

W4SL-3 miniature photoelectric sensors: The special solution for detection with absolute precision

The miniature photoelectric sensors in the W4SL-3 product family are the number one choice where the detection of minute and transparent objects is concerned. They are the ideal solution even under critical ambient conditions such as ambient light from modern energy-saving lights or when detection through small drill holes is required. The latest laser and ASIC technology from SICK makes this possible.



Highly precise and not sensitive to
any source of light interference



Reliable detection of the smallest objects

The extremely small light spot of the W4SL-3 miniature photoelectric sensors provides the ideal starting point for precise object and product detection in automation. It makes the sensors ideal for precise position, presence, overhang and height checks involving the smallest objects, even under critical light conditions. The precise laser light spot supports switching with maximum accuracy, thus providing the basis not only for optimum product quality but also for reduced machine downtime as there are fewer switching errors.

Versatility for many industries

W4SL-3 miniature photoelectric sensors are perfect for the packaging industry, the automotive and part supplier industries, the electronics industry and the solar industry. But that's not all: they even deliver optimum results in machine tool building, in the food and beverage industry, and the pharmaceutical industry. Applications include examining grippers in the automotive industry, inspecting dies in machine tool building, or edge detection of semiconductor wafer carriers.

For more information, visit www.sick.com/de/W4SL-3.



W4SL-3 miniature photoelectric sensors: High performance for high expectations

With their precise laser light spot, the new W4SL-3 miniature photoelectric sensors are setting new standards by providing high optical immunity to undesired background reflections and immunity to ambient light even from modern energy-saving bulbs. They also are impressive with maximum mechanical and electromechanical ruggedness.

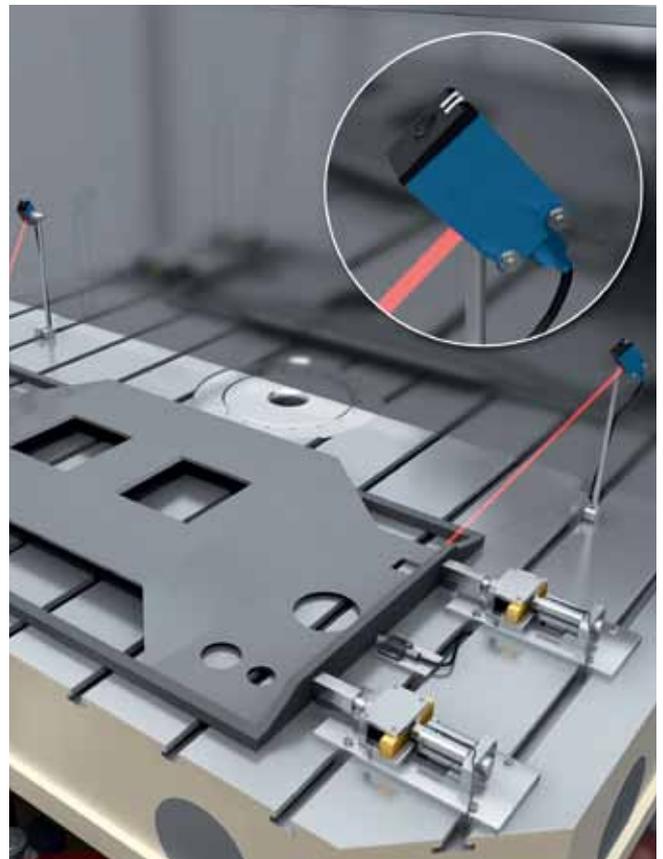
Reliable switching in all environments

The photoelectric proximity sensors in the WTB4SL-3 product family outperform all other laser sensors currently available on the market. In everyday production, they have absolutely no sensitivity to all active and passive sources of light interference. High-frequency lights or any type of reflection, reflective metal surfaces, windows or high-visibility vests – none of these sources of optical interference will trigger a switching signal incorrectly from a WTB4SL-3 photoelectric proximity sensor. Accordingly, these sensors reduce incorrect switching and avoid consequential machine downtime.



Lowering costs and creating new solutions

Best-in-class performance for background suppression creates maximum freedom in machine design, as changing and reflective backgrounds or dead spots no longer pose a problem for the application.



Maximum optical ruggedness thanks to innovative ASIC technology

State-of-the-art technology in a miniature size

Available exclusively in the photoelectric proximity sensors in the W4SL-3 product family, the ASIC developed by SICK meets very stringent requirements where detection quality is concerned. Where ruggedness of ambient light and reflections is concerned, the ASIC is unrivaled by other products. Furthermore, it is incredibly resistant to shock and vibration. These properties also significantly reduce instances of incorrect switching and machine downtime.



W4SL-3 miniature photoelectric sensors: The best clear object detection in their class

The photoelectric retro-reflective sensors in the WL4SLG-3 product family stand out in their class with the best detection performance for transparent glass and plastic objects –all with just one device. They provide the ideal starting point for efficient and automated production.



Duo mode: One sensor for two applications

WL4SLG-3 photoelectric retro-reflective sensors are supplied as standard with a switchable operating mode for detecting transparent objects and a mode with non-transparent objects can be detected. Simply press a button to switch between the two user modes. A single device can detect, for example, not only transparent vials and PET bottles but also metallic needles and wires, thus reducing the variety of sensors and their storage costs.

Fully automatic: adaptation to contamination

The photoelectric retro-reflective sensors in the WL4SLG-3 product family automatically adapt to changing light conditions. If dust or dirt collects on the sensor lens over time, the microprocessor responds to the reduced incidence of light and adjusts the switching threshold accordingly. Once the sensor lens has been cleaned, the original signal level is restored automatically – representing a significant reduction in maintenance time and costs from all angles.

Absolutely reliable: detection of clear objects

The aim: best possible performance in clear object detection. The solution: the SICK photoelectric sensor package, comprising the innovative ASIC, an autocollimation lens, and two polarizing filters. Thanks to these features, the WL4SLG-3 photoelectric retro-reflective sensors are able to offer the best detection of transparent or shiny surfaces and objects in their class. They are able to detect clear glass surfaces just as reliably as small vials, tape edges, and PET bottles.

W4SL-3 product type	Laser class	Sensing range	Diameter of light spot
WTB4SL-3	1	25 - 300 mm / 25 - 170 mm ¹⁾	Ø < 1 mm (170 mm)
WL4SL-3	1	12 m ²⁾	Ø 1 mm (500 mm)
WSE4SL-3	1	70 m / 50 m ³⁾	Ø 1 mm (500 mm)
WL4SLG-3 for detection of transparent objects	1	4.5 m ⁴⁾	Ø 1 mm (500 mm)

¹⁾ On white / on black.

²⁾ Based on the PL80A reflector.

³⁾ Max. / recommended sensing range.

⁴⁾ Based on REF-AC1000 reflective tape.

A laser sensor must be capable of quality in every millimeter

Stable housing, proven mounting

Systematic production and testing procedures safeguard the high mechanical quality of the sensor. A compact plastic housing measuring 19 x 12.2 x 17.3 mm (H x W x D) encases all W4SL-3 miniature photoelectric sensors. The hole spacing is the same as is featured on the W4S-3 mounting system, which is already successful in the automation.

Reliable thanks to high EMC safety

The high-quality design and manufacture of the housing continues with the electronics inside the sensor: W4SL-3 miniature photoelectric sensors with laser technology are impressive with high insensitivity to all kinds of electromagnetic interference.

IO-Link: The world as seen by a sensor

The W4SL-3 miniature photoelectric sensors with laser technology also feature IO-Link technology, meaning that they can be used for initial diagnosis of system performance. Additional functions such as meters or profile detection can be integrated directly into the sensor, rendering complex programming of controllers unnecessary.

