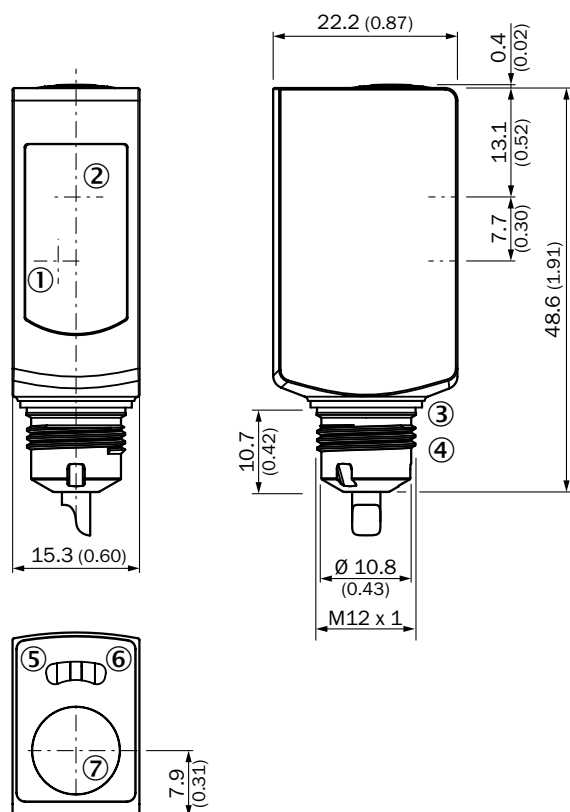
WTB4S-3H, WTF4S-3H,
without single teach-in button

- ① Center of optical axis, receiver
- ② Center of optical axis, sender
- ③ Gasket (tightening torque 6Nm)
- ④ Connector M12
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Status indicator LED green: power on

WTB4S-3H, WTF4S-3H,
with single teach-in button, D12 adapter shaft, L-adaption

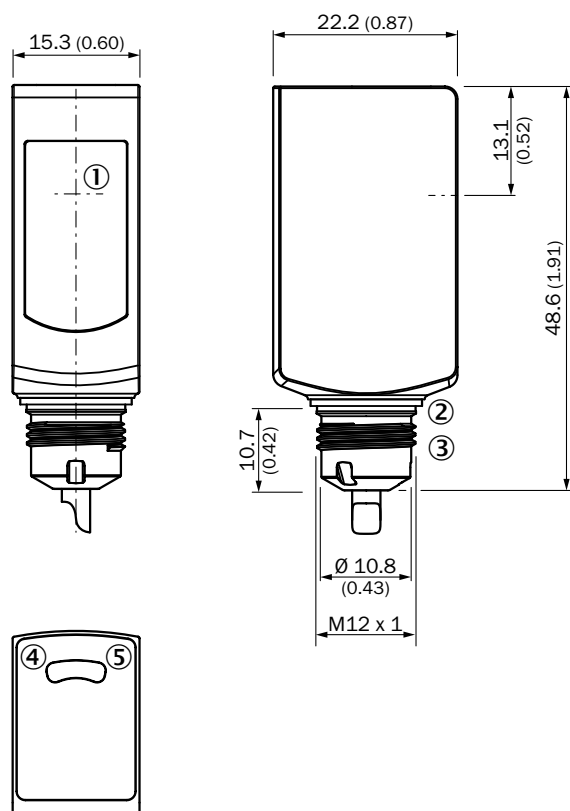
- ① Center of receiver's optical axis
- ② Center of optical axis, sender
- ③ Status indicator LED, yellow: Status of received light beam
- ④ Status indicator LED green: power on
- ⑤ Single teach-in button

WTB4S-3H, WTF4S-3H, with single teach-in button

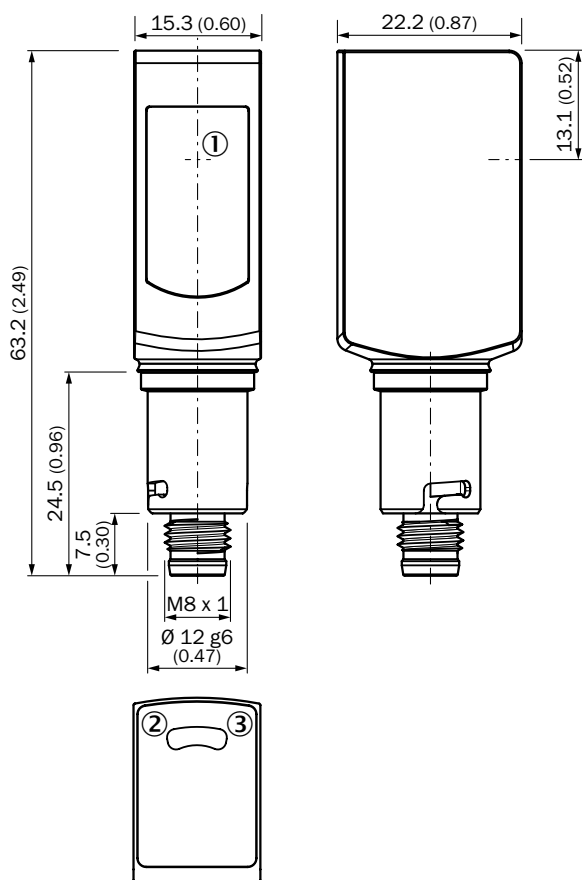


- ① Center of optical axis, receiver
- ② Center of optical axis, sender
- ③ Gasket (tightening torque 6Nm)
- ④ Connector M12
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Status indicator LED green: power on
- ⑦ Teach-in button

WL4S-3H, without single teach-in button

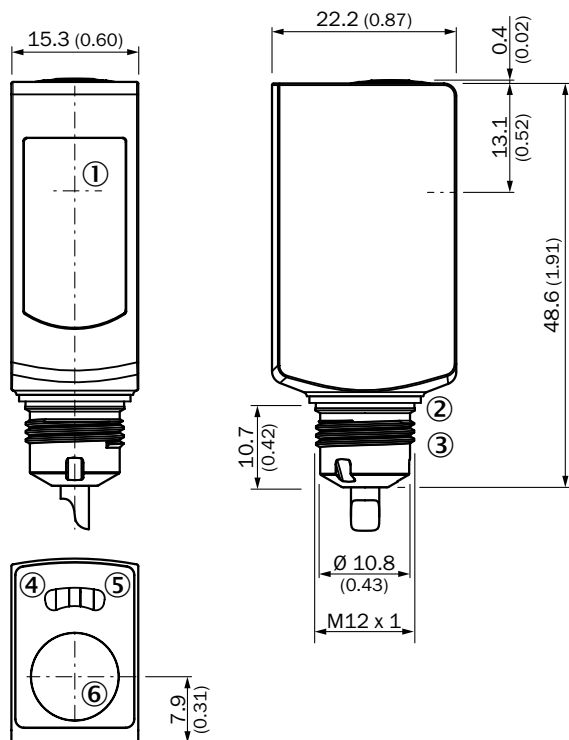


- ① Center of optical axis
- ② Gasket (tightening torque 6Nm)
- ③ Connector M12
- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Status indicator LED green: power on

WL4S-3H, with single teach-in button, D12 adapter shaft, I-adaption

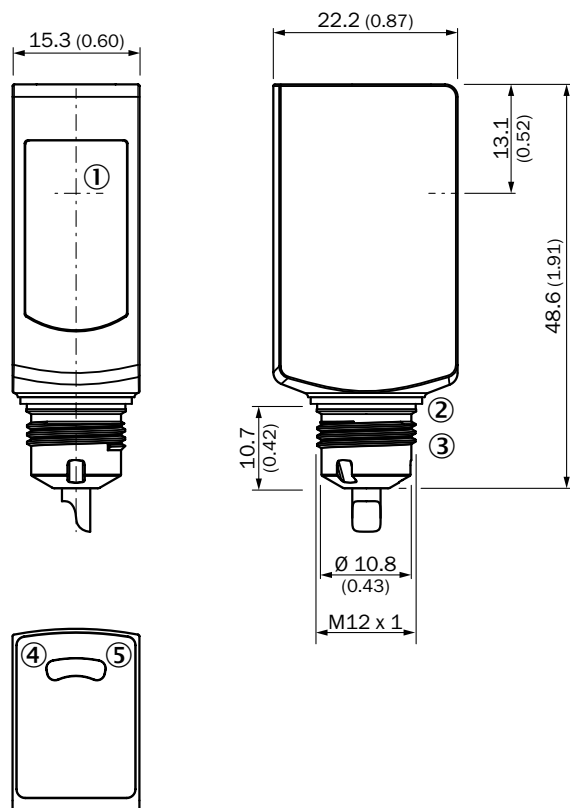
- ① Center of optical axis
- ② Status indicator LED green: power on
- ③ Status indicator LED, yellow: Status of received light beam

F

WL4S-3H, with single teach-in button

- ① Center of optical axis
- ② Gasket (tightening torque 6Nm)
- ③ Connector M12
- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Status indicator LED green: power on
- ⑥ Teach-in button

WSE4S-3H

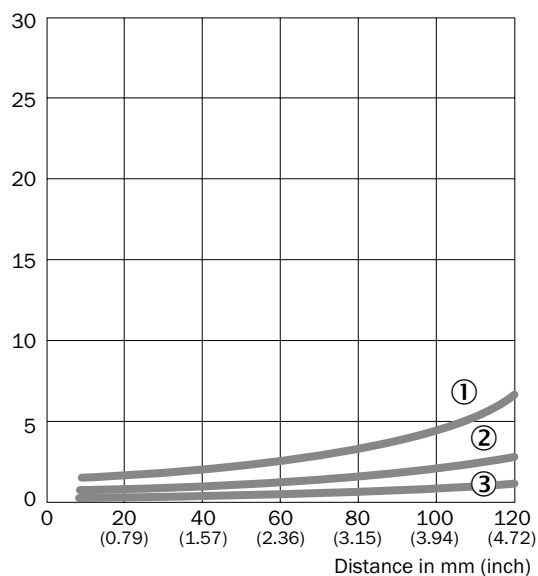


- ① Center of optical axis, sender (WS) and receiver (WE)
- ② Gasket (tightening torque 6Nm)
- ③ Connector M12
- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Status indicator LED green: power on

Characteristic curves

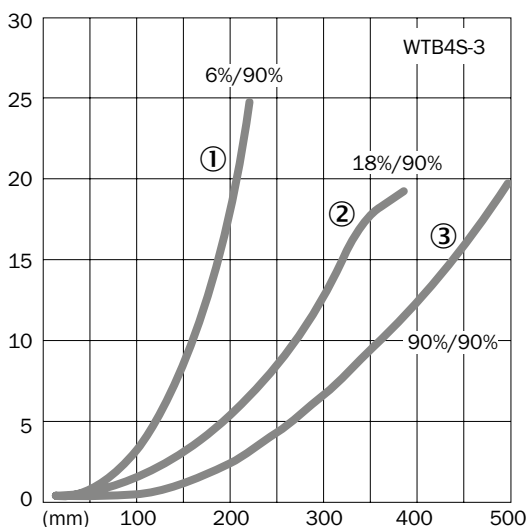
Black-white shift

WTB4S-3, 120 mm



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

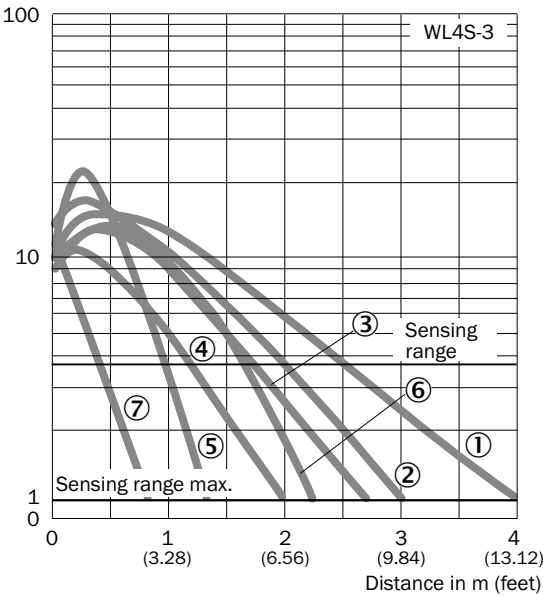
WTB4S-3, 500 mm



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

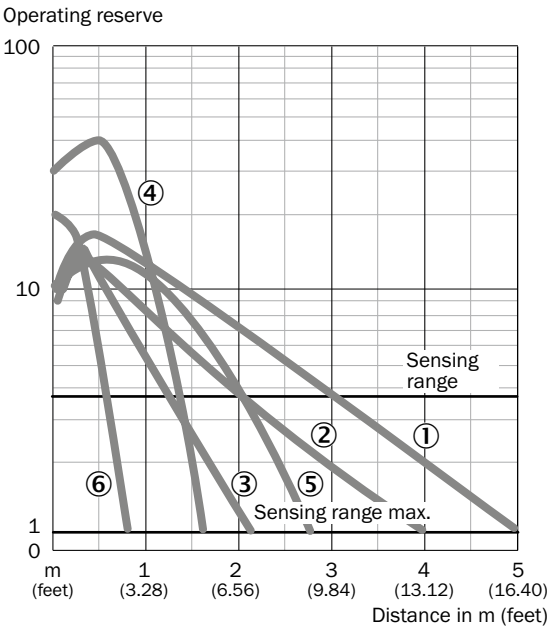
Operating reserve

WL4S-3, 4 m



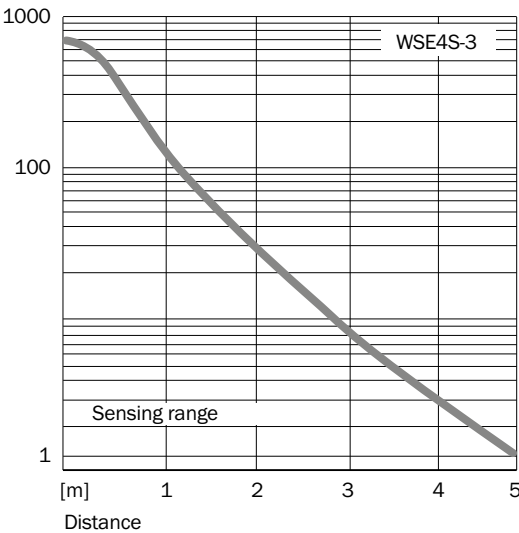
- ① PL80A
- ② P250F
- ③ PL40A
- ④ PL20A
- ⑤ PL10F
- ⑥ P250 CHEM
- ⑦ REF-IRF-56

WL4S-3, 5 m



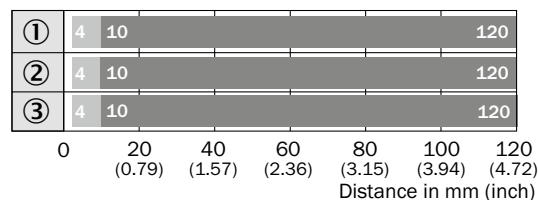
- ① PL80A
- ② PL40A
- ③ PL20A
- ④ PL10F
- ⑤ P250 CHEM
- ⑥ REF-IRF-56

WSE4S-3V, WSE4S-3H



Bar diagrams

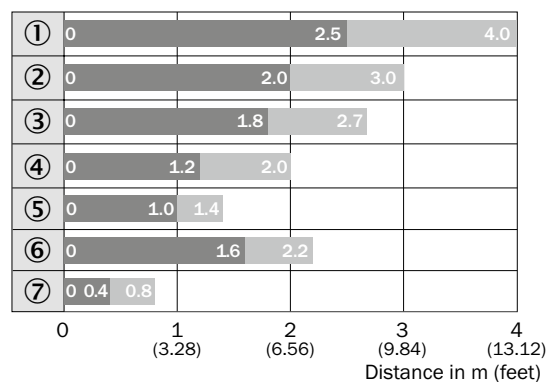
WTB4S-3, 120 mm



■ Sensing range ■ Sensing range max.

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

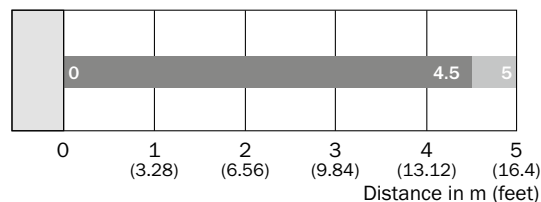
WL4S-3, 4 m



■ Sensing range ■ Sensing range max.

- ① PL80A
- ② P250F
- ③ PL40A
- ④ PL20A
- ⑤ PL10F
- ⑥ P250 CHEM
- ⑦ REF-IRF-56

WSE4S-3



■ Sensing range ■ Sensing range max.

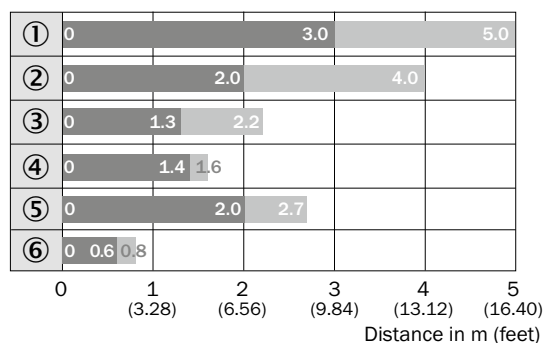
WTB4S-3, 500 mm



■ Sensing range ■ Sensing range max.

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

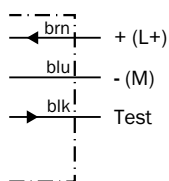
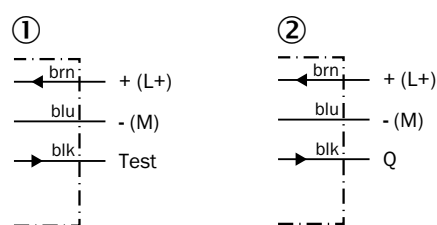
WL4S-3, 5 m



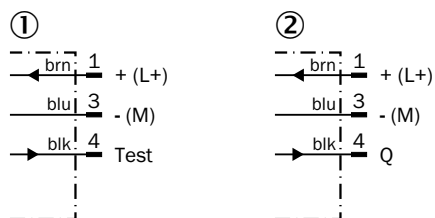
■ Sensing range ■ Sensing range max.

- ① PL80A
- ② PL40A
- ③ PL20A
- ④ PL10F
- ⑤ P250 CHEM
- ⑥ REF-IRF-56

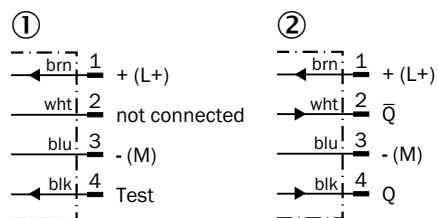
Connection diagram

Cd-055**Cd-061**

① Sender
② Receiver

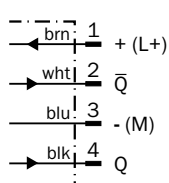
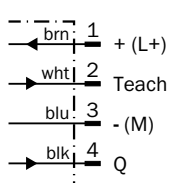
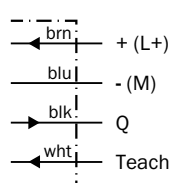
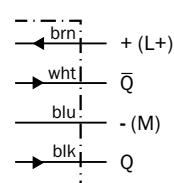
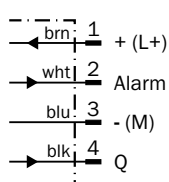
Cd-069

① Sender
② Receiver

Cd-072

① Sender
② Receiver

F

Cd-083**Cd-092****Cd-093****Cd-094****Cd-107**

Recommended accessories

Plug connectors and cables

Connecting cable (female connector-open)M8, 4-pin, PP, hygienic systems

- Cable material: PP
- Connector material: PP

Figure	Connection type head A	Connection type head B	Connecting cable	Enclosure rating	Model name	Part no.
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-0804-G02MN	6033670
			5 m, 4-wire	IP 67, IP 69K	DOL-0804-G05MN	6033671
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-0804-W02MN	6033673
			5 m, 4-wire	IP 67, IP 69K	DOL-0804-W05MN	6033674

Universal bar clamp systems

- For product family: Hygienic Design BeftecHD for sensors with D12 adapter shaft

Figure	Material	Description	Model name	Part no.
	Hygienic Design, Stainless steel V4A (1.4404, 316L), Silicone (seal)	Hygienic design mounting tube with bayonet lock, 14.4 mm x 85.5 mm x 14.4 mm	BEF-HDSBR	4074403
		Hygienic design flange with seal, 40 mm x 12 mm x 40 mm	BEF-HDSF	4072880
		Hygienic design telescopic tube, straight, with bayonet lock without flange, 23 mm x 153 mm x 23 mm	BEF-HDSTRG	2067780
		Hygienic design telescopic tube, straight, with bayonet lock with flange, 40 mm x 165 mm x 40 mm	BEF-HDSTRGF	2067779
		Hygienic design telescopic tube, angled, with bayonet lock without flange, 23 mm x 125 mm x 73 mm	BEF-HDSTRW	2067778
		Hygienic design telescopic tube, angled, with bayonet lock with flange, 40 mm x 125 mm x 76 mm	BEF-HDSTRWF	2067777

Reflectors

Angular

Figure	Material	Description	Model name	Part no.
	Plastic	Chemically resistant, screw connection, 47 mm x 47 mm	P250 CHEM	5321097
	PMMA/ABS	Rectangular, screw connection, 80 mm x 80 mm	PL80A	1003865

Fine triple reflectors

Figure	Material	Description	Model name	Part no.
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
		Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089

Reflective tape

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

Special reflectors

Figure	Material	Description	Model name	Part no.
	Plastic	Chemically resistant, screw connection, 38 mm x 15 mm	PL20 CHEM	5321089
	PMMA/ABS	Antifog, for prevention of moisture fogging on the reflection area, screw connection, 56 mm x 37 mm	PL40A Antifog	5322011
	Plastic	Rectangular, screw connection M3, countersunk screw head, chemical resistant, 56 mm x 37 mm	PL40B-CHEM	5326088
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adapter shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adapter thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

→ For additional accessories, please see page L-861

Reliable detection of transparent objects



Additional information

Detailed technical data.....	F-335
Ordering information.....	F-336
Dimensional drawings	F-337
Characteristic curves	F-338
Bar diagrams.....	F-338
Connection diagram	F-338
Recommended accessories.....	F-339

Product description

The WLG4S-3 Inox Hygiene photoelectric retro-reflective sensors combine strict hygiene requirements based on EHEDG with best-in-class optical performance. The continuous threshold adaptation (AutoAdapt) of the switching threshold enables reliable transparent object detection and reduces the frequency that the sensor or reflector needs. Enclosed in an IP 69K stainless steel housing, these sensors can be adjusted

via a stainless steel pushbutton with a metal membrane. With built-in protection for the sensor cable, no additional mounting brackets or mounting holes are required for in-process machine integration. These sensors as well as additional hygienic reflectors are designed for a completely hygienic sensor solution that is a necessity for the most hygienic machines.

At a glance

- Hygienic designed stainless steel housing and accessories (316L/1.4404)
- Hygienic mounting using M12-adaptor thread or D12-adaptor shaft
- IP 66, IP 67, IP 68 and IP 69K enclosure rating and Ecolab certified
- Resistant to a variety of common cleaning and disinfection agents
- PinPoint LED technology provides a highly visible laser-like light spot
- Teach-in stainless steel metal membrane or external teach-in

Your benefits

- Smooth hygienic housing and accessories with no grooves or crevices eliminates the potential for bacteria to grow, providing a more hygienic solution.
- Long service life in harsh conditions ensures less downtime and fewer replacement costs
- Reliable detection of all transparent objects in the pharmaceutical and food and beverage industries
- Quick and easy adjustment via a stainless steel metal membrane teach-in pushbutton
- Quick and easy alignment due to highly visible PinPoint emitter LED
- Remote monitoring and fast diagnostics via IO-Link (optional)

→ www.mysick.com/en/W4S-3_Inox_Hygiene_Glass

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

Sensor principle	Photoelectric retro-reflective sensor
Detection principle	Autocollimation
Dimensions (W x H x D)	15.25 mm x 63.2 mm x 22.15 mm
Housing design	Hygiene
Housing design (light emission)	Rectangular
Sensing range max. ¹⁾	0 m ... 5 m
Sensing range ¹⁾	0 m ... 3 m
Type of light	Visible red light
Light source ²⁾	PinPoint LED
Light spot size (distance)	Ø 45 mm (1.5 m)
Wave length	650 nm
Adjustment	Single teach-in button / Cable, Single teach-in button ³⁾ / Cable ³⁾ (depending on type)
Continuous threshold adaption (AutoAdapt)	✓
Special feature	Detection of transparent objects

¹⁾ PL80A.

²⁾ Average service life of 100,000 h at T_A = +25 °C.

³⁾ External teach-in: pulse > 2 s with voltage U_v with PNP and M with NPN.

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	< 5 V _{pp}
Power consumption ³⁾	≤ 30 mA
Output type	PNP / NPN (depending on type)
Output function	Complementary
Switching mode	Light/dark-switching / Dark-switching (depending on type)
Output current I _{max.}	≤ 100 mA
Response time ⁴⁾	< 0.5 ms
Switching frequency ⁵⁾	1,000 Hz
Connection type	Cable, 2 m ⁶⁾ / Male connector, M8 ⁷⁾ / Cable with connector, M8, 150 mm ^{6) 7)} (depending on type)
Mechanical connection	M12 adapter thread / D12 adapter shaft (depending on type)
Circuit protection	A ⁸⁾ , B ⁹⁾ , C ¹⁰⁾
Protection class	III
Weight	
	Cable ⁶⁾ 80 g
	Connector ⁷⁾ 140 g
	Cable with connector ^{6) 7)} 50 g
Polarisation filter	✓

F

Housing material	Stainless steel 316L
Enclosure rating	IP 66, IP 67, IP 68, IP 69K
Ambient operating temperature	-30 °C ... +60 °C / -30 °C ... +70 °C ¹⁾
Ambient storage temperature	-30 °C ... +75 °C

¹⁾ Limit values, reverse-polarity protected, 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⁾ Tightening torque, max.: 0.6 Nm.

⁸⁾ A = V_S connections reverse-polarity protected.

⁹⁾ B = inputs and output reverse-polarity protected.

¹⁰⁾ C = interference suppression.

¹¹⁾ At $UV \leq 24$ V and $IA < 30$ mA.

Ordering information

Other models available at www.mysick.com/en/W4S-3_Inox_Hygiene_Glass

WLG4S-3H

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation

Sensing range max. ¹⁾	Mechanical connection	Output type	Switching mode	Adjustment	Connection	Connection diagram	Model name	Part no.
0 m ... 5 m	M12 adapter thread	PNP	Light/dark-switching	Single teach-in button	Cable with connector M8, 4-pin, 150 mm, PVC	Cd-083	WLG4S-3P3232H	1048120
			Dark-switching	Cable, Single teach-in button ²⁾		Cd-092	WLG4S-3F3234H	1048121
		NPN	Light/dark-switching	Single teach-in button	Cable, 4-wire, 2 m, PVC	Cd-094	WLG4S-3N1132H	1048123
			Dark-switching	Cable, Single teach-in button ²⁾	Cable, 4-wire, 2 m, PVC	Cd-093	WLG4S-3E1134H	1048124
	D12 adapter shaft	PNP	Light/dark-switching	Cable ²⁾	Cable, 4-wire, 2 m, PVC	Cd-093	WLG4S-3E1135H	1048126
				Single teach-in button	Connector M8, 4-pin	Cd-083	WLG4S-3P5232H	1057053

¹⁾ PL80A.

²⁾ External teach-in: pulse > 2 s with voltage U_v with PNP and M with NPN.

WLG4S-3H Alarm output

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation

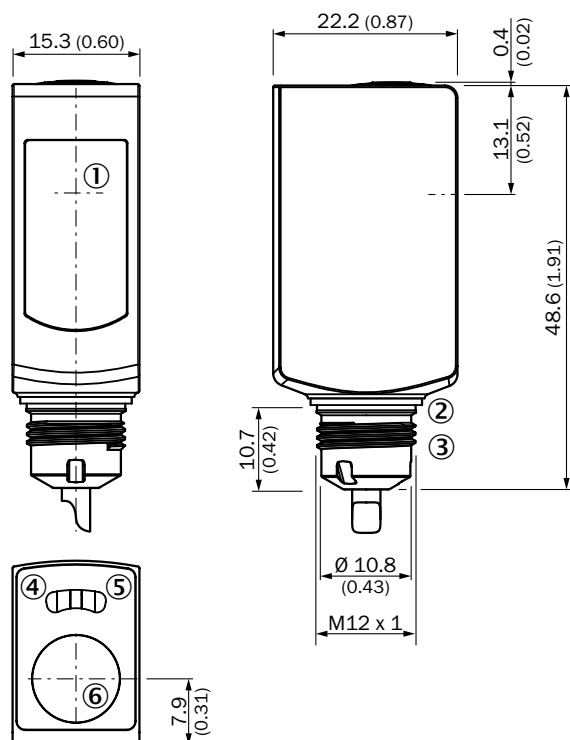
Sensing range max. ¹⁾	Mechanical connection	Output type	Switching mode	Adjustment	Connection	Connection diagram	Model name	Part no.
0 m ... 5 m	M12 adapter thread	PNP	Dark-switching	Single teach-in button	Cable with connector M8, 4-pin, 150 mm, PVC	Cd-107	WLG4S-3V3232H	1048122

¹⁾ PL80A.

Dimensional drawings

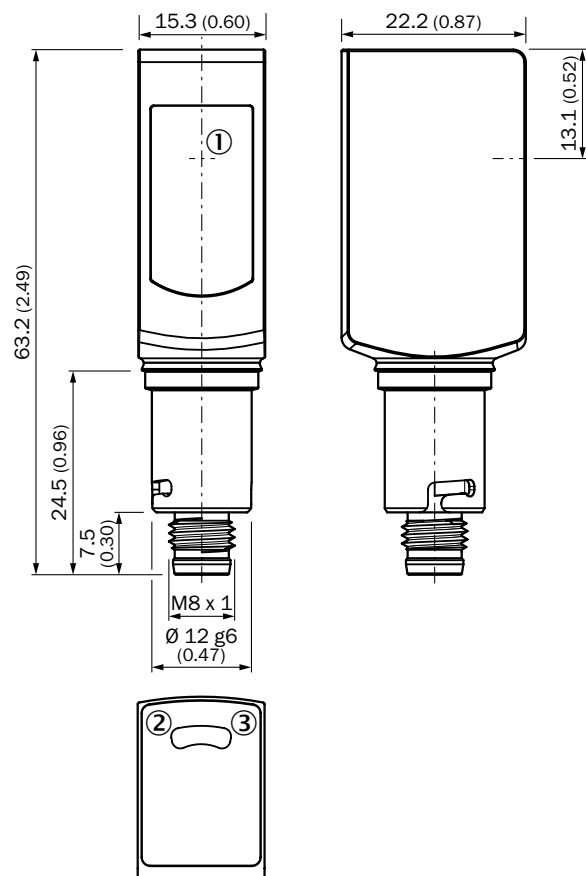
Dimensions in mm (inch)

WLG4S-3H, with single teach-in button



- ① Center of optical axis
- ② Gasket (tightening torque 6Nm)
- ③ Connector M12
- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Status indicator LED green: power on
- ⑥ Teach-in button

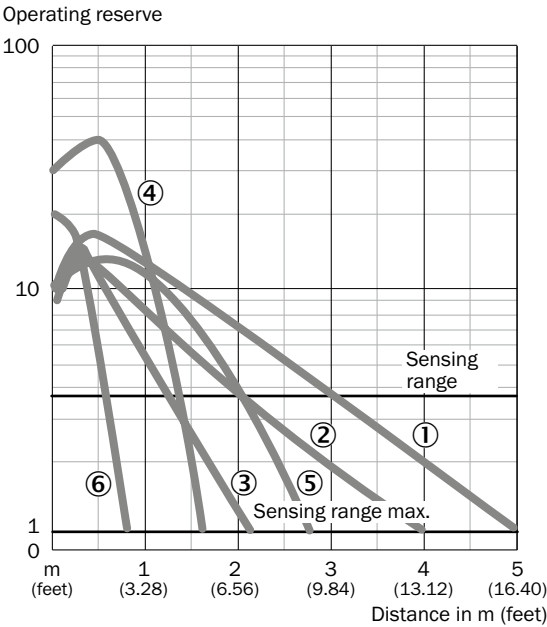
WLG4S-3H, without single teach-in button, D12 adapter shaft, I-adaption



- ① Center of optical axis
- ② Status indicator LED green: power on
- ③ Status indicator LED, yellow: Status of received light beam

Characteristic curves

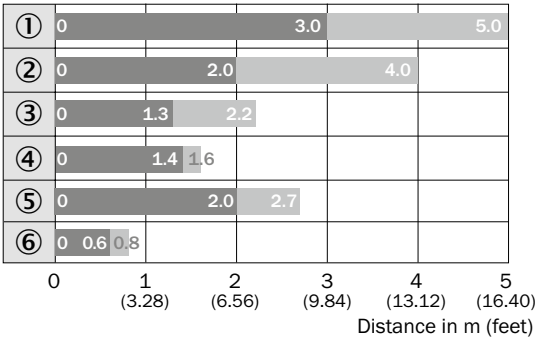
WLG4S-3, 5 m



- ① PL80A
- ② PL40A
- ③ PL20A
- ④ PL10F
- ⑤ P250 CHEM
- ⑥ REF-IRF-56

Bar diagrams

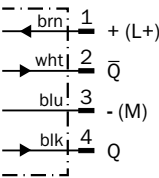
WLG4S-3, 5 m



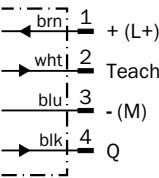
- Sensing range ■ Sensing range max.
- ① PL80A
 - ② PL40A
 - ③ PL20A
 - ④ PL10F
 - ⑤ P250 CHEM
 - ⑥ REF-IRF-56

Connection diagram

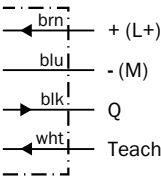
Cd-083



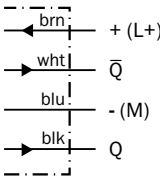
Cd-092



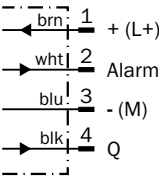
Cd-093



Cd-094



Cd-107



Recommended accessories

Plug connectors and cables

Connecting cable (female connector-open), hygienic systems

- Cable material: PP
- Connector material: PP

Figure	Connection type head A	Connection type head B	Connecting cable	Enclosure rating	Model name	Part no.
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-0804-G02MN	6033670
			5 m, 4-wire	IP 67, IP 69K	DOL-0804-G05MN	6033671
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-0804-W02MN	6033673
			5 m, 4-wire	IP 67, IP 69K	DOL-0804-W05MN	6033674

Universal bar clamp systems

- For product family: Hygienic Design BeftecHD for sensors with D12 adapter shaft

Figure	Material	Description	Model name	Part no.
	Hygienic Design, Stainless steel V4A (1.4404, 316L), Silicone (seal)	Hygienic design mounting tube with bayonet lock, 14.4 mm x 85.5 mm x 14.4 mm	BEF-HDSBR	4074403
		Hygienic design flange with seal, 40 mm x 12 mm x 40 mm	BEF-HDSF	4072880
		Hygienic design telescopic tube, straight, with bayonet lock without flange, 23 mm x 153 mm x 23 mm	BEF-HDSTRG	2067780
		Hygienic design telescopic tube, straight, with bayonet lock with flange, 40 mm x 165 mm x 40 mm	BEF-HDSTRGF	2067779
		Hygienic design telescopic tube, angled, with bayonet lock without flange, 23 mm x 125 mm x 73 mm	BEF-HDSTRW	2067778
		Hygienic design telescopic tube, angled, with bayonet lock with flange, 40 mm x 125 mm x 76 mm	BEF-HDSTRWF	2067777

Reflectors

Angular

Figure	Material	Description	Model name	Part no.
	Plastic	Chemically resistant, screw connection, 47 mm x 47 mm	P250 CHEM	5321097
	PMMA/ABS	Rectangular, screw connection, 80 mm x 80 mm	PL80A	1003865

Fine triple reflectors

Figure	Material	Description	Model name	Part no.
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
		Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089

Reflective tape

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

Special reflectors

Figure	Material	Description	Model name	Part no.
	Plastic	Chemically resistant, screw connection, 38 mm x 15 mm	PL20 CHEM	5321089
	PMMA/ABS	Antifog, for prevention of moisture fogging on the reflection area, screw connection, 56 mm x 37 mm	PL40A Antifog	5322011
	Plastic	Rectangular, screw connection M3, countersunk screw head, chemical resistant, 56 mm x 37 mm	PL40B-CHEM	5326088
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adapter shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adapter thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

→ For additional accessories, please see page L-861

The new standard for optical and mechanical ruggedness



Additional information

Detailed technical data.	F-343
Ordering information.	F-344
Dimensional drawings.	F-345
Characteristic curves.	F-346
Bar diagrams.	F-346
Light spot diameter.	F-347
Connection diagram.	F-348
Recommended accessories.	F-349

Product description

For the best possible performance in a wet environment: thanks to high light immunity, the new W4SL-3 Inox miniature photoelectric sensors from SICK with precise laser light spot set new standards when it comes to preventing undesired background reflections and to ambient light immunity, even in modern energy-saving lights. The combination of SICK's latest proprietary laser and SIRIC® technologies reduces incorrect switching. The photoelectric sensors complete this product family. One device can reliably

detect all transparent objects as well as tiny non-transparent objects. This reduces the variety of devices and saves on storage costs. The photoelectric sensors also feature an IO-Link function, so that initial system performance diagnostics can be done independently. The W4SL-3 Inox is certified in accordance with ECOLAB. The membrane teach-in pushbutton and the pin-cast electrical connections make it reliable even in critical ambient conditions.

At a glance

- Precise laser light spot, laser class 1
- Stainless steel housing with wash-down design
- Latest SIRIC® and laser technologies for outstanding background suppression and ambient light immunity
- Teach-in pushbutton can be switched between detection of transparent and tiny non-transparent objects
- ECOLAB certified, tested to IP 66, IP 67, IP 68 and IP 69K enclosure rating
- IO-Link (optional)

Your benefits

- Precise laser light spot for highly accurate switching
- Washable stainless steel housing reduces bacterial contamination
- Innovative washdown design with sealed connections and unique patented membrane teach-in pushbutton
- High ambient light immunity reduces incorrect switching and ultimately machine downtime, even when modern energy-saving lights are used
- The highest degree of machine design flexibility. Outstanding BGS (background suppression) eliminates the effect of undesired background reflections. Autocollimation permits detection through very small drilled holes.
- IO-Link provides effortless initial diagnostics of system performance

→ www.mysick.com/en/W4SL-3V

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

	WTB4SL-3V	WSE4SL-3V
Sensor principle	Photoelectric proximity sensor	Through-beam photoelectric sensor
Detection principle	Background suppression	–
Dimensions (W x H x D)	15.3 mm x 55.4 mm x 22.2 mm	
Housing design	Washdown	
Housing design (light emission)	Rectangular, Slim	
Mounting hole	M3	
Sensing range max.	25 mm ... 300 mm ¹⁾	0 m ... 60 m
Sensing range	25 mm ... 300 mm ¹⁾	0 m ... 50 m
Type of light	Visible red light	
Light source ²⁾	Laser	
Light spot size (distance)	Ø 1 mm (170 mm)	Ø 1 mm (500 mm)
Wave length	650 nm	
Laser class ³⁾	1	
Adjustment	Single teach-in button	

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

²⁾ Average service life 50,000 h at T_A = +25 °C.

³⁾ EN60825-1:2008-05 & IEC 60825-1:2007-03 / CDRH 21 CFR 1040.10 & 1040.11

Mechanics/electronics

	WTB4SL-3V	WSE4SL-3V
Supply voltage ¹⁾	10 V DC ... 30 V DC	
Ripple ²⁾	< 5 V _{pp}	
Power consumption ³⁾	≤ 30 mA	
Output type	PNP ⁴⁾ / NPN ⁴⁾ (depending on type)	
Output function	Complementary	
Switching mode ⁴⁾	Light/dark-switching	
Output current I _{max.}	≤ 100 mA	
Response time ⁵⁾	≤ 0.5 ms	
Switching frequency ⁶⁾	1,000 Hz	
Connection type	Male connector, M8 ⁷⁾ / Male connector, M12 ⁹⁾ / Cable, 2 m ⁸⁾ (depending on type)	
Circuit protection	A ¹⁰⁾ , B ¹¹⁾ , C ¹²⁾	
Protection class	III	
Weight	Cable ⁸⁾ Connector M8 ⁷⁾ Connector M12 ⁹⁾ 80 g 40 g 45 g	
Housing material	Stainless steel V4A (1.4404, 316L)	
Optics material	PMMA	

	WTB4SL-3V	WSE4SL-3V
Enclosure rating	IP 66, IP 67, IP 68, IP 69K ¹³⁾	
Ambient operating temperature	-10 °C ... +50 °C	
Ambient operating temperature extended ^{14) 15)}	-30 °C ... +55 °C	
Ambient storage temperature	-30 °C ... +70 °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⁾ Q = light-switching.

⁵⁾ Signal transit time with resistive load.

⁶⁾ With light/dark ratio 1:1.

⁷⁾ Tightening torque, max.: 0.6 Nm.

⁸⁾ Do not bend below 0 °C.

⁹⁾ Tightening torque, max.: 0.7 Nm.

¹⁰⁾ A = V_S connections reverse-polarity protected.

¹¹⁾ B = inputs and output reverse-polarity protected.

¹²⁾ C = interference suppression.

¹³⁾ Only in case of correctly mounted IP 69K connecting cable.

¹⁴⁾ As of $T_a = 50$ °C, a max. supply voltage $V_{max.} = 24$ V and a max. load current $I_{max.} = 50$ mA is permitted.

¹⁵⁾ Using the sensor below $T_a = -10$ °C is possible, if the sensor is turned on at $T_a > -10$ °C, then the environment cools down and the sensor is not disconnected from the supply voltage during the whole time. It is not allowed to turn on the sensor below $T_a = -10$ °C.

Ordering information

Other models available at www.mysick.com/en/W4SL-3V

WTB4SL-3V

- **Sensor principle:** photoelectric proximity sensor
- **Switching mode:** light/dark-switching (Q = light-switching.)
- **Adjustment:** single teach-in button

Sensing range max. ¹⁾	Output type	Connection	Connection diagram	Model name	Part no.
25 mm ... 300 mm	PNP	Connector M8, 4-pin	Cd-083	WTB4SL-3P2262V	1058251
		Connector M12, 4-pin	Cd-083	WTB4SL-3P2462V	1058253
		Cable, 4-wire, 2 m, PVC	Cd-094	WTB4SL-3P1162V	1058256
	NPN	Connector M8, 4-pin	Cd-083	WTB4SL-3N2262V	1058252
		Connector M12, 4-pin	Cd-083	WTB4SL-3N2462V	1058254
		Cable, 4-wire, 2 m, PVC	Cd-094	WTB4SL-3N1162V	1058257

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

WSE4SL-3V

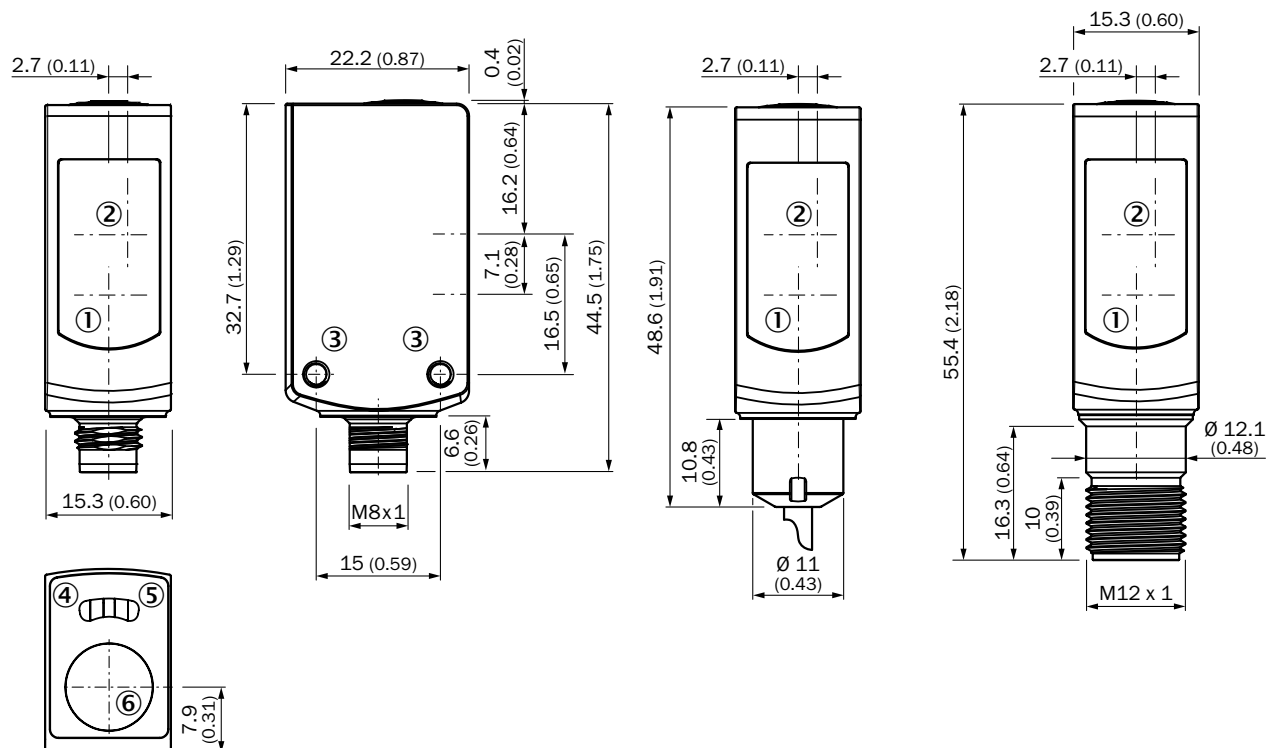
- **Sensor principle:** through-beam photoelectric sensor
- **Switching mode:** light/dark-switching (Q = light-switching.)
- **Adjustment:** single teach-in button

Sensing range max.	Output type	Connection	Connection diagram	Model name	Part no.
0 m ... 60 m	PNP	Connector M8, 4-pin	Cd-232	WSE4SL-3P2237V	1058267
		Connector M12, 4-pin	Cd-232	WSE4SL-3P2437V	1058269
	NPN	Cable, 4-wire, 2 m, PVC	Cd-231	WSE4SL-3N1137V	1058270

Dimensional drawings

Dimensions in mm (inch)

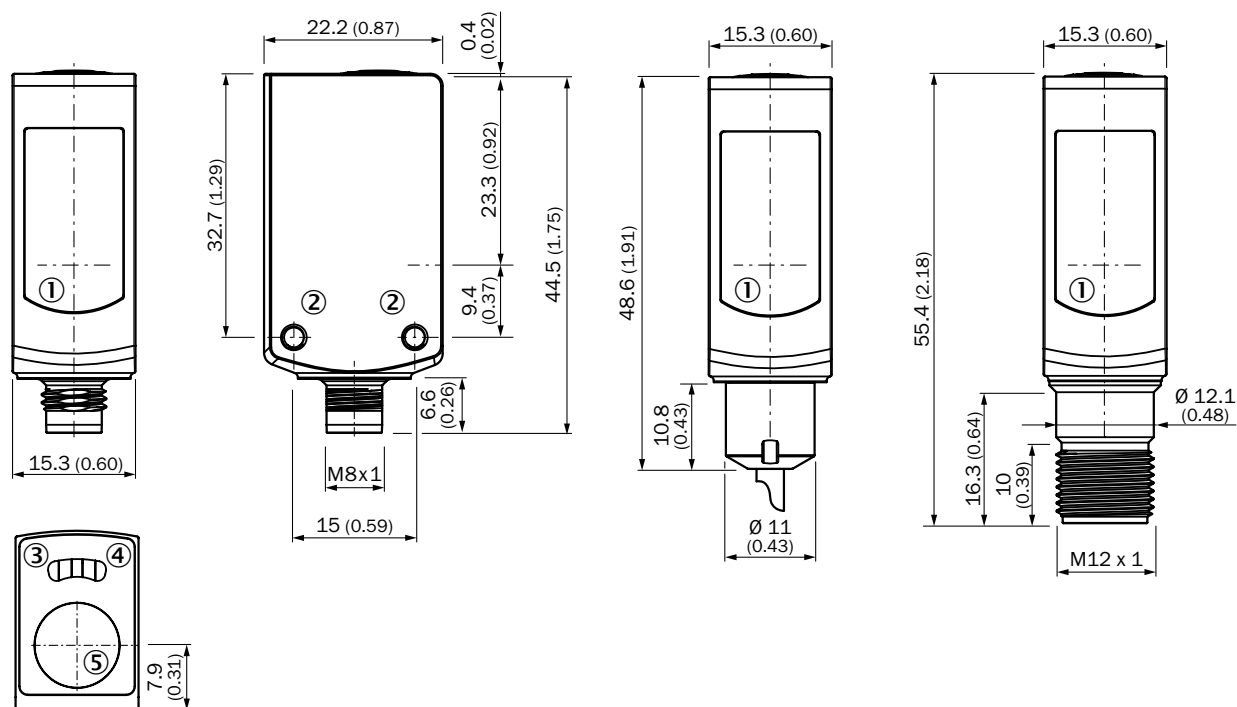
WTB4SL-3



- ① Center of optical axis, sender
- ② Center of optical axis, receiver
- ③ Threaded mounting hole M3

- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Status indicator LED green: power on
- ⑥ Single teach-in button

WSE4SL-3



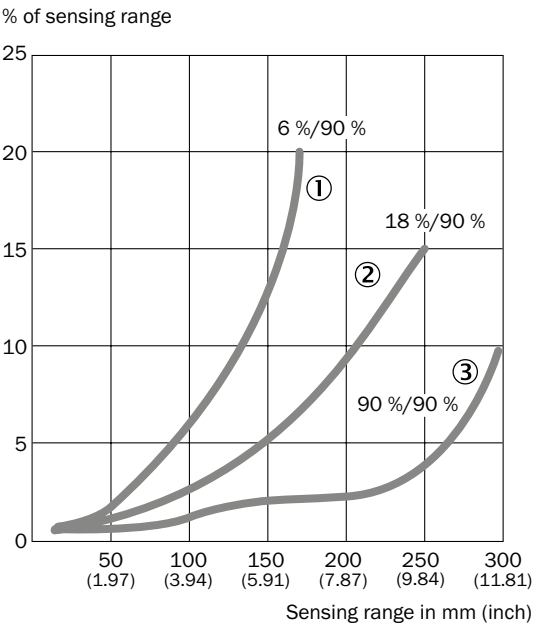
- ① Center of optical axis
- ② Threaded mounting hole M3
- ③ Status indicator LED, yellow: Status of received light beam

- ④ Status indicator LED green: power on
- ⑤ Single teach-in button

Characteristic curves

Black-white shift

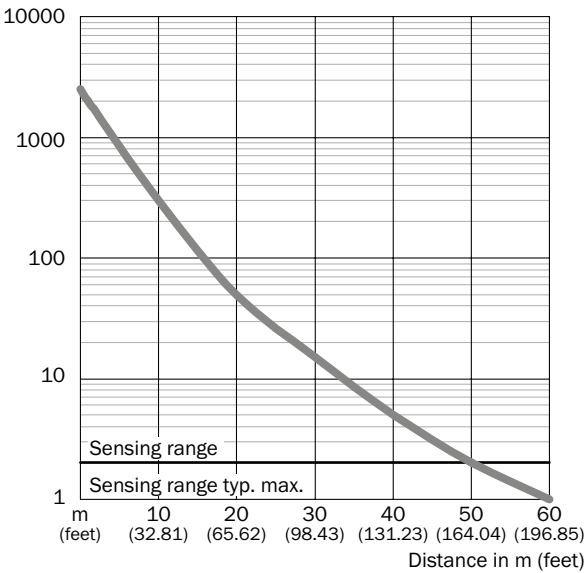
WTB4SL-3



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

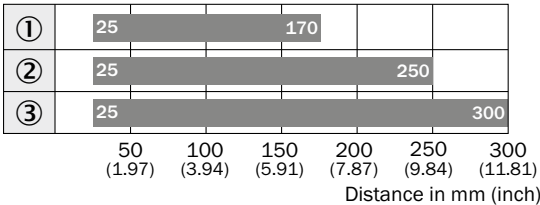
Operating reserve

WSE4SL-3



Bar diagrams

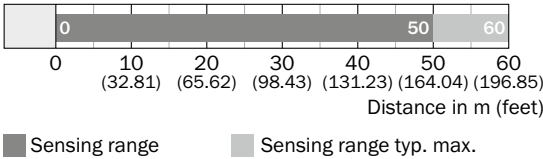
WTB4SL-3



■ 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

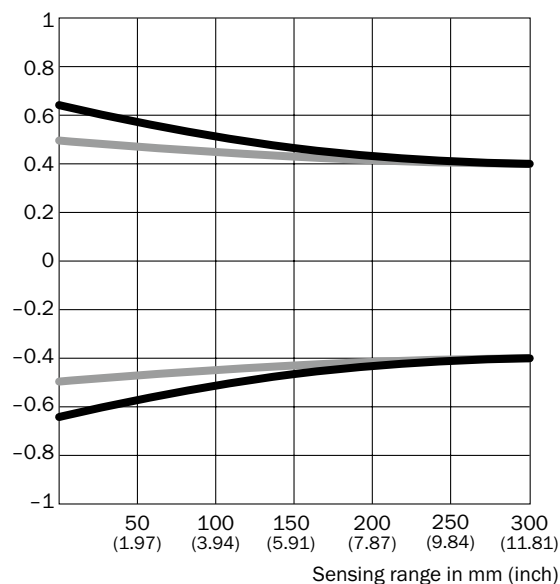
WSE4SL-3



Light spot diameter

WTB4SL-3

Radius in mm (inch)



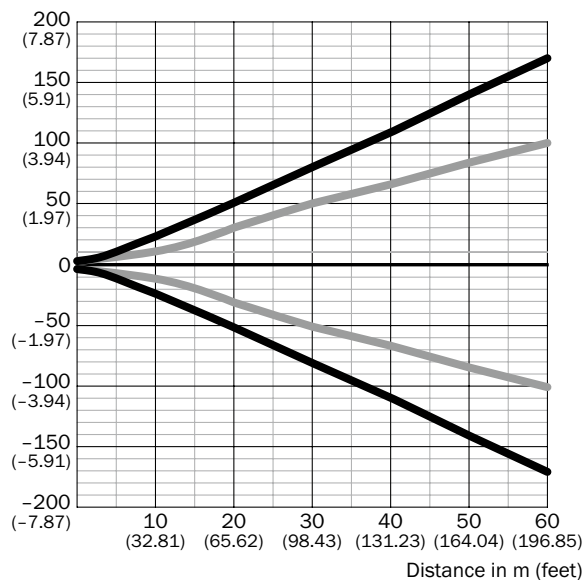
Dimensions in mm (inch)

Sensing range	Vertical	Horizontal
50 mm (1.97)	1.2 (0.05)	1.0 (0.04)
100 mm (3.94)	1.1 (0.04)	1.0 (0.04)
200 mm (7.87)	0.9 (0.04)	0.9 (0.04)
300 mm (11.81)	0.8 (0.03)	0.8 (0.03)

— Vertical
— Horizontal

WSE4SL-3

Radius in mm (inch)



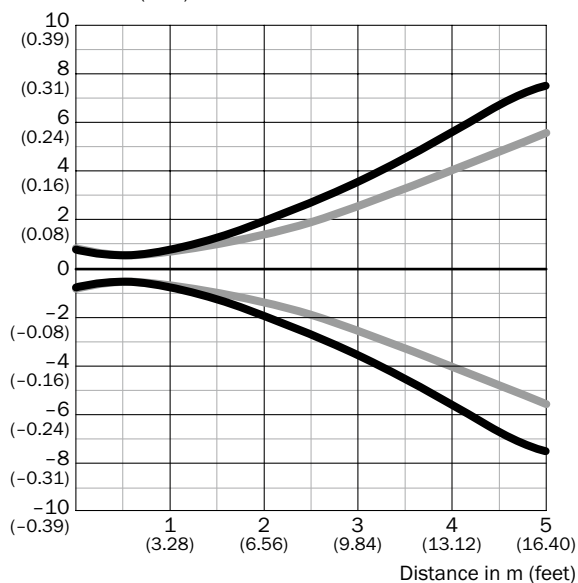
Dimensions in mm (inch)

Sensing range	Vertical	Horizontal
0.5 m (1.64 feet)	< 1.0 (0.04)	< 1.0 (0.04)
1 m (3.28 feet)	1.5 (0.06)	1.2 (0.05)
5 m (16.40 feet)	15 (0.59)	11 (0.43)
10 m (32.81 feet)	45 (1.77)	28 (1.10)
60 m (196.85 feet)	336 (13.23)	200 (7.87)

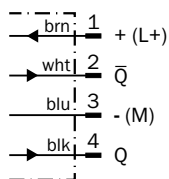
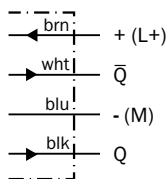
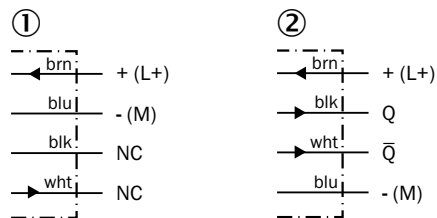
— Vertical
— Horizontal

WSE4SL-3, close up, near range

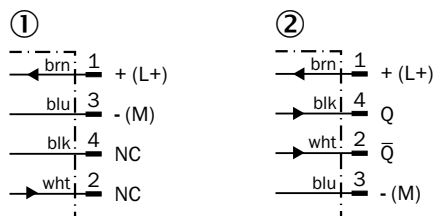
Radius in mm (inch)



— Vertical
— Horizontal

F**Connection diagram****Cd-083****Cd-094****Cd-231**

① Sender
② Receiver

Cd-232

① Sender
② Receiver

Recommended accessories

Plug connectors and cables

Connecting cable (female connector-open), PVC, hygienic systems

- Cable material: PVC
- Connector material: PVC

Figure	Connection type head A	Connection type head B	Connecting cable	Enclosure rating	Model name	Part no.
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-0804-G02MN	6033670
			5 m, 4-wire	IP 67, IP 69K	DOL-0804-G05MN	6033671
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-0804-W02MN	6033673
			5 m, 4-wire	IP 67, IP 69K	DOL-0804-W05MN	6033674
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-1204-G02MN	6028128
			5 m, 4-wire	IP 67, IP 69K	DOL-1204-G05MN	6028130
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-1204-W02MN	6028129
			5 m, 4-wire	IP 67, IP 69K	DOL-1204-W05MN	6028131

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N02N for universal clamp bracket	BEF-KHS-N02N	2051618

→ For additional accessories, please see page L-861

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Detect all transparent objects with one device – Change mode via teach button



Additional information

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Bar diagrams.....	F-353
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Connection diagram	F-355
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Product description

A single press of a button on the WL4SLG-3 Inox allows operation in the detection mode for transparent and/or non-transparent objects. This means that one device can be used to detect transparent vials and PET bottles, but also metallic needles and wires, for example. The precise, highly visible laser light spot with sharp contour ensures a high level of detection quality and facilitates alignment. Autocollimation technology ensures that the sensor

reliably detects objects at close range as well as through narrow gaps or small drilled holes. The photoelectric sensors also feature an IO-Link function, so that initial system performance diagnostics can be done independently. Furthermore, IO-Link permits the integration of additional functions such as meters or profile recognition directly into the sensor. There is no need for complex control programming.

At a glance

- Precise laser light spot, laser class 1, no blind spots
- Stainless steel housing with wash-down design
- Latest SIRIC® and laser technologies for very good background suppression and ambient light immunity
- ECOLAB certified, tested to IP66, IP67, IP68 and IP69K enclosure rating
- Teach-in pushbutton can be switched between detection of transparent and tiny non-transparent objects
- IO-Link (optional)

Your benefits

- Precise laser light spot for highly accurate switching
- Washable stainless steel housing reduces bacterial contamination
- Innovative washdown design with sealed connections and unique patented membrane teach-in pushbutton
- High ambient light immunity reduces incorrect switching and ultimately machine downtime, even when modern energy-saving lights are used
- The highest degree of machine design flexibility. Outstanding BGS (background suppression) eliminates the effect of undesired background reflections. Autocollimation permits detection through very small drilled holes.
- IO-Link provides effortless initial diagnostics of system performance

→ www.mysick.com/en/W4SLG-3V

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

Sensor principle	Photoelectric retro-reflective sensor
Detection principle	Autocollimation
Dimensions (W x H x D)	15.3 mm x 55.4 mm x 22.2 mm
Housing design	Washdown
Housing design (light emission)	Rectangular, Slim
Mounting hole	M3
Sensing range max. ¹⁾	0 m ... 4.5 m
Sensing range ¹⁾	0 m ... 2 m
Type of light	Visible red light
Light source ²⁾	Laser
Light spot size (distance)	Ø 1 mm (500 mm)
Wave length	650 nm
Laser class ³⁾	1
Adjustment	Single teach-in button / Cable, Single teach-in button ⁴⁾ (depending on type)
Special feature	Detection of transparent objects

¹⁾ REF-AC1000.

²⁾ Average service life 50,000 h at T_A = +25 °C.

³⁾ EN60825-1:2008-05 & IEC 60825-1:2007-03 / CDRH 21 CFR 1040.10 & 1040.11.

⁴⁾ Adjustment via cable (ET): white cable or PIN2 according to the desired sensitivity > 2 ... < 8 s or put > 8 s on L+ (PNP) or on M (NPN)

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	< 5 V _{pp}
Power consumption ³⁾	≤ 30 mA
Output type	PNP ⁴⁾ ⁵⁾
Output function	Complementary
Switching mode	Light/dark-switching ⁴⁾ ⁵⁾
Output current I _{max.}	≤ 100 mA
Response time ⁶⁾	≤ 0.5 ms
Switching frequency ⁷⁾	1,000 Hz
Connection type	Male connector, M8 ⁸⁾ / Male connector, M12 ⁹⁾ / Cable, 2 m ¹⁰⁾ (depending on type)
Circuit protection	A ¹¹⁾ , B ¹²⁾ , C ¹³⁾
Protection class	III
Weight	
	Cable ¹⁰⁾ 80 g
	Connector M8 ⁸⁾ 40 g
	Connector M12 ⁹⁾ 45 g
Polarisation filter	✓
Housing material	Stainless steel V4A (1.4404, 316L)
Optics material	PMMA

Enclosure rating	IP 66, IP 67, IP 68, IP 69K ¹⁴⁾
Ambient operating temperature	-10 °C ... +50 °C
Ambient operating temperature extended ^{15) 16)}	-30 °C ... +55 °C
Ambient storage temperature	-30 °C ... +70 °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⁾ Q = light-switching.

⁵⁾ Q = dark-switching.

⁶⁾ Signal transit time with resistive load.

⁷⁾ With light/dark ratio 1:1.

⁸⁾ Tightening torque, max.: 0.6 Nm.

⁹⁾ Tightening torque, max.: 0.7 Nm.

¹⁰⁾ Do not bend below 0 °C.

¹¹⁾ A = V_S connections reverse-polarity protected.

¹²⁾ B = inputs and output reverse-polarity protected.

¹³⁾ C = interference suppression.

¹⁴⁾ Only in case of correctly mounted IP 69K connecting cable.

¹⁵⁾ As of $T_a = 50$ °C, a max. supply voltage $V_{max.} = 24$ V and a max. load current $I_{max.} = 50$ mA is permitted.

¹⁶⁾ Using the sensor below $T_a = -10$ °C is possible, if the sensor is turned on at $T_a > -10$ °C, then the environment cools down and the sensor is not disconnected from the supply voltage during the whole time. It is not allowed to turn on the sensor below $T_a = -10$ °C.

Ordering information

Other models available at www.mysick.com/en/W4SLG-3V

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WL4SLG-3V

- **Sensor principle:** photoelectric retro-reflective sensor
- **Output type:** PNP

Sensing range max. ¹⁾	Switching mode	Adjustment	Connection	Connection diagram	Model name	Part no.
0 m ... 4.5 m	Light/dark-switching ²⁾	Single teach-in button	Connector M8, 4-pin	Cd-083	WL4SLG-3P2232V	1058258
			Connector M12, 4-pin	Cd-083	WL4SLG-3P2432V	1058261
			Cable, 4-wire, 2 m, PVC	Cd-094	WL4SLG-3P1132V	1058266
	Light/dark-switching ³⁾	Cable, Single teach-in button ⁴⁾	Connector M8, 4-pin	Cd-195	WL4SLG-3F2234V	1058260
			Connector M12, 4-pin	Cd-195	WL4SLG-3F2434V	1058263

¹⁾ REF-AC1000.

²⁾ Q = light-switching.

³⁾ Q = dark-switching.

⁴⁾ Adjustment via cable (ET): white cable or PIN2 according to the desired sensitivity > 2 ... < 8 s or put > 8 s on L+ (PNP) or on M (NPN)

WL4SLG-3V, IO-Link

- **Sensor principle:** photoelectric retro-reflective sensor
- **Output type:** PNP
- **IO-Link:** standard functions

Sensing range max. ¹⁾	Switching mode ²⁾	Adjustment	Connection	Connection diagram	Model name	Part no.
0 m ... 4.5 m	Light/dark-switching	Single teach-in button	Connector M12, 4-pin	Cd-083	WL4SLGC-3P2432V	1058262

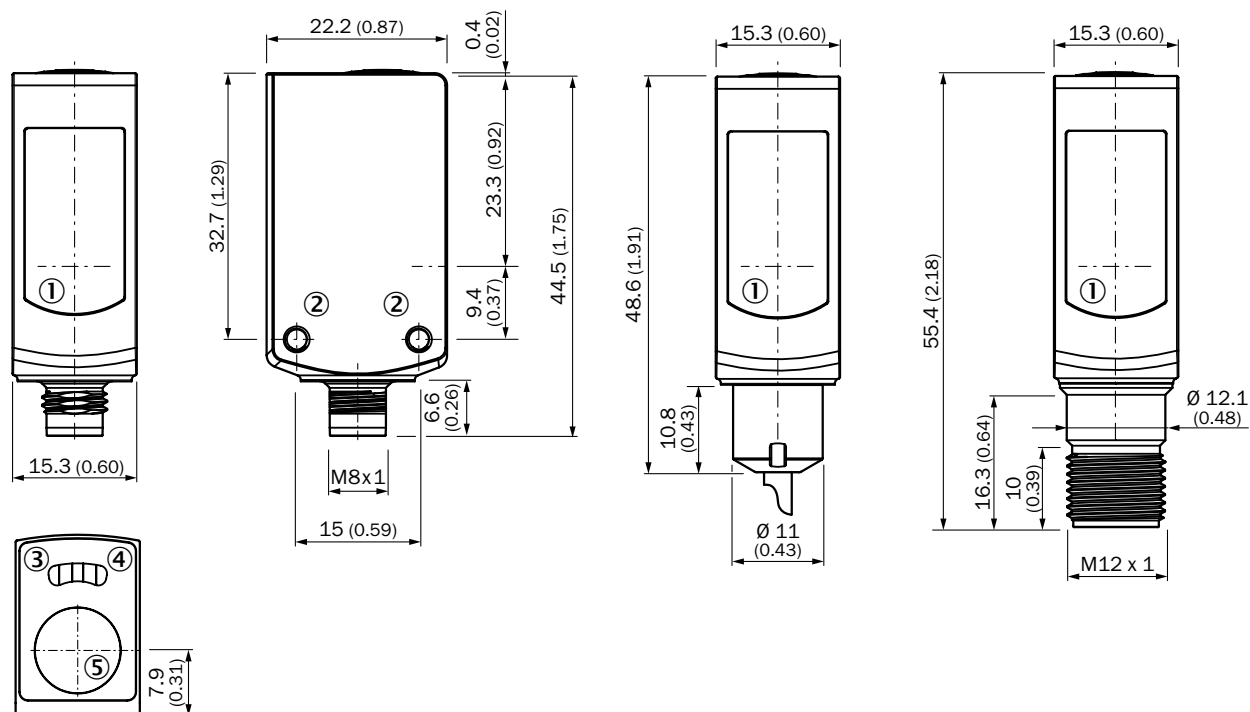
¹⁾ REF-AC1000.

²⁾ Q = light-switching.

Dimensional drawings

Dimensions in mm (inch)

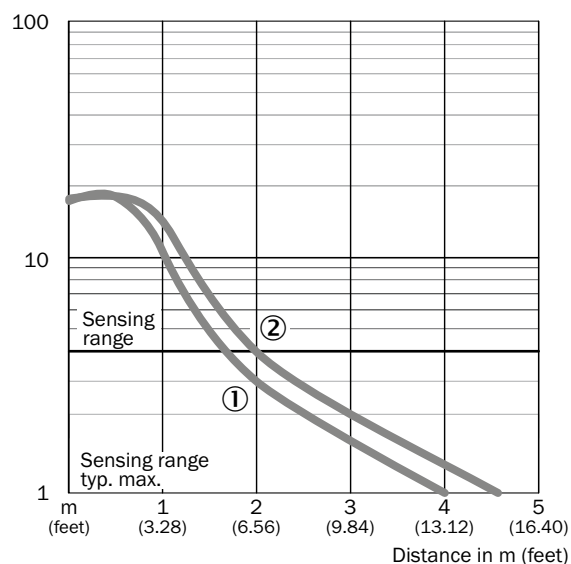
WL4SLG-3V



Characteristic curves

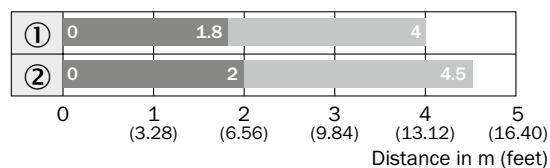
Operating reserve

WL4SLG-3



Bar diagrams

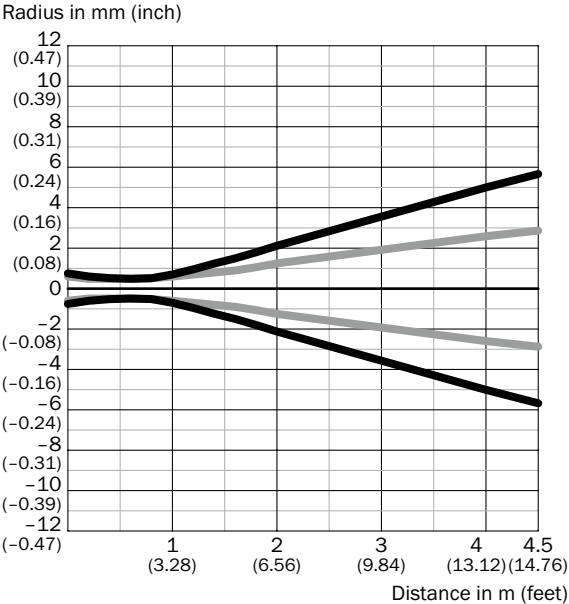
WL4SLG-3



■ Sensing range ■ Sensing range max.
① PLV14-A / PLH25-M12 / PLH25-D12
② P41F / REF-AC1000

Light spot diameter

WL4SLG-3, overview

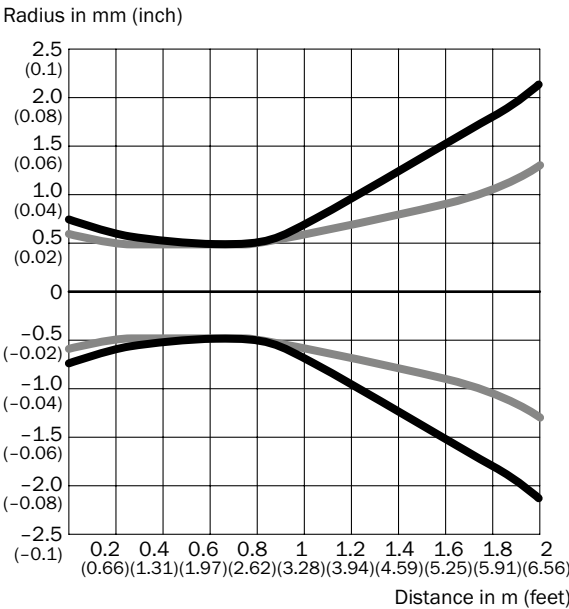


Dimensions in mm (inch)

Sensing range	Vertical	Horizontal
0.5 m (1.64 feet)	< 1.0 (0.04)	< 1.0 (0.04)
1 m (3.28 feet)	1.5 (0.06)	1.2 (0.05)
2 m (6.56 feet)	4.3 (0.17)	2.6 (0.10)
4.5 m (14.76 feet)	11.3 (0.44)	5.6 (0.22)

— Vertical
— Horizontal

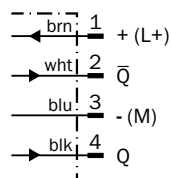
WL4SLG-3, detailed view



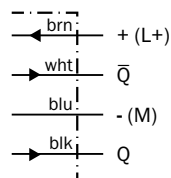
— Vertical
— Horizontal

Connection diagram

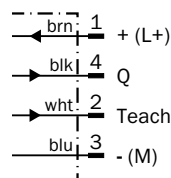
Cd-083



Cd-094



Cd-195



Recommended accessories

Plug connectors and cables

Connecting cable (female connector-open), PVC, hygienic systems

- Cable material: PVC
- Connector material: PVC

Figure	Connection type head A	Connection type head B	Connecting cable	Enclosure rating	Model name	Part no.
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-0804-G02MN	6033670
			5 m, 4-wire	IP 67, IP 69K	DOL-0804-G05MN	6033671
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-0804-W02MN	6033673
			5 m, 4-wire	IP 67, IP 69K	DOL-0804-W05MN	6033674
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-1204-G02MN	6028128
			5 m, 4-wire	IP 67, IP 69K	DOL-1204-G05MN	6028130
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-1204-W02MN	6028129
			5 m, 4-wire	IP 67, IP 69K	DOL-1204-W05MN	6028131

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N02N for universal clamp bracket	BEF-KHS-N02N	2051618

Reflectors

Angular

Figure	Material	Description	Model name	Part no.
	Plastic	Chemically resistant, screw connection, 47 mm x 47 mm	P250 CHEM	5321097
	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, screw connection, suitable for laser sensors, 18 mm x 18 mm	PL10F	5311210
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
	PMMA/ABS	Fine triple, screw connection, suitable for laser sensors, 38 mm x 16 mm	PL20F	5308844
	Plastic	Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089
	PMMA/ABS	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

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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

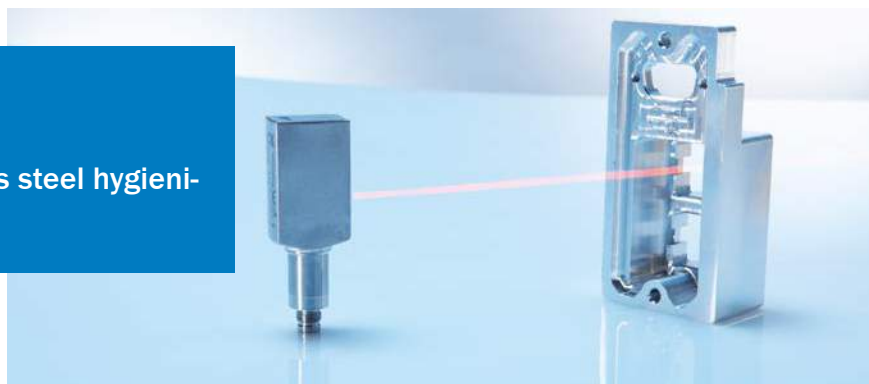
Special reflectors

Figure	Material	Description	Model name	Part no.
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adaptor shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adaptor thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

→ For additional accessories, please see page L-861



Laser technology and stainless steel hygienically combined



Additional information

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Light spot diameter.....	F-362
Connection diagram.....	F-363
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Product description

For the best possible hygienic performance: thanks to high immunity to ambient light, the new W4SL-3 Inox Hygiene miniature photoelectric sensors with precise laser light spot set new standards when it comes to preventing undesired background reflections and to ambient light immunity, even with modern energy-saving lights. The combination of SICK's latest proprietary laser and SIRIC® technologies reduces incorrect switching to minimize machine downtime. The photoelectric sensors complete this product

family. One device can reliably detect all transparent objects as well as tiny non-transparent objects, thus reducing the variety of devices. The photoelectric sensors also feature an IO-Link function, so that initial system performance diagnostics can be done independently. The W4SL-3 Inox Hygiene is certified in accordance with ECOLAB. In addition to an innovative leak-tight design, the sensors also have an impressive smooth housing design, which follows current hygiene guidelines.

At a glance

- Precise laser light spot, laser class 1
- Stainless steel housing with wash down design
- Latest SIRIC® and laser technologies for outstanding background suppression and ambient light immunity
- Teach-in pushbutton can be switched between detection of transparent and tiny non-transparent objects
- ECOLAB certified, tested to IP 66, IP 67, IP 68 and IP 69K enclosure rating
- IO-Link (optional)

Your benefits

- Precise laser light spot for highly accurate switching
- Washable stainless steel housing reduces bacterial contamination
- Innovative wash down design with sealed connections and unique patented membrane teach-in pushbutton
- High ambient light immunity reduces incorrect switching and ultimately machine downtime, even when modern energy-saving lights are used
- The highest degree of machine design flexibility. Outstanding BGS (background suppression) eliminates the effect of undesired background reflections. Autocollimation permits detection through very small drilled holes.
- IO-Link provides effortless initial diagnostics of system performance

→ www.mysick.com/en/W4SL-3H

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

Sensor principle	Photoelectric proximity sensor
Detection principle	Background suppression
Dimensions (W x H x D)	15.3 mm x 63.2 mm x 22.2 mm
Housing design	Hygiene
Housing design (light emission)	Rectangular, Slim
Mounting hole	M3
Sensing range max. ¹⁾	25 mm ... 300 mm
Sensing range ¹⁾	25 mm ... 300 mm
Type of light	Visible red light
Light source ²⁾	Laser
Light spot size (distance)	Ø 1 mm (170 mm)
Wave length	650 nm
Laser class ³⁾	1
Adjustment	Single teach-in button

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

²⁾ Average service life 50,000 h at T_A = +25 °C.

³⁾ EN60825-1:2008-05 & IEC 60825-1:2007-03 / CDRH 21 CFR 1040.10 & 1040.11.

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	< 5 V _{pp}
Power consumption ³⁾	≤ 30 mA
Output type	PNP ⁴⁾ / NPN ⁴⁾ (depending on type)
Output function	Complementary
Switching mode ⁴⁾	Light/dark-switching
Output current I _{max.}	≤ 100 mA
Response time ⁵⁾	≤ 0.5 ms
Switching frequency ⁶⁾	± 1,000 Hz
Connection type	Male connector, M8 ⁷⁾ / Cable, 2 m ⁸⁾ (depending on type)
Mechanical connection	D12 adapter shaft
Circuit protection	A ⁹⁾ , B ¹⁰⁾ , C ¹¹⁾
Protection class	III
Weight	
Connector M8 ⁷⁾	140 g
Cable ⁸⁾	180 g
Housing material	Stainless steel V4A (1.4404, 316L)
Optics material	PMMA

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Enclosure rating	IP 66, IP 67, IP 68, IP 69K ¹²⁾
Ambient operating temperature	-10 °C ... +50 °C
Ambient operating temperature extended ¹³⁾ ¹⁴⁾	-30 °C ... +55 °C
Ambient storage temperature	-30 °C ... +70 °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⁾ Q = light-switching.

⁵⁾ Signal transit time with resistive load.

⁶⁾ With light/dark ratio 1:1.

⁷⁾ Tightening torque, max.: 0.6 Nm.

⁸⁾ Do not bend below 0 °C.

⁹⁾ A = V_s connections reverse-polarity protected.

¹⁰⁾ B = inputs and output reverse-polarity protected.

¹¹⁾ C = interference suppression.

¹²⁾ Only in case of correctly mounted IP 69K connecting cable.

¹³⁾ As of $T_a = 50$ °C, a max. supply voltage $V_{max.} = 24$ V and a max. load current $I_{max.} = 50$ mA is permitted.

¹⁴⁾ Using the sensor below $T_a = -10$ °C is possible, if the sensor is turned on at $T_a > -10$ °C, then the environment cools down and the sensor is not disconnected from the supply voltage during the whole time. It is not allowed to turn on the sensor below $T_a = -10$ °C.

Ordering information

Other models available at www.mysick.com/en/W4SL-3H

WTB4SL-3H

- **Sensor principle:** photoelectric proximity sensor
- **Switching mode:** light/dark-switching (Q = light-switching.)
- **Adjustment:** single teach-in button

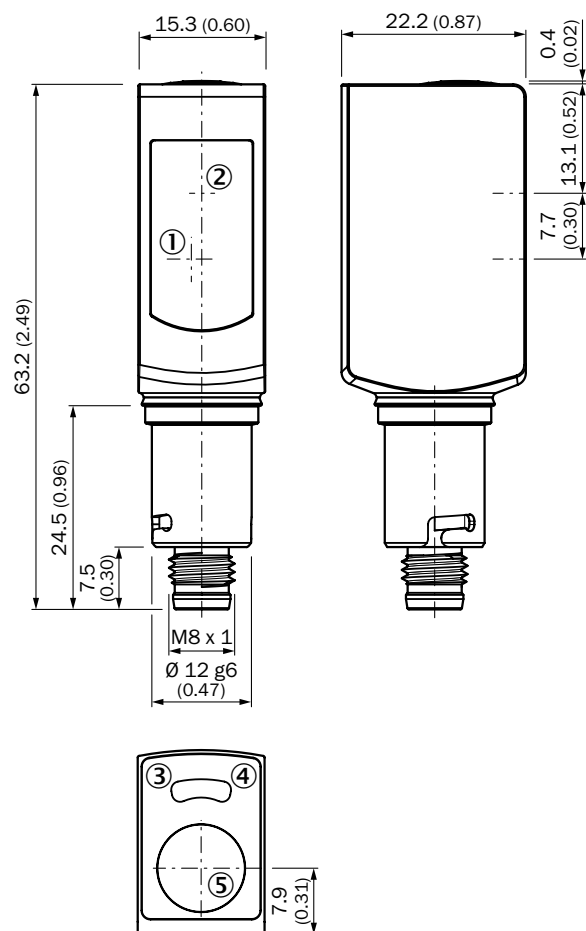
Sensing range max. ¹⁾	Mechanical connection	Output type	Connection	Connection diagram	Model name	Part no.
25 mm ... 300 mm	D12 adapter shaft	PNP	Connector M8, 4-pin	Cd-094	WTB4SL-3P5262H	1058271
			Cable, 4-wire, 2 m, PVC	Cd-083	WTB4SL-3P4162H	1058274
		NPN	Cable, 4-wire, 2 m, PVC	Cd-083	WTB4SL-3N4162H	1058275

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

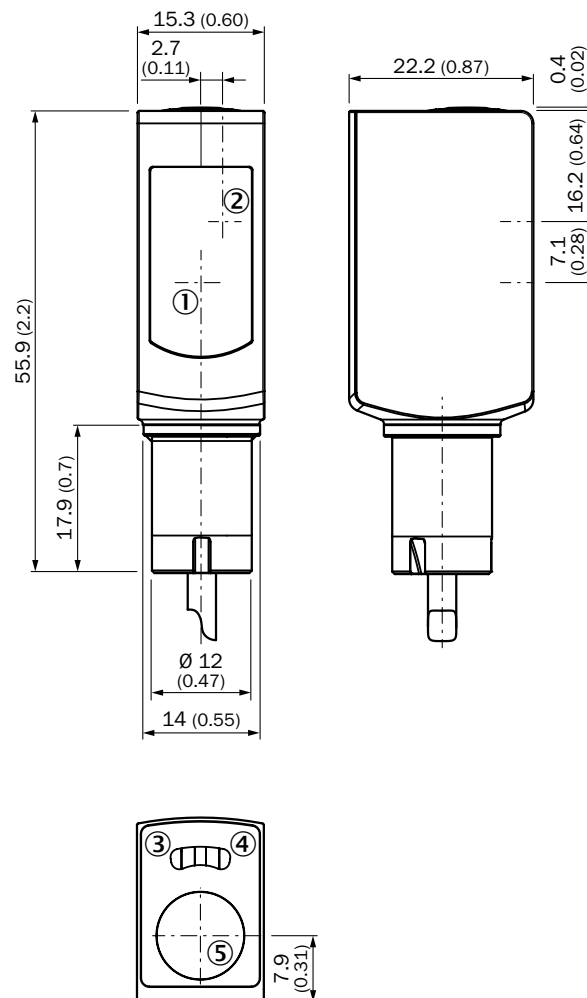
Dimensional drawings

Dimensions in mm (inch)

WTB4SL-3H, connector



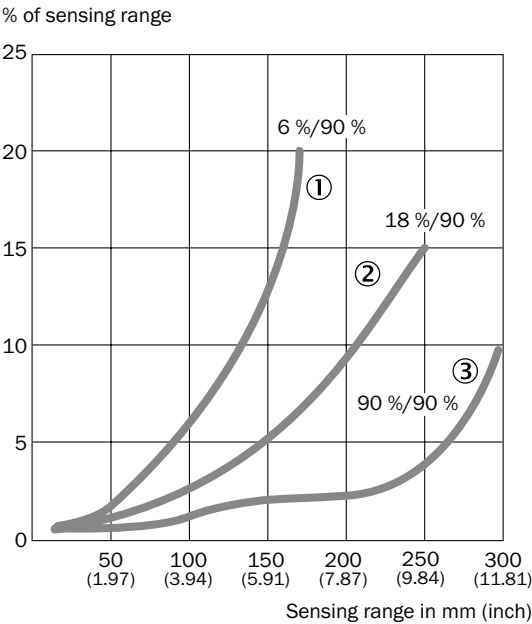
WTB4SL-3H, cable



Characteristic curves

Black-white shift

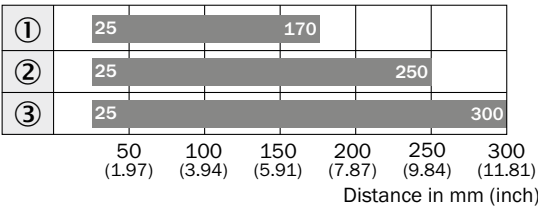
WTB4SL-3H



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

Bar diagrams

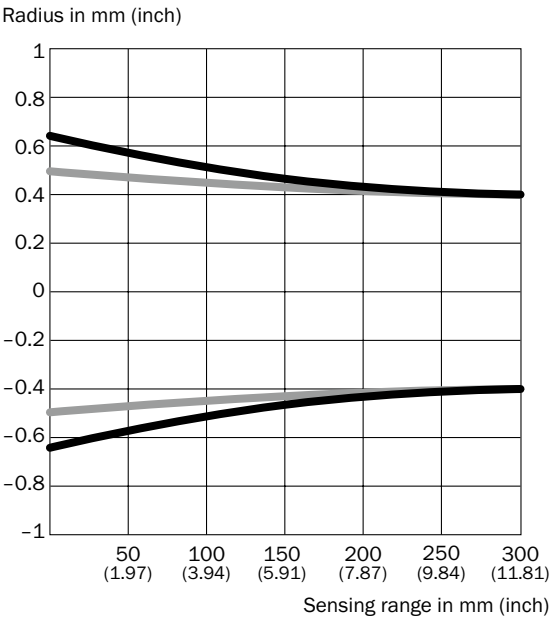
WTB4SL-3H



- 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

Light spot diameter

WTB4SL-3H



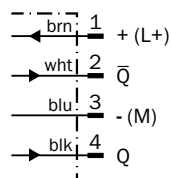
Dimensions in mm (inch)

Sensing range	Vertical	Horizontal
50 mm (1.97)	1.2 (0.05)	1.0 (0.04)
100 mm (3.94)	1.1 (0.04)	1.0 (0.04)
200 mm (7.87)	0.9 (0.04)	0.9 (0.04)
300 mm (11.81)	0.8 (0.03)	0.8 (0.03)

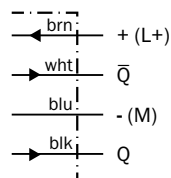
- Vertical
— Horizontal

Connection diagram

Cd-083



Cd-094



Recommended accessories

Plug connectors and cables

Connecting cable (female connector-open), PVC, hygienic systems

- Cable material: PVC
- Connector material: PVC

Figure	Connection type head A	Connection type head B	Connecting cable	Enclosure rating	Model name	Part no.
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-0804-G02MN	6033670
			5 m, 4-wire	IP 67, IP 69K	DOL-0804-G05MN	6033671
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-0804-W02MN	6033673
			5 m, 4-wire	IP 67, IP 69K	DOL-0804-W05MN	6033674

Universal bar clamp systems

- For product family: Hygienic Design BeftecHD for sensors with D12 adapter shaft

Figure	Material	Description	Model name	Part no.
	Hygienic Design, Stainless steel V4A (1.4404, 316L), Silicone (seal)	Hygienic design mounting tube with bayonet lock, 14.4 mm x 85.5 mm x 14.4 mm	BEF-HDSBR	4074403
		Hygienic design flange with seal, 40 mm x 12 mm x 40 mm	BEF-HDSF	4072880
		Hygienic design telescopic tube, straight, with bayonet lock without flange, 23 mm x 153 mm x 23 mm	BEF-HDSTRG	2067780
		Hygienic design telescopic tube, straight, with bayonet lock with flange, 40 mm x 165 mm x 40 mm	BEF-HDSTRGF	2067779
		Hygienic design telescopic tube, angled, with bayonet lock without flange, 23 mm x 125 mm x 73 mm	BEF-HDSTRW	2067778
		Hygienic design telescopic tube, angled, with bayonet lock with flange, 40 mm x 125 mm x 76 mm	BEF-HDSTRWF	2067777

→ For additional accessories, please see page L-861

Detect all transparent objects with one device – Change mode via teach button



Additional information

Detailed technical data.....	F-365
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Dimensional drawings	F-367
Characteristic curves	F-368
Bar diagrams.....	F-368
Light spot diameter.....	F-368
Connection diagram	F-369
Recommended accessories.....	F-370

Product description

The stainless steel housing of the WL4SLG-3 Inox Hygiene photoelectric retro-reflective sensor, which is designed based on hygienic guidelines, is especially suited to machines in which hygiene is already part of the design. A press of a button allows operation in the detection mode for transparent and/or non-transparent objects. This means that one device can be used to detect transparent vials and metallic needles, for example. This reduces the variety of sensors needed. The precise, highly

visible laser light spot ensures a high level of detection quality and facilitates alignment. Autocollimation technology ensures that the sensor reliably detects objects at close range as well as through small drilled holes. The photoelectric sensors also feature an IO-Link function, so that initial system performance diagnostics can be done independently. Furthermore, IO-Link permits the integration of additional functions such as meters directly into the sensor. There is no need for complex control programming.

At a glance

- Precise laser light spot, laser class 1
- Stainless steel housing with hygienic design
- Latest SICK proprietary ASIC and laser technologies for outstanding background suppression and ambient light immunity
- Teach-in pushbutton can be switched between detection of transparent and tiny non-transparent objects
- ECOLAB certified, tested to IP 66, IP 67, IP 68 and IP 69K enclosure rating
- IO-Link (optional)

Your benefits

- Precise laser light spot for highly accurate switching
- Washable stainless steel housing reduces bacterial contamination
- Innovative hygienic design with sealed connections and unique patented membrane teach-in pushbutton
- One sensor for detecting both transparent objects and tiny non-transparent objects. This reduces the variety of sensors and saves on storage costs
- Autocollimation permits detection through very small drilled holes
- IO-Link facilitates, for example, effortless initial system performance diagnostics and uses additional sensor functions to reduce complex control programming

→ www.mysick.com/en/W4SLG-3H

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

Sensor principle	Photoelectric retro-reflective sensor
Detection principle	Autocollimation
Dimensions (W x H x D)	15.3 mm x 63.2 mm x 22.2 mm
Housing design	Hygiene
Housing design (light emission)	Rectangular, Slim
Mounting hole	M3
Sensing range max. ¹⁾	0 m ... 4.5 m
Sensing range ¹⁾	0 m ... 2 m
Type of light	Visible red light
Light source ²⁾	Laser
Light spot size (distance)	Ø 1 mm (500 mm)
Wave length	650 nm
Laser class ³⁾	1
Adjustment	Cable, Single teach-in button ⁴⁾ / Single teach-in button (depending on type)
Special feature	Detection of transparent objects

¹⁾ REF-AC1000.

²⁾ Average service life 50,000 h at T_A = +25 °C.

³⁾ EN60825-1:2008-05 & IEC 60825-1:2007-03 / CDRH 21 CFR 1040.10 & 1040.11.

⁴⁾ Adjustment via cable (ET): white cable or PIN2 according to the desired sensitivity > 2 ... < 8 s or put > 8 s on L+ (PNP) or on M (NPN)

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	< 5 V _{pp}
Power consumption ³⁾	≤ 30 mA
Output type	PNP / NPN (depending on type)
Output function	Complementary
Switching mode	Dark-switching ⁴⁾ / Light/dark-switching ⁵⁾ (depending on type)
Output current I _{max.}	≤ 100 mA
Response time ⁶⁾	≤ 0.5 ms
Switching frequency ⁷⁾	± 1,000 Hz
Connection type	Male connector, M8 ⁸⁾ / Cable, 2 m ⁹⁾ (depending on type)
Mechanical connection	D12 adapter shaft
Circuit protection	A ¹⁰⁾ , B ¹¹⁾ , C ¹²⁾
Protection class	III
Weight	
	Connector M8 ⁸⁾ 140 g
	Cable ⁹⁾ 180 g
IO-Link	- / ✓ (COM2) (depending on type)
Housing material	Stainless steel V4A (1.4404, 316L)
Optics material	PMMA

Enclosure rating	IP 66, IP 67, IP 68, IP 69K ¹³⁾
Ambient operating temperature	-10 °C ... +50 °C
Ambient operating temperature extended ¹⁴⁾ ¹⁵⁾	-30 °C ... +55 °C
Ambient storage temperature	-30 °C ... +70 °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⁾ Q = dark-switching.

⁵⁾ Q = light-switching.

⁶⁾ Signal transit time with resistive load.

⁷⁾ With light/dark ratio 1:1.

⁸⁾ Tightening torque, max.: 0.6 Nm.

⁹⁾ Do not bend below 0 °C.

¹⁰⁾ A = V_S connections reverse-polarity protected.

¹¹⁾ B = inputs and output reverse-polarity protected.

¹²⁾ C = interference suppression.

¹³⁾ Only in case of correctly mounted IP 69K connecting cable.

¹⁴⁾ As of $T_a = 50$ °C, a max. supply voltage $V_{max} = 24$ V and a max. load current $I_{max} = 50$ mA is permitted.

¹⁵⁾ Using the sensor below $T_a = -10$ °C is possible, if the sensor is turned on at $T_a > -10$ °C, then the environment cools down and the sensor is not disconnected from the supply voltage during the whole time. It is not allowed to turn on the sensor below $T_a = -10$ °C.

Ordering information

Other models available at www.mysick.com/en/W4SLG-3H

WL4SLG-3H

- **Sensor principle:** photoelectric retro-reflective sensor

Sensing range max. ¹⁾	Mechanical connection	Output type	Switching mode	Adjustment	Connection	Connection diagram	Model name	Part no.
0 m ... 4.5 m	D12 adapter shaft	PNP	Dark-switching ²⁾	Cable, Single teach-in button ³⁾	Connector M8, 4-pin	Cd-195	WL4SLG-3F5234H	1058278
					Cable, 4-wire, 2 m, PVC	Cd-212	WL4SLG-3F4134H	1058283
			Light/dark-switching ⁴⁾	Single teach-in button	Connector M8, 4-pin	Cd-083	WL4SLG-3P5232H	1058276
					Cable, 4-wire, 2 m, PVC	Cd-094	WL4SLG-3P4132H	1058282
		NPN	Light/dark-switching ⁴⁾	Single teach-in button	Cable, 4-wire, 2 m, PVC	Cd-094	WL4SLG-3N4132H	1058284

¹⁾ REF-AC1000.

²⁾ Q = dark-switching.

³⁾ Adjustment via cable (ET): white cable or PIN2 according to the desired sensitivity > 2 ... < 8 s or put > 8 s on L+ (PNP) or on M (NPN)

⁴⁾ Q = light-switching.

WL4SLG-3H, IO-Link

- **Sensor principle:** photoelectric retro-reflective sensor
- **IO-Link:** standard functions

Sensing range max. ¹⁾	Mechanical connection	Output type	Switching mode	Adjustment	Connection	Connection diagram	Model name	Part no.
0 m ... 4.5 m	D12 adapter shaft	PNP	Light/dark-switching ²⁾	Single teach-in button	Connector M8, 4-pin	Cd-098	WL4SLGC-3P5232H	1058277

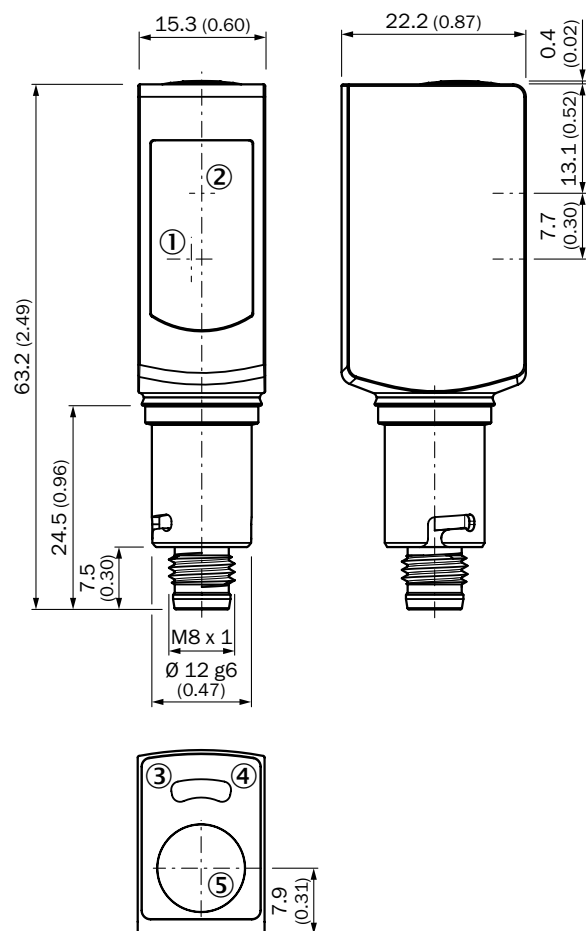
¹⁾ REF-AC1000.

²⁾ Q = light-switching.

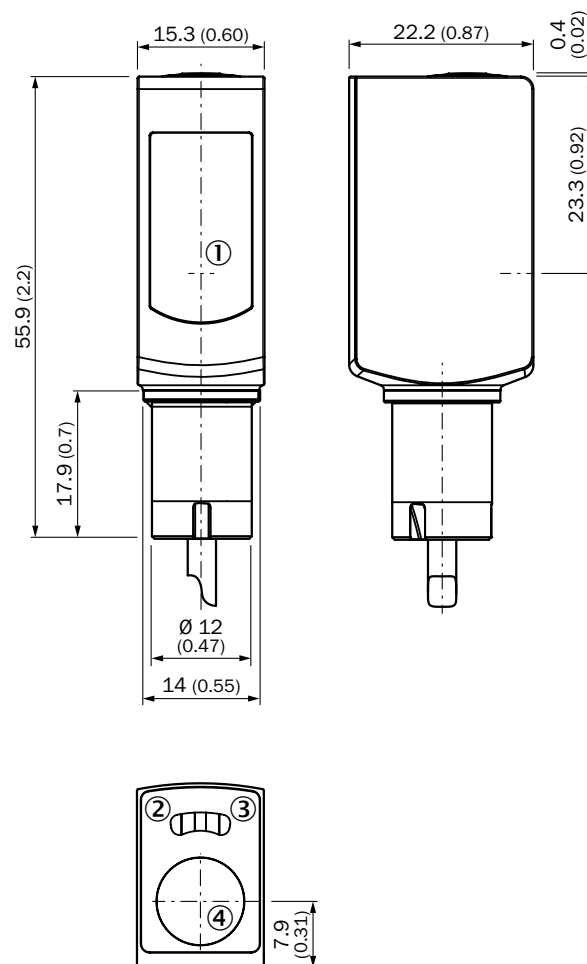
Dimensional drawings

Dimensions in mm (inch)

WL4SLG-3H, connector



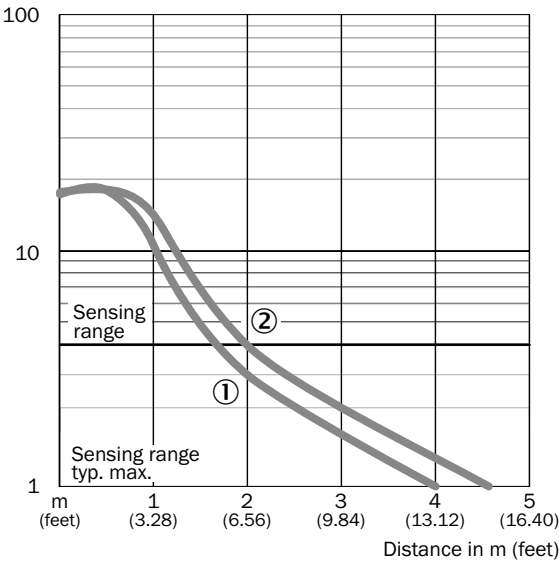
WL4SLG-3H, cable



Characteristic curves

Operating reserve

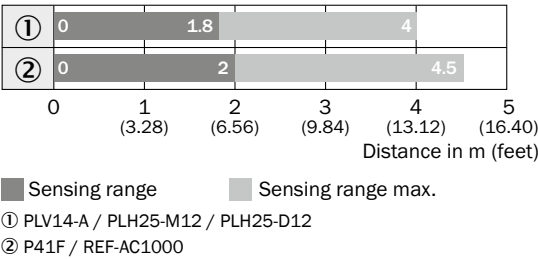
WL4SLG-3H



- ① PLV14-A / PLH25-M12 / PLH25-D12
- ② P41F / REF-AC1000

Bar diagrams

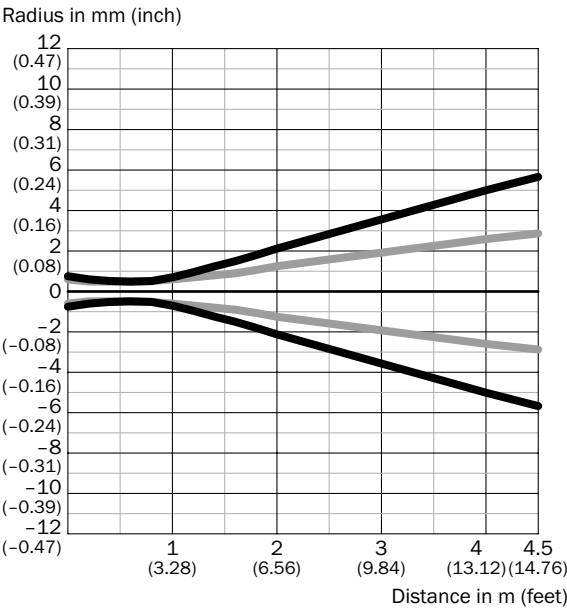
WL4SLG-3H



- Sensing range
- Sensing range max.
- ① PLV14-A / PLH25-M12 / PLH25-D12
- ② P41F / REF-AC1000

Light spot diameter

WL4SLG-3H, overview



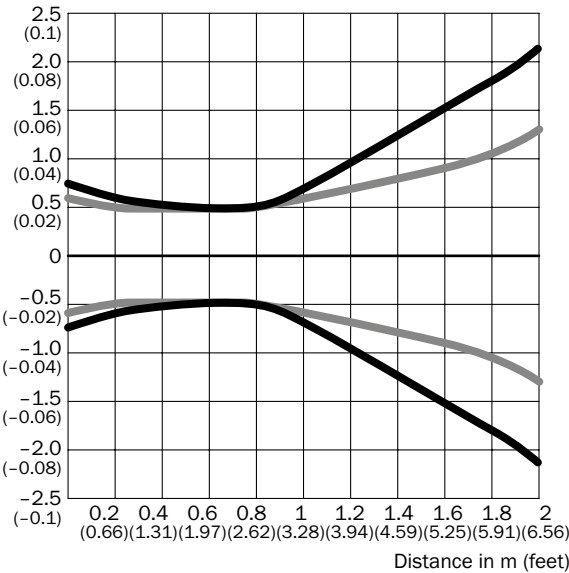
Dimensions in mm (inch)

Sensing range	Vertical	Horizontal
0.5 m (1.64 feet)	< 1.0 (0.04)	< 1.0 (0.04)
1 m (3.28 feet)	1.5 (0.06)	1.2 (0.05)
2 m (6.56 feet)	4.3 (0.17)	2.6 (0.10)
4.5 m (14.76 feet)	11.3 (0.44)	5.6 (0.22)

- Vertical
- Horizontal

WL4SLG-3, detailed view

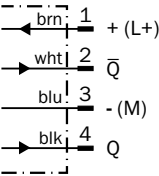
Radius in mm (inch)



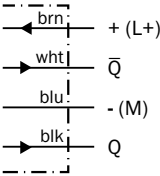
— Vertical
— Horizontal

Connection diagram

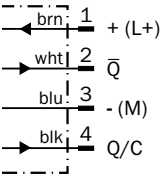
Cd-083



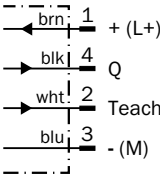
Cd-094



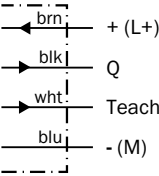
Cd-098



Cd-195



Cd-212



Recommended accessories

Plug connectors and cables

Connecting cable (female connector-open), hygienic systems

- Cable material: PP
- Connector material: PP

Figure	Connection type head A	Connection type head B	Connecting cable	Enclosure rating	Model name	Part no.
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-0804-G02MN	6033670
			5 m, 4-wire	IP 67, IP 69K	DOL-0804-G05MN	6033671
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-0804-W02MN	6033673
			5 m, 4-wire	IP 67, IP 69K	DOL-0804-W05MN	6033674
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-1204-G02MN	6028128
			5 m, 4-wire	IP 67, IP 69K	DOL-1204-G05MN	6028130
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-1204-W02MN	6028129
			5 m, 4-wire	IP 67, IP 69K	DOL-1204-W05MN	6028131

Universal bar clamp systems

- For product family: Hygienic Design BeftechHD for sensors with D12 adapter shaft

Figure	Material	Description	Model name	Part no.
	Hygienic Design, Stainless steel V4A (1.4404, 316L), Silicone (seal)	Hygienic design mounting tube with bayonet lock, 14.4 mm x 85.5 mm x 14.4 mm	BEF-HDSBR	4074403
		Hygienic design flange with seal, 40 mm x 12 mm x 40 mm	BEF-HDSF	4072880
		Hygienic design telescopic tube, straight, with bayonet lock without flange, 23 mm x 153 mm x 23 mm	BEF-HDSTRG	2067780
		Hygienic design telescopic tube, straight, with bayonet lock with flange, 40 mm x 165 mm x 40 mm	BEF-HDSTRGF	2067779
		Hygienic design telescopic tube, angled, with bayonet lock without flange, 23 mm x 125 mm x 73 mm	BEF-HDSTRW	2067778
		Hygienic design telescopic tube, angled, with bayonet lock with flange, 40 mm x 125 mm x 76 mm	BEF-HDSTRWF	2067777

Reflectors

Angular

Figure	Material	Description	Model name	Part no.
	Plastic	Chemically resistant, screw connection, 47 mm x 47 mm	P250 CHEM	5321097
	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
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
	Plastic	Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089
	PMMA/ABS	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

Special reflectors

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Antifog, for prevention of moisture fogging on the reflection area, screw connection, 56 mm x 37 mm	PL40A Antifog	5322011
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adapter shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adapter thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

→ For additional accessories, please see page L-861

High-performance object detection at close range



Additional information

Detailed technical data.....	F-373
Ordering information.....	F-374
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Adjustments.....	F-375
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Connection diagram.....	F-377
Recommended accessories.....	F-377



Product description

The W8 is a high-quality, miniature photoelectric sensor family specially designed for close-range applications. Autocollimation, background suppression, and high switching frequencies of 2 kHz make these sensors ideal for a broad range of applications. The

series is comprised of the WTB8 photoelectric proximity sensor, the WL8 and WLG8 photoelectric retro-reflective sensor and the WSE8 photoelectric through-beam sensor. The housing is designed with M3 threaded mounting holes that provide easy and secure mounting.

At a glance

- Miniature housing with M3 threaded mounting holes
- Switching frequency up to 2 kHz
- Stainless steel mounting bracket (1.4301/304) BEF-W100-A included with delivery

Your benefits

- Highly flexible design and operational capabilities due to precise background suppression
- Quick and easy mounting due to the universally compatible M3 threaded mounting holes
- A fast switching frequency optimizes production processes
- All necessary accessories are included with delivery, decreasing installation and procurement costs
- Application versatility due to sensitivity adjustments, light/dark switching and a variety of connection options

→ www.mysick.com/en/W8

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

	WTB8	WL8
Sensor principle	Photoelectric proximity sensor	Photoelectric retro-reflective sensor
Detection principle	Background suppression	Autocollimation
Dimensions (W x H x D)	11 mm x 31 mm x 20 mm	
Housing design (light emission)	Rectangular	
Sensing range max.	5 mm ... 300 mm ¹⁾ (depending on type)	0 m ... 4 m ²⁾
Sensing range	20 mm ... 300 mm ¹⁾ (depending on type)	0 ... 3 m ²⁾
Type of light	Visible red light	
Light source ³⁾	LED	
Wave length	650 nm	
Adjustment	Potentiometer, 4 turns	Potentiometer, 270 °

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

	WTB8	WL8
Supply voltage ¹⁾	10 V DC ... 30 V DC	
Ripple ²⁾	± 10 %	
Power consumption ³⁾	≤ 30 mA	
Output type	PNP, open collector / NPN, open collector (depending on type)	
Switching mode	Light/dark-switching (manually selectable)	
Signal voltage PNP HIGH/LOW	Approx. V _S – 1.8 V / 0 V	
Signal voltage NPN HIGH/LOW	Approx. V _S / < 1.8 V	
Output current I _{max.}	≤ 100 mA	
Response time ⁴⁾	≤ 0.5 ms	≤ 25 ms
Switching frequency ⁵⁾	1,000 Hz	2,000 Hz
Connection type	Cable, 2 m ⁶⁾ / Male connector, M8 (depending on type)	
Circuit protection	A ⁷⁾ , B ⁸⁾ , D ⁹⁾	
Weight		
Cable	50 g	
Connector M8	10 g	
Polarisation filter	–	✓
Housing material	ABS	
Optics material	PMMA	
Enclosure rating	IP 67	
Items supplied	Stainless steel mounting bracket (1.4301/304) BEF-W100-A	Stainless steel mounting bracket (1.4301/304) BEF-W100-A, Reflector P250
Ambient operating temperature	–25 °C ... +55 °C	
Ambient storage temperature	–40 °C ... +70 °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⁾ B = inputs and output reverse-polarity protected.

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

Ordering information

Other models available at www.mysick.com/en/W8

WTB8

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer, 4 turns

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
5 mm ... 100 mm	Ø 6 mm (100 mm)	PNP	Cable, 3-wire, 2 m, PVC	Cd-043	WTB8-P1111	6033211
			Connector M8, 3-pin	Cd-045	WTB8-P2111	6033213
			Connector M8, 4-pin	Cd-066	WTB8-P2211	6033215
		NPN	Cable, 3-wire, 2 m, PVC	Cd-043	WTB8-N1111	6033210
			Connector M8, 3-pin	Cd-045	WTB8-N2111	6033212
			Connector M8, 4-pin	Cd-066	WTB8-N2211	6033214
30 mm ... 300 mm	Ø 6 mm (100 mm)	PNP	Cable, 3-wire, 2 m, PVC	Cd-043	WTB8-P1131	6033205
			Connector M8, 3-pin	Cd-045	WTB8-P2131	6033207
			Connector M8, 4-pin	Cd-066	WTB8-P2231	6033209
		NPN	Cable, 3-wire, 2 m, PVC	Cd-043	WTB8-N1131	6033204
			Connector M8, 3-pin	Cd-045	WTB8-N2131	6033206
			Connector M8, 4-pin	Cd-066	WTB8-N2231	6033208

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

WL8

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation
- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer, 270 °

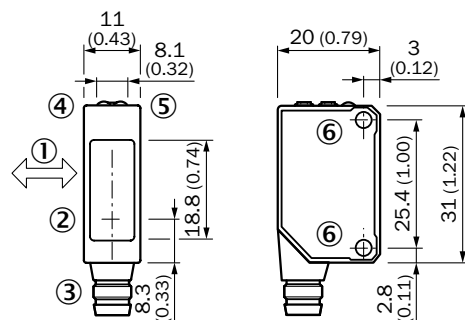
Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
0 m ... 4 m	Ø 30 mm (1 m)	PNP	Cable, 3-wire, 2 m, PVC	Cd-043	WL8-P1131	6033177
			Connector M8, 3-pin	Cd-045	WL8-P2131	6033180
			Connector M8, 4-pin	Cd-066	WL8-P2231	6033182
		NPN	Cable, 3-wire, 2 m, PVC	Cd-043	WL8-N1131	6033176
			Connector M8, 3-pin	Cd-045	WL8-N2131	6033179
			Connector M8, 4-pin	Cd-066	WL8-N2231	6033181

¹⁾ PL80A.

Dimensional drawings

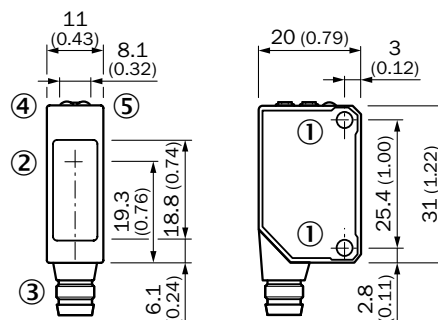
Dimensions in mm (inch)

WTB8



- ① Standard direction
- ② Center of optical axis
- ③ Connection
- ④ Orange LED indicator: switching output active
- ⑤ LED indicator green: stability indicator
- ⑥ Threaded mounting hole M3, max. tightening torque: 0.6 Nm

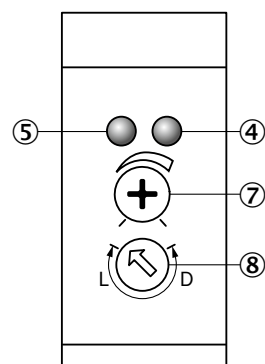
WL8



- ① Threaded mounting hole M3, max. tightening torque: 0.6 Nm
- ② Center of optical axis
- ③ Connection
- ④ Orange LED indicator: switching output active
- ⑤ LED indicator green: stability indicator

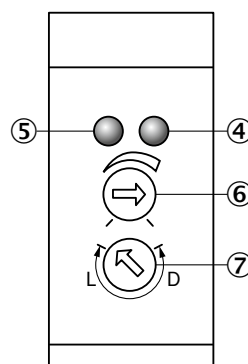
Adjustments

WTB8



- ④ Orange LED indicator: switching output active
- ⑤ LED indicator green: stability indicator
- ⑦ Sensing range adjustment
- ⑧ Light/ dark rotary switch:
L = light switching, D = dark switching

WL8



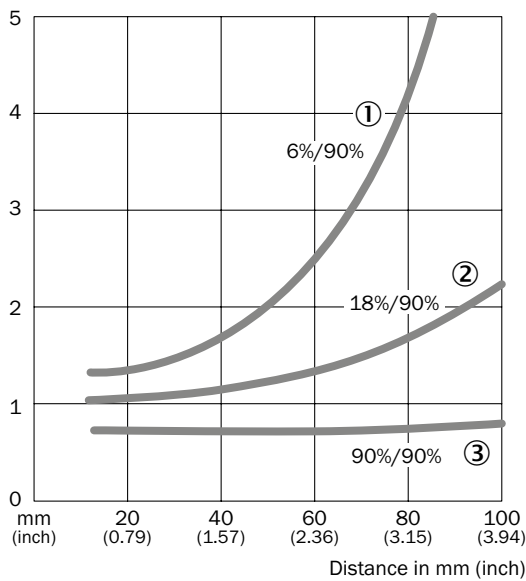
- ④ Orange LED indicator: switching output active
- ⑤ LED indicator green: stability indicator
- ⑥ Sensitivity adjustment
- ⑦ Light/ dark rotary switch:
L = light switching, D = dark switching

F

Characteristic curves

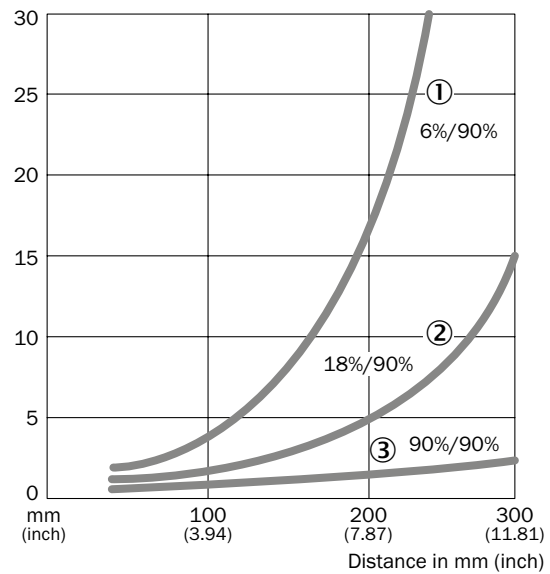
Black-white shift

WTB8, 100 mm



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

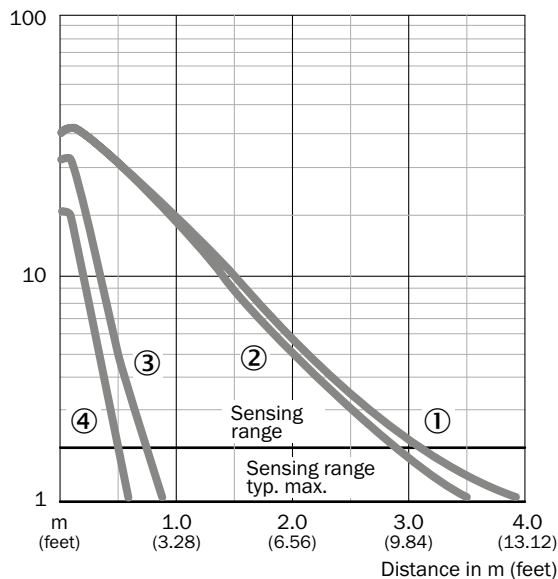
WTB8, 300 mm



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

Operating reserve

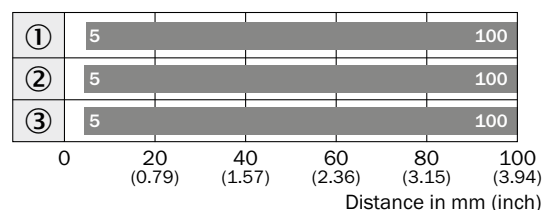
WL8



- ① PL80A
- ② P250
- ③ P45
- ④ Reflective tape Diamond Grade

Bar diagrams

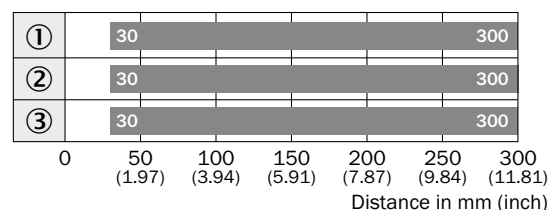
WTB8, 100 mm



■ Sensing range

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

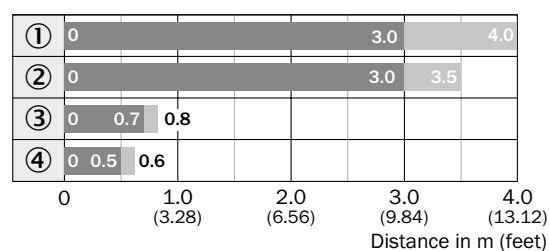
WTB8, 300 mm



■ Sensing range

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

WL8



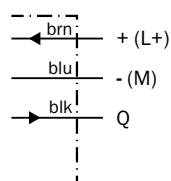
■ Sensing range

■ Sensing range max.

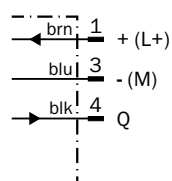
- ① PL80A
- ② P250
- ③ P45
- ④ Reflective tape Diamond Grade

Connection diagram

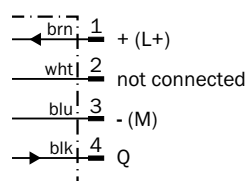
Cd-043



Cd-045



Cd-066



Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Stainless steel	Mounting bracket for wall mounting	BEF-W100-A	5311520
	Steel, zinc coated	Mounting bracket for floor mounting	BEF-W100-B	5311521

Plug connectors and cables

Connecting cable (female connector-open), 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

Female connector (ready to assemble)M8, 3-pin

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0803-G	7902077
	Female connector, M8, 3-pin, angled	Pin penetration	PBT	IP 67	DOS-0803-W	7902078
	Female connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0804-G	6009974
	Female connector, M8, 4-pin, angled	Pin penetration	PBT	IP 67	DOS-0804-W	6009975

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N08 for universal clamp bracket	BEF-KHS-N08	2051607

Device protection (mechanical)

Protective housing/tubes

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571	Safety bracket for floor mounting	BEF-SW-W4S	2051497

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, plugable for metal plates	PL22-3	1004488

→ For additional accessories, please see page L-861

F

Photoelectric sensor detects transparent objects at close range



Additional information

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Product description

The WL8G is a high-quality, miniature retro-reflective clear material photoelectric sensor for detection of transparent objects in close-range applications. Autocollimation optics enable the reflector

to be positioned as close to the sensor's front face as necessary. The housing design, with M3 threaded mounting holes, ensures easy and secure installation.

At a glance

- Autocollimation
- Standard miniature housing with M3 threaded mounting holes
- Light/dark switching selectable via rotary switch
- Adjustable sensing range
- All necessary accessories (BEF-W100-A and P250) are included with delivery

Your benefits

- Reliable object detection of transparent objects even at the shortest distances (no blind spot) or through narrow gaps
- Highly visible light spot makes alignment quick and easy
- Reliable detection of all materials, including small and/or transparent objects, min. attenuation 15 %
- All necessary accessories (bracket and reflector) are included with delivery, reducing installation and procurement costs
- M3 mounting hole provides quick installation

→ www.mysick.com/en/W8G

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

Sensor principle	Photoelectric retro-reflective sensor
Detection principle	Autocollimation
Dimensions (W x H x D)	11 mm x 31 mm x 20 mm
Housing design (light emission)	Rectangular
Sensing range max. ¹⁾	0 m ... 3 m
Sensing range ¹⁾	0 ... 1.7 m
Type of light	Visible red light
Light source ²⁾	LED
Light spot size (distance)	Ø 70 mm (2 m)
Wave length	650 nm
Adjustment	Potentiometer, 270 °
Special feature	Detection of transparent objects

¹⁾ PL80A.

²⁾ Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	± 10 %
Power consumption ³⁾	≤ 30 mA
Output type	PNP, open collector / NPN, open collector (depending on type)
Switching mode	Light/dark-switching (manually selectable)
Signal voltage PNP HIGH/LOW	Approx. V _S – 1.8 V / 0 V
Signal voltage NPN HIGH/LOW	Approx. V _S / < 1.8 V
Output current I _{max.}	100
Response time ⁴⁾	≤ 0.5 ms
Switching frequency ⁵⁾	1,000
Attenuation along light beam	≤ 20 %
Connection type	Cable, 2 m ⁶⁾ / Male connector, M8 (depending on type)
Circuit protection	A ⁷⁾ , B ⁸⁾ , D ⁹⁾
Weight	
Cable ⁶⁾	50 g
Connector	10 g
Polarisation filter	✓
Housing material	ABS
Optics material	PMMA
Enclosure rating	IP 67
Items supplied	Stainless steel mounting bracket (1.4301/304) BEF-W100-A, Reflector P250F
Ambient operating temperature	–25 °C ... +55 °C
Ambient storage temperature	–40 °C ... +70 °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⁾ B = inputs and output reverse-polarity protected.

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

Ordering information

Other models available at www.mysick.com/en/W8G

WL8G

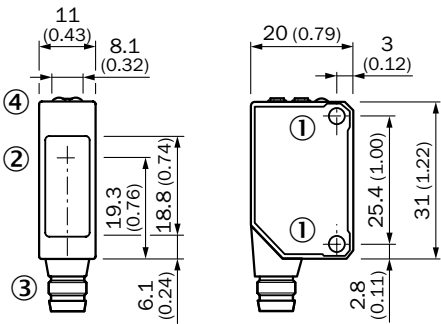
- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation
- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer, 270 °
- **Items supplied:** stainless steel mounting bracket (1.4301/304) BEF-W100-A, Reflector P250F

Sensing range max. ¹⁾	Output type	Connection	Connection diagram	Model name	Part no.
0 m ... 3 m	PNP	Cable, 3-wire 2 m PVC	Cd-043	WL8G-P1131	6033184
		Connector M8, 3-pin	Cd-045	WL8G-P2131	6033186
		Connector M8, 4-pin	Cd-066	WL8G-P2231	6033188
	NPN	Cable, 3-wire 2 m PVC	Cd-043	WL8G-N1131	6033183
		Connector M8, 3-pin	Cd-045	WL8G-N2131	6033185
		Connector M8, 4-pin	Cd-066	WL8G-N2231	6033187

¹⁾ PL80A.

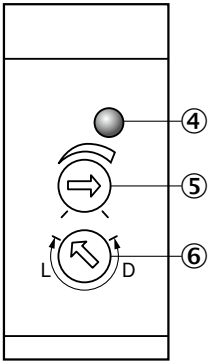
Dimensional drawings

Dimensions in mm (inch)



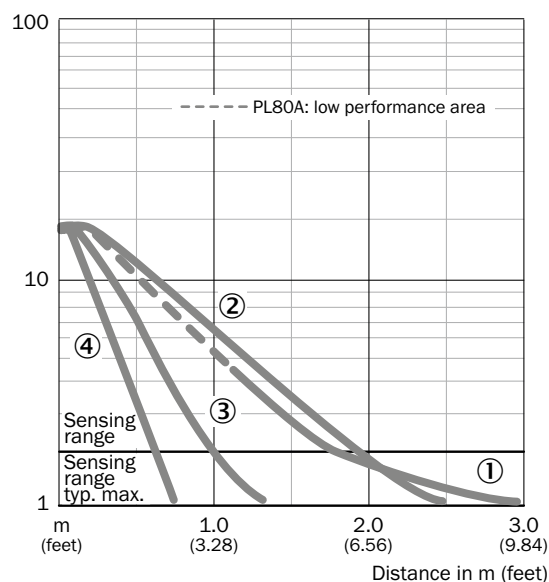
- ① Threaded mounting hole M3, max. tightening torque: 0.6 Nm
- ② Center of optical axis
- ③ Connection
- ④ Orange LED indicator: switching output active

Adjustments



- ④ Orange LED indicator: switching output active
- ⑤ Sensitivity adjustment
- ⑥ Light/ dark rotary switch: L = light switching, D = dark switching

Characteristic curves



- ① PL80A
- ② P250F
- ③ PL20F
- ④ PL10F

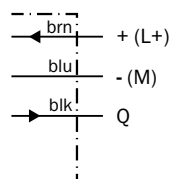
Bar diagrams



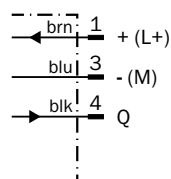
- Sensing range
- Sensing range typ. max.
- ① PL80A
- ② P250F
- ③ PL20F
- ④ PL10F

Connection diagram

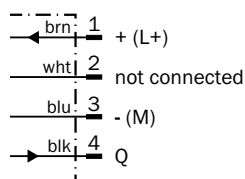
Cd-043



Cd-045



Cd-066



Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Stainless steel	Mounting bracket for wall mounting	BEF-W100-A	5311520
	Steel, zinc coated	Mounting bracket for floor mounting	BEF-W100-B	5311521

Plug connectors and cables

Connecting cable (female connector-open), 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

Female connector (ready to assemble)

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0803-G	7902077
	Female connector, M8, 3-pin, angled	Pin penetration	PBT	IP 67	DOS-0803-W	7902078
	Female connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0804-G	6009974
	Female connector, M8, 4-pin, angled	Pin penetration	PBT	IP 67	DOS-0804-W	6009975

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N08 for universal clamp bracket	BEF-KHS-N08	2051607

Device protection (mechanical)

Protective housing/tubes

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571	Safety bracket for floor mounting	BEF-SW-W4S	2051497

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, screw connection, suitable for laser sensors, 18 mm x 18 mm	PL10F	5311210
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
	PMMA/ABS	Fine triple, screw connection, suitable for laser sensors, 38 mm x 16 mm	PL20F	5308844
	Plastic	Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089
	PMMA/ABS	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

Special reflectors

Figure	Material	Description	Model name	Part no.
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adaptor shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adaptor thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

→ For additional accessories, please see page L-861

Compact, high-performance INOX sensors for harsh wash down environments

STAIN-
LESS
STEEL

IP 69K



Additional information

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Product description

The W8 INOX is a miniature product family, especially for applications in harsh ambient conditions. The high-quality IP 69K stainless steel housing (1.4404/SUS316L) in combination with high-performance PPSU and PEEK plastics make these sensors suitable for a broad range of applications. In addition to a highly visible LED light spot, the W8 INOX includes M3 threaded mounting holes that

reduce mounting time. These compact, lightweight sensors provide maximum resistance to harsh wash down environments in the food and beverage industry. The four models – through-beam, retro-reflective, energetic and background suppression (BGS) – provide reliable, high-performance solutions for harsh environments.

At a glance

- Rugged IP 69K stainless steel housing 1.4404/316L
- Front screen made of high-performance PPSU plastic that is resistant to heat and chemicals
- Potentiometer made of mechanically stable high-performance PEEK (poly-ether ketone) plastic
- Constructed with FDA-approved materials
- Well-defined, highly visible light spot
- M3 threaded mounting holes and stainless steel mounting bracket (1.4301/304) included with delivery

Your benefits

- High reliability due to an IP 69K stainless steel housing, which withstands aggressive cleaning agents or cooling lubricants
- Quick and easy mounting due to universally compatible M3 threaded mounting holes
- Compact housing saves space (equal to W8 plastic version)
- Highly visible light spot provides easy alignment
- All necessary accessories are included, which simplifies installation

→ www.mysick.com/en/W8_Inox

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

	WTB8 Inox	WTE8 Inox	WL8 Inox	WSE8 Inox
Sensor principle	Photoelectric proximity sensor		Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Detection principle	Background suppression	Energetic	Standard optics	–
Dimensions (W x H x D)	11 mm x 21 mm x 33.3 mm			
Housing design (light emission)	Rectangular			
Sensing range max.	5 mm ... 500 mm ¹⁾ (depending on type)	0 mm ... 950 mm ¹⁾	0.01 m ... 6.5 m ²⁾	0 m ... 45 m
Sensing range	5 mm ... 300 mm ¹⁾ (depending on type)	0 mm ... 700 mm ¹⁾	0.01 m ... 4.5 m ³⁾	0 m ... 20 m
Type of light	Visible red light			
Light source ⁴⁾	LED			
Angle of dispersion	–	Approx. 3°		Approx. 2.5°
Wave length	650 nm	645 nm		
Adjustment	Potentiometer, 4 turns	Potentiometer, 270°		

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

²⁾ PL80A.

³⁾ P250A.

⁴⁾ Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

	WTB8 Inox	WTE8 Inox	WL8 Inox	WSE8 Inox
Supply voltage ¹⁾	10 V DC ... 30 V DC			
Ripple ²⁾	± 10 %			
Power consumption ³⁾	≤ 30 mA			–
Power consumption, sender	–			≤ 15 mA ⁴⁾
Power consumption, receiver	–			≤ 20 mA ⁴⁾
Output type	PNP / NPN (depending on type)			
Switching mode	Light/dark-switching (selectable via light/dark selector)			
Signal voltage PNP HIGH/LOW	Approx. V _S – 1.8 V / 0 V			
Signal voltage NPN HIGH/LOW	Approx. V _S / < 1.8 V			
Output current I_{max.}	100 mA			
Response time ⁵⁾	≤ 0.5 ms			
Switching frequency ⁶⁾	1,000 Hz			
Angle of reception	–			Approx. 15°
Connection type	Cable, 2 m ⁷⁾ / Male connector, M8 (depending on type)			
Circuit protection	A ⁸⁾ , B ⁹⁾ , D ¹⁰⁾			
Protection class	III			
Weight	83.6 g			
Polarisation filter	–		✓	–
Housing material	Stainless steel V4A (1.4404, 316L)			

	WTB8 Inox	WTE8 Inox	WL8 Inox	WSE8 Inox
Enclosure rating	IP 69K			
Items supplied	Stainless steel mounting bracket (1.4301/304) BEF-W100-A		Stainless steel mounting bracket (1.4301/304) BEF-W100-A, P250A reflector	Stainless steel mounting bracket (1.4301/304) BEF-W100-A
Ambient operating temperature ¹¹⁾	-30 °C ... +60 °C			
Ambient storage temperature	-40 °C ... +70 °C			

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

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

³⁾ Without load.

⁴⁾ Receiver without load.

⁵⁾ Signal transit time with resistive load.

⁶⁾ With light/dark ratio 1:1.

⁷⁾ Do not bend below 0 °C.

⁸⁾ A = V_s connections reverse-polarity protected.

⁹⁾ B = inputs and output reverse-polarity protected.

¹⁰⁾ D = outputs overcurrent and short-circuit protected.

¹¹⁾ At an air humidity of 35 ... 95 %.

Ordering information

Other models available at www.mysick.com/en/W8_Inox

WTB8 Inox

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer, 4 turns

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
5 mm ... 150 mm	Ø 8 mm (100 mm)	PNP	Cable, 3-wire 2 m PVC	Cd-043	WTB8-P1111V	6041457
			Connector M8, 3-pin	Cd-045	WTB8-P2111V	6041458
			Connector M8, 4-pin	Cd-066	WTB8-P2211V	6041459
		NPN	Cable, 3-wire 2 m PVC	Cd-043	WTB8-N1111V	6041453
			Connector M8, 3-pin	Cd-045	WTB8-N2111V	6041454
			Connector M8, 4-pin	Cd-066	WTB8-N2211V	6041455
10 mm ... 500 mm	Ø 22 mm (350 mm)	PNP	Cable, 3-wire 2 m PVC	Cd-043	WTB8-P1131V	6041465
			Connector M8, 3-pin	Cd-045	WTB8-P2131V	6041466
			Connector M8, 4-pin	Cd-066	WTB8-P2231V	6041467
		NPN	Cable, 3-wire 2 m PVC	Cd-043	WTB8-N1131V	6041461
			Connector M8, 3-pin	Cd-045	WTB8-N2131V	6041462
			Connector M8, 4-pin	Cd-066	WTB8-N2231V	6041463

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

WTE8 Inox

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** energetic
- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer, 270 °

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
0 mm ... 950 mm	Ø 35 mm (700 mm)	PNP	Cable, 3-wire 2 m PVC	Cd-043	WTE8-P1131V	6041473
			Connector M8, 3-pin	Cd-045	WTE8-P2131V	6041474
			Connector M8, 4-pin	Cd-066	WTE8-P2231V	6041475
		NPN	Cable, 3-wire 2 m PVC	Cd-043	WTE8-N1131V	6041469
			Connector M8, 3-pin	Cd-045	WTE8-N2131V	6041470
			Connector M8, 4-pin	Cd-066	WTE8-N2231V	6041471

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

WL8 Inox

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer, 270 °

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
0.01 m ... 6.5 m	Ø 245 mm (4.5 m)	PNP	Cable, 3-wire 2 m PVC	Cd-043	WL8-P1131V	6041481
			Connector M8, 3-pin	Cd-045	WL8-P2131V	6041482
			Connector M8, 4-pin	Cd-066	WL8-P2231V	6041483
		NPN	Cable, 3-wire 2 m PVC	Cd-043	WL8-N1131V	6041477
			Connector M8, 3-pin	Cd-045	WL8-N2131V	6041478
			Connector M8, 4-pin	Cd-066	WL8-N2231V	6041479

¹⁾ PL80A.

WSE8 Inox

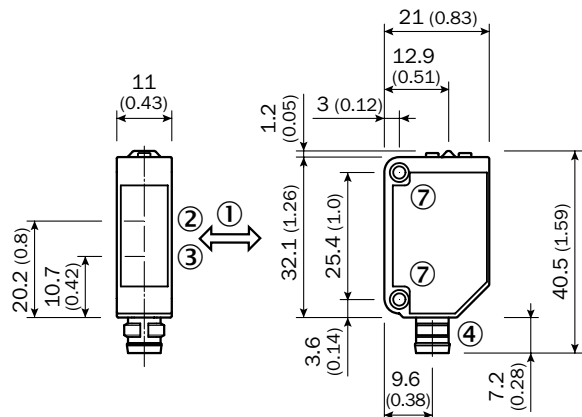
- **Sensor principle:** through-beam photoelectric sensor
- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer, 270 °

Sensing range max.	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
0 m ... 45 m	Ø 900 mm (20 m)	PNP	Cable, 3-wire 2 m PVC	Cd-049	WSE8-P1131V	6041489
			Connector M8, 3-pin	Cd-051	WSE8-P2131V	6041490
			Connector M8, 4-pin	Cd-057	WSE8-P2231V	6041491
		NPN	Cable, 3-wire 2 m PVC	Cd-049	WSE8-N1131V	6041485
			Connector M8, 3-pin	Cd-051	WSE8-N2131V	6041486
			Connector M8, 4-pin	Cd-057	WSE8-N2231V	6041487

Dimensional drawings

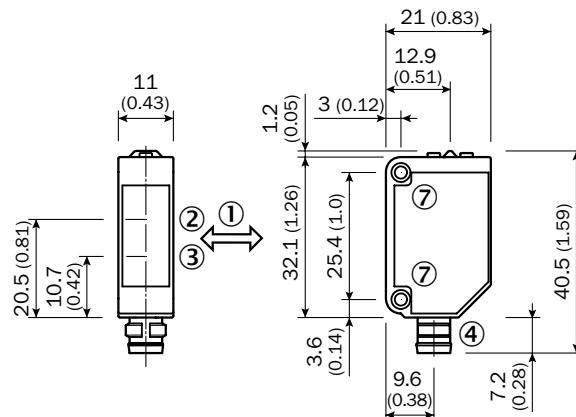
Dimensions in mm (inch)

WTB8, 150 mm



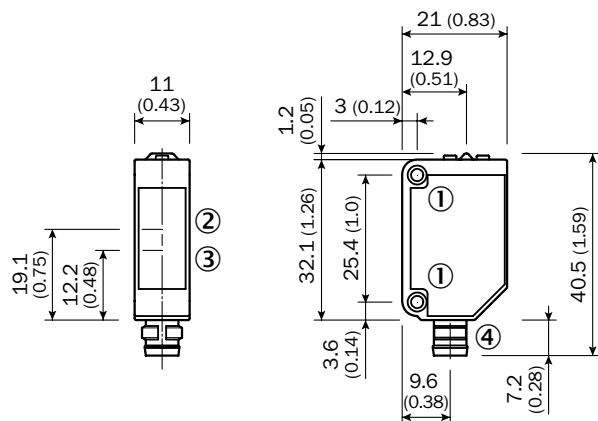
- ① Standard direction
- ② Center of optical axis, receiver
- ③ Center of optical axis, sender
- ④ Connection
- ⑦ Threaded mounting hole M3, max. tightening torque of 1.8 Nm for M3 screw with washer, spring ring and mounting bracket (2 x 3.2 mm borehole)

WTB8, 500 mm



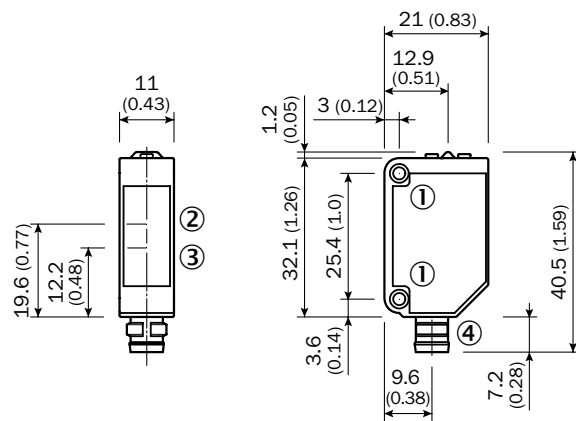
- ① Standard direction
- ② Center of optical axis, receiver
- ③ Center of optical axis, sender
- ④ Connection
- ⑦ Threaded mounting hole M3, max. tightening torque of 1.8 Nm for M3 screw with washer, spring ring and mounting bracket (2 x 3.2 mm borehole)

WTE8



- ① Threaded mounting hole M3, max. tightening torque of 1.8 Nm for M3 screw with washer, spring ring and mounting bracket (2 x 3.2 mm borehole)
- ② Center of optical axis, receiver
- ③ Center of optical axis, sender
- ④ Connection

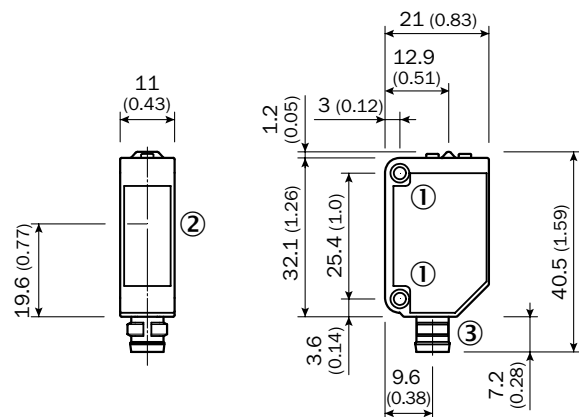
WL8



- ① Threaded mounting hole M3, max. tightening torque of 1.8 Nm for M3 screw with washer, spring ring and mounting bracket (2 x 3.2 mm borehole)
- ② Center of optical axis, receiver
- ③ Center of optical axis, sender
- ④ Connection

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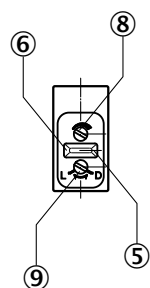
WSE8



- ① Threaded mounting hole M3, max. tightening torque of 1.8 Nm for M3 screw with washer, spring ring and mounting bracket (2 x 3.2 mm borehole)
- ② Center of optical axis, sender and receiver
- ③ Connection

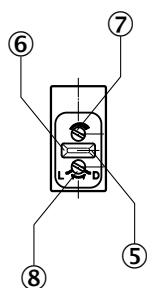
Adjustments

WTB8



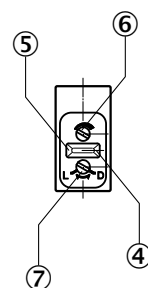
- ⑤ Orange LED indicator: switching output active
- ⑥ LED indicator green: stability indicator light up when the light received is < 0.9 or > 1.1 (based on switching threshold Q = 1)
- ⑧ Sensing range adjustment: potentiometer, 4-turn
- ⑨ Light/ dark rotary switch: L = light switching, D = dark switching

WTE8, WL8



- ⑤ Orange LED indicator: switching output active
- ⑥ LED indicator green: stability indicator light up when the light received is < 0.9 or > 1.1 (based on switching threshold Q = 1)
- ⑦ Sensitivity control: potentiometer 270°
- ⑧ Light/ dark rotary switch: L = light switching, D = dark switching

WSE8



- ④ Orange LED indicator: switching output active (only WE)
- ⑤ LED indicator green: stability indicator light up when the light received is < 0.9 or > 1.1 (based on switching threshold Q = 1)
- ⑥ Sensitivity control: potentiometer 270° on WE
- ⑦ Light/ dark rotary switch: L = light switching, D = dark switching

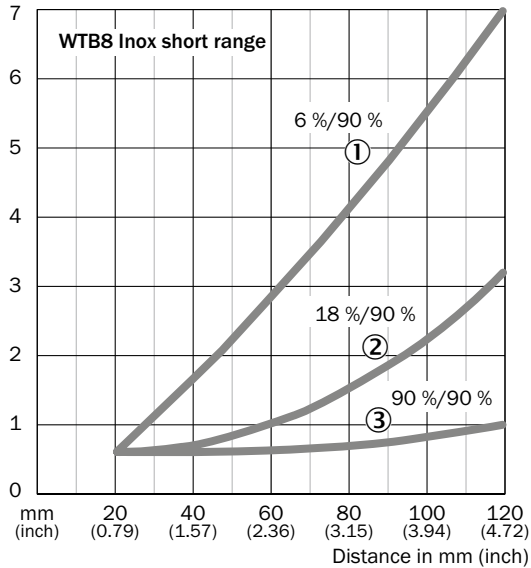
F

Characteristic curves

Black-white shift

WTB8, 150 mm

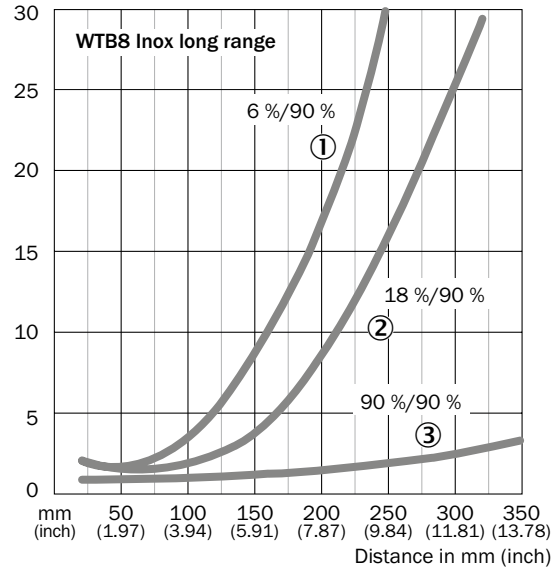
% of sensing distance



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

WTB8, 500 mm

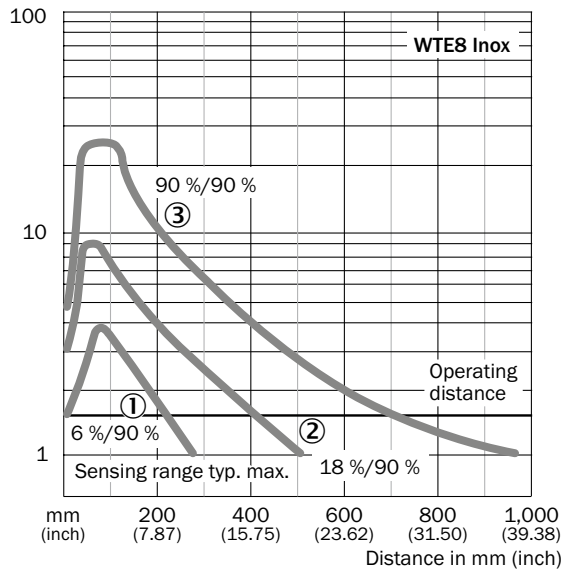
% of sensing



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

WTE8

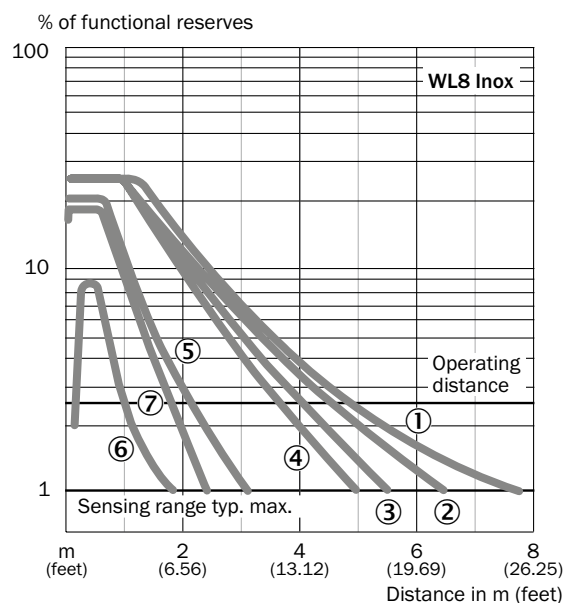
% of functional reserves



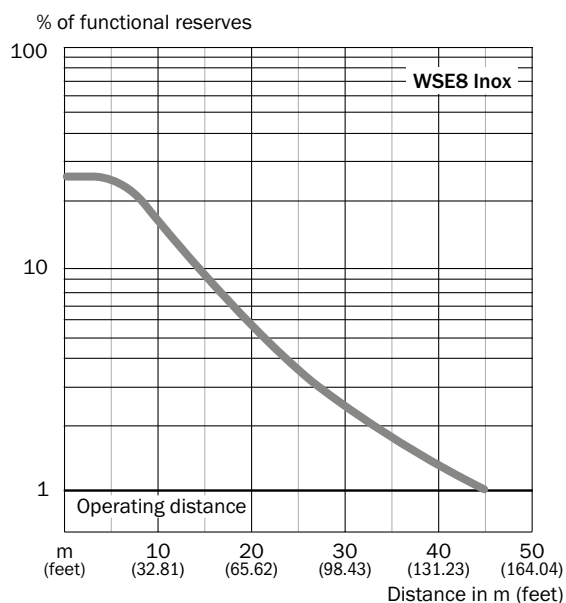
- ① Sensing range on black, 6 % remission
 ② Sensing range on gray, 18 % remission
 ③ Sensing range on white, 90 % remission

Operating reserve

WL8

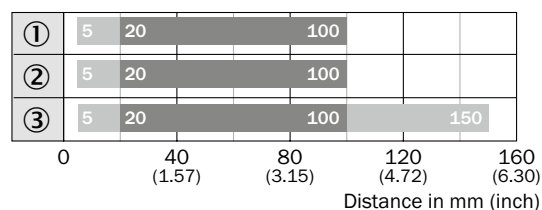


WSE8



Bar diagrams

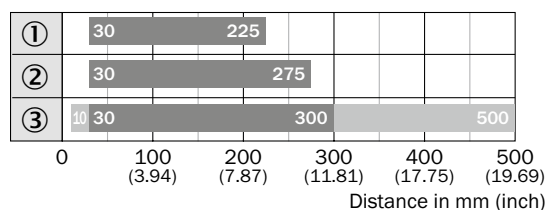
WTB8, 150 mm



■ Sensing range ■ Sensing range max.

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

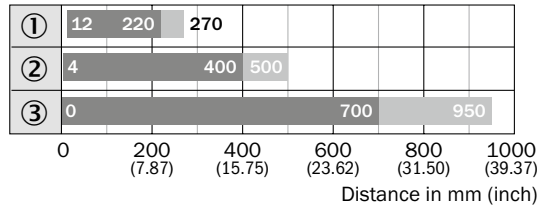
WTB8, 500 mm



■ Sensing range ■ Sensing range max.

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

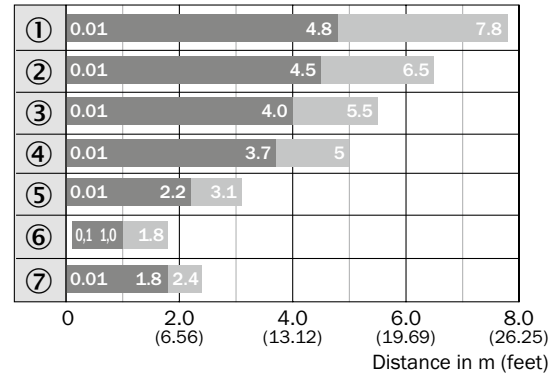
WTE8



■ Sensing range ■ Sensing range max.

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

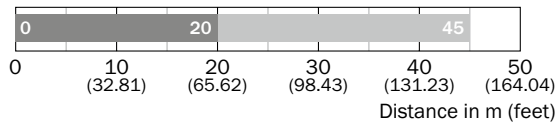
WL8



■ Sensing range ■ Sensing range max.

- ① PL80A ⑤ PL20A
 ② P250 ⑥ Reflective tape
 ③ PL40A Diamond Grade
 ④ PL30A ⑦ P45

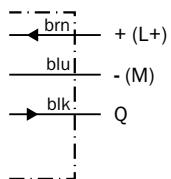
WSE8



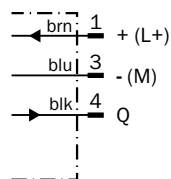
■ Sensing range ■ Sensing range max.

Connection diagram

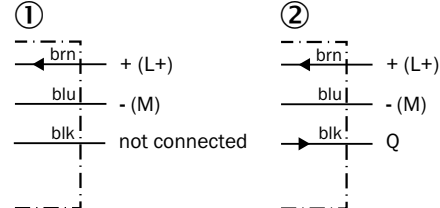
Cd-043



Cd-045

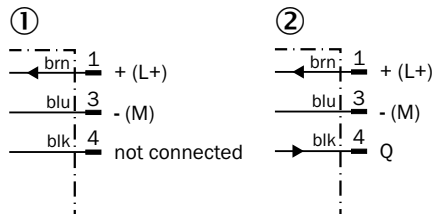


Cd-049



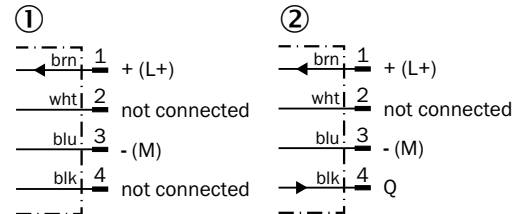
- ① Sender
 ② Receiver

Cd-051



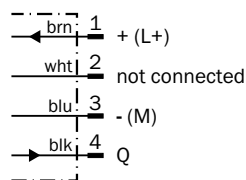
- ① Sender
 ② Receiver

Cd-057



- ① Sender
 ② Receiver

Cd-066



Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Stainless steel	Mounting bracket for wall mounting	BEF-W100-A	5311520
	Steel, zinc coated	Mounting bracket for floor mounting	BEF-W100-B	5311521

Plug connectors and cables

Connecting cable (female connector-open), hygienic systems

- Cable material: PP
- Connector material: PP

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, IP 69K	DOL-0803-G02MN	6033664
			5 m, 3-wire	IP 67, IP 69K	DOL-0803-G05MN	6033665
	Female connector, M8, 3-pin, angled	Cable, open conductor heads	2 m, 3-wire	IP 67, IP 69K	DOL-0803-W02MN	6033667
			5 m, 3-wire	IP 67, IP 69K	DOL-0803-W05MN	6033668
			10 m, 3-wire	IP 67, IP 69K	DOL-0803-W10MN	6033669
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-0804-G02MN	6033670
			5 m, 4-wire	IP 67, IP 69K	DOL-0804-G05MN	6033671
			10 m, 4-wire	IP 67, IP 69K	DOL-0804-G10MN	6033672
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-0804-W02MN	6033673
			5 m, 4-wire	IP 67, IP 69K	DOL-0804-W05MN	6033674

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate NO8N for universal clamp bracket	BEF-KHS-NO8N	2051616

Device protection (mechanical)

Protective housing/tubes

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571	Safety bracket for floor mounting	BEF-SW-W4S	2051497

Reflectors

Angular

Figure	Material	Description	Model name	Part no.
	Plastic	Chemically resistant, screw connection, 47 mm x 47 mm	P250 CHEM	5321097

Fine triple reflectors

Figure	Material	Description	Model name	Part no.
	Plastic	Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089

F

Reflective tape

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

Special reflectors

Figure	Material	Description	Model name	Part no.
	Plastic	Chemically resistant, screw connection, 38 mm x 15 mm	PL20 CHEM	5321089
	PMMA/ABS	Antifog, for prevention of moisture fogging on the reflection area, screw connection, 56 mm x 37 mm	PL40A Antifog	5322011
	Plastic	Rectangular, screw connection M3, countersunk screw head, chemical resistant, 56 mm x 37 mm	PL40B-CHEM	5326088
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adapter shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adapter thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

→ For additional accessories, please see page L-861

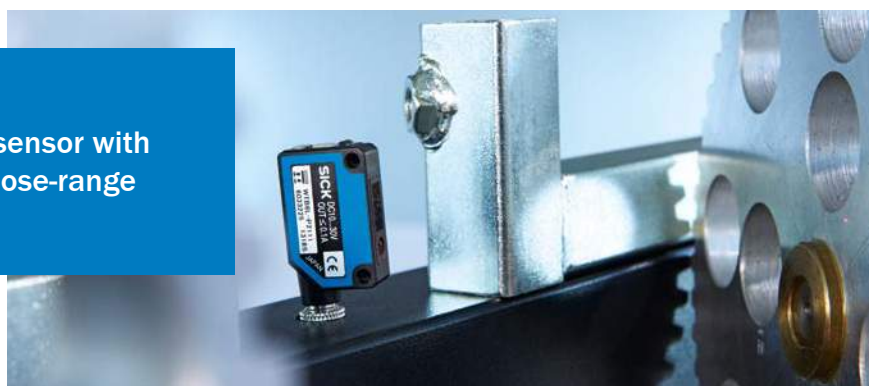


Laser photoelectric proximity sensor with background suppression for close-range applications



Additional information

Detailed technical data.....	F-399
Ordering information.....	F-400
Dimensional drawings.....	F-400
Adjustments.....	F-400
Characteristic curves.....	F-401
Bar diagrams.....	F-401
Connection diagram.....	F-401
Recommended accessories.....	F-402



Product description

The WTB8L is a high-quality miniature photoelectric proximity sensor with laser emitter LEDs and outstanding background suppression specially designed for close-range applications. High switch-

ing frequencies of 2 kHz make these sensors suitable for a broad range of applications. The housing design, with M3 threaded mounting holes, ensures easy and secure mounting.

At a glance

- Laser class 1
- Background suppression
- Standard miniature housing with M3 threaded mounting holes
- Switching frequency up to 2 kHz
- Light/dark switching via rotary switch
- Mounting bracket BEF-W100-A is included with delivery

Your benefits

- Highly flexible design and operational capabilities due to precise background suppression
- Reliable detection of small objects, regardless of color or surface qualities
- Rapid switching frequency reliably detects objects travelling at high speeds which allows to optimize the production processes
- Highly visible laser light spot simplifies alignment
- All necessary accessories are included with delivery, reducing installation and procurement costs

→ www.mysick.com/en/W8_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.



Detailed technical data

Features

Sensor principle	Photoelectric proximity sensor
Detection principle	Background suppression
Dimensions (W x H x D)	11 mm x 31 mm x 20 mm
Housing design (light emission)	Rectangular
Sensing range max.	5 mm ... 300 mm ¹⁾ (depending on type)
Sensing range	20 mm ... 300 mm ¹⁾ (depending on type)
Type of light	Visible red light
Light source ²⁾	Laser
Wave length	650 nm
Laser class	I
Adjustment	Potentiometer, 4 turns

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

²⁾ Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	± 10 %
Power consumption ³⁾	≤ 30 mA
Output type	PNP, open collector / NPN, open collector (depending on type)
Switching mode	Light/dark-switching (manually selectable)
Signal voltage PNP HIGH/LOW	Approx. V _S – 1.8 V / 0 V
Signal voltage NPN HIGH/LOW	Approx. V _S / < 1.8 V
Output current I_{max.}	≤ 100 mA
Response time ⁴⁾	≤ 0.25 ms
Switching frequency ⁵⁾	2,000 Hz
Connection type	Cable, 2 m ⁶⁾ / Male connector, M8 (depending on type)
Circuit protection	A ⁷⁾ , B ⁸⁾ , D ⁹⁾
Weight	
	Cable ⁶⁾ 50 g
	Connector 10 g
Housing material	ABS
Optics material	PMMA
Enclosure rating	IP 67
Items supplied	Stainless steel mounting bracket (1.4301/304) BEF-W100-A
Ambient operating temperature	–10 °C ... +50 °C
Ambient storage temperature	–40 °C ... +70 °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⁾ B = inputs and output reverse-polarity protected.

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

Ordering information

Other models available at www.mysick.com/en/W8_Laser

WTB8L

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer, 4 turns

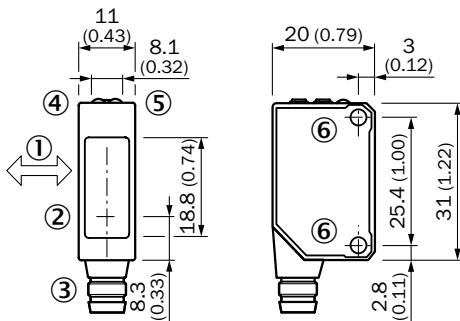
Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
5 mm ... 100 mm	Ø 1 mm (100 mm)	PNP	Cable, 4-wire 2 m PVC	Cd-116	WTB8L-P1111	6033223
			Connector M8, 3-pin	Cd-045	WTB8L-P2111	6033225
			Connector M8, 4-pin	Cd-078	WTB8L-P2211	6033227
		NPN	Cable, 4-wire 2 m PVC	Cd-116	WTB8L-N1111	6033222
			Connector M8, 3-pin	Cd-045	WTB8L-N2111	6033224
			Connector M8, 4-pin	Cd-078	WTB8L-N2211	6033226
30 mm ... 300 mm	Ø 1.5 mm (300 mm)	PNP	Cable, 4-wire 2 m PVC	Cd-116	WTB8L-P1131	6033217
			Connector M8, 3-pin	Cd-045	WTB8L-P2131	6033219
			Connector M8, 4-pin	Cd-078	WTB8L-P2231	6033221
		NPN	Cable, 4-wire 2 m PVC	Cd-116	WTB8L-N1131	6033216
			Connector M8, 3-pin	Cd-045	WTB8L-N2131	6033218
			Connector M8, 4-pin	Cd-078	WTB8L-N2231	6033220

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

Dimensional drawings

Dimensions in mm (inch)

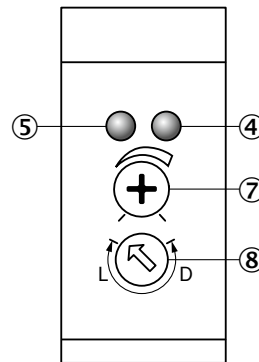
WTB8L



- ① Standard direction
- ② Center of optical axis
- ③ Connection
- ④ Orange LED indicator: switching output active
- ⑤ LED indicator green: stability indicator
- ⑥ Threaded mounting hole M3, max. tightening torque: 0.6 Nm

Adjustments

WTB8L

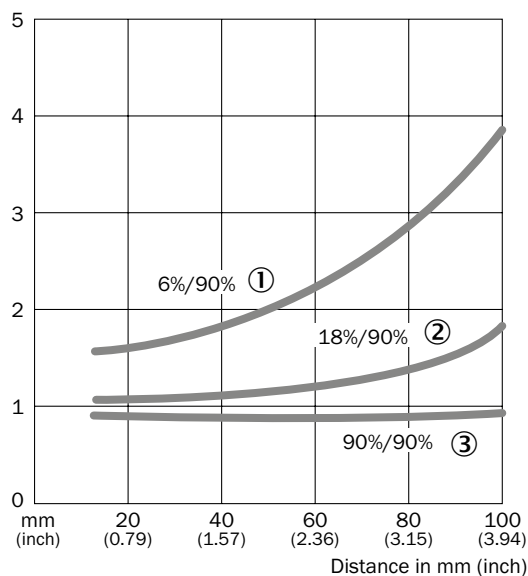


- ④ Orange LED indicator: switching output active
- ⑤ LED indicator green: stability indicator
- ⑦ Sensing range adjustment
- ⑧ Light/ dark rotary switch:
L = light switching, D = dark switching

Characteristic curves

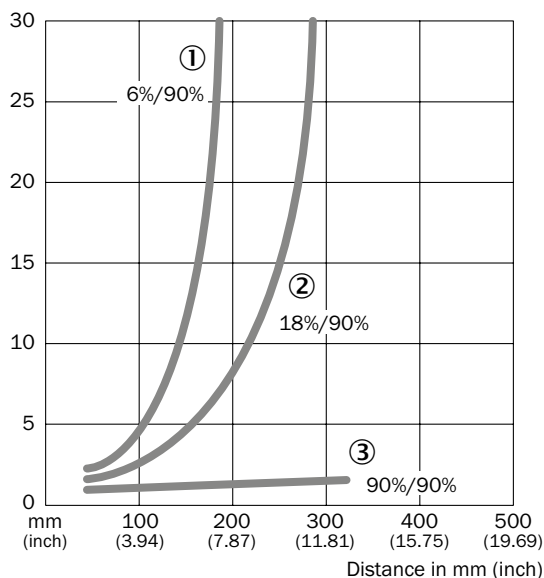
Black-white shift

WTB8L, 100 mm



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

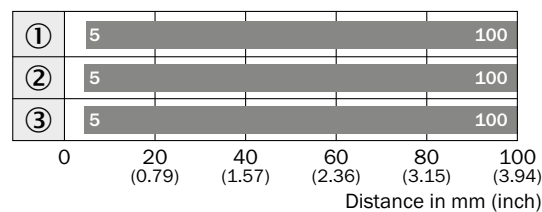
WTB8L, 300 mm



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

Bar diagrams

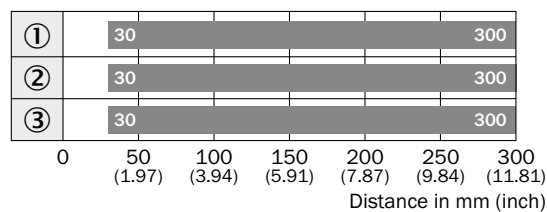
WTB8L, 100 mm



■ Sensing range

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

WTB8L, 300 mm

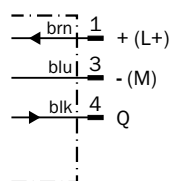


■ Sensing range

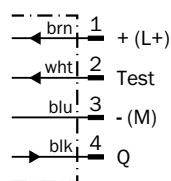
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

Connection diagram

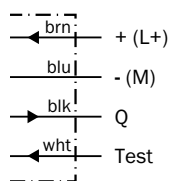
Cd-045



Cd-078



Cd-116



Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Stainless steel	Mounting bracket for wall mounting	BEF-W100-A	5311520
	Steel, zinc coated	Mounting bracket for floor mounting	BEF-W100-B	5311521

Plug connectors and cables

Connecting cable (female connector-open), 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

Female connector (ready to assemble)

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0803-G	7902077
	Female connector, M8, 3-pin, angled	Pin penetration	PBT	IP 67	DOS-0803-W	7902078
	Female connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0804-G	6009974
	Female connector, M8, 4-pin, angled	Pin penetration	PBT	IP 67	DOS-0804-W	6009975

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N08 for universal clamp bracket	BEF-KHS-N08	2051607

Device protection (mechanical)

Protective housing/tubes

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571	Safety bracket for floor mounting	BEF-SW-W4S	2051497

→ For additional accessories, please see page L-861

Miniature photoelectric sensors for standard applications



Available from June 2014



Additional information

Detailed technical data.....	F-405
Ordering information.....	F-406
Dimensional drawings	F-408
Adjustments	F-408
Connection diagram	F-408
Recommended accessories.....	F-409

Product description

W100-2 miniature photoelectric sensors are compatible with all standard detection principles (through-beam photoelectric sensors, photoelectric retro-reflective sensors, photoelectric retro-reflective sensors for detecting transparent objects, energetic sensors, and sensors with background blanking), making them an ideal sensor family for detection applications.

The housing design includes M3 threaded mounting holes, spaced one inch apart, that allows for straightforward, standardized, and inexpensive mounting. As a result, the W100-2 product family offers an economical photoelectric sensor solution with outstanding performance.

At a glance

- Reliable detection behavior, rugged housing and immunity to ambient light
- WT100-2 photoelectric proximity sensor (energetic or with background blanking)
- WL100-2 photoelectric retro-reflective sensor; variant available for detecting transparent objects
- WS/WE100-2 through-beam photoelectric sensor
- Various connection types available (standard: 2 m cable; M8 male connector, 3-pin; M8 male connector, 4-pin; male cable connector available on request)
- Light/dark switching and sensitivity adjustment possible
- Wide range of accessories

Your benefits

- Reliable detection in standard applications
- Short downtime and high throughput thanks to reliable object detection
- Ability to handle a wide range of detection principles within a single standardized housing, reducing the number of model variants
- Simple commissioning thanks to easily visible display LEDs
- Easy to set up thanks to user-friendly potentiometer (dependent on model)
- Standard housing that is compatible with many commonly used mounting systems
- Easy mounting thanks to 1-inch hole spacing
- High level of operating reserve minimizes susceptibility to contamination

→ www.mysick.com/en/W100-2

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

	WT100-2	WL100-2	WS/WE100-2
Sensor principle	Photoelectric proximity sensor	Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Detection principle	Energetic / Background blanking (depending on type)	–	
Dimensions (W x H x D)	11 m x 31 m x 20 m		
Housing design (light emission)	Rectangular		
Sensing range max.	0 mm ... 1,000 mm ¹⁾ (depending on type)	0.01 m ... 7.5 m ²⁾ (depending on type)	0 m ... 30 m
Sensing range	0 mm ... 750 mm ¹⁾ (depending on type)	0.01 m ... 6 m ²⁾ (depending on type)	0 m ... 20 m
Type of light	Visible red light		
Light source ³⁾	LED		
Angle of dispersion	Approx. 6.8° / approx. 5° (depending on type)	Approx. 4°	± 7.2°
Wave length	632 nm		
Adjustment	Potentiometer		Potentiometer, 270 °
Special feature	–	Detection of transparent objects (depending on type)	–

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

	WT100-2	WL100-2	WS/WE100-2
Supply voltage ¹⁾	10 V ... 30 V		
Ripple ²⁾	± 10 %		
Power consumption ³⁾	≤ 30 mA		–
Power consumption, sender	–		≤ 15 mA ³⁾
Power consumption, receiver	–		≤ 20 mA ³⁾
Output type	PNP / NPN (depending on type)		
Switching mode	Light/dark-switching (manually selectable)		
Signal voltage PNP HIGH/LOW	U _V – 1,8 V / ca. 0 V		
Signal voltage NPN HIGH/LOW	Approx. V _S / < 1.8 V		
Output current I _{max.}	100 mA		
Response time ⁴⁾	≤ 0.5 ms		
Switching frequency	1,000 Hz		
Angle of reception	–		± 15°
Attenuation along light beam	–	≥ 20 %	–
Connection type	Cable, 2 m ⁵⁾ / Male connector, M8 (depending on type)		
Circuit protection	A ⁶⁾ , B ⁷⁾ , D ⁸⁾		
Protection class	III		
Polarisation filter	–	✓ / – (depending on type)	–
Housing material	ABS/PC/POM		
Optics material	PMMA		

	WT100-2	WL100-2	WS/WE100-2
Enclosure rating	IP 67		
Items supplied	Mounting bracket BEF-W100-A	Mounting bracket BEF-W100-A, Reflector P250	Mounting bracket BEF-W100-A
Ambient operating temperature	-25 °C ... +55 °C		
Ambient storage temperature	-40 °C ... +70 °C		

¹⁾ Limit values.

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

³⁾ Without load.

⁴⁾ Signal transit time with resistive load.

⁵⁾ Do not bend below 0 °C.

⁶⁾ A = V_s connections reverse-polarity protected.

⁷⁾ B = output reverse-polarity protected.

⁸⁾ D = outputs overcurrent and short-circuit protected.

Ordering information

Other models available at www.mysick.com/en/W100-2

WT100-2

- **Sensor principle:** photoelectric proximity sensor
- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer
- **Items supplied:** mounting bracket BEF-W100-A

F

Detection principle	Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
Energetic	0 mm ... 1,000 mm	Ø 55 mm (400 mm)	PNP	Cable, 3-wire, 2 m, PVC	Cd-043	WT100-2P1439	6052372
				Connector M8, 3-pin	Cd-045	WT100-2P3439	6052373
				Connector M8, 4-pin	Cd-040	WT100-2P4439	6052374
			NPN	Cable, 3-wire, 2 m, PVC	Cd-043	WT100-2N1439	6052369
				Connector M8, 3-pin	Cd-045	WT100-2N3439	6052370
				Connector M8, 4-pin	Cd-040	WT100-2N4439	6052371
Background blanking	4 mm ... 140 mm	Ø 8 mm (90 mm)	PNP	Cable, 3-wire, 2 m, PVC	Cd-043	WT100-2P1419	6052378
				Connector M8, 3-pin	Cd-045	WT100-2P3419	6052379
				Connector M8, 4-pin	Cd-040	WT100-2P4419	6052380
			NPN	Cable, 3-wire, 2 m, PVC	Cd-043	WT100-2N1419	6052375
				Connector M8, 3-pin	Cd-045	WT100-2N3419	6052376
				Connector M8, 4-pin	Cd-040	WT100-2N4419	6052377

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

WL100-2

- **Sensor principle:** photoelectric retro-reflective sensor
- **Polfilter:** ✓
- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer
- **Items supplied:** mounting bracket BEF-W100-A, Reflector P250

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
0.01 m ... 7.5 m	Ø 250 mm (3.5 mm)	PNP	Cable, 3-wire, 2 m, PVC	Cd-043	WL100-2P1439	6052360
			Connector M8, 3-pin	Cd-045	WL100-2P3439	6052361
			Connector M8, 4-pin	Cd-040	WL100-2P4439	6052362
		NPN	Cable, 3-wire, 2 m, PVC	Cd-043	WL100-2N1439	6052357
			Connector M8, 3-pin	Cd-045	WL100-2N3439	6052358
			Connector M8, 4-pin	Cd-040	WL100-2N4439	6052359

¹⁾ PL80A.

WL100-2, detection of transparent objects

- **Sensor principle:** photoelectric retro-reflective sensor
- **Polfilter:** –
- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer
- **Items supplied:** mounting bracket BEF-W100-A, Reflector P250

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
0.01 m ... 3 m	Ø 200 mm (2 mm)	PNP	Cable, 3-wire, 2 m, PVC	Cd-043	WL100-2P1429	6052384
			Connector M8, 3-pin	Cd-045	WL100-2P3429	6052385
			Connector M8, 4-pin	Cd-040	WL100-2P4429	6052386
		NPN	Cable, 3-wire, 2 m, PVC	Cd-043	WL100-2N1429	6052381
			Connector M8, 3-pin	Cd-045	WL100-2N3429	6052382
			Connector M8, 4-pin	Cd-040	WL100-2N4429	6052383

¹⁾ PL80A.

WS/WE100-2

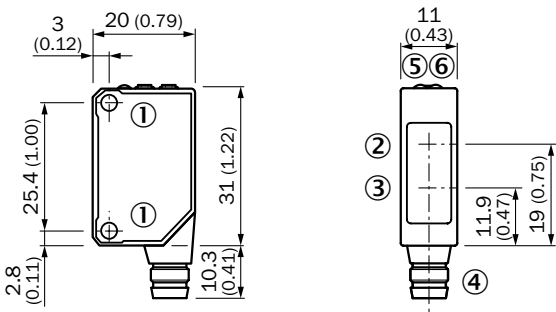
- **Sensor principle:** through-beam photoelectric sensor
- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer, 270 °
- **Items supplied:** mounting bracket BEF-W100-A

Sensing range max.	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
0 m ... 30 m	Ø 1,500 mm (12 mm)	PNP	Cable, 3-wire, 2 m, PVC	Cd-049	WS/WE100-2P1439	6052366
			Connector M8, 3-pin	Cd-051	WS/WE100-2P3439	6052367
			Connector M8, 4-pin	Cd-057	WS/WE100-2P4439	6052368
		NPN	Cable, 3-wire, 2 m, PVC	Cd-049	WS/WE100-2N1439	6052363
			Connector M8, 3-pin	Cd-051	WS/WE100-2N3439	6052364
			Connector M8, 4-pin	Cd-057	WS/WE100-2N4439	6052365

Dimensional drawings

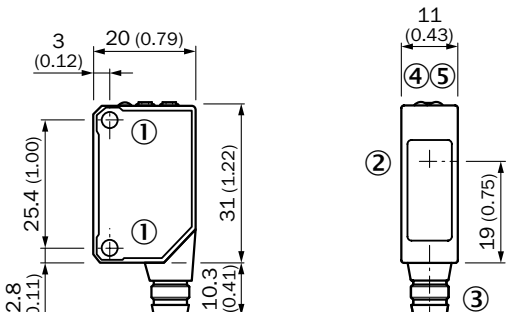
Dimensions in mm (inch)

WT100, WL100



- ① Threaded mounting hole M3
- ② Center of optical axis, receiver
- ③ Center of optical axis, sender
- ④ Connection
- ⑤ LED indicator orange: switching output active
- ⑥ LED indicator green: stability indicator

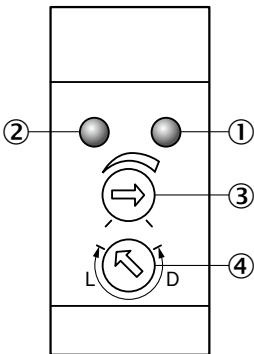
WS/WE100



- ① Threaded mounting hole M3
- ② Center of optical axis, receiver
- ③ Center of optical axis, sender
- ④ Connection
- ⑤ LED indicator orange: output active
- ⑥ LED indicator green: stability indicator
- ⑦ Sensing range adjustment: potentiometer, 270°
- ⑧ Light/ dark rotary switch: L = light switching, D = dark switching

Adjustments

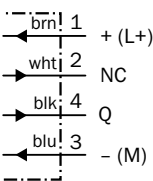
W100-2



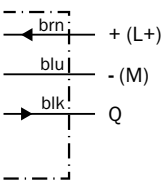
- ① LED indicator orange: switching output active
- ② LED indicator green: power on
- ③ Sensing range adjustment: potentiometer
- ④ Light/ dark rotary switch:
L = light switching, D = dark switching

Connection diagram

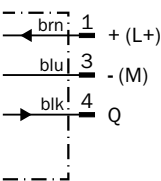
Cd-040



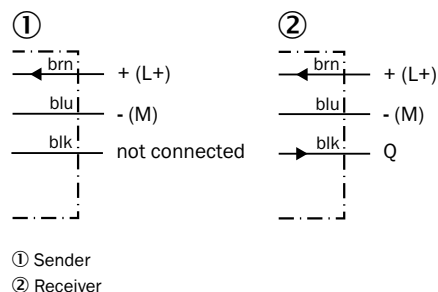
Cd-043



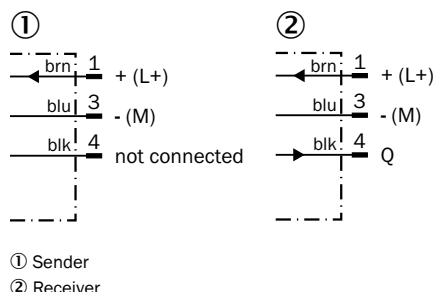
Cd-045



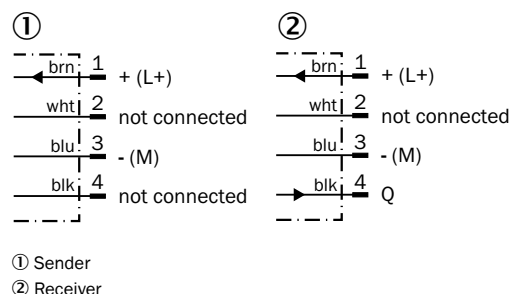
Cd-049



Cd-051



Cd-057



Recommended accessories

Plug connectors and cables

Connecting cable (female connector-open), 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

Male connector (ready to assemble)M8, 3-pin

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Male connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	STE-0803-G	6037322

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

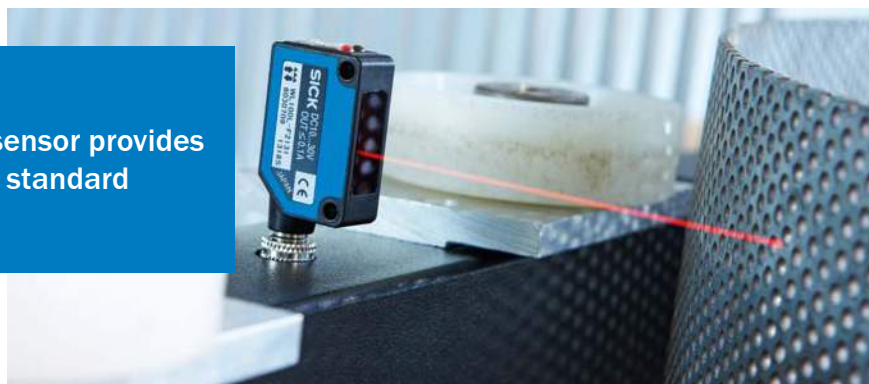
Figure	Description	Model name	Part no.
	Self-adhesive, 50 mm x 60 mm	REF-IRF-56	5314244

Round

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Round, plugable for metal plates	PL22-3	1004488

→ For additional accessories, please see page L-861

Miniature photoelectric laser sensor provides precise detection of objects in standard applications



Additional information

Detailed technical data.....	F-413
Ordering information.....	F-414
Dimensional drawings	F-415
Adjustments	F-415
Characteristic curves	F-416
Bar diagrams.....	F-417
Light spot diameter.....	F-417
Connection diagram	F-417
Recommended accessories.....	F-418

Product description

The W100 Laser is a complete family of photoelectric sensors enclosed in a miniature housing. These sensors feature a laser sender LED that provides large sensing ranges for standard applications. The compact housing design

with M3 threaded mounting holes allows for quick and simple mounting. The W100 Laser is a great alternative to the standard W100, especially for applications that demand higher precision or a longer sensing range.

At a glance

- Standard miniature housing with M3 threaded mounting holes
- Long sensing range
- Light/dark switching and sensitivity adjustment via rotary switch possible
- Various versions are available, including through-beam, retro-reflective and energetic
- Wide variety of accessories available
- Laser emitter LED, class 1

Your benefits

- Reliable detection of small objects
- Less contamination due to high optical operating reserve
- M3 threaded mounting holes provide easy installation
- Compact housing easily fits in applications with limited space

→ www.mysick.com/en/W100_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.



Detailed technical data

Features

	WT100L	WL100L	WS/WE100L
Sensor principle	Photoelectric proximity sensor	Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Detection principle	Energetic	Standard optics	–
Dimensions (W x H x D)	11 mm x 31 mm x 20 mm		
Housing design (light emission)	Rectangular		
Sensing range max.	0 mm ... 450 mm ¹⁾	0.08 m ... 12 m ²⁾	0 m ... 35 m
Sensing range	0 mm ... 400 mm	0.08 m ... 10 m ²⁾	0 m ... 30 m
Type of light	Visible red light		
Light source ³⁾	Laser		
Light spot size (distance)	Ø 2 mm (400 mm)	Ø 12 mm (10 m)	Ø 30 mm (30 m)
Wave length	650 nm		
Laser class	1		
Adjustment	Potentiometer, 270 °		

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

²⁾ P250F.

³⁾ Average service life 50,000 h at T_A = +25 °C.

Mechanics/electronics

	WT100L	WL100L	WS/WE100L
Supply voltage ¹⁾	10 V DC ... 30 V DC		
Ripple ²⁾	± 10 %		
Power consumption ³⁾	≤ 30 mA		–
Power consumption, sender	–		≤ 15 mA ³⁾
Power consumption, receiver	–		≤ 20 mA ³⁾
Output type	PNP, open collector / NPN, open collector (depending on type)		
Switching mode	Light/dark-switching (manually selectable)		
Signal voltage PNP HIGH/LOW	U _V – 1,8 V / ca. 0 V		
Signal voltage NPN HIGH/LOW	Approx. V _S / < 1.8 V		
Output current I_{max.}	100		
Response time ⁴⁾	< 0.25 ms		
Switching frequency ⁵⁾	2,000		
Connection type	Cable, 2 m ⁶⁾ / Male connector, M8 (depending on type)		
Circuit protection	A ⁷⁾ , B ⁸⁾ , D ⁹⁾		
Weight			
	Cable ⁶⁾	50 g	
	Connector	10 g	
Polarisation filter	–	✓	–
Housing material	ABS/PC/POM, ABS/PC (depending on type)		
Optics material	PMMA		

F

	WT100L	WL100L	WS/WE100L
Enclosure rating	IP 65		
Items supplied	Stainless steel mounting bracket (1.4301/304) BEF-W100-A	Stainless steel mounting bracket (1.4301/304) BEF-W100-A, Reflector P250F	2 Stainless steel mounting brackets (1.4301/304) BEF-W100-A
Ambient operating temperature	-10 °C ... +50 °C		
Ambient storage temperature	-40 °C ... +70 °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⁾ B = inputs and output reverse-polarity protected.

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

Ordering information

Other models available at www.mysick.com/en/W100_Laser

WT100L

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** energetic
- **Light spot size (distance):** Ø 2 mm (400 mm)
- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer, 270 °
- **Items supplied:** stainless steel mounting bracket (1.4301/304) BEF-W100-A

Sensing range max. ¹⁾	Output type	Connection	Connection diagram	Model name	Part no.
0 mm ... 450 mm	PNP	Cable, 3-wire, 2 m, PVC	Cd-043	WT100L-F1141	6030702
		Connector M8, 3-pin	Cd-045	WT100L-F2141	6030703
		Connector M8, 4-pin	Cd-066	WT100L-F2241	6030704
	NPN	Cable, 3-wire, 2 m, PVC	Cd-043	WT100L-E1141	6030705
		Connector M8, 3-pin	Cd-045	WT100L-E2141	6030706
		Connector M8, 4-pin	Cd-066	WT100L-E2241	6030707

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

WL100L

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Light spot size (distance):** Ø 12 mm (10 m)
- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer, 270 °
- **Items supplied:** stainless steel mounting bracket (1.4301/304) BEF-W100-A, Reflector P250F

Sensing range max. ¹⁾	Output type	Connection	Connection diagram	Model name	Part no.
0.08 m ... 12 m	PNP	Cable, 3-wire, 2 m, PVC	Cd-043	WL100L-F1131	6030708
		Connector M8, 3-pin	Cd-045	WL100L-F2131	6030709
		Connector M8, 4-pin	Cd-066	WL100L-F2231	6030710
	NPN	Cable, 3-wire, 2 m, PVC	Cd-043	WL100L-E1131	6030711
		Connector M8, 3-pin	Cd-045	WL100L-E2131	6030712
		Connector M8, 4-pin	Cd-066	WL100L-E2231	6030713

¹⁾ P250F.

WS/WE100L

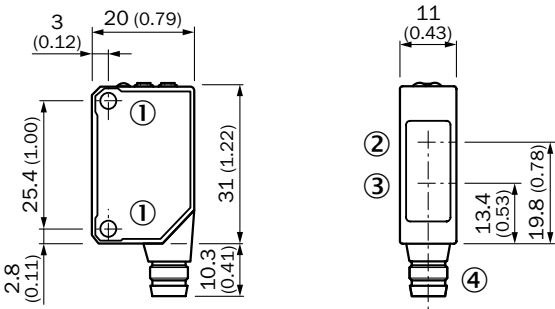
- **Sensor principle:** through-beam photoelectric sensor
- **Light spot size (distance):** Ø 30 mm (30 m)
- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer, 270 °
- **Items supplied:** 2 Stainless steel mounting brackets (1.4301/304) BEF-W100-A

Sensing range max.	Output type	Connection	Connection diagram	Model name	Part no.
0 m ... 35 m	PNP	Cable, 3-wire, 2 m, PVC	Cd-047	WS/WE100L-F1131	6030714
		Connector M8, 3-pin	Cd-051	WS/WE100L-F2131	6030715
		Connector M8, 4-pin	Cd-071	WS/WE100L-F2231	6030716
	NPN	Cable, 3-wire, 2 m, PVC	Cd-047	WS/WE100L-E1131	6030717
		Connector M8, 3-pin	Cd-051	WS/WE100L-E2131	6030718
		Connector M8, 4-pin	Cd-071	WS/WE100L-E2231	6030719

Dimensional drawings

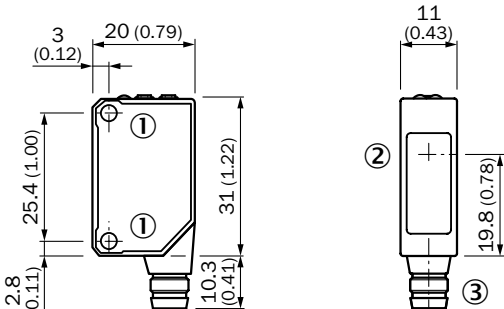
Dimensions in mm (inch)

WT100L, WL100L



- ① Threaded mounting hole M3
- ② Center of optical axis, receiver
- ③ Center of optical axis, sender
- ④ Connection

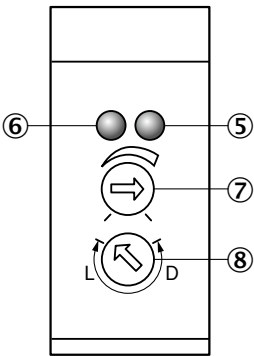
WS/WE100L



- ① Threaded mounting hole M3
- ② Center of optical axis
- ③ Connection

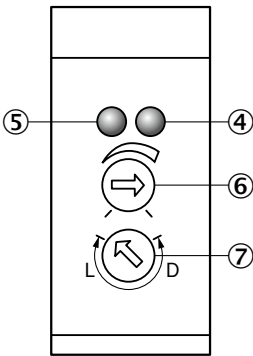
Adjustments

WT100L, WL100L



- ⑤ Orange LED indicator: switching output active
- ⑥ LED signal strength indicator green: power on
- ⑦ Sensing range (WT) / sensitivity (WL) adjustment: potentiometer, 270 °
- ⑧ Light/ dark rotary switch: L = light switching, D = dark switching

WS/WE100L

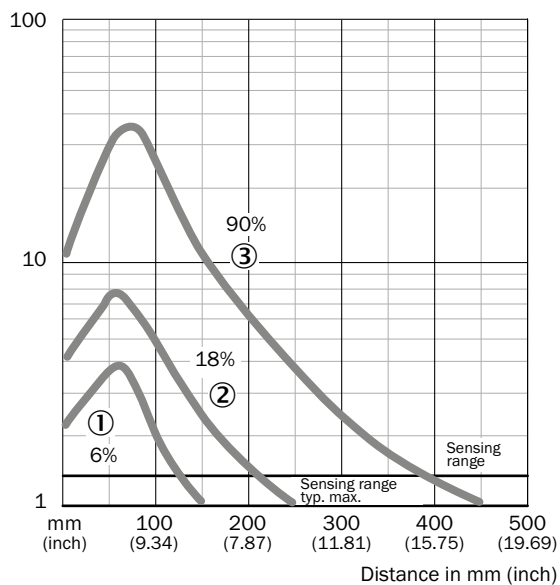


- ④ Orange LED indicator: switching output active
- ⑤ LED signal strength indicator green: power on
- ⑥ Sensitivity adjustment 270 °
- ⑦ Light/ dark rotary switch: L = light switching, D = dark switching

Characteristic curves

Black-white shift

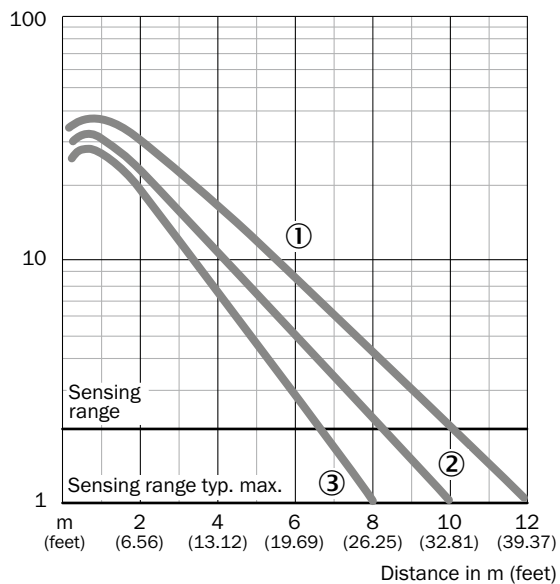
WT100L



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

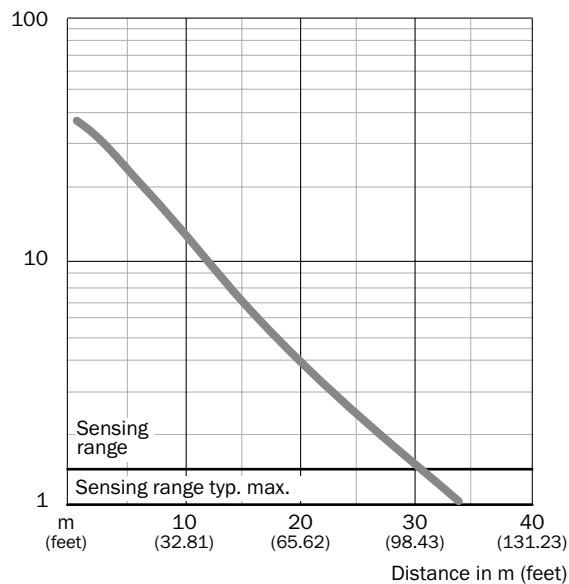
Operating reserve

WL100L



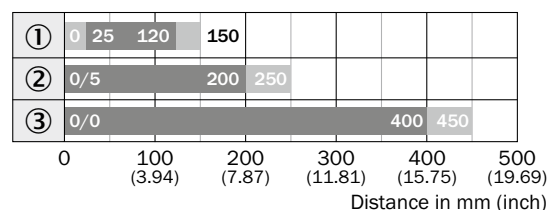
- ① P250F
- ② PL20F
- ③ PL10F

WS/WE100L



Bar diagrams

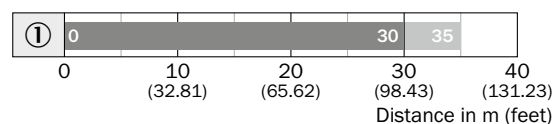
WT100L



■ Sensing range ■ Sensing range max.

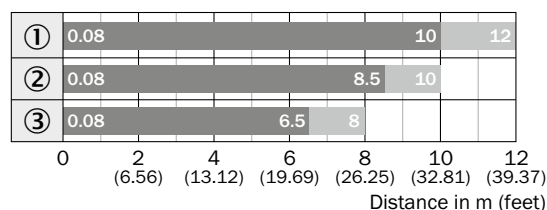
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WS/WE100L



■ Sensing range ■ Sensing range typ. max.

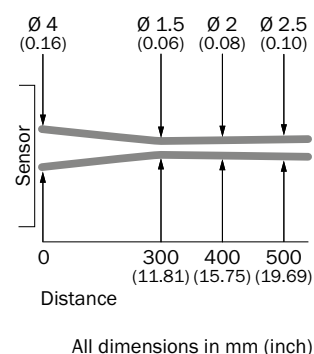
WL100L



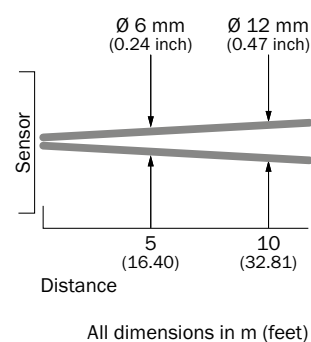
■ Sensing range ■ Sensing range max.

Light spot diameter

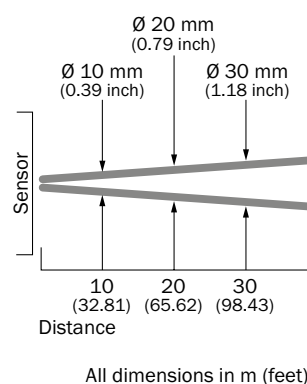
WT100L



WL100L

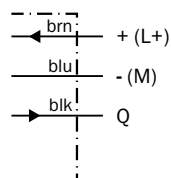


WS/WE100L

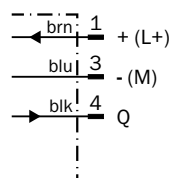


Connection diagram

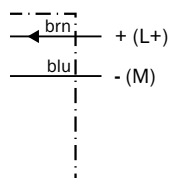
Cd-043

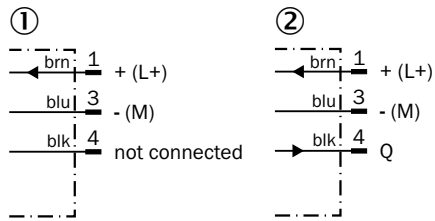
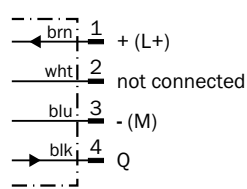
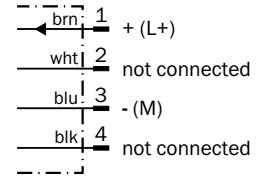


Cd-045



Cd-047



Cd-051**Cd-066****Cd-071****Recommended accessories**

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Stainless steel	Mounting bracket for wall mounting	BEF-W100-A	5311520
	Steel, zinc coated	Mounting bracket for floor mounting	BEF-W100-B	5311521

F

Plug connectors and cables

Connecting cable (female connector-open), 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

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N08 for universal clamp bracket	BEF-KHS-N08	2051607

Device protection (mechanical)

Protective housing/tubes

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571	Safety bracket for floor mounting	BEF-SW-W4S	2051497

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



G

The packaging specialists – photoelectric sensors to optimize your applications

From harsh environments in the food and beverage industry to high-speed cigarette manufacturing, sensors are exposed to a variety of challenges. Due to high-performance electronics and sophisticated optics, small photoelectric sensors from SICK detect all objects, even under difficult conditions. The latest technologies, such as PinPoint LED, custom ASICs, μ C or IO-Link provide outstanding performance in modern, functional housings.

Your benefits

- Outstanding sensor performance in small housings
- Reliable object detection of difficult targets using best-in-class technology
- A wide range of different sensor housings and connection systems ensures optimal integration of sensors in the system
- Many options for protective housings – super tough VISTAL™, metal or highly resistant plastic, ensures that the sensor can be installed without damage
- Wide range of accessories ensures easy installation, quick commissioning and maximum sensor performance for varying application needs





Small photoelectric sensors

G

Product selection		G-422	
Product family overview		G-426	
	G10 G-430 Powerful detection, smart installation – down to the last detail		W11G-2 G-504 Reliable detection of clear material objects – from PET bottles to transparent film
	W9-3 G-448 High-performance sensors in a rugged VISTAL™ housing		W12-2 Laser G-510 High-performance photoelectric sensor family with laser optics
	W9-3 Glass G-462 High-performance sensors for clear material detection in a rugged VISTAL™ housing		W12G G-520 High-performance detection of transparent objects in metal housing
	W9L-3 G-470 Laser precision in a rugged VISTAL™ housing		W12-3 G-528 Rugged metal housing provides exceptional performance in demanding applications
	W9LG-3 G-484 Laser precision in a rugged VISTAL™ housing for clear material detection		W14-2 G-544 Cost-effective photoelectric sensors for demanding applications
	W11-2 G-492 High-performance photoelectric sensors with application flexibility in industrial environments		W18-3 G-556 Reliable object detection for demanding applications

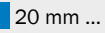
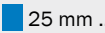
Overview of small photoelectric sensors

	Housing properties									Sensor properties												
	Material					Enclosure rating																
	Plastic	Metal	VISTAL™	Explosion protection housing★	PTFE coating★	IP 65	IP 66	IP 67	IP 69K★	Photoelectric proximity sensor	Energetic	Background suppression	Foreground suppression	Photoelectric retro-reflective sensor	Autocollimation	Standard optics	Through-beam photoelectric sensor	IO-Link	AutoAdapt★	Switching frequency ≥ 2 kHz★	AC/DC	
G10																						
G10 NEW																						
W9																						
W9-3																						
W9-3 Glass																						
W9L-3 NEW																						
W9LG-3 NEW																						
W11																						
W11-2																						
W11G-2																						
W12																						
W12-2 Laser																						
W12G																						
W12-3																						
W14																						
W14-2																						
W18																						
W18-3																						

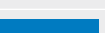
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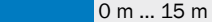
Photoelectric proximity sensors

	 Maximum sensing range	 Dimensions (W x H x D)	Page
W12-2 Laser	 20 mm ... 200 mm	15.0 mm x 49.0 mm x 41.5 mm	G-510
W9L-3	 25 mm ... 400 mm	12.2 mm x 52.2 mm x 23.6 mm	G-470
W12-3	 20 mm ... 800 mm	15.6 mm x 48.5 mm x 42.0 mm	G-528
W9-3	 20 mm ... 800 mm	12.2 mm x 52.2 mm x 23.6 mm	G-448
W18-3	 10 mm ... 1,000 mm	17.6 mm x 75.5 mm x 33.5 mm	G-556
W11-2	 20 mm ... 1,100 mm	15.6 mm x 48.5 mm x 42.0 mm	G-492
W14-2	 20 mm ... 1,500 mm	17.6 mm x 75.5 mm x 33.5 mm	G-544
G10	 20 mm ... 2,000 mm	20 mm x 50 mm x 51.5 mm	G-430

Photoelectric retro-reflective sensors

	 Maximum sensing range	 Dimensions (W x H x D)	Page
W11G-2	 0 m ... 4 m	15.6 mm x 48.5 mm x 42.0 mm	G-504
W12G	 0 m ... 4 m	15.6 mm x 48.5 mm x 42.0 mm	G-520
W9LG-3	 0 m ... 4.5 m	12.2 mm x 52.2 mm x 23.6 mm	G-484
W9-3	 0 m ... 5 m	12.2 mm x 52.2 mm x 23.6 mm	G-448
W9-3 Glass	 0 m ... 5 m	12.2 mm x 52.2 mm x 23.6 mm	G-462
W12-3	 0 m ... 7 m	15.6 mm x 48.5 mm x 42.0 mm	G-528
W18-3	 0 m ... 7 m	17.6 mm x 75.5 mm x 33.5 mm	G-556
W11-2	 0.15 m ... 10 m	15.6 mm x 48.5 mm x 42.0 mm	G-492
W9L-3	 0 m ... 12 m	12.2 mm x 52.2 mm x 23.6 mm	G-470
G10	 0.08 m ... 15 m	20 mm x 50 mm x 51.5 mm	G-430
W14-2	 0.15 m ... 17 m	17.6 mm x 75.5 mm x 33.5 mm	G-544
W12-2 Laser	 0 m ... 18 m	15.0 mm x 49.0 mm x 41.5 mm	G-510

Through-beam photoelectric sensors

	 Maximum sensing range	 Dimensions (W x H x D)	Page
W9-3	 0 m ... 10 m	12.2 mm x 52.2 mm x 23.6 mm	G-448
W14-2	 0 m ... 15 m	17.6 mm x 75.5 mm x 33.5 mm	G-544
W11-2	 0 m ... 20 m	15.6 mm x 48.5 mm x 42 mm	G-492
W12-3	 0 m ... 20 m	15.6 mm x 48.5 mm x 42 mm	G-528
W18-3	 0 m ... 20 m	17.6 mm x 75.5 mm x 33.5 mm	G-556
G10	 0 m ... 40 m	20 mm x 50 mm x 51.5 mm	G-430
W9L-3	 0 m ... 60 m	12.2 mm x 52.2 mm x 23.6 mm	G-470
W12-2 Laser	 0 m ... 80 m	15 mm x 49 mm x 41.5 mm	G-510

Product family overview

				
	G10	W9-3	W9-3 Glass	
	Fast, reliable and robust	High-performance sensors in a rugged VISTAL™ housing	High-performance sensors for clear material detection in a rugged VISTAL™ housing	
Technical data overview				
Dimensions (W x H x D)	20 mm x 50 mm x 39 mm / 20 mm x 50 mm x 51.5 mm	12,2 mm x 52.2 mm x 23,6 mm	12,2 mm x 52.2 mm x 23.6 mm	
Sensing range max.				
Photoelectric proximity sensor	20 mm ... 2,000 mm	20 mm ... 800 mm	–	
Photoelectric retro-reflective sensor	0.05 m ... 15 m	0 m ... 5 m	0 m ... 5 m	
Through-beam photoelectric sensor	0 m ... 40 m	0 m ... 10 m	–	
Light source	PinPoint LED/LED	PinPoint LED/LED	PinPoint LED	
Type of light	Visible red light/Infrared light	Visible red light/Infrared light	Visible red light	
Enclosure rating	IP 67	IP 66, IP 67, IP 69K	IP 66, IP 67, IP 69K	
Housing material	Plastic	Plastic VISTAL™	Plastic VISTAL™	
At a glance				
	• Maximum optical window surface combined with a small sensor housing • Sensing range up to 1,200 mm with background suppression performance • PinPoint LED with bright and precise light spot • Sensor variants in all major detection principles and with DC or AC/DC power supply • Transistor output or relay output • Latest SICK ASIC chip technology • Rugged sensor housing with metal sleeved mounting holes	• High-performance sensor in ultra-rugged VISTAL™ housing • PinPoint LED for highly visible and precise light spot • Two emitter LEDs for best-in-class background suppression • Variable mounting with M3 or M4 hole pattern • Wide range of connection options	• High-performance sensor in ultra-rugged VISTAL™ housing • Best-in-class optical performance for transparent object detection • Continuous threshold adaption • PinPoint LED for highly visible and precise light spot • Variable mounting with M3 or M4 hole pattern • Wide range of connection options	
Detailed information	→ G-430	→ G-448	→ G-462	

**W9L-3**

Laser precision in a rugged VISTAL™ housing

**W9LG-3**

Laser precision in a rugged VISTAL™ housing for clear material detection

**W11-2**

High-performance photoelectric sensors with application flexibility in industrial environments

	12,2 mm x 52.2 mm x 23.6 mm	12.2 mm x 52.2 mm x 23.6 mm	15.6 mm x 48.5 mm x 42 mm
	25 mm ... 400 mm 0 m ... 12 m	– 0 m ... 4.5 m	20 mm ... 1,100 mm 0.05 m ... 10 m
	0 m ... 60 m	–	0 m ... 20 m
	Laser	Laser	PinPoint LED/LED
	Visible red light	Visible red light	Visible red light
	IP 66, IP 67, IP 69K	IP 66, IP 67, IP 69K	IP 66, IP 67, IP 69K
	Plastic VISTAL™	Plastic VISTAL™	Plastic
	• Tough VISTAL™ housing • Precise laser light spot • Photoelectric proximity sensor in laser classes 1 and 2 • Photoelectric retro-reflective sensor with autocollimation optics and polarizing filter; models available for clear material detection • Through-beam photoelectric sensors with sensing ranges of up to 60 m • SIRIC technology • Connections: M8 and M12 plugs, cable as well as cable with plug • M3 and M4 hole pattern	• Tough VISTAL™ housing • Precise laser light spot, laser class 1 • Continuous switching threshold adjustment (CTA) • Autocollimation optics and polarizing filter • Teach-in • SIRIC technology • Connections: M8 and M12 plugs, cable as well as cable with plug • M3 and M4 hole pattern	• 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
	→ G-470	→ G-484	→ G-492

Product family overview

				
	W11G-2	W12-2 Laser	W12G	
	Reliable detection of clear material objects – from PET bottles to transparent film	High-performance photoelectric sensor family with laser optics	High-performance detection of transparent objects in metal housing	
Technical data overview				
Dimensions (W x H x D)	15.6 mm x 48.5 mm x 42 mm	15 mm x 49 mm x 41.5 mm	15.6 mm x 48.5 mm x 42 mm	
Sensing range max.				
Photoelectric proximity sensor	–	20 mm ... 50 mm 30 mm ... 200 mm	–	
Photoelectric retro-reflective sensor	0 m ... 4 m	0 m ... 18 m	0 m ... 4 m	
Through-beam photoelectric sensor	–	0 m ... 80 m	–	
Light source	LED	Laser	PinPoint LED/LED	
Type of light	Visible red light	Visible red light	Visible red light/Infrared light	
Enclosure rating	IP 66, IP 67, IP 69K	IP 67, IP 69K	IP 66, IP 67, IP 69K	
Housing material	Plastic	Metal/PTFE	Metal/PTFE	
At a glance				
	• Retro-reflective for detection of clear material objects • Rugged housing for industrial use • PinPoint LED technology with a highly visible light spot • Space-saving plastic housing in chemically, thermally or mechanically resistant designs • Dovetail mounting – standard mounting holes and oblong holes • Highly visible 360° status LEDs • Simple sensitivity adjustment via potentiometer	• Best-in-class retro-reflective laser performance in a metal housing • Teflon® coating available • Precise autocollimation optics • Adjustable focus on retro-reflective sensors • High switching frequency of 2.5 kHz • Connection via cable or rotatable connector • Mounting options with through holes, blind holes, oblong holes and dovetail • Laser protection class 1 or 2	• Rugged die-cast zinc housing with optional Teflon® coating • Reliable detection of transparent objects • Precise autocollimation optics • Robust sensors for industrial use • Precise PinPoint LED • Dovetail mounting – mounting holes and oblong holes • Highly visible status LEDs • Flexible sensor settings, monitoring, advanced diagnostics, and visualization thanks to IO-Link	
Detailed information	→ G-504	→ G-510	→ G-520	

G

**W12-3**

Rugged metal housing provides exceptional performance in demanding applications

**W14-2**

Cost-effective photoelectric sensors for demanding applications

**W18-3**

Reliable object detection for demanding applications

	15.6 mm x 48.5 mm x 42 mm	17.6 mm x 75.5 mm x 33.5 mm	17.6 mm x 75.5 mm x 33.5 mm
	20 mm ... 800 mm	20 mm ... 1,500 mm	10 mm ... 1,000 mm
	0 m ... 7 m	0.15 m ... 17 m 0.5 m ... 5 m	0 m ... 7 m
	0 m ... 20 m	0 m ... 15 m	0 m ... 20 m
	PinPoint-LED/LED	PinPoint-LED/LED	LED
	Visible red light/Infrared light	Visible red light/Infrared light	Visible red light/Infrared light
	IP 66, IP 67, IP 69K	IP 67	IP 65 / IP67
	Metal/PTFE	Plastic	Plastic
	• Best-in-class optical performance due to superior OES technology • Autocollimation with retro-reflective sensors • Background and foreground suppression with second emitter LED on proximity sensors • Highly visible, precise light spot and high-energy IR transmitters • Rugged die-cast zinc housing, optional with Teflon® coating • Mounting options with through holes, base blind holes, oblong through holes and dovetail • Flexible sensor settings, monitoring, advanced diagnostics, and visualization thanks to IO-Link	• 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	• 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
	→ G-528	→ G-544	→ G-556

Powerful detection, smart installation –
down to the last detail



Additional information

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Connection diagram	G-445
Recommended accessories....	G-446



Product description

One thing is for sure – thanks to Q-Lock, G10 sensors are mounted lightning fast, connected in the flick of a wrist, and get your line up and running within seconds! Tick, tock, done. Even in large-scale systems. The hawk's-eye of the G10 makes no compromises and detects exactly what it's meant to see, without being

distracted by dirt, grime or optical reflections. Always focused: Its acute optics increases productivity while the Q-Lock allows systems being set-up faster and more efficiently than ever before. All this at a price that is as sharply calculated as its vision. Count on it!

At a glance

- Maximum optical window surface combined with a small sensor housing
- Sensing range up to 1,200 mm with background suppression performance
- PinPoint LED with bright and precise light spot
- Sensor variants in all major detection principles and with DC or AC/DC power supply
- Transistor output or relay output
- Latest SICK ASIC chip technology
- Rugged sensor housing with metal sleeved mounting holes

Your benefits

- G10 focuses on the essentials the user really needs – without compromising quality, reliability or performance
- One sensor family serves all standard industrial and domestic applications
- Reliable object detection and long scanning ranges thanks to large optics and SICK ASIC technology
- Easy and fast sensor alignment due to small and highly visible PinPoint light spot
- Insensitive to dust and dirt on front lens or reflector
- Clever accessories reduce installation effort and safe time

→ www.mysick.com/en/G10

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

	GTB10	GTE10	GL10	GL10G	GSE10
Sensor principle	Photoelectric proximity sensor		Photoelectric retro-reflective sensor		Through-beam photoelectric sensor
Detection principle	Background suppression	Energetic	Standard optics		–
Dimensions (W x H x D)					
	DC	20 mm x 50 mm x 39 mm			
	AC/DC	20 mm x 50 mm x 51.5 mm			
Housing design (light emission)	Rectangular				
Sensing range max.	20 mm ... 1,200 mm ¹⁾ (depending on type)	20 mm ... 2,000 mm ¹⁾ (depending on type)	0.05 m ... 15 m ²⁾ (depending on type)	0.05 m ... 12 m ²⁾	0 m ... 40 m
Sensing range	–	40 mm ... 1,500 mm ¹⁾ (depending on type)	0.08 m ... 12 m ²⁾ (depending on type)	0.03 m ... 9.5 m ²⁾	0 m ... 35 m
Type of light	Visible red light/Infrared light (depending on type)		Visible red light		Visible red light/Infrared light (depending on type)
Light source ³⁾	PinPoint LED/LED (depending on type)		PinPoint LED		PinPoint LED /LED (depending on type)
Wave length					
	Visible red light	625 nm			
	Infrared light	850 nm		–	850 nm
Adjustment	Potentiometer, 5 turns	Potentiometer, 270 °	Potentiometer, 270 ° (depending on type)		
Special feature	–			Clear material detection	–

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

		GTB10	GTE10	GL10	GL10G	GSE10
Supply voltage	DC ¹⁾	10 V DC ... 30 V DC				
	AC/DC ²⁾	24 V AC/DC ... 240 V AC/DC			–	24 V AC/DC ... 240 V AC/DC
Ripple ³⁾		± 5 V _{pp}				
Power consumption ⁴⁾						
	DC	≤ 30 mA				
Current consumption						
	AC/DC	≤ 0.6 VA			–	≤ 0.6 VA
Output type						
	DC	PNP Open collector/NPN Open collector (typabhängig)				
	AC/DC	Relais, SPDT, electrically isolated ⁵⁾				
Switching mode						
	DC	Light/dark-switching (selectable via light/dark selector)				

	GTB10	GTE10	GL10	GL10G	GSE10
Switching mode selector	Selectable via light/dark selector				
Output current $I_{\max}$	≤ 100 mA				
DC	≤ 100 mA				
Switching load max. (current/voltage)					
AC/DC	0,11 A (250 V DC)/3 A (30 V DC) 3 A (250 V AC)			–	0,11 A (250 V DC)/3 A (30 V DC)/ 3 A (250 V AC)
Response time					
DC ⁶⁾	≤ 500 μ s			≤ 500 μ s/ ≤ 1 ms	≤ 500 μ s
AC/DC	≤ 10 ms			–	≤ 10 ms
Switching frequency ⁷⁾					
DC	1,000 Hz			1,000 Hz/500 Hz	1,000 Hz
AC/DC	20 Hz			–	20 Hz
Connection type	Cable, 2 m ⁸⁾ /Male connector, M12 (depending on type)				
Circuit protection					
DC	A ⁹⁾ , B ¹⁰⁾ , D ¹¹⁾				
AC/DC	A ⁹⁾ , C ¹²⁾				
Protection class					
DC	III				
AC/DC	II				
Polarisation filter	–			✓	–
Interference emission ¹³⁾					
AC/DC	EN 61000-6-3 (2011-09)				
Housing material	ABS/PMMA				
Enclosure rating	IP 67				
Relay switching cycles min.					
AC/DC	100.000 cycles (3 A)				
Usage category					
AC/DC	AC-15, DC-13, according to EN 60947-1				
EMC	EN 60947-5-2				
Test input					
DC	–				Sender OFF at "Test" 0 V
Ambient operating temperature	–30 °C ... +60 °C				
Ambient storage temperature	–40 °C ... +70 °C				
Weight					
Connector M12, 4-pin	Approx. 35 g				Approx. 70 g
Cable, 3-wire	Approx. 90 g				Approx. 180 g
Cable, 5-wire	Approx. 115 g				–
					Approx. 230 g

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

²⁾ +/- 10 %.

³⁾ May not exceed or fall short of V_s tolerances.

⁴⁾ Without load.

⁵⁾ Provide suitable spark suppression for inductive or capacitive loads.

⁶⁾ Signal transit time with resistive load.

⁷⁾ With light/dark ratio 1:1.

⁸⁾ Do not bend below 0 °C.

⁹⁾ A = V_s connections reverse-polarity protected.

¹⁰⁾ B = inputs and output reverse-polarity protected.

¹¹⁾ D = outputs overcurrent and short-circuit protected.

¹²⁾ C = interference suppression.

¹³⁾ In the case of a DC supply (ref. to EN 61000-6-3) the length of cable between the supply source and the sensor must be < 30 m.

Ordering information

Other models available at www.mysick.com/en/G10

GTB10, DC

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Type of light:** visible red light
- **Supply voltage:** 10 V DC ... 30 V DC
- **Switching frequency:** 1,000 Hz
- **Switching mode:** light/dark-switching

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Adjustment	Connection	Connection diagram	Items supplied	Model name	Part no.
20 mm ... 950 mm	Ø 8 mm (700 mm)	PNP	Adjustable, potentiometer, 5 turns	Cable, 3-wire, 2 m, PVC	Cd-044	–	GTB10-P1211	1065854
						Mounting bracket BEF-G10DC01	GTB10-P1212	1065856
				Connector M12, 4-pin	Cd-066	–	GTB10-P4211	1064694
						Mounting bracket BEF-G10DC01	GTB10-P4212	1065857
		NPN	Adjustable, potentiometer, 5 turns	Cable, 3-wire, 2 m, PVC	Cd-044	–	GTB10-N1211	1065858
						Mounting bracket BEF-G10DC01	GTB10-N1212	1065859
				Connector M12, 4-pin	Cd-066	–	GTB10-N4211	1065860
						Mounting bracket BEF-G10DC01	GTB10-N4212	1065861

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

GTB10, AC/DC

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Output type:** relay
- **Supply voltage:** 10 V DC ... 30 V DC
- **Switching frequency:** 20 Hz
- **Switching mode:** light/dark-switching

Sensing range max. ¹⁾	Light spot size (distance)	Type of light	Adjustment	Connection	Connection diagram	Items supplied	Model name	Part no.
20 mm ... 950 mm	Ø 8 mm (700 mm)	Visible red light	Adjustable, potentiometer, 5 turns	Cable, 5-wire, 2 m, PVC	Cd-163	–	GTB10-R3811	1064686
						Mounting bracket BEF-G10UC01	GTB10-R3812	1065862
20 mm ... 1,200 mm	Ø 22 mm (700 mm)	Infrared light	Adjustable, potentiometer, 5 turns	Cable, 5-wire, 2 m, PVC	Cd-163	–	GTB10-R3821	1065863
						Mounting bracket BEF-G10UC01	GTB10-R3822	1065864

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

GTE10, DC

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** energetic
- **Type of light:** visible red light
- **Supply voltage:** 10 V DC ... 30 V DC
- **Switching frequency:** 1,000 Hz
- **Switching mode:** light/dark-switching

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Adjustment	Connection	Connection diagram	Items supplied	Model name	Part no.
20 mm ... 1,300 mm	Ø 28 mm (1,400 mm)	PNP	Adjustable, potentiometer, 270 °	Connector M12, 4-pin	Cd-066	–	GTE10-P4211	1064697
						Mounting bracket BEF-G10DC01	GTE10-P4212	1065867
				Cable, 3-wire, 2 m, PVC	Cd-044	–	GTE10-P1211	1065865
						Mounting bracket BEF-G10DC01	GTE10-P1212	1065866
		NPN	Adjustable, potentiometer, 270 °	Cable, 3-wire, 2 m, PVC	Cd-044	–	GTE10-N1211	1065868
						Mounting bracket BEF-G10DC01	GTE10-N1212	1065869
				Connector M12, 4-pin	Cd-066	–	GTE10-N4211	1065871
						Mounting bracket BEF-G10DC01	GTE10-N4212	1065872

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

GTE10, AC/DC

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** energetic
- **Output type:** relay
- **Supply voltage:** 10 V DC ... 30 V DC
- **Switching frequency:** 20 Hz
- **Switching mode:** –

Sensing range max. ¹⁾	Light spot size (distance)	Type of light	Adjustment	Connection	Connection diagram	Items supplied	Model name	Part no.
20 mm ... 1,300 mm	Ø 28 mm (1,400 mm)	Visible red light	Adjustable, potentiometer, 270 °	Cable, 5-wire, 2 m, PVC	Cd-163	–	GTE10-R3811	1064688
						Mounting bracket BEF-G10UC01	GTE10-R3812	1065873
20 mm ... 2,000 mm	Ø 57 mm (1,500 mm)	Infrared light	Adjustable, potentiometer, 270 °	Cable, 5-wire, 2 m, PVC	Cd-163	–	GTE10-R3821	1065874
						Mounting bracket BEF-G10UC01	GTE10-R3822	1065875

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

GL10, DC

- **Sensor principle:** photoelectric retro-reflective sensor
- **Type of light:** visible red light
- **Supply voltage:** 10 V DC ... 30 V DC
- **Switching frequency:** 1,000 Hz
- **Switching mode:** light/dark-switching

Sensing range max.	Light spot size (distance)	Output type	Adjustment	Connection	Connection diagram	Items supplied	Model name	Part no.
0.08 m ... 15 m ¹⁾ 0.08 m ... 12 m ²⁾	Ø 58 mm (5 m)	PNP	No/fix	Cable, 3-wire, 2 m, PVC	Cd-044	–	GL10-P1111	1065876
						Mounting bracket BEF-G10DC01, Reflector P250	GL10-P1112	1065877
			Adjustable	Connector M12, 4-pin	Cd-066	–	GL10-P4111	1065878
						Mounting bracket BEF-G10DC01, Reflector P250	GL10-P4112	1065879
				Cable, 3-wire, 2 m, PVC	Cd-044	–	GL10-P1211	1065885
						Mounting bracket BEF-G10DC01, Reflector P250	GL10-P1212	1065886
		NPN	Adjustable, potentiometer, 270 °	Connector M12, 4-pin	Cd-066	–	GL10-P4211	1065890
						Mounting bracket BEF-G10DC01, Reflector P250	GL10-P4212	1065887
			No/fix	Cable, 3-wire, 2 m, PVC	Cd-044	–	GL10-N1111	1065880
						Mounting bracket BEF-G10DC01, Reflector P250	GL10-N1112	1065882
			Adjustable, potentiometer, 270 °	Connector M12, 4-pin	Cd-066	–	GL10-N4111	1065883
						Mounting bracket BEF-G10DC01, Reflector P250	GL10-N4112	1065884
				Cable, 3-wire, 2 m, PVC	Cd-044	–	GL10-N1211	1065888
						Mounting bracket BEF-G10DC01, Reflector P250	GL10-N1212	1065889
			Adjustable, potentiometer, 270 °	Connector M12, 4-pin	Cd-066	–	GL10-N4211	1064700
						Mounting bracket BEF-G10DC01, Reflector P250	GL10-N4212	1065891

¹⁾ PL80A.

²⁾ P250.

GL10, AC/DC

- **Sensor principle:** photoelectric proximity sensor
- **Output type:** relay
- **Supply voltage:** 10 V DC ... 30 V DC
- **Switching frequency:** 20 Hz
- **Switching mode:** –

Sensing range max.	Light spot size (distance)	Type of light	Adjustment	Connection	Connection diagram	Items supplied	Model name	Part no.
0.08 m ... 15 m ¹⁾ 0.08 m ... 12 m ²⁾	Ø 58 mm (5 m)	Visible red light	No/fix	Cable, 5-wire, 2 m, PVC	Cd-163	–	GL10-R3711	1065896
						Mounting bracket BEF-G10UC01, Reflector P250	GL10-R3712	1065897
			Adjustable, potentiometer, 270 °	Cable, 5-wire, 2 m, PVC	Cd-163	–	GL10-R3811	1064689
						Mounting bracket BEF-G10UC01, Reflector P250	GL10-R3812	1065898

¹⁾ PL80A.

²⁾ P250.

GL10, detecting objects wrapped in film

- **Sensor principle:** photoelectric retro-reflective sensor
- **Type of light:** visible red light
- **Supply voltage:** 10 V DC ... 30 V DC
- **Switching frequency:** 500 Hz
- **Switching mode:** light-switching

Sensing range max.	Light spot size (distance)	Output type	Adjustment	Connection	Connection diagram	Items supplied	Model name	Part no.
0.15 m ... 12 m ¹⁾ 0.15 m ... 10 m ²⁾	Ø 58 mm (5 m)	PNP	No/fix	Connector M12, 4-pin	Cd-066	–	GL10-P4551	1064702
		NPN		Cable, 3-wire, 2 m, PVC	Cd-044	Q-Lock mounting system BEF-KHSQ12R01	GL10-P4554	1065893
						–	GL10-N1551	1065892

¹⁾ PL80A.²⁾ P250.

GL10G, clear material detection

- **Sensor principle:** photoelectric retro-reflective sensor
- **Type of light:** visible red light
- **Supply voltage:** 10 V DC ... 30 V DC
- **Switching frequency:** 500 Hz
- **Switching mode:** light/dark-switching

Sensing range max.	Light spot size (distance)	Output type	Adjustment	Connection	Connection diagram	Items supplied	Model name	Part no.
0.15 m ... 12 m ¹⁾ 0.15 m ... 10 m ²⁾	Ø 58 mm (5 m)	PNP	Adjustable, potentiometer, 270 °	Connector M12, 4-pin	Cd-066	–	GL10G-P4251	1064704
		NPN		Cable, 3-wire, 2 m, PVC	Cd-044	Mounting bracket BEF-G10DC01, Reflector P250	GL10G-P4252	1065894
						–	GL10G-N1251	1064705
						Mounting bracket BEF-G10DC01, Reflector P250	GL10G-N1252	1065895

¹⁾ PL80A.²⁾ P250.

GSE10, DC

- **Sensor principle:** through-beam photoelectric sensor
- **Type of light:** visible red light
- **Supply voltage:** 10 V DC ... 30 V DC
- **Switching frequency:** 1,000 Hz
- **Switching mode:** light/dark-switching

Sensing range max.	Light spot size (distance)	Type of light	Output type	Adjustment	Connection	Connection diagram	Items supplied	Model name	Part no.
0 m ... 40 m	Ø 180 mm (50 m)	Visible red light	PNP	No/fix	Connector M12, 4-pin	Cd-073	–	GSE10-P4111	1065899
				Adjustable, potentiometer, 270 °	Connector M12, 4-pin	Cd-073	Mounting bracket BEF-G10DC01 (2x)	GSE10-P4112	1065900
			NPN	No/fix	Cable, 3-wire, 2 m, PVC	Cd-061	–	GSE10-P4211	1064706
							Mounting bracket BEF-G10DC01 (2x)	GSE10-P4212	1065903
				Adjustable, potentiometer, 270 °	Cable, 3-wire, 2 m, PVC	Cd-061	–	GSE10-N1111	1065901
							Mounting bracket BEF-G10DC01 (2x)	GSE10-N1112	1065902
		Infra-red light	PNP	Adjustable, potentiometer, 270 °	Connector M12, 4-pin	Cd-073	–	GSE10-N1211	1065904
							Mounting bracket BEF-G10DC01 (2x)	GSE10-N1212	1065905
			NPN	Adjustable, potentiometer, 270 °	Cable, 3-wire, 2 m, PVC	Cd-061	–	GSE10-P4221	1065906
							Mounting bracket BEF-G10DC01 (2x)	GSE10-P4222	1065907
				Adjustable, potentiometer, 270 °	Cable, 3-wire, 2 m, PVC	Cd-061	–	GSE10-N1221	1065908
							Mounting bracket BEF-G10DC01 (2x)	GSE10-N1222	1065909

GSE10, AC/DC

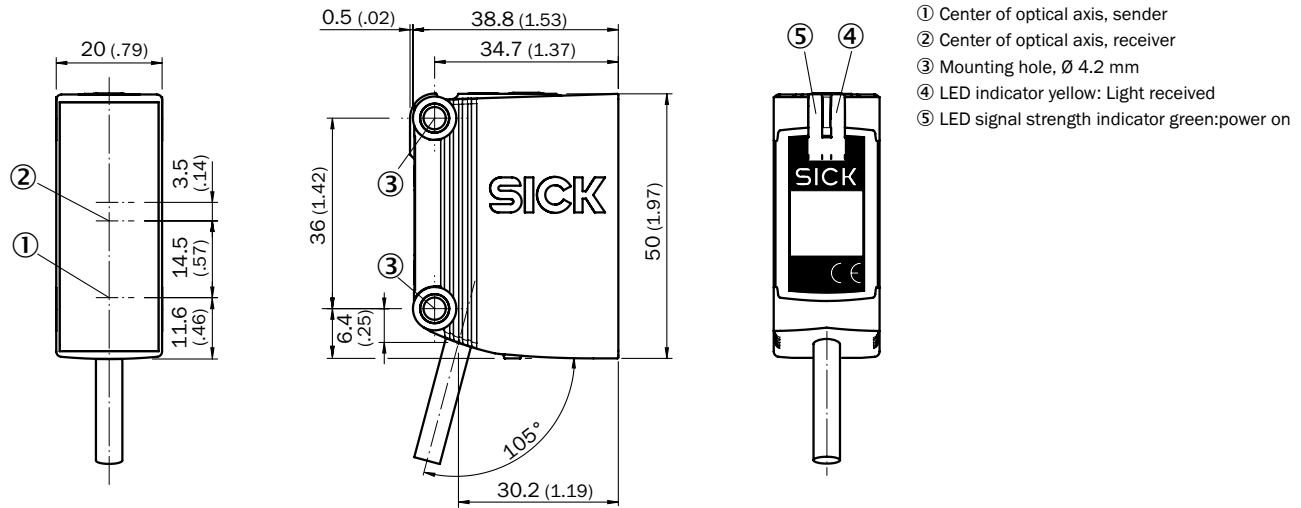
- **Sensor principle:** through-beam photoelectric sensor
- **Type of light:** relay
- **Supply voltage:** 10 V DC ... 30 V DC
- **Switching frequency:** 1,000 Hz
- **Switching mode:** –

Sensing range max.	Light spot size (distance)	Type of light	Adjustment	Connection	Connection diagram	Items supplied	Model name	Part no.
0 m ... 40 m	Ø 180 mm (50 m)	Visible red light	No/fix	Cable, 5-wire, 2 m, PVC	Cd-170	–	GSE10-R3711	1065910
						Mounting bracket BEF-G10UC01 (2x)	GSE10-R3712	1065911
			Adjustable, potentiometer, 270 °	Cable, 5-wire, 2 m, PVC	Cd-170	–	GSE10-R3811	1064691
						Mounting bracket BEF-G10UC01 (2x)	GSE10-R3812	1065912
		Infrared light	No/fix	Cable, 5-wire, 2 m, PVC	Cd-170	–	GSE10-R3721	1065913
						Mounting bracket BEF-G10UC01 (2x)	GSE10-R3722	1065914

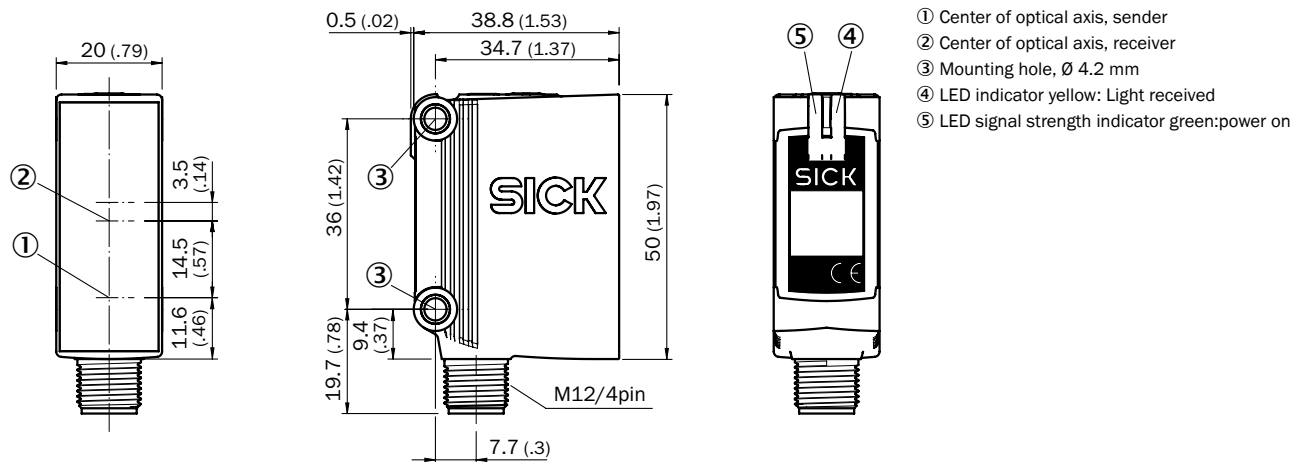
Dimensional drawings

Dimensions in mm (inch)

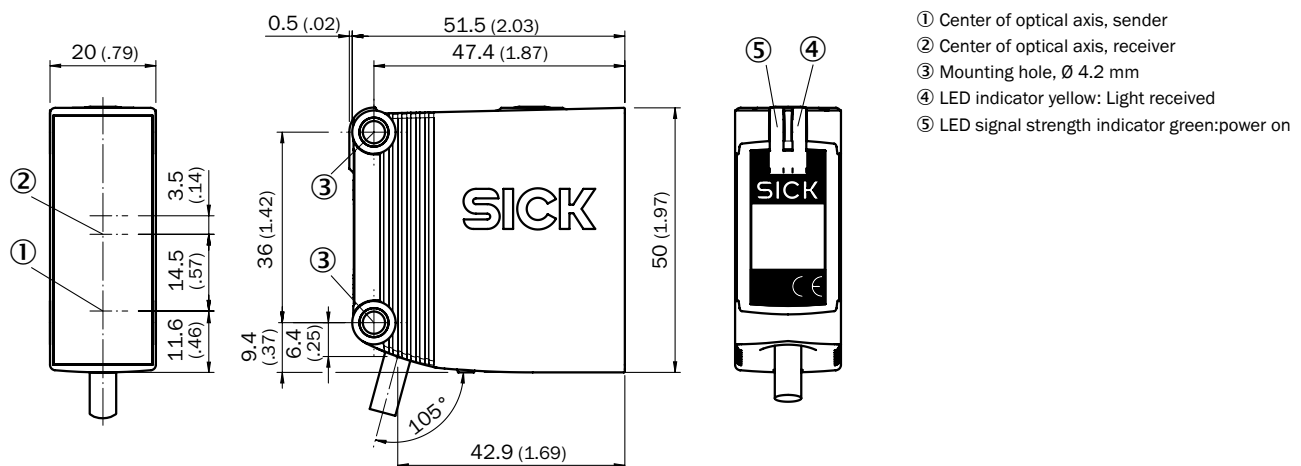
GTB10, DC, cable



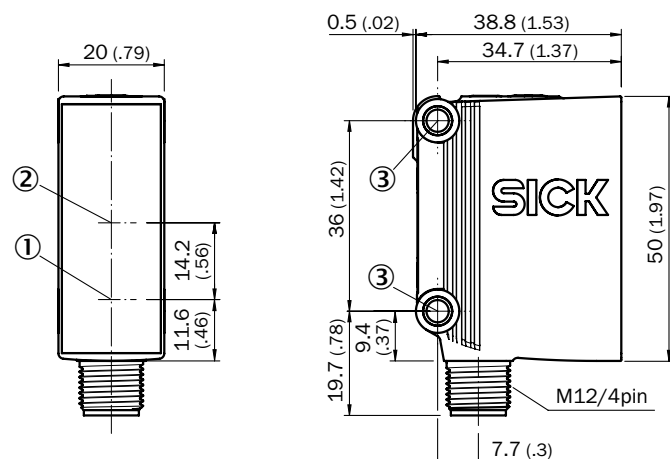
GTB10, DC, connector



GTB10, AC/DC, cable

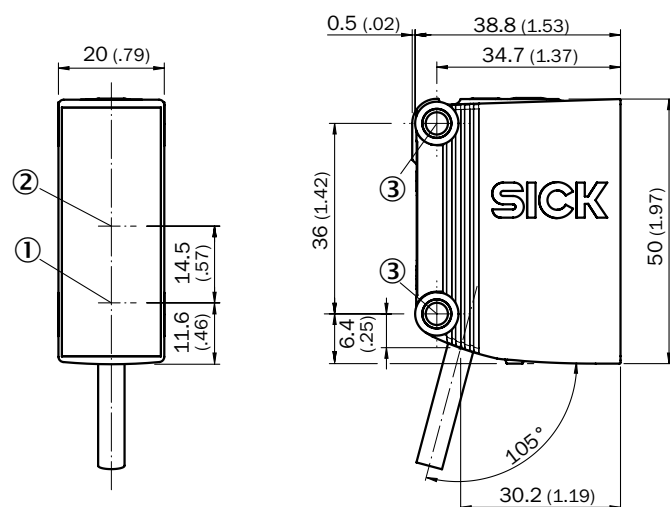


GTE10, GL10, GL10G, DC, connector



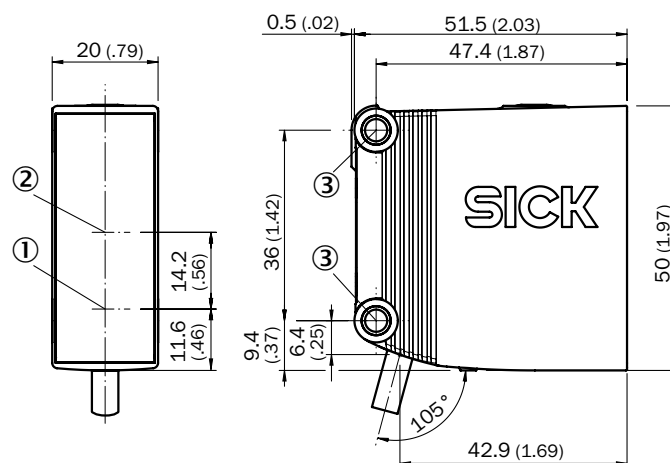
- ① Center of optical axis, sender
- ② Center of optical axis, receiver
- ③ Mounting hole, Ø 4.2 mm
- ④ LED indicator yellow: Light received
- ⑤ LED signal strength indicator green: power on

GTE10, GL10, GL10G, DC, cable

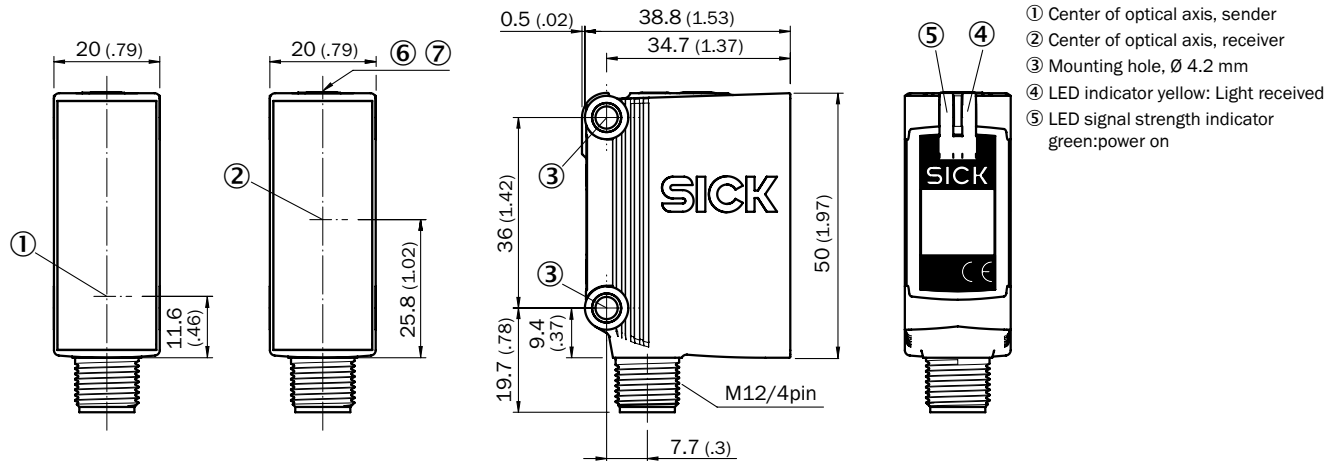
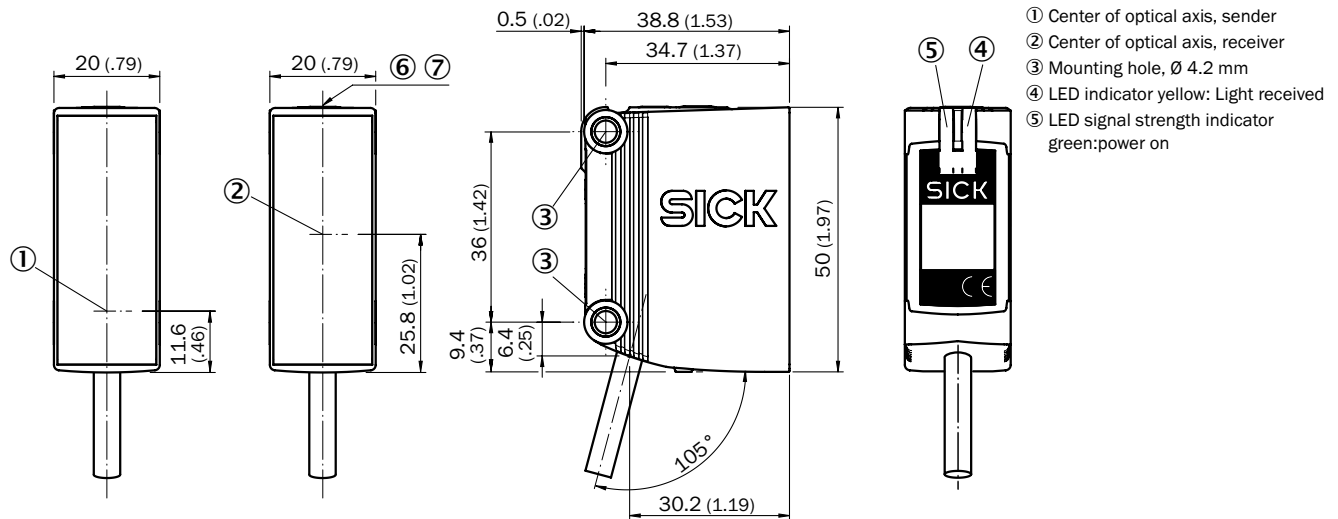
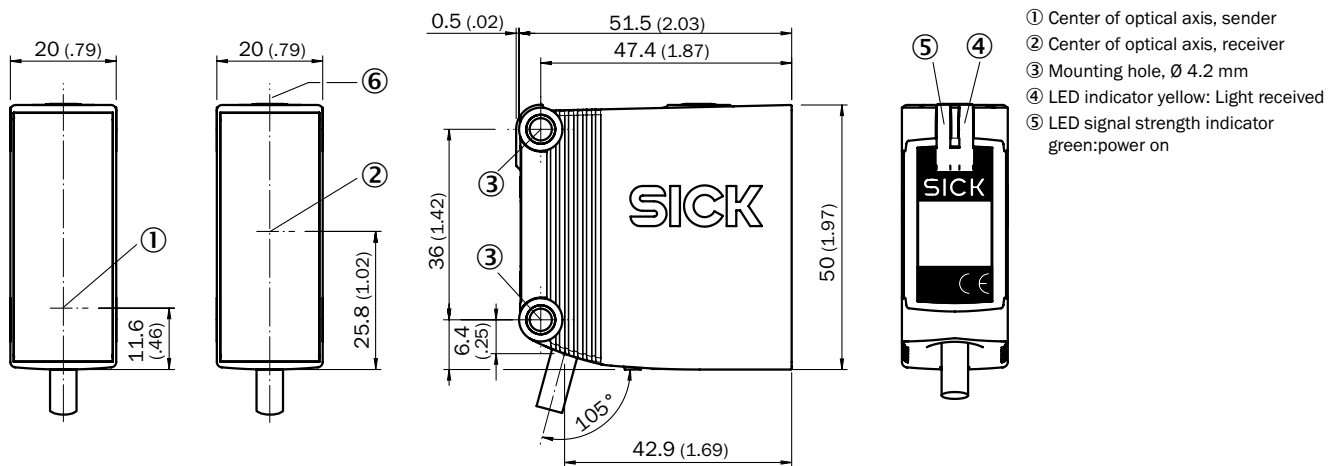


- ① Center of optical axis, sender
- ② Center of optical axis, receiver
- ③ Mounting hole, Ø 4.2 mm
- ④ LED indicator yellow: Light received
- ⑤ LED signal strength indicator green: power on

GTE10, GL10, GL10G, AC/DC, cable

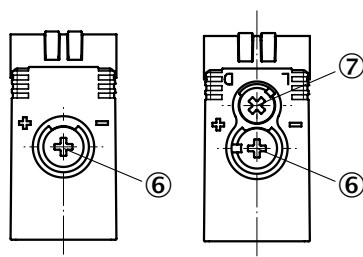


- ① Center of optical axis, sender
- ② Center of optical axis, receiver
- ③ Mounting hole, Ø 4.2 mm
- ④ LED indicator yellow: Light received
- ⑤ LED signal strength indicator green: power on

GSE10, DC, connector**GSE10, DC, cable****GSE10, AC/DC, cable**

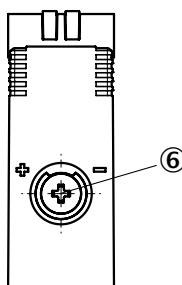
Adjustments

GTB10, GTE10, DC



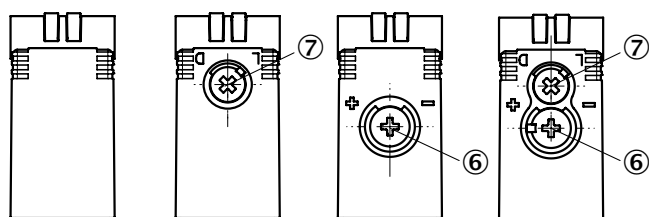
- ⑥ Sensing range adjustment
- ⑦ Light/dark selector

GTB10, GTE10, AC/DC



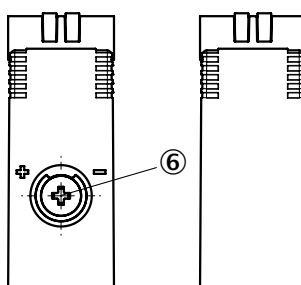
- ⑥ Sensing range adjustment

GL10, GL10G, GSE10, DC



- ⑥ Sensing range adjustment
- ⑦ Light/dark selector

GL10, GL10G, GSE10, AC/DC



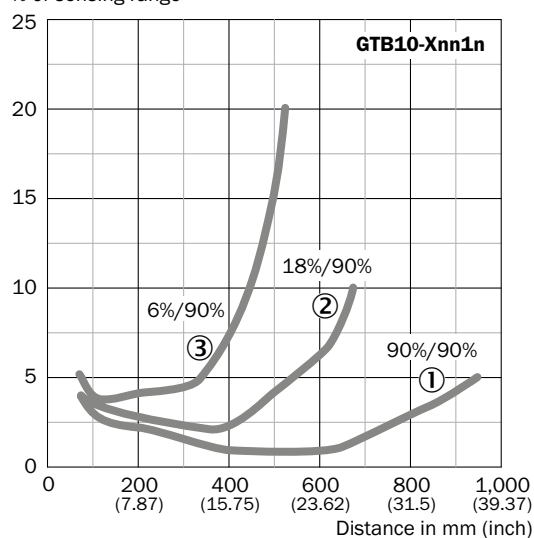
- ⑥ Sensing range adjustment

Characteristic curves

Black-white shift

GTB10, redlight

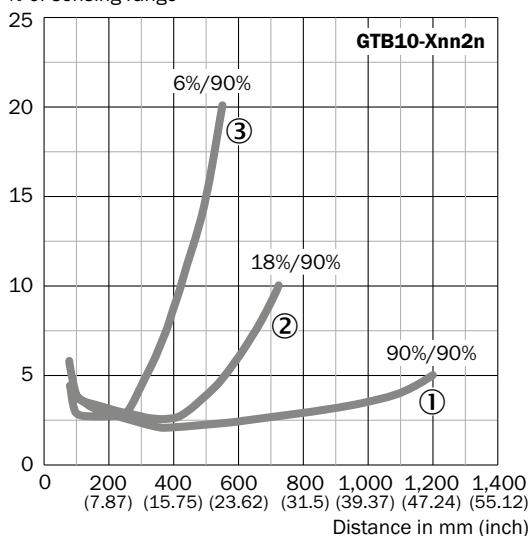
% of sensing range



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

GTB10, infrared light

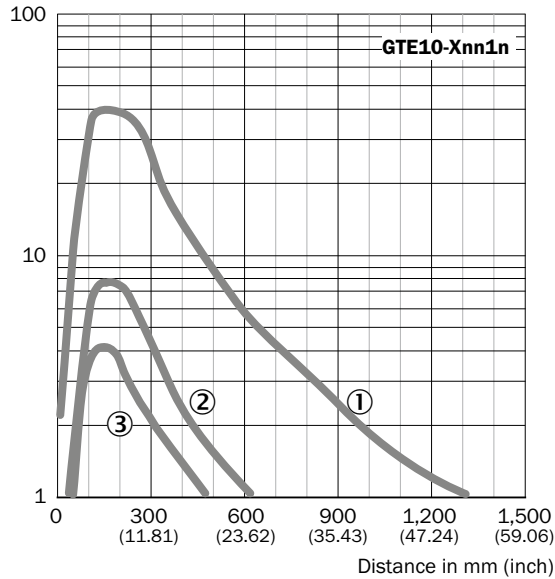
% of sensing range



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

GTE10, red light

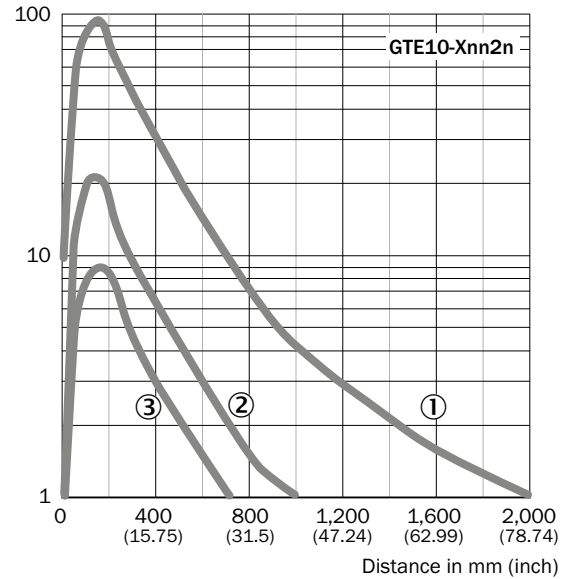
Operating reserve



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

GTE10, infrared light

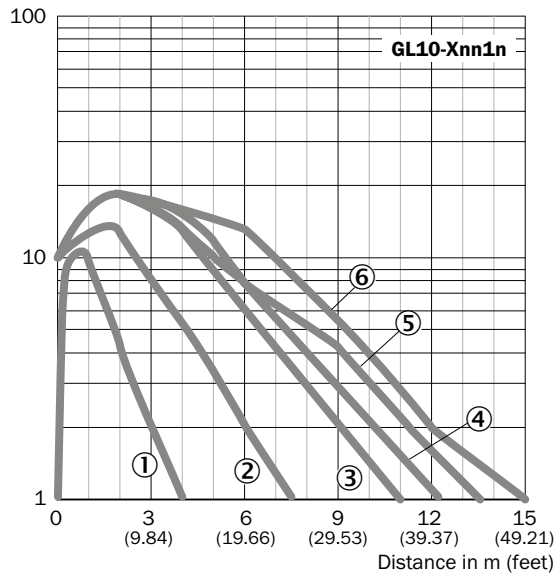
Operating reserve



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

Operating reserve**GL10, DC, AC/DC**

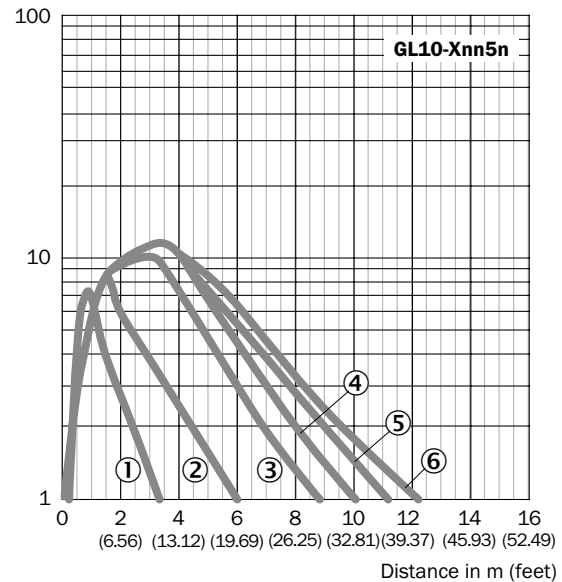
Operating reserve



- ① REF-IRF-56
- ② PL20A
- ③ PL30A
- ④ P250
- ⑤ PL40A
- ⑥ PL80A

GL10 logistics, DC

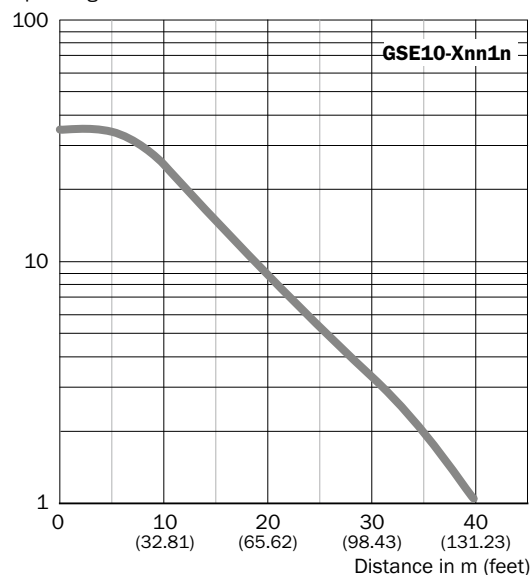
Operating Reserve



- ① REF-IRF-56
- ② PL20A
- ③ PL30A
- ④ P250
- ⑤ PL40A
- ⑥ PL80A

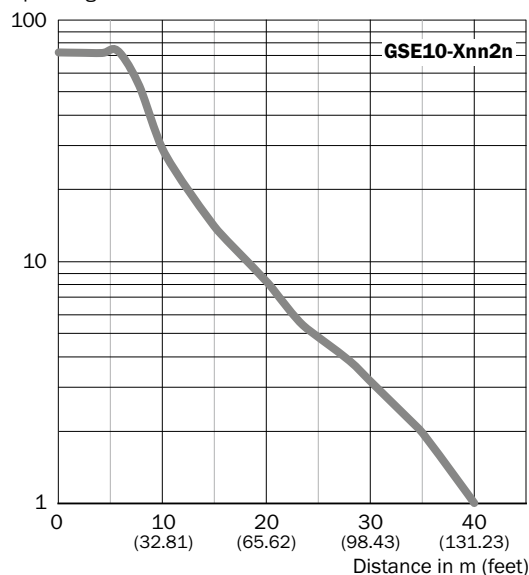
GSE10, red light

Operating reserve



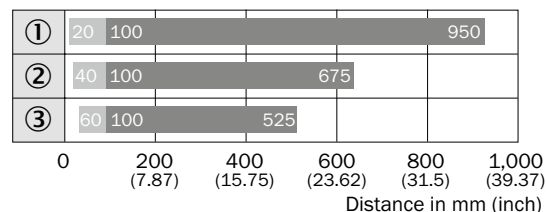
GSE10, infrared light

Operating reserve



Bar diagrams

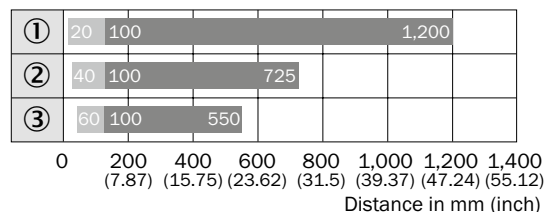
GTB10, redlight



■ 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

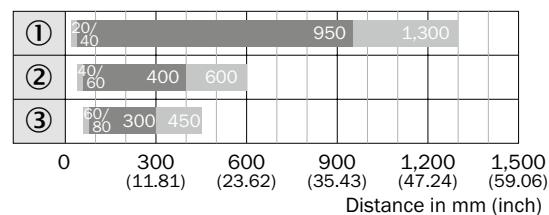
GTB10, infrared light



■ 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

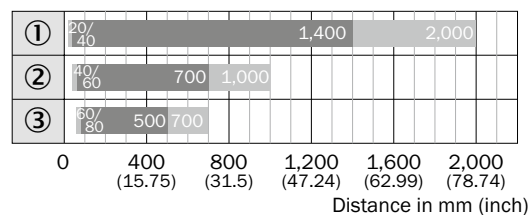
GTE10, red light



■ Sensing range ■ Sensing range max.

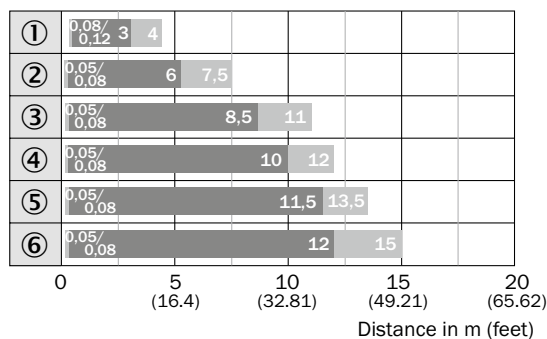
- ① Sensing range on white, 90 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on black, 6 % remission

GTE10, infrared light



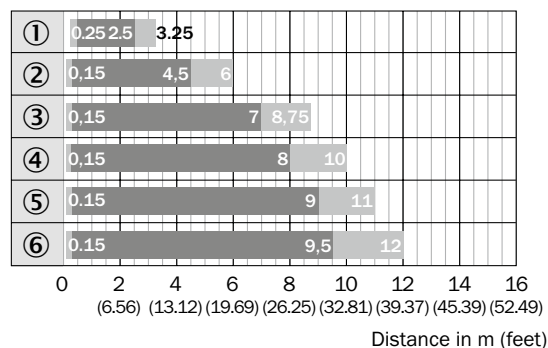
■ Sensing range ■ Sensing range max.

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

GL10

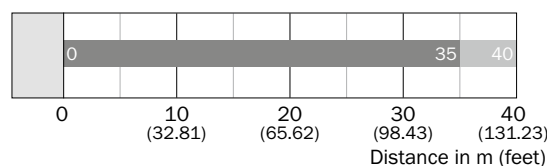
■ Sensing range ■ Sensing range max.

- ① REF-IRF-56
- ② PL20A
- ③ PL30A
- ④ P250
- ⑤ PL40A
- ⑥ PL80A

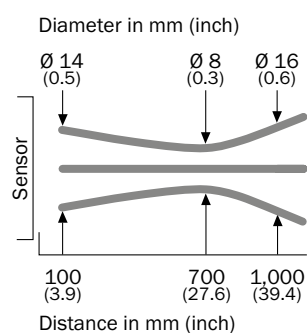
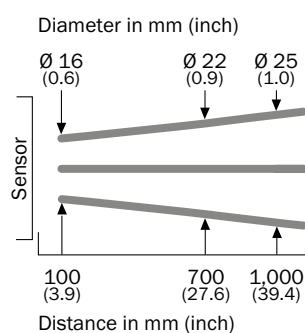
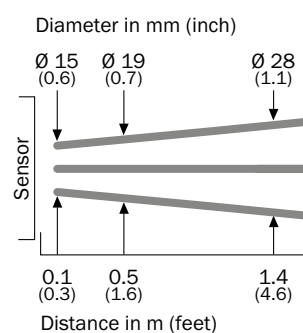
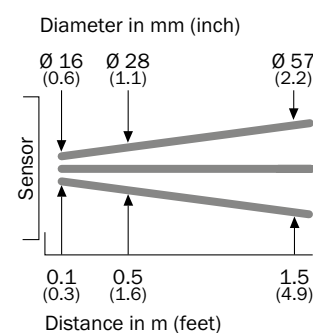
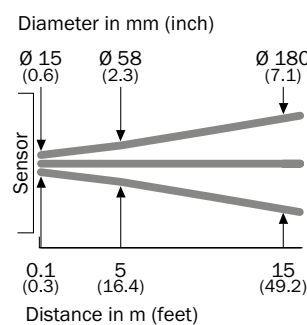
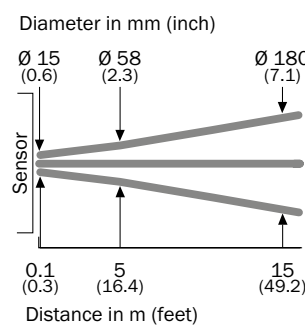
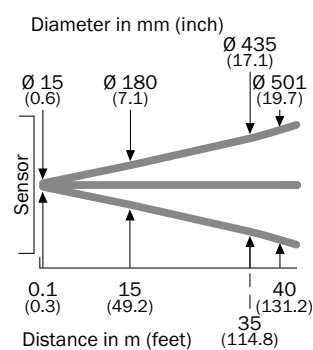
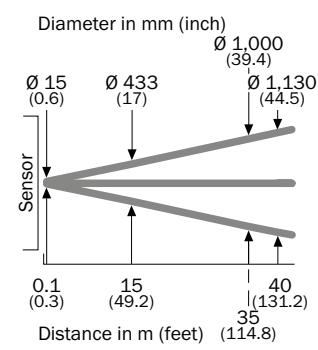
GL10, Logistik, DC

■ Sensing range ■ Sensing range max.

- ① REF-IRF-56
- ② PL20A
- ③ PL30A
- ④ P250
- ⑤ PL40A
- ⑥ PL80A

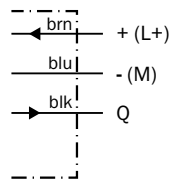
GSE10, red light, infrared light

■ Sensing range ■ Sensing range max.

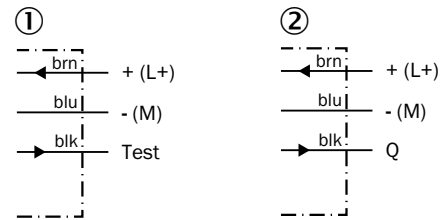
Light spot diameter**GTB10, redlight****GTB10, infrared light****GTE10, red light****GTE10, infrared light****GL10, AC/DC****GL10, GL10G****GSE10, red light****GSE10, infrared light**

Connection diagram

Cd-044

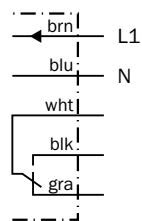


Cd-061

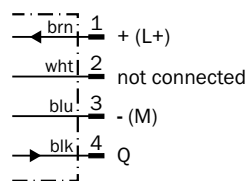


① Sender
② Receiver

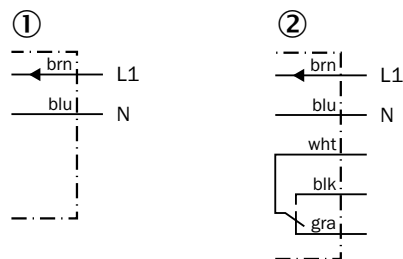
Cd-163



Cd-066

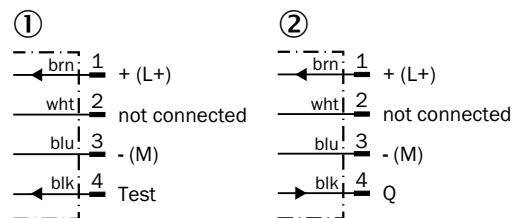


Cd-170



① Sender
② Receiver

Cd-073



① Sender
② Receiver

Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Description	Material	Model name	Part no.
	Mounting bracket for wall and floor mounting for G10 DC	Steel, zinc coated	BEF-G10DC01	2071258
	Mounting bracket for wall and floor mounting for G10 AC/DC		BEF-G10UC01	2071259

Universal bar clamp systems

Figure	Description	Material	Model name	Part no.
	Q-Lock, bar clamp system for G10 and reflector P250	Die-cast zinc, Steel, zinc coated	BEF-KHSQ12R01	2071260
	Q-Lock, bar clamp system for G10 and reflector P250, incl. sheet clamp		BEF-KHSQ12ZR01	2071262

Device protection (mechanical)

Figure	Description	Material	Model name	Part no.
	Weather protection hood for G10	Steel, zinc coated	BEF-G10WSG	2071960
	Weather protection hood for reflectors PL80A, P250, PL40A		BEF-PL80AWSG	2071961

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

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, 47 mm x 47 mm	P250F	5308843
		Fine triple, screw connection, suitable for laser sensors, 18 mm x 18 mm	PL10F	5311210
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
	PMMA/ABS	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
	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

High-performance sensors in a rugged VISTAL™ housing



Additional information

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Adjustments	G-454
Characteristic curves	G-455
Bar diagrams.....	G-457
Light spot diameter.....	G-458
Connection diagram	G-458
Recommended accessories....	G-459

Product description

The W9-3 sensors feature a compact, rugged housing made from VISTAL™, offers an outstanding mechanical robustness. Plus, proprietary optic and OES3 ASIC technology provides best-in-class sensing performance. The

W9-3 also includes unique connectivity options, mounting variability and optical specifications, making it the perfect solution for challenging automation applications. Add this advantage to your machine.

At a glance

- High-performance sensor in ultra-rugged VISTAL™ housing
- PinPoint LED for highly visible and precise light spot
- Two emitter LEDs for best-in-class background suppression
- Variable mounting with M3 or M4 hole pattern
- Wide range of connection options

Your benefits

- Robustness with the VISTAL™ housing
- Best in class performance
- Wide variance in connection, mounting and optic

→ www.mysick.com/en/W9-3

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

	WTB9-3	WTB9M4-3	WL9-3	WL9M4-3	WSE9-3	WSE9M4-3
Sensor principle	Photoelectric proximity sensor		Photoelectric retro-reflective sensor		Through-beam photoelectric sensor	
Detection principle	Background suppression		Autocollimation		-	
Dimensions (W x H x D)	12.2 mm x 50 mm x 23.6 mm/12.2 mm x 49.8 mm x 23.6 mm/ 12.2 mm x 52.2 mm x 23.6 mm (depending on type)					
Housing design (light emission)	Rectangular					
Mounting hole	M3	M4	M3	M4	M3	M4
Sensing range max.	20 mm ... 800 mm ¹⁾ (depending on type)		0 m ... 5 m ²⁾ (depending on type)		0 m ... 10 m	
Sensing range	20 mm ... 400 mm ³⁾ (depending on type)		0 m ... 3 m ²⁾ (depending on type)		0 m ... 7 m	
Type of light	Visible red light/Infrared light (depending on type)		Visible red light			
Light source ⁴⁾	PinPoint LED /LED (depending on type)		PinPoint LED			
Wave length						
	Visible red light	650 nm				
Infrared light	850 nm		-			
Adjustment	Potentiometer, 5 turns		Single teach-in button		No adjustment	
Special feature	-		Focused optics	-		

¹⁾ Object with 90 % reflectance (referred to standard white, DIN 5033)²⁾ PL80A.³⁾ Object with 6 % reflectance (referred to standard white, DIN 5033)⁴⁾ Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

	WTB9-3	WTB9M4-3	WL9-3	WL9M4-3	WSE9-3	WSE9M4-3
Supply voltage ¹⁾	10 V DC ... 30 V DC					
Ripple ²⁾	< 5 V _{pp}					
Power consumption ³⁾	≤ 30 mA					
Output type ⁴⁾	PNP/NPN (depending on type)					
Output function	Complementary					
Switching mode ⁴⁾	Light/dark-switching					
Output current I _{max.} ⁵⁾	≤ 100 mA					
Connection type	Cable, 2 m ⁸⁾ /Male connector, M8/Male connector, M12/Cable with connector, M12, 120 mm ⁸⁾ (depending on type)					
Circuit protection	A ⁹⁾ , B ¹⁰⁾ , C ¹¹⁾					
Protection class	III					
Weight						
	Connector	13 g				
	Cable/cable with connector	80 g				
Polarisation filter	–			✓	–	
Housing material	VISTAL™					
Optics material	PMMA					

	WTB9-3	WTB9M4-3	WL9-3	WL9M4-3	WSE9-3	WSE9M4-3
Enclosure rating	IP 66/IP 67/IP 69K					
Test input sender off	–				Sender off	
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⁾ Q = light-switching.

⁵⁾ As of Tu 50 °C, a max. load current I_{lmax} = 50 mA is permitted.

⁶⁾ Signal transit time with resistive load.

⁷⁾ With light/dark ratio 1:1.

⁸⁾ Do not bend below 0 °C.

⁹⁾ A = V_S connections reverse-polarity protected.

¹⁰⁾ B = inputs and output reverse-polarity protected.

¹¹⁾ C = interference suppression.

Ordering information

Other models available at www.mysick.com/en/W9-3

WTB9-3

- **Detection principle:** background suppression
- **Mounting hole:** M3
- **Adjustment:** potentiometer, 5 turns
- **Switching mode:** light/dark-switching (Q = light-switching.)

Type of light	Sensing range max. ¹⁾	Light spot size (distance)	Switching frequency ^{2)/} Response time ³⁾	Output type	Connection	Connection diagram	Model name	Part no.
Visible red light	20 mm ... 350 mm	Ø 4.5 mm (75 mm)	1,500 Hz/ < 0.333 ms	PNP	Cable, 4-wire, 2 m, PVC	Cd-094	WTB9-3P1161	1049043
					Cable, 4-wire, 5 m, PVC	Cd-094	WTB9-3P1261	1049044
					Connector M8, 4-pin	Cd-084	WTB9-3P2261	1049047
					Connector M12, 4-pin	Cd-084	WTB9-3P2461	1049049
					Cable with connector M12, 4-pin, 120 mm, PVC	Cd-084	WTB9-3P3461	1049051
				NPN	Cable, 4-wire, 2 m, PVC	Cd-094	WTB9-3N1161	1049052
Infrared light	20 mm ... 500 mm	Ø 20 mm (250 mm)	1,000 Hz/ < 0.5 ms	PNP	Connector M12, 4-pin	Cd-084	WTB9-3N2461	1049053
					Cable, 4-wire, 2 m, PVC	Cd-094	WTB9-3P1111	1049042
					Connector M8, 4-pin	Cd-084	WTB9-3P2211	1049045
	20 mm ... 800 mm	Ø 40 mm (400 mm)	200 Hz/ < 2.5 ms	PNP	Connector M12, 4-pin	Cd-084	WTB9-3P2411	1049048
					Cable, 4-wire, 2 m, PVC	Cd-094	WTB9-3P1111S14	1052173
					Connector M8, 4-pin	Cd-084	WTB9-3P2211S14	1052171
				PNP	Connector M12, 4-pin	Cd-084	WTB9-3P2411S14	1052172
					Cable with connector M12, 4-pin, 120 mm, PVC	Cd-084	WTB9-3P3411S14	1054431
					Cable, 4-wire, 2 m, PVC	Cd-094	WTB9-3N1111S14	1050948
				NPN	Cable, 4-wire, 2 m, PVC	Cd-094	WTB9-3N1111S14	1050948

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

⁷⁾ With light/dark ratio 1:1.

⁶⁾ Signal transit time with resistive load.

WTB9M4-3

- **Detection principle:** background suppression
- **Mounting hole:** M4
- **Adjustment:** potentiometer, 5 turns
- **Switching mode:** light/dark-switching (Q = light-switching.)

Type of light	Sensing range max. ¹⁾	Light spot size (distance)	Switching frequency ²⁾ /Response time ³⁾	Output type	Connection	Connection diagram	Model name	Part no.
Visible red light	20 mm ... 350 mm	Ø 4.5 mm (75 mm)	1,500 Hz/ < 0.333 ms	PNP	Cable, 4-wire, 2 m, PVC	Cd-094	WTB9M4-3P1161	1051887
					Connector M8, 4-pin	Cd-084	WTB9M4-3P2261	1051889
					Connector M12, 4-pin	Cd-084	WTB9M4-3P2461	1051891
				NPN	Cable, 4-wire, 2 m, PVC	Cd-094	WTB9M4-3N1161	1051882
					Connector M8, 4-pin	Cd-084	WTB9M4-3N2261	1051885
Infrared light	20 mm ... 500 mm	Ø 20 mm (250 mm)	1,000 Hz/ < 0.5 ms	PNP	Cable, 4-wire, 2 m, PVC	Cd-094	WTB9M4-3P1111	1051886
					Connector M8, 4-pin	Cd-084	WTB9M4-3P2211	1051888
					Connector M12, 4-pin	Cd-084	WTB9M4-3P2411	1051890
				NPN	Connector M12, 4-pin	Cd-084	WTB9M4-3N2411	1055145

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

²⁾ With light/dark ratio 1:1.

³⁾ Signal transit time with resistive load.

WL9-3

- **Detection principle:** autocollimation
- **Type of light:** visible red light
- **Mounting hole:** M3
- **Switching mode:** light/dark-switching (Q = light-switching.)

Sensing range max. ¹⁾	Light spot size (distance)	Switching frequency ²⁾ /Response time ³⁾	Adjustment	Output type	Connection	Connection diagram	Model name	Part no.
0 m ... 0.4 m	Ø 2 mm (35 mm)	1,000 Hz/ < 0.5 ms	Single teach-in button	PNP	Cable, 4-wire, 2 m, PVC	Cd-094	WL9-3P1162	1049054
					Connector M8, 4-pin	Cd-084	WL9-3P2262	1049058
					Connector M12, 4-pin	Cd-084	WL9-3P2462	1049061
					Cable with connector M12, 4-pin, 120 mm, PVC	Cd-084	WL9-3P3462	1049065
				NPN	Cable, 4-wire, 2 m, PVC	Cd-094	WL9-3N1162	1049068
					Connector M12, 4-pin	Cd-084	WL9-3N2462	1049072
0 m ... 4 m	Ø 45 mm (1.5 m)	1,000 Hz/ < 0.5 ms	-	PNP	Cable, 4-wire, 2 m, PVC	Cd-094	WL9-3P1130	1049055
					Connector M8, 4-pin	Cd-084	WL9-3P2230	1049059
					Connector M12, 4-pin	Cd-084	WL9-3P2430	1049062
					Cable with connector M12, 4-pin, 120 mm, PVC	Cd-084	WL9-3P3430	1049066
				NPN	Cable, 4-wire, 2 m, PVC	Cd-094	WL9-3N1130	1049069
					Connector M8, 4-pin	Cd-084	WL9-3N2230	1049071
					Connector M12, 4-pin	Cd-084	WL9-3N2430	1049073

¹⁾ PL80A.

²⁾ With light/dark ratio 1:1.

³⁾ Signal transit time with resistive load.

Sensing range max. ¹⁾	Light spot size (distance)	Switching frequency ²⁾ /Response time ³⁾	Adjustment	Output type	Connection	Connection diagram	Model name	Part no.
0 m ... 5 m	Ø 45 mm (1.5 m)	1,000 Hz/ < 0.5 ms	Single teach-in button	PNP	Cable, 4-wire, 2 m, PVC	Cd-094	WL9-3P1132	1049056
					Cable, 4-wire, 5 m, PVC	Cd-094	WL9-3P1232	1049057
					Connector M8, 4-pin	Cd-084	WL9-3P2232	1049060
					Connector M12, 4-pin	Cd-084	WL9-3P2432	1049063
					Cable with connector M12, 4-pin, 120 mm, PVC	Cd-084	WL9-3P3432	1049067
				NPN	Cable, 4-wire, 2 m, PVC	Cd-094	WL9-3N1132	1049070
					Connector M12, 4-pin	Cd-084	WL9-3N2432	1049074

¹⁾ PL80A.²⁾ With light/dark ratio 1:1.³⁾ Signal transit time with resistive load.

WL9M4-3

- **Detection principle:** autocollimation
- **Type of light:** visible red light
- **Mounting hole:** M4
- **Switching mode:** light/dark-switching (Q = light-switching.)

Sensing range max. ¹⁾	Light spot size (distance)	Switching frequency ²⁾ /Response time ³⁾	Adjustment	Output type	Connection	Connection diagram	Model name	Part no.
0 m ... 5 m	Ø 45 mm (1.5 m)	1,000 Hz/ < 0.5 ms	Single teach-in button	PNP	Cable, 4-wire, 2 m, PVC	Cd-094	WL9M4-3P1132	1051894
					Connector M8, 4-pin	Cd-084	WL9M4-3P2232	1051895
					Connector M12, 4-pin	Cd-084	WL9M4-3P2432	1051896
					Cable with connector M12, 4-pin, 120 mm, PVC	Cd-084	WL9M4-3P3432	1051907
				NPN	Cable, 4-wire, 2 m, PVC	Cd-094	WL9M4-3N1132	1051892
					Connector M8, 4-pin	Cd-084	WL9M4-3N2232	1051893

¹⁾ PL80A.²⁾ With light/dark ratio 1:1.³⁾ Signal transit time with resistive load.

WSE9-3

- **Type of light:** visible red light
- **Mounting hole:** M3
- **Switching mode:** light/dark-switching (Q = light-switching.)

Sensing range max.	Light spot size (distance)	Switching frequency ²⁾ /Response time ³⁾	Adjustment	Output type	Connection	Connection diagram	Model name	Part no.
0 m ... 10 m	Ø 25 mm (1.0 m)	1,000 Hz/ < 0.5 ms	-	PNP	Cable, 4-wire, 2 m, PVC	Cd-074	WSE9-3P1130	1049075
					Connector M8, 4-pin	Cd-077	WSE9-3P2230	1049076
					Connector M12, 4-pin	Cd-077	WSE9-3P2430	1049077
					Cable with connector M12, 4-pin, 120 mm, PVC	Cd-077	WSE9-3P3430	1049078
				NPN	Cable, 4-wire, 2 m, PVC	Cd-074	WSE9-3N1130	1049079
					Connector M8, 4-pin	Cd-077	WSE9-3N2230	1055041
					Connector M12, 4-pin	Cd-077	WSE9-3N2430	1049080

²⁾ With light/dark ratio 1:1.³⁾ Signal transit time with resistive load.

WSE9M4-3

- **Type of light:** visible red light
- **Mounting hole:** M4
- **Switching mode:** light/dark-switching (Q = light-switching.)

Sensing range max.	Light spot size (distance)	Switching frequency ²⁾ /Response time ³⁾	Adjustment	Output type	Connection	Connection diagram	Model name	Part no.
0 m ... 10 m	Ø 25 mm (1.0 m)	1,000 Hz/ < 0.5 ms	-	PNP	Cable, 4-wire, 2 m, PVC	Cd-074	WSE9M4-3P1130	1051911
					Connector M8, 4-pin	Cd-077	WSE9M4-3P2230	1051912
					Connector M12, 4-pin	Cd-077	WSE9M4-3P2430	1051913
					Cable with connector M12, 4-pin, 120 mm	Cd-077	WSE9M4-3P3430	1054435
				NPN	Cable, 4-wire, 2 m, PVC	Cd-074	WSE9M4-3N1130	1051914
					Connector M8, 4-pin	Cd-077	WSE9M4-3N2230	1052938

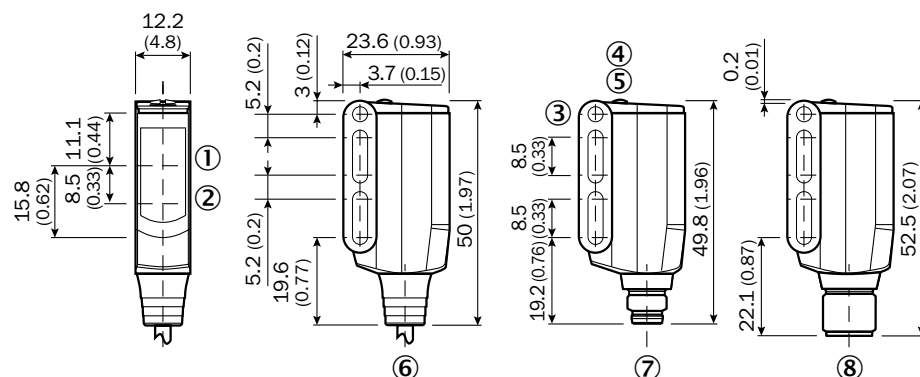
⁷⁾ With light/dark ratio 1:1.

⁸⁾ Signal transit time with resistive load.

Dimensional drawings

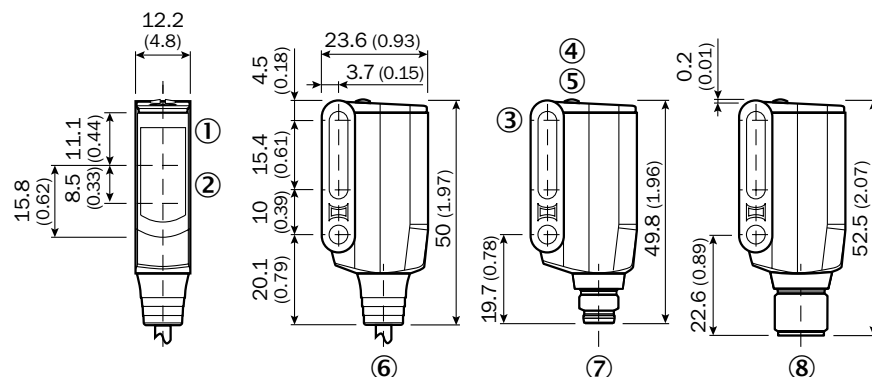
Dimensions in mm (inch)

WTB9-3

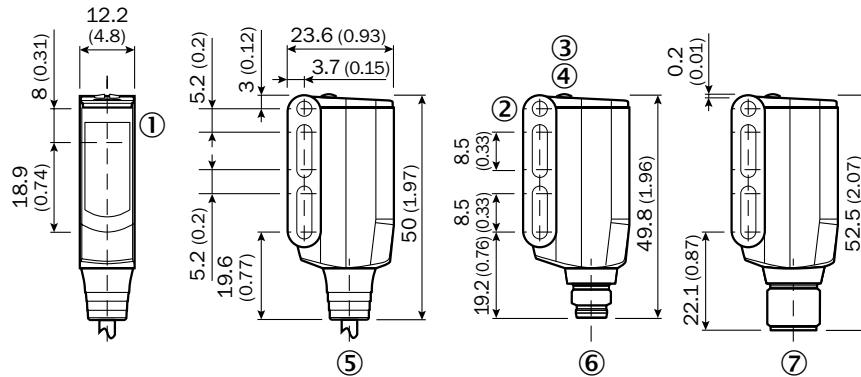


- ① Center of optical axis, receiver
- ② Center of optical axis, sender
- ③ Mounting hole M3 (Ø 3.1 mm)
- ④ LED indicator yellow: Light received
- ⑤ LED signal strength indicator green: power on
- ⑥ Connection cable 2 m
- ⑦ Connector M8, 4-pin
- ⑧ Connector M12, 4-pin

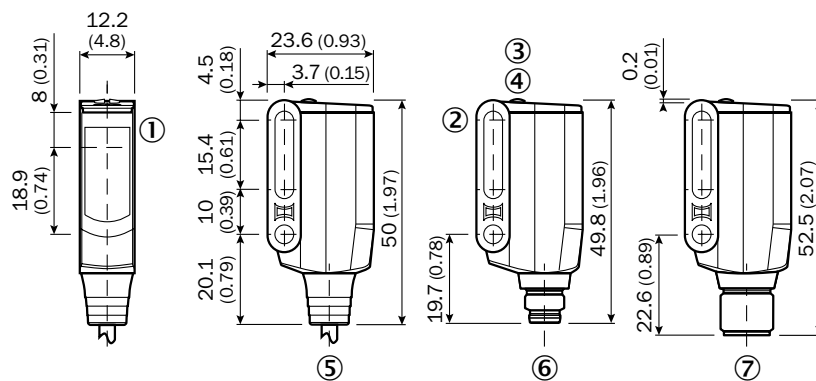
WTB9M4-3



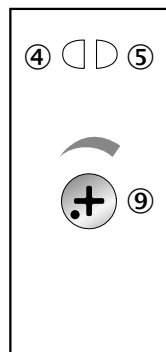
- ① Center of optical axis, receiver
- ② Center of optical axis, sender
- ③ Mounting hole M4 (Ø 4.1 mm)
- ④ LED indicator yellow: Light received
- ⑤ LED signal strength indicator green: power on
- ⑥ Connection cable
- ⑦ Connector M8, 4-pin
- ⑧ Connector M12, 4-pin

WL9-3, WL9-3G

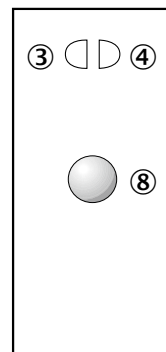
- ① Centre of optical axis, sender and receiver
- ② Mounting hole M3 (Ø 3.1 mm)
- ③ LED indicator yellow: Light received
- ④ LED signal strength indicator green: power on
- ⑤ Connecting cable or connector
- ⑥ Connector M8, 4-pin
- ⑦ Connector M12, 4-pin

WL9M4-3, WL9M4-3G

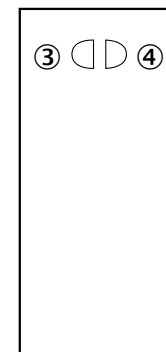
- ① Centre of optical axis, sender and receiver
- ② Mounting hole M4 (Ø 4.1 mm)
- ③ LED indicator yellow: Light received
- ④ LED signal strength indicator green: power on
- ⑤ Connecting cable or connector
- ⑥ Connector M8, 4-pin
- ⑦ Connector M12, 4-pin

G**Adjustments****Potentiometer**

- ④ LED indicator yellow: Light received
- ⑤ LED signal strength indicator green: power on
- ⑨ Sensing range adjustment

Single teach-in button

- ③ LED indicator yellow: Light received
- ④ LED signal strength indicator green: power on
- ⑧ Teach-in button

No adjustment possibility

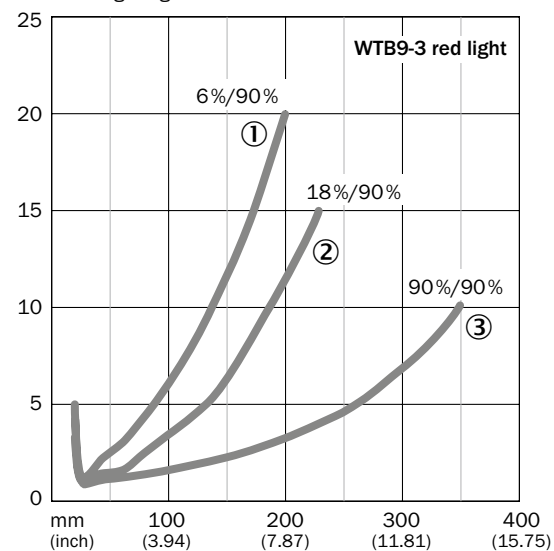
- ③ LED indicator yellow: Light received
- ④ LED signal strength indicator green: power on

Characteristic curves

Black-white shift

WTB9-3, red light, 350 mm

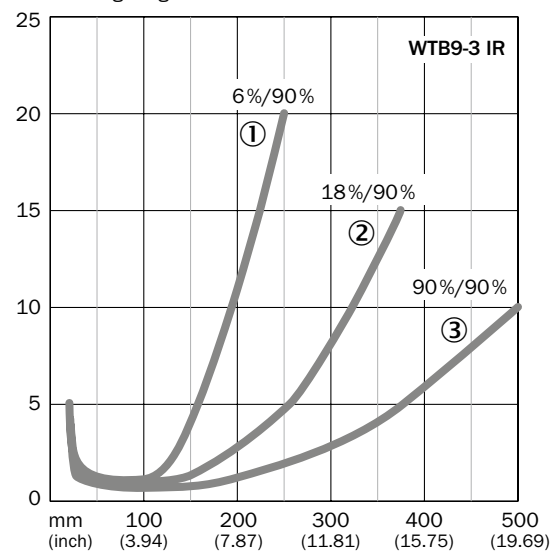
% of sensing range



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

WTB9-3, infrared light, 500 mm

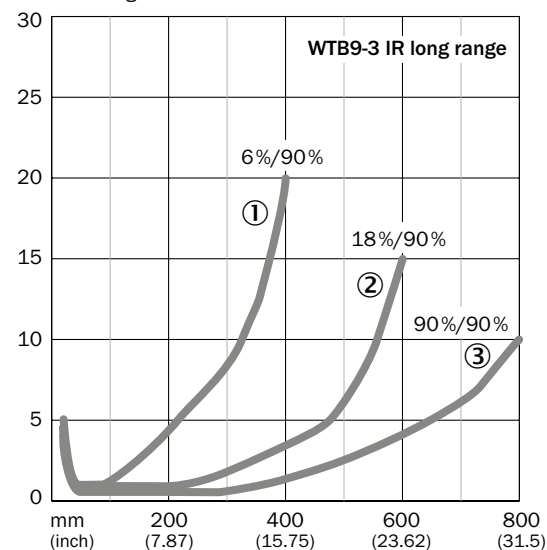
% of sensing range



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

WTB9-3, infrared light, 800 mm

% of scanning distance

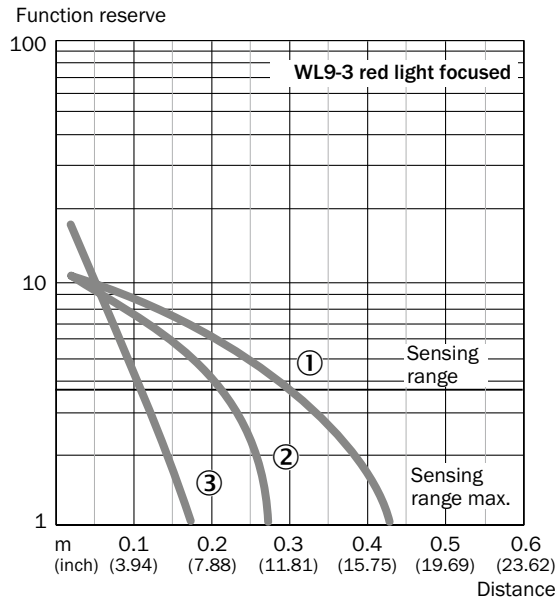


- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

G

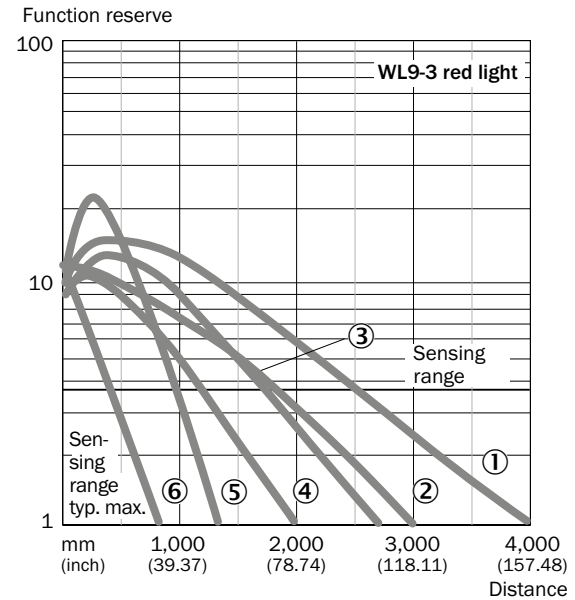
Operating reserve

WL9-3, red light, 0.4 m



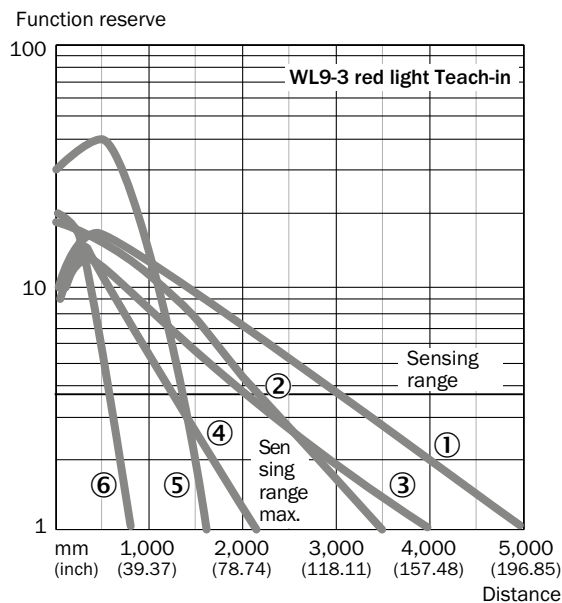
- ① PL80A
- ② PL40A
- ③ REF-IRF-56

WL9-3, red light, 4 m



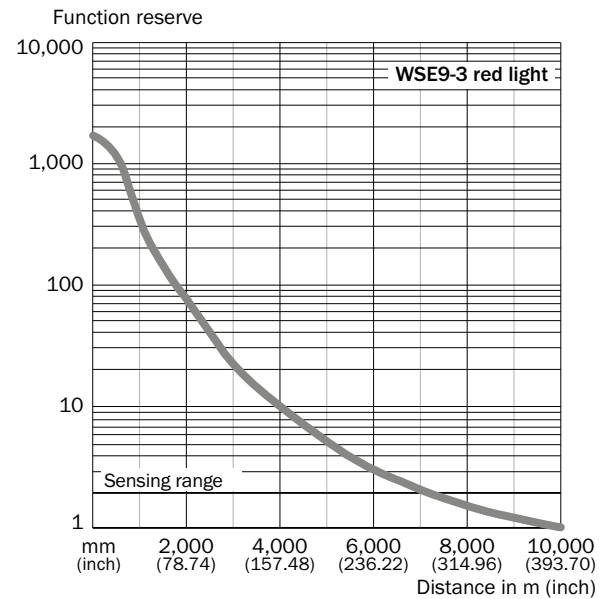
- ① PL80A
- ② P250
- ③ PL40A
- ④ PL20A
- ⑤ PL10F
- ⑥ REF-IRF-56

WL9-3, red light, 5 m



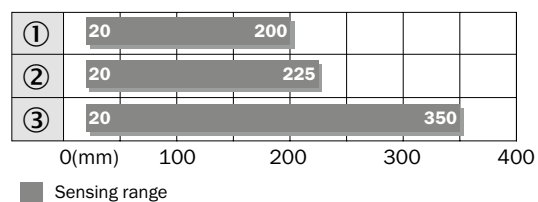
- ① PL80A
- ② P250
- ③ PL40A
- ④ PL20A
- ⑤ PL10F
- ⑥ REF-IRF-56

WSE9-3, red light, 10 m



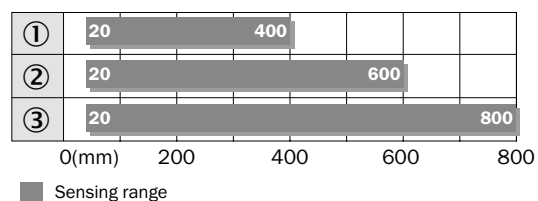
Bar diagrams

WTB9-3, red light, 350 mm



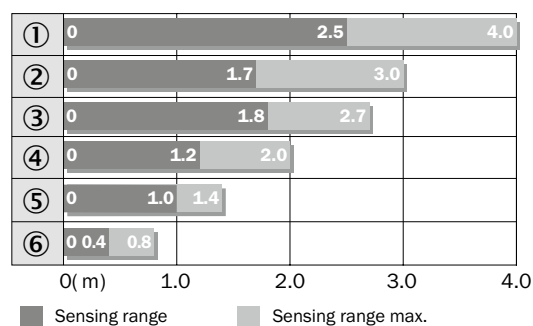
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WTB9-3, infrared light, 800 mm



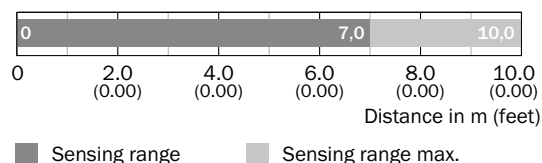
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WL9-3, red light, 4 m



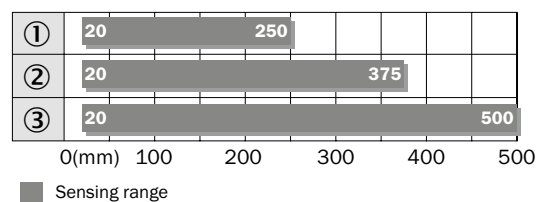
- ① PL80A
- ② P250
- ③ PL40A
- ④ PL20A
- ⑤ PL10F
- ⑥ REF-IRF-56

WSE9-3, red light, 10 m



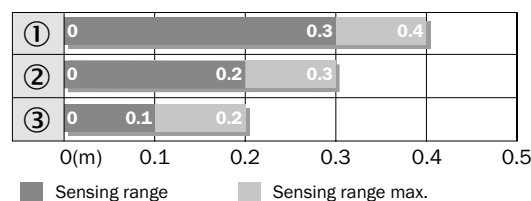
- ① Sensing range
- ① Sensing range max.

WTB9-3, infrared light, 500 mm



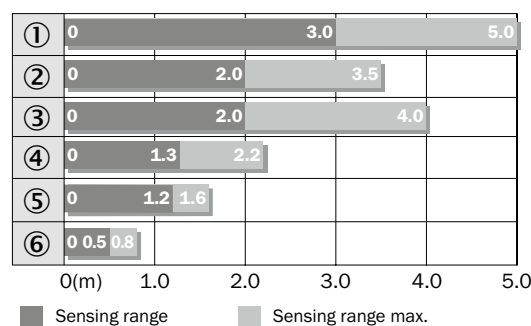
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WL9-3, red light, 0.4 m



- ① PL80A
- ② PL40A
- ③ REF-IRF-56

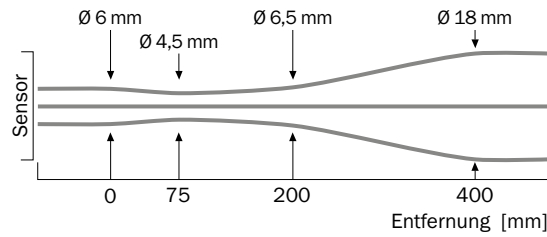
WL9-3, red light, 5 m



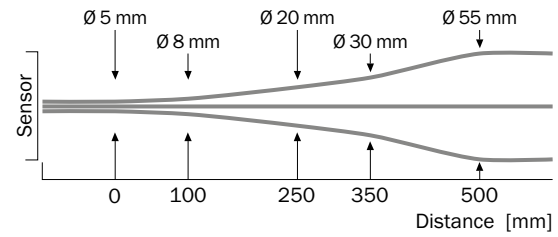
- ① PL80A
- ② P250F
- ③ PL40A
- ④ PL20F
- ⑤ PL10F
- ⑥ REF-IRF-56

Light spot diameter

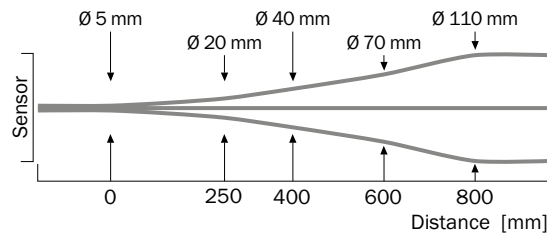
WTB9-3, red light, 350 mm



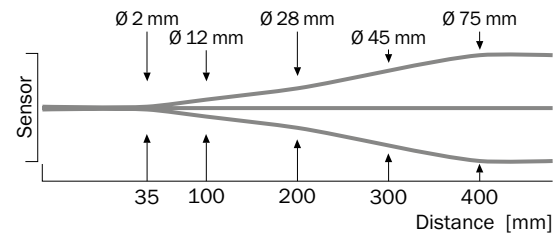
WTB9-3, infrared light, 500 mm



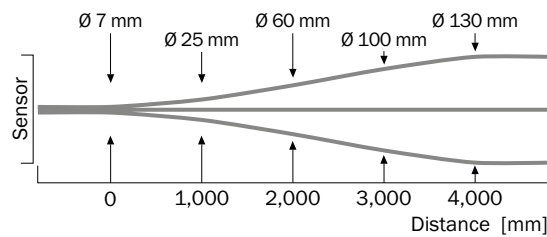
WTB9-3, infrared light, 800 mm



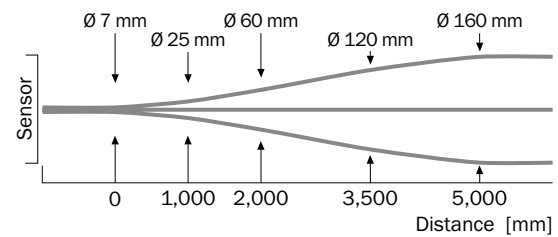
WL9-3, red light, 0.4 m



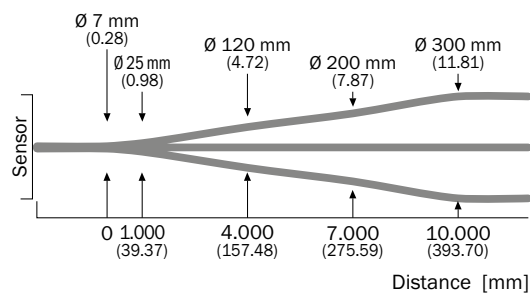
WL9-3, red light, 4 m



WL9-3, red light, 5 m

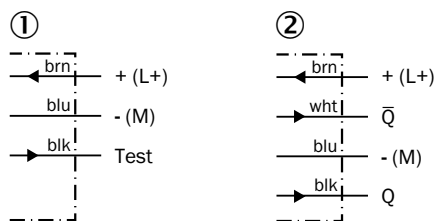


WSE9-3, red light, 10 m

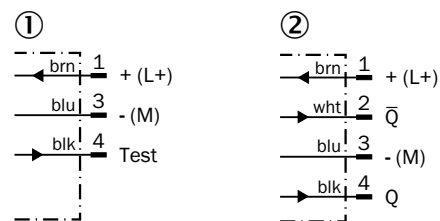


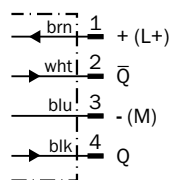
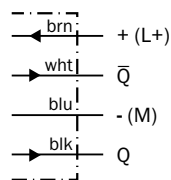
Connection diagram

Cd-074



Cd-077



Cd-084**Cd-094****Recommended accessories**

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Mounting bracket for wall mounting	BEF-W160	5305197
		Mounting bracket	BEF-WN-W9-2	2022855

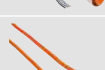
Mounting plates

Figure	Material	Description	Model name	Part no.
	Stainless steel	Adapter plate	BEF-AP-W9	2022734
	PMMA, Brass (Br)	Fastening plate with threaded sleeve M3	BEF-GPM3-W9	4066039

Plug connectors and cables

Connecting cable (female connector-open)

- Cable material: PVC

Figure	Connection type head A	Connection type head B	Connecting cable	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	PVC	IP 67	DOL-0804-G02M	6009870
			5 m, 4-wire	PVC	IP 67	DOL-0804-G05M	6009872
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	PVC	IP 67	DOL-0804-W02M	6009871
			5 m, 4-wire	PVC	IP 67	DOL-0804-W05M	6009873
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	TPU	IP 67	DOL-1204-G02M	6009382
			5 m, 4-wire	TPU	IP 67	DOL-1204-G05M	6009866
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	TPU	IP 67	DOL-1204-W02M	6009383
			5 m, 4-wire	TPU	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, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0804-G	6009974
	Female connector, M8, 4-pin, angled	Pin penetration	PBT	IP 67	DOS-0804-W	6009975
	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

Masks

Figure	Description	Model name	Part no.
	Mask card, vertical/horizontal slots, slot width: 0.5 mm / 1.0 mm / 1.5 mm / 2.0 mm	BL-9-2	4033253

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 N08 for universal clamp bracket	BEF-KHS-N08	2051607

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

High-performance sensors for clear material detection in a rugged VISTAL™ housing



Additional information

Detailed technical data.....	G-463
Ordering information.....	G-464
Dimensional drawings	G-465
Adjustments	G-465
Characteristic curves	G-465
Bar diagrams.....	G-466
Light spot diameter.....	G-466
Connection diagram	G-466
Recommended accessories....	G-466

Product description

The WL9G-3 Clear Material photoelectric sensor family features a compact, rugged housing. They are high-performance sensors that are ideal for clear object detection. These sensors have a tough plastic housing made from VISTAL™, which offers outstanding mechanical

durability. The WL9G-3 Clear Material family also includes unique connectivity options, mounting variability and optical specifications, making it the perfect solution for challenging automation applications. Add this advantage to your machine.

At a glance

- High-performance sensor in ultra-rugged VISTAL™ housing
- Best-in-class optical performance for transparent object detection
- Continuous threshold adaption
- PinPoint LED for highly visible and precise light spot
- Variable mounting with M3 or M4 hole pattern
- Wide range of connection options

Your benefits

- Tough VISTAL™ housing provides reliable installation and operation
- Best-in-class optical performance
- Wide variety of connection, mounting and optical possibilities to solve many different applications

→ www.mysick.com/en/W9-3_Glass

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

	WL9G-3	WL9M4G-3
Sensor principle	Photoelectric retro-reflective sensor	
Detection principle	Autocollimation	
Dimensions (W x H x D)	12.2 mm x 50 mm x 23.6 mm 12.2 mm x 49.8 mm x 23.6 mm 12.2 mm x 52.2 mm x 23.6 mm (depending on type)	
Housing design (light emission)	Rectangular	
Mounting hole	M3	M4
Sensing range max. ¹⁾	0 m ... 5 m	
Sensing range ¹⁾	0 m ... 3 m	
Type of light	Visible red light	
Light source ²⁾	PinPoint LED	
Light spot size (distance)	Ø 45 mm (1.5 m)	
Wave length	650 nm	
Adjustment	Single teach-in button	
Continuous threshold adaption	✓	
Special feature	Detection of transparent objects	

¹⁾ PL80A.²⁾ Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

	WL9G-3	WL9M4G-3
Supply voltage ¹⁾	10 V DC ... 30 V DC	
Ripple ²⁾	< 5 V _{pp}	
Power consumption ³⁾	≤ 20 mA	
Output type ⁴⁾	PNP/NPN (depending on type)	
Output function	Complementary	
Switching mode ⁴⁾	Light/dark-switching ⁴⁾	
Output current I _{max.} ⁵⁾	≤ 100 mA	
Response time ⁶⁾	< 0.5 ms	
Switching frequency ⁷⁾	1,000 Hz	
Connection type	Cable, 2 m ⁸⁾ /Male connector, M8/Male connector, M12/ Cable with connector, M12, 120 mm ⁸⁾ (depending on type)	
Circuit protection	A ⁹⁾ , B ¹⁰⁾ , C ¹¹⁾	
Protection class	III	
Weight		
Connector M8, 4-pin	13 g	
Cable/cable with connector	80 g	
Polarisation filter	✓	
Housing material	VISTAL™	

	WL9G-3	WL9M4G-3
Optics material	PMMA	
Enclosure rating	IP 66/IP 67/IP 69K	
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⁾ Q = light-switching.

⁵⁾ As of Tu 50 °C, a max. load current $I_{\text{max.}} = 50 \text{ mA}$ is permitted.

⁶⁾ Signal transit time with resistive load.

⁷⁾ With light/dark ratio 1:1.

⁸⁾ Do not bend below 0 °C.

⁹⁾ A = V_S connections reverse-polarity protected.

¹⁰⁾ B = inputs and output reverse-polarity protected.

¹¹⁾ C = interference suppression.

Ordering information

Other models available at www.mysick.com/en/W9-3_Glass

WL9G-3

- Mounting hole: M3
- Detection principle: autocollimation

Adjustment	Sensing range max. ¹⁾	Switching mode ²⁾	Output type	Connection	Connection diagram	Model name	Part no.
Single teach-in button	0 m ... 5 m	Light/dark-switching	PNP	Cable, 4-wire, 2 m, PVC	Cd-094	WL9G-3P1132	1049081
				Connector M8, 4-pin	Cd-084	WL9G-3P2232	1049082
				Connector M12, 4-pin	Cd-084	WL9G-3P2432	1049083
				Cable with connector M12, 4-pin, 120 mm, PVC	Cd-084	WL9G-3P3432	1049084
			NPN	Cable, 4-wire, 2 m, PVC	Cd-094	WL9G-3N1132	1049085
				Connector M12, 4-pin	Cd-084	WL9G-3N2432	1054152

¹⁾ PL80A.

²⁾ Q = light-switching.

WL9M4G-3

- Mounting hole: M4
- Detection principle: autocollimation

Adjustment	Sensing range max. ¹⁾	Switching mode ²⁾	Output type	Connection	Connection diagram	Model name	Part no.
Single teach-in button	0 m ... 5 m	Light/dark-switching	PNP	Cable, 4-wire, 2 m, PVC	Cd-094	WL9M4G-3P1132	1051898
				Connector M8, 4-pin	Cd-084	WL9M4G-3P2232	1051899
				Connector M12, 4-pin	Cd-084	WL9M4G-3P2432	1051900
				Cable with connector M12, 4-pin, 120 mm, PVC	Cd-084	WL9M4G-3P3432	1051910
			NPN	Cable, 4-wire, 2 m, PVC	Cd-094	WL9M4G-3N1132	1051897

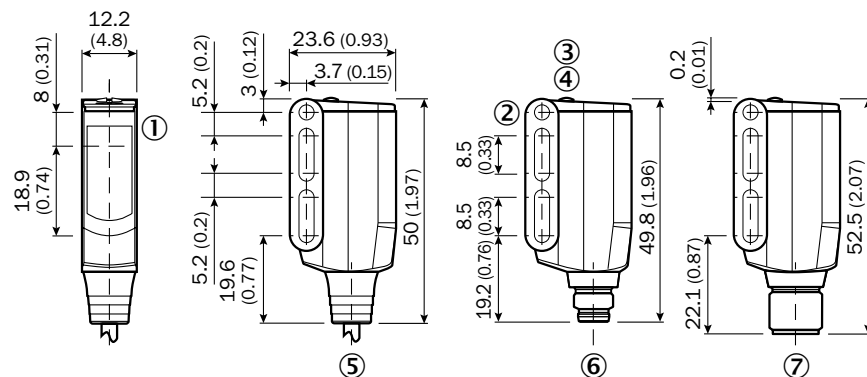
¹⁾ PL80A.

²⁾ Q = light-switching.

Dimensional drawings

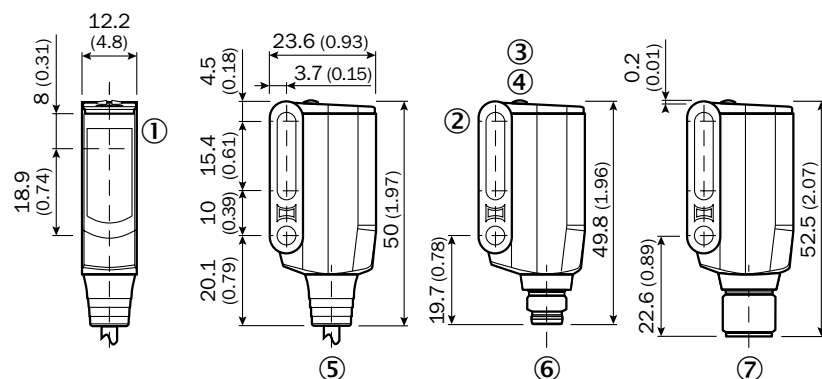
Dimensions in mm (inch)

WL9G-3



- ① Centre of optical axis, sender and receiver
- ② Mounting hole M3 (Ø 3.1 mm)
- ③ LED indicator yellow: Light received
- ④ LED signal strength indicator green: power on
- ⑤ Connecting cable or connector
- ⑥ Connector M8, 4-pin
- ⑦ Connector M12, 4-pin

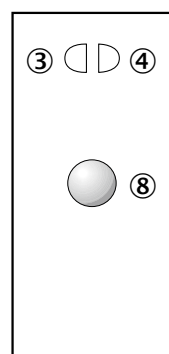
WL9M4G-3



- ① Centre of optical axis, sender and receiver
- ② Mounting hole M4 (Ø 4.1 mm)
- ③ LED indicator yellow: Light received
- ④ LED signal strength indicator green: power on
- ⑤ Connecting cable or connector
- ⑥ Connector M8, 4-pin
- ⑦ Connector M12, 4-pin

Adjustments

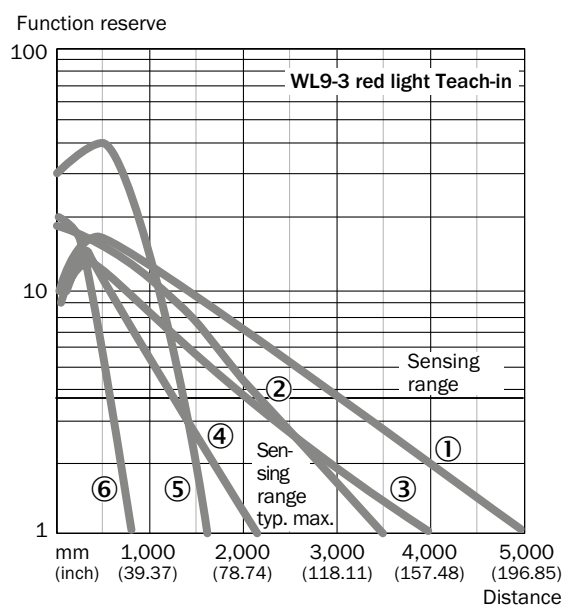
Single teach-in button



- ③ LED indicator yellow: Light received
- ④ LED signal strength indicator green: power on
- ⑧ Teach-in button

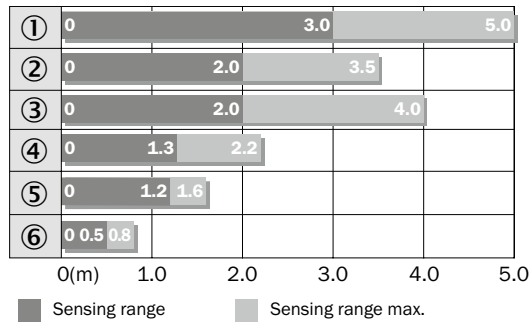
Characteristic curves

Operating reserve



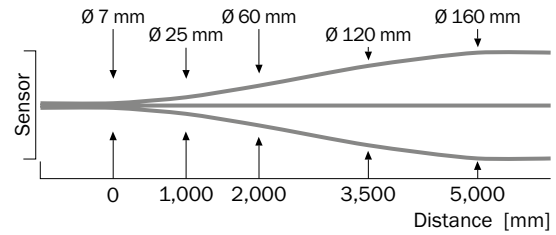
- ① PL80A
- ② P250F
- ③ PL40A
- ④ PL20F
- ⑤ PL10F
- ⑥ REF-IRF-56

Bar diagrams



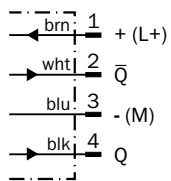
- ① PL80A
 ② P250F
 ③ PL40A
 ④ PL20F
 ⑤ PL10F
 ⑥ REF-IRF-56

Light spot diameter

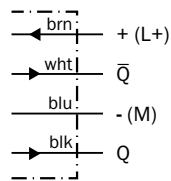


Connection diagram

Cd-084



Cd-094



Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Mounting bracket for wall mounting	BEF-W160	5305197
		Mounting bracket	BEF-WN-W9-2	2022855

Mounting plates

Figure	Material	Description	Model name	Part no.
	Stainless steel	Adapter plate	BEF-AP-W9	2022734
	PMMA, Brass (Br)	Fastening plate with threaded sleeve M3	BEF-GPM3-W9	4066039

Plug connectors and cables

Connecting cable (female connector-open)

- Cable material: PVC

Figure	Connection type head A	Connection type head B	Connecting cable	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	PVC	IP 67	DOL-0804-G02M	6009870
			5 m, 4-wire	PVC	IP 67	DOL-0804-G05M	6009872
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	PVC	IP 67	DOL-0804-W02M	6009871
			5 m, 4-wire	PVC	IP 67	DOL-0804-W05M	6009873
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	TPU	IP 67	DOL-1204-G02M	6009382
			5 m, 4-wire	TPU	IP 67	DOL-1204-G05M	6009866
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	TPU	IP 67	DOL-1204-W02M	6009383
			5 m, 4-wire	TPU	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, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0804-G	6009974
	Female connector, M8, 4-pin, angled	Pin penetration	PBT	IP 67	DOS-0804-W	6009975
	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

Masks

Figure	Description	Model name	Part no.
	Mask card, vertical/horizontal slots, slot width: 0.5 mm / 1.0 mm / 1.5 mm / 2.0 mm	BL-9-2	4033253

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 N08 for universal clamp bracket	BEF-KHS-N08	2051607

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, screw connection, suitable for laser sensors, 18 mm x 18 mm	PL10F	5311210
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
	PMMA/ABS	Fine triple, screw connection, suitable for laser sensors, 38 mm x 16 mm	PL20F	5308844
	Plastic	Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089
	PMMA/ABS	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

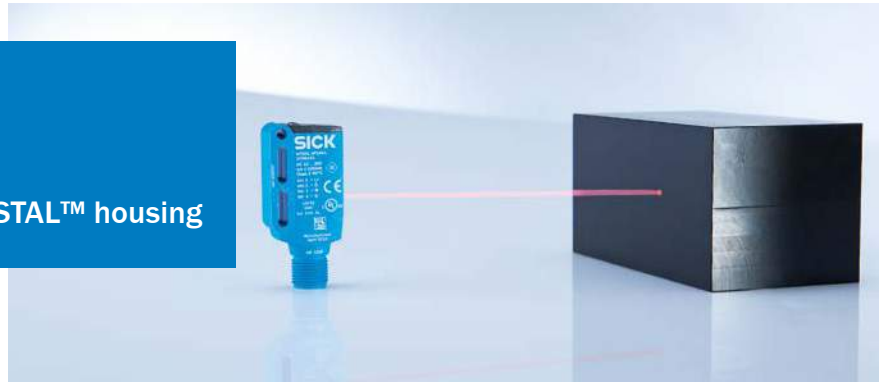
Figure	Description	Model name	Part no.
	Suitable for laser sensors, self-adhesive, cut, see alignment note, 56.3 mm x 56.3 mm	REF-AC1000-56	4063030

Special reflectors

Figure	Material	Description	Model name	Part no.
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adapter shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adapter thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

→ For additional accessories, please see page L-861

Laser precision in a rugged VISTAL™ housing



Additional information

Detailed technical data.....	G-471
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Light spot diameter.....	G-478
Connection diagram	G-481
Recommended accessories....	G-482

Product description

Precise detection of small objects and object features. Reliable for use in harsh industrial environments. The W9L-3 laser photoelectric sensor offers a wider range of solutions than ever before. It is a complete product family, including photoelectric proximity sensors, photoelectric retro-reflective sensors and through-beam photoelectric switches. All sensors are equipped with the latest laser technology, protected by a rugged

VISTAL™ housing – for even stronger mechanical resistance and reliability. The W9L-3 range works using SICK's optimized ASIC technology; optical and electromagnetic interference is effectively suppressed for safe switching behavior in any environment. With its various connection, mounting and sensing options, the W9L-3 sensor family can solve a variety of application needs in the automation environment.

At a glance

- Tough VISTAL™ housing
- Precise laser light spot
- Photoelectric proximity sensor in laser classes 1 and 2
- Photoelectric retro-reflective sensor with autocollimation optics and polarizing filter; models available for clear material detection
- Through-beam photoelectric sensors with sensing ranges of up to 60 m
- SIRIC technology
- Connections: M8 and M12 plugs, cable as well as cable with plug
- M3 and M4 hole pattern

Your benefits

- Precise detection of small objects and object features
- Detection of objects even through small openings
- Less machine downtime due to stable VISTAL™ housing as well as the suppression of optical interference
- The longest detection and sensing ranges in its class
- Best-in-class background suppression for photoelectric proximity sensors
- No blind spots, detection of shiny objects using photoelectric retro-reflective sensors
- A wide variety of connection and mounting options
- Highly visible light spot simplifies alignment

→ www.mysick.com/en/W9L-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

	WTB9L-3	WTB9M4L-3	WL9L-3	WL9M4L-3	WSE9L-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)	12.2 mm x 50 mm x 23.6 mm/12.2 mm x 49.8 mm x 23.6 mm 12.2 mm x 52.2 mm x 23.6 mm (depending on type)				
Housing design (light emission)	Rectangular				
Mounting hole	M3	M4	M3	M4	M3
Sensing range max.	25 mm ... 400 mm ¹⁾ (depending on type)		0 m ... 12 m ²⁾		0 m ... 60 m
Sensing range	25 mm ... 400 mm ¹⁾ (depending on type)		0 m ... 8 m ²⁾		0 m ... 50 m
Type of light	Visible red light				
Light source ³⁾	Laser				
Wave length	650 nm				
Laser class ⁴⁾	1/2 (depending on type)		1		
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 50,000 h at T_A = +25 °C.⁴⁾ (IEC 60825-1/CDRH 21 CFR 1040.10 & 1040.11)

Mechanics/electronics

	WTB9L-3	WTB9M4L-3	WL9L-3	WL9M4L-3	WSE9L-3
Supply voltage ¹⁾	10 V DC ... 30 V DC				
Ripple ²⁾	< 5 V _{pp}				
Power consumption ³⁾	≤ 30 mA				
Output type ⁴⁾	PNP/NPN (depending on type)				
Output function	Complementary				
Switching mode ⁴⁾	Light/dark-switching				
Output current I _{max.}	≤ 100 mA				
Connection type	Cable, 2 m ⁵⁾ /Male connector, M8/Male connector, M12/ Cable with connector, M12, 120 mm ⁵⁾ (depending on type)				
Circuit protection	A ⁶⁾ , B ⁷⁾ , C ⁸⁾				
Protection class	III				
Weight					
	Connector	13 g			
	Cable/cable with connector	80 g			
Polarisation filter	-		✓	-	
Housing material	VISTAL™				

	WTB9L-3	WTB9M4L-3	WL9L-3	WL9M4L-3	WSE9L-3
Optics material	PMMA				
Enclosure rating	IP 66/IP 67/IP 69K				
Ambient operating temperature	-10 °C ... +50 °C				
Ambient operating temperature extended ¹¹⁾ ¹²⁾	-30 °C ... +55 °C				
Ambient storage temperature	-30 °C ... +70 °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⁾ Q = light-switching.

⁵⁾ Do not bend below 0 °C.

⁶⁾ A = V_s connections reverse-polarity protected.

⁷⁾ B = inputs and output reverse-polarity protected.

⁸⁾ C = interference suppression.

⁹⁾ As of $T_a = 50$ °C, a max. supply voltage $V_{max.} = 24$ V and a max. load current $I_{max.} = 50$ mA is permitted.

¹⁰⁾ Using the sensor below $T_a = -10$ °C is possible, if the sensor is turned on at $T_a > -10$ °C, then the environment cools down and the sensor is not disconnected from the supply voltage during the whole time. It is not allowed to turn on the sensor below $T_a = -10$ °C.

Ordering information

Other models available at www.mysick.com/en/W9L-3

WTB9L-3

- **Mounting hole:** M3
- **Switching mode:** light/dark-switching (Q = light-switching.)
- **Adjustment:** potentiometer, 5 turns

Laser class	Sensing range max. ¹⁾	Light spot size (distance)	Switching frequency ²⁾ /Response time ³⁾	Output type	Connection	Connection diagram	Model name	Part no.
1	25 mm ... 300 mm	Ø 1 mm (170 mm)	1,000 Hz/ ≤ 0.5 ms	PNP	Cable, 4-wire, 2 m, PVC	Cd-095	WTB9L-3P1161	1058232
					Connector M8, 4-pin	Cd-083	WTB9L-3P2261	1058230
					Connector M12, 4-pin	Cd-083	WTB9L-3P2461	1058231
					Cable with connector M12, 4-pin, 120 mm, PVC	Cd-083	WTB9L-3P3461	1058916
				NPN	Connector M8, 4-pin	Cd-083	WTB9L-3N2261	1062523
					Connector M12, 4-pin	Cd-083	WTB9L-3N2461	1062524
					Cable with connector M12, 4-pin, 120 mm, PVC	Cd-083	WTB9L-3N3461	1062525
					Connector M8, 4-pin	Cd-083	WTB9L-3P2291	1058150
2	25 mm ... 400 mm	Ø 0.9 mm (230 mm)	500 Hz/ ≤ 1 ms	PNP	Connector M12, 4-pin	Cd-083	WTB9L-3P2491	1058151
					Cable with connector M12, 4-pin, 120 mm, PVC	Cd-083	WTB9L-3P3491	1058153
					Connector M8, 4-pin	Cd-083	WTB9L-3N2291	1058146
				NPN	Connector M12, 4-pin	Cd-083	WTB9L-3N2491	1058149
					Cable with connector M12, 4-pin, 120 mm, PVC	Cd-083	WTB9L-3N3491	1058152

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

⁷⁾ With light/dark ratio 1:1.

⁶⁾ Signal transit time with resistive load.

WTB9M4L-3

- **Mounting hole:** M4
- **Switching mode:** light/dark-switching (Q = light-switching.)
- **Adjustment:** potentiometer, 5 turns

Laser class	Sensing range max. ¹⁾	Light spot size (distance)	Switching frequency ²⁾ /Response time ³⁾	Output type	Connection	Connection diagram	Model name	Part no.
1	25 mm ... 300 mm	Ø 1 mm (170 mm)	1.000 Hz/ ≤ 0,5 ms	PNP	Cable, 4-wire, 2 m, PVC	Cd-095	WTB9M4L-3P1161	1058188
					Connector M8, 4-pin	Cd-083	WTB9M4L-3P2261	1058186
					Connector M12, 4-pin	Cd-083	WTB9M4L-3P2461	1058187
2	25 mm ... 400 mm	Ø 0.9 mm (230 mm)	500 Hz/ ≤ 1 ms	PNP	Cable, 4-wire, 2 m, PVC	Cd-095	WTB9M4L-3P1191	1058226
					Connector M8, 4-pin	Cd-083	WTB9M4L-3P2291	1058224
					Connector M12, 4-pin	Cd-083	WTB9M4L-3P2491	1058225

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

⁷⁾ With light/dark ratio 1:1.

⁶⁾ Signal transit time with resistive load.

WL9L-3

- **Mounting hole:** M3
- **Switching mode:** light/dark-switching (Q = light-switching.)
- **Adjustment:** single teach-in button

Laser class	Sensing range max. ¹⁾	Light spot size (distance)	Switching frequency ²⁾ /Response time ³⁾	Output type	Connection	Connection diagram	Model name	Part no.
1	0 m ... 12 m	Ø 1 mm (500 mm)	1,000 Hz/ ≤ 0.5 ms	PNP	Cable, 4-wire, 2 m, PVC	Cd-095	WL9L-3P1132	1058233
					Connector M8, 4-pin	Cd-083	WL9L-3P2232	1058174
					Connector M12, 4-pin	Cd-083	WL9L-3P2432	1058175
					Cable with connector M12, 4-pin, 120 mm, PVC	Cd-083	WL9L-3P3432	1058176
				NPN	Connector M8, 4-pin	Cd-083	WL9L-3N2232	1058172
					Connector M12, 4-pin	Cd-083	WL9L-3N2432	1058173

¹⁾ PL80A.

⁷⁾ With light/dark ratio 1:1.

⁶⁾ Signal transit time with resistive load.

WL9M4L-3

- **Mounting hole:** M4
- **Switching mode:** light/dark-switching (Q = light-switching.)
- **Adjustment:** single teach-in button

Laser class	Sensing range max. ¹⁾	Light spot size (distance)	Switching frequency ²⁾ /Response time ³⁾	Output type	Connection	Connection diagram	Model name	Part no.
1	0 m ... 12 m	Ø 1 mm (500 mm)	1,000 Hz/ ≤ 0.5 ms	PNP	Cable, 4-wire, 2 m, PVC	Cd-095	WL9M4L-3P1132	1058229
					Connector M8, 4-pin	Cd-083	WL9M4L-3P2232	1058227
					Connector M12, 4-pin	Cd-083	WL9M4L-3P2432	1058228

¹⁾ PL80A.

⁷⁾ With light/dark ratio 1:1.

⁶⁾ Signal transit time with resistive load.

WSE9L-3

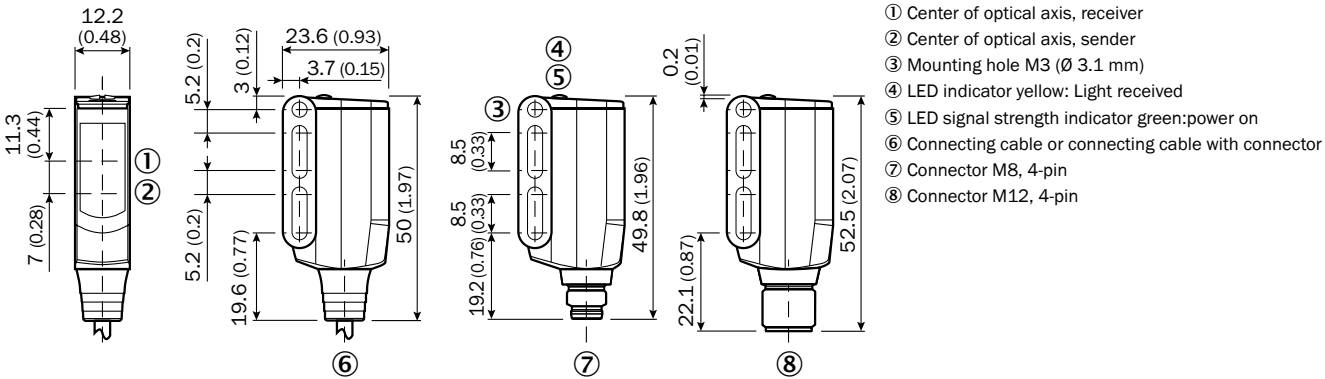
- **Mounting hole:** M3
- **Switching mode:** light/dark-switching (Q = light-switching.)
- **Adjustment:** single teach-in button

Laser class	Sensing range max. ¹⁾	Light spot size (distance)	Switching frequency ²⁾ /Response time ³⁾	Output type	Connection	Connection diagram	Model name	Part no.
1	0 m ... 60 m	Ø 1 mm (500 mm)	1,000 Hz/ ≤ 0.5 ms	PNP	Cable, 4-wire, 2 m, PVC	Cd-231	WSE9L-3P1137	1058915
					Connector M8, 4-pin	Cd-232	WSE9L-3P2237	1058182
					Connector M12, 4-pin	Cd-232	WSE9L-3P2437	1058181
				NPN	Connector M8, 4-pin	Cd-232	WSE9L-3N2237	1058179
					Connector M12, 4-pin	Cd-232	WSE9L-3N2437	1058180

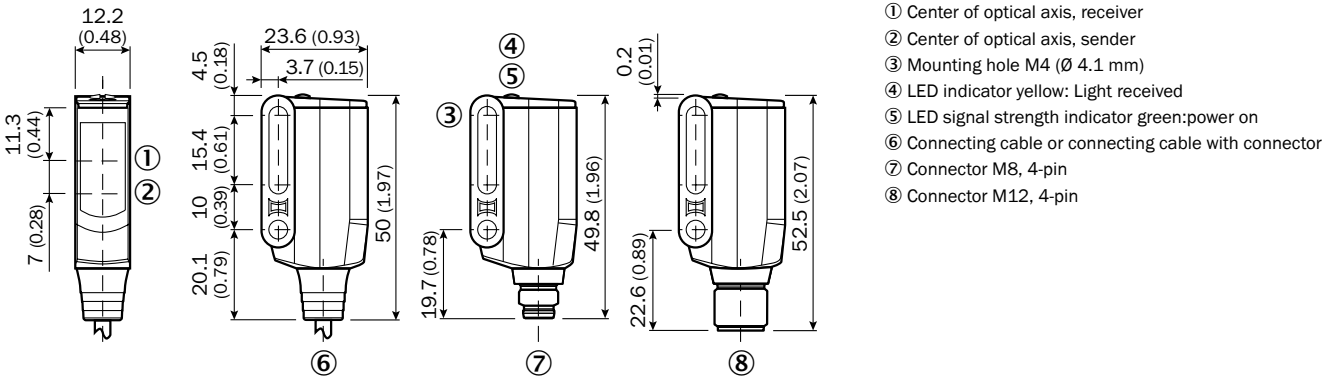
Dimensional drawings

Dimensions in mm (inch)

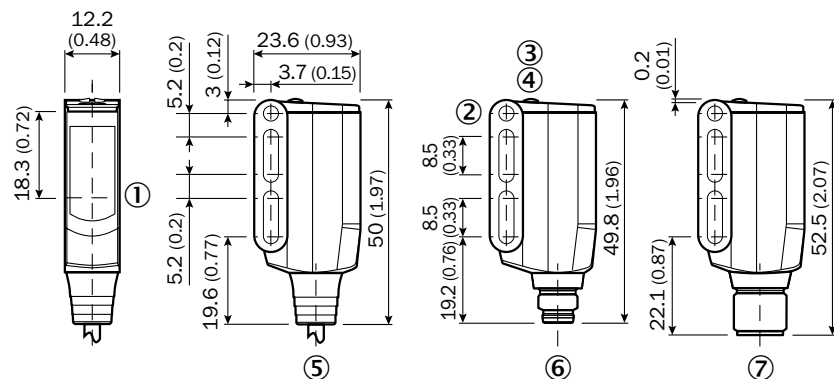
WTB9L-3



WTB9M4L-3

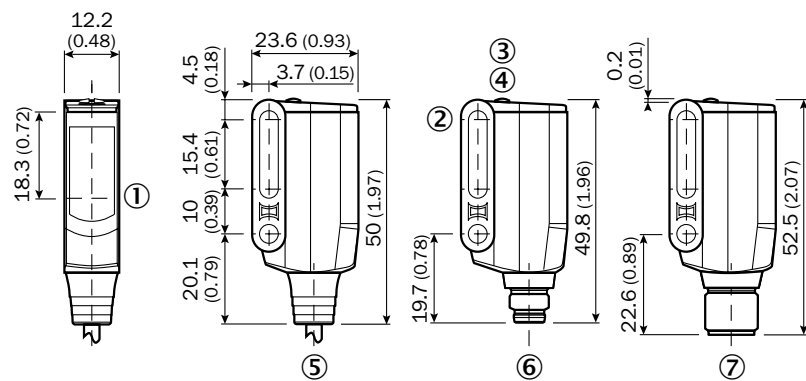


WL9L-3



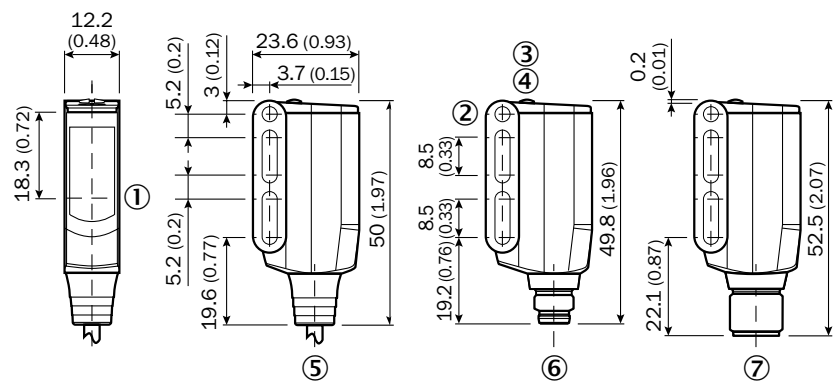
- ① Centre of optical axis, sender and receiver
- ② Mounting hole M3 (Ø 3.1 mm)
- ③ LED indicator yellow: Light received
- ④ LED signal strength indicator green: power on
- ⑤ Connecting cable or connecting cable with connector
- ⑥ Connector M8, 4-pin
- ⑦ Connector M12, 4-pin

WL9M4L-3



- ① Centre of optical axis, sender and receiver
- ② Mounting hole M4 (Ø 4.1 mm)
- ③ LED indicator yellow: Light received
- ④ LED signal strength indicator green: power on
- ⑤ Connecting cable or connecting cable with connector
- ⑥ Connector M8, 4-pin
- ⑦ Connector M12, 4-pin

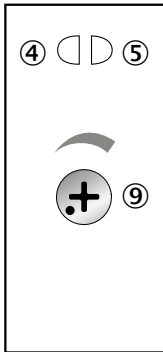
WSE9L-3



- ① Centre of optical axis, sender and receiver
- ② Mounting hole M3 (Ø 3.1 mm)
- ③ LED indicator yellow: Light received
- ④ LED signal strength indicator green: power on
- ⑤ Connecting cable or connecting cable with connector
- ⑥ Connector M8, 4-pin
- ⑦ Connector M12, 4-pin

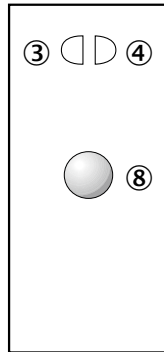
Adjustments

Potentiometer



- ④ LED indicator yellow: Light received
- ⑤ LED signal strength indicator green: power on
- ⑨ Sensing range adjustment

Single teach-in button



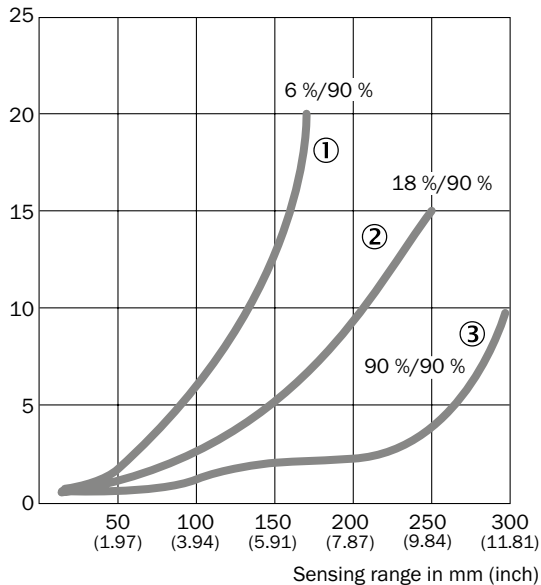
- ③ LED indicator yellow: Light received
- ④ LED signal strength indicator green: power on
- ⑧ Teach-in button

Characteristic curves

Black-white shift

WTB9L-3, laser class 1

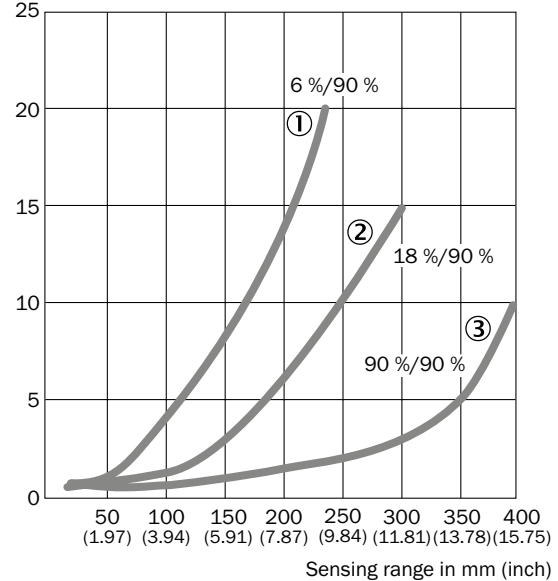
% of sensing range



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

WTB9L-3, laser class 2

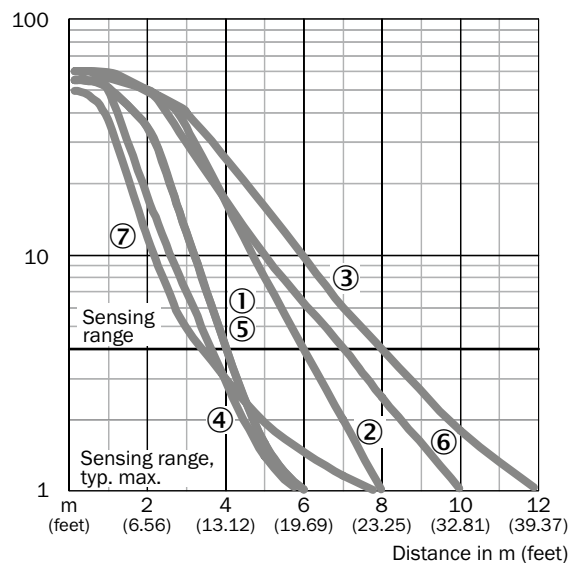
% of sensing range



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

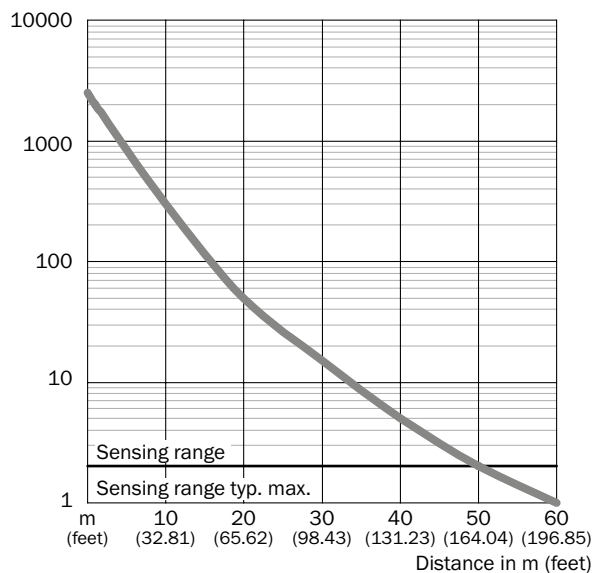
Operating reserve

WL9L-3



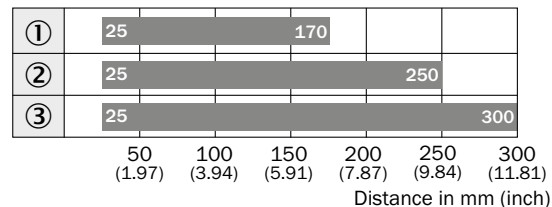
- ① PL20A
- ② PL40A
- ③ PL80A
- ④ PL10F
- ⑤ PL20F
- ⑥ P250F
- ⑦ REF-AC1000

WSE9L-3



Bar diagrams

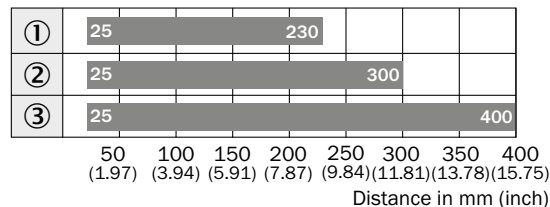
WTB9L-3, laser class 1



■ 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

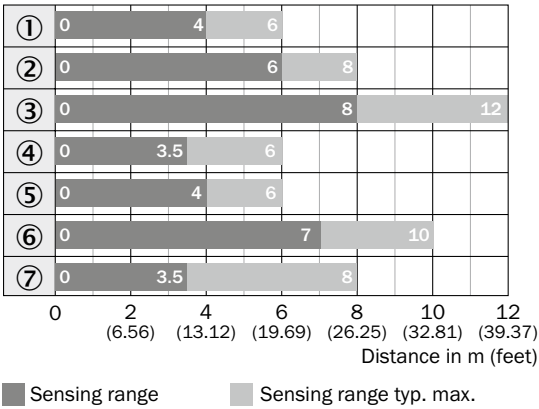
WTB9L-3, laser class 2



■ Sensing range typ. max.

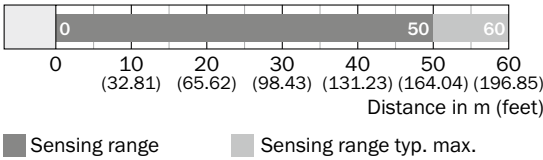
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WL9L-3



- ① PL20A
- ② PL40A
- ③ PL80A
- ④ PL10F
- ⑤ PL20F
- ⑥ P250F
- ⑦ REF-AC1000

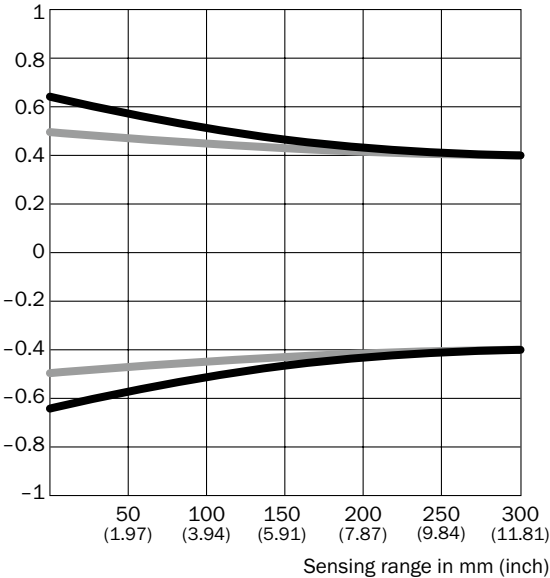
WSE9L-3



Light spot diameter

WTB9L-3, laser class 1

Radius in mm (inch)



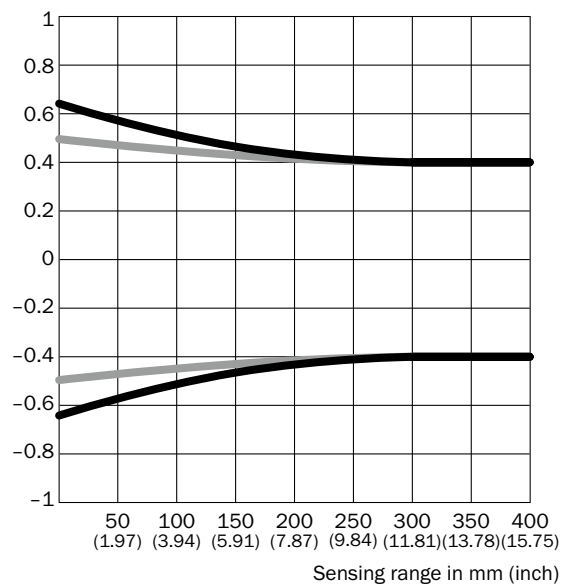
Dimensions in mm (inch)

Sensing range	Vertical	Horizontal
50 mm (1.97)	1.2 (0.05)	1.0 (0.04)
100 mm (3.94)	1.1 (0.04)	1.0 (0.04)
200 mm (7.87)	0.9 (0.04)	0.9 (0.04)
300 mm (11.81)	0.8 (0.03)	0.8 (0.03)

— Vertical
— Horizontal

WTB9L-3, laser class 2

Radius in mm (inch)



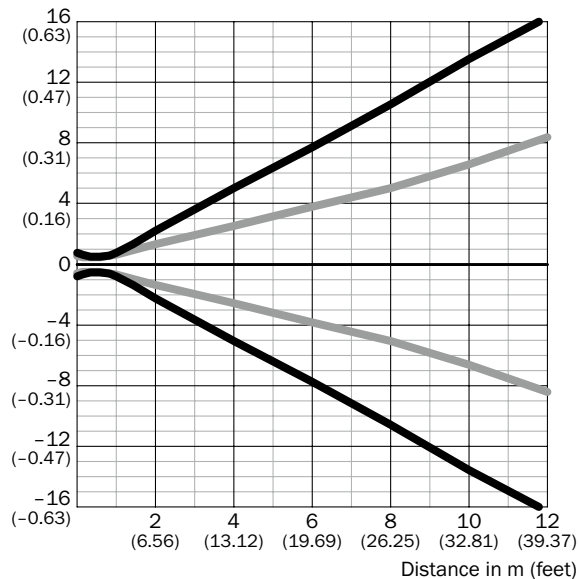
Dimensions in mm (inch)

Sensing range	Vertical	Horizontal
50 mm (1.97)	1.2 (0.05)	1.0 (0.04)
100 mm (3.94)	1.1 (0.04)	1.0 (0.04)
200 mm (7.87)	0.9 (0.04)	0.9 (0.04)
400 mm (15.75)	0.8 (0.03)	0.8 (0.03)

— Vertical
— Horizontal

WL9-3, Overview

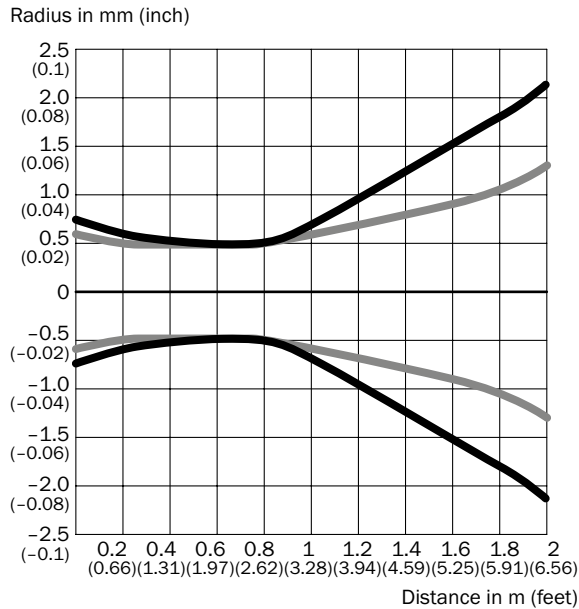
Radius in mm (inch)



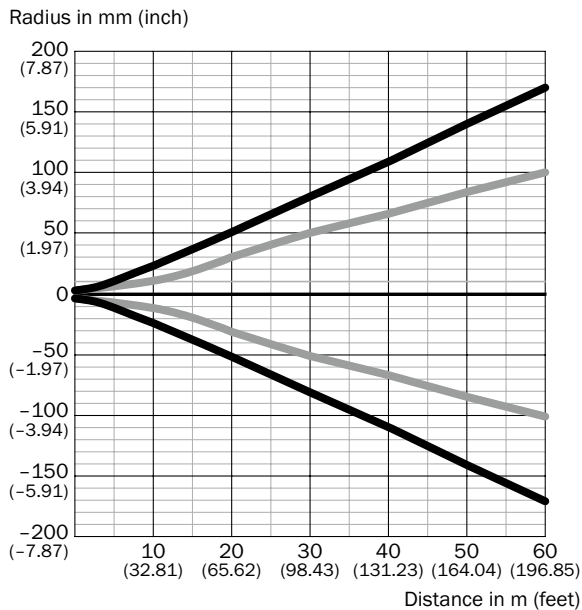
Dimensions in mm (inch)

Sensing range	Vertical	Horizontal
0.5 m (1.64 feet)	< 1.0 (0.04)	< 1.0 (0.04)
1 m (3.28 feet)	1.5 (0.06)	1.2 (0.05)
6 m (19.69 feet)	15.2 (0.60)	7.6 (0.30)
12 m (39.37 feet)	32.4 (1.28)	16.4 (0.65)

— Vertical
— Horizontal

WL9L-3 close up near range

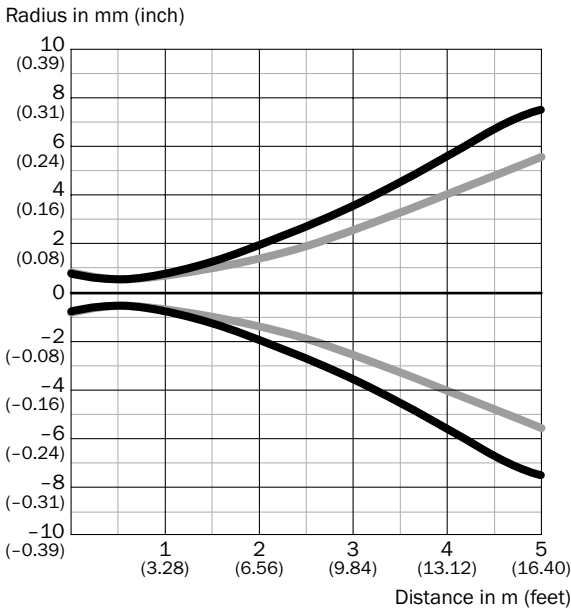
— Vertical
— Horizontal

WSE9L-3 overview**Dimensions in mm (inch)**

Sensing range	Vertical	Horizontal
0.5 m (1.64 feet)	< 1.0 (0.04)	< 1.0 (0.04)
1 m (3.28 feet)	1.5 (0.06)	1.2 (0.05)
5 m (16.40 feet)	15 (0.59)	11 (0.43)
10 m (32.81 feet)	45 (1.77)	28 (1.10)
60 m (196.85 feet)	336 (13.23)	200 (7.87)

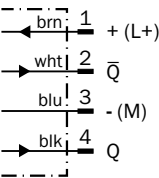
— Vertical
— Horizontal

WSE9L-3 close up near range

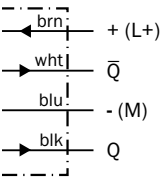


Connection diagram

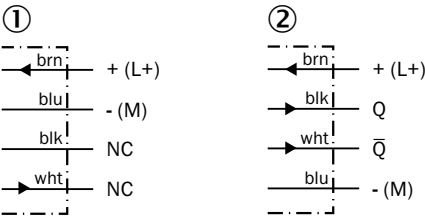
Cd-083



Cd-095

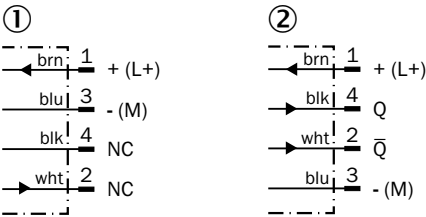


Cd-231



① Sender
② Receiver

Cd-232



① Sender
② Receiver

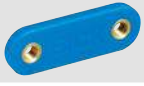
Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Mounting bracket for wall mounting	BEF-W160	5305197
		Mounting bracket	BEF-WN-W9-2	2022855

Mounting plates

Figure	Material	Description	Model name	Part no.
	PMMA, Brass (Br)	Fastening plate with threaded sleeve M3	BEF-GPM3-W9	4066039

Plug connectors and cables

Connecting cable (female connector-open)

- Cable material: PVC

Figure	Connection type head A	Connection type head B	Connecting cable	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	PVC	IP 67	DOL-0804-G02M	6009870
			5 m, 4-wire	PVC	IP 67	DOL-0804-G05M	6009872
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	PVC	IP 67	DOL-0804-W02M	6009871
			5 m, 4-wire	PVC	IP 67	DOL-0804-W05M	6009873
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	TPU	IP 67	DOL-1204-G02M	6009382
			5 m, 4-wire	TPU	IP 67	DOL-1204-G05M	6009866
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	TPU	IP 67	DOL-1204-W02M	6009383
			5 m, 4-wire	TPU	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, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0804-G	6009974
	Female connector, M8, 4-pin, angled	Screw-type terminals	PBT	IP 67	DOS-0804-W	6009975
	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

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 N02 for universal clamp bracket	BEF-KHS-N02	2051608
		Plate N08 for universal clamp bracket	BEF-KHS-N08	2051607

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

Laser precision in a rugged VISTAL™ housing for clear material detection



Additional information

Detailed technical data.....	G-485
Ordering information.....	G-486
Dimensional drawings	G-486
Adjustments	G-487
Characteristic curves	G-487
Light spot diameter.....	G-487
Connection diagram	G-488
Recommended accessories....	G-488

Product description

Precise detection of small objects and object features. Reliable even in harsh industrial environments. Equipped with the latest laser technology as well as offering continuous switching threshold adjustment (CTA), the WL9LG-3 photoelectric retro-reflective sensor is the ideal solution for detecting transparent materials. The innovative technology is protected by a rugged VISTAL™ housing – for even stronger mechanical resistance

and reliability. The WL9LG-3 range works using SICK's optimized ASIC technology, optical and electromagnetic interference is effectively suppressed for safe switching behavior in any environment. With various connection, mounting and sensing options, the WL9LG-3 sensor family is the ideal solution for a variety of application needs in the automation environment.