Further advantages:

- Exact and precise configuration
- Support of remote control and remote monitoring
- Straightforward transfer of analog values
- Wire break detection
- Can be connected to any fieldbus
- Predictive error detection
- Intelligent additional functions in the sensor



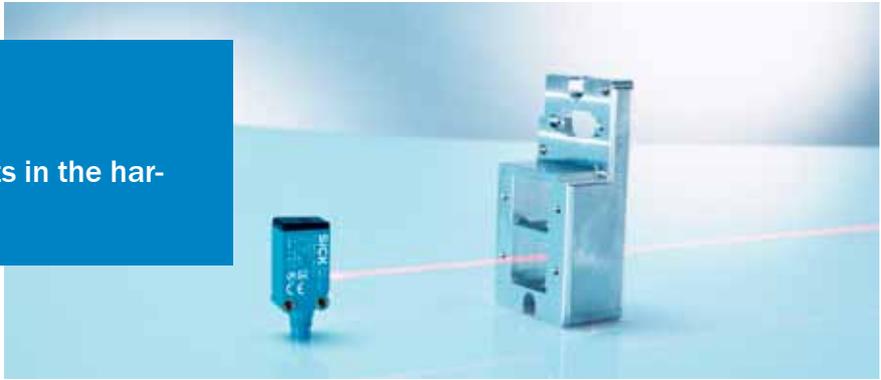
W4: Small but mighty

The new W4SL-3 sensors are part of the established W4 range of photoelectric sensors from SICK. In addition to making it very easy to implement custom solutions, the W4 sensors are impressive due to their ability to reliably detect transparent objects. Their PinPoint technology facilitates the combination of commissioning that couldn't be easier with very high levels of performance. What's more, stainless steel housings make for maximum ruggedness through tightness in harsh environments.

For all you need to know about W4, visit www.sick.com/de/w4-3united.



Precise detection of tiny objects in the harshest industrial environments



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Product description

The WTB4SL-3 photoelectric proximity sensor features a high-precision laser light spot for reliably detecting tiny objects such as syringe needles, wires, or drilled holes, even under adverse ambient conditions. Both active and passive sources of interference such as modern energy-saving lamps and background

reflections do not impair detection reliability, meaning that process reliability is not affected. The combination of SICK's latest proprietary laser and ASIC technologies meets the demanding requirements for detection quality. The sensing range is between 25 and 300 mm.

At a glance

- Precise laser light spot, laser class 1
- Latest SICK proprietary ASIC and laser technologies with second emitter LED to provide outstanding background suppression and ambient light immunity
- Sensing range between 25 and 300 mm
- Established and proven housing design
- High-quality sensor manufacturing and testing for mechanical ruggedness
- Choice of adjustment via teach-in button, 5-turn potentiometer, or cable

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
- High-quality sensor manufacturing and testing reduce maintenance costs
- The highest degree of machine design flexibility and outstanding BGS (background suppression) minimizes the effect of background reflections
- Established and proven housing design for easy installation

→ www.mysick.com/en/WTB4SL-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 proximity sensor
Detection principle	Background suppression
Dimensions (W x H x D)	12.2 mm x 41.8 mm x 17.3 mm
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
Laser class	1 (EN60825-1:2008-05 & IEC 60825-1:2007-03 / CDRH 21 CFR 1040.10 & 1040.11)
Wave length	650 nm
Light spot size (distance)	Ø 1 mm (170 mm)
Sensitivity adjustment	Potentiometer, 5-turn

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

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

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Residual ripple ²⁾	< 5 V _{pp}
Power consumption ³⁾	≤ 30 mA
Switching output	PNP, light/dark-switching, complementary ⁴⁾ NPN, light/dark-switching, complementary ⁴⁾ (depending on type)
Output current I_{max.}	≤ 100 mA
Response time ⁵⁾	≤ 0.5 ms
Switching frequency ⁶⁾	1,000 Hz
Connection type	Cable with connector, 120 mm, PVC, 0.14 mm ² ⁷⁾ Cable, 2 m, PVC, 0.14 mm ² ⁷⁾ Connector (depending on type)
Circuit protection	A ⁸⁾ B ⁹⁾ C ¹⁰⁾
Protection class	⊕
Weight	
Cable with connector, M8, 4-pin	20 g
Cable, M8, 4-pin	45 g
Connector, 4-wire	10 g
Housing material	Bayblend Plastic
Optics material	PMMA
Enclosure rating	IP 66 IP 67

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 .

³⁾ Without load.

⁴⁾ Q = light-switching.

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⁾ C = interference suppression.

¹¹⁾ 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.

¹²⁾ 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.

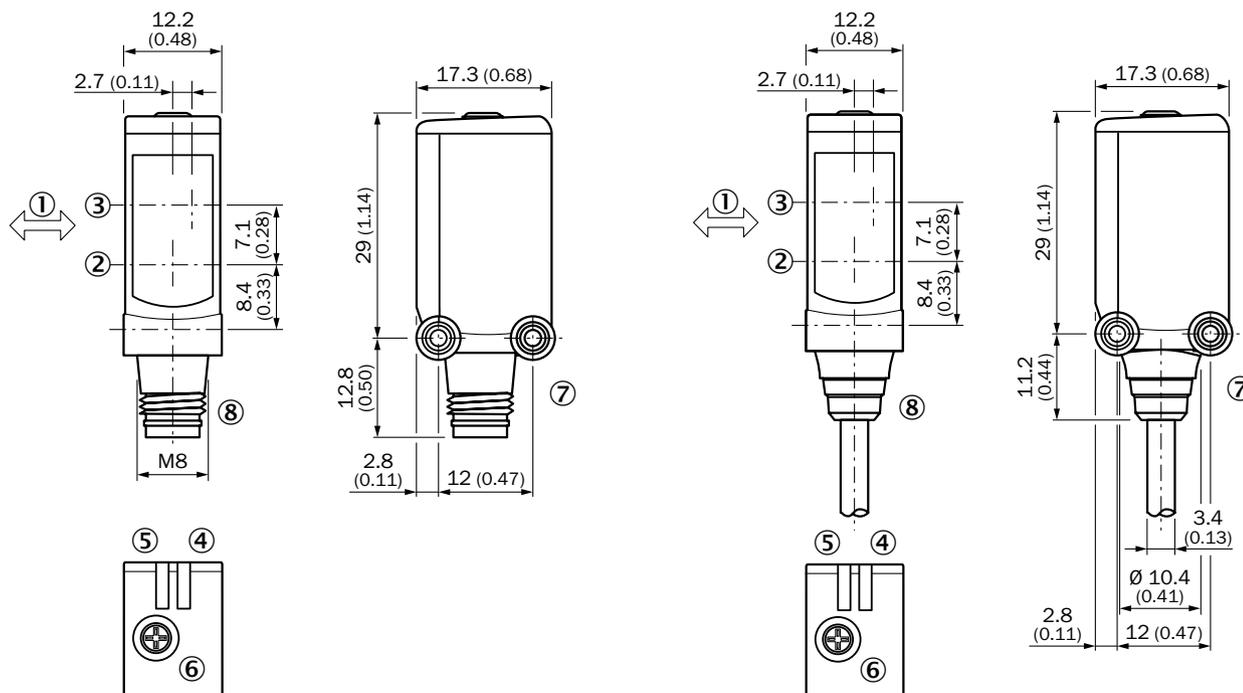
Ordering information

Sensing range max. ¹⁾	Output function	Connection	Model name	Part no.
25 mm ... 300 mm	PNP	Connector, M8, 4-pin	WTB4SL-3P2261	1058237
		Cable with connector, M8, 4-pin, 120 mm, PVC	WTB4SL-3P3261	1058238
		Cable, 4-wire, 2 m, PVC	WTB4SL-3P1161	1058239
	NPN	Connector, M8, 4-pin	WTB4SL-3N2261	1058240
		Cable with connector, M8, 4-pin, 120 mm, PVC	WTB4SL-3N3261	1058241
		Cable, 4-wire, 2 m, PVC	WTB4SL-3N1161	1058242

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

Dimensional drawings

dimensions in mm (inch)

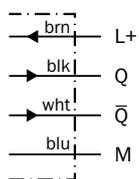


- ① Standard direction of the material being scanned
- ② Center of optical axis, sender
- ③ Center of optical axis, receiver
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Potentiometer
- ⑦ Threaded mounting hole M3
- ⑧ Connection

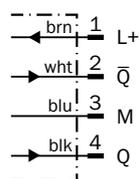
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- ⑥ Potentiometer
- ⑦ Threaded mounting hole M3
- ⑧ Connection