At a glance

- Tough VISTAL™ housing
- Precise laser light spot, laser class 1
- Continuous switching threshold adjustment (CTA)
- Autocollimation optics and polarizing filter
- Teach-in
- SIRIC technology
- Connections: M8 and M12 plugs, cable as well as cable with plug
- M3 and M4 hole pattern

Your benefits

- Precise detection of small objects and object features
- Detection of objects even through small openings
- Best-in-class for detecting transparent objects
- Less machine downtime thanks to the stable VISTAL™ housing
- No blind spots, also detects shiny objects
- Wide range of connection options
- Multiple mounting options
- Highly visible light spot simplifies alignment

→ www.mysick.com/en/W9LG-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

Sensor principle	Photoelectric retro-reflective sensor
Detection principle	Autocollimation
Dimensions (W x H x D)	12.2 mm x 50 mm x 23.6 mm/12.2 mm x 49.8 mm x 23.6 mm/ 12.2 mm x 52.2 mm x 23.6 mm (depending on type)
Housing design (light emission)	Rectangular
Mounting hole	M3
Sensing range max. ¹⁾	0 m ... 4.5 m
Sensing range ¹⁾	0 m ... 2 m
Type of light	Visible red light
Light source ²⁾	Laser
Light spot size (distance)	Ø 1 mm (500 mm)
Wave length	650 nm
Laser class ³⁾	1
Adjustment	Single teach-in button
Continuous threshold adaption	✓
Special feature	Detection of transparent objects

¹⁾ REF-AC1000.²⁾ Average service life 50,000 h at T_A = +25 °C.³⁾ IEC 60825-1/CDRH 21 CFR 1040.10 & 1040.11.

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple	< 5 V _{pp}
Power consumption ²⁾	≤ 30 mA
Output type ³⁾	PNP
Output function	Complementary
Switching mode ³⁾	Light/dark-switching
Output current I _{max.}	≤ 100 mA
Response time ⁴⁾	≤ 0.5 ms
Switching frequency ⁵⁾	1,000 Hz
Connection type	Cable, 2 m ⁶⁾ /Male connector, M8/Male connector, M12 (depending on type)
Circuit protection	A ⁷⁾ , B ⁸⁾ , C ⁹⁾
Protection class	III
Weight	
Connector	13 g
Cable/cable with connector	80 g
Polarisation filter	✓
Housing material	VISTAL
Optics material	PMMA

Enclosure rating	IP 66/IP 67/IP 69K
Ambient operating temperature	-10 °C ... +50 °C
Ambient operating temperature extended ^{10) 11)}	-30 °C ... +55 °C
Ambient storage temperature	-30 °C ... +70 °C

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

²⁾ Without load.

³⁾ Q = light-switching.

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⁾ B = inputs and output reverse-polarity protected.

⁹⁾ C = interference suppression.

¹⁰⁾ As of T_a = 50 °C, a max. supply voltage V_{max.} = 24 V and a max. load current I_{max.} = 50 mA is permitted.

¹¹⁾ Using the sensor below T_a = -10 °C is possible, if the sensor is turned on at T_a > -10 °C, then the environment cools down and the sensor is not disconnected from the supply voltage during the whole time. It is not allowed to turn on the sensor below T_a = -10 °C.

Ordering information

Other models available at www.mysick.com/en/W9LG-3

WL9LG-3

- Laser class: 1
- Light spot size (distance): Ø 1 mm (500 mm)
- Mounting hole: M3
- Output type: PNP
- Switching mode: light/dark-switching (Q = light-switching.)
- Adjustment: single teach-in button

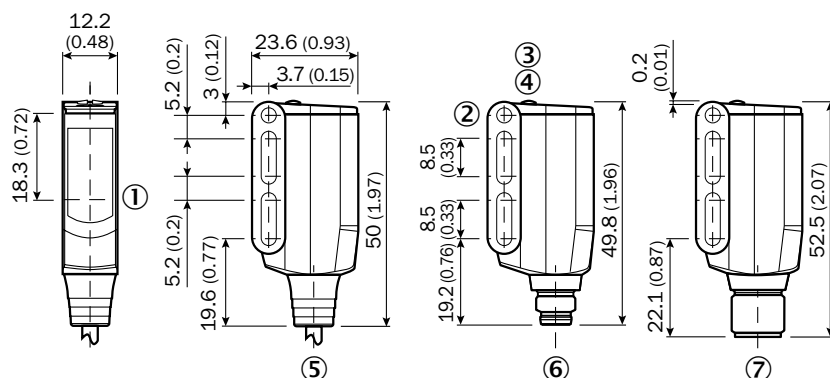
Sensing range max. ¹⁾	Connection	Connection diagram	Model name	Part no.
0 m ... 4.5 m	Cable, 4-wire, 2 m, PVC	Cd-095	WL9LG-3P1132	1058236
	Connector M8, 4-pin	Cd-083	WL9LG-3P2232	1058234
	Connector M12, 4-pin	Cd-083	WL9LG-3P2432	1058235

¹⁾ REF-AC1000.

Dimensional drawings

Dimensions in mm (inch)

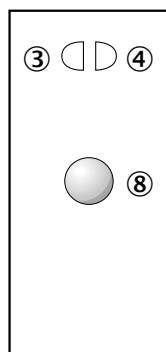
WL9LG-3



- ① Centre of optical axis, sender and receiver
- ② Mounting hole M3 (Ø 3.1 mm)
- ③ LED indicator yellow: Light received
- ④ LED signal strength indicator green: power on
- ⑤ Connecting cable or connecting cable with connector
- ⑥ Connector M8, 4-pin
- ⑦ Connector M12, 4-pin

Adjustments

Single teach-in button

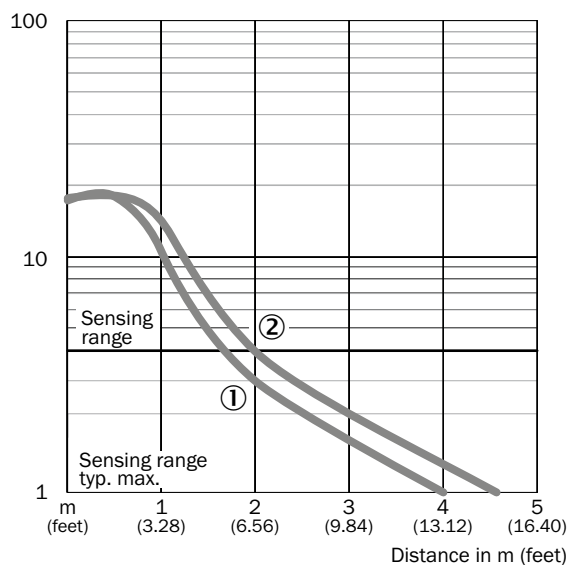


- ③ LED indicator yellow: Light received
- ④ LED signal strength indicator green: power on
- ⑧ Teach-in button

Characteristic curves

Operating reserve

WL9LG-3

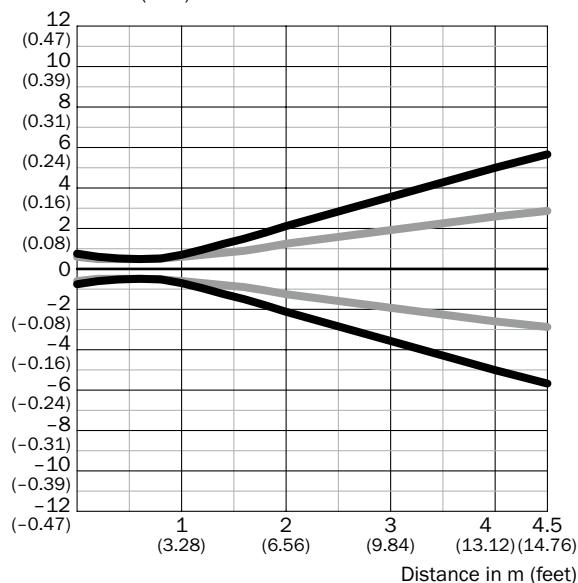


- ① PLV14-A / PLH25-M12 / PLH25-D12
- ② P41F / REF-AC1000

Light spot diameter

Overview

Radius in mm (inch)

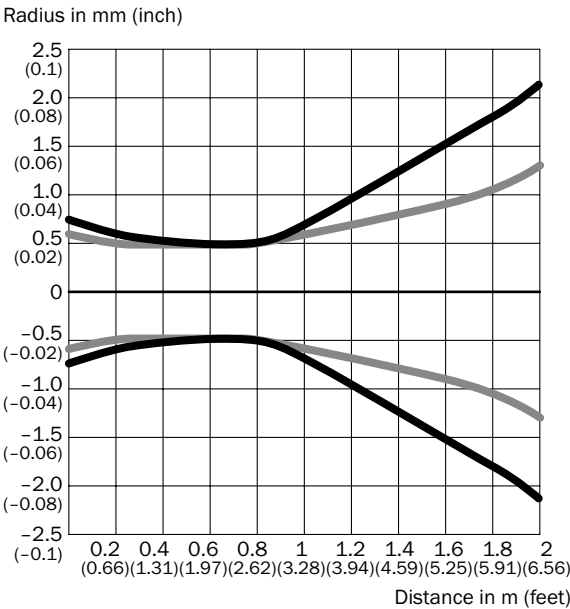


Dimensions in mm (inch)

Sensing range	Vertical	Horizontal
0.5 m (1.64 feet)	< 1.0 (0.04)	< 1.0 (0.04)
1 m (3.28 feet)	1.5 (0.06)	1.2 (0.05)
2 m (6.56 feet)	4.3 (0.17)	2.6 (0.10)
4.5 m (14.76 feet)	11.3 (0.44)	5.6 (0.22)

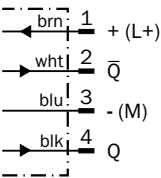
— Vertical
— Horizontal

WL9LG-3, close up near range

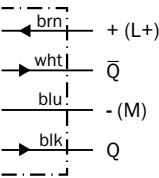


Connection diagram

Cd-083



Cd-095



Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Mounting bracket	BEF-WN-W9-2	2022855

Mounting plates

Figure	Material	Description	Model name	Part no.
	PMMA, Brass (Br)	Fastening plate with threaded sleeve M3	BEF-GPM3-W9	4066039

Plug connectors and cables

Connecting cable (female connector-open)

- Cable material: PVC

Figure	Connection type head A	Connection type head B	Connecting cable	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	PVC	IP 67	DOL-0804-G02M	6009870
			5 m, 4-wire	PVC	IP 67	DOL-0804-G05M	6009872
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	PVC	IP 67	DOL-0804-W02M	6009871
			5 m, 4-wire	PVC	IP 67	DOL-0804-W05M	6009873
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	TPU	IP 67	DOL-1204-G02M	6009382
			5 m, 4-wire	TPU	IP 67	DOL-1204-G05M	6009866
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	TPU	IP 67	DOL-1204-W02M	6009383
			5 m, 4-wire	TPU	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, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0804-G	6009974
	Female connector, M8, 4-pin, angled	Pin penetration	PBT	IP 67	DOS-0804-W	6009975
	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

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 N02 for universal clamp bracket	BEF-KHS-N02	2051608
		Plate N08 for universal clamp bracket	BEF-KHS-N08	2051607

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, screw connection, suitable for laser sensors, 18 mm x 18 mm	PL10F	5311210
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
	PMMA/ABS	Fine triple, screw connection, suitable for laser sensors, 38 mm x 16 mm	PL20F	5308844
	Plastic	Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089
	PMMA/ABS	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

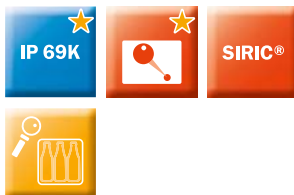
Special reflectors

Figure	Material	Description	Model name	Part no.
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adaptor shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adaptor thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

→ For additional accessories, please see page L-861



High-performance photoelectric sensors with application flexibility in industrial environments



Additional information

Detailed technical data.....	G-493
Ordering information.....	G-494
Dimensional drawings.....	G-496
Adjustments.....	G-497
Characteristic curves.....	G-498
Bar diagrams.....	G-499
Connection diagram.....	G-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 _s / < 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:** –

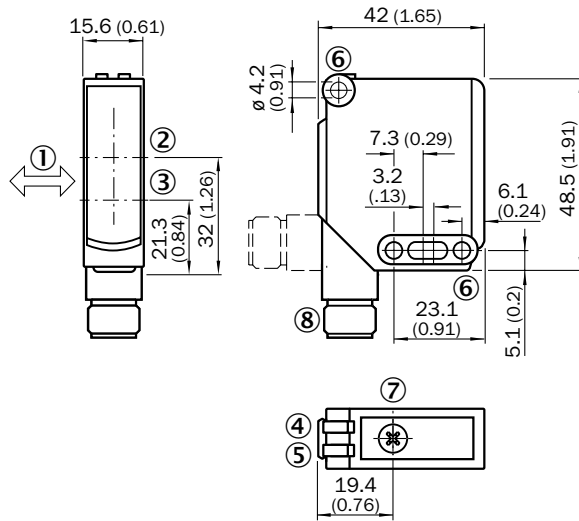
Sensing range max. ¹⁾	Light source	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
0 m ... 20 m	LED	Ø 220 mm (15 m)	PNP	Cable, 4-wire, 2 m, PVC	Cd-088	WSE11-2P1130	1057572
				Connector M12, 4-pin	Cd-084	WSE11-2P2430	1057571
			NPN	Cable, 4-wire, 2 m, PVC	Cd-088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

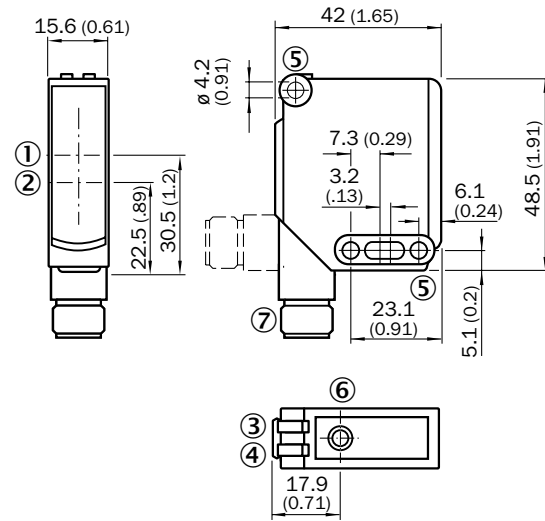
Dimensions in mm (inch)

WTB11-2, WTF11-2



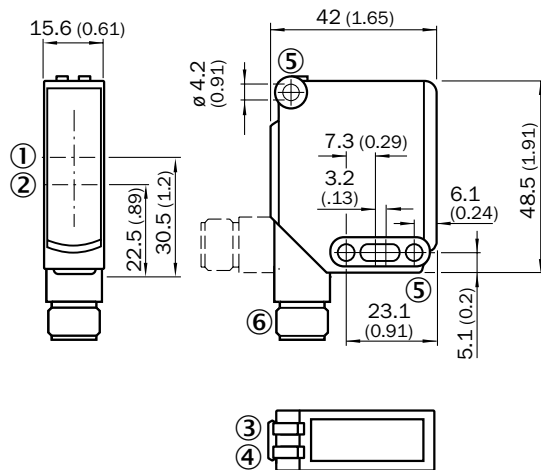
- ① Standard direction of the material being detected
- ② Optical axis, receiver
- ③ Optical axis, sender
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Mounting hole $\varnothing$ 4.2 mm
- ⑦ Sensing range adjustment: potentiometer
- ⑧ Connection

WTE11-2



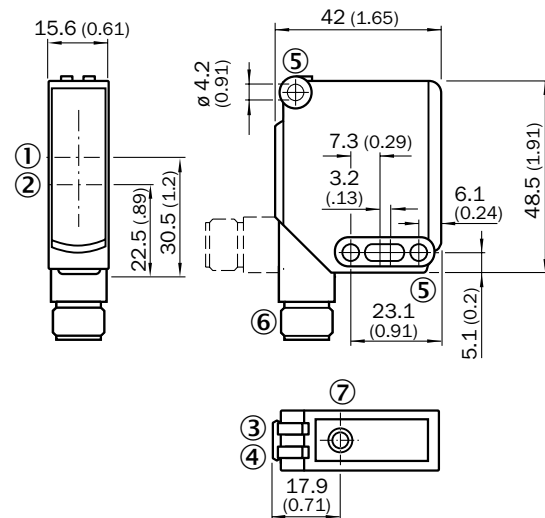
- ① Optical axis, sender
- ② Optical axis, receiver
- ③ Status indicator LED green: power on
- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Mounting hole $\varnothing$ 4.2 mm
- ⑥ Sensitivity setting: single teach-in button
- ⑦ Connector M12 or cable

WL11-2



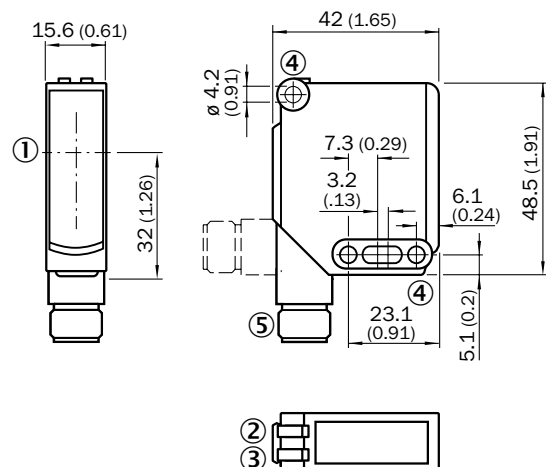
- ① Optical axis, sender
- ② Optical axis, receiver
- ③ Status indicator LED green: power on
- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Mounting hole $\varnothing$ 4.2 mm
- ⑥ M12 connector, 4-pin or cable

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

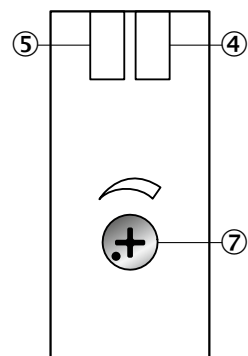
WSE11-2



- 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

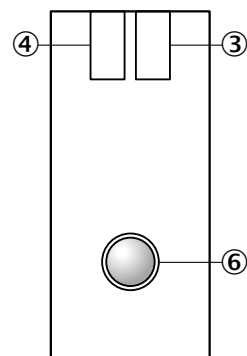
Adjustments

WTB11-2, WTF11-2



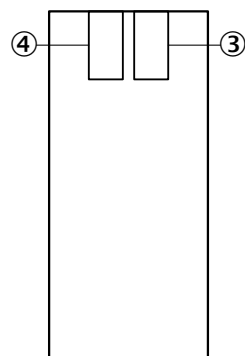
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑦ Sensing range adjustment: potentiometer

WTE11-2, WSE11-2



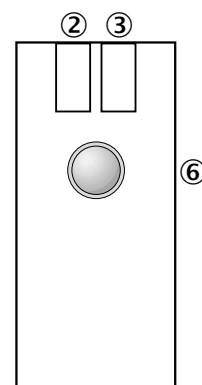
- ③ Status indicator LED green: power on
- ④ Status indicator LED, yellow: Status of received light beam
- ⑥ Adjustment sensing range: single teach-in button

WL11-2



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

WL11-2, teach-in button

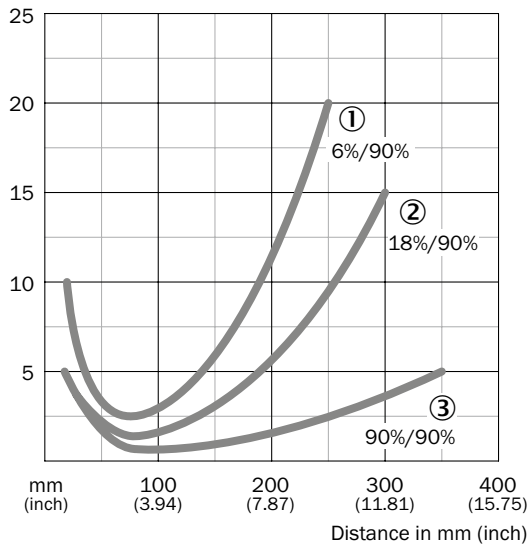


- ② LED indicator yellow: Light received
- ③ LED indicator, green: power on, teach-in mode I, LED indicator, blue: teach-in mode II
- ⑥ Single teach-in button, Function 1: teach-in sensitivity on reflector, Function 2: change operation/teach-in mode

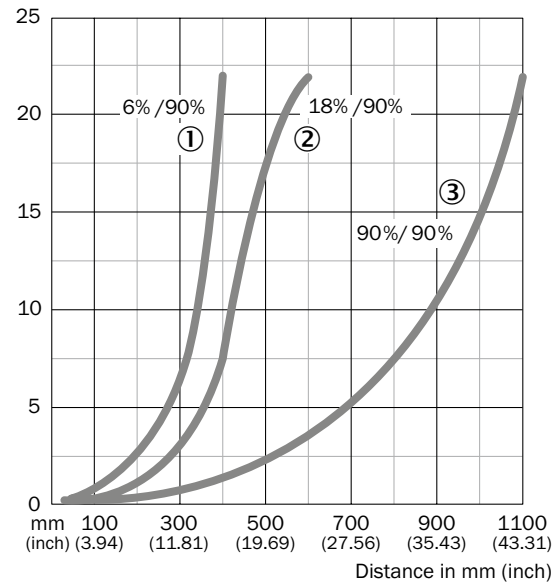
Characteristic curves

Black-white shift

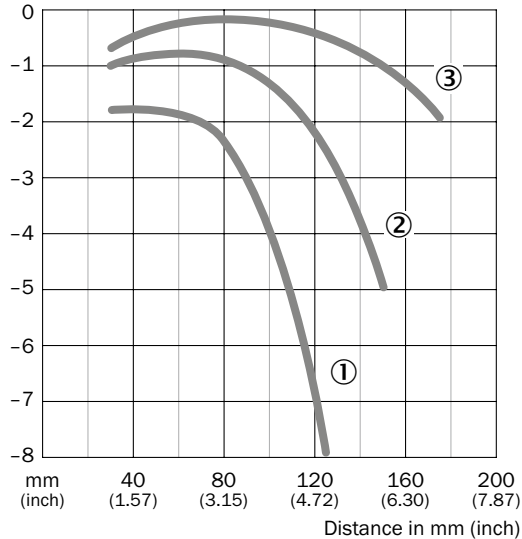
WTB11-2, 350 mm



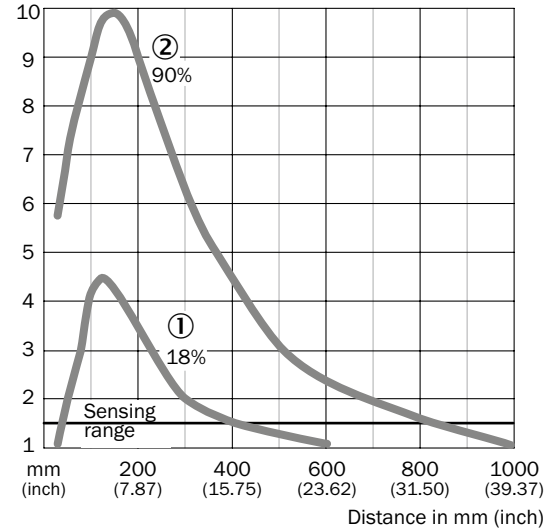
WTB11-2, 1,100 mm



WTF11-2



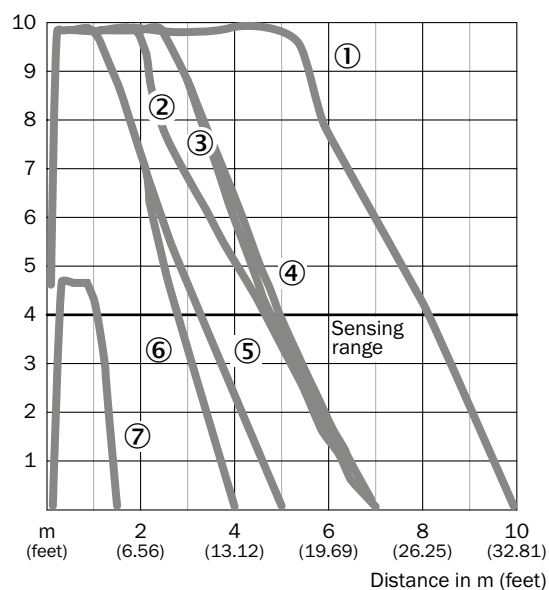
WTE11-2



G

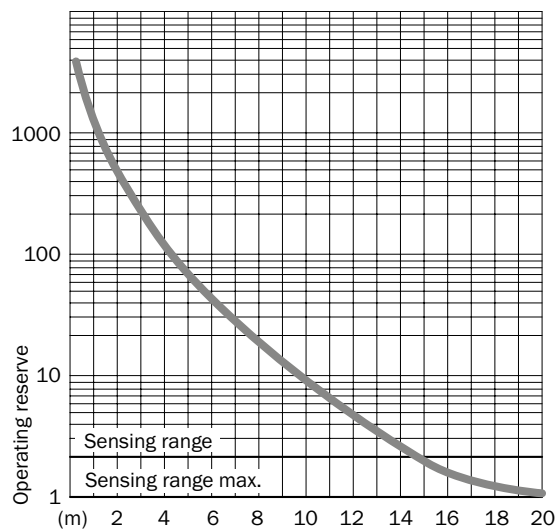
Operating reserve

WL11-2



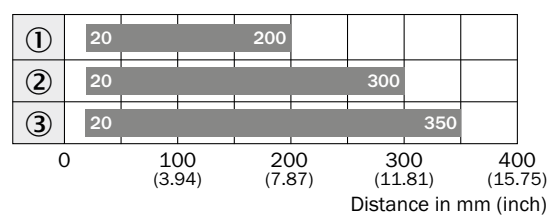
- ① PL80A
- ② C110A
- ③ PL50A
- ④ PL40A
- ⑤ PL30A
- ⑥ PL20A
- ⑦ Reflective tape Diamond Grade

WSE11-2



Bar diagrams

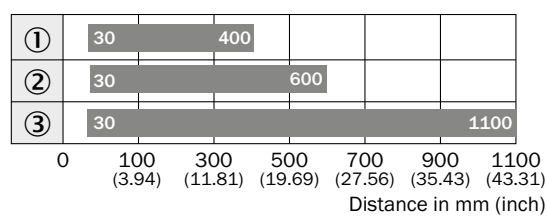
WTB11-2, 350 mm



■ Sensing range

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

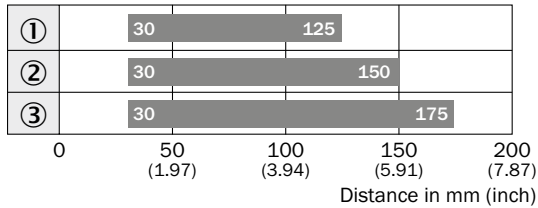
WTB11-2, 1,100 mm



■ Sensing range

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

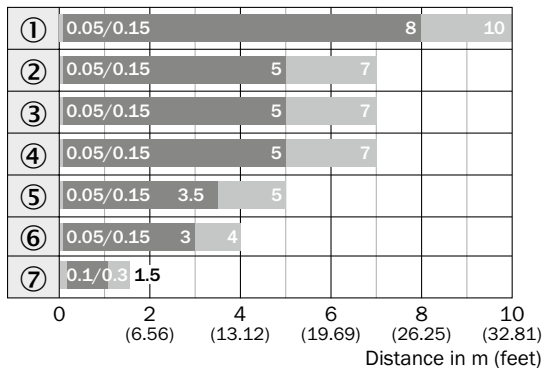
WTF11-2



■ Sensing range

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

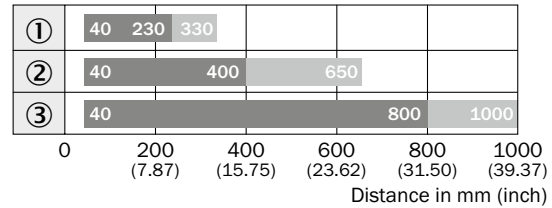
WL11-2



■ Sensing range ■ Sensing range typ. max.

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

WTE11-2



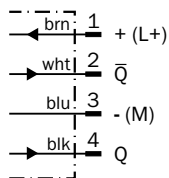
■ Sensing range

■ Sensing range typ. max.

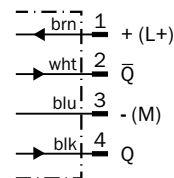
- ① Sensing range on black, 6 % remission
 ② Sensing range on gray, 18 % remission
 ③ Sensing range on white, 90 % remission

Connection diagram

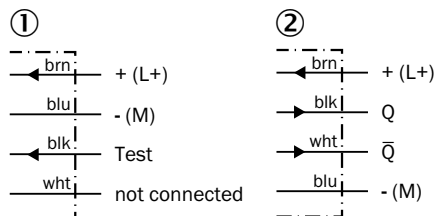
Cd-083



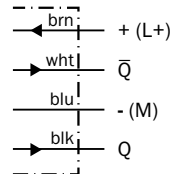
Cd-084



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

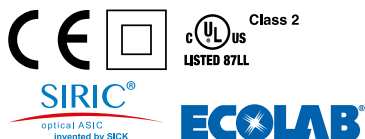
Terminal and alignment brackets

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

Reliable detection of clear material objects
– from PET bottles to transparent film



Additional information

Detailed technical data. G-505
Ordering information. G-506
Dimensional drawings G-506
Adjustments G-506
Characteristic curves G-507
Bar diagrams. G-507
Connection diagram G-507
Recommended accessories. . . .G-507



Product description

WL11G-2 represents glass photoelectric sensor technology designed optimally for individual applications, thus enabling a wide range of applications in very different areas of automation technology. Whether in filling or packaging

technology, WL11G-2 offers optimum performance in a small robust housing, dependable object detection – everything from PET bottles to film – in the range up to 4 m, PinPoint LED, and high reliability in industrial environments.

At a glance

- Retro-reflective for detection of clear material objects
- Rugged housing for industrial use
- PinPoint LED technology with a highly visible light spot
- Space-saving plastic housing in chemically, thermally or mechanically resistant designs
- Dovetail mounting – standard mounting holes and oblong holes
- Highly visible 360° status LEDs
- Simple sensitivity adjustment via potentiometer

Your benefits

- Superior ASIC ensures reliable detection of transparent objects
- PinPoint LED 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 fast and easy commissioning
- Rugged housing design withstands harsh environments, reducing downtime and maintenance effort
- Uniform housing, mounting and connection systems reduce mounting and installation time
- High immunity to optical interferences reduces false readings and downtime

→ www.mysick.com/en/W11G-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

Sensor principle	Photoelectric retro-reflective sensor
Detection principle	Autocollimation
Dimensions (W x H x D)	15.6 mm x 48.5 mm x 42 mm
Housing design (light emission)	Rectangular
Sensing range max. ¹⁾	0 m ... 4 m
Sensing range ¹⁾	0 m ... 4 m
Type of light	Visible red light
Light source ²⁾	LED
Light spot size (distance)	Ø 25 mm (1.5 m)
Angle of dispersion	Approx. 1.5 °
Wave length	640 nm
Adjustment	Potentiometer, 11 turns
Special feature	Detection of transparent objects

¹⁾ PL80A.²⁾ Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	≤ 5 V _{pp}
Power consumption ³⁾	≤ 30 mA
Output type	PNP/NPN (depending on type)
Output function	Complementary
Switching mode	Light/dark-switching
Switching mode selector	Selectable via L/D control wire, 0 V or not connected, light-switching, Uv, dark-switching
Signal voltage PNP HIGH/LOW	Uv – 3 V / approx. 0 V
Signal voltage NPN HIGH/LOW	Approx. Uv / < 3 V
Output current I _{max.}	100 mA
Response time ⁴⁾	≤ 330 µs
Switching frequency ⁵⁾	1,500 Hz
Attenuation along light beam	> 8 %
Connection type	Male connector, M12/Cable with connector, M12 (depending on type)
Circuit protection	A ⁶⁾ , C ⁷⁾ , D ⁸⁾
Protection class	II
Weight	120 g
Polarisation filter	✓
Housing material	ABS
Optics material	PMMA
Enclosure rating	IP 66/IP 67/IP 69K
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⁾ A = V_S connections reverse-polarity protected.⁷⁾ C = interference suppression.⁸⁾ D = outputs overcurrent and short-circuit protected.

Ordering information

Other models available at www.mysick.com/en/W11G-2

WL11G-2

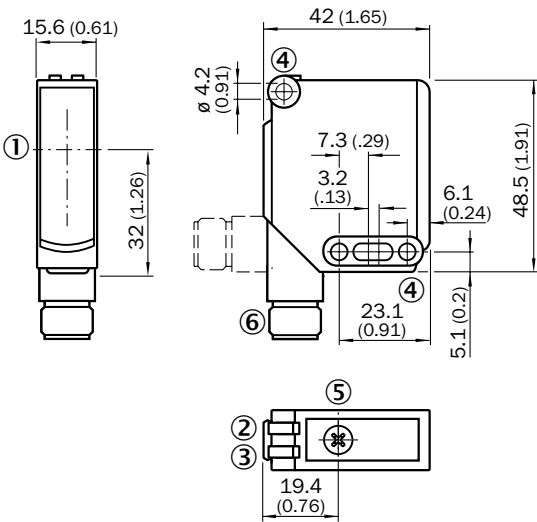
- **Adjustment:** potentiometer, 11 turns
- **Polarisation filter:** ✓

Sensing range max. ¹⁾	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0 m ... 4 m	PNP, NPN	Light/dark-switching	Connector M12, 5-pin	Cd-144	WL11G-2B2531	1041390
	PNP	Light/dark-switching ²⁾	Cable with connector M12, 4-pin	Cd-101	WL11G-2K3431	1048313

¹⁾ PL80A.
²⁾ Pin 2 / Pin 4 swapped over.

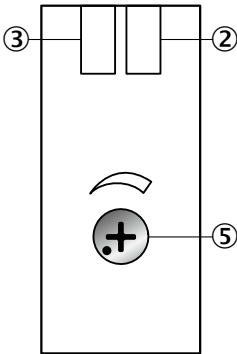
Dimensional drawings

Dimensions in mm (inch)



- 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 Sensitivity adjustment: poti

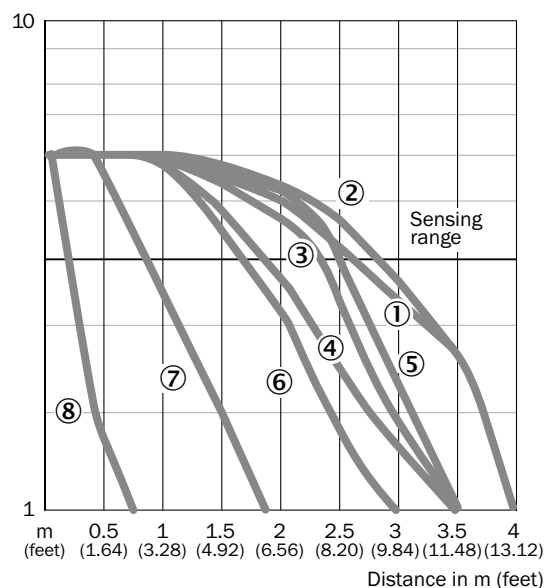
Adjustments



- ② Status indicator LED green: power on
③ Status indicator LED, yellow: Status of received light beam
⑤ Sensitivity adjustment

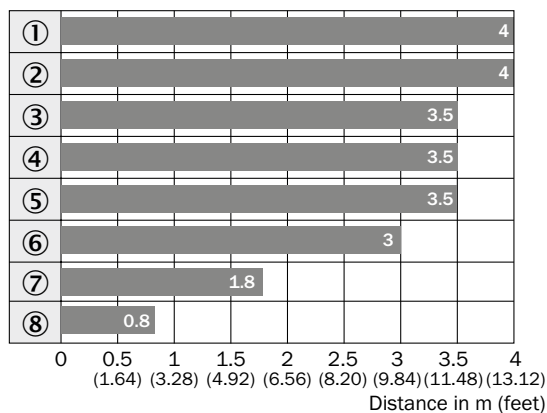
Characteristic curves

Operating reserve



- ① PL80A
- ② C110A
- ③ P250F
- ④ PL50A
- ⑤ PL40A
- ⑥ PL30A
- ⑦ PL20A
- ⑧ Reflective tape Diamond Grade

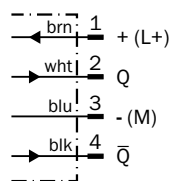
Bar diagrams



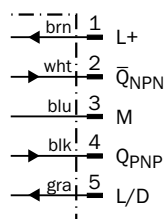
- Sensing range
- ① PL80A
- ② C110A
- ③ P250F
- ④ PL50A
- ⑤ PL40A
- ⑥ PL30A
- ⑦ PL20A
- ⑧ Reflective tape Diamond Grade

Connection diagram

Cd-101



Cd-144



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

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

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

Reflectors

Angular

Figure	Material	Description	Model name	Part no.
	Plastic	Chemically resistant, screw connection, 47 mm x 47 mm	P250 CHEM	5321097
	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, screw connection, suitable for laser sensors, 18 mm x 18 mm	PL10F	5311210
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
	Plastic	Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089
	PMMA/ABS	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

G

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
	Reflective tape "Diamond Grade", self-adhesive, customizable size by sheet, width max. 74.9 cm, length max. 91.4 cm	REF-DG-K	4019634

Special reflectors

Figure	Material	Description	Model name	Part no.
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adaptor shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adaptor thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

→ For additional accessories, please see page L-861

High-performance photoelectric sensor family with laser optics



Additional information

Detailed technical data.....	G-511
Ordering information.....	G-512
Dimensional drawings	G-513
Adjustments	G-514
Characteristic curves	G-514
Bar diagrams.....	G-516
Light spot diameter.....	G-517
Connection diagram	G-517
Recommended accessories....	G-518

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
- Teflon® coating available
- Precise autocollimation optics
- Adjustable focus on retro-reflective sensors
- High switching frequency of 2.5 kHz
- Connection via cable or rotatable connector
- Mounting options with through holes, blind holes, oblong holes and dovetail
- 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
- Red light laser technology provides quick and easy alignment of sensor
- Rugged metal housing (available with Teflon® coating) withstands harsh environments
- Laser protection class 1 or 2 for eye safety
- Resistance to optical interference reduces false readings and downtime
- Rotatable connector provides easy installation

→ 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.



Detailed technical data

Features

	WT12L-2	WL12L-2	WS/WE12L-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)	15 mm x 49 mm x 41.5 mm		
Housing design (light emission)	Rectangular		
Sensing range max.	20 mm ... 50 mm ¹⁾ 30 mm ... 200 mm ²⁾ (depending on type)	0 m ... 18 m ³⁾ (depending on type)	0 m ... 80 m (depending on type)
Focus	45 mm ... 100 mm (depending on type)	–	
Type of light	Visible red light		
Light source	Laser ⁴⁾		Laser ^{4)/Laser ⁴⁾ ⁵⁾ (depending on type)}
Wave length	650 nm		
Laser class	1/2 (depending on type)		
Adjustment	Potentiometer		

¹⁾ Object with 6 % reflectance (referred to standard white, DIN 5033)²⁾ Objects to be sensed with 18 % reflectivity (based on DIN 5033 white standard)³⁾ PL80A.⁴⁾ Average service life 50,000 h at T_A = +25 °C.⁵⁾ Parallel light beam.

Mechanics/electronics

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

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⁾ A = V_S connections reverse-polarity protected.

⁷⁾ C = interference suppression.

⁸⁾ D = outputs overcurrent and short-circuit protected.

Ordering information

Other models available at 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. ¹⁾	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

¹⁾ 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. ¹⁾	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

¹⁾ 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. ¹⁾	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 ... 15 m	2,500 Hz	Ø 0.8 mm (300 mm)	PNP, NPN	Connector M12, 5-pin	Cd-145	WL12L-2B520	1018253
	0 m ... 18 m	2,500 Hz	Ø 0.8 mm (300 mm)	PNP, NPN	Cable, 4-wire 2 m	Cd-089	WL12L-2P130	1022041
				PNP, NPN	Connector M12, 5-pin	Cd-145	WL12L-2B530	1018252

¹⁾ PL80A.

WS/WE12L-2

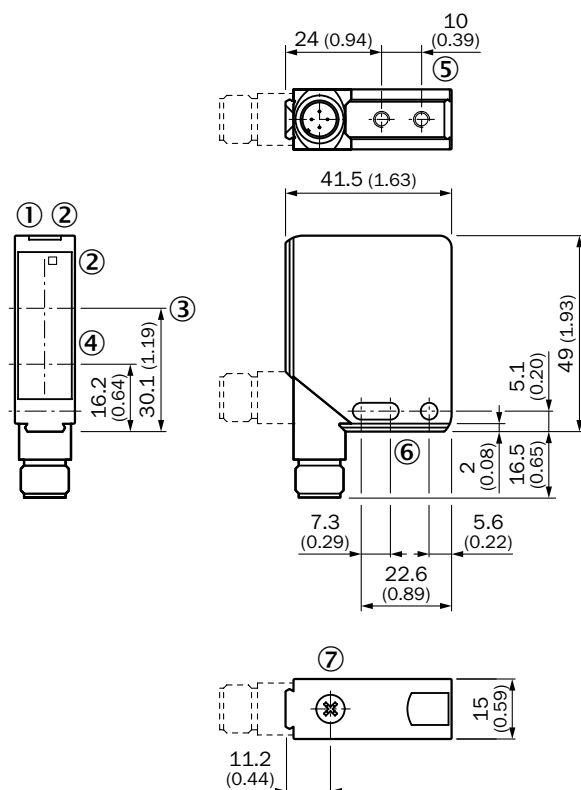
- **Connection:** connector M12, 4-pin

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

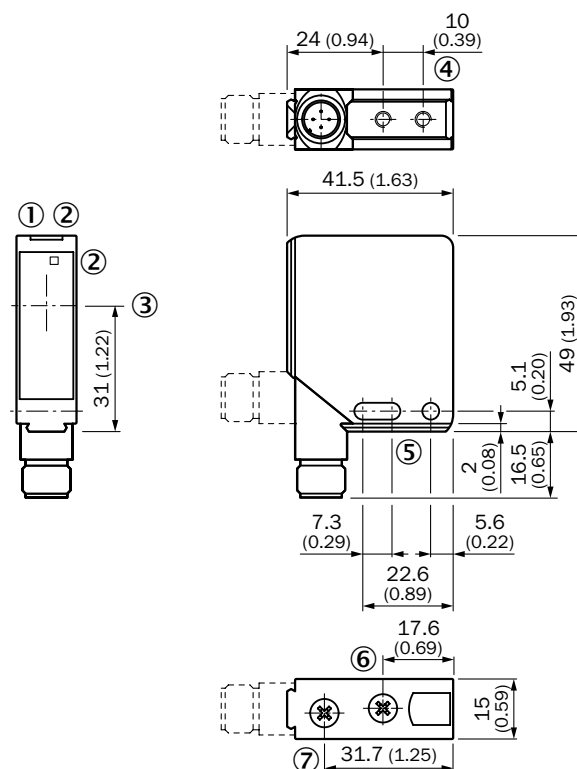
Dimensions in mm (inch)

WT12L-2



- 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

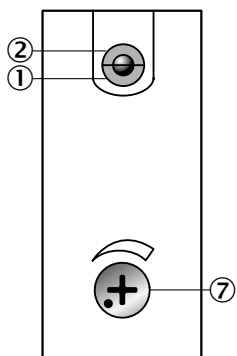
WL12L-2, WS/WE12L-2



- 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

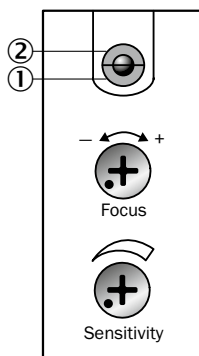
Adjustments

WT12L-2



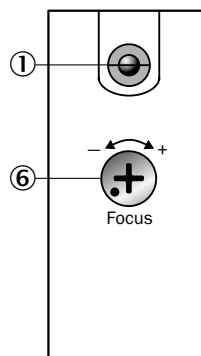
- ① Operating indicator, green
- ② LED reception indicator, yellow
- ⑦ Sensing range adjustment

WL12L-2



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

WS/WE12L-2

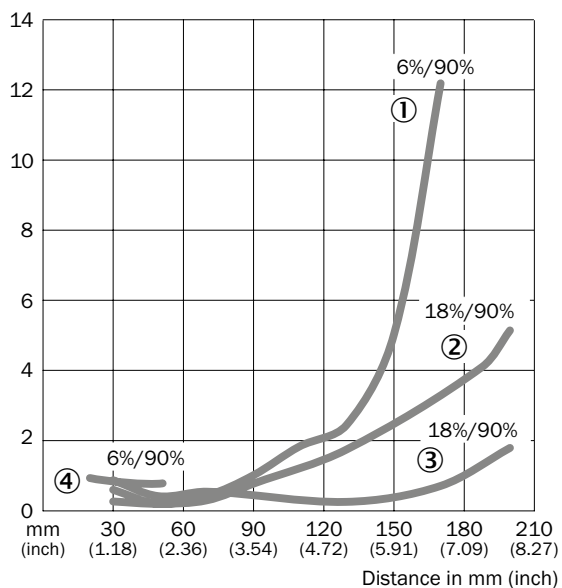


- ① Operating indicator (WS above only)
- ⑥ Focal adjustment (WS)

Characteristic curves

Black-white shift

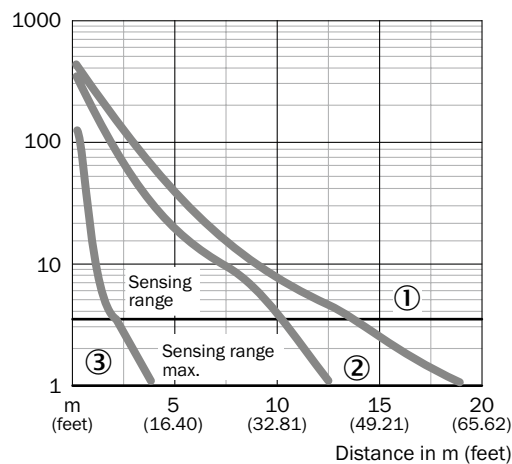
WT12L-2



- 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

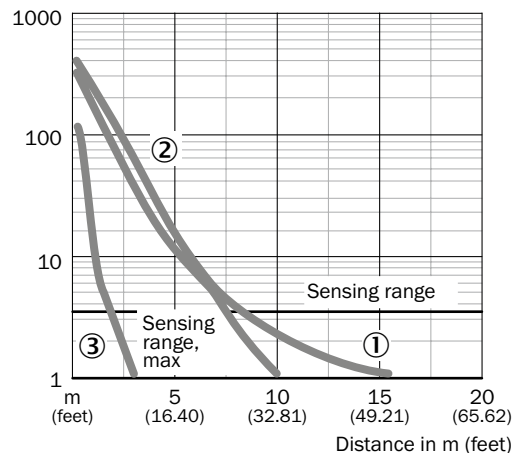
Operating reserve

WL12L-2, 18 m



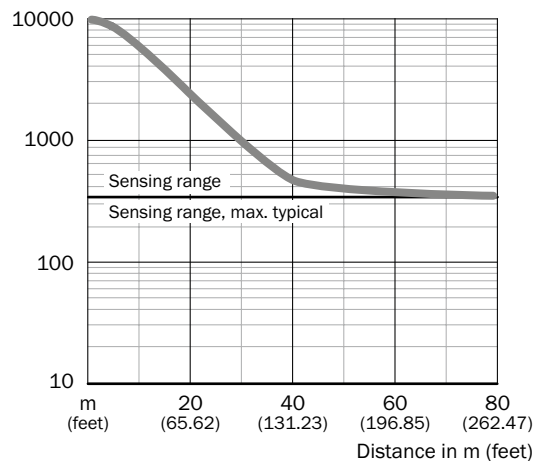
- ① PL80A
- ② PL50A
- ③ Reflective tape Diamond Grade

WL12L-2, 15 m

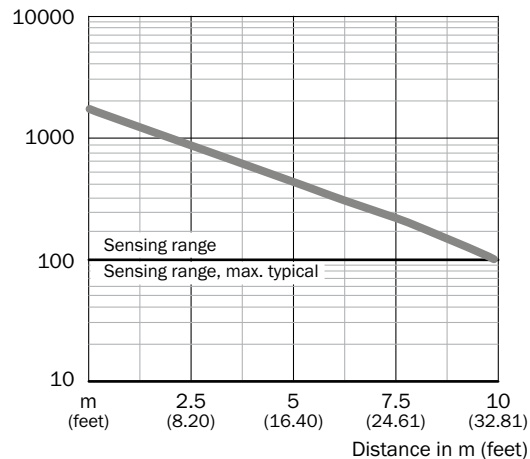


- ① PL80A
- ② PL50A
- ③ Reflective tape Diamond Grade

WS/WE12L-2, 80 m



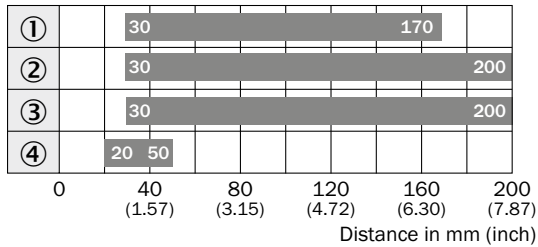
WS/WE12L-2, 10 m



G

Bar diagrams

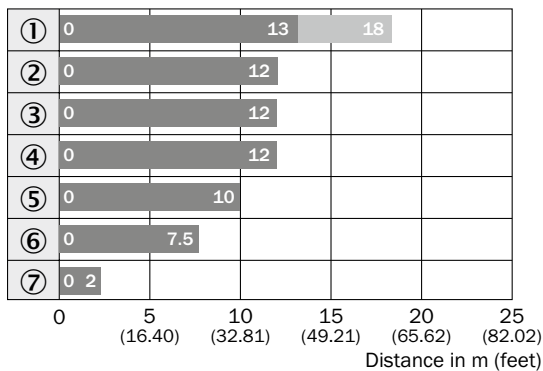
WT12L-2



■ 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

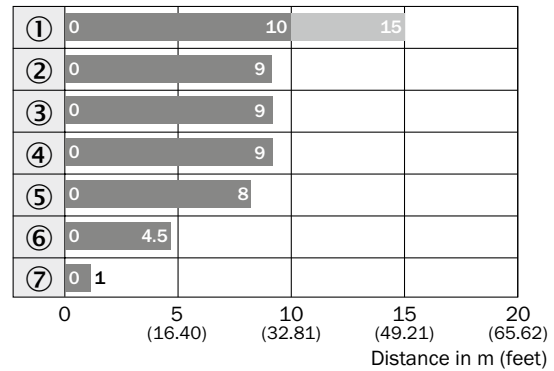
WL12L-2, 18 m



■ Sensing range ■ Sensing range typ. max.

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

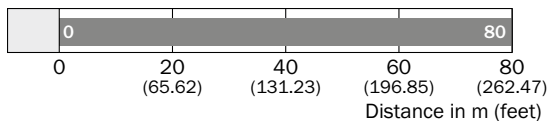
WL12L-2, 15 m



■ Sensing range ■ Sensing range typ. max.

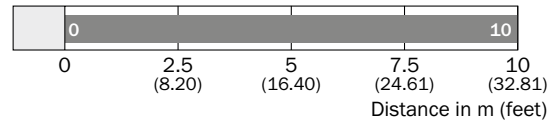
- ① PL80A
 ② PL50A
 ③ PL40A
 ④ P250
 ⑤ PL30A
 ⑥ PL20A
 ⑦ Reflective tape Diamond Grade

WS/WE12L-2, 80 m



■ Sensing range/sensing range typ. max.

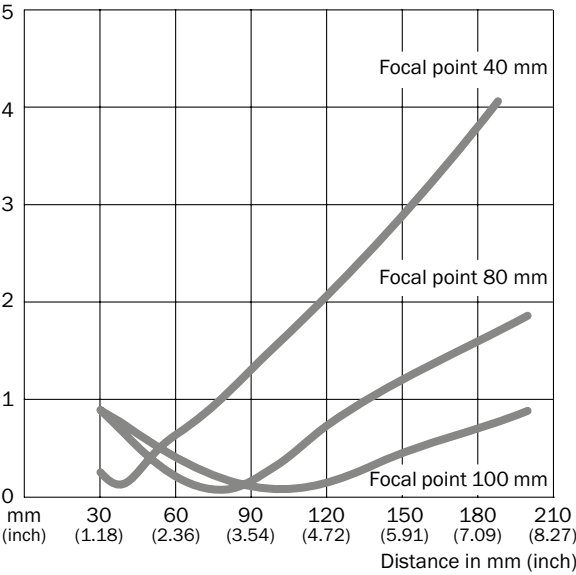
WS/WE12L-2, 10 m



■ Sensing range/sensing range typ. max.

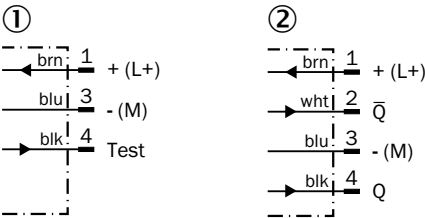
Light spot diameter

WT12L-2



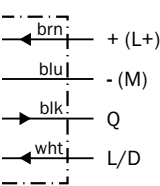
Connection diagram

Cd-077

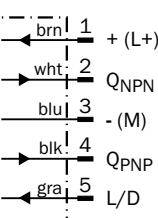


① Sender
② Receiver

Cd-089



Cd-145



G

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

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 N02 for universal clamp bracket	BEF-KHS-N02	2051608
		Plate N03 for universal clamp bracket	BEF-KHS-N03	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

High-performance detection of transparent objects in metal housing



SIRIC®
optical ASIC
invented by SICK

ECOLAB®



PinPoint
by SICK

IO-Link

Additional information

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Ordering information.....	G-522
Dimensional drawings.....	G-524
Adjustments.....	G-524
Bar diagrams.....	G-524
Light spot diameter.....	G-524
Connection diagram.....	G-525
Recommended accessories....	G-525



Product description

The W12G photoelectric sensors provide reliable detection of transparent objects. Everything from PET bottles to thin, transparent films is detected. The W12G features a rugged metal housing with

high electromagnetic compatibility, high immunity to chemical and thermal conditions, and excellent resistance to high pressure cleaning.

At a glance

- Rugged die-cast zinc housing with optional Teflon® coating
- Reliable detection of transparent objects
- Precise autocollimation optics
- Robust sensors for industrial use
- Precise PinPoint LED
- Dovetail mounting – mounting holes and oblong holes
- Highly visible status LEDs
- Flexible sensor settings, monitoring, advanced diagnostics, and visualization thanks to IO-Link

Your benefits

- Reliable detection of transparent objects – from PET bottles to transparent film – due to superior ASIC (application-specific integrated circuit) technology
- High immunity to ambient conditions reduces false readings
- Red PinPoint LED provides quick and easy alignment of sensor
- Precise switching characteristics, fast response times and high performance ensure superior reliability and productivity in nearly every application type
- Withstands mechanical, thermal, chemical and electromagnetic factors, providing increased industrial reliability
- Flexible mounting and installation due to rotatable connector and versatile mounting options
- IO-Link provides easy data access from the PLC
- Quick and easy configuration

→ www.mysick.com/en/W12G

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

Sensor principle	Photoelectric retro-reflective sensor
Detection principle	Autocollimation
Dimensions (W x H x D)	15.6 mm x 48.5 mm x 42 mm
Housing design (light emission)	Rectangular
Sensing range max. ¹⁾	0 m ... 4 m
Type of light	Visible red light/Infrared light (depending on type)
Light source	LED ²⁾ /PinPoint LED ²⁾ (depending on type)
Angle of dispersion	Approx. 1.5 °
Wave length	
Visible red light	640 nm/660 nm (depending on type)
Infrared light	850 nm
Adjustment	Potentiometer, 11 turns/Single teach-in button ³⁾ ⁴⁾ (depending on type)
Continuous threshold adaption	-/✓ (depending on type)
Special feature	Detection of transparent objects

¹⁾ PL80A.²⁾ Average service life of 100,000 h at T_A = +25 °C.³⁾ Mode I, 10 % attenuation.⁴⁾ Mode II, 18 % attenuation.

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	≤ 5 V _{pp}
Power consumption	≤ 40 mA ³⁾
Output type	PNP/NPN/PNP, NPN (depending on type)
Output function	Complementary
Switching mode	Light switching/Dark-switching/Light/dark-switching (depending on type)
Switching mode selector	Selectable via L/D control wire
Signal voltage PNP HIGH/LOW	> U _v – 3 V/ca. 0 V/approx. V _s – 2.5 V/0 V (depending on type)
Signal voltage NPN HIGH/LOW	Approx. U _v / < 3 V/approx. V _s / < 2.5 V (depending on type)
Output current I _{max.}	100 mA
Response time	≤ 330 μs ⁴⁾
Switching frequency ⁵⁾	1,500 Hz
Connection type	Male connector, M12
Circuit protection	
With automatic threshold adaption (AutoAdapt)	A ⁶⁾ , B ⁹⁾ , C ⁷⁾ , D ⁸⁾
Without automatic threshold adaption (AutoAdapt)	A ⁶⁾ , C ⁷⁾ , D ⁸⁾
Protection class	II
Weight	120 g
Polarisation filter	✓
IO-Link	✓
Housing material	Zinc diecast
Optics material	PMMA, PMMA, PTFE-coated (depending on type)
Enclosure rating	IP 66, IP 67, IP 69K
Operating mode	Mode I, 10 % attenuation, Mode II, 18 % attenuation
Plausibility output, stable detection	Approx. 0 V/approx. V _s (depending on type)

Plausibility output, unstable detection	$V_S - 2.5 \text{ V}$ /approx. 1.5 V (depending on type)
Ambient operating temperature	-40 °C ... +60 °C (depending on type)
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⁾ A = V_S connections reverse-polarity protected.

⁷⁾ C = interference suppression.

⁸⁾ D = outputs overcurrent and short-circuit protected.

⁹⁾ B = inputs and output reverse-polarity protected.

Ordering information

Other models available at www.mysick.com/en/W12G

WL12G, metal

- Housing material: metal

Type of light	Sensing range max. ¹⁾	Light spot size (distance)	Continuous threshold adaption	Output type	Switching mode	Adjustment	Connection	Connection diagram	Model name	Part no.
Visible red light	0 m ... 4 m	Ø 25 mm (1.5 m)	-	PNP	Light switching Dark-switching	Potentiometer, 11 turns	Connector M12, 4-pin	Cd-087	WL12G-302431	1041457
				PNP, NPN	Light switching Dark-switching	Potentiometer, 11 turns	Connector M12, 5-pin	Cd-144	WL12G-3B2531	1041456
			✓	PNP	Light switching Dark-switching	Single teach-in button ²⁾ ³⁾	Connector M12, 5-pin	Cd-146	WL12G-3P2572	1053535
				NPN	Light switching Dark-switching	Single teach-in button ²⁾ ³⁾	Connector M12, 5-pin	Cd-146	WL12G-3N2572	1053530
Infrared light	0 m ... 4 m	Ø 100 mm (3 m)	✓	PNP	Light switching Dark-switching	Single teach-in button ²⁾ ³⁾	Connector M12, 5-pin	Cd-233	WL12G-3P2582	1053536

¹⁾ PL80A.

²⁾ Mode I, 10 % attenuation.

³⁾ Mode II, 18 % attenuation.

WL12G, PTFE

- **Housing material:** PTFE
- **Type of light:** visible red light

Sensing range max. ¹⁾	Light spot size (distance)	Continuous threshold adaption	Output type	Switching mode	Adjustment ^{2) 3)}	Connection	Connection diagram	Model name	Part no.
0 m ... 4 m	Ø 25 mm (1.5 m)	✓	PNP	Light/dark-switching	Single teach-in button	Connector M12, 5-pin	Cd-146	WL12G-3P2572T01	1053546

¹⁾ PL80A.

²⁾ Mode I, 10 % attenuation.

³⁾ Mode II, 18 % attenuation.

WL12G, metal alarm output

- **Housing material:** metal
- **Type of light:** visible red light

Sensing range max. ¹⁾	Light spot size (distance)	Continuous threshold adaption	Output type	Switching mode	Adjustment	Connection	Connection diagram	Model name	Part no.
0 m ... 4 m	Ø 25 mm (1.5 m)	✓	PNP	Light/dark-switching	Single teach-in button ^{2) 3)}	Connector M12, 5-pin	Cd-147	WL12G-3V2572	1053537
			NPN	Light/dark-switching	Single teach-in button ^{2) 3)}	Connector M12, 5-pin	Cd-147	WL12G-3W2572	1053538

¹⁾ PL80A.

²⁾ Mode I, 10 % attenuation.

³⁾ Mode II, 18 % attenuation.



WL12G, metal IO-Link

- **Housing material:** metal
- **Type of light:** visible red light
- **Output type:** PNP
- **Switching mode:** light/dark-switching
- **Adjustment:** single teach-in button (Mode I, 10 % attenuation.) (Mode II, 18 % attenuation.)
- **Continuous threshold adaption:** ✓

Sensing range max. ¹⁾	Light spot size (distance)	IO-Link	Advanced functions	Connection	Connection diagram	Model name	Part no.
0 m ... 4 m	Ø 25 mm (1.5 m)	Standard functions	–	Connector M12, 4-pin	Cd-098	WL12GC-3P2472	1054087
		Standard functions, advanced functions	Timer, False Tripping Suppression (Debouncing)			WL12GC-3P2472A70	1067778
			High-Speed Counter, False Tripping Suppression (Debouncing)			WL12GC-3P2472A71	1067779
			Time Stamp, False Tripping Suppression (Debouncing)			WL12GC-3P2472A91	1061063

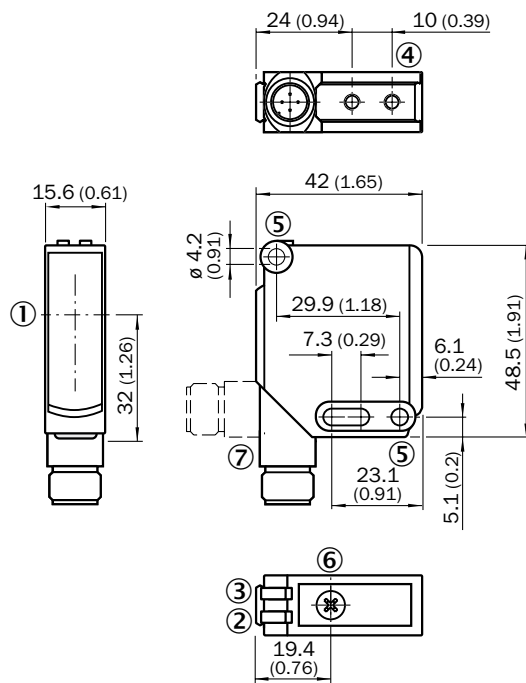
¹⁾ PL80A.

²⁾ Mode I, 10 % attenuation.

³⁾ Mode II, 18 % attenuation.

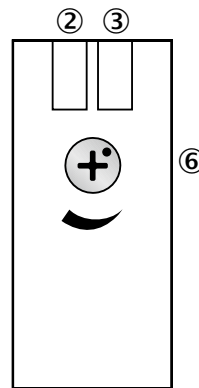
Dimensional drawings

Dimensions in mm (inch)



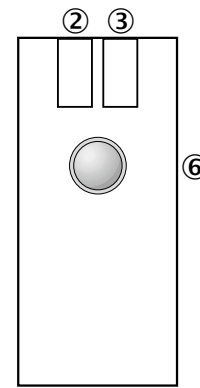
Adjustments

Potentiometer



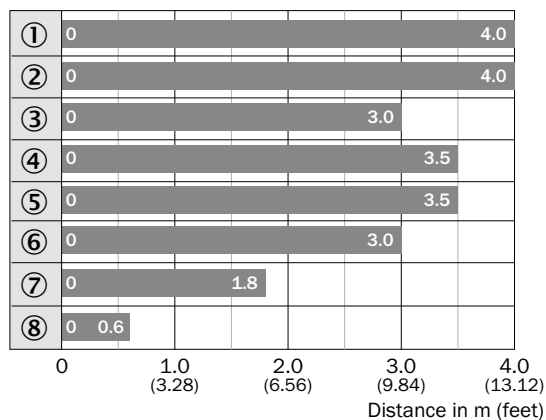
- ② LED indicator yellow: Light received
③ Green LED indicator: supply voltage active
⑥ Sensitivity adjustment: poti

Singel 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

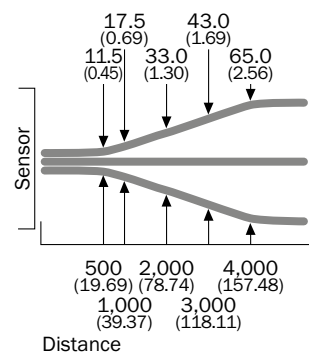
Bar diagrams



■ Sensing range max.

- ① PL80A
② C110A
③ P250F
④ PL50A
⑤ PL40A
⑥ PL30A
⑦ PL20A
⑧ REF-IRF-56

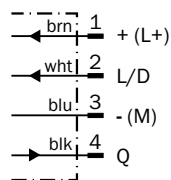
Light spot diameter



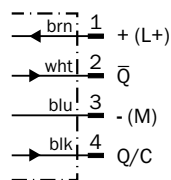
All dimensions in mm (inch)

Connection diagram

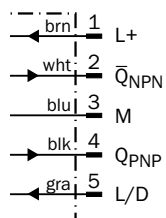
Cd-087



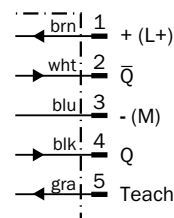
Cd-098



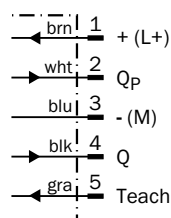
Cd-144



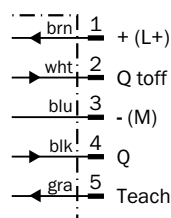
Cd-146



Cd-147



Cd-233



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
	Female connector, M12, 5-pin, straight	Cable, open conductor heads	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

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

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

G**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

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

Reflectors

Angular

Figure	Material	Description	Model name	Part no.
	Plastic	Chemically resistant, screw connection, 47 mm x 47 mm	P250 CHEM	5321097
	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, screw connection, suitable for laser sensors, 18 mm x 18 mm	PL10F	5311210
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
	PMMA/ABS	Fine triple, screw connection, suitable for laser sensors, 38 mm x 16 mm	PL20F	5308844
	Plastic	Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089
	PMMA/ABS	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

G

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

Special reflectors

Figure	Material	Description	Model name	Part no.
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adapter shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adapter thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

→ For additional accessories, please see page L-861

Rugged metal housing provides exceptional performance in demanding applications



Additional information

Detailed technical data.....	G-529
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Dimensional drawings	G-534
Adjustments	G-537
Characteristic curves	G-537
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Light spot diameter.....	G-541
Connection diagram	G-541
Recommended accessories....	G-542

Product description

The W12-3 family features a complete range of photoelectric sensors that are enclosed in a metal housing. There are a large number of variations that are available, including proximity, retro-reflective, through-beam, special laser and clear material versions. These sensors offer

many advantages over conventional optical sensors due to their reliable object detection and monitoring capabilities. Whether in packaging, pharmaceutical, or the food and beverage industries – the W12 family provides a solution for any application.

At a glance

- Best-in-class optical performance due to superior OES technology
- Autocollimation with retro-reflective sensors
- Background and foreground suppression with second emitter LED on proximity sensors
- Highly visible, precise light spot and high-energy IR transmitters
- Rugged die-cast zinc housing, optional with Teflon® coating
- Mounting options with through holes, base blind holes, oblong through holes and dovetail
- Flexible sensor settings, monitoring, advanced diagnostics, and visualization thanks to IO-Link

Your benefits

- Reliable detection due to superior ASIC (application-specific integrated circuit) technology and immunity to optical interference factors from the industrial environment
- PinPoint LED technology provides a bright, small and precise light spot that enables quick and easy sensor alignment
- Precise switching characteristics ensure reliable object detection, reducing downtime caused by re-adjusting sensors during recipe changes
- Wide range of products enclosed in a rugged metal housing enables application flexibility in a broad range of industrial environments
- Flexible mounting options reduce installation time
- IO-Link provides easy data access from the PLC
- Quick and easy configuration
- Quick and easy integration using function blocks

→ www.mysick.com/en/W12-3

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

	WTB12-3	WTF12-3	WL12-3	WSE12-3
Sensor principle	Photoelectric proximity sensor		Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Detection principle	Background suppression	Foreground suppression	Autocollimation	–
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 ... 800 mm ¹⁾ (depending on type)	30 mm ... 500 mm ¹⁾ (depending on type)	0 m ... 7 m ²⁾ (depending on type)	0 m ... 20 m
Sensing range	20 mm ... 800 mm (depending on type)	30 mm ... 500 mm (depending on type)	0 m ... 5 m ²⁾ (depending on type)	0 m ... 15 m
Type of light	Visible red light/Infra-red light (depending on type)	Visible red light		
Light source	LED ³⁾ /PinPoint LED ³⁾ (depending on type)	LED ³⁾		
Angle of dispersion	–		Approx. 1.5°/5° (depending on type)	Approx. 1.5°
Wave length				
Visible red light	660 nm/640 nm (depending on type)		640 nm	
Infrared light	850 nm/880 nm (depending on type)	–		
Adjustment	Potentiometer, 5 turns/Single teach-in button/Double teach-in button/Cable (depending on type)			
Special feature	Line-shaped light spot (depending on type)	–	Focused optics (depending on type)	–

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

	WTB12-3	WTF12-3	WL12-3	WSE12-3
Supply voltage ¹⁾	10 V DC ... 30 V DC			
Ripple ²⁾	≤ 5 V _{pp}			
Power consumption ³⁾	≤ 30 mA ... ≤ 60 mA (depending on type)	≤ 30 mA ... ≤ 45 mA (depending on type)	≤ 30 mA ... ≤ 100 mA (depending on type)	–
Power consumption, sender ³⁾	–			≤ 30 mA
Power consumption, receiver ³⁾	–			≤ 15 mA ... ≤ 25 mA (depending on type)
Output type	PNP/NPN (depending on type)			
Output function	Complementary			
Switching mode	Light/dark-switching/Dark-switching (depending on type)			
Signal voltage PNP HIGH/LOW	> U _v – 2,5 V/ca. 0 V			
Signal voltage NPN HIGH/LOW	Approx. V _S / _{<} 2.5 V			
Output current I _{max.}	100 mA			
Response time				
Switching frequency 750 Hz ⁵⁾	≤ 700 μs ⁴⁾	–		
Switching frequency 1,500 Hz ⁵⁾	≤ 330 μs ⁴⁾			
Switching frequency 5,000 Hz ⁵⁾	–		≤ 100 μs ⁴⁾	–
Connection type	Male connector, M12/Cable/Cable, 3 m ⁶⁾ (depending on type)			

	WTB12-3	WTF12-3	WL12-3	WSE12-3
Circuit protection	A ⁷⁾ , C ⁸⁾ , D ⁹⁾			
Protection class	II			
Weight	Connector	200 g ... 280 g	200 g	200 g ... 250 g
	Cable	120 g		
Polarisation filter	–		✓ (depending on type)	–
IO-Link	✓ (depending on type)			
Enclosure rating	IP 66, IP 67, IP 69K			
Test input sender off	–			TE to 0 V
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.

Ordering information

Other models available at www.mysick.com/en/W12-3

WTB12-3

- **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	35 mm ... 100 mm	Ø 2 mm (60 mm)	PNP	Potentiometer, 5 turns	Connector M12, 4-pin	Cd-083	WTB12-3P2441	1041421
	20 mm ... 350 mm	Ø 6 mm (200 mm)	PNP	Potentiometer, 5 turns	Cable, 4-wire 2 m PVC	Cd-094	WTB12-3P1131	1041413
				Double teach-in button	Connector M12, 4-pin	Cd-083	WTB12-3P2431	1041411
				Double teach-in button	Connector M12, 4-pin	Cd-083	WTB12-3P2433	1041412
			NPN	Potentiometer, 5 turns	Cable, 4-wire 2 m PVC	Cd-094	WTB12-3N1131	1041418
				Double teach-in button	Connector M12, 4-pin	Cd-083	WTB12-3N2431	1041416
				Double teach-in button	Connector M12, 4-pin	Cd-083	WTB12-3N2433	1041417
	50 mm ... 800 mm	Ø 9 mm (400 mm)	PNP	Potentiometer, 5 turns	Connector M12, 4-pin	Cd-083	WTB12-3P2461S01	1051967
Infrared light	20 mm ... 600 mm	15 mm x 15 mm (200 mm)	PNP	Potentiometer, 5 turns	Cable, 4-wire 2 m PVC	Cd-094	WTB12-3P1111	1041424
				Potentiometer, 5 turns	Cable, 4-wire 3 m PVC	Cd-094	WTB12-3P1711	1041426
				Double teach-in button	Connector M12, 4-pin	Cd-083	WTB12-3P2411	1041422
				Double teach-in button	Connector M12, 4-pin	Cd-083	WTB12-3P2413	1041423
			NPN	Potentiometer, 5 turns	Cable, 4-wire 2 m PVC	Cd-094	WTB12-3N1111	1041429
				Potentiometer, 5 turns	Cable, 4-wire 3 m PVC	Cd-094	WTB12-3N1711	1041430
				Double teach-in button	Connector M12, 4-pin	Cd-083	WTB12-3N2411	1041427
				Double teach-in button	Connector M12, 4-pin	Cd-083	WTB12-3N2413	1041428
				Double teach-in button	Connector M12, 4-pin	Cd-083	WTB12-3N2413	1041428

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

WTB12-3, line-shaped light spot

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

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Adjustment	Connection	Connection diagram	Model name	Part no.
30 mm ... 500 mm	50 mm x 5 mm (200 mm)	PNP	Potentiometer, 5 turns	Connector M12, 4-pin	Cd-083	WTB12-3P2461S58	1047850

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



WTB12-3, IO-Link

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Type of light:** visible red light
- **Switching mode:** light/dark-switching
- **Output type:** PNP
- **Adjustment:** cable, single teach-in button

Sensing range max. ¹⁾	Light spot size (distance)	IO-Link	Advanced functions	Connection	Connection diagram	Model name	Part no.
20 mm ... 350 mm	15 mm x 15 mm (200 mm)	Standard functions	–	Connector M12, 4-pin	Cd-098	WTB12C-3P2432	1067771
		Standard functions, advanced functions	Timer, False Tripping Suppression (Debouncing)			WTB12C-3P2432A70	1067772
			High-Speed Counter, False Tripping Suppression (Debouncing)			WTB12C-3P2432A71	1067773
			Time Stamp, False Tripping Suppression (Debouncing)			WTB12C-3P2432A91	1060222

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

WTF12-3

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** foreground suppression
- **Type of light:** visible red light
- **Switching mode:** light/dark-switching

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Adjustment	Connection	Connection diagram	Model name	Part no.
30 mm ... 175 mm	Ø 2 mm (60 mm)	PNP	Potentiometer, 5 turns	Cable, 4-wire 2 m PVC	Cd-094	WTF12-3P1131	1041406
			Double teach-in button	Connector M12, 4-pin	Cd-083	WTF12-3P2431	1041404
				Connector M12, 4-pin	Cd-083	WTF12-3P2433	1041405
		NPN	Potentiometer, 5 turns	Cable, 4-wire 2 m PVC	Cd-094	WTF12-3N1131	1041410
			Double teach-in button	Connector M12, 4-pin	Cd-083	WTF12-3N2431	1041408
				Connector M12, 4-pin	Cd-083	WTF12-3N2433	1041409

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

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Adjustment	Connection	Connection diagram	Model name	Part no.
30 mm ... 500 mm	Ø 7 mm (300 mm)	PNP	Potentiometer, 5 turns	Cable, 4-wire 2 m PVC	Cd-094	WTF12-3P1141	1041402
			Single teach-in button	Connector M12, 4-pin	Cd-083	WTF12-3P2441	1041400
		NPN	Potentiometer, 5 turns	Connector M12, 4-pin	Cd-083	WTF12-3P2443	1041401
			Potentiometer, 5 turns	Connector M12, 4-pin	Cd-083	WTF12-3N2441	1041403

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

WL12-3

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation
- **Switching mode:** light/dark-switching
- **Type of light:** visible red light
- **Light spot size (distance):** Ø 100 mm (3 m)

Sensing range max. ¹⁾	Polarisation filter	Output type	Adjustment	Connection	Connection diagram	Model name	Part no.
0 m ... 7 m	✓	PNP	Potentiometer, 5 turns	Cable, 4-wire 2 m PVC	Cd-094	WL12-3P1131	1041437
				Cable, 4-wire 3 m PVC	Cd-094	WL12-3P1731	1041438
				Connector M12, 4-pin	Cd-083	WL12-3P2431	1041436
		NPN	Potentiometer, 5 turns	Cable, 4-wire 2 m PVC	Cd-094	WL12-3N1131	1041441
				Cable, 4-wire 3 m PVC	Cd-094	WL12-3N1731	1041442
				Connector M12, 4-pin	Cd-083	WL12-3N2431	1041440
	-	PNP	Potentiometer, 5 turns	Cable, 4-wire 2 m PVC	Cd-094	WL12-3P1141	1041445
				Connector M12, 4-pin	Cd-083	WL12-3P2441	1041444
		NPN	Potentiometer, 5 turns	Cable, 4-wire 2 m PVC	Cd-094	WL12-3N1141	1041447
				Connector M12, 4-pin	Cd-083	WL12-3N2441	1041446

¹⁾ PL80A.

WL12-3, alarm output

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation
- **Switching mode:** dark-switching
- **Type of light:** visible red light
- **Light spot size (distance):** Ø 100 mm (3 m)

Sensing range max. ¹⁾	Polarisation filter	Output type	Adjustment	Connection	Connection diagram	Model name	Part no.
0 m ... 7 m	✓	PNP	Potentiometer, 5 turns	Connector M12, 4-pin	Cd-110	WL12-3V2431	1041537

¹⁾ PL80A.

WL12-3, focused optics

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation
- **Switching mode:** light/dark-switching
- **Type of light:** visible red light
- **Light spot size (distance):** Ø 2 mm (90 mm)

Sensing range max. ¹⁾	Polarisation filter	Output type	Adjustment	Connection	Connection diagram	Model name	Part no.
0 m ... 2 m	✓	PNP	Potentiometer, 5 turns	Cable, 4-wire 2 m PVC	Cd-094	WL12-3P1151	1041449
				Connector M12, 4-pin	Cd-083	WL12-3P2451	1041448
		NPN	Potentiometer, 5 turns	Cable, 4-wire 2 m PVC	Cd-094	WL12-3N1151	1041451
				Connector M12, 4-pin	Cd-083	WL12-3N2451	1041450
	-	PNP	Potentiometer, 5 turns	Cable, 4-wire 2 m PVC	Cd-094	WL12-3P1161	1041453
				Connector M12, 4-pin	Cd-083	WL12-3P2461	1041452
		NPN	Potentiometer, 5 turns	Cable, 4-wire 2 m PVC	Cd-094	WL12-3N1161	1041455
				Connector M12, 4-pin	Cd-083	WL12-3N2461	1041454

¹⁾ PL80A.



WL12-3, IO-Link

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation
- **Type of light:** visible red light
- **Output type:** PNP
- **Switching mode:** light/dark-switching
- **Adjustment:** cable, single teach-in button

Sensing range max. ¹⁾	Polarisation filter	IO-Link	Advanced functions	Connection	Connection diagram	Model name	Part no.
0 m ... 7 m	✓	Standard functions	-	Connector M12, 4-pin	Cd-098	WL12C-3P2432	1067774
		Standard functions, advanced functions	Timer,			WL12C-3P2432A70	1067775
			False Tripping Suppression (Debouncing)			WL12C-3P2432A71	1067776
			High-Speed Counter,			WL12C-3P2432A91	1067777
			False Tripping Suppression (Debouncing)				

¹⁾ PL80A.

WSE12-3

- **Sensor principle:** through-beam photoelectric sensor
- **Switching mode:** light/dark-switching
- **Type of light:** visible red light

Sensing range max.	Light spot size (distance)	Output type	Adjustment	Connection	Connection diagram	Model name	Part no.
0 m ... 20 m	Ø 220 mm (15 mm)	PNP	Potentiometer, 5 turns	Cable, 4-wire 2 m PVC	Cd-088	WSE12-3P1131	1041460
				Connector M12, 4-pin	Cd-072	WSE12-3P2431	1041459
		NPN	Potentiometer, 5 turns	Cable, 4-wire 2 m PVC	Cd-088	WSE12-3N1131	1041463
				Connector M12, 4-pin	Cd-072	WSE12-3N2431	1041462



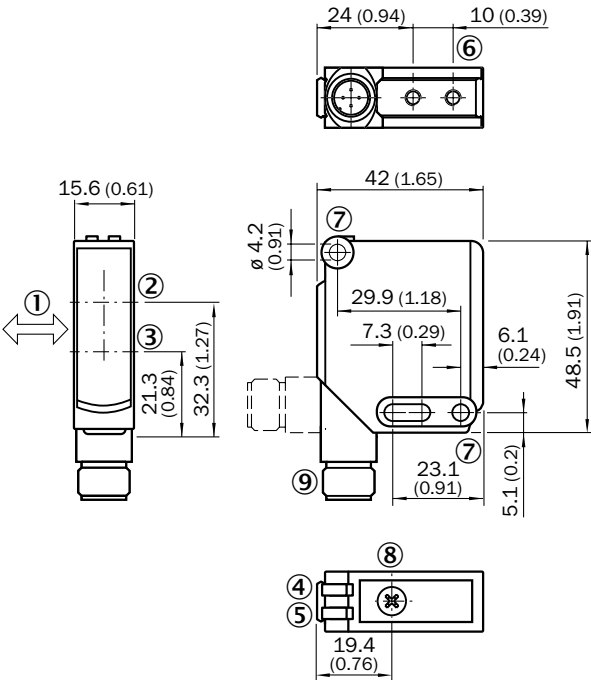
- **Sensor principle:** through-beam photoelectric sensor
- **Type of light:** visible red light
- **Light spot size:** Ø 220 mm (15 mm)
- **Switching mode:** light/dark-switching
- **Output type:** PNP

Sensing range max.	IO-Link	Advanced functions	Connection	Connection diagram	Model name	Part no.
0 m ... 20 m	Standard functions	–	Connector M12, 4-pin	Cd-268	WSE12C-3P2430	1067780
	Standard functions, advanced functions	Timer, False Tripping Suppression (Debouncing)			WSE12C-3P2430A70	1067781
		High-Speed Counter, False Tripping Suppression (Debouncing)			WSE12C-3P2430A71	1067782
		Time Stamp, False Tripping Suppression (Debouncing)			WSE12C-3P2430A91	1067783

Dimensional drawings

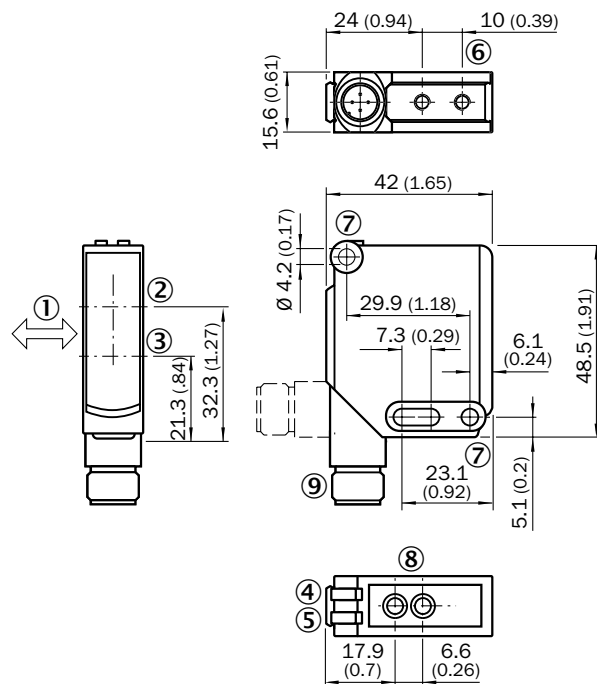
Dimensions in mm (inch)

WTB12-3, potentiometer



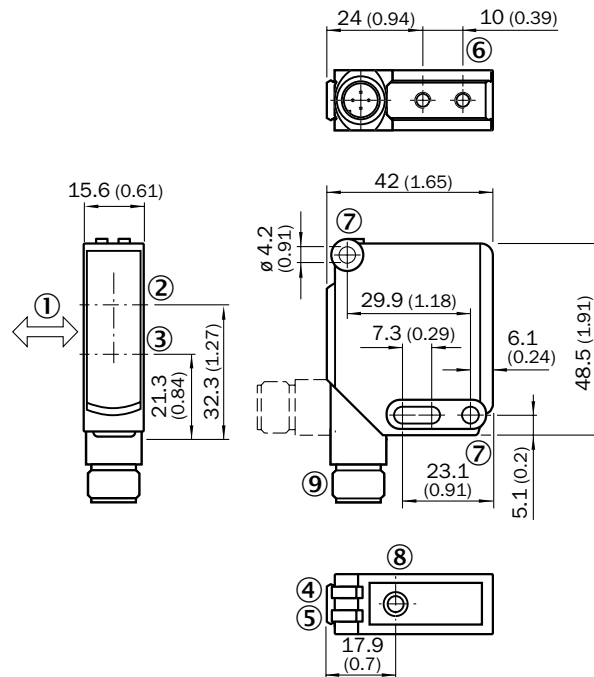
- ① Standard direction of the material being detected
- ② Optical axis, receiver
- ③ Optical axis, sender
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ M4 threaded mounting hole, 4 mm deep
- ⑦ Mounting hole, Ø 4.2 mm
- ⑧ Sensing range adjustment: potentiometer
- ⑨ Connection

WTB12-3, double teach-in button



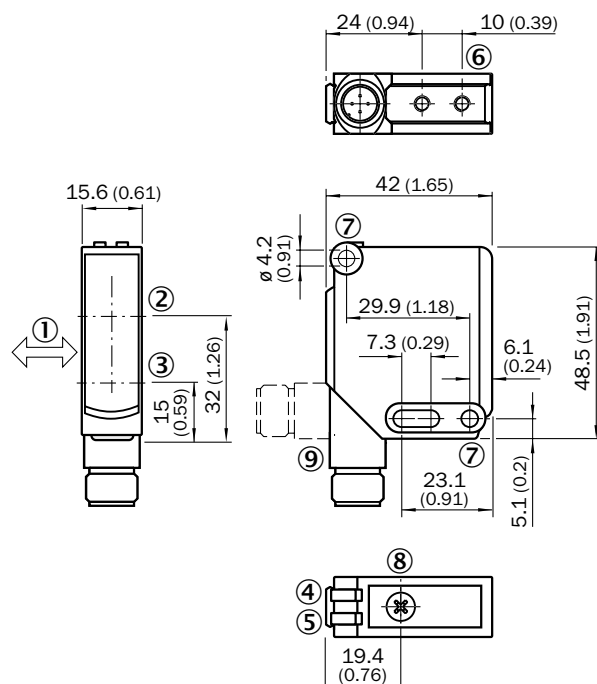
- ① Standard direction of the material being detected
- ② Optical axis, receiver
- ③ Optical axis, sender
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ M4 threaded mounting hole, 4 mm deep
- ⑦ Mounting hole, $\varnothing$ 4.2 mm
- ⑧ Sensing range adjustment: double teach-in button
- ⑨ Connection

WTB12-3, IO-Link

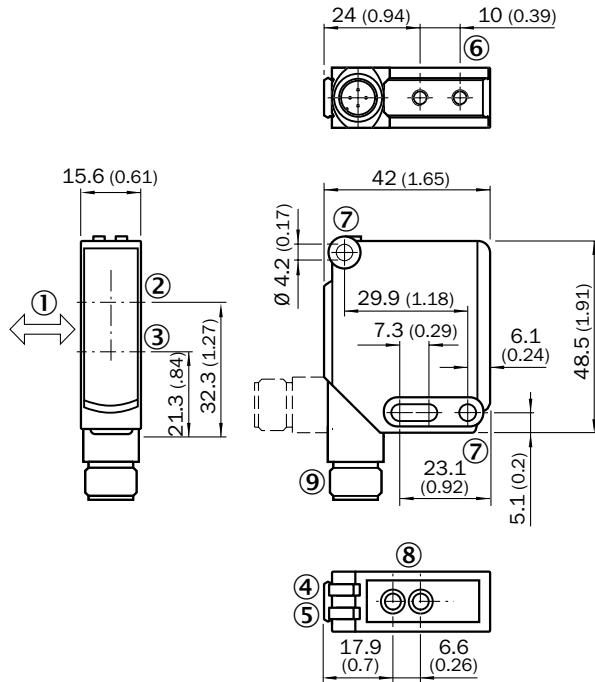


- ① Standard direction of the material being detected
- ② Optical axis, receiver
- ③ Optical axis, sender
- ④ Green LED indicator: supply voltage active
- ⑤ LED indicator yellow: Light received
- ⑥ M4 threaded mounting hole, 4 mm deep
- ⑦ Mounting hole, $\varnothing$ 4.2 mm
- ⑧ Adjustment sensing range: single teach-in button
- ⑨ Connection

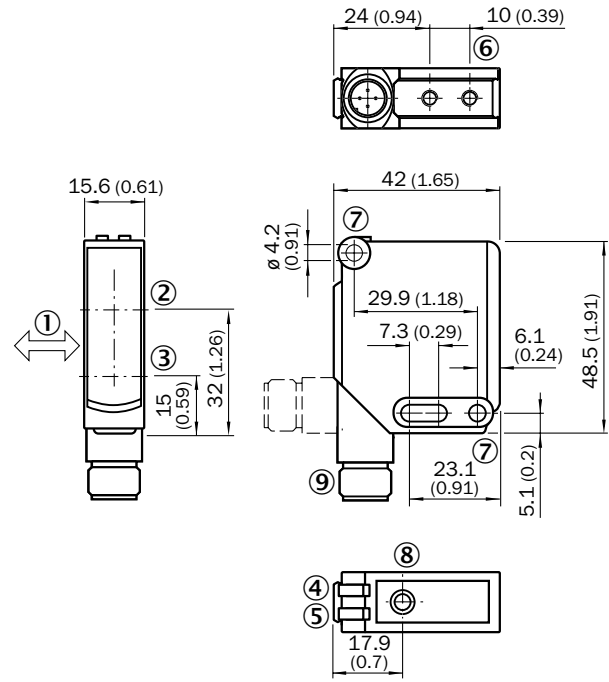
WTF12-3, potentiometer



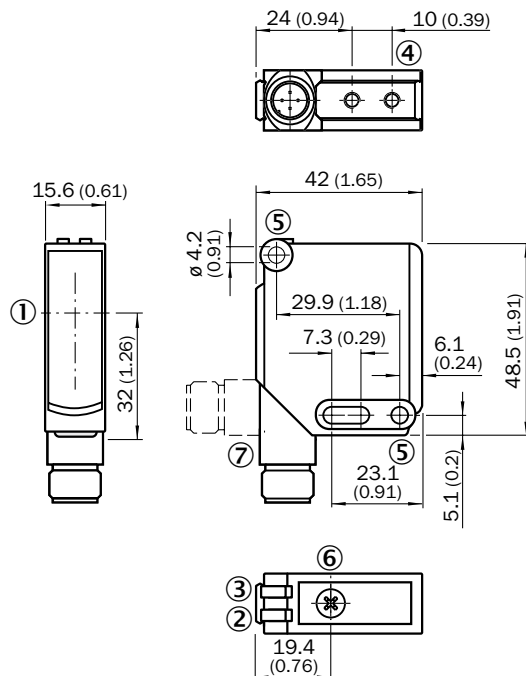
- ① Standard direction of the material being detected
- ② Optical axis, receiver
- ③ Optical axis, sender
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ M4 threaded mounting hole, 4 mm deep
- ⑦ Mounting hole, $\varnothing$ 4.2 mm
- ⑧ Sensing range adjustment: potentiometer
- ⑨ Connection

WTF12-3, single teach-in button

- 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 M4 threaded mounting hole, 4 mm deep
- ⑦ Mounting hole, Ø 4.2 mm
- ⑧ Sensing range adjustment: potentiometer
- ⑨ Connection

WTF12-3, IO-Link

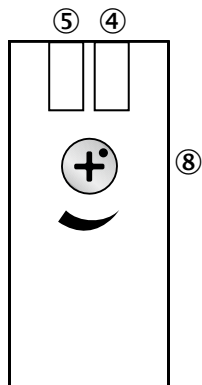
- ① Standard direction of the material being detected
- ② Optical axis, receiver
- ③ Optical axis, sender
- ④ Green LED indicator: supply voltage active
- ⑤ LED indicator yellow: Light received
- ⑥ M4 threaded mounting hole, 4 mm deep
- ⑦ Mounting hole, Ø 4.2 mm
- ⑧ Adjustment sensing range: single teach-in button
- ⑨ Connection

WL12-3, WSE12-3

- ① Optical axis
- ② LED indicator yellow: Light received
- ③ Green LED indicator: supply voltage active
- ④ M4 threaded mounting hole, 4 mm deep
- ⑤ Mounting hole, Ø 4.2 mm
- ⑥ Sensitivity adjustment: poti
- ⑦ Connection

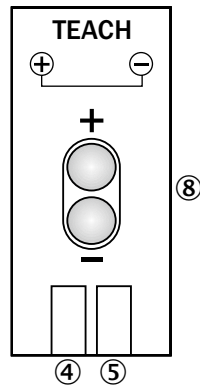
Adjustments

WTB12-3, WTF12-3, potentiometer



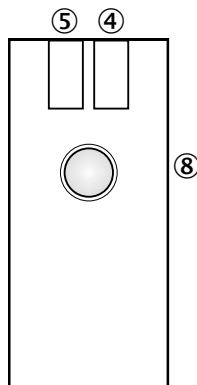
- ④ Green LED indicator: supply voltage active
- ⑤ LED indicator yellow: Light received
- ⑧ Sensing range adjustment: potentiometer

WTB12-3, WTF12-3, double teach-in button



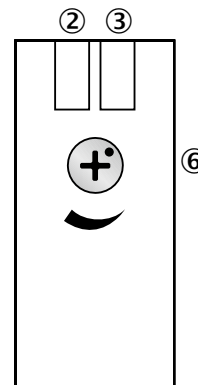
- ④ Green LED indicator: supply voltage active
- ⑤ LED indicator yellow: Light received
- ⑧ Sensing range adjustment: double teach-in button

WTB12-3, WTF12-3, IO-Link



- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑧ Adjustment sensing range: single teach-in button

WL12-3, WSE12-3

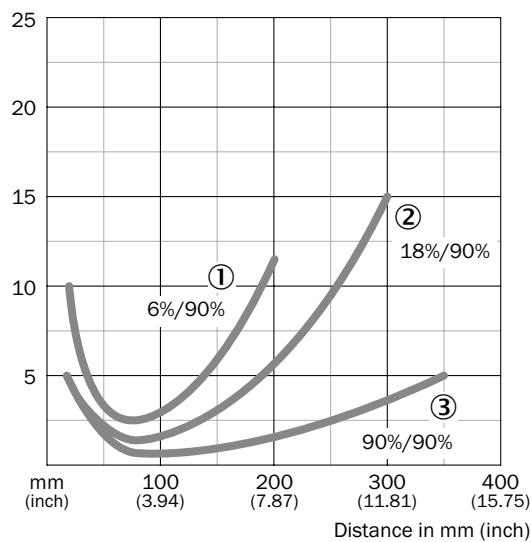


- ② LED indicator yellow: Light received
- ③ Green LED indicator: supply voltage active
- ⑥ Sensitivity adjustment: poti

Characteristic curves

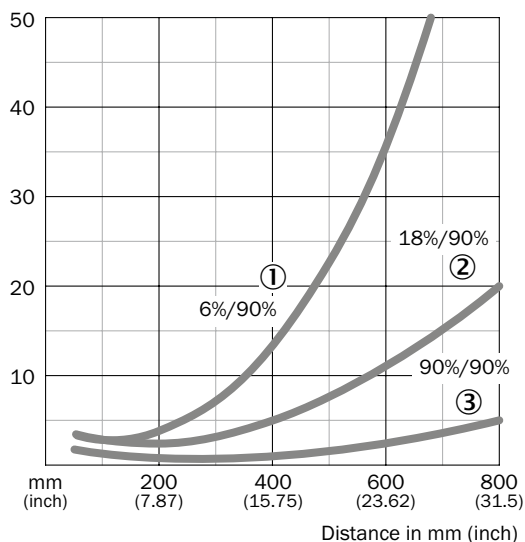
Black-white shift

WTB12-3, red light, 350 mm

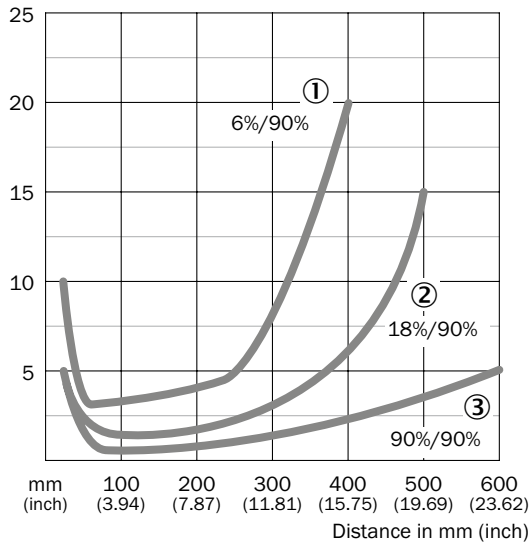


- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

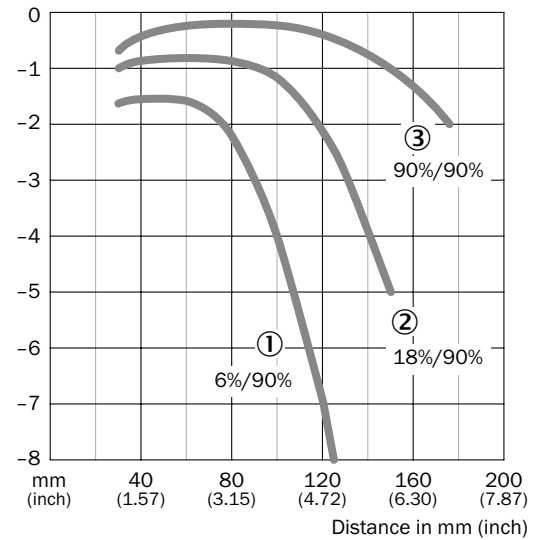
WTB12-3, red light, 800 mm



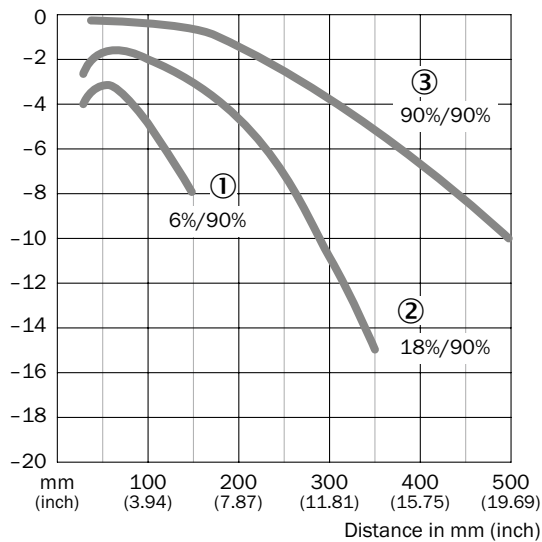
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WTB12-3, infrared light

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

WTF12-3, 175 mm

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

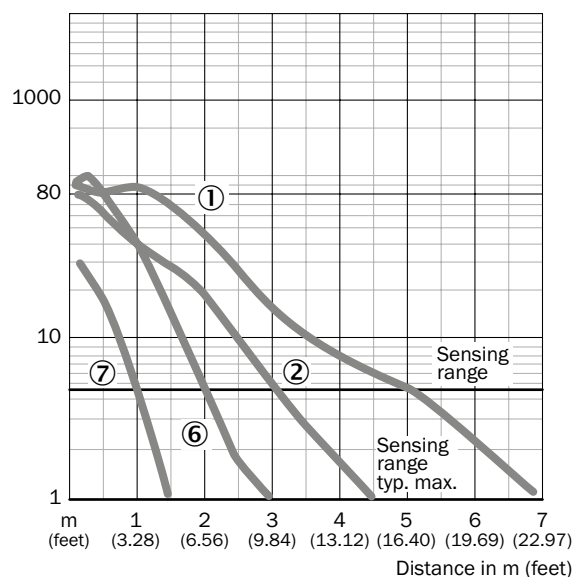
WTF12-3, 500 mm

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

G

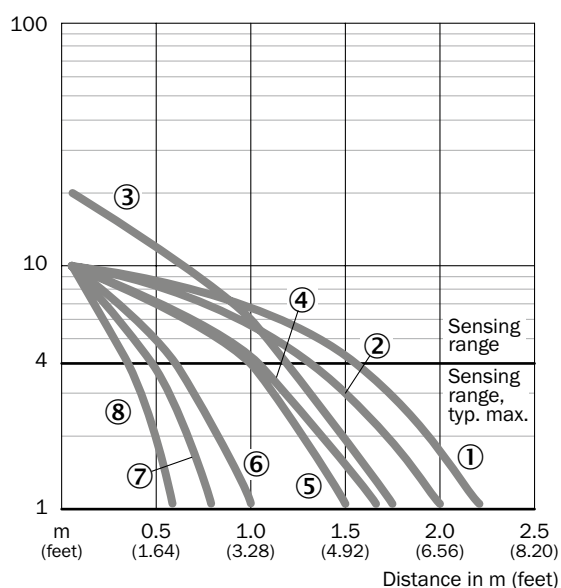
Operating reserve

WL12-3



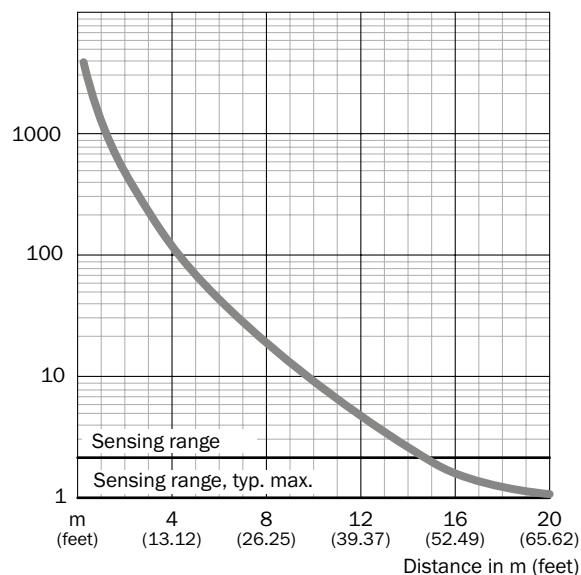
- ① Reflector type PL80A
- ② Reflector type C110A
- ⑥ Reflector type PL20A
- ⑦ Reflective tape

WL12-3, focused



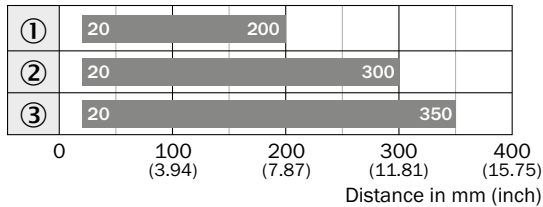
- ① Reflector type C110A
- ② Reflector type PL80A
- ③ Reflector type P205
- ④ Reflector type PL50A
- ⑤ Reflector type PL40A
- ⑥ Reflector type PL30A
- ⑦ Reflector type PL20A
- ⑧ Reflector type DG/IRF6000

WSE12-3



Bar diagrams

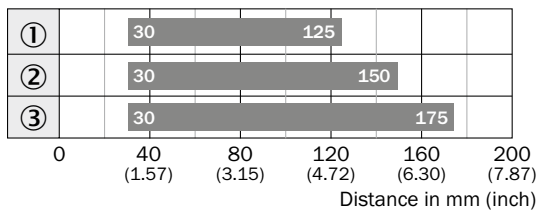
WTB12-3, red light, 350 mm



■ Sensing range

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

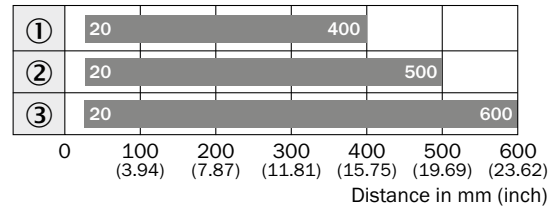
WTF12-3, 175 mm



■ Sensing range

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

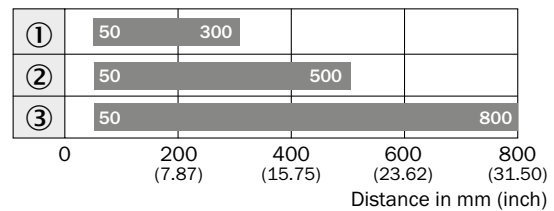
WTB12-3, infrared light



■ Sensing range

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

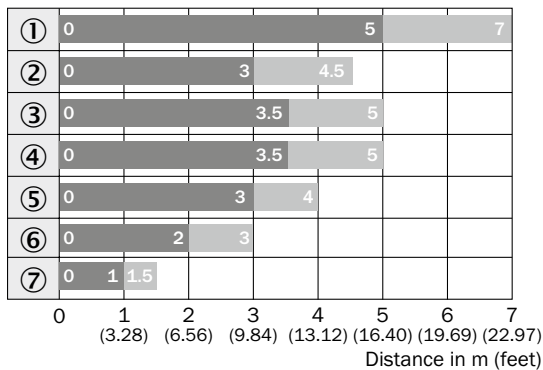
WTF12-3, 500 mm



■ Sensing range

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

WL12-3

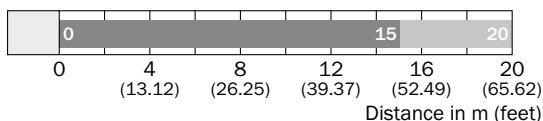


■ Sensing range

■ Sensing range typ. max.

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

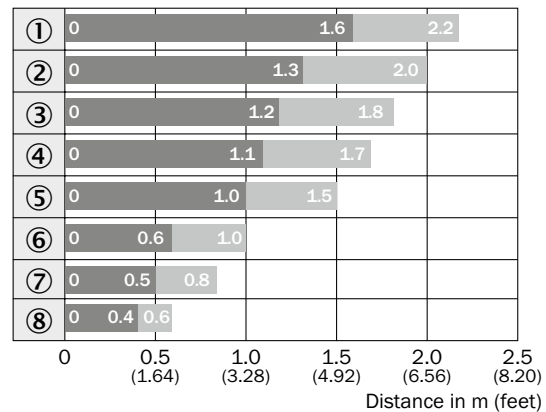
WSE12-3



■ Sensing range

■ Sensing range typ. max.

WL12-3, focused



■ Sensing range

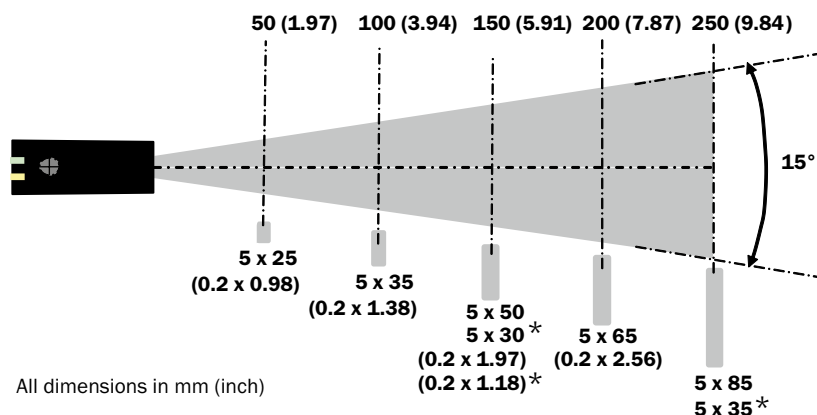
■ Sensing range typ. max.

- ① C110A
 ② PL80A
 ③ PL50A
 ④ PL40A
 ⑤ PL30A
 ⑥ PL20A
 ⑦ Reflective tape
 ⑧ Reflective tape

Diamond Grade

Light spot diameter

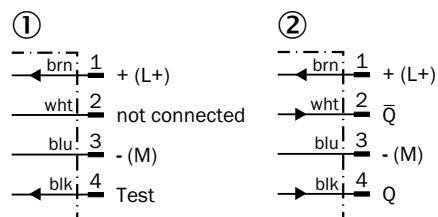
WTB12-3, line shaped light spot



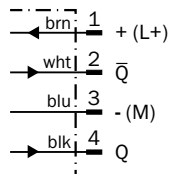
*The angle of reception is smaller than the angle of dispersion therefore the effective length of the light spot is smaller than the real visible line-shaped light spot.

Connection diagram

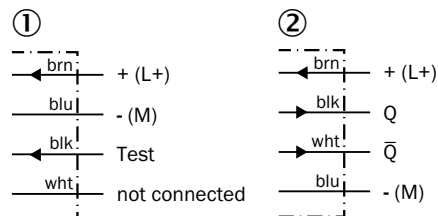
Cd-072



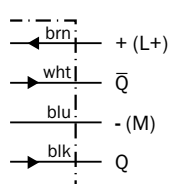
Cd-083



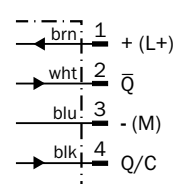
Cd-088



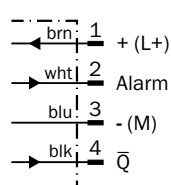
Cd-094



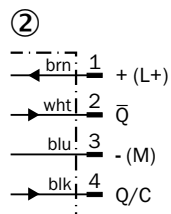
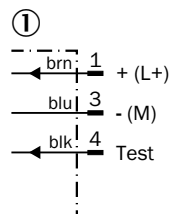
Cd-098



Cd-110



Cd-268



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

Figure	Connection type head A	Connection type head B	Connecting cable	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	TPU	IP 67	DOL-1204-G02M	6009382
			5 m, 4-wire	TPU	IP 67	DOL-1204-G05M	6009866
	Female connector, M12, 4-pin, angled, with 3 LEDs	Cable, open conductor heads	2 m, 4-wire	TPU	IP 67	DOL-1204-L02M	6027945
			5 m, 4-wire	TPU	IP 67	DOL-1204-L05M	6027944
				PVC	IP 67, IP 69K	DOL-1204-L05MN	6028137
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	TPU	IP 67	DOL-1204-W02M	6009383
			5 m, 4-wire	TPU	IP 67	DOL-1204-W05M	6009867
			10 m, 4-wire	TPU	IP 67	DOL-1204-W10M	6010541

G

Masks

Figure	Description	Model name	Part no.
	Mask card for WS/WE12-3 with 2 self-adhesive masks each for sender and receiver, slot width X: 0.5 mm/1.0 mm/1.5 mm/2.0 mm	BL-12-SKN	4031815

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

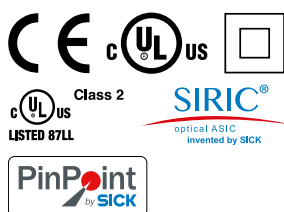
Terminal and alignment brackets

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

Cost-effective photoelectric sensors for demanding applications



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

Additional information

Detailed technical data.....	G-545
Ordering information.....	G-546
Dimensional drawings.....	G-548
Adjustments.....	G-549
Characteristic curves.....	G-550
Bar diagrams.....	G-552
Connection diagram.....	G-553
Recommended accessories....	G-553

→ 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.



Detailed technical data

Features

	WT14-2	WL14-2	WS/WE14-2
Sensor principle	Photoelectric proximity sensor	Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Detection principle	Background suppression/energetic (depending on type)	Standard optics	–
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.	20 mm ... 1,500 mm ¹⁾ (depending on type)	0.15 m ... 17 m ²⁾ (depending on type)	0 m ... 15 m
Sensing range	50 mm ... 1,500 mm ¹⁾ (depending on type)	0.15 m ... 12 m ²⁾ (depending on type)	0 m ... 10 m
Type of light	Visible red light/Infrared light (depending on type)	Visible red light	
Light source	LED ³⁾ /PinPoint-LED ³⁾ (depending on type)		LED ³⁾
Angle of dispersion	–	Approx. 2°/approx. 0.9° (depending on type)	–
Wave length			
Visible red light	675 nm/637 nm (depending on type)	645 nm/637 nm (depending on type)	645 nm
Infrared light	870 nm	–	
Adjustment	Potentiometer, 4 turns Single teach-in button (depending on type)	Single teach-in button	–
Special feature	Line-shaped light spot (depending on type)	–	

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

	WT14-2	WL14-2	WS/WE14-2
Supply voltage ¹⁾	10 V DC ... 30 V DC		
Ripple ²⁾	5 V _{pp}		
Power consumption	≤ 25 mA ³⁾ ... ≤ 55 mA ³⁾ (depending on type)	≤ 35 mA ³⁾	–
Power consumption, sender	–		35 mA ³⁾
Power consumption, receiver	–		25 mA ³⁾
Output type	PNP/NPN (depending on type)		
Output function	Complementary		
Switching mode	Light/dark-switching		
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)	Cable, 2 m ⁶⁾ Male connector, M12 Cable with connector, M12 ⁶⁾ (depending on type)	Cable, 2 m ⁶⁾ Male connector, M12 (depending on type)
Circuit protection	A ⁷⁾ , C ⁸⁾ , D ⁹⁾		

	WT14-2	WL14-2	WS/WE14-2
Weight			
	Connector M12, 4-pin	40 g	
	Cable/cable with connector	120 g	
Polarisation filter	–	✓	–
Housing material	ABS		
Optics material	PMMA		
Enclosure rating	IP 67		
Ambient operating temperature	–30 °C ... +60 °C	–25 °C ... +60 °C	
Ambient storage temperature	–40 °C ... +70 °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.

Ordering information

Other models available at 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. ¹⁾	Light spot size (distance)	Output type	Adjustment	Connection	Connection diagram	Model name	Part no.
Back-ground 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	Potentiometer, 4 turns	Cable, 4-wire 2 m PVC	Cd-094	WT14-2P122	1026051
						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

¹⁾ 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. ¹⁾	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

¹⁾ 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. ¹⁾	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

¹⁾ 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. ¹⁾	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

¹⁾ PL80A.

WS/WE14-2

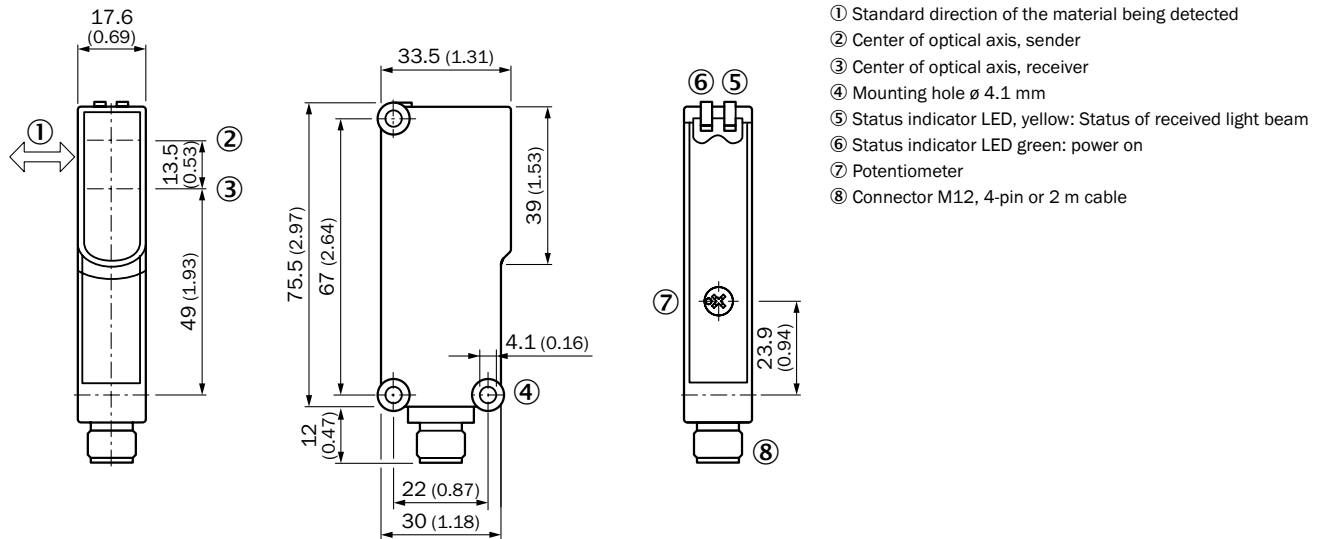
- **Sensor principle:** through-beam photoelectric sensor
- **Switching mode:** light/dark-switching

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

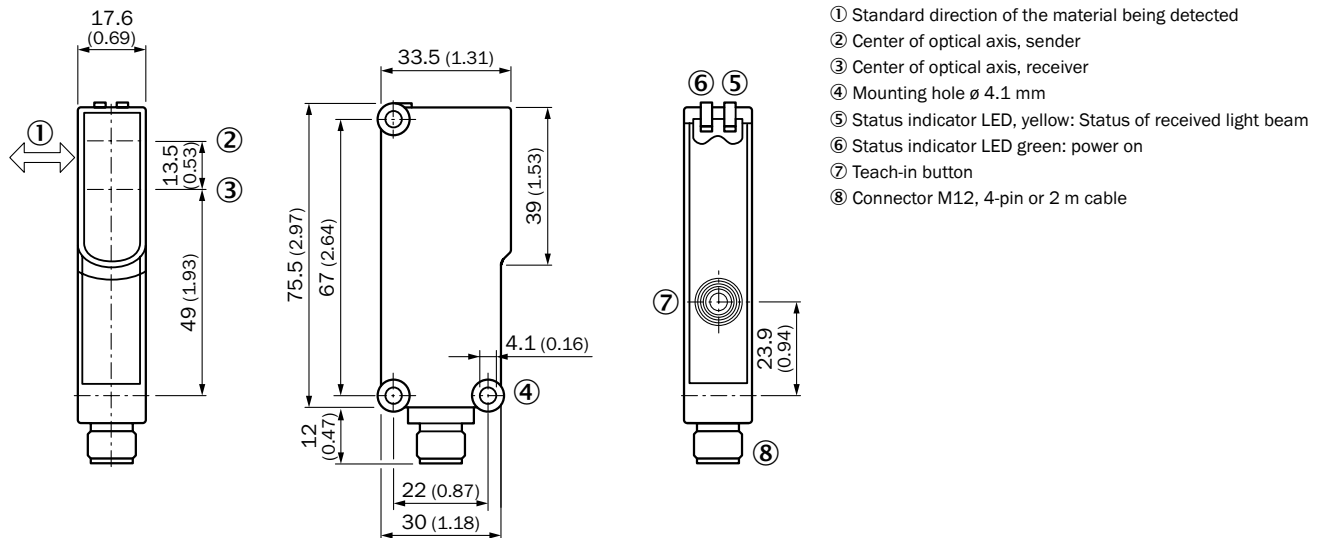
Dimensional drawings

Dimensions in mm (inch)

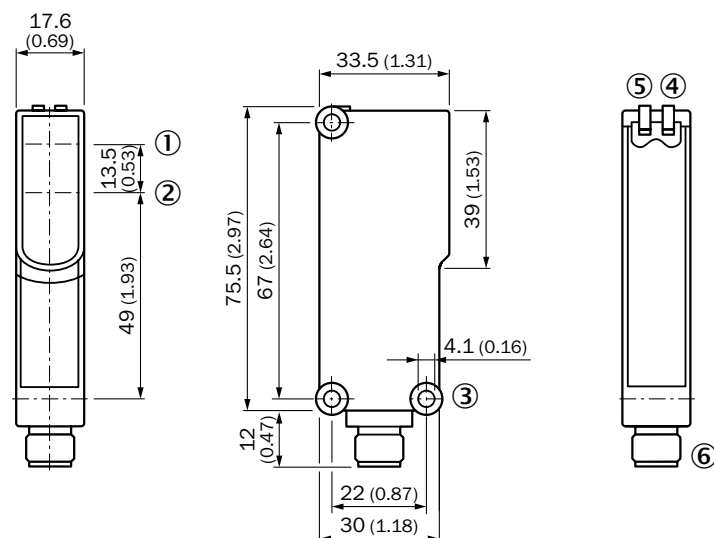
WT14-2, potentiometer



WT14-2, single teach-in button

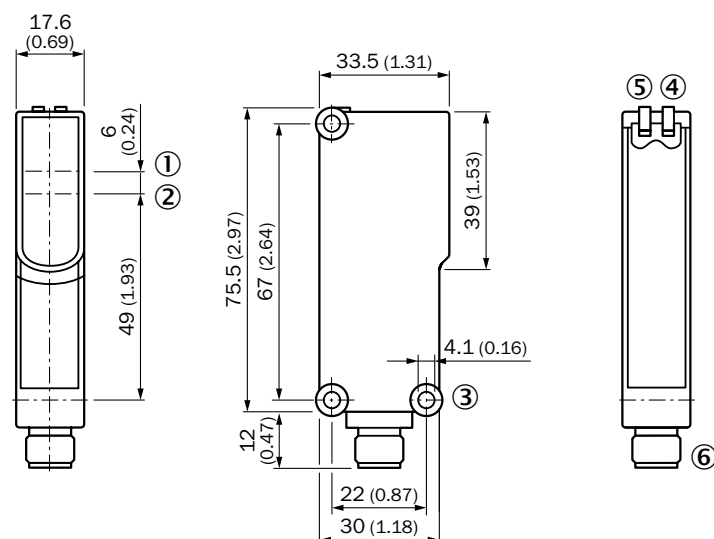


WL14-2



- 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

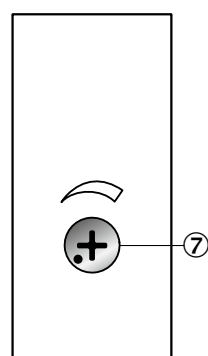
WS/WE14-2



- 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

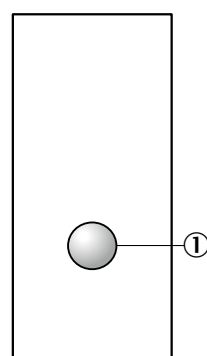
Adjustments

Potentiometer



- ⑦ Sensing range adjustment: potentiometer, 4-turn

Single teach-in button

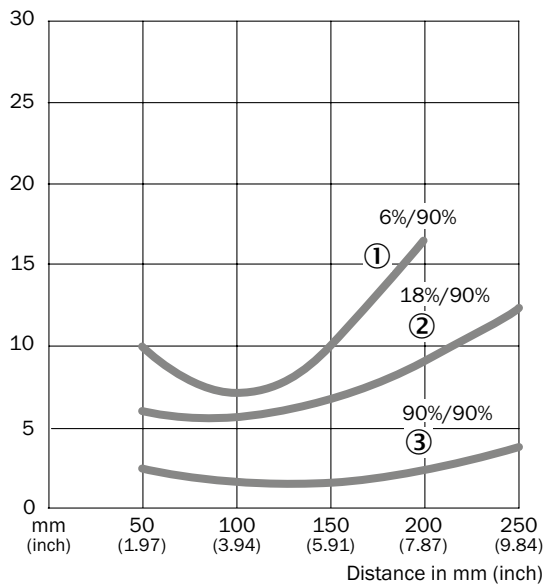


- ① Teach-in button

Characteristic curves

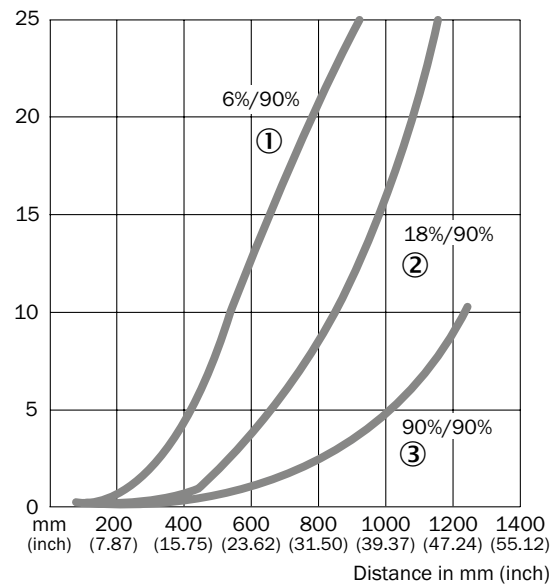
Black-white shift

WT14-2, red light, 250 mm



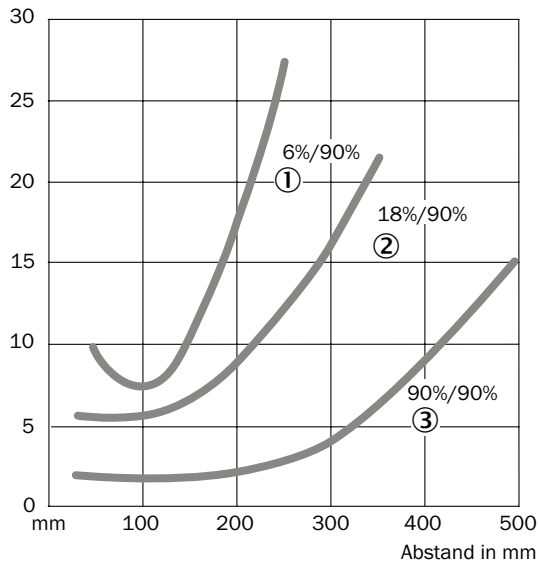
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WT14-2, red light, 1300 mm



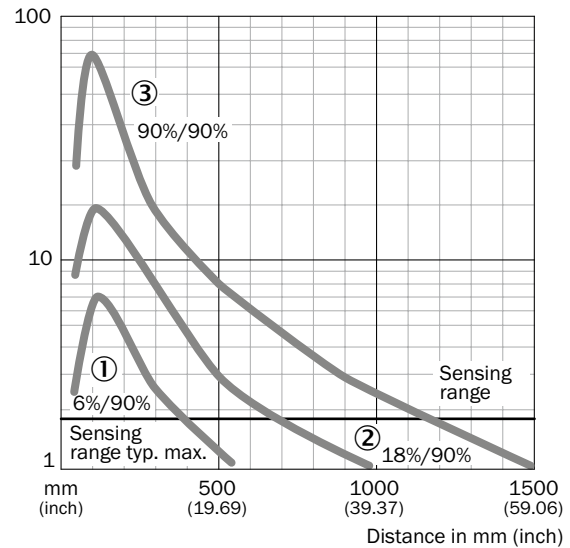
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

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

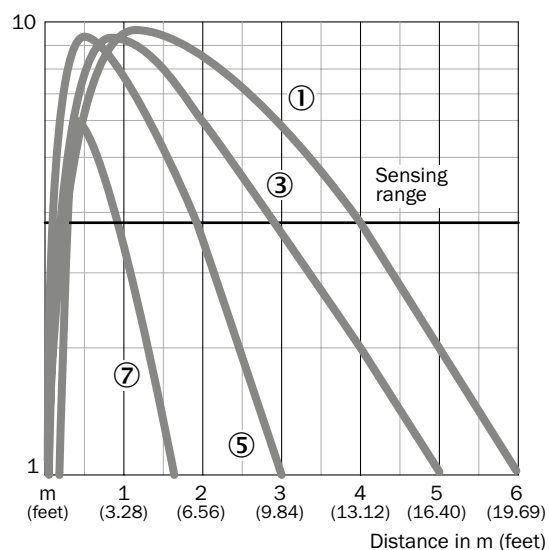
WT14-2, infrared light, 1500 mm



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

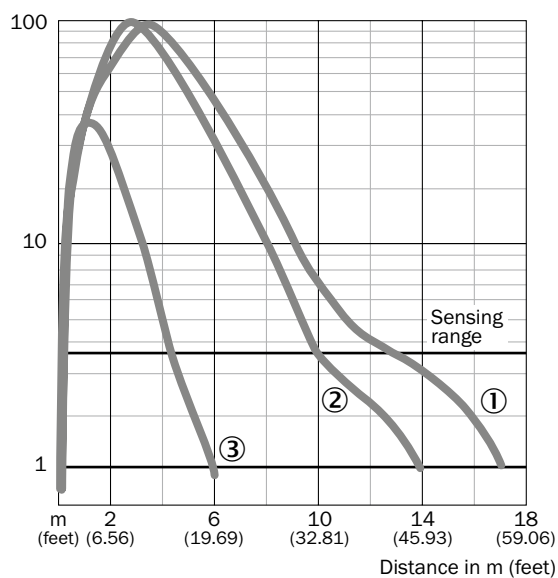
Operating reserve

WL14-2, 6 m



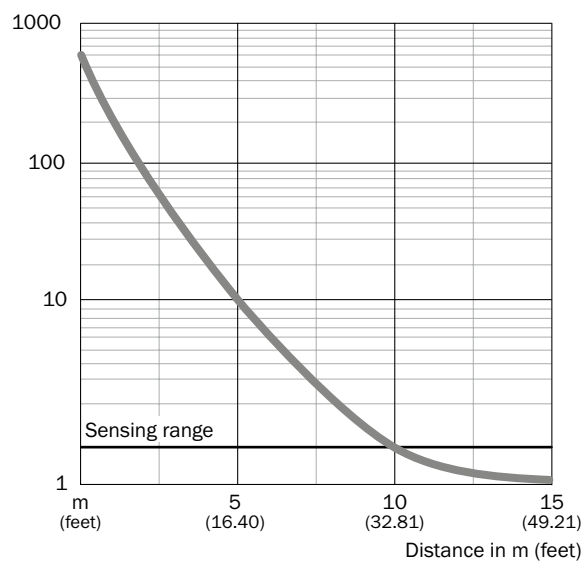
- ① PL80A
- ③ PL40A
- ⑤ PL20A
- ⑦ Reflective tape Diamond Grade

WL14-2, 17 m



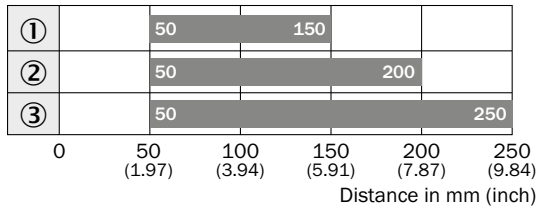
- ① PL80A
- ② PL40A
- ③ Reflective tape REF-IRF-56

WS/WE14-2



Bar diagrams

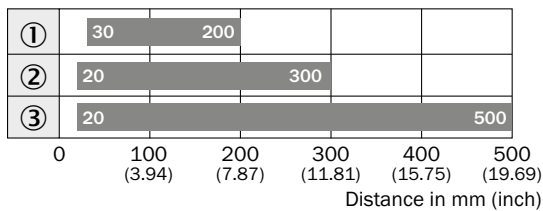
WT14-2, red light, 250 mm



■ Sensing range

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

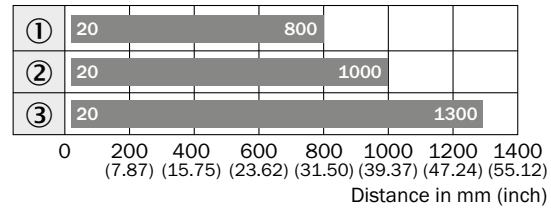
WT14-2, infrared light, 500 mm



■ Sensing range

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

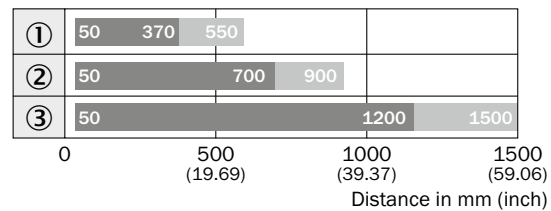
WT14-2, red light, 1300 mm



■ 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

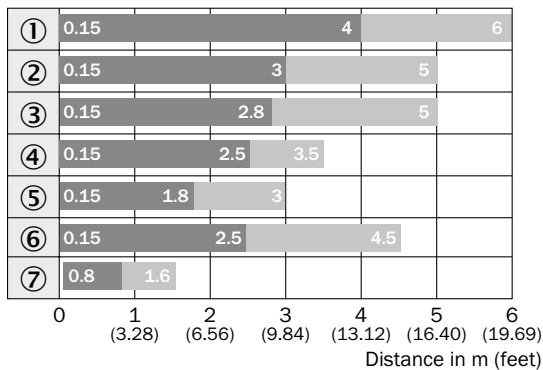


■ Sensing range

■ 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

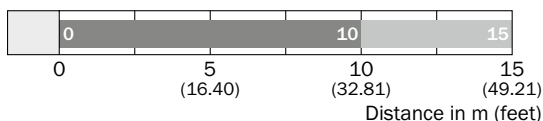


■ Sensing range

■ Sensing range max.

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

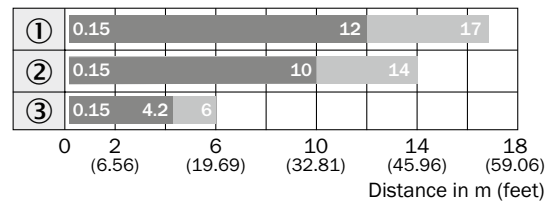
WS/WE14-2



■ Sensing range

■ Sensing range typ. max.

WL14-2, 17 m



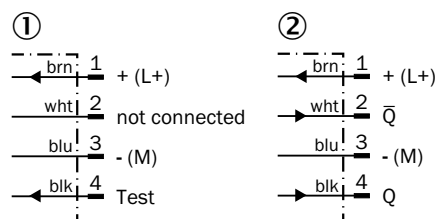
■ Sensing range

■ Sensing range max.

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

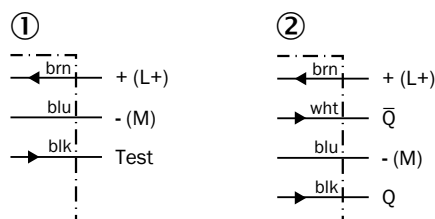
Connection diagram

Cd-072



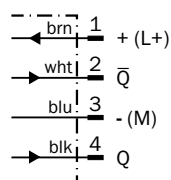
① Sender
② Receiver

Cd-074

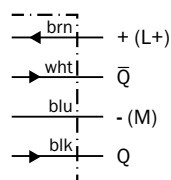


① Sender
② Receiver

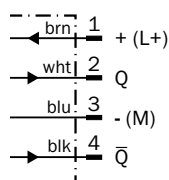
Cd-083



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

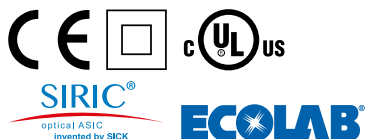
Figure	Description	Model name	Part no.
	Self-adhesive, 50 mm x 60 mm	REF-IRF-56	5314244

Round

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

→ For additional accessories, please see page L-861

Reliable object detection for demanding applications



Additional information

Detailed technical data.....	G-557
Ordering information.....	G-559
Dimensional drawings	G-561
Adjustments	G-563
Characteristic curves	G-564
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Connection diagram	G-567
Recommended accessories....	G-568



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

→ 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 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

	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 (de- pending on type)	PNP	PNP/NPN (de- pending on type)	PNP	PNP/NPN (de- pending 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
	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)	PNP	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
			NPN	Double teach-in button	Cable, 4-wire 2 m PVC	Cd-094	WT18-3P131	1026034
					Connector M12, 4-pin	Cd-083	WT18-3P431	1026032
Infrared light	10 mm ... 700 mm	Ø 20 mm (400 mm)	PNP	Potentiometer, 4 turns	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
			NPN	Double teach-in button	Cable, 4-wire 2 m PVC	Cd-094	WT18-3P111	1026033
					Connector M12, 4-pin	Cd-083	WT18-3P411	1026031
	10 mm ... 1,000 mm	Ø 30 mm (600 mm)	PNP	Potentiometer, 4 turns	Cable, 4-wire 2 m PVC	Cd-094	WT18-3P120	1025904
					Connector M12, 4-pin	Cd-083	WT18-3P420	1025905
						Cd-102	WT18-3K420	1061203
			NPN	Double teach-in button	Cable, 4-wire 2 m PVC	Cd-094	WT18-3P120	1025904
					Connector M12, 4-pin	Cd-083	WT18-3P420	1025905
						Cd-102	WT18-3K420	1061203

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)	PNP	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
		NPN		-	Cable, 4-wire 2 m PVC	Cd-094	WL18-3N130	1025913
					Connector M12, 4-pin	Cd-083	WL18-3N430	1025915
				✓	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

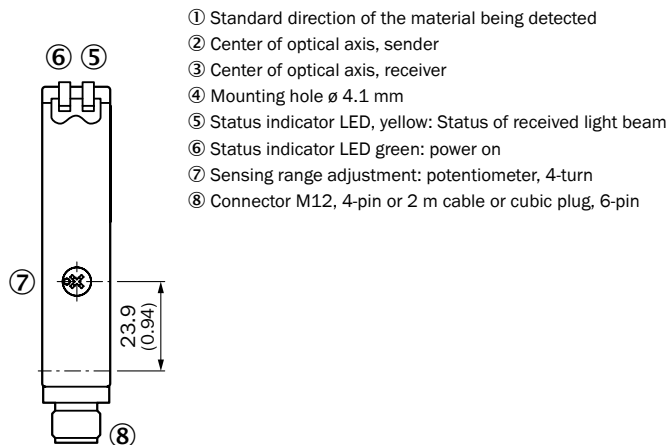
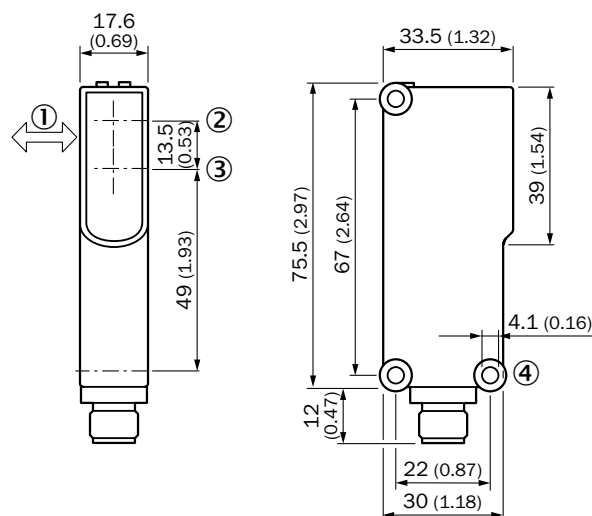
- **Sensor principle:** through-beam photoelectric sensor
- **Switching mode:** light/dark-switching

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
			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
Infrared light	0 m ... 20 m	Ø 950 mm (15 m)	PNP	Potentiometer, 1 turn	Connector M12, 4-pin	Cd-072	WS/WE18-3P410	1025927

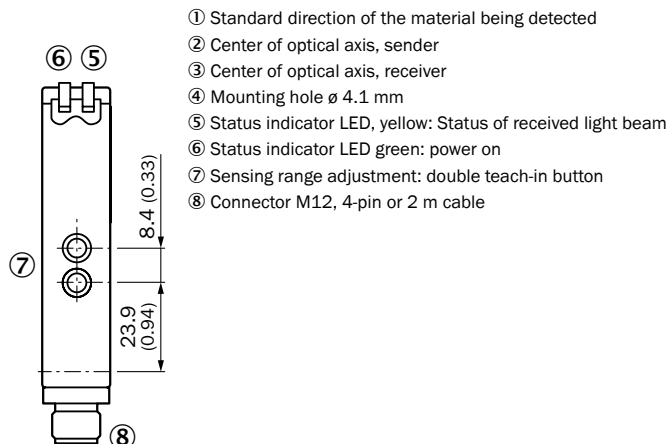
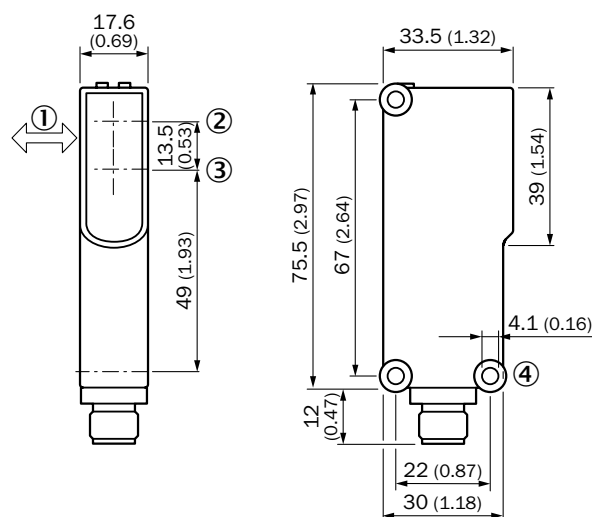
Dimensional drawings

Dimensions in mm (inch)

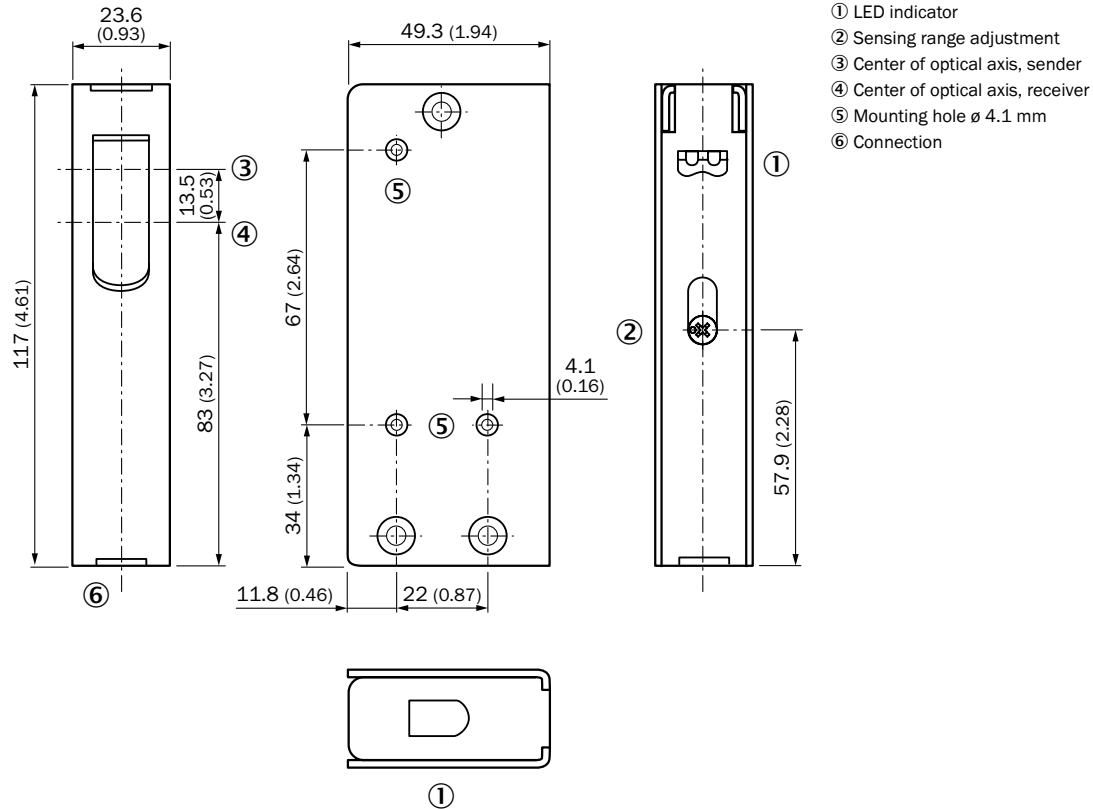
WT18-3, potentiometer



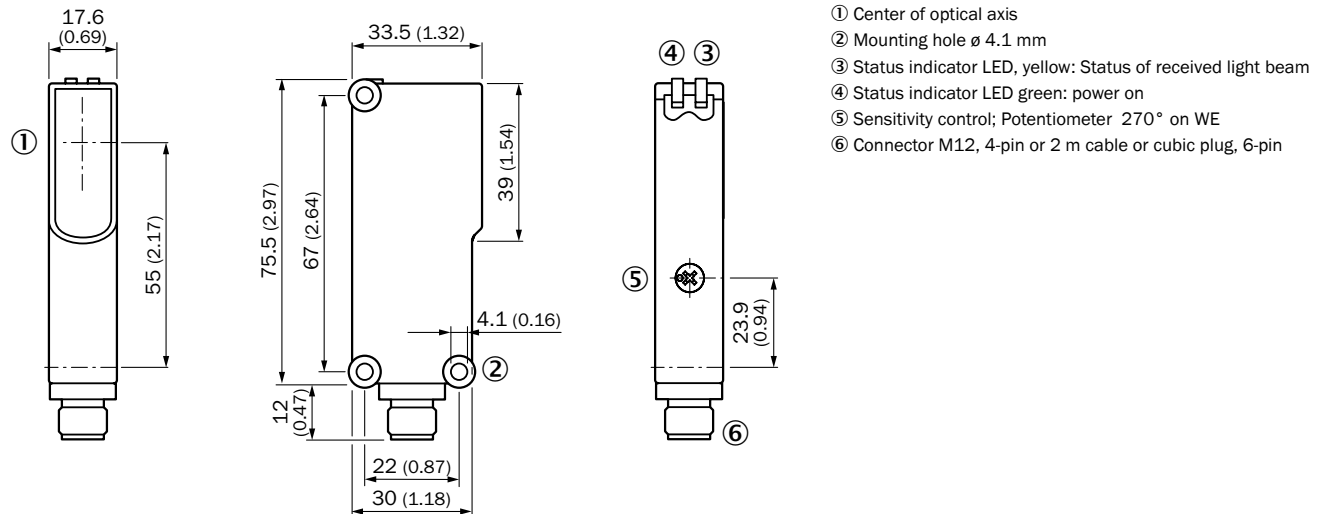
WTB18-3, double teach-in button



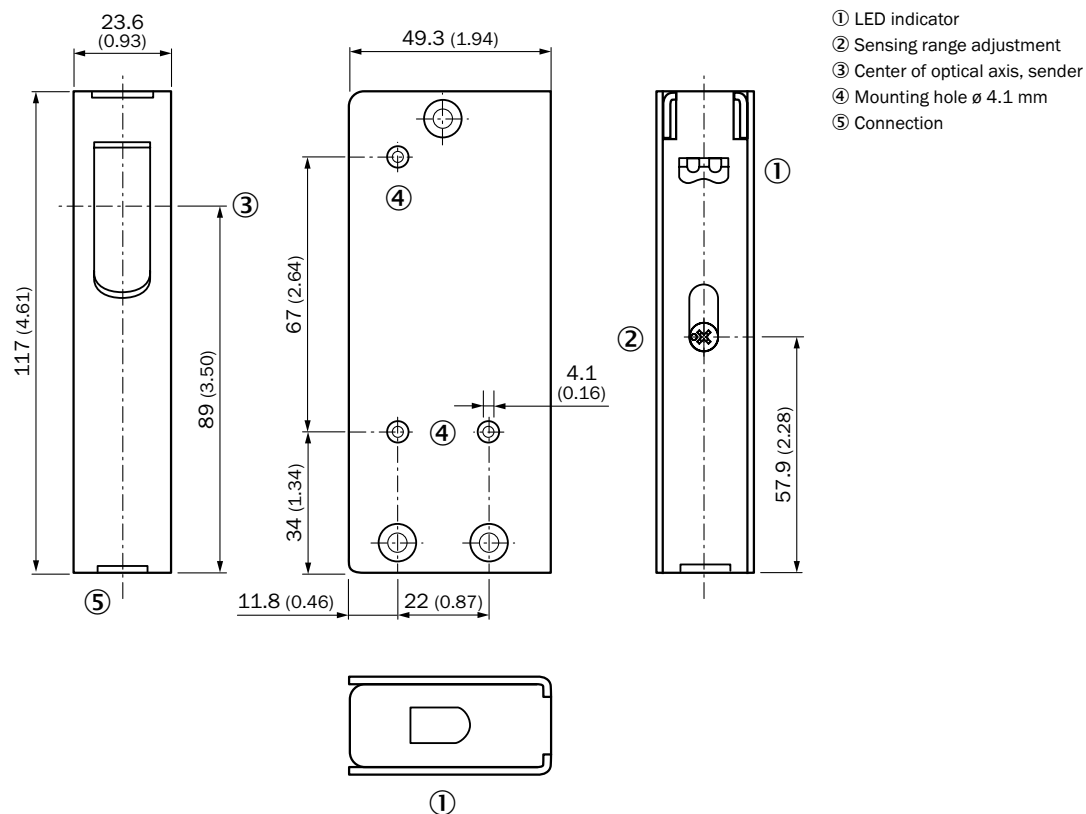
WT18-3 Ex



WL18-3, WS/WE18-3

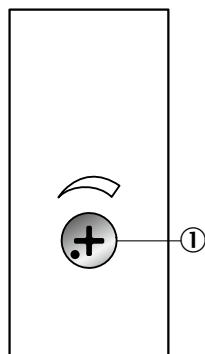


WL18-3 Ex



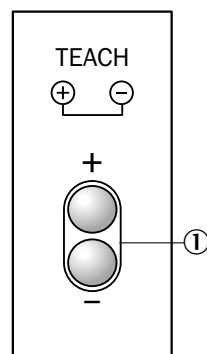
Adjustments

Potentiometer



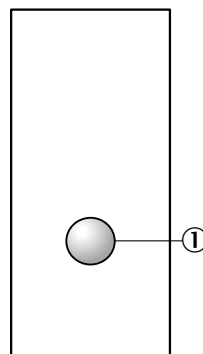
① Sensing range adjustment: potentiometer, 4-turn

Double teach-in button



① Sensing range adjustment: double teach-in button

Single teach-in button

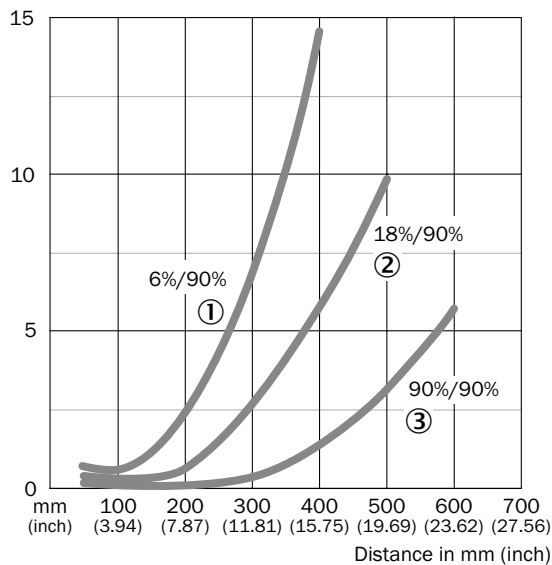


① Teach-in button

Characteristic curves

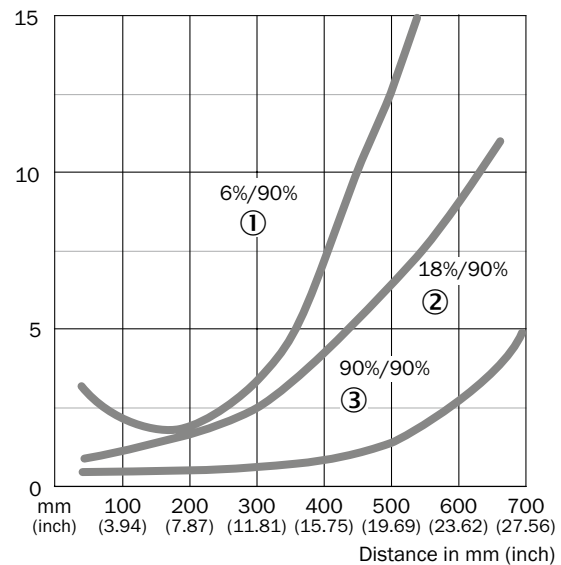
Black-white shift

WT18-3, red light



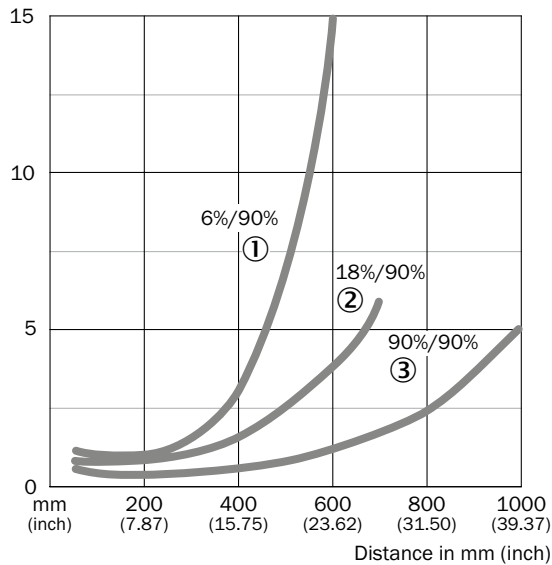
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WT18-3, infrared, 700 nm



- 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 nm

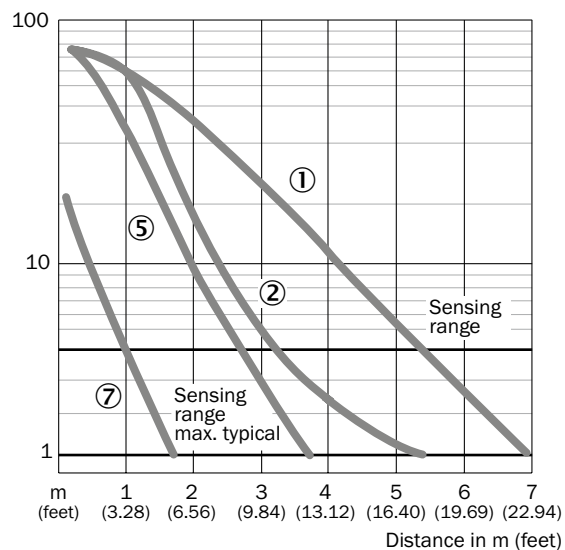


- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

G

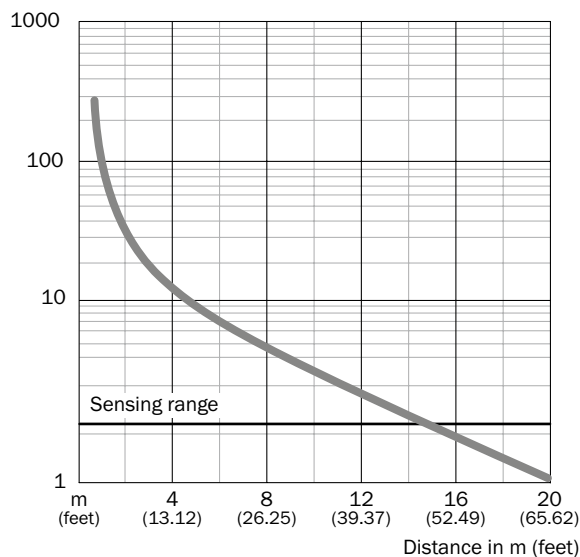
Operating reserve

WL18-3, WL18-3 Ex



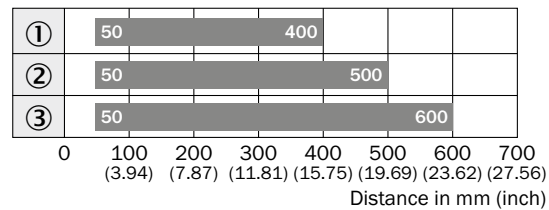
- ① PL80A
- ② C110A
- ⑤ PL30A
- ⑦ Reflective tape Diamond Grade

WS/WE18-3



Bar diagrams

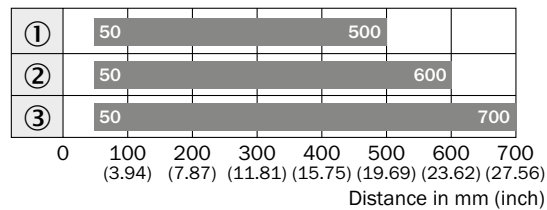
WT18-3, red light



■ 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

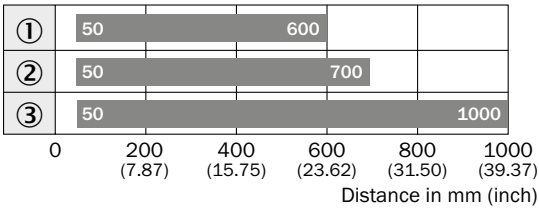


■ Sensing range

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

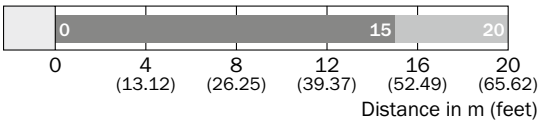
G

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



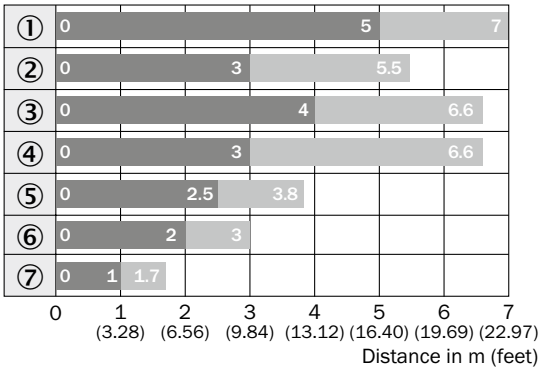
- Sensing range
- ① Sensing range on black, 6 % remission
② Sensing range on gray, 18 % remission
③ Sensing range on white, 90 % remission

WS/WE18-3



- Sensing range ■ Sensing range typ. max.

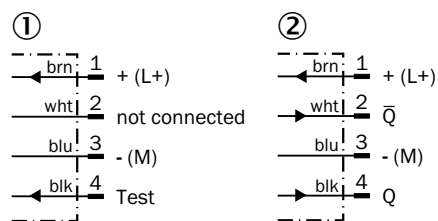
WL18-3, WL18-3 Ex



- Sensing range ■ Sensing range max.
- ① PL80A
② C110A
③ PL50A
④ PL40A
⑤ PL30A
⑥ PL20A
⑦ Reflective tape Diamond Grade

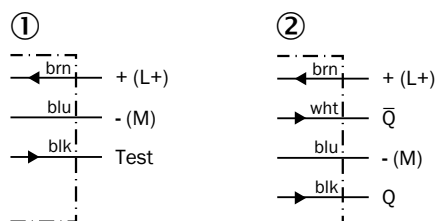
Connection diagram

Cd-072



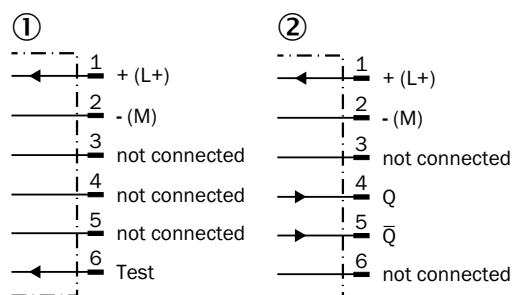
① Sender
② Receiver

Cd-074



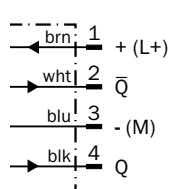
① Sender
② Receiver

Cd-075

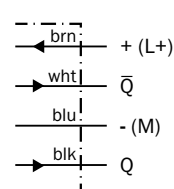


① Sender
② Receiver

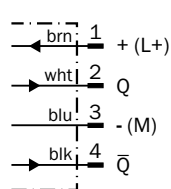
Cd-083



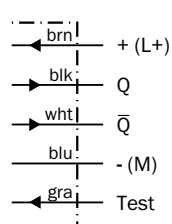
Cd-094



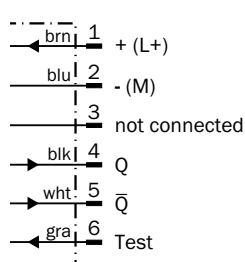
Cd-102



Cd-141



Cd-178



G

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

Sturdiness is their strength: SICK's compact sensors

H The harsh climate of a port, the high temperature of a steel mill, or a through-put-optimized logistics center: the challenge for sensors is precise and reliable functioning even under the least favorable conditions. This is achieved with the latest PinPoint LEDs, intelligent ASIC, μ C and IO-Link technology together with rugged plastic or metal housings. An extensive range of specialized accessories ensures broader application options including even the most extreme cases.

Your benefits

- The large sensing range and high operating reserves ensure a high level of reliability during use
- Extremely resistant to vibrations and immune to ambient conditions
- Reliable operation in ambient light, with optical reflections, and when devices are mounted opposite one another
- Reduces setup costs, e.g., in case of format adjustment using an IO-Link sensor communication interface
- PinPoint technology can replace laser photoelectric proximity sensors in some applications, eliminating the need for laser safety measures, and the service life of the PinPoint LED is double that of conventional laser diodes





Compact photoelectric sensors

Product selection	H-572
Product family overview	H-576

H

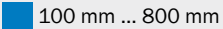
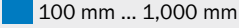
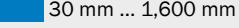
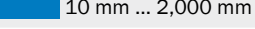
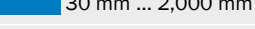
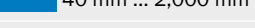
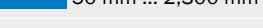
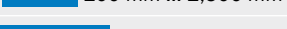
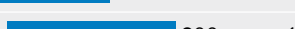
	W23-2 H-580 Simple, economical and reliable		W27-3 Ex H-632 Ready-to-install sensors compliant with ATEX category 3G/3D
	W24-2 H-590 Long-range sensor with a metal housing for harsh environments		W250-2 H-640 High performance in a compact housing with universal AC/DC voltage
	W24-2 Ex H-602 W24-2 for use in Category 2G explosive environments (gas)		W280-2 H-654 Sensor kit with mounting bracket and reflector
	W27-2 Laser H-610 Photoelectric proximity sensor with a small laser light spot and a large sensing range		W280L-2 Long Range H-666 Laser class 1 photoelectric proximity sensors – great performance, simple operation
	W27-3 H-616 Precise, durable and powerful solution for a wide range of applications		W2000 H-672 Power, flexibility and reliability for long-range applications

Overview of compact photoelectric sensors

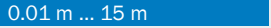
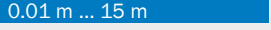
	Housing properties						Sensor properties							
	Material			Enclosure rating										
	Plastic	Metal	Explosion protection housing 	IP 66	IP 67	IP 69K 	Photoelectric proximity sensor	Energetic	Background suppression	Photoelectric retro-reflective sensor	Standard optics	Through-beam photoelectric sensor	AC/DC	
W23														
W23-2	■				■		■	■	■	■	■			
W24														
W24-2		■			■	■	■		■	■	■	■	■	
W24-2 Ex	■		■		■		■		■	■	■			
W27														
W27-2 Laser	■				■		■		■					
W27-3	■			■	■	■	■		■	■	■	■	■	
W27-3 Ex	■		■		■		■		■	■	■	■		
W250														
W250-2	■				■		■		■	■	■	■	■	
W280														
W280-2	■			■	■		■	■		■	■	■	■	
W280L-2 Long Range 	■				■		■		■					
W2000	■				■		■	■		■	■	■	■	

	Optical properties					Special applications			Page
	Type of light/Light sender				Technology				
	LED infrared light	LED red light	Red laser light	PinPoint LED red light	SIRIC®	Detecting small objects	Detecting objects wrapped in film	Explosive areas	
	■	■		■	■		■		H-580
	■	■			■				H-590
	■	■			■			■	H-602
			■		■	■			H-610
	■	■		■	■		■		H-616
	■	■			■			■	H-632
		■							H-640
		■							H-654
			■			■			H-666
	■	■							H-672

Photoelectric proximity sensors

	 Maximum sensing range	 Dimensions (W x H x D)	Page
W27-2 Laser	 100 mm ... 800 mm	24.6 mm x 80 mm x 53.5 mm	H-610
W250-2	 100 mm ... 1,000 mm	20 mm x 65 mm x 43.9 mm	H-640
W27-3 Ex	 30 mm ... 1,600 mm	31.4 mm x 112.3 mm x 70.4 mm	H-632
W280-2	 10 mm ... 2,000 mm	23.5 mm x 74.5 mm x 63 mm	H-654
W27-3	 30 mm ... 2,000 mm	24.6 mm x 80.6 mm x 54 mm	H-616
W24-2 Ex	 40 mm ... 2,000 mm	27 mm x 87.5 mm x 65 mm	H-602
W23-2	 50 mm ... 2,300 mm	24.6 mm x 80.6 mm x 54 mm	H-580
W24-2	 100 mm ... 2,500 mm	27 mm x 87.5 mm x 65 mm	H-590
W2000	 0 mm ... 3,500 mm	45 mm x 73.7 mm x 48.6 mm	H-672
W280L-2 Long Range	 200 mm ... 18,000 mm	23.5 mm x 76 mm x 55.8 mm	H-666

Photoelectric retro-reflective sensors

	 Maximum sensing range	 Dimensions (W x H x D)	Page
W23-2	 0.01 m ... 12 m	24.6 mm x 80.6 mm x 54 mm	H-580
W27-3 Ex	 0.01 m ... 15 m	31.4 mm x 112.3 mm x 70.4 mm	H-632
W250-2	 0.01 m ... 15 m	20 mm x 65 mm x 43.9 mm	H-640
W280-2	 0.01 m ... 15 m	23.5 mm x 74.5 mm x 63 mm	H-654
W2000	 0 m ... 15 m	45 mm x 73.7 mm x 48.6 mm	H-672
W27-3	 0.1 m ... 19 m	24.6 mm x 80.6 mm x 54 mm	H-616
W24-2 Ex	 0 m ... 22 m	27 mm x 87.5 mm x 65 mm	H-602
W24-2	 0 m ... 22 m	27 mm x 87.5 mm x 65 mm	H-590

Through-beam photoelectric sensors

	 Maximum sensing range	 Dimensions (W x H x D)	Page
W27-3	 0 m ... 35 m	24.6 mm x 80.6 mm x 54 mm	H-616
W27-3 Ex	 0 m ... 35 m	31.4 mm x 112.3 mm x 70.4 mm	H-632
W250-2	 0 m ... 50 m	20 mm x 65 mm x 43.9 mm	H-640
W2000	 0 m ... 50 m	45 mm x 73.7 mm x 48.6 mm	H-672
W24-2	 0 m ... 60 m	27 mm x 87.5 mm x 65 mm	H-590
W280-2	 0 m ... 60 m	23.5 mm x 74.5 mm x 63 mm	H-654



Product family overview

				
	W23-2	W24-2	W24-2 Ex	
	Simple, economical and reliable	Long-range sensor with a metal housing for harsh environments	W24-2 for use in Category 2G explosive environments (gas)	
Technical data overview				
Dimensions (W x H x D)	24.6 mm x 80.6 mm x 54 mm	27 mm x 87,5 mm x 65 mm	27 mm x 87.5 mm x 65 mm	
Sensing range max.				
Photoelectric proximity sensor	50 mm ... 2,300 mm	100 mm ... 2,500 mm	40 mm ... 2,000 mm	
Photoelectric retro-reflective sensor	0.1 m ... 12 m	0 m ... 22 m	0 m ... 22 m	
Through-beam photoelectric sensor	–	0 m ... 60 m	–	
Supply voltage	DC	DC, AC/DC	–	
Light source	LED/PinPoint LED	LED	LED	
Type of light	Visible red light/Infrared light	Visible red light/Infrared light	Visible red light/Infrared light	
Enclosure rating	IP 67	IP 67, IP 69K	IP 67	
Housing material	Plastic	Metal	Metal	
At a glance				
	• Energetic photoelectric sensor with easy teach-in • Photoelectric proximity sensors with background suppression • Intense red emitting LED with consistent light spot on PinPoint models • Retro-reflective versions provided with and without adjustment • Teach-in pushbutton on energetic proximity versions for quick, repeatable commissioning • Cable or M12 connection	• IP 69K-tested die-cast zinc housing • Terminal chamber protected by the housing • Immune to ambient light and crosstalk • Selectable PNP/NPN, light/dark output • Variants with DC voltage and universal AC/DC voltage with UL approval • Optional test input, time delays, alarm output and front screen heating also available in high-power version. • M12 or terminal chamber connection: both 90° rotatable	• Classification: EX II 2G Ex ia op is IIC T4 according to Directive 94/9/EC (ATEX) • Corresponds to Category 2G • Output type: EN 60947-5-6 (NAMUR) • M12 or terminal chamber connection: 90° rotatable • Durable metal housing • Precise background suppression	
Detailed information	→ H-580	→ H-590	→ H-602	

**W27-2 Laser**

Photoelectric proximity sensor with a small laser light spot and a large sensing range

**W27-3**

Precise, durable and powerful solution for a wide range of applications

**W27-3 Ex**

Ready-to-install sensors compliant with ATEX category 3G/3D

24.6 mm x 80 mm x 53.5 mm	24.6 mm x 80.6 mm x 54 mm	31.4 mm x 112.3 mm x 70.4 mm
100 mm ... 800 mm	30 mm ... 2,000 mm	30 mm ... 1,600 mm
–	0.1 m ... 19 m	0.1 m ... 15 m
–	0.1 m ... 3 m	–
–	0 m ... 35 m	0 m ... 35 m
DC	DC, AC/DC	–
Laser	LED/PinPoint LED	LED
Visible red light	Visible red light/Infrared light	Visible red light/Infrared light
IP 67	IP 65, IP 66, IP 67, IP 69K	IP 67
Plastic	Plastic	Plastic/Metal/Stainless steel

- 2 mm diameter light spot at a distance of 400 mm
- Precise adjustable background suppression
- Visible red laser LED
- Sensing range adjustment via potentiometer
- UL approval

→ H-610

- Intense visible red emitter LED with consistent light spot for PinPoint versions
- Long sensing ranges with IR LED achieve up to 2500 mm
- Precise background suppression for detection of multi-colored objects
- Universal DC or DC/AC supply voltage
- Operating temperature: –40 °C – +60 °C

→ H-616

- Classification: EX II 3G EX nA op is IIB T4 Gc X, EX II 3D EX tc IIIB T135 °C Dc IP67 X according to Directive 94/9/EC (ATEX)
- Corresponds to category 3D/3G
- Conform to standards and ready-to-install: Sensor and additional protective housing (stainless steel 1.4301)
- Long sensing range with IR LED
- High level of operating reserve
- Resistant to ambient light, optical reflections, and crosstalk from other photoelectric devices

→ H-632

H

Product family overview

	 W250-2	 W280-2	
	High performance in a compact housing with universal AC/DC voltage	Sensor kit with mounting bracket and reflector	
Technical data overview			
Dimensions (W x H x D)	20 mm x 65 mm x 43,9 mm 20 mm x 60 mm x 43,9 mm	23,5 mm x 74,5 mm x 63 mm	
Sensing range max.			
Photoelectric proximity sensor	100 mm ... 1.000 mm	10 mm ... 2.000 mm	
Photoelectric retro-reflective sensor	0,01 m ... 15 m	0,01 m ... 15 m	
Through-beam photoelectric sensor	0 m ... 50 m	0 m ... 60 m	
Supply voltage	DC, AC/DC	DC, AC	
Light source	BrightLight-LED	BrightLight-LED	
Type of light	Visible red light	Visible red light	
Enclosure rating	IP 67	IP 66, IP 67	
Housing material	Plastic	Plastic	
At a glance			
	• Highly visible red light spot thanks to the Bright Light LED • Potentiometer for adjusting sensing range • Operating mode (light/dark) selectable via control wire • Cable or rotatable M12 connector • Versions for 10 – 30 V DC or 24 – 240 V DC/ 24 – 240 V AC voltage supply in compact design • Stainless steel mounting bracket BEF-W250 included in delivery	• Highly visible red light spot thanks to the BrightLight LED • Potentiometer for adjusting sensing range • Light/dark switching (DC devices only) • Rotatable connector, cable connection or terminal chamber • Versions for 10 – 30 V DC or 24 – 240 V DC/AC voltage supply • AC/DC (-2Hxxxx) devices are compliant with EN61000-6-3 (electromagnetic interference for “residential, commercial and light-industrial environments”) • Stainless steel mounting bracket and P250 reflector (for WL280 only) are included in delivery	
Detailed information	→ H-640	→ H-654	

**W280L-2 Long Range**

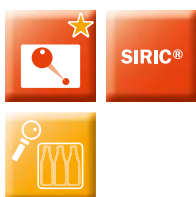
Laser class 1 photoelectric proximity sensors – great performance, simple operation

**W2000**

Power, flexibility and reliability for long-range applications

	23,5 mm x 76 mm x 55,8 mm	45 mm x 73.7 mm x 48.6 mm
	200 mm ... 18.000 mm	0 m ... 3.5 m
	–	0 m ... 15 m
	–	0 m ... 50 m
	DC	DC / AC/DC
	Laser	LED
	Visible red light	Infrared light / visible red light
	IP 67	IP 67, NEMA 6
	Plastic	Plastic
	• WTT280L-2: sensing range up to 4 m • WLT280L-2: sensing range up to 18 m • Complete background suppression: very small black/white shift, insensitive against reflections from the background (e.g. shiny metal, window, safety vest) • Visible red class 1 laser light • Version 1: with 1 x switching output and light/dark switch, version 2: with 2 x switching outputs and light/dark switch • Disable laser by wire • Reliable detection also in very fast production processes thanks to the switching frequency of 1000 Hz	• Rugged, plastic housing • Crosstalk and ambient light immunity • Adjustable sensing range • Signal strength indicator • IP 67/NEMA 6 enclosure rating
	→ H-666	→ H-672

Simple, economical and reliable



Additional information

Detailed technical data.	H-581
Ordering information.	H-582
Dimensional drawings	H-583
Adjustments	H-584
Characteristic curves	H-585
Bar diagrams.	H-586
Connection diagram	H-587
Recommended accessories.	H-588

Product description

The W23-2 family is widely used due its economical price structure and ease of installation. Standard sensor types as proximity and retro-reflective are offered in their simplified versions. The W23-2 type has become one of the most widely used photoelectric sensors, particularly in handling and warehouse systems. Users appreciate its three key qualities – simplicity, tamper-proofing and reliability.

This family also offers special versions, including a retro-reflective variant for detection of plastic wrapped pallets. Laser and PinPoint background suppression variants for detection of small targets further enhance the product offering.

A wide range of accessories is available for mechanical and electrical integration in systems.

At a glance

- Energetic photoelectric sensor with easy teach-in
- Photoelectric proximity sensors with background suppression
- Intense red emitting LED with consistent light spot on PinPoint models
- Retro-reflective versions provided with and without adjustment
- Teach-in pushbutton on energetic proximity versions for quick, repeatable commissioning
- Cable or M12 connection

Your benefits

- Teach-in pushbutton option for quick commissioning
- Easy alignment with PinPoint LED and laser technology
- 360° LEDs provide device status indication from multiple angles

→ www.mysick.com/en/W23-2

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

	WT23-2	WTE23-2	WL23-2
Sensor principle	Photoelectric proximity sensor		Photoelectric retro-reflective sensor
Detection principle	Background suppression	Energetic	Standard optics
Dimensions (W x H x D)	24.6 mm x 80.6 mm x 54 mm		
Housing design (light emission)	Rectangular		
Sensing range max.	50 mm ... 1,000 mm ¹⁾ (depending on type)	50 mm ... 2,300 mm ¹⁾	0.1 m ... 12 m ²⁾ (depending on type)
Sensing range	100 mm ... 1,000 mm (depending on type)	30 mm ... 2,000 mm	0.3 m ... 9 m ²⁾ (depending on type)
Type of light	Infrared light/visible red light (depending on type)	Infrared light	Visible red light
Light source	LED ³⁾		LED ³⁾ /PinPoint LED ³⁾ (depending on type)
Wave length	Infrared light	880 nm	–
	Visible red light	660 nm	660 nm
Adjustment	Potentiometer	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

	WT23-2	WTE23-2	WL23-2
Supply voltage ¹⁾	10 V DC ... 30 V DC		
Ripple ²⁾	≤ 5 V _{pp}		
Power consumption	≤ 35 mA ^{3)/} ≤ 30 mA ³⁾ (depending on type)	≤ 35 mA ³⁾	
Output type	PNP/NPN (depending on type)		
Output function	Complementary		
Switching mode	Light/dark-switching		
Signal voltage PNP HIGH/LOW	Approx. V _s – 2.5 V / 0 V		
Signal voltage NPN HIGH/LOW	Approx. V _S / < 2.5 V		
Output current I _{max}	≤ 100 mA		
Response time	≤ 2.5 ms ⁴⁾		≤ 2.5 ms ^{4)/} ≤ 3.5 ms ⁴⁾ (depending on type)
Switching frequency	200 Hz ⁵⁾		200 Hz ^{5)/} ± 150 Hz ⁵⁾ (depending on type)
Connection type	Cable, 2 m ⁶⁾ Male connector, M12 Cable with connector, M12, 270 mm ⁶⁾ (depending on type)		
Circuit protection	A ⁷⁾ , C ⁸⁾ , D ⁹⁾		
Protection class ¹⁰⁾	II		
Weight			
Connector M12, 4-pin	100 g		
Cable with connector M12, 4-pin	120 g	–	120 g
Cable, 4-wire	–		180 g
Polarisation filter	–		✓

	WT23-2	WTE23-2	WL23-2
Housing material	ABS		
Optics material	PMMA		
Enclosure rating	IP 67		
Ambient operating temperature	-25 °C ... +60 °C		
Ambient storage temperature	-40 °C ... +70 °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: 50 V DC.

Ordering information

Other models available at www.mysick.com/en/W23-2

WT23-2

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

Type of light	Light source	Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Connection diagram	Type	Part no.
Infrared light	LED	50 mm ... 1,000 mm	Ø 50 mm (800 mm)	PNP	Connector M12, 4-pin	Cd-083	WT23-2P2421	1027778
				NPN	Connector M12, 4-pin	Cd-101	WT23-2K2421	1028068
Visible red light	LED	50 mm ... 800 mm	Ø 30 mm (800 mm)	PNP	Connector M12, 4-pin	Cd-083	WT23-2N2421	1028073
					Cable with connector M12, 4-pin, 270 mm, PVC	Cd-083	WT23-2P2441	1027779
						Cd-083	WT23-2P3441	1028066

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

WTE23-2

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** energetic
- **Type of light:** visible red light
- **Switching mode:** light/dark-switching
- **Adjustment:** single teach-in button

Light source	Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Connection diagram	Type	Part no.
LED	50 mm ... 2,300 mm	Ø 160 mm (2,000 mm)	PNP	Connector M12, 4-pin	Cd-083	WTE23-2P2412	1027781
			NPN	Connector M12, 4-pin	Cd-083	WTE23-2N2412	1027782

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

WL23-2

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Type of light:** visible red light
- **Switching mode:** light/dark-switching

Light source	Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Connection diagram	Type	Part no.
LED	0.1 m ... 10 m	Ø 45 mm (2.7 m)	PNP	Cable, 4-wire, 2 m, PVC	Cd-094	WL23-2P1130	1027784
				Connector M12, 4-pin	Cd-083	WL23-2P2430	1027785
				Cable with connector M12, 4-pin, 270 mm, PVC	Cd-083	WL23-2P3430	1027786
			NPN	Connector M12, 4-pin	Cd-083	WL23-2N2430	1027787
PinPoint LED	0.1 m ... 12 m	Ø 45 mm (2.7 m)	PNP	Connector M12, 4-pin	Cd-083	WL23-2P2460	1044165

¹⁾ PL80A.

WL23-2, detecting objects wrapped in film

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Type of light:** visible red light
- **Switching mode:** light/dark-switching

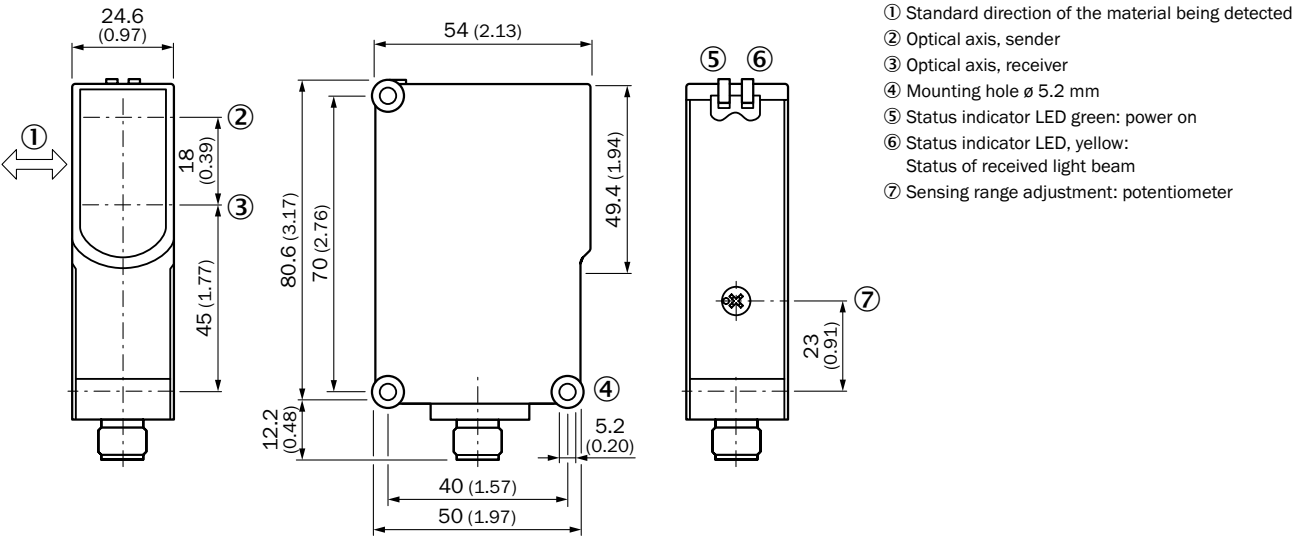
Light source	Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Connection diagram	Type	Part no.
LED	0.1 m ... 4 m	Ø 45 mm (2.7 m)	PNP	Connector M12, 4-pin	Cd-083	WL23-2P2430S01	1041159

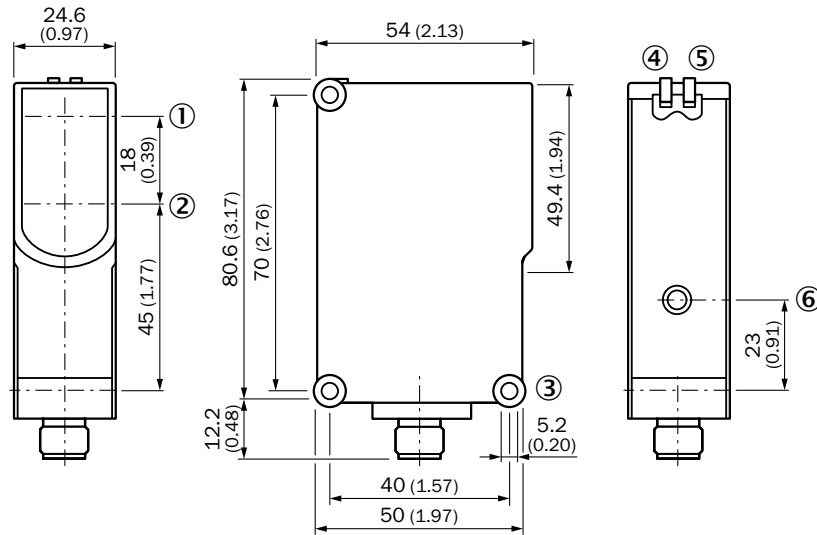
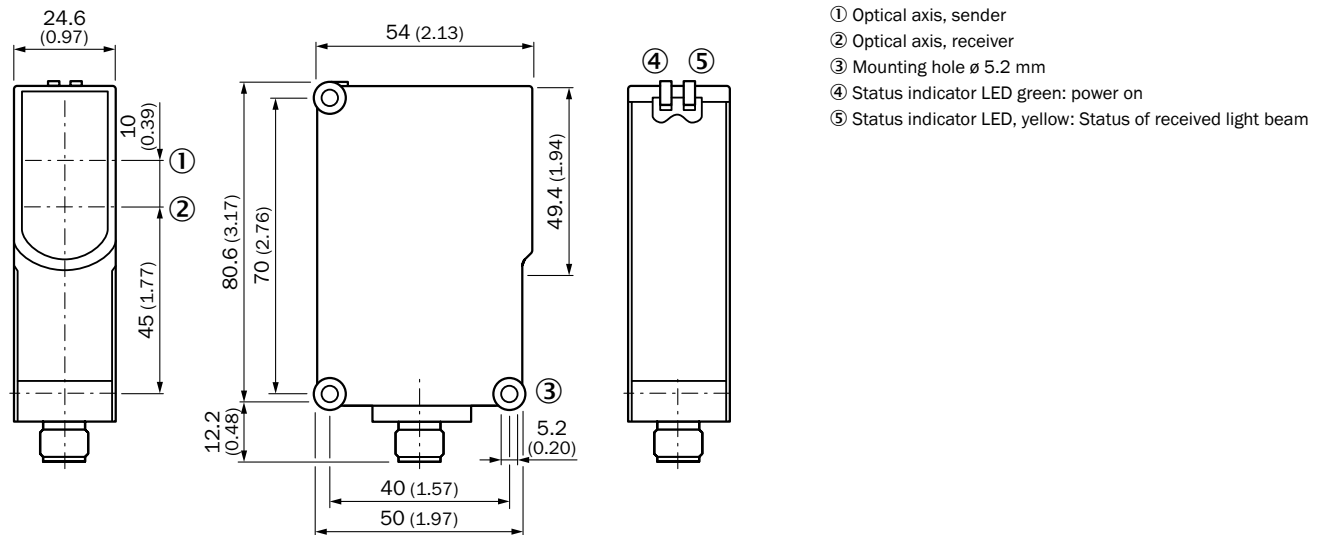
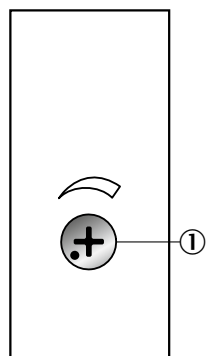
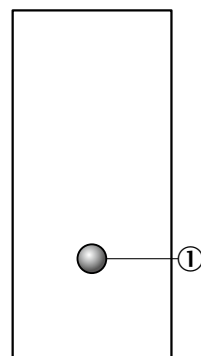
¹⁾ PL80A.

Dimensional drawings

Dimensions in mm (inch)

WT23-2, potentiometer



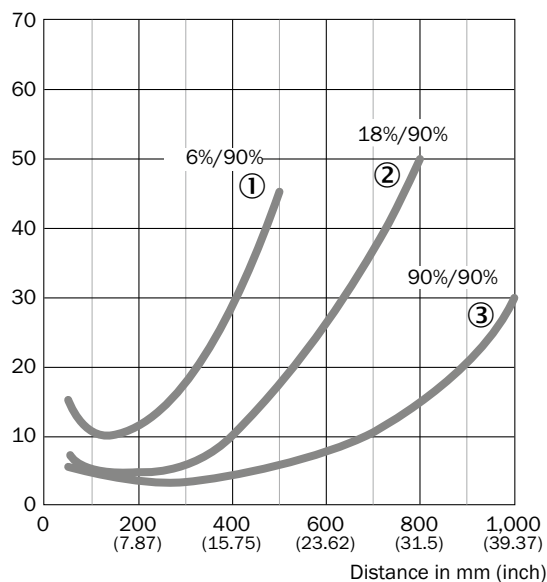
WTE23-2, single teach-in button**WL23-2****Adjustments****Potentiometer**① Sensing range adjustment:
potentiometer**Single teach-in button**① Adjustment sensing range:
single teach button

Characteristic curves

Black-white shift

WT23-2, infrared

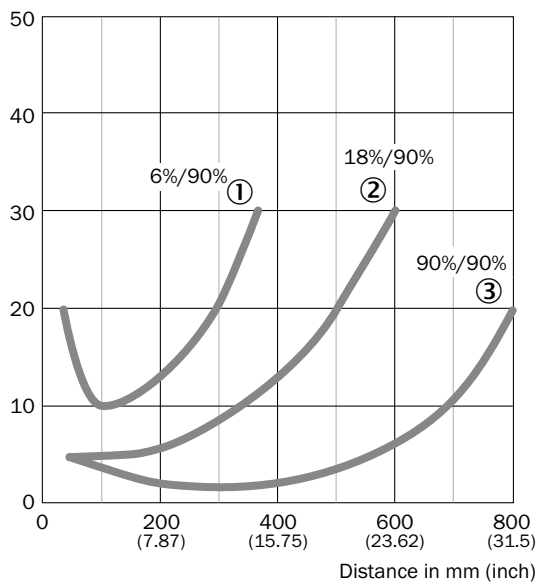
% of sensing range



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

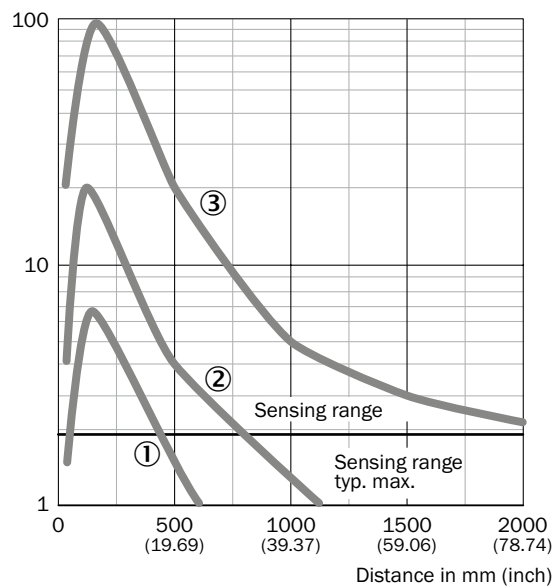
WT23-2, redlight

% of sensing range



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

WT23-2, energetic

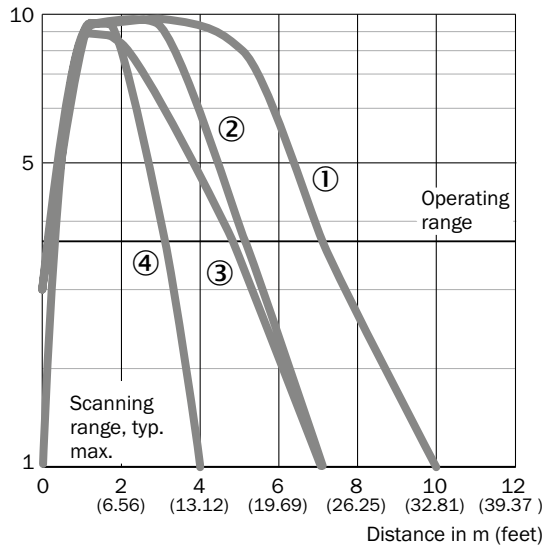


- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

Operating reserve

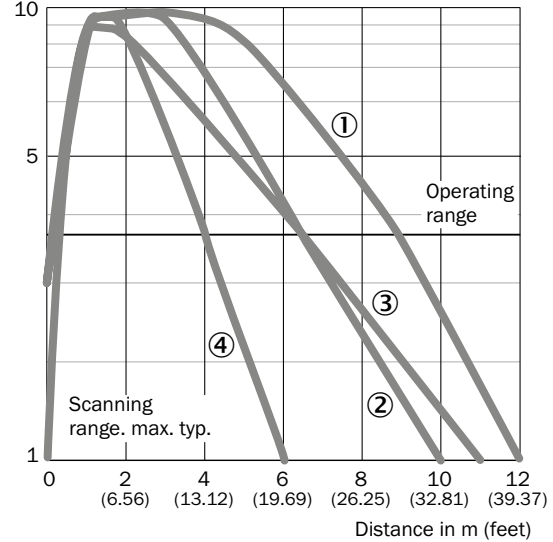
WL23-2

Operating reserve



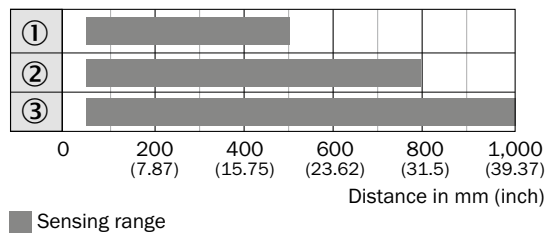
WL23-2, PinPoint

Operating reserve

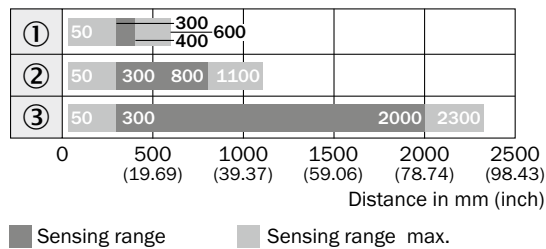


Bar diagrams

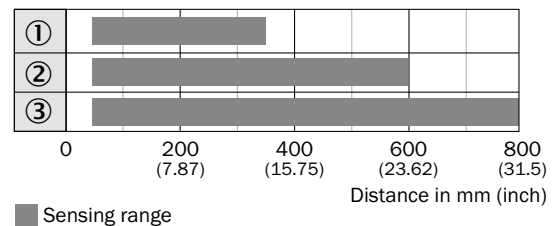
WT23-2, infrared



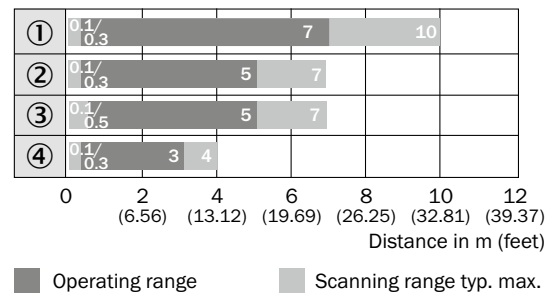
WT23-2, energetic



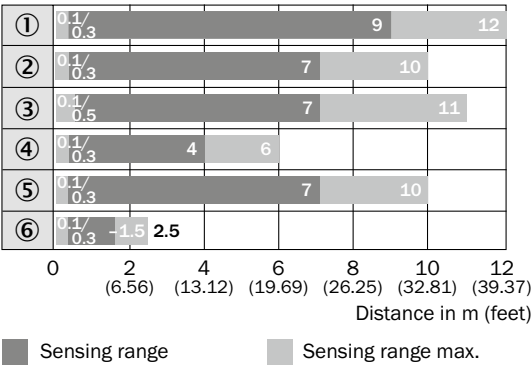
WT23-2, redlight



WL23-2



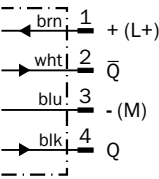
WL23-2, PinPoint



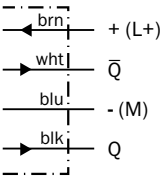
- ① PL80A
- ② PL40A
- ③ C110A
- ④ PL20A
- ⑤ P250
- ⑥ Reflective tape Diamond Grade

Connection diagram

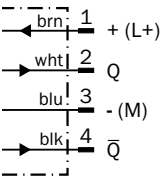
Cd-083



Cd-094



Cd-101



Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Mounting bracket with hinged arm	BEF-WN-MULTI	2064469
		Mounting bracket	BEF-WN-W23	2019085
		Mounting bracket with hinged arm	BEF-WN-W27	2009122

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 plated steel (sheet), Diecast zinc (clamp)	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-W27	2039601
	Steel, zinc coated	Weather hood for universal clamp bracket	OBW-KHS-M01	2023240

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

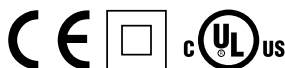
Round

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

→ For additional accessories, please see page L-861



Long-range sensor with a metal housing for harsh environments



Additional information

Detailed technical data.	H-591
Ordering information.	H-592
Dimensional drawings	H-595
Adjustments	H-596
Characteristic curves	H-596
Bar diagrams.	H-597
Connection diagram	H-598
Recommended accessories. . . .	H-599



Product description

The W24 features a rugged metal housing that has passed IP 69K testing, which ensures reliability in harsh industrial conditions. These sensors are highly resistant to ambient light and offer a very long sensing range with a high operating reserve. As a result, there are optional a standard front lens heating or a high-power front lens heating versions, similar to automotive rear window defrost, for use in environments with extreme temperatures fluctuation. An

alarm output option enables early detection of contamination, reducing down-time that results from contamination interruptions. Variants with DC voltage and universal voltage DC/AC and multiple connectivity options provide additional flexibility within the W24 family.

The sensors are conform with the 2G category for explosive zones, which enhances their range of applications even further.

At a glance

- IP 69K-tested die-cast zinc housing
- Terminal chamber protected by the housing
- Immune to ambient light and cross-talk
- Selectable PNP/NPN, light/dark output
- Variants with DC voltage and universal AC/DC voltage with UL approval
- Optional test input, time delays, alarm output and front screen heating also available in high-power version.
- M12 or terminal chamber connection: both 90° rotatable

Your benefits

- Rugged metal housing that has passed IP 69K testing offers reliability and a long service life
- Immune to ambient light and crosstalk, which improves detection security
- Long-range retro-reflective and through-beam versions have a very high operating reserve, which ensures reliable operation even when if sensor is contaminated
- Ensuring reliable operation in environments with temperatures fluctuation due to standard or high-power front lens heating (prevention and reduction of condensation water on the front lens)
- Variants with DC voltage and universal AC/DC voltage provide installation flexibility

→ www.mysick.com/en/W24-2

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

	DC			AC/DC		
	WT24-2	WL24-2	WS/WE24-2	WT24-2	WL24-2	WS/WE24-2
Sensor principle	Photoelectric proximity sensor	Photoelectric retro-reflective sensor	Through-beam photoelectric sensor	Photoelectric proximity sensor	Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Detection principle	Background suppression	Standard optics	–	Background suppression	Standard optics	–
Dimensions (W x H x D)	27 mm x 87.5 mm x 65 mm					
Housing design (light emission)	Rectangular					
Sensing range max.	100 mm ... 2,500 mm ¹⁾ (depending on type)	0 m ... 22 m ²⁾	0 m ... 60 m	100 mm ... 2,500 mm ¹⁾ (depending on type)	0 m ... 22 m ²⁾	0 m ... 60 m
Sensing range	100 mm ... 2,500 mm ¹⁾ (depending on type)	0 m ... 15 m ²⁾	0 m ... 50 m	100 mm ... 2,500 mm ¹⁾ (depending on type)	0 m ... 15 m ²⁾	0 m ... 50 m
Type of light	Infrared light/ visible red light (depend- ing on type)	Visible red light		Infrared light/ visible red light (depend- ing on type)	Visible red light	
Light source ³⁾	LED					
Angle of dispersion	–		Approx. 1°	–		Approx. 1°
Adjustment	Potentiometer					
Time type	Switch on delay/time delay off					
Delay time	Adjustable via time delay selector switch: 0.5 s ... 10 s					
Alarm output	–/✓ (depending on type)					

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

	DC			AC/DC		
	WT24-2	WL24-2	WS/WE24-2	WT24-2	WL24-2	WS/WE24-2
Supply voltage	10 V DC ... 30 V DC			12 V DC ... 240 V DC ¹⁾ /24 V AC ... 240 V AC ²⁾		
Ripple ³⁾	< 5 V _{pp}			–		
Current consumption	≤ 50 mA ⁴⁾		–	–		
With dynamic front lense heating	≤ 150 mA ⁴⁾					
Current consumption, sender	–		50 mA ⁴⁾	–		
With dynamic front lense heating	–		150 mA ⁴⁾	–		
Current consumption, receiver	–		40 mA ⁴⁾	–		
With dynamic front lense heating	–		140 mA ⁴⁾	–		
Power consumption	–			< 2 VA		
Output type	PNP/NPN (selectable via NPN/PNP selector)			Relay, electrically isolated ⁵⁾		
Output function	–			Change-over contacts		
Switching mode	Light/dark-switching (selectable via light/dark rotary switch)			Light/dark-switching ⁵⁾ (selectable via light/dark rotary switch)		
Output current I _{max.}	≤ 100 mA	–	≤ 100 mA	100 mA	–	
Switching current (switching voltage)	–			4 A (250 V AC)/4 A (24 V DC)		
Response time	≤ 500 μs ⁶⁾			≤ 10 ms		
Switching frequency ⁷⁾	1,000 Hz			10 Hz		

	DC			AC/DC		
	WT24-2	WL24-2	WS/WE24-2	WT24-2	WL24-2	WS/WE24-2
Angle of reception	–		Approx. 2.5 °	–		Approx. 2.5 °
Connection type	Male connector, M12 ⁸⁾ /Terminals with gland ⁸⁾ (depending on type)			Terminals with gland ⁸⁾		
Circuit protection	A ⁹⁾ , C ¹⁰⁾ , D ¹¹⁾			A ⁹⁾ , C ¹⁰⁾		
Protection class	II ¹²⁾			II ¹³⁾		
Weight	330 g		660 g	330 g		660 g
Polarisation filter	–	✓	–	–	✓	–
Front screen heating	–/✓ (depending on type)					
Housing material	Zinc diecast					
Optics material	PMMA, glass (depending on type)			PMMA		
Enclosure rating	IP 69K/IP 67 (depending on type)			IP 69K		
Usage category	–			AC-15, DC-13, according to EN 60947-1		
Test input sender off	TE to 0 V			–		
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⁾ +/- 10 %.

³⁾ May not exceed or fall short of V_S tolerances.

⁴⁾ Without load.

⁵⁾ Provide suitable spark suppression for inductive or capacitive loads.

⁶⁾ Signal transit time with resistive load.

⁷⁾ With light/dark ratio 1:1.

⁸⁾ Connection rotatable by 90°.

⁹⁾ A = V_S connections reverse-polarity protected.

¹⁰⁾ C = interference suppression.

¹¹⁾ D = outputs overcurrent and short-circuit protected.

¹²⁾ Reference voltage: 50 V DC.

¹³⁾ Rated voltage: 250 V AC/DC.

Ordering information

Other models available at www.mysick.com/en/W24-2

WT24-2, DC

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Light source:** LED
- **Output type:** NPN, PNP
- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer

Type of light	Sensing range max. ¹⁾	Light spot size (distance)	Connection	Alarm output	Front screen heating	Time functions	Con- nection diagram	Type	Part no.
Infrared light	100 mm ... 2,500 mm	Ø 80 mm (2,500 mm)	Connector M12, 4-pin	–	–	–	Cd-117	WT24-2B410	1016933
					✓ ²⁾	✓	Cd-117	WT24-2B420	1017885
			Terminal connection with M16 gland	✓	–	–	Cd-150	WT24-2V510	1017855
					–	–	Cd-120	WT24-2B210	1016931
				✓	✓	✓	Cd-120	WT24-2B220	1017882
					✓ ²⁾	✓	Cd-121	WT24-2V220	1017886
Visible red light	100 mm ... 1,200 mm	Ø 40 mm (1,200 mm)	Connector M12, 4-pin	–	–	–	Cd-117	WT24-2B440	1016934
					–	–	Cd-150	WT24-2V540	1017888
			Terminal connection with M16 gland	✓	✓ ³⁾	✓	Cd-150	WT24-2V550S12	1019468
					–	–	Cd-120	WT24-2B240	1017813
				✓	✓	✓	Cd-120	WT24-2B250	1017883
					✓ ²⁾	✓	Cd-121	WT24-2V250	1017887

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

²⁾ Static, low heat output, use in +5° C ... +15° C.

³⁾ Dynamic, high heat output, application for quickly changing temperatures between –5° C ... +10° C, Front screen material: Glass.

WL24-2, DC

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Light source:** LED
- **Output type:** NPN, PNP
- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer

Type of light	Sensing range max. ¹⁾	Light spot size (distance)	Connection	Alarm output	Front screen heating	Time functions	Con-nection diagram	Type	Part no.
Visible red light	0 m ... 22 m	Ø 250 mm (15 mm)	Connector M12, 4-pin	–	–	–	Cd-117	WL24-2B430	1017860
					✓ ²⁾	✓	Cd-117	WL24-2B440	1017879
			Connector M12, 5-pin	✓	–	–	Cd-150	WL24-2V530	1017881
					✓ ²⁾	✓	Cd-150	WL24-2V540	1018025
					✓ ³⁾	–	Cd-150	WL24-2V530S04	1023550
			Terminal connection with M16 gland	–	–	–	Cd-120	WL24-2B230	1015852
					✓ ²⁾	✓	Cd-120	WL24-2B240	1017859
				✓	–	–	Cd-121	WL24-2V230	1017880
					✓ ²⁾	✓	Cd-121	WL24-2V240	1018024

¹⁾ PL80A.²⁾ Static, low heat output, use in +5° C ... +15° C.³⁾ Dynamic, high heat output, application for quickly changing temperatures between –5° C ... +10° C, Front screen material: Glass.

WS/WE24-2, DC

- **Sensor principle:** through-beam photoelectric sensor
- **Light source:** LED
- **Output type:** NPN, PNP
- **Switching mode:** light/dark-switching
- **Adjustment:** potentiometer

Type of light	Sensing range max. ¹⁾	Light spot size (distance)	Connection	Alarm output	Front screen heating	Time functions	Con-nection diagram	Type	Part no.
Visible red light	0 m ... 60 m	Ø 700 mm (50 mm)	Connector M12, 4-pin	–	–	✓	Cd-118	WS/WE24-2B430	1017853
					✓ ¹⁾	✓	Cd-118	WS/WE24-2B440	1017875
			Connector M12, 5-pin	✓	–	–	Cd-119	WS/WE24-2V530	1017877
					✓ ²⁾	–	Cd-119	WS/WE24-2V530S01	1023549
			Terminal connection with M16 gland	–	–	✓	Cd-097	WS/WE24-2B230	1017861
				✓	–	–	Cd-097	WS/WE24-2V230	1017876
				–	✓ ¹⁾	✓	Cd-097	WS/WE24-2B240	1017862

¹⁾ Static, low heat output, use in +5° C ... +15° C.²⁾ Dynamic, high heat output, application for quickly changing temperatures between –5° C ... +10° C, Front screen material: Glass.

WT24-2, AC/DC

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Light source:** LED
- **Output type:** relay
- **Switching mode:** light/dark-switching (Provide suitable spark suppression for inductive or capacitive loads.)
- **Adjustment:** potentiometer

Type of light	Sensing range max. ¹⁾	Light spot size (distance)	Connection	Front screen heating	Time functions	Connection diagram	Type	Part no.
Infrared light	100 mm ... 2,500 mm	Ø 80 mm (2,500 mm)	Terminal connection with M16 gland	–	–	Cd-167	WT24-2R210	1016932
				✓ ²⁾	✓	Cd-167	WT24-2R220	1016854
Visible red light	100 mm ... 1,200 mm	Ø 40 mm (1,200 mm)	Terminal connection with M16 gland	–	–	Cd-167	WT24-2R240	1017854
				✓ ²⁾	✓	Cd-167	WT24-2R250	1016820

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

²⁾ Static, low heat output, use in +5° C ... +15° C.

WL24-2, AC/DC

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Light source:** LED
- **Output type:** relay
- **Switching mode:** light/dark-switching (Provide suitable spark suppression for inductive or capacitive loads.)
- **Adjustment:** potentiometer

Type of light	Sensing range max. ¹⁾	Light spot size (distance)	Connection	Front screen heating	Time functions	Connection diagram	Type	Part no.
Visible red light	0 m ... 22 m	Ø 250 mm (15 mm)	Terminal connection with M16 gland	–	–	Cd-167	WL24-2R230	1017857
				✓ ²⁾	✓	Cd-167	WL24-2R240	1017858

¹⁾ PL80A.

²⁾ Static, low heat output, use in +5° C ... +15° C.

H

WS/WE24-2, AC/DC

- **Sensor principle:** through-beam photoelectric sensor
- **Light source:** LED
- **Output type:** relay
- **Switching mode:** light/dark-switching (Provide suitable spark suppression for inductive or capacitive loads.)
- **Adjustment:** potentiometer

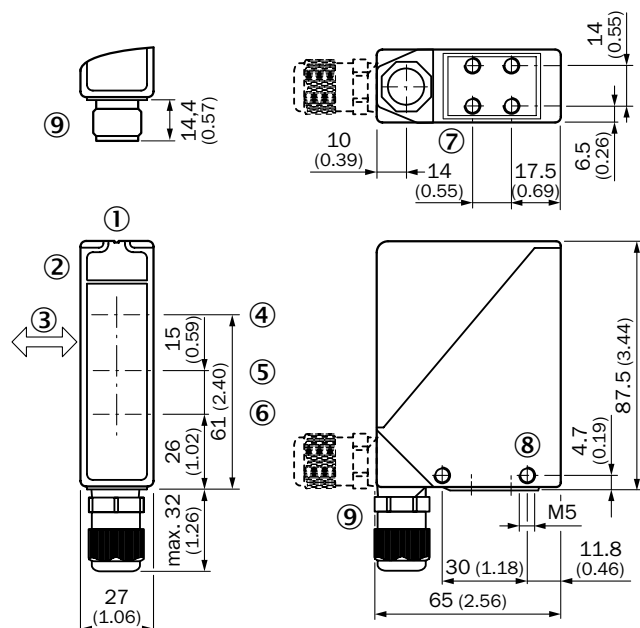
Type of light	Sensing range max.	Light spot size (distance)	Connection	Front screen heating	Time functions	Connection diagram	Type	Part no.
Visible red light	0 m ... 60 m	Ø 700 mm (50 mm)	Terminal connection with M16 gland	–	–	Cd-127	WS/WE24-2R230	1017863
				✓ ¹⁾	✓	Cd-127	WS/WE24-2R240	1017864

¹⁾ Static, low heat output, use in +5° C ... +15° C.

Dimensional drawings

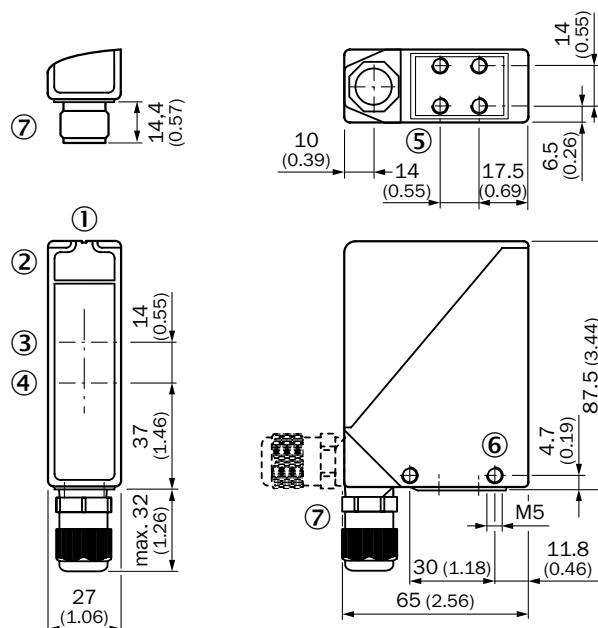
Dimensions in mm (inch)

WT24-2



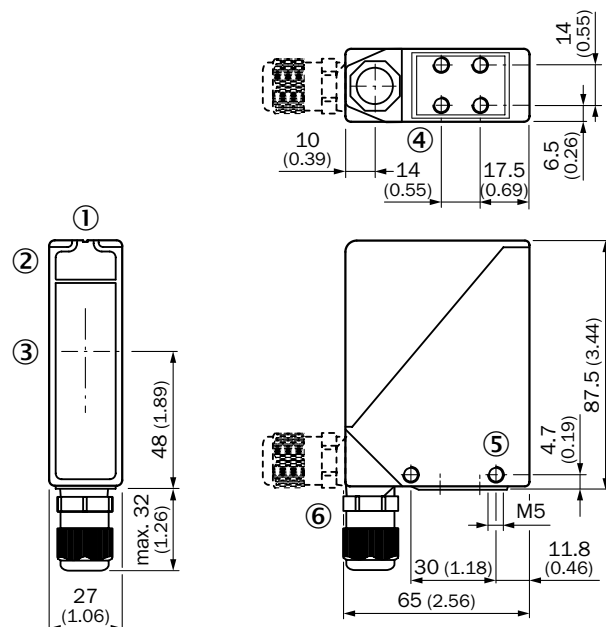
- ① Alignment sight
- ② LED signal strength indicator
- ③ Standard direction of the material being detected
- ④ Center of optical axis, sender
- ⑤ Centre of optical axis, receiver (close range)
- ⑥ Centre of optical axis, receiver (far range)
- ⑦ M5 threaded mounting hole, 6 mm deep
- ⑧ M5 threaded mounting hole, through-hole
- ⑨ M16 screw fixing and plug rotatable by 90°

WL24-2



- ① Alignment sight
- ② LED signal strength indicator
- ③ Center of optical axis, sender
- ④ Center of optical axis, receiver
- ⑤ M5 threaded mounting hole, 6 mm deep
- ⑥ M5 threaded mounting hole, through-hole
- ⑦ M16 screw fixing and plug rotatable by 90°

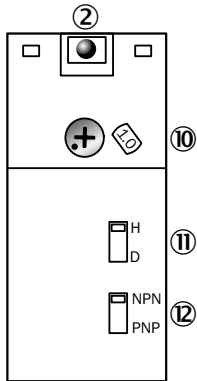
WS/WE24-2



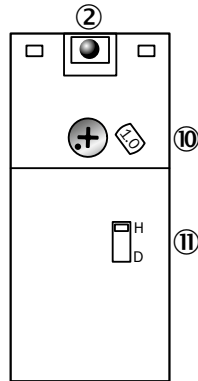
- ① Alignment sight
- ② LED signal strength indicator
- ③ Center of optical axis
- ④ M5 threaded mounting hole, 6 mm deep
- ⑤ M5 threaded mounting hole, through-hole
- ⑥ M16 screw fixing and plug rotatable by 90°

H

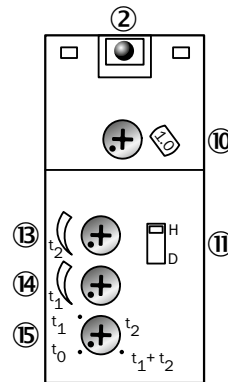
Adjustments

WT24-2, WL24-2,
WS/WE24-2, DC

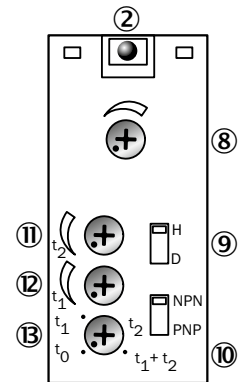
- ② LED signal strength indicator
- ⑩ Adjustment sensing range (WT) / sensitivity (WL, WS/WE)
- ⑪ Light/dark selector
- ⑫ NPN/ PNP selector

WT24-2, WL24-2,
WS/WE24-2, AC/DC

- ② LED signal strength indicator
- ⑩ Adjustment sensing range (WT) / sensitivity (WL, WS/WE)
- ⑪ Light/dark selector

WT24-2, WL24-2,
WS/WE24-2, AC/DC,
with time functions

- ② LED signal strength indicator
- ⑩ Adjustment sensing range (WT) / sensitivity (WL, WS/WE)
- ⑪ Light/dark selector
- ⑫ Time control t_2 =OFF-delay
- ⑬ Time control t_1 =ON-delay
- ⑭ Time delay selector switch

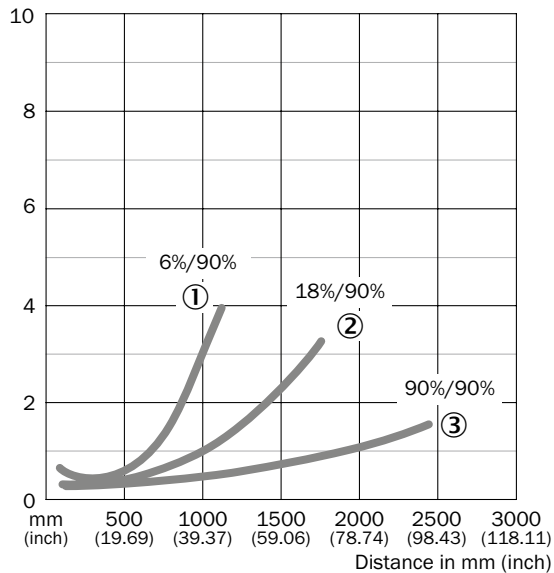
WT24-2, WL24-2,
WS/WE24-2, DC,
with time functions

- ② LED signal strength indicator
- ⑧ Sensitivity adjustment
- ⑨ Light/dark selector
- ⑩ NPN/ PNP selector
- ⑪ Time control t_2 =OFF-delay
- ⑫ Time control t_1 =ON-delay
- ⑬ Time delay selector switch

Characteristic curves

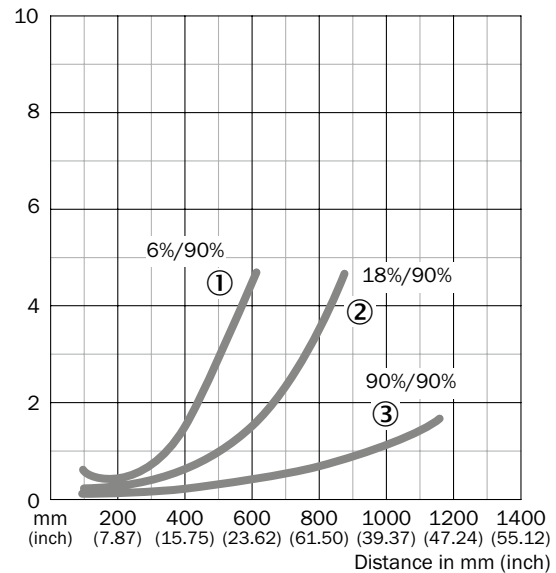
Black-white shift

WT24-2, infrared light



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

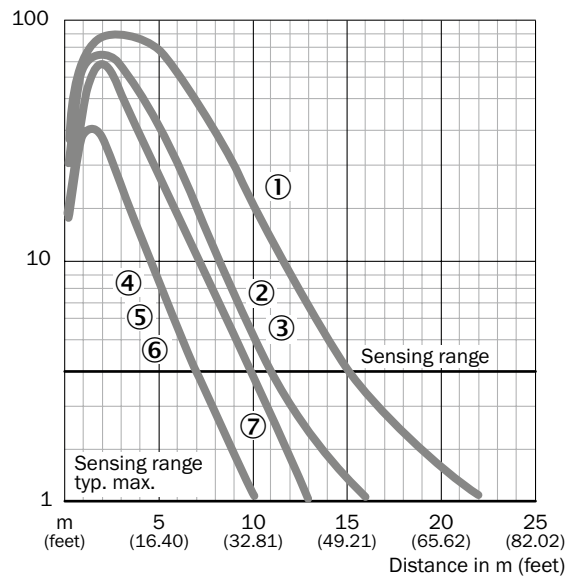
WT24-2, red light



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

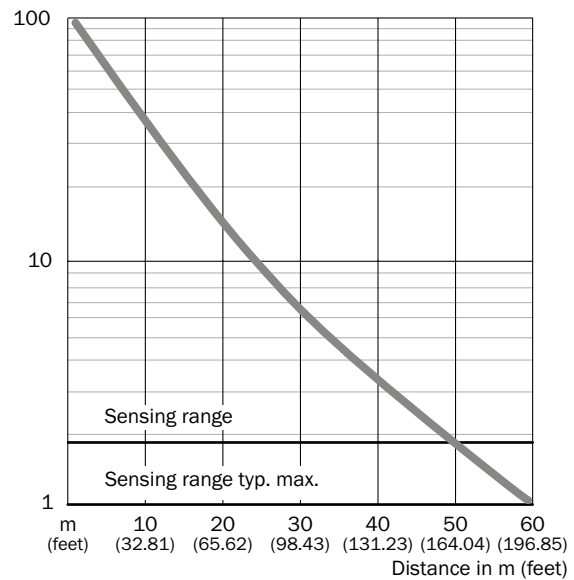
Operating reserve

WL24-2



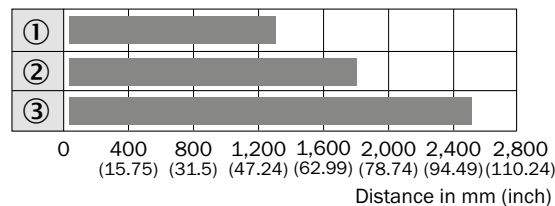
- ① PL80A
- ② PL50A
- ③ PL40A
- ④ PL30A
- ⑤ PL20A
- ⑥ Reflective tape Diamond Grade
- ⑦ C110A

WS/WE24-2



Bar diagrams

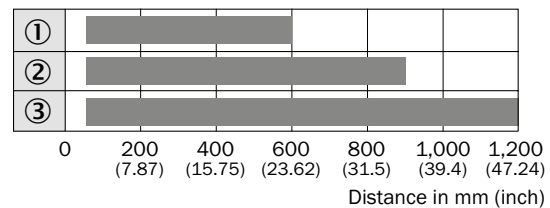
WT24-2, infrared light



■ Sensing range

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

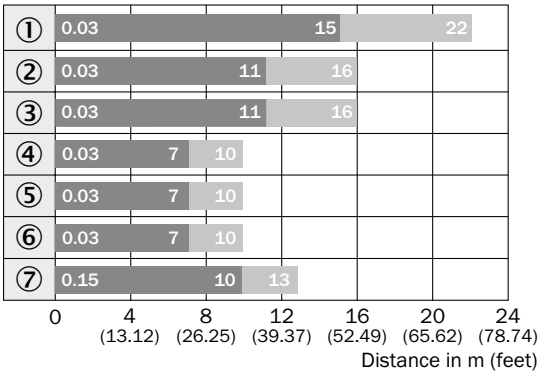
WT24-2, red light



■ Sensing range

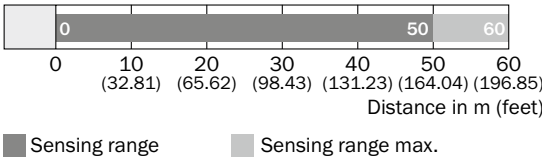
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WL24-2



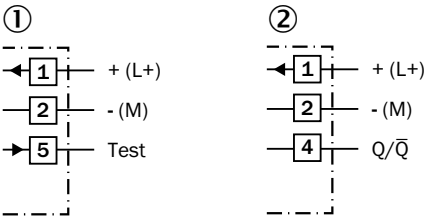
- ① PL80A
② PL50A
③ PL40A
④ PL30A
⑤ PL20A
⑥ Reflective tape Diamond Grade
⑦ C110A

WS/WE24-2



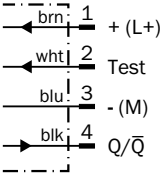
Connection diagram

Cd-097

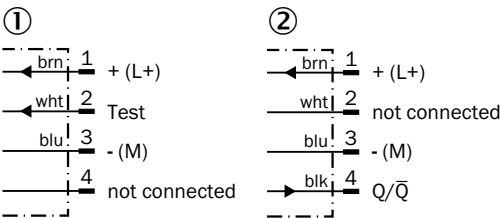


- ① Sender
② Receiver

Cd-117

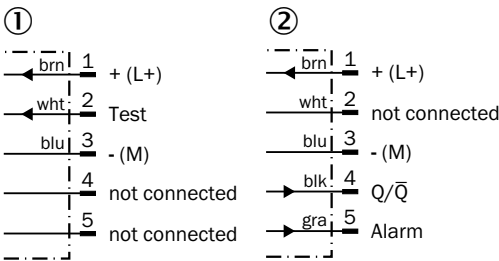


Cd-118

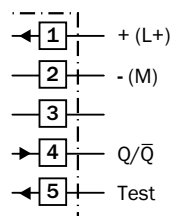
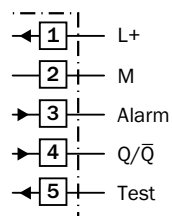
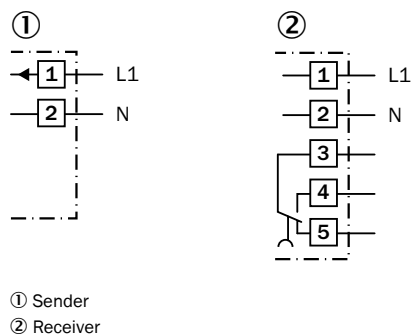
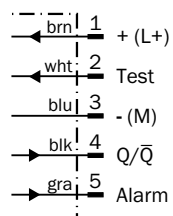
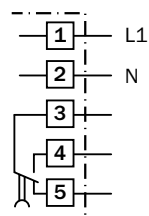


- ① Sender
② Receiver

Cd-119



- ① Sender
② Receiver

Cd-120**Cd-121****Cd-127****Cd-150****Cd-167****Recommended accessories**

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Stainless steel	Mounting bracket, small	BEF-WK-W24	4027532
	Stainless steel (1.4301)	Mounting bracket	BEF-WN-W24	2015248

Plug connectors and cables

Connecting cable (female connector-open)

- Connector material: TPU

Figure	Connection type head A	Connection type head B	Cable material	Enclosure rating	Connecting cable	Model name	Part no.
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	PVC	IP 67	2 m, 4-wire	DOL-1204-G02M	6009382
					5 m, 4-wire	DOL-1204-G05M	6009866
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	PUR, halogen-free	IP 65, IP 68, IP 69K	2 m, 4-wire	DOL-1204-G02MC	6025900
					5 m, 4-wire	DOL-1204-G05MC	6025901
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	PVC	IP 67	2 m, 4-wire	DOL-1204-W02M	6009383
					5 m, 4-wire	DOL-1204-W05M	6009867
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	PUR, halogen-free	IP 65, IP 68, IP 69K	2 m, 4-wire	DOL-1204-W02MC	6025903
					5 m, 4-wire	DOL-1204-W05MC	6025904

Figure	Connection type head A	Connection type head B	Cable material	Enclosure rating	Connecting cable	Model name	Part no.
	Female connector, M12, 5-pin, straight	Cable, open conductor heads	PVC	IP 67	2 m, 5-wire	DOL-1205-G02M	6008899
			PVC	IP 67	5 m, 5-wire	DOL-1205-G05M	6009868
	Female connector, M12, 5-pin, straight	Cable, open conductor heads	PUR, halogen-free	IP 65, IP 68, IP 69K	2 m, 5-wire	DOL-1205-G02MC	6025906
			PUR, halogen-free	IP 65, IP 68, IP 69K	5 m, 5-wire	DOL-1205-G05MC	6025907
	Female connector, M12, 5-pin, angled	Cable, open conductor heads	PVC	IP 67	2 m, 5-wire	DOL-1205-W02M	6008900
			PVC	IP 67	5 m, 5-wire	DOL-1205-W05M	6009869
	Female connector, M12, 5-pin, angled	Cable, open conductor heads	PUR, halogen-free	IP 65, IP 68, IP 69K	2 m, 5-wire	DOL-1205-W02MC	6025909
			PUR, halogen-free	IP 65, IP 68, IP 69K	5 m, 5-wire	DOL-1205-W05MC	6025910

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

Alignment aids

Figure	Description	Model name	Part no.
	Adapter for alignment aid AR60	Adapter AR60 for W24-2	4032976

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 N04 for universal clamp bracket	BEF-KHS-N04	2051610

Device protection (mechanical)

Cooling elements

Figure	Description	Model name	Part no.
	Water cooling plate	BEF-KP-W24	2015071

Protective housing/tubes

Figure	Material	Description	Model name	Part no.
	Aluminum (anodised)	Dust protection tube, air-purged	OBS-W24	2015069
	Steel, zinc coated	Weather hood for universal clamp bracket	OBW-KHS-M01	2023240
	Aluminum (anodised)	Weather hood	OBW-W24	2015070
	Aluminum (anodised)	Weather hood	WSG1-01	1018470

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 ¹⁾	Model name	Part no.
	Reflective tape "Diamond Grade", self-adhesive, customizable size by sheet, 74.9 cm x 91.4 cm	REF-DG-K	4019634

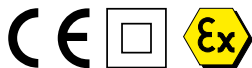
¹⁾ Customizable length by sheet. Width max. 74.9 cm, length max. 91.4 cm.

Round

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

→ For additional accessories, please see page L-861

W24-2 for use in Category 2G explosive environments (gas)



Additional information

Detailed technical data.....	H-603
Ordering information.....	H-604
Dimensional drawings	H-604
Adjustments	H-605
Characteristic curves	H-606
Bar diagrams.....	H-606
Connection diagram	H-607
Recommended accessories....	H-608

Product description

The W24-2Ex features a rugged metal housing which ensures reliability in harsh industrial conditions. Special electronics allows longer sensing range despite the

limited factors of the norms for Category 2G (ATEX, explosive environments). The necessary switching amplifiers are also available.

At a glance

- Classification: EX II 2G Ex ia op is IIC T4 according to Directive 94/9/EC (ATEX)
- Corresponds to Category 2G
- Output type: EN 60947-5-6 (NAMUR)
- M12 or terminal chamber connection: 90° rotatable
- Durable metal housing
- Precise background suppression

Your benefits

- The W24-2Ex features a rugged metal housing that has been IP 69K tested which ensures reliability in harsh industrial conditions
- Special electronics allows longer sensing range despite the limited factors of the norms for Category 2G (ATEX, explosive environments)
- Flexible installation due to 90° rotatable connector

→ www.mysick.com/en/W24-2_Ex

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

	WT24-2 Ex	WL24-2 Ex
Sensor principle	Photoelectric proximity sensor	Photoelectric retro-reflective sensor
Detection principle	Background suppression	–
Dimensions (W x H x D)	27 mm x 87.5 mm x 65 mm	
Housing design (light emission)	Rectangular	
Sensing range max.	40 mm ... 2,000 mm ¹⁾	0 m ... 22 m ²⁾
Sensing range	100 mm ... 2,000 mm ¹⁾	0 mm ... 15 mm ²⁾
Type of light	Infrared light	Visible red light
Light source ³⁾	LED	
Light spot size (distance)	Ø 50 mm (2,000 mm)	Ø 250 mm (15 m)
Adjustment	Potentiometer	

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

	WT24-2 Ex	WL24-2 Ex
Supply voltage ¹⁾	5 V DC ... 15.5 V DC	
Ripple ²⁾	< 0.4 V _{pp}	
Output type	NAMUR	
Switching mode	Light switching	
Response time ³⁾	≤ 10 ms	
Switching frequency ⁴⁾	50 Hz	
Connection type	Terminals with gland ⁵⁾ /Male connector, M12 ⁵⁾ (depending on type)	
Circuit protection	A ⁶⁾ , C ⁷⁾	
Protection class ⁸⁾	II	
Weight	330 g	
Polarisation filter	✓	
Housing material	Zinc diecast	
Optics material	Glass	
Enclosure rating	IP 67	
EC Approval Certificate	PTB 03 ATEX 2105	PTB 08 ATEX 2029
ATEX marking	II 2G Ex ia op is IIC T4 according to directive 94/9/EG (ATEX)	
Hazardous area category	2G	
Input voltage U _i max. ⁹⁾	≤ 15.5 V	
Input power P _i max. ⁹⁾	≤ 100 mW	
Input current I _i max. ⁹⁾	≤ 53 mA	
Internal capacitance C _i max. ⁹⁾	80 nF	
Internal inductance L _i max. ⁹⁾	0 µH	
Ambient operating temperature	–20 °C ... +60 °C	
Ambient storage temperature	–25 °C ... +70 °C	

¹⁾ Limit values, supply with switching amplifier EN2Ex (internal resistor approx. 1 kOhm)

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

³⁾ Signal transit time with resistive load.

⁴⁾ With light/dark ratio 1:1.

⁵⁾ Connection rotatable by 90°.

⁶⁾ A = V_S connections reverse-polarity protected.

⁷⁾ C = interference suppression.

⁸⁾ Reference voltage: 50 V DC.

⁹⁾ For connection to a separately certified intrinsically safe circuit only.

Ordering information

Other models available at www.mysick.com/en/W24-2_Ex

WT24-2 Ex

- **Sensor principle:** photoelectric proximity sensor
- **Output type:** NAMUR

Sensing range max. ¹⁾	Light spot size (distance)	Connection	Connection diagram	Type	Part no.
40 mm ... 2,000 mm	Ø 50 mm (2,000 mm)	Terminal connection with M16 gland	Cd-050	WT24-2X200	1041910
		Connector M12, 4-pin	Cd-122	WT24-2X400	1040722

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

WL24-2 Ex

- **Sensor principle:** photoelectric retro-reflective sensor
- **Output type:** NAMUR

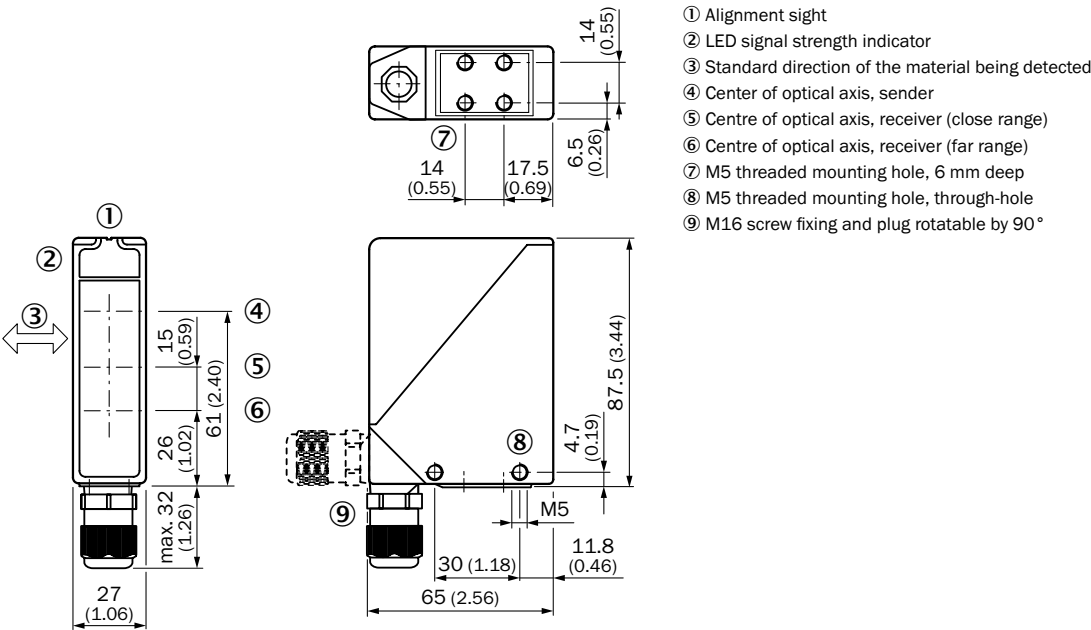
Sensing range max. ¹⁾	Light spot size (distance)	Connection	Connection diagram	Type	Part no.
0 m ... 22 m	Ø 250 mm (15 m)	Terminal connection with M16 gland	Cd-050	WL24-2X230	1026036
		Connector M12, 4-pin	Cd-122	WL24-2X430	1026037

¹⁾ PL80A.

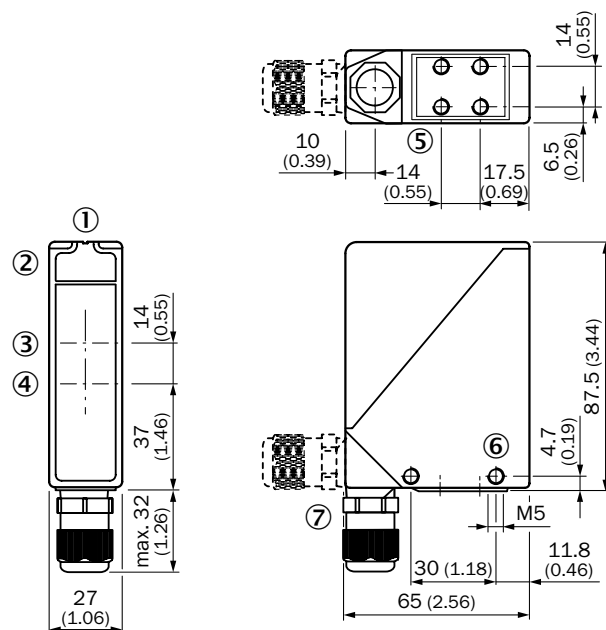
Dimensional drawings

Dimensions in mm (inch)

WT24-2 EX



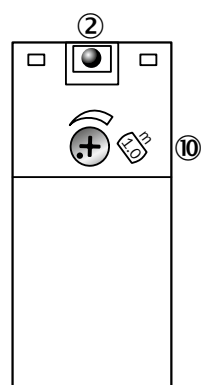
WL24-2 EX



- ① Alignment sight
- ② LED signal strength indicator
- ③ Center of optical axis, sender
- ④ Center of optical axis, receiver
- ⑤ M5 threaded mounting hole, 6 mm deep
- ⑥ M5 threaded mounting hole, through-hole
- ⑦ M16 screw fixing rotatable by 90°

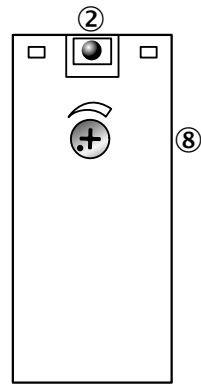
Adjustments

WT24-2 EX



- ② LED signal strength indicator
- ⑩ Sensing range adjustment

WL24-2 EX

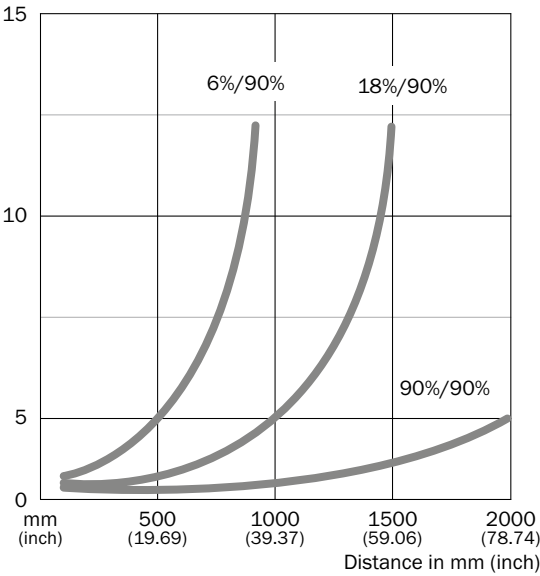


- ② LED signal strength indicator
- ⑧ Sensitivity adjustment

Characteristic curves

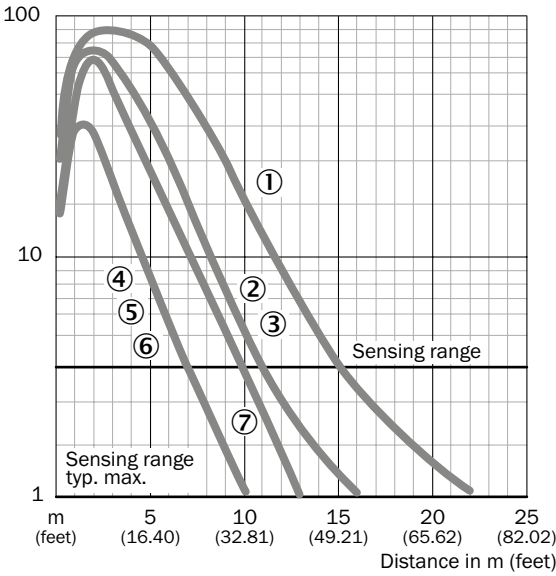
Black-white shift

WT24-2 EX



Operating reserve

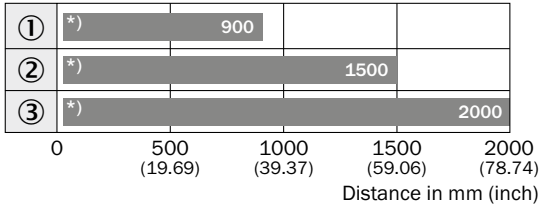
WL24-2



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

Bar diagrams

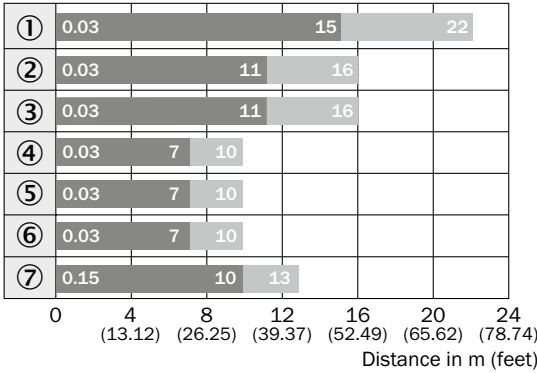
WT24-2



*) Lower bound of detection area depending on the adjusted sensing distance (see blind zone curve)

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

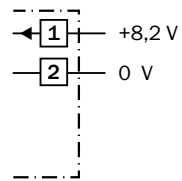
WL24-2



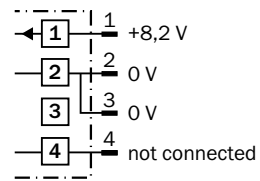
- ① PL80A
- ② PL50A
- ③ PL40A
- ④ PL30A
- ⑤ PL20A
- ⑥ Reflective tape Diamond Grade
- ⑦ C110A

Connection diagram

Cd-050



Cd-122



Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Stainless steel	Mounting bracket, small	BEF-WK-W24	4027532
	Stainless steel (1.4301)	Mounting bracket	BEF-WN-W24	2015248

Alignment aids

Figure	Description	Model name	Part no.
	Adapter for alignment aid AR60	Adapter AR60 for W24-2	4032976

Others

Figure	Supply voltage	Output function	Approvals	Model name	Part no.
	AC/DC 24 V ... 230 V, 1.3 W	2 channels with invertible SPDT relay	II (1) G [Ex ia] IIC II (1) D [Ex iaD] II (3) G Ex nAC [ia] IIC T4 X	EN2-2EX-1	6041096
	DC 19.2 V ... 30 V, 1 W	2 channels with invertible NO relay	II (1) GD [Ex ia] IIC, IIB II (3) G Ex nAC II T4 X	EN2-2EX-3	6041095

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)

Cooling elements

Figure	Description	Model name	Part no.
	Water cooling plate	BEF-KP-W24	2015071

Protective housing/tubes

Figure	Material	Description	Model name	Part no.
	Aluminum (anodised)	Dust protection tube, air-purged	OBS-W24	2015069
	Steel, zinc coated	Weather hood for universal clamp bracket	OBW-KHS-M01	2023240
	Aluminum (anodised)	Weather hood	OBW-W24	2015070
	Aluminum (anodised)	Weather hood	WSG1-01	1018470

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

H

Photoelectric proximity sensor with a small laser light spot and a large sensing range



Additional information

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Product description

The WT27L-2 Laser photoelectric sensor is ideal for precisely detecting small objects from long distances. These sensors

feature crosstalk immunity, background suppression and a laser light source.

At a glance

- 2 mm diameter light spot at a distance of 400 mm
- Precise adjustable background suppression
- Visible red laser LED
- Sensing range adjustment via potentiometer
- UL approval

Your benefits

- Precise detection of very small parts up to a distance of 400 mm due to 2 mm light spot
- Highly visible red laser provides quick and easy alignment
- Durable design provides high resistance to vibration

→ www.mysick.com/en/W27-2_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.



Detailed technical data

Features

Sensor principle	Photoelectric proximity sensor
Detection principle	Background suppression
Dimensions (W x H x D)	24.6 mm x 80 mm x 53.5 mm
Housing design (light emission)	Rectangular
Sensing range max. ¹⁾	100 mm ... 800 mm
Sensing range	100 mm ... 800 mm
Type of light	Visible red light
Light source ²⁾	Laser
Light spot size (distance)	Ø 2 mm (400 mm)
Laser class ³⁾	1/2 (depending on type)
Adjustment	Potentiometer

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

²⁾ Average service life 50,000 h at T_A = +25 °C.

³⁾ (EN 60825-1), low power. Eyes normally protected by averting reaction and eyelid closing reflex.

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	≤ 5 %
Power consumption ³⁾	≤ 35 mA
Output type	PNP/NPN (depending on type)
Output function	Complementary
Switching mode	Light/dark-switching
Output current I _{max.}	≤ 100 mA
Response time	< 25 ms ⁴⁾ < 500 µs ⁴⁾ (depending on type)
Switching frequency ⁵⁾	
Response time: < 25 ms	50 Hz
Response time: < 500 µs	1,000 Hz
Connection type	Male connector
Circuit protection	A ⁶⁾ , C ⁷⁾ , D ⁸⁾
Protection class ⁹⁾	II
Weight	100 g
Housing material	ABS
Enclosure rating	IP 67
Ambient operating temperature	-10 °C ... +45 °C
Ambient storage temperature	-10 °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⁾ A = V_S connections reverse-polarity protected.

⁷⁾ C = interference suppression.

⁸⁾ D = outputs overcurrent and short-circuit protected.

⁹⁾ Reference voltage: 50 V DC.

Ordering information

Other models available at www.mysick.com/en/W27-2_Laser

WT27-2 Laser

- **Sensor principle:** photoelectric proximity sensor
- **Light spot size (distance):** Ø 2 mm (400 mm)
- **Connection:** Connector M12, 4-pin

Sensing range max. ¹⁾	Laser class	Response time ²⁾	Switching frequency ³⁾	Output type	Connection diagram	Type	Part no.
100 mm ... 800 mm	1	< 25 ms	50 Hz	PNP	Cd-083	WT27K-2F430	1059239
	2	< 500 µs	1,000 Hz	PNP	Cd-083	WT27L-2F430	1016019
				NPN	Cd-083	WT27L-2N430	1026165

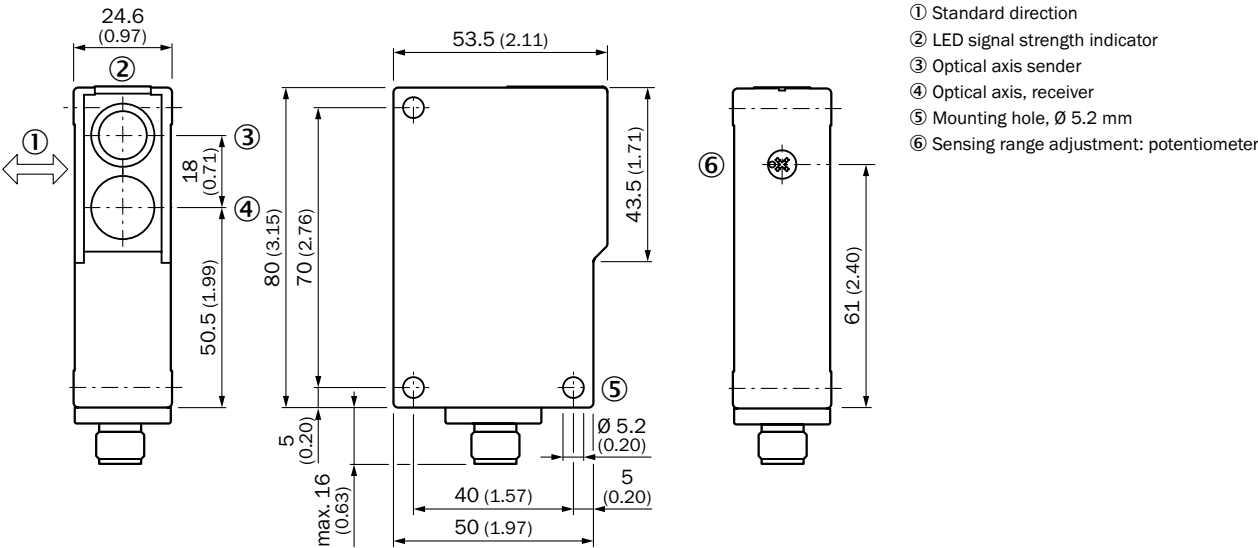
¹⁾ Object with 90 % reflectance (referred to standard white, DIN 5033)

²⁾ Signal transit time with resistive load.

³⁾ With light/dark ratio 1:1.

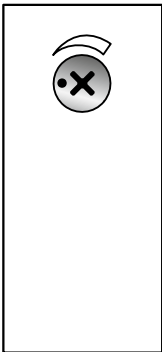
Dimensional drawings

Dimensions in mm (inch)

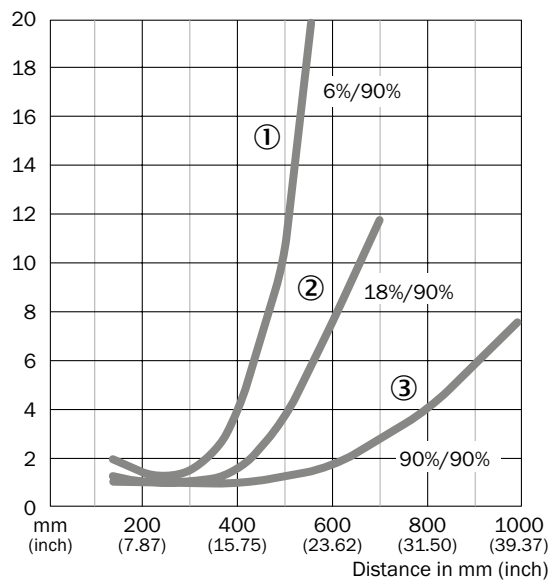


Adjustments

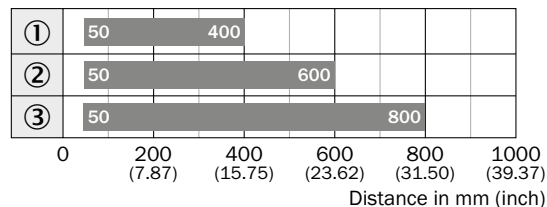
Potentiometer



Characteristic curves



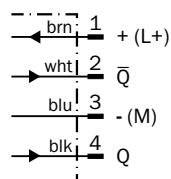
Bar diagrams



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

Connection diagram

Cd-083



Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Mounting bracket with hinged arm	BEF-WN-MULTI	2064469
		Mounting bracket	BEF-WN-W23	2019085
		Mounting bracket with hinged arm	BEF-WN-W27	2009122

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

Alignment aids

Figure	Description	Model name	Part no.
	Laser alignment aid for various sensors, laser class 2 (IEC 60825): Never look into the beam.	AR60	1015741

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Zinc plated steel (sheet), Diecast zinc (clamp)	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-W27	2039601
	Steel, zinc coated	Weather hood for universal clamp bracket	OBW-KHS-M01	2023240

→ For additional accessories, please see page L-861



Precise, durable and powerful solution for a wide range of applications



Additional information

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Product description

The W27 family is designed for harsh industrial environments where it copes easily with heavy vibrations, shocks and extreme temperature fluctuations. The photoelectric proximity sensor is a leader in its class, especially through its reliable detection at long ranges. A sensor with PinPoint LED or a laser photoelectric proximity sensor is available for detection

of small targets. The retro-reflective and through-beam versions reduce downtime due to high operating reserves. A diverse range of features further enhance application-specific functionality including, Teach or potentiometer adjustment, time delays, front lens heating, ASi, and universal voltage DC or AC/DC.

At a glance

- Intense visible red emitter LED with consistent light spot for PinPoint versions
- Long sensing ranges with IR LED achieve up to 2500 mm
- Precise background suppression for detection of multi-colored objects
- Universal DC or DC/AC supply voltage
- Operating temperature: -40 °C – +60 °C

Your benefits

- Quick and easy commissioning due to a highly visible red PinPoint LED
- PinPoint technology can replace laser photoelectric proximity sensors in some applications. No laser safety regulations and a longer operating life due to PinPoint technology
- Resistant to ambient light, optical reflections, and crosstalk from other photoelectric devices
- Less contamination due to high operating reserves, reducing downtime
- Resistant to vibrations, reducing downtime
- Operation in harsh environments with temperatures as low as -40 °C
- Quick and easy configuration

→ www.mysick.com/en/W27-3

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

	DC			AC/DC		
	WTB27-3	WL27-3	WSE27-3	WTB27-3	WL27-3	WSE27-3
Sensor principle	Photoelectric proximity sensor	Photoelectric retro-reflective sensor	Through-beam photoelectric sensor	Photoelectric proximity sensor	Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Detection principle	Background suppression	Standard optics	–	Background suppression	Standard optics	–
Dimensions (W x H x D)	24.6 mm x 80.6 mm x 54 mm					
Housing design (light emission)	Rectangular					
Sensing range max.	30 mm ... 2,000 mm ¹⁾ (depending on type)	0.1 m ... 19 m ²⁾ (depending on type)	0 m ... 35 m	30 mm ... 1,600 mm ¹⁾ (depending on type)	0.1 m ... 15 m ²⁾	0 m ... 35 m
Sensing range	100 mm ... 2,000 mm (depending on type)	0.1 m ... 14 m ²⁾ (depending on type)	0 m ... 25 m	100 mm ... 1,600 mm (depending on type)	0.1 m ... 11 m ²⁾	0 m ... 25 m
Type of light	Infrared light/visible red light (depending on type)					
Light source	LED ³⁾ /PinPoint LED ³⁾ (depending on type)					
Wave length						
Infrared light	880 nm		–	880 nm	–	
Visible red light	660 nm		645 nm	660 nm		645 nm
Adjustment	Potentiometer Double teach-in button (depending on type)	Potentiometer				
Time type	Switch on delay/Time delay off/Switch on delay and time delay off					
Delay time	Adjustable via time delay selector switch: 0.02 s ... 0.5 s/0.5 s ... 10 s			Adjustable via time delay selector switch: 0.5 s ... 10 s		

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

	DC			AC/DC		
	WTB27-3	WL27-3	WSE27-3	WTB27-3	WL27-3	WSE27-3
Supply voltage	10 V DC ... 30 V DC ¹⁾	24 V AC/DC ... 240 V AC/ DC ²⁾	10 V DC ... 30 V DC ¹⁾	24 V AC/DC ... 240 V AC/ DC ²⁾	10 V DC ... 30 V DC ¹⁾	24 V AC/DC ... 240 V AC/ DC ²⁾
Ripple ³⁾	≤ 5 V _{SS}			–		
Current consumption	≤ 35 mA ... ≤ 55 mA ⁴⁾					
Current consumption, sender	–		35 mA ... 50 mA ⁴⁾	–		
Current consumption, receiver	–		20 mA ⁴⁾ ... 35 mA ⁴⁾	–		
Power consumption	–			≤ 2,5 VA	≤ 2,5 VA	≤ 5,5 VA
Output type	PNP / NPN (depending on type)			Relay, electrically isolated ⁵⁾ , Relay, galvanically isolated ⁶⁾ (depending on type)		Relay, galvanically isolated ⁶⁾
Output function	Complementary			Change-over contacts		
Switching mode	Light/dark-switching / Light switching (depending on type)			Light/dark-switching ⁵⁾ /Light switching ⁶⁾ (depending on type)		
Switching mode selector	–			Selectable via time delay selector switch		

	DC			AC/DC		
	WTB27-3	WL27-3	WSE27-3	WTB27-3	WL27-3	WSE27-3
Signal voltage PNP HIGH/LOW	Approx. $V_s - 2.5 \text{ V} / 0 \text{ V}$			–		
Signal voltage NPN HIGH/LOW	Approx. $V_s / < 2.5 \text{ V}$			–		
Output current I_{max}	≤ 100 mA			–		
Switching current (switching voltage)	–			3 A (250 V AC), 3 A (24 V DC), 0.11 A (250 V DC)		
Response time	≤ 1.5 ms ⁷⁾ ≤ 1.9 ms ⁸⁾ (depending on type)	≤ 500 μs ⁷⁾ ≤ 2.5 ms ⁷⁾ (depending on type)	≤ 500 μs ⁷⁾	≤ 10 ms		
Switching frequency	350 Hz ^{9), 10)}	1,000 Hz ⁹⁾ ± 200 Hz ⁹⁾ (depending on type)	1,000 Hz ⁹⁾	10 Hz ⁹⁾		
Angle of reception	–		Approx. 3°	–		Approx. 3°
Connection type	Cable, 2 m ¹¹⁾ /Male connector, M12/Cable with connector, M12 ¹¹⁾ (depending on type)			Male connector Q6/Cable, 2 m ¹¹⁾ (depending on type)		
Circuit protection	A ¹²⁾ , B ¹³⁾ , C ¹⁴⁾			A ¹²⁾ , C ¹⁴⁾		
Protection class	II ¹⁵⁾			II ¹⁶⁾		
Weight						
	Connector M12	100 g		200 g	–	
	Connector Q6	100 g		200 g	120 g	240 g
	Cable	180 g/300 g (depending on type)	180 g	200 g/360 g (depending on type)	180 g	–
	Cable with connector	120 g		–	–	
Polarisation filter	–	✓/– (depend- ing on type)	–		✓	–
Front screen heating	–/✓ (depending on type)					
Housing material	ABS					
Optics material	PMMA					
Enclosure rating	IP 65, IP 66, IP 67, IP 69K (depending on type)			IP 65, IP 66, IP 67(depend- ing on type)	IP 65, IP 67 (depending on type)	IP 65
Usage category	–			AC-15, DC-13, according to EN 60947-1		
Test input sender off	TE to V_s / TE to 0 V (depending on type)			–		
Ambient operating temperature	–40 °C ... +60 °C			–40 °C ... +60 °C ¹⁷⁾		
Ambient storage temperature	–40 °C ... +75 °C					

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

²⁾ $\pm 10\%$.

³⁾ May not exceed or fall short of V_s tolerances.

⁴⁾ Without load.

⁵⁾ Provide suitable spark suppression for inductive or capacitive loads. Relay contacts are separated from the power supply by a basic isolation of 3 mm. Depending on the application, additional isolation might have to be applied in the user's circuit.

⁶⁾ Provide suitable spark suppression for inductive or capacitive loads.

⁷⁾ Signal transit time with resistive load.

⁸⁾ Signal transit time with resistive load in switching mode. Different values possible in COM2 mode.

⁹⁾ With light/dark ratio 1:1.

¹⁰⁾ With light/dark ratio 1:1 in switching mode. Different values possible in COM2 mode.

¹¹⁾ Do not bend below 0°C .

¹²⁾ A = V_s connections reverse-polarity protected.

¹³⁾ B = inputs and output reverse-polarity protected.

¹⁴⁾ C = interference suppression.

¹⁵⁾ Reference voltage: 50 V DC.

¹⁶⁾ Reference voltage: 250 V AC.

¹⁷⁾ UL: $0^\circ\text{C} \dots +60^\circ\text{C}$.

Ordering information

Other models available at www.mysick.com/en/W27-3

WTB27-3, DC, infrared light

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

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Adjustment	Connection	Front screen heating	Time functions	Connection diagram	Type	Part no.
30 mm ... 1,600 mm	Ø 25 mm (800 mm)	PNP	Potentiometer	Cable, 4-wire, 2 m	–	–	Cd-094	WTB27-3P1111	1027752
				Cable, 4-wire, 5 m	–	–	Cd-094	WTB27-3P1211	1028065
				Connector M12, 4-pin	–	–	Cd-083	WTB27-3P2411	1025994
					–	✓	Cd-083	WTB27-3F2411	1027753
					✓	–	Cd-083	WTB27-3P2421	1027754
				Connector Q6, 6-pin, DC-coding	–	✓	Cd-178	WTB27-3F2611	1027756
				Cable with connector M12, 4-pin, 270 mm	–	–	Cd-083	WTB27-3P3411	1044438
			Double teach-in button	Cable, 4-wire, 2 m	–	–	Cd-094	WTB27-3P1113	1027759
				Connector M12, 4-pin	–	–	Cd-083	WTB27-3P2413	1027760
		NPN	Potentiometer	Cable, 4-wire, 2 m	–	–	Cd-094	WTB27-3N1111	1044855
				Connector M12, 4-pin	–	✓	Cd-083	WTB27-3E2411	1027755
				Connector Q6, 6-pin, DC-coding	–	✓	Cd-178	WTB27-3E2611	1027757
			Double teach-in button	Connector M12, 4-pin	–	–	Cd-083	WTB27-3N2413	1027761

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

WTB27-3, DC, visible red light

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Type of light:** visible red light
- **Switching mode:** light/dark-switching
- **Front screen heating:** –

H

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Adjustment	Connection	Time functions	Connection diagram	Type	Part no.
30 mm ... 1,100 mm	Ø 15 mm (500 mm)	PNP	Potentiometer	Connector M12, 4-pin	–	Cd-083	WTB27-3P2441	1027744
				Connector Q6, 6-pin, DC-coding	✓	Cd-178	WTB27-3F2641	1027746
				Cable with connector M12, 4-pin, 270 mm, PVC	–	Cd-083	WTB27-3P3441	1029082
			Double teach-in button	Connector M12, 4-pin	–	Cd-083	WTB27-3P2443	1027745
		NPN	Potentiometer	Connector Q6, 6-pin, DC-coding	✓	Cd-178	WTB27-3E2641	1027747
30 mm ... 2,000 mm	Ø 12 mm (800 mm)	PNP	Potentiometer	Connector M12, 4-pin	–	Cd-083	WTB27-3P2461	1044163
				Cable with connector M12, 4-pin	–	Cd-083	WTB27-3P3461	1048546
		NPN	Potentiometer	Cable, 4-wire, 2 m, PVC	–	Cd-094	WTB27-3N1161	1051644

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

WL27-3, DC, visible red light

- **Sensor principle:** photoelectric retro-reflective sensor
- **Type of light:** visible red light

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Adjustment	Connection	Time functions	Connection diagram	Type	Part no.
0.1 m ... 15 m	Ø 220 mm (10 m)	PNP	Light/dark-switching	Potentiometer	Cable, 4-wire, 2 m	–	Cd-094	WL27-3P1131	1027768
					Connector M12, 4-pin	–	Cd-083	WL27-3P2431	1027982
					Cable with connector M12, 4-pin, 270 mm	–	Cd-083	WL27-3P2451	1027770
					Connector Q6, 6-pin, DC-coding	✓	Cd-178	WL27-3P3431	1029081
				–	Connector M12, 4-pin	–	Cd-083	WL27-3P2430	1027769
					Connector M12, 4-pin	–	Cd-101	WL27-3P2450	1027771
					Connector M12, 4-pin	–	Cd-104	WL27-3K2430	1028069
			Light switching	–	Connector M12, 4-pin	–	Cd-104	WL27-3V2430	1028063
		NPN	Light/dark-switching	Potentiometer	Connector Q6, 6-pin, DC-coding	✓	Cd-178	WL27-3E2631	1027773
				–	Cable with connector M12, 4-pin, 270 mm	–	Cd-083	WL27-3P3460	1047955
0.1 m ... 19 m	Ø 60 mm (6 m)	PNP	Light/dark-switching	Potentiometer	Connector M12, 4-pin	–	Cd-083	WL27-3P2461	1044166

¹⁾ PL80A.

WL27-3, DC, detecting objects wrapped in film

- **Sensor principle:** photoelectric retro-reflective sensor
- **Type of light:** visible red light
- **Switching mode:** light/dark-switching

Sensing range max.	Light spot size (distance)	Output type	Connection	Connection diagram	Type	Part no.
0.1 m ... 4.3 m ¹⁾	Ø 90 mm (4 m)	PNP	Connector M12, 4-pin	Cd-083	WL27-3P2430S01	1028057
0.1 m ... 3 m ²⁾	Ø 30 mm (3 m)	PNP	Connector M12, 4-pin	Cd-083	WL27-3P2460S14	1047908

¹⁾ PL80A.²⁾ PL20A.

WSE27-3, DC, infrared light

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

Sensing range max.	Light spot size (distance)	Output type	Adjustment	Connection	Front screen heating	Time functions	Connection diagram	Type	Part no.
0 m ... 35 m	Ø 3.7 m (25 m)	PNP	–	Cable, 4-wire, 3 m, PVC	–	–	Cd-088	WSE27-3P1710	1028059
				Connector M12, 4-pin	–	–	Cd-072	WSE27-3P2410	1048199

WSE27-3, DC, visible red light

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

Sensing range max.	Light spot size (distance)	Output type	Adjustment	Connection	Front screen heating	Time functions	Con-nection diagram	Type	Part no.
0 m ... 35 m	Ø 600 mm (25 m)	PNP	–	Connector M12, 4-pin	–	–	Cd-072	WSE27-3P2430	1027790
			Potentiometer	Connector Q6, 6-pin, DC-coding	✓	–	Cd-072	WSE27-3P2450	1027791
		NPN	–	Cable, 4-wire, 2 m, PVC	–	✓	Cd-143	WSE27-3F2631	1027792
				Connector M12, 4-pin	–	–	Cd-088	WSE27-3N1130	1047803
				Connector M12, 4-pin	–	–	Cd-072	WSE27-3N2430	1028072
				Potentiometer	–	✓	Cd-143	WSE27-3E2631	1027793

WTB27-3, AC/DC

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Output type:** relay
- **Adjustment:** potentiometer

Type of light	Sensing range max. ¹⁾	Light spot size (distance)	Switching mode	Connection	Time functions	Con-nection diagram	Type	Part no.
Infrared light	30 mm ... 1,600 mm	Ø 25 mm (800 mm)	Light/dark-switching ²⁾	Connector Q6, 6-pin, AC/UC-coding	✓	Cd-181	WTB27-3R2611	1027763
			Light switching ³⁾	Cable, 5-wire, 2 m	–	Cd-161	WTB27-3S1511	1027762
Visible red light	30 mm ... 1,100 mm	Ø 15 mm (500 mm)	Light/dark-switching ²⁾	Connector Q6, 6-pin, AC/UC-coding	✓	Cd-181	WTB27-3R2641	1027750
			Light switching ³⁾	Cable, 5-wire, 2 m	–	Cd-161	WTB27-3S1541	1027749

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

²⁾ Provide suitable spark suppression for inductive or capacitive loads. Relay contacts are separated from the power supply by a basic isolation of 3 mm. Depending on the application, additional isolation might have to be applied in the user's circuit.

³⁾ Provide suitable spark suppression for inductive or capacitive loads.

WL27-3, AC/DC

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Type of light:** visible red light
- **Output type:** relay
- **Adjustment:** potentiometer

Sensing range max. ¹⁾	Light spot size (distance)	Switching mode	Connection	Time functions	Con-nection diagram	Type	Part no.
0.1 m ... 15 m	Ø 220 mm (10 mm)	Light/dark-switching ²⁾	Connector Q6, 6-pin, AC/UC-coding	✓	Cd-181	WL27-3R2631	1027776
		Light switching ³⁾	Cable, 5-wire, 2 m, PVC	–	Cd-161	WL27-3S1531	1027775

¹⁾ PL80A.

²⁾ Provide suitable spark suppression for inductive or capacitive loads. Relay contacts are separated from the power supply by a basic isolation of 3 mm. Depending on the application, additional isolation might have to be applied in the user's circuit.

³⁾ Provide suitable spark suppression for inductive or capacitive loads.

WSE27-3, AC/DC

- **Sensor principle:** through-beam photoelectric sensor
- **Type of light:** visible red light
- **Output type:** relay
- **Adjustment:** potentiometer

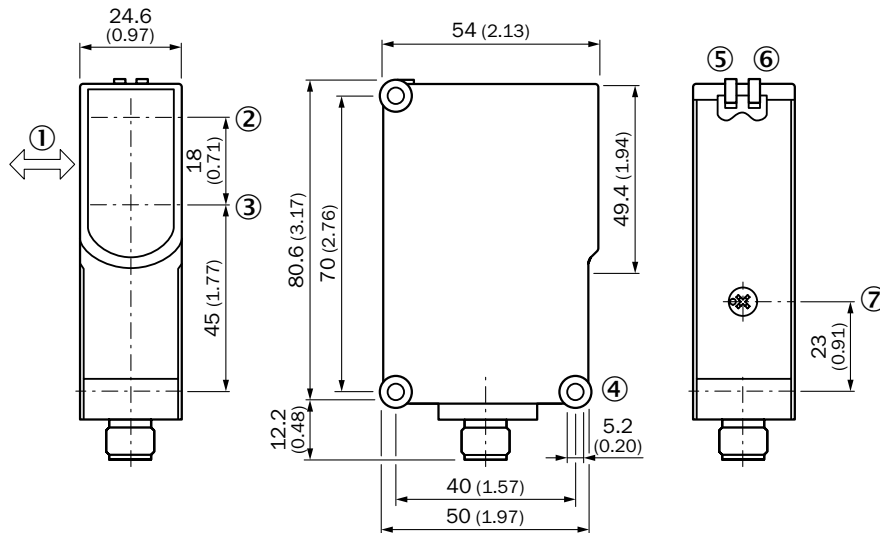
Sensing range max.	Light spot size (distance)	Switching mode	Connection	Time functions	Con- nection diagram	Type	Part no.
0 m ... 35 m	Ø 600 mm (25 mm)	Light/dark-switching ¹⁾	Connector Q6, 6-pin, AC/ UC-coding	✓	Cd-159	WSE27-3R2631	1027795

¹⁾ Provide suitable spark suppression for inductive or capacitive loads. Relay contacts are separated from the power supply by a basic isolation of 3 mm. Depending on the application, additional isolation might have to be applied in the user's circuit.

Dimensional drawings

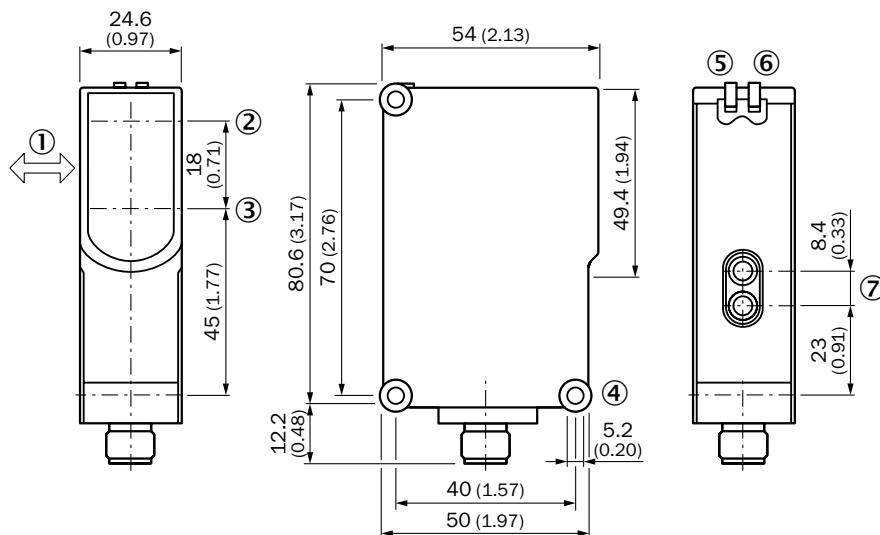
Dimensions in mm (inch)

WTB27-3, potentiometer



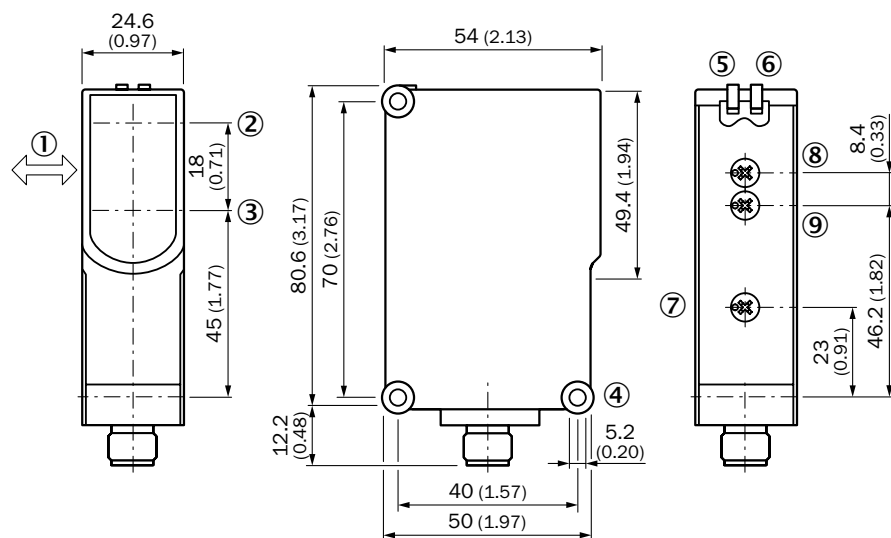
- ① Standard direction of the material being detected
- ② Optical axis, sender
- ③ Optical axis, receiver
- ④ Mounting hole Ø 5.2 mm
- ⑤ Status indicator LED green: power on
- ⑥ Status indicator LED, yellow: Status of received light beam
- ⑦ Sensing range adjustment: potentiometer

WTB27-3, double teach-in button



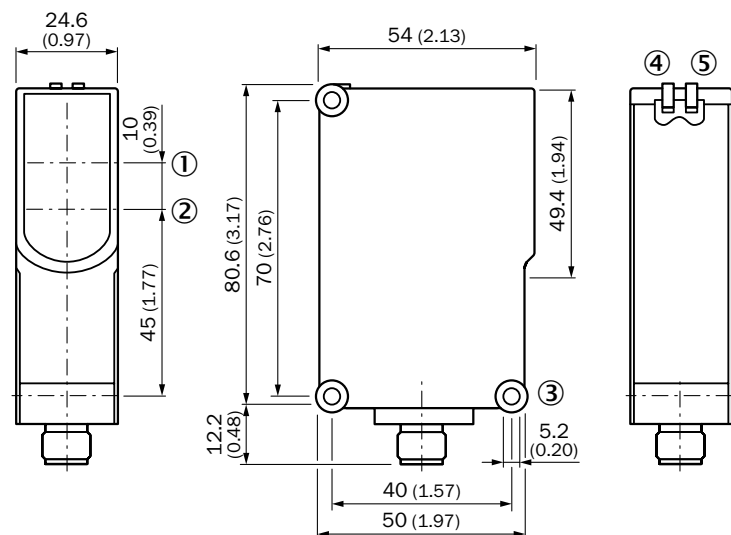
- ① Standard direction of the material being detected
- ② Optical axis, sender
- ③ Optical axis, receiver
- ④ Mounting hole Ø 5.2 mm
- ⑤ Status indicator LED green: power on
- ⑥ Status indicator LED, yellow: Status of received light beam
- ⑦ Sensing range adjustment: double teach button

WTB27-3, potentiometer, time functions



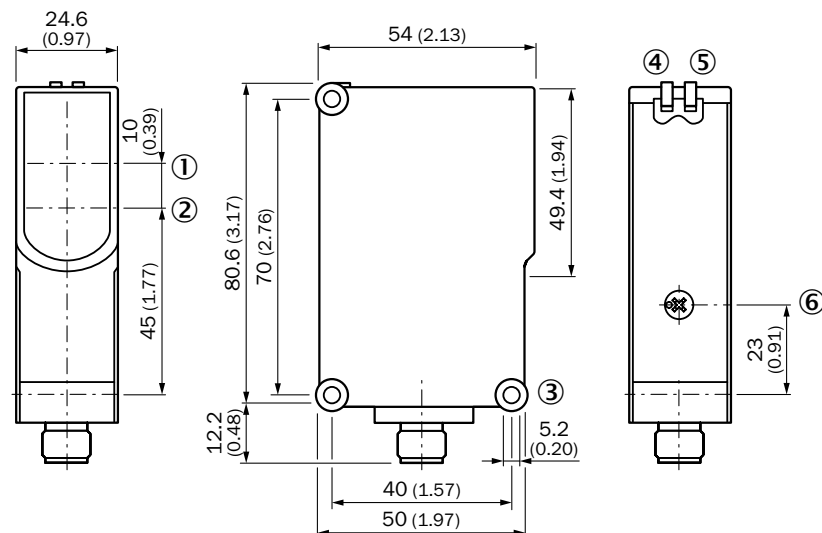
- ① Standard direction of the material being detected
- ② Optical axis, sender
- ③ Optical axis, receiver
- ④ Mounting hole $\varnothing$ 5.2 mm
- ⑤ Status indicator LED green: power on
- ⑥ Status indicator LED, yellow: Status of received light beam
- ⑦ Sensing range adjustment: potentiometer
- ⑧ Time control
- ⑨ Time delay selector switch

WL27-3, WSE27-3

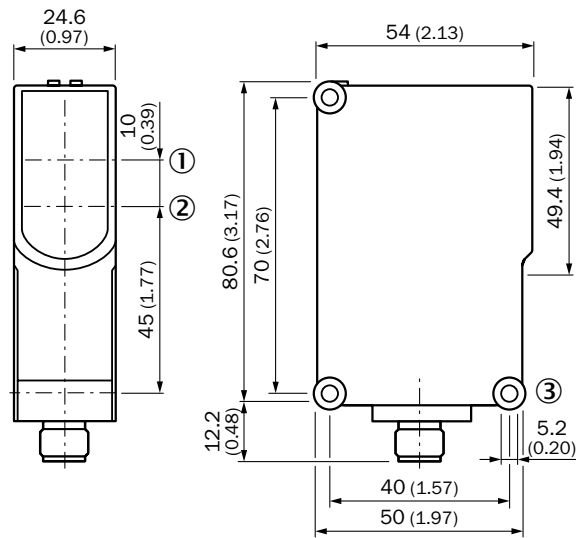


- ① Optical axis, sender
- ② Optical axis, receiver
- ③ Mounting hole $\varnothing$ 5.2 mm
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam

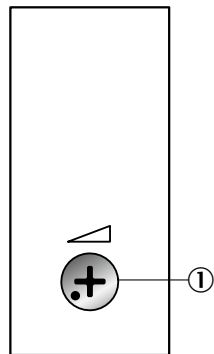
WL27-3, potentiometer



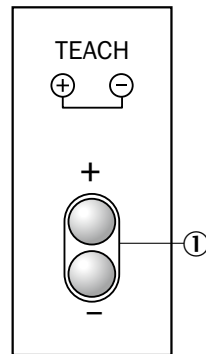
- ① Optical axis, sender
- ② Optical axis, receiver
- ③ Mounting hole $\varnothing$ 5.2 mm
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Sensitivity control (10 revolutions)

WL27-3, WSE27-3, potentiometer, time functions

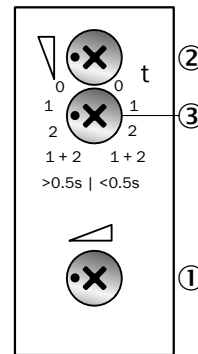
- ① Optical axis sender
- ② Optical axis, receiver
- ③ Mounting hole $\varnothing$ 5.2 mm
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Sensitivity control (10 revolutions)
- ⑦ Time control
- ⑧ Time delay selector switch

Adjustments**Potentiometer**

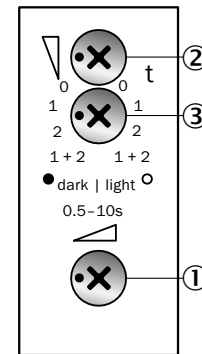
① Potentiometer

Double teach-in button

① Double teach-in button

Potentiometer, time functions

① Potentiometer
② Time control
③ Time delay selector switch

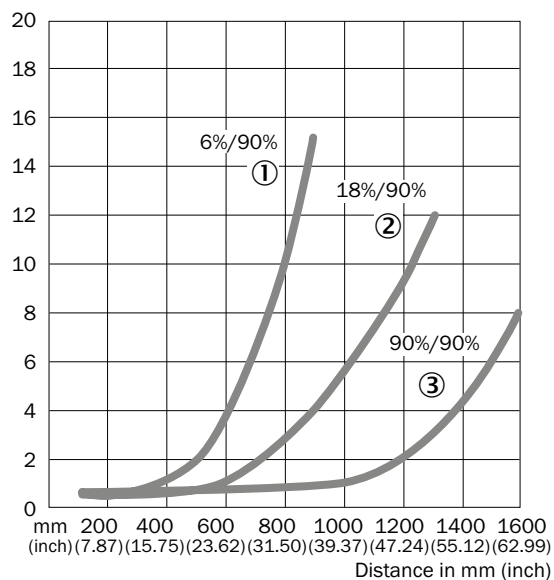
Potentiometer, time functions, light-/dark-switch

① Potentiometer
② Time control
③ Time delay selector switch

Characteristic curves

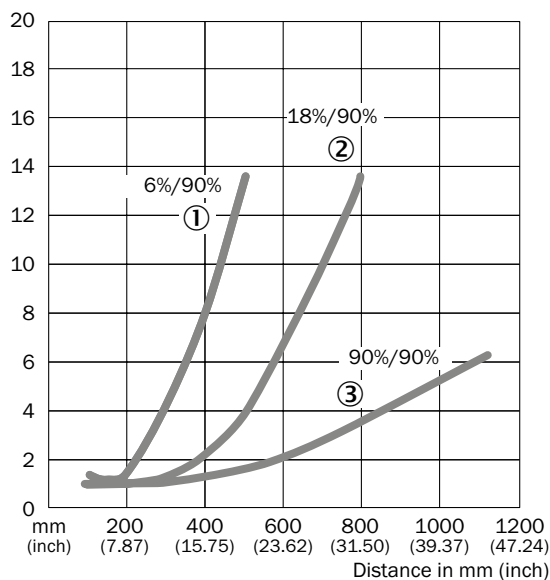
Black-white shift

WTB27-3, infrared



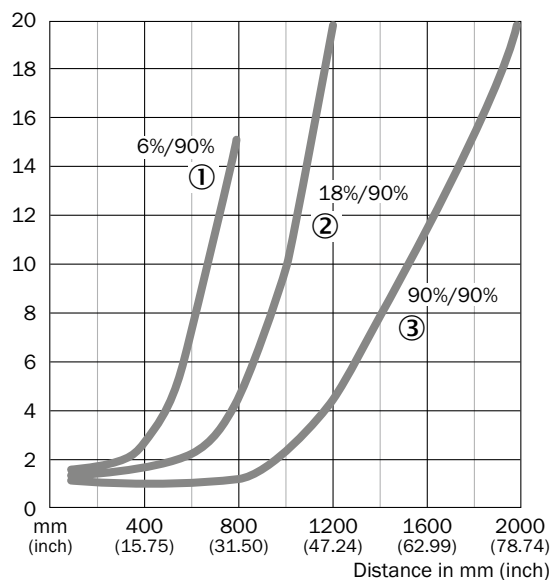
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WTB27-3, red light



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

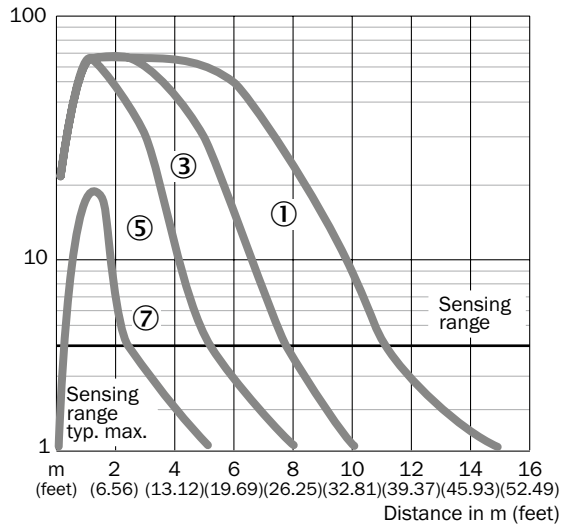
WTB27-3, PinPoint LED



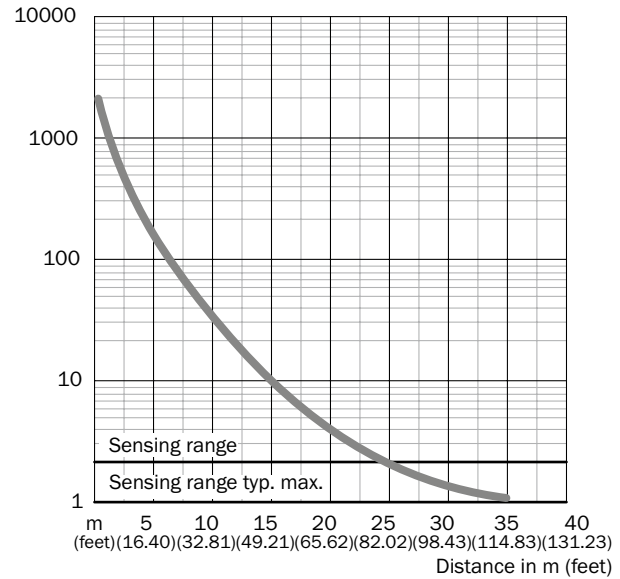
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

Operating reserve

WL27-3

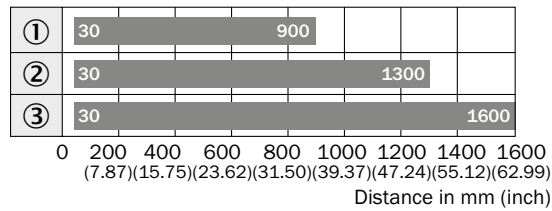


WSE27-3



Bar diagrams

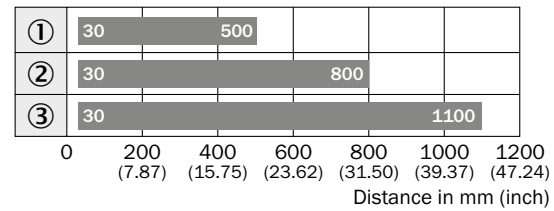
WTB27-3, infrared



■ Sensing range

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

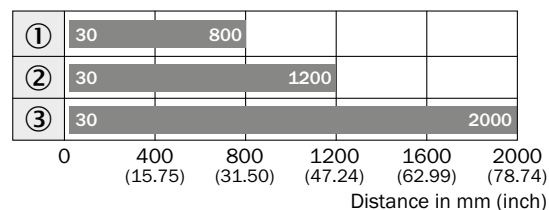
WTB27-3, red light



■ Sensing range

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

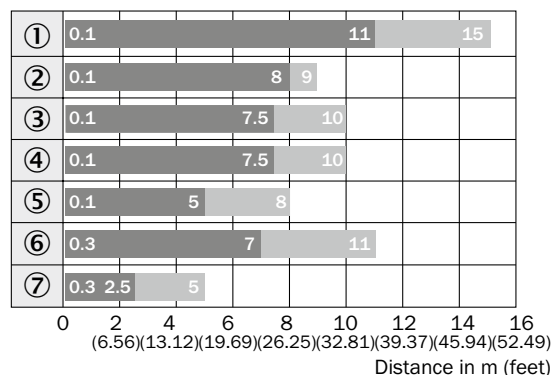
WTB27-3, PinPoint LED



Sensing range

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

WL27-3

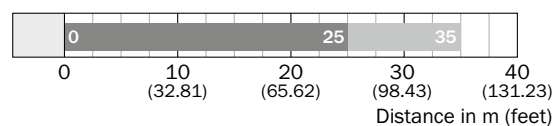


Sensing range

Sensing range max.

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

WSE27-3

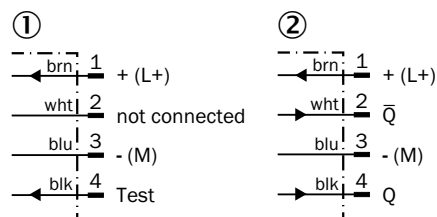


Sensing range

Sensing range typ. max.

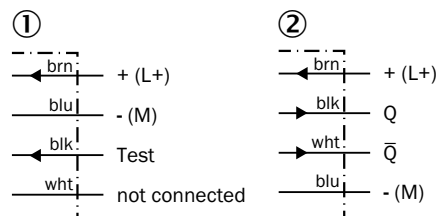
Connection diagram

Cd-072



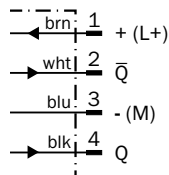
- ① Sender
- ② Receiver

Cd-088

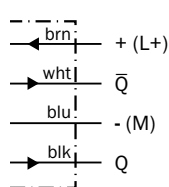


- ① Sender
- ② Receiver

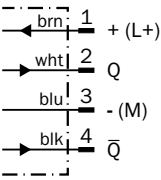
Cd-083



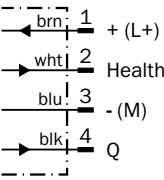
Cd-094



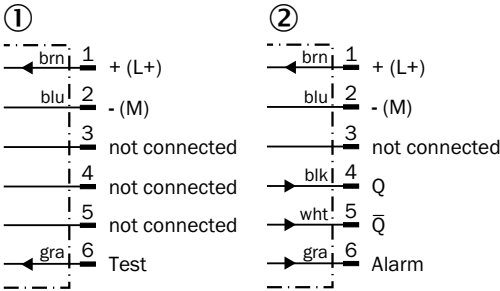
Cd-101



Cd-104

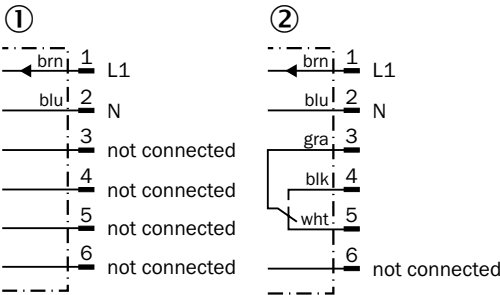


Cd-143



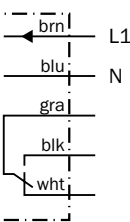
① Sender
② Receiver

Cd-159

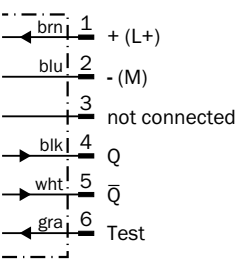


① Sender
② Receiver

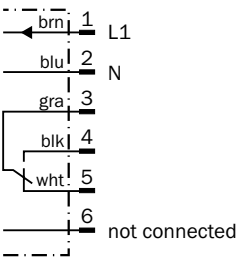
Cd-161



Cd-178



Cd-181



Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Mounting bracket with hinged arm	BEF-WN-MULTI	2064469
			BEF-WN-W27	2009122

Plug connectors and cables

Connecting cable (female connector-open)

- Connector material: TPU

Figure	Connection type head A	Connection type head B	Connect-ing cable	Cable material	Enclosure rating	Model name	Part no.
	Female connector, M12, 4-pin, straight	Cable, open con-ductor heads	2 m, 4-wire	PVC	IP 67	DOL-1204-G02M	6009382
			5 m, 4-wire	PVC	IP 67	DOL-1204-G05M	6009866
			2 m, 4-wire	PUR, halo-gen-free	IP 65, IP 68, IP 69K	DOL-1204-G02MC	6025900
			5 m, 4-wire	PUR, halo-gen-free	IP 65, IP 68, IP 69K	DOL-1204-G05MC	6025901
	Female connector, M12, 4-pin, angled, with 3 LEDs	Cable, open con-ductor heads	2 m, 4-wire	PVC	IP 67	DOL-1204-L02M	6027945
			5 m, 4-wire	PVC	IP 67	DOL-1204-L05M	6027944
	Female connector, M12, 4-pin, angled	Cable, open con-ductor heads	2 m, 4-wire	PVC	IP 67	DOL-1204-W02M	6009383
			5 m, 4-wire	PVC	IP 67	DOL-1204-W05M	6009867
			2 m, 4-wire	PUR, halo-gen-free	IP 65, IP 68, IP 69K	DOL-1204-W02MC	6025903
			5 m, 4-wire	PUR, halo-gen-free	IP 65, IP 68, IP 69K	DOL-1204-W05MC	6025904

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 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-W27	2039601
	Steel, zinc coated	Weather hood for universal clamp bracket	OBW-KHS-M01	2023240

Reflectors**Angular**

H

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.
	Reflective tape "Diamond Grade", self-adhesive, customizable size by sheet, 74.9 cm x 91.4 cm ¹⁾	REF-DG-K	4019634
	Self-adhesive, 50 mm x 60 mm	REF-IRF-56	5314244

¹⁾ Customizable length by sheet. Width max. 74.9 cm, length max. 91.4 cm.

Round

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

→ For additional accessories, please see page L-861

Ready-to-install sensors compliant with ATEX category 3G/3D



Product description

The W27 family is designed for harsh industrial environments where it copes easily with heavy vibrations, shocks and extreme temperature fluctuations. The W27-3 Ex photoelectric sensor meets category 3G/3D (ATEX) requirements for use in explosive environments. These sensors are enclosed in a rugged metal

housing that provides users with a ready-to-install solution that complies with all its aspects. For, besides limit values for temperature, performance or UV resistance, the standard also prescribes a specific mechanical stability that conventional sensors do not meet.

At a glance

- Classification: EX II 3G EX nA op is IIB T4 Gc X, EX II 3D EX tc IIIB T135 °C Dc IP67 X according to Directive 94/9/EC (ATEX)
- Corresponds to category 3D/3G
- Conform to standards and ready-to-install: Sensor and additional protective housing (stainless steel 1.4301)
- Long sensing range with IR LED
- High level of operating reserve
- Resistant to ambient light, optical reflections, and crosstalk from other photoelectric devices

Your benefits

- Ready-to-install sensors including rugged metal housing conform with the 3G/3D category for explosive zones (ATEX)
- Resistant to ambient light, optical reflections, and immune to crosstalk from other photoelectric devices, reducing false detection
- Long sensing range with high operating reserve
- Resistant to vibrations, reducing downtime
- Withstands harsh environments with temperatures between -20 °C - +50 °C



Additional information

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Ordering information.....	H-634
Dimensional drawings	H-635
Adjustments	H-636
Characteristic curves	H-637
Bar diagrams.....	H-638
Connection diagram	H-638
Recommended accessories....	H-638

→ www.mysick.com/en/W27-3_Ex

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

	WT27-3 Ex	WL27-3 Ex	WSE27-3 Ex
Sensor principle	Photoelectric proximity sensor	Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Detection principle	Background suppression	Standard optics	–
Dimensions (W x H x D)	31.4 mm x 112.3 mm x 70.4 mm		
Housing design (light emission)	Rectangular		
Sensing range max.	30 mm ... 1,600 mm ¹⁾	0.1 m ... 15 m ²⁾	0 m ... 35 m
Sensing range	100 mm ... 1,600 mm	0.1 m ... 11 m ²⁾	0 m ... 25 m
Type of light	Infrared light	Visible red light	
Light source ³⁾	LED		
Light spot size (distance)	Ø 25 mm (800 mm)	Ø 220 mm (10 m)	Ø 600 mm (25 m)
Angle of dispersion	–	Approx. 1.5°	
Wave length	880 nm	660 nm	645 nm
Adjustment	Potentiometer		–

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

	WT27-3 Ex	WL27-3 Ex	WSE27-3 Ex
Supply voltage ¹⁾	10 V DC ... 30 V DC		
Ripple ²⁾	≤ 5 V _{pp}		
Current consumption ³⁾	≤ 40 mA	≤ 30 mA	35 mA
Current consumption, sender ³⁾	–		35 mA
Current consumption, receiver ³⁾	–		20 mA
Output type	PNP		
Output function	Complementary		
Switching mode	Light/dark-switching		
Signal voltage PNP HIGH/LOW	Approx. V _S – 2.5 V / 0 V		
Output current I _{max}	≤ 100 mA		
Response time ⁴⁾	≤ 1.5 ms	≤ 500 µs	
Switching frequency ⁵⁾	350 Hz	1,000 Hz	
Angle of reception	–		Approx. 3°
Connection type	Cable, 10 m ⁶⁾ Cable with connector, M12 (depending on type)		
Circuit protection	A ⁷⁾ , B ⁸⁾ , C ⁹⁾		
Protection class ¹⁰⁾	II		
Weight	750 g		1,500 g
Polarisation filter	–	✓	–
Housing material			
Sensor	ABS		
Protection housing	Stainless steel V2A (1.4301)		
Optics material	PMMA		
Enclosure rating	IP 67		

	WT27-3 Ex	WL27-3 Ex	WSE27-3 Ex
ATEX marking	EX II 3G EX nA op is IIB T4 Gc X/EX II 3D EX tc IIB T135 °C Dc		
Hazardous area category	3D, 3G		
Ambient operating temperature	-20 °C ... +50 °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⁾ B = inputs and output reverse-polarity protected.

⁹⁾ C = interference suppression.

¹⁰⁾ Reference voltage: 50 V DC.

Ordering information

Other models available at www.mysick.com/en/W27-3_Ex

WT27-3 Ex

- **Sensor principle:** photoelectric proximity sensor

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Connection diagram	Type	Part no.
30 mm ... 1,600 mm	Ø 25 mm (800 mm)	PNP	Cable, 4-wire, 10 m	Cd-094	WTB27X-3P1811	1027988

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

WL27-3 Ex

- **Sensor principle:** photoelectric retro-reflective sensor

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Connection diagram	Type	Part no.
0.1 m ... 15 m	Ø 220 mm (10 mm)	PNP	Cable, 4-wire, 10 m, PVC	Cd-094	WL27X-3P1831	1027989
			Cable with connector M12, 4-pin	Cd-094	WL27X-3P3431	1029955

¹⁾ PL80A.

WSE27-3 Ex

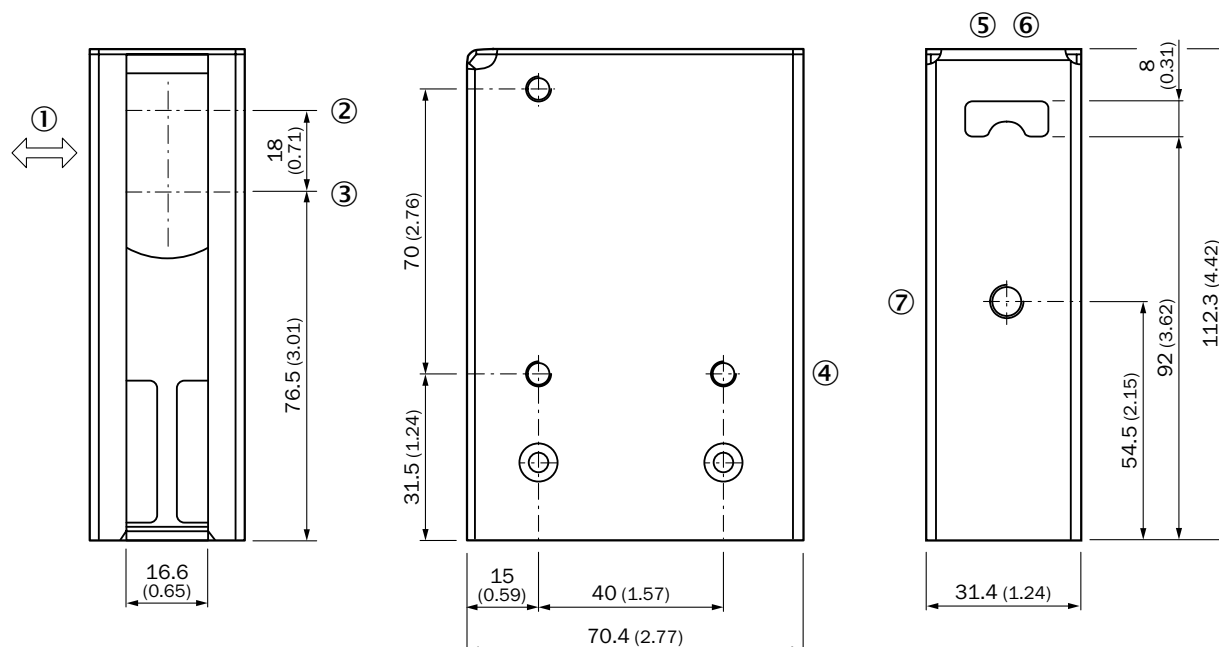
- **Sensor principle:** through-beam photoelectric sensor

Sensing range max.	Light spot size (distance)	Output type	Connection	Connection diagram	Type	Part no.
0 m ... 35 m	Ø 600 mm (25 m)	PNP	Cable, 4-wire, 10 m	Cd-088	WSE27X-3P1830	1027991

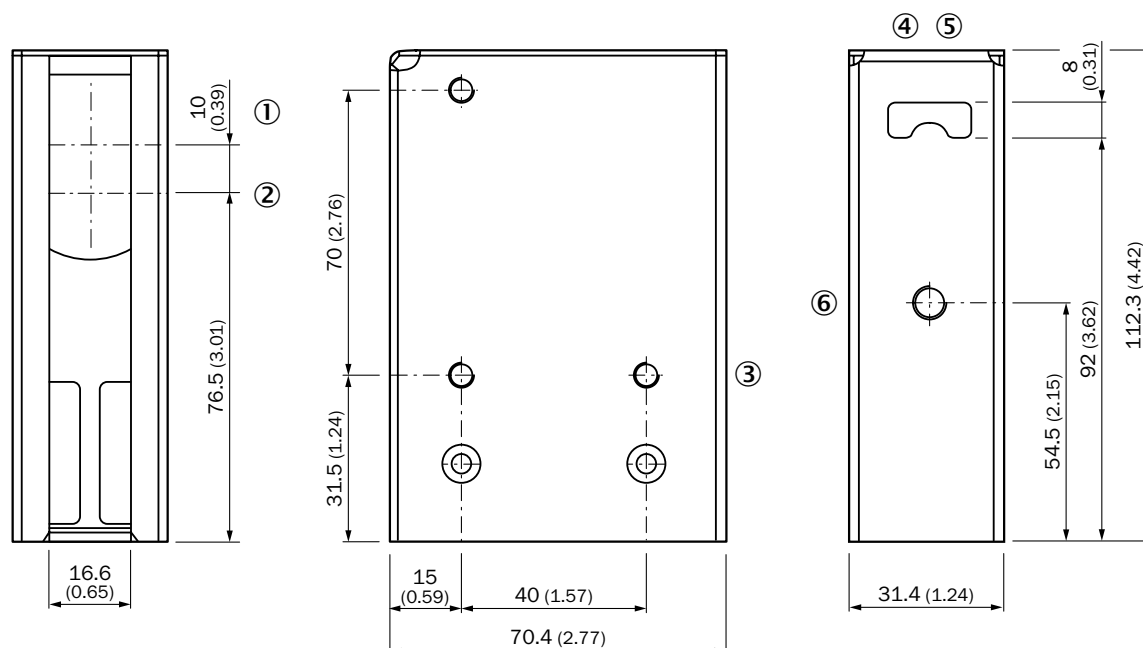
Dimensional drawings

Dimensions in mm (inch)

WTB27-3 EX

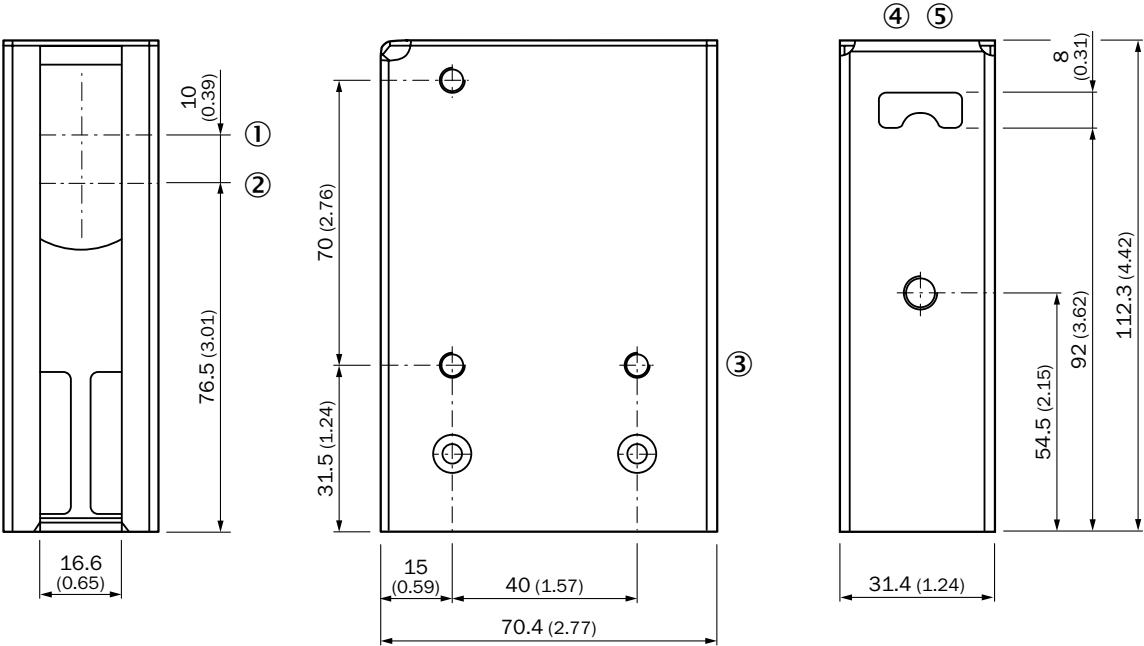


WL27-3 EX



H

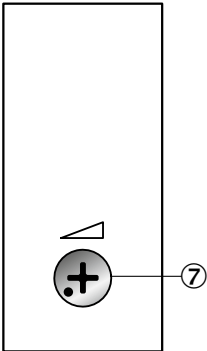
WSE27-3 EX



- ① Optical axis, sender
- ② Optical axis, receiver
- ③ Mounting hole $\varnothing$ 5.2 mm
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam

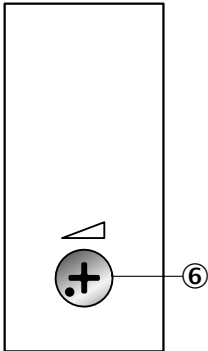
Adjustments

WTB27-3 Ex



⑦ Sensing range adjustment:
potentiometer

WL27-3 Ex

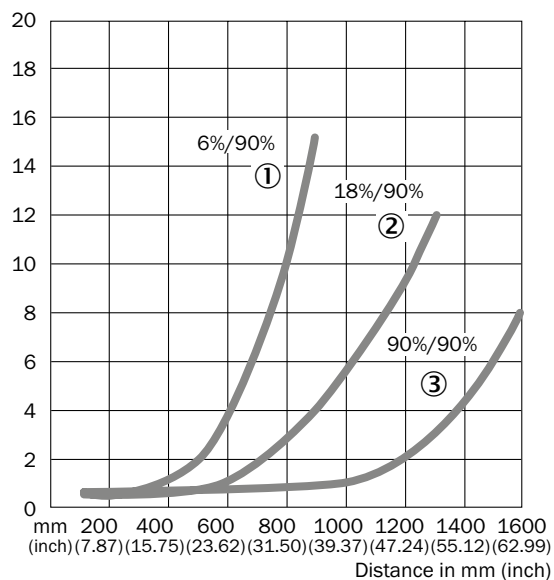


⑥ Sensitivity adjustment:
potentiometer

Characteristic curves

Black-white shift

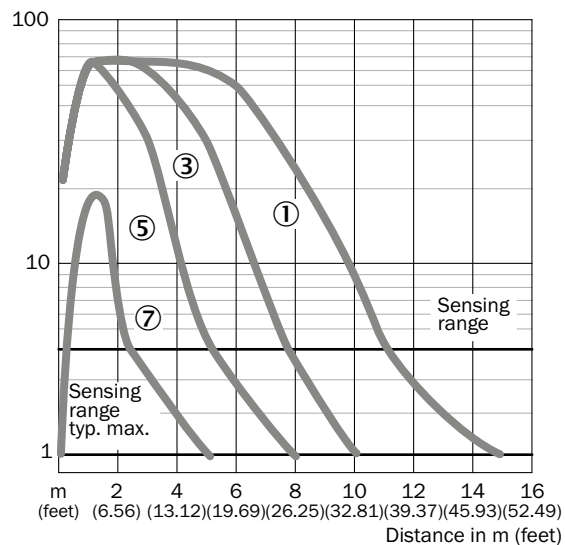
WTB27-3 EX



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

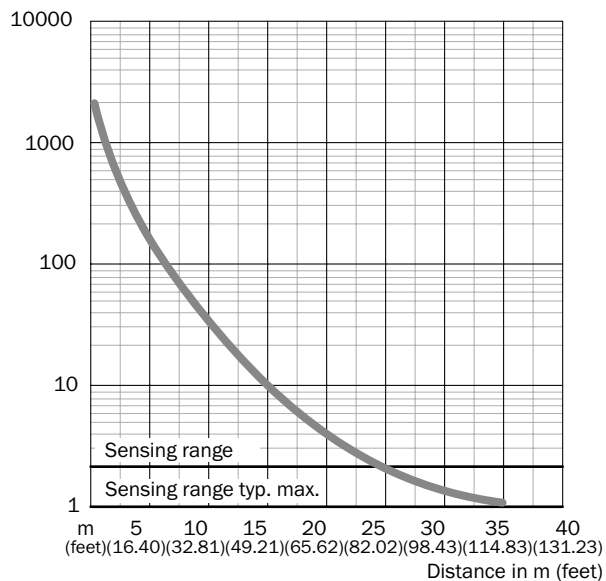
Operating reserve

WL27-3 EX



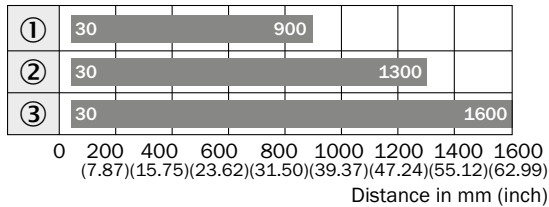
- ① PL80A
- ③ PL40A
- ⑤ PL20A
- ⑦ Reflective tape Diamond Grade

WSE27-3 EX



Bar diagrams

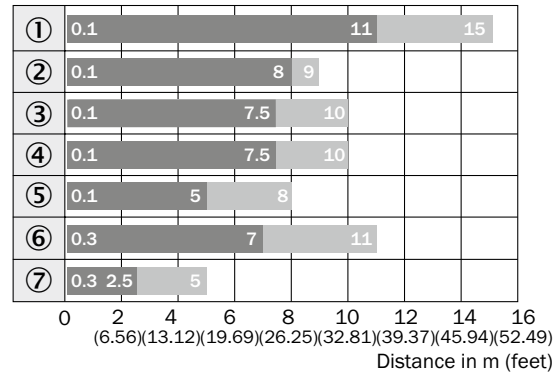
WTB27-3 EX



■ Sensing range

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

WL27-3 EX

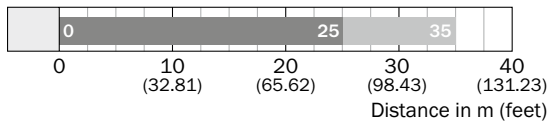


■ Sensing range

■ Sensing range max.

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

WSE27-3 Ex

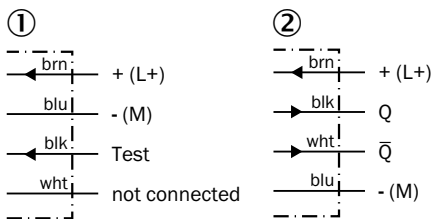


■ Sensing range

■ Sensing range typ. max.

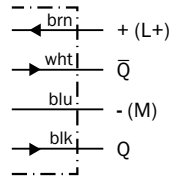
Connection diagram

Cd-088



- ① Sender
 ② Receiver

Cd-094



Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Mounting bracket with hinged arm	BEF-WN-MULTI	2064469
			BEF-WN-W27	2009122

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Zinc plated steel (sheet), Diecast zinc (clamp)	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-W27	2039601
	Steel, zinc coated	Weather hood for universal clamp bracket	OBW-KHS-M01	2023240

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

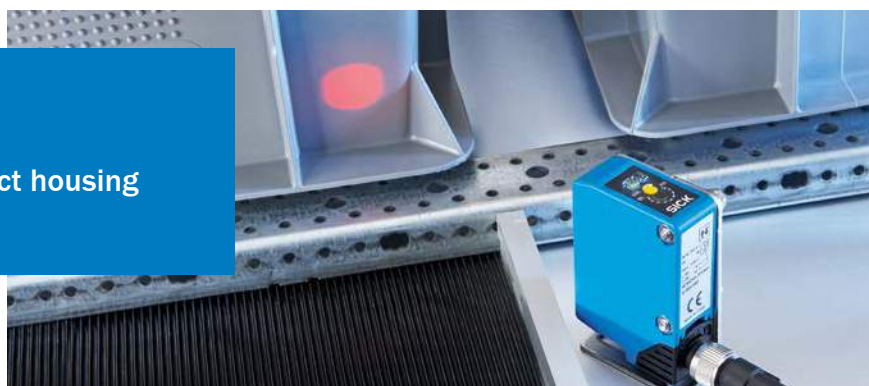
Round

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

→ For additional accessories, please see page L-861

High performance in a compact housing
with universal AC/DC voltage

AC/DC



Product description

The W250 family integrates both DC and universal AC/DC versions into one compact housing. Both cable and rotatable M12 connector versions enhance this sensor's integration flexibility. In addition,

an easy-to-read sensing range indicator aids users during adjustment. Operating mode (light/dark) is selectable via a control cable, which reduces the number of device variants.

At a glance

- Highly visible red light spot thanks to the Bright Light LED
- Potentiometer for adjusting sensing range
- Operating mode (light/dark) selectable via control wire
- Cable or rotatable M12 connector
- Versions for 10 – 30 V DC or 24 – 240 V DC/ 24 – 240 V AC voltage supply in compact design
- Stainless steel mounting bracket BEF-W250 included in delivery

Your benefits

- Mounting bracket is included to ease installation
- Visible red Bright Light LED for simpler alignment of the sensors
- Cable or rotatable M12 connector provide installation flexibility
- Operating mode (light/dark) is selectable via a control cable to reduce the number of device variants
- Variants with DC voltage and universal AC/DC voltage in the same housing provide increased flexibility



Additional information

Detailed technical data.....	H-641
Ordering information.....	H-642
Dimensional drawings.....	H-644
Adjustments.....	H-649
Characteristic curves.....	H-649
Bar diagrams.....	H-651
Connection diagram.....	H-651
Recommended accessories....	H-652

→ www.mysick.com/en/W250-2

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

	DC			AC/DC		
	WTB250-2	WL250-2	WSE250-2	WTB250-2	WL250-2	WSE250-2
Sensor principle	Photoelectric proximity sensor	Photoelectric retro-reflective sensor	Through-beam photoelectric sensor	Photoelectric proximity sensor	Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Detection principle	Background suppression	Standard optics	–	Background suppression	Standard optics	–
Dimensions (W x H x D)	20 mm x 65 mm x 43.9 mm					
Housing design (light emission)	Rectangular					
Sensing range max.	100 mm ... 1,000 mm ¹⁾ (depending on type)	0.01 m ... 15 m ²⁾	0 m ... 50 m	100 mm ... 1,000 mm ¹⁾ (depending on type)	0.01 m ... 15 m ²⁾	0 m ... 50 m
Sensing range	100 mm ... 1,000 mm ¹⁾ (depending on type)	0.01 m ... 13 m ²⁾	0 m ... 40 m	100 mm ... 1,000 mm ¹⁾ (depending on type)	0.01 m ... 13 m ²⁾	0 m ... 40 m
Type of light	Visible red light					
Light source ³⁾	BrightLight LED					
Angle of dispersion	Approx. 3°	Approx. 2°		Approx. 3°	Approx. 2°	
Adjustment ⁴⁾	Potentiometer, 2 turns					

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.⁴⁾ With position indicator.

Mechanics/electronics

	DC			AC/DC		
	WTB250-2	WL250-2	WSE250-2	WTB250-2	WL250-2	WSE250-2
Supply voltage	10 V DC ... 30 V DC ¹⁾			24 V DC ... 240 V DC ²⁾ 24 V AC/DC ... 240 V AC/DC ²⁾		
Ripple ³⁾	≤ 5 V _{pp}			–		
Current consumption	≤ 35 mA	≤ 20 mA	–	–		
Current consumption, sender	–		20 mA ³⁾	–		
Current consumption, receiver	–		20 mA ³⁾	–		
Power consumption	–			≤ 5 VA		–
Power consumption, sender	–				≤ 3,5 VA	
Power consumption, receiver	–				≤ 3,5 VA	
Output type	PNP, open collector/NPN, open collector (depending on type)			Relay, electrically isolated ⁵⁾		
Output function	–			Change-over contacts		
Switching mode	Light/dark-switching/Light switching (Selectable via L/D control wire)			Light switching ⁵⁾		
Output current I _{max.}	≤ 100 mA			–		
Switching current (switching voltage)	–			3 A (240 V AC)/3 A (30 V DC)		
Response time	≤ 3 ms ⁶⁾			≤ 15 ms		
Switching frequency ⁷⁾	160 Hz	1,000 Hz		33 Hz		
Angle of reception	–		20°	–		20°
Connection type	Cable ⁸⁾ /Male connector, M12 ⁹⁾ (depending on type)			Cable ⁸⁾		
Circuit protection	A ¹⁰⁾ , B ¹¹⁾ , C ¹²⁾ , D ¹³⁾			A ¹⁰⁾ , C ¹²⁾		

	DC			AC/DC		
	WTB250-2	WL250-2	WSE250-2	WTB250-2	WL250-2	WSE250-2
Protection class	III			II ¹⁴⁾		
Overvoltage category	–			2		
Weight						
	Cable	150 g	300 g	330 g		660 g
	Connector	40 g	80 g	–		
Polarisation filter	–	✓	–	✓	–	
Housing material	ABS					
Optics material	PMMA					
Enclosure rating	IP 67					
Items supplied	BEF-W250 mounting bracket	Reflector P250, BEF-W250 mounting bracket	BEF-W250 mounting bracket		Reflector P250, BEF-W250 mounting bracket	BEF-W250 mounting bracket
Usage category	–			AC-15, DC-13, according to EN 60947-1		
EMC ¹⁵⁾	EN 60947-5-2					
Ambient operating temperature	–25 °C ... +55 °C					
Ambient storage temperature	–40 °C ... +70 °C					

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

²⁾ ±10 %.

³⁾ May not exceed or fall short of V_s tolerances.

⁴⁾ Without load.

⁵⁾ Provide suitable spark suppression for inductive or capacitive loads.

⁶⁾ Signal transit time with resistive load.

⁷⁾ With light/dark ratio 1:1.

⁸⁾ Do not bend below 0 °C.

⁹⁾ 90 ° rotatable.

¹⁰⁾ A = V_s connections reverse-polarity protected.

¹¹⁾ B = inputs and output reverse-polarity protected.

¹²⁾ C = interference suppression.

¹³⁾ D = outputs overcurrent and short-circuit protected.

¹⁴⁾ Reference voltage: 250 V AC.

¹⁵⁾ The AC/DC devices meet the interference suppression requirements for industrial use (interference suppression class A). When used in residential areas it can cause interference.

Ordering information

Other models available at www.mysick.com/en/W250-2

WTB250-2, DC

- Sensor principle: photoelectric proximity sensor

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
100 mm ... 300 mm	Ø 30 mm (300 mm)	PNP	Light/dark-switching	Cable, 4-wire, 2 m, PVC	Cd-089	WTB250-2P1131	6044674
				Connector M12, 4-pin	Cd-087	WTB250-2P2431	6044675
		NPN	Light/dark-switching	Cable, 4-wire, 2 m, PVC	Cd-089	WTB250-2N1131	6044672
				Connector M12, 4-pin	Cd-087	WTB250-2N2431	6044673
150 mm ... 500 mm	Ø 30 mm (500 mm)	PNP	Light/dark-switching	Cable, 4-wire, 2 m, PVC	Cd-089	WTB250-2P1141	6044680
				Cable, 4-wire, 5 m, PVC	Cd-089	WTB250-2P1241	6044681
			Light switching	Connector M12, 4-pin	Cd-087	WTB250-2P2441	6044682
				Connector M12, 4-pin	Cd-066	WTB250-2F2441	6044685
		NPN	Light/dark-switching	Cable, 4-wire, 2 m, PVC	Cd-089	WTB250-2N1141	6044678
				Connector M12, 4-pin	Cd-087	WTB250-2N2441	6044679

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

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
200 mm ... 1,000 mm	Ø 35 mm (1,000 mm)	PNP	Light/dark-switching	Cable, 4-wire, 2 m, PVC	Cd-089	WTB250-2P1151	6044690
				Cable, 4-wire, 5 m, PVC	Cd-089	WTB250-2P1251	6044691
				Connector M12, 4-pin	Cd-087	WTB250-2P2451	6044692
		NPN	Light/dark-switching	Cable, 4-wire, 2 m, PVC	Cd-089	WTB250-2N1151	6044686
				Cable, 5-wire, 5 m, PVC	Cd-089	WTB250-2N1251	6044687
				Connector M12, 4-pin	Cd-087	WTB250-2N2451	6044689

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

WL250-2, DC

- **Sensor principle:** photoelectric retro-reflective sensor

Sensing range max.	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0.01 m ... 15 m ¹⁾ 0.01 m ... 12 m ²⁾	Ø 260 mm (8 m)	PNP	Light/dark-switching	Cable, 4-wire, 2 m, PVC	Cd-089	WL250-2P1131	6044697
				Cable, 4-wire, 5 m, PVC	Cd-089	WL250-2P1231	6044698
				Connector M12, 4-pin	Cd-087	WL250-2P2431	6044699
		NPN	Light/dark-switching	Connector M12, 4-pin	Cd-067	WL250-2F2431	6044702
				Cable, 4-wire, 2 m, PVC	Cd-089	WL250-2N1131	6044695
				Connector M12, 4-pin	Cd-087	WL250-2N2431	6044696

¹⁾ PL80A.

²⁾ P250.

WSE250-2, DC

- **Sensor principle:** through-beam photoelectric sensor

Sensing range max.	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0 m ... 50 m	Ø 0.6 m (20 m)	PNP	Light/dark-switching	Cable, 4-wire, 2 m, PVC	Cd-058	WSE250-2P1131	6044703
				Cable, 4-wire, 5 m, PVC	Cd-058	WSE250-2P1231	6044704
				Connector M12, 4-pin	Cd-060	WSE250-2P2431	6044705
		NPN	Light/dark-switching	Connector M12, 4-pin	Cd-071	WSE250-2F2431	6044706
				Cable, 4-wire, 2 m, PVC	Cd-058	WSE250-2N1131	6044709
				Connector M12, 4-pin	Cd-060	WSE250-2N2431	6044711

WTB250-2, AC/DC

- **Sensor principle:** photoelectric proximity sensor

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode ²⁾	Connection	Connection diagram	Model name	Part no.
100 mm ... 300 mm	Ø 30 mm (300 mm)	Relay	Light switching	Cable, 5-wire, 2 m, PVC	Cd-163	WTB250-2R1531	6044676
				Cable, 5-wire, 5 m, PVC	Cd-163	WTB250-2R1631	6044677
150 mm ... 500 mm	Ø 30 mm (500 mm)	Relay	Light switching	Cable, 5-wire, 2 m, PVC	Cd-163	WTB250-2R1541	6044683
				Cable, 5-wire, 5 m, PVC	Cd-163	WTB250-2R1641	6044684
200 mm ... 1,000 mm	Ø 35 mm (1,000 mm)	Relay	Light switching	Cable, 5-wire, 2 m, PVC	Cd-163	WTB250-2R1551	6044693
				Cable, 5-wire, 5 m, PVC	Cd-163	WTB250-2R1651	6044694

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

²⁾ Provide suitable spark suppression for inductive or capacitive loads.

WL250-2, AC/DC

- **Sensor principle:** photoelectric retro-reflective sensor

Sensing range max.	Light spot size (distance)	Output type	Switching mode ²⁾	Connection	Connection diagram	Model name	Part no.
0.01 m ... 15 m ¹⁾	Ø 260 mm (8 m)	Relay	Light switching	Cable, 5-wire, 2 m, PVC	Cd-229	WL250-2R1531	6044700
0.01 m ... 12 m ²⁾				Cable, 5-wire, 5 m, PVC	Cd-229	WL250-2R1631	6044701

¹⁾ PL80A.

²⁾ P250.

²⁾ Provide suitable spark suppression for inductive or capacitive loads.

WSE250-2, AC/DC

- **Sensor principle:** through-beam photoelectric sensor

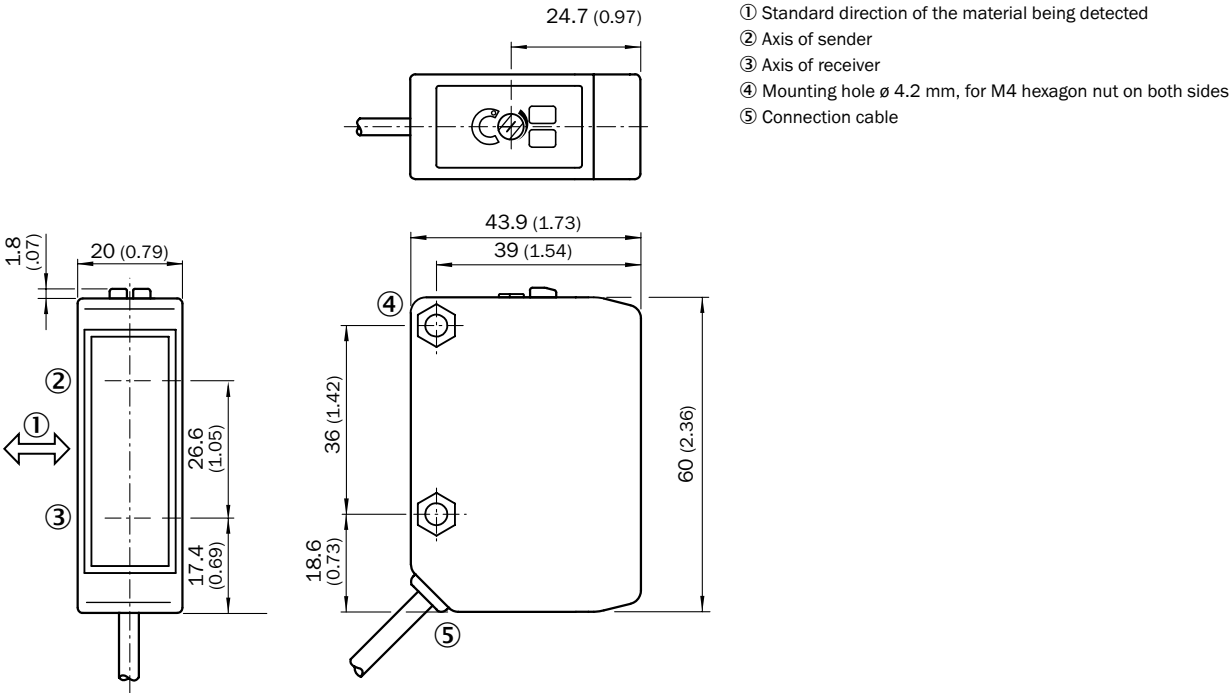
Sensing range max.	Light spot size (distance)	Output type	Switching mode ²⁾	Connection	Connection diagram	Model name	Part no.
0 m ... 50 m	Ø 0.6 m (20 m)	Relay	Light switching	Cable, 5-wire, 2 m, PVC	Cd-228	WSE250-2R1531	6044707
				Cable, 5-wire, 5 m, PVC	Cd-228	WSE250-2R1631	6044708

²⁾ Provide suitable spark suppression for inductive or capacitive loads.

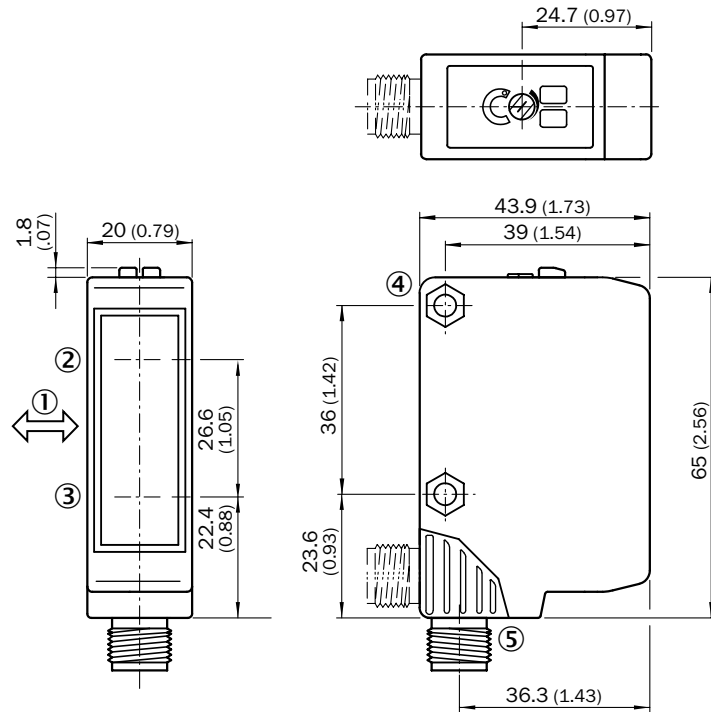
Dimensional drawings

Dimensions in mm (inch)

WTB250-2, DC, cable

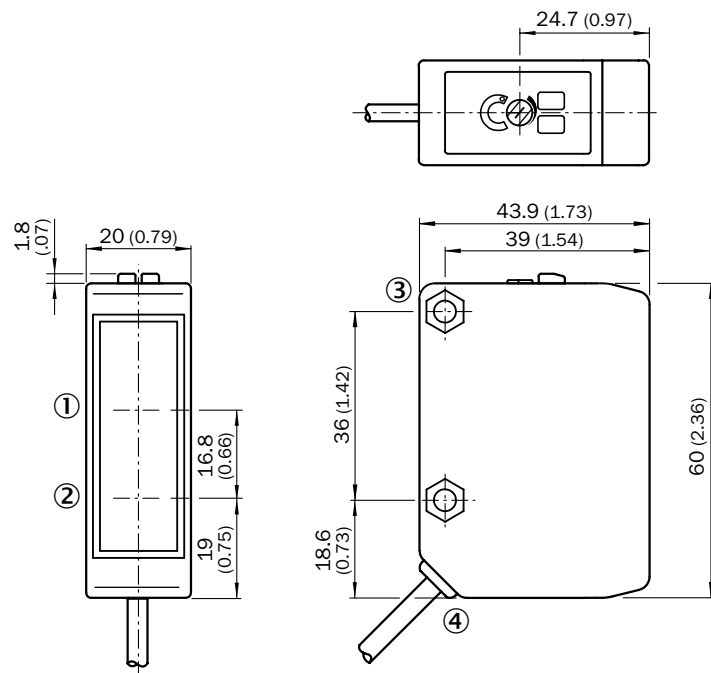


WTB250-2, DC, connector

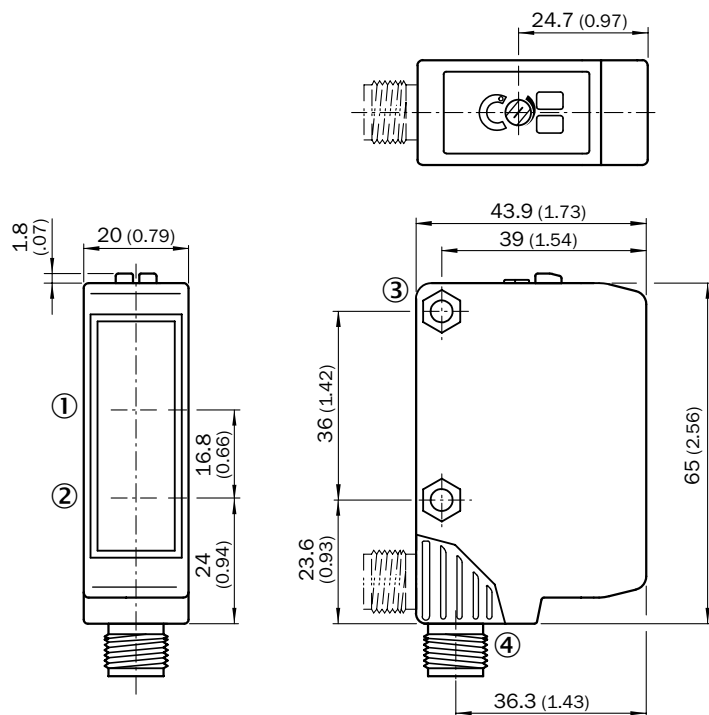
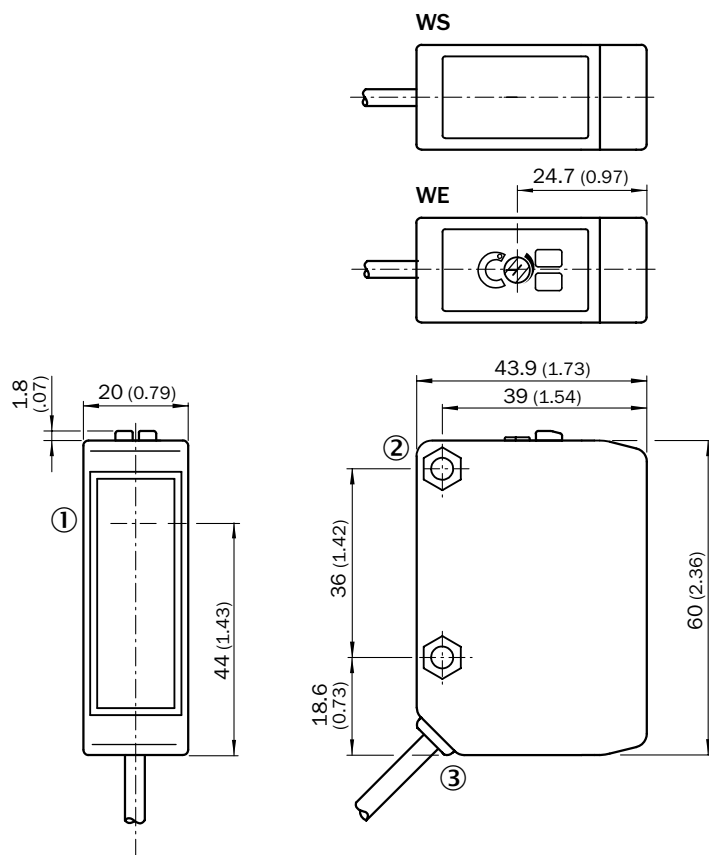


- ① Standard direction of the material being detected
- ② Axis of sender
- ③ Axis of receiver
- ④ Mounting hole $\varnothing$ 4.2 mm, for M4 hexagon nut on both sides
- ⑤ Connector M12, 4-pin: Connector position rotatable by 90° (V>H); V: Vertical final position; H: Horizontal final position, can be locked with slider

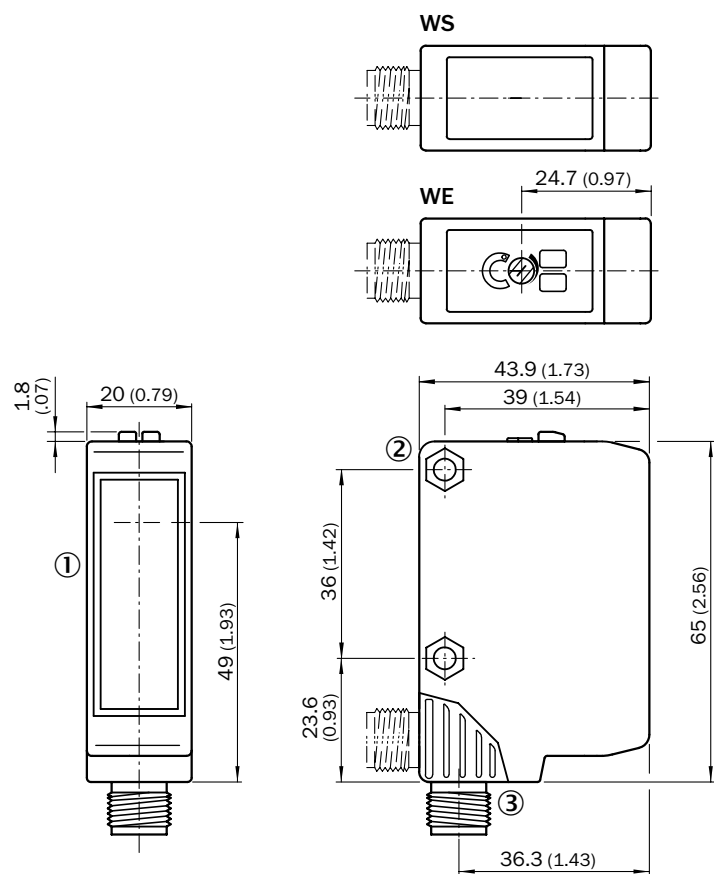
WL250-2, DC, cable



- ① Reception axis
- ② Axis of sender
- ③ Mounting hole $\varnothing$ 4.2 mm, for M4 hexagon nut on both sides
- ④ Connection cable

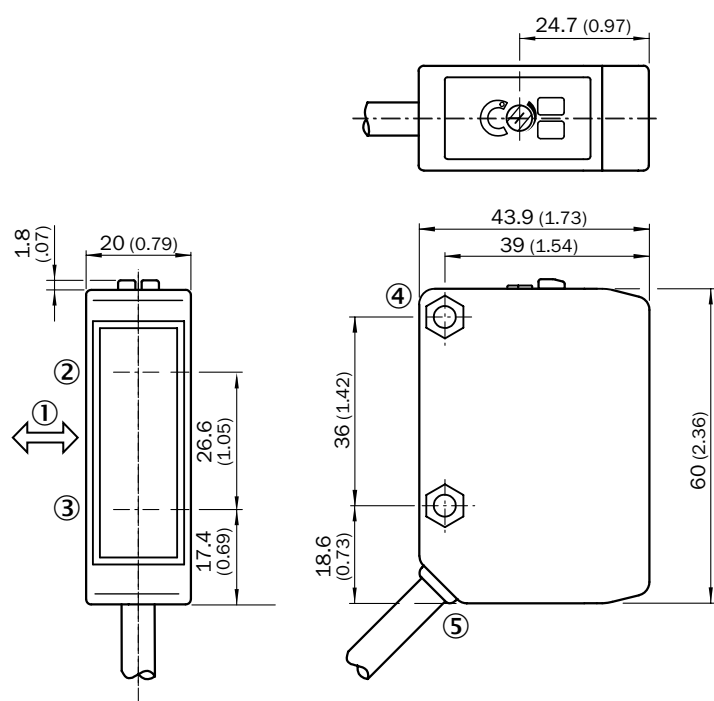
WL250-2, DC, connector**WSE250-2, DC, cable**

WSE250-2, DC, connector



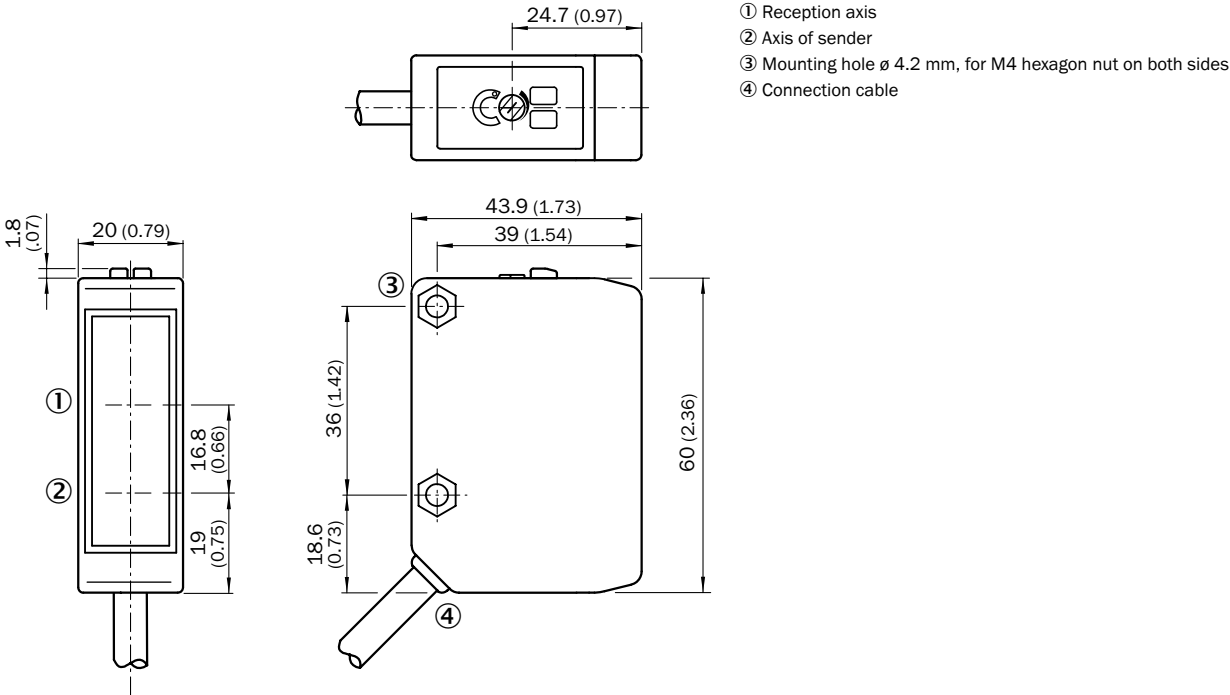
- ① Center of the optical axis, sender (WS 250), receiver (WE 250)
- ② Mounting hole $\varnothing$ 4.2 mm, for M4 hexagon nut on both sides
- ③ Connector M12, 4-pin: Connector position rotatable by 90° (V>H); V: Vertical final position; H: Horizontal final position, can be locked with slider

WTB250-2, AC/DC, cable

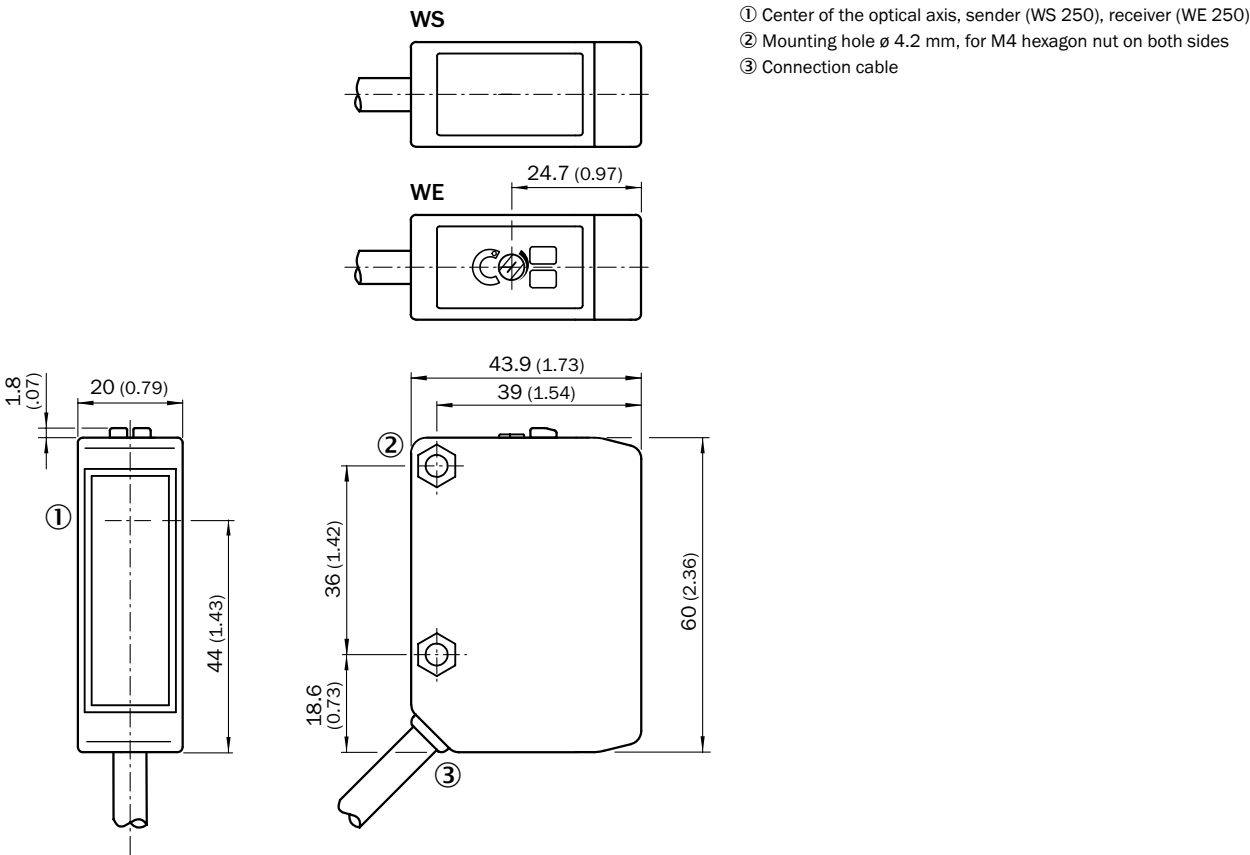


- ① Standard direction of the material being detected
- ② Axis of sender
- ③ Axis of receiver
- ④ Mounting hole $\varnothing$ 4.2 mm, for M4 hexagon nut on both sides
- ⑤ Connection cable

WL250-2, AC/DC, cable

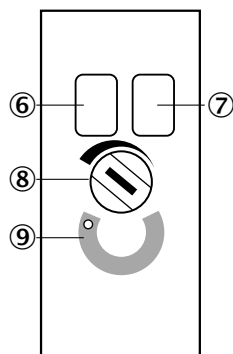


WSE250-2, AC/DC, cable



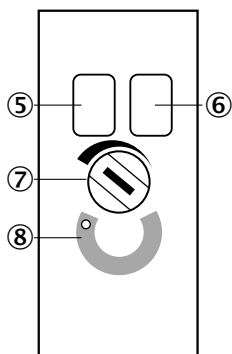
Adjustments

WTB250-2



- ⑥ LED indicator green: Stability indicator
- ⑦ Status indicator LED, yellow:
Status of received light beam
- ⑧ Sensing range adjustment: potentiometer
- ⑨ Position indicator for sensitivity setting (270°)

WL250-2, WSE250-2, Sender



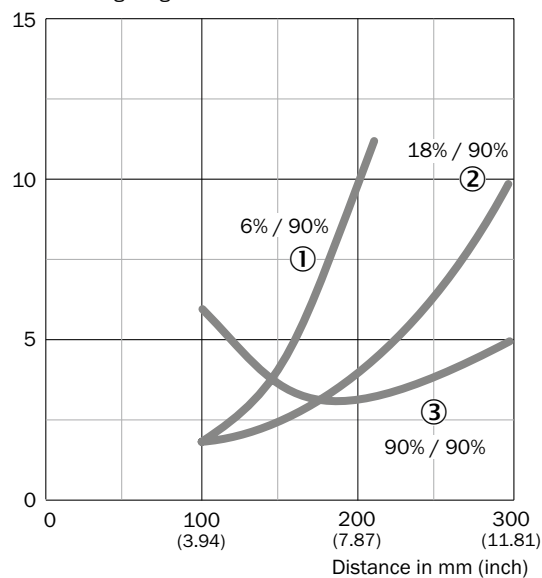
- ⑤ LED indicator green: Stability indicator
- ⑥ Status indicator LED, yellow:
Status of received light beam
- ⑦ Sensitivity adjustment: potentiometer
- ⑧ Position indicator for sensitivity setting (270°)

Characteristic curves

Black-white shift

WTB250-2, 300 mm

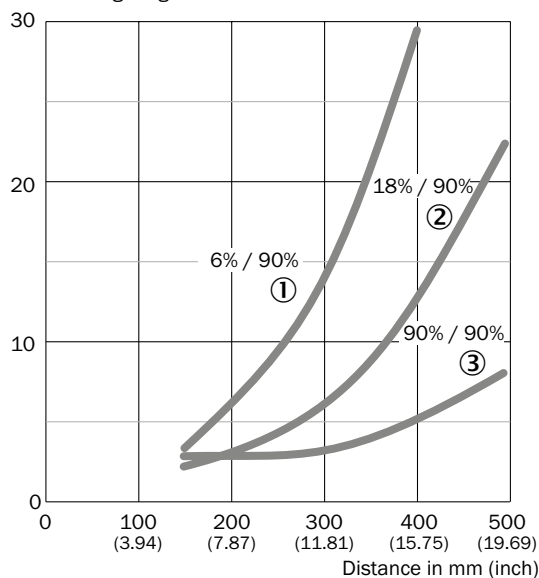
% of sensing range



- ① Sensing range on black, background white
- ② Sensing range on gray, background white
- ③ Sensing range on white, background white

WTB250-2, 500 mm

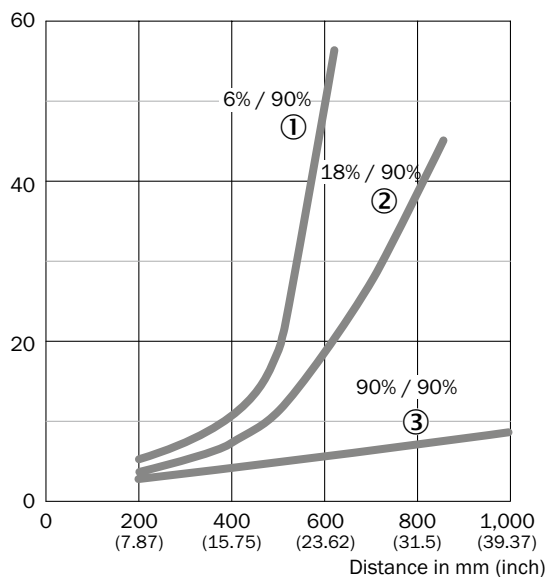
% of sensing range



- ① Sensing range on black, background white
- ② Sensing range on gray, background white
- ③ Sensing range on white, background white

WTB250-2, 1000 mm

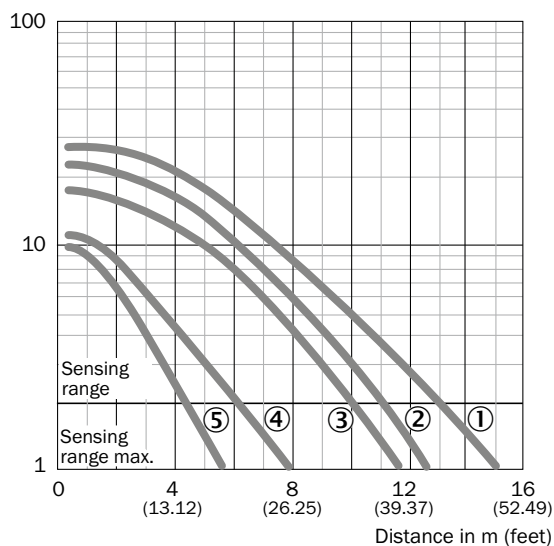
% of sensing range



- ① Sensing range on black, background white
- ② Sensing range on gray, background white
- ③ Sensing range on white, background white

Operating reserve**WL250-2**

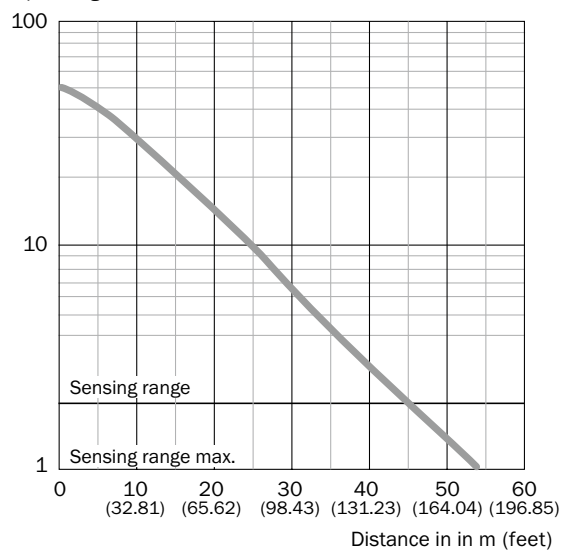
Function reserve



- ① Reflector type PL80A, C110A
- ② Reflector type P205
- ③ Reflector type PL50A, PL40A, PL30A, PL31A
- ④ Reflector type PL20A
- ⑤ Reflective tape Diamond Grade (100 mm x 100 mm/3.94 inch x 3.94 inch)

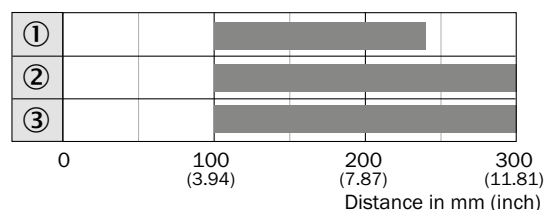
WSE250-2

Operating reserve



Bar diagrams

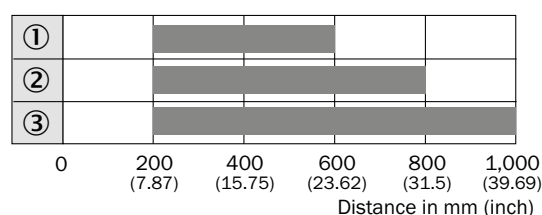
WTB250-2, 300 mm



■ Sensing range

- ① Sensing range on black, background white
- ② Sensing range on gray, background white
- ③ Sensing range on white, background white

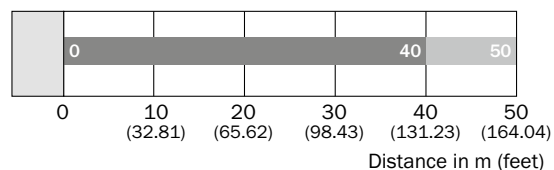
WTB250-2, 1000 mm



■ Sensing range

- ① Sensing range on black, background white
- ② Sensing range on gray, background white
- ③ Sensing range on white, background white

WSE250-2

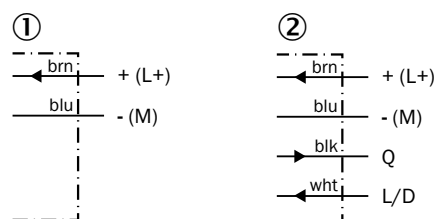


■ Sensing range

■ Sensing range max.

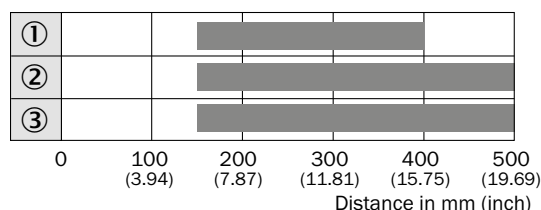
Connection diagram

Cd-058



- ① Sender
- ② Receiver

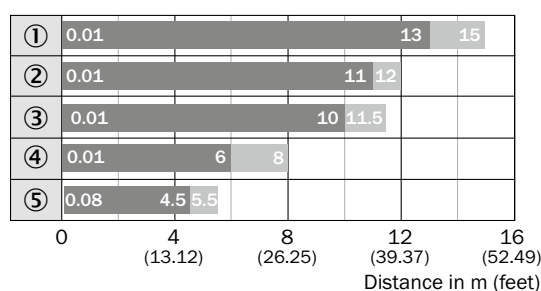
WTB250-2, 500 mm



■ Sensing range

- ① Sensing range on black, background white
- ② Sensing range on gray, background white
- ③ Sensing range on white, background white

WL250-2

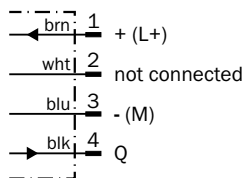
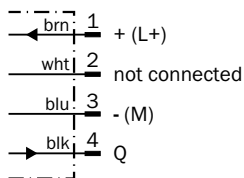
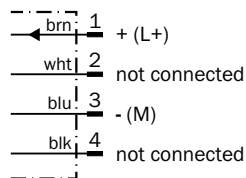
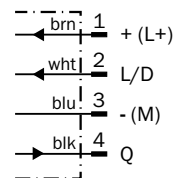
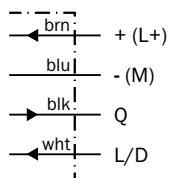
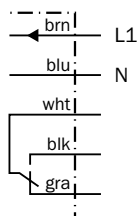
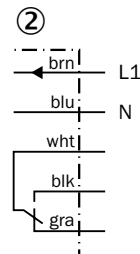
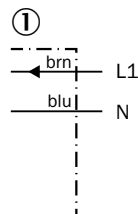


■ Sensing range

■ Sensing range max.