Connection diagram

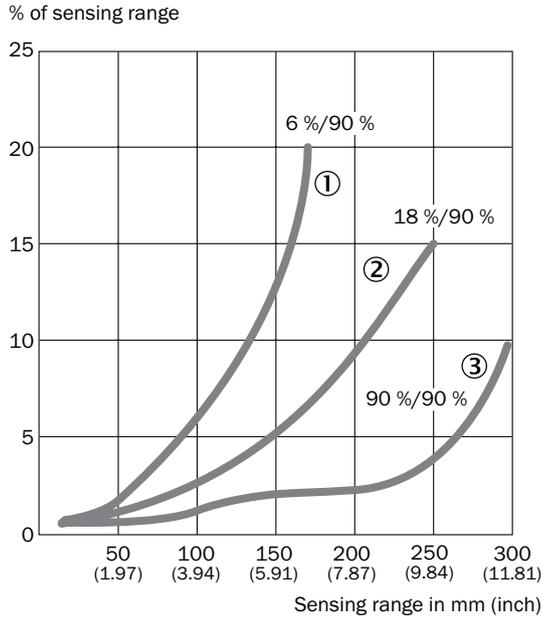
WTB4SL-3x11xx Cable



WTB4SL-3xx2xx (Cable with) connector

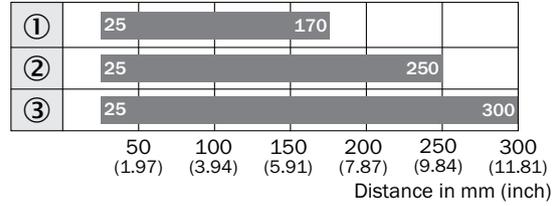


Black/white shift



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

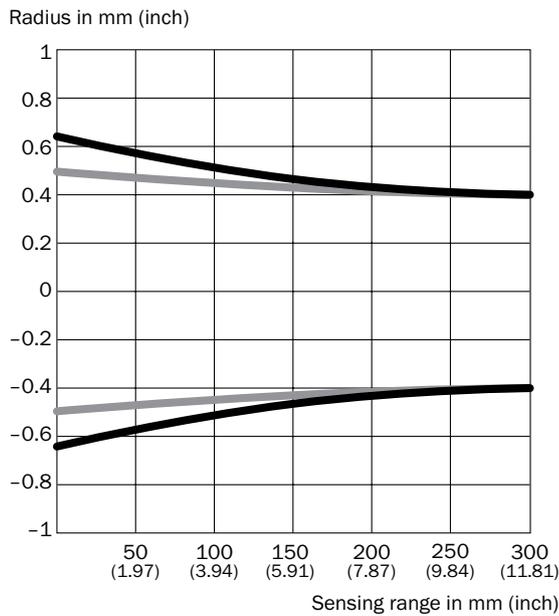
Sensing range



■ 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

Light spot size

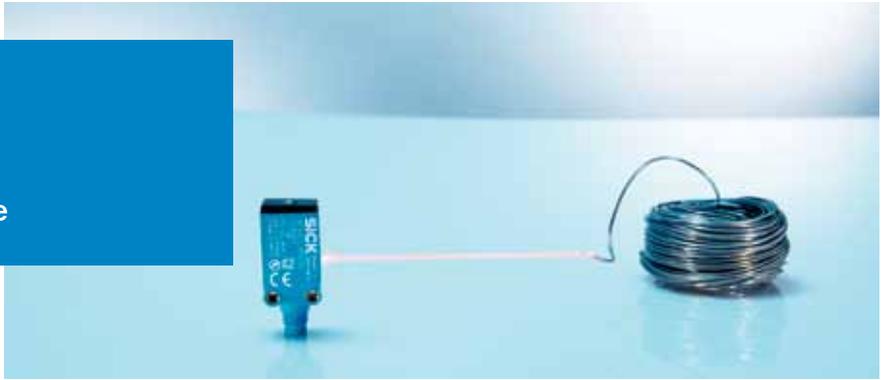


- Vertical
- Horizontal

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)

Quality with long sensing range



Product description

The WL4SL-3 photoelectric retro-reflective sensor has a long sensing range of up to 12 m. The highly visible homogeneous laser light spot has a sharp contour to facilitate alignment. The photoelectric sensors use autocollimation technology to ensure that the sensor also reliably detects close-range objects. This technology also enables detection through nar-

row gaps or very small drilled holes. The photoelectric sensors also provide an IO-Link interface to allow performing initial system performance diagnostics. In addition, 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
- Long sensing range up to 12 m
- Autocollimation optics prevent blind spots
- Established and proven housing design
- High-quality sensor manufacturing and testing for mechanical ruggedness
- Choice of adjustment via teach-in button, 5-turn potentiometer, cable, or IO-Link

Your benefits

- Highly visible, even laser light spot with a sharp contour to facilitate alignment
- Sensing ranges between 0 and 12 m permit both short- and long-range use
- 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



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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 / Slim
Mounting hole	M3
Sensing range max. ¹⁾	0 m ... 12 m
Sensing range ¹⁾	0 m ... 8 m
Type of light	Visible red light
Light source ²⁾	Laser
Laser class	1 (EN60825-1:2008-05 & IEC 60825-1:2007-03 / CDRH 21 CFR 1040.10 & 1040.11)
Wave length	650 nm
Light spot size (distance)	Ø 1 mm (500 mm)
Sensitivity adjustment	Single teach-in button and teach-in via cable ³⁾ (depending on type)

¹⁾ PL80A.

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

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)

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Residual ripple ²⁾	< 5 V _{pp}
Power consumption ³⁾	≤ 30 mA
Switching output	PNP, dark-switching ⁴⁾ PNP, light/dark-switching, complementary ⁵⁾ NPN, dark-switching ⁴⁾ NPN, light/dark-switching, complementary 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 with connector, 120 mm, PVC, 0.14 mm ² ⁸⁾ Cable, 2 m, PVC, 0.14 mm ² ⁸⁾ Connector (depending on type)
Circuit protection	A ⁹⁾ B ¹⁰⁾ C ¹¹⁾
Protection class	⊕
Weight	
Cable with connector, M8, 4-pin	20 g
Cable, M8, 4-pin	45 g
Connector, 4-wire	10 g
Polarisation filter	✓
IO-Link	✓ (COM2) (depending on type)
Housing material	Bayblend Plastic
Optics material	PMMA

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 .

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⁾ 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

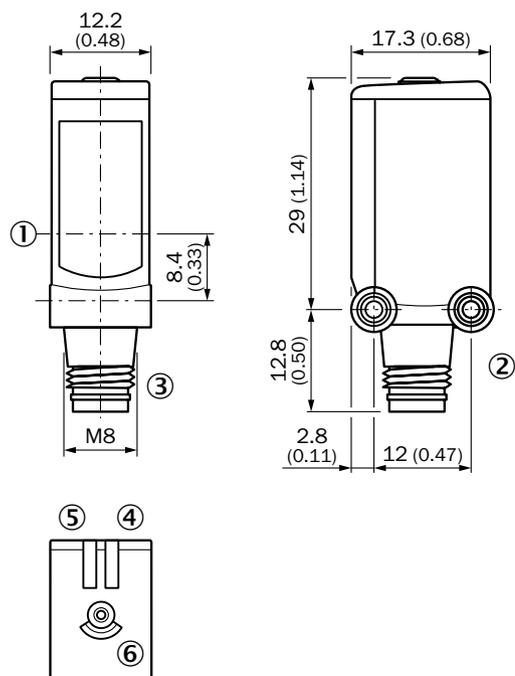
Sensing range max. ¹⁾	Output function	Switching mode	Sensitivity adjustment	IO-Link	Connection	Model name	Part no.
0 m ... 12 m	PNP	Dark-switching	Single teach-in button and teach-in via cable ²⁾	-	Cable with connector, M8, 4-pin, 120 mm, PVC	WL4SL-3F3234	1061564
				-	Connector, M8, 4-pin	WL4SL-3F2234	1061562
		Light/dark-switching	Single teach-in button	-	Cable with connector, M8, 4-pin, 120 mm, PVC	WL4SL-3P3232	1061563
				COM2	Connector, M8, 4-pin	WL4SLC-3P2232	1061569
	NPN	Dark-switching	Single teach-in button and teach-in via cable ²⁾	-	Cable, 4-wire, 2 m, PVC	WL4SL-3E1134	1061566
				-	Connector, M8, 4-pin	WL4SL-3P2232	1061561
		Light/dark-switching	Single teach-in button	-	Cable, 4-wire, 2 m, PVC	WL4SL-3N1132	1061565
				-	Connector, M8, 4-pin	WL4SLC-3N2232	1061570

¹⁾ PL80A.

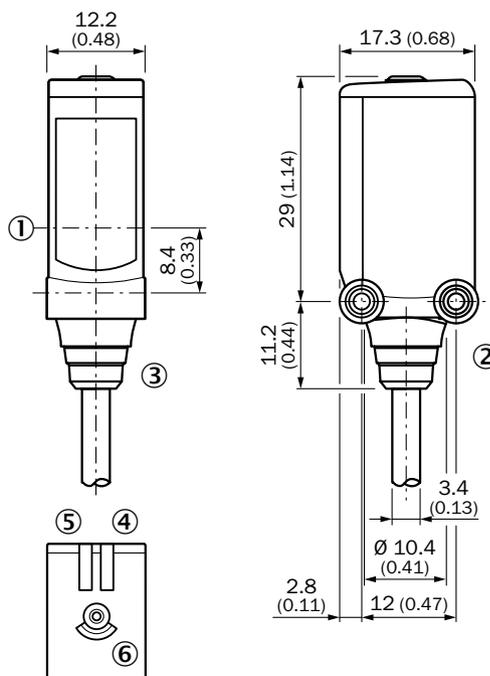
²⁾ Adjustment via cable (ET): white cable or PIN2 according to the desired sensitivity > 2 ... < 8 s or put > 8 s on L+ (PNP) or on M (NPN)

Dimensional drawings

dimensions in mm (inch)



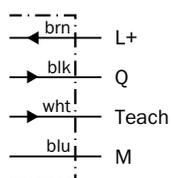
- ① Center of optical axis
- ② Threaded mounting hole M3
- ③ Connection
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Single teach-in button



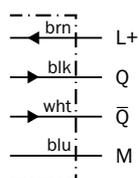
- ① Center of optical axis
- ② Threaded mounting hole M3
- ③ Connection
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Single teach-in button

Connection diagram

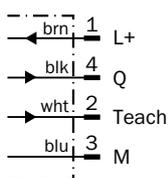
WL4SL-3x11x4 Cable



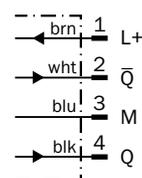
WL4SL-3x11x2 Cable



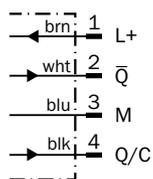
WL4SL-3xx2x4 (Cable with) connector



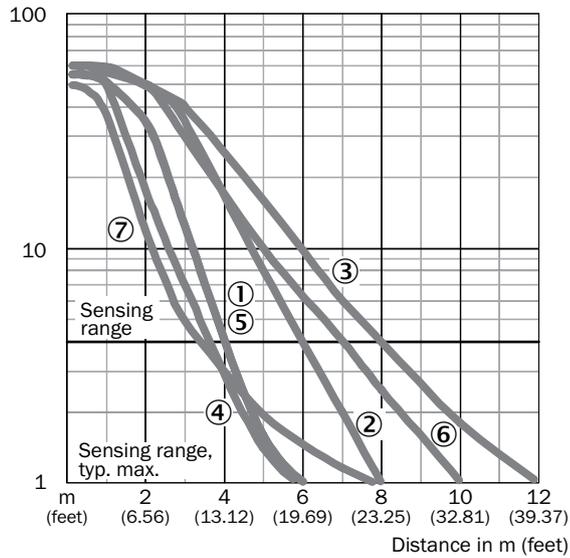
WL4SL-3xx2x2 (Cable with) connector



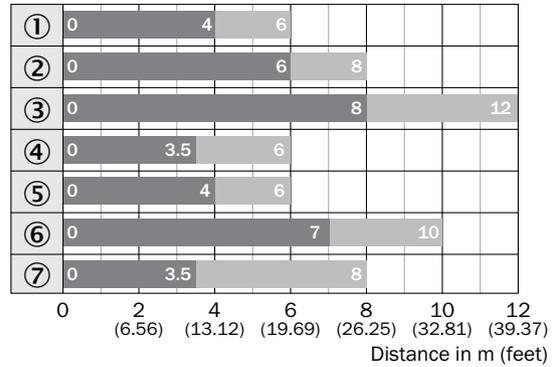
WL4SLC-3P2232 Connector



Operating reserve



Sensing range

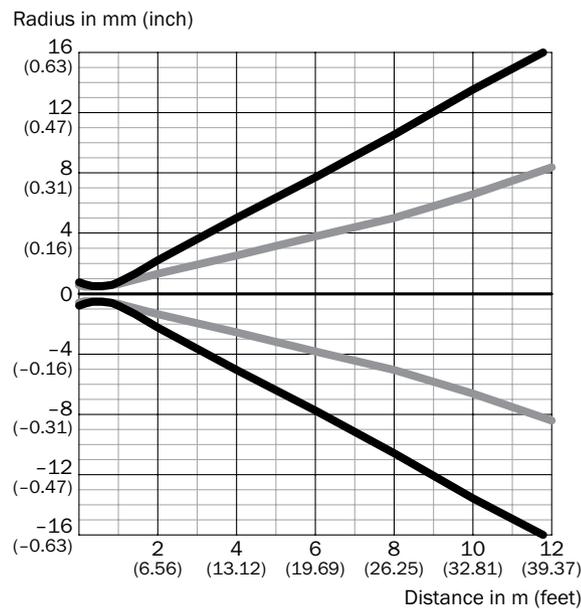


Reflector type

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

Light spot size

Overview

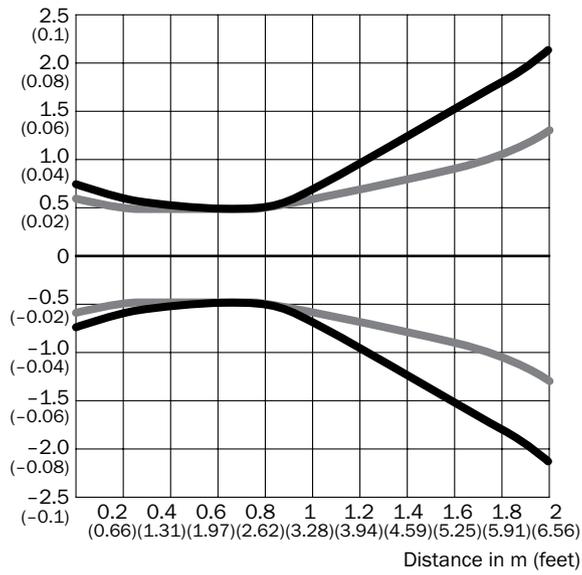


Dimensions in mm (inch)

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)

Close up

Radius in mm (inch)



- Vertical
- Horizontal

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 automatic

switching threshold adaptation 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
- Automatic switching threshold adaptation 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



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Light spot size.....	24

→ www.mysick.com/en/WL4SLG-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 / Slim
Mounting hole	M3
Sensing range max. ¹⁾²⁾	0 m ... 4.5 m
Sensing range ¹⁾²⁾	0 m ... 2 m
Type of light	Visible red light
Light source ³⁾	Laser
Laser class	1 (EN60825-1:2008-05 & IEC 60825-1:2007-03 / CDRH 21 CFR 1040.10 & 1040.11)
Wave length	650 nm
Light spot size (distance)	Ø 1 mm (500 mm)
Sensitivity adjustment	Single teach-in button and teach-in via cable ⁴⁾ (depending on type)

¹⁾ REF-AC1000.

²⁾ We recommend using reflective tape REF-AC1000 or reflectors based on this reflective tape, like P41F, PLV14-A, PLH25-M12 or PLH25-D12, to ensure reliable operation. Reflectors with larger-scaled triple structures should only be used after application clarification.

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

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
Residual ripple ²⁾	< 5 V _{pp}
Power consumption ³⁾	≤ 30 mA
Switching output	PNP, dark-switching ⁴⁾ PNP, light/dark-switching, complementary ⁵⁾ NPN, dark-switching ⁴⁾ NPN, light/dark-switching, complementary 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 with connector, 120 mm, PVC, 0.14 mm ² ⁸⁾ Cable, 2 m, PVC, 0.14 mm ² ⁸⁾ Connector (depending on type)
Circuit protection	A ⁹⁾ B ¹⁰⁾ C ¹¹⁾
Protection class	⊕
Weight	
Cable with connector, M8, 4-pin	20 g
Cable, M8, 4-pin	45 g
Connector, 4-wire	10 g
Polarisation filter	✓
IO-Link	✓ (COM2) (depending on type)
Housing material	Bayblend Plastic

Optics material	PMMA
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 .