- ① Reflector type PL80A, C110A
- ② Reflector type P205
- ③ Reflector type PL50A, PL40A, PL30A, PL31A
- ④ Reflector type PL20A
- ⑤ Reflective tape Diamond Grade (100 mm x 100 mm/3.94 inch x 3.94 inch)

H

Cd-066**Cd-067****Cd-071****Cd-087****Cd-089****Cd-163****Cd-228**

① Sender
② Receiver

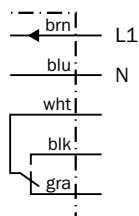
Cd-229**Recommended accessories****Mounting brackets/plates****Mounting brackets**

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Mounting bracket	BEF-W250	5305850

Plug connectors and cables**Connecting cable (female connector-open)**

- Cable material: PVC

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
			10 m, 4-wire	IP 67	DOL-1204-G10M	6010543
	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 (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

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

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

Sensor kit with mounting bracket and reflector

AC/DC



Additional information

Detailed technical data.	H-655
Ordering information.	H-656
Dimensional drawings	H-658
Adjustments	H-660
Characteristic curves	H-660
Bar diagrams.	H-661
Connection diagram	H-662
Recommended accessories.	H-663



Product description

The W280-2 consists of three high-performance sensor types – energetic photoelectric proximity sensor, photoelectric retro-reflective sensor and through-beam photoelectric sensor. The AC/DC devices (-2Hxxxx) are compliant with EN 61000-6-3 (electromagnetic interference for “residential, commercial and light-industrial environments”) which makes the sensor especially suitable for

door and gates areas. In other branches the fast install kit provides a rotatable M12 connector, cable or screw terminal connection which offer a quick and easy setup even in space-restricted conditions. Devices with potentiometer and light/dark switching provide application flexibility. In addition, these sensors are available in DC and AC/DC versions.

At a glance

- Highly visible red light spot thanks to the BrightLight LED
- Potentiometer for adjusting sensing range
- Light/dark switching (DC devices only)
- Rotatable connector, cable connection or terminal chamber
- Versions for 10 – 30 V DC or 24 – 240 V DC/AC voltage supply
- AC/DC (-2Hxxxx) devices are compliant with EN61000-6-3 (electromagnetic interference for “residential, commercial and light-industrial environments”)
- Stainless steel mounting bracket and P250 reflector (for WL280 only) are included in delivery

Your benefits

- Simple and fast commissioning with the highly visible light spot of the BrightLight LED
- Simple operation via potentiometer
- Light/dark switching provides application flexibility
- All necessary mounting and operating accessories are included in delivery, enabling quick and easy setup: since mounting bracket (stainless steel 1.4301) is included in delivery scope
- DC devices and AC/DC devices available in the same housing, allowing electrical flexibility
- Less contamination due to high operating reserves, reducing downtime

→ www.mysick.com/en/W280-2

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

	DC			AC/DC		
	WTE280-2	WL280-2	WSE280-2	WTE280-2	WL280-2	WSE280-2
Sensor principle	Photoelectric proximity sensor	Photoelectric retro-reflective sensor	Through-beam photoelectric sensor	Photoelectric proximity sensor	Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Detection principle	Energetic	Standard optics	–	Energetic	Standard optics	–
Dimensions (W x H x D)	23.5 mm x 74.5 mm x 63 mm					
Housing design (light emission)	Rectangular					
Sensing range max.	10 mm ... 2,000 mm ¹⁾	0.01 m ... 15 m ²⁾	0 m ... 60 m	10 mm ... 2,000 mm ¹⁾	0.01 m ... 15 m ²⁾	0 m ... 60 m
Sensing range	10 mm ... 1,500 mm	0.01 m ... 13 m ²⁾	0 m ... 50 m	10 mm ... 1,500 mm	0.01 m ... 13 m ²⁾	0 m ... 50 m
Type of light	Visible red light					
Light source ³⁾	BrightLight LED					
Adjustment	Potentiometer					

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

	DC			AC/DC		
	WTE280-2	WL280-2	WSE280-2	WTE280-2	WL280-2	WSE280-2
Supply voltage	10 V DC ... 30 V DC ¹⁾			24 V DC ... 240 V DC ²⁾ 24 V AC ... 240 V AC ²⁾		
Ripple ³⁾	≤ 5 V _{pp}		≤ 5 V _{pp}	–		
Current consumption	≤ 20 mA		–	–		
Current consumption, sender	–		≤ 20 mA	–		
Current consumption, receiver	–		≤ 20 mA ⁴⁾	–		
Power consumption	–			≤ 5 VA		–
Power consumption, sender	–			–		≤ 3,5 VA
Power consumption, receiver	–			–		≤ 3,5 VA
Output type	PNP, open collector/NPN, open collector (depending on type)			Relay, electrically isolated ⁵⁾		
Output function	–			Change-over contacts		
Switching mode	Light/dark-switching (selectable via light/dark rotary switch)			Light switching ⁵⁾		
Output current I _{max.}	100 mA			–		
Switching current (switching voltage)	–			3 A (240 V AC)/3 A (30 V DC)		
Response time	≤ 0.5 ms ⁶⁾			≤ 15 ms		
Switching frequency ⁷⁾	1,000 Hz			33 Hz		
Connection type	Cable ⁸⁾ /Cable gland (depending on type)					
Circuit protection	A ⁹⁾ , B ¹⁰⁾ , C ¹¹⁾ , D ¹²⁾			A ⁹⁾ , C ¹¹⁾		
Protection class	III					II ¹³⁾
Overvoltage category	–			2/3 (depending on type)		
Weight	150 g		300 g	150 g		300 g
Polarisation filter	–	✓	–	–	✓	–
Interference emission	–			EN 61000-6-3 (only –2Hxxxx) ¹⁴⁾		
Housing material	ABS					

	DC			AC/DC		
	WTE280-2	WL280-2	WSE280-2	WTE280-2	WL280-2	WSE280-2
Optics material	PMMA					
Enclosure rating	IP 66, IP 67					
Items supplied	Mounting bracket BEF-W280	Mounting bracket BEF-W280, Reflector P250	Mounting bracket BEF-W280		Mounting bracket BEF-W280, Reflector P250	Mounting bracket BEF-W280
Usage category	–			AC-15, DC-13, according to EN 60947-1		
EMC ¹⁵⁾	EN 60947-5-2					
Ambient operating temperature	–25 °C ... +55 °C					
Ambient storage temperature	–40 °C ... +70 °C					

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

²⁾ ±10 %.

³⁾ May not exceed or fall short of V_S tolerances.

⁴⁾ Without load.

⁵⁾ Provide suitable spark suppression for inductive or capacitive loads.

⁶⁾ Signal transit time with resistive load.

⁷⁾ With light/dark ratio 1:1.

⁸⁾ Do not bend below 0 °C.

⁹⁾ A = V_S connections reverse-polarity protected.

¹⁰⁾ B = inputs and output reverse-polarity protected.

¹¹⁾ C = interference suppression.

¹²⁾ D = outputs overcurrent and short-circuit protected.

¹³⁾ Rated voltage: 250 V AC/DC.

¹⁴⁾ In the case of a DC supply (relating to EN 61000-6-3) the length of cable between the supply source and the sensor must be < 30 m.

¹⁵⁾ The AC/DC devices meet the interference suppression requirements for industrial use (interference suppression class A). When used in residential areas it can cause interference.

Ordering information

Other models available at www.mysick.com/en/W280-2

WTE280-2, DC

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

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
10 mm ... 2,000 mm	Ø 45 mm (1,500 mm)	PNP	Cable, 3-wire, 2 m	Cd-043	WTE280-2P1131	6044726
			Connector M12, 4-pin	Cd-068	WTE280-2P2431	6044728
			Cable gland	Cd-207	WTE280-2P4331	6044724
		NPN	Cable, 3-wire, 2 m	Cd-043	WTE280-2N1131	6044727
			Connector M12, 4-pin	Cd-068	WTE280-2N2431	6044729
			Cable gland	Cd-207	WTE280-2N4331	6044725

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

WL280-2, DC

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

Sensing range max.	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
0.01 m ... 15 m ¹⁾ 0.01 m ... 12 m ²⁾	Ø 260 mm (8 m)	PNP	Cable, 3-wire, 2 m	Cd-043	WL280-2P1131	6044734
			Connector M12, 4-pin	Cd-068	WL280-2P2431	6044736
			Cable gland	Cd-207	WL280-2P4331	6044732
		NPN	Cable, 3-wire, 2 m	Cd-043	WL280-2N1131	6044735
			Connector M12, 4-pin	Cd-068	WL280-2N2431	6044737
			Cable gland	Cd-207	WL280-2N4331	6044733

¹⁾ PL80A.

²⁾ P250.

WSE280-2, DC

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

Sensing range max.	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
0 m ... 60 m	Ø 0.6 mm (20 m)	PNP	Cable, 3-wire, 2 m	Cd-049	WSE280-2P1131	6044743
			Connector M12, 4-pin	Cd-187	WSE280-2P2431	6044745
			Cable gland	Cd-190	WSE280-2P4331	6044741
		NPN	Cable, 3-wire, 2 m	Cd-049	WSE280-2N1131	6044744
			Connector M12, 4-pin	Cd-187	WSE280-2N2431	6044746
			Cable gland	Cd-190	WSE280-2N4331	6044742

WTE280-2, AC

- **Sensor principle:** photoelectric proximity sensor
- **Switching mode:** light switching (provide suitable spark suppression for inductive or capacitive loads.)

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Overvoltage category	Connection diagram	Model name	Part no.
10 mm ... 2,000 mm	Ø 45 mm (1,500 mm)	Relay	Cable, 5-wire, 2 m	2	Cd-229	WTE280-2H1531	6044731
				3	Cd-163	WTE280-2R1531	6044759
			Cable gland	2	Cd-169	WTE280-2H4331	6044730
				3	Cd-169	WTE280-2R4331	6044758

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

WL280-2, AC

- **Sensor principle:** photoelectric retro-reflective sensor
- **Switching mode:** light switching (provide suitable spark suppression for inductive or capacitive loads.)

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Overvoltage category	Connection diagram	Model name	Part no.
0.01 m ... 15 m	Ø 260 mm (8 m)	Relay	Cable, 5-wire, 2 m	2	Cd-229	WL280-2H1531	6044739
				3	Cd-163	WL280-2R1531	6044761
			Cable gland	2	Cd-229	WL280-2H1631	6044740
				2	Cd-169	WL280-2H4331	6044738
				3	Cd-169	WL280-2R4331	6044760

¹⁾ PL80A.

WSE280-2, AC

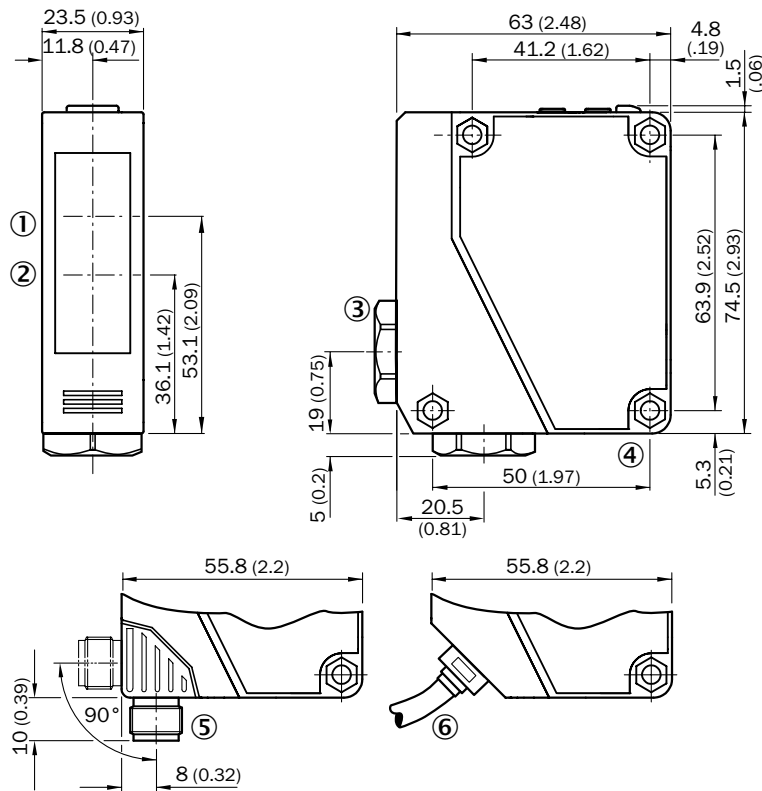
- **Sensor principle:** through-beam photoelectric sensor
- **Switching mode:** light switching (provide suitable spark suppression for inductive or capacitive loads.)

Sensing range max.	Light spot size (distance)	Output type	Connection	Overvoltage category	Connection diagram	Model name	Part no.
0 m ... 60 m	Ø 0.6 mm (20 m)	Relay	Cable, 5-wire, 2 m	2	Cd-228	WSE280-2H1531	6044748
				3	Cd-228	WSE280-2R1531	6044763
			Cable gland	2	Cd-228	WSE280-2H1631	6044749
				2	Cd-227	WSE280-2H4331	6044747
				3	Cd-227	WSE280-2R4331	6044762

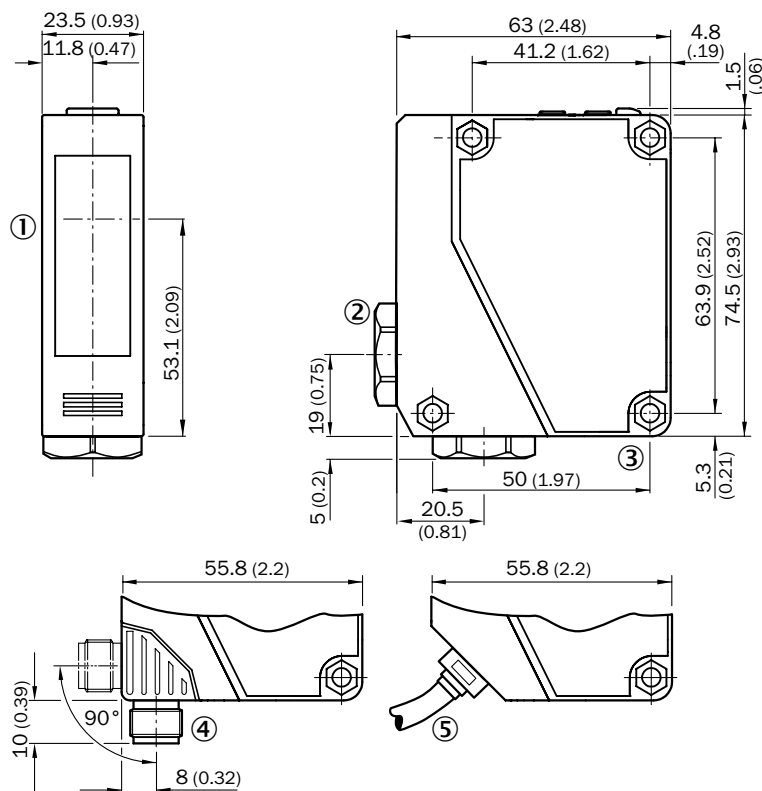
Dimensional drawings

Dimensions in mm (inch)

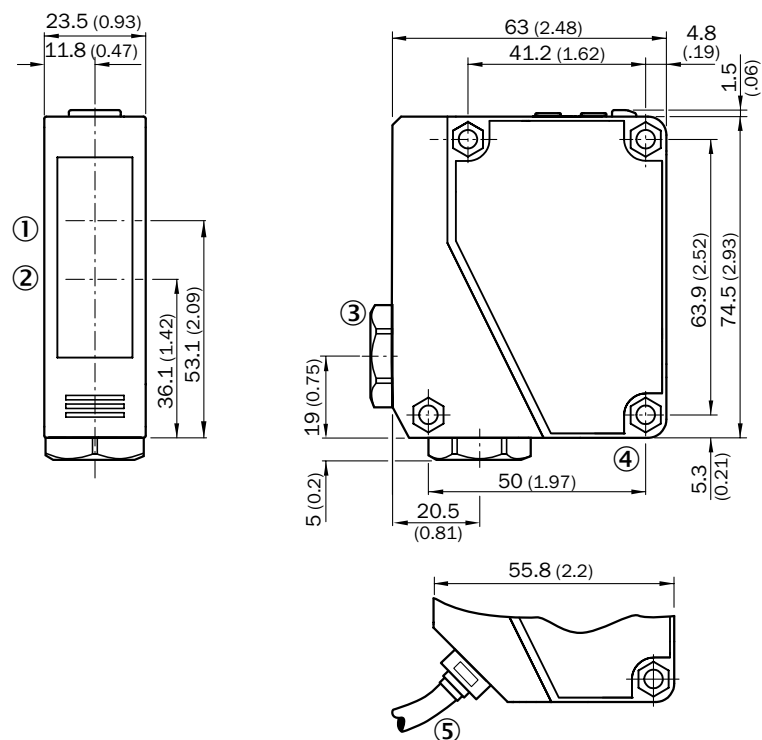
WTE280-2, WL280-2, DC



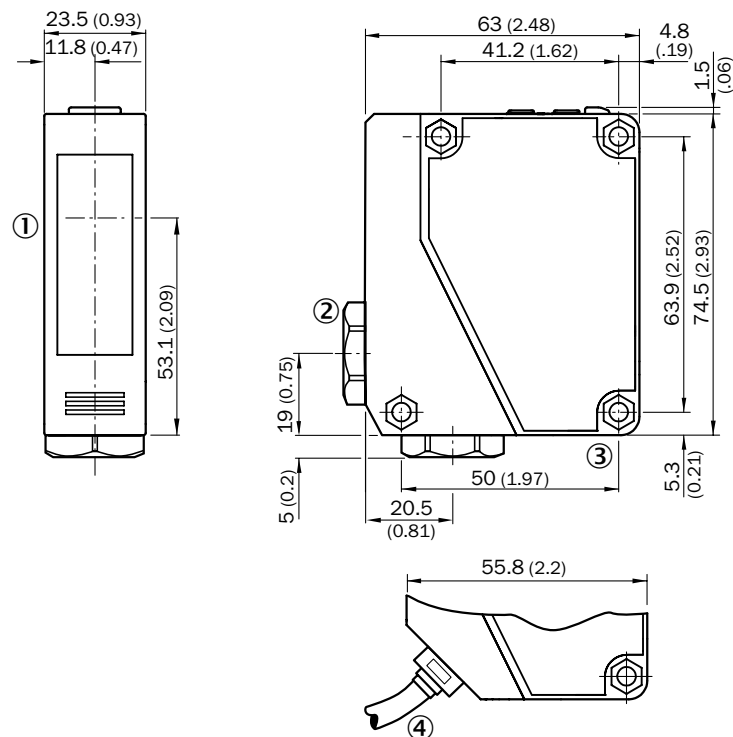
WSE280-2, DC



WTE280-2, WL280-2, AC/DC

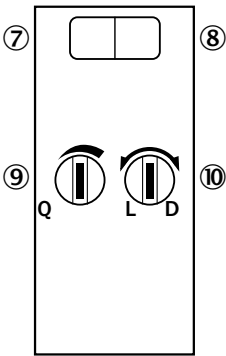


WSE280-2, AC/DC



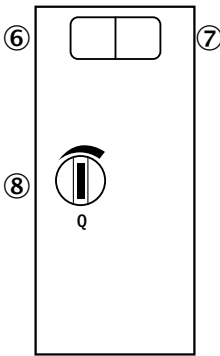
Adjustments

WTE280-2P/-2N, DC, WSE280-2P/-2N, DC



- ⑦ LED indicator green: Stability indicator
- ⑧ Status indicator LED, yellow: Status of received light beam
- ⑨ Sensing range/Sensitivity adjustment: potentiometer
- ⑩ Light/dark selector

WTE280-2, AC/DC, WL280-2H/-2R, WSE280-2H/-2R

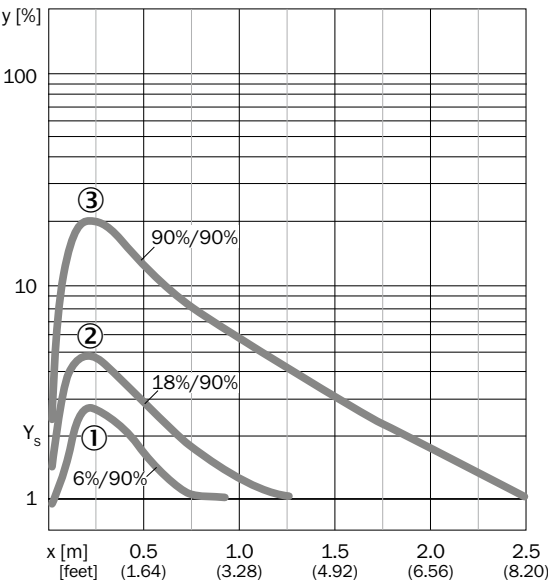


- ⑥ LED indicator green: Stability indicator
- ⑦ Status indicator LED, yellow: Status of received light beam
- ⑧ Sensing range/Sensitivity adjustment: potentiometer

Characteristic curves

Black-white shift

WTE280-2

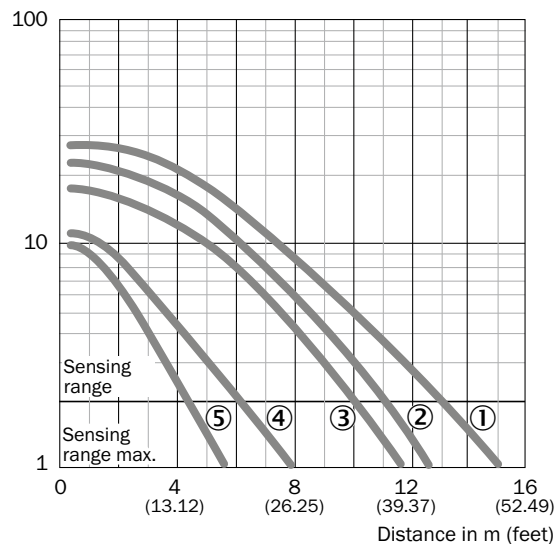


- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

Operating reserve

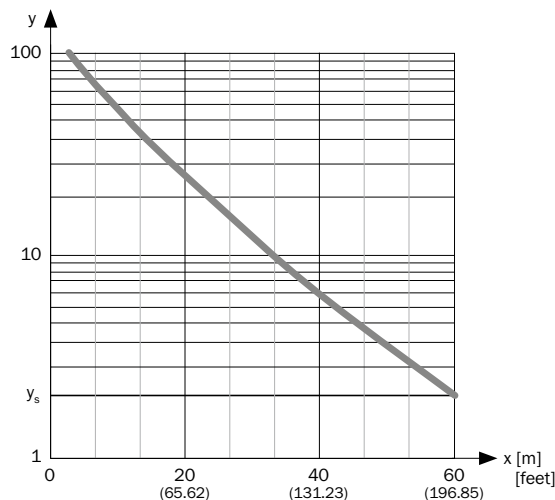
WL280-2

Function reserve



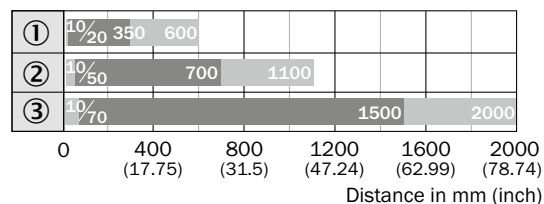
- ① Reflector type PL80A, C110A
- ② Reflector type P205
- ③ Reflector type PL50A, PL40A, PL30A, PL31A
- ④ Reflector type PL20A
- ⑤ Reflective tape Diamond Grade (100 mm x 100 mm/3.94 inch x 3.94 inch)

WSE280-2



Bar diagrams

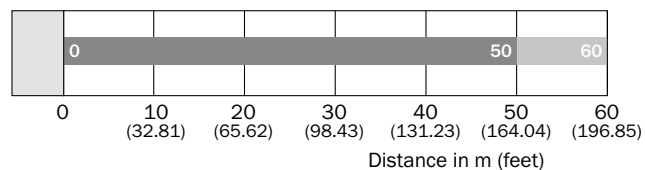
WTE280-2



■ Sensing range ■ Sensing range max.

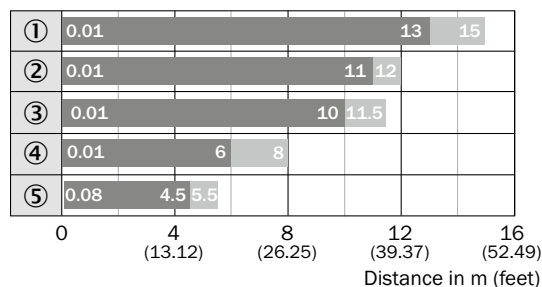
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WSE280-2



■ Sensing range ■ Sensing range max.

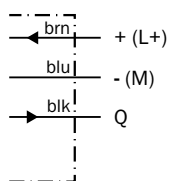
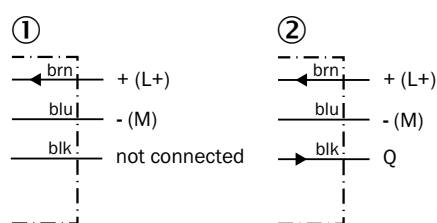
WL280-2



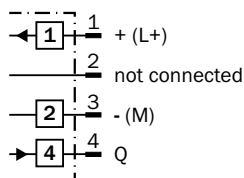
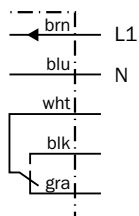
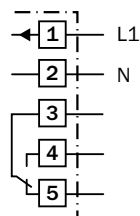
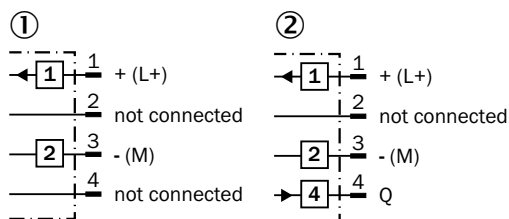
■ Sensing range ■ Sensing range max.

- ① Reflector type PL80A, C110A
- ② Reflector type P205
- ③ Reflector type PL50A, PL40A, PL30A, PL31A
- ④ Reflector type PL20A
- ⑤ Reflective tape Diamond Grade (100 mm x 100 mm/3.94 inch x 3.94 inch)

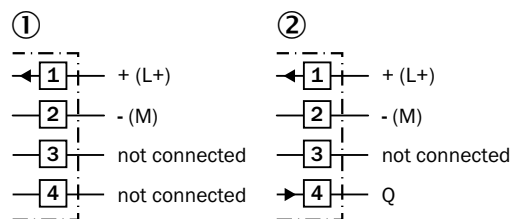
Connection diagram

Cd-043**Cd-049**

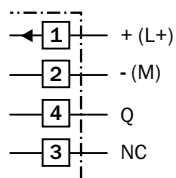
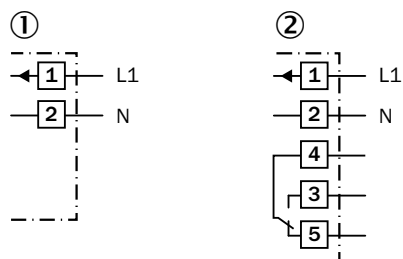
① Sender
② Receiver

Cd-068**Cd-163****Cd-169****Cd-187**

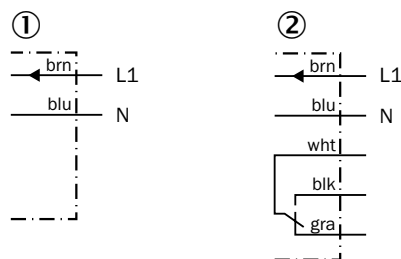
① Sender
② Receiver

Cd-190

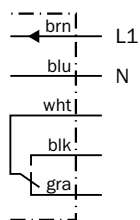
① Sender
② Receiver

Cd-207**Cd-227**

① Sender
② Receiver

Cd-228

① Sender
② Receiver

Cd-229**Recommended accessories**

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Stainless steel V2A (1.4301)	Mounting bracket	BEF-W280	5313885

Plug connectors and cables

Connecting cable (female connector-open)

- Connector material: TPU

Figure	Connection type head A	Connection type head B	Connecting cable	Cable material	Enclosure rating	Model name	Part no.
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	PVC	IP 67	DOL-1204-G02M	6009382
			5 m, 4-wire	PVC	IP 67	DOL-1204-G05M	6009866
			2 m, 4-wire	PUR, halogen-free	IP 65, IP 68, IP 69K	DOL-1204-G02MC	6025900
			5 m, 4-wire	PUR, halogen-free	IP 65, IP 68, IP 69K	DOL-1204-G05MC	6025901
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	PVC	IP 67	DOL-1204-W02M	6009383
			5 m, 4-wire	PVC	IP 67	DOL-1204-W05M	6009867
			2 m, 4-wire	PUR, halogen-free	IP 65, IP 68, IP 69K	DOL-1204-W02MC	6025903
			5 m, 4-wire	PUR, halogen-free	IP 65, IP 68, IP 69K	DOL-1204-W05MC	6025904

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 N04 for universal clamp bracket	BEF-KHS-N04	2051610

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.



Laser class 1 photoelectric proximity sensors – great performance, simple operation



Product description

The powerful photoelectric proximity sensor W280L-2 Long Range is characterized by its maximum sensing range of up to 4 m combined with extremely simple operation. The sensing range can be further extended to 18 m with the WLT280L-2 Long Range reflector version. The option of 2 independent switching outputs allows feedback of low and high detection points. Setup is easy through an intuitive sensing range adjustment

potentiometer and indicator LED for each switching output. A visible red class 1 laser light ensures that the alignment is quick and precise. An integrated protective system in the W280L-2 Long Range prevents adverse effects caused by reflections in the background, for example, resulting from reflective metal surfaces, windows and warning vests. Additionally, the W280L-2 Long Range ignores cross-talk from an adjacent sensor.

At a glance

- WTT280L-2: sensing range up to 4 m
- WLT280L-2: sensing range up to 18 m
- Complete background suppression: very small black/white shift, insensitive against reflections from the background (e.g. shiny metal, window, safety vest)
- Visible red class 1 laser light
- Version 1: with 1 x switching output and light/dark switch, version 2: with 2 x switching outputs and light/dark switch
- Disable laser by wire
- Reliable detection also in very fast production processes thanks to the switching frequency of 1000 Hz

Your benefits

- Reliable target detection with difficult target colors, angles and color transitions (black/white shift)
- One sensor with two outputs and two status LEDs improves application flexibility and reduces the number of sensors needed
- Quick and easy commissioning with sensing range adjustment potentiometers and status LED – one for each output
- Quick and easy alignment with a red class 1 laser light
- Rotatable connector and light/dark switch for mounting and installation flexibility



Additional information

Detailed technical data	H-667
Ordering information	H-668
Dimensional drawing	H-669
Adjustments	H-669
Bar diagrams	H-669
Connection diagram	H-670
Recommended accessories	H-670

→ www.mysick.com/en/W280L-2_Long_Range

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

	WTT280L-2 Long Range	WLT280L-2 Long Range
Sensor principle	Photoelectric proximity sensor	
Detection principle	Background suppression	
Dimensions (W x H x D)	23.5 mm x 76 mm x 55.8 mm	
Housing design (light emission)	Rectangular	
Sensing range max.	200 mm ... 4,000 mm ¹⁾ 200 mm ... 3,000 mm ²⁾	200 mm ... 18,000 mm ³⁾
Sensing range	–	200 mm ... 18,000 mm
Type of light	Visible red light	
Light source ⁴⁾	Laser	
Light spot size (distance)	Ø 12 mm (3 m)	Ø 50 mm (18 m)
Laser class	1 (EN 60825-1:2008-5, IEC 60825-1:2007-03)	
Adjustment	Potentiometer	

¹⁾ Object with 90 % reflectance (referred to standard white, DIN 5033)²⁾ Objects to be sensed with 6 % reflectivity (based on black)³⁾ Reflector P250, PL80A.⁴⁾ Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

	WTT280L-2 Long Range	WLT280L-2 Long Range
Supply voltage ¹⁾	10 V DC ... 30 V DC	
Ripple ²⁾	≤ 3 V _{pp}	
Power consumption ³⁾	≤ 70 mA	
Output type	PNP, open collector/NPN, open collector 2 x PNP, open collector/ 2 x NPN, open collector (depending on type)	2 x PNP, open collector 2 x NPN, open collector (depending on type)
Switching mode	Light/dark-switching (selectable via light/dark rotary switch)	
Output current I _{max.}	≤ 100 mA	
Response time ⁴⁾	≤ 0.5 ms	≤ 2 ms
Switching frequency ⁵⁾	1,000 Hz	± 250 Hz
Connection type	Cable, 2 m ⁶⁾ /Male connector (depending on type)	
Circuit protection	A ⁷⁾ , B ⁸⁾ , C ⁹⁾ , D ¹⁰⁾	
Protection class	III	
Weight	120 g	
Housing material	ABS	
Optics material	PMMA	
Enclosure rating	IP 67	
Items supplied	Mounting bracket BEF-W280	
EMC ¹¹⁾	EN 60947-5-2	
Ambient operating temperature	–10 °C ... +50 °C	
Ambient storage temperature	–40 °C ... +70 °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⁾ B = output reverse-polarity protected.⁹⁾ C = interference suppression.¹⁰⁾ D = outputs overcurrent and short-circuit protected.¹¹⁾ The devices meet the interference suppression requirements for industrial use (interference suppression class A). When used in residential areas it can cause interference.

Ordering information

Other models available at www.mysick.com/en/W280L-2_Long_Range

WTT280L-2 Long Range

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

Sensing range max.	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
200 mm ... 4,000 mm ¹⁾ 200 mm ... 3,000 mm ²⁾	Ø 12 mm (3 m)	PNP	Cable, 5-wire, 2 m, PVC	Cd-209	WTT280L-2P1531	6048065
			Connector M12, 5-pin	Cd-210	WTT280L-2P2531	6048061
		NPN	Cable, 5-wire, 2 m, PVC	Cd-209	WTT280L-2N1531	6048067
			Connector M12, 5-pin	Cd-210	WTT280L-2N2531	6048063
		2 x PNP	Cable, 5-wire, 2 m, PVC	Cd-208	WTT280L-2P1536	6048066
			Connector M12, 5-pin	Cd-211	WTT280L-2P2536	6048062
		2 x NPN	Cable, 5-wire, 2 m, PVC	Cd-208	WTT280L-2N1536	6048068
			Connector M12, 5-pin	Cd-211	WTT280L-2N2536	6048064

¹⁾ Object with 90 % reflectance (referred to standard white, DIN 5033)²⁾ Objects to be sensed with 6 % reflectivity (based on black)

WLT280L-2 Long Range

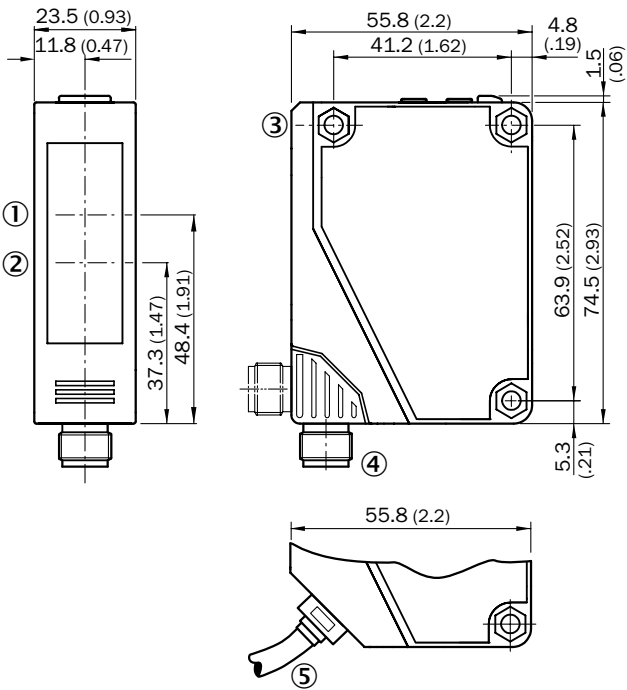
- **Sensor principle:** photoelectric proximity sensor
- **Voltage type:** DC
- **Switching mode:** light/dark-switching

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
200 mm ... 18,000 mm	Ø 50 mm (18 m)	2 x PNP	Cable, 5-wire, 2 m, PVC	Cd-208	WLT280L-2P1536	6048071
			Connector M12, 5-pin	Cd-211	WLT280L-2P2536	6048069
		2 x NPN	Cable, 5-wire, 2 m, PVC	Cd-208	WLT280L-2N1536	6048072
			Connector M12, 5-pin	Cd-211	WLT280L-2N2536	6048070

¹⁾ Reflector P250, PL80A.

Dimensional drawing

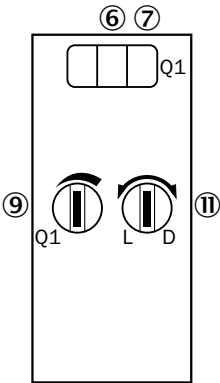
Dimensions in mm (inch)



- ① Center of optical axis, receiver
- ② Center of optical axis, sender
- ③ Mounting hole, Ø 4.3 mm
- ④ Connector M12, 5-pin, rotatable by 90°
- ⑤ Cable, 2 m, 5-wire, Ø 3.8 mm

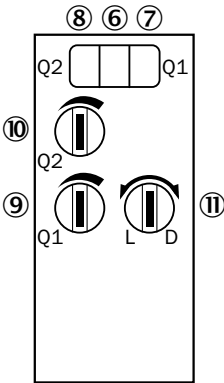
Adjustments

WTT280L-2xxxx1



- ⑥ LED indicator green: Stability indicator
- ⑦ Status indicator LED, yellow: Status of received light beam
- ⑨ Sensing range adjustment: potentiometer
- ⑪ Light/dark selector

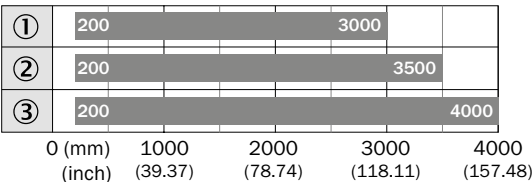
WxT280L-2xxxx6



- ⑥ LED indicator green: Stability indicator
- ⑦ Status indicator LED, yellow: Status of received light beam (switching output 1)
- ⑧ Status indicator LED, yellow: Status of received light beam (switching output 2)
- ⑨ Sensing range adjustment: potentiometer for switching output 1
- ⑩ Sensing range adjustment: potentiometer for switching output 2
- ⑪ Light/dark selector

Bar diagrams

Bar diagram photoelectric proximity sensors

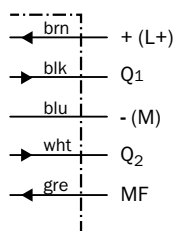


■ Sensing range max.

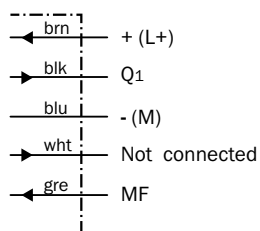
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

Connection diagram

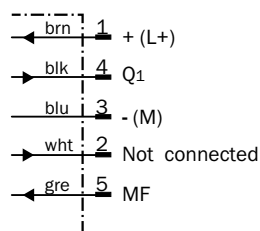
Cd-208



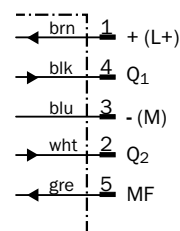
Cd-209



Cd-210



Cd-211



Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Stainless steel V2A (1.4301)	Mounting bracket	BEF-W280	5313885

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, 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

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N04 for universal clamp bracket	BEF-KHS-N04	2051610

Reflectors

Angular

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Rectangular, screw connection, 47 mm x 47 mm	P250	5304812
		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

Power, flexibility and reliability for long-range applications

AC/DC



Additional information

Detailed technical data.....	H-673
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Adjustments.....	H-676
Characteristic curves.....	H-677
Bar diagrams.....	H-678
Connection diagram.....	H-678
Recommended accessories....	H-679



Product description

The W2000 sensor family offers advanced features with application flexibility and long sensing ranges. Designed with an IP 67-rated housing and a watertight front window, the W2000 is ideal for harsh duty applications. The gasketed top cover can be easily opened to provide access to timing functions, sensitivity adjustments, and a light/dark switching mode. The W2000 family also features SICK's custom Application-Spe-

cific Integrated Circuit (ASIC). This superior technology eliminates crosstalk interference and provides immunity to ambient lighting. Three LED indicators provide easily identifiable power, signal and status information from any angle. The W2000 through-beam, retro-reflective and energetic proximity variants enable users to choose the version suited for their application needs.

At a glance

- Rugged, plastic housing
- Crosstalk and ambient light immunity
- Adjustable sensing range
- Signal strength indicator
- IP 67/NEMA 6 enclosure rating

Your benefits

- Application-Specific Integrated Circuit (ASIC) technology eliminates crosstalk interference and provides ambient light immunity, which reduces false detection of unwanted targets
- Rugged IP-67 rated housing withstands harsh duty applications, increasing the sensor lifetime
- Three LED indicators make it easy to install and troubleshoot
- Versatile mounting brackets and cable options simplify installation

→ www.mysick.com/en/W2000

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

	DC			AC/DC		
	WT2000	WL2000	WS/WE2000	WT2000	WL2000	WS/WE2000
Sensor principle	Photoelectric proximity sensor	Photoelectric retro-reflective sensor	Through-beam photoelectric sensor	Photoelectric proximity sensor	Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Dimensions (W x H x D)	45 mm x 73.7 mm x 48.6 mm					
Housing design (light emission)	Rectangular					
Sensing range max.	0 m ... 3.5 m ¹⁾	0 m ... 15 m ²⁾	0 m ... 50 m	0 m ... 3.5 m ¹⁾	0 m ... 15 m ²⁾	0 m ... 50 m
Sensing range	0 m ... 3.5 m ¹⁾	0 m ... 15 m ²⁾	0 m ... 50 m	0 m ... 3.5 m ¹⁾	0 m ... 15 m ²⁾	0 m ... 50 m
Type of light	Infrared light	Visible red light	Infrared light		Visible red light	Infrared light
Light source ³⁾	LED					
Light spot size (distance)	Ø 55 mm (2.5 m)	Ø 320 mm (14 m)		Ø 55 mm (2.5 m)	Ø 320 mm (14 m)	
Angle of dispersion	Approx. 1.3°		1.3°	Approx. 1.3°		1.3°
Wave length						
Infrared light	880 nm					
Visible red light	660 nm					
Time type	Time delay off ⁴⁾ , Switch on delay ⁵⁾					

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.

⁴⁾ Adjustable via Off delay selector switch.

⁵⁾ Adjustable via On delay selector switch.

Mechanics/electronics

	DC			AC/DC		
	WT2000	WL2000	WS/WE2000	WT2000	WL2000	WS/WE2000
Supply voltage ¹⁾	10 V DC ... 30 V DC			24 V AC/DC ... 240 V AC/DC		
Ripple ²⁾	≤ 5 V			–		
Power consumption ³⁾	≤ 80 mA			≤ 6 W		
Output type	PNP, NPN			Relay, electrically isolated		
Output function	Complementary, complementary			Change-over contacts		
Switching mode	Light/dark-switching (selectable via light/dark selector)					
Signal voltage PNP HIGH/LOW	Approx. VS – 2.0 V / 0 V			–		
Output current I _{max.}	100 mA			–		
Switching current (switching voltage)	–			3 A (265 V)		
Response time ⁴⁾	≤ 1 ms			≤ 10 ms		
Switching frequency	500 Hz			10 Hz		
Connection type	Cable, 2 m ⁵⁾ / Male connector (depending on type)					
Circuit protection	A ⁶⁾ , C ⁷⁾ , D ⁸⁾			–		
Protection class ⁹⁾	II					
Weight	5.3 oz, 150 g					
Polarisation filter	–	✓	–	–	✓	–
Alarm output	PNP			–		

	DC			AC/DC		
	WT2000	WL2000	WS/WE2000	WT2000	WL2000	WS/WE2000
Housing material	Glassfibre reinforced plastic					
Enclosure rating	IP 67, NEMA 6					
Ambient operating temperature	-13 °F ... 104 °F / -25 °C ... +40 °C					
Ambient storage temperature	-40 °F ... 158 °F / -40 °C ... +70 °C					

¹⁾ Limit values.

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

³⁾ Without load.

⁴⁾ Signal transit time with resistive load.

⁵⁾ Do not bend below 0 °C.

⁶⁾ A = V_s connections reverse-polarity protected.

⁷⁾ C = interference suppression.

⁸⁾ D = outputs overcurrent and short-circuit protected.

⁹⁾ Reference voltage: 50 V DC.

Ordering information

Other models available at www.mysick.com/en/W2000

WT2000, DC

- **Sensor principle:** Photoelectric proximity sensor
- **Type of light:** Infrared light
- **Light spot size (distance):** Ø 2.2 in (8.2 ft) / Ø 55 mm (2.5 m)
- **Output type:** PNP, NPN
- **Switching mode:** Light/dark-switching
- **Alarm output:** PNP

Sensing range max. ¹⁾	Time functions	Connection	Connection diagram	Model name	Part no.
0 ft ... 11.5 ft 0 m ... 3.5 m	–	Cable, 5-wire, 2 m, PVC	Cd-142	WT2000-B1102	7023056
		Connector M12, 4-pin	Cd-086	WT2000-B4100	7024001
		Connector M12, 5-pin	Cd-154	WT2000-B5100	7023059
	Time delay off ²⁾ Switch on delay ³⁾	Cable, 5-wire, 2 m, PVC	Cd-142	WT2000-B1122	7023058
		Connector M12, 5-pin	Cd-154	WT2000-B5120	7023061

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

²⁾ Adjustable via Off delay selector switch.

³⁾ Adjustable via On delay selector switch.

WL2000, DC

- **Sensor principle:** Photoelectric retro-reflective sensor
- **Type of light:** visible red light
- **Light spot size (distance):** Ø 12.5 in (45.9 ft) / Ø 320 mm (14 m)
- **Output type:** PNP, NPN
- **Switching mode:** Light/dark-switching
- **Alarm output:** PNP

Sensing range max. ¹⁾	Time functions	Connection	Connection diagram	Model name	Part no.
0 ft ... 49 ft 0 m ... 15 m	–	Cable, 5-wire, 2 m, PVC	Cd-142	WL2000-B1302	7023044
		Connector M12, 4-pin	Cd-086	WL2000-B4300	7024002
		Connector M12, 5-pin	Cd-154	WL2000-B5300	7023047
	Time delay off ²⁾ Switch on delay ³⁾	Cable, 5-wire, 2 m, PVC	Cd-142	WL2000-B1322	7023046
		Connector M12, 5-pin	Cd-154	WL2000-B5320	7023049

¹⁾ PL80A.

²⁾ Adjustable via Off delay selector switch.

³⁾ Adjustable via On delay selector switch.

WS/WE2000, DC

- **Sensor principle:** Through-beam photoelectric sensor
- **Type of light:** Infrared light
- **Light spot size (distance):** 12.5 in (45.9 ft) / Ø 320 mm (14 m)
- **Output type:** PNP, NPN
- **Switching mode:** Light/dark-switching
- **Alarm output:** PNP

Sensing range max.	Time functions	Connection	Connection diagram	Model name	Part no.
0 ft ... 164 ft 0 m ... 50 m	–	Cable, 5-wire, 2 m, PVC	Cd-206	WS/WE2000-B1102	7025964
		Connector M12, 4-pin	Cd-215	WS/WE2000-B4100	7028604
		Connector M12, 5-pin	Cd-155	WS/WE2000-B5100	7025965
	Time delay off ¹⁾ Switch on delay ²⁾	Cable, 5-wire, 2 m, PVC	Cd-206	WS/WE2000-B1122	7025966
		Connector M12, 5-pin	Cd-155	WS/WE2000-B5120	7025967

¹⁾ Adjustable via Off delay selector switch.²⁾ Adjustable via On delay selector switch.

WT2000, AC/DC

- **Sensor principle:** Photoelectric proximity sensor
- **Type of light:** Infrared light
- **Light spot size (distance):** Ø 2.2 in (8.2 ft) / Ø 55 mm (2.5 m)
- **Output type:** relay
- **Switching mode:** Light/dark-switching

Sensing range max. ¹⁾	Time functions	Connection	Connection diagram	Model name	Part no.
0 ft ... 11.5 ft 0 m ... 3.5 m	–	Cable, 5-wire, 2 m, PVC	Cd-165	WT2000-R1102	7023062
		Mini connector, 5-pin	Cd-171	WT2000-R5100	7023065
	Time delay off ²⁾ Switch on delay ³⁾	Cable, 5-wire, 2 m, PVC	Cd-165	WT2000-R1122	7023064
		Mini connector, 5-pin	Cd-171	WT2000-R5120	7023067

¹⁾ Object with 90 % reflectance (referred to standard white, DIN 5033)²⁾ Adjustable via Off delay selector switch.³⁾ Adjustable via On delay selector switch.

H

WL2000, AC/DC

- **Sensor principle:** Photoelectric retro-reflective sensor
- **Type of light:** visible red light
- **Light spot size (distance):** Ø 12.5 in (45.9 ft) / Ø 320 mm (14 m)
- **Output type:** relay
- **Switching mode:** Light/dark-switching

Sensing range max. ¹⁾	Time functions	Connection	Connection diagram	Model name	Part no.
0 ft ... 49 ft 0 m ... 15 m	–	Cable, 5-wire, 2 m, PVC	Cd-165	WL2000-R1302	7023050
		Mini connector, 5-pin	Cd-171	WL2000-R5300	7023053
	Time delay off ²⁾ Switch on delay ³⁾	Cable, 5-wire, 2 m, PVC	Cd-165	WL2000-R1322	7023052
		Mini connector, 5-pin	Cd-171	WL2000-R5320	7023055

¹⁾ PL80A.²⁾ Adjustable via Off delay selector switch.³⁾ Adjustable via On delay selector switch.

WS/WE2000, AC/DC

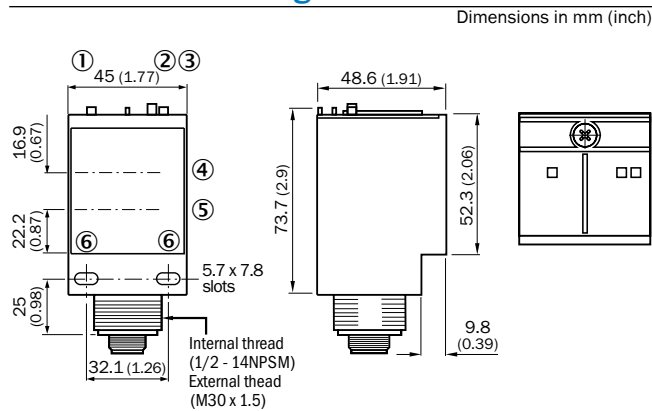
- **Sensor principle:** Through-beam photoelectric sensor
- **Type of light:** Infrared light
- **Light spot size (distance):** 12.5 in (45.9 ft) / Ø 320 mm (14 m)
- **Output type:** relay
- **Switching mode:** Light/dark-switching

Sensing range max.	Time functions	Connection	Connection diagram	Model name	Part no.
0 ft ... 164 ft 0 m ... 50 m	-	Cable, 5-wire, 2 m, PVC	Cd-046	WS/WE2000-R1102	7025968
		Mini connector, 5-pin	Cd-172	WS/WE2000-R5100	7025969
	Time delay off ¹⁾ Switch on delay ²⁾	Cable, 5-wire, 2 m, PVC	Cd-046	WS/WE2000-R1122	7025970
		Mini connector, 5-pin	Cd-172	WS/WE2000-R5120	7025971

¹⁾ Adjustable via Off delay selector switch.

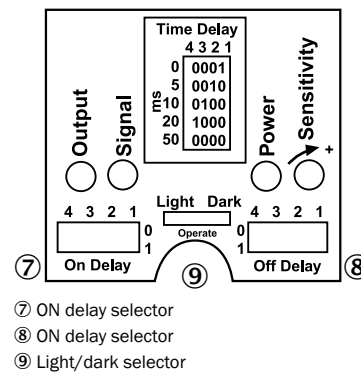
²⁾ Adjustable via On delay selector switch.

Dimensional drawing



- ① Status indicator LED green: power on
- ② Status indicator LED red: signal strength
- ③ Status indicator LED, yellow: Output active
- ④ Center of emitter optical axis
- ⑤ Center of receiver optical axis
- ⑥ Mounting hole Ø 0.2 mm x 0.8 mm

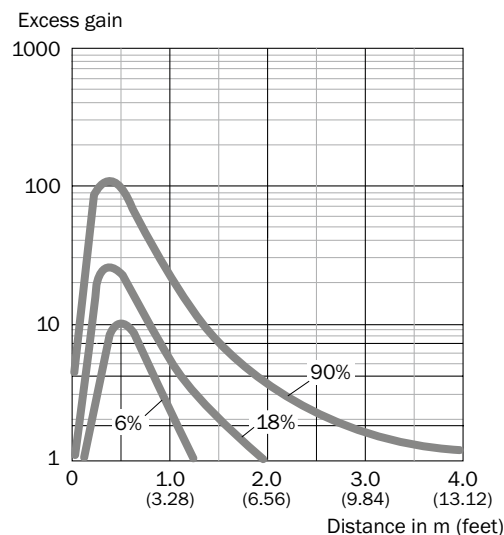
Adjustments



Characteristic curves

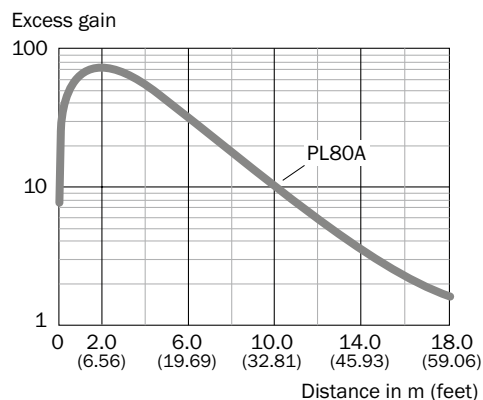
Black-white shift

WT2000

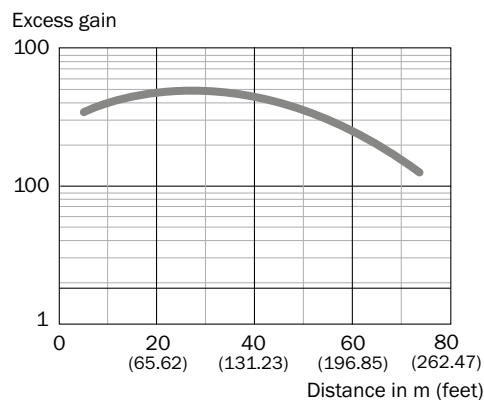


Operating range

WL2000



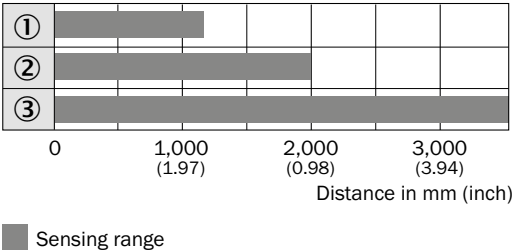
WS/WE2000



H

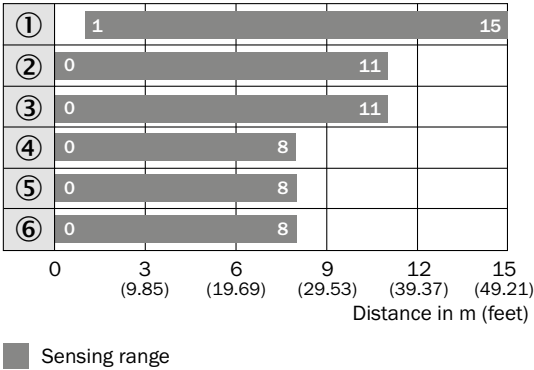
Bar diagrams

WT2000



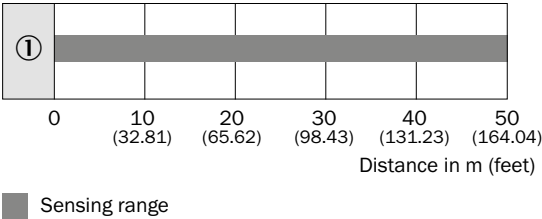
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90 % remission

WL2000



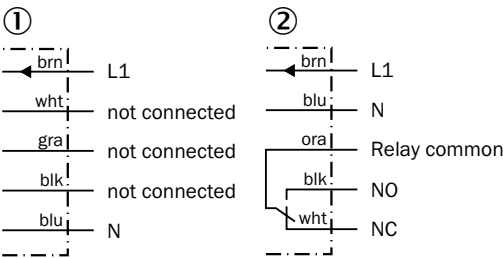
- ① PL80A
- ② PL50A
- ③ PL40A
- ④ PL30A
- ⑤ PL20A
- ⑥ Reflective tape Diamond Grade

WS/WE2000



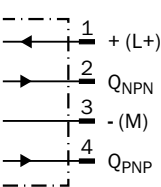
Connection diagram

Cd-046

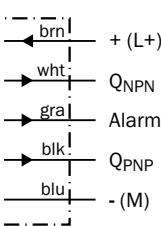


- ① Sender
- ② Receiver

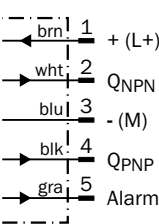
Cd-086



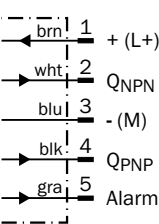
Cd-142



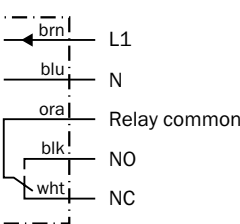
Cd-154



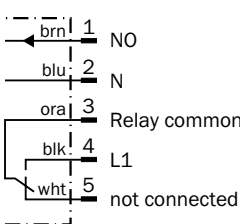
Cd-155



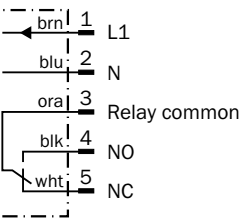
Cd-165



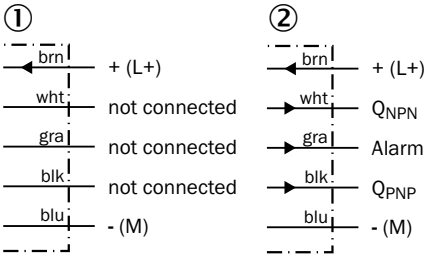
Cd-171



Cd-172

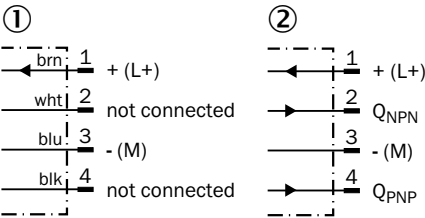


Cd-206



① Sender
② Receiver

Cd-215



① Sender
② Receiver

Recommended accessories

Plug connectors and cables

Connecting cable (female connector-open)

- Enclosure rating: IP 67

Figure	Connection type head A	Connection type head B	Cable length	Model name	Part no.
	Female connector, M12, 4-pin, straight	Cable	2 m	DOL-1204-G02M	6009382
			5 m	DOL-1204-G05M	6009866
	Female connector, M12, 4-pin, angled	Cable	2 m	DOL-1204-W02M	6009383
			5 m	DOL-1204-W05M	6009867

Reflectors

Angular

- **Description:** Rectangular, screw connection

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

Reflective tape

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

Round

Figure	Description	Material	Diameter	Model name	Part no.
	Round, screw connection	PMMA/ABS	80 mm	C110A	5304549

→ For additional accessories, please see page L-861



A well-rounded package

No tools required: cylindrical sensors are easy to install and ready for operation in no time. With the broadest portfolio on the market, this sensor family offers total versatility. They are equipped with an innovative mounting system, short-body or standard housings in metal, INOX stainless steel, or plastic, in versions suitable for food and beverage, or with high-precision laser technology. The comprehensive range covers the entire application spectrum of modern photoelectric sensor technology. SICK's cylindrical sensors are simply designed for every area of application.

Your benefits

- The solution for economical challenges thanks to simple mounting, standardized connection technology and universal use
- Compatible due to standardized design in cylindrical housing, standardized connection system and electrical interfaces
- High operating reserves and access to new solutions due to large sensing ranges and similar system specifications for all variants
- Standard housing made of plastic, metal or stainless steel ensures durability in rough environmental conditions





Cylindrical photoelectric sensors

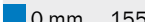
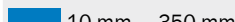
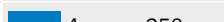
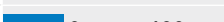
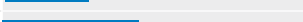
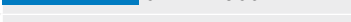
	General information	I-684
	Product selection	I-686
	Product family overview	I-690
	ELF Hybrid sensor with integrated M18 threads for front and base mounting	I-692
	GR18S Round, short and economically unbeatable	I-698
	MH15V Space-saving photoelectric sensors designed for wash down applications	I-714
	V18 Laser Low-cost cylindrical M18 Laser photoelectric sensor	I-724
	V18V Cylindrical photoelectric sensors with foolproof touch-teach for washdown areas	I-732
	V180-2 Lowest-cost cylindrical photoelectric sensor on the market!	I-742
	W15 Improve performance and reduce downtime with W15 sensors	I-766
	Z-Sensor Flexible, low-cost presence detection solutions with clear housings	I-776

Overview of cylindrical photoelectric sensors

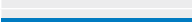
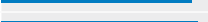
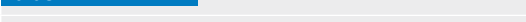
Cylindrical photoelectric sensors	 Housing									 Sensor principle						
	Material			Enclosure rating			Housing design									
	Stainless steel	Plastic	Metal	IP 67	IP 68	IP 69K 	Cylindrical, axial	Cylindrical, radial	Hybrid	Photoelectric proximity sensor	Energetic	Background suppression	Photoelectric retro-reflective sensor	Dual lens	Through-beam photoelectric sensor	
ELF																
ELF3																
GR18																
GR18S 																
MH15																
MH15V																
V18																
V18 Laser																
V18V																
V180																
V180-2																
W15																
W15																
Z-Sensor																
Z-Sensor																

	 Optics/Technology					 Special applications				Page
	Type of light/Light sender				Technology					
	LED infrared light	LED red light	 Red laser light	 PinPoint LED red light	SIRIC®	Hygienic and washdown zones	Detecting transparent objects	Detecting small objects	Detecting objects wrapped in film	
	■	■						■		I-692
		■		■			■	■		I-698
	■	■		■		■				I-714
		■	■					■		I-724
	■	■				■	■	■		I-732
		■						■		I-742
	■	■		■	■				■	I-766
	■	■								I-776

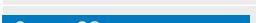
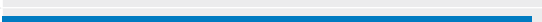
Photoelectric proximity sensors

		Maximum sensing range	Dimensions (W x H x D)/ Housing length	Page
ELF		0 mm ... 155 mm	23.8 mm x 45.4 mm x 33.6 mm	I-692
Z-Sensor		0 mm ... 155 mm	13.6 mm x 45.2 mm x 31.7 mm	I-776
MH15V		10 mm ... 350 mm	52.9 mm	I-714
W15		4 mm ... 350 mm	16.2 mm x 48.5 mm x 31.9 mm	I-766
V18 Laser		0 mm ... 400 mm	97.7 mm ... 107.7 mm	I-724
GR18S		3 mm ... 550 mm	36.1 mm ... 53.7 mm	I-698
V18V		0 mm ... 900 mm	83 mm	I-732
V180-2		1 mm ... 1,100 mm	62.5 mm ... 84.2 mm	I-742

Photoelectric retro-reflective sensors

		Maximum sensing range	Dimensions (W x H x D)/ Housing length	Page
ELF		0.1 m ... 4.8 m	23.8 mm x 45.4 mm x 33.6 mm	I-692
Z-Sensor		0.1 m ... 4.8 m	13.6 mm x 45.2 mm x 31.7 mm	I-776
MH15V		0.035 m ... 5 m	52.9 mm	I-714
V18V		0.035 m ... 5 m	83 mm	I-732
W15		0.035 m ... 5 m	16.2 mm x 48.5 mm x 31.9 mm	I-766
V180-2		0.05 m ... 7 m	62.5 mm ... 84.2 mm	I-742
GR18S		0.03 m ... 7.2 m	36.1 mm ... 53.7 mm	I-698
V18 Laser		0.1 m ... 35 m	97.7 mm ... 107.7 mm	I-724

Through-beam photoelectric sensors

		Maximum sensing range	Dimensions (W x H x D)/ Housing length	Page
MH15V		0 m ... 5 m	52.9 mm	I-714
W15		0 m ... 5 m	16.2 mm x 48.5 mm x 31.9 mm	I-766
GR18S		0 m ... 15 m	36.1 mm ... 53.7 mm	I-698
V18V		0 m ... 20 m	83 mm	I-732
V180-2		0 m ... 28 m	62.5 mm ... 84.2 mm	I-742
V18 Laser		0 m ... 60 m	97.7 mm ... 107.7 mm	I-724

Product family overview

					
	ELF3	GR18S	MH15V	V18 Laser	
	Hybrid sensor with integrated M18 threads for front and base mounting	Round, short and economically unbeatable	Space-saving photoelectric sensors designed for wash down applications	Low-cost cylindrical M18 Laser photoelectric sensor	

Technical data overview

Optical axis		Axial/Axial, fully flush Radial/Radial, fully flush	Axial	Axial / radial	
Dimensions (W x H x D)	23.8 mm x 45.4 mm x 33.6 mm	–	–	–	
Sensing range max.					
Photoelectric proximity sensor	0 mm ... 155 mm	3 mm ... 550 mm	3 mm ... 350 mm	0 mm ... 400 mm	
Photoelectric retro-reflective sensor	0.1 m ... 4.8 m	0.03 m ... 7.2 m	0.035 m ... 5 m	0.1 m ... 35 m	
Through-beam photoelectric sensor		0 m ... 15 m	0 m ... 5 m	0 m ... 60 m	
Light source	LED	PinPoint LED	PinPoint LED / LED	Laser	
Type of light	Visible red light / Infrared light	Visible red light	Visible red light / Infrared light	Visible red light	
Enclosure rating	IP 67	IP 67	IP 67, IP 68, IP 69K	IP 67	
Housing material	Plastic	Metal/Plastic	Stainless steel	Metal	

At a glance

	• Flush red lens • Polarization filter • Clear back cover for highly visible status indication • 18 mm front and base mount • Power and status indicator	• Low-cost cylindrical M18 sensor with extra short housing • Potentiometer for adjustment of switching threshold • Five different housing styles • Variety of plastic and metal housing styles, with straight or right angle optics • Bright and highly visible PinPoint-LED • Special flush type, one-piece metal housing • Highly visible signal indicator LED • IP 67 rating	• Field-tested resistance to acidic and alkaline cleaning and disinfecting agents • Corrosion-resistant stainless steel housing 316L, certified by ECOLAB and JohnsonDiversey • IP 69K-rated housing is resistant to wash down environments • Available as complete family including proximity, BGS, retro-reflective and through-beam • 3 mm chemical resistant sensor lens	• Laser emitter LED enclosed in a cylindrical M18 housing • Laser class 1 • Fast response time • Straight or right-angle housing • Durable metal housing • IP 67 • Small visible light spot to detect small objects	
Detailed information	→ I-692	→ I-698	→ I-714	→ I-724	

 V18V	 V180-2	 W15	 Z-Sensor
Cylindrical photoelectric sensors with foolproof touch-teach for washdown areas	Lowest-cost cylindrical photoelectric sensor on the market!	Improve performance and reduce downtime with W15 sensors	Flexible, low-cost presence detection solutions with clear housings
Axial / radial	Axial / radial	–	–
–	16.2 mm x 48.5 mm x 31.9 mm	13.6 mm x 45.2 mm x 31.7 mm	
0 mm ... 900 mm	1 mm ... 1.100 mm	4 mm ... 350 mm	0 mm ... 155 mm
0,035 m ... 5 m	0,05 m ... 7 m	0,035 m ... 5 m	0,1 m ... 4,8 m
0 m ... 20 m	0 m ... 28 m	0 m ... 5 m	–
LED	LED	PinPoint LED / LED	LED
Visible red light	Visible red light	Visible red light / Infrared light	Infrared light / visible red light
IP 67	IP 67	IP 66, IP 67, IP 67	IP 67
Metal/Plastic	Metal/Plastic	Plastic	Plastic
• IP 69K-rated cylindrical photoelectric sensors in M18 stainless steel housing • Resistant to all common cleaning agents and certified by independent institutes • Extended temperature range: +85° C (long-term), +100° C / 15 min. (short-term) • Touch (smart) teach-in adjustment • All sensor materials, including the housing, LED and lens are resistant to chemicals • IP 69K and IP 68 according to DIN 40050 • Laser-etched part numbers • Ecolab & JohnsonDiversey certified for chemical resistance	• Low-cost M18 housing sensor on the market • Long sensing distances: 100 mm, 400 mm, 800 mm (proximity sensor), 300 mm (proximity sensor with BGS), 6 m (retro-reflective sensor) and 20 m (through-beam sensor) • Bright power and signal LEDs with 360° visibility • Wide product portfolio solves a broad range of applications • High switching frequencies up to 1000 Hz • Available in a metal housing for applications in harsh environments • Optical axis selectively axial or radial (90°)	• M18 front mount using plastic nut or snap ring, side assembly with 24.1 mm through holes • Flush mounting possible using the snap ring • Transparent back cover • Best-in-class background suppression and red Pin-Point LED • High immunity to ambient light • Highly visible LED indicators	• Economical design with background suppression, retro-reflective or energetic variants available; non-adjustable • Compact, transparent housing with 360° status indication • M18 front mount and 24-25.4 mm slotted side through holes compatible with competitor devices • Spherical eyeball-style housing with 24 mm ball mount allows for infinite adjustability (depending on type) • Connection system: straight or angled cable outlet (60°) or M12 or M8 connector outlet • IP 67 enclosure rating for harsh environments
→ I-732	→ I-742	→ I-766	→ I-776

Hybrid sensor with integrated M18 threads for front and base mounting



Additional information

Detailed technical data.	I-693
Ordering information.	I-694
Dimensional drawings	I-695
Characteristic curves	I-695
Bar diagrams.	I-696
Connection diagram	I-696
Recommended accessories.	I-697



Product description

The industry-proven ELF-3 family of hybrid photoelectric sensors offers basic functions for presence detection applications. These low-cost sensors provide a variety of features that can be optimized for customers to reduce installation and procurement costs. They are ideal for standard, short-range applications, such as conveyor systems, vending machines, packaging lines, or other simple on/off applications. ASIC (application-specific integrated circuit) technology, which is proprietary to SICK, guarantees the best optical performance. ELF-3 sensors are

available in background suppression, energetic and retro-reflective variants. The background suppression variant offers a 50 mm fixed sensing distance. The energetic variant has a 155 mm sensing range and the retro-reflective variant has a 5 m sensing range. A clear back cover provides highly visible power and status indication. These multi-functional sensors are able to integrate optical and electronic elements into different housings. The ELF-3 comes with integrated M18 threads for front and base mounting.

At a glance

- Flush red lens
- Polarization filter
- Clear back cover for highly visible status indication
- 18 mm front and base mount
- Power and status indicator

Your benefits

- A wide range of customizable options reduces material and labor costs
- Flush red lens provides an increased sensing range for a broader range of application possibilities
- IP 67-rated housing has a longer service life that stands up to harsh environments, reducing maintenance time and costs
- Highly visible status/power indicator provides quick and easy troubleshooting from a distance
- M18 front and base mounting ensures quick and easy installation
- Small sensor footprint easily fits into applications with limited space

→ www.mysick.com/en/ELF3

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

	ET3	EL3	EL4
Sensor principle	Photoelectric proximity sensor	Photoelectric retro-reflective sensor	
Detection principle	Background suppression / energetic (depending on type)	–	
Dimensions (W x H x D)	23.8 mm x 45.4 mm x 33.6 mm		
Housing design (light emission)	Hybrid		
Thread diameter (housing)	M18		
Sensing range max.	0 mm ... 155 mm ¹⁾ (depending on type)	0.1 m ... 4.8 m ²⁾	
Sensing range	0 mm ... 155 mm ¹⁾ (depending on type)	0.1 m ... 3 m ²⁾	
Type of light	Infrared light / visible red light (depending on type)	Visible red light	
Light source ³⁾	LED		
Wave length	Infrared light	880 nm	–
	Visible red light	660 nm	
Special feature	Focused optics	–	

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

	ET3	EL3	EL4
Supply voltage ¹⁾	10 V DC ... 30 V DC		
Ripple ²⁾	< 5 V _{pp}		
Power consumption ³⁾	< 20 mA		
Output type	PNP		
Switching mode	Light switching / Dark-switching (depending on type)		
Output current I _{max.}	50 mA		
Switching frequency ⁴⁾	200 Hz	400 Hz	
Connection type ⁵⁾	Cable, 2 m		
Circuit protection	A ⁶⁾ , D ⁷⁾		
Protection class ⁸⁾	III		
Weight	0.036 kg, 0.08 lbs		
Polarisation filter	–	✓	
Housing material	Glass fiber reinforced ABS plastic		
Enclosure rating	IP 67		
Ambient operating temperature	–25 °C ... +50 °C		
Ambient storage temperature	–40 °C ... +70 °C		

¹⁾ Limit values.

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

³⁾ Without load.

⁴⁾ With light/dark ratio 1:1.

⁵⁾ Do not bend below 0 °C.

⁶⁾ A = V_S connections reverse-polarity protected.

⁷⁾ D = outputs overcurrent and short-circuit protected.

⁸⁾ Reference voltage: 50 V DC.

Ordering information

Other models available at www.mysick.com/en/ELF3

ET3

- **Sensor principle:** photoelectric proximity sensor
- **Output type:** PNP
- **Connection:** cable, 3-wire, 2 m, PVC

Detection principle	Type of light	Sensing range max. ¹⁾	Light spot size (distance)	Switching mode	Connection diagram	Model name	Part no.
Background suppression	Infrared light	0 mm ... 50 mm	10.5 mm x 10.5 mm (50 mm)	Light switching	Cd-043	ET3-P3215	1045187
				Dark-switching	Cd-043	ET3-F3215	1045189
Energetic	Visible red light	5 mm ... 60 mm	8 mm x 8 mm (60 mm)	Light switching	Cd-043	ET3-P2215	1045195
				Dark-switching	Cd-043	ET3-F2215	1045196
	Infrared light	1 mm ... 100 mm	20 mm x 20 mm (100 mm)	Light switching	Cd-043	ET3-P4215	1045191
				Dark-switching	Cd-043	ET3-F4215	1045193
		5 mm ... 155 mm	31 mm x 31 mm (150 mm)	Light switching	Cd-043	ET3-P5215	1045199
				Dark-switching	Cd-043	ET3-F5215	1045200

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

EL3

- **Sensor principle:** photoelectric retro-reflective sensor
- **Output type:** PNP
- **Connection:** cable, 3-wire, 2 m, PVC

Type of light	Sensing range max. ¹⁾	Light spot size (distance)	Switching mode	Connection diagram	Model name	Part no.
Visible red light	0.1 m ... 4.8 m	125 mm x 125 mm (1 m)	Light switching	Cd-043	EL3-P2415	1043960
			Dark-switching	Cd-043	EL3-F2415	1043961

¹⁾ PL80A.

EL4

- **Sensor principle:** photoelectric retro-reflective sensor
- **Output type:** PNP
- **Connection:** cable, 3-wire, 2 m, PVC

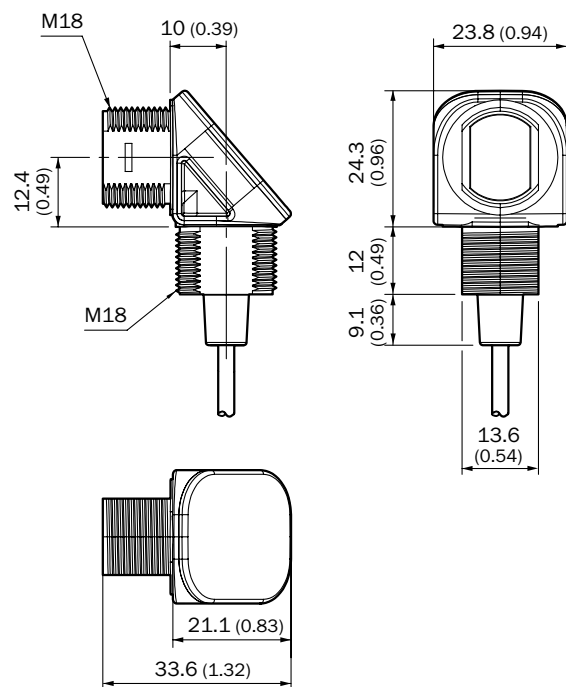
Type of light	Sensing range max. ¹⁾	Light spot size (distance)	Switching mode	Connection diagram	Model name	Part no.
Visible red light	0.1 m ... 4.8 m	125 mm x 125 mm (1 m)	Light switching	Cd-043	EL4-P2415	1044683
			Dark-switching	Cd-043	EL4-F2415	1044684

¹⁾ PL80A.

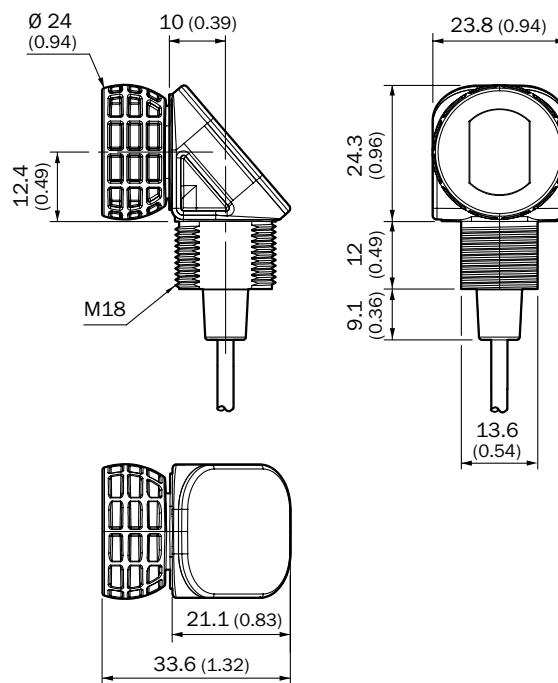
Dimensional drawings

Dimensions in mm (inch)

ET3, EL3



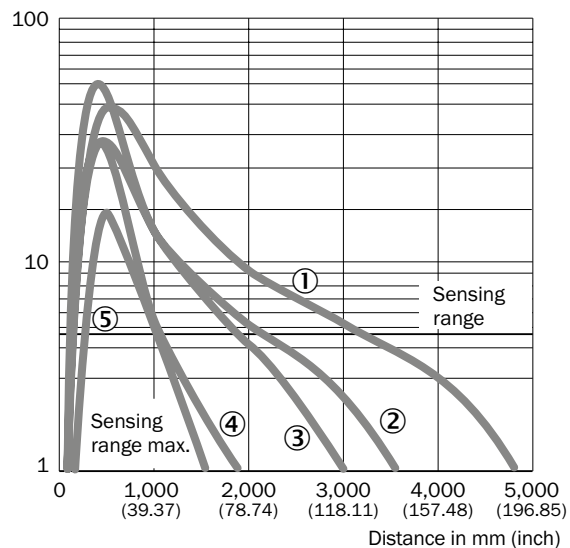
EL4



Characteristic curves

EL3

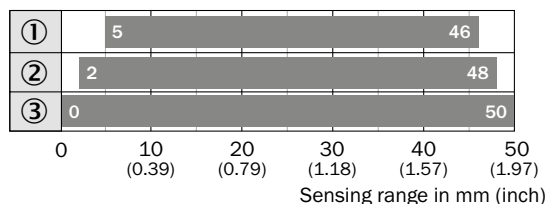
% of sensing range



- ① PL80A
- ② P250
- ③ PL40A
- ④ PL20A
- ⑤ Reflective tape REF-Plus

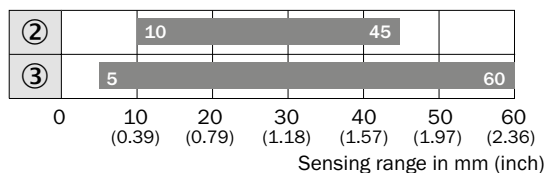
Bar diagrams

ET3, 50 mm



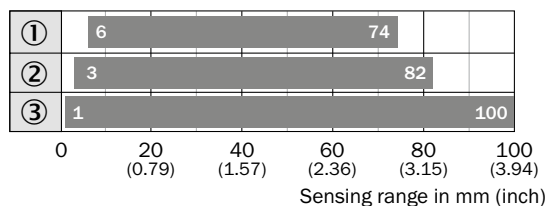
- ① Sensing range on black, 6 % remission
② Sensing range on gray, 18 % remission
③ Sensing range on white, 90 % remission

ET3, 60 mm



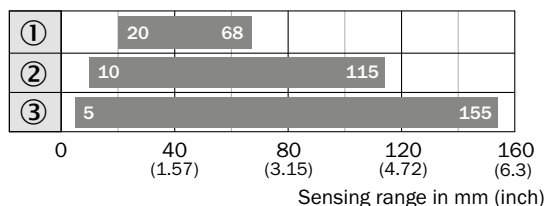
- ② Sensing range on gray, 18 % remission
③ Sensing range on white, 90 % remission

ET3, ET4, 100 mm



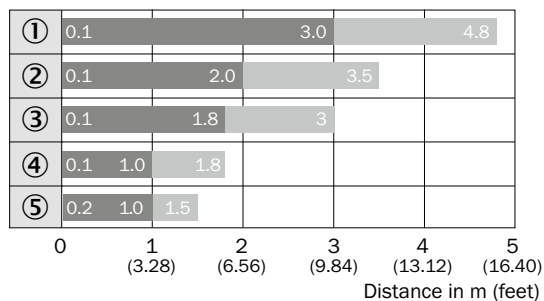
- ① Sensing range on black, 6 % remission
② Sensing range on gray, 18 % remission
③ Sensing range on white, 90 % remission

ET3, 150 mm



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

EL3, EL4

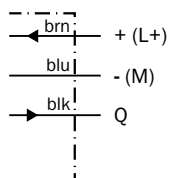


■ Sensing range ■ Sensing range max.

- ① PL80A
② P250
③ PL40A
④ PL20A
⑤ Reflective tape REF-Plus

Connection diagram

Cd-043



Recommended accessories

Reflectors

Angular

- **Description:** Rectangular, screw connection

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

Reflective tape

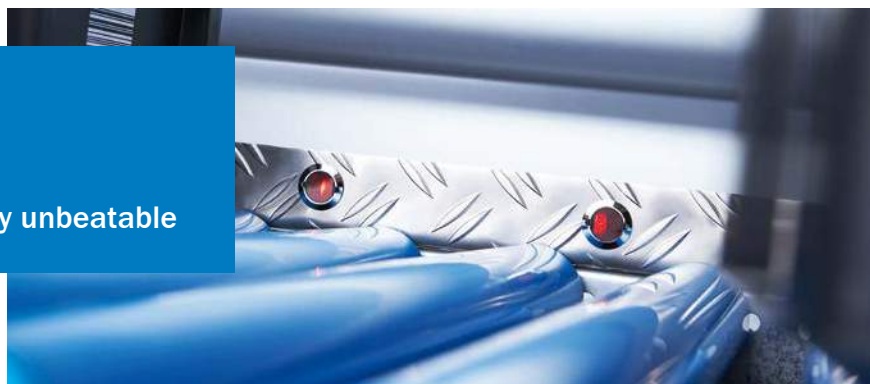
Figure	Description	Dimensions	Model name	Part no.
	Self-adhesive	50 mm x 60 mm	REF-IRF-56	5314244

Round

Figure	Description	Material	Diameter	Model name	Part no.
	Round, screw connection	PMMA/ABS	80 mm	C110A	5304549

→ For additional accessories, please see page L-861

Round, short and economically unbeatable



Additional information

Detailed technical data.....	I-699
Ordering information.....	I-700
Dimensional drawings	I-703
Characteristic curves	I-706
Bar diagrams.....	I-707
Light spot diameter.....	I-708
Response curve.....	I-708
Connection diagram	I-709
Recommended accessories.....	I-710

Product description

The GR18S family of photoelectric sensors in cylindrical M18-housings has a special shortened design and offers an optimal price/performance ratio. It can be used universally in many applications thanks to five different housing designs. PinPoint LEDs, plastic and metal housing versions as well as status indicators that

are easily visible from all angles round off the sensor family's features. One highlight is the fully-flush metal variant, which has been especially designed for use in harsh industrial environments found in handling and warehousing systems.

At a glance

- Low-cost cylindrical M18 sensor with extra short housing
- Potentiometer for adjustment of switching threshold
- Five different housing styles
- Variety of plastic and metal housing styles, with straight or right angle optics
- Bright and highly visible PinPoint-LED
- Special flush type, one-piece metal housing
- Highly visible signal indicator LED
- IP 67 rating

Your benefits

- Space-saving solution due to short housing
- Flexible mounting options due to versatile housing styles
- Potentiometer for adjustment of switching threshold allows detection of transparent objects.
- Easy installation and precise detection due to PinPoint LED
- Reduced maintenance costs due to high tightening torque of single piece flush metal housing
- Rugged and reliable with proven SICK technology
- Highly visible signal indicator LED saves maintenance and commissioning time

→ www.mysick.com/en/GR18S

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

	GRTE18S	GRL18S	GRL18SG	GRSE18S
Sensor principle	Photoelectric proximity sensor	Photoelectric retro-reflective sensor		Through-beam photoelectric sensor
Detection principle	Energetic	Standard optics		–
Housing design (light emission)	Cylindrical, straight / cylindrical, straight, fully flush; Cylindrical, angled / cylindrical, angled, fully flush (depending on type)			
Sensing range max.	3 mm ... 550 mm ¹⁾ (depending on type)	0.03 m ... 7.2 m ²⁾		0 m ... 15 m
Sensing range	5 mm ... 400 mm ¹⁾ (depending on type)	0.06 m ... 6 m ²⁾		0 m ... 10 m
Type of light	Visible red light			
Light source ³⁾	PinPoint LED			
Wave length	650 nm			
Adjustment	Potentiometer, 270 °	–	Potentiometer, 270 °	–
Special feature	–		Detection of transparent objects	–

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

	GRTE18S	GRL18S	GRL18SG	GRSE18S
Supply voltage ¹⁾	10 V DC ... 30 V DC			
Ripple ²⁾	± 5 V _{pp}			
Power consumption	≤ 30 mA			
Output type	PNP/NPN (depending on type)			
Switching mode	Light switching/dark-switching (depending on type)			
Output current I _{max.} ³⁾	100 mA			
Response time ⁴⁾	< 1,000 µs	< 500 µs		
Switching frequency	500 Hz	1,000 Hz		
Connection type	Male connector, M12/Cable, 2 m ⁵⁾ (depending on type)			
Circuit protection	A ⁶⁾ , B ⁷⁾ , D ⁸⁾			
Protection class	III			
Polarisation filter	–	✓		–
Enclosure rating	IP 67			
Ambient operating temperature ⁹⁾	–25 °C ... +55 °C		–25 °C ... +55 °C ¹⁰⁾	–25 °C ... +55 °C
Ambient storage temperature	–40 °C ... +70 °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⁾ At V_S > 24 V or ambient temperature > 49 °C, I_A max = 50 mA.

⁴⁾ Signal transit time with resistive load.

⁵⁾ Do not bend below 0 °C.

⁶⁾ A = V_S connections reverse-polarity protected.

⁷⁾ B = inputs and output reverse-polarity protected.

⁸⁾ D = outputs overcurrent and short-circuit protected.

⁹⁾ At U_V ≤ 24V and I_A < 50mA.

¹⁰⁾ Temperature stability after adjustment +/-10 °C.

Ordering information

Other models available at www.mysick.com/en/GR18S

GRTE18S, metal

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** energetic
- **Adjustment:** potentiometer, 270 °

Housing design	Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
Axial	3 mm ... 115 mm	Ø 8 mm (100 mm)	PNP	Light switching	Connector M12, 3-pin	Cd-045	GRTE18S-P2312	1058204
					Cable, 3-wire, 2 m, PVC	Cd-044	GRTE18S-P1312	1058203
			NPN	Light switching	Connector M12, 3-pin	Cd-045	GRTE18S-N2312	1059408
					Cable, 3-wire, 2 m, PVC	Cd-044	GRTE18S-N1312	1058201
	5 mm ... 550 mm	Ø 9 mm (400 mm)	PNP	Light switching	Cable, 3-wire, 2 m, PVC	Cd-044	GRTE18S-P1342	1058205
					Connector M12, 3-pin	Cd-045	GRTE18S-P2342	1058200
			NPN	Light switching	Cable, 3-wire, 2 m, PVC	Cd-044	GRTE18S-N1342	1058202
					Connector M12, 3-pin	Cd-045	GRTE18S-N2342	1059482
Axial, fully flush	3 mm ... 115 mm	Ø 8 mm (100 mm)	PNP	Light switching	Connector M12, 3-pin	Cd-045	GRTE18S-P231Z	1059436
				Dark-switching	Connector M12, 3-pin	Cd-045	GRTE18S-F231Z	1059435
			NPN	Light switching	Connector M12, 3-pin	Cd-045	GRTE18S-N231Z	1059432
				Dark-switching	Connector M12, 3-pin	Cd-045	GRTE18S-E231Z	1059409
	5 mm ... 550 mm	Ø 9 mm (400 mm)	PNP	Light switching	Connector M12, 3-pin	Cd-045	GRTE18S-P234Z	1059487
				Dark-switching	Connector M12, 3-pin	Cd-045	GRTE18S-F234Z	1059486
			NPN	Light switching	Connector M12, 3-pin	Cd-045	GRTE18S-N234Z	1059484
				Dark-switching	Connector M12, 3-pin	Cd-045	GRTE18S-E234Z	1059483
Radial, fully flush	3 mm ... 115 mm	Ø 8 mm (100 mm)	PNP	Light switching	Connector M12, 3-pin	Cd-045	GRTE18S-P231X	1059440
				Dark-switching	Connector M12, 3-pin	Cd-045	GRTE18S-F231X	1059438
	5 mm ... 550 mm	Ø 9 mm (400 mm)	PNP	Light switching	Connector M12, 3-pin	Cd-045	GRTE18S-P234X	1059489
				Dark-switching	Connector M12, 3-pin	Cd-045	GRTE18S-F234X	1059488

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

GRTE18S, plastic

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** energetic
- **Adjustment:** potentiometer, 270 °

Housing design	Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
Axial	3 mm ... 115 mm	Ø 8 mm (100 mm)	PNP	Light switching	Cable, 3-wire, 2 m, PVC	Cd-044	GRTE18S-P1317	1058195
					Connector M12, 3-pin	Cd-045	GRTE18S-P2317	1058196
			NPN	Light switching	Cable, 3-wire, 2 m, PVC	Cd-044	GRTE18S-N1317	1058194
					Connector M12, 3-pin	Cd-045	GRTE18S-N2317	1059378
	5 mm ... 550 mm	Ø 9 mm (400 mm)	PNP	Light switching	Cable, 3-wire, 2 m, PVC	Cd-044	GRTE18S-P1347	1058197
					Connector M12, 3-pin	Cd-045	GRTE18S-P2347	1058193
			NPN	Light switching	Cable, 3-wire, 2 m, PVC	Cd-044	GRTE18S-N1347	1058393
					Connector M12, 3-pin	Cd-045	GRTE18S-N2347	1059441
Radial	3 mm ... 115 mm	Ø 8 mm (100 mm)	PNP	Light switching	Connector M12, 3-pin	Cd-045	GRTE18S-P2319	1059407
				Dark-switching	Connector M12, 3-pin	Cd-045	GRTE18S-F2319	1059406
	5 mm ... 550 mm	Ø 9 mm (400 mm)	PNP	Light switching	Connector M12, 3-pin	Cd-045	GRTE18S-P2349	1059481
				Dark-switching	Connector M12, 3-pin	Cd-045	GRTE18S-F2349	1059480

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

GRL18S, metal

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics

Housing design	Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
Axial	0.03 m ... 7.2 m	Ø 175 mm (7 m)	PNP	Light switching	Cable, 3-wire, 2 m, PVC	Cd-044	GRL18S-P1331	1059542
					Connector M12, 3-pin	Cd-045	GRL18S-P2331	1058199
			NPN	Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-044	GRL18S-F1331	1059541
					Connector M12, 3-pin	Cd-045	GRL18S-F2331	1058198
			NPN	Light switching	Cable, 3-wire, 2 m, PVC	Cd-044	GRL18S-N1331	1059538
				Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-044	GRL18S-E1331	1059537
Axial, fully flush	0.03 m ... 7.2 m	Ø 175 mm (7 m)	PNP	Light switching	Connector M12, 3-pin	Cd-045	GRL18S-P233Y	1058207
				Dark-switching	Connector M12, 3-pin	Cd-045	GRL18S-F233Y	1058206
Radial, fully flush	0.03 m ... 7.2 m	Ø 175 mm (7 m)	PNP	Light switching	Connector M12, 3-pin	Cd-045	GRL18S-P233W	1058210
				Dark-switching	Connector M12, 3-pin	Cd-045	GRL18S-F233W	1058209

¹⁾ PL80A.

GRL18S, plastic

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics

Housing design	Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
Axial	0.03 m ... 7.2 m	Ø 175 mm (7 m)	PNP	Light switching	Cable, 3-wire, 2 m, PVC	Cd-044	GRL18S-P1336	1059534
					Connector M12, 3-pin	Cd-045	GRL18S-P2336	1058192
			NPN	Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-044	GRL18S-F1336	1059532
					Connector M12, 3-pin	Cd-045	GRL18S-F2336	1059533
			NPN	Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-044	GRL18S-E1336	1059530
				Light switching	Cable, 3-wire, 2 m, PVC	Cd-044	GRL18S-N1336	1059531
Radial	0.03 m ... 7.2 m	Ø 175 mm (7 m)	PNP	Light switching	Cable, 3-wire, 2 m, PVC	Cd-044	GRL18S-P1338	1059536
					Connector M12, 3-pin	Cd-045	GRL18S-P2338	1058212
				Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-044	GRL18S-F1338	1059535
					Connector M12, 3-pin	Cd-045	GRL18S-F2338	1058211

¹⁾ PL80A.

GRL18SG, metal, clear material detection

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Adjustment:** potentiometer, 270 °

Housing design	Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
Axial	0.03 m ... 7.2 m	Ø 175 mm (7 m)	PNP	Dark-switching	Connector M12, 3-pin	Cd-045	GRL18SG-F2332	1059555
Axial, fully flush	0.03 m ... 7.2 m	Ø 175 mm (7 m)	PNP	Dark-switching	Connector M12, 3-pin	Cd-045	GRL18SG-F233Z	1059556
Radial, fully flush	0.03 m ... 7.2 m	Ø 175 mm (7 m)	PNP	Dark-switching	Connector M12, 3-pin	Cd-045	GRL18SG-F233X	1059557

¹⁾ PL80A.

GRL18SG, plastic, clear material detection

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Adjustment:** potentiometer, 270 °

Housing design	Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
Axial	0.03 m ... 7.2 m	Ø 175 mm (7 m)	PNP	Dark-switching	Connector M12, 3-pin	Cd-045	GRL18SG-F2337	1059553
		Ø 175 mm (7 m)	PNP	Dark-switching	Cable, 3-wire, 2 m	Cd-045	GRL18SG-F1337	1062231
Radial	0.03 m ... 7.2 m	Ø 175 mm (7 m)	PNP	Dark-switching	Connector M12, 3-pin	Cd-045	GRL18SG-F2339	1059554

¹⁾ PL80A.

GRSE18S, metal

- **Sensor principle:** through-beam photoelectric sensor

Housing design	Sensing range max.	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
Axial	0 m ... 15 m	Ø 250 mm (10 m)	PNP	Light switching	Connector M12, 3-pin	Cd-051	GRSE18S-P2331	1059550
				Dark-switching	Connector M12, 3-pin	Cd-051	GRSE18S-F2331	1059549
			NPN	Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-049	GRSE18S-E1331	1059548
Radial, fully flush	0 m ... 15 m	Ø 250 mm (10 m)	PNP	Light switching	Connector M12, 3-pin	Cd-051	GRSE18S-P233W	1059552
				Dark-switching	Connector M12, 3-pin	Cd-051	GRSE18S-F233W	1059551

GRSE18S, plastic

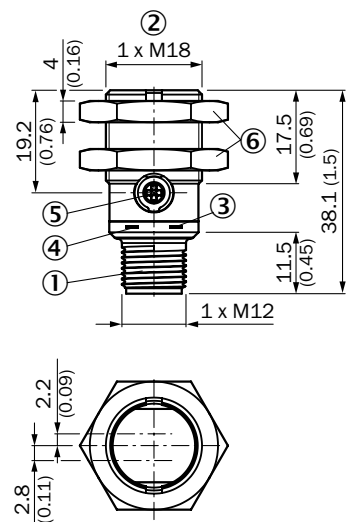
- **Sensor principle:** through-beam photoelectric sensor

Housing design	Sensing range max.	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
Axial	0 m ... 15 m	Ø 250 mm (10 m)	PNP	Light switching	Cable, 3-wire, 2 m, PVC	Cd-049	GRSE18S-P1336	1059545
					Connector M12, 3-pin	Cd-051	GRSE18S-P2336	1058215
				Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-049	GRSE18S-F1336	1059544
					Connector M12, 3-pin	Cd-051	GRSE18S-F2336	1058214
			NPN	Dark-switching	Cable, 3-wire, 2 m, PVC	Cd-049	GRSE18S-E1336	1059543
Radial	0 m ... 15 m	Ø 250 mm (10 m)	PNP	Light switching	Connector M12, 3-pin	Cd-051	GRSE18S-P2338	1059547
				Dark-switching	Connector M12, 3-pin	Cd-051	GRSE18S-F2338	1059546

Dimensional drawings

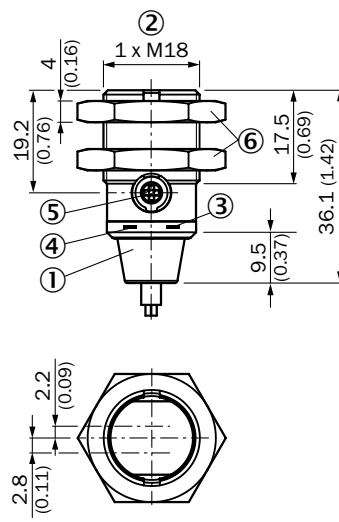
Dimensions in mm (inch)

GRTE18S, metal, connector, axial



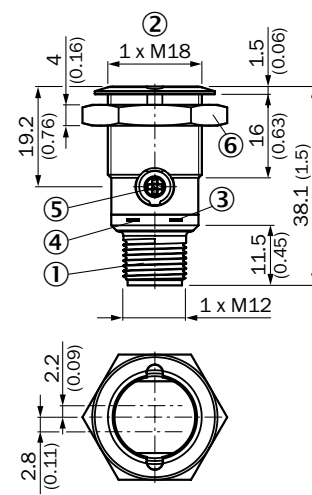
- ① Connector M12, 3-pin
- ② Threaded mounting hole M18 x 1
- ③ LED indicator yellow
- ④ LED indicator green
- ⑤ Sensitivity control; Potentiometer 270°
- ⑥ Fastening nuts (2 x); 24 mm hex, metal

GRTE18S, metal, cable, axial



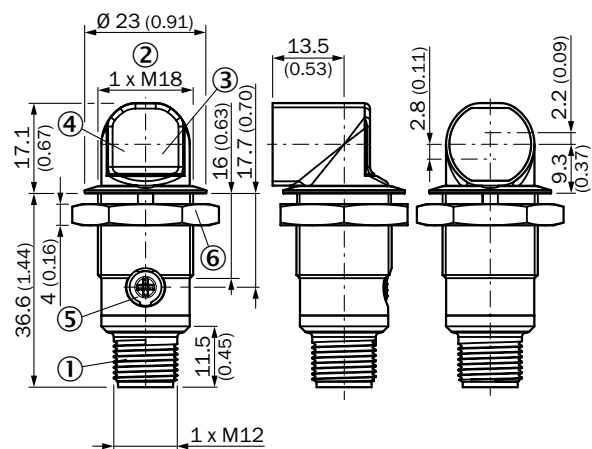
- ① Connection cable 2 m
- ② Threaded mounting hole M18 x 1
- ③ LED indicator yellow
- ④ LED indicator green
- ⑤ Sensitivity control; Potentiometer 270°
- ⑥ Fastening nuts (2 x); 24 mm hex, metal

GRTE18S, metal, connector, axial, fully flush



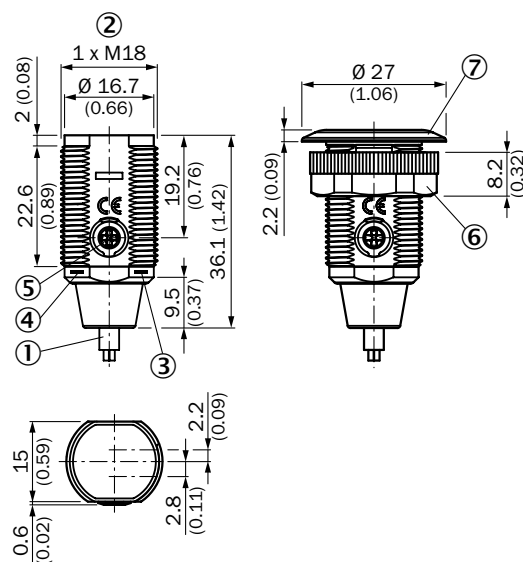
- ① Connector M12, 3-pin
- ② Threaded mounting hole M18 x 1
- ③ LED indicator yellow
- ④ LED indicator green
- ⑤ Sensitivity control; Potentiometer 270°
- ⑥ Fastening nut; 24 mm hex, metal

GRTE18S, metal, connector, radial, fully flush

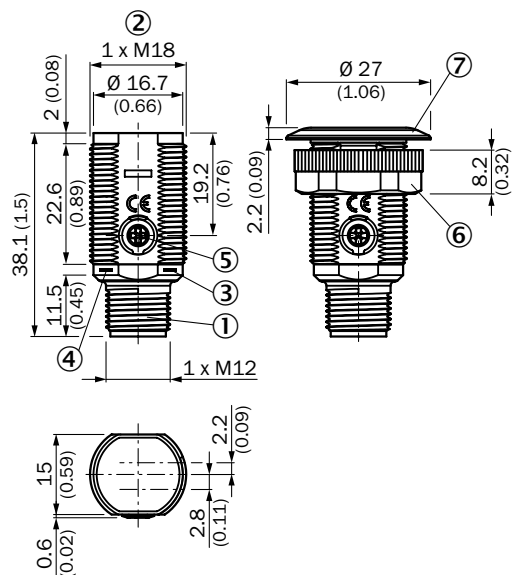


- ① Connector M12, 3-pin
- ② Threaded mounting hole M18 x 1
- ③ LED indicator yellow
- ④ LED indicator green
- ⑤ Sensitivity control; Potentiometer 270°
- ⑥ Fastening nut; 24 mm hex, metal

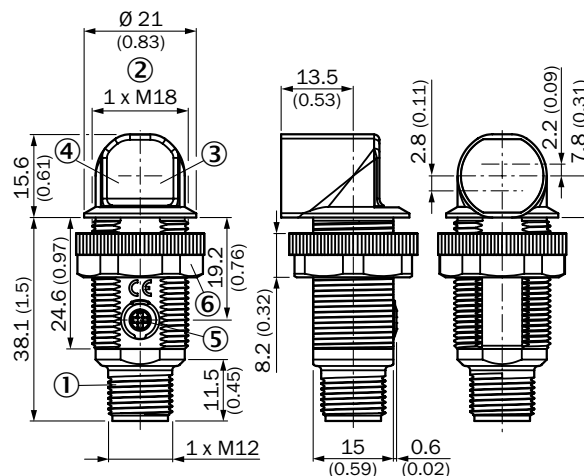
GRTE18S, plastic, cable, axial



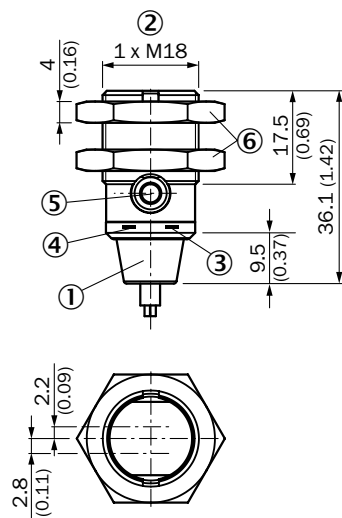
- ① Connection cable 2 m
- ② Threaded mounting hole M18 x 1
- ③ LED indicator yellow
- ④ LED indicator green
- ⑤ Sensitivity control; Potentiometer 270°
- ⑥ Fastening nut; 22 mm hex, plastic
- ⑦ Mounting ring

GRTE18S, plastic, connector, axial

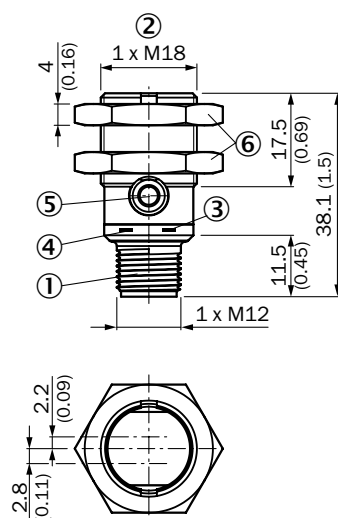
- ① Connector M12, 3-pin
- ② Threaded mounting hole M18 x 1
- ③ LED indicator yellow
- ④ LED indicator green
- ⑤ Sensitivity control; Potentiometer 270°
- ⑥ Fastening nut; 22 mm hex, plastic
- ⑦ Mounting ring

GRTE18S, plastic, connector, radial

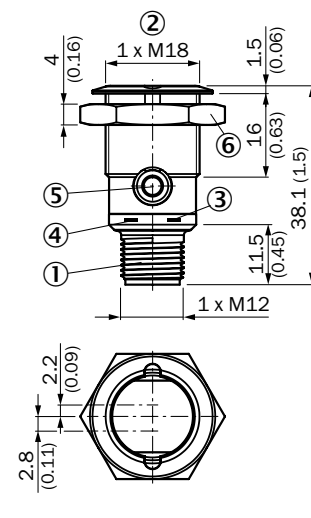
- ① Connector M12, 3-pin
- ② Threaded mounting hole M18 x 1
- ③ LED indicator yellow
- ④ LED indicator green
- ⑤ Sensitivity control; Potentiometer 270°
- ⑥ Fastening nut; 22 mm hex, plastic

**GRL18S, GRSE18S,
metal, cable, axial**

- ① Connection cable 2 m
- ② Threaded mounting hole M18 x 1
- ③ LED indicator yellow
- ④ LED indicator green
- ⑤ Dummy plug
- ⑥ Fastening nuts (2 x); 24 mm hex, metal

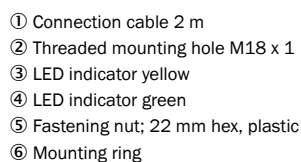
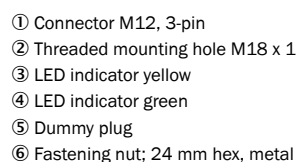
**GRL18S, GRSE18S,
metal, connector, axial**

- ① Connector M12, 3-pin
- ② Threaded mounting hole M18 x 1
- ③ LED indicator yellow
- ④ LED indicator green
- ⑤ Dummy plug
- ⑥ Fastening nuts (2 x); 24 mm hex, metal

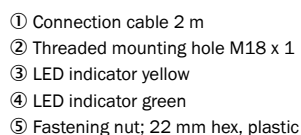
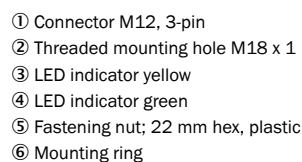
**GRL18S, GRSE18S,
metal, connector, axial, fully flush**

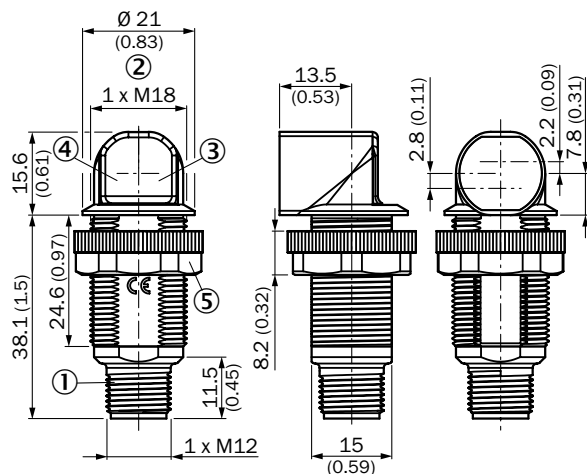
- ① Connector M12, 3-pin
- ② Threaded mounting hole M18 x 1
- ③ LED indicator yellow
- ④ LED indicator green
- ⑤ Dummy plug
- ⑥ Fastening nut; 24 mm hex, metal

GRL18S, GRSE18S, plastic, cable, axial



GRL18S, GRSE18S, plastic, cable, radial

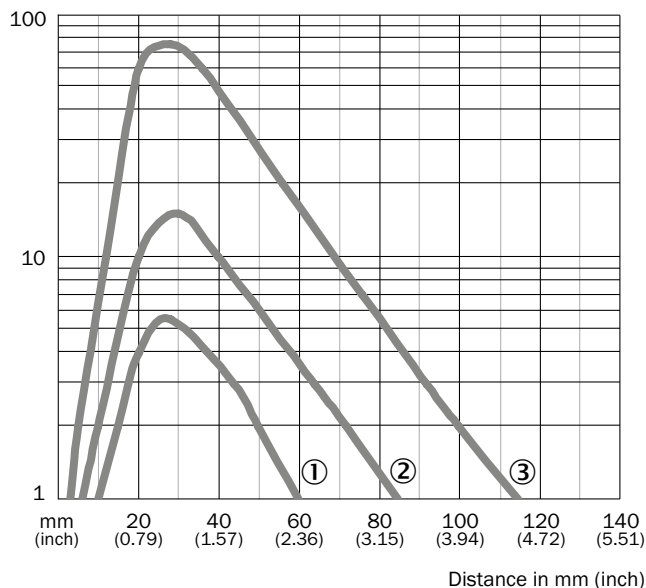


GRL18S, GRSE18S, plastic, connector, radial

- ① Connector M12, 3-pin
- ② Threaded mounting hole M18 x 1
- ③ LED indicator yellow
- ④ LED indicator green
- ⑤ Fastening nut; 22 mm hex, plastic

Characteristic curves**Black-white shift****GRTE18S, 115 mm**

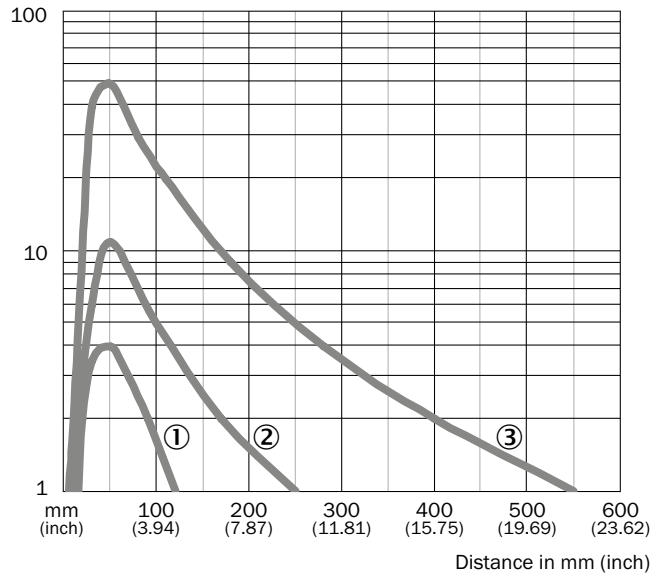
Operating reserve



- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 20 % remission
- ③ Sensing range on white, 90 % remission

GRTE18S, 550 mm

Operating reserve

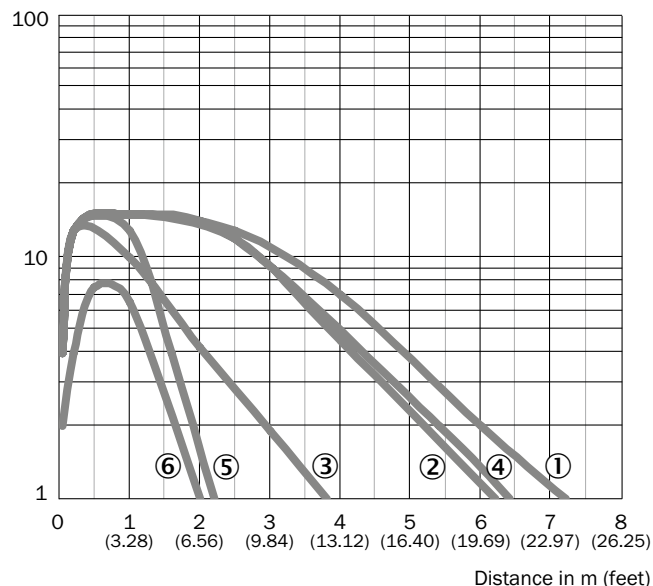


- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 20 % remission
- ③ Sensing range on white, 90 % remission

Operating reserve

GRL18S

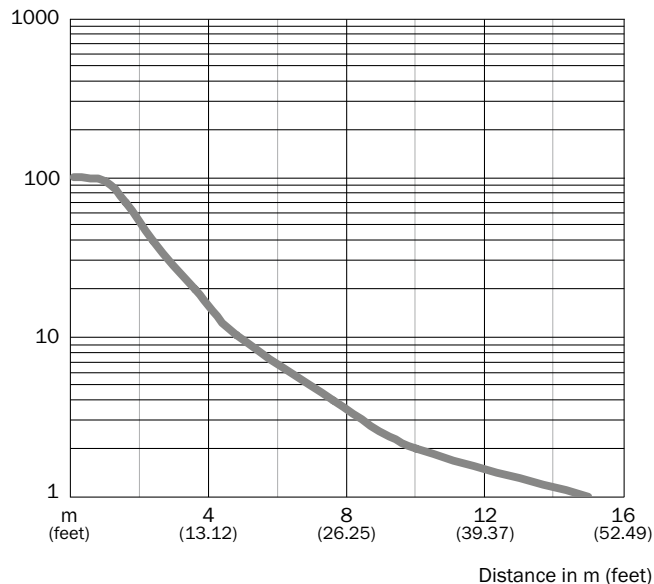
Operating reserve



- ① Reflector type PL80A
- ② Reflector type PL40A
- ③ Reflector type PL20A
- ④ Reflector type P205
- ⑤ Reflector type PL22-2
- ⑥ Reflective tape REF-Plus 3436

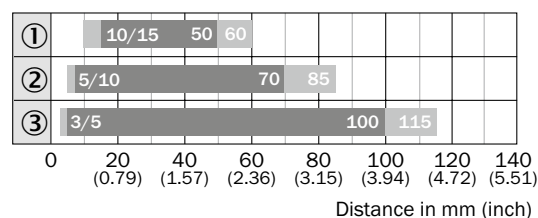
GRSE18S

Operating reserve



Bar diagrams

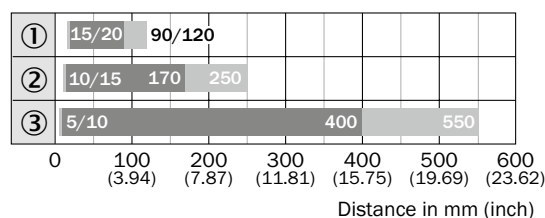
GRTE18S, 115 mm



■ Sensing range ■ Sensing range max.

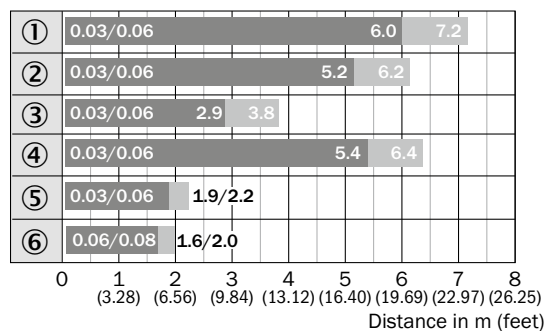
- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 20 % remission
- ③ Sensing range on white, 90 % remission

GRTE18S, 550 mm



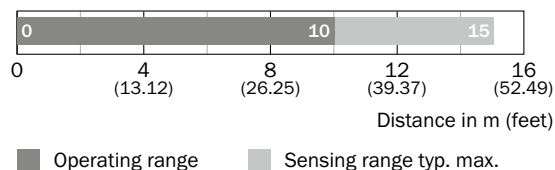
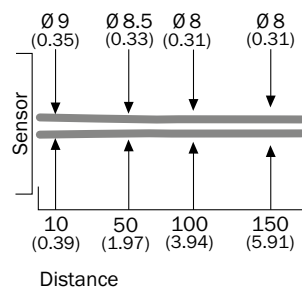
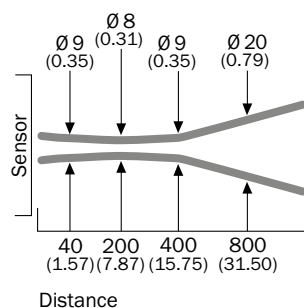
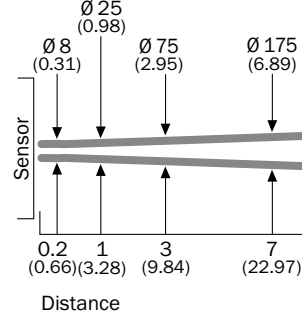
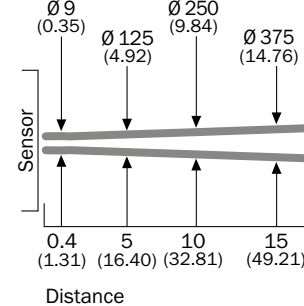
■ Sensing range ■ Sensing range max.

- ① Sensing range on black, 6 % remission
- ② Sensing range on gray, 20 % remission
- ③ Sensing range on white, 90 % remission

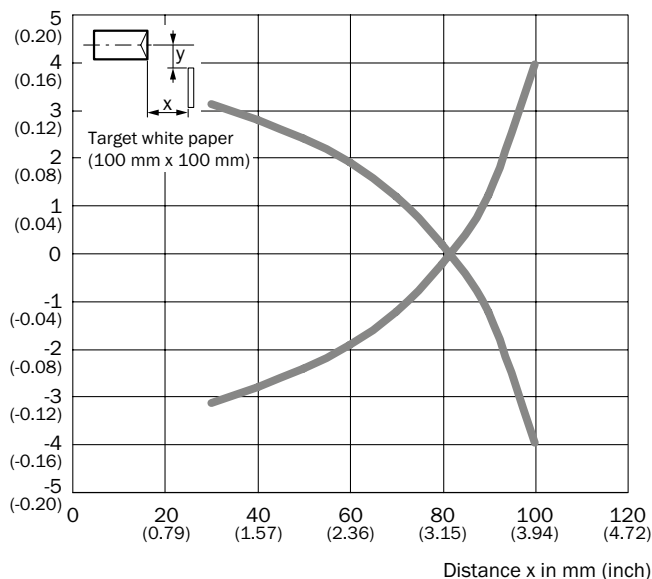
GRL18S

■ Sensing range ■ Sensing range max.

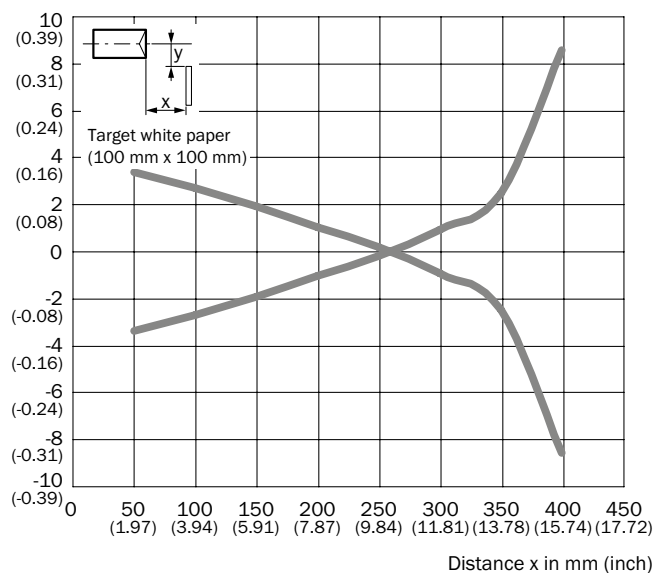
- ① Reflector type PL80A ④ Reflector type P205
 ② Reflector type PL40A ⑤ Reflector type PL22-2
 ③ Reflector type PL20A ⑥ Reflective tape REF-Plus 3436

GRSE18S**Light spot diameter****GRTE18S, 115 mm****GRTE18S, 550 mm****GRL18S****GRSE18S****Response curve****GRTE18S, 115 mm**

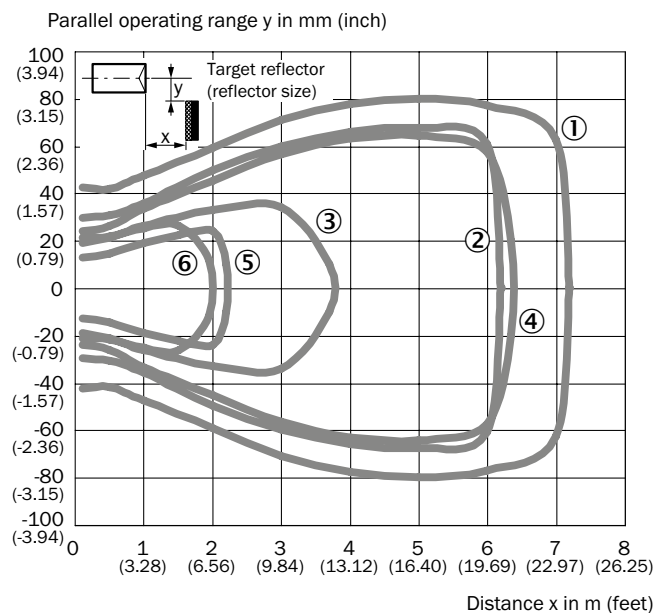
Parallel operating range y in mm (inch)

**GRTE18S, 550 mm**

Parallel operating range y in mm (inch)

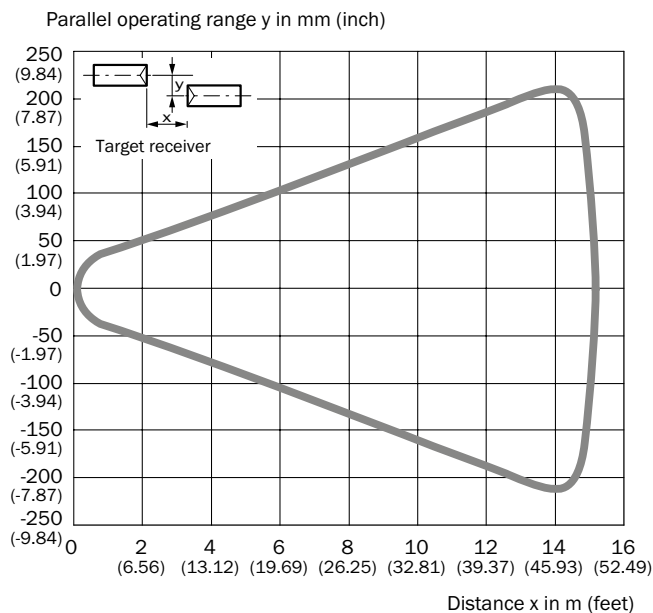


GRL18S



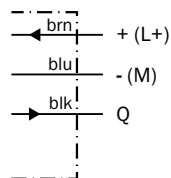
- ① Reflector type PL80A
- ② Reflector type PL40A
- ③ Reflector type PL20A
- ④ Reflector type P205
- ⑤ Reflector type PL22-2
- ⑥ Reflective tape REF-Plus 3436

GRSE18S

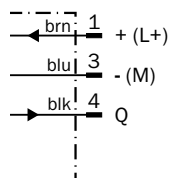


Connection diagram

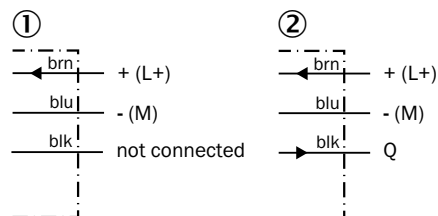
Cd-044



Cd-045

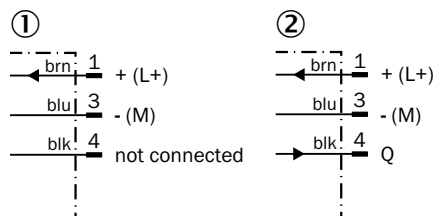


Cd-049



- ① Sender
- ② Receiver

Cd-051



- ① Sender
- ② Receiver

Recommended accessories

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
			10 m, 4-wire	IP 67	DOL-1204-G10M	6010543
	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 (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

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.	GR18S	GR18SG
	Steel, zinc coated	Mounting plate for M18 sensors	BEF-WG-M18	5321870	●	●
		Mounting bracket, M18 thread	BEF-WN-M18	5308446	●	●

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.	GR18S	GR18SG
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N06 for universal clamp bracket	BEF-KHS-N06	2051612	●	●

Other mounting accessories

Others

Figure	Description	Model name	Part no.	GR18S	GR18SG
	Mounting tool for "fully flush" variants	BEF-TO-GR18S	4072132	●	●

Reflectors

Angular

Figure	Material	Description	Model name	Part no.	GR18S	GR18SG
	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.	GR18S	GR18SG
	PMMA/ABS	Fine triple, screw connection, suitable for laser sensors, 47 mm x 47 mm	P250F	5308843	-	●
		Fine triple, screw connection, suitable for laser sensors, 18 mm x 18 mm	PL10F	5311210	-	●
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636	-	●
	PMMA/ABS	Fine triple, screw connection, suitable for laser sensors, 38 mm x 16 mm	PL20F	5308844	-	●
	Plastic	Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089	-	●
	PMMA/ABS	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.	GR18S	GR18SG
	Suitable for laser sensors, self-adhesive, cut, see alignment note, 56.3 mm x 56.3 mm	REF-AC1000-56	4063030	-	●
	Self-adhesive, 50 mm x 60 mm	REF-IRF-56	5314244	●	●

Round

Figure	Material	Description	Model name	Part no.	GR18S	GR18SG
	PMMA/ABS	Round, screw connection	C110A	5304549	●	●

Special reflectors

Figure	Material	Description	Model name	Part no.	GR18S	GR18SG
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adaptor shaft, 25 mm x 25 mm	PLH25-D12	2063404	-	●
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adaptor thread, 25 mm x 25 mm	PLH25-M12	2063403	-	●
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405	-	●

Terminal and alignment brackets**Alignment brackets**

Figure	Material	Description	Model name	Part no.	GR18S	GR18SG
	Plastic	Mounting bracket with ball-and-socket	BEF-WN-M18-ST02	5312973	●	●

Terminal brackets

Figure	Material	Description	Model name	Part no.	GR18S	GR18SG
	Plastic (PA12), glass-fiber reinforced	Clamping block for round sensors M18, without fixed stop	BEF-KH-M18	2051481	●	●
		Clamping block for round sensors M18, with fixed stop	BEF-KHF-M18	2051482	●	●
	Plastic (PA12)	Integrated adapter	BEF-WN-MH15-1	4039533	●	●
	Stainless steel	Mounting ring	BEF-WN-MH15-2V	4053358	●	●

→ For additional accessories, please see page L-861

Space-saving photoelectric sensors designed for wash down applications



Product description

The stainless steel housing of the MH15V is specifically designed to operate in very harsh environments that use cleaning methods such as HPLV (High Pressure Low Volume), CIP (Clean-In-Place), and SIP (Sterilize-In-Place). Years of research and collaboration with customers in the food and beverage industry perfected the stainless steel housing design of the MH15V. It is designed to withstand chemical cleaning processes, high humidity, and high-pressure cleaning, all in order to reduce downtime

caused by failing sensors in harsh wash down environments.

The MHTB15V's superior resistance to acidic and alkaline cleaning and disinfecting agents is field tested and certified in independent tests by ECOLAB and JohnsonDiversey. The 316L stainless steel housing and 3 mm thick flat sensor lens construction also allow for quick and easy, yet thorough, cleaning. This thorough cleaning reduces the risk of dirt build-up, bacteria growth and process contamination.

At a glance

- Field-tested resistance to acidic and alkaline cleaning and disinfecting agents
- Corrosion-resistant stainless steel housing 316L, certified by ECOLAB und JohnsonDiversey
- IP 69K-rated housing is resistant to wash down environments
- Available as complete family including proximity, BGS, retro-reflective and through-beam
- 3 mm chemical resistant sensor lens

Your benefits

- Field-tested, compact, stainless steel IP 69K design of the MH15V reduces downtime and replacement costs
- 3 mm flat, chemically resistant material of the sensor lens offers a long service life, reducing maintenance time and costs
- Reliable object detection, even in difficult environments reduces miscount and increases machine throughput
- Short M18 housing with flush mounting fits in tight areas, which saves machine space
- ECOLAB and JohnsonDiversey certified MH15V are suitable for hygienic environments, reducing maintenance costs
- Innovative stainless steel mounting accessories provide fast and low-cost installation



JohnsonDiversey
ECOLAB®

Additional information

Detailed technical data. I-715
Ordering information. I-716
Dimensional drawings I-717
Characteristic curves I-718
Bar diagrams. I-720
Connection diagram I-720
Recommended accessories. . . . I-721

→ www.mysick.com/en/MH15V

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

	MHTB15V	MHT15V	MHL15V	MHSE15V
Sensor principle	Photoelectric proximity sensor		Photoelectric retro-reflective sensor	Through-beam photo-electric sensor
Detection principle	Background suppression	Energetic	Standard optics	–
Housing design (light emission)	Cylindrical, straight			
Housing length	52.9 mm			
Thread diameter (housing)	M18 x 1			
Sensing range max.	3 mm ... 300 mm ¹⁾	10 mm ... 350 mm ¹⁾ (depending on type)	0.035 m ... 5 m ²⁾	0 m ... 5 m
Sensing range	3 mm ... 300 mm	10 mm ... 250 mm (depending on type)	0.035 m ... 3.5 m ²⁾	0 m ... 3.8 m
Type of light	Visible red light	Infrared light	Visible red light	
Light source ³⁾	PinPoint LED	LED		
Angle of dispersion	–	Approx. 4.5 °	Approx. 1.5 °	
Wave length	650 nm	950 nm	650 nm	
Adjustment	Potentiometer, 270 °		–	

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

	MHTB15V	MHT15V	MHL15V	MHSE15V
Supply voltage ¹⁾	10 V DC ... 30 V DC			
Ripple ²⁾	≤ 5 V _{pp}			
Power consumption ³⁾	≤ 30 mA			
Output type	PNP/NPN (depending on type)			
Switching mode	Dark-switching/Light switching (depending on type)			
Signal voltage PNP HIGH/LOW	U _v - (< 2,9 V) / ca. 0 V			
Signal voltage NPN HIGH/LOW	U _v / < 2,9 V			
Output current I _{max.}	≤ 100 mA ⁴⁾	≤ 100 mA		
Response time ⁵⁾	≤ 0.72 ms	≤ 1.25 ms		≤ 1.4 ms
Switching frequency ⁶⁾	700 Hz	400 Hz		350 Hz
Connection type ⁷⁾	Male connector, M12			
Circuit protection	A ⁸⁾ , C ⁹⁾ , D ¹⁰⁾			
Protection class	III			
Weight	50 g			100 g
Polarisation filter	–	–	✓	–
Housing material	Stainless steel V4A (1.4404, 316L)			
Optics material	PMMA			
Enclosure rating	IP 67, IP 68, IP 69K			
Ambient operating temperature ¹¹⁾¹²⁾	–25 °C ... +55 °C			
Ambient storage temperature	–25 °C ... +70 °C			

¹⁾ Limit values.

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

³⁾ Without load.

⁴⁾ Reduced output current at ambient operating temperatures > 50 °C: I_{Amax} = 50 mA.

⁵⁾ Signal transit time with resistive load.

⁶⁾ With light/dark ratio 1:1.

⁷⁾ With gold plated contact pins.

⁸⁾ A = V_S connections reverse-polarity protected.

⁹⁾ C = interference suppression.

¹⁰⁾ D = outputs overcurrent and short-circuit protected.

¹¹⁾ Use at higher ambient temperatures reduce the sender LED lifetime.

¹²⁾ +100 °C for 15 minutes.

Ordering information

Other models available at www.mysick.com/en/MH15V

MHTB15V

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Adjustment:** potentiometer, 270 °

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
3 mm ... 300 mm	Ø 7 mm (100 mm)	PNP	Dark-switching	Connector M12, 4-pin	Cd-066	MHTB15-P3267V	1047160
			Light switching	Connector M12, 4-pin	Cd-066	MHTB15-P3367V	1046537
		NPN	Dark-switching	Connector M12, 4-pin	Cd-066	MHTB15-N3267V	1047159
			Light switching	Connector M12, 4-pin	Cd-066	MHTB15-N3367V	1046536

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

MHT15V

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** energetic
- **Adjustment:** potentiometer, 270 °

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
10 mm ... 100 mm	Ø 20 mm (100 mm)	PNP	Dark-switching	Connector M12, 4-pin	Cd-066	MHT15-P3217V	1043805
			Light switching	Connector M12, 4-pin	Cd-066	MHT15-P3317V	1043806
		NPN	Dark-switching	Connector M12, 4-pin	Cd-066	MHT15-N3217V	1043803
			Light switching	Connector M12, 4-pin	Cd-066	MHT15-N3317V	1043804
10 mm ... 350 mm	Ø 50 mm (350 mm)	PNP	Dark-switching	Connector M12, 4-pin	Cd-066	MHT15-P3247V	1043810
			Light switching	Connector M12, 4-pin	Cd-066	MHT15-P3347V	1043811
		NPN	Dark-switching	Connector M12, 4-pin	Cd-066	MHT15-N3247V	1043808
			Light switching	Connector M12, 4-pin	Cd-066	MHT15-N3347V	1043809

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

MHL15V

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0.035 m ... 5 m	Ø 80 mm (3.5 m)	PNP	Dark-switching	Connector M12, 4-pin	Cd-066	MHL15-P3236V	1043814
			Light switching	Connector M12, 4-pin	Cd-066	MHL15-P3336V	1043815
		NPN	Dark-switching	Connector M12, 4-pin	Cd-066	MHL15-N3236V	1043812
			Light switching	Connector M12, 4-pin	Cd-066	MHL15-N3336V	1043813

¹⁾ PL80A.

MHSE15V

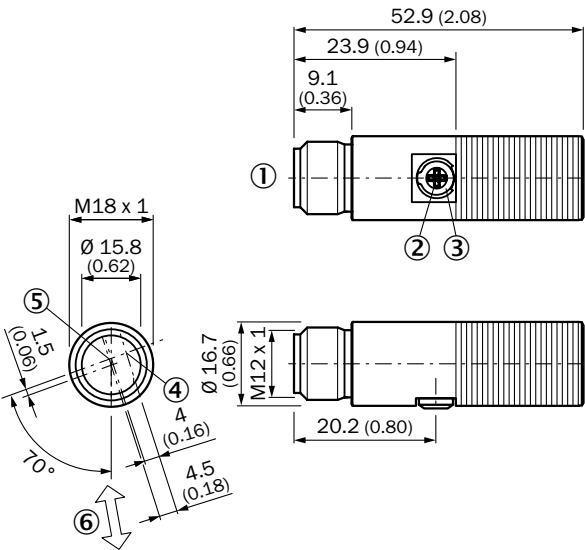
- **Sensor principle:** through-beam photoelectric sensor

Sensing range max.	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0 m ... 5 m	Ø 65 mm (4 m)	PNP	Dark-switching	Connector M12, 4-pin	Cd-057	MHSE15-P3236V	1043818
			Light switching	Connector M12, 4-pin	Cd-057	MHSE15-P3336V	1043819
		NPN	Dark-switching	Connector M12, 4-pin	Cd-057	MHSE15-N3236V	1043816
			Light switching	Connector M12, 4-pin	Cd-057	MHSE15-N3336V	1043817

Dimensional drawings

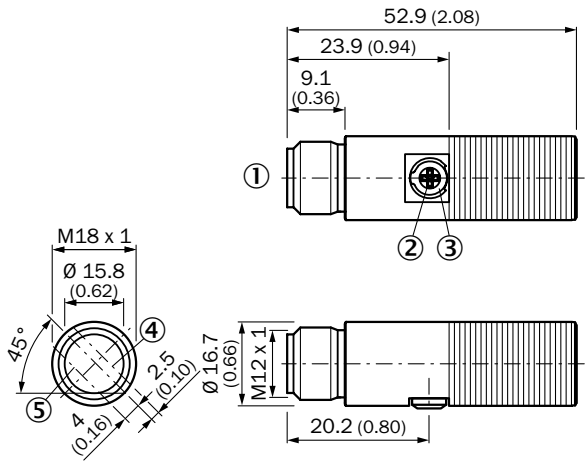
Dimensions in mm (inch)

MHTB15V

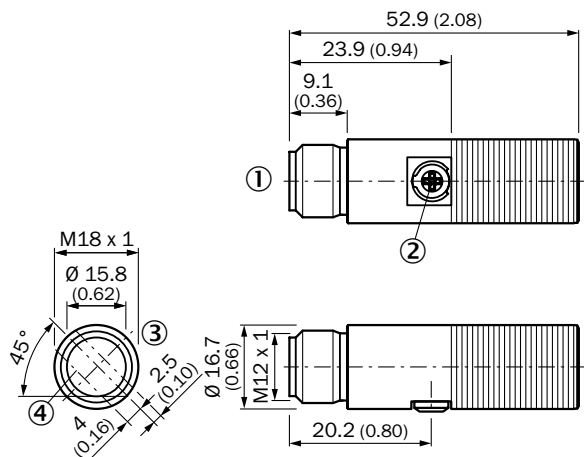


- ① Connector M12, 4-pin
- ② Sensing range adjustment: potentiometer, 270°
- ③ Status indicator LED, yellow: Status of received light beam
- ④ Optical axis, sender
- ⑤ Optical axis, receiver
- ⑥ Standard direction of the material being detected

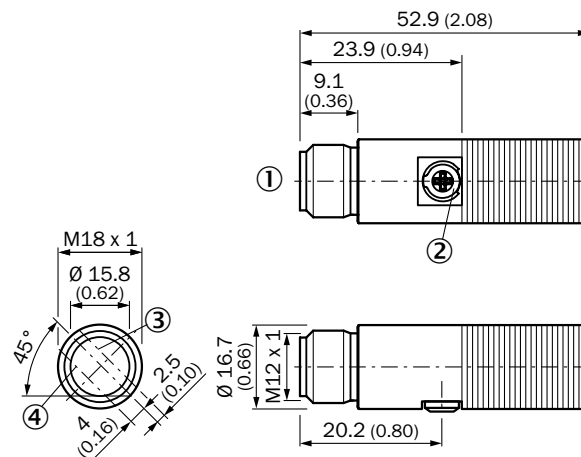
MHT15V



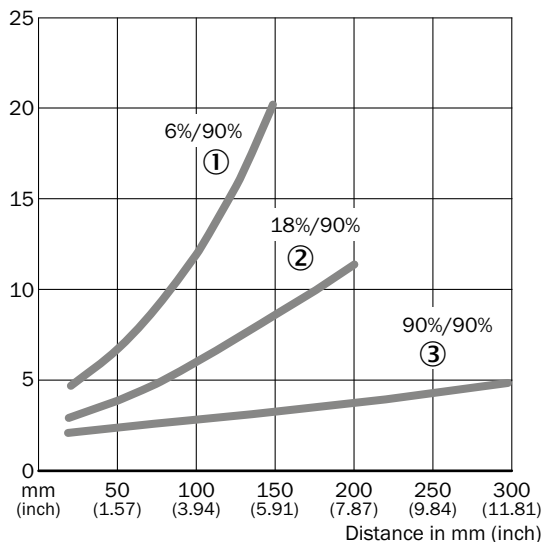
- ① Connector M12, 4-pin
- ② Sensitivity adjustment 270°
- ③ Yellow LED indicator, lights continuously: Light reception > reserve factor 1.3-blinks: Light reception, reserve factor > 1.0 ... < 1.3
- ④ Optical axis, sender
- ⑤ Optical axis, receiver

MHL15V

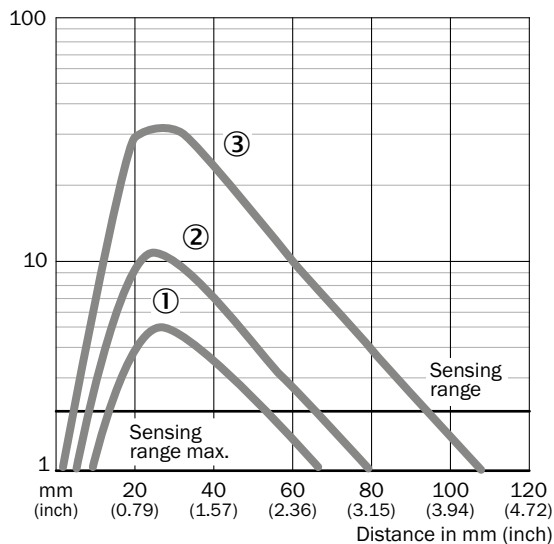
- ① Connector M12, 4-pin
- ② Yellow LED indicator, lights continuously: Light reception > reserve factor 1.5-blinks: Light reception, reserve factor > 1 ... < 1.5
- ③ Optical axis, sender
- ④ Optical axis, receiver

MHSE15V

- ① Connector M12, 4-pin
- ② Yellow LED indicator- lights continuously: Light reception, Reserve factor > 1
- ③ Optical axis, sender
- ④ Optical axis, receiver

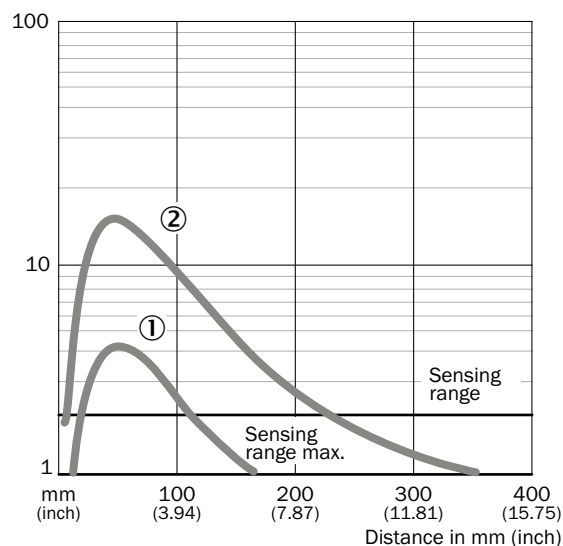
Characteristic curves**Black-white shift****MHTB15V**

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

MHT15V, 100 mm

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

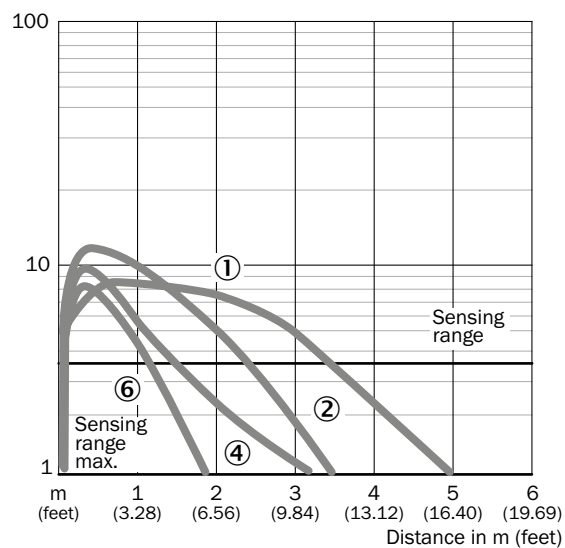
MHT15V, 350 mm



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

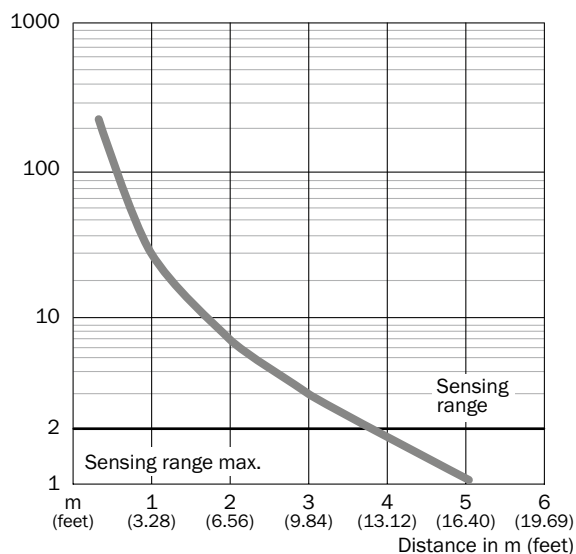
Operating reserve

MHL15V



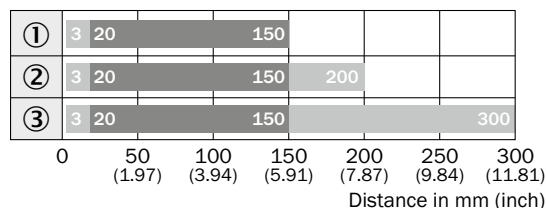
- ① PL80A
- ② P250
- ④ PL50A, PL40A
- ⑥ PL20A

MHSE15V



Bar diagrams

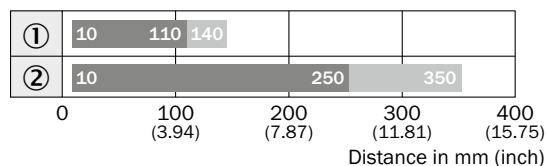
MHTB15V



■ Sensing range ■ Sensing range max.

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

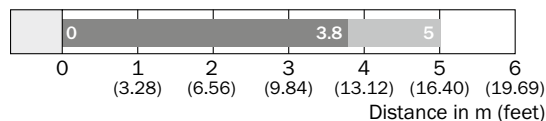
MHT15V, 350 mm



■ Sensing range ■ Sensing range max.

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

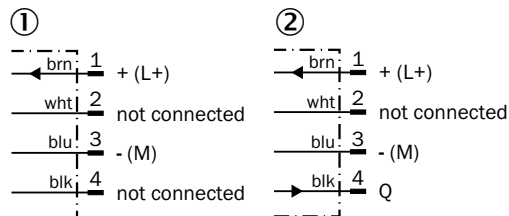
MHSE15V



■ Sensing range ■ Sensing range max.

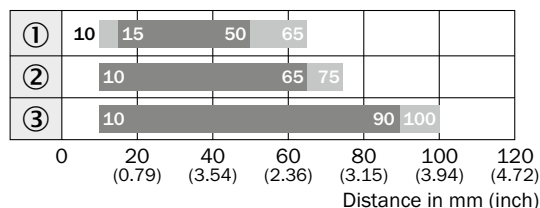
Connection diagram

Cd-057



- ① Sender
② Receiver

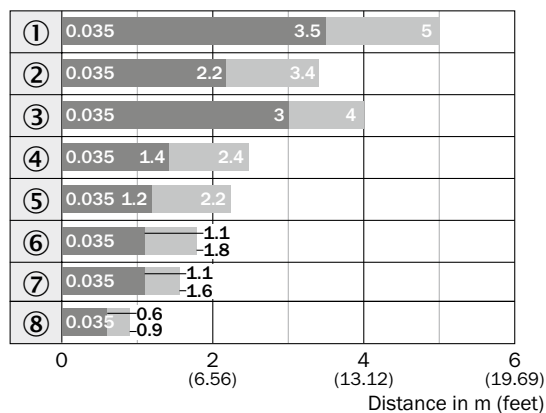
MHT15V, 100 mm



■ Sensing range ■ Sensing range max.

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

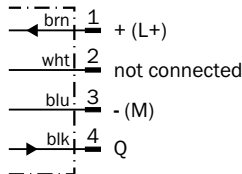
MHL15V



■ Sensing range ■ Sensing range max.

- ① PL80A
② P250
③ C110A
④ PL50A, PL40A
⑤ PL30A, PL31A
⑥ PL20A
⑦ P250 CHEM
⑧ PL20 CHEM

Cd-066



Recommended accessories

Mounting brackets/plates

Mounting plates

Figure	Material	Description	Model name	Part no.
	Stainless steel	Mounting plate for M18 housing	BEF-WG-M18N	5320948
		Mounting bracket	BEF-WN-M18N	5320947

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N06N for universal clamp bracket, M18	BEF-KHS-N06N	2051622

Reflectors

Angular

Figure	Material	Description	Model name	Part no.
	Plastic	Chemically resistant, screw connection, 47 mm x 47 mm	P250 CHEM	5321097
	PMMA/ABS	Rectangular, screw connection, 80 mm x 80 mm	PL80A	1003865

Fine triple reflectors

Figure	Material	Description	Model name	Part no.
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
		Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089

Reflective tape

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

Special reflectors

Figure	Material	Description	Model name	Part no.
	Plastic	Chemically resistant, screw connection, 38 mm x 15 mm	PL20 CHEM	5321089
	PMMA/ABS	Antifog, for prevention of moisture fogging on the reflection area, screw connection, 56 mm x 37 mm	PL40A Antifog	5322011
	Plastic	Rectangular, screw connection M3, countersunk screw head, chemical resistant, 56 mm x 37 mm	PL40B-CHEM	5326088
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adapter shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adapter thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

Terminal and alignment brackets**Alignment brackets**

Figure	Material	Description	Model name	Part no.
	Plastic	Mounting bracket with ball-and-socket	BEF-WN-M18-ST02	5312973

Terminal brackets

Figure	Material	Description	Model name	Part no.
	Plastic (PA12), glass-fiber reinforced	Clamping block for round sensors M18, without fixed stop	BEF-KH-M18	2051481
		Clamping block for round sensors M18, with fixed stop	BEF-KHF-M18	2051482
	Stainless steel	Mounting ring	BEF-WN-MH15-2V	4053358

→ For additional accessories, please see page L-861

Low-cost cylindrical M18 Laser photoelectric sensor



Additional information

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Dimensional drawings	I-727
Characteristic curves	I-727
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Connection diagram	I-729
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Product description

The V18 Laser family of photoelectric sensors offers modern laser technology with a small, highly visible light spot that detects small parts and offers precise sensing. These laser class 1 sensors provide long sensing distances and short response times.

Yellow and green indicator LEDs ensure easy mounting, commissioning, adjustment and maintenance. Sensitivity can be set in several ways - either manually via a teach-in pushbutton or electronically using control input C.

At a glance

- Laser emitter LED enclosed in a cylindrical M18 housing
- Laser class 1
- Fast response time
- Straight or right-angle housing
- Durable metal housing
- IP 67
- Small visible light spot to detect small objects

Your benefits

- Lowest-cost laser sensor in M18 cylindrical housing saves installation costs
- Time-saving installation and alignment with highly visible light spot
- Laser class 1 does not require increased safety measures or markings, reducing installation costs
- Fast response time ensures reliable object detection at high speeds and increases machine throughput

→ www.mysick.com/en/V18_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.



Detailed technical data

Features

	VTE18L	VL18L	VSE18L
Sensor principle	Photoelectric proximity sensor	Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Detection principle	Energetic	Standard optics	–
Housing design (light emission)	Cylindrical, straight; cylindrical, angled (depending on type)		
Housing length	97.7 mm/107.7 mm (depending on type)		
Thread diameter (housing)	M18 x 1		
Sensing range max.			
Axial	0 mm ... 400 mm ¹⁾	0.1 m ... 35 m ²⁾	0 m ... 60 m
Radial	2 mm ... 250 mm ¹⁾	0.1 m ... 35 m ²⁾	0 m ... 60 m
Sensing range			
Axial	5 mm ... 300 mm	0.1 m ... 30 m ²⁾	0 m ... 50 m
Radial	5 mm ... 200 mm	0.1 m ... 30 m ²⁾	0 m ... 50 m
Focus ³⁾		–	
Type of light	Visible red light		
Light source ⁴⁾	Laser		
Angle of dispersion	–	0.04°	0.06°
Wave length	650 nm		
Laser class	1 (IEC 60825-1)		
Adjustment	Cable, Single teach-in button		Potentiometer, 270 °

¹⁾ Object with 90 % reflectance (referred to standard white, DIN 5033)²⁾ P250F.³⁾ Focused, focus at 100 mm.⁴⁾ Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

	VTE18L	VL18L	VSE18L
Supply voltage ¹⁾	10 V DC ... 30 V DC		
Ripple ²⁾	≤ 10 %		
Power consumption ³⁾	≤ 30 mA	≤ 20 mA	≤ 25 mA
Output type	PNP/NPN (depending on type)		
Switching mode	Light/dark-switching		
Switching mode selector	Selectable via control input C		Selectable via L/D control wire
Output current I _{max.}	≤ 100 mA		
Response time ⁴⁾	≤ 0.625 ms		≤ 0.5 ms
Switching frequency ⁵⁾	800 Hz		1,000 Hz
Angle of reception	–		0.08°
Connection type	Male connector, M12		
Circuit protection	A ⁶⁾ , B ⁷⁾ , C ⁸⁾ , D ⁹⁾		
Protection class	III		
Weight	60 g		120 g
Polarisation filter	–	✓	–
Housing material	Nickel-plated brass/PC		
Optics material	PC with protective glass pane		

	VTE18L	VL18L	VSE18L
Enclosure rating	IP 67		
Test input sender off	–		“Test” to 0V
Ambient operating temperature	–15 °C ... +55 °C		
Ambient storage temperature	–25 °C ... +70 °C		

¹⁾ Limit values.

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⁾ A = V_S connections reverse-polarity protected.

⁷⁾ B = inputs and output reverse-polarity protected.

⁸⁾ C = interference suppression.

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

Ordering information

Other models available at www.mysick.com/en/V18_Laser

VTE18L

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** energetic
- **Adjustment:** cable, single teach-in button

Housing design	Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
Axial	0 mm ... 400 mm	Ø 8 mm (300 mm)	PNP	Light/dark-switching	Connector M12, 4-pin	Cd-099	VTE18L-4P324	6027418
			NPN	Light/dark-switching	Connector M12, 4-pin	Cd-099	VTE18L-4N324	6027420
Radial	2 mm ... 250 mm	Ø 5 mm (200 mm)	PNP	Light/dark-switching	Connector M12, 4-pin	Cd-099	VTE18L-4P344	6027422
			NPN	Light/dark-switching	Connector M12, 4-pin	Cd-099	VTE18L-4N344	6027424

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

VL18L

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Adjustment:** cable, single teach-in button

Housing design	Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
Axial	0.1 m ... 35 m	Ø 9 mm (35 mm)	PNP	Light/dark-switching	Connector M12, 4-pin	Cd-099	VL18L-4P324	6027430
				Light switching	Connector M12, 4-pin	Cd-066	VL18L-3F324	6034330
			NPN	Light/dark-switching	Connector M12, 4-pin	Cd-099	VL18L-4N324	6027432
Radial	0.1 m ... 35 m	Ø 9 mm (35 mm)	PNP	Light/dark-switching	Connector M12, 4-pin	Cd-099	VL18L-4P344	6027434
			NPN	Light/dark-switching	Connector M12, 4-pin	Cd-099	VL18L-4N344	6027436

¹⁾ P250F.

VSE18L

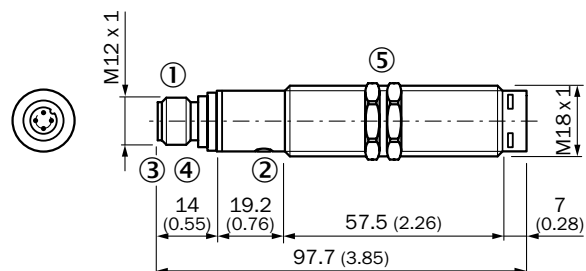
- **Sensor principle:** through-beam photoelectric sensor
- **Adjustment:** potentiometer, 270 °

Housing design	Sensing range max.	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
Axial	0 m ... 60 m	Ø 40 mm (50 mm)	PNP	Light/dark-switching	Connector M12, 4-pin	Cd-219	VSE18L-4P324	6027931
			NPN	Light/dark-switching	Connector M12, 4-pin	Cd-219	VSE18L-4N324	6027933
Radial	0 m ... 60 m	Ø 40 mm (50 mm)	PNP	Light/dark-switching	Connector M12, 4-pin	Cd-219	VSE18L-4P344	6027935
			NPN	Light/dark-switching	Connector M12, 4-pin	Cd-219	VSE18L-4N344	6027937

Dimensional drawings

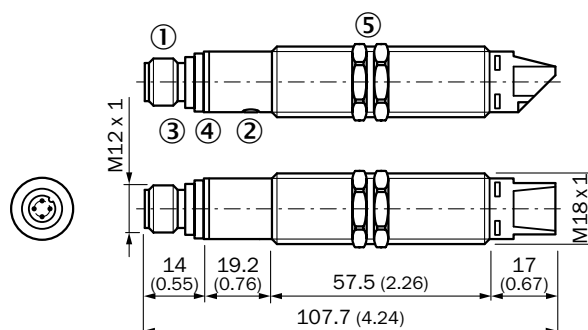
Dimensions in mm (inch)

Axial



- ① Connector M12, 4-pin
- ② Sensitivity setting; single teach-in button
- ③ Green LED indicator: V_s supply voltage feed
- ④ Yellow LED indicator: lights continuously: Reception signal > reserve factor 2- blinks: Reception signal < reserve factor 2 but > switching threshold 1
- ⑤ Fastening nuts (2 x); width across 24, metal (included with delivery)

Radial

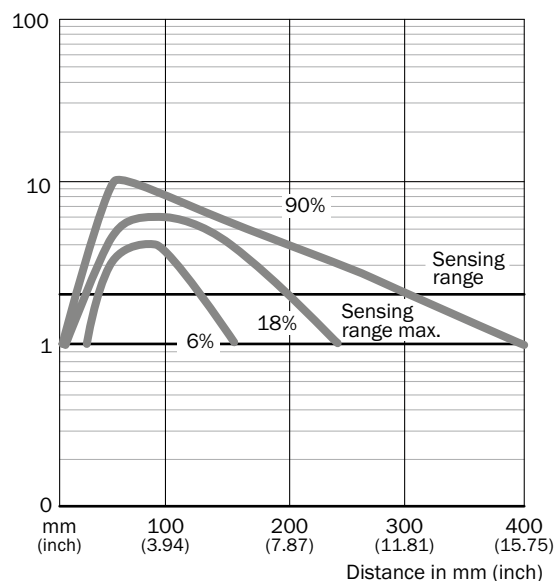


- ① Connector M12, 4-pin
- ② Sensitivity setting; single teach-in button
- ③ Green LED indicator: V_s supply voltage feed
- ④ Yellow LED indicator: lights continuously: Reception signal > reserve factor 2- blinks: Reception signal < reserve factor 2 but > switching threshold 1
- ⑤ Fastening nuts (2 x); width across 24, metal (included with delivery)

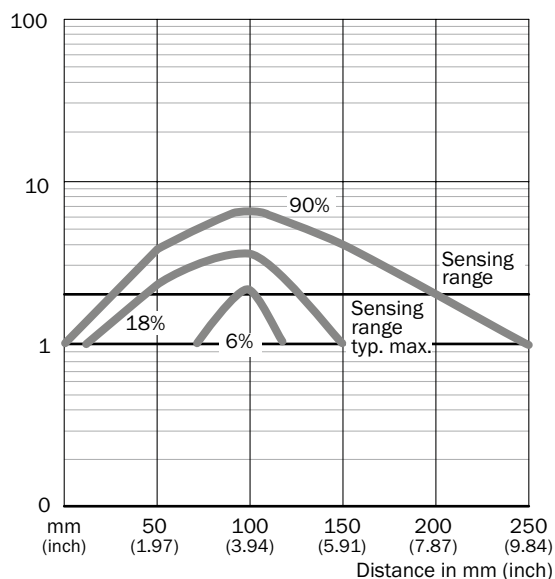
Characteristic curves

Black-white shift

VTE18L, axial

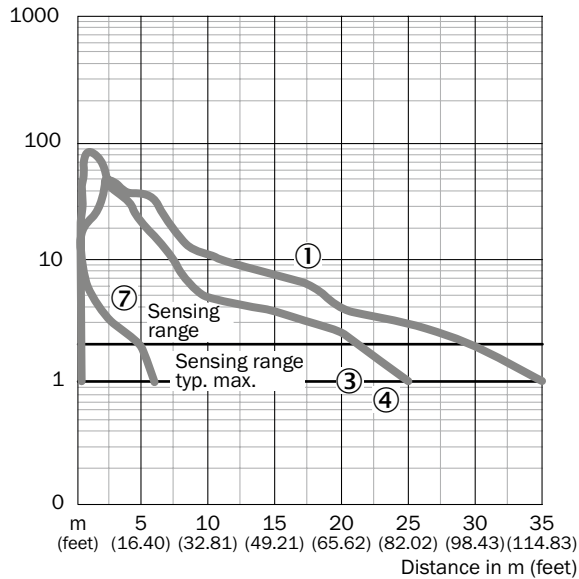


VTE18L, radial

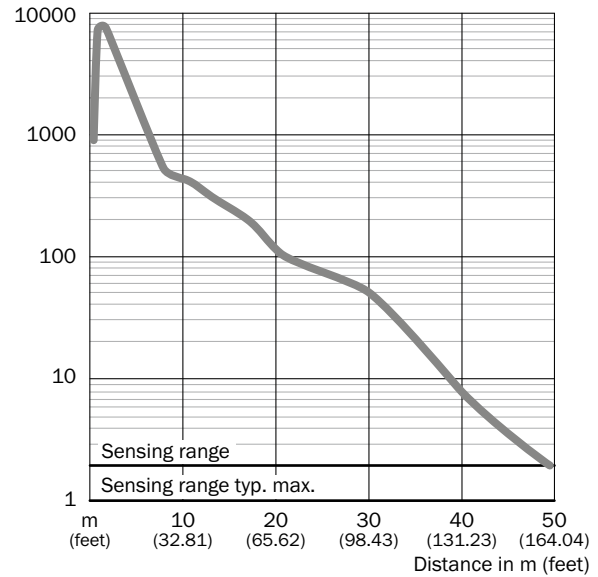


Operating reserve

VL18L



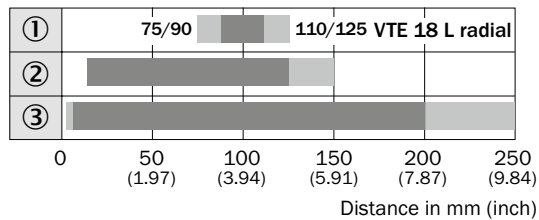
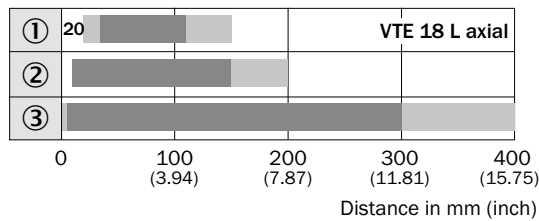
VSE18L



- ① P250F
③ PL80A
④ P250
⑦ Reflective tape Diamond Grade

Bar diagrams

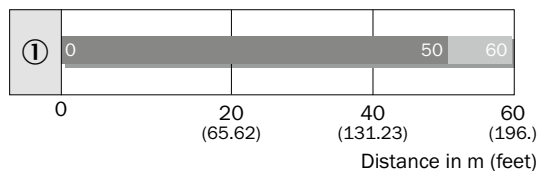
VTE18L



■ Sensing range ■ Sensing range max.

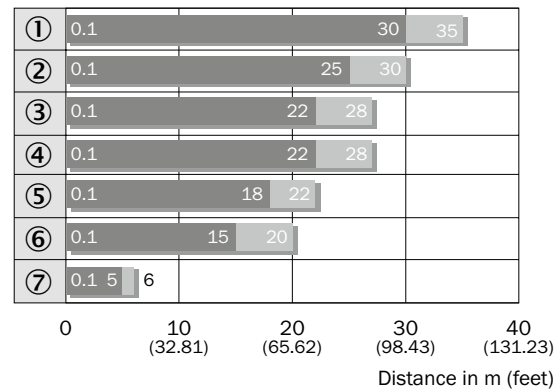
- ① Sensing range on black, 6 % remission
② Sensing range on gray, 18 % remission
③ Sensing range on white, 90 % remission

VSE18L



■ Sensing range ■ Sensing range max.

VL18L

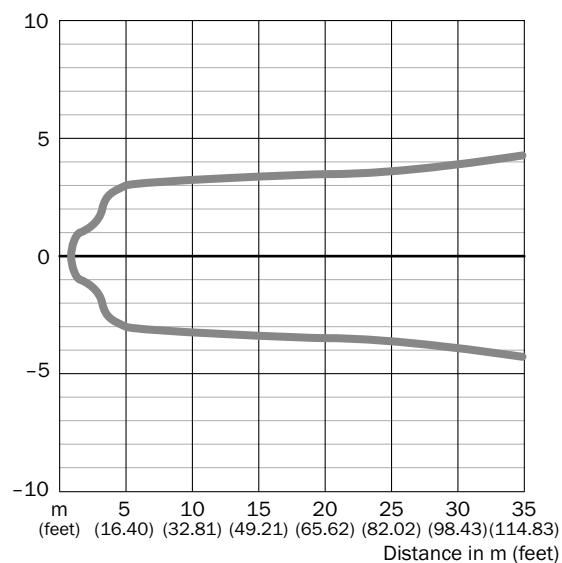


■ Sensing range ■ Sensing range max.

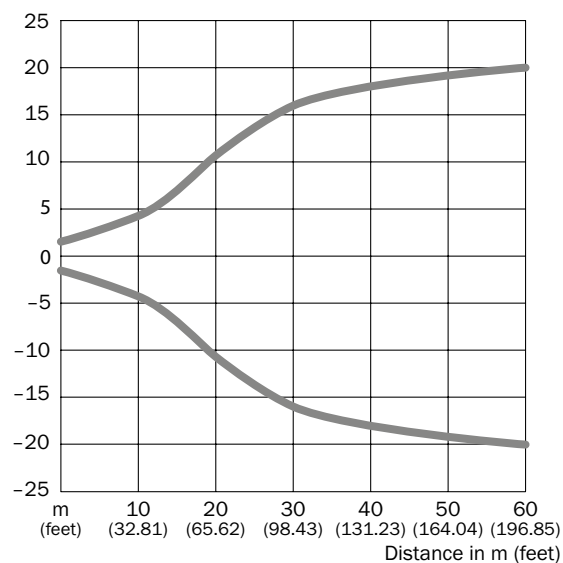
- ① P250F
② PL10F
③ PL80A
④ P250
⑤ C110A
⑥ PL20F
⑦ Reflective tape Diamond Grade

Light spot diameter

VL18L

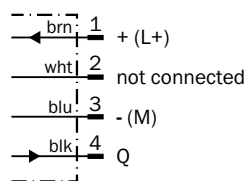


VSE18L

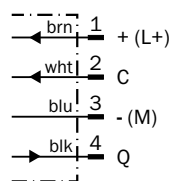


Connection diagram

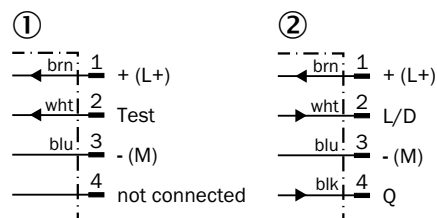
Cd-066



Cd-099



Cd-219



① Sender
 ② Receiver

Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Mounting plate for M18 sensors	BEF-WG-M18	5321870
		Mounting bracket, M18 thread	BEF-WN-M18	5308446

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

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N06 for universal clamp bracket	BEF-KHS-N06	2051612

Reflectors

Angular

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Rectangular, screw connection, 47 mm x 47 mm	P250	5304812
		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, 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

Round

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

Terminal and alignment brackets**Alignment brackets**

Figure	Material	Description	Model name	Part no.
	Plastic	Mounting bracket with ball-and-socket	BEF-WN-M18-ST02	5312973

Terminal brackets

Figure	Material	Description	Model name	Part no.
	Plastic (PA12), glass-fiber reinforced	Clamping block for round sensors M18, without fixed stop	BEF-KH-M18	2051481
		Clamping block for round sensors M18, with fixed stop	BEF-KHF-M18	2051482

→ For additional accessories, please see page L-861

Cylindrical photoelectric sensors with fool-proof touch-teach for washdown areas



Additional information

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Ordering information.....	I-734
Dimensional drawings	I-735
Characteristic curves	I-736
Bar diagrams.....	I-738
Connection diagram	I-739
Recommended accessories.....	I-739



Product description

The V18V has a chemical and pressure cleaning resistant housing for wash down applications and includes patented touch (smart) teach for foolproof operation. These sensors are field-tested and are able to stand up to harsh environments. The sensors offer ease of use in wash down areas due to corrosion resistant and food grade materials, a

wide sensing range and an extended temperature range.

The V18V sensors are certified by ECO-LAB and JohnsonDiversey. Their IP 69K enclosure rating makes them ideal for applications in the food and beverage, pharmaceutical and packaging industries.

At a glance

- IP 69K-rated cylindrical photoelectric sensors in M18 stainless steel housing
- Resistant to all common cleaning agents and certified by independent institutes
- Extended temperature range: +85 °C (long-term), +100 °C / 15 min. (short-term)
- Touch (smart) teach-in adjustment
- All sensor materials, including the housing, LED and lens are resistant to chemicals
- IP 69K and IP 68 according to DIN 40050
- Laser-etched part numbers
- Ecolab & JohnsonDiversey certified for chemical resistance

Your benefits

- Simple, time-saving design ensures easy mounting, alignment and replacement
- IP 69K-rated stainless steel housing has a long service life that withstands wash down environments, reducing maintenance time and costs
- Unique touch-teach feature and lock/unlock functionality allow users to control who can change the sensor setting, which reduces the chances of disturbing a proven process and saves commissioning and maintenance time
- Laser-etched part numbers ensures the part numbers will not be washed off, saving maintenance time

→ www.mysick.com/en/V18V

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

	VTB18V	VTF18V	VTE18V	VL18V	VS/VE18V
Sensor principle	Photoelectric proximity sensor			Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Detection principle	Background suppression	Energetic		Standard optics	–
Housing design (light emission)	Cylindrical, straight				
Housing length	83 mm				
Thread diameter (housing)	M18 x 1				
Sensing range max.	0 mm ... 140 mm ¹⁾	0 mm ... 110 mm ¹⁾	0 mm ... 900 mm ¹⁾ (depending on type)	0.035 m ... 5 m ²⁾ (depending on type)	0 m ... 20 m
Sensing range	0 mm ... 130 mm	5 mm ... 100 mm	5 mm ... 800 mm (depending on type)	0.035 m ... 4.5 m ²⁾ (depending on type)	0 m ... 18 m
Type of light	Visible red light		Infrared light	Visible red light	Infrared light
Light source ³⁾	LED				
Wave length	660 nm		880 nm	660 nm	880 nm
Adjustment	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

	VTB18V	VTF18V	VTE18V	VL18V	VS/VE18V
Supply voltage ¹⁾	10 V DC ... 30 V DC				
Ripple ²⁾	≤ 10 %				
Power consumption ³⁾	≤ 50 mA	≤ 35 mA			–
Power consumption, sender	–				35 mA ³⁾
Power consumption, receiver	–				40 mA ³⁾
Output type	PNP, open collector/NPN, open collector (depending on type)				
Switching mode	Light/dark-switching (selectable via L/D control wire)				
Signal voltage PNP HIGH/LOW	Approx. VS – 2.0 V / 0 V				
Signal voltage NPN HIGH/LOW	Approx. VS / < 2.0 V				
Output current I _{max.}	≤ 100 mA				
Response time ⁴⁾	≤ 0.5 ms	≤ 1 ms			≤ 2 ms
Switching frequency ⁵⁾	1,000 Hz	500 Hz	± 500 Hz	500 Hz	250 Hz
Angle of reception	–				8°
Attenuation along light beam	–			≥ 20 %	
Attenuation difference along light beam	–			≥ 15 %	–
Attenuation difference of object	–			≥ 7.5 %	
Connection type ⁶⁾	Male connector, M12				
Circuit protection	A ⁷⁾ , B ⁸⁾ , C ⁹⁾ , D ¹⁰⁾				
Protection class	III				
Weight	120 g				240 g
Polarisation filter	–			–/ ✓ (depending on type)	–
Housing material	Stainless steel V4A (1.4404, 316L)				

	VTB18V	VTF18V	VTE18V	VL18V	VS/VE18V
Optics material	Plan, PPS (Grilamid)			Plan, PPS (Grilamid), Plan, PMMA, surface hardened and tempered (depending on type)	Plan, PPS (Grilamid)
Enclosure rating ¹¹⁾	IP 67, IP 68, IP 69K				
Test input sender off	–				“Test” to 0V
Ambient operating temperature	–25 °C ... +80 °C ¹²⁾				
Ambient storage temperature	–40 °C ... +80 °C				

¹⁾ Limit values.²⁾ May not exceed or fall short of V_s tolerances.³⁾ Without load, at VS 30 V DC.⁴⁾ Signal transit time with resistive load.⁵⁾ With light/dark ratio 1:1.⁶⁾ With gold plated contact pins, PPS with FDA certificate.⁷⁾ A = V_s connections reverse-polarity protected.⁸⁾ B = interference suppression.⁹⁾ D = outputs overcurrent and short-circuit protected.¹⁰⁾ D = inputs and output reverse-polarity protected.¹¹⁾ With correct mounted IP 69K connector.¹²⁾ +100 °C at max 15 minutes.

Ordering information

Other models available at www.mysick.com/en/V18V

VTB18V

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Switching mode:** light/dark-switching
- **Connection:** connector M12, 4-pin PPS (Grilamid)

Sensing range max. ¹⁾	Light spot size (distance)	Adjustment	Output type	Connection diagram	Model name	Part no.
0 mm ... 140 mm	Ø 15 mm (130 mm)	Single teach-in button	PNP	Cd-087	VTB18-4P1240V	6035493
			NPN	Cd-087	VTB18-4N1240V	6035494

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

VTF18V

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** energetic
- **Switching mode:** light/dark-switching
- **Connection:** connector M12, 4-pin PPS (Grilamid)

Sensing range max. ¹⁾	Light spot size (distance)	Adjustment	Output type	Connection diagram	Model name	Part no.
0 mm ... 110 mm	Ø 15 mm (100 mm)	Single teach-in button	PNP	Cd-087	VTF18-4P1240V	6035487
			NPN	Cd-087	VTF18-4N1240V	6035488

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

VTE18V

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** energetic
- **Switching mode:** light/dark-switching
- **Connection:** connector M12, 4-pin PPS (Grilamid)

Sensing range max. ¹⁾	Light spot size (distance)	Adjustment	Output type	Connection diagram	Model name	Part no.
0 mm ... 450 mm	Ø 60 mm (400 mm)	Single teach-in button	PNP	Cd-087	VTE18-4P4240V	6035489
			NPN	Cd-087	VTE18-4N4240V	6035490
0 mm ... 900 mm	Ø 100 mm (800 mm)	Single teach-in button	PNP	Cd-087	VTE18-4P8240V	6035491
			NPN	Cd-087	VTE18-4N8240V	6035492

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

VL18V, clear material detection

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Switching mode:** light/dark-switching
- **Connection:** connector M12, 4-pin PPS (Griamid)

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection diagram	Model name	Part no.
0.035 m ... 4.5 m	Ø 60 mm (1 m)	PNP	Cd-087	VL18-4P2240V	6035497
		NPN	Cd-087	VL18-4N2240V	6035498

¹⁾ PL80A.

VL18V

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Switching mode:** light/dark-switching
- **Connection:** connector M12, 4-pin PPS (Griamid)

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection diagram	Model name	Part no.
0.1 m ... 5 m	Ø 200 mm (4.5 m)	PNP	Cd-087	VL18-4P3140V	6035495
		NPN	Cd-087	VL18-4N3140V	6035496

¹⁾ PL80A.