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⁾ 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

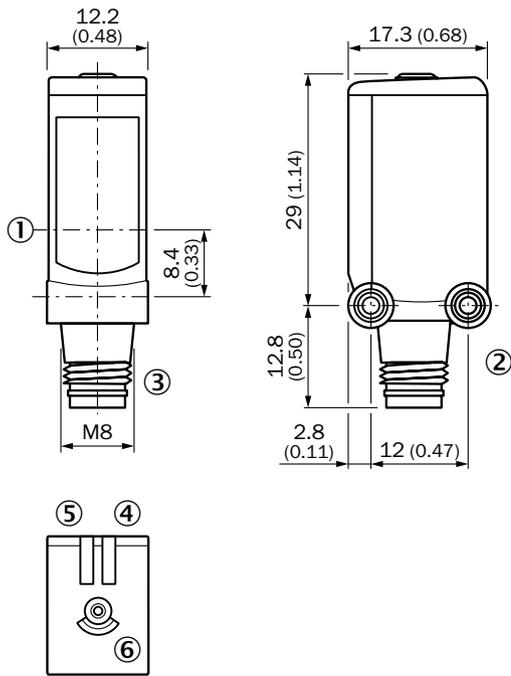
Sensing range max. ¹⁾	Output function	Switching mode	Sensitivity adjustment	IO-Link	Connection	Model name	Part no.
0 m ... 4.5 m	PNP	Dark-switching	Single teach-in button and teach-in via cable ²⁾	-	Cable with connector, M8, 4-pin, 120 mm, PVC	WL4SLG-3F3234	1058246
				-	Connector, M8, 4-pin	WL4SLG-3F2234	1058244
		Light/dark-switching	Single teach-in button	-	Cable with connector, M8, 4-pin, 120 mm, PVC	WL4SLG-3P3232	1058245
				COM2	Connector, M8, 4-pin	WL4SLGC-3P2232	1061286
	NPN	Dark-switching	Single teach-in button and teach-in via cable ²⁾	-	Cable, 4-wire, 2 m, PVC	WL4SLG-3E1134	1058248
				-	Cable, 4-wire, 2 m, PVC	WL4SLG-3N1132	1058247

¹⁾ REF-AC1000.

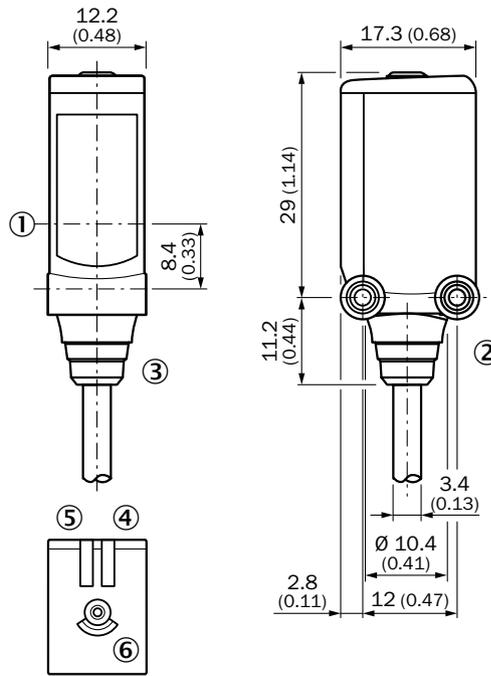
²⁾ Adjustment via cable (ET): white cable or PIN2 according to the desired sensitivity > 2 ... < 8 s or put > 8 s on L+ (PNP) or on M (NPN)

Dimensional drawings

dimensions in mm (inch)



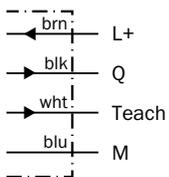
- ① Center of optical axis
- ② Threaded mounting hole M3
- ③ Connection
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Single teach-in button



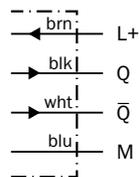
- ① Center of optical axis
- ② Threaded mounting hole M3
- ③ Connection
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Single teach-in button

Connection diagram

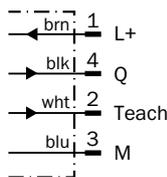
WL4SLG-3x11x4
Cable



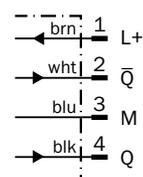
WL4SLG-3x11x2
Cable



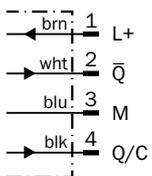
WL4SLG-3xx2x4
(Cable with) connector



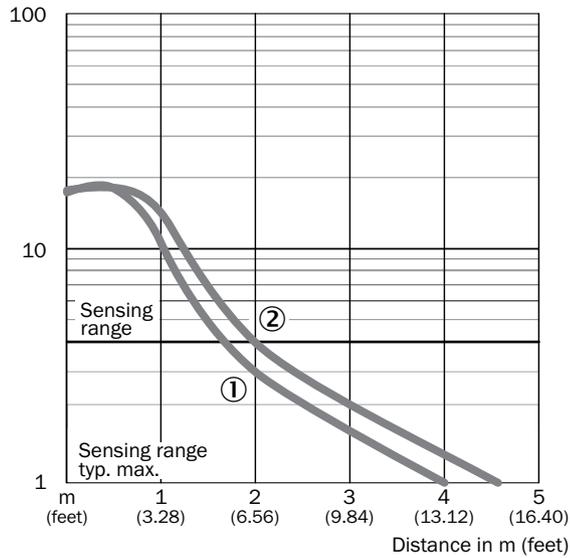
WL4SLG-3xx2x2
(Cable with) connector



WL4SLGC-3P2232
Connector

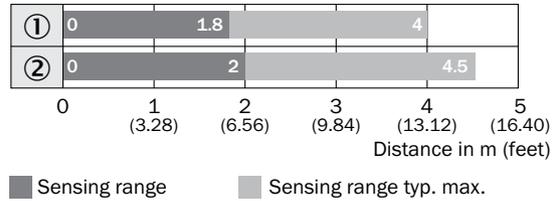


Operating reserve



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

Sensing range

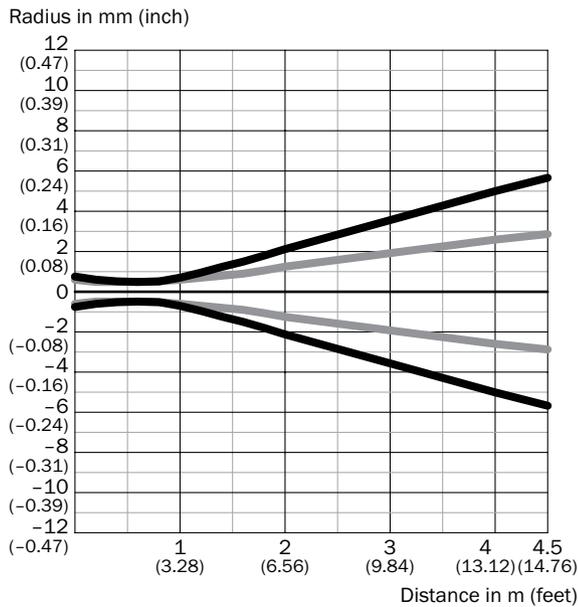


Reflector type

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

Light spot size

Overview



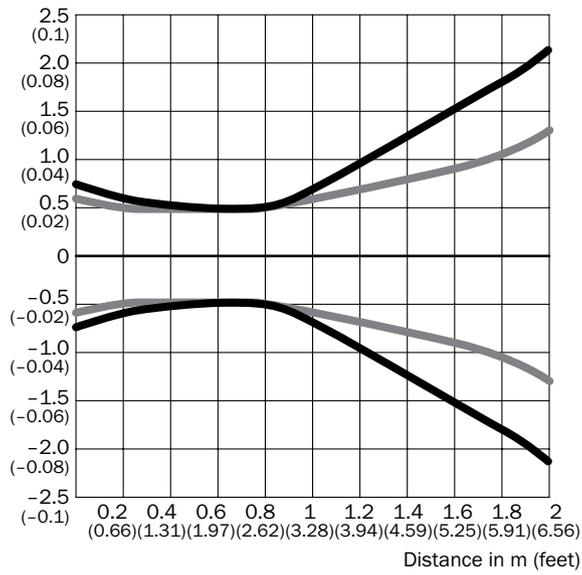
- Vertical
- Horizontal

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)

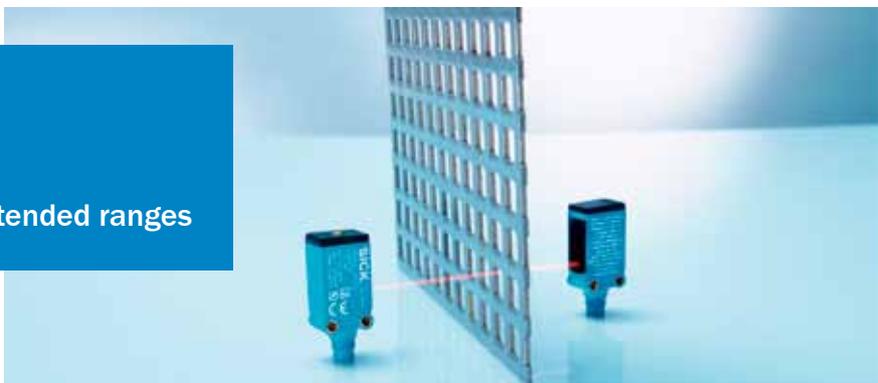
Close up

Radius in mm (inch)



- Vertical
- Horizontal

Reliable object detection at extended ranges



Product description

The WSE4SL-3 through-beam photoelectric switch reliably detects objects even at long distances of up to 60 m. The switch’s precise, highly visible laser light spot has a sharp contour, enabling

highly accurate switching and facilitating alignment. The sensor’s high precision also makes it suitable for applications requiring the laser beam to be guided through small openings or holes.