VS/VE18V

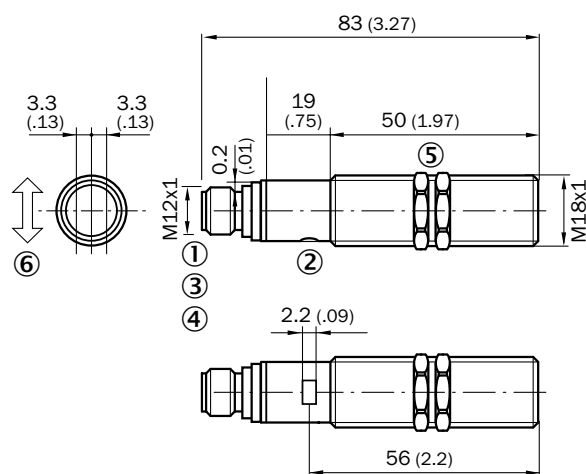
- **Sensor principle:** through-beam photoelectric sensor
- **Switching mode:** light/dark-switching
- **Connection:** connector M12, 4-pin PPS (Griamid)

Sensing range max.	Light spot size (distance)	Output type	Connection diagram	Model name	Part no.
0 m ... 20 m	Ø 600 mm (15 m)	PNP	Cd-219	VS/VE18-4P3140V	6035499
		NPN	Cd-219	VS/VE18-4N3140V	6035500

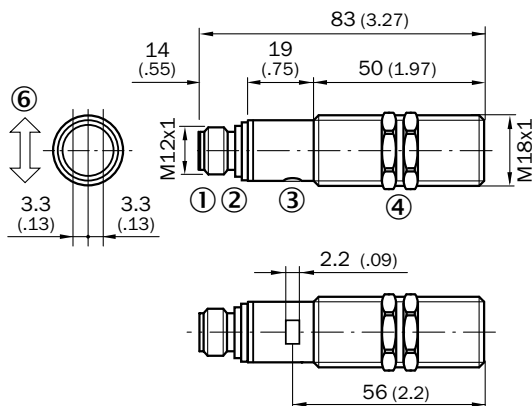
Dimensional drawings

Dimensions in mm (inch)

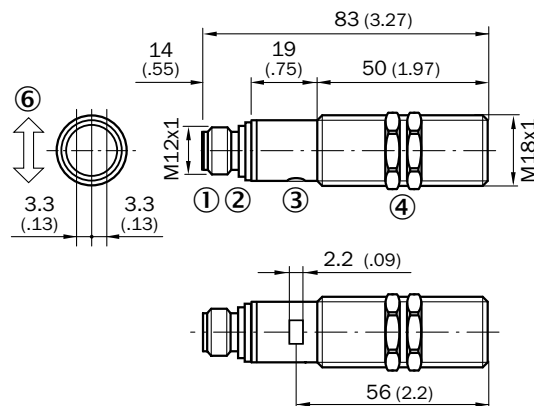
VTB18V



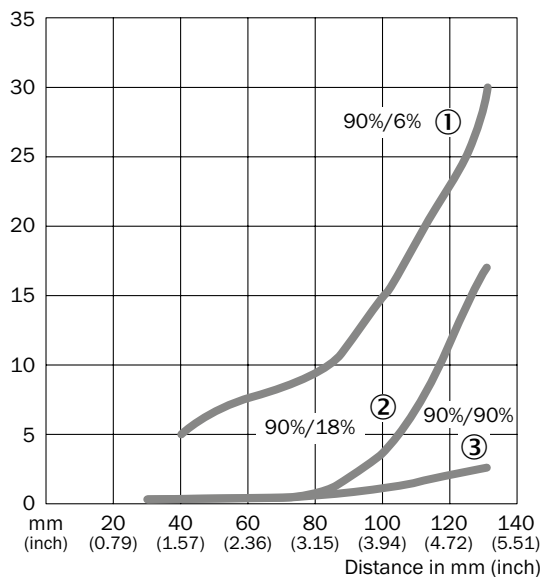
- ① Connector M12, 4-pin
- ② Sensing range adjustment: Touch-Teach-In
- ③ Status indicator LED, green: signaling Touch-Teach-in
- ④ Status indicator LED, yellow: Status of received light beam
- ⑤ Fastening nuts (2 x); width across 24, stainless steel
- ⑥ Standard direction of the material being detected

VL18V, VSE18V

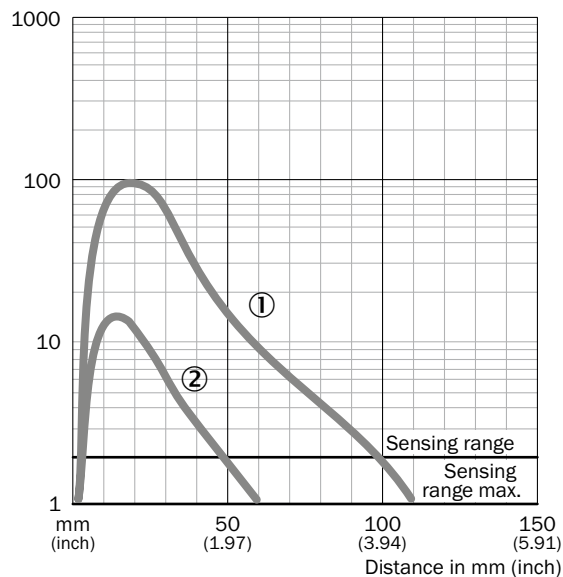
- ① Connector M12, 4-pin
- ② Yellow LED indicator:
 - lights continuously: Reception signal > reserve factor 2
 - blinks: Reception signal < reserve factor 2 but > switching threshold 1
- ③ Fastening nuts (2 x); width across 24, stainless steel

VTF18V, VTE18V

- ① Connector M12, 4-pin
- ② Sensing range adjustment: Touch-Teach-In
- ③ Status indicator LED, green: signaling Touch-Teach-in
- ④ Yellow LED indicator:
 - lights continuously: Reception signal > reserve factor 2
 - blinks: Reception signal < reserve factor 2 but > switching threshold 1
- ⑤ Fastening nuts (2 x); width across 24, stainless steel

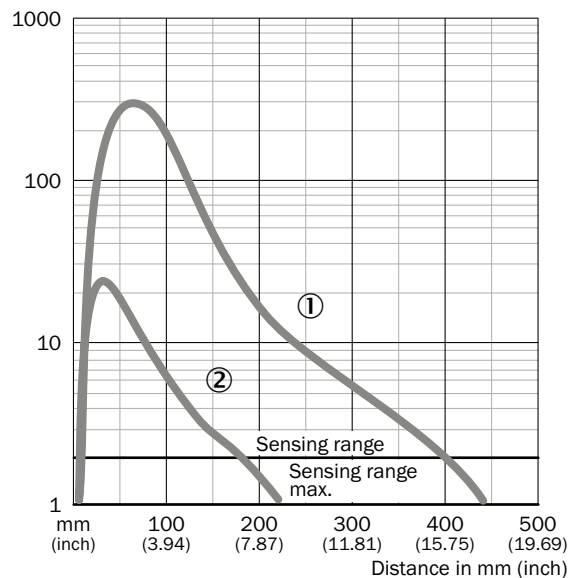
Characteristic curves**Black-white shift****VTB18V**

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

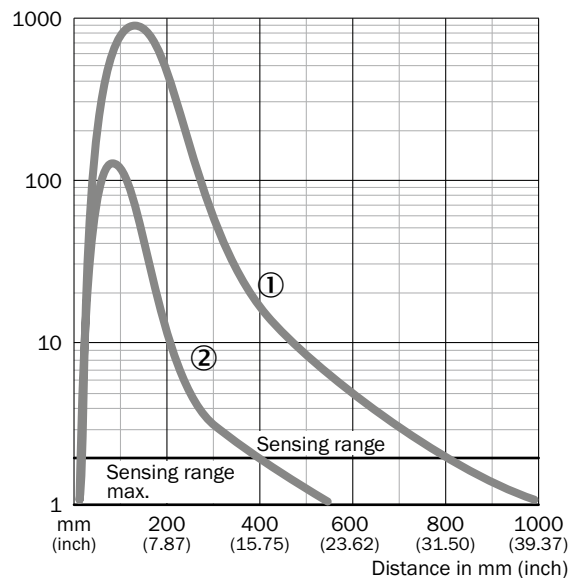
VTF18V

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

VTE18V, 450 mm

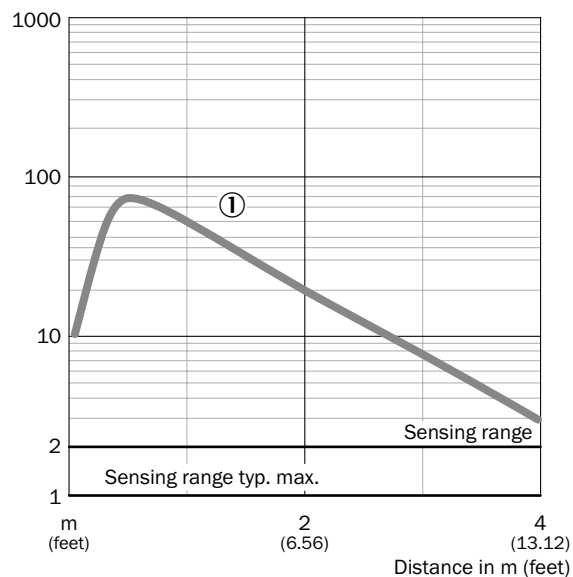


VTE18V, 900 mm

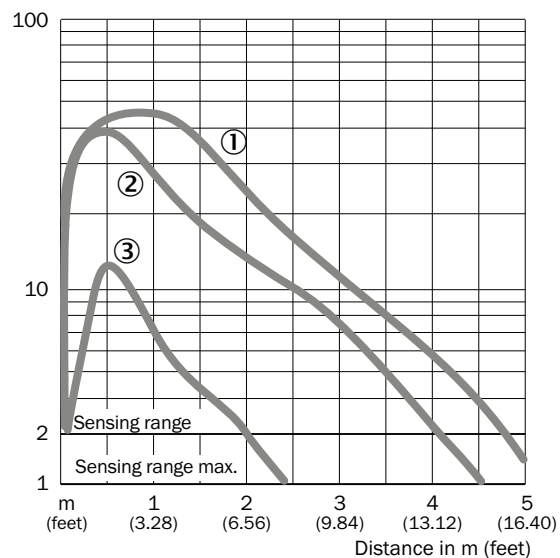


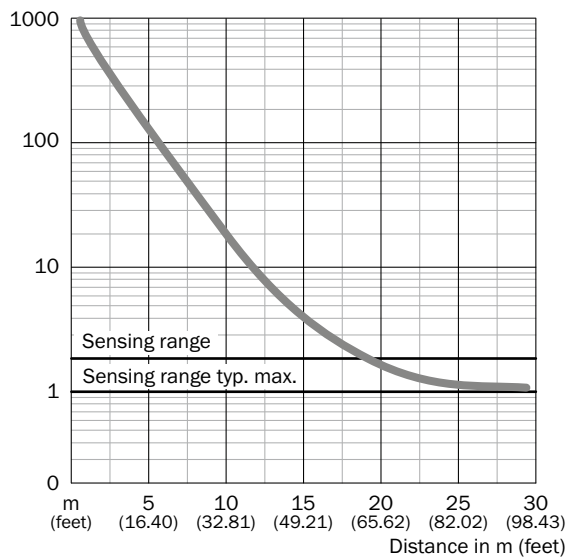
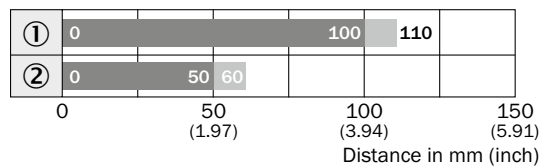
Operating reserve

VL18V, clear material detection



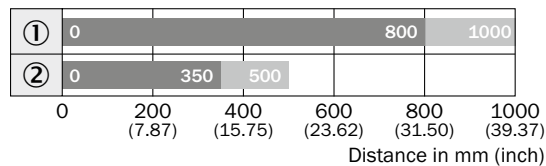
VL18V



VS/VE18V**Bar diagrams****VTF18V**

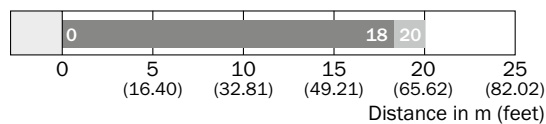
■ Sensing range ■ Sensing range max.

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

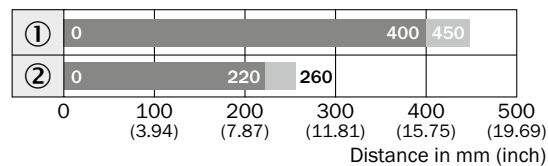
VTE18V, 900 mm

■ Sensing range ■ Sensing range max.

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

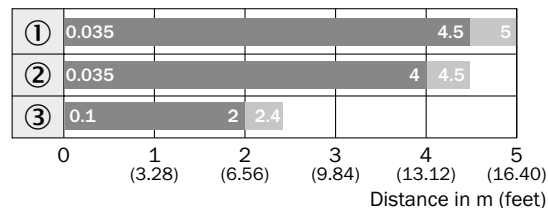
VS/VE18V

■ Sensing range ■ Sensing range max.

VTE18V, 450 mm

■ Sensing range ■ Sensing range max.

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

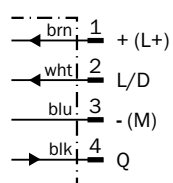
VL18V

■ Sensing range ■ Sensing range max.

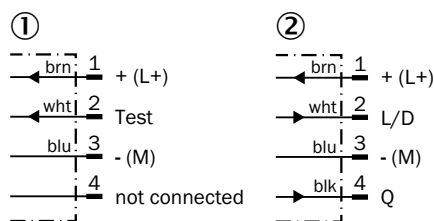
- ① PL80A
② C110A
③ Reflective tape Diamond Grade

Connection diagram

Cd-087



Cd-219



Recommended accessories

Mounting brackets/plates

Mounting plates

Figure	Material	Description	Model name	Part no.
	Stainless steel	Mounting plate for M18 housing	BEF-WG-M18N	5320948
		Mounting bracket	BEF-WN-M18N	5320947

Plug connectors and cables

Connecting cable (female connector-open)

- Cable material: PVC
- Connector material: PVC

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, IP 69K	DOL-1204-G02MN	6028128
			5 m, 4-wire	IP 67, IP 69K	DOL-1204-G05MN	6028130
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-1204-W02MN	6028129
			5 m, 4-wire	IP 67, IP 69K	DOL-1204-W05MN	6028131

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N06N for universal clamp bracket, M18	BEF-KHS-N06N	2051622

Reflectors

Angular

Figure	Material	Description	Model name	Part no.
	Plastic	Chemically resistant, screw connection, 47 mm x 47 mm	P250 CHEM	5321097
	PMMA/ABS	Rectangular, screw connection, 80 mm x 80 mm	PL80A	1003865

Fine triple reflectors

Figure	Material	Description	Model name	Part no.
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
		Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089

Reflective tape

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

Special reflectors

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Antifog, for prevention of moisture fogging on the reflection area, screw connection, 56 mm x 37 mm	PL40A Antifog	5322011
	Plastic	Rectangular, screw connection M3, countersunk screw head, chemical resistant, 56 mm x 37 mm	PL40B-CHEM	5326088
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adapter shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adapter thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

Terminal and alignment brackets

Alignment brackets

Figure	Material	Description	Model name	Part no.
	Plastic	Mounting bracket with ball-and-socket	BEF-WN-M18-ST02	5312973

Terminal brackets

Figure	Material	Description	Model name	Part no.
	Plastic (PA12), glass-fiber reinforced	Clamping block for round sensors M18, without fixed stop	BEF-KH-M18	2051481
		Clamping block for round sensors M18, with fixed stop	BEF-KHF-M18	2051482
	Stainless steel	Mounting ring	BEF-WN-MH15-2V	4053358

→ For additional accessories, please see page L-861

Lowest-cost cylindrical photoelectric sensor on the market!



Additional information

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Characteristic curves	I-757
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Connection diagram	I-762
Recommended accessories.....	I-762



Product description

The V180-2 sensors are designed to provide the longest sensing range for proximity sensors. These low-cost cylindrical sensors are easy to use, easy to install and maintain saving installation time and maintenance costs. The V180-2 is available in either a plastic or metal housing. The bright red LED makes these sensors easy to align and set up, offering time-saving installation. Plus,

the indication LEDs provide continuous signal strength information for quick and simple troubleshooting.

The V180-2 provides an economical solution for universal applications, such as product detection and machine positioning in packaging, general manufacturing automation, material handling and warehousing systems.

At a glance

- Low-cost M18 housing sensor on the market
- Long sensing distances: 100 mm, 400 mm, 800 mm (proximity sensor), 300 mm (proximity sensor with BGS), 6 m (retro-reflective sensor) and 20 m (through-beam sensor)
- Bright power and signal LEDs with 360° visibility
- Wide product portfolio solves a broad range of applications
- High switching frequencies up to 1000 Hz
- Available in a metal housing for applications in harsh environments
- Optical axis selectively axial or radial (90°)

Your benefits

- Low-cost M18 cylindrical sensor on the market reduces installation costs
- Bright red sender LED simplifies alignment and saves installation time
- Bright power and signal LEDs with 360° visibility offer quick and simple troubleshooting, reducing maintenance time and costs
- The flat and smooth lens reduces the collection of dust and dirt, ensuring safe operation with less maintenance and fewer costs

→ www.mysick.com/en/V180-2

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

	VTB180-2	VTF180-2	VTE180-2	VL180-2	VSE180-2	
Sensor principle	Photoelectric proximity sensor			Photoelectric retro-reflective sensor	Through-beam photoelectric sensor	
Detection principle	Background suppression	Background blanking	Background blanking/energetic (depending on type)	Standard optics	–	
Housing design (light emission)	Axial	Axial/radial (depending on type)				
Thread diameter (housing)	M18 x 1					
Sensing range max.	Axial	10 mm ... 350 mm ¹⁾	1 mm ... 140 mm ¹⁾	1 mm ... 1,100 mm ¹⁾ (depending on type)	0.05 m ... 7 m ²⁾	0 m ... 28 m
	Radial	–	1 mm ... 130 mm ¹⁾	1 mm ... 900 mm ¹⁾ (depending on type)	0.05 m ... 5.5 m ²⁾	0 m ... 25 m
Sensing range	Axial	30 mm ... 200 mm ¹⁾	1 mm ... 100 mm ¹⁾	1 mm ... 800 mm ¹⁾ (depending on type)	0.05 m ... 6 m ²⁾	0 m ... 20 m
	Radial	–	1 mm ... 100 mm ¹⁾	1 mm ... 650 mm ¹⁾ (depending on type)	0.05 m ... 4.5 m ²⁾	0 m ... 19 m
Focus	–	✓ ^{3/4)}	–			
Type of light	Visible red light					
Light source ⁵⁾	LED					
Wave length	632 nm	645 nm				
Adjustment	Potentiometer, 4 turns	Potentiometer, 270 °			Potentiometer, 270 ° ⁶⁾	

¹⁾ Object with 90 % reflectance (referred to standard white, DIN 5033)²⁾ PL80A.³⁾ Focused approx. 7 mm at 60 mm distance.⁴⁾ Focused, focus approx. 7 mm at 60 mm .⁵⁾ Average service life of 100,000 h at T_A = +25 °C.⁶⁾ Receiver.

Mechanics/electronics

	VTB180-2	VTF180-2	VTE180-2	VL180-2	VSE180-2
Supply voltage ¹⁾	10 V DC ... 30 V DC				
Ripple ²⁾	± 10 %				
Current consumption ³⁾	≤ 35 mA	≤ 30 mA			–
Current consumption, sender	–				20 mA ³⁾
Current consumption, receiver	–				15 mA ³⁾
Output type	PNP, open collector ⁴⁾ /NPN, open collector ⁵⁾ (depending on type)				
Switching mode	Light-switching ⁴⁾ /dark-switching/Light/dark-switching ⁵⁾ (depending on type)				
Switching mode selector	Selectable via L/D control wire				
Signal voltage PNP HIGH/LOW	Approx. V _S – 1.8 V / 0 V				
Signal voltage NPN HIGH/LOW	Approx. V _S / < 1.8 V				
Output current I _{max.}	≤ 100 mA				
Response time ⁶⁾	≤ 1 ms	≤ 0.5 ms			
Switching frequency ⁷⁾	≤ 500 Hz	1,000 Hz			

	VTB180-2	VTF180-2	VTE180-2	VL180-2	VSE180-2
Connection type	Cable, 2 m ⁸⁾ /Male connector, M12 (depending on type)				
Circuit protection	A ⁹⁾ , B ¹⁰⁾ , D ¹¹⁾				
Protection class	III				
Weight					
	Plastic, cable	62 g			124 g
	Plastic, connector	18 g			36 g
	Metal, cable	95 g			190 g
	Metal, connector	47 g			94 g
Polarisation filter	-			✓	-
Housing material					
	Plastic	PBT/PC			
	Metal	Nickel-plated brass and PC			
Optics material	PMMA				
Enclosure rating	IP 67				
Items supplied	Fastening nuts (2 x)			Reflector P250, fastening nuts (2 x), Reflector P250 (depending on type)	Fastening nuts (4 x)
Ambient operating temperature	-25 °C ... +55 °C				
Ambient storage temperature	-40 °C ... +70 °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⁾ Control wire open: dark-switching D.ON.

⁵⁾ Control wire open: light-switching L.ON.

⁶⁾ Signal transit time with resistive load.

⁷⁾ With light/dark ratio 1:1.

⁸⁾ Do not bend below 0 °C.

⁹⁾ A = V_S connections reverse-polarity protected.

¹⁰⁾ B = inputs and output reverse-polarity protected.

¹¹⁾ D = outputs overcurrent and short-circuit protected.

Selection aid

Sensor principle	Sensing range max.	Housing material	Model name	Page
Photoelectric proximity sensor	10 mm ... 350 mm	Metal	VTB180-2, metal	I-745
		Plastic	VTB180-2, plastic	I-745
	1 mm ... 140 mm	Metal	VTF180-2, metal	I-746
		Plastic	VTF180-2, plastic	I-746
	1 mm ... 500 mm	Metal	VTE180-2, metal, mid range	I-747
		Plastic	VTE180-2, plastic, mid range	I-747
	1 mm ... 1100 mm	Metal	VTE180-2, Metal, long range	I-748
		Plastic	VTE180-2, plastic, long range	I-748
Photoelectric retro-reflective sensor	0,05 m ... 7 m	Metal	VL180-2, metal	I-749
		Plastic	VL180-2, plastic	I-749
Through-beam photoelectric sensor	0 m ... 28 m	Metal	VSE180-2, metal	I-750
		Plastic	VSE180-2, plastic	I-750

Ordering information

Other models available at www.mysick.com/en/V180-2

VTB180-2, metal

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Adjustment:** potentiometer, 4 turns

Sensing range max. ¹⁾	Light spot size (distance)	Optical axis	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
10 mm ... 350 mm	Ø 15 mm (300 mm)	Axial	PNP	Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-089	VTB180-2P41112	6043869
					Connector M12, 4-pin	Cd-087	VTB180-2P42412	6043870
				Light switching	Connector M12, 4-pin	Cd-066	VTB180-2F32412	6044019
			NPN	Light/dark-switching ³⁾	Cable, 4-wire 2 m	Cd-089	VTB180-2N41112	6043867
					Connector M12, 4-pin	Cd-087	VTB180-2N42412	6043868

¹⁾ Object with 90 % reflectance (referred to standard white, DIN 5033)¹⁾ Control wire open: dark-switching D.ON.²⁾ Control wire open: light-switching L.ON.

VTB180-2, plastic

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Adjustment:** potentiometer, 4 turns

Sensing range max. ¹⁾	Light spot size (distance)	Optical axis	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
10 mm ... 350 mm	Ø 15 mm (300 mm)	Axial	PNP	Light/dark-switching ¹⁾	Cable, 4-wire 2 m	Cd-089	VTB180-2P41117	6043873
					Connector M12, 4-pin	Cd-087	VTB180-2P42417	6043874
				Light switching	Connector M12, 4-pin	Cd-066	VTB180-2F32417	6044020
			NPN	Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-089	VTB180-2N41117	6043871
					Connector M12, 4-pin	Cd-087	VTB180-2N42417	6043872

¹⁾ Object with 90 % reflectance (referred to standard white, DIN 5033)¹⁾ Control wire open: dark-switching D.ON.²⁾ Control wire open: light-switching L.ON.

VTF180-2, metal

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background blanking
- **Adjustment:** potentiometer, 270 °

Sensing range max. ¹⁾	Light spot size (distance)	Optical axis	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
1 mm ... 130 mm	Ø 8 mm (100 mm)	Radial	PNP	Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-089	VTF180-2P41114	6043805
					Connector M12, 4-pin	Cd-087	VTF180-2P42414	6043806
			NPN	Light switching	Connector M12, 3-pin	Cd-066	VTF180-2F32414	6044023
					Cable, 4-wire 2 m	Cd-089	VTF180-2N41114	6043803
					Connector M12, 4-pin	Cd-087	VTF180-2N42414	6043804
1 mm ... 140 mm	Ø 8 mm (100 mm)	Axial	PNP	Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-089	VTF180-2P41112	6041802
					Connector M12, 4-pin	Cd-087	VTF180-2P42412	6041803
			NPN	Light switching	Connector M12, 3-pin	Cd-066	VTF180-2F32412	6044021
					Cable, 4-wire 2 m	Cd-089	VTF180-2N41112	6041799
					Connector M12, 4-pin	Cd-087	VTF180-2N42412	6041801

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

²⁾ Control wire open: dark-switching D.ON.

³⁾ Control wire open: light-switching L.ON.

VTF180-2, plastic

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background blanking
- **Adjustment:** potentiometer, 270 °

Sensing range max. ¹⁾	Light spot size (distance)	Optical axis	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
1 mm ... 130 mm	Ø 8 mm (100 mm)	Radial	PNP	Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-089	VTF180-2P41119	6043810
					Connector M12, 4-pin	Cd-087	VTF180-2P42419	6043811
			NPN	Light switching	Connector M12, 4-pin	Cd-066	VTF180-2F32419	6044024
					Cable, 4-wire 2 m	Cd-089	VTF180-2N41119	6043807
					Connector M12, 4-pin	Cd-087	VTF180-2N42419	6043808
1 mm ... 140 mm	Ø 8 mm (100 mm)	Axial	PNP	Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-089	VTF180-2P41117	6037479
					Connector M12, 4-pin	Cd-087	VTF180-2P42417	6037480
			NPN	Light switching	Connector M12, 3-pin	Cd-066	VTF180-2F32417	6044022
					Cable, 4-wire 2 m	Cd-089	VTF180-2N41117	6037477
					Connector M12, 4-pin	Cd-087	VTF180-2N42417	6037478

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

²⁾ Control wire open: dark-switching D.ON.

³⁾ Control wire open: light-switching L.ON.

VTE180-2, metal, mid range

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background blanking
- **Adjustment:** potentiometer, 270 °

Sensing range max. ¹⁾	Light spot size (distance)	Optical axis	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
1 mm ... 500 mm	Ø 20 mm (400 mm)	Axial	PNP	Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-089	VTE180-2P41142	6041806
					Connector M12, 4-pin	Cd-087	VTE180-2P42442	6041807
				Light switching	Connector M12, 3-pin	Cd-066	VTE180-2F32342	6042576
			NPN	Light/dark-switching ³⁾	Cable, 4-wire 2 m	Cd-089	VTE180-2N41142	6041804
					Connector M12, 4-pin	Cd-087	VTE180-2N42442	6041805
				Light switching	Connector M12, 3-pin	Cd-066	VTE180-2F32342	6042576
1 mm ... 450 mm	Ø 20 mm (400 mm)	Radial	PNP	Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-089	VTE180-2P41144	6043814
					Connector M12, 4-pin	Cd-087	VTE180-2P42444	6043815
				Light switching	Connector M12, 3-pin	Cd-066	VTE180-2F32444	6044025
			NPN	Light/dark-switching ³⁾	Cable, 4-wire 2 m	Cd-089	VTE180-2N41144	6043812
					Connector M12, 4-pin	Cd-087	VTE180-2N42444	6043813
				Light switching	Connector M12, 3-pin	Cd-066	VTE180-2F32444	6044025

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

²⁾ Control wire open: dark-switching D.ON.

³⁾ Control wire open: light-switching L.ON.

VTE180-2, plastic, mid range

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background blanking
- **Adjustment:** potentiometer, 270 °

Sensing range max. ¹⁾	Light spot size (distance)	Optical axis	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
1 mm ... 500 mm	Ø 20 mm (400 mm)	Axial	PNP	Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-089	VTE180-2P41147	6037483
					Connector M12, 4-pin	Cd-087	VTE180-2P42447	6037484
				Light switching	Connector M12, 3-pin	Cd-066	VTE180-2P32447	6043946
			NPN	Light/dark-switching ³⁾	Cable, 4-wire 2 m	Cd-089	VTE180-2N41147	6037481
					Connector M12, 4-pin	Cd-087	VTE180-2N42447	6037482
				Light switching	Connector M12, 3-pin	Cd-066	VTE180-2F32447	6043946
1 mm ... 450 mm	Ø 20 mm (400 mm)	Radial	PNP	Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-089	VTE180-2P41149	6043818
					Connector M12, 4-pin	Cd-087	VTE180-2P42449	6043819
				Light switching	Connector M12, 3-pin	Cd-066	VTE180-2F32449	6044026
			NPN	Light/dark-switching ³⁾	Cable, 4-wire 2 m	Cd-089	VTE180-2N41149	6043816
					Connector M12, 4-pin	Cd-087	VTE180-2N42449	6043817
				Light switching	Connector M12, 3-pin	Cd-066	VTE180-2F32449	6044026

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

²⁾ Control wire open: dark-switching D.ON.

³⁾ Control wire open: light-switching L.ON.

VTE180-2, metal, long range

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** energetic
- **Adjustment:** potentiometer, 270 °

Sensing range max. ¹⁾	Light spot size (distance)	Optical axis	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
1 mm ... 1,100 mm	Ø 30 mm (800 mm)	Axial	PNP	Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-089	VTE180-2P41182	6041810
					Connector M12, 4-pin	Cd-087	VTE180-2P42482	6041811
			NPN	Light switching	Connector M12, 3-pin	Cd-066	VTE180-2P32482	6043945
					Cable, 4-wire 2 m	Cd-089	VTE180-2N41182	6041808
1 mm ... 900 mm	Ø 30 mm (800 mm)	Radial	PNP	Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-089	VTE180-2P41184	6043822
					Connector M12, 4-pin	Cd-087	VTE180-2P42484	6043823
			NPN	Light switching	Connector M12, 3-pin	Cd-066	VTE180-2F32484	6044028
					Cable, 4-wire 2 m	Cd-089	VTE180-2N41184	6043820
			NPN	Light/dark-switching ³⁾	Cable, 4-wire 2 m	Cd-089	VTE180-2N41184	6043820
					Connector M12, 4-pin	Cd-087	VTE180-2N42484	6043821

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

²⁾ Control wire open: dark-switching D.ON.

³⁾ Control wire open: light-switching L.ON.

VTE180-2, plastic, long range

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** energetic
- **Adjustment:** potentiometer, 270 °

Sensing range max. ¹⁾	Light spot size (distance)	Optical axis	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
1 mm ... 900 mm	Ø 30 mm (800 mm)	Radial	PNP	Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-089	VTE180-2P41189	6043826
					Connector M12, 4-pin	Cd-087	VTE180-2P42489	6043827
			NPN	Light switching	Connector M12, 3-pin	Cd-066	VTE180-2F32489	6044029
					Cable, 4-wire 2 m	Cd-089	VTE180-2N41189	6043824
1 mm ... 1,100 mm	Ø 30 mm (800 mm)	Axial	PNP	Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-089	VTE180-2P41187	6037487
					Connector M12, 4-pin	Cd-087	VTE180-2P42487	6037488
			NPN	Light switching ²⁾	Connector M12, 3-pin	Cd-066	VTE180-2F32487	6044027
					Cable, 4-wire 2 m	Cd-089	VTE180-2N41187	6037485
			NPN	Light/dark-switching ³⁾	Cable, 4-wire 2 m	Cd-089	VTE180-2N41187	6037485
					Connector M12, 4-pin	Cd-087	VTE180-2N42487	6037486

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

²⁾ Control wire open: dark-switching D.ON.

³⁾ Control wire open: light-switching L.ON.

VL180-2, metal

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Adjustment:** potentiometer, 270 °

Sensing range max. ¹⁾	Light spot size (distance)	Optical axis	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0.05 m ... 7 m	Ø 400 mm (6 m)	Axial	PNP	Light switching	Connector M12, 4-pin	Cd-066	VL180-2F32331	6043458
				Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-089	VL180-2P41131	6041818
					Connector M12, 4-pin	Cd-087	VL180-2P42431	6041819
			NPN	Dark-switching	Connector M12, 4-pin	Cd-066	VL180-2P32431	6044030
				Light/dark-switching ³⁾	Cable, 4-wire 2 m	Cd-089	VL180-2N41131	6041816
					Connector M12, 4-pin	Cd-087	VL180-2N42431	6041817
0.05 m ... 5.5 m	Ø 270 mm (4 m)	Radial	PNP	Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-089	VL180-2P41133	6043832
					Connector M12, 4-pin	Cd-087	VL180-2P42433	6043834
			NPN	Dark-switching	Connector M12, 3-pin	Cd-066	VL180-2P32433	6044032
				Light/dark-switching ³⁾	Connector M12, 4-pin	Cd-087	VL180-2N42433	6043830

¹⁾ PL80A.²⁾ Control wire open: dark-switching D.ON.³⁾ Control wire open: light-switching L.ON.

VL180-2, plastic

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Adjustment:** potentiometer, 270 °

Sensing range max. ¹⁾	Light spot size (distance)	Optical axis	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0.05 m ... 7 m	Ø 400 mm (6 m)	Axial	PNP	Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-089	VL180-2P41136	6037495
					Connector M12, 4-pin	Cd-087	VL180-2P42436	6037496
			NPN	Light/dark-switching ³⁾	Cable, 4-wire 2 m	Cd-089	VL180-2N41136	6037493
					Connector M12, 4-pin	Cd-087	VL180-2N42436	6037494
0.05 m ... 5.5 m	Ø 270 mm (4 m)	Radial	PNP	Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-089	VL180-2P41138	6043837
					Connector M12, 4-pin	Cd-087	VL180-2P42438	6043838
			NPN	Dark-switching	Connector M12, 3-pin	Cd-066	VL180-2P32438	6044033
				Light/dark-switching ³⁾	Cable, 4-wire 2 m	Cd-089	VL180-2N41138	6043835
					Connector M12, 4-pin	Cd-087	VL180-2N42438	6043836

¹⁾ PL80A.²⁾ Control wire open: dark-switching D.ON.³⁾ Control wire open: light-switching L.ON.

VSE180-2, metal

- **Sensor principle:** through-beam photoelectric sensor
- **Adjustment:** potentiometer, 270 ° (Receiver.)

Sensing range max.	Light spot size (distance)	Optical axis	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0 m ... 28 m	Ø 1,100 mm (20 m)	Axial	PNP	Light/dark-switching ¹⁾	Cable, 4-wire 2 m	Cd-058	VSE180-2P41132	6041822
					Connector M12, 4-pin	Cd-060	VSE180-2P42432	6041823
			NPN	Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-058	VSE180-2N41132	6041820
					Connector M12, 4-pin	Cd-060	VSE180-2N42432	6041821
0 m ... 25 m	Ø 1,100 mm (20 m)	Radial	PNP	Light/dark-switching ¹⁾	Cable, 4-wire 2 m	Cd-058	VSE180-2P41134	6043849
					Connector M12, 4-pin	Cd-060	VSE180-2P42434	6043850
			NPN	Dark-switching	Connector M12, 3-pin	Cd-057	VSE180-2P32434	6044036
				Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-058	VSE180-2N41134	6043847
					Connector M12, 4-pin	Cd-060	VSE180-2N42434	6043848

¹⁾ Control wire open: dark-switching D.ON.

²⁾ Control wire open: light-switching L.ON.

VSE180-2, plastic

- **Sensor principle:** through-beam photoelectric sensor
- **Adjustment:** potentiometer, 270 ° (Receiver.)

Sensing range max.	Light spot size (distance)	Optical axis	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0 m ... 28 m	Ø 1,100 mm (20 m)	Axial	PNP	Light/dark-switching ¹⁾	Cable, 4-wire 2 m	Cd-058	VSE180-2P41137	6037499
					Connector M12, 4-pin	Cd-060	VSE180-2P42437	6037500
			NPN	Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-058	VSE180-2N41137	6037497
					Connector M12, 4-pin	Cd-060	VSE180-2N42437	6037498
0 m ... 25 m	Ø 1,100 mm (20 m)	Radial	PNP	Light/dark-switching ¹⁾	Cable, 4-wire 2 m	Cd-058	VSE180-2P41139	6043853
					Connector M12, 4-pin	Cd-060	VSE180-2P42439	6043854
			NPN	Dark-switching	Connector M12, 3-pin	Cd-057	VSE180-2P32439	6044037
				Light/dark-switching ²⁾	Cable, 4-wire 2 m	Cd-058	VSE180-2N41139	6043851
					Connector M12, 4-pin	Cd-060	VSE180-2N42439	6043852

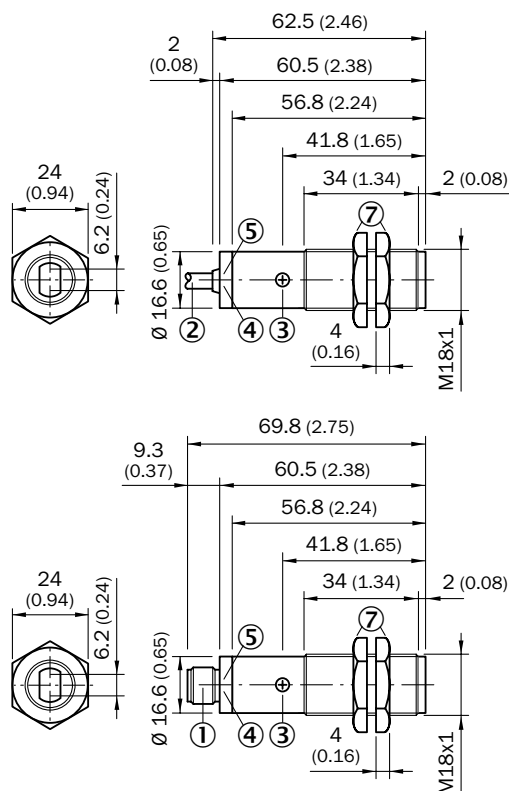
¹⁾ Control wire open: dark-switching D.ON.

²⁾ Control wire open: light-switching L.ON.

Dimensional drawings

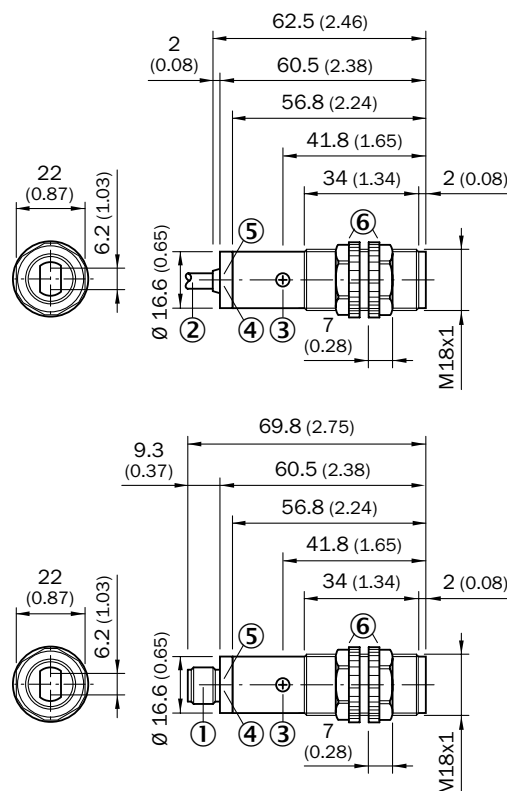
Dimensions in mm (inch)

VTF180-2, VTE180-2, VTB180-2, metal, axial

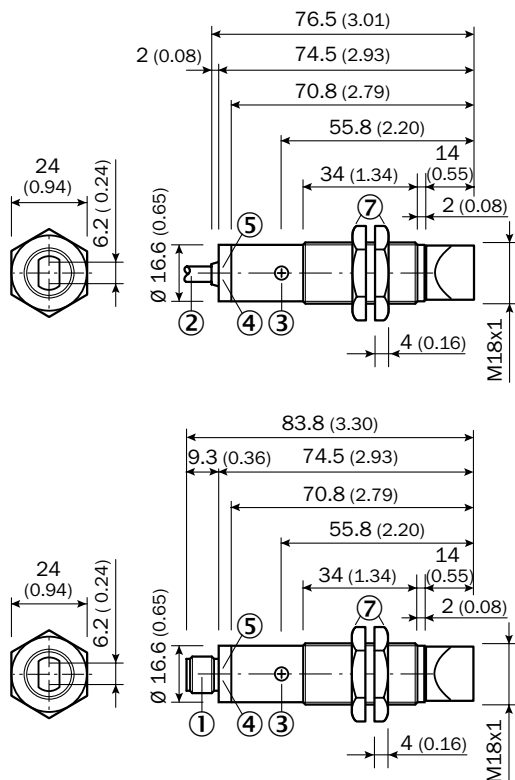


- ① Connector M12, 4-pin
- ② Connection cable 2 m
- ③ Sensitivity adjustment 270°
- ④ LED indicator orange: switching output active
- ⑤ LED indicator green: strength indicator
- ⑦ Fastening nuts (2 x); 24 mm hex, metal

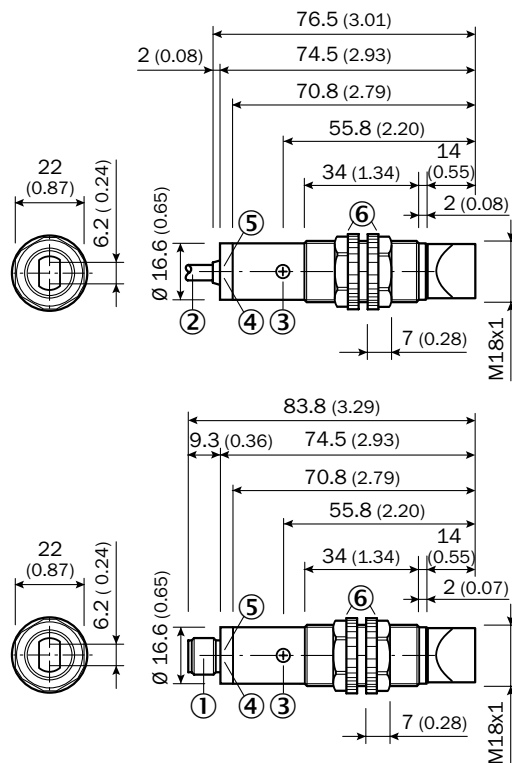
VTF180-2, VTE180-2, VTB180-2, plastic, axial



- ① Connector M12, 4-pin
- ② Connection cable 2 m
- ③ Sensitivity control (potentiometer, 270°)
- ④ LED indicator orange: switching output active
- ⑤ LED indicator green: strength indicator
- ⑥ Fastening nuts (2 x); width across 22, PC

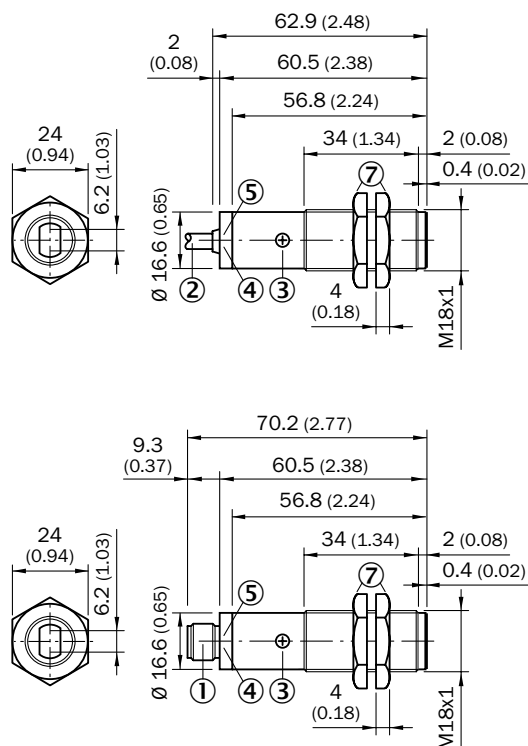
VTF180-2, VTE180-2, metal, radial

- ① Connector M12, 3-pin / Connector M12, 3-pin
- ② Connection cable 2 m
- ③ Sensitivity control; Potentiometer 270°
- ④ LED indicator orange: switching output active
- ⑤ LED indicator green, stability indicator: LED lights continuously = light reception < 0.9/> 1.1; LED off = light reception > 0.9 / < 1.1
- ⑦ Metal housing, fastening nuts (2 x); width across 24

VTF180-2, VTE180-2, plastic, radial

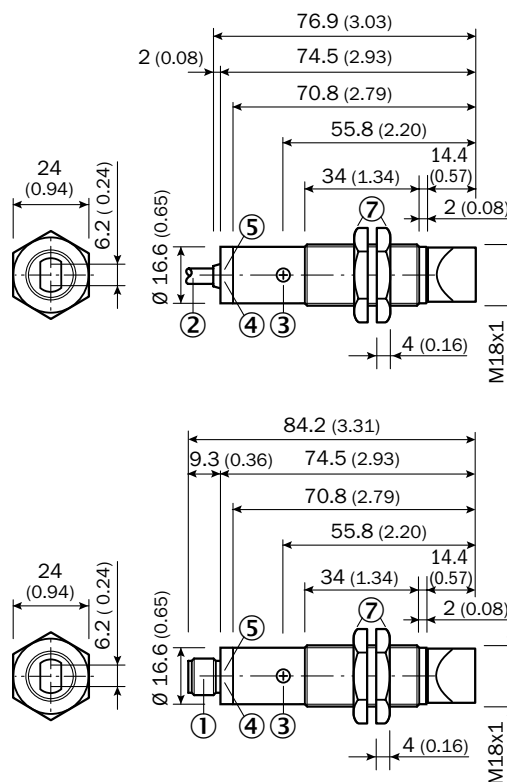
- ① Connector M12
- ② Connection cable 2 m
- ③ Sensitivity control; Potentiometer 270°
- ④ LED indicator orange: switching output active
- ⑤ LED indicator green, stability indicator: LED lights continuously = light reception < 0.9/> 1.1; LED off = light reception > 0.9 / < 1.1
- ⑥ Fastening nuts (2 x); width across 22, PC

VL180-2, metal, axial

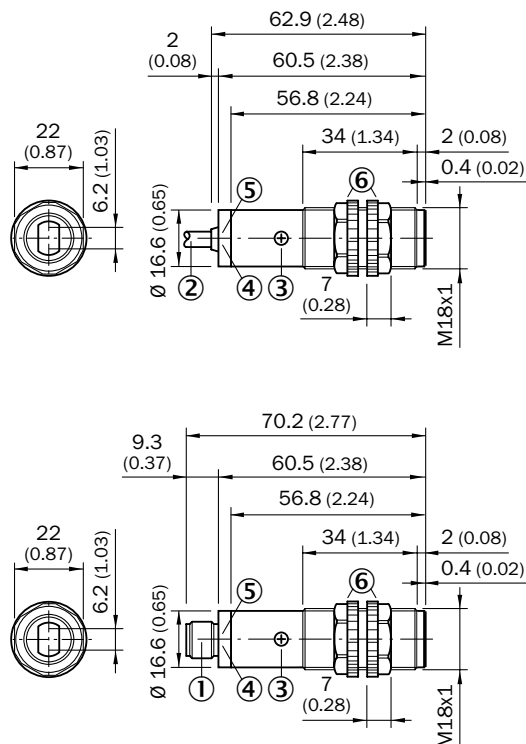


- ① Connector M12, 4-pin
- ② Connection cable 2 m
- ③ Sensitivity adjustment 270°
- ④ LED indicator orange: switching output active
- ⑤ LED indicator green: strength indicator
- ⑦ Fastening nuts (2 x); 24 mm hex, metal

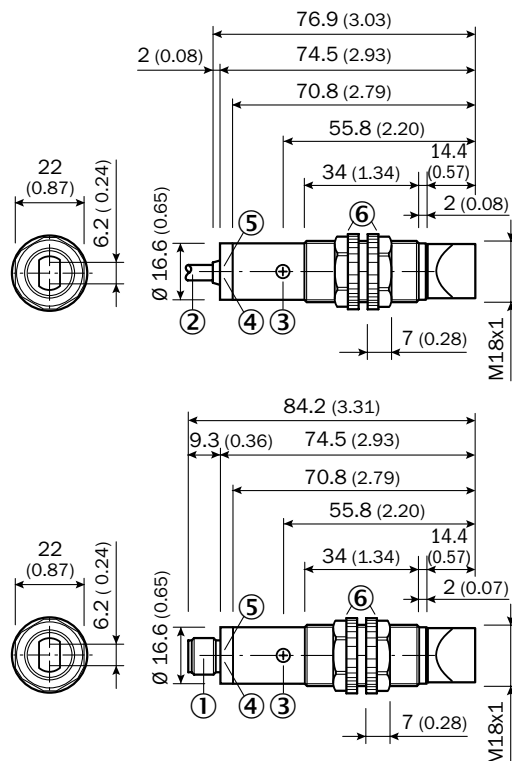
VL180-2, metal, radial



- ① Connector M12, 3-pin / Connector M12, 3-pin
- ② Connection cable 2 m
- ③ Sensitivity control; Potentiometer 270°
- ④ LED indicator orange: switching output active
- ⑤ LED indicator green, stability indicator: LED lights continuously = light reception < 0.9 / > 1.1; LED off = light reception > 0.9 / < 1.1
- ⑦ Metal housing, fastening nuts (2 x); width across 24

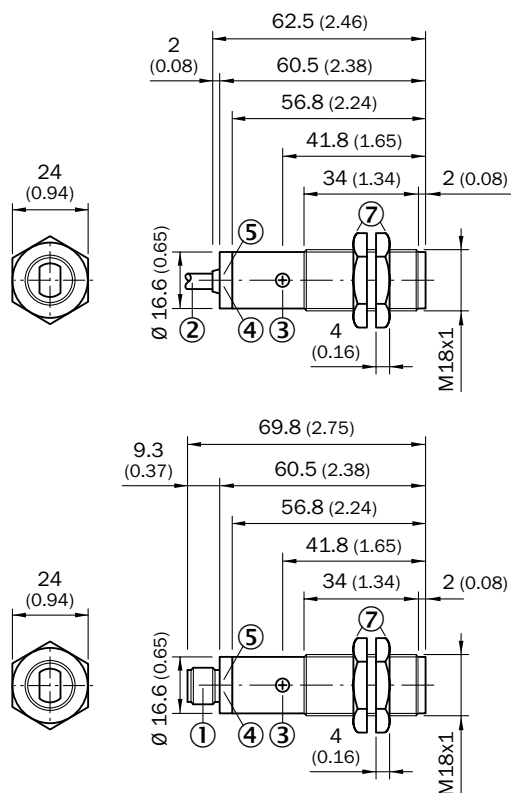
VL180-2, plastic, axial

- ① Connector M12, 4-pin
- ② Connection cable 2 m
- ③ Sensitivity control (potentiometer, 270°)
- ④ LED indicator orange: switching output active
- ⑤ LED indicator green: strength indicator
- ⑥ Fastening nuts (2 x); width across 22, PC

VL180-2, plastic, radial

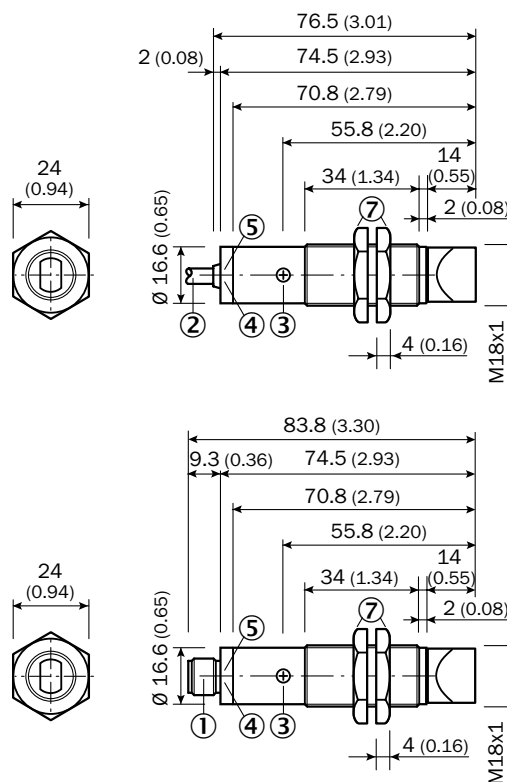
- ① Connector M12
- ② Connection cable 2 m
- ③ Sensitivity control; Potentiometer 270°
- ④ LED indicator orange: switching output active
- ⑤ LED indicator green, stability indicator: LED lights continuously = light reception < 0.9/> 1.1; LED off = light reception > 0.9 / < 1.1
- ⑥ Fastening nuts (2 x); width across 22, PC

VSE180-2, metal, axial

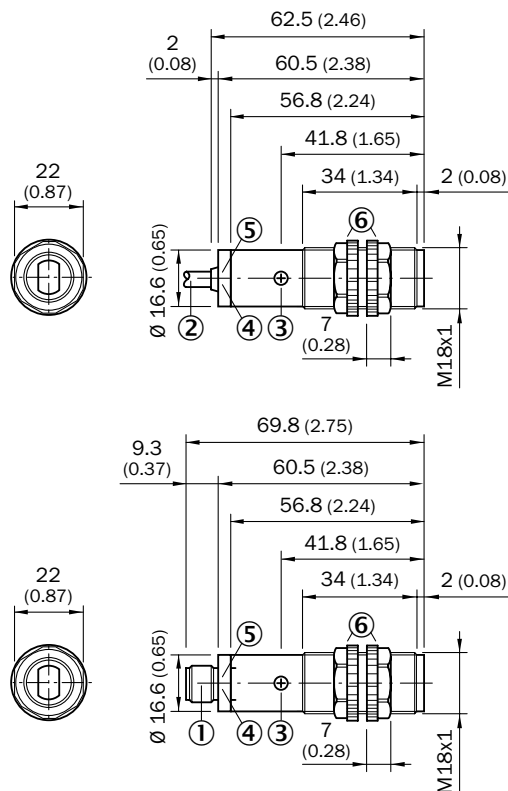


- ① Connector M12, 4-pin
- ② Connection cable 2 m
- ③ Sensitivity adjustment 270°
- ④ LED indicator orange: switching output active
- ⑤ LED indicator green: strength indicator
- ⑦ Fastening nuts (2 x); 24 mm hex, metal

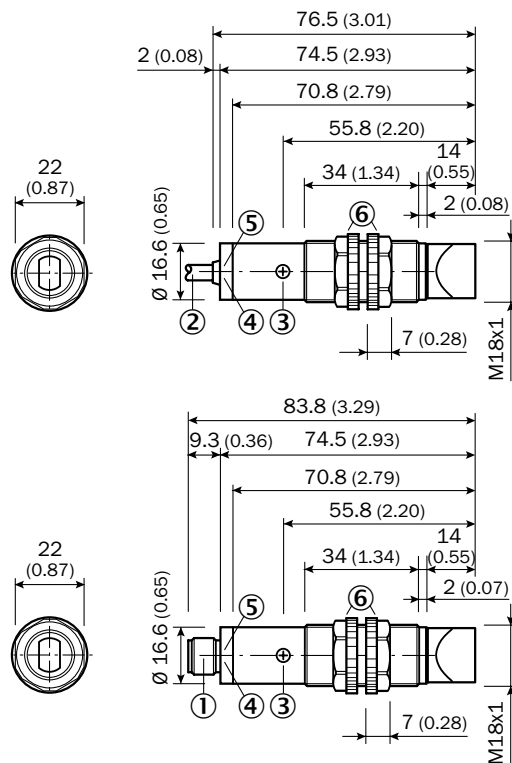
VSE180-2, metal, radial



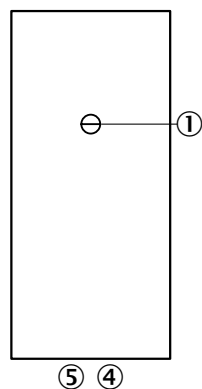
- ① Connector M12, 3-pin / Connector M12, 3-pin
- ② Connection cable 2 m
- ③ Sensitivity control; Potentiometer 270° (only VE)
- ④ LED indicator orange: switching output active (only VE)
- ⑤ LED indicator green, stability indicator (only VE): LED lights continuously = light reception < 0.9/> 1.1; LED off = light reception > 0.9 / < 1.1
- ⑦ Metal housing, fastening nuts (2 x); width across 24

VSE180-2, plastic, axial

- ① Connector M12, 4-pin
- ② Connection cable 2 m
- ③ Sensitivity adjustment 270°
- ④ LED indicator orange
- ⑤ LED indicator green: strength indicator
- ⑥ Fastening nuts (2 x); width across 22, PC

VSE180-2, plastic, radial

- ① Connector M12
- ② Connection cable 2 m
- ③ Sensitivity control; Potentiometer 270° (only VE)
- ④ LED indicator orange: switching output active (only VE)
- ⑤ LED indicator green, stability indicator (only VE): LED lights continuously = light reception < 0.9 / > 1.1; LED off = light reception > 0.9 / < 1.1
- ⑥ Fastening nuts (2 x); width across 22, PC

Adjustments

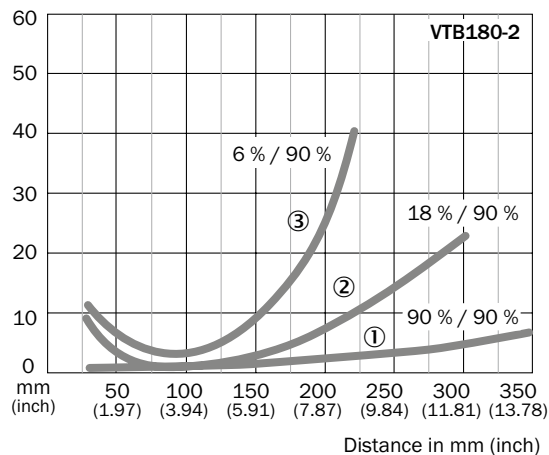
- ③ Sensitivity adjustment 270°
- ④ LED indicator orange: switching output active
- ⑤ LED indicator green

Characteristic curves

Black-white shift

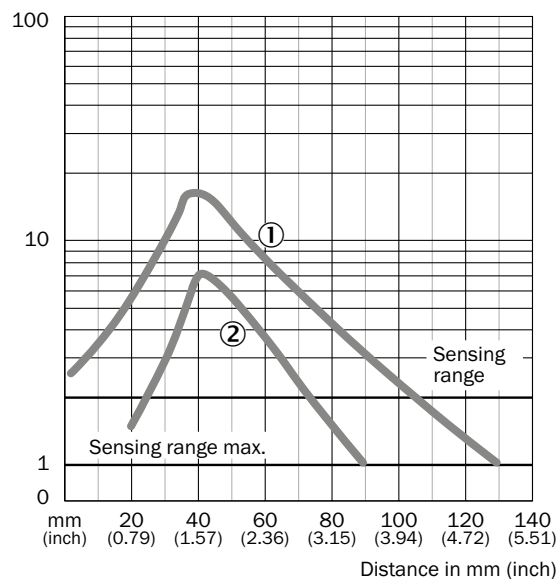
VTB180-2, 350 mm

% of sensing range



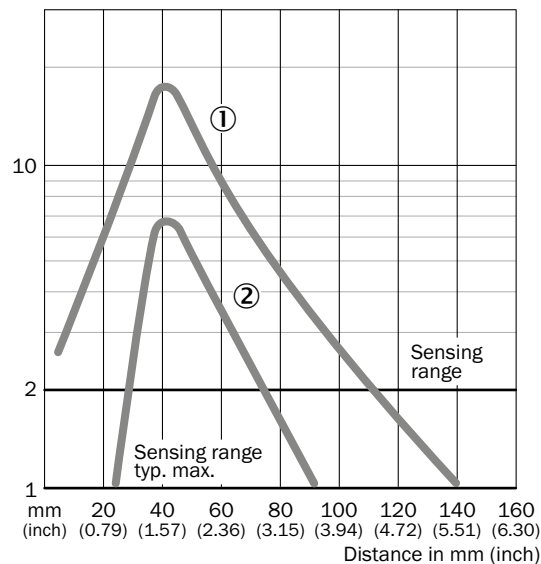
- ① Sensing range on white, 90 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on black, 6 % remission

VTF180-2, 130 mm, radial

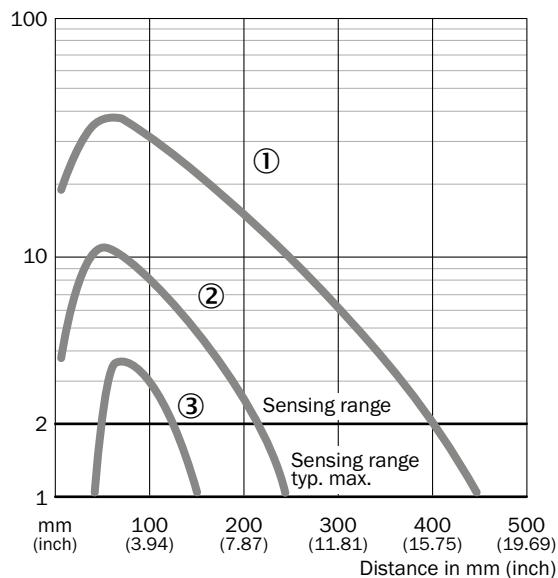


- ① Sensing range on white, 90 % remission
- ② Sensing range on gray, 18 % remission

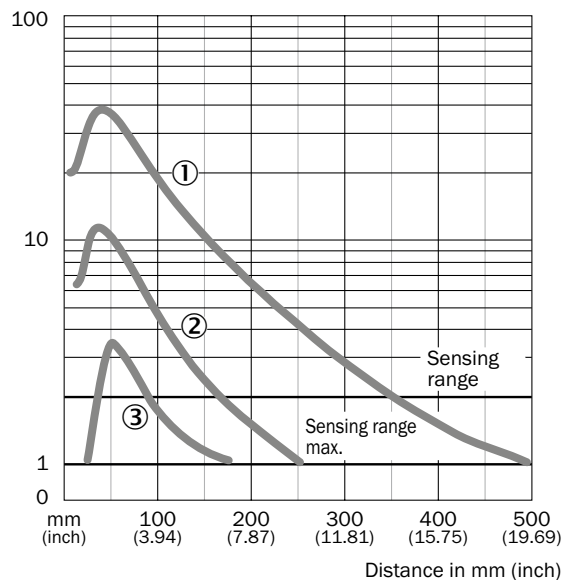
VTF180-2, 140 mm, axial



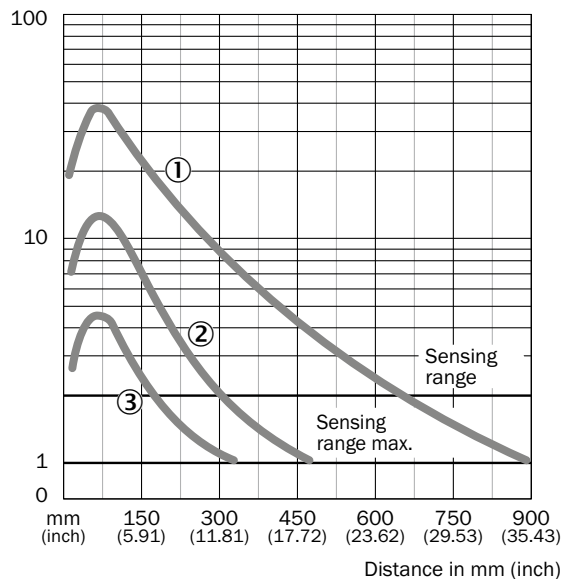
- ① Sensing range on white, 90 % remission
- ② Sensing range on gray, 18 % remission

VTE180-2, 450 mm, radial

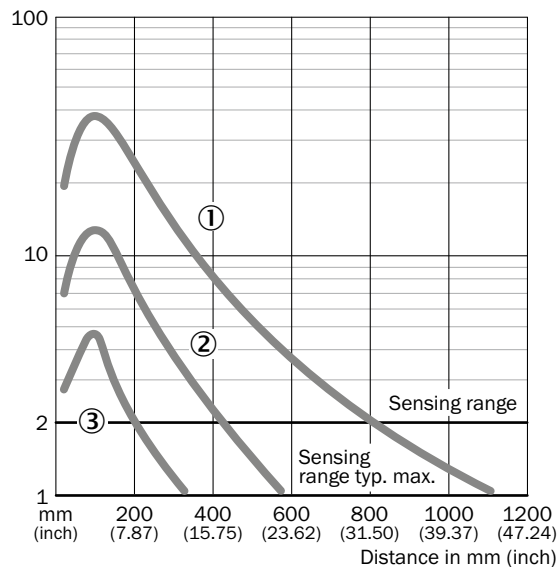
- ① Sensing range on white, 90 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on black, 6 % remission

VTE180-2, 500 mm, axial

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

VTE180-2, 900 mm, radial

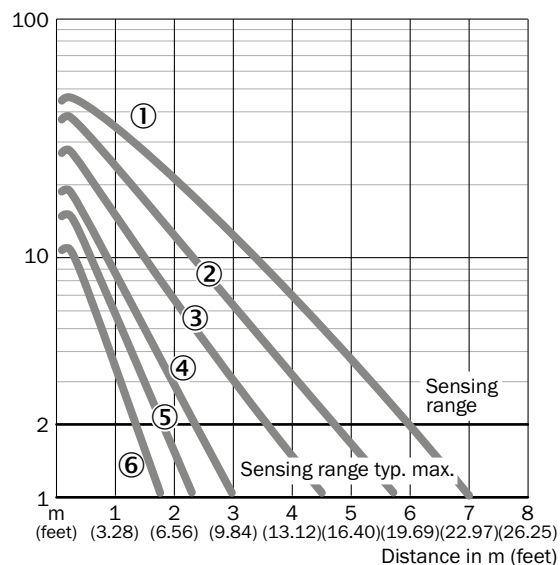
- ① Sensing range on white, 90 % remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on black, 6 % remission

VTE180-2, 1.100 mm, axial

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

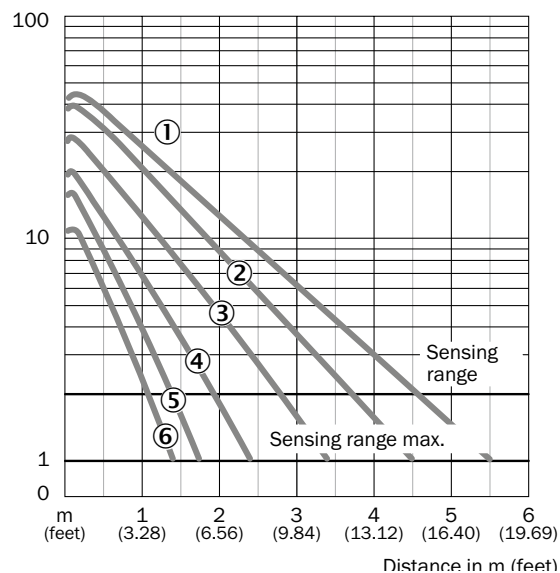
Operating reserve

VL180-2, 7 m, axial



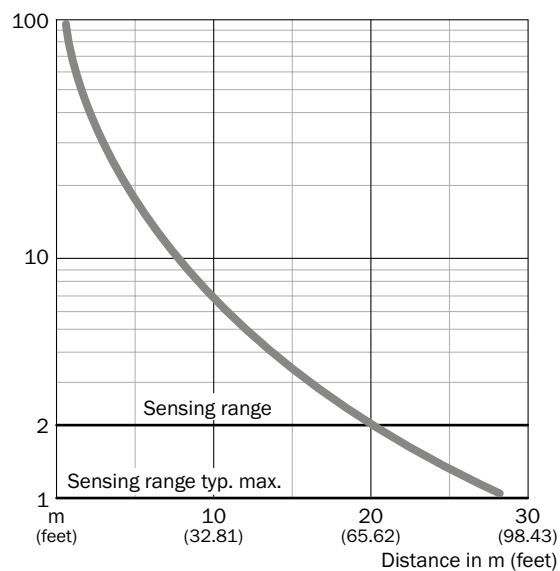
- ① PL80A
- ② P250, PL40A, PL50A, C110A
- ③ PL30A, PL31A
- ④ PL20A
- ⑤ P45
- ⑥ Reflective tape Diamond Grade

VL180-2, 5.5 m, axial

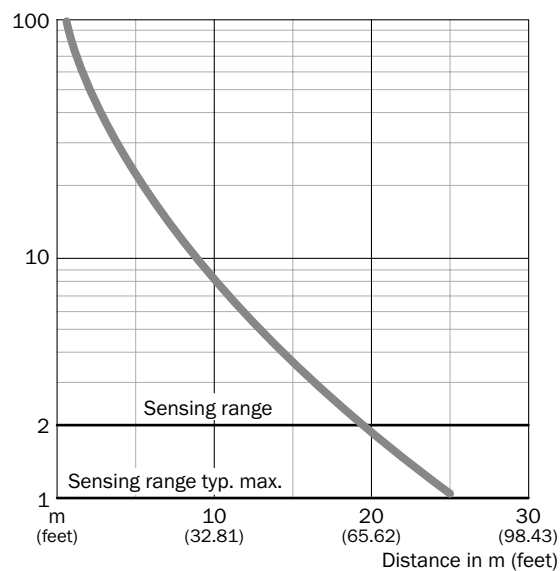


- ① PL80A
- ② P250, PL40A, PL50A, C110A
- ③ PL30A, PL31A
- ④ PL20A
- ⑤ P45
- ⑥ Reflective tape Diamond Grade

VSE180-2, 28 m, axial

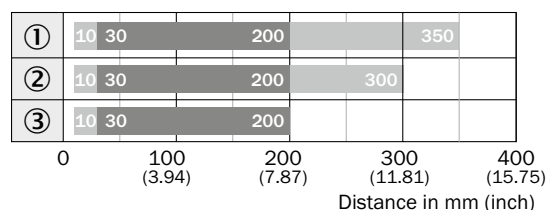


VSE180-2, 25 m, radial



Bar diagrams

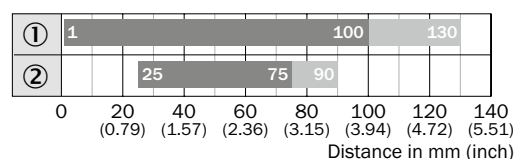
VTB180-2, 350 mm



■ 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

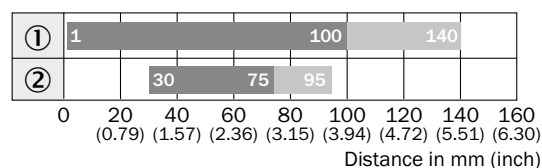
VTF180-2, 130 mm, radial



■ Sensing range ■ Sensing range max.

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

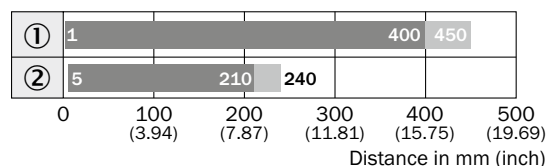
VTF180-2, 140 mm, axial



■ Sensing range ■ Sensing range max.

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

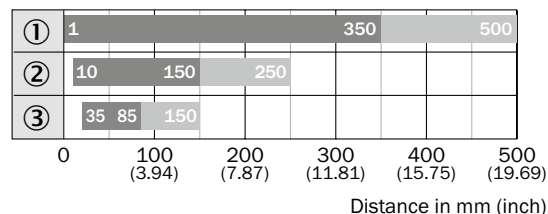
VTE180-2, 450 mm, radial



■ Sensing range ■ Sensing range max.

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

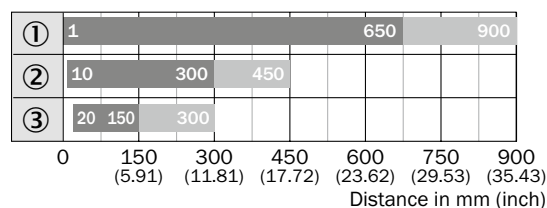
VTE180-2, 500 mm, axial



■ 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

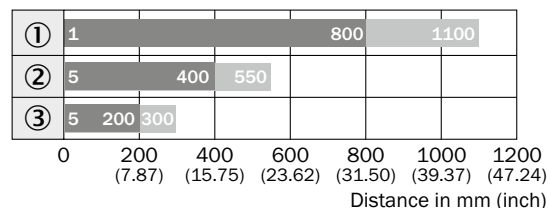
VTE180-2, 900 mm, radial



■ Sensing range ■ Sensing range max.

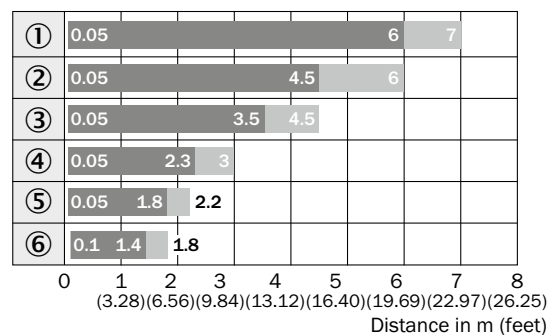
- ① Sensing range on white, 90 % remission
② Sensing range on gray, 18 % remission
③ Sensing range on black, 6 % remission

VTE180-2, 1.100 mm, axial



■ Sensing range ■ Sensing range max.

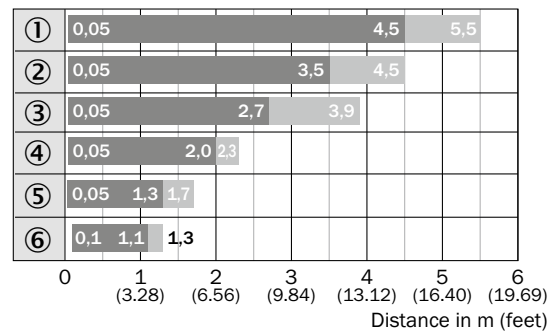
VL180-2, 7 m, axial



■ Sensing range ■ Sensing range max.

- ① PL80A
- ② P250, PL40A, PL50A, C110A
- ③ PL30A, PL31A
- ④ PL20A
- ⑤ P45
- ⑥ Reflective tape Diamond Grade

VL180-2, 5.5 m, radial



■ Sensing range ■ Sensing range max.

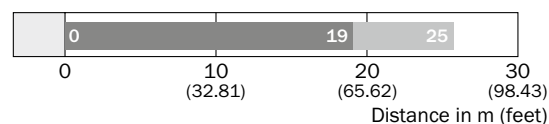
- ① PL80A
- ② P250, PL40A, PL50A, C110A
- ③ PL30A, PL31A
- ④ PL20A
- ⑤ P45
- ⑥ Reflective tape Diamond Grade

VSE180-2, 28 m, axial



■ Sensing range ■ Sensing range typ. max.

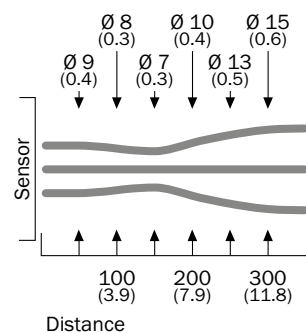
VSE180-2, 25 m, radial



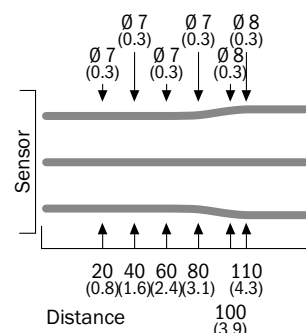
■ Sensing range ■ Sensing range typ. max.

Light spot diameter

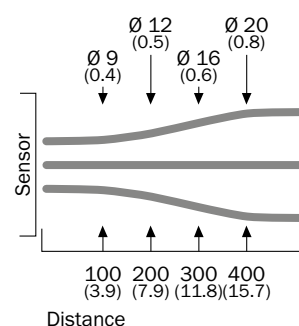
VTB180-2



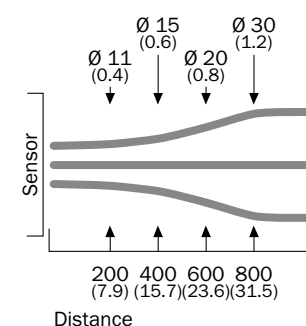
VTF180-2



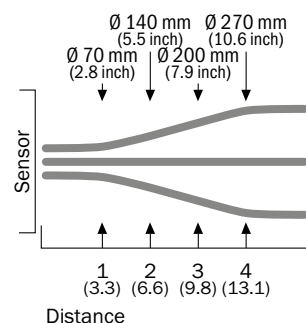
VTE180-2, 400 mm, 500 mm



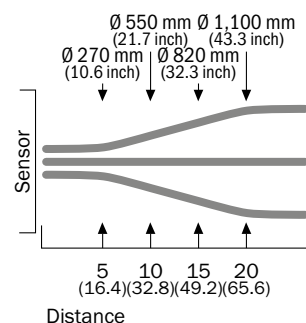
VTE180-2, 900 mm, 1.100 mm



VL180-2

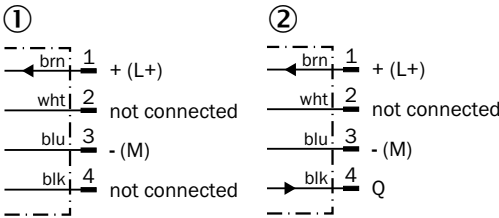


VSE180-2, 28 m, axial

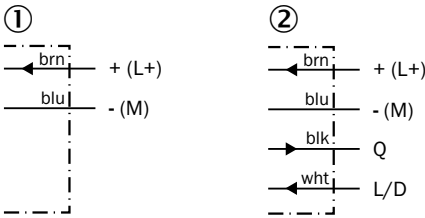


Connection diagram

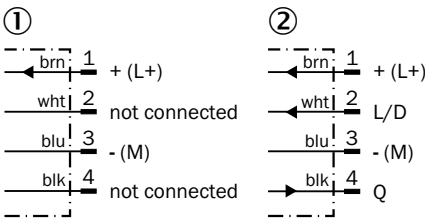
Cd-057



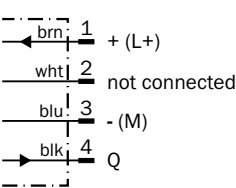
Cd-058



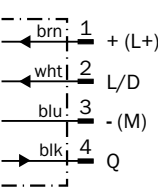
Cd-060



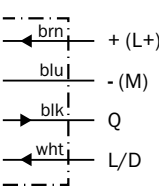
Cd-066



Cd-087



Cd-089



Recommended accessories

Mounting brackets/plates

Mounting plates

Figure	Material	Description	Model name	Part no.
	Stainless steel	Mounting plate for M18 housing	BEF-WG-M18N	5320948
		Mounting bracket	BEF-WN-M18N	5320947

Plug connectors and cables

Connecting cable (female connector-open)

- Cable material: PVC
- Connector material: PVC

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, IP 69K	DOL-1204-G02MN	6028128
			5 m, 4-wire	IP 67, IP 69K	DOL-1204-G05MN	6028130
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-1204-W02MN	6028129
			5 m, 4-wire	IP 67, IP 69K	DOL-1204-W05MN	6028131

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N06N for universal clamp bracket, M18	BEF-KHS-N06N	2051622

Reflectors

Angular

Figure	Material	Description	Model name	Part no.
	Plastic	Chemically resistant, screw connection, 47 mm x 47 mm	P250 CHEM	5321097
	PMMA/ABS	Rectangular, screw connection, 80 mm x 80 mm	PL80A	1003865

Fine triple reflectors

Figure	Material	Description	Model name	Part no.
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
		Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089

Reflective tape

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

Special reflectors

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Antifog, for prevention of moisture fogging on the reflection area, screw connection, 56 mm x 37 mm	PL40A Antifog	5322011
	Plastic	Rectangular, screw connection M3, countersunk screw head, chemical resistant, 56 mm x 37 mm	PL40B-CHEM	5326088
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adapter shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adapter thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

Terminal and alignment brackets**Alignment brackets**

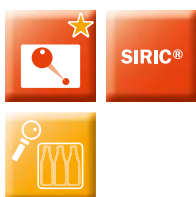
Figure	Material	Description	Model name	Part no.
	Plastic	Mounting bracket with ball-and-socket	BEF-WN-M18-ST02	5312973

Terminal brackets

Figure	Material	Description	Model name	Part no.
	Plastic (PA12), glass-fiber reinforced	Clamping block for round sensors M18, without fixed stop	BEF-KH-M18	2051481
		Clamping block for round sensors M18, with fixed stop	BEF-KHF-M18	2051482
	Stainless steel	Mounting ring	BEF-WN-MH15-2V	4053358

→ For additional accessories, please see page L-861

Improve performance and reduce downtime
with W15 sensors



Additional information

Detailed technical data..... I-767
Ordering information..... I-768
Dimensional drawings I-770
Characteristic curves I-771
Bar diagrams..... I-772
Connection diagram I-773
Recommended accessories..... I-774

Product description

The high-performance W15 photoelectric sensor family is flexible and versatile, combining a modern industrial design with SICK technology for an optimum application solution.

These sensors use SICK's third generation custom ASIC that incorporates OES3 technology to provide exceptional background suppression at an extended range. The W15 series includes four different sensing modes, including the

WTB15, WTE15, WL15 and WSE15 to provide a complete product offering.

An attractive feature of this series is its flexible mounting options. The W15 features 18 mm front mount and side mount through holes. The M18 front mount enables the sensor to be flush mounted with a snap ring, which prevents the disruption of product flow in conveyor systems.

At a glance

- M18 front mount using plastic nut or snap ring, side assembly with 24.1 mm through holes
- Flush mounting possible using the snap ring
- Transparent back cover
- Best-in-class background suppression and red PinPoint LED
- High immunity to ambient light
- Highly visible LED indicators

Your benefits

- Completely compatible with many competitor models, making it easy install and commission
- Flush mounting reduces setup time and prevents obstructions to material flow on conveyor systems
- Clearly visible LED indicators reduce setup time and simplify troubleshooting
- Reliable detection due to best-in-class background suppression that ignores stray background reflections, detects multi-colored/shiny objects and provides high immunity to ambient light
- Customer-specific options reduce material and labor costs

→ www.mysick.com/en/W15

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

	WTB15	WTE15	WL15	WSE15
Sensor principle	Photoelectric proximity sensor		Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Detection principle	Background suppression	Energetic	Standard optics	–
Dimensions (W x H x D)	16.2 mm x 48.5 mm x 31.9 mm			
Housing design (light emission)	Hybrid			
Thread diameter (housing)	M18 x 1			
Sensing range max.	4 mm ... 200 mm ¹⁾	10 mm ... 350 mm ¹⁾	0.035 m ... 5 m ²⁾	0 m ... 5 m
Sensing range	15 mm ... 200 mm	10 mm ... 250 mm	0.035 m ... 3.5 m	0 m ... 3.8 m
Type of light	Visible red light	Infrared light	Visible red light	
Light source ³⁾	PinPoint LED	LED		
Light spot size (distance)	Ø 7 mm (50 mm)	Ø 50 mm (350 mm)	Ø 140 mm (3.5 m)	160 mm (4 m)
Angle of dispersion	–	4.5°	1.5°	
Wave length	650 nm	950 nm	650 nm	
Adjustment	Potentiometer, 5 turns		–	
Time type	–		Time delay off / adjustable via time control (depending on type)	–
Delay time	–		0 s ... 2 s (depending on type)	–

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

	WTB15	WTE15	WL15	WSE15
Supply voltage ¹⁾	10 V DC ... 30 V DC			
Ripple ²⁾	< 5 V _{pp}	≤ 5 V _{pp}		
Power consumption ³⁾	≤ 30 mA			
Output type	PNP, NPN, PNP/NPN (depending on type)			
Output function	Complementary			–
Switching mode	Light/dark-switching;/Light switching/Dark-switching (depending on type)			
Output current I _{max.}	≤ 100 mA			
Response time ⁴⁾	< 0.5 ms	≤ 1.25 ms		≤ 1.4 ms
Switching frequency ⁵⁾	1,000 Hz	400 Hz		350 Hz
Connection type	Male connector/Cable, 2 m ⁶⁾ (depending on type)			
Circuit protection	A ⁷⁾ , B ⁸⁾ , D ⁹⁾			
Protection class ¹⁰⁾	II			
Weight	10 g / 20 g (depending on type)			20 g / 40 g (depending on type)
Polarisation filter	–		✓	–
Housing material	ABS			
Optics material	PMMA			

	WTB15	WTE15	WL15	WSE15
Enclosure rating	IP 66, IP 67	IP 67		
Items supplied	Snap-ring and M18 nut			
Ambient operating temperature	-40 °C ... +60 °C	-25 °C ... +55 °C		
Ambient storage temperature	-40 °C ... +75 °C	-25 °C ... +70 °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⁾ B = inputs and output reverse-polarity protected.

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

¹⁰⁾ Reference voltage: 50 V DC.

Ordering information

Other models available at www.mysick.com/en/W15

WTB15

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Adjustment:** potentiometer, 5 turns

Sensing range max. ¹⁾	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
4 mm ... 200 mm	PNP	Light/dark-switching	Connector M12, 4-pin	Cd-083	WTB15-P2431	1044305
			Cable, 4-wire 2 m PUR	Cd-094	WTB15-P1131	1046284
	NPN	Light/dark-switching	Connector M12, 4-pin	Cd-083	WTB15-N2431	1044306
			Cable, 4-wire 2 m PUR	Cd-094	WTB15-N1131	1046283
	PNP, NPN	Light switching,	Connector M12, 4-pin	Cd-086	WTB15-B2431	1043326
			Cable, 4-wire 2 m PUR	Cd-096	WTB15-B1131	1046282
		Dark-switching	Connector M12, 4-pin	Cd-086	WTB15-A2431	1043325
			Cable, 4-wire 2 m PUR	Cd-096	WTB15-A1131	1046281

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

WTE15

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** energetic
- **Adjustment:** potentiometer, 5 turns

Sensing range max. ¹⁾	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
10 mm ... 350 mm	PNP	Light/dark-switching	Connector M12, 4-pin	Cd-083	WTE15-P2411	1043314
			Cable, 4-wire 2 m PUR	Cd-094	WTE15-P1111	1046148
	NPN	Light/dark-switching	Connector M12, 4-pin	Cd-083	WTE15-N2411	1043313
			Cable, 4-wire 2 m PUR	Cd-094	WTE15-N1111	1046147
	PNP, NPN	Light switching,	Connector M12, 4-pin	Cd-086	WTE15-B2411	1043317
			Cable, 4-wire 2 m PUR	Cd-096	WTE15-B1111	1046278
		Dark-switching	Connector M12, 4-pin	Cd-086	WTE15-A2411	1043316
			Cable, 4-wire 2 m PUR	Cd-096	WTE15-A1111	1046277

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

WL15

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics

Sensing range max. ¹⁾	Output type	Switching mode	Time functions	Connection	Connection diagram	Model name	Part no.
0.035 m ... 5 m	PNP	Light/dark-switching	-	Connector M12, 4-pin	Cd-083	WL15-P2430	1043321
				Cable, 4-wire 2 m PUR	Cd-094	WL15-P1130	1044303
			Time delay off ²⁾	Connector M12, 4-pin	Cd-083	WL15-F2433	1043319
				Cable, 4-wire 2 m PUR	Cd-094	WL15-F1133	1046150
	NPN	Light/dark-switching	-	Connector M12, 4-pin	Cd-083	WL15-N2430	1043320
				Cable, 4-wire 2 m PUR	Cd-094	WL15-N1130	1044304
			Time delay off ²⁾	Connector M12, 4-pin	Cd-083	WL15-E2433	1043318
				Cable, 4-wire 2 m PUR	Cd-094	WL15-E1133	1046149
	PNP, NPN	Light switching, Light switching,	-	Connector M12, 4-pin	Cd-086	WL15-B2430	1043324
				Cable, 4-wire 2 m PUR	Cd-096	WL15-B1130	1046280
		Dark-switching, Dark-switching	-	Connector M12, 4-pin	Cd-086	WL15-A2430	1043323
				Cable, 4-wire 2 m PUR	Cd-096	WL15-A1130	1046279

¹⁾ PL80A.²⁾ Adjustable via time control.

WL15, detecting objects wrapped in film

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics

Sensing range max. ¹⁾	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0.035 m ... 5 m	PNP	Light/dark-switching	Connector M12, 4-pin	Cd-083	WL15-P2430S01	1054623

¹⁾ PL80A.

WSE15

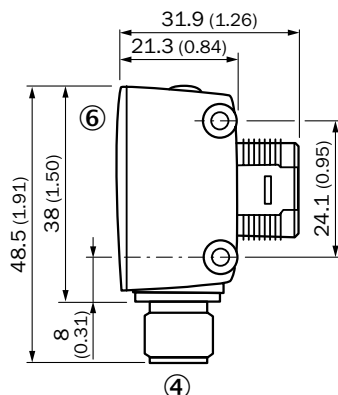
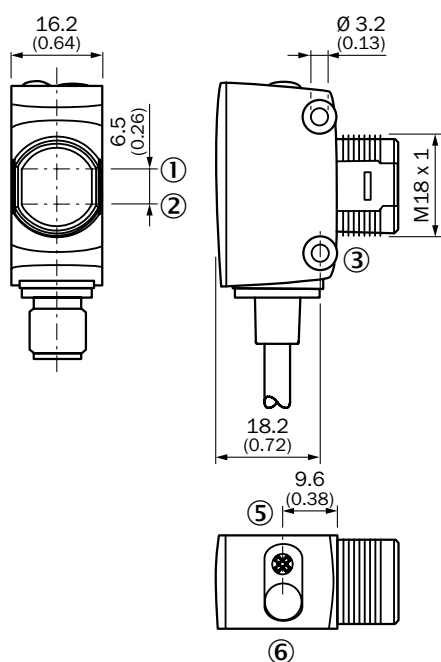
- **Sensor principle:** through-beam photoelectric sensor

Sensing range max.	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0 m ... 5 m	PNP, NPN	Light switching, Light switching,	Connector M12, 4-pin	Cd-215	WSE15-B2430	1043328
			Cable, 4-wire 2 m PUR	Cd-218	WSE15-B1130	1046286
		Dark-switching, Dark-switching	Connector M12, 4-pin	Cd-215	WSE15-A2430	1043327
			Cable, 4-wire 2 m PUR	Cd-218	WSE15-A1130	1046285

Dimensional drawings

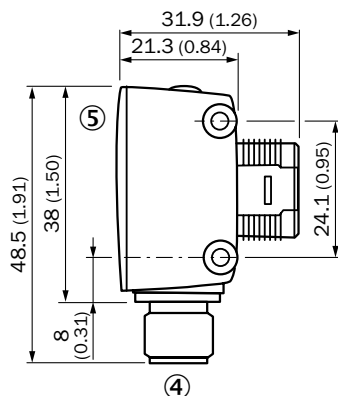
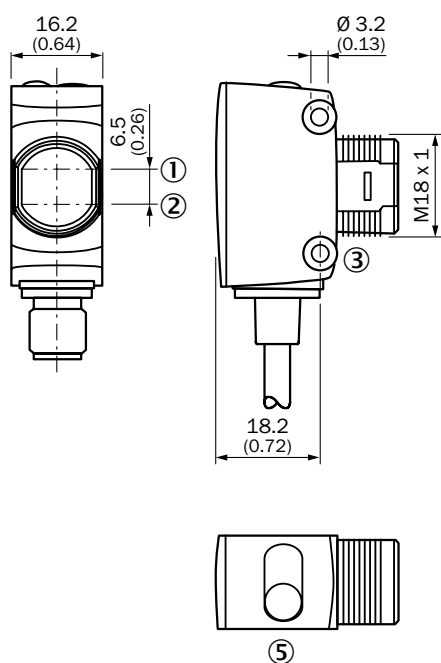
Dimensions in mm (inch)

WTE15, WTB15



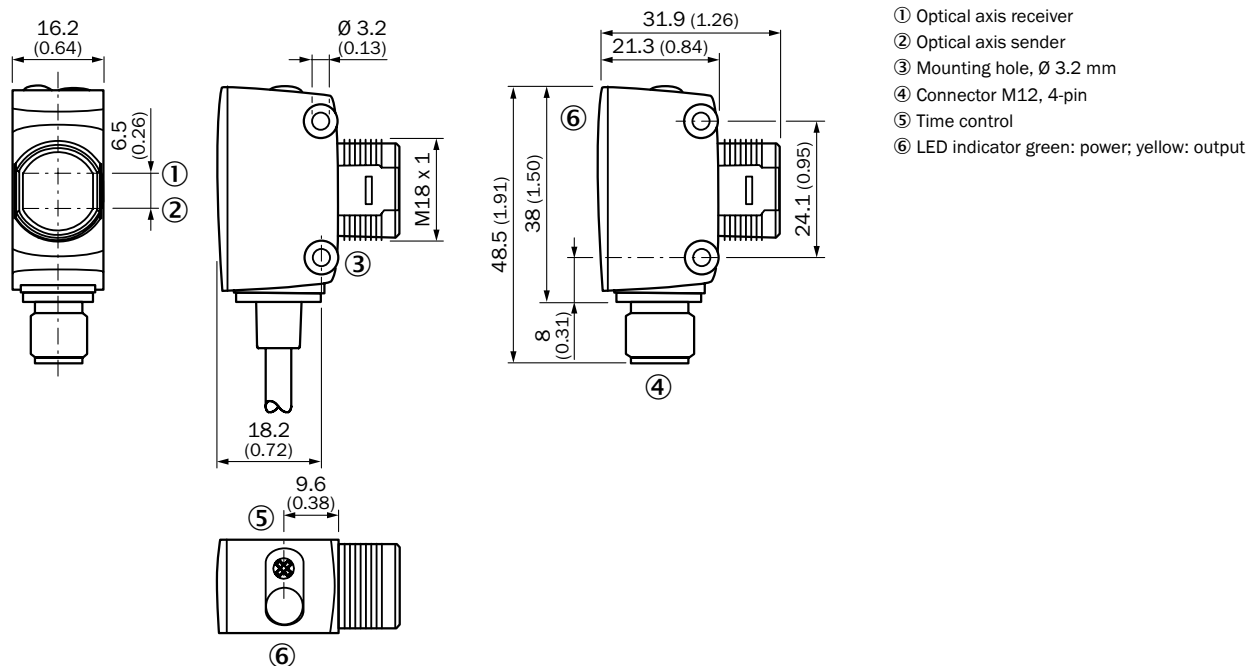
- ① Optical axis receiver
- ② Optical axis sender
- ③ Mounting hole, Ø 3.2 mm
- ④ Connector M12, 4-pin
- ⑤ Potentiometer
- ⑥ LED indicator green: power; yellow: output

WL15, WSE15, without time functions



- ① Optical axis, receiver
- ② Optical axis, sender
- ③ Mounting hole, Ø 3.2 mm
- ④ Connector M12, 4-pin
- ⑤ LED indicator green: power; yellow: output

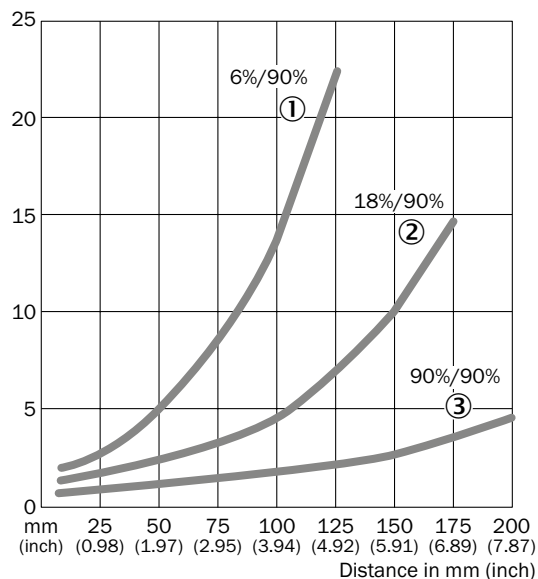
WL15, WSE15, with time functions



Characteristic curves

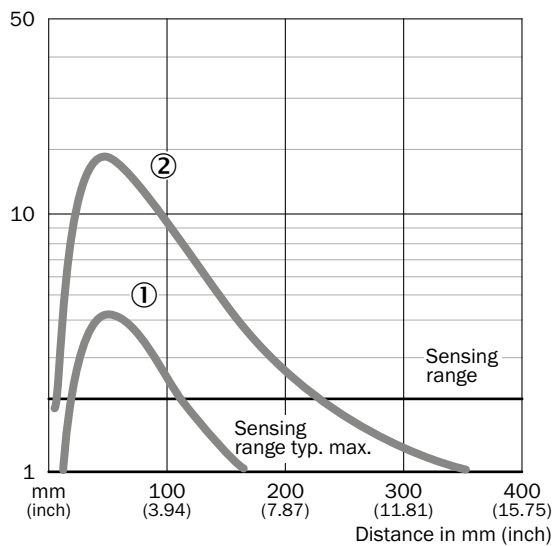
Black-white shift

WTB15



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

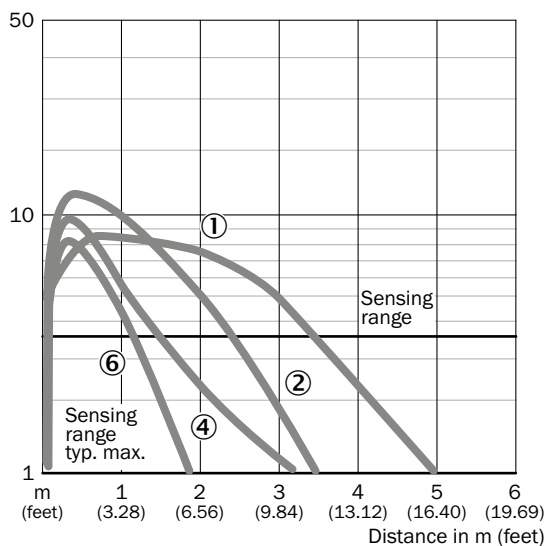
WTE15



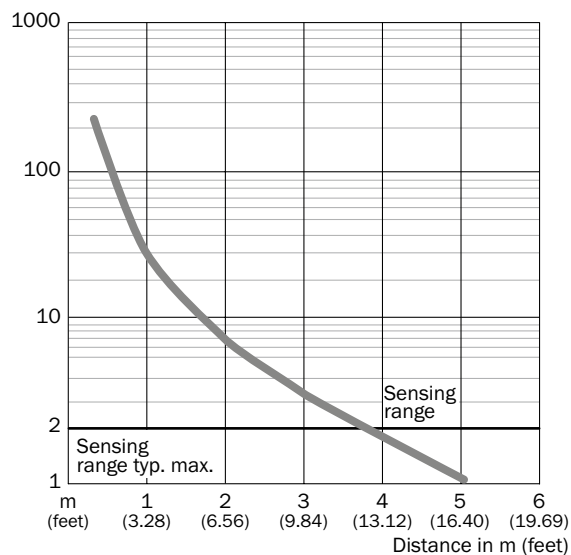
- ① Sensing range on gray, 18 % remission
- ② Sensing range on white, 90 % remission

Operating reserve

WL15

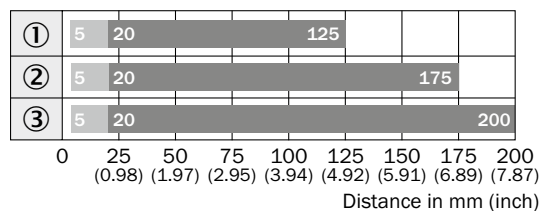


WSE15



Bar diagrams

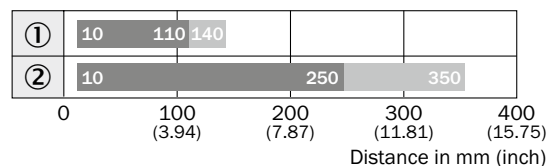
WTB15



■ Sensing range ■ Sensing range max.

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

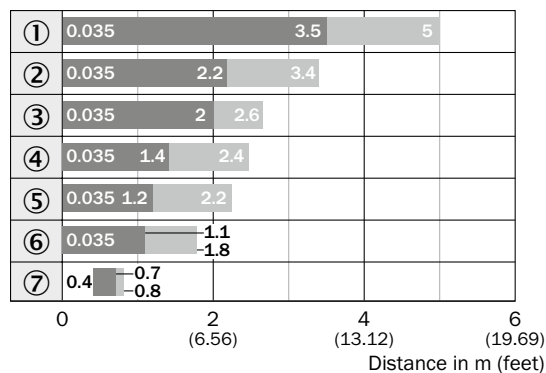
WTE15



■ Sensing range ■ Sensing range max.

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

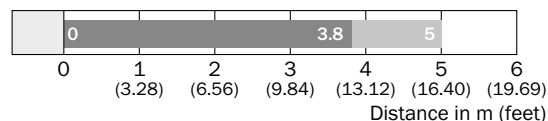
WL15



■ Sensing range ■ Sensing range max.

- ① PL80A
② P250
③ C110A
④ PL50A, PL40A
⑤ PL30A, PL31A
⑥ PL20A
⑦ Reflective tape REF-Plus

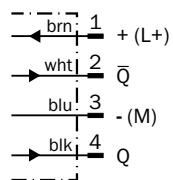
WSE15



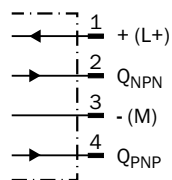
■ Sensing range ■ Sensing range typ. max.

Connection diagram

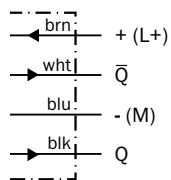
Cd-083



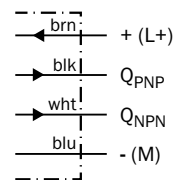
Cd-086



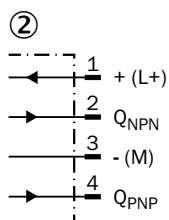
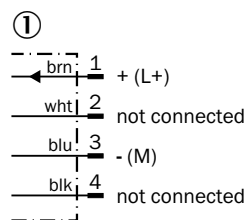
Cd-094



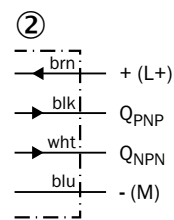
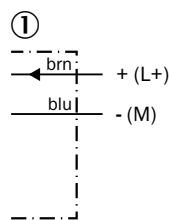
Cd-096



Cd-215



Cd-218



Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Mounting plate for M18 sensors	BEF-WG-M18	5321870
		Mounting bracket, M18 thread	BEF-WN-M18	5308446

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 plated steel (sheet), Diecast zinc (clamp)	Plate N06 for universal clamp bracket	BEF-KHS-N06	2051612

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

Flexible, low-cost presence detection solutions with clear housings



Product description

The Z photoelectric sensor is a low-cost sensor for standard applications in conveyor lines, packaging machines, bin controls and hands-free systems. The sensor's transparent housing provides 360° status indication and has a straight cable outlet for easy connection. The Z1 and Z2 are offered in many differ-

ent sensing ranges and are available in three variants: retro-reflective, background suppression and energetic. The eyeball-shaped housing of the Z3 allows for infinite adjustability and the indicator LED to be seen from 360° around the device.

At a glance

- Economical design with background suppression, retro-reflective or energetic variants available; non-adjustable
- Compact, transparent housing with 360° status indication
- M18 front mount and 24-25.4 mm slotted side through holes compatible with competitor devices
- Spherical eyeball-style housing with 24 mm ball mount allows for infinite adjustability (depending on type)
- Connection system: straight or angled cable outlet (60°) or M12 or M8 connector outlet
- IP 67 enclosure rating for harsh environments

Your benefits

- High performance at a low cost
- Clear housing provides highly visible 360° of status indication, which simplifies troubleshooting
- Simple and unique mounting options lower installation costs
- Small size fits applications with limited space
- Customization options reduce material and labor costs
- Compatibility with competitor products for easy integration into existing systems



Additional information

Detailed technical data. I-777
Ordering information. I-778
Dimensional drawings I-780
Characteristic curves I-781
Bar diagrams. I-781
Connection diagram I-782
Recommended accessories. . . . I-782

→ www.mysick.com/en/Z-Sensor

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

	ZT1	ZT2	ZL1	ZL2	ZL3
Sensor principle	Photoelectric proximity sensor		Photoelectric retro-reflective sensor		
Detection principle	Background suppression / energetic (depending on type)		Standard optics		
Dimensions (W x H x D)	13.6 mm x 41.9 mm x 31.7 mm 13.6 mm x 45.2 mm x 31.7 mm 13.6 mm x 34.8 mm x 21.9 mm (depending on type)				
Housing design (light emission)	Hybrid				
Thread diameter (housing)	M18 x 1			–	
Sensing range max.	0 mm ... 155 mm ¹⁾ (depending on type)		0.1 m ... 4.8 m ²⁾		
Sensing range	0 mm ... 155 mm (depending on type)		0.1 m ... 3 m ²⁾		
Type of light	Infrared light		Visible red light		
Light source ³⁾	LED				
Wave length	880 nm		660 nm		

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

	ZT1	ZT2	ZL1	ZL2	ZL3
Supply voltage ¹⁾	10 V DC ... 30 V DC				
Ripple ²⁾	< 5 V _{pp}				
Power consumption ³⁾	< 20 mA				
Output type	PNP/NPN (depending on type)		PNP	PNP/NPN (depending on type)	
Switching mode	Light switching / Dark-switching (depending on type)				
Output current I _{max.}	50 mA				
Switching frequency ⁴⁾	200 Hz		400 Hz		
Connection type	Cable with connector, M8, 150 mm ⁵⁾ Cable with connector, M12, 150 mm ⁵⁾ Cable, 2 m ⁵⁾ (depending on type)				
Circuit protection	A ⁶⁾ , D ⁷⁾				
Protection class ⁸⁾	III				
Polarisation filter	–		✓		
Housing material	Glass fiber reinforced ABS plastic				
Enclosure rating	IP 67				
Items supplied	Mounting nut M18				–
Ambient operating temperature	–25 °C ... +50 °C				
Ambient storage temperature	–40 °C ... +70 °C				

¹⁾ Limit values.

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

³⁾ Without load.

⁴⁾ With light/dark ratio 1:1.

⁵⁾ Do not bend below 0 °C.

⁶⁾ A = V_S connections reverse-polarity protected.

⁷⁾ D = outputs overcurrent and short-circuit protected.

⁸⁾ Reference voltage: 50 V DC.

Ordering information

Other models available at www.mysick.com/en/Z-Sensor

ZT1

- **Sensor principle:** photoelectric proximity sensor
- **Type of light:** infrared light
- **Switching mode:** light switching

Detection principle	Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
Background suppression	0 mm ... 50 mm	10.5 mm (50 mm)	PNP	Cable with connector M8, 4-pin 150 mm	Cd-067	ZT1-P3231	1045595
				Cable with connector M12, 4-pin 150 mm	Cd-067	ZT1-P3221	1045579
			NPN	Cable, 3-wire 2 m PVC	Cd-043	ZT1-P3215	1045563
				Cable, 3-wire 2 m PVC	Cd-043	ZT1-N3215	1045562
Energetic	1 mm ... 100 mm	20 mm (100 mm)	PNP	Cable with connector M12, 4-pin 150 mm	Cd-067	ZT1-P4221	1045583
				Cable, 3-wire 2 m PVC	Cd-043	ZT1-P4215	1045567
	5 mm ... 155 mm	31 mm (100 mm)	PNP	Cable with connector M8, 4-pin 150 mm	Cd-067	ZT1-P5231	1045591
				Cable with connector M12, 4-pin 150 mm	Cd-067	ZT1-P5221	1045575
				Cable, 3-wire 2 m PVC	Cd-043	ZT1-P5215	1045559

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

ZT2

- **Sensor principle:** photoelectric proximity sensor
- **Type of light:** infrared light
- **Switching mode:** light switching

Detection principle	Sensing range max. ¹⁾	Light spot size (distance)	Output type	Connection	Connection diagram	Model name	Part no.
Background suppression	0 mm ... 50 mm	10.5 mm (50 mm)	PNP	Connector M8, 4-pin	Cd-067	ZT2-P3238	1045489
				Connector M12, 4-pin	Cd-067	ZT2-P3228	1045473
				Cable, 3-wire 2 m PVC	Cd-043	ZT2-P3215	1045408
			NPN	Cable, 3-wire 2 m PVC	Cd-043	ZT2-N3215	1045407
Energetic	1 mm ... 100 mm	20 mm (100 mm)	PNP	Connector M8, 4-pin	Cd-067	ZT2-P4238	1045493
				Connector M12, 4-pin	Cd-067	ZT2-P4228	1045477
	5 mm ... 155 mm	31 mm (100 mm)	PNP	Connector M8, 4-pin	Cd-067	ZT2-P5238	1045485
				Connector M12, 4-pin	Cd-067	ZT2-P5228	1045469

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

ZL1

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Type of light:** visible red light

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0.1 m ... 4.8 m	125 mm (1 m)	PNP	Light switching	Cable with connector M8, 4-pin 150 mm	Cd-067	ZL1-P2431	1045505
				Cable with connector M12, 4-pin 150 mm	Cd-067	ZL1-P2421	1045501
				Cable, 3-wire 2 m PVC	Cd-043	ZL1-P2415	1045497
		Dark-switching		Cable with connector M8, 4-pin 150 mm	Cd-067	ZL1-F2431	1045506
				Cable with connector M12, 4-pin 150 mm	Cd-067	ZL1-F2421	1045502
				Cable, 3-wire 2 m PVC	Cd-043	ZL1-F2415	1045498

¹⁾ PL80A.

ZL2

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Type of light:** visible red light

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0.1 m ... 4.8 m	125 mm (1 m)	PNP	Dark-switching	Cable, 3-wire 2 m PVC	Cd-043	ZL2-F2415	1045389
				Connector M8, 4-pin	Cd-067	ZL2-F2438	1045385
				Connector M12, 4-pin	Cd-067	ZL2-F2428	1045371
		NPN	Dark-switching	Cable, 3-wire 2 m PVC	Cd-043	ZL2-E2415	1045390
				Connector M12, 4-pin	Cd-067	ZL2-E2428	1045372

¹⁾ PL80A.

ZL3

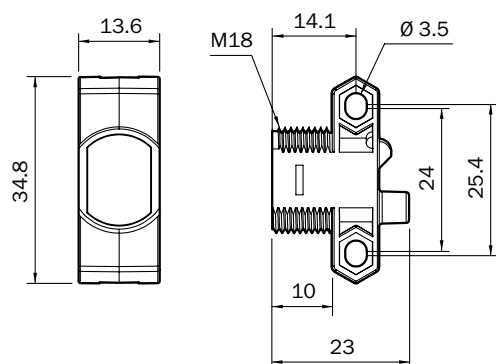
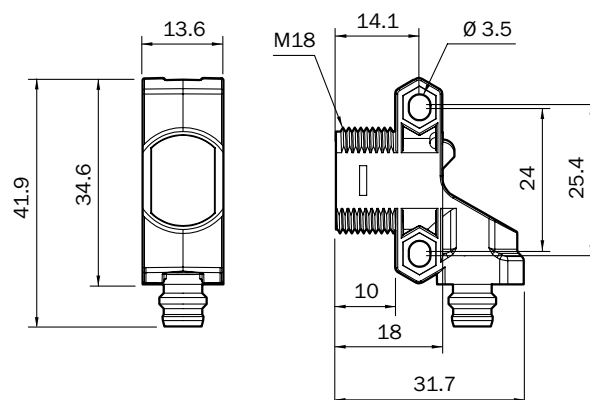
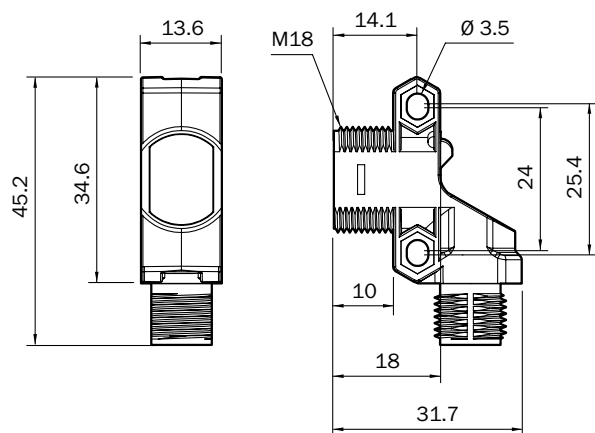
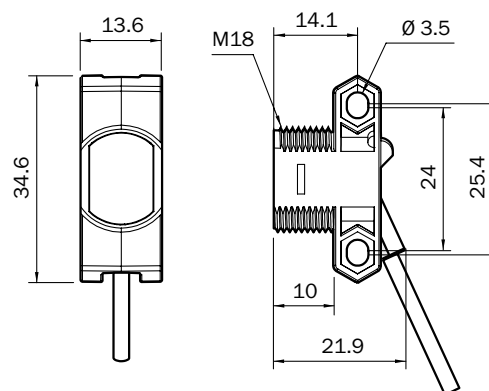
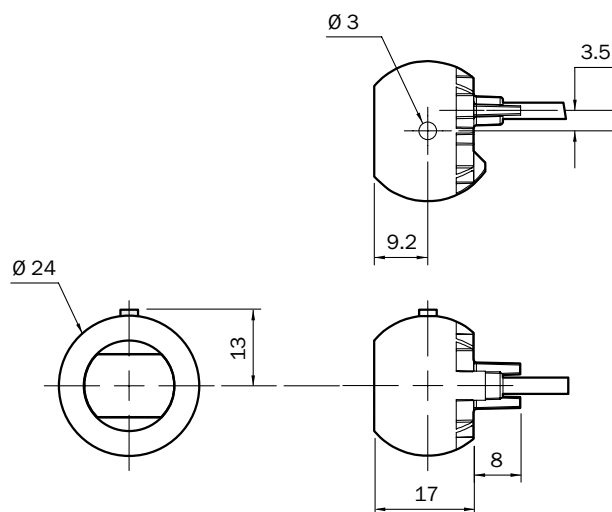
- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Type of light:** visible red light

Sensing range max. ¹⁾	Light spot size (distance)	Output type	Switching mode	Connection	Connection diagram	Model name	Part no.
0.1 m ... 4.8 m	125 mm (1 m)	PNP	Dark-switching	Cable with connector M8, 4-pin 150 mm	Cd-067	ZL3-F2431	1045539
				Cable with connector M12, 4-pin 150 mm	Cd-067	ZL3-F2421	1045535
				Cable, 3-wire 2 m PVC	Cd-043	ZL3-F2415	1045531
		Light switching		Cable, 3-wire 2 m PVC	Cd-043	ZL3-P2415	1045530
		NPN	Dark-switching	Cable with connector M8, 4-pin 150 mm	Cd-067	ZL3-E2431	1045540
				Cable with connector M12, 4-pin 150 mm	Cd-067	ZL3-E2421	1045536

¹⁾ PL80A.

Dimensional drawings

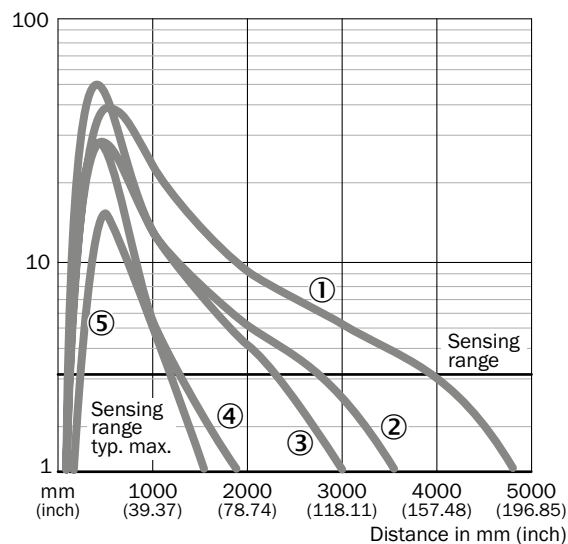
Dimensions in mm (inch)

ZT1, ZL1**ZT2, ZL2, Connector M8, 4-pin****ZT2, ZL2, Connector M12, 4-pin****ZT2, ZL2, cable****ZL3**

Characteristic curves

Operating reserve

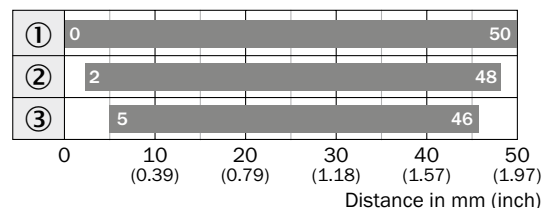
ZL1, ZL2, ZL3



- ① PL80A
- ② P250
- ③ PL40A
- ④ PL20A
- ⑤ Reflective tape REF-Plus

Bar diagrams

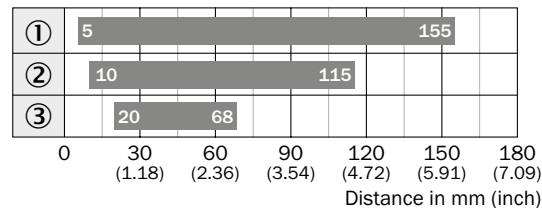
ZT1, 50 mm



■ 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

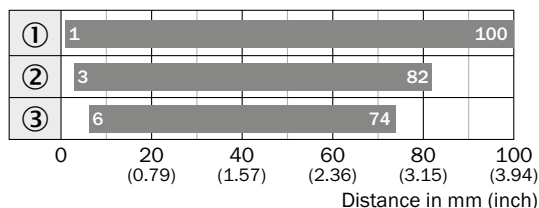
ZT1, 155 mm



■ 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

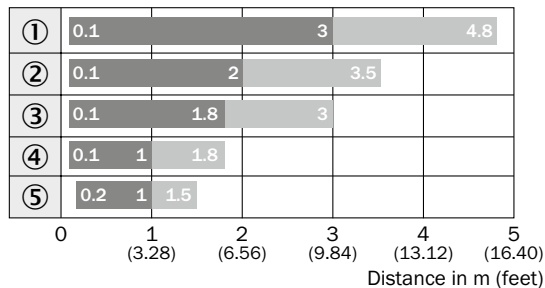
ZT1, 100 mm



■ 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

ZL1, ZL2, ZL3

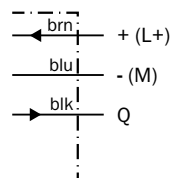


■ Sensing range ■ Sensing range max.

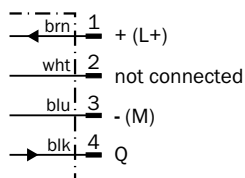
- ① PL80A
- ② P250
- ③ PL40A
- ④ PL20A
- ⑤ Reflective tape REF-Plus

Connection diagram

Cd-043



Cd-067



Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Mounting plate for M18 sensors	BEF-WG-M18	5321870
		Mounting bracket, M18 thread	BEF-WN-M18	5308446

Plug connectors and cables

Connecting cable (female connector-open)

- Cable material: PVC

Figure	Connection type head A	Connection type head B	Connecting cable	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	PVC	IP 67, IP 69K	DOL-0804-G02M	6009870
			5 m, 4-wire	PVC	IP 67, IP 69K	DOL-0804-G05M	6009872
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	TPU	IP 67	DOL-1204-G02M	6009382
			5 m, 4-wire	TPU	IP 67	DOL-1204-G05M	6009866

Female connector (ready to assemble)

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Female connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0803-G	7902077
	Female connector, M8, 3-pin, angled	Pin penetration	PBT	IP 67	DOS-0803-W	7902078

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N06 for universal clamp bracket	BEF-KHS-N06	2051612

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

Fits flexibly into the narrowest corners

When installation space is extremely limited or the objects to be detected are tiny, fiber-optic sensors are the ideal solution. If it is necessary for even higher requirements to be fulfilled, such as sensing range, temperature resistance, material durability or a flexible mounting process, the intelligent combination of sensors and fiber-optic cables can provide the perfect solution. A wide range of fiber-optic cables with application-specific optical heads ensure that every need is met.

Your benefits

- Reliable and accurate detection of the smallest objects thanks to innovative, microcontroller-supported electronics
- Immune to EMC, high temperatures or chemicals, as the electronic evaluation system is fitted separately from the fiber-optic cable head
- Space-saving mounting even in confined spaces
- Multiple setting options permit solutions for practically any application
- Light weight, suitable for use on a robot arm
- Universal application possibilities due to diversity of fiber-optic cables





Fiber-optic sensors and fibers

General information	J-786
Product family overview	J-788



WLL170-2	J-790
Versatility for standard applications	



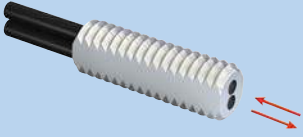
WLL180T	J-798
High-performance fiber-optic sensor with world's fastest response time	



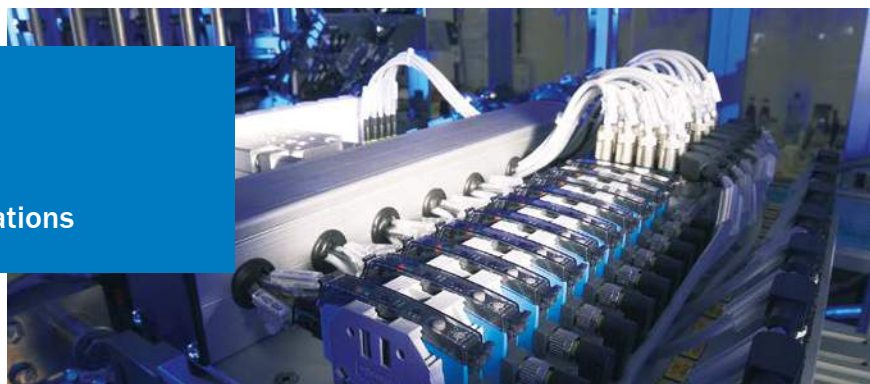
LL3	J-804
A wide variety of solutions to your most challenging applications: SICK's fiber-optic cables	

Product family overview

			
		WLL170-2	
		Versatility for standard applications	
Technical data overview			
Housing material	Plastic		
Type of light	Visible red light / Green light		
Enclosure rating	IP 66		
Response time	≤ 0.25 ms, ≤ 50 µs		
Switching mode	Light/dark-switching		
Indication	LED		
At a glance			
	• Rapid response time (50 µs) • Switching threshold adjustment via potentiometer, or teach-in via button or cable • Four different teach-in modes • Simple installation • Red or green LED emitter		
Detailed information		→ J-790	

			
WLL180T		LL3	
High-performance fiber-optic sensor with world's fastest response time		A wide variety of solutions to your most challenging applications: SICK's fiber-optic cables	
	Plastic	-	
	Visible red light / Infrared light	-	
	IP 50	-	
	≤ 2 ms, ≤ 8 ms, ≤ 16 μs, ≤ 70 μs, ≤ 250 μs	-	
	Light/dark-switching	-	
	Display	-	
	• Selectable response time up to 16 μs • Sensing range up to 20 m (Through-beam system); up to 1400 mm (proximity system) • Bus-compatible with anti-interference • 2 x 4-digit display • Adjustable hysteresis • Rotatable display screen • High-resolution signal processing • Programmable time delays	• Very large selection of plastic and glass fiber-optic cables. • Fiber-optic cables resistant to chemicals and high temperature • Threaded and smooth sleeves, bands of light (array), 90° reflection versions available • Focused optics • Proximity and through-beam versions available • Plastic , protective metal or Teflon sheathing available	
	→ J-798	→ J-804	

Versatility for standard applications



Product description

The WLL170-2 fiber-optic photoelectric sensor family features a standard operating system that is especially suitable for basic applications, but can be used when rapid response times are crucial. There are several variants. The WLL170(T) version is optimized for a number of key applications, such as detection of very small objects, colored marks, or transparent objects. The WLL170T-2 is a teach-in version where the switching threshold can be set either

automatically by pressing a button or via a cable. In contrast, the WLL170-2 has a manual switching threshold adjustment via a potentiometer. Both models are available in a high-speed version with a switching frequency of 10 kHz for extremely fast response times. For optimum detection of color contrasts, you can choose between devices with a red or green LED emitter. Detection tasks are handled securely and reliably using the LL3 series of fiber-optic cables.

At a glance

- Rapid response time (50 µs)
- Switching threshold adjustment via potentiometer, or teach-in via button or cable
- Four different teach-in modes
- Simple installation
- Red or green LED emitter

Your benefits

- Reliable, rapid process detection
- Low installation costs due to short commissioning time
- Flexible teach-in modes allow the sensor to be customized according to the specific application
- Emitted light ideal for color or contrast detection
- Easy programming via simple potentiometer and switch adjustment

Additional information

Detailed technical data.....	J-791
Ordering information.....	J-792
Dimensional drawings	J-793
Adjustments	J-794
Connection diagram	J-795
Function diagram	J-795
Recommended accessories.....	J-795

→ www.mysick.com/en/WLL170-2

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

	WLL170-2	WLL170T-2
Sensor principle	Fiber-optic photoelectric sensor	
Dimensions (W x H x D)	10.5 mm x 35.5 mm x 83.7 mm	
Housing design (light emission)	Rectangular	
Sensing range max.	0 mm ... 4,000 mm, through-beam system ¹⁾ (depending on type)	0 mm ... 3,500 mm, through-beam system ¹⁾ (depending on type)
Sensing range	0 mm ... 160 mm, proximity system ²⁾ 0 mm ... 700 mm, through-beam system ³⁾ (depending on type)	0 mm ... 160 mm, proximity system ²⁾ 0 ... 700 mm, through-beam system ³⁾ (depending on type)
Type of light	Visible red light/Green light (depending on type)	
Light source ⁴⁾	LED	
Wave length		
Visible red light	660 nm	
Green light	520 nm	525 nm
Teach-in	Potentiometer, 10-turn ⁵⁾	Teach-in-button, cable
Time type	Off-delayed	
Delay time	Selectable by sliding switch: ≤ 40 ms	
Indication	LED	

¹⁾ LL3-TB02 and tip adapter LL3-TA01.

²⁾ Objects to be sensed with 90% reflectivity (based on DIN 5033 white standard). Sensing range depends on fiber-optic cable.

³⁾ LL3-tB01.

⁴⁾ Average service life of 100,000 h at T_A = +25 °C.

⁵⁾ Scale 270 °.

Mechanics/electronics

	WLL170-2	WLL170T-2
Supply voltage ¹⁾	10 V DC ... 30 V DC	
Ripple ²⁾	10 %	
Power consumption ³⁾	≤ 30 mA	
Output type	PNP, open collector/NPN, open collector (depending on type)	
Switching mode	Light/dark-switching (selectable via light/dark selector)	
Output current I_{max.}	≤ 100 mA	
Response time	≤ 0.25 ms ⁴⁾ ≤ 50 μs ⁴⁾ (depending on type)	
Switching frequency ⁵⁾		
Response time ≤ 0,25 ms ⁴⁾	2,000 Hz	
Response time ≤ 50 μs ⁴⁾	10,000 Hz	
Connection type	Cable, 2 m ⁶⁾ /Male connector, M8 (depending on type)	
Circuit protection	A ⁷⁾ , B ⁸⁾ , C ⁹⁾ , D ¹⁰⁾	
Protection class	III	

	WLL170-2	WLL170T-2
Housing material	ABS/PC	ABS
Enclosure rating ¹¹⁾	IP 66	
Ambient operating temperature	-25 °C ... +55 °C	
Ambient storage temperature	-40 °C ... +70 °C	

¹⁾ Limit values.

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⁾ B = inputs and output reverse-polarity protected.

⁹⁾ C = interference suppression.

¹⁰⁾ D = outputs overcurrent and short-circuit protected.

¹¹⁾ With correctly attached fibre-optic cable LL3 and closed protection hood.

Ordering information

Other models available at www.mysick.com/en/WLL170-2

WLL170-2

- **Adjustment:** Potentiometer, 10-turn (Scale 270°.)

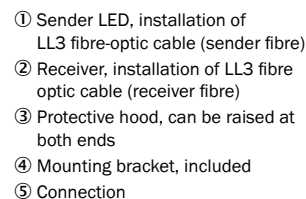
Type of light	Response time	Sensing range max. ¹⁾	Switching mode	Connection	Connection diagram	Model name	Part no.
Visible red light	≤ 0.25 ms	0 mm ... 4,000 mm, through-beam system	PNP	Cable, 3-wire, 2 m	Cd-043	WLL170-2P132	6029511
				Male connector, M8, 3-pin	Cd-045	WLL170-2P330	6029513
				Male connector, M8, 4-pin	Cd-066	WLL170-2P430	6029514
			NPN	Cable, 3-wire, 2 m	Cd-043	WLL170-2N132	6029515
				Male connector, M8, 3-pin	Cd-045	WLL170-2N330	6029517
				Male connector, M8, 4-pin	Cd-066	WLL170-2N430	6029518
Green light	≤ 0.25 ms	0 mm ... 1,700 mm, through-beam system	PNP	Cable, 3-wire, 2 m	Cd-043	WLL170-2P192	6029519
				Male connector, M8, 3-pin	Cd-045	WLL170-2P390	6029521
				Male connector, M8, 4-pin	Cd-066	WLL170-2P490	6029522
			NPN	Cable, 3-wire, 2 m	Cd-043	WLL170-2N192	6029523
				Male connector, M8, 3-pin	Cd-045	WLL170-2N390	6029525
				Male connector, M8, 4-pin	Cd-066	WLL170-2N490	6029526
Visible red light	≤ 50 μs	0 mm ... 1,600 mm, through-beam system	PNP	Cable, 3-wire, 2 m	Cd-043	WLL170-2P162	6029527
				Male connector, M8, 3-pin	Cd-045	WLL170-2P360	6029529
				Male connector, M8, 4-pin	Cd-066	WLL170-2P460	6029530
			NPN	Cable, 3-wire, 2 m	Cd-043	WLL170-2N162	6029531
				Male connector, M8, 3-pin	Cd-045	WLL170-2N360	6029533
				Male connector, M8, 4-pin	Cd-066	WLL170-2N460	6029534

¹⁾ LL3-TB02 and tip adapter LL3-TA01.

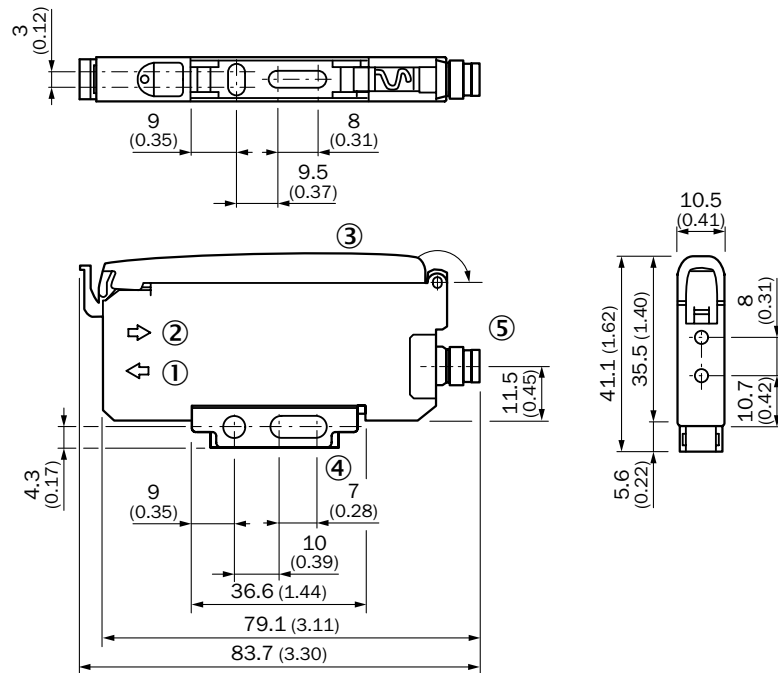
Type of light	Response time	Sensing range max. ¹⁾	Switching mode	Adjustment	Connection	Con- nection diagram	Model name	Part no.
Visible red light	≤ 0.25 ms	0 mm ... 3,500 mm, through- beam system	PNP	Teach-in button, Cable	Cable, 4-wire, 2 m	Cd-093	WLL170T-2P132	6033948
					Male connector, M8, 4-pin	Cd-092	WLL170T-2P430	6033950
				Teach-in button	Male connector, M8, 3-pin	Cd-045	WLL170T-2P330	6033949
			NPN	Teach-in button, Cable	Cable, 4-wire, 2 m	Cd-093	WLL170T-2N132	6033951
					Male connector, M8, 4-pin	Cd-092	WLL170T-2N430	6033953
				Teach-in button	Male connector, M8, 3-pin	Cd-045	WLL170T-2N330	6033952
Green light	≤ 0.25 ms	0 mm ... 1,600 mm, through- beam system	PNP	Teach-in button, Cable	Cable, 4-wire, 2 m	Cd-093	WLL170T-2P192	6033954
					Male connector, M8, 4-pin	Cd-092	WLL170T-2P490	6033956
				Teach-in button	Male connector, M8, 3-pin	Cd-045	WLL170T-2P390	6033955
			NPN	Teach-in button, Cable	Cable, 4-wire, 2 m	Cd-093	WLL170T-2N192	6033957
					Male connector, M8, 4-pin	Cd-092	WLL170T-2N490	6033959
				Teach-in button	Male connector, M8, 3-pin	Cd-045	WLL170T-2N390	6033958
Visible red light	≤ 50 µs	0 mm ... 1,500 mm, through- beam system	PNP	Teach-in button, Cable	Cable, 4-wire, 2 m	Cd-093	WLL170T-2P162	6033963
					Male connector, M8, 4-pin	Cd-092	WLL170T-2P460	6033965
				Teach-in button	Male connector, M8, 3-pin	Cd-045	WLL170T-2P360	6033964
			NPN	Teach-in button, Cable	Cable, 4-wire, 2 m	Cd-093	WLL170T-2N162	6033960
					Male connector, M8, 4-pin	Cd-092	WLL170T-2N460	6033962
				Teach-in button	Male connector, M8, 3-pin	Cd-045	WLL170T-2N360	6033961

Dimensional drawings

WLL170-2



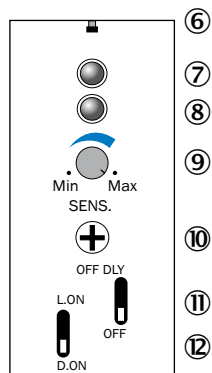
WLL170T-2



- ① Sender LED, installation of LL3 fibre-optic cable (sender fibre)
- ② Receiver, installation of LL3 fibre optic cable (receiver fibre)
- ③ Protective hood, can be raised at both ends
- ④ Mounting bracket, included
- ⑤ Connection

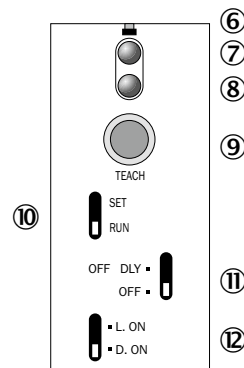
Adjustments

WLL170-2



- ⑥ Indication of correct fibre-optic cable mounting
- ⑦ LED indicator orange, lights up when switching output is active
- ⑧ LED signal strength indicator green, lights up, when light received < 0.9 or > 1.1 (switching threshold = 1)
- ⑨ Sensitivity scale 270°
- ⑩ Sensitivity control (10 revolutions)
- ⑪ L.ON/ d.ON selection switch. "OFF DLY" (on) / "OFF", 40 ms fixed
- ⑫ Selector switch: "L.ON" (light-switching) / "D.ON" (dark-switching)

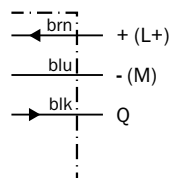
WLL170T-2



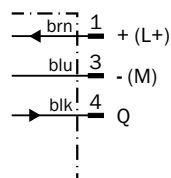
- ⑥ Indication of correct fibre-optic cable mounting
- ⑦ LED indicator orange: switching output active
- ⑧ LED signal strength indicator green, lights up, when light received < 0.9 or > 1.1 (switching threshold = 1)
- ⑨ Teach-in button
- ⑩ Operating mode selector switch: "SET" (Teach-in mode) / "RUN" (sensor mode)
- ⑪ L.ON/ d.ON selection switch. "OFF DLY" (on) / "OFF", 40 ms fixed
- ⑫ Selector switch: "L.ON" (light-switching) / "D.ON" (dark-switching)

Connection diagram

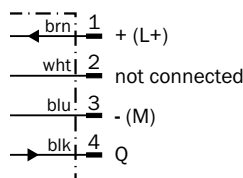
Cd-043



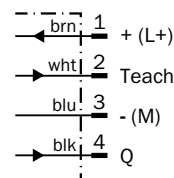
Cd-045



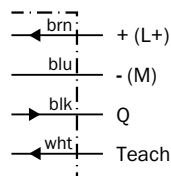
Cd-066



Cd-092



Cd-093



Function diagram

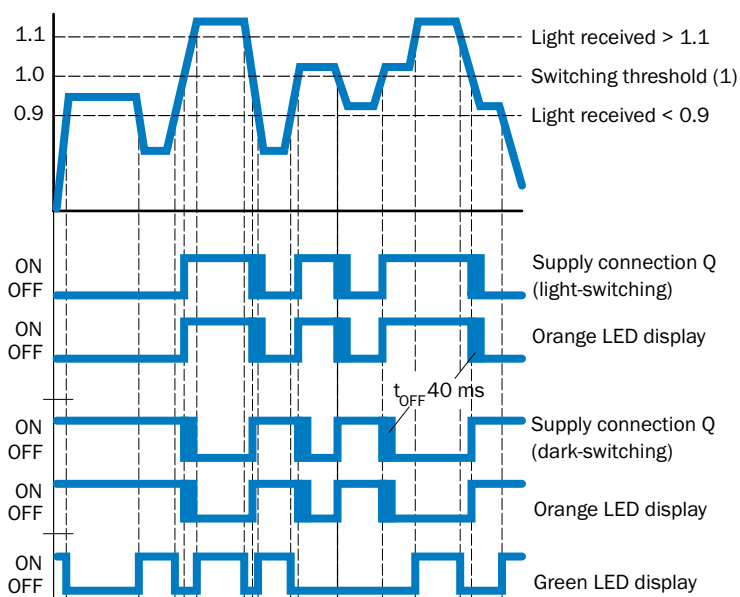
WLL170T-2

■ WLL170T-2 in sensor mode

Operating mode selector switch in RUN mode (after setting the switching threshold by means of Teach-in).

Orange LED display: lights up if supply connection Q is active. Dependent on setting of light/dark-selector switch.

Green LED display: lights up if light received is < 0.9 or > 1.1 (based on the switching threshold Q, switching threshold = 1).



Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Mounting bracket	BEF-WLL170	5306574

Plug connectors and cables

Connecting cable (female connector-open)

- Cable material: PVC
- Enclosure rating: IP 67, IP 69K

Figure	Connection type head A	Connection type head B	Connecting cable	Connector material	Model name	Part no.
	Female connector, M8, 3-pin, straight	Cable, open conductor heads	2 m, 3-wire	TPU	DOL-0803-G02M	6010785
			5 m, 3-wire	TPU	DOL-0803-G05M	6022009
	Female connector, M8, 3-pin, angled	Cable, open conductor heads	2 m, 3-wire	TPU	DOL-0803-W02M	6008489
			5 m, 3-wire	TPU	DOL-0803-W05M	6022010
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	PVC	DOL-0804-G02M	6009870
			5 m, 4-wire	PVC	DOL-0804-G05M	6009872
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	PVC	DOL-0804-W02M	6009871
			5 m, 4-wire	PVC	DOL-0804-W05M	6009873

Female connector (ready to assemble)

Figure	Connection type head A	Connection type head B	Connector material	Description	Model name	Part no.
	Female connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0803-G	7902077
	Female connector, M8, 3-pin, angled	Pin penetration	PBT	IP 67	DOS-0803-W	7902078
	Female connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	DOS-0804-G	6009974
	Female connector, M8, 4-pin, angled	Pin penetration	PBT	IP 67	DOS-0804-W	6009975

Male connector (ready to assemble)

Figure	Connection type head A	Connection type head B	Connector material	Description	Model name	Part no.
	Male connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	STE-0803-G	6037322
	Male connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	STE-0804-G	6037323

Other mounting accessories

Others

Figure	Material	Description	Model name	Part no.
	Stainless steel	Rail end piece for block mounting	BF-EB01-W190	5313011
	Plastic	Cutter for fibers, supplied with LL3, 10 mm x 37 mm x 65 mm	FC	5304141

→ For additional accessories, please see page L-861

High-performance fiber-optic sensor with
world's fastest response time



Product description

The WLL180T fiber-optic photoelectric sensor family provides the world's fastest response time - only 16 μ s. In addition, it offers superior sensing distances of up to 20 m and its high light intensity delivers a reliable, high-powered solution – even in difficult ambient conditions, like dust, spray, mist, and water jets. Commissioning is simple – either via the external teach-in input or directly on the unit. Two, four-digit displays provide visualization of all programming

steps, status displays, plus target and actual values through an intuitive menu structure. The WLL180T sensors can be operated either as a stand-alone or in a bus configuration, depending on the requirements. In a bus configuration, several sensors are networked via an internal bus, enabling the settings on one WLL180T to be copied to all other devices on the bus. Fiber-optic amplifier cross-talk is prevented by the sensors' integrated anti-interference logic.

At a glance

- Selectable response time up to 16 μ s
- Sensing range up to 20 m (Through-beam system); up to 1400 mm (proximity system)
- Bus-compatible with anti-interference
- 2 x 4-digit display
- Adjustable hysteresis
- Rotatable display screen
- High-resolution signal processing
- Programmable time delays

Your benefits

- Reliable, rapid process detection, even under the most difficult ambient conditions, such as dust, spray or mist
- Easy commissioning and product changeover due to external teach-in
- Cross-talk is eliminated when utilizing bus configuration option
- Quick, easy setup and adjustment due to an intuitive operating menu
- Flexible parameter adjustment due to high-resolution signal processing. Hysteresis and time delays can be adapted to suit the application, e.g., when detecting tiny or transparent objects
- Easy-to-read display, even under difficult installation conditions



Additional information

Detailed technical data..... J-799
Ordering information..... J-800
Dimensional drawings J-801
Adjustments J-802
Connection diagram J-802
Recommended accessories..... J-803

→ www.mysick.com/en/WLL180T

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

Sensor principle	Fiber-optic photoelectric sensor
Device type	Stand-alone/Base unit ¹⁾ /Expansion unit (depending on type)
Dimensions (W x H x D)	10.5 mm x 34.6 mm x 71.9 mm
Housing design (light emission)	Rectangular
Sensing range max. ²⁾	0 m ... 20 m, through-beam system ³⁾ (depending on type)
Sensing range	0 mm ... 1,400 mm, proximity system ^{4) 5)} 0 ... 18 m, through-beam system ³⁾ (depending on type)
Type of light	Visible red light / Infrared light (depending on type)
Light source ⁶⁾	LED
Angle of dispersion	Approx. 65°
Wave length	
	Visible red light 650 nm Infrared light 1,450 nm
Teach-in	Menu-controlled
Time type	Without time delay Time delay off Switch on delay ON and OFF delay One shot
Delay time	Programmable: 0 ms ... 9,999 ms
Indication	Display
Display	LED status display / 2x 4-character digital dual displays, Set value (green indicator) and actual value (red indicator) are displayed simultaneously, display of parameters

¹⁾ Up to 15 expansion units can be connected.

²⁾ Sensing range with 8 ms response time. Reduction with shorter response time (see tables LL3/WLL180T)

³⁾ LL3-TX01.

⁴⁾ Objects to be sensed with 90% reflectivity (based on DIN 5033 white standard). Sensing range with 8 ms response time. Reduction with shorter response time (see tables LL3/WLL180T)

⁵⁾ LL3-DK06.

⁶⁾ Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

Supply voltage ¹⁾	12 V DC ... 24 V DC
Ripple ²⁾	≤ 10 %
Power consumption ³⁾	≤ 50 mA
Output type	PNP, open collector/NPN, open collector (depending on type)
Switching mode	Light/dark-switching (manually selectable)
Output current I_{max.}	≤ 100 mA
Response time ⁴⁾	≤ 2 ms, ≤ 8 ms, ≤ 16 μs, ≤ 70 μs, ≤ 250 μs
Switching frequency	31.2 kHz, 7.1 kHz, 2 kHz, 250 Hz, 62.5 Hz
Connection type	Cable, 2 m ⁵⁾ /Male connector, M8 (depending on type)
Circuit protection	A ⁶⁾ , B ⁷⁾ , C ⁸⁾ , D ⁹⁾
Protection class	III

Housing material	ABS/PC
Enclosure rating ¹⁰⁾	IP 50
Ambient operating temperature	-25 °C ... +55 °C ¹¹⁾ (depending on type)
Ambient storage temperature	-40 °C ... +70 °C

¹⁾ +/- 10%.

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

³⁾ Without load.

⁴⁾ Selectable.

⁵⁾ Do not bend below 0 °C.

⁶⁾ A = V_S connections reverse-polarity protected.

⁷⁾ B = inputs and output reverse-polarity protected.

⁸⁾ C = interference suppression.

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

¹⁰⁾ With correctly attached fibre-optic cable LL3 and closed protection hood.

¹¹⁾ Operating temperature fluctuates according to number of devices connected: 4–8 devices: -25 °C ... +50 °C (output current 50 mA) / 9–16 devices: -25 °C ... +45 °C (output current 20 mA)

Ordering information

Other models available at www.mysick.com/en/WLL180T

Stand-alone

- **Adjustment:** Teach-in buttoncable+/- increment button, manual

Type of light	Sensing range max. ¹⁾	Output type	Connection	Connection diagram	Model name	Part no.
Visible red light	0 m ... 20 m, through-beam system ²⁾	PNP	Cable, 4-wire, 2 m	Cd-136	WLL180T-P432	6039093
			Male connector, M8, 4-pin	Cd-134	WLL180T-P434	6039095
		NPN	Cable, 4-wire, 2 m	Cd-136	WLL180T-N432	6039094
			Male connector, M8, 4-pin	Cd-134	WLL180T-N434	6039096
Infrared light	0 mm ... 1,000 mm, through-beam system ³⁾	PNP	Male connector, M8, 4-pin	Cd-134	WLL180T-P474	6039618
		NPN	Male connector, M8, 4-pin	Cd-134	WLL180T-N474	6039619

¹⁾ Sensing range with 8 ms response time. Reduction with shorter response time (see tables LL3/WLL180T)

²⁾ LL3-TX01.

³⁾ LL3-TW01.

Base unit

- **Type of light:** visible red light
- **Adjustment:** Teach-in button, cable, manual +/- increment button
- **Sensing range max.:** 0 m ... 20 m, through-beam system (Sensing range with 8 ms response time. Reduction with shorter response time (see tables LL3/WLL180T)) (LL3-TX01.)

Output type	Connection	Connection diagram	Model name	Part no.
PNP	Cable, 4-wire, 2 m	Cd-138	WLL180T-M432	6039097
	Male connector, M8, 3-pin	Cd-045	WLL180T-M333	6042428
	Male connector, M8, 4-pin	Cd-140	WLL180T-M434	6039101
NPN	Cable, 4-wire, 2 m	Cd-138	WLL180T-L432	6039099
	Male connector, M8, 3-pin	Cd-045	WLL180T-L333	6049837
	Male connector, M8, 4-pin	Cd-140	WLL180T-L434	6039103
2 x PNP	Male connector, M8, 4-pin	Cd-213	WLL180T-M634	6050760

Expansion unit

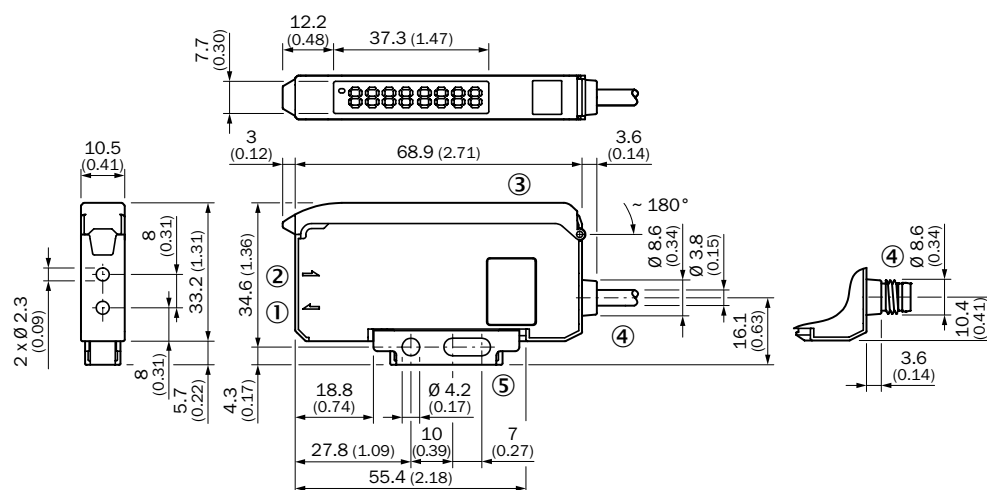
- **Type of light:** visible red light
- **Adjustment:** Teach-in button cable +/- increment button, manual
- **Sensing range max.:** 0 m ... 20 m, through-beam system (Sensing range with 8 ms response time. Reduction with shorter response time (see tables LL3/WLL180T)) (LL3-TX01.)

Output type	Connection	Connection diagram	Model name	Part no.
PNP	Cable, 2-wire, 2 m	Cd-138	WLL180T-F232	6039098
	Male connector, M8, 3-pin	Cd-045	WLL180T-F333	6042429
	Male connector, M8, 4-pin	Cd-140	WLL180T-F434	6039102
NPN	Cable, 2-wire, 2 m	Cd-138	WLL180T-E232	6039100
	Male connector, M8, 3-pin	Cd-045	WLL180T-E333	6049838
	Male connector, M8, 4-pin	Cd-140	WLL180T-E434	6039104
2 x NPN	Cable, 2-wire, 2 m	Cd-214	WLL180T-E632	6050763

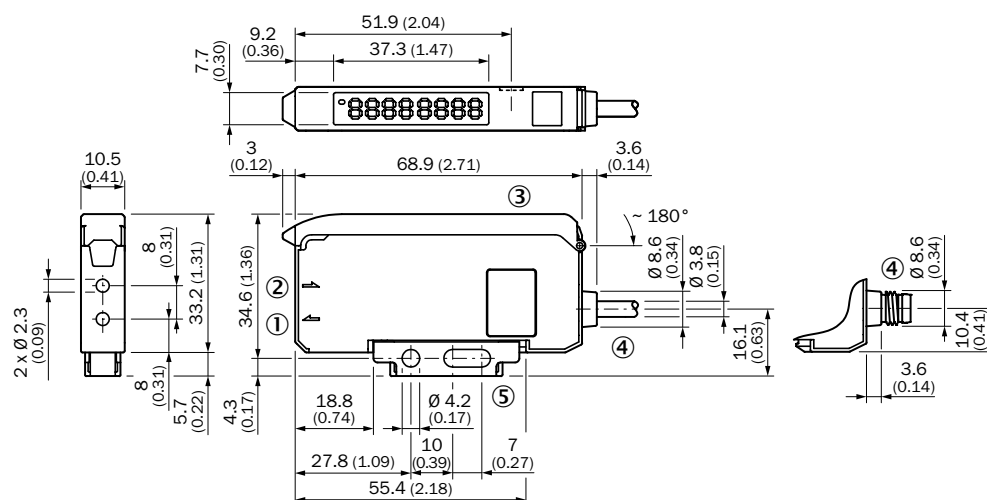
Dimensional drawings

Dimensions in mm (inch)

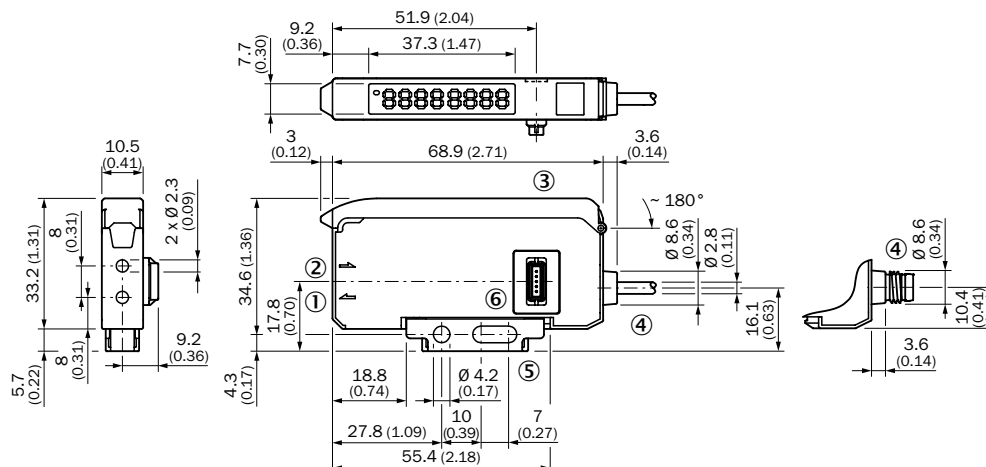
Stand-alone



Base unit

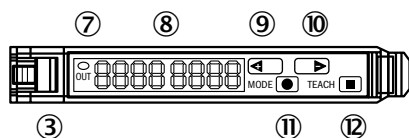


Extension unit



- ① Sender LED, installation of LL3 fibre-optic cable (sender fibre)
- ② Receiver, installation of LL3 fibre-optic cable (receiver fibre)
- ③ Protective hood, can be raised at both ends
- ④ Connection
- ⑤ Mounting bracket, included
- ⑥ Bus connector

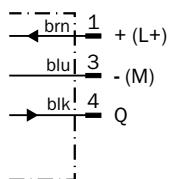
Adjustments



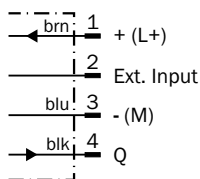
- ③ Locking the fiber-optic cables
- ⑦ LED indicator orange, lights up when switching output is active
- ⑧ Numeric display 2 x 4-digit; green: switching threshold, operating mode; red: actual value, Teach-in and function parameter
- ⑨ Step-button> (manual switching threshold: higher; or next function parameter)
- ⑩ Step-button< (manual switching threshold: lower; or previous function parameter)
- ⑪ Mode/Enter-button
- ⑫ Teach-in button

Connection diagram

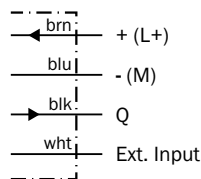
Cd-045



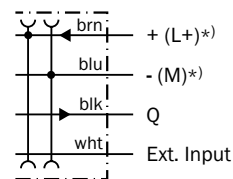
Cd-134



Cd-136

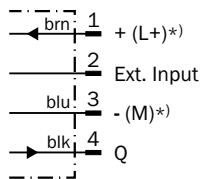


Cd-138



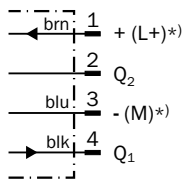
*) Only base unit

Cd-140



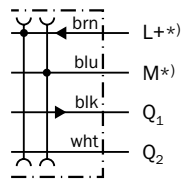
*) Only base unit

Cd-213



*) Only base unit

Cd-214



*) Only base unit

Recommended accessories

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Mounting bracket	BEF-WLL170	5306574
			BEF-WLL180	5325812

Plug connectors and cables

Connecting cable (female connector-open)

- Cable material: PVC
- Enclosure rating: IP 67, IP 69K

Figure	Connection type head A	Connection type head B	Connecting cable	Connector material	Model name	Part no.
	Female connector, M8, 3-pin, straight	Cable, open conductor heads	2 m, 3-wire	TPU	DOL-0803-G02M	6010785
			5 m, 3-wire	TPU	DOL-0803-G05M	6022009
	Female connector, M8, 3-pin, angled	Cable, open conductor heads	2 m, 3-wire	TPU	DOL-0803-W02M	6008489
			5 m, 3-wire	TPU	DOL-0803-W05M	6022010
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	PVC	DOL-0804-G02M	6009870
			5 m, 4-wire	PVC	DOL-0804-G05M	6009872
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	PVC	DOL-0804-W02M	6009871
			5 m, 4-wire	PVC	DOL-0804-W05M	6009873

Other mounting accessories

Others

Figure	Material	Description	Model name	Part no.
	Stainless steel	Rail end piece for block mounting	BF-EB01-W190	5313011
	Plastic	Cutter for fibers, supplied with LL3, 10 mm x 37 mm x 65 mm	FC	5304141

→ For additional accessories, please see page L-861

A wide variety of solutions to your most challenging applications: SICK's fiber-optic cables



Product description

For any application-oriented sensor solution, a suitable fiber-optic cable must be chosen. At SICK, the broad range of fiber-optic cables made from plastic and glass fibers permits optimal automation solutions. This applies in particular to tasks for which the fiber-optic cable requires application-specific adaption, where flexible cable installation is crucial, where high temperatures prevail, or a particular material compatibility is important. While the fibers of plastic fiber-optic cables are characterized, among other things, by

the smallest of bend radii and maximum flexibility, and can also be shortened to any length, the glass fiber-optic cables are more chemically resistant and suitable for a higher temperature range. The wide variety of end sleeve options or individual special sleeves enable virtually any installation possibility. Depending on the application, the fiber-optic cable's protective cladding can be made from plastic, metal, or Teflon for exposure to aggressive chemicals.

At a glance

- Very large selection of plastic and glass fiber-optic cables.
- Fiber-optic cables resistant to chemicals and high temperature
- Threaded and smooth sleeves, bands of light (array), 90° reflection versions available
- Focused optics
- Proximity and through-beam versions available
- Plastic, protective metal or Teflon sheathing available

Your benefits

- Very large selection of fiber-optic cables with plastic and glass fibers, giving users more application flexibility
- Resistant to damage caused by mechanical and chemical stress, as well as high temperatures
- Standard and customer-specific types
- Simple installation saves time
- For detection of objects, surfaces, leading edges, and fluid levels



Additional information

Selection chart J-805
Ordering information. J-806
Dimensional drawings J-833
Recommended accessories. J-855

→ www.mysick.com/en/LL3

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.



Selection chart

Detection principle	Category	Ordering information (page)	Dimensional drawing (page)
Proximity system 	Threaded sleeve	J-806	J-833
	Smooth sleeve	J-808	J-835
	90° deflection	J-809	J-836
	Flat type	J-810	J-836
	Long end sleeve	J-812	J-839
	Area detection	J-814	J-841
	Heat-resistant	J-815	J-842
	Resistant to oil/chemicals	J-815	J-842
	LCDs/transparent objects/semiconductors	J-816	J-843
	Retro-reflective	J-816	J-843
	Liquid level	J-817	J-844
	Tip adapters	J-832	J-855
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	Liquid level	J-827	J-855
	Tip adapters	J-828	J-855

Ordering information

Other models available at www.mysick.com/en/LL3

Threaded sleeve

- **Detection principle:** Proximity system

Figure	Length	Minimal object diameter	Minimum bend radius	Fiber-optic cable cut-table	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	1,000 mm	≥ 0.02 mm	10 mm	–	14 mm ¹⁾ 49 mm ²⁾ 99 mm ³⁾ 190 mm ⁴⁾ 210 mm ⁵⁾	60 mm ⁶⁾ 27 mm ⁷⁾ 17 mm ⁸⁾	LL3-DJ01	5325989
					38 mm ¹⁾ 120 mm ²⁾ 230 mm ³⁾ 460 mm ⁴⁾ 490 mm ⁵⁾	110 mm ⁶⁾ 50 mm ⁷⁾ 30 mm ⁸⁾	LL3-DJ02	5325992
		≥ 0.015 mm	4 mm	✓	18 mm ¹⁾ 50 mm ²⁾ 90 mm ³⁾ 200 mm ⁴⁾ 370 mm ⁵⁾	22 mm ⁶⁾ 9 mm ⁷⁾ 3 mm ⁸⁾	LL3-DR02	5308079
	2,000 mm	≥ 0.015 mm	4 mm	✓	18 mm ¹⁾ 60 mm ²⁾ 100 mm ³⁾ 220 mm ⁴⁾ 360 mm ⁵⁾	37 mm ⁶⁾ 11 mm ⁷⁾ 5 mm ⁸⁾	LL3-DR06	5308082
			15 mm	✓	18 mm ¹⁾ 55 mm ²⁾ 95 mm ³⁾ 190 mm ⁴⁾ 360 mm ⁵⁾	47 mm ⁶⁾ 17 mm ⁷⁾ 7 mm ⁸⁾	LL3-DS06	5308073
					40 mm ¹⁾ 130 mm ²⁾ 200 mm ³⁾ 350 mm ⁴⁾ 600 mm ⁵⁾	75 mm ⁶⁾ 22 mm ⁷⁾ 11 mm ⁸⁾	LL3-DT01	5308076
			25 mm	✓	90 mm ¹⁾ 280 mm ²⁾ 500 mm ³⁾ 900 mm ⁴⁾ 1,350 mm ⁵⁾	160 mm ⁶⁾ 62 mm ⁷⁾ 37 mm ⁸⁾	LL3-DB01	5308074
					90 mm ¹⁾ 300 mm ²⁾ 500 mm ³⁾ 900 mm ⁴⁾ 1,350 mm ⁵⁾	160 mm ⁶⁾ 62 mm ⁷⁾ 37 mm ⁸⁾	LL3-DB03	5313021
					90 mm ¹⁾ 280 mm ²⁾ 500 mm ³⁾ 900 mm ⁴⁾ 1,350 mm ⁵⁾	90 mm ⁶⁾ 55 mm ⁷⁾ 50 mm ⁸⁾	LL3-DB04	5325990
					90 mm ¹⁾ 280 mm ²⁾ 500 mm ³⁾ 900 mm ⁴⁾ 1,350 mm ⁵⁾	90 mm ⁶⁾ 55 mm ⁷⁾ 50 mm ⁸⁾	LL3-DB04	5325990

¹⁾ Operating mode: 16 µs.²⁾ Operating mode: 70 µs.³⁾ Operating mode: 250 µs.⁴⁾ Operating mode: 2 ms.⁵⁾ Operating mode: 8 ms.⁶⁾ Red light: 250 µs.⁷⁾ High speed: 50 µs.⁸⁾ Green light: 250 µs.

Figure	Length	Minimal object diameter	Minimum bend radius	Fiber-optic cable cuttable	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	2,000 mm	≥ 0.015 mm	25 mm	✓	100 mm ¹⁾ 300 mm ²⁾ 500 mm ³⁾ 900 mm ⁴⁾ 1,400 mm ⁵⁾	165 mm ⁶⁾ 65 mm ⁷⁾ 37 mm ⁸⁾	LL3-DK06	5313019
			2 mm	✓	90 mm ¹⁾ 300 mm ²⁾ 500 mm ³⁾ 900 mm ⁴⁾ 1,400 mm ⁵⁾	115 mm ⁶⁾ 47 mm ⁷⁾ 27 mm ⁸⁾	LL3-DK66	5313024
							LL3-DK67	5313025
			4 mm	✓	90 mm ¹⁾ 280 mm ²⁾ 450 mm ³⁾ 880 mm ⁴⁾ 1,350 mm ⁵⁾	135 mm ⁶⁾ 50 mm ⁷⁾ 20 mm ⁸⁾	LL3-DR01	5308078
		≥ 0.02 mm	4 mm	✓	8 mm ¹⁾ 25 mm ²⁾ 46 mm ³⁾ 90 mm ⁴⁾ 98 mm ⁵⁾	22 mm ⁶⁾ 9 mm ⁷⁾ 6 mm ⁸⁾	LL3-DR08	5326037
			15 mm	-	14 mm ¹⁾ 45 mm ²⁾ 75 mm ³⁾ 135 mm ⁴⁾ 200 mm ⁵⁾	17 mm ⁶⁾ 7 mm ⁷⁾ 3 mm ⁸⁾	LL3-DK21	5313023
				✓	40 mm ¹⁾ 130 mm ²⁾ 200 mm ³⁾ 350 mm ⁴⁾ 600 mm ⁵⁾	72 mm ⁶⁾ 22 mm ⁷⁾ 11 mm ⁸⁾	LL3-DM02	5308077
			25 mm	✓	27 mm ¹⁾ 88 mm ²⁾ 165 mm ³⁾ 330 mm ⁴⁾ 350 mm ⁵⁾	65 mm ⁶⁾ 30 mm ⁷⁾ 20 mm ⁸⁾	LL3-DB07	5325988
				✓	75 mm ¹⁾ 255 mm ²⁾ 420 mm ³⁾ 800 mm ⁴⁾ 1,300 mm ⁵⁾	165 mm ⁶⁾ 65 mm ⁷⁾ 37 mm ⁸⁾	LL3-DM01	5308071

¹⁾ Operating mode: 16 µs. ²⁾ Operating mode: 70 µs. ³⁾ Operating mode: 250 µs. ⁴⁾ Operating mode: 2 ms. ⁵⁾ Operating mode: 8 ms.
⁶⁾ Red light: 250 µs. ⁷⁾ High speed: 50 µs. ⁸⁾ Green light: 250 µs.

→ For dimensional drawings, please see page J-833



Smooth sleeve

- **Detection principle:** Proximity system

Figure	Length	Minimal object diameter	Minimum bend radius	Fiber-optic cable cut-table	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	1,000 mm	≥ 0.015 mm	4 mm	–	20 mm ¹⁾ 70 mm ²⁾ 110 mm ³⁾ 220 mm ⁴⁾ 360 mm ⁵⁾	25 mm ⁶⁾ 9 mm ⁷⁾ 3 mm ⁸⁾	LL3-DR04	5308081
		≥ 0.02 mm	10 mm	–	3 mm ²⁾ 14 mm ³⁾ 29 mm ⁴⁾ 31 mm ⁵⁾	3.5 mm ⁶⁾ 3.5 mm ⁷⁾	LL3-DP01	5325998
	2,000 mm	≥ 0.015 mm	2 mm	✓	65 mm ¹⁾ 200 mm ²⁾ 350 mm ³⁾ 650 mm ⁴⁾ 1,000 mm ⁵⁾	115 mm ⁶⁾ 47 mm ⁷⁾ 27 mm ⁸⁾	LL3-DK4Z	5313026
			4 mm	✓	30 mm ¹⁾ 85 mm ²⁾ 140 mm ³⁾ 300 mm ⁴⁾ 600 mm ⁵⁾	37 mm ⁶⁾ 13 mm ⁷⁾ 8 mm ⁸⁾	LL3-DR03	5308080
			15 mm	✓	18 mm ¹⁾ 55 mm ²⁾ 95 mm ³⁾ 190 mm ⁴⁾ 360 mm ⁵⁾	47 mm ⁶⁾ 17 mm ⁷⁾ 7 mm ⁸⁾	LL3-DT03	5308072
			25 mm	✓	100 mm ¹⁾ 300 mm ²⁾ 500 mm ³⁾ 900 mm ⁴⁾ 1,400 mm ⁵⁾	165 mm ⁶⁾ 65 mm ⁷⁾ 37 mm ⁸⁾	LL3-DK04	5313020
		≥ 0.02 mm	1 mm	✓	4 mm ¹⁾ 13 mm ²⁾ 27 mm ³⁾ 55 mm ⁴⁾ 59 mm ⁵⁾	11 mm ⁶⁾ 5 mm ⁷⁾	LL3-DR12	5326001
			2 mm	✓	22 mm ¹⁾ 74 mm ²⁾ 140 mm ³⁾ 280 mm ⁴⁾ 300 mm ⁵⁾	65 mm ⁶⁾ 30 mm ⁷⁾ 20 mm ⁸⁾	LL3-DR11	5326000
			25 mm	✓	70 mm ¹⁾ 220 mm ²⁾ 360 mm ³⁾ 720 mm ⁴⁾ 770 mm ⁵⁾	170 mm ⁶⁾ 75 mm ⁷⁾ 60 mm ⁸⁾	LL3-DB10	5325999

¹⁾ Operating mode: 16 µs.

²⁾ Operating mode: 70 µs.

³⁾ Operating mode: 250 µs.

⁴⁾ Operating mode: 2 ms.

⁵⁾ Operating mode: 8 ms.

⁶⁾ Red light: 250 µs.

⁷⁾ High speed: 50 µs.

⁸⁾ Green light: 250 µs.

→ For dimensional drawings, please see page J-835



90° deflection

- **Detection principle:** Proximity system
- **Length:** 2,000 mm
- **Fiber-optic cable cuttable:** ✓

Figure	Minimal object diameter	Minimum bend radius	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	≥ 0.015 mm	2 mm	20 mm ¹⁾ 110 mm ²⁾ 180 mm ³⁾ 400 mm ⁴⁾ 650 mm ⁵⁾	16 mm ⁶⁾ 12 mm ⁷⁾ 12 mm ⁸⁾	LL3-DV07	5322551
		25 mm	25 mm ¹⁾ 110 mm ²⁾ 185 mm ³⁾ 400 mm ⁴⁾ 650 mm ⁵⁾	47 mm ⁶⁾ 17 mm ⁷⁾ 17 mm ⁸⁾	LL3-DV05	5322549
			30 mm ¹⁾ 130 mm ²⁾ 210 mm ³⁾ 450 mm ⁴⁾ 800 mm ⁵⁾	47 mm ⁶⁾ 12 mm ⁷⁾ 12 mm ⁸⁾	LL3-DV06	5322550
	≥ 0.02 mm	25 mm	47 mm ¹⁾ 165 mm ²⁾ 285 mm ³⁾ 575 mm ⁴⁾ 610 mm ⁵⁾	110 mm ⁶⁾ 55 mm ⁷⁾ 30 mm ⁸⁾	LL3-DB09	5325991

¹⁾ Operating mode: 16 µs. ²⁾ Operating mode: 70 µs. ³⁾ Operating mode: 250 µs. ⁴⁾ Operating mode: 2 ms. ⁵⁾ Operating mode: 8 ms.
⁶⁾ Red light: 250 µs. ⁷⁾ High speed: 50 µs. ⁸⁾ Green light: 250 µs.

→ For dimensional drawings, please see page J-836



Flat type

- Detection principle: Proximity system

Figure	Length	Minimal object diameter	Minimum bend radius	Fiber-optic cable cut-table	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	1,000 mm	≥ 0.01 mm	1 mm	✓	13 mm ¹⁾ 48 mm ²⁾ 86 mm ³⁾ 170 mm ⁴⁾ 180 mm ⁵⁾	35 mm ⁶⁾ 15 mm ⁷⁾ 12 mm ⁸⁾	LL3-DE02	5324497
		≥ 0.16 mm	1 mm	✓	11 mm ¹⁾ 38 mm ²⁾ 78 mm ³⁾ 150 mm ⁴⁾ 160 mm ⁵⁾	35 mm ⁶⁾ 8 mm ⁷⁾	LL3-DE01	5325285
		≥ 0.3 mm	1 mm	✓	2 mm ¹⁾ 4 mm ²⁾ 6 mm ³⁾ 9 mm ⁴⁾ 10 mm ⁵⁾	4.5 mm ⁶⁾ 2.5 mm ⁷⁾ 2.5 mm ⁸⁾	LL3-DC08	5326029
	2,000 mm	–	4 mm	✓	15 mm ¹⁾ 22 mm ²⁾ 23 mm ³⁾ 25 mm ⁴⁾ 25 mm ⁵⁾	15 mm ⁶⁾ 15 mm ⁷⁾ 10 mm ⁸⁾	LL3-DC06	5326017
		≥ 0.01 mm	1 mm	✓	12 mm ¹⁾ 25 mm ²⁾ 37 mm ³⁾ 75 mm ⁴⁾ 90 mm ⁵⁾	30 mm ⁶⁾ 10 mm ⁷⁾ 5 mm ⁸⁾	LL3-DC47	5324268
					35 mm ¹⁾ 45 mm ²⁾ 55 mm ³⁾ 250 mm ⁴⁾ 330 mm ⁵⁾	50 mm ⁶⁾ 35 mm ⁷⁾ 10 mm ⁸⁾	LL3-DC57	5324269
			10 mm	✓	8 mm ¹⁾ 10 mm ²⁾ 11 mm ³⁾ 13 mm ⁴⁾ 17 mm ⁵⁾	8 mm ⁶⁾ 8 mm ⁷⁾ 8 mm ⁸⁾	LL3-DC09	5326028
		≥ 0.02 mm	25 mm	–	5 mm ¹⁾ 10 mm ²⁾ 19 mm ³⁾ 37 mm ⁴⁾ 43 mm ⁵⁾	7 mm ⁶⁾ 10.5 mm ⁷⁾ 9 mm ⁸⁾	LL3-DH06	5326026
				✓	5 mm ¹⁾ 11 mm ²⁾ 22 mm ³⁾ 30 mm ⁴⁾ 38 mm ⁵⁾	11 mm ⁶⁾ 15.5 mm ⁷⁾ 9.3 mm ⁸⁾	LL3-DH08	5326025

¹⁾ Operating mode: 16 µs. ²⁾ Operating mode: 70 µs. ³⁾ Operating mode: 250 µs.

⁴⁾ Operating mode: 2 ms.

⁵⁾ Operating mode: 8 ms.

⁶⁾ Red light: 250 µs.

⁷⁾ High speed: 50 µs.

⁸⁾ Green light: 250 µs.

Figure	Length	Minimal object diameter	Minimum bend radius	Fiber-optic cable cuttable	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	2,000 mm	≥ 0.03 mm	1 mm	✓	45 mm ¹⁾ 130 mm ²⁾ 250 mm ³⁾ 510 mm ⁴⁾ 550 mm ⁵⁾	110 mm ⁶⁾ 43 mm ⁷⁾ 31 mm ⁸⁾	LL3-DE03	5325986
					50 mm ¹⁾ 130 mm ²⁾ 250 mm ³⁾ 500 mm ⁴⁾ 540 mm ⁵⁾	110 mm ⁶⁾ 50 mm ⁷⁾ 35 mm ⁸⁾	LL3-DE04	5325987
					110 mm ¹⁾ 345 mm ²⁾ 560 mm ³⁾ 1,100 mm ⁴⁾ 1,190 mm ⁵⁾	300 mm ⁶⁾ 120 mm ⁷⁾ 80 mm ⁸⁾	LL3-DR09	5325528
		≥ 0.06 mm	10 mm	✓	8 mm ¹⁾ 12 mm ²⁾ 14 mm ³⁾ 16 mm ⁴⁾ 18 mm ⁵⁾	10 mm ⁶⁾ 8 mm ⁷⁾ 8 mm ⁸⁾	LL3-DC07	5326019
	3,000 mm	–	4 mm	✓	18 mm ¹⁾ 31 mm ²⁾ 34 mm ³⁾ 38 mm ⁴⁾ 38 mm ⁵⁾	20 mm ⁶⁾ 20 mm ⁷⁾ 15 mm ⁸⁾	LL3-DC04	5326018
		≥ 0.02 mm	25 mm	–	11 mm ¹⁾ 18 mm ²⁾ 21 mm ³⁾ 24 mm ⁴⁾ 26 mm ⁵⁾	18 mm ⁶⁾ 18 mm ⁷⁾ 15 mm ⁸⁾	LL3-DH10	5326023
					19 mm ¹⁾ 29 mm ²⁾ 34 mm ³⁾ 39 mm ⁴⁾ 42 mm ⁵⁾	24 mm ⁶⁾ 24 mm ⁷⁾ 24 mm ⁸⁾	LL3-DH11	5326024
		≥ 0.3 mm	25 mm	✓	60 mm ¹⁾ 75 mm ²⁾ 85 mm ³⁾ 150 mm ⁴⁾ 280 mm ⁵⁾	80 mm ⁶⁾ 60 mm ⁷⁾ 60 mm ⁸⁾	LL3-DC03	5326020

¹⁾ Operating mode: 16 µs. ²⁾ Operating mode: 70 µs. ³⁾ Operating mode: 250 µs. ⁴⁾ Operating mode: 2 ms. ⁵⁾ Operating mode: 8 ms.

⁶⁾ Red light: 250 µs. ⁷⁾ High speed: 50 µs. ⁸⁾ Green light: 250 µs.

→ For dimensional drawings, please see page J-836

J



Long end sleeve

- **Detection principle:** Proximity system

Figure	Length	Minimal object diameter	Minimum bend radius	Fiber-optic cable cut-table	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	500 mm	≥ 0.015 mm	4 mm	✓	10 mm ¹⁾ 30 mm ²⁾ 60 mm ³⁾ 140 mm ⁴⁾ 225 mm ⁵⁾	9 mm ⁶⁾ 4 mm ⁷⁾ 2 mm ⁸⁾	LL3-DT02	5308085
				–	13 mm ¹⁾ 45 mm ²⁾ 80 mm ³⁾ 140 mm ⁴⁾ 280 mm ⁵⁾	9 mm ⁶⁾ 4 mm ⁷⁾ 2 mm ⁸⁾	LL3-DT04	5308086
					10 mm ¹⁾ 30 mm ²⁾ 60 mm ³⁾ 140 mm ⁴⁾ 225 mm ⁵⁾	12 mm ⁶⁾ 4 mm ⁷⁾ 2 mm ⁸⁾	LL3-DR05	5308087
	1,000 mm	≥ 0.015 mm	25 mm	–	5 mm ¹⁾ 15 mm ²⁾ 35 mm ³⁾ 65 mm ⁴⁾ 120 mm ⁵⁾	7 mm ⁶⁾ 3 mm ⁷⁾	LL3-DR07	5326007
		≥ 0.02 mm	25 mm	–	8 mm ¹⁾ 25 mm ²⁾ 52 mm ³⁾ 100 mm ⁴⁾ 110 mm ⁵⁾	22 mm ⁶⁾ 6 mm ⁷⁾ 6 mm ⁸⁾	LL3-DB05	5326002
					55 mm ¹⁾ 220 mm ²⁾ 580 mm ³⁾ 1,170 mm ⁴⁾ 1,240 mm ⁵⁾	220 mm ⁶⁾ 90 mm ⁷⁾ 70 mm ⁸⁾	LL3-DH05	5326021
	2,000 mm	≥ 0.015 mm	2 mm	✓	90 mm ¹⁾ 300 mm ²⁾ 500 mm ³⁾ 900 mm ⁴⁾ 1,400 mm ⁵⁾	115 mm ⁶⁾ 47 mm ⁷⁾ 27 mm ⁸⁾	LL3-DK63Z	5313027
			15 mm	✓	10 mm ¹⁾ 28 mm ²⁾ 45 mm ³⁾ 93 mm ⁴⁾ 170 mm ⁵⁾	47 mm ⁶⁾ 17 mm ⁷⁾ 8 mm ⁸⁾	LL3-DK43	5313030
					10 mm ¹⁾ 25 mm ²⁾ 45 mm ³⁾ 90 mm ⁴⁾ 170 mm ⁵⁾	50 mm ⁶⁾ 17 mm ⁷⁾ 8 mm ⁸⁾	LL3-DM03	5308084
					10 mm ¹⁾ 28 mm ²⁾ 45 mm ³⁾ 95 mm ⁴⁾ 170 mm ⁵⁾	50 mm ⁶⁾ 17 mm ⁷⁾ 8 mm ⁸⁾	LL3-DT05	5313028

¹⁾ Operating mode: 16 µs. ²⁾ Operating mode: 70 µs. ³⁾ Operating mode: 250 µs. ⁴⁾ Operating mode: 2 ms. ⁵⁾ Operating mode: 8 ms.