At a glance

- Precise laser light spot, laser class 1
- Long-range detection up to 60 m
- Established and proven housing design
- High-quality sensor manufacturing and testing for mechanical ruggedness
- Choice of adjustment via teach-in button, 5-turn potentiometer, or cable

Your benefits

- Highly visible, even laser light spot with a sharp contour to facilitate alignment
- Long sensing range allows use up to 60 m
- Sender-receiver system ensures high reliability
- Established and proven housing design for easy installation



Additional information

Detailed technical data 27

Ordering information 28

Dimensional drawings 28

Connection diagram 29

Operating reserve 29

Sensing range 29

Light spot size 30

→ www.mysick.com/en/WSE4SL-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	Through-beam photoelectric sensor
Dimensions (W x H x D)	12.2 mm x 41.8 mm x 17.3 mm
Housing design (light emission)	Rectangular / Slim
Mounting hole	M3
Sensing range max.	0 m ... 60 m
Sensing range	0 m ... 50 m
Type of light	Visible red light
Light source ¹⁾	Laser
Laser class	1 (EN60825-1:2008-05 & IEC 60825-1:2007-03 / CDRH 21 CFR 1040.10 & 1040.11)
Wave length	650 nm
Light spot size (distance)	Ø 1 mm (500 mm)
Sensitivity adjustment	Single teach-in button

¹⁾ Average service life 50,000 h at T_a = +25 °C.

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Residual ripple ²⁾	< 5 V _{pp}
Power consumption ³⁾	≤ 30 mA
Switching output	PNP, light/dark-switching, complementary ⁴⁾ NPN, light/dark-switching, complementary ⁴⁾ (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, PVC, 0.14 mm ² ⁷⁾ Connector (depending on type)
Circuit protection	A ⁸⁾ B ⁹⁾ C ¹⁰⁾
Protection class	⊕
Weight	Cable, M8, 4-pin: 90 g Connector, 4-wire: 20 g
Housing material	Bayblend Plastic
Optics material	PMMA
Enclosure rating	IP 66 IP 67

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 .

³⁾ Without load.

⁴⁾ Q = light-switching.

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⁾ C = interference suppression.

¹¹⁾ 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.

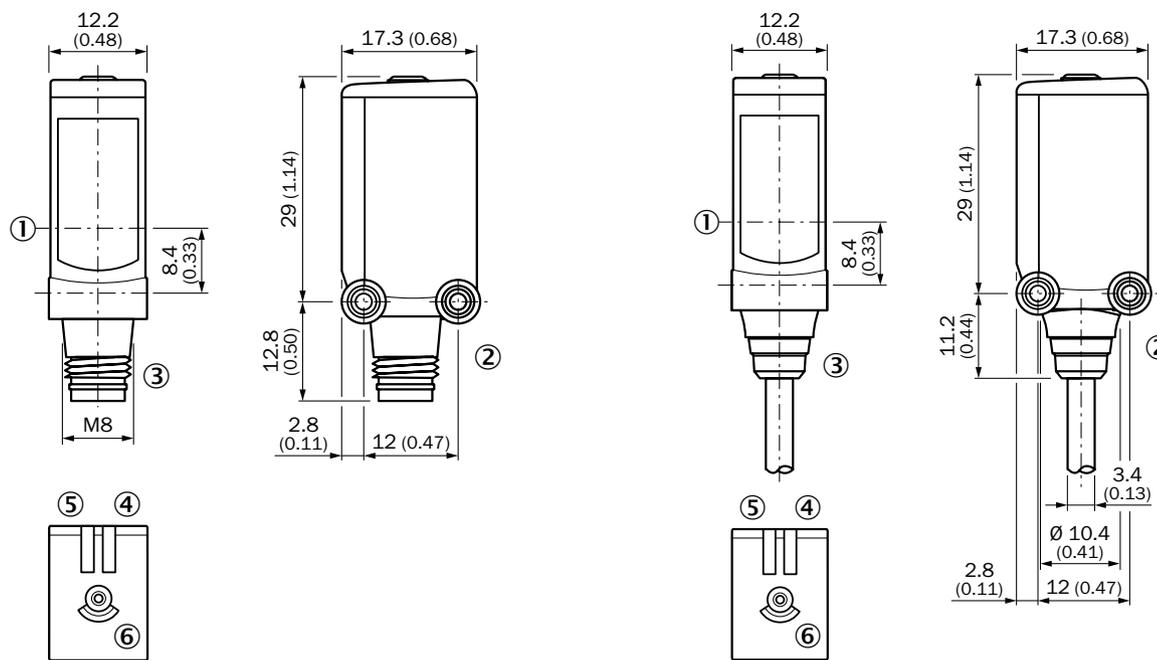
¹²⁾ Using the sensor below $T_a = -10$ °C is possible, if the sensor is turned on at $T_a > -10$ °C, then the environment cools down and the sensor is not disconnected from the supply voltage during the whole time. It is not allowed to turn on the sensor below $T_a = -10$ °C.

Ordering information

Sensing range max.	Output function	Connection	Model name	Part no.
0 m ... 60 m	PNP	Connector M8, 4-pin	WSE4SL-3P2237	1058249
	NPN	Cable, 4-wire, 2 m, PVC	WSE4SL-3N1137	1058250

Dimensional drawings

dimensions in mm (inch)

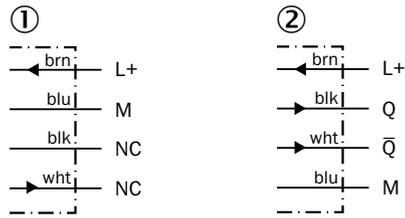


- ① Center of optical axis
- ② Threaded mounting hole M3
- ③ Connection
- ④ Status indicator LED green: power on
- ⑤ Status indicator LED, yellow: Status of received light beam
- ⑥ Single teach-in button