⁶⁾ Red light: 250 µs. ⁷⁾ High speed: 50 µs. ⁸⁾ Green light: 250 µs.

Figure	Length	Minimal object diameter	Minimum bend radius	Fiber-optic cable cuttable	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	2,000 mm	≥ 0.015 mm	15 mm	✓	10 mm ¹⁾ 35 mm ²⁾ 70 mm ³⁾ 125 mm ⁴⁾ 290 mm ⁵⁾	16 mm ⁶⁾ 3 mm ⁷⁾ 3 mm ⁸⁾	LL3-DV02	5308089
			25 mm	✓	100 mm ¹⁾ 350 mm ²⁾ 580 mm ³⁾ 850 mm ⁴⁾ 1,300 mm ⁵⁾	170 mm ⁶⁾ 67 mm ⁷⁾ 42 mm ⁸⁾	LL3-DB02	5308083
		≥ 0.02 mm	1 mm	✓	12 mm ¹⁾ 40 mm ²⁾ 77 mm ³⁾ 150 mm ⁴⁾ 160 mm ⁵⁾	35 mm ⁶⁾ 15 mm ⁷⁾ 9 mm ⁸⁾	LL3-DR10	5326005
			25 mm	✓	60 mm ¹⁾ 210 mm ²⁾ 360 mm ³⁾ 700 mm ⁴⁾ 760 mm ⁵⁾	150 mm ⁶⁾ 60 mm ⁷⁾ 40 mm ⁸⁾	LL3-DB06	5326006
					17 mm ¹⁾ 55 mm ²⁾ 107 mm ³⁾ 200 mm ⁴⁾ 220 mm ⁵⁾	45 mm ⁶⁾ 18 mm ⁷⁾ 13 mm ⁸⁾	LL3-DB08	5326004
				–	65 mm ¹⁾ 225 mm ²⁾ 500 mm ³⁾ 1,000 mm ⁴⁾ 1,060 mm ⁵⁾	350 mm ⁶⁾ 120 mm ⁷⁾ 90 mm ⁸⁾	LL3-DH04	5326022
			25 mm	✓	35 mm ¹⁾ 135 mm ²⁾ 170 mm ³⁾ 290 mm ⁴⁾ 320 mm ⁵⁾	95 mm ⁶⁾ 41 mm ⁷⁾ 27 mm ⁸⁾	LL3-DK33	5313031
		≥ 0.025 mm	25 mm	✓	40 mm ¹⁾ 135 mm ²⁾ 180 mm ³⁾ 270 mm ⁴⁾ 330 mm ⁵⁾	95 mm ⁶⁾ 41 mm ⁷⁾ 22 mm ⁸⁾	LL3-DV01	5308088
					35 mm ¹⁾ 135 mm ²⁾ 170 mm ³⁾ 290 mm ⁴⁾ 320 mm ⁵⁾	95 mm ⁶⁾ 41 mm ⁷⁾ 22 mm ⁸⁾	LL3-DV03	5308090

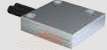
¹⁾ Operating mode: 16 µs. ²⁾ Operating mode: 70 µs. ³⁾ Operating mode: 250 µs. ⁴⁾ Operating mode: 2 ms. ⁵⁾ Operating mode: 8 ms.
⁶⁾ Red light: 250 µs. ⁷⁾ High speed: 50 µs. ⁸⁾ Green light: 250 µs.

→ For dimensional drawings, please see page J-839



Area detection

- **Detection principle:** Proximity system
- **Length:** 2,000 mm
- **Minimal object diameter:** ≥ 0.02 mm
- **Minimum bend radius:** 25 mm
- **Fiber-optic cable cuttable:** ✓

Figure	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	65 mm ¹⁾ 240 mm ²⁾ 320 mm ³⁾ 650 mm ⁴⁾ 690 mm ⁵⁾	–	LL3-DZ01	5326013
	57 mm ¹⁾ 190 mm ²⁾ 310 mm ³⁾ 630 mm ⁴⁾ 670 mm ⁵⁾	150 mm ⁶⁾ 70 mm ⁷⁾ 50 mm ⁸⁾	LL3-DZ02	5326014
	50 mm ¹⁾ 160 mm ²⁾ 280 mm ³⁾ 450 mm ⁴⁾ 590 mm ⁵⁾	110 mm ⁶⁾ 55 mm ⁷⁾ 35 mm ⁸⁾	LL3-DZ03	5326015

¹⁾ Operating mode: 16 μ s.²⁾ Operating mode: 70 μ s.³⁾ Operating mode: 250 μ s.⁴⁾ Operating mode: 2 ms.⁵⁾ Operating mode: 8 ms.⁶⁾ Red light: 250 μ s.⁷⁾ High speed: 50 μ s.⁸⁾ Green light: 250 μ s.

→ For dimensional drawings, please see page J-841



Heat-resistant

- **Detection principle:** Proximity system

Figure	Length	Minimal object diameter	Minimum bend radius	Fiber-optic cable cut-table	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	1,000 mm	≥ 0.02 mm	25 mm	–	65 mm ¹⁾ 260 mm ²⁾ 670 mm ³⁾ 1,340 mm ⁴⁾ 1,430 mm ⁵⁾	220 mm ⁶⁾ 100 mm ⁷⁾ 70 mm ⁸⁾	LL3-DH07	5326031
					20 mm ¹⁾ 50 mm ²⁾ 95 mm ³⁾ 150 mm ⁴⁾ 400 mm ⁵⁾	–	LL3-DW01	5315234
	2,000 mm	≥ 0.015 mm	25 mm	✓	70 mm ¹⁾ 230 mm ²⁾ 350 mm ³⁾ 600 mm ⁴⁾ 1,000 mm ⁵⁾	125 mm ⁶⁾ 45 mm ⁷⁾ 8 mm ⁸⁾	LL3-DH02	5308092
			35 mm	✓	120 mm ¹⁾ 350 mm ²⁾ 600 mm ³⁾ 980 mm ⁴⁾ 1,500 mm ⁵⁾	220 mm ⁶⁾ 95 mm ⁷⁾ 45 mm ⁸⁾	LL3-DH01	5308091
		≥ 0.02 mm	25 mm	–	55 mm ¹⁾ 220 mm ²⁾ 490 mm ³⁾ 990 mm ⁴⁾ 1,050 mm ⁵⁾	170 mm ⁶⁾ 80 mm ⁷⁾ 50 mm ⁸⁾	LL3-DH03	5324787
				✓	70 mm ¹⁾ 230 mm ²⁾ 370 mm ³⁾ 750 mm ⁴⁾ 800 mm ⁵⁾	220 mm ⁶⁾ 90 mm ⁷⁾ 70 mm ⁸⁾	LL3-DH09	5326030

¹⁾ Operating mode: 16 µs. ²⁾ Operating mode: 70 µs. ³⁾ Operating mode: 250 µs. ⁴⁾ Operating mode: 2 ms. ⁵⁾ Operating mode: 8 ms.
⁶⁾ Red light: 250 µs. ⁷⁾ High speed: 50 µs. ⁸⁾ Green light: 250 µs.

→ For dimensional drawings, please see page J-842



Resistant to oil/chemicals

- **Detection principle:** Proximity system

Figure	Length	Minimal object diameter	Minimum bend radius	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	2,000 mm	≥ 0.02 mm	60 mm	100 mm ¹⁾ 180 mm ²⁾ 200 mm ³⁾ 150 mm ⁴⁾ 280 mm ⁵⁾	50 mm ⁶⁾ 27 mm ⁷⁾ 12 mm ⁸⁾	LL3-DY01	5308093

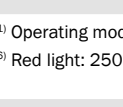
¹⁾ Operating mode: 16 µs. ²⁾ Operating mode: 70 µs. ³⁾ Operating mode: 250 µs. ⁴⁾ Operating mode: 2 ms. ⁵⁾ Operating mode: 8 ms.
⁶⁾ Red light: 250 µs. ⁷⁾ High speed: 50 µs. ⁸⁾ Green light: 250 µs.

→ For dimensional drawings, please see page J-842



LCDs/transparent objects/semiconductors

- **Detection principle:** Proximity system
- **Fiber-optic cable cuttable:** ✓

Figure	Length	Minimal object diameter	Minimum bend radius	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	2,000 mm	≥ 0.02 mm	10 mm	6 mm ¹⁾	7 mm ⁶⁾	LL3-DC38	5322472
				6 mm ²⁾ 6 mm ³⁾ 10 mm ⁴⁾ 15 mm ⁵⁾	7 mm ⁷⁾ 6 mm ⁸⁾		
	3,000 mm	≥ 25 mm	25 mm	4 mm ²⁾ 4 mm ³⁾ 4 mm ⁴⁾ 4 mm ⁵⁾	5 mm ⁶⁾ 4 mm ⁷⁾ 4 mm ⁸⁾	LL3-DC39	5322513
				18 mm ¹⁾ 29 mm ²⁾ 35 mm ³⁾ 40 mm ⁴⁾ 43 mm ⁵⁾	22 mm ⁶⁾ 22 mm ⁷⁾ 25 mm ⁸⁾	LL3-DC05	5326016

¹⁾ Operating mode: 16 µs.²⁾ Operating mode: 70 µs.³⁾ Operating mode: 250 µs.⁴⁾ Operating mode: 2 ms.⁵⁾ Operating mode: 8 ms.⁶⁾ Red light: 250 µs.⁷⁾ High speed: 50 µs.⁸⁾ Green light: 250 µs.

→ For dimensional drawings, please see page J-843



Retro-reflective

- **Detection principle:** Proximity system
- **Length:** 2,000 mm
- **Fiber-optic cable cuttable:** ✓

Figure	Minimal object diameter	Minimum bend radius	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	≥ 0.06 mm	10 mm	105 mm ¹⁾ 190 mm ²⁾ 230 mm ³⁾ 460 mm ⁴⁾ 490 mm ⁵⁾	220 mm ⁶⁾ 80 mm ⁷⁾ 65 mm ⁸⁾	LL3-RB01	5326010
			100 mm ¹⁾ 170 mm ²⁾ 210 mm ³⁾ 430 mm ⁴⁾ 460 mm ⁵⁾	220 mm ⁶⁾ 80 mm ⁷⁾ 65 mm ⁸⁾		
	≥ 0.12 mm	10 mm	80 mm ¹⁾ 200 mm ²⁾ 310 mm ³⁾ 620 mm ⁴⁾ 660 mm ⁵⁾	–	LL3-RG01	5326012
	≥ 0.3 mm	1 mm	290 mm ¹⁾ 580 mm ²⁾ 720 mm ³⁾ 1,450 mm ⁴⁾ 1,550 mm ⁵⁾	650 mm ⁶⁾ 250 mm ⁷⁾ 180 mm ⁸⁾	LL3-RR01	5326008

¹⁾ Operating mode: 16 µs.²⁾ Operating mode: 70 µs.³⁾ Operating mode: 250 µs.⁴⁾ Operating mode: 2 ms.⁵⁾ Operating mode: 8 ms.⁶⁾ Red light: 250 µs.⁷⁾ High speed: 50 µs.⁸⁾ Green light: 250 µs.

→ For dimensional drawings, please see page J-843



Liquid level

- **Detection principle:** Proximity system

Figure	Length	Minimum bend radius	Fiber-optic cable cuttable	Model name	Part no.
	2,000 mm	10 mm	✓	LL3-DF04	5326035
				LL3-DF05	5326034
				LL3-DF07	5326033
		30 mm	✓	LL3-DF02-S01	5321924
	5,000 mm	20 mm	✓	LL3-DW02	5325608

→ For dimensional drawings, please see page J-844



Threaded sleeve

- **Detection principle:** Through-beam system

Figure	Length	Minimal object diameter	Minimum bend radius	Fiber-optic cable cut-table	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	1,000 mm	≥ 0.05 mm	10 mm	–	145 mm ¹⁾ 460 mm ²⁾ 830 mm ³⁾ 1,600 mm ⁴⁾ 1,770 mm ⁵⁾	40 mm ⁶⁾ 120 mm ⁷⁾ 150 mm ⁸⁾	LL3-TJ01	5325915
	       	≥ 0.1 mm	4 mm	✓	60 mm ¹⁾ 175 mm ²⁾ 330 mm ³⁾ 750 mm ⁴⁾ 1,100 mm ⁵⁾	115 mm ⁶⁾ 38 mm ⁷⁾ 23 mm ⁸⁾	LL3-TR02	5308053
			15 mm	✓	55 mm ¹⁾ 175 mm ²⁾ 300 mm ³⁾ 700 mm ⁴⁾ 1,100 mm ⁵⁾	125 mm ⁶⁾ 45 mm ⁷⁾ 30 mm ⁸⁾	LL3-TM02	5308069
		≥ 0.2 mm	2 mm	✓	220 mm ¹⁾ 650 mm ²⁾ 1,200 mm ³⁾ 2,750 mm ⁴⁾ 4,000 mm ⁵⁾	370 mm ⁶⁾ 125 mm ⁷⁾ 120 mm ⁸⁾	LL3-TK77	5313035
			25 mm	✓	225 mm ¹⁾ 650 mm ²⁾ 1,200 mm ³⁾ 2,500 mm ⁴⁾ 4,000 mm ⁵⁾	470 mm ⁶⁾ 165 mm ⁷⁾ 135 mm ⁸⁾	LL3-TB02	5308048
					220 mm ¹⁾ 680 mm ²⁾ 1,200 mm ³⁾ 2,500 mm ⁴⁾ 4,000 mm ⁵⁾	470 mm ⁶⁾ 165 mm ⁷⁾ 135 mm ⁸⁾	LL3-TM01	5308068
		≥ 0.3 mm	4 mm	✓	200 mm ¹⁾ 600 mm ²⁾ 1,000 mm ³⁾ 2,400 mm ⁴⁾ 4,000 mm ⁵⁾	340 mm ⁶⁾ 125 mm ⁷⁾ 125 mm ⁸⁾	LL3-TR01	5308052
		≥ 0.5 mm	30 mm	✓	300 mm ¹⁾ 950 mm ²⁾ 1,700 mm ³⁾ 3,500 mm ⁴⁾ 4,000 mm ⁵⁾	720 mm ⁶⁾ 315 mm ⁷⁾ 280 mm ⁸⁾	LL3-TB01	5308050
	10,000 mm	≥ 0.4 mm	25 mm	✓	6,600 mm ¹⁾ 19,500 mm ²⁾ 19,500 mm ³⁾ 19,500 mm ⁴⁾ 19,500 mm ⁵⁾	19,500 mm ⁶⁾ 7,500 mm ⁷⁾ 6,000 mm ⁸⁾	LL3-TB08	5325917
	20,000 mm	≥ 0.5 mm	25 mm	✓	2,000 mm ¹⁾ 7,500 mm ²⁾ 13,500 mm ³⁾ 27,000 mm ⁴⁾ 40,000 mm ⁵⁾	3,000 mm ⁶⁾ 1,300 mm ⁷⁾ 1,200 mm ⁸⁾	LL3-TX02	5325046

¹⁾ Operating mode: 16 µs. ²⁾ Operating mode: 70 µs. ³⁾ Operating mode: 250 µs. ⁴⁾ Operating mode: 2 ms. ⁵⁾ Operating mode: 8 ms.

⁶⁾ Red light: 250 µs. ⁷⁾ High speed: 50 µs. ⁸⁾ Green light: 250 µs.

→ For dimensional drawings, please see page J-845



Smooth sleeve

- **Detection principle:** Through-beam system

Figure	Length	Minimal object diameter	Minimum bend radius	Fiber-optic cable cuttable	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	500 mm	≥ 0.02 mm	4 mm	–	5 mm ¹⁾ 17 mm ²⁾ 28 mm ³⁾ 56 mm ⁴⁾ 60 mm ⁵⁾	12 mm ⁶⁾ 5 mm ⁷⁾ 5 mm ⁸⁾	LL3-TR04	5325918
	1,000 mm	≥ 0.1 mm	4 mm	✓	60 mm ¹⁾ 175 mm ²⁾ 330 mm ³⁾ 750 mm ⁴⁾ 1,100 mm ⁵⁾	115 mm ⁶⁾ 38 mm ⁷⁾ 23 mm ⁸⁾	LL3-TR03	5308054
		≥ 10 mm	10 mm	✓	6 mm ¹⁾ 19 mm ²⁾ 38 mm ³⁾ 74 mm ⁴⁾ 130 mm ⁵⁾	18 mm ⁶⁾ 7 mm ⁷⁾ 11 mm ⁸⁾	LL3-TH06	5325926
	2,000 mm	≥ 0.02 mm	1 mm	✓	13 mm ¹⁾ 50 mm ²⁾ 85 mm ³⁾ 170 mm ⁴⁾ 180 mm ⁵⁾	25 mm ⁶⁾ 12 mm ⁷⁾ 12 mm ⁸⁾	LL3-TG05	5325921
					380 mm ¹⁾ 1,220 mm ²⁾ 2,000 mm ³⁾ 4,000 mm ⁴⁾ 4,000 mm ⁵⁾	800 mm ⁶⁾ 250 mm ⁷⁾ 250 mm ⁸⁾	LL3-TR10	5325920
		≥ 0.03 mm	25 mm	✓	180 mm ¹⁾ 540 mm ²⁾ 890 mm ³⁾ 1,700 mm ⁴⁾ 1,900 mm ⁵⁾	400 mm ⁶⁾ 190 mm ⁷⁾ 200 mm ⁸⁾	LL3-TB07	5325919
		≥ 0.05 mm	25 mm	✓	590 mm ¹⁾ 1,790 mm ²⁾ 2,400 mm ³⁾ 4,000 mm ⁴⁾ 4,000 mm ⁵⁾	1,100 mm ⁶⁾ 600 mm ⁷⁾ 500 mm ⁸⁾	LL3-TV08	5325922
		≥ 0.1 mm	15 mm	✓	55 mm ¹⁾ 175 mm ²⁾ 300 mm ³⁾ 700 mm ⁴⁾ 1,100 mm ⁵⁾	125 mm ⁶⁾ 45 mm ⁷⁾ 30 mm ⁸⁾	LL3-TM03	5308070
		≥ 0.2 mm	2 mm	✓	220 mm ¹⁾ 650 mm ²⁾ 1,200 mm ³⁾ 2,750 mm ⁴⁾ 4,000 mm ⁵⁾	370 mm ⁶⁾ 125 mm ⁷⁾ 120 mm ⁸⁾	LL3-TK05	5313034
		≥ 0.5 mm	30 mm	✓	275 mm ¹⁾ 1,000 mm ²⁾ 1,800 mm ³⁾ 3,500 mm ⁴⁾ 4,000 mm ⁵⁾	720 mm ⁶⁾ 315 mm ⁷⁾ 280 mm ⁸⁾	LL3-TS07	5308049

¹⁾ Operating mode: 16 µs. ²⁾ Operating mode: 70 µs. ³⁾ Operating mode: 250 µs. ⁴⁾ Operating mode: 2 ms. ⁵⁾ Operating mode: 8 ms.

⁶⁾ Red light: 250 µs. ⁷⁾ High speed: 50 µs. ⁸⁾ Green light: 250 µs.

→ For dimensional drawings, please see page J-846



90° deflection

- **Detection principle:** Through-beam system

Figure	Length	Minimal object diameter	Minimum bend radius	Fiber-optic cable cut-table	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	2,000 mm	≥ 0.04 mm	1 mm	✓	360 mm ¹⁾ 1,200 mm ²⁾ 2,200 mm ³⁾ 4,000 mm ⁴⁾ 4,000 mm ⁵⁾	900 mm ⁶⁾ 500 mm ⁷⁾ 450 mm ⁸⁾	LL3-TR09	5325985
		≥ 0.05 mm	25 mm	✓	150 mm ¹⁾ 480 mm ²⁾ 770 mm ³⁾ 1,500 mm ⁴⁾ 1,600 mm ⁵⁾	400 mm ⁶⁾ 170 mm ⁷⁾ 150 mm ⁸⁾	LL3-TB06	5325916
		≥ 0.06 mm	1 mm	✓	160 mm ¹⁾ 480 mm ²⁾ 800 mm ³⁾ 1,600 mm ⁴⁾ 1,700 mm ⁵⁾	350 mm ⁶⁾ 170 mm ⁷⁾ 150 mm ⁸⁾	LL3-TR08	5325984
		≥ 0.1 mm	50 mm	–	18 mm ¹⁾ 30 mm ²⁾ 120 mm ³⁾ 220 mm ⁴⁾ 420 mm ⁵⁾	23 mm ⁶⁾ 23 mm ⁷⁾	LL3-TH07	5325977
		≥ 0.16 mm	25 mm	✓	90 mm ¹⁾ 290 mm ²⁾ 480 mm ³⁾ 970 mm ⁴⁾ 1,000 mm ⁵⁾	170 mm ⁶⁾ 75 mm ⁷⁾ 110 mm ⁸⁾	LL3-TH15	5325975
							LL3-TH16	5325976
		≥ 0.4 mm	25 mm	✓	350 mm ¹⁾ 750 mm ²⁾ 1,800 mm ³⁾ 4,000 mm ⁴⁾ 4,000 mm ⁵⁾	400 mm ⁶⁾ 170 mm ⁷⁾ 150 mm ⁸⁾	LL3-TV05	5322546
					180 mm ¹⁾ 550 mm ²⁾ 900 mm ³⁾ 2,100 mm ⁴⁾ 3,500 mm ⁵⁾	350 mm ⁶⁾ 150 mm ⁷⁾ 150 mm ⁸⁾	LL3-TV06	5322547
			2 mm	✓	340 mm ¹⁾ 1,000 mm ²⁾ 1,800 mm ³⁾ 4,000 mm ⁴⁾ 4,000 mm ⁵⁾	290 mm ⁶⁾ 150 mm ⁷⁾ 150 mm ⁸⁾	LL3-TV07	5322548
	3,000 mm	≥ 0.3 mm	20 mm	✓	460 mm ¹⁾ 1,400 mm ²⁾ 2,500 mm ³⁾ 4,000 mm ⁴⁾ 4,000 mm ⁵⁾	1,000 mm ⁶⁾ 350 mm ⁷⁾ 450 mm ⁸⁾	LL3-TY03	5325982

¹⁾ Operating mode: 16 µs.²⁾ Operating mode: 70 µs.³⁾ Operating mode: 250 µs.⁴⁾ Operating mode: 2 ms.⁵⁾ Operating mode: 8 ms.⁶⁾ Red light: 250 µs.⁷⁾ High speed: 50 µs.⁸⁾ Green light: 250 µs.

→ For dimensional drawings, please see page J-847



Flat type

- **Detection principle:** Through-beam system
- **Fiber-optic cable cuttable:** ✓

Figure	Length	Minimal object diameter	Minimum bend radius	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	1,000 mm	≥ 0.08 mm	1 mm	120 mm ¹⁾ 350 mm ²⁾ 620 mm ³⁾ 1,250 mm ⁴⁾ 1,330 mm ⁵⁾	250 mm ⁶⁾ 120 mm ⁷⁾ 120 mm ⁸⁾	LL3-TE01	5325807
				40 mm ¹⁾ 140 mm ²⁾ 220 mm ³⁾ 450 mm ⁴⁾ 480 mm ⁵⁾	130 mm ⁶⁾ 60 mm ⁷⁾ 50 mm ⁸⁾	LL3-TE02	5325910
	2,000 mm	≥ 0.03 mm	1 mm	150 mm ¹⁾ 440 mm ²⁾ 700 mm ³⁾ 1,400 mm ⁴⁾ 1,490 mm ⁵⁾	320 mm ⁶⁾ 160 mm ⁷⁾ 120 mm ⁸⁾	LL3-TE04	5325911
			4 mm	150 mm ¹⁾ 460 mm ²⁾ 840 mm ³⁾ 1,680 mm ⁴⁾ 1,780 mm ⁵⁾	350 mm ⁶⁾ 140 mm ⁷⁾ 240 mm ⁸⁾	LL3-TE05	5325914
				360 mm ¹⁾ 1,300 mm ²⁾ 2,300 mm ³⁾ 4,000 mm ⁴⁾ 4,000 mm ⁵⁾	1,200 mm ⁶⁾ 500 mm ⁷⁾ 750 mm ⁸⁾	LL3-TR05	5325808
				560 mm ¹⁾ 1,600 mm ²⁾ 2,200 mm ³⁾ 4,000 mm ⁴⁾ 4,000 mm ⁵⁾	1,200 mm ⁶⁾ 500 mm ⁷⁾ 750 mm ⁸⁾	LL3-TR06	5325912

¹⁾ Operating mode: 16 µs. ²⁾ Operating mode: 70 µs. ³⁾ Operating mode: 250 µs. ⁴⁾ Operating mode: 2 ms. ⁵⁾ Operating mode: 8 ms.
⁶⁾ Red light: 250 µs. ⁷⁾ High speed: 50 µs. ⁸⁾ Green light: 250 µs.

Figure	Length	Minimal object diameter	Minimum bend radius	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	2,000 mm	≥ 0.04 mm	1 mm	250 mm ¹⁾ 730 mm ²⁾ 1,280 mm ³⁾ 2,560 mm ⁴⁾ 2,730 mm ⁵⁾	600 mm ⁶⁾ 300 mm ⁷⁾ 400 mm ⁸⁾	LL3-TR13	5325909
				600 mm ¹⁾ 1,400 mm ²⁾ 2,300 mm ³⁾ 4,000 mm ⁴⁾ 4,000 mm ⁵⁾	1,400 mm ⁶⁾ 650 mm ⁷⁾ 600 mm ⁸⁾	LL3-TR12	5325907
		≥ 0.08 mm	1 mm	590 mm ¹⁾ 1,500 mm ²⁾ 2,200 mm ³⁾ 4,000 mm ⁴⁾ 4,000 mm ⁵⁾	1,800 mm ⁶⁾ 800 mm ⁷⁾ 750 mm ⁸⁾	LL3-TR11	5325906
				190 mm ¹⁾ 580 mm ²⁾ 980 mm ³⁾ 1,970 mm ⁴⁾ 2,100 mm ⁵⁾	500 mm ⁶⁾ 250 mm ⁷⁾ 200 mm ⁸⁾	LL3-TE03	5325908

¹⁾ Operating mode: 16 µs. ²⁾ Operating mode: 70 µs. ³⁾ Operating mode: 250 µs. ⁴⁾ Operating mode: 2 ms. ⁵⁾ Operating mode: 8 ms.

⁶⁾ Red light: 250 µs. ⁷⁾ High speed: 50 µs. ⁸⁾ Green light: 250 µs.

→ For dimensional drawings, please see page J-848



Long end sleeve

- **Detection principle:** Through-beam system

Figure	Length	Minimal object diameter	Minimum bend radius	Fiber-optic cable cut-table	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	500 mm	≥ 0.02 mm	5 mm	–	2 mm ¹⁾ 8 mm ²⁾ 14 mm ³⁾ 28 mm ⁴⁾ 30 mm ⁵⁾	5 mm ⁶⁾ 3 mm ⁷⁾ 3 mm ⁸⁾	LL3-TP01	5325925
	2,000 mm	≥ 0.03 mm	25 mm	✓	50 mm ¹⁾ 140 mm ²⁾ 250 mm ³⁾ 500 mm ⁴⁾ 530 mm ⁵⁾	120 mm ⁶⁾ 60 mm ⁷⁾ 60 mm ⁸⁾	LL3-TB05	5325924
		≥ 0.1 mm	15 mm	✓	10 mm ¹⁾ 30 mm ²⁾ 60 mm ³⁾ 140 mm ⁴⁾ 200 mm ⁵⁾	32 mm ⁶⁾ 13 mm ⁷⁾ 5 mm ⁸⁾	LL3-TT01	5308057
					30 mm ¹⁾ 130 mm ²⁾ 250 mm ³⁾ 550 mm ⁴⁾ 800 mm ⁵⁾	77 mm ⁶⁾ 27 mm ⁷⁾ 16 mm ⁸⁾	LL3-TV02	5308059
							LL3-TV04	5308060
		≥ 0.2 mm	25 mm	✓	240 mm ¹⁾ 700 mm ²⁾ 1,400 mm ³⁾ 2,500 mm ⁴⁾ 2,900 mm ⁵⁾	470 mm ⁶⁾ 165 mm ⁷⁾ 132 mm ⁸⁾	LL3-TB03	5308056
					180 mm ¹⁾ 600 mm ²⁾ 1,100 mm ³⁾ 2,500 mm ⁴⁾ 3,300 mm ⁵⁾	2,050 mm ⁶⁾ 950 mm ⁷⁾ 850 mm ⁸⁾	LL3-TK16	5313038
					170 mm ¹⁾ 500 mm ²⁾ 1,000 mm ³⁾ 2,300 mm ⁴⁾ 3,000 mm ⁵⁾	355 mm ⁶⁾ 125 mm ⁷⁾ 115 mm ⁸⁾	LL3-TS08	5308061
		≥ 0.5 mm	25 mm	✓	120 mm ¹⁾ 400 mm ²⁾ 800 mm ³⁾ 1,800 mm ⁴⁾ 2,750 mm ⁵⁾	325 mm ⁶⁾ 115 mm ⁷⁾ 87 mm ⁸⁾	LL3-TV01	5308058
					170 mm ¹⁾ 550 mm ²⁾ 1,000 mm ³⁾ 2,300 mm ⁴⁾ 3,000 mm ⁵⁾	1,800 mm ⁶⁾ 840 mm ⁷⁾ 760 mm ⁸⁾	LL3-TS12	5308062

¹⁾ Operating mode: 16 µs. ²⁾ Operating mode: 70 µs. ³⁾ Operating mode: 250 µs. ⁴⁾ Operating mode: 2 ms. ⁵⁾ Operating mode: 8 ms.

⁶⁾ Red light: 250 µs. ⁷⁾ High speed: 50 µs. ⁸⁾ Green light: 250 µs.

→ For dimensional drawings, please see page J-846



Area detection

- **Detection principle:** Through-beam system
- **Length:** 2,000 mm
- **Fiber-optic cable cuttable:** ✓

Figure	Minimal object diameter	Minimum bend radius	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	≥ 0.25 mm	1 mm	1,300 mm ¹⁾ 2,500 mm ²⁾ 3,000 mm ³⁾ 3,500 mm ⁴⁾ 4,000 mm ⁵⁾	2,000 mm ⁶⁾ 1,000 mm ⁷⁾ 800 mm ⁸⁾	LL3-TZ09	5326598
		10 mm	1,700 mm ¹⁾ 2,500 mm ²⁾ 3,000 mm ³⁾ 3,500 mm ⁴⁾ 4,000 mm ⁵⁾	2,800 mm ⁶⁾ 1,200 mm ⁷⁾ 800 mm ⁸⁾	LL3-TZ10	5326599
	≥ 0.4 mm	2 mm	3,000 mm ¹⁾ 4,000 mm ²⁾ 4,000 mm ³⁾ 4,000 mm ⁴⁾ 4,000 mm ⁵⁾	4,000 mm ⁶⁾ 1,300 mm ⁷⁾ 1,600 mm ⁸⁾	LL3-TS40	5323971
	≥ 0.45 mm	25 mm	150 mm ¹⁾ 450 mm ²⁾ 740 mm ³⁾ 1,400 mm ⁴⁾ 1,500 mm ⁵⁾	350 mm ⁶⁾ 150 mm ⁷⁾ 250 mm ⁸⁾	LL3-TZ05	5325937
			150 mm ¹⁾ 480 mm ²⁾ 790 mm ³⁾ 1,500 mm ⁴⁾ 1,600 mm ⁵⁾	350 mm ⁶⁾ 150 mm ⁷⁾ 250 mm ⁸⁾	LL3-TZ06	5325938
	≥ 0.5 mm	25 mm	130 mm ¹⁾ 400 mm ²⁾ 800 mm ³⁾ 2,000 mm ⁴⁾ 3,500 mm ⁵⁾	335 mm ⁶⁾ 125 mm ⁷⁾ 90 mm ⁸⁾	LL3-TS14	5313039
	≥ 1 mm	25 mm	130 mm ¹⁾ 400 mm ²⁾ 800 mm ³⁾ 2,000 mm ⁴⁾ 3,500 mm ⁵⁾	335 mm ⁶⁾ 125 mm ⁷⁾ 90 mm ⁸⁾	LL3-TS10	5308063

¹⁾ Operating mode: 16 µs. ²⁾ Operating mode: 70 µs. ³⁾ Operating mode: 250 µs. ⁴⁾ Operating mode: 2 ms. ⁵⁾ Operating mode: 8 ms.
⁶⁾ Red light: 250 µs. ⁷⁾ High speed: 50 µs. ⁸⁾ Green light: 250 µs.

→ For dimensional drawings, please see page J-851.



Heat-resistant

- **Detection principle:** Through-beam system

Figure	Length	Minimal object diameter	Minimum bend radius	Fiber-optic cable cut-table	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	1,000 mm	≥ 0.02 mm	10 mm	–	50 mm ¹⁾ 180 mm ²⁾ 300 mm ³⁾ 600 mm ⁴⁾ 640 mm ⁵⁾	130 mm ⁶⁾ 50 mm ⁷⁾ 80 mm ⁸⁾	LL3-TH10	5325970
		≥ 0.04 mm	25 mm	–	130 mm ¹⁾ 400 mm ²⁾ 700 mm ³⁾ 1,400 mm ⁴⁾ 1,500 mm ⁵⁾	320 mm ⁶⁾ 130 mm ⁷⁾ 200 mm ⁸⁾	LL3-TH11	5325971
					80 mm ¹⁾ 230 mm ²⁾ 350 mm ³⁾ 560 mm ⁴⁾ 980 mm ⁵⁾	–	LL3-TW01	5315233
	2,000 mm	≥ 0.04 mm	25 mm	–	150 mm ¹⁾ 480 mm ²⁾ 790 mm ³⁾ 1,500 mm ⁴⁾ 1,600 mm ⁵⁾	350 mm ⁶⁾ 140 mm ⁷⁾ 240 mm ⁸⁾	LL3-TH08	5325978
					140 mm ¹⁾ 460 mm ²⁾ 700 mm ³⁾ 1,400 mm ⁴⁾ 1,500 mm ⁵⁾	350 mm ⁶⁾ 140 mm ⁷⁾ 240 mm ⁸⁾	LL3-TH09	5325979
		≥ 0.06 mm	25 mm	✓	230 mm ¹⁾ 690 mm ²⁾ 1,100 mm ³⁾ 2,300 mm ⁴⁾ 2,400 mm ⁵⁾	600 mm ⁶⁾ 250 mm ⁷⁾ 400 mm ⁸⁾	LL3-TH17	5325967
		≥ 0.12 mm	25 mm	✓	100 mm ¹⁾ 330 mm ²⁾ 570 mm ³⁾ 1,100 mm ⁴⁾ 1,200 mm ⁵⁾	250 mm ⁶⁾ 100 mm ⁷⁾ 170 mm ⁸⁾	LL3-TH12	5325972
							LL3-TH13	5325973
							LL3-TH14	5325974
		≥ 0.2 mm	25 mm	✓	55 mm ¹⁾ 180 mm ²⁾ 320 mm ³⁾ 680 mm ⁴⁾ 1,000 mm ⁵⁾	305 mm ⁶⁾ 125 mm ⁷⁾ 50 mm ⁸⁾	LL3-TH01	5308064
		≥ 0.5 mm	35 mm	✓	230 mm ¹⁾ 700 mm ²⁾ 1,300 mm ³⁾ 2,700 mm ⁴⁾ 4,000 mm ⁵⁾	620 mm ⁶⁾ 255 mm ⁷⁾ 125 mm ⁸⁾	LL3-TH02	5308065

¹⁾ Operating mode: 16 µs. ²⁾ Operating mode: 70 µs. ³⁾ Operating mode: 250 µs. ⁴⁾ Operating mode: 2 ms. ⁵⁾ Operating mode: 8 ms.

⁶⁾ Red light: 250 µs. ⁷⁾ High speed: 50 µs. ⁸⁾ Green light: 250 µs.

→ For dimensional drawings, please see page J-852



LCDs/transparent objects/semiconductors

- **Detection principle:** Through-beam system
- **Length:** 2,000 mm
- **Fiber-optic cable cuttable:** ✓

Figure	Minimal object diameter	Minimum bend radius	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	≥ 0.02 mm	10 mm	100 mm ¹⁾ 290 mm ²⁾ 500 mm ³⁾ 1,000 mm ⁴⁾ 1,100 mm ⁵⁾	250 mm ⁶⁾ 120 mm ⁷⁾ 120 mm ⁸⁾	LL3-TG04	5324499
	≥ 0.05 mm	10 mm	220 mm ¹⁾ 760 mm ²⁾ 1,500 mm ³⁾ 2,900 mm ⁴⁾ 4,000 mm ⁵⁾	625 mm ⁶⁾ 400 mm ⁷⁾ 300 mm ⁸⁾	LL3-TS22M	5325968
		25 mm	390 mm ¹⁾ 1,300 mm ²⁾ 2,600 mm ³⁾ 4,000 mm ⁴⁾ 4,000 mm ⁵⁾	850 mm ⁶⁾ 500 mm ⁷⁾ 400 mm ⁸⁾	LL3-TS22	5325944
	≥ 0.06 mm	1 mm	580 mm ¹⁾ 1,670 mm ²⁾ 2,400 mm ³⁾ 4,000 mm ⁴⁾ 4,000 mm ⁵⁾	1,100 mm ⁶⁾ 450 mm ⁷⁾ 700 mm ⁸⁾	LL3-TG02	5325943
		25 mm	880 mm ¹⁾ 2,300 mm ²⁾ 3,500 mm ³⁾ 4,000 mm ⁴⁾ 4,000 mm ⁵⁾	2,500 mm ⁶⁾ 1,300 mm ⁷⁾ 1,600 mm ⁸⁾	LL3-TG01	5325940
			570 mm ¹⁾ 1,980 mm ²⁾ 2,400 mm ³⁾ 4,000 mm ⁴⁾ 4,000 mm ⁵⁾	1,000 mm ⁶⁾ 450 mm ⁷⁾ 700 mm ⁸⁾	LL3-TG03	5325942

¹⁾ Operating mode: 16 µs.²⁾ Operating mode: 70 µs.³⁾ Operating mode: 250 µs.⁴⁾ Operating mode: 2 ms.⁵⁾ Operating mode: 8 ms.⁶⁾ Red light: 250 µs.⁷⁾ High speed: 50 µs.⁸⁾ Green light: 250 µs.

→ For dimensional drawings, please see page J-854



Resistant to oil/chemicals

- **Detection principle:** Through-beam system

Figure	Length	Minimal object diameter	Minimum bend radius	Fiber-optic cable cuttable	Sensing range with WLL180	Sensing range with WLL170	Model name	Part no.
	2,000 mm	≥ 0.3 mm	60 mm	–	400 mm ¹⁾ 1,200 mm ²⁾ 2,100 mm ³⁾ 4,000 mm ⁴⁾ 4,000 mm ⁵⁾	2,000 mm ⁶⁾ 415 mm ⁷⁾ 390 mm ⁸⁾	LL3-TY01	5308066
					300 mm ¹⁾ 1,000 mm ²⁾ 1,300 mm ³⁾ 3,000 mm ⁴⁾ 4,000 mm ⁵⁾	620 mm ⁶⁾ 225 mm ⁷⁾ 210 mm ⁸⁾	LL3-TY02	5308067
		≥ 4 mm	25 mm	✓	850 mm ¹⁾ 2,700 mm ²⁾ 3,000 mm ³⁾ 4,000 mm ⁴⁾ 4,000 mm ⁵⁾	2,200 mm ⁶⁾ 800 mm ⁷⁾ 1,300 mm ⁸⁾	LL3-TY05	5325980
	2,500 mm	≥ 0.3 mm	30 mm	✓	740 mm ¹⁾ 2,400 mm ²⁾ 3,000 mm ³⁾ 4,000 mm ⁴⁾ 4,000 mm ⁵⁾	2,200 mm ⁶⁾ 800 mm ⁷⁾ 1,300 mm ⁸⁾	LL3-TY04	5325981

¹⁾ Operating mode: 16 µs. ²⁾ Operating mode: 70 µs. ³⁾ Operating mode: 250 µs. ⁴⁾ Operating mode: 2 ms. ⁵⁾ Operating mode: 8 ms.

⁶⁾ Red light: 250 µs. ⁷⁾ High speed: 50 µs. ⁸⁾ Green light: 250 µs.

→ For dimensional drawings, please see page J-854



Liquid level

- **Detection principle:** Through-beam system

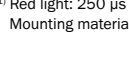
Figure	Length	Minimum bend radius	Model name	Part no.
	2,000 mm	20 mm	LL3-TF01	5324242

→ For dimensional drawings, please see page J-855



Tip adapters through-beam system

Suitable for amplifier WLL170-2

Figure	Temperature	LL model name/sensing range (mm)										
		LL3-TB01		LL3-TB01-10		LL3-TB01-30		LL3-TB02		LL3-TB06		
	-40 °C		3000 ¹⁾		1800 ¹⁾		1000 ¹⁾		3500 ¹⁾		3500 ¹⁾	
	-		1200 ²⁾		700 ²⁾		400 ²⁾		1400 ²⁾		1400 ²⁾	
	+100 °C		1100 ³⁾		600 ³⁾		200 ³⁾		1200 ³⁾		1200 ³⁾	
	-40 °C		3000 ¹⁾		1800 ¹⁾		1000 ¹⁾		3500 ¹⁾		3500 ¹⁾	
	-		1200 ²⁾		700 ²⁾		400 ²⁾		1400 ²⁾		1400 ²⁾	
	+100 °C		800 ³⁾		500 ³⁾		200 ³⁾		1000 ³⁾		1000 ³⁾	
	-40 °C		600 ¹⁾		360 ¹⁾		200 ¹⁾		600 ¹⁾		-	
	-		230 ²⁾		130 ²⁾		80 ²⁾		230 ²⁾		-	
	+70 °C		100 ³⁾				100 ³⁾					
	-40 °C		3500 ¹⁾		2100 ¹⁾		1200 ¹⁾		3500 ¹⁾		3500 ¹⁾	
	-		1400 ²⁾		850 ²⁾		500 ²⁾		1400 ²⁾		1400 ²⁾	
	+350 °C		1000 ³⁾		600 ³⁾		200 ³⁾		1000 ³⁾		1000 ³⁾	
	-60 °C		3500 ¹⁾		2100 ¹⁾		1200 ¹⁾		3500 ¹⁾		3500 ¹⁾	
	-		1400 ²⁾		850 ²⁾		500 ²⁾		1400 ²⁾		1400 ²⁾	
	+350 °C		1000 ³⁾		600 ³⁾		200 ³⁾		1000 ³⁾		1000 ³⁾	
	-60 °C		500 ¹⁾		300 ¹⁾		180 ¹⁾		500 ¹⁾			
	-		200 ²⁾		100 ²⁾		70 ²⁾		200 ²⁾			
	+300 °C						80 ³⁾		-		400 ¹⁾	
											150 ²⁾	

¹⁾ Red light: 250 µs ²⁾ Highspeed: 50 µs ³⁾ Green light: 250 µs
Mounting material included.

Suitable for amplifier WLL180T

Figure	Temperature	LL model name/sensing range (mm)												
		LL3-TB01		LL3-TB01-10		LL3-TB01-30		LL3-TB02			LL3-TB06		LL3-TH01	
	-40 °C – +100 °C		800 ¹⁾		720 ¹⁾		570 ¹⁾		1800 ¹⁾		1500 ¹⁾		500 ¹⁾	
			2500 ²⁾		2250 ²⁾		1800 ²⁾		4000 ²⁾		4000 ²⁾		1400 ²⁾	
			4000 ³⁾		3600 ³⁾		2880 ³⁾		4000 ³⁾		4000 ³⁾		2500 ³⁾	
			4000 ⁴⁾		3600 ⁴⁾		2880 ⁴⁾		4000 ⁴⁾		4000 ⁴⁾		4000 ⁴⁾	
			4000 ⁵⁾		3600 ⁵⁾		2880 ⁵⁾		4000 ⁵⁾		4000 ⁵⁾		4000 ⁵⁾	
	-40 °C – +100 °C		800 ¹⁾		720 ¹⁾		570 ¹⁾		1800 ¹⁾		1500 ¹⁾		500 ¹⁾	
			2500 ²⁾		2250 ²⁾		1800 ²⁾		4000 ²⁾		4000 ²⁾		1400 ²⁾	
			4000 ³⁾		3600 ³⁾		2880 ³⁾		4000 ³⁾		4000 ³⁾		2500 ³⁾	
			4000 ⁴⁾		3600 ⁴⁾		2880 ⁴⁾		4000 ⁴⁾		4000 ⁴⁾		4000 ⁴⁾	
			4000 ⁵⁾		3600 ⁵⁾		2880 ⁵⁾		4000 ⁵⁾		4000 ⁵⁾		4000 ⁵⁾	
	-40 °C – +70 °C		200 ¹⁾		180 ¹⁾		150 ¹⁾		300 ¹⁾					
			650 ²⁾		585 ²⁾		460 ²⁾		1000 ²⁾					
			1200 ³⁾		1080 ³⁾		860 ³⁾		1800 ³⁾					
			2500 ⁴⁾		2250 ⁴⁾		1800 ⁴⁾		3500 ⁴⁾					
			3600 ⁵⁾		3240 ⁵⁾		2600 ⁵⁾		4000 ⁵⁾					
	-40 °C – +350 °C		360 ¹⁾		324 ¹⁾		260 ¹⁾		1200 ¹⁾		1200 ¹⁾		1200 ¹⁾	
			2000 ²⁾		1800 ²⁾		1440 ²⁾		4000 ²⁾		4000 ²⁾		2000 ²⁾	
			4000 ³⁾		3600 ³⁾		2880 ³⁾		4000 ³⁾		4000 ³⁾		4000 ³⁾	
			4000 ⁴⁾		3600 ⁴⁾		2880 ⁴⁾		4000 ⁴⁾		4000 ⁴⁾		4000 ⁴⁾	
			4000 ⁵⁾		3600 ⁵⁾		2880 ⁵⁾		4000 ⁵⁾		4000 ⁵⁾		4000 ⁵⁾	
	-60 °C – +350 °C		4000 ¹⁾		3600 ¹⁾		2880 ¹⁾		4000 ¹⁾		4000 ¹⁾		4000 ¹⁾	
			4000 ²⁾		3600 ²⁾		2880 ²⁾		4000 ²⁾		4000 ²⁾		4000 ²⁾	
			4000 ³⁾		3600 ³⁾		2880 ³⁾		4000 ³⁾		4000 ³⁾		4000 ³⁾	
			4000 ⁴⁾		3600 ⁴⁾		2880 ⁴⁾		4000 ⁴⁾		4000 ⁴⁾		4000 ⁴⁾	
			4000 ⁵⁾		3600 ⁵⁾		2880 ⁵⁾		4000 ⁵⁾		4000 ⁵⁾		4000 ⁵⁾	

¹⁾ Operating mode: 16 µs ²⁾ Operating mode: 70 µs ³⁾ Operating mode: 250 µs ⁴⁾ Operating mode: 2 ms ⁵⁾ Operating mode: 8 ms
Mounting material included.

		LL model name/sensing range (mm)										Model name	Part no.
LL3-TH08		LL3-TH10		LL3-TH11		LL3-TJ01		LL3-TK77		LL3-TR01			
		—		—		—	1500 ¹⁾ — 600 ²⁾ — 400 ³⁾		— 3500 ¹⁾ — 1400 ²⁾ — 1200 ³⁾		— 3000 ¹⁾ — 1200 ²⁾ — 1000 ³⁾	LL3-TA01	5308128
		—		—		—	1500 ¹⁾ — 600 ²⁾ — 400 ³⁾		— 3500 ¹⁾ — 1400 ²⁾ — 1100 ³⁾		— 3000 ¹⁾ — 1200 ²⁾ — 1100 ³⁾	LL3-TA01S	5326461
		—		—		—	500 ¹⁾ — 200 ²⁾		— 600 ¹⁾ — 230 ²⁾		— 500 ¹⁾ — 200 ²⁾	LL3-TA02	5308129
	— 2100 ¹⁾ — 850 ²⁾ — 500 ³⁾		— 1500 ¹⁾ — 600 ²⁾ — 300 ³⁾		— 1500 ¹⁾ — 600 ²⁾ — 300 ³⁾		— 1500 ¹⁾ — 600 ²⁾ — 300 ³⁾		— 3500 ¹⁾ — 1400 ²⁾ — 1000 ³⁾		— 2500 ¹⁾ — 1000 ²⁾ — 700 ³⁾	LL3-TA03	5326462
	— 3500 ¹⁾ — 1400 ²⁾ — 1000 ³⁾		— 1500 ¹⁾ — 600 ²⁾ — 300 ³⁾		— 1500 ¹⁾ — 600 ²⁾ — 250 ³⁾		— 1500 ¹⁾ — 600 ²⁾ — 250 ³⁾		— 3500 ¹⁾ — 1400 ²⁾ — 1000 ³⁾		— 3500 ¹⁾ — 1400 ²⁾ — 1100 ³⁾	LL3-TA04	5326463
	— 350 ¹⁾ — 140 ²⁾		— 300 ¹⁾ — 120 ²⁾		— 350 ¹⁾ — 140 ²⁾		— 400 ¹⁾ — 160 ²⁾		— 400 ¹⁾ — 160 ²⁾		— 350 ¹⁾ — 140 ²⁾	LL3-TA05	5326464

	LL model name/sensing range (mm)										Model name	Part no.										
	LL3-TH08		LL3-TH10		LL3-TH11		LL3-TJ01		LL3-TK77		LL3-TR01											
							750 ¹⁾ 2000 ²⁾ 2000 ³⁾ 2000 ⁴⁾ 2000 ⁵⁾		2000 ¹⁾ 4000 ²⁾ 4000 ³⁾ 4000 ⁴⁾ 4000 ⁵⁾	1800 ¹⁾ 4000 ²⁾ 4000 ³⁾ 4000 ⁴⁾ 4000 ⁵⁾	LL3-TA01	5308128										
						650 ¹⁾ 2000 ²⁾ 2000 ³⁾ 2000 ⁴⁾ 2000 ⁵⁾		2000 ¹⁾ 4000 ²⁾ 4000 ³⁾ 4000 ⁴⁾ 4000 ⁵⁾	LL3-TA01S	5326461												
						200 ¹⁾ 600 ²⁾ 950 ³⁾ 1900 ⁴⁾ 4000 ⁵⁾		300 ¹⁾ 950 ²⁾ 1800 ³⁾ 3500 ⁴⁾ 4000 ⁵⁾					LL3-TA02	5308129								
						800 ¹⁾ 2000 ²⁾ 4000 ³⁾ 4000 ⁴⁾ 4000 ⁵⁾		750 ¹⁾ 2000 ²⁾ 2000 ³⁾ 2000 ⁴⁾ 2000 ⁵⁾								1000 ¹⁾ 2000 ²⁾ 2000 ³⁾ 2000 ⁴⁾ 2000 ⁵⁾		600 ¹⁾ 2000 ²⁾ 2000 ³⁾ 2000 ⁴⁾ 2000 ⁵⁾		600 ¹⁾ 2000 ²⁾ 4000 ³⁾ 4000 ⁴⁾ 4000 ⁵⁾	LL3-TA03	5326462
						4000 ¹⁾ 4000 ²⁾ 4000 ³⁾ 4000 ⁴⁾ 4000 ⁵⁾		2000 ¹⁾ 2000 ²⁾ 2000 ³⁾ 2000 ⁴⁾ 2000 ⁵⁾								2000 ¹⁾ 2000 ²⁾ 2000 ³⁾ 2000 ⁴⁾ 2000 ⁵⁾		4000 ¹⁾ 4000 ²⁾ 4000 ³⁾ 4000 ⁴⁾ 4000 ⁵⁾	LL3-TA04	5326463		

Figure	Tempera- ture	LL model name/sensing range (mm)											
		LL3-TB01		LL3-TB01-10		LL3-TB01-30		LL3-TB02		LL3-TB06			LL3-TH01
	-60 °C		250 ¹⁾		225 ¹⁾		180 ¹⁾		250 ¹⁾	-		160 ¹⁾	
			800 ²⁾		720 ²⁾		570 ²⁾		800 ²⁾			450 ²⁾	
	-		1200 ³⁾		1080 ³⁾		860 ³⁾		1200 ³⁾			800 ³⁾	
	+300 °C		2400 ⁴⁾		2160 ⁴⁾		1700 ⁴⁾		2400 ⁴⁾			1500 ⁴⁾	
			4000 ⁵⁾		3600 ⁵⁾		2880 ⁵⁾		4000 ⁵⁾			4000 ⁵⁾	

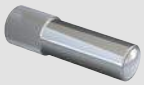
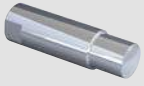
¹⁾ Operating mode: 16 µs ²⁾ Operating mode: 70 µs ³⁾ Operating mode: 250 µs ⁴⁾ Operating mode: 2 ms ⁵⁾ Operating mode: 8 ms
Mounting material included.

→ For dimensional drawings, please see page J-855

	LL model name/sensing range (mm)											Model name	Part no.	
	LL3-TH08		LL3-TH10		LL3-TH11		LL3-TJ01		LL3-TK77		LL3-TR01			
		170 ¹⁾		100 ¹⁾		150 ¹⁾		200 ¹⁾		200 ¹⁾		160 ¹⁾	LL3-TA05	5326464
		550 ²⁾		300 ²⁾		400 ²⁾		600 ²⁾		600 ²⁾		550 ²⁾		
		800 ³⁾		600 ³⁾		700 ³⁾		950 ³⁾		950 ³⁾		850 ³⁾		
		1600 ⁴⁾		1100 ⁴⁾		1400 ⁴⁾		1900 ⁴⁾		1900 ⁴⁾		1700 ⁴⁾		
		4000 ⁵⁾		2000 ⁵⁾		4000 ⁵⁾		4000 ⁵⁾		4000 ⁵⁾		4000 ⁵⁾		



Tip adapters proximity system

Figure	Temperature	Light spot size			Focal length [mm]	Model name	Part no.
		LL3-DK21	LL3-DT01	LL3-DM02			
	- 40 °C – + 70 °C	Ø 0.2 mm	Ø 0.4 mm	–	6	LL3-DA01	5308127
	- 40 °C – + 70 °C	Ø 1.2 mm	Ø 1.4 mm	–	15	LL3-DA02	5308130
	- 20 °C – + 60 °C	Ø 0.2 mm	Ø 0.4 mm	–	7	LL3-DA03	5326465
	- 40 °C – + 70 °C	Ø 0.3 mm	Ø 0.5 mm	–	7,5	LL3-DA04	5326466
	- 40 °C – + 70 °C	–	–	Ø 0.5 mm	6	LL3-DA05	5326467
	- 40 °C – + 70 °C	–	–	Ø 0.7 mm – 0.85 mm	~ 20	LL3-DA06	5326468
	- 40 °C – + 70 °C	–	–	Ø 0.5 mm – 0.8 mm	~ 14	LL3-DA07	5326469

→ For dimensional drawings, please see page J-855

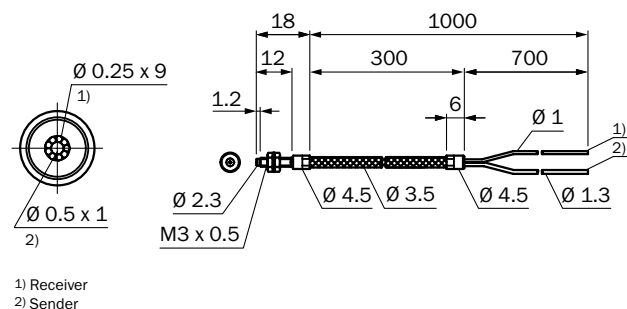
Dimensional drawings

Dimensions in mm (inch)

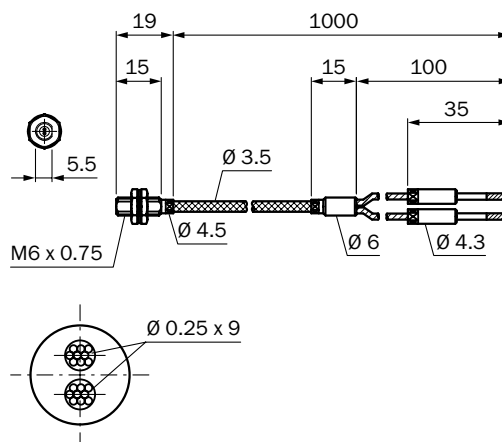
Threaded sleeve

- **Detection principle:** Proximity system

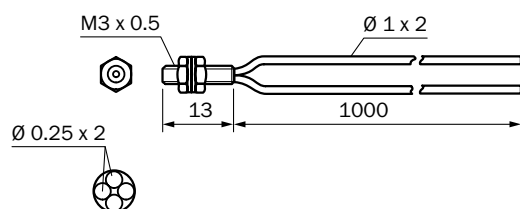
LL3-DJ01



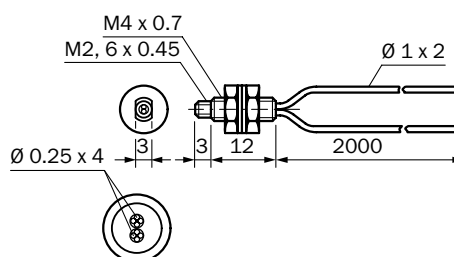
LL3-DJ02



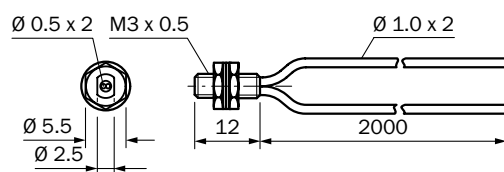
LL3-DR02



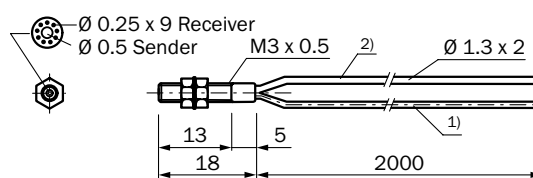
LL3-DR06



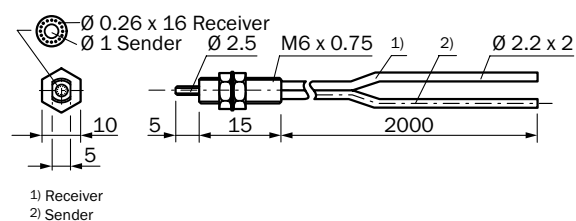
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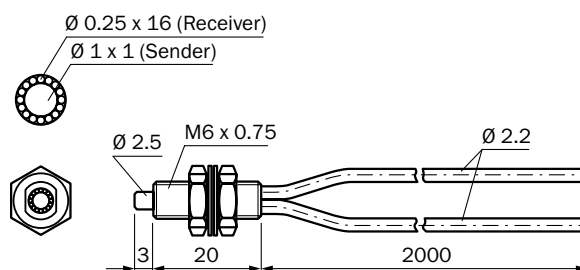
LL3-DT01

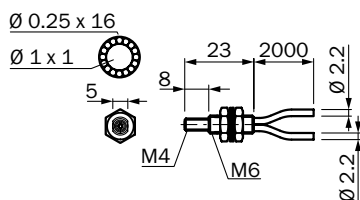
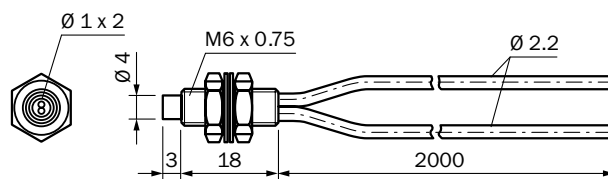
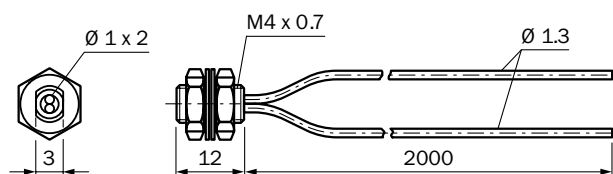
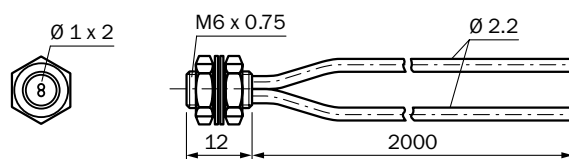
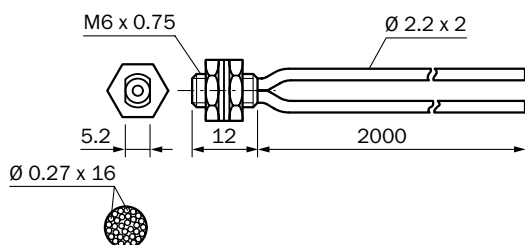
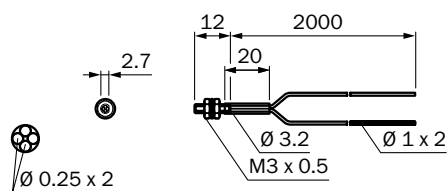
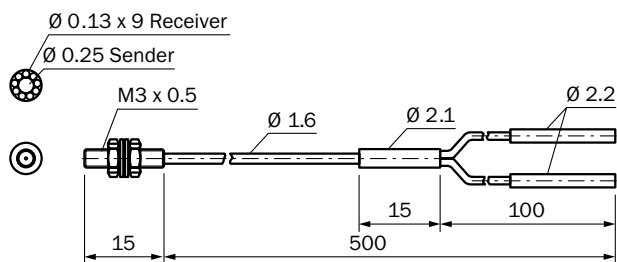
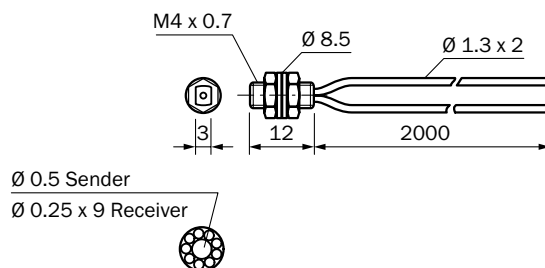
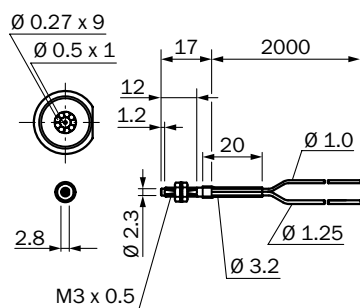
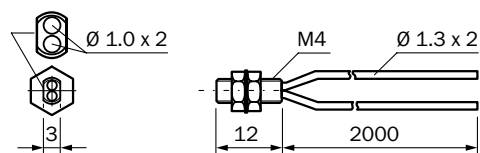


LL3-DB01



LL3-DB03

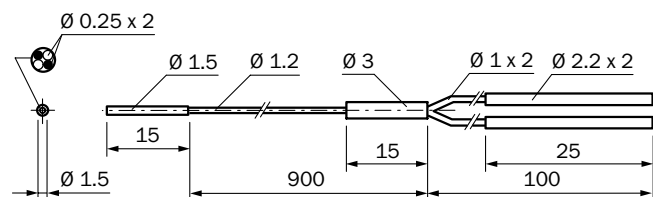


LL3-DB04**LL3-DK06****LL3-DK66****LL3-DK67****LL3-DR01****LL3-DR08****LL3-DK21****LL3-DM02****LL3-DB07****LL3-DM01**

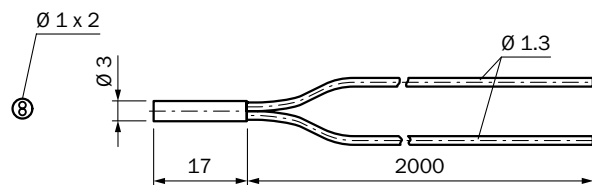
Smooth sleeve

- **Detection principle:** Proximity system

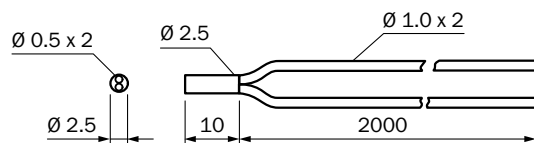
LL3-DR04



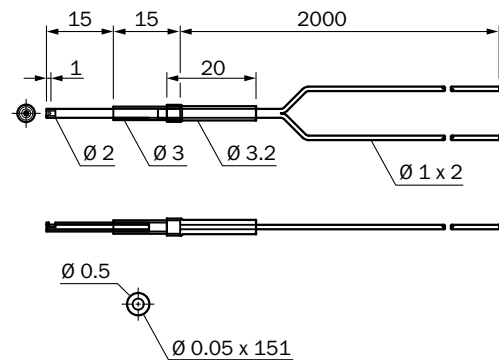
LL3-DK4Z



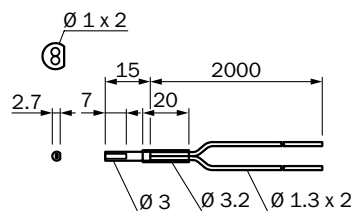
LL3-DT03



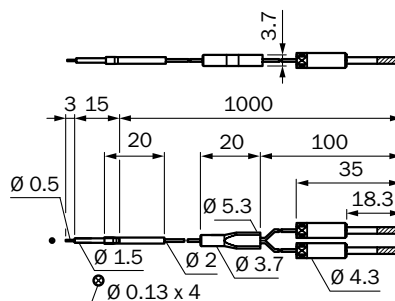
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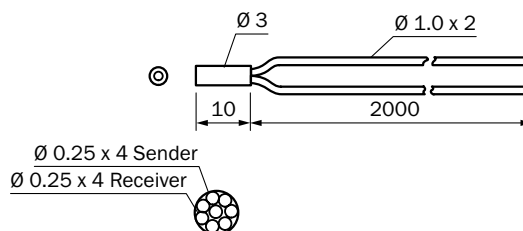
LL3-DB10



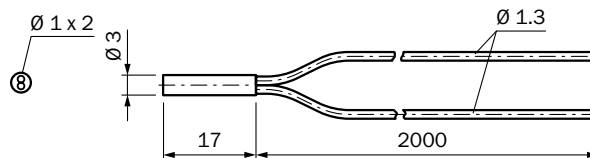
LL3-DP01



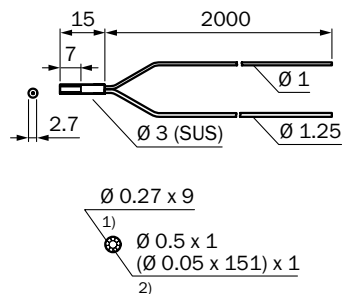
LL3-DR03



LL3-DK04



LL3-DR11

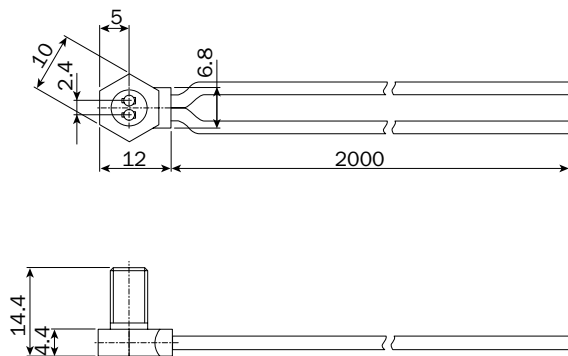


- 1) Receiver
2) Sender

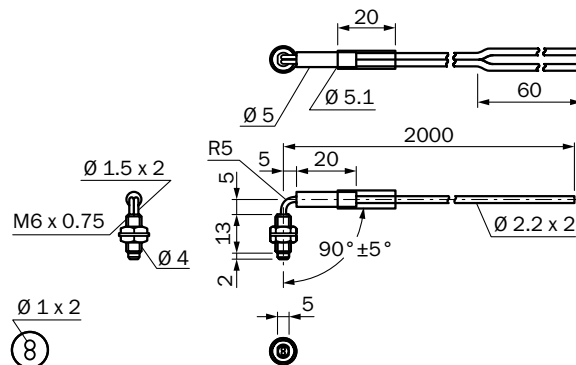
90° deflection

- Detection principle: Proximity system

LL3-DV05, LL3-DV06, LL3-DV07



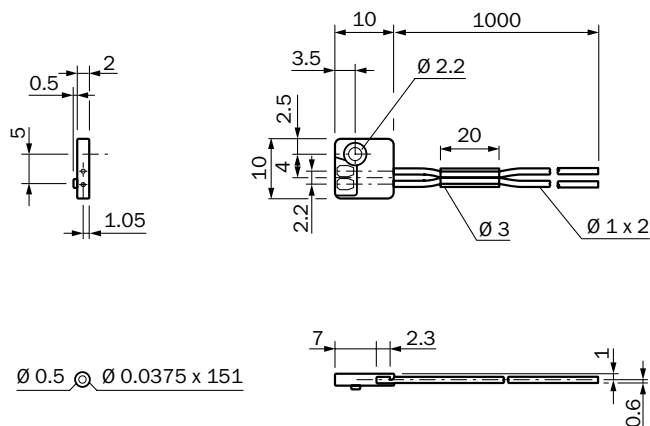
LL3-DB09



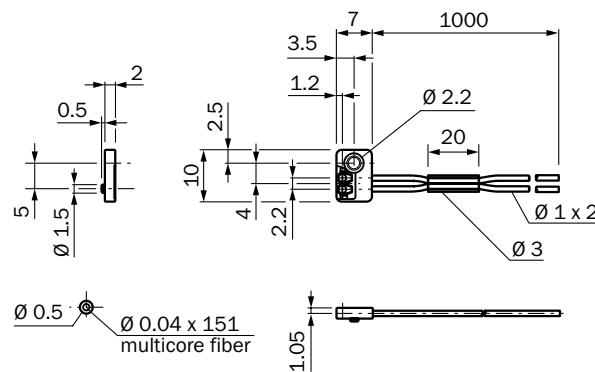
Flat type

- Detection principle: Proximity system

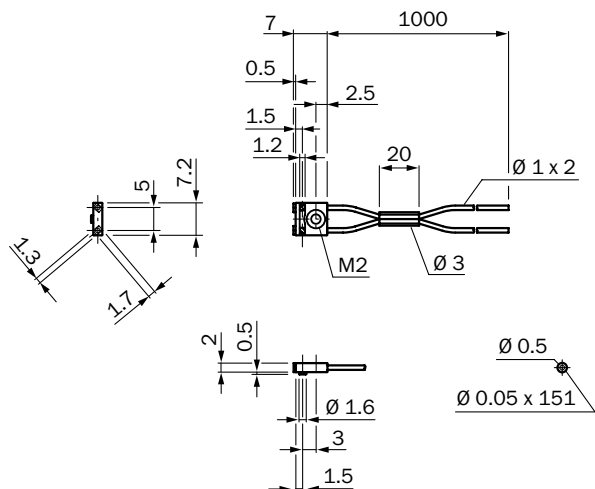
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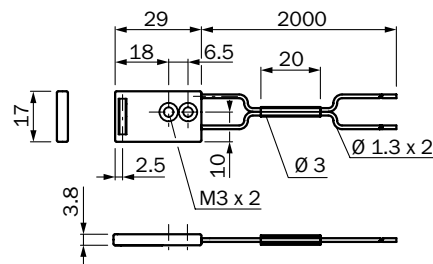
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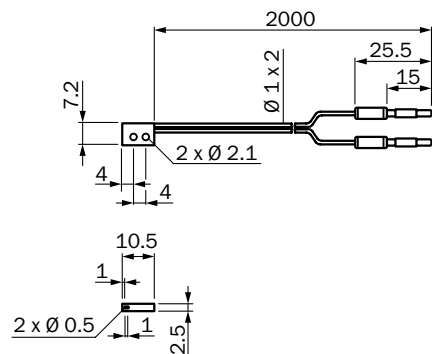
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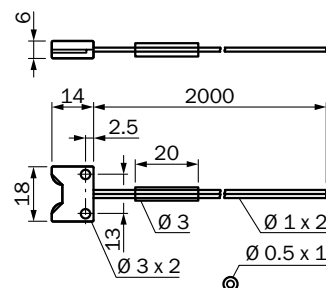
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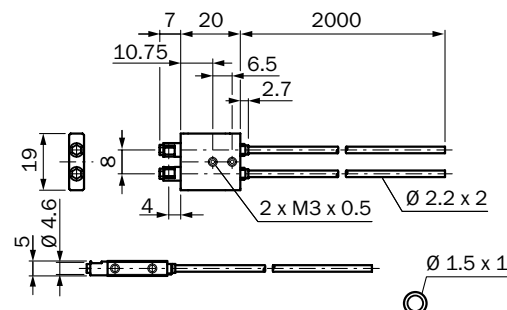
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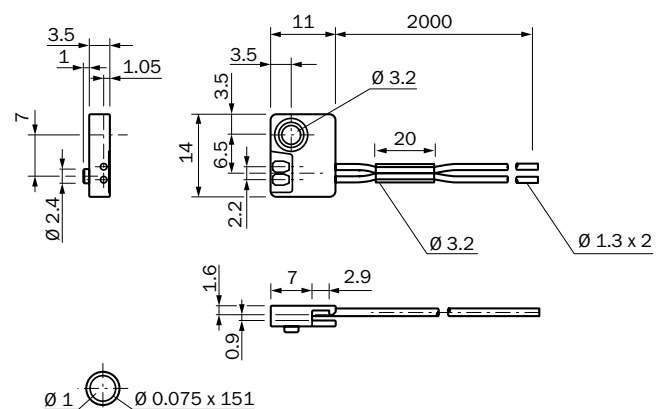
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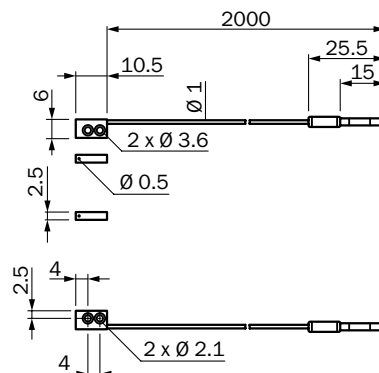
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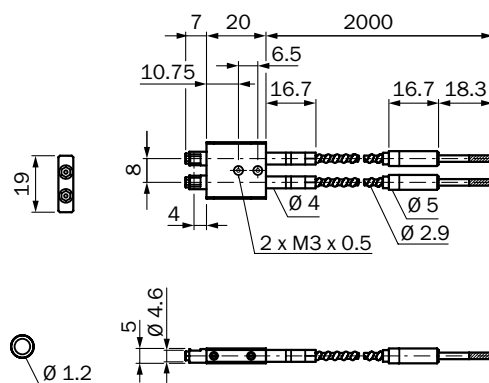
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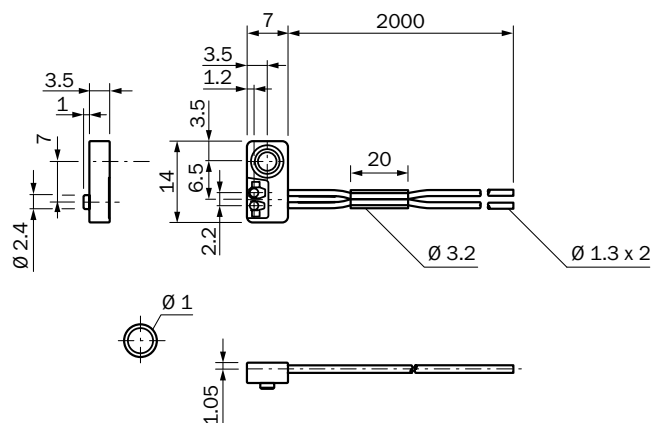
LL3-DC57



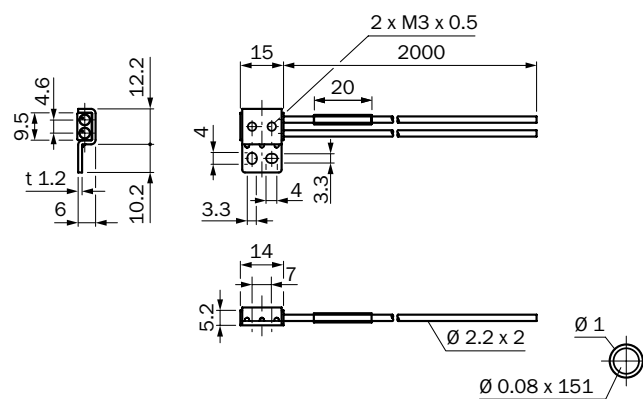
LL3-DH06



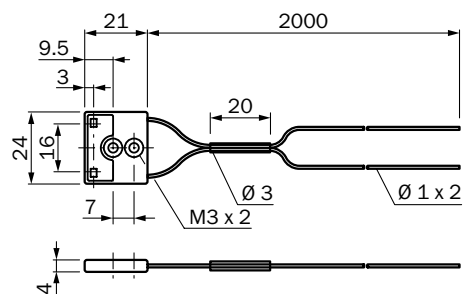
LL3-DE03



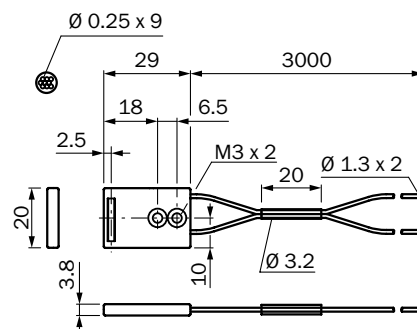
LL3-DR09



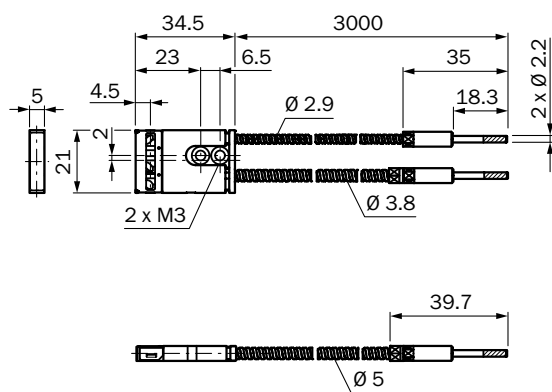
LL3-DC07



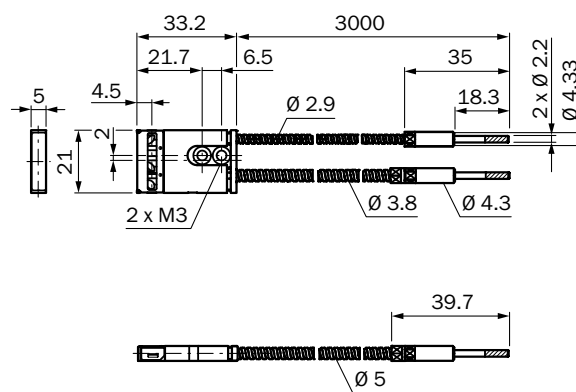
LL3-DC04



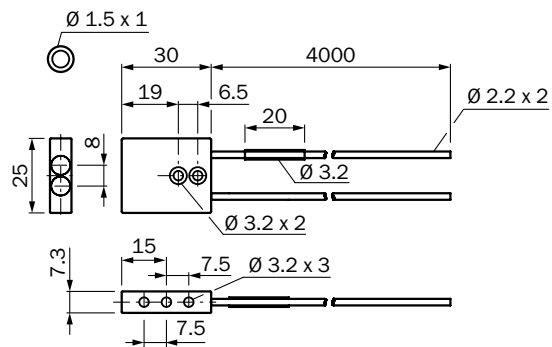
LL3-DH11



LL3-DH10



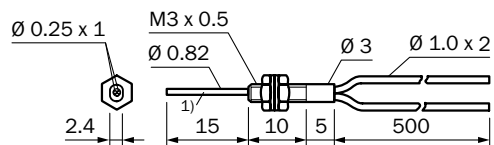
LL3-DC03



Long end sleeve

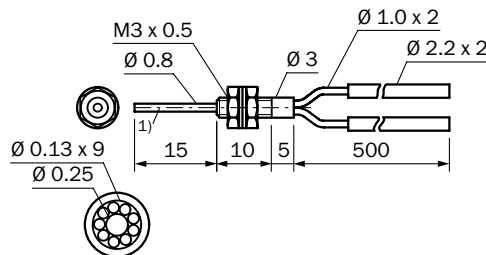
- **Detection principle:** Proximity system

LL3-DT02



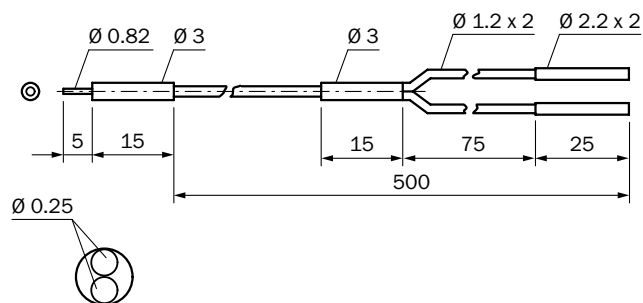
1) End tip cannot be bent

LL3-DT04

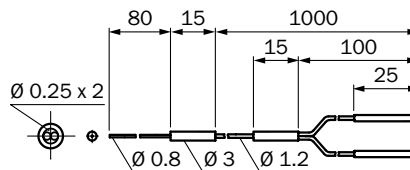


1) End tip cannot be bent

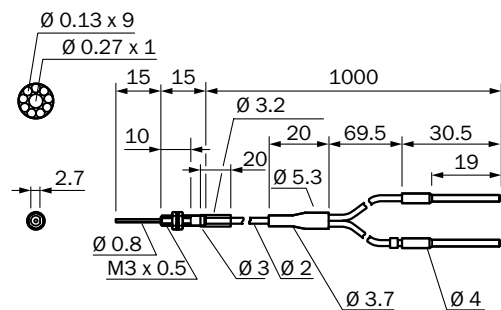
LL3-DR05



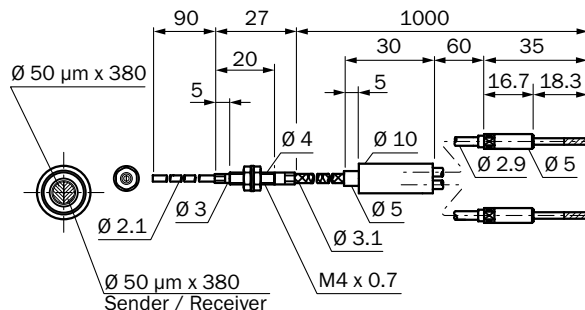
LL3-DR07



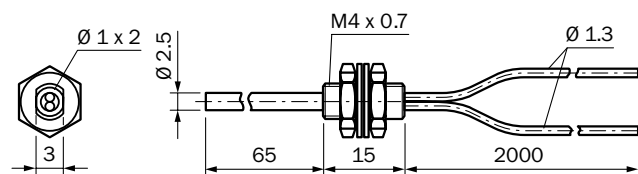
LL3-DB05



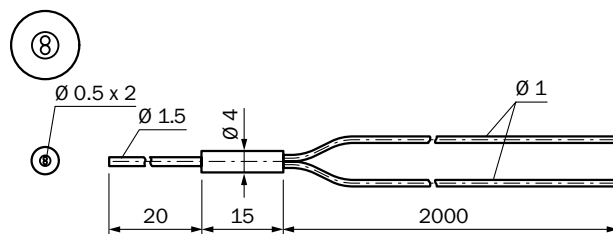
LL3-DH05

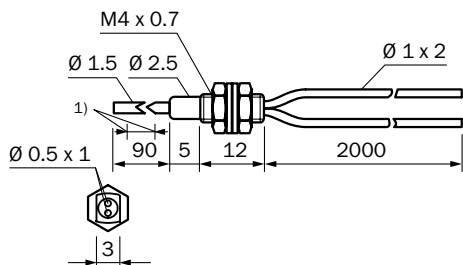


LL3-DK63Z

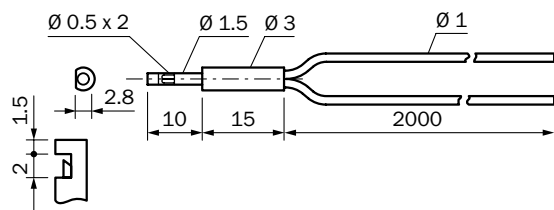
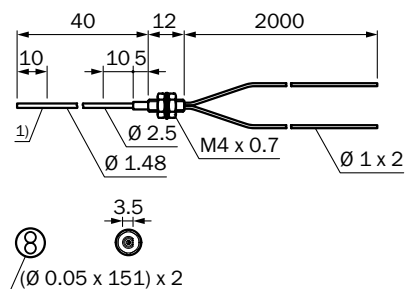


LL3-DK43

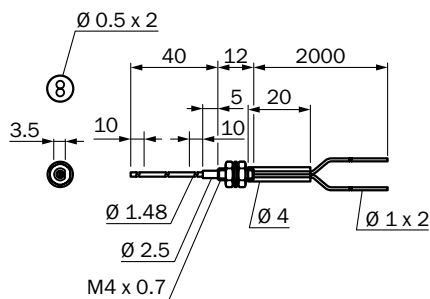
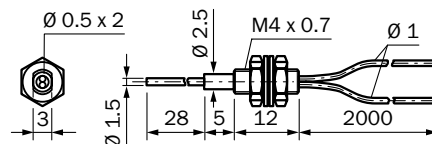
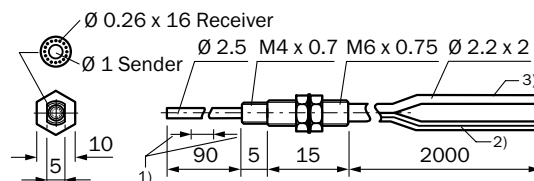


LL3-DM03

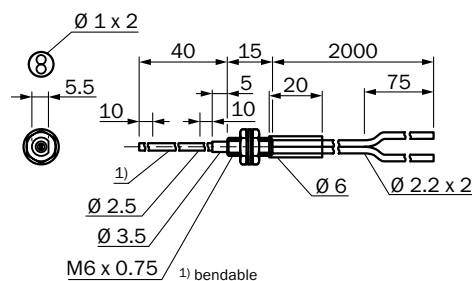
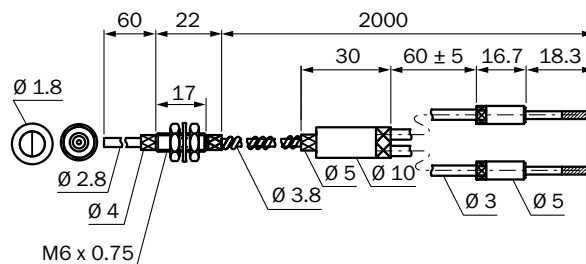
1) Flexible end tip, do not bend in this area (10 mm), bend radius R10 mm

LL3-DV02**LL3-DR10**

1) bendable

LL3-DB08**LL3-DT05****LL3-DB02**

1) Flexible end tip, do not bend in this area (10 mm), bend radius R10 mm
2) Sender (marked blue)
3) Receiver

LL3-DB06**LL3-DH04**

Technical drawing of a mechanical part, showing a side view and a cross-section.

Side View Dimensions:

- Overall length: 2000
- Section 1 length: 4.8
- Section 2 length: 65
- Section 3 length: 15
- Section 4 length: 15
- Section 5 length: 15
- Section 6 length: 15
- Section 7 length: 15
- Section 8 length: 15
- Section 9 length: 15
- Section 10 length: 15
- Section 11 length: 15
- Section 12 length: 15
- Section 13 length: 15
- Section 14 length: 15
- Section 15 length: 15
- Section 16 length: 15
- Section 17 length: 15
- Section 18 length: 15
- Section 19 length: 15
- Section 20 length: 15
- Section 21 length: 15
- Section 22 length: 15
- Section 23 length: 15
- Section 24 length: 15
- Section 25 length: 15
- Section 26 length: 15
- Section 27 length: 15
- Section 28 length: 15
- Section 29 length: 15
- Section 30 length: 15
- Section 31 length: 15
- Section 32 length: 15
- Section 33 length: 15
- Section 34 length: 15
- Section 35 length: 15
- Section 36 length: 15
- Section 37 length: 15
- Section 38 length: 15
- Section 39 length: 15
- Section 40 length: 15
- Section 41 length: 15
- Section 42 length: 15
- Section 43 length: 15
- Section 44 length: 15
- Section 45 length: 15
- Section 46 length: 15
- Section 47 length: 15
- Section 48 length: 15
- Section 49 length: 15
- Section 50 length: 15
- Section 51 length: 15
- Section 52 length: 15
- Section 53 length: 15
- Section 54 length: 15
- Section 55 length: 15
- Section 56 length: 15
- Section 57 length: 15
- Section 58 length: 15
- Section 59 length: 15
- Section 60 length: 15
- Section 61 length: 15
- Section 62 length: 15
- Section 63 length: 15
- Section 64 length: 15
- Section 65 length: 15
- Section 66 length: 15
- Section 67 length: 15
- Section 68 length: 15
- Section 69 length: 15
- Section 70 length: 15
- Section 71 length: 15
- Section 72 length: 15
- Section 73 length: 15
- Section 74 length: 15
- Section 75 length: 15
- Section 76 length: 15
- Section 77 length: 15
- Section 78 length: 15
- Section 79 length: 15
- Section 80 length: 15
- Section 81 length: 15
- Section 82 length: 15
- Section 83 length: 15
- Section 84 length: 15
- Section 85 length: 15
- Section 86 length: 15
- Section 87 length: 15
- Section 88 length: 15
- Section 89 length: 15
- Section 90 length: 15
- Section 91 length: 15
- Section 92 length: 15
- Section 93 length: 15
- Section 94 length: 15
- Section 95 length: 15
- Section 96 length: 15
- Section 97 length: 15
- Section 98 length: 15
- Section 99 length: 15
- Section 100 length: 15

Cross-section Dimensions:

- Overall width: 2.5
- Section 1 width: 1.5
- Section 2 width: 2
- Section 3 width: 2
- Section 4 width: 2
- Section 5 width: 2
- Section 6 width: 2
- Section 7 width: 2
- Section 8 width: 2
- Section 9 width: 2
- Section 10 width: 2
- Section 11 width: 2
- Section 12 width: 2
- Section 13 width: 2
- Section 14 width: 2
- Section 15 width: 2
- Section 16 width: 2
- Section 17 width: 2
- Section 18 width: 2
- Section 19 width: 2
- Section 20 width: 2
- Section 21 width: 2
- Section 22 width: 2
- Section 23 width: 2
- Section 24 width: 2
- Section 25 width: 2
- Section 26 width: 2
- Section 27 width: 2
- Section 28 width: 2
- Section 29 width: 2
- Section 30 width: 2
- Section 31 width: 2
- Section 32 width: 2
- Section 33 width: 2
- Section 34 width: 2
- Section 35 width: 2
- Section 36 width: 2
- Section 37 width: 2
- Section 38 width: 2
- Section 39 width: 2
- Section 40 width: 2
- Section 41 width: 2
- Section 42 width: 2
- Section 43 width: 2
- Section 44 width: 2
- Section 45 width: 2
- Section 46 width: 2
- Section 47 width: 2
- Section 48 width: 2
- Section 49 width: 2
- Section 50 width: 2
- Section 51 width: 2
- Section 52 width: 2
- Section 53 width: 2
- Section 54 width: 2
- Section 55 width: 2
- Section 56 width: 2
- Section 57 width: 2
- Section 58 width: 2
- Section 59 width: 2
- Section 60 width: 2
- Section 61 width: 2
- Section 62 width: 2
- Section 63 width: 2
- Section 64 width: 2
- Section 65 width: 2
- Section 66 width: 2
- Section 67 width: 2
- Section 68 width: 2
- Section 69 width: 2
- Section 70 width: 2
- Section 71 width: 2
- Section 72 width: 2
- Section 73 width: 2
- Section 74 width: 2
- Section 75 width: 2
- Section 76 width: 2
- Section 77 width: 2
- Section 78 width: 2
- Section 79 width: 2
- Section 80 width: 2
- Section 81 width: 2
- Section 82 width: 2
- Section 83 width: 2
- Section 84 width: 2
- Section 85 width: 2
- Section 86 width: 2
- Section 87 width: 2
- Section 88 width: 2
- Section 89 width: 2
- Section 90 width: 2
- Section 91 width: 2
- Section 92 width: 2
- Section 93 width: 2
- Section 94 width: 2
- Section 95 width: 2
- Section 96 width: 2
- Section 97 width: 2
- Section 98 width: 2
- Section 99 width: 2
- Section 100 width: 2

Technical drawing of a cable assembly. The drawing shows a cross-section of the cable with a diameter of $\varnothing 2.7$ and a length of 20. The cable is connected to a terminal block with a length of 15. The terminal block has a width of 2.5 and a height of 2. The cable is labeled M6 x 0.75 and $\varnothing 2.2 \times 2$. The cable is shown with a break in the middle, indicating a total length of 2000. The drawing also shows a cross-section of the cable with a diameter of $\varnothing 1$ and a length of 5.

All dimensions in mm

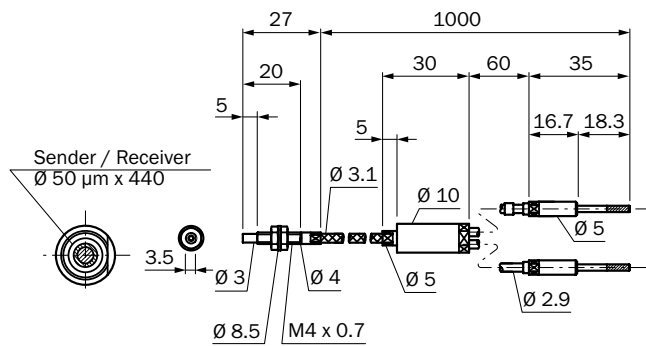
Technical drawing of a cable assembly. The drawing shows a cross-section of a cable with a central core and outer insulation. The central core is labeled "Array: Ø 0.265 x 32". The outer insulation is labeled "3 x M3 x 0.5". The drawing includes various dimensions: 10.9, 1, 5, 20, 15, 13, 10, 20, 10, 2000, Ø 3.2 x 2, Ø 2.2 x 2, 2.5, and 2.5. The drawing is a technical drawing of a cable assembly, showing a cross-section of the cable with various dimensions and labels. The central part of the cable is labeled "Array: Ø 0.265 x 32". The outer part of the cable is labeled "3 x M3 x 0.5". The drawing includes various dimensions: 10.9, 1, 5, 20, 15, 13, 10, 20, 10, 2000, Ø 3.2 x 2, Ø 2.2 x 2, 2.5, and 2.5. The drawing is a technical drawing of a cable assembly, showing a cross-section of the cable with various dimensions and labels. The central part of the cable is labeled "Array: Ø 0.265 x 32". The outer part of the cable is labeled "3 x M3 x 0.5". The drawing includes various dimensions: 10.9, 1, 5, 20, 15, 13, 10, 20, 10, 2000, Ø 3.2 x 2, Ø 2.2 x 2, 2.5, and 2.5.

J-841

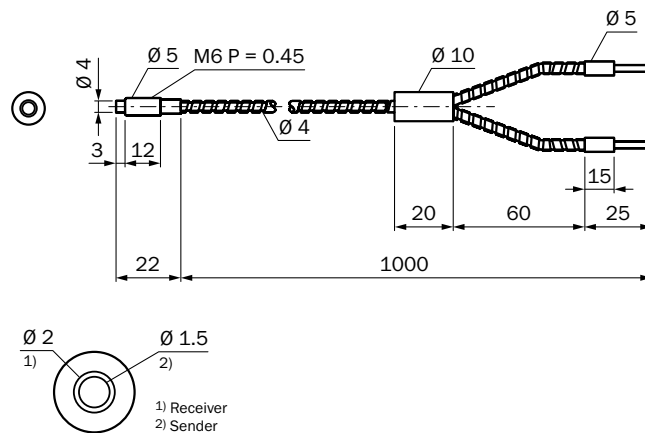
Heat-resistant

- Detection principle: Proximity system

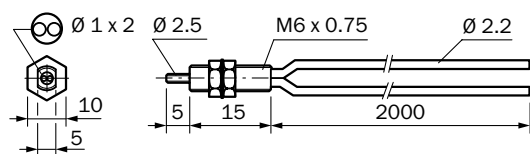
LL3-DH07



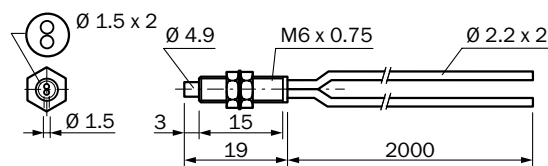
LL3-DW01



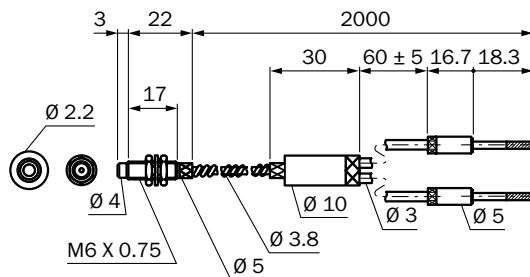
LL3-DH02



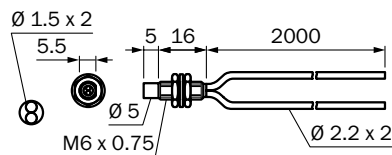
LL3-DH01



LL3-DH03



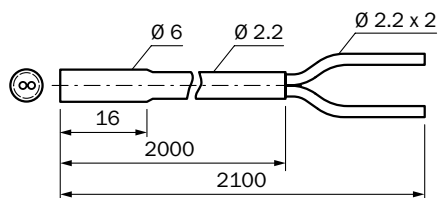
LL3-DH09



Resistant to oil/chemicals

- Detection principle: Proximity system

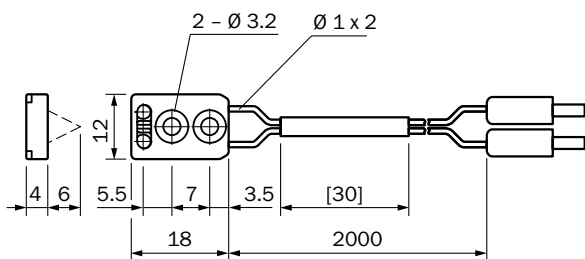
LL3-DY01



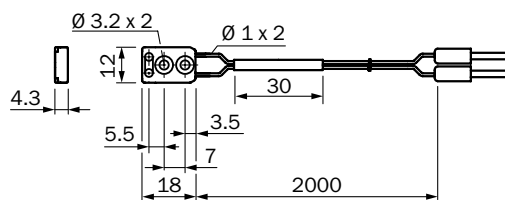
LCDs/transparent objects/semiconductors

- **Detection principle:** Proximity system

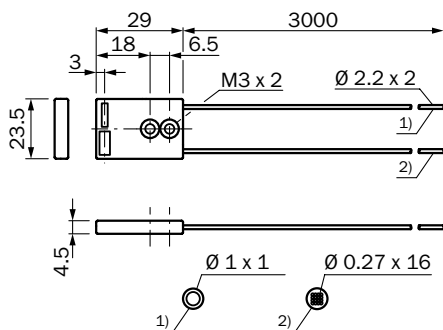
LL3-DC38



LL3-DC39



LL3-DC05

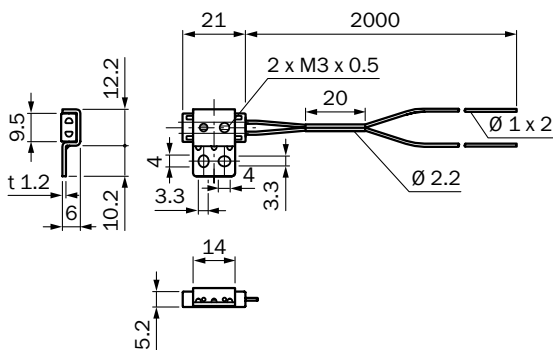


- 1) Sender
- 2) Receiver

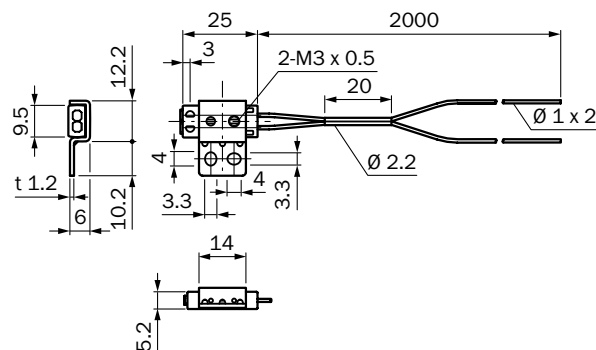
Retro-reflective

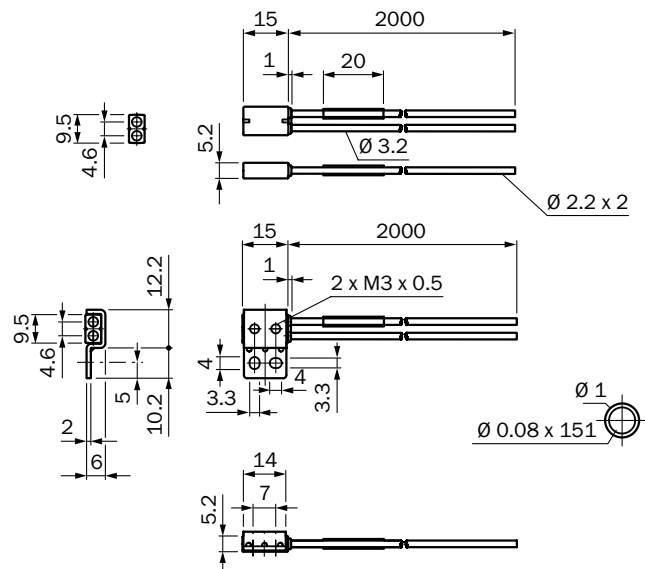
- **Detection principle:** Proximity system

LL3-RB01

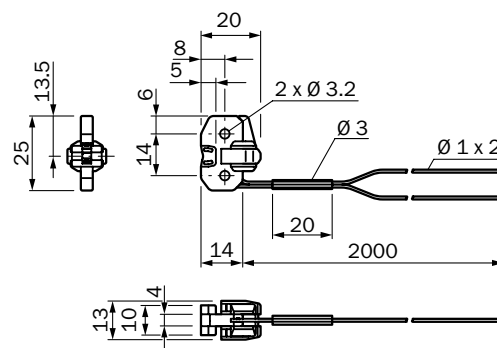


LL3-RB02

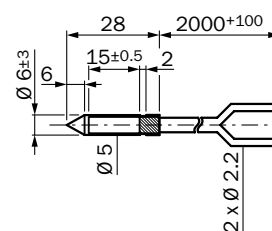


LL3-RR01

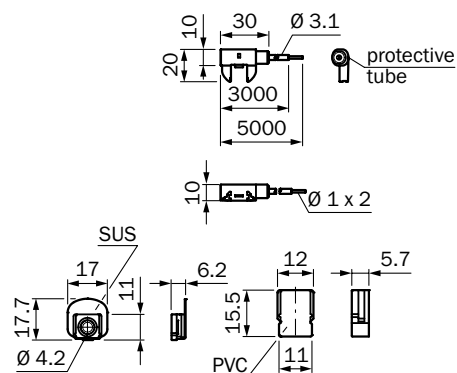
- **Detection principle:** Proximity system

LL3-DF05

LL3-DF02-S01



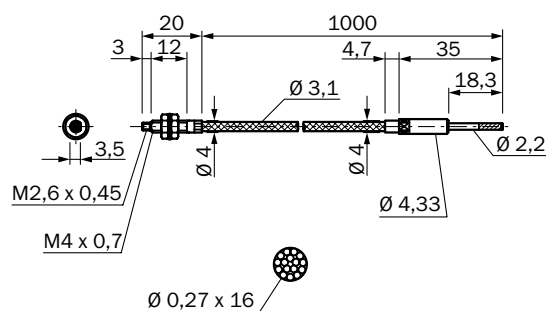
LL3-DW02



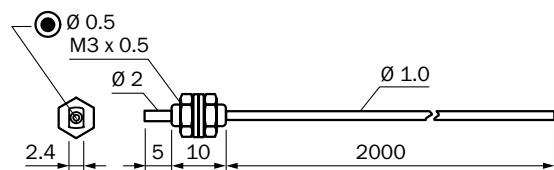
Threaded sleeve

- **Detection principle:** Through-beam system

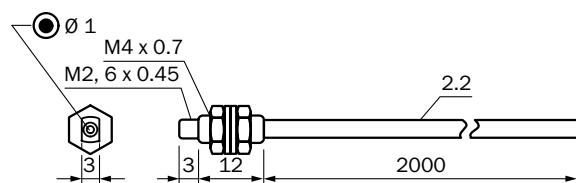
LL3-TJ01



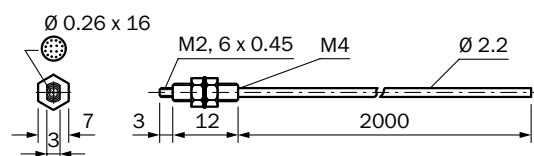
LL3-TM02



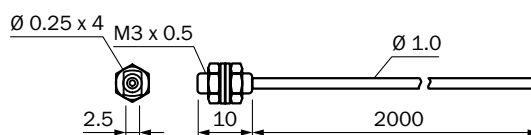
LL3-TB02



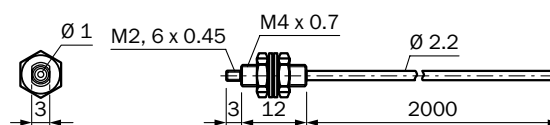
LL3-TR01



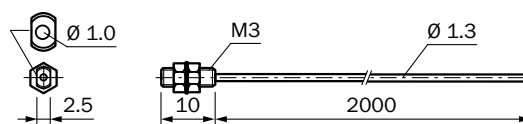
LL3-TR02



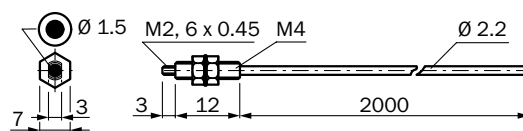
LL3-TK77

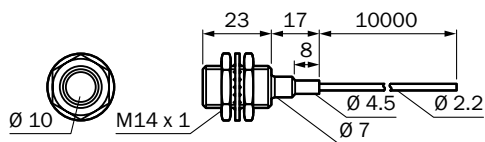
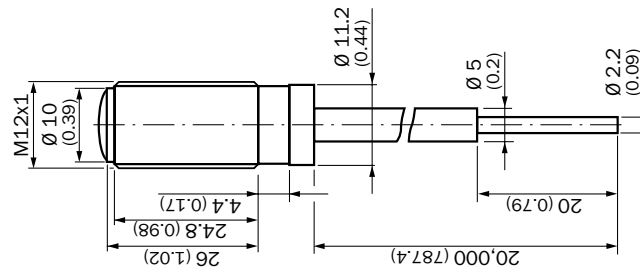


LL3-TM01

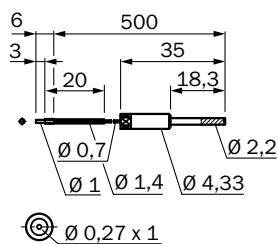
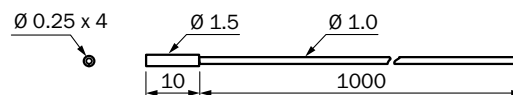
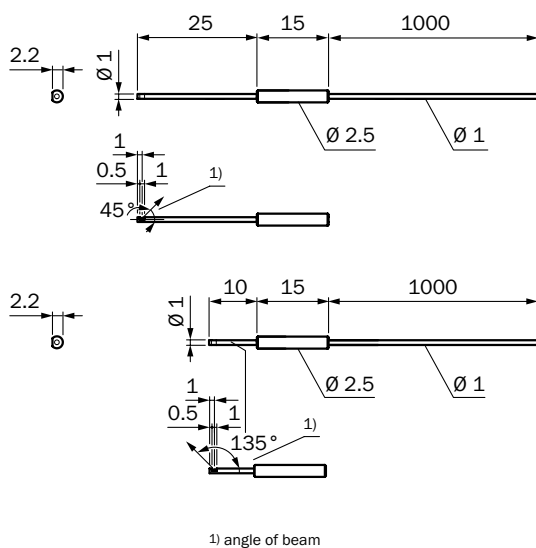
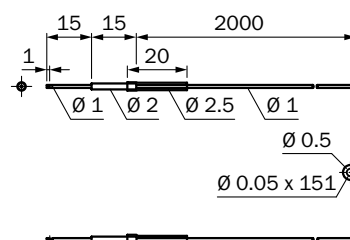
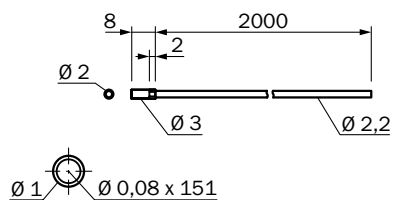
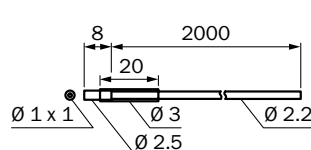


LL3-TB01

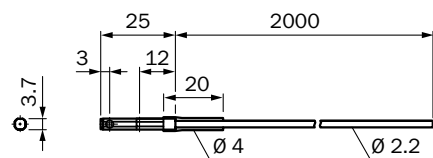


LL3-TB08**LL3-TX02****Smooth sleeve**

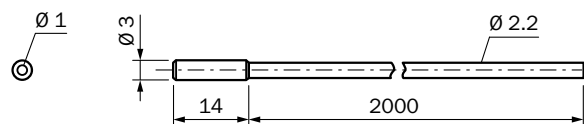
- **Detection principle:** Through-beam system

LL3-TR04**LL3-TR03****LL3-TH06****LL3-TG05****LL3-TR10****LL3-TB07**

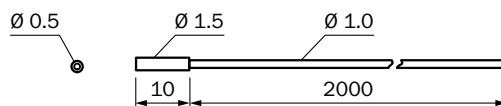
LL3-TG03, LL3-TV08



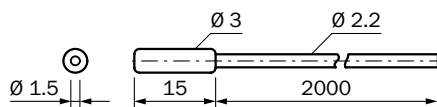
LL3-TK05



LL3-TM03



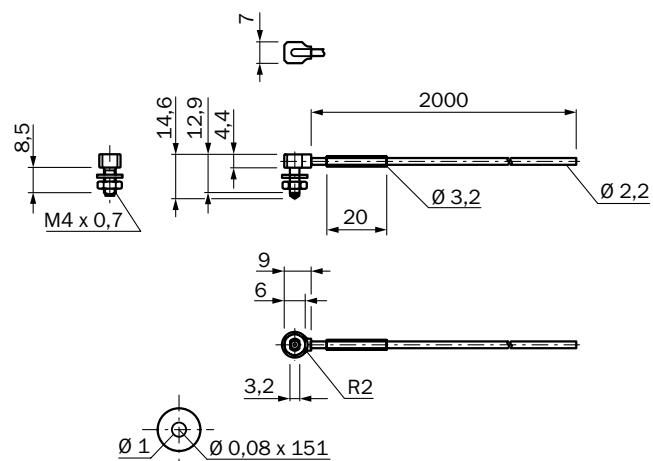
LL3-TS07



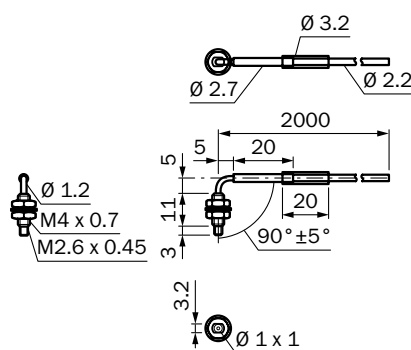
90° deflection

- Detection principle: Through-beam system

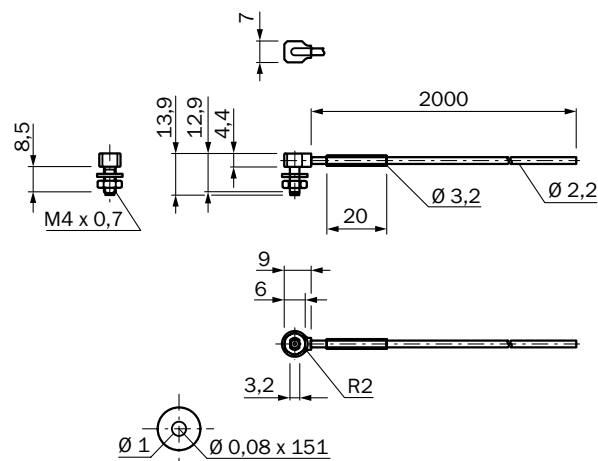
LL3-TR09



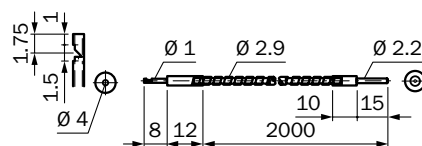
LL3-TB06



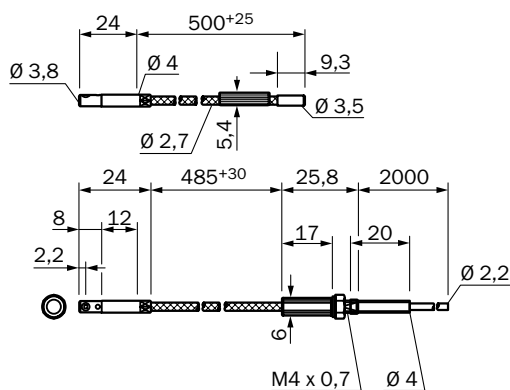
LL3-TR08



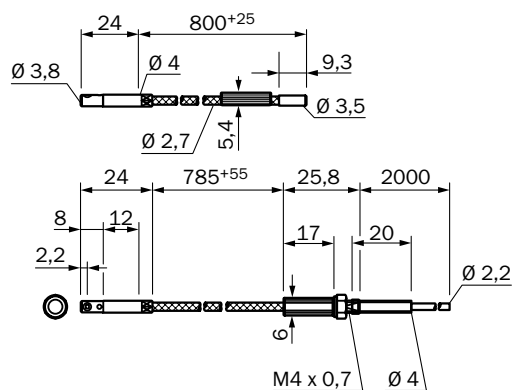
LL3-TH07



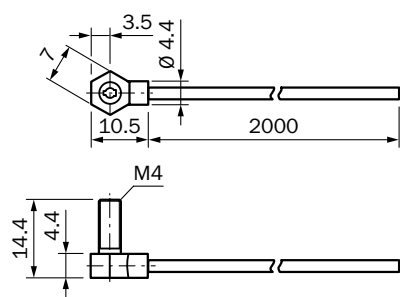
LL3-TH15



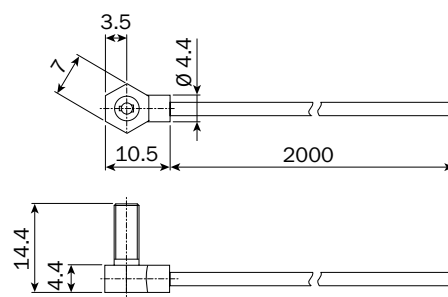
LL3-TH16



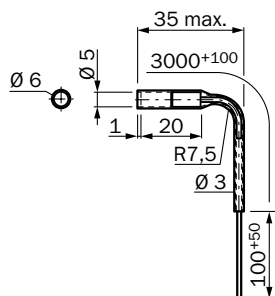
LL3-TV05



LL3-TV06, LL3-TV07



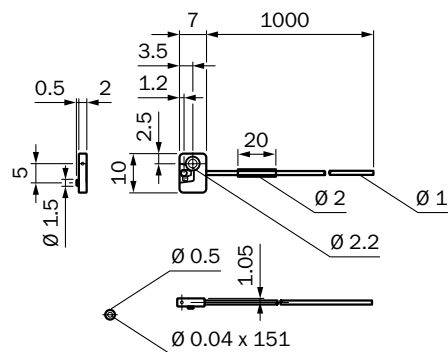
LL3-TY03



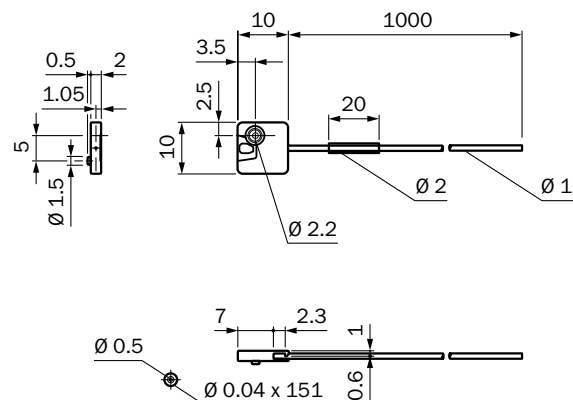
Flat type

- Detection principle: Through-beam system

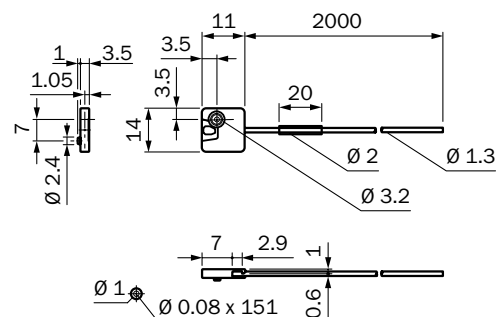
LL3-TE01



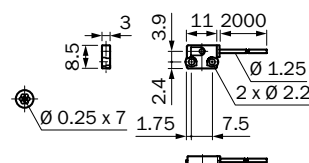
LL3-TE02



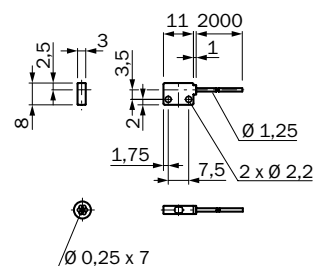
LL3-TE04



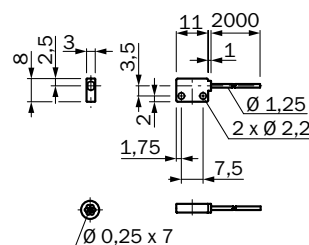
LL3-TE05



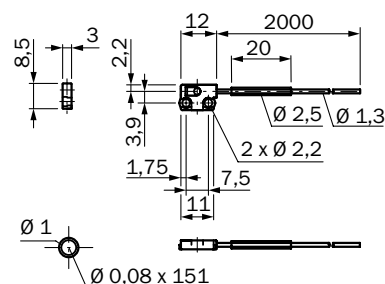
LL3-TR05



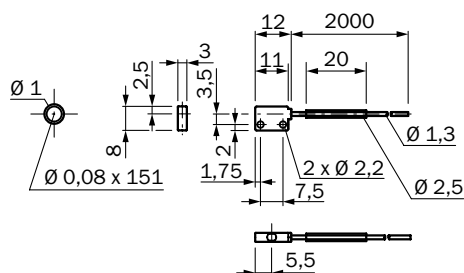
LL3-TR06



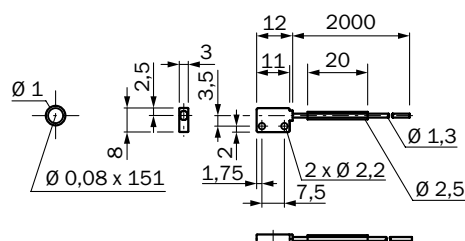
LL3-TR13



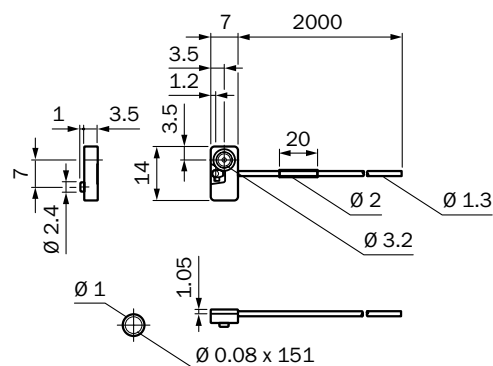
LL3-TR12



LL3-TR11



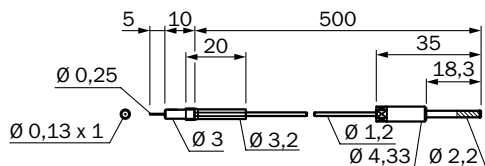
LL3-TE03



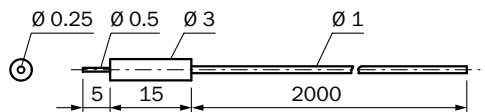
Long end sleeve

- Detection principle: Through-beam system

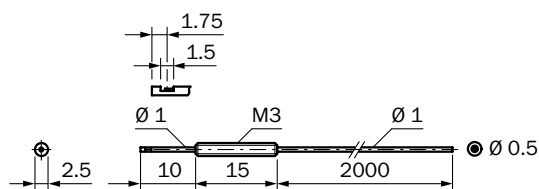
LL3-TP01



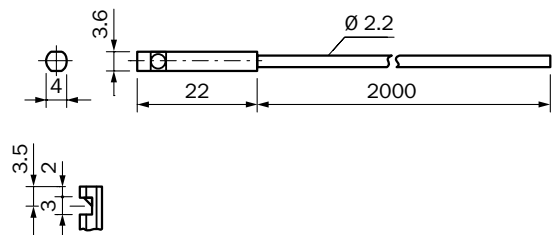
LL3-TT01



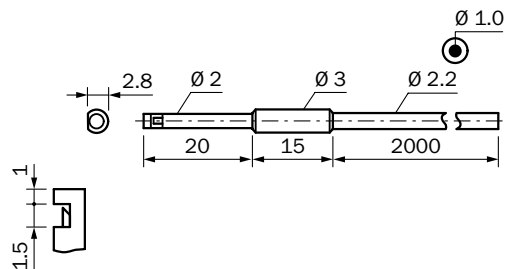
LL3-TV04



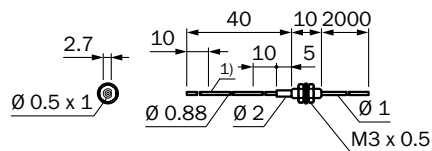
LL3-TK16



LL3-TV01

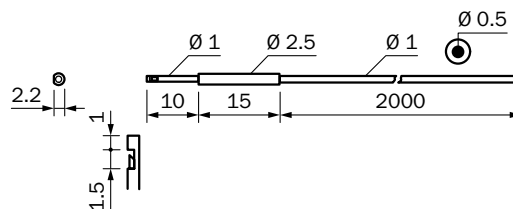


LL3-TB05

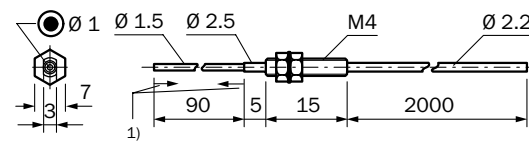


1) bendable

LL3-TV02

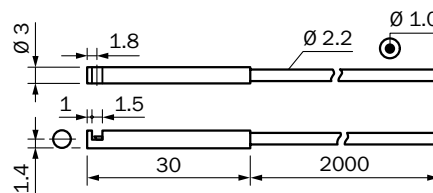


LL3-TB03

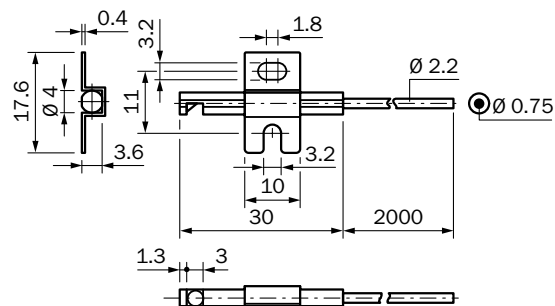


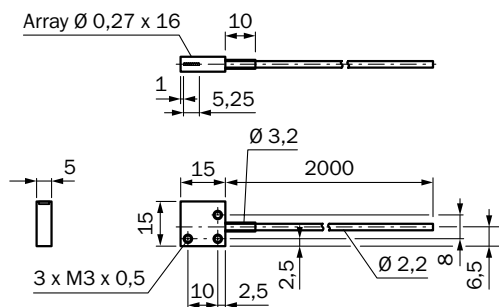
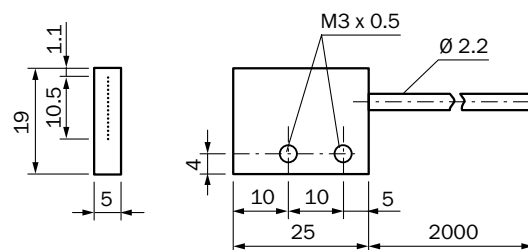
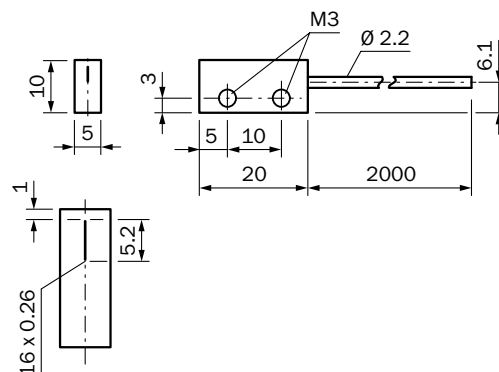
1) Flexible end tip, do not bend in this area (10 mm), bend radius R10 mm

LL3-TS08

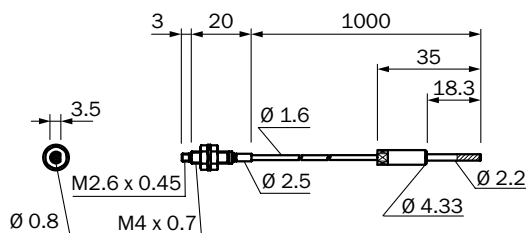
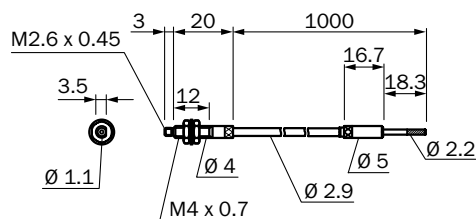
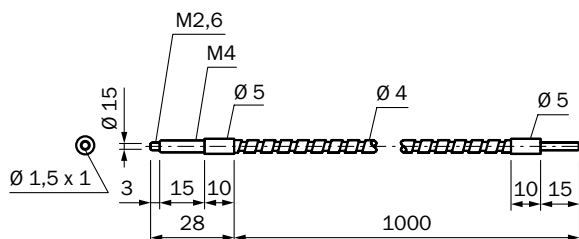
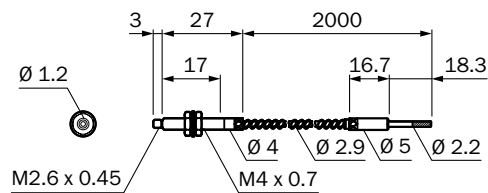


LL3-TS12

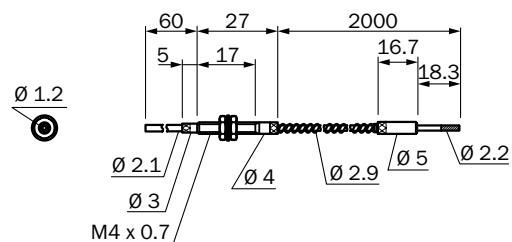


LL3-TZ06**LL3-TS14****LL3-TS10****Heat-resistant**

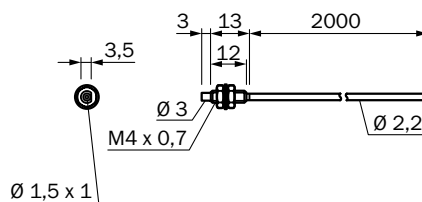
- Detection principle: Through-beam system

LL3-TH10**LL3-TH11****LL3-TW01****LL3-TH08**

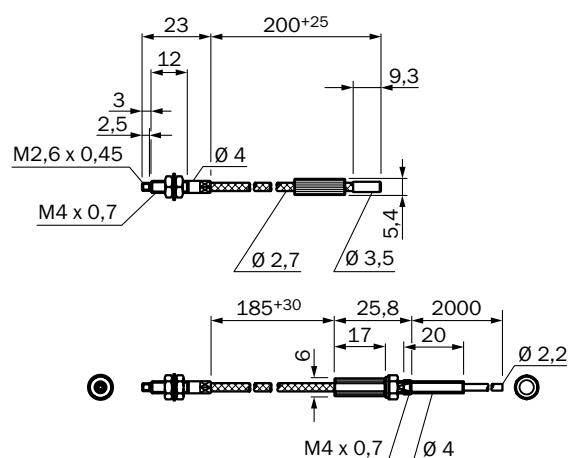
LL3-TH09



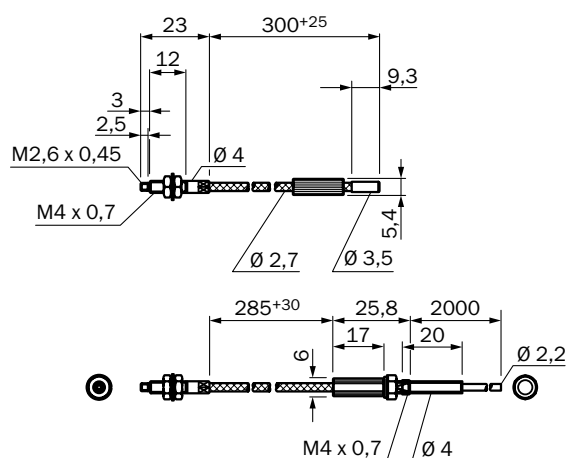
LL3-TH17



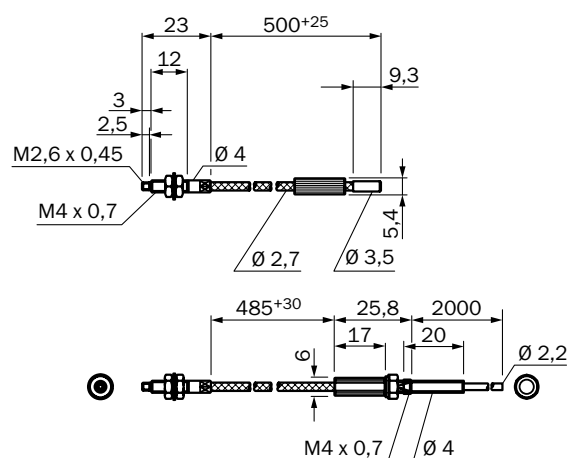
LL3-TH12



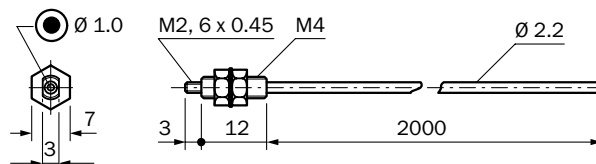
LL3-TH13



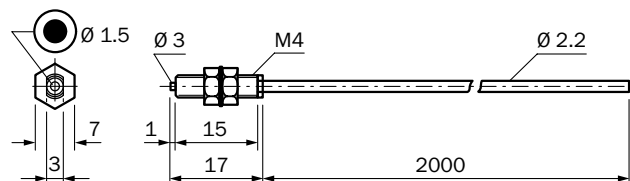
LL3-TH14



LL3-TH01

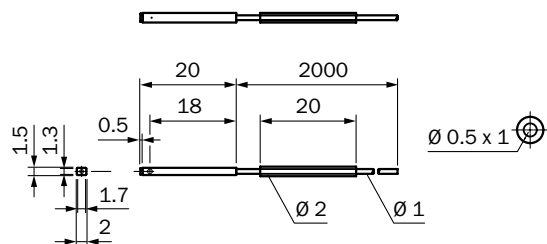
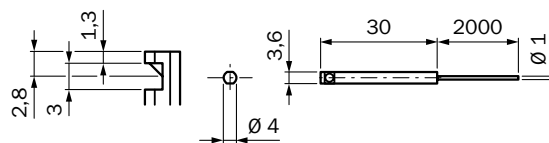
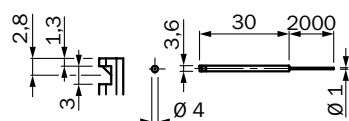
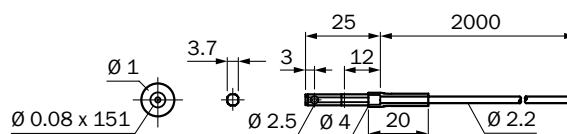
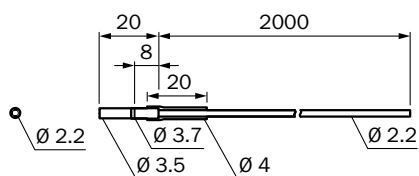
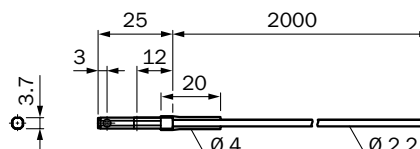


LL3-TH02



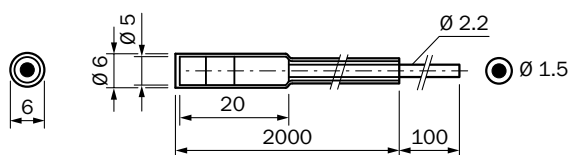
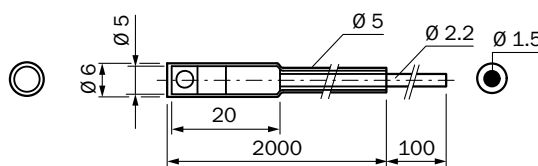
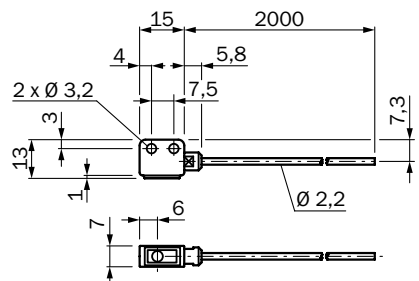
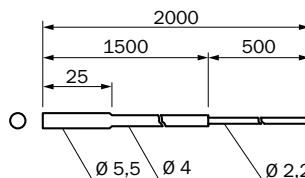
LCDs/transparent objects/semiconductors

- Detection principle: Through-beam system

LL3-TG04**LL3-TS22M****LL3-TS22****LL3-TG02****LL3-TG01****LL3-TG03**

Resistant to oil/chemicals

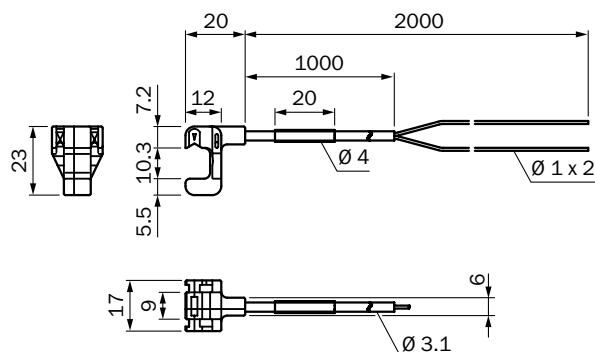
- Detection principle: Through-beam system

LL3-TY01**LL3-TY02****LL3-TY05****LL3-TY04**

Liquid level

- **Detection principle:** Through-beam system

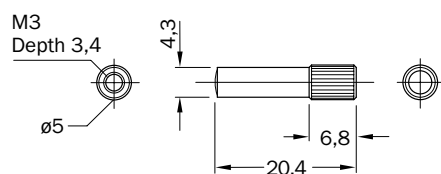
LL3-TF01



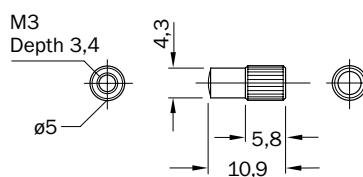
Tip adapters

- **Detection principle:** Proximity system

LL3-DA01

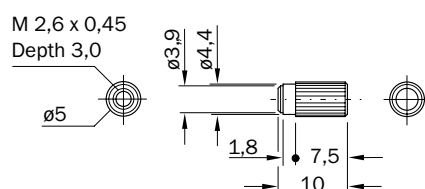


LL3-DA02

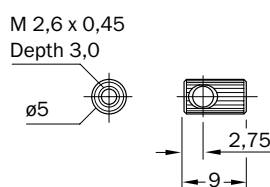


- **Detection principle:** Through-beam system

LL3-TA01



LL3-TA02



Recommended accessories

Others

Figure	Description	Model name	Part no.
	Cutter for fibers, supplied with LL3	FC	5304141

→ For additional accessories, please see page L-861



Perfect sensor integration made easy

Innovative sensor technology is only one side of the coin when talking about intelligent automation solutions. The picture is completed by matching accessories for professional and cost-effective integration. Whether electrical connection technology or mechanical mounting systems, only the right integrative system products lead to a high quality, highly available application solution. The advantage? Sensors and accessories work in conjunction to offer maximum operational safety.

In addition, the user is able to save additional costs for development, manufacture and procurement. A wide range of accessory components are always available on short-notice – convenient single-source availability in combination with sensors. And in the event that a custom solution is required, SICK is on your side as a reliable and competent partner. Tailored developments and adaptations can be implemented in just a short period of time.



Accessories from SICK – the solution for reliable sensor integration.



Accessories

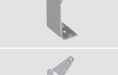
General information	L-862
Mounting systems	L-864
Reflectors	L-889
Connection systems	L-903
Other accessories.	L-921

Mounting systems

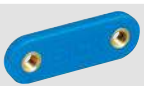
Mounting brackets/plates

Mounting brackets

Figure	For product family	Material	Description	Model name	Part no.
	G10	Steel, zinc coated	Mounting bracket for wall and floor mounting for G10 DC	BEF-G10DC01	2071258
			Mounting bracket for wall and floor mounting for G10 AC/DC	BEF-G10UC01	2071259
	W8, W8 Inox, W100, G6	Stainless steel	Mounting bracket for wall mounting	BEF-W100-A	5311520
		Steel, zinc coated	Mounting bracket for floor mounting	BEF-W100-B	5311521
	W9M4-3			BEF-W160	5305197
	W250-2	Steel, zinc coated	Mounting bracket	BEF-W250	5305850
	W280-2	Stainless steel V2A (1.4301)	Mounting bracket	BEF-W280	5313885
	W2S-2	Steel, zinc coated	Mounting bracket for floor mounting	BEF-W2S-A	4034748
			Mounting bracket for wall mounting	BEF-W2S-B	4034749
	W4-3	Stainless steel 1.4571	Mounting bracket for wall mounting	BEF-W4-A	2051628
			Mounting bracket for floor mounting	BEF-W4-B	2051630
	GR18, V180-2, V18, W15, Z1, Z2	Steel, zinc coated	Mounting plate for M18 sensors	BEF-WG-M18	5321870
	W11-2, W12-3	Stainless steel	Mounting bracket, large	BEF-WG-W12	2013942
	W24-2			BEF-WG-W24	4026324
	W11-2, W12-3		Mounting bracket, small	BEF-WK-W12	2012938
	W24-2			BEF-WK-W24	4027532

Figure	For product family	Material	Description	Model name	Part no.
	R/IR	Steel, zinc coated	Mounting bracket	BEF-WK-WTR	2051786
	WLL170-2			BEF-WLL170	5306574
	WLL180			BEF-WLL180	5325812
	G6	–	–	BEF-WN-G6	2062909
	GR18, V180-2, V18, W15, Z1, Z2	Steel, zinc coated	Mounting bracket, M18 thread	BEF-WN-M18	5308446
	W27-3	Steel, zinc coated	Mounting bracket for weather hood	BEF-WN-OBW	2023251
	C110A, P250, PL20A PL30A, PL40A, PL80A	Steel, zinc coated	Universal mounting bracket for reflectors, 85 mm x 90 mm x 35 mm	BEF-WN-REFX	2064574
	W100-2	Steel, zinc coated	Mounting bracket for floor mounting	BEF-WN-W100-S01	4073866
	W14-2, W18-3	Steel, zinc coated	Mounting bracket	BEF-WN-W14	2019084
			Mounting bracket with hinged arm	BEF-WN-W18	2009317
	W23-2, W27-3, Reflex Array		Mounting bracket	BEF-WN-W23	2019085
	W24-2	Stainless steel (1.4301)	Mounting bracket	BEF-WN-W24	2015248
	W23-2, W27-3, Reflex Array	Steel, zinc coated	Mounting bracket with hinged arm	BEF-WN-W27	2009122
	W9-3		Mounting bracket	BEF-WN-W9-2	2022855

Mounting plates

Figure	For product family	Material	Description	Model name	Part no.
	W9-3	PMMA, Brass (Br)	Fastening plate with threaded sleeve M3	BEF-GPM3-W9	4066039
	GR18, V180-2, V18, W15, Z1, Z2	Stainless steel	Mounting plate for M18 housing	BEF-WG-M18N	5320948
			Mounting bracket	BEF-WN-M18N	5320947
	R/IR	Steel, zinc coated	Mounting bracket	BEF-WN-WTR	2017417

Masks

Figure	Description	Model name	Part no.
	Slotted mask, transmitter and receiver each have 2 self-adhesive masks	BL-100-10	5314182
	Mask card for WS/WE12-3 with 2 self-adhesive masks each for sender and receiver, slot width X: 0.5 mm/1.0 mm/1.5 mm/2.0 mm	BL-12-SKN	4031815
	Mask card, vertical/horizontal slots, slot width: 0.5 mm / 1.0 mm / 1.5 mm / 2.0 mm	BL-9-2	4033253

Device protection (mechanical)

Cooling elements

Figure	For product family	Description	Model name	Part no.
	W24-2	Water cooling plate	BEF-KP-W24	2015071

Protective housings/pipes

Figure	For product family	Material	Description	Model name	Part no.
	G10	Steel, zinc coated	Weather protection hood for G10	BEF-G10WSG	2071960
	Reflector PL80A		Weather protection hood for reflectors PL80A, P250, PL40A	BEF-PL80AWSG	2071961
	W11-2, W12-3	Zinc plated steel (protective housing), Diecast zinc (clamp)	Protective housing for universal clamp	BEF-SG-W12-3	2045175
	W14-2, W18-3			BEF-SG-W14	2058124
	W27-3, Reflex Array			BEF-SG-W27	2039601
	W4S-3, W8, W100, G6	Stainless steel 1.4571	Safety bracket for floor mounting	BEF-SW-W4S	2051497
	W2S-2, G2	Aluminum (mounting bracket), Steel, chrome-plated (coil)	Protective housing for spiral flex hose	BEF-W2S-C	2033270
	W24-2	Aluminum (anodised)	Dust protection tube, air-purged	OBS-W24	2015069
	W23-2, W24-2, W27-3, W34, Reflex Array	Steel, zinc coated	Weather hood for universal clamp bracket	OBW-KHS-M01	2023240
	W24-2	Aluminum (anodised)	Weather hood	OBW-W24	2015070
	W24-2			WSG1-01	1018470

Terminal and alignment brackets

Alignment brackets

Figure	For product family	Material	Description	Model name	Part no.
	W2S-2	Plastic	Ball clamp bracket	BEF-GH-MINI01	2023160
	GR18, V180-2, V18, W15, Z1, Z2	Plastic	Mounting bracket with ball-and-socket	BEF-WN-M18-ST02	5312973

Terminal brackets

Figure	For product family	Material	Description	Model name	Part no.
	W11-2, W12-3	Steel, zinc coated	Double clamp bracket for dovetail mounting	BEF-DKH-W12	2013947
	GR18, V180-2, V18, W15, Z1, Z2	Plastic	M18 mounting bracket, radial rotation possible, with 4 mm fixing holes	BEF-HA-M18R	5313513
	GR18, MH15V, V180-2, V18	Plastic (PA12), glass-fiber reinforced	Clamping block for round sensors M18, without fixed stop	BEF-KH-M18	2051481
			Clamping block for round sensors M18, with fixed stop	BEF-KHF-M18	2051482
	W11-2, W12-3	Steel, zinc coated	Clamping block for dovetail mounting	BEF-KH-W12	2013285
	GR18, MH15V	Plastic (PA12)	Integrated adapter	BEF-WN-MH15-1	4039533
	MH15V, V180-2, V18	Stainless steel	Mounting ring	BEF-WN-MH15-2V	4053358

Other mounting accessories

Figure	Description	Model name	Part no.
	Diameter 18 mm x 100 mm for W4S-3 Inox hygiene. Hygienic integration without holes and brackets. Cable runs inside tube	BEF-MR18G-NA	4065853

Others

Figure	For product family	Material	Description	Model name	Part no.
	GR18S, radial, fully flush	–	Mounting tool for “fully flush” variants	BEF-TO-GR18S	4072132
	WLL180T	Stainless steel	Rail end piece for block mounting	BF-EB01-W190	5313011
	LL3	–	Cutter for fibers, supplied with LL3, 10 mm x 37 mm x 65 mm	FC	5304141

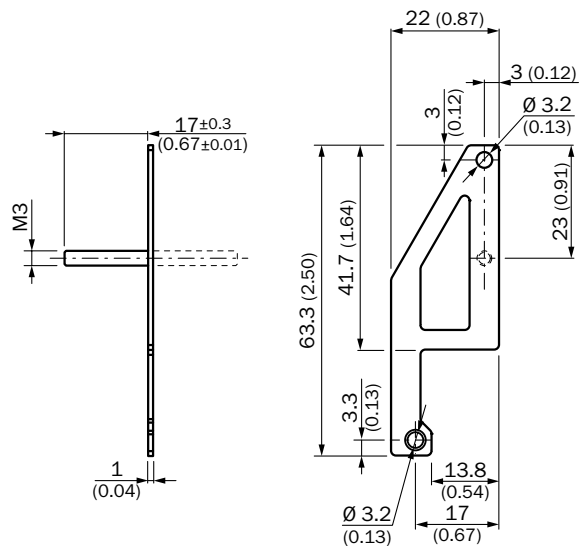
Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Hygienic Design, Stainless steel V4A (1.4404, 316L), Silicone (seal)	Hygienic design mounting tube with bayonet lock, 14.4 mm x 85.5 mm x 14.4 mm	BEF-HDSBR	4074403
		Hygienic design flange with seal, 40 mm x 12 mm x 40 mm	BEF-HDSF	4072880
		Hygienic design telescopic tube, straight, with bayonet lock without flange, 23 mm x 153 mm x 23 mm	BEF-HDSTRG	2067780
		Hygienic design telescopic tube, straight, with bayonet lock with flange, 40 mm x 165 mm x 40 mm	BEF-HDSTRGF	2067779
		Hygienic design telescopic tube bended, shorted, with shorted bayonet lock with flange, 40 mm x 97.5 mm x 76 mm	BEF-HDSTRK1WF	2071931
		Hygienic design telescopic tube bended, extended, with extended bayonet lock with flange, 40 mm x 249 mm x 40 mm ¹⁾	BEF-HDSTRL1GF	2072047
		Hygienic design telescopic tube, angled, with bayonet lock without flange, 23 mm x 125 mm x 73 mm	BEF-HDSTRW	2067778
		Hygienic design telescopic tube, angled, with bayonet lock with flange, 40 mm x 125 mm x 76 mm	BEF-HDSTRWF	2067777
	Zinc diecast	Universal bar clamp for mounting bars with 12 mm diameter	BEF-KHS-KH3	5322626
	Stainless steel V2A (1.4301)	Universal clamp bracket for mounting bars with 12 mm diameter	BEF-KHS-KH3N	5322627
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N02 for universal clamp bracket	BEF-KHS-N02	2051608
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N02N for universal clamp bracket	BEF-KHS-N02N	2051618
	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
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N03N for universal clamp bracket	BEF-KHS-N04N	2051619
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N05 for universal clamp bracket	BEF-KHS-N05	2051611
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N04N for universal clamp bracket	BEF-KHS-N05N	2051620
		Plate N05N for universal clamp bracket, M12	BEF-KHS-N05N	2051621
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N06 for universal clamp bracket	BEF-KHS-N06	2051612
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N06N for universal clamp bracket, M18	BEF-KHS-N06N	2051622
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N07 for universal clamp bracket	BEF-KHS-N07	2051613
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N07N for universal clamp bracket	BEF-KHS-N07N	2051623

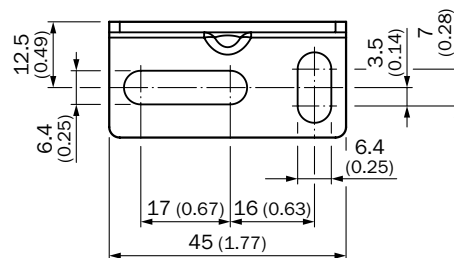
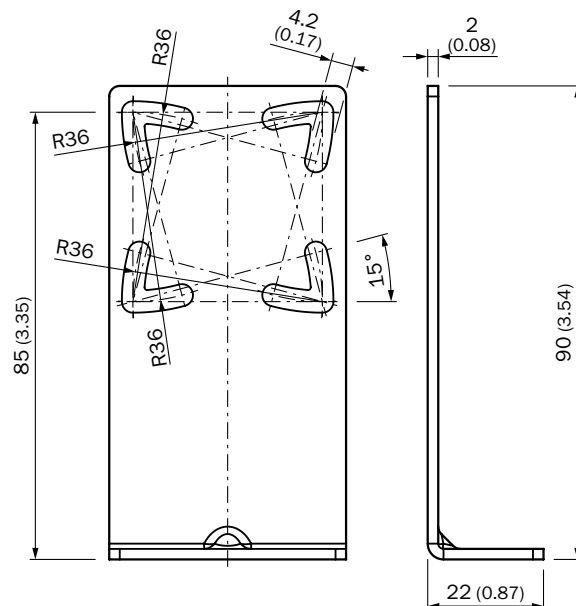
Figure	Material	Description	Model name	Part no.	
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N08 for universal clamp bracket	BEF-KHS-N08	2051607	
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N08N for universal clamp bracket	BEF-KHS-N08N	2051616	
	Die-cast zinc, Steel, zinc coated	Q-Lock, bar clamp system for G10 and reflector P250	BEF-KHSQ12R01	2071260	
			BEF-KHSQ12ZR01	2071262	
	Steel, zinc coated	Mounting bar, straight, 200 mm	BEF-MS12G-A	4056054	
		Mounting bar, straight, 300 mm	BEF-MS12G-B	4056055	
	Stainless steel (1.4571)	Mounting bar, straight, 200 mm	BEF-MS12G-NA	4058914	
		Mounting bar, straight, 300 mm	BEF-MS12G-NB	4058915	
	Steel, zinc coated	Mounting bar, L-shaped, 150 mm x 150 mm	BEF-MS12L-A	4056052	
		Mounting bar, L-shaped, 250 x 250 mm	BEF-MS12L-B	4056053	
	Stainless steel (1.4571)	Mounting bar, L-shaped, 150 mm x 150 mm	BEF-MS12L-NA	4058912	
		Mounting bar, L-shaped, 250 mm x 250 mm	BEF-MS12L-NB	4058913	
	Steel, zinc coated	Mounting rod, U-shape, bending radius 26 mm, 130 mm	BEF-MS12U	4065437	
		Mounting bar, Z-shaped, 150 mm x 70 mm x 150 mm	BEF-MS12Z-A	4056056	
		Mounting bar, Z-shaped, 150 mm x 70 mm x 250 mm	BEF-MS12Z-B	4056057	
		Mounting bar, Z-shaped, 100 mm x 150 mm x 200 mm	BEF-MS12Z-C	4064563	
		Stainless steel (1.4571)	Mounting bar, Z-shaped, 150 mm x 70 mm x 150 mm	BEF-MS12Z-NA	4058916
			Mounting bar, Z-shaped, 150 mm x 70 mm x 250 mm	BEF-MS12Z-NB	4058917
	Aluminum	Bar clamp for bar diameter of 12 mm (fixing the mounting rod)	BEF-RMC-D12	5321878	

Dimensional drawings mounting brackets/plates

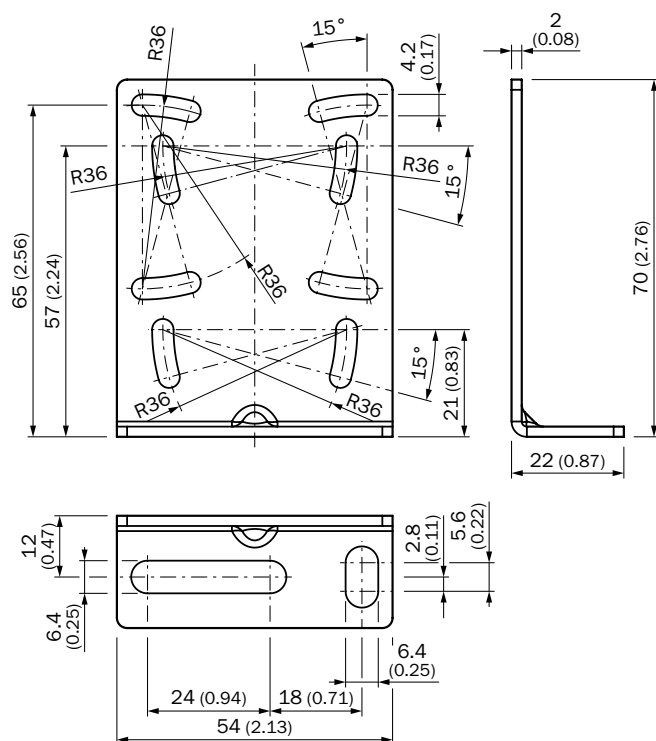
BEF-AP-W9



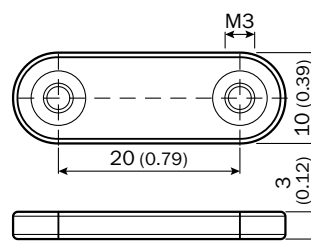
BEF-G10DC01



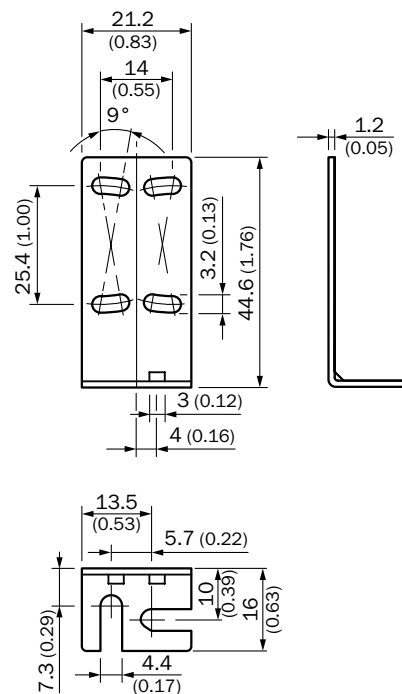
BEF-G10UC01



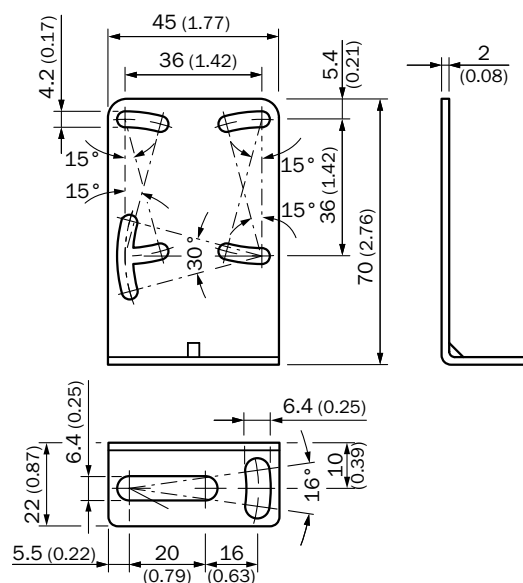
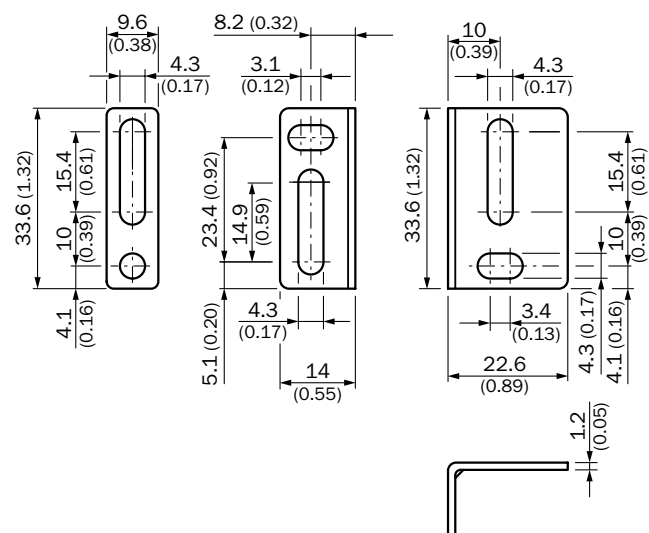
BEF-GPM3-W9



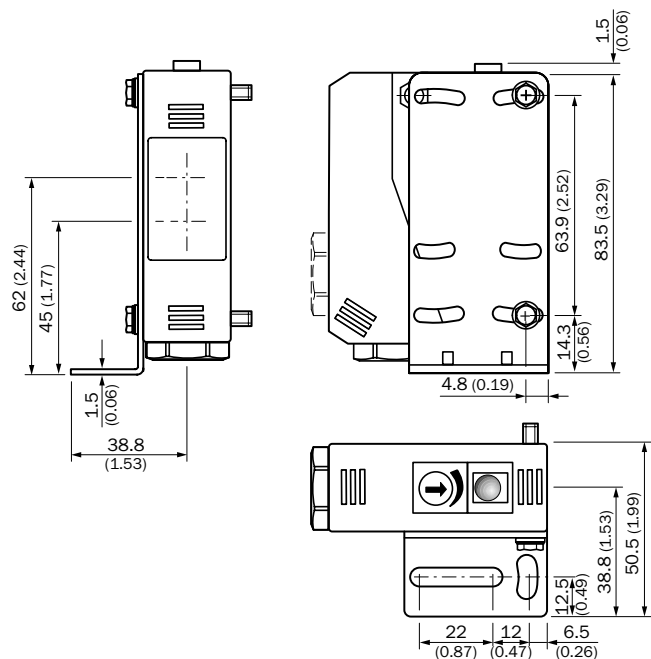
BEF-W100-B



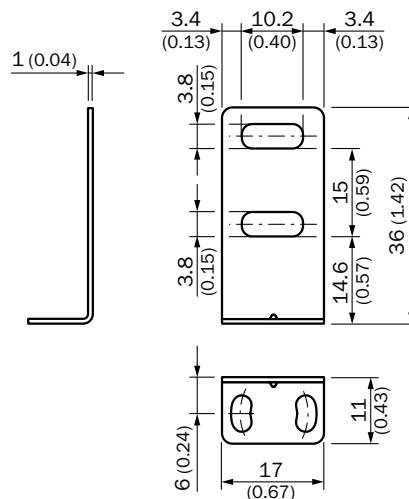
BEF-W250



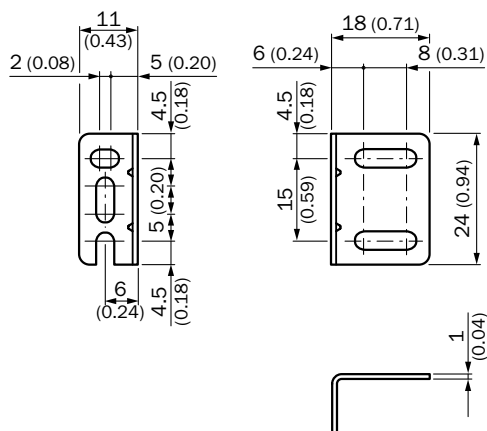
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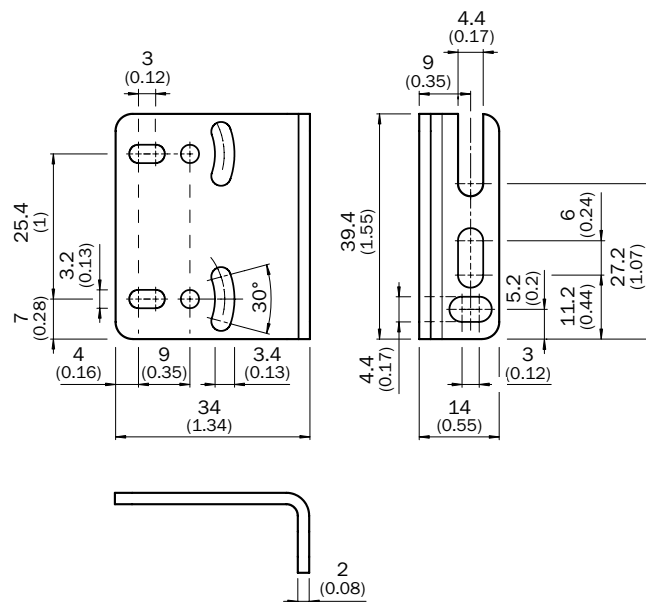
BEF-W2S-A

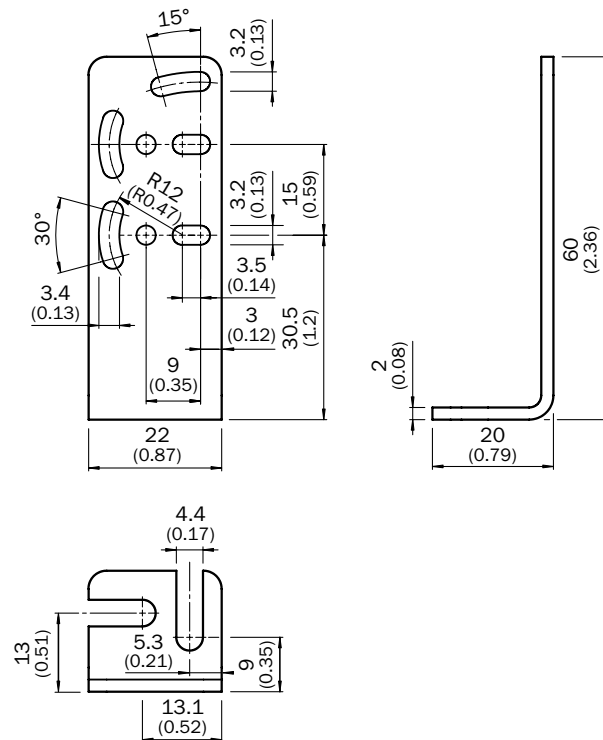
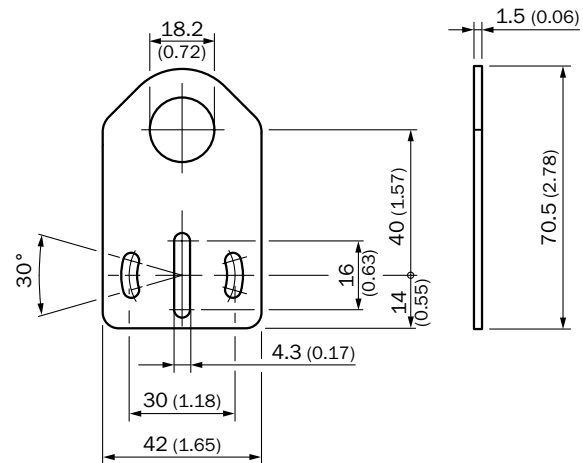
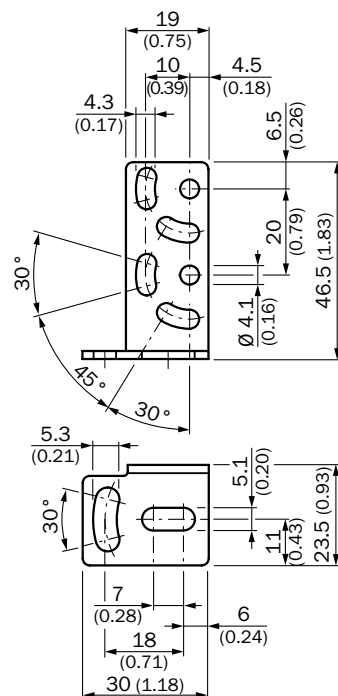
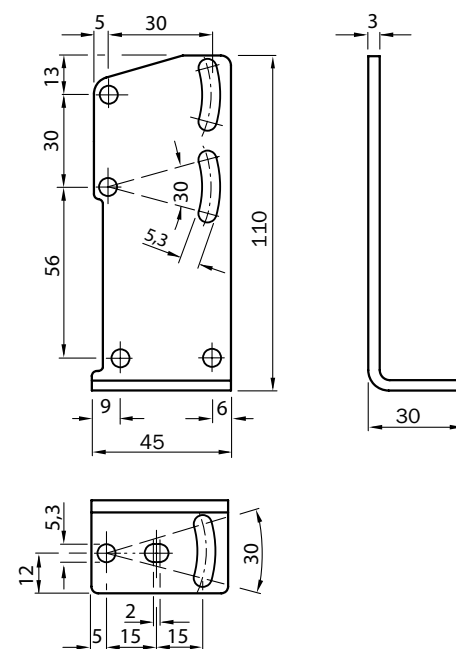


BEF-W2S-B

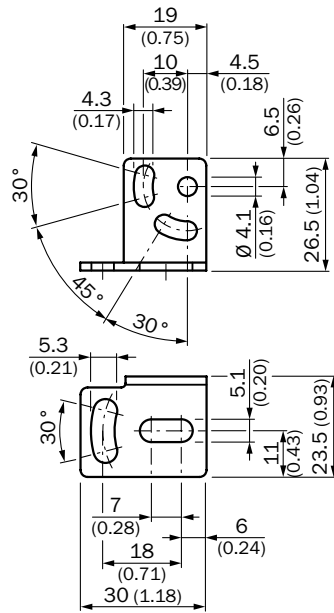


BEF-W4-A

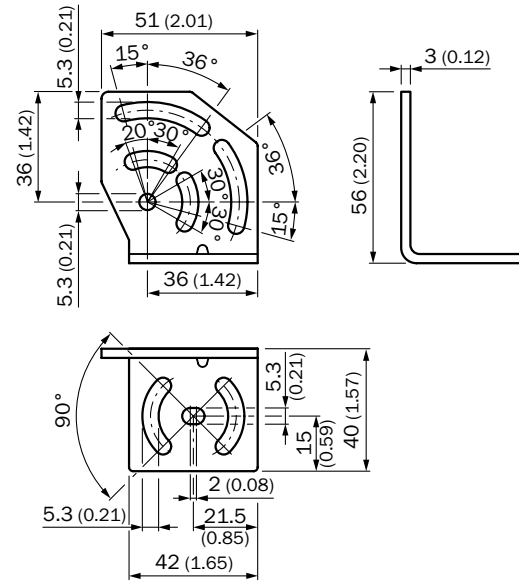


BEF-W4-B**BEF-WG-M18****BEF-WG-M18N****BEF-WG-W12****BEF-WG-W24**

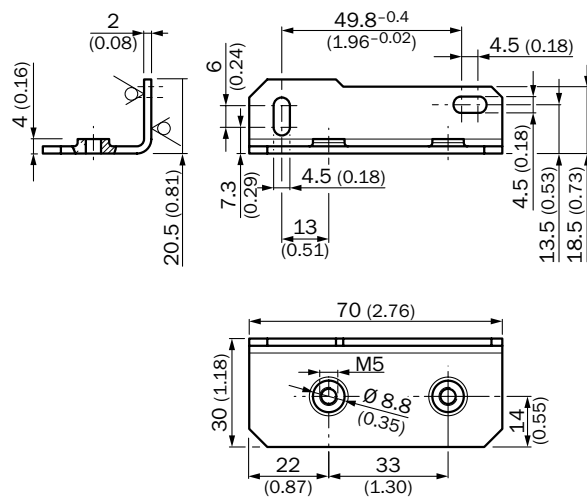
BEF-WK-W12



BEF-WK-W24

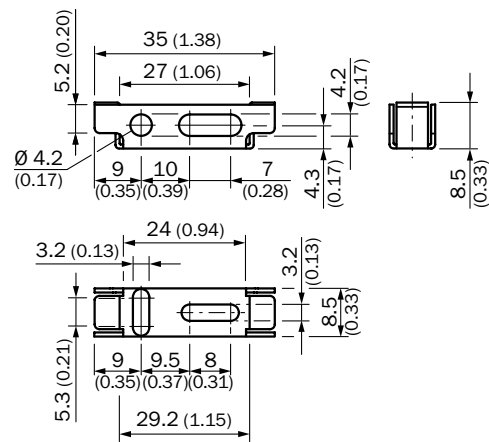


BEF-WK-WTR



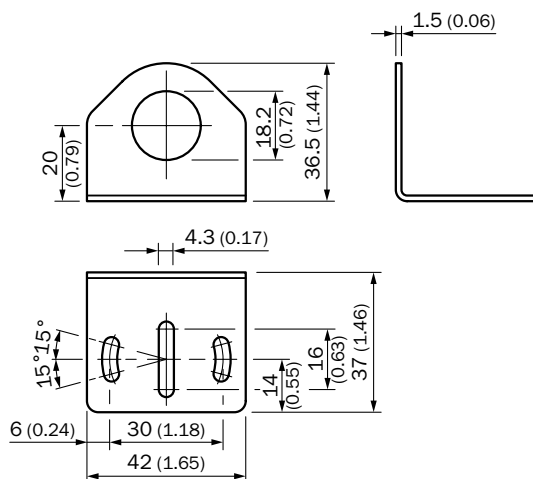
BEF-WLL170

BEF-WLL180

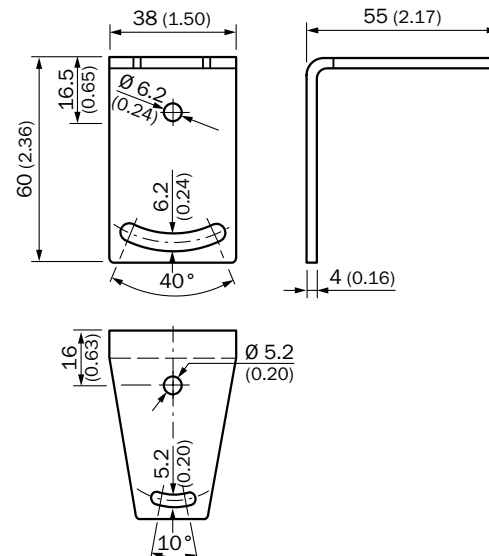


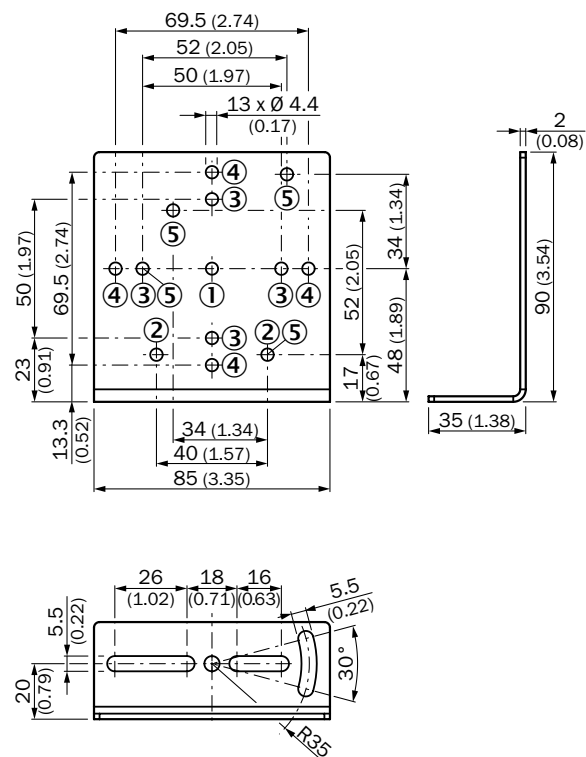
BEF-WN-M18

BEF-WN-M18N

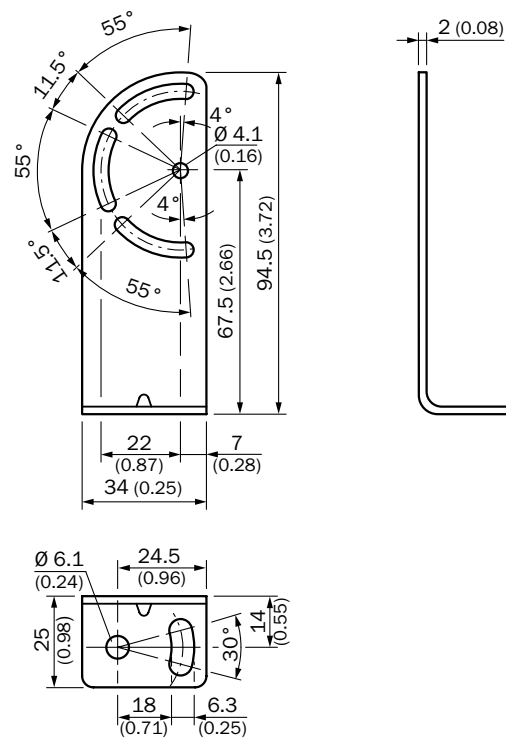
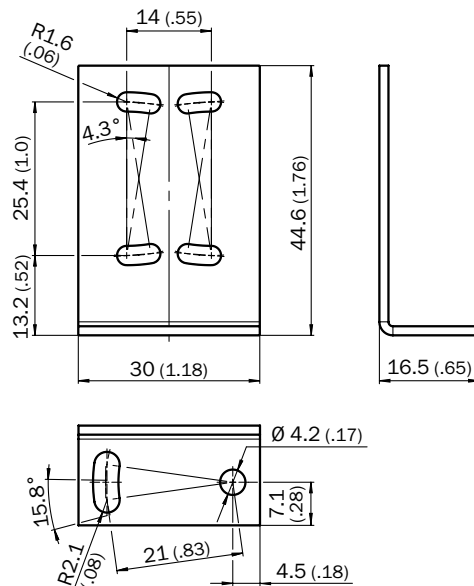
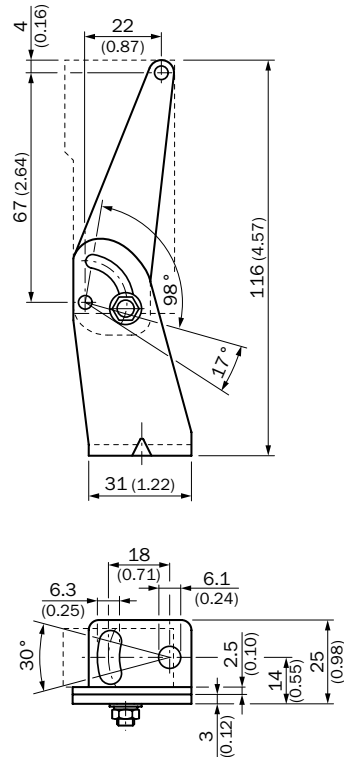


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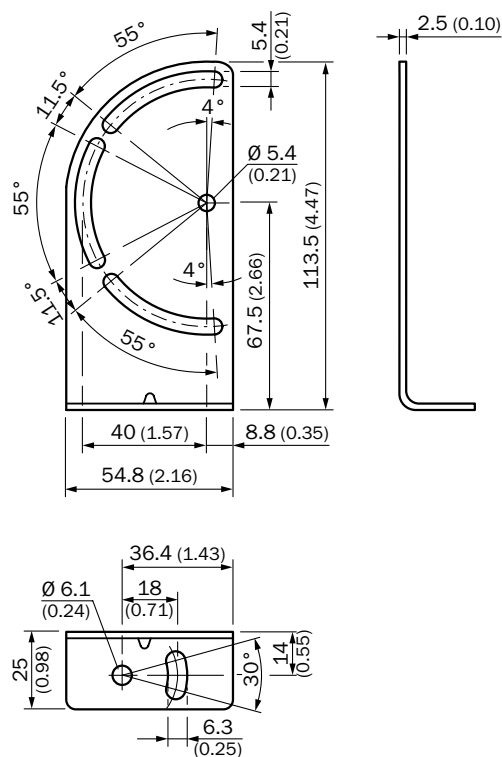


BEF-WN-REFX

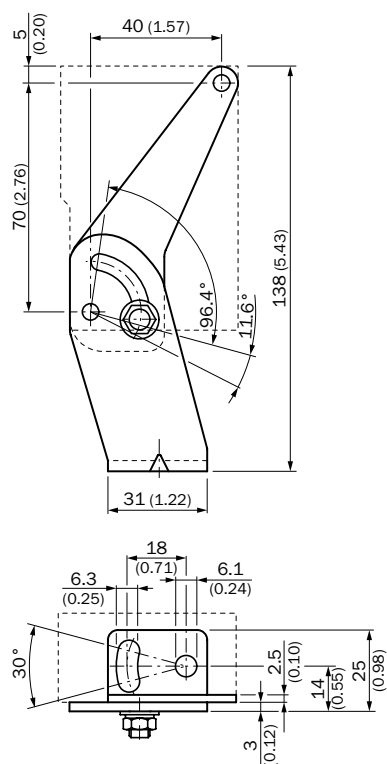
- ① C110A
- ② P250
- ③ PL20A
- ④ PL30A, PL80A
- ⑤ PL40A

BEF-WN-W14**BEF-WN-W100-S01****BEF-WN-W18**

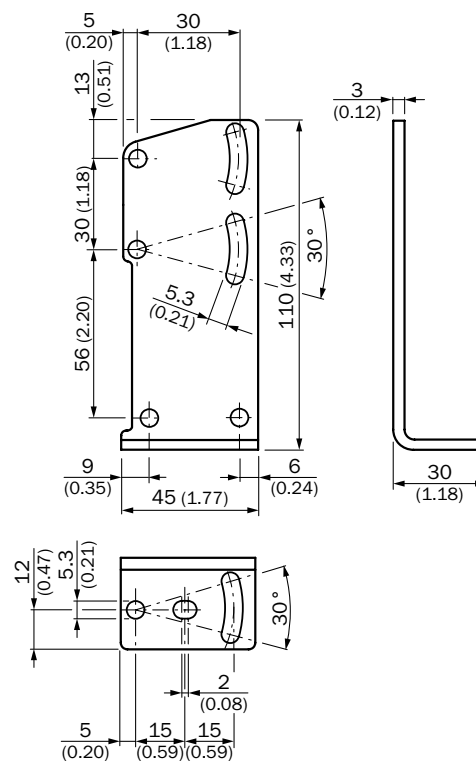
BEF-WN-W23



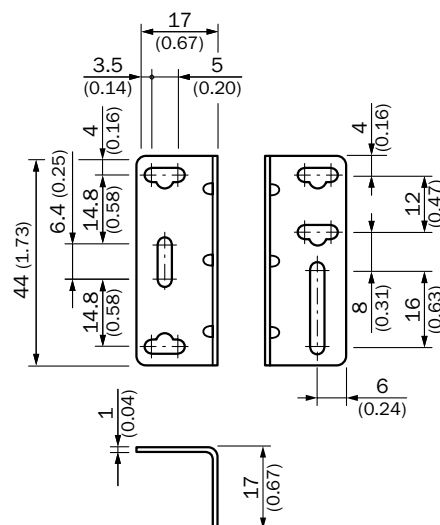
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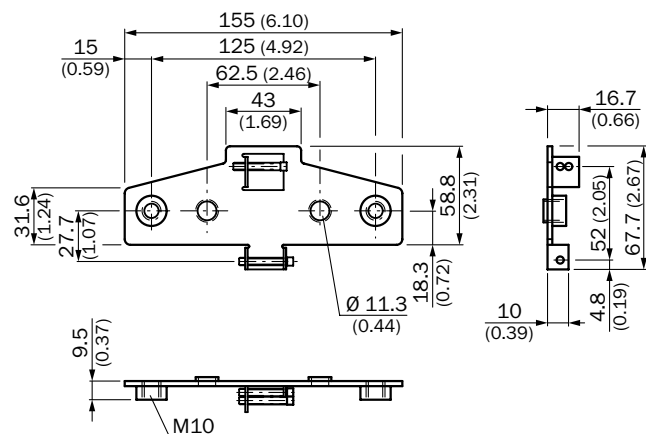


BEF-WN-W24

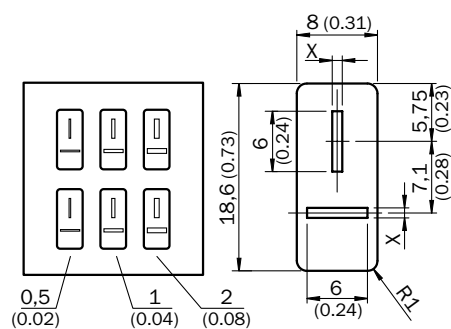


BEF-WN-W9-2



BEF-WN-WTR

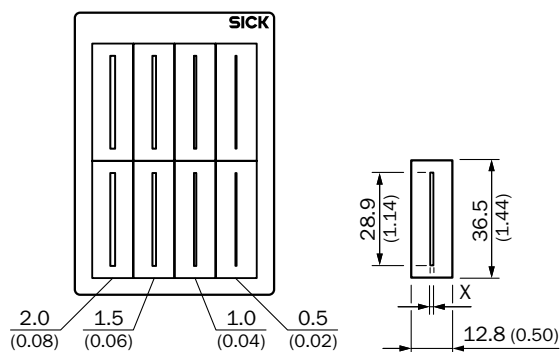
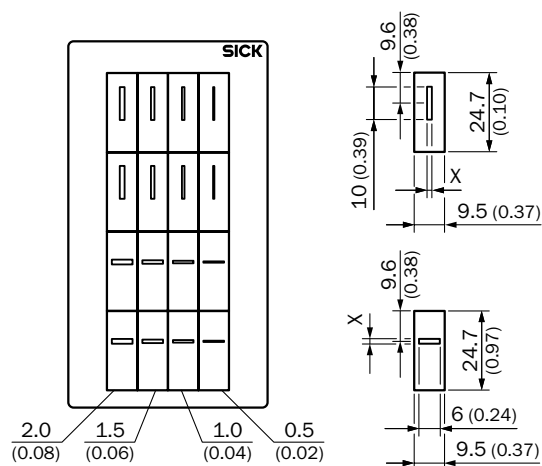
Dimensional drawings Masks

BL-100-10

3 pairs included with apertures A, B, C.
Self-adhesive backing for easy mounting.
Apply stick-on mask to WS100 and WE100 front lens.
For small object detection or increasing indexing accuracy.