- 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

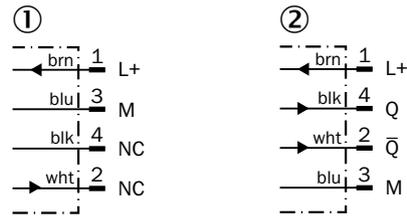
Connection diagram

Cable



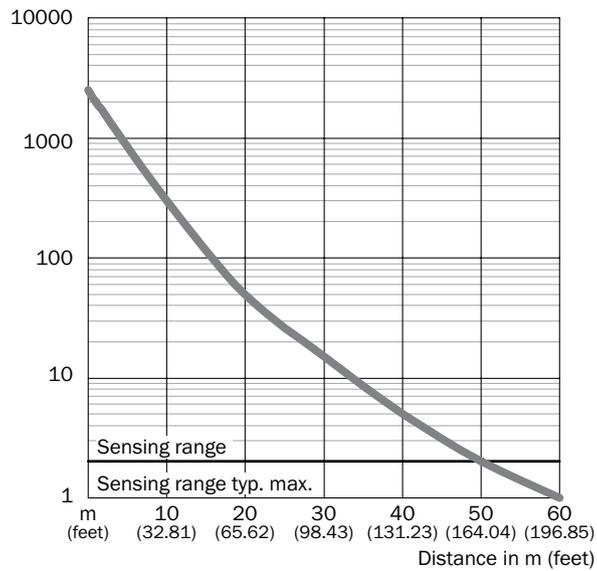
① Sender
② Receiver

Connector

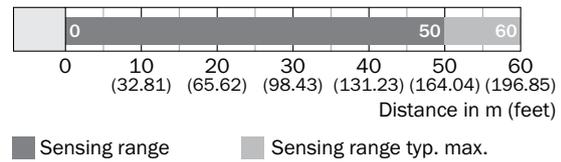


① Sender
② Receiver

Operating reserve

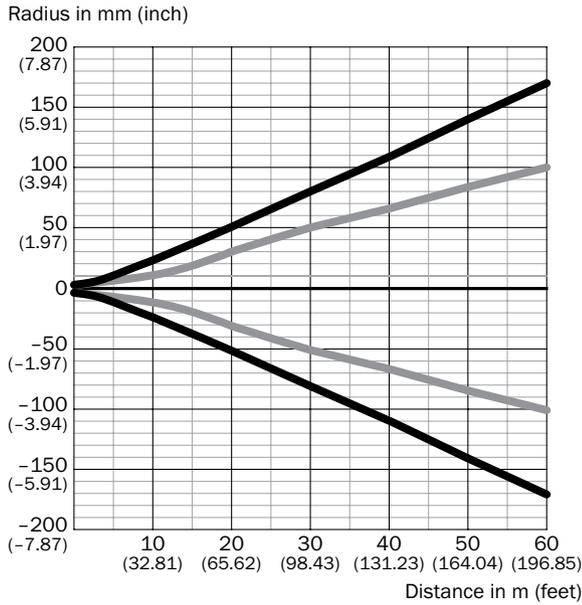


Sensing range



Light spot size

Overview

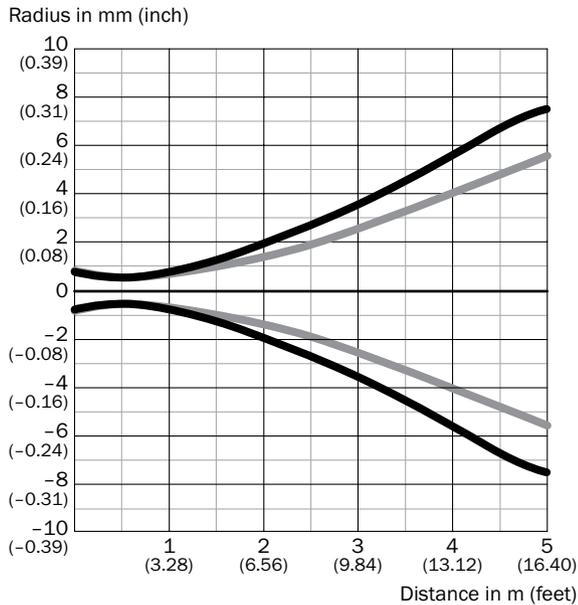


Dimensions in mm (inch)

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

Close up



— Vertical
— Horizontal

W4SL-3

Mounting brackets/plates

Figure	Accessory type	Material	Model name	Part no.	WTB4SL-3	WL4SL-3	WL4SLG-3	WSE4SL-3
	Mounting brackets	Stainless steel 1.4571	BEF-W4-A	2051628	●	●	●	●
			BEF-W4-B	2051630	●	●	●	●

Terminal and alignment brackets

- **Accessory type:** Universal terminal systems

Figure	Material	Model name	Part no.	WTB4SL-3	WL4SL-3	WL4SLG-3	WSE4SL-3
	Steel, zinc coated	BEF-KHS-H01	2022465	●	●	●	●
	Zinc diecast	BEF-KHS-KH3	5322626	●	●	●	●
	Zinc plated steel (sheet), Diecast zinc (clamp)	BEF-KHS-N02	2051608	●	●	●	●
		BEF-KHS-N08	2051607	●	●	●	●
	Steel, zinc coated	BEF-MS12G-A	4056054	●	●	●	●
		BEF-MS12G-B	4056055	●	●	●	●
		BEF-MS12L-A	4056052	●	●	●	●
		BEF-MS12L-B	4056053	●	●	●	●
		BEF-MS12Z-A	4056056	●	●	●	●
		BEF-MS12Z-B	4056057	●	●	●	●
	Aluminum	BEF-RMC-D12	5321878	●	●	●	●

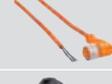
Reflectors

Figure	Accessory type	Dimensions (L x W)	Material	Model name	Part no.	WTB4SL-3	WL4SL-3	WL4SLG-3	WSE4SL-3
	Fine triple reflectors	47 mm x 47 mm	PMMA/ABS	P250F	5308843	-	●	-	-
		∅ 23 mm	PMMA/ABS	P25F-1	5319385	-	●	-	-
		23 mm x 23 mm	PMMA/ABS	P41F	5315128	-	●	●	-
		18 mm x 18 mm	PMMA/ABS	PL10F	5311210	-	●	-	-
		16 mm x 38 mm	PMMA/ABS	PL20F	5308844	-	●	-	-
		28 mm x 56 mm	PMMA/ABS	PL30F	5326523	-	●	-	-
		45 mm x 76 mm	PMMA/ABS	PL81-1F	5325060	-	●	-	-
	Angular	80 mm x 80 mm	PMMA/ABS	PL80A	1003865	-	●	-	-

Figure	Accessory type	Dimensions (L x W)	Material	Model name	Part no.	WTB4SL-3	WL4SL-3	WL4SLG-3	WSE4SL-3
	Special reflectors	25 mm x 25 mm	Stainless steel V4A (1.4404, 316L)	PLH25-D12	2063404	-	●	●	-
				PLH25-M12	2063403	-	●	●	-
		14 mm x 14 mm	Stainless steel V4A (1.4404, 316L)	PLV14-A	2063405	-	●	●	-
	Reflective tape	225 mm x 225 mm	-	REF-AC1000	5319429	-	●	●	-
		56.3 mm x 56.3 mm	-	REF-AC1000-56	4063030	-	●	●	-

Plug connectors and cables

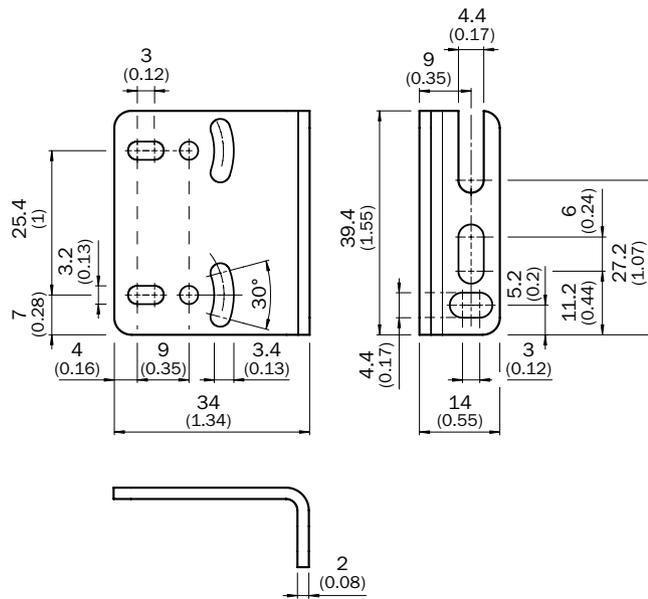
- **Connector type:** Female connector
- **Enclosure rating:** IP 67

Figure	Connection type	Configuration	Jacket material	Cable length	Model name	Part no.	WTB4SL-3	WL4SL-3	WL4SLG-3	WSE4SL-3
	Connector M8, 4-pin	Straight	PVC	2 m	DOL-0804-G02M	6009870	●	●	●	●
				5 m	DOL-0804-G05M	6009872	●	●	●	●
	Angled	PVC	PVC	2 m	DOL-0804-W02M	6009871	●	●	●	●
				5 m	DOL-0804-W05M	6009873	●	●	●	●
	Connector M12, 4-pin	Straight	PVC	2 m	DOL-1204-G02M	6009382	●	●	●	●
				5 m	DOL-1204-G05M	6009866	●	●	●	●
	Angled	PVC	PVC	2 m	DOL-1204-W02M	6009383	●	●	●	●
				5 m	DOL-1204-W05M	6009867	●	●	●	●
	Connector M8, 4-pin	Straight	-	-	DOS-0804-G	6009974	●	●	●	●
		Angled	-	-	DOS-0804-W	6009975	●	●	●	●
	Connector M12, 4-pin	Straight	PBT	-	DOS-1204-G	6007302	●	●	●	●
		Angled	PBT	-	DOS-1204-W	6007303	●	●	●	●