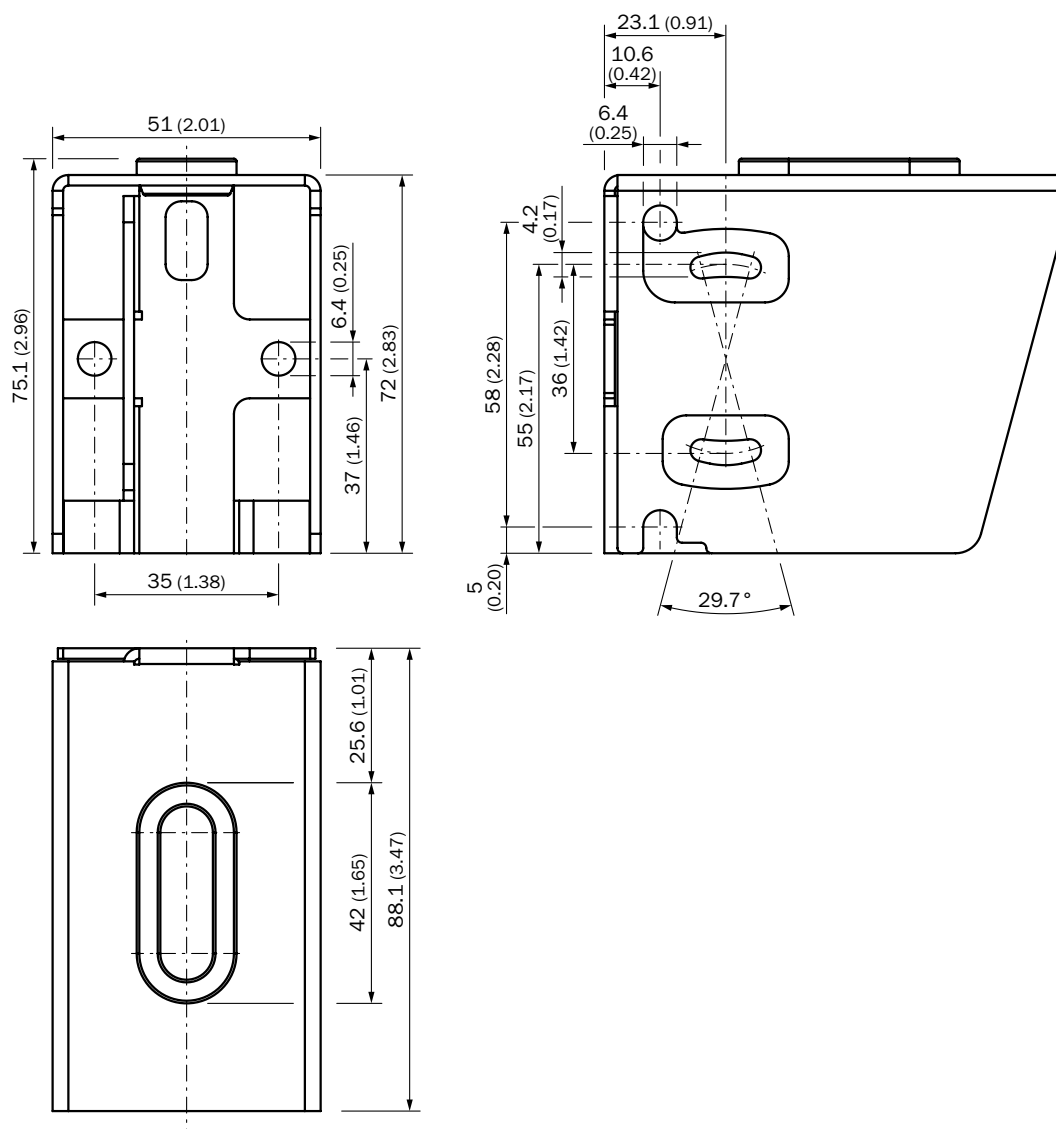
Sensing ranges with apertures applied:

- A) Aperture 2.0 mm: Range = 4.0 m
- B) Aperture 1.0 mm: Range = 2.0 m
- C) Aperture 0.5 mm: Range = 1.0 m

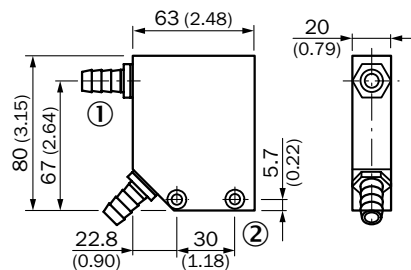
BL-12-SKN**BL-9-2**

Dimensional drawings Device protection (mechanical)

BEF-G10WSG

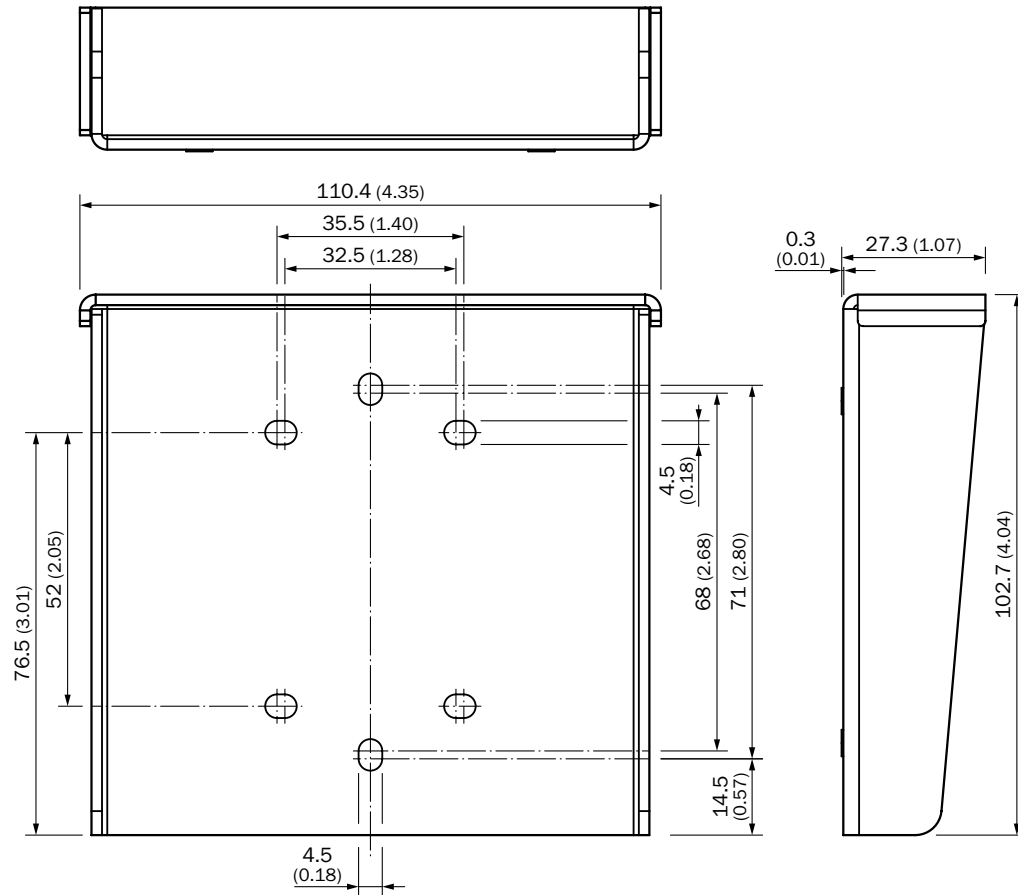
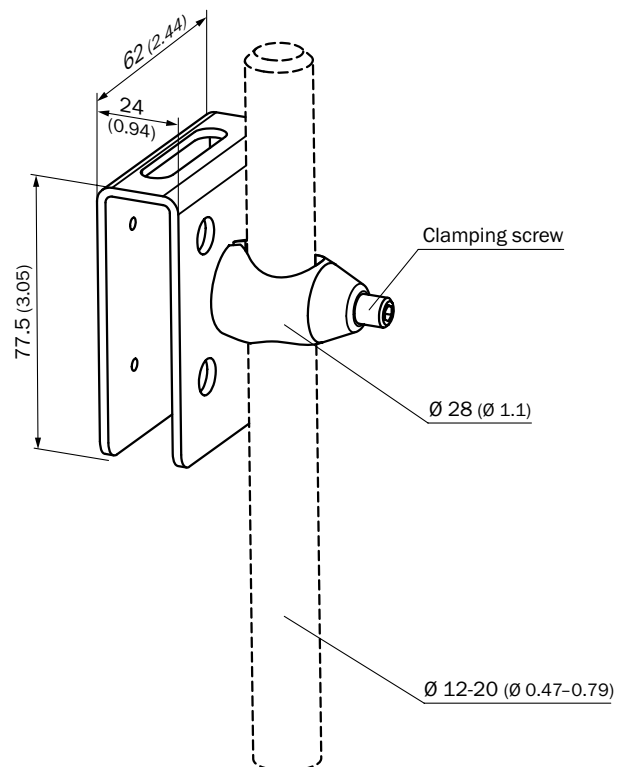
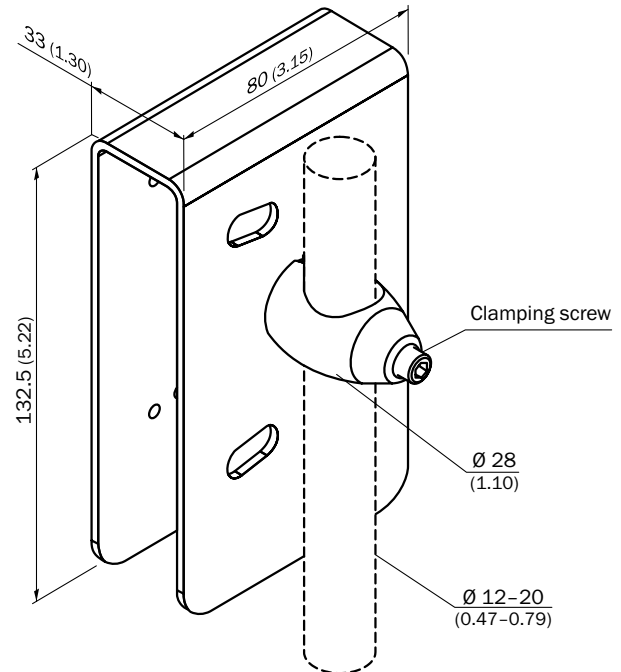


BEF-KP-W24

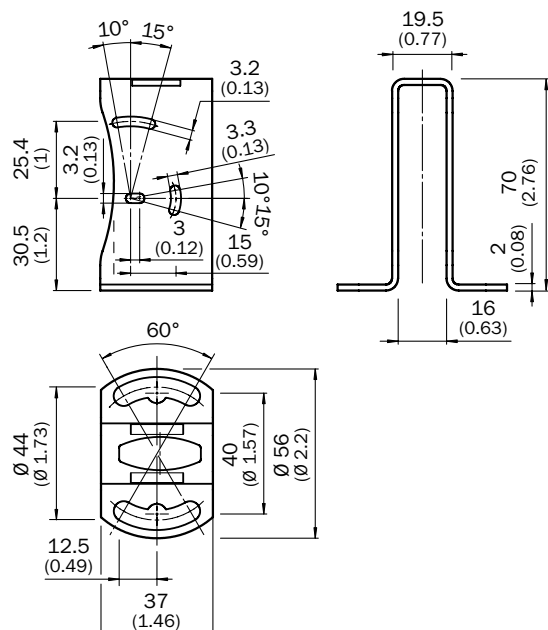
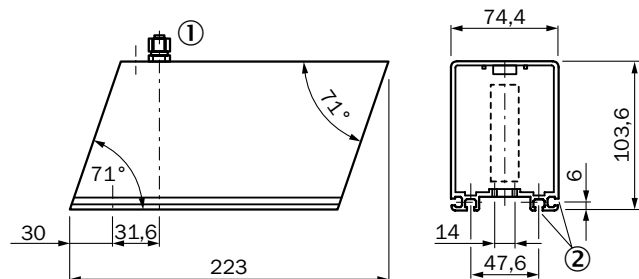


① Hose nozzle R1/4"

② Tapped hole for countersunk screw M5

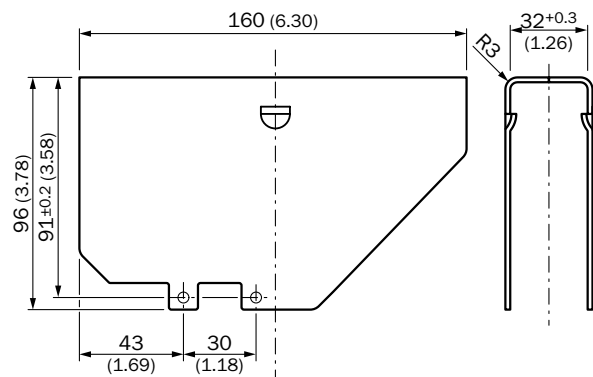
BEF-PL80AWSG**BEF-SG-W12-3****BEF-SG-W27**

BEF-SW-W4S

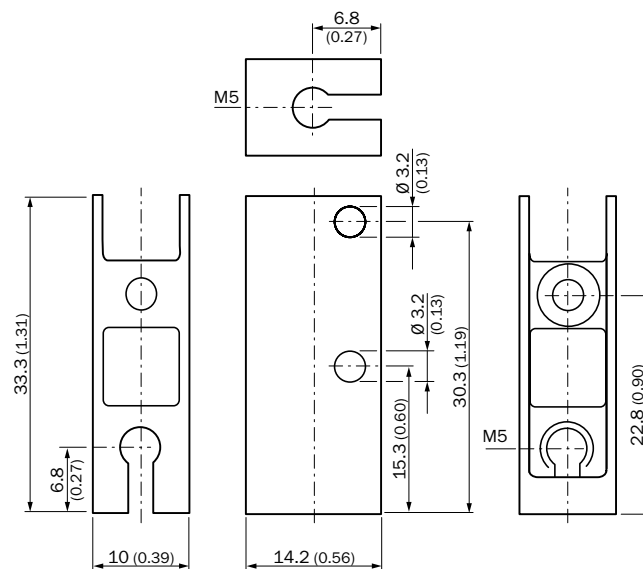
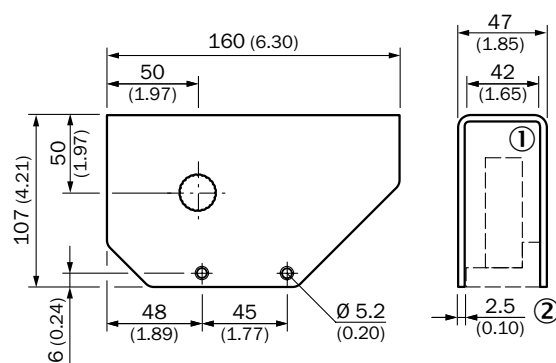
**OBS-W24**

Alle Maße in mm

- ① Fast action screw fitting for hose internal diameter 6mm
- ② Running nut channel for M5 nut

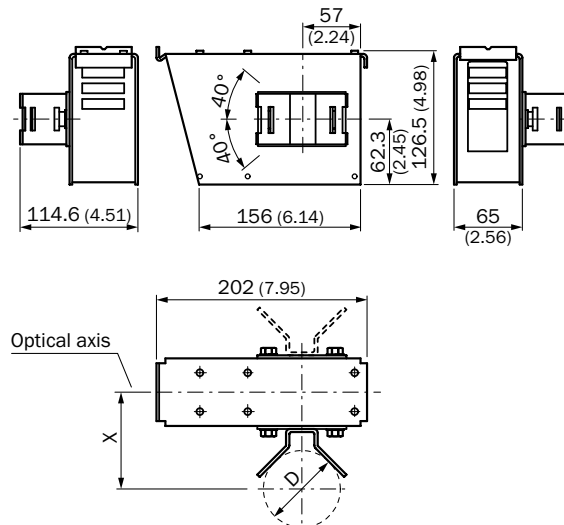
OBW-W24

BEF-W2S-C

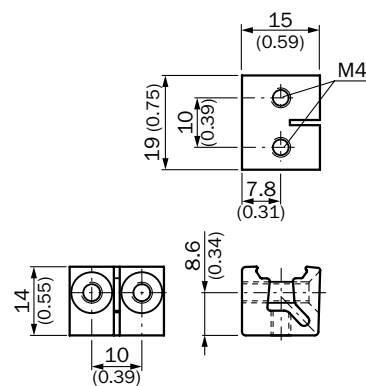
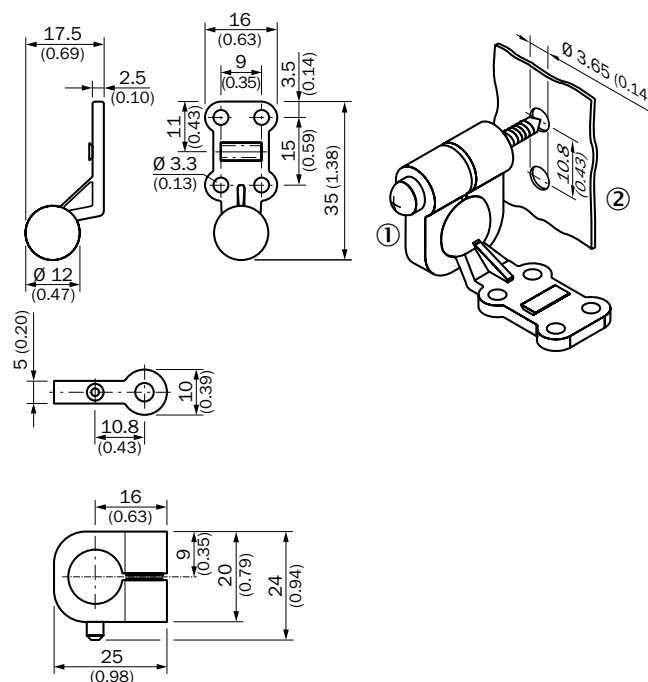
**OBW-KHS-M01**

- ① Sensor
- ② Base plate with clamp supplied with unit

WSG1-01

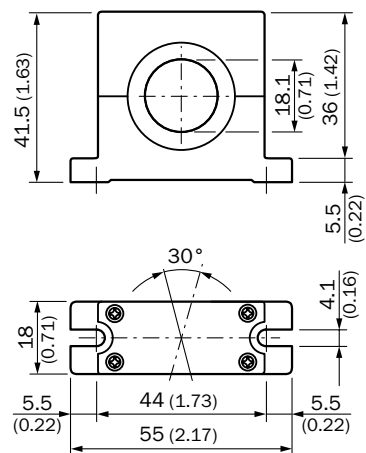
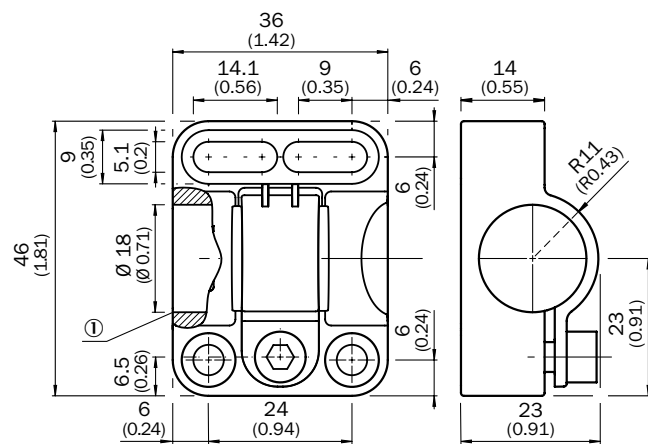


Dimensional drawings Terminal and alignment brackets

BEF-DKH-W12**BEF-GH-MINI01**

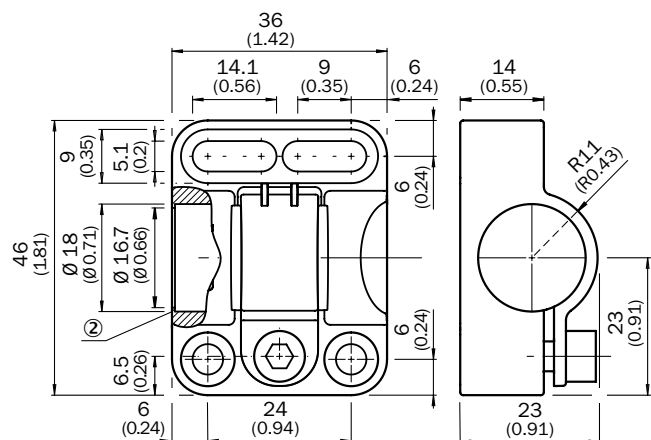
① Self-tapping screw Ø 4mm

② System or machine part

BEF-HA-M18R**BEF-WN-M18-ST02****BEF-KH-M18**

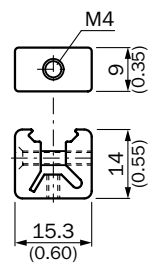
① Without fixed stop

BEF-KHF-M18

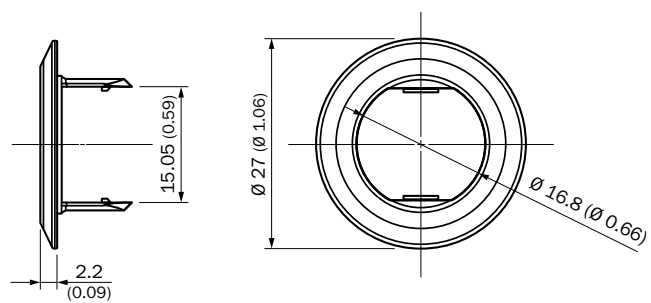


② With fixed stop

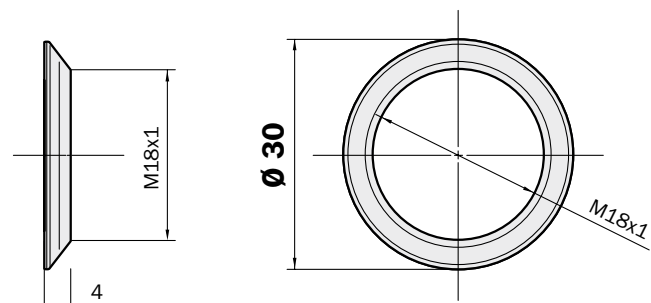
BEF-KH-W12



BEF-WN-MH15-1

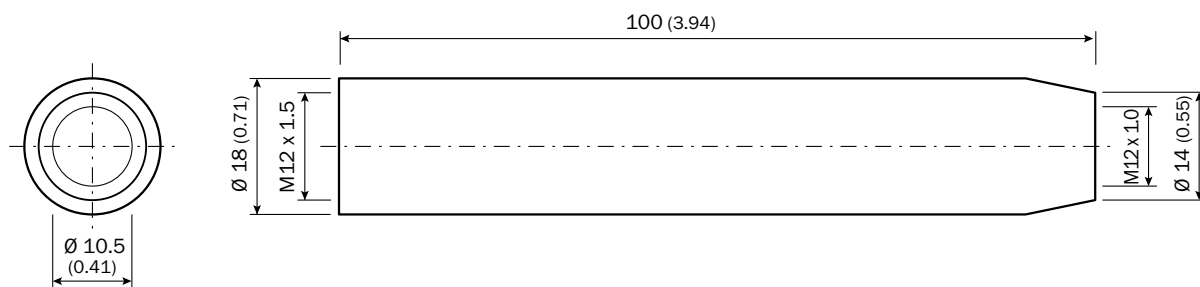


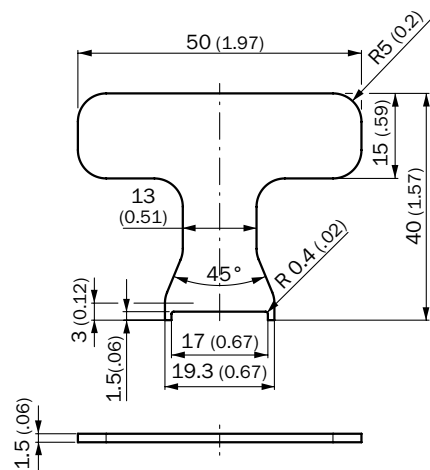
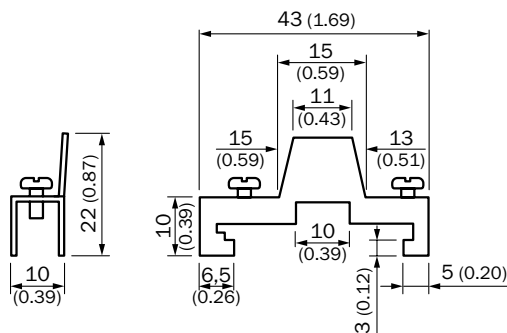
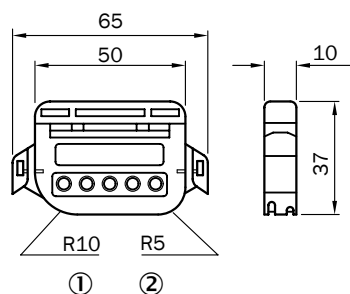
BEF-WN-MH15-2V



Dimensional drawings Other mounting accessories

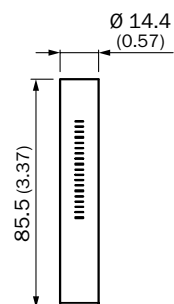
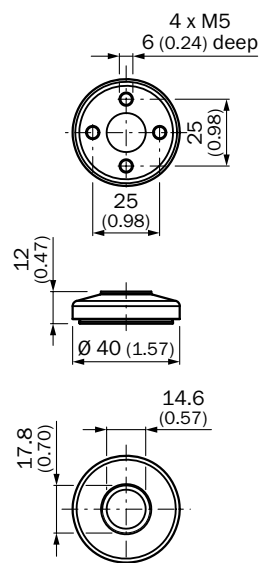
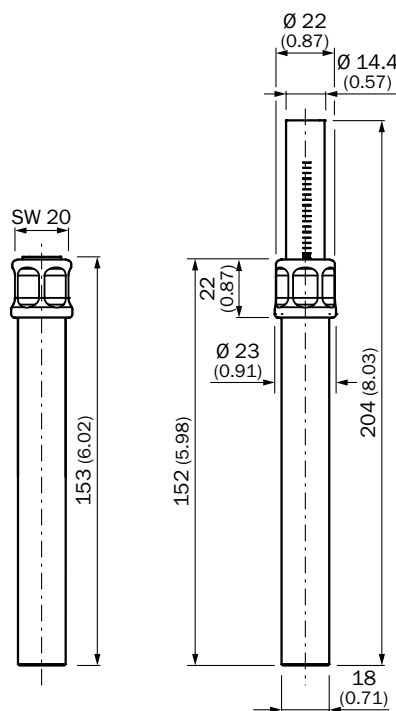
BEF-MR18G-NA



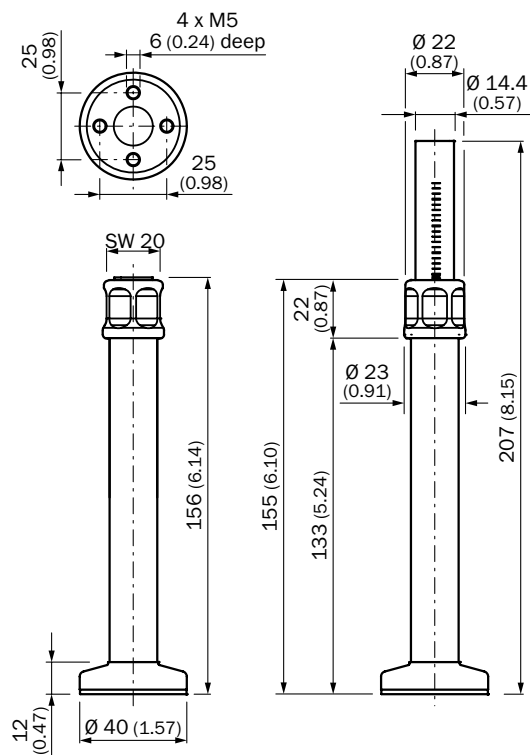
BEF-TO-GR18S**BF-EB01-W190****FC**

- ① Template for bend radius R10 mm, for end sleeve Ø 1.5 mm and Ø 2.5 mm
 ② Bend radius R5 mm

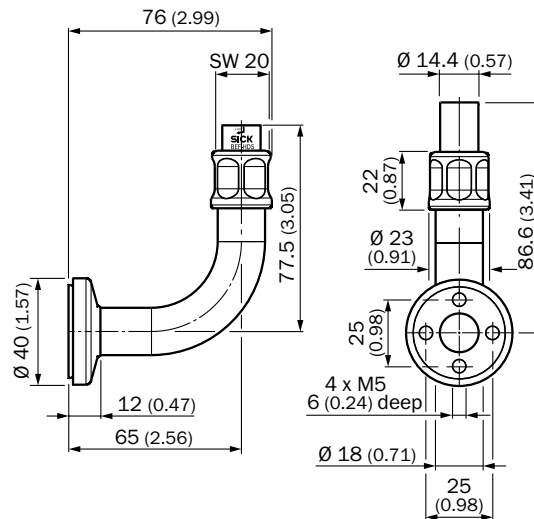
Dimensional drawings Universal bar clamp systems

BEF-HDSBR**BEF-HDSF****BEF-HDSTRG**

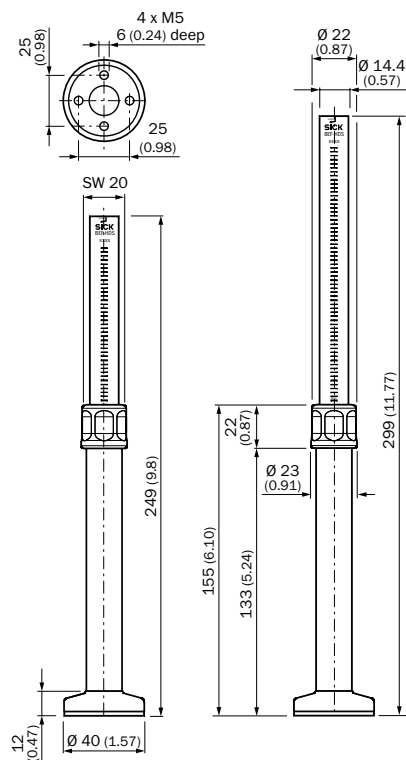
BEF-HDSTRGF



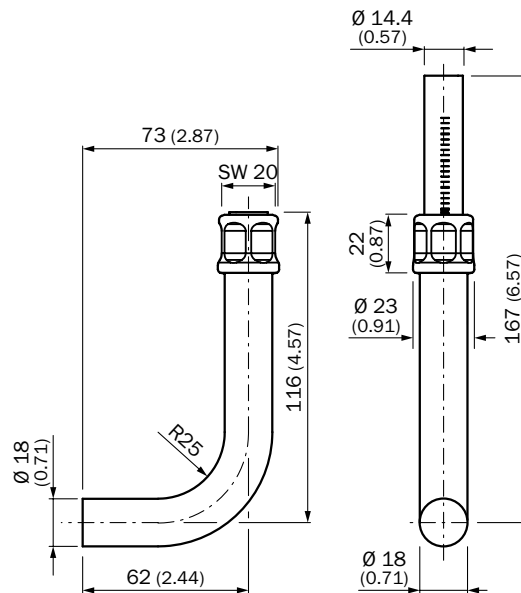
BEF-HDSTRK1WF

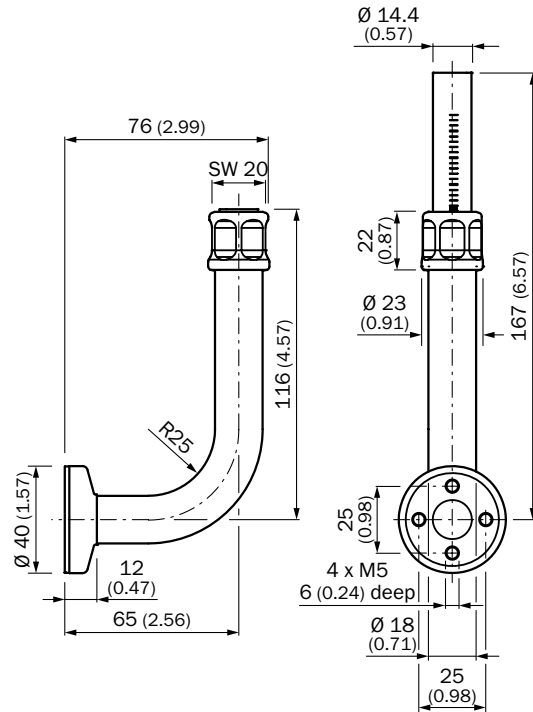
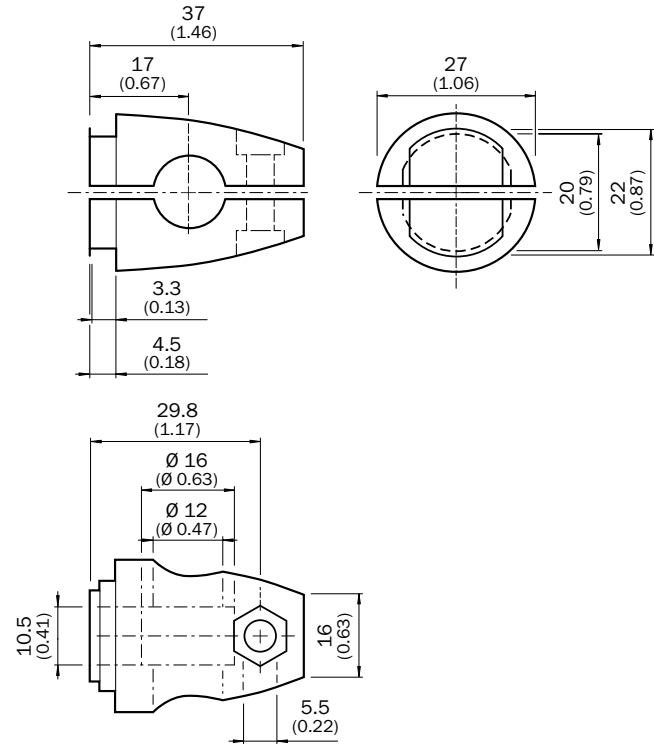
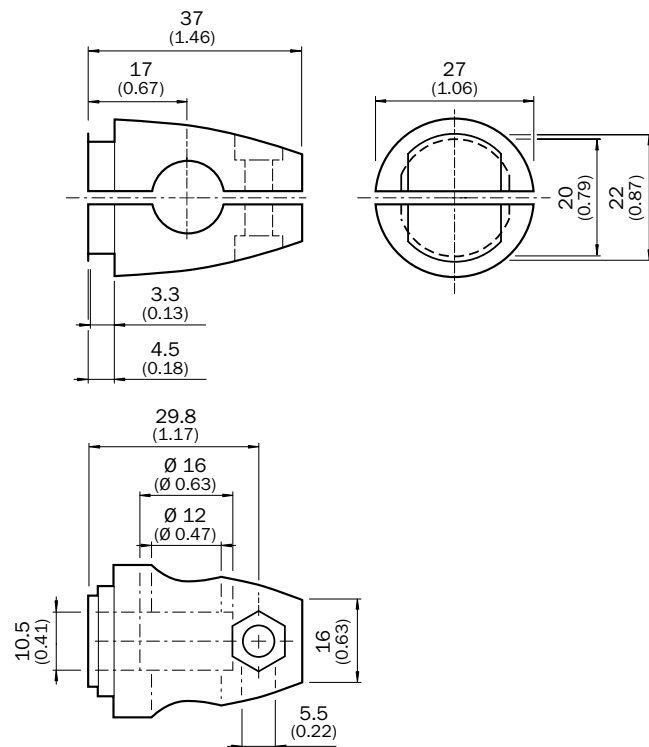
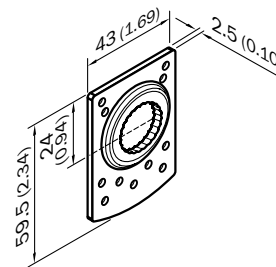


BEF-HDSTRL1GF

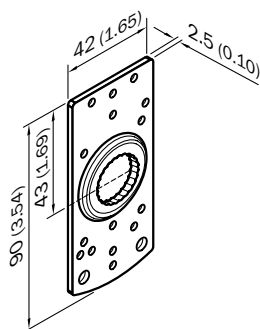


BEF-HDSTRW

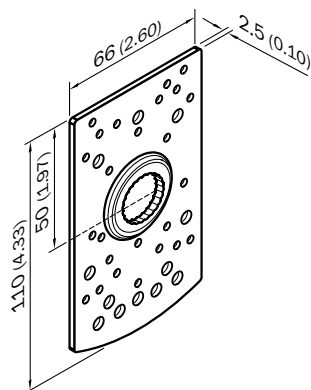


BEF-HDSTRWF**BEF-KHS-KH3****BEF-KHS-KH3N****BEF-KHS-N02****BEF-KHS-N02N**

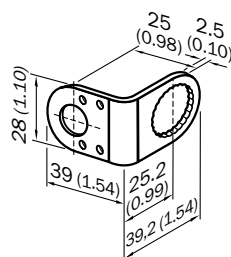
BEF-KHS-N03
BEF-KHS-N04N



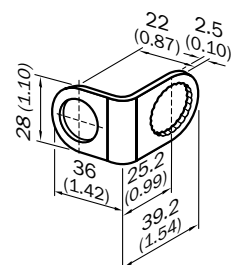
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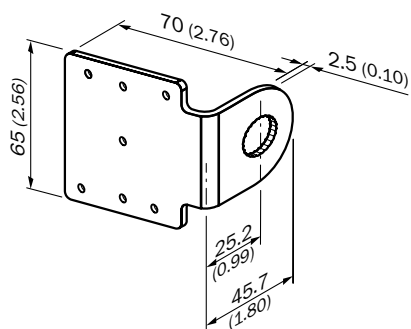
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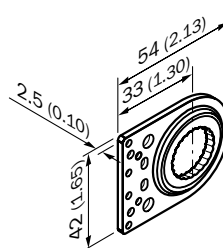
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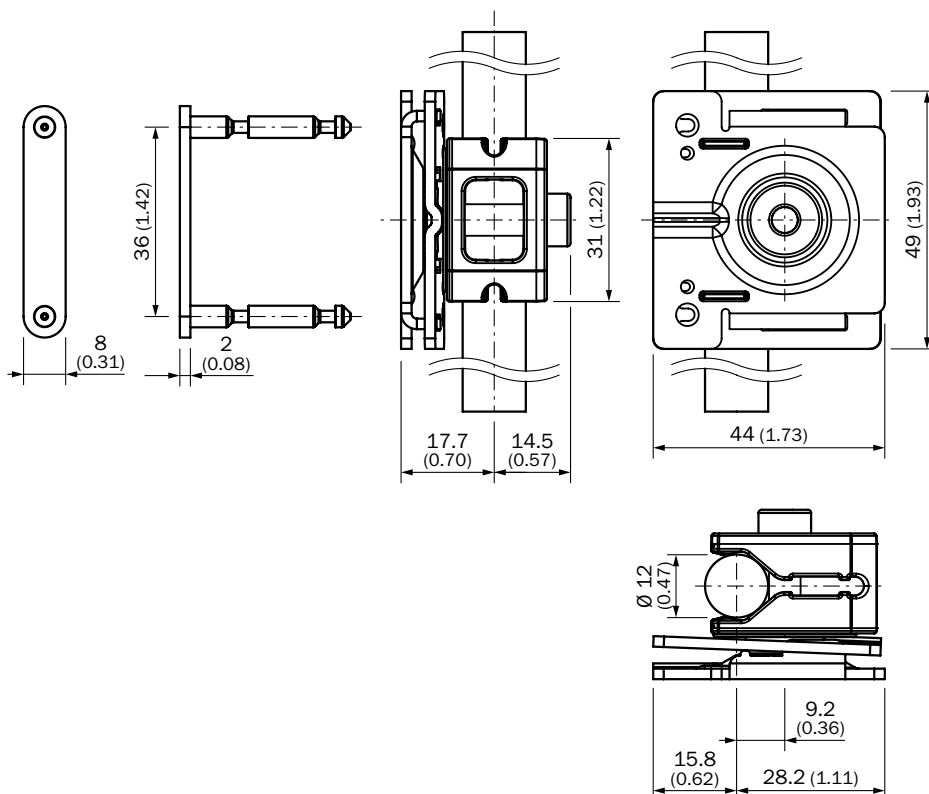
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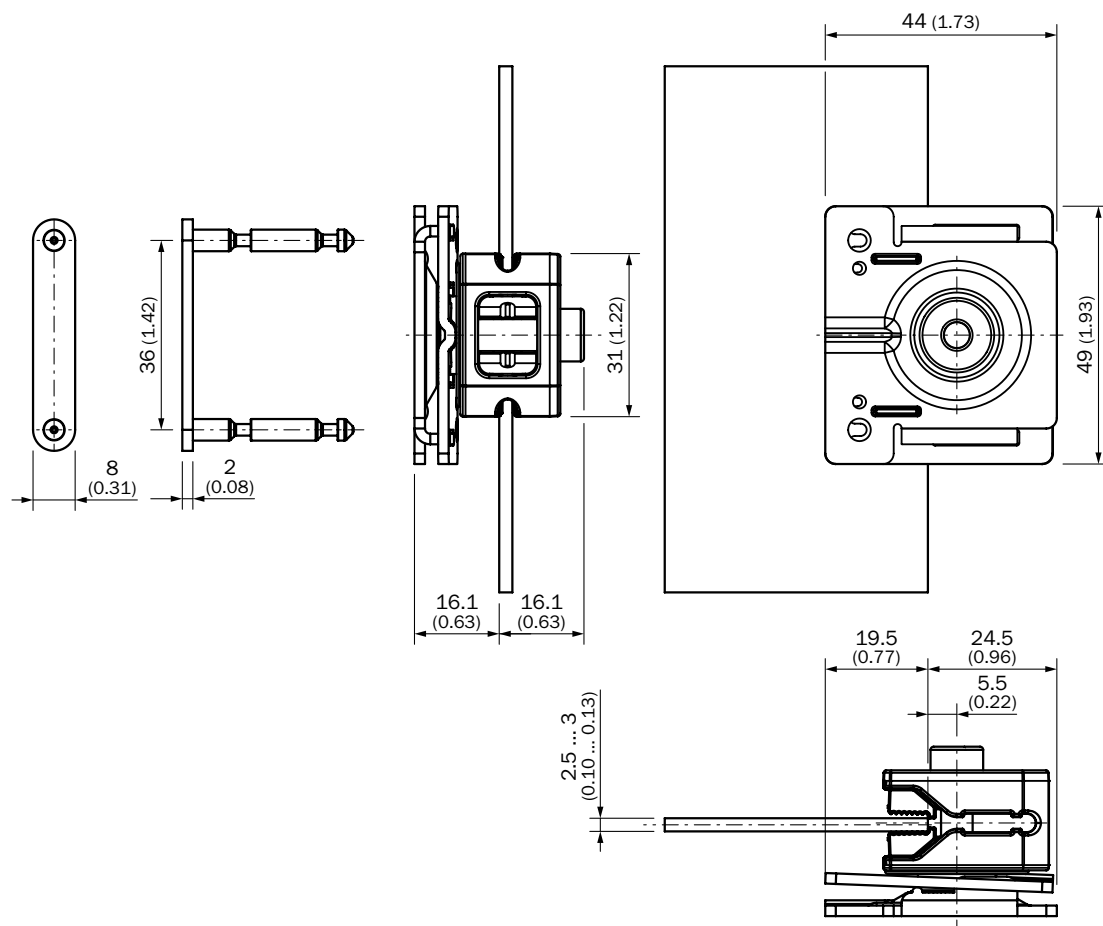


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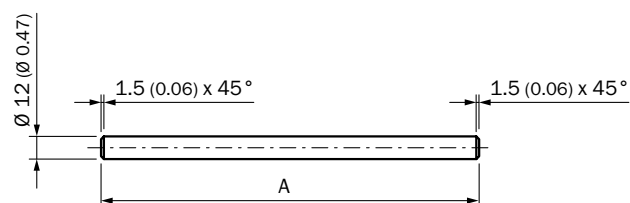


BEF-KHSQ12R01



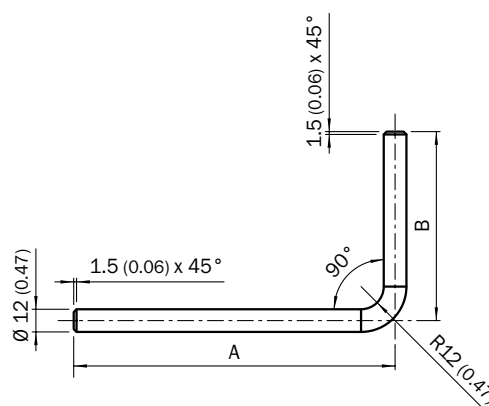
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BEF-MS12G-A
BEF-MS12G-B
BEF-MS12G-NA
BEF-MS12G-NB



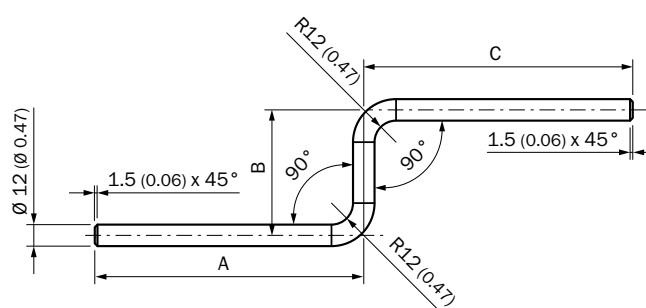
- ① BEF-MS12G-(N)A: A = 200 mm
 ② BEF-MS12G-(N)B: A = 300 mm

BEF-MS12L-A
BEF-MS12L-B
BEF-MS12L-NA
BEF-MS12L-NB



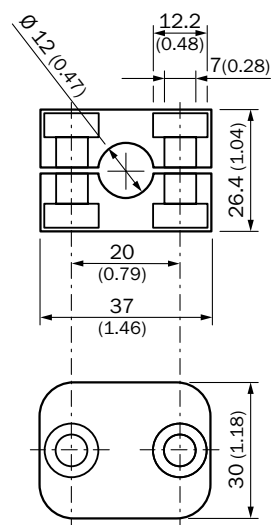
- ① BEF-MS12L-(N)A: A = 200 mm, B = 150 mm
 ② BEF-MS12L-(N)B: A = 250 mm, B = 250 mm

BEF-MS12Z-A, BEF-MS12Z-B, BEF-MS12Z-C, BEF-MS12Z-NA, BEF-MS12Z-NB



- ① BEF-MS12Z-(N)A: A = 150 mm, B = 70 mm, C = 150 mm
- ② BEF-MS12Z-(N)B: A = 150 mm, B = 70 mm, C = 250 mm

BEF-RMC-D12



Reflectors

Reflectors

Angular

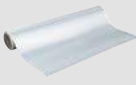
Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Rectangular, screw connection, 47 mm x 47 mm	P250	5304812
		Rectangular, screw connection, 45 mm x 28 mm	P32	5314001
		Rectangular, screw connection, 25 mm x 21 mm	P40	5313923
		Rectangular, screw connection, 32 mm x 31 mm	P42	5314825
		Rectangular, screw connection, 31 mm x 8.5 mm	P45A	5320027
		Rectangular, screw connection, 96 mm x 96 mm	PL100	5321625
		Rectangular, self-adhesive, 146 mm x 14 mm	PL150	5315548
		Rectangular, screw connection, 175 mm x 34 mm	PL180E01	1013289
		Rectangular, screw connection, 38 mm x 15 mm	PL20A	1012719
		Rectangular, self-adhesive, 38 mm x 15 mm	PL21A	1015172
		Rectangular, screw connection, 56 mm x 28 mm	PL30A	1002314
		Rectangular, self-adhesive, 56 mm x 28 mm	PL31A	1002315
		Rectangular, screw connection, 37 mm x 56 mm	PL40A	1012720
		Rectangular, screw connection M3, countersunk screw head, 40 mm x 60 mm	PL40B	5320134
		Rectangular, screw connection, wrench size 48 mm	PL50A	1000132
		Rectangular, self-adhesive, wrench size 48 mm	PL51A	1001628
		Rectangular, with M6x14 threaded bolt and locking device, 75 mm x 45 mm	PL72-2	5322723

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Rectangular, screw connection, 80 mm x 80 mm	PL80A	1003865
		Rectangular, self-adhesive, 76 mm x 45 mm	PL81	5322795
	Plastic	Chemically resistant, screw connection, 47 mm x 47 mm	P250 CHEM	5321097

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, Wrench size 48 mm	P55F	5313924
		Fine triple, screw connection, suitable for laser sensors, 18 mm x 18 mm	PL10F	5311210
		Fine triple, planar, suitable for laser sensors, 45 mm x 17 mm	PL15F	5313849
		Fine triple, self-adhesive, suitable for laser sensors, 27 mm x 17 mm	PL18F	5319994
		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
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
		Fine triple, chemically resistant, screw connection, 20 mm x 32 mm	PL10FB-CHEM	5327722
		Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089

Reflective tape

Figure	Description	Model name	Part no.
	Self-adhesive, not suitable for photoelectric retro-reflective sensors with polarisation filter, length customisable by roll, 91.4 cm x 4.57 m ¹⁾	REF-3290	5301885
	Self-adhesive, not suitable for photoelectric retro-reflective sensors with polarisation filter, dimensions customisable by roll, 91.4 cm x 4.57 m ¹⁾	REF-3290-K	4018696
	With alignment mark, self-adhesive, customizable size by roll, 91.4 cm x 45.7 m ¹⁾	REF-3930-K2	2057035
	Self-adhesive, not suitable for photoelectric retro-reflective sensors with polarisation filter, customizable length by roll, 61 cm x 4.57 m ¹⁾	REF-7610-0K4	5600079
	Self-adhesive, not suitable for photoelectric retro-reflective sensors with polarisation filter, customizable size by roll, 61 cm x 4.57 m ¹⁾	REF-7610-K	4018617
	Suitable for laser sensors, self-adhesive, sheet, see alignment note, 225 mm x 225 mm	REF-AC1000	5319429
	Suitable for laser sensors, self-adhesive, cut, see alignment note, 28 mm x 28 mm	REF-AC1000-28	4067881
	Suitable for laser sensors, self-adhesive, cut, see alignment note, 56.3 mm x 56.3 mm	REF-AC1000-56	4063030
	Suitable for laser sensors, self-adhesive, cut, 20 pieces per pack, see alignment note, 73 mm x 73 mm	REF-AC1000-73P01	2061557
	Sheet, self-adhesive, not suitable for laser sensors, 225 mm x 225 mm	REF-APM	4025097
	Reflective tape "Diamond Grade", self-adhesive, sheet, 749 mm x 914 mm	REF-DG	5320565
	Reflective tape "Diamond Grade", self-adhesive, customizable size by sheet, 74.9 cm x 91.4 cm ¹⁾	REF-DG-K	4019634
	Self-adhesive, 50 mm x 60 mm	REF-IRF-56	5314244
	Self-adhesive, customizable length by roll, 2.5 cm x 22.8 m ¹⁾	REF-PLUS-25-K	4051184
	Self-adhesive, customizable length by roll, 5 cm x 22.8 m ¹⁾	REF-PLUS-50-K	4051185
	Roll, self-adhesive, 100 mm x 22.8 m	REF-PLUS-R100	5319915
	Self-adhesive, customizable length by roll, 10 cm x 22.8 m ¹⁾	REF-PLUS-R100-K	4071461
	Self-adhesive, roll, 25 mm x 22.8 m	REF-PLUS-R25	5319929
	Self-adhesive, roll, 50 mm x 22.8 m	REF-PLUS-R50	5319981
	Self-adhesive, customizable length by roll, 7.6 cm x 22.8 m ¹⁾	REF-PLUS-R76	4071462
	100 pieces per pack, self-adhesive, 34 mm x 36 mm	REF-Plus-3436	5321337
	Roll, self-adhesive, 7.6 cm x 22.8 m ¹⁾	REF-Plus-R76	5322215
	100 pieces per pack, red, self-adhesive, 25 mm x 50 mm	REF-Plus-RED-2550	5320285

Round

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Round, screw connection	C110A	5304549
		Round, plugable	C42-1	5313506
		Round, M5x9 threaded bolt	C42-2	5324281
		Round, screw connection	C64A	5325185
		Reflector, round, M4x8 threaded bolt	P25	5315172
		Round, plugable	P25-2	5318969
		Round, planar	P34	5313922
		Round, M5x9 threaded bolt	P50-1	5322673
		Round, screw connection, wrench size 48 mm	P55	5318680
		Round, plugable	PL22-1	1003546
		Round, self-adhesive	PL22-2	1003621
		Round, plugable for metal plates	PL22-3	1004488
		Round, plugable	PL34-1	5322257

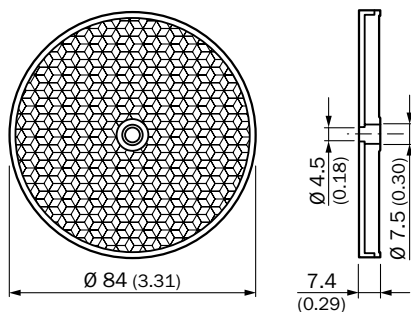
Special reflectors

Figure	Material	Description	Model name	Part no.
	Aluminum (anodized) / glass	Single-triple glass reflector for very high sensing ranges, focus: infinite, screw connection	OP60-00	1000141
		Single-triple glass reflector for very high sensing ranges, focus: 20 m, screw connection	OP60-20	1000136
		Single-triple glass reflector for high-temperature applications, screw connection	OP61-00	1002627
	HOT Thermoplast	High-temperature reflector, screw connection, 47 mm x 47 mm	P250H	5315124
	Plastic	Chemically resistant, screw connection, 38 mm x 15 mm	PL20 CHEM	5321089
	PMMA/ABS	Antifog, for prevention of moisture fogging on the reflection area, screw connection, 56 mm x 37 mm	PL40A Antifog	5322011

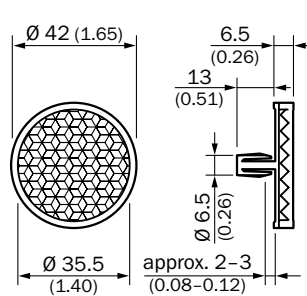
Figure	Material	Description	Model name	Part no.
	Plastic	Rectangular, screw connection M3, countersunk screw head, chemical resistant, 56 mm x 37 mm	PL40B-CHEM	5326088
	PMMA/ABS	Permanently heated, screw connection, wrench size 48 mm	PL50HK	1011545
		Regulated heated, screw connection; heating ON: T < 15 °C, wrench size 48 mm	PL50HS	1009871
	Anodised Aluminium / borosilicate glass	Oil-proof, solvent-resistant, screw connection	PL53A	1000382
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adapter shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adapter thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405
	Anodised Aluminium / borosilicate glass	High-temperature reflector, glass, screw connection	SW50	1000131

Dimensional drawings Reflectors

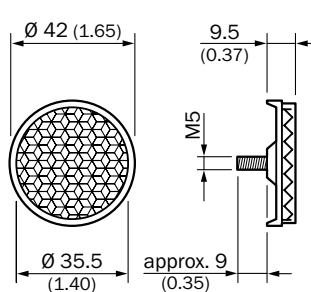
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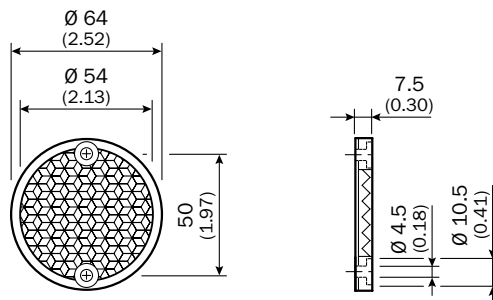
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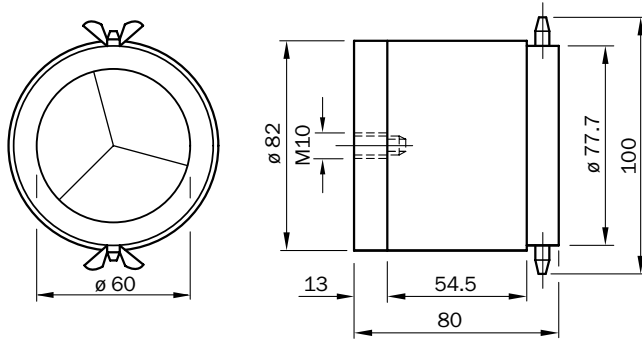
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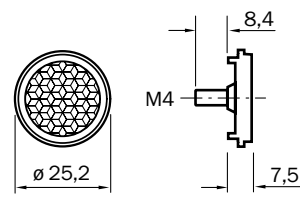
C64A



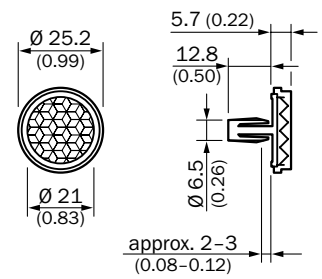
OP60-00, OP60-20, OP61-00



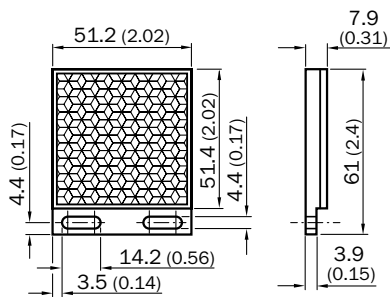
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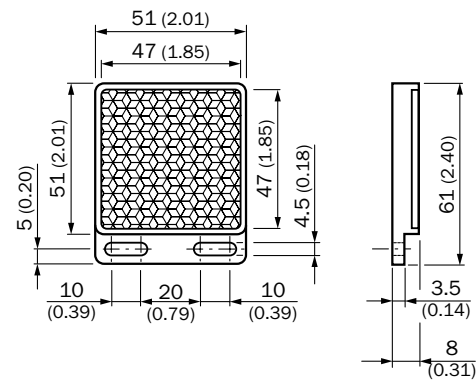
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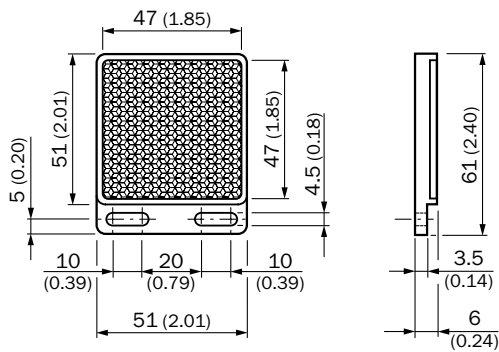
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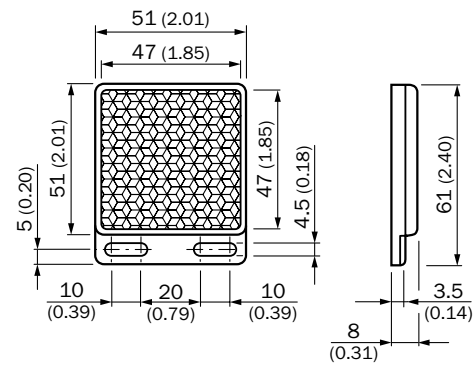
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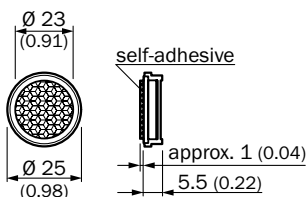
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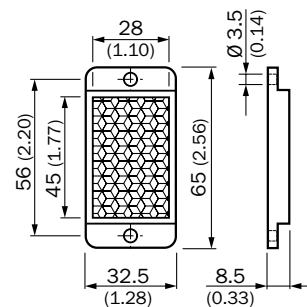
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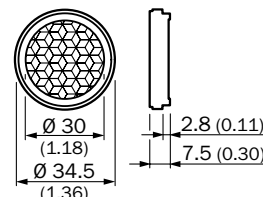
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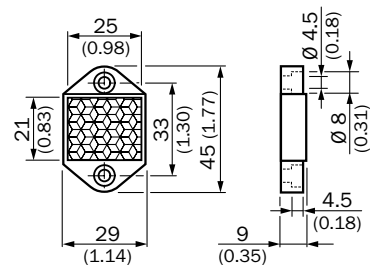
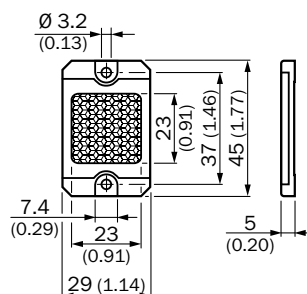
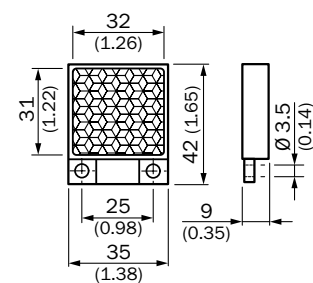
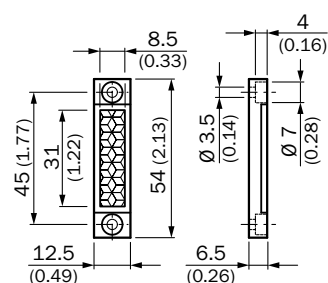
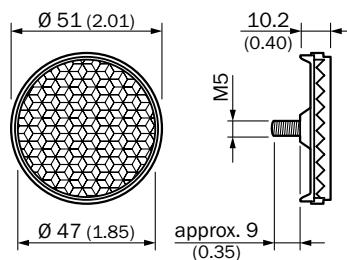
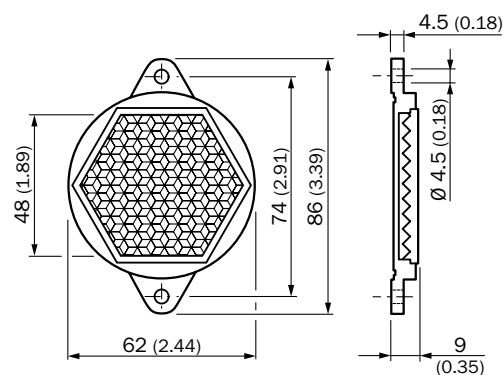
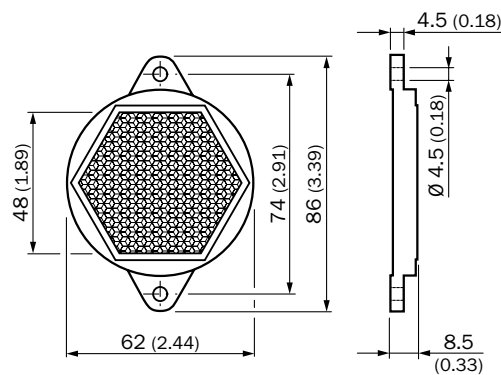
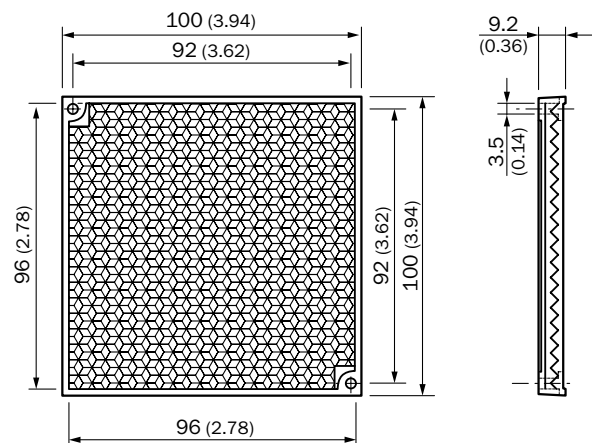
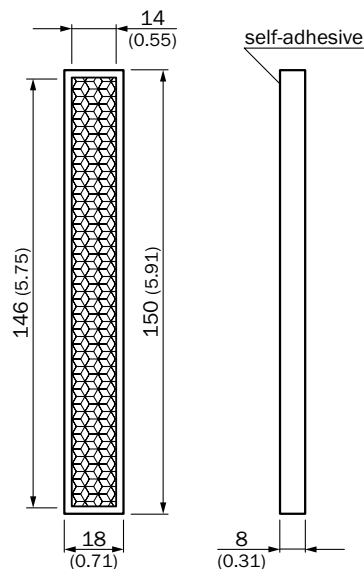


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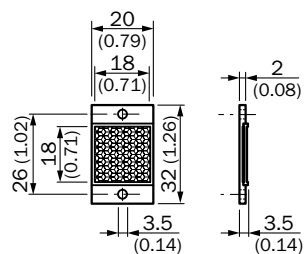


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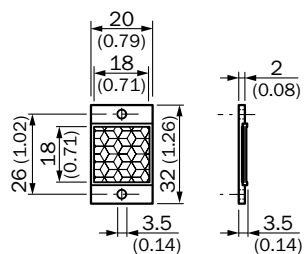


P40**P41F****P42****P45A****P50-1****P55****P55F****PL100****PL150**

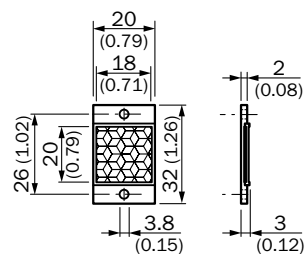
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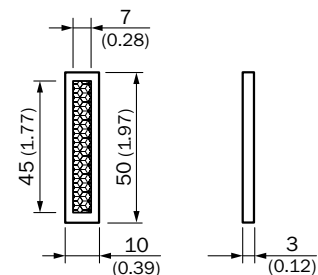
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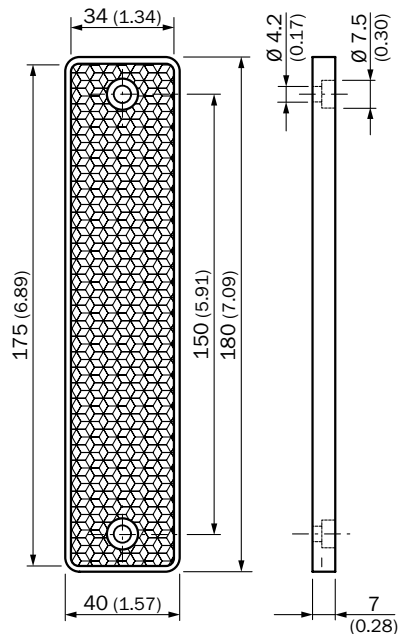
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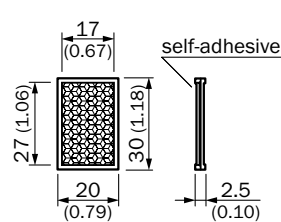
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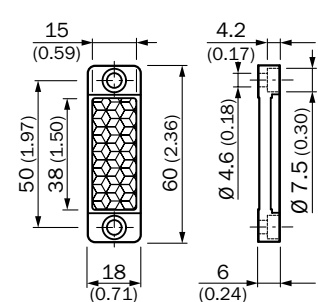
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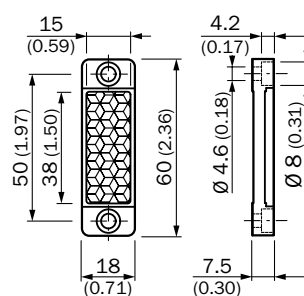
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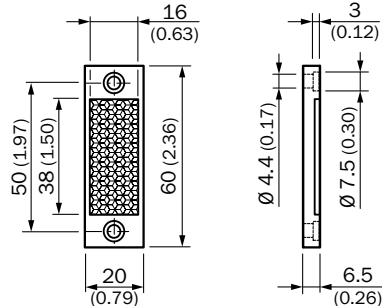
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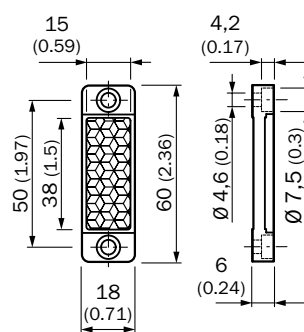
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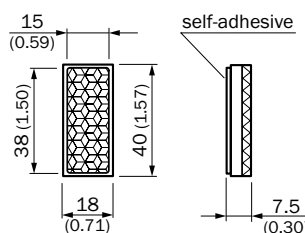
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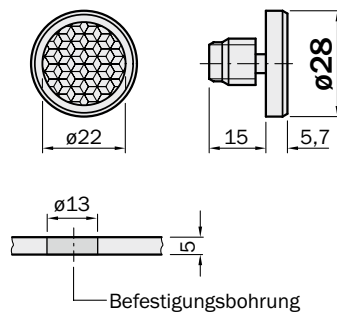
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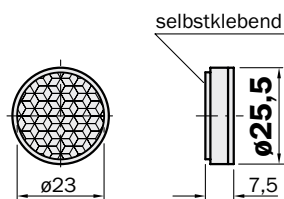
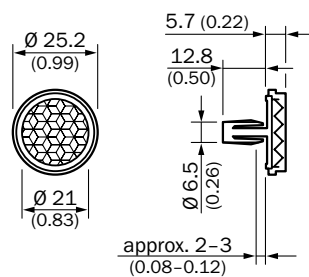
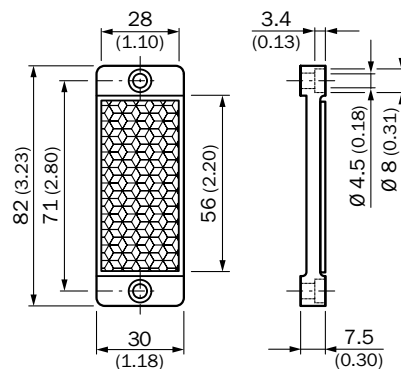
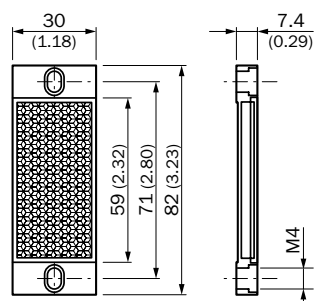
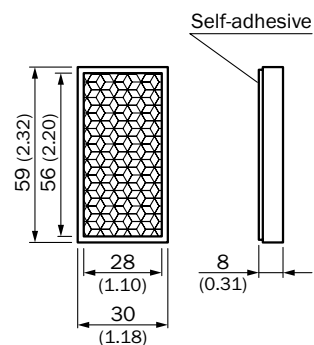
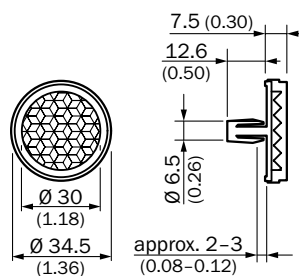
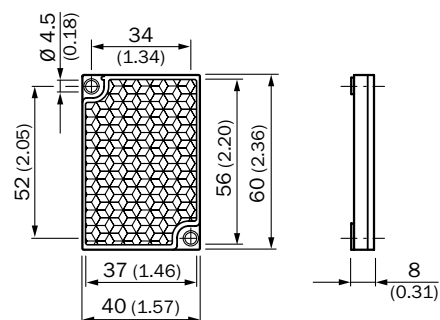
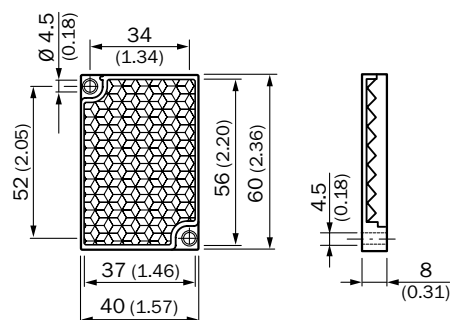
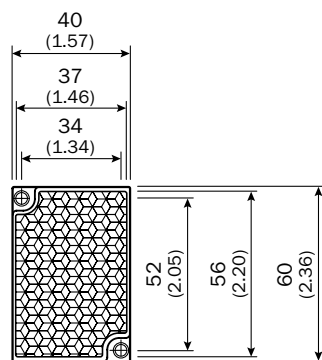
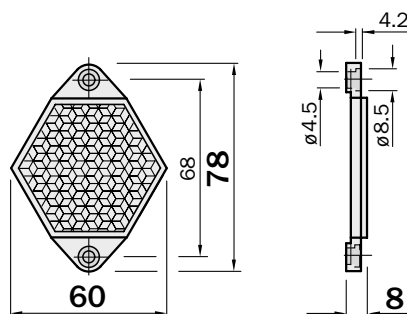


PL21A

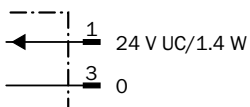
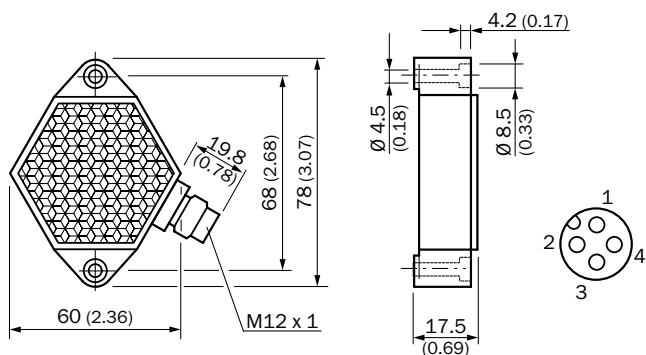


PL22-1

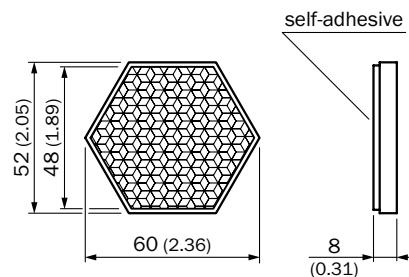


PL22-2**PL22-3****PL30A****PL30F****PL31A****PL34-1****PL40A****PL40A Antifog****PL40B
PL40B-CHEM****PL50A**

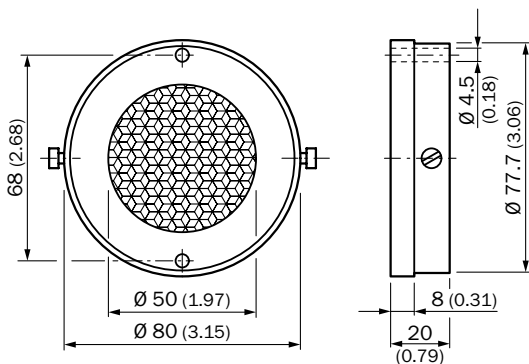
**PL50HK
PL50HS**



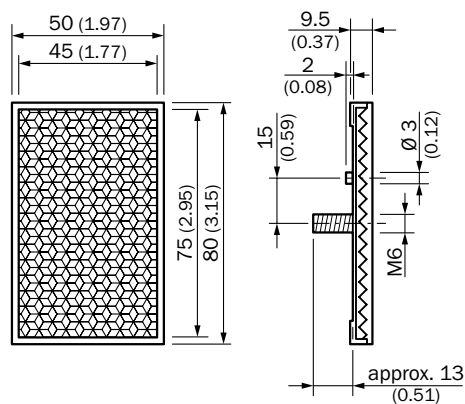
PL51A



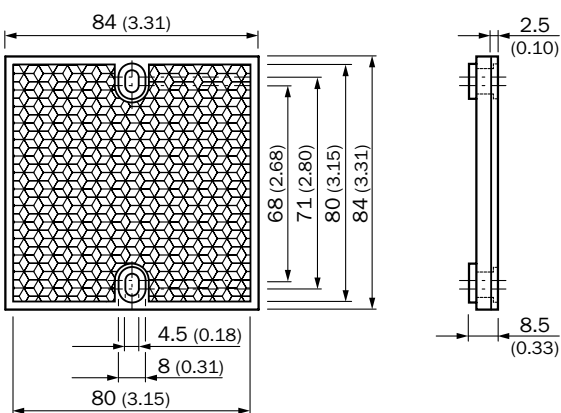
PL53A



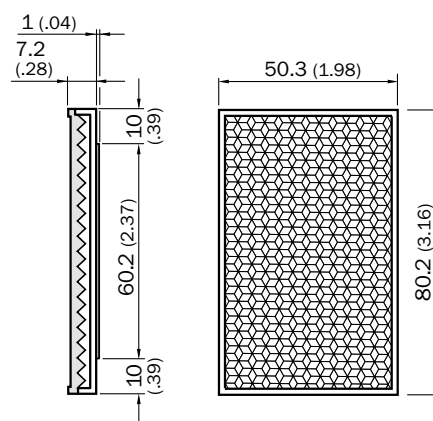
PL72-2

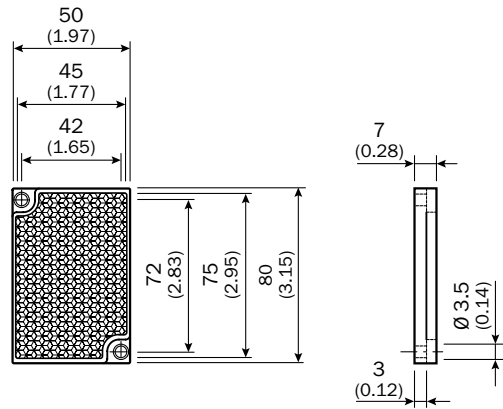
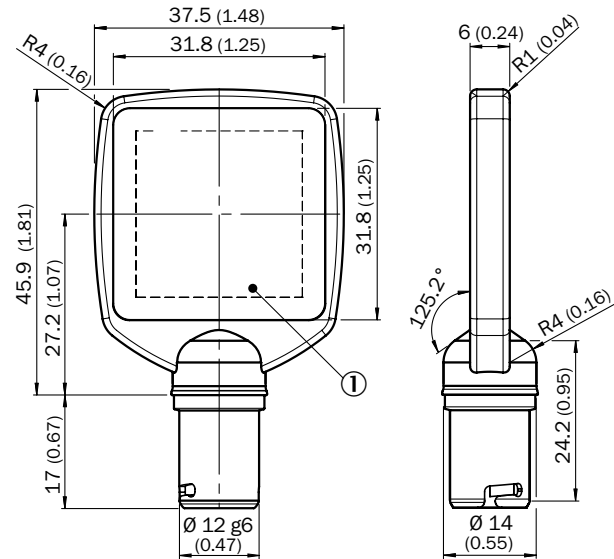


PL80A

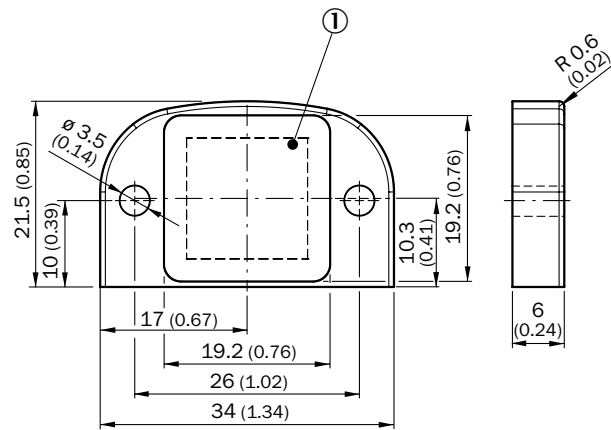


PL81

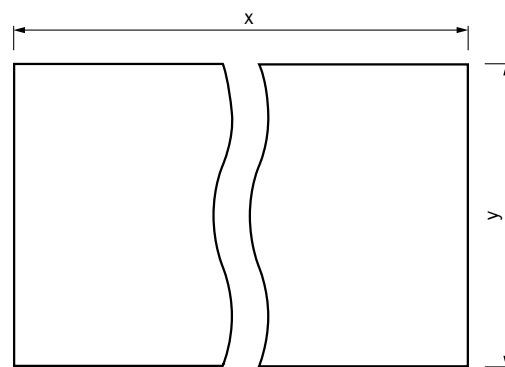


PL81-1F**PLH25-D12**

① Reflective area

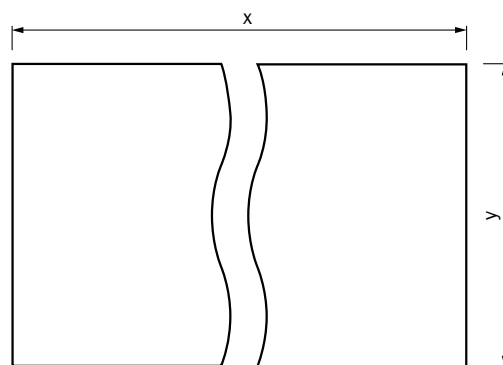
PLV14-A

① Reflective area

REF-3290

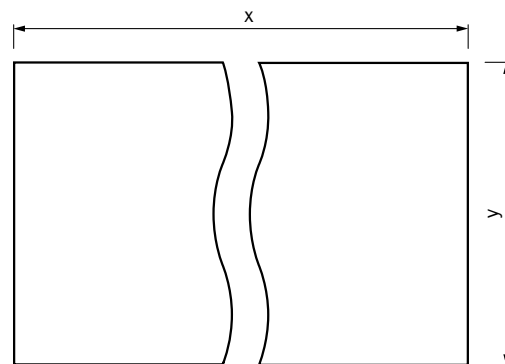
① X = 91.4 cm

② Y = 4.57 m

REF-3290-K
REF-AC1000-28
REF-PLUS-R100-K


① X = 91.4 cm

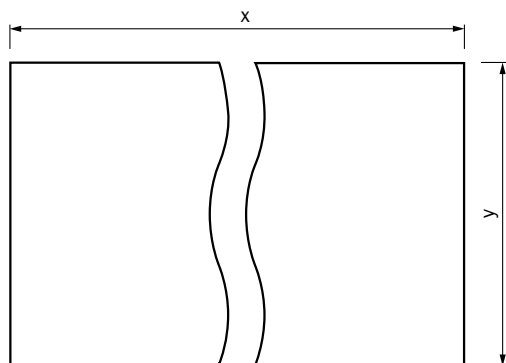
② Y = 4.57 m

REF-7610-0K4

① X = 61 cm

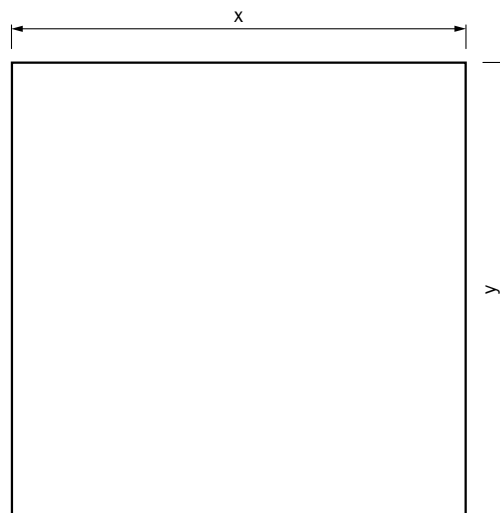
② Y = 4.57 m

REF-7610-K



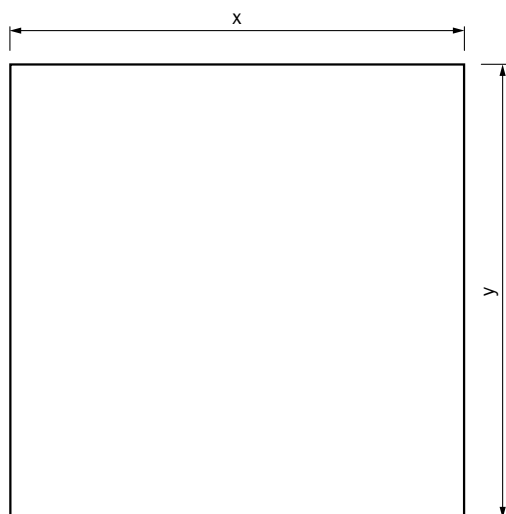
- ① X = 61 cm
- ② Y = 4.57 m

REF-AC1000



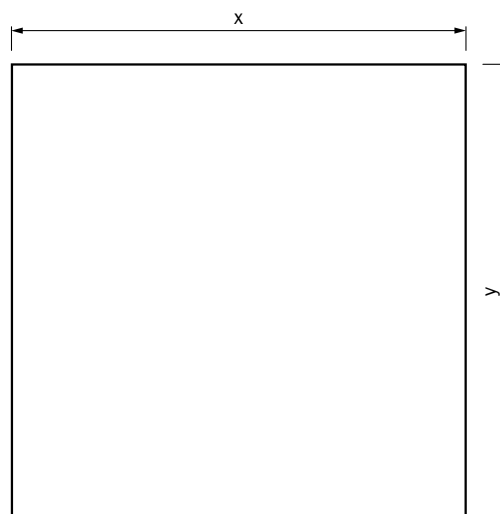
- ① X = 225 mm
- ② Y = 225 mm

REF-AC1000-56

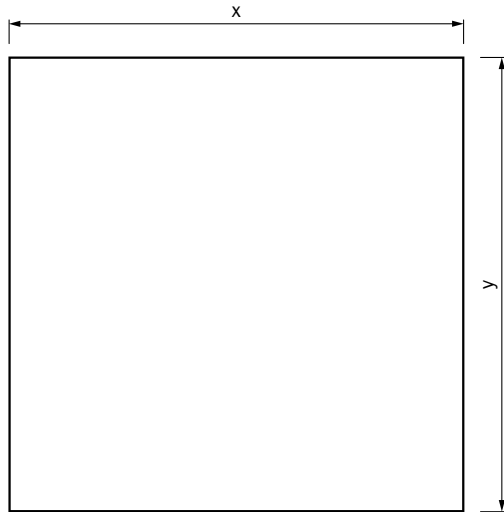


- ① X = 56,3 mm
- ② Y = 56,3 mm

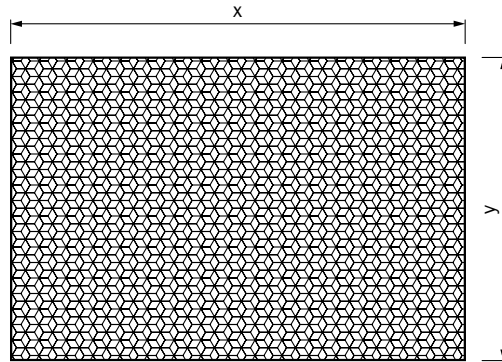
REF-AC1000-73P01



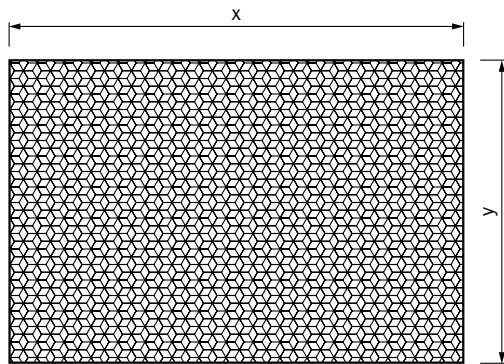
- ① X = 73 mm
- ② Y = 73 mm

REF-APM

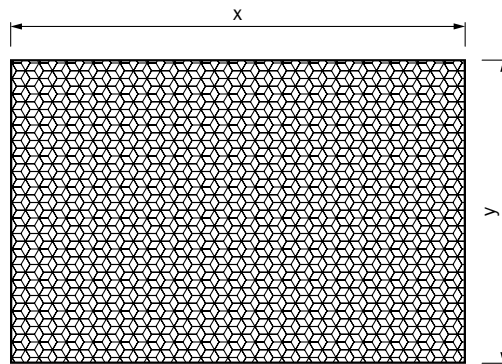
- ① X = 225 mm
- ② Y = 225 mm

REF-DG

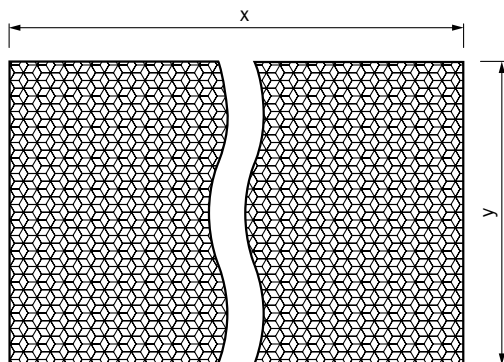
- ① X = 74.9 cm
- ② Y = 91.4 cm

REF-DG-K

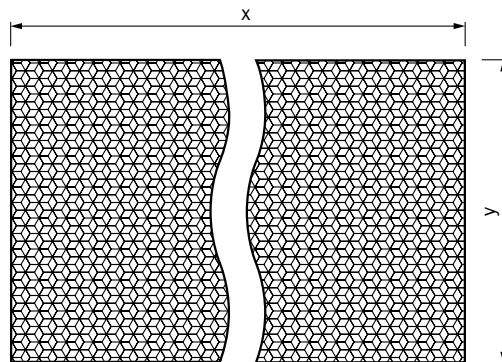
- ① X = 74.9 cm
- ② Y = 91.4 cm

REF-IRF-56

- ① X = 50 mm
- ② Y = 60 mm

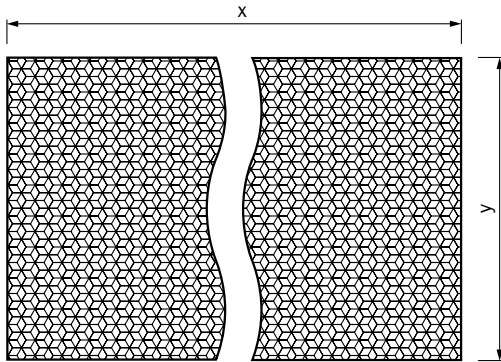
REF-PLUS-25-K
REF-PLUS-R25


- ① X = 2.5 cm
- ② Y = 22.8 m

REF-PLUS-R100

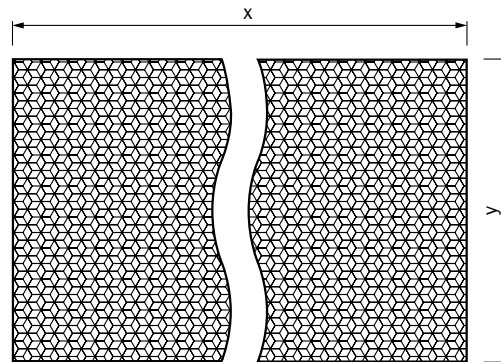
- ① X = 100 mm
- ② Y = 22.8 m

REF-PLUS-R50



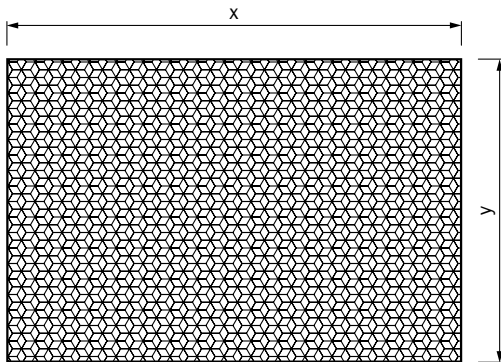
- ① X = 50 mm
- ② Y = 22.8 mm

REF-PLUS-R76 REF-Plus-R76



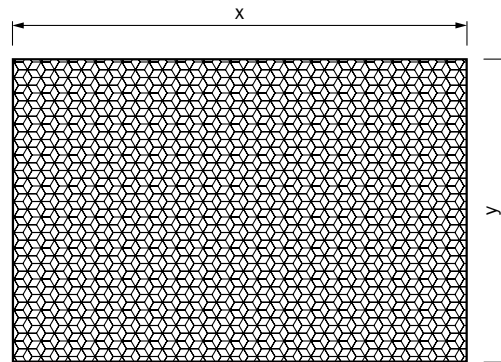
- ① X = 7.6 cm
- ② Y = 22.8 mm

REF-Plus-3436



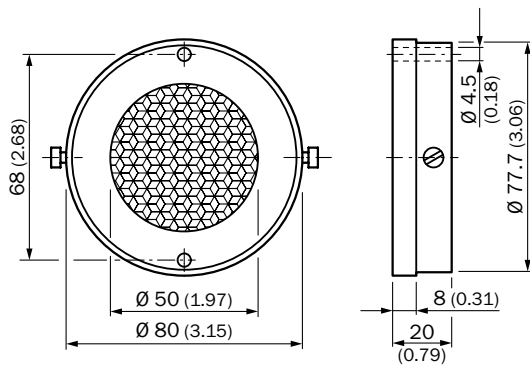
- ① X = 34 mm
- ② Y = 36 mm

REF-Plus-RED-2550



- ① X = 25 mm
- ② Y = 50 mm

SW50



Connection systems

Modules/gateways

Connection modules

Figure	Description	Model name	Part no.
	I/O box extension with 2 ethernet ports enabling switch functionality, number of logical input: 4, output: 8	I/O box extension, 4 in/8 out	6037654
	I/O module to add logical output to the I/O extension box, number of logical output = 8, only usage with accessory 6037654	I/O extension module, 8 out	6037750
	I/O extension module to extend the number of digital inputs in combination with I/O box extension. Number of digital inputs: 2, only usage with accessory 6037654	I/O module, 2 extra digital inputs	6039038

Connecting cable (female connector-open) M8, 3-pin, PP, hygienic systems

- Cable material: PP
- Connector material: PP
- Enclosure rating: IP 67, IP 69K

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
	Female connector, M8, 3-pin, straight	Cable, open conductor heads	2 m, 3-wire	DOL-0803-G02MN	6033664
			5 m, 3-wire	DOL-0803-G05MN	6033665
			10 m, 3-wire	DOL-0803-G10MN	6033666
			25 m, 3-wire	DOL-0803-G25MN	6044452
	Female connector, M8, 3-pin, angled	Cable, open conductor heads	2 m, 3-wire	DOL-0803-W02MN	6033667
			5 m, 3-wire	DOL-0803-W05MN	6033668
			10 m, 3-wire	DOL-0803-W10MN	6033669

Connecting cable (female connector-open) M8, 3-pin, PUR, halogen-free

- Cable material: PUR, halogen-free
- Connector material: TPU
- Enclosure rating: IP 65, IP 68, IP 69K

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
	Female connector, M8, 3-pin, straight	Cable, open conductor heads	1 m, 3-wire	DOL-0803-G01MC	6036455
			2 m, 3-wire	DOL-0803-G02MC	6025888
			5 m, 3-wire	DOL-0803-G05MC	6025889
			10 m, 3-wire	DOL-0803-G10MC	6025890
			20 m, 3-wire	DOL-0803-G20MC	6036456
	Female connector, M8, 3-pin, angled	Cable, open conductor heads	2 m, 3-wire	DOL-0803-W02MC	6025891
			3 m, 3-wire	DOL-0803-W03MC	6038991
			5 m, 3-wire	DOL-0803-W05MC	6025892
			10 m, 3-wire	DOL-0803-W10MC	6025893

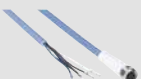
Connecting cable (female connector-open) M8, 3-pin, PVC

- Cable material: PVC
- Connector material: TPU
- Enclosure rating: IP 67, IP 69K

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
	Female connector, M8, 3-pin, straight	Cable, open conductor heads	2 m, 3-wire	DOL-0803-G02M	6010785
			5 m, 3-wire	DOL-0803-G05M	6022009
			10 m, 3-wire	DOL-0803-G10M	6022011
			15 m, 3-wire	DOL-0803-G15M	6036472
	Female connector, M8, 3-pin, angled	Cable, open conductor heads	2 m, 3-wire	DOL-0803-W02M	6008489
			5 m, 3-wire	DOL-0803-W05M	6022010
			10 m, 3-wire	DOL-0803-W10M	6022012
			15 m, 3-wire	DOL-0803-W15M	6036473

Connecting cable (female connector-open) M8, 4-pin, PP, hygienic systems

- Cable material: PP
- Connector material: PP
- Enclosure rating: IP 67, IP 69K

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	DOL-0804-G02MN	6033670
			5 m, 4-wire	DOL-0804-G05MN	6033671
			10 m, 4-wire	DOL-0804-G10MN	6033672
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	DOL-0804-W02MN	6033673
			5 m, 4-wire	DOL-0804-W05MN	6033674
			10 m, 4-wire	DOL-0804-W10MN	6033675

Connecting cable (female connector-open) M8, 4-pin, PUR, halogen-free

- Cable material: PUR, halogen-free
- Connector material: TPU
- Enclosure rating: IP 65, IP 68, IP 69K

Figure	Connection type head A	Connection type head B	Shielding	Connecting cable	Model name	Part no.
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	Unshielded	2 m, 4-wire	DOL-0804-G02MC	6025894
				5 m, 4-wire	DOL-0804-G05MC	6025895
				10 m, 4-wire	DOL-0804-G10MC	6025896
				15 m, 4-wire	DOL-0804-G15MC	6038622
				20 m, 4-wire	DOL-0804-G20MC	6051148
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	Shielded	5 m, 4-wire	DOL-0804-G05MAC	6050809
				10 m, 4-wire	DOL-0804-G10MAC	6050808
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	Unshielded	2 m, 4-wire	DOL-0804-W02MC	6025897
				5 m, 4-wire	DOL-0804-W05MC	6025898
				10 m, 4-wire	DOL-0804-W10MC	6025899

Connecting cable (female connector-open) M8, 4-pin, PVC

- Cable material: PVC
- Connector material: PVC
- Enclosure rating: IP 67, IP 69K

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
	Female connector, M8, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	DOL-0804-G02M	6009870
			5 m, 4-wire	DOL-0804-G05M	6009872
			10 m, 4-wire	DOL-0804-G10M	6010754
			15 m, 4-wire	DOL-0804-G15M	6035232
			20 m, 4-wire	DOL-0804-G20M	6029109
			30 m, 4-wire	DOL-0804-G30M	6029110
	Female connector, M8, 4-pin, angled	Cable, open conductor heads	50 m, 4-wire	DOL-0804-G50M	6029111
			2 m, 4-wire	DOL-0804-W02M	6009871
			5 m, 4-wire	DOL-0804-W05M	6009873
			10 m, 4-wire	DOL-0804-W10M	6010755

Connecting cable (female connector-open) M12, 3-pin, PUR, halogen-free

- Cable material: PUR, halogen-free
- Connector material: TPU
- Enclosure rating: IP 65, IP 68, IP 69K

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
	Female connector, M12, 3-pin, straight	Cable, open conductor heads	2 m, 3-wire	DOL-1203-G02MC	6039075
			5 m, 3-wire	DOL-1203-G05MC	6039076
			10 m, 3-wire	DOL-1203-G10MC	6039077
	Female connector, M12, 3-pin, angled	Cable, open conductor heads	2 m, 3-wire	DOL-1203-W02MC	6039078
			5 m, 3-wire	DOL-1203-W05MC	6039079
			10 m, 3-wire	DOL-1203-W10MC	6036752
			15 m, 3-wire	DOL-1203-W15MC	6036753
			20 m, 3-wire	DOL-1203-W20MC	6036754

Connecting cable (female connector-open) M12, 4-pin, PUR, halogen-free

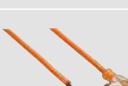
- Cable material: PUR, halogen-free
- Connector material: TPU

Figure	Connection type head A	Connection type head B	Shielding	Enclosure rating	Connecting cable	Model name	Part no.
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	Unshielded	IP 65, IP 68, IP 69K	2 m, 4-wire	DOL-1204-G02MC	6025900
					5 m, 4-wire	DOL-1204-G05MC	6025901
					10 m, 4-wire	DOL-1204-G10MC	6025902
					15 m, 4-wire	DOL-1204-G15MC	6034749
					20 m, 4-wire	DOL-1204-G20MC	6034750
					25 m, 4-wire	DOL-1204-G25MC	6034751
			Shielded	IP 67	5 m, 4-wire	DOL-1204-G05MAC	6038621

Figure	Connection type head A	Connection type head B	Shielding	Enclosure rating	Connecting cable	Model name	Part no.
	Female connector, M12, 4-pin, angled, with 3 LEDs	Cable, open conductor heads	Unshielded	IP 65, IP 68, IP 69K	5 m, 4-wire	DOL-1204-L05MC	6020398
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	Unshielded	IP 65, IP 68, IP 69K	2 m, 4-wire	DOL-1204-W02MC	6025903
					5 m, 4-wire	DOL-1204-W05MC	6025904
					10 m, 4-wire	DOL-1204-W10MC	6025905
					15 m, 4-wire	DOL-1204-W15MC	6034752
					20 m, 4-wire	DOL-1204-W20MC	6034753
					25 m, 4-wire	DOL-1204-W25MC	6034754

Connecting cable (female connector-open) M12, 4-pin, PVC

- Cable material: PVC
- Connector material: TPU
- Enclosure rating: IP 67

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	DOL-1204-G02M	6009382
			5 m, 4-wire	DOL-1204-G05M	6009866
			10 m, 4-wire	DOL-1204-G10M	6010543
			15 m, 4-wire	DOL-1204-G15M	6010753
			20 m, 4-wire	DOL-1204-G20M	6034401
	Female connector, M12, 4-pin, angled, with 3 LEDs	Cable, open conductor heads	2 m, 4-wire	DOL-1204-L02M	6027945
			5 m, 4-wire	DOL-1204-L05M	6027944
			10 m, 4-wire	DOL-1204-L10M	6027946
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	DOL-1204-W02M	6009383
			5 m, 4-wire	DOL-1204-W05M	6009867
			10 m, 4-wire	DOL-1204-W10M	6010541
			15 m, 4-wire	DOL-1204-W15M	6036474
			20 m, 4-wire	DOL-1204-W20M	6033559

Connecting cable (female connector-open) M12, 4-pin, PVC, hygienic systems

- Cable material: PVC
- Connector material: PVC
- Enclosure rating: IP 67, IP 69K

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	DOL-1204-G02MN	6028128
			5 m, 4-wire	DOL-1204-G05MN	6028130
			10 m, 4-wire	DOL-1204-G10MN	6028132
			25 m, 4-wire	DOL-1204-G25MN	6028134
	Female connector, M12, 4-pin, angled, with 3 LEDs	Cable, open conductor heads	2 m, 4-wire	DOL-1204-L02MN	6028136
			5 m, 4-wire	DOL-1204-L05MN	6028137
			10 m, 4-wire	DOL-1204-L10MN	6028138
			25 m, 4-wire	DOL-1204-L25MN	6028139
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	DOL-1204-W02MN	6028129
			5 m, 4-wire	DOL-1204-W05MN	6028131
			10 m, 4-wire	DOL-1204-W10MN	6028133
			25 m, 4-wire	DOL-1204-W25MN	6028135

Connecting cable (female connector-open) M12, 5-pin, PUR, halogen-free

- Cable material: PUR, halogen-free
- Connector material: TPU
- Enclosure rating: IP 65, IP 68, IP 69K

Figure	Connection type head A	Connection type head B	Shielding	Connecting cable	Model name	Part no.
	Female connector, M12, 5-pin, straight	Cable, open conductor heads	Unshielded	2 m, 5-wire	DOL-1205-G02MC	6025906
				5 m, 5-wire	DOL-1205-G05MC	6025907
				10 m, 5-wire	DOL-1205-G10MC	6025908
	Female connector, M12, 5-pin, straight	Cable, open conductor heads	Shielded	5 m, 5-wire	DOL-1205-G05MAC	6036384
				10 m, 5-wire	DOL-1205-G10MAC	6036385
				20 m, 5-wire	DOL-1205-G20MAC	6036386
	Female connector, M12, 5-pin, angled	Cable, open conductor heads	Unshielded	2 m, 5-wire	DOL-1205-W02MC	6025909
				5 m, 5-wire	DOL-1205-W05MC	6025910
				10 m, 5-wire	DOL-1205-W10MC	6025911

Connecting cable (female connector-open) M12, 5-pin, PVC

- Cable material: PVC
- Connector material: TPU
- Enclosure rating: IP 67

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
	Female connector, M12, 5-pin, straight	Cable, open conductor heads	2 m, 5-wire	DOL-1205-G02M	6008899
			5 m, 5-wire	DOL-1205-G05M	6009868
			10 m, 5-wire	DOL-1205-G10M	6010544
			15 m, 5-wire	DOL-1205-G15M	6029215
	Female connector, M12, 5-pin, angled	Cable, open conductor heads	2 m, 5-wire	DOL-1205-W02M	6008900
			5 m, 5-wire	DOL-1205-W05M	6009869
			10 m, 5-wire	DOL-1205-W10M	6010542

Connecting cable (female connector-open) M12, 5-pin, PVC, hygienic systems

- Cable material: PVC
- Connector material: PVC
- Enclosure rating: IP 67, IP 69K

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
	Female connector, M12, 5-pin, straight	Cable, open conductor heads	2 m, 5-wire	DOL-1205-G02MN	6028140
			5 m, 5-wire	DOL-1205-G05MN	6028141
			10 m, 5-wire	DOL-1205-G10MN	6028142
			25 m, 5-wire	DOL-1205-G25MN	6028143

Connecting cable (male connector-open) M12, 4-pin, PUR, halogen-free

- Cable material: PUR, halogen-free
- Connector material: TPU
- Enclosure rating: IP 65, IP 68, IP 69K

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
	Male connector, M12, 4-pin, straight	Cable, open conductor heads	0.29 m, 4-wire	STL-1204-G0M3C	6011311
			2 m, 4-wire	STL-1204-G02MC	6028077
			5 m, 4-wire	STL-1204-G05MC	6048170
			10 m, 4-wire	STL-1204-G10MC	6041750
			15 m, 4-wire	STL-1204-G15MC	6048171
	Male connector, M12, 4-pin, angled	Cable, open conductor heads	5 m, 4-wire	STL-1204-W05MC	6037472
			15 m, 4-wire	STL-1204-W15MC	6037473

Connecting cable (male connector-open) M12, 5-pin

- Cable material: PUR, halogen-free
- Connector material: TPU
- Enclosure rating: IP 65, IP 68, IP 69K

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
 Illustration may differ	Male connector, M12, 5-pin, straight	Cable, open conductor heads	1 m, 5-wire	STL-1205-G01MC	6037741
			2 m, 5-wire	STL-1205-G02MC	6051951
			5 m, 5-wire	STL-1205-G05MC	6051952
			10 m, 5-wire	STL-1205-G10MC	6051953

Female connector (ready to assemble) M8, 3-pin

- Connector material: PBT
- Enclosure rating: IP 67

Figure	Connection type head A	Connection type head B	Model name	Part no.
	Female connector, M8, 3-pin, straight	Screw-type terminals	DOS-0803-G	7902077
	Female connector, M8, 3-pin, angled	Pin penetration	DOS-0803-W	7902078

Female connector (ready to assemble) M8, 4-pin

- Connector material: PBT
- Enclosure rating: IP 67

Figure	Connection type head A	Connection type head B	Model name	Part no.
	Female connector, M8, 4-pin, straight	Screw-type terminals	DOS-0804-G	6009974
	Female connector, M8, 4-pin, angled	Pin penetration	DOS-0804-W	6009975

Female connector (ready to assemble) M12, 4-pin

- Connector material: PBT
- Enclosure rating: IP 67

Figure	Connection type head A	Connection type head B	Locking nut material	Model name	Part no.
	Female connector, M12, 4-pin, straight	Screw-type terminals	CuZn	DOS-1204-G	6007302
			Stainless steel	DOS-1204-GN	6028357
	Female connector, M12, 4-pin, angled	Screw-type terminals	CuZn	DOS-1204-W	6007303
			Stainless steel	DOS1204-WN	6028358

Female connector (ready to assemble) M12, 5-pin

- Connector material: PBT
- Enclosure rating: IP 67

Figure	Connection type head A	Connection type head B	Model name	Part no.
	Female connector, M12, 5-pin, straight	Screw-type terminals	DOS-1205-G	6009719
	Female connector, M12, 5-pin, angled	Screw-type terminals	DOS-1205-W	6009720

Male connector (ready to assemble) M8, 3-pin

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Male connector, M8, 3-pin, straight	Screw-type terminals	PBT	IP 67	STE-0803-G	6037322

Male connector (ready to assemble) M8, 4-pin

Figure	Connection type head A	Connection type head B	Connector material	Enclosure rating	Model name	Part no.
	Male connector, M8, 4-pin, straight	Screw-type terminals	PBT	IP 67	STE-0804-G	6037323

Male connector (ready to assemble) M12, 4-pin

- Connector material: PBT
- Enclosure rating: IP 67

Figure	Connection type head A	Connection type head B	Locking nut material	Model name	Part no.
	Male connector, M12, 4-pin, straight	Screw-type terminals	CuZn	STE-1204-G	6009932
			Stainless steel	STE-1204-GN	6028359
	Male connector, M12, 4-pin, angled	Screw-type terminals	CuZn	STE-1204-W	6022084

Male connector (ready to assemble) M12, 5-pin

- Connector material: PBT
- Enclosure rating: IP 67

Figure	Connection type head A	Connection type head B	Model name	Part no.
	Male connector, M12, 5-pin, straight	Screw-type terminals	STE-1205-G	6022083
	Male connector, M12, 5-pin, angled	Screw-type terminals	STE-1205-W	6022082

Connection cable (male connector-female connector) M8, 3-pin, PUR, halogen-free

- Cable material: PUR, halogen-free
- Connector material: TPU
- Enclosure rating: IP 65, IP 68, IP 69K

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
	Female connector, M8, 3-pin, angled	Male connector, M12, 3-pin, straight	0.6 m, 3-wire	DSL-8203-B0M6C	6025916
			2 m, 3-wire	DSL-8203-B02MC	6025917
			5 m, 3-wire	DSL-8203-B05MC	6039185
	Female connector, M8, 3-pin, straight	Male connector, M12, 3-pin, straight	0.6 m, 3-wire	DSL-8203-G0M6C	6025914
			2 m, 3-wire	DSL-8203-G02MC	6025915
			5 m, 3-wire	DSL-8203-G05MC	6030608

Connection cable (male connector-female connector) M8, 3-pin, PVC

- Cable material: PVC
- Enclosure rating: IP 67

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
 Illustration may differ	Female connector, M8, 3-pin, straight	Male connector, M12, 3-pin, straight	0.6 m	DSL-8203-G0M6	6022570
			2 m	DSL-8203-G02M	6022572

Connection cable (male connector-female connector) M8, 4-pin, PUR, halogen-free

- Cable material: PUR, halogen-free
- Connector material: TPU
- Enclosure rating: IP 65, IP 68, IP 69K

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
 Illustration may differ	Female connector, M8, 4-pin, straight	Male connector, M8, 4-pin, straight	0.6 m, 4-wire	DSL-0804-G0M6C	6039089
			2 m, 4-wire	DSL-0804-G02MC	6036335
			5 m, 4-wire	DSL-0804-G05MC	6039090
	Female connector, M8, 4-pin, straight	Male connector, M12, 4-pin, straight	0.6 m, 4-wire	DSL-8204-G0M6C	6025918
			2 m, 4-wire	DSL-8204-G02MC	6025919
			5 m, 4-wire	DSL-8204-G05MC	6039181
	Female connector, M8, 4-pin, angled	Male connector, M12, 4-pin, straight	0.6 m, 4-wire	DSL-8204-B0M6C	6025920
			2 m, 4-wire	DSL-8204-B02MC	6025921
			5 m, 4-wire	DSL-8204-B05MC	6039182

Connection cable (male connector-female connector) M8, 4-pin, PVC

- Cable material: PVC
- Enclosure rating: IP 67

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
 Illustration may differ	Female connector, M8, 4-pin, straight	Male connector, M8, 4-pin, straight	0.6 m, 4-wire	DSL-0804-G0M6	6034664
			1.5 m, 4-wire	DSL-0804-G1M5	6042050
			2.5 m, 4-wire	DSL-0804-G2M5	6051282
			3 m, 4-wire	DSL-0804-G03M	6051283
	Male connector, M8, 4-pin, straight	Male connector, M12, 4-pin, straight	0.6 m, 4-wire	DSL-8204-G0M6	6022571
			2 m, 4-wire	DSL-8204-G02M	6022573
			5 m, 4-wire	DSL-8204-G05M	6034403
			10 m, 4-wire	DSL-8204-G10M	6034404
			20 m, 4-wire	DSL-8204-G20M	6034405

Connection cable (male connector-female connector), M12, 3-pin, PUR, halogen-free

- Cable material: PUR, halogen-free
- Enclosure rating: IP 67

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
 Illustration may differ	Female connector, M12, 3-pin, straight	Male connector, M8, 3-pin, straight	0.6 m	DSL-2803-G0M6C	6039183
			2 m	DSL-2803-G02MC	6039184
			5 m	DSL-2803-G05MC	6028664

Connection cable (male connector-female connector) M12, 4-pin, PUR, halogen-free

- Cable material: PUR, halogen-free
- Connector material: TPU
- Enclosure rating: IP 67, IP 68, IP 69K

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
	Female connector, M12, 4-pin, angled	Male connector, M12, 3-pin, straight	0.6 m, 4-wire	DSL-1203-B0M6C	6025924
			2 m, 4-wire	DSL-1203-B02MC	6025925
	Female connector, M12, 4-pin, straight	Male connector, M8, 3-pin, straight	0.6 m, 4-wire	DSL-2804-G0M6C	6037595
			2 m, 4-wire	DSL-2804-G02MC	6039180
			5 m, 4-wire	DSL-2804-G05MC	6039091
		Male connector, M12, 3-pin, straight	0.6 m, 4-wire	DSL-1203-G0M6C	6025922
			2 m, 4-wire	DSL-1203-G02MC	6025923
		Male connector, M12, 4-pin, straight	0.6 m, 4-wire	DSL-1204-G0M6C	6025926
			1 m, 4-wire	DSL-1204-G01MC	6033244
			2 m, 4-wire	DSL-1204-G02MC	6025927
			5 m, 4-wire	DSL-1204-G05MC	6033245
			10 m, 4-wire	DSL-1204-G10MC	6033698

Connection cable (male connector-female connector) M12, 4-pin, PVC

- Cable material: PVC
- Connector material: TPU
- Enclosure rating: IP 67, IP 69K

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
	Female connector, M12, 4-pin, straight	Male connector, M12, 4-pin, straight	5 m, 4-wire	DSL-1204-G05M	6022569

Connection cable (male connector-female connector) M12, 4-pin, PVC, hygienic systems

- Cable material: PVC
- Connector material: PVC
- Enclosure rating: IP 67, IP 69K

Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
	Female connector, M12, 4-pin, angled	Male connector, M12, 4-pin, straight	0.6 m, 4-wire	DSL-1204-B0M6N	6028197
			2 m, 4-wire	DSL-1204-B02MN	6028198
			5 m, 4-wire	DSL-1204-B05MN	6028199
	Female connector, M12, 4-pin, straight	Male connector, M12, 4-pin, straight	0.6 m, 4-wire	DSL-1204-G0M6N	6028194
			2 m, 4-wire	DSL-1204-G02MN	6028195
			5 m, 4-wire	DSL-1204-G05MN	6028196

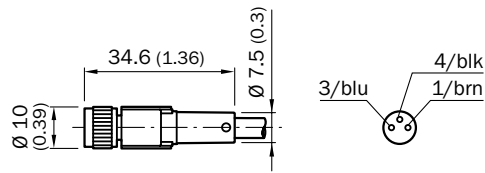
Connection cable (male connector-female connector) M12, 5-pin, PUR, halogen-free

- **Cable material:** PUR, halogen-free
- **Connector material:** TPU
- **Enclosure rating:** IP 67, IP 68, IP 69K

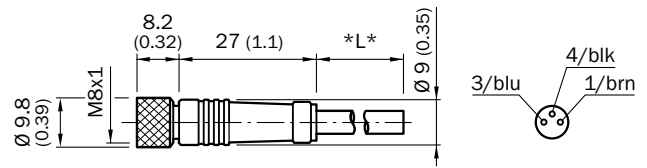
Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
 Illustration may differ	Male connector, M12, 5-pin, straight	Female connector, M12, 5-pin, angled	0.6 m, 5-wire	DSL-1205-B0M6C	6029283
			1 m, 5-wire	DSL-1205-B01MC	6029284
			1.5 m, 5-wire	DSL-1205-B1M5C	6029286
			2 m, 5-wire	DSL-1205-B02MC	6029287
			5 m, 5-wire	DSL-1205-B05MC	6029288
		Female connector, M12, 5-pin, straight	0.6 m, 5-wire	DSL-1205-G0M6C	6025930
			1 m, 5-wire	DSL-1205-G01MC	6029280
			2 m, 5-wire	DSL-1205-G02MC	6025931
			5 m, 5-wire	DSL-1205-G05MC	6029282
			10 m, 5-wire	DSL-1205-G10MC	6038954
			15 m, 5-wire	DSL-1205-G15MC	6038956
			20 m, 5-wire	DSL-1205-G20MC	6038957

Dimensional drawings Plug connectors and cables

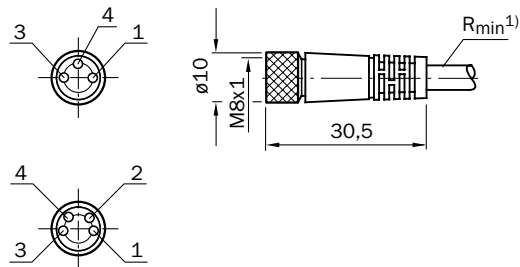
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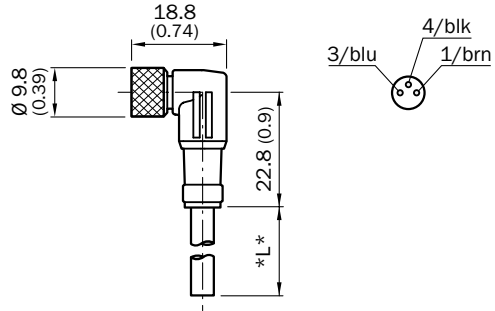
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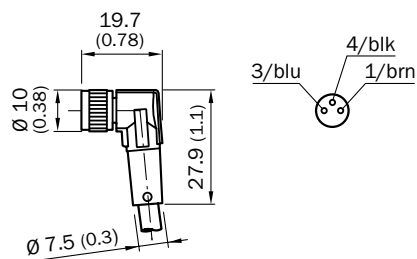
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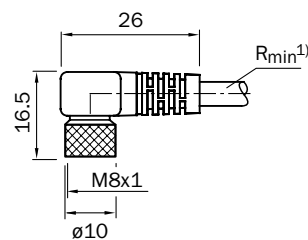
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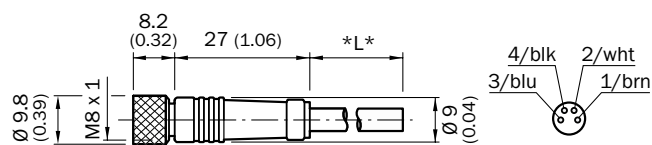
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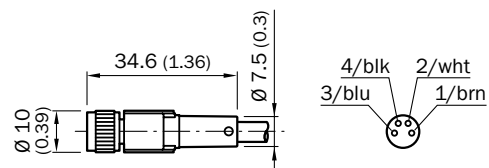
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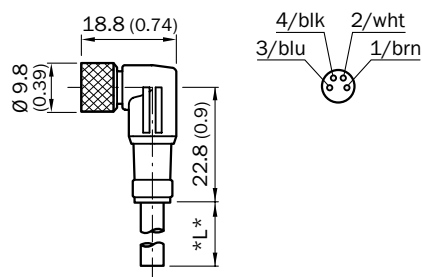
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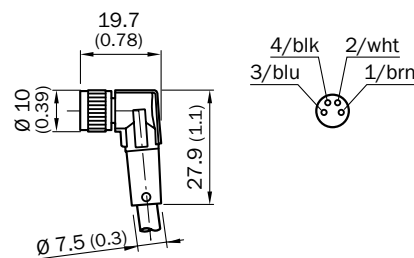
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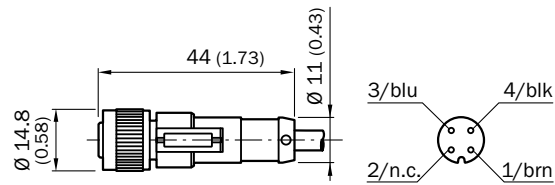
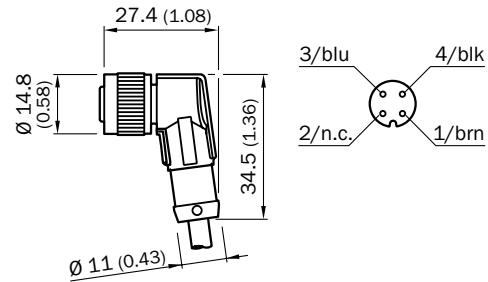
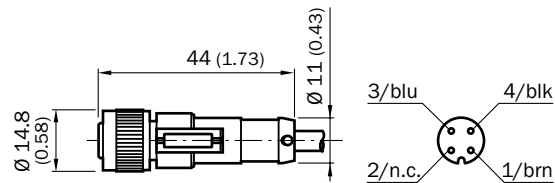
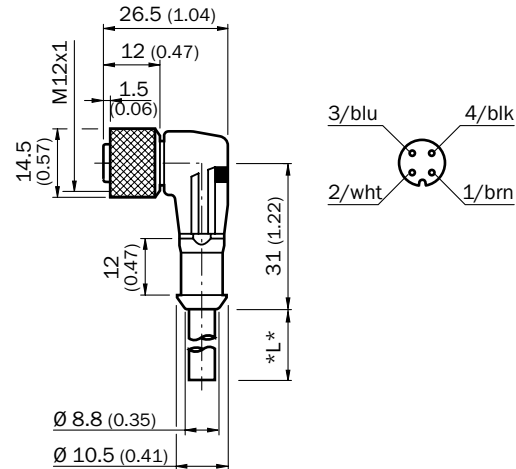
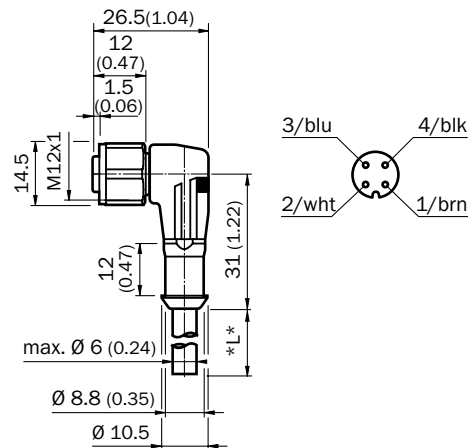
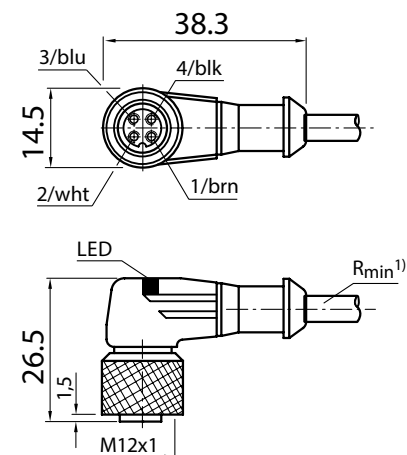


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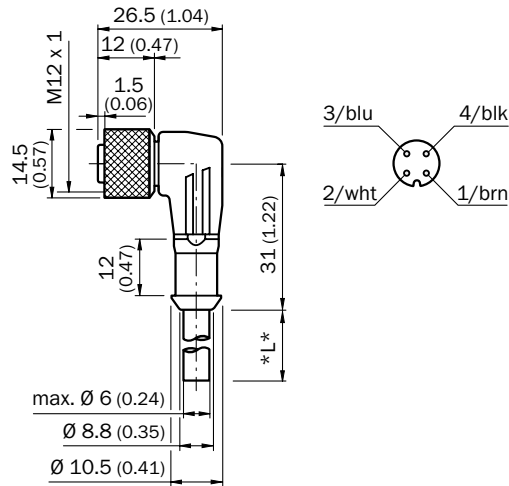


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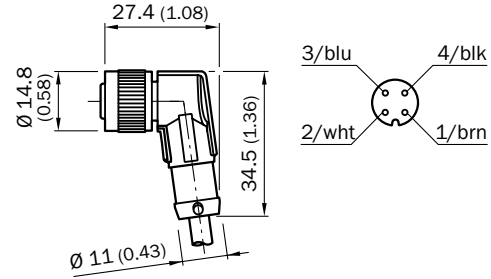


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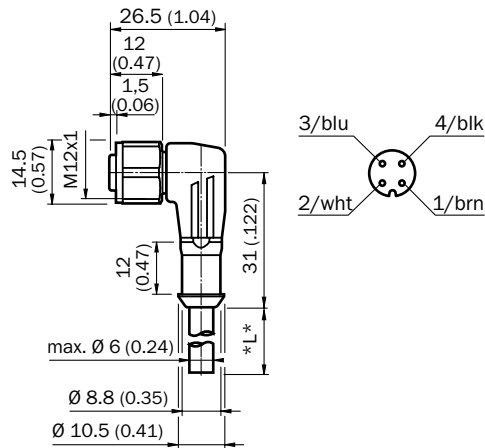
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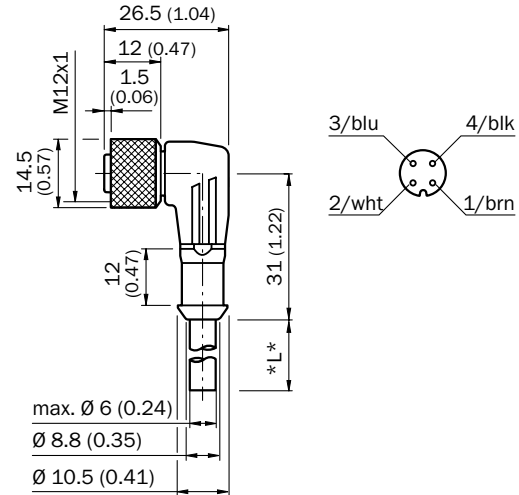
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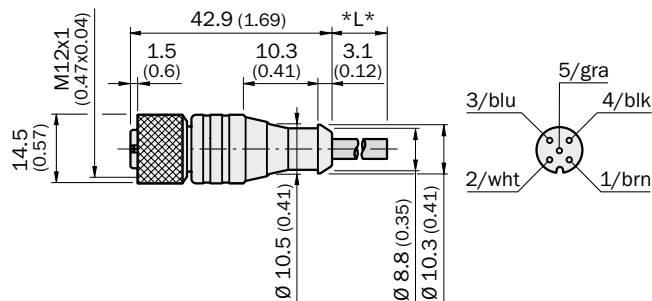
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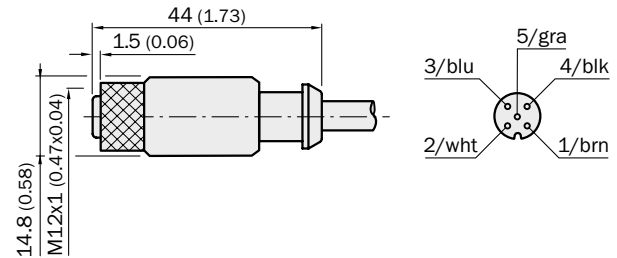
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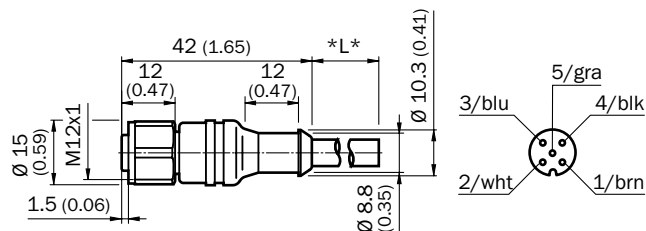
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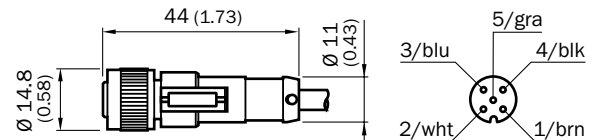
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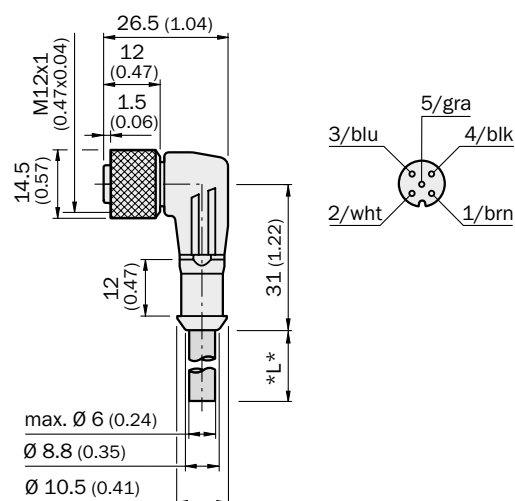
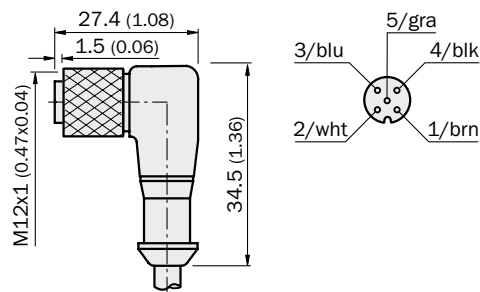
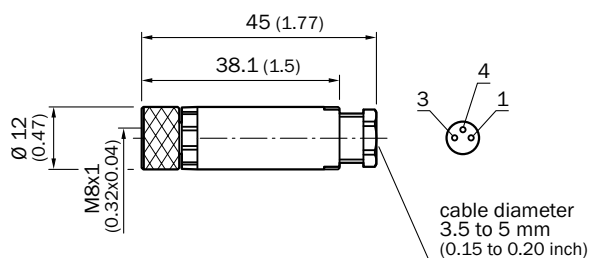
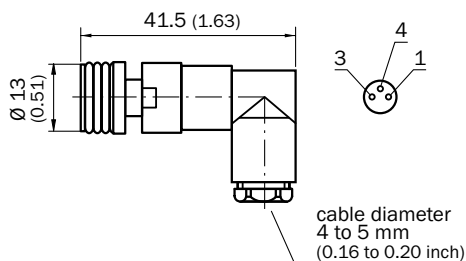
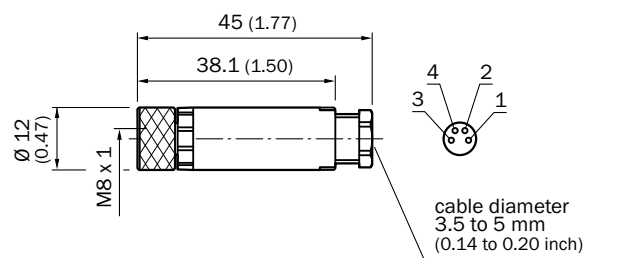
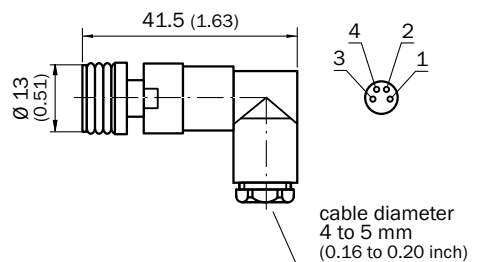
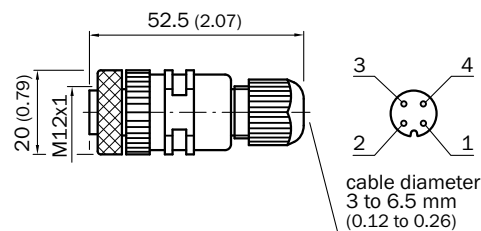
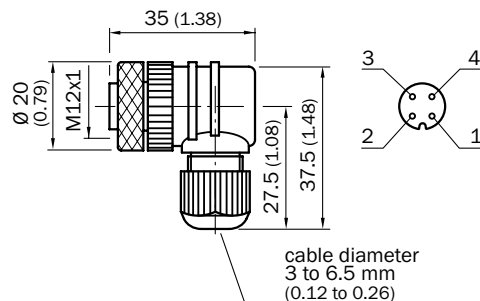


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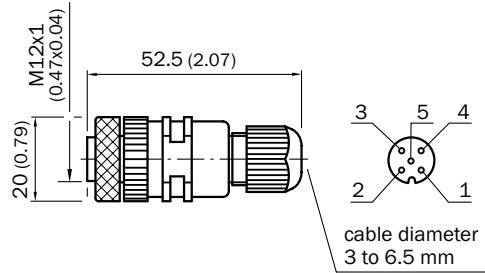


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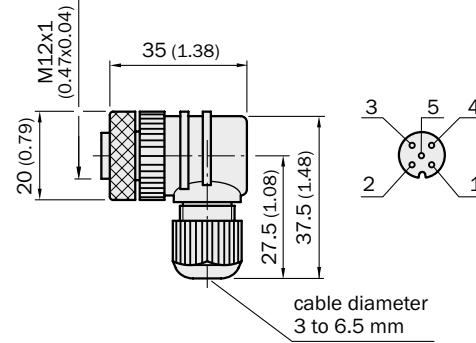


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DOS-1205-G



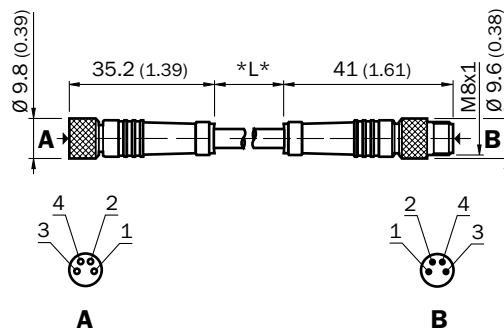
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DSL-0804-G0M6

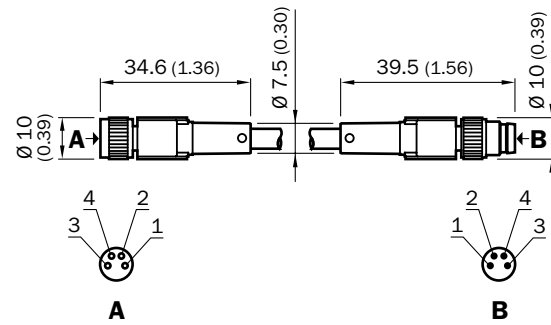
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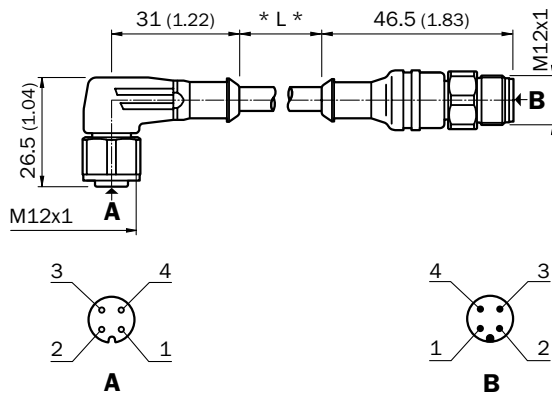
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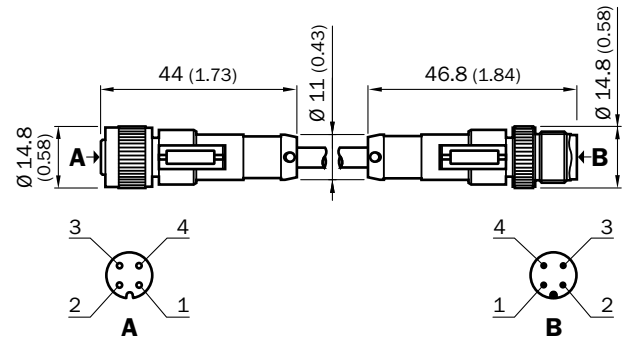
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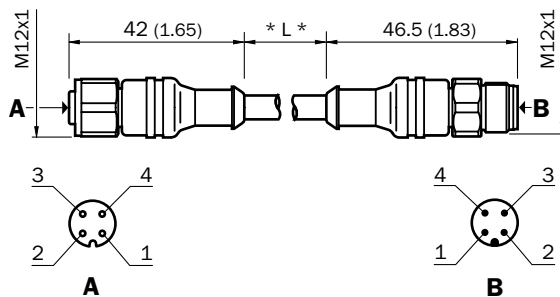
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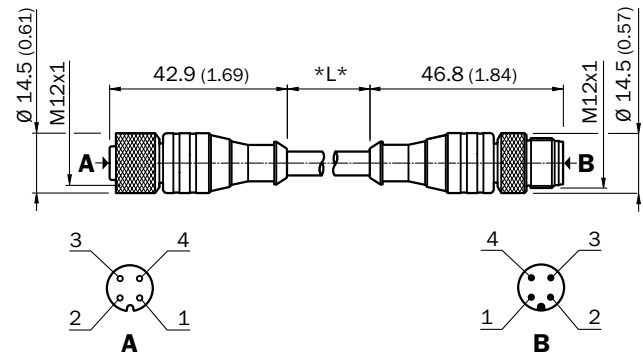
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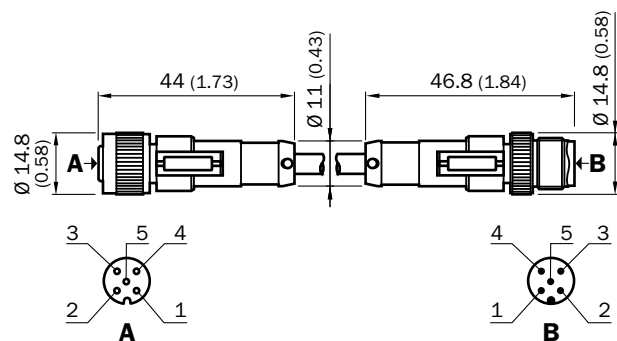
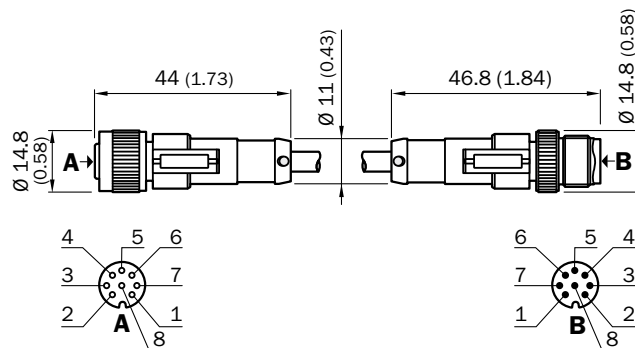
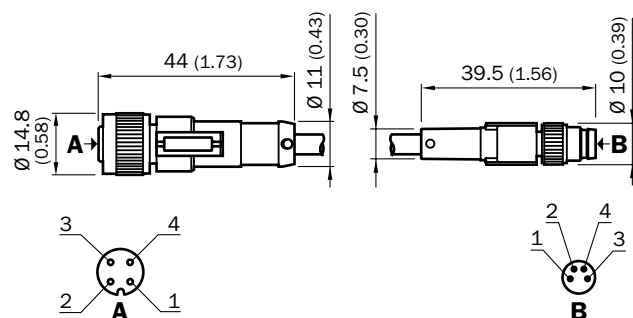
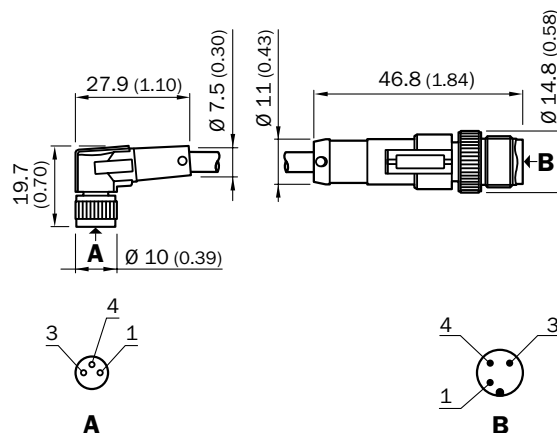
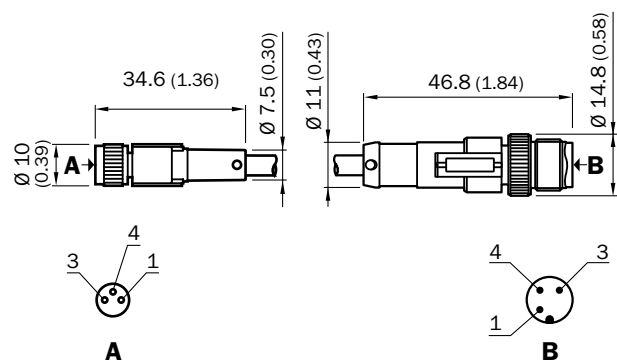
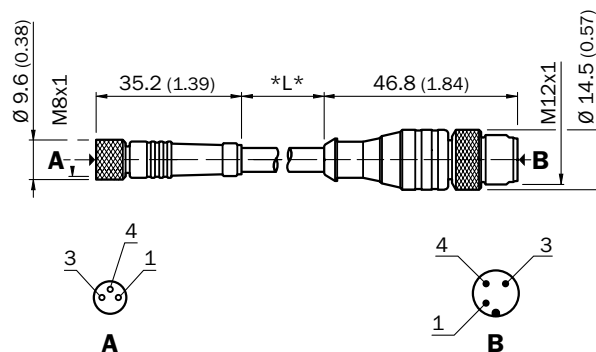
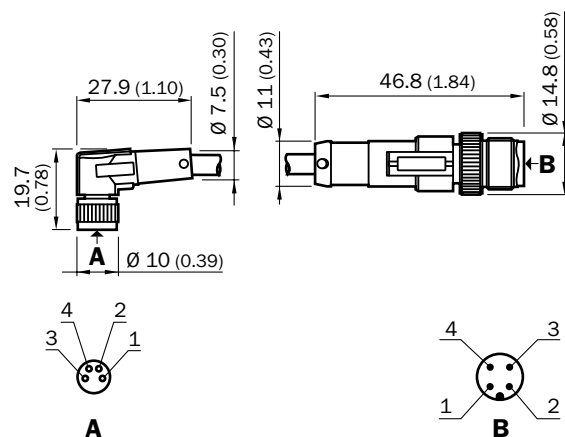
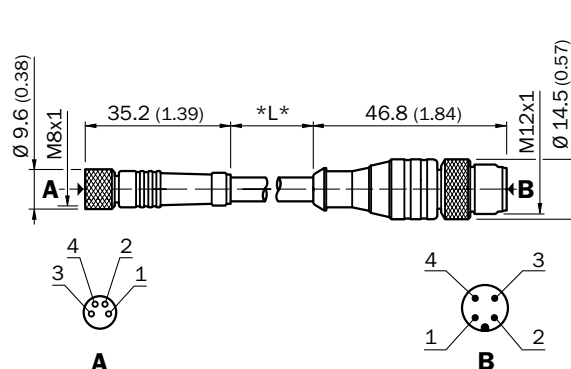


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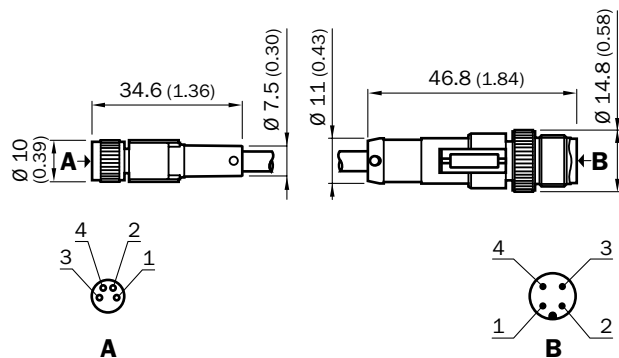


DSL-1204-GxxM

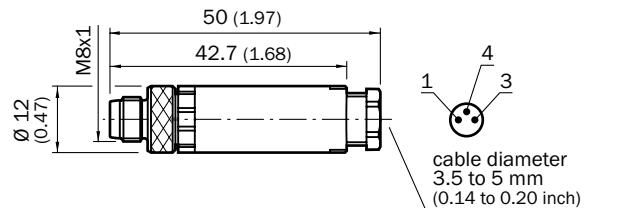


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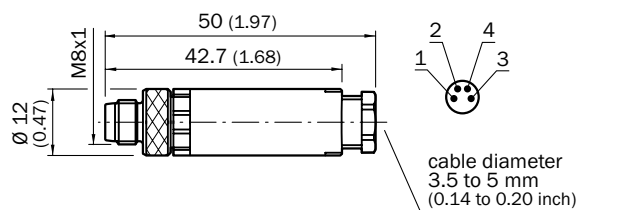
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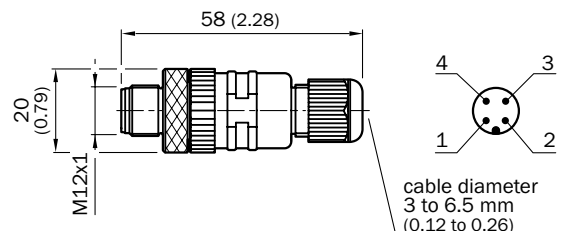
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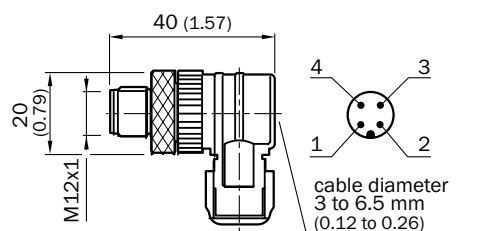
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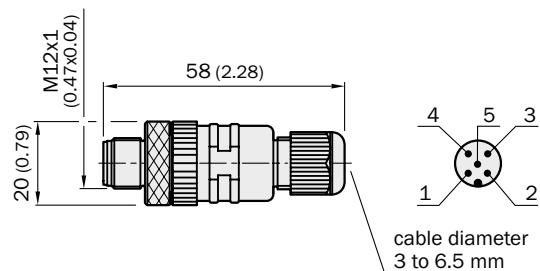
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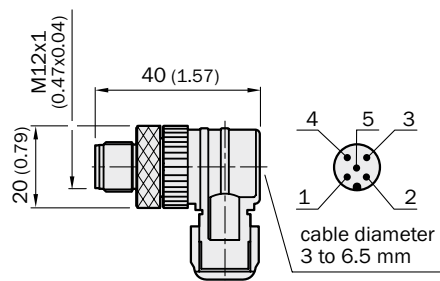
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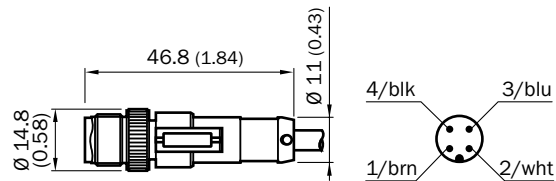
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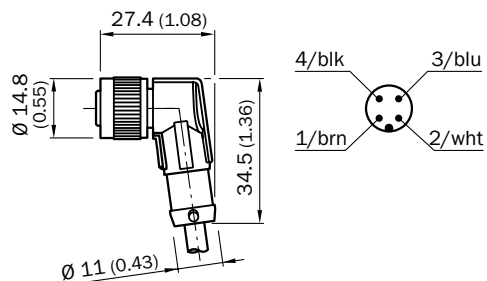
STE-1205-W



STL-1204-GxxMC



STL-1204-WxxMC



Other accessories

Power supplies

Figure	Output type	Description	Model name	Part no.
	NPN	Cable with receptacle, M12, 4-pin, 0.2 m, IP 65	ACIM1-N2221	1057381
		Cable with receptacle, M8, 4-pin, 0.2 m, IP 65	ACIM1-N3221	1057380
	PNP	Cable with receptacle, M12, 4-pin, 0.2 m, IP 65	ACIM1-P2221	1057184
		Cable with receptacle, M8, 4-pin, 0.2 m, IP 65	ACIM1-P3221	1057183

Switching amplifiers

Figure	Supply voltage	Output function	Approvals	Model name	Part no.
	AC/DC 24 V ... 230 V, 1.3 W	2 channels with invertible SPDT relay	II (1) G [Ex ia] IIC II (1) D [Ex iaD] II (3) G Ex nAC [ia] IIC T4 X	EN2-2EX-1	6041096
	DC 19.2 V ... 30 V, 1 W	2 channels with invertible NO relay	II (1) GD [Ex ia] IIC, IIB II (3) G Ex nAC II T4 X	EN2-2EX-3	6041095

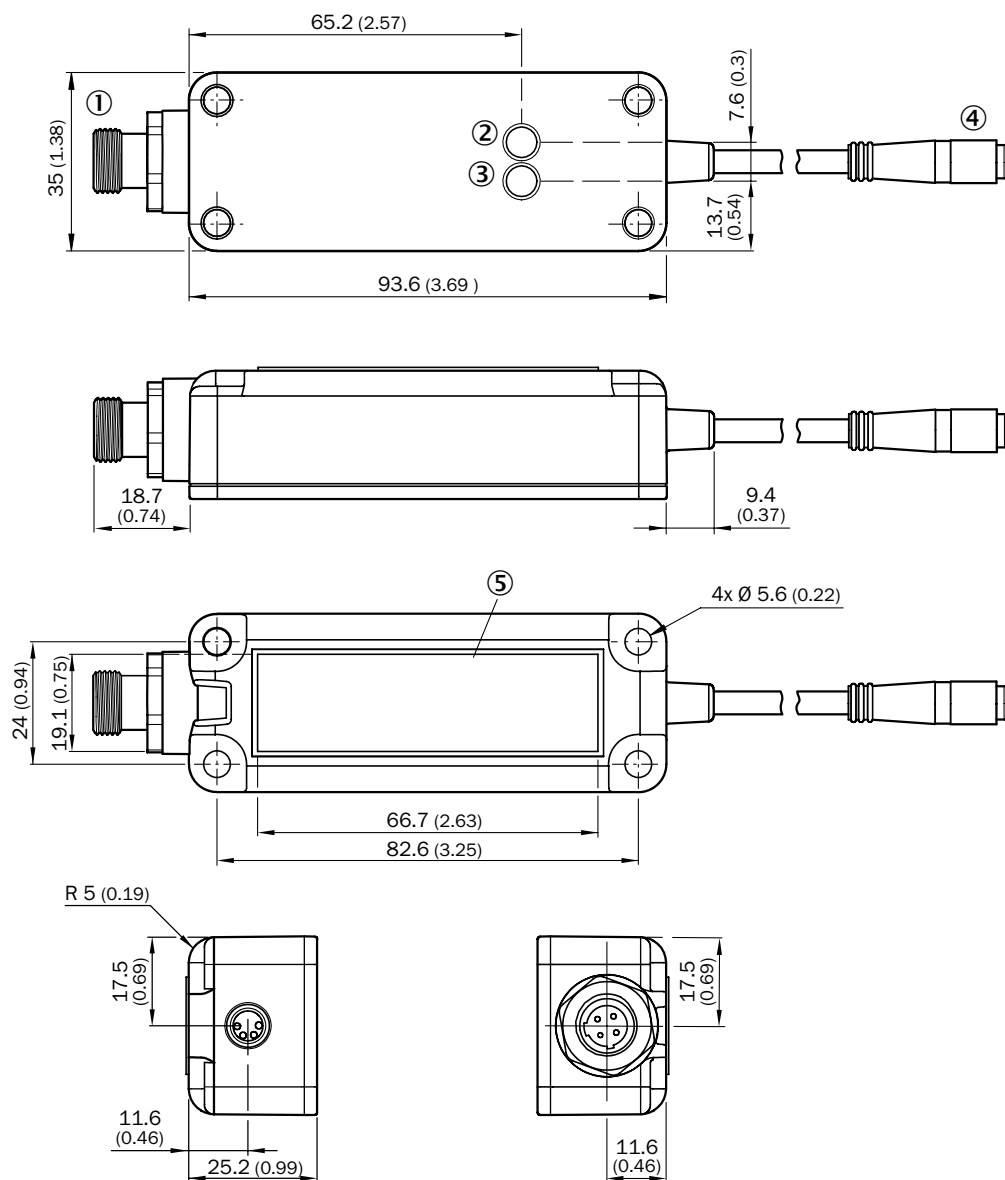
IO-Link modules

Figure	Description	Model name	Part no.
	IO-Link V1.1 Class A Port, USB2.0 port, optional external power supply 24V / 1A	SiLink2 Master	1061790
	IO-Link master, IO-Link field module, DC 18 V ... 30 V, IP 65, IP 67	IOLSHPB-P3104	6032904

Dimensional drawings other accessories

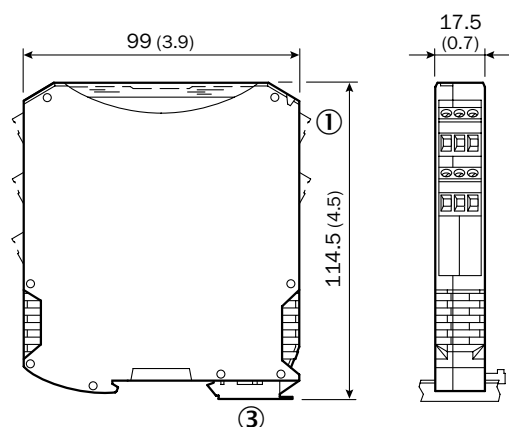
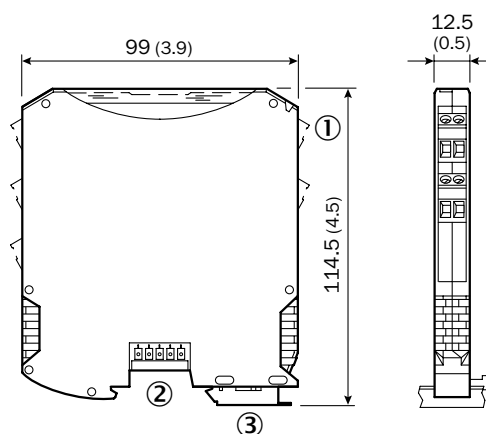
Power supplies

ACIM1

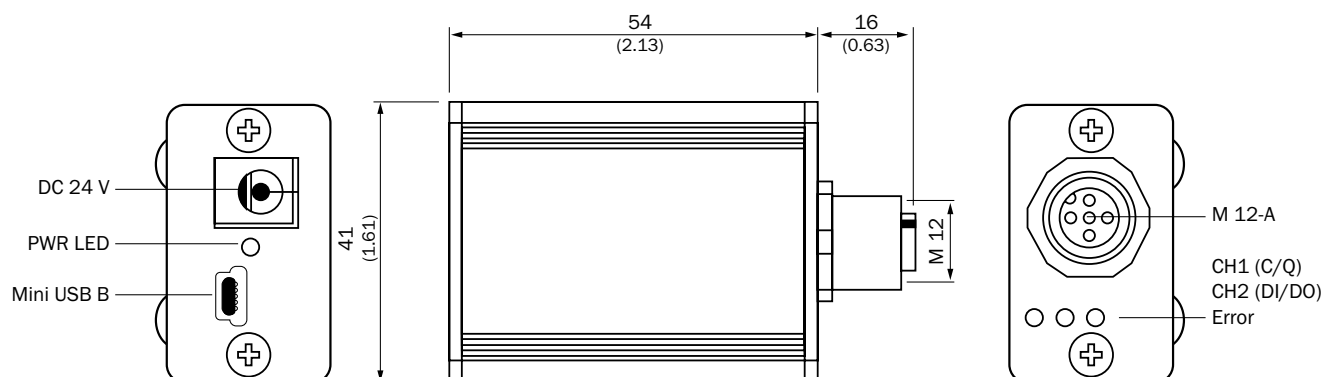
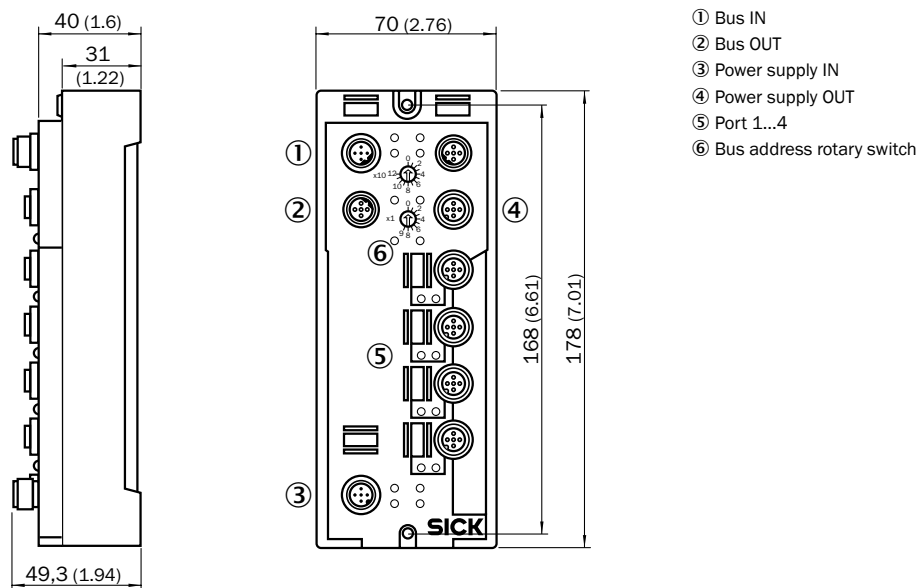


- ① AC input power, switch output
- ② Status indicator LED green: DC output power present
- ③ Orange LED indicator : DC switch input present
- ④ DC output power, switch input
- ⑤ Magnet

Switching amplifiers

EN2-2EX-1**EN2-2EX-3**

IO-Link modules

SiLink2 Master**IOLSHPB-P3104**

- ① Bus IN
- ② Bus OUT
- ③ Power supply IN
- ④ Power supply OUT
- ⑤ Port 1...4
- ⑥ Bus address rotary switch

Model name	Part no.	Page
ACIM1-N2221	1057381	L-921
ACIM1-N3221	1057380	L-921
ACIM1-P2221	1057184	L-921
ACIM1-P3221	1057183	L-921
BEF-DKH-W12	2013947	L-867
BEF-G10DC01	2071258	L-864
BEF-G10UC01	2071259	L-864
BEF-G10WSG	2071960	L-866
BEF-GH-MINI01	2023160	L-867
BEF-GPM3-W9	4066039	L-865
BEF-HA-M18R	5313513	L-867
BEF-HDSBR	4074403	L-868
BEF-HDSF	4072880	L-868
BEF-HDSTRGF	2067779	L-868
BEF-HDSTRG	2067780	L-868
BEF-HDSTRK1WF	2071931	L-868
BEF-HDSTRL1GF	2072047	L-868
BEF-HDSTRWF	2067777	L-868
BEF-HDSTRW	2067778	L-868
BEF-KH-M18	2051481	L-867
BEF-KH-W12	2013285	L-867
BEF-KHF-M18	2051482	L-867
BEF-KHS-KH3N	5322627	L-868
BEF-KHS-KH3	5322626	L-868
BEF-KHS-N02N	2051618	L-868
BEF-KHS-N02	2051608	L-868
BEF-KHS-N03	2051609	L-868
BEF-KHS-N04N	2051619	L-868
BEF-KHS-N04	2051610	L-868
BEF-KHS-N05N	2051620	L-868
BEF-KHS-N05N	2051621	L-868
BEF-KHS-N05	2051611	L-868
BEF-KHS-N06N	2051622	L-868
BEF-KHS-N06	2051612	L-868
BEF-KHS-N07N	2051623	L-868
BEF-KHS-N07	2051613	L-868
BEF-KHS-N08N	2051616	L-869
BEF-KHS-N08	2051607	L-869
BEF-KHSQ12R01	2071260	L-869
BEF-KHSQ12ZR01	2071262	L-869
BEF-KP-W24	2015071	L-866
BEF-MR18G-NA	4065853	L-867
BEF-MS12G-A	4056054	L-869
BEF-MS12G-B	4056055	L-869
BEF-MS12G-NA	4058914	L-869
BEF-MS12G-NB	4058915	L-869
BEF-MS12L-A	4056052	L-869
BEF-MS12L-B	4056053	L-869
BEF-MS12L-NA	4058912	L-869
BEF-MS12L-NB	4058913	L-869
BEF-MS12U	4065437	L-869
BEF-MS12Z-A	4056056	L-869
BEF-MS12Z-B	4056057	L-869
BEF-MS12Z-C	4064563	L-869
BEF-MS12Z-NA	4058916	L-869
BEF-MS12Z-NB	4058917	L-869
BEF-PL80AWSG	2071961	L-866
BEF-RMC-D12	5321878	L-869

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BEF-SG-W12-3	2045175	L-866
BEF-SG-W14	2058124	L-866
BEF-SG-W27	2039601	L-866
BEF-SW-W4S	2051497	L-866
BEF-TO-GR18S	4072132	L-867
BEF-W100-A	5311520	L-864
BEF-W100-B	5311521	L-864
BEF-W160	5305197	L-864
BEF-W250	5305850	L-864
BEF-W280	5313885	L-864
BEF-W2S-A	4034748	L-864
BEF-W2S-B	4034749	L-864
BEF-W2S-C	2033270	L-866
BEF-W4-A	2051628	L-864
BEF-W4-B	2051630	L-864
BEF-WG-M18N	5320948	L-865
BEF-WG-M18	5321870	L-864
BEF-WG-W12	2013942	L-864
BEF-WG-W24	4026324	L-864
BEF-WK-W12	2012938	L-864
BEF-WK-W24	4027532	L-864
BEF-WK-WTR	2051786	L-865
BEF-WLL170	5306574	L-865
BEF-WLL180	5325812	L-865
BEF-WN-G6	2062909	L-865
BEF-WN-M18-ST02	5312973	L-867
BEF-WN-M18N	5320947	L-865
BEF-WN-M18	5308446	L-865
BEF-WN-MH15-1	4039533	L-867
BEF-WN-MH15-2V	4053358	L-867
BEF-WN-OBW	2023251	L-865
BEF-WN-REFX	2064574	L-865
BEF-WN-W100-S01	4073866	L-865
BEF-WN-W14	2019084	L-865
BEF-WN-W18	2009317	L-865
BEF-WN-W23	2019085	L-865
BEF-WN-W24	2015248	L-865
BEF-WN-W27	2009122	L-865
BEF-WN-W9-2	2022855	L-865
BEF-WN-WTR	2017417	L-865
BF-EB01-W190	5313011	L-867
BL-100-10	5314182	L-866
BL-12-SKN	4031815	L-866
BL-9-2	4033253	L-866
C110A	5304549	L-892
C42-1	5313506	L-892
C42-2	5324281	L-892
C64A	5325185	L-892
DOL-0803-G01MC	6036455	L-903
DOL-0803-G02MC	6025888	L-903
DOL-0803-G02MN	6033664	L-903
DOL-0803-G02M	6010785	L-904
DOL-0803-G05MC	6025889	L-903
DOL-0803-G05MN	6033665	L-903
DOL-0803-G05M	6022009	L-904
DOL-0803-G10MC	6025890	L-903
DOL-0803-G10MN	6033666	L-903
DOL-0803-G10M	6022011	L-904

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DOL-0803-G15M	6036472	L-904
DOL-0803-G20MC	6036456	L-903
DOL-0803-G25MN	6044452	L-903
DOL-0803-W02MC	6025891	L-903
DOL-0803-W02MN	6033667	L-903
DOL-0803-W02M	6008489	L-904
DOL-0803-W03MC	6038991	L-903
DOL-0803-W05MC	6025892	L-903
DOL-0803-W05MN	6033668	L-903
DOL-0803-W05M	6022010	L-904
DOL-0803-W10MC	6025893	L-903
DOL-0803-W10MN	6033669	L-903
DOL-0803-W10M	6022012	L-904
DOL-0803-W15M	6036473	L-904
DOL-0804-G02MC	6025894	L-904
DOL-0804-G02MN	6033670	L-904
DOL-0804-G02M	6009870	L-905
DOL-0804-G05MAC	6050809	L-904
DOL-0804-G05MC	6025895	L-904
DOL-0804-G05MN	6033671	L-904
DOL-0804-G05M	6009872	L-905
DOL-0804-G10MAC	6050808	L-904
DOL-0804-G10MC	6025896	L-904
DOL-0804-G10MN	6033672	L-904
DOL-0804-G10M	6010754	L-905
DOL-0804-G15MC	6038622	L-904
DOL-0804-G15M	6035232	L-905
DOL-0804-G20MC	6051148	L-904
DOL-0804-G20M	6029109	L-905
DOL-0804-G30M	6029110	L-905
DOL-0804-G50M	6029111	L-905
DOL-0804-W02MC	6025897	L-904
DOL-0804-W02MN	6033673	L-904
DOL-0804-W02M	6009871	L-905
DOL-0804-W05MC	6025898	L-904
DOL-0804-W05MN	6033674	L-904
DOL-0804-W05M	6009873	L-905
DOL-0804-W10MC	6025899	L-904
DOL-0804-W10MN	6033675	L-904
DOL-0804-W10M	6010755	L-905
DOL-1203-G02MC	6039075	L-905
DOL-1203-G05MC	6039076	L-905
DOL-1203-G10MC	6039077	L-905
DOL-1203-W02MC	6039078	L-905
DOL-1203-W05MC	6039079	L-905
DOL-1203-W10MC	6036752	L-905
DOL-1203-W15MC	6036753	L-905
DOL-1203-W20MC	6036754	L-905
DOL-1204-G02MC	6025900	L-905
DOL-1204-G02MN	6028128	L-906
DOL-1204-G02M	6009382	L-906
DOL-1204-G05MAC	6038621	L-905
DOL-1204-G05MC	6025901	L-905
DOL-1204-G05MN	6028130	L-906
DOL-1204-G05M	6009866	L-906
DOL-1204-G10MC	6025902	L-905
DOL-1204-G10MN	6028132	L-906
DOL-1204-G10M	6010543	L-906

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DOL-1204-G15MC	6034749	L-905
DOL-1204-G15M	6010753	L-906
DOL-1204-G20MC	6034750	L-905
DOL-1204-G20M	6034401	L-906
DOL-1204-G25MC	6034751	L-905
DOL-1204-G25MN	6028134	L-906
DOL-1204-L02MN	6028136	L-906
DOL-1204-L02M	6027945	L-906
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DOL-1204-L05MN	6028137	L-906
DOL-1204-L05M	6027944	L-906
DOL-1204-L10MN	6028138	L-906
DOL-1204-L10M	6027946	L-906
DOL-1204-L25MN	6028139	L-906
DOL-1204-W02MC	6025903	L-906
DOL-1204-W02MN	6028129	L-906
DOL-1204-W02M	6009383	L-906
DOL-1204-W05MC	6025904	L-906
DOL-1204-W05MN	6028131	L-906
DOL-1204-W05M	6009867	L-906
DOL-1204-W10MC	6025905	L-906
DOL-1204-W10MN	6028133	L-906
DOL-1204-W10M	6010541	L-906
DOL-1204-W15MC	6034752	L-906
DOL-1204-W15M	6036474	L-906
DOL-1204-W20MC	6034753	L-906
DOL-1204-W20M	6033559	L-906
DOL-1204-W25MC	6034754	L-906
DOL-1204-W25MN	6028135	L-906
DOL-1205-G02MC	6025906	L-907
DOL-1205-G02MN	6028140	L-907
DOL-1205-G02M	6008899	L-907
DOL-1205-G05MAC	6036384	L-907
DOL-1205-G05MC	6025907	L-907
DOL-1205-G05MN	6028141	L-907
DOL-1205-G05M	6009868	L-907
DOL-1205-G10MAC	6036385	L-907
DOL-1205-G10MC	6025908	L-907
DOL-1205-G10MN	6028142	L-907
DOL-1205-G10M	6010544	L-907
DOL-1205-G15M	6029215	L-907
DOL-1205-G20MAC	6036386	L-907
DOL-1205-G25MN	6028143	L-907
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DOL-1205-W02M	6008900	L-907
DOL-1205-W05MC	6025910	L-907
DOL-1205-W05M	6009869	L-907
DOL-1205-W10MC	6025911	L-907
DOL-1205-W10M	6010542	L-907
DOS-0803-G	7902077	L-908
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DOS-0804-G	6009974	L-908
DOS-0804-W	6009975	L-908
DOS-1204-GN	6028357	L-909
DOS-1204-G	6007302	L-909
DOS-1204-W	6007303	L-909
DOS-1205-G	6009719	L-909
DOS-1205-W	6009720	L-909

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DOS1204-WN	6028358	L-909
DSL-0804-G02MC	6036335	L-911
DSL-0804-G03M	6051283	L-911
DSL-0804-G05MC	6039090	L-911
DSL-0804-G0M6C	6039089	L-911
DSL-0804-G0M6	6034664	L-911
DSL-0804-G1M5	6042050	L-911
DSL-0804-G2M5	6051282	L-911
DSL-1203-B02MC	6025925	L-912
DSL-1203-B0M6C	6025924	L-912
DSL-1203-G02MC	6025923	L-912
DSL-1203-G0M6C	6025922	L-912
DSL-1204-B02MN	6028198	L-912
DSL-1204-B05MN	6028199	L-912
DSL-1204-B0M6N	6028197	L-912
DSL-1204-G01MC	6033244	L-912
DSL-1204-G02MC	6025927	L-912
DSL-1204-G02MN	6028195	L-912
DSL-1204-G05MC	6033245	L-912
DSL-1204-G05MN	6028196	L-912
DSL-1204-G05M	6022569	L-912
DSL-1204-G0M6C	6025926	L-912
DSL-1204-G0M6N	6028194	L-912
DSL-1204-G10MC	6033698	L-912
DSL-1205-B01MC	6029284	L-913
DSL-1205-B02MC	6029287	L-913
DSL-1205-B05MC	6029288	L-913
DSL-1205-B0M6C	6029283	L-913
DSL-1205-B1M5C	6029286	L-913
DSL-1205-G01MC	6029280	L-913
DSL-1205-G02MC	6025931	L-913
DSL-1205-G05MC	6029282	L-913
DSL-1205-G0M6C	6025930	L-913
DSL-1205-G10MC	6038954	L-913
DSL-1205-G15MC	6038956	L-913
DSL-1205-G20MC	6038957	L-913
DSL-2803-G02MC	6039184	L-911
DSL-2803-G05MC	6028664	L-911
DSL-2803-G0M6C	6039183	L-911
DSL-2804-G02MC	6039180	L-912
DSL-2804-G05MC	6039091	L-912
DSL-2804-G0M6C	6037595	L-912
DSL-8203-B02MC	6025917	L-910
DSL-8203-B05MC	6039185	L-910
DSL-8203-B0M6C	6025916	L-910
DSL-8203-G02MC	6025915	L-910
DSL-8203-G02M	6022572	L-911
DSL-8203-G05MC	6030608	L-910
DSL-8203-G0M6C	6025914	L-910
DSL-8203-G0M6	6022570	L-911
DSL-8204-B02MC	6025921	L-911
DSL-8204-B05MC	6039182	L-911
DSL-8204-B0M6C	6025920	L-911
DSL-8204-G02MC	6025919	L-911
DSL-8204-G02M	6022573	L-911
DSL-8204-G05MC	6039181	L-911
DSL-8204-G05M	6034403	L-911
DSL-8204-G0M6C	6025918	L-911

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DSL-8204-G0M6	6022571	L-911
DSL-8204-G10M	6034404	L-911
DSL-8204-G20M	6034405	L-911
EL3-F2415	1043961	I-694
EL3-P2415	1043960	I-694
EL4-F2415	1044684	I-694
EL4-P2415	1044683	I-694
EN2-2EX-1	6041096	L-921
EN2-2EX-3	6041095	L-921
ET3-F2215	1045196	I-694
ET3-F3215	1045189	I-694
ET3-F4215	1045193	I-694
ET3-F5215	1045200	I-694
ET3-P2215	1045195	I-694
ET3-P3215	1045187	I-694
ET3-P4215	1045191	I-694
ET3-P5215	1045199	I-694
FC	5304141	L-867
GL10-N1111	1065880	G-435
GL10-N1112	1065882	G-435
GL10-N1211	1065888	G-435
GL10-N1212	1065889	G-435
GL10-N1551	1065892	G-436
GL10-N4111	1065883	G-435
GL10-N4112	1065884	G-435
GL10-N4211	1064700	G-435
GL10-N4212	1065891	G-435
GL10-P1111	1065876	G-435
GL10-P1112	1065877	G-435
GL10-P1211	1065885	G-435
GL10-P1212	1065886	G-435
GL10-P4111	1065878	G-435
GL10-P4112	1065879	G-435
GL10-P4211	1065890	G-435
GL10-P4212	1065887	G-435
GL10-P4551	1064702	G-436
GL10-P4554	1065893	G-436
GL10-R3711	1065896	G-435
GL10-R3712	1065897	G-435
GL10-R3811	1064689	G-435
GL10-R3812	1065898	G-435
GL10G-N1251	1064705	G-436
GL10G-N1252	1065895	G-436
GL10G-P4251	1064704	G-436
GL10G-P4252	1065894	G-436
GL2S-E1311	1063009	F-188
GL2S-E1312	1064424	F-188
GL2S-F1311	1064358	F-188
GL2S-F5311	1063008	F-188
GL2S-N1311	1064360	F-188
GL2S-N1312	1064423	F-188
GL2S-P5311	1064359	F-188
GL6-N1111	1050709	F-200
GL6-N1112	1051780	F-200
GL6-N1212	1060814	F-200
GL6-N4112	1051778	F-200
GL6-N4211	1059631	F-200
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