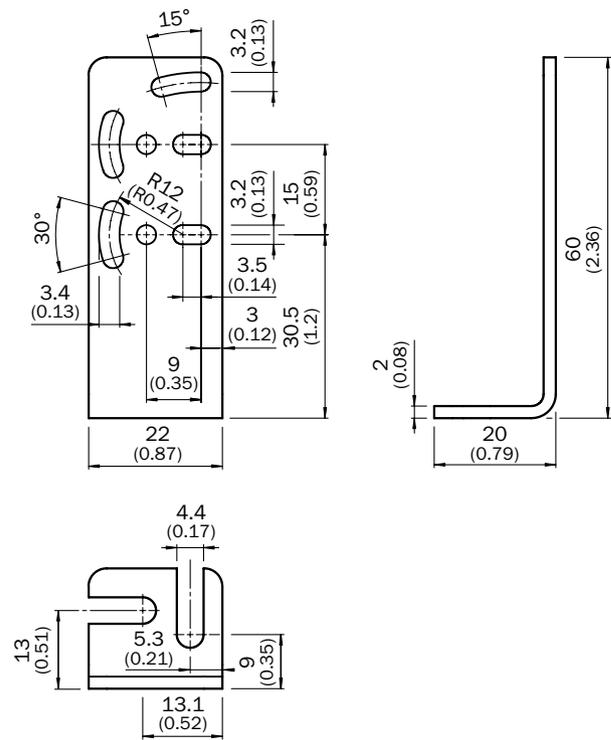
Dimensional drawings Mounting brackets/plates

dimensions in mm (inch)

BEF-W4-A



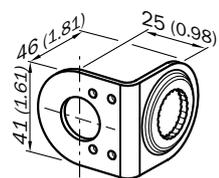
BEF-W4-B



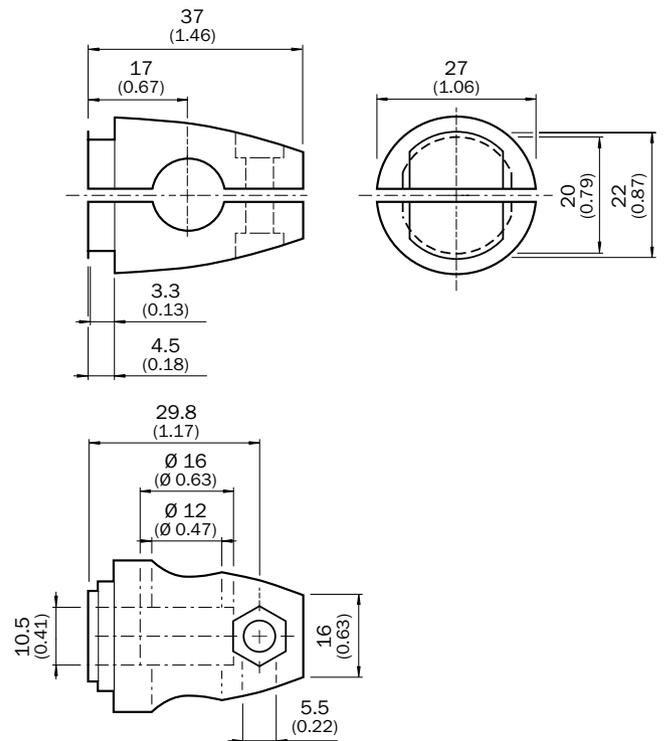
Dimensional drawings Terminal and alignment brackets

dimensions in mm (inch)

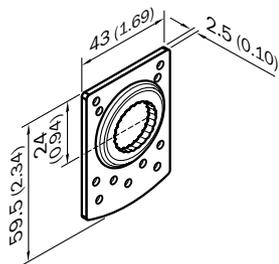
BEF-KHS-H01



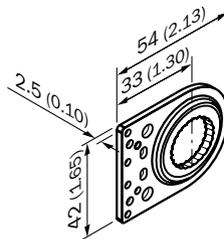
BEF-KHS-KH3



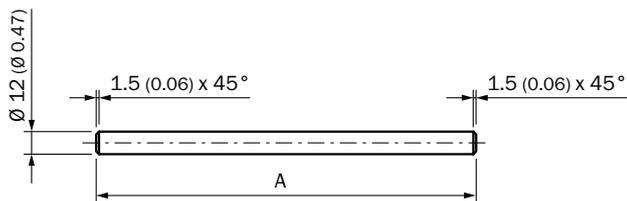
BEF-KHS-N02



BEF-KHS-N08

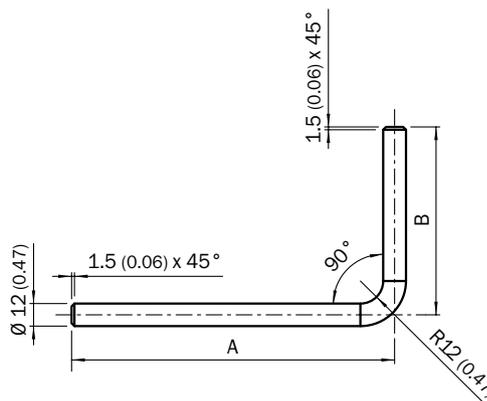


BEF-MS12G-A
BEF-MS12G-B



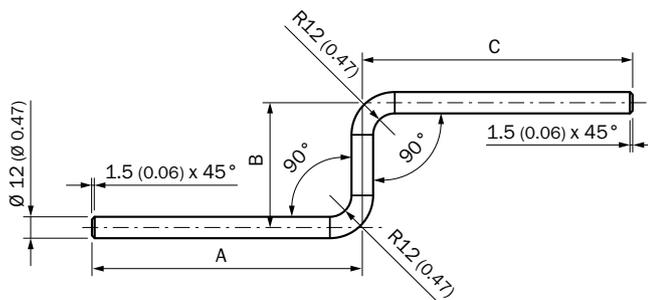
A = 200 mm (BEF-MS12G-A)
A = 300 mm (BEF-MS12G-B)

BEF-MS12L-A
BEF-MS12L-B



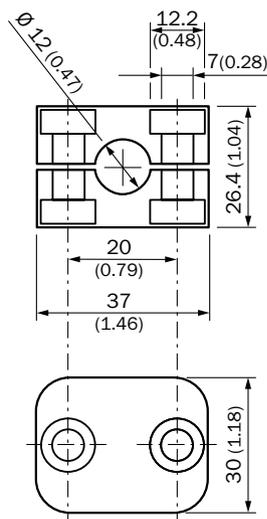
A = 200 mm, B = 150 mm (BEF-MS12L-A)
A = 250 mm, B = 250 mm (BEF-MS12L-B)

BEF-MS12Z-A
BEF-MS12Z-B



A = 150 mm, B = 70 mm, C = 150 mm (BEF-MS12Z-A)
A = 150 mm, B = 70 mm, C = 250 mm (BEF-MS12Z-B)

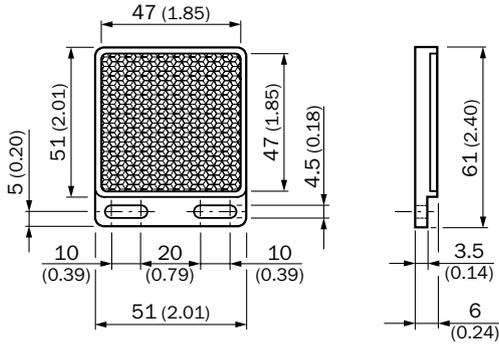
BEF-RMC-D12



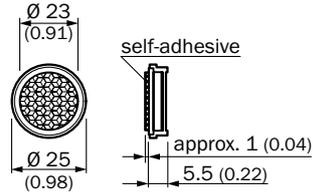
Dimensional drawings Reflectors

dimensions in mm (inch)

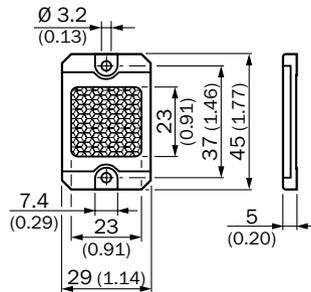
P250F



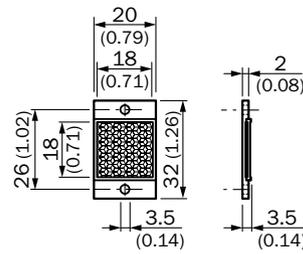
P25F-1



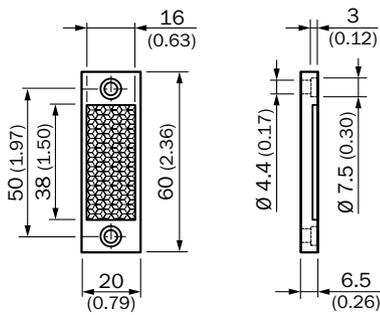
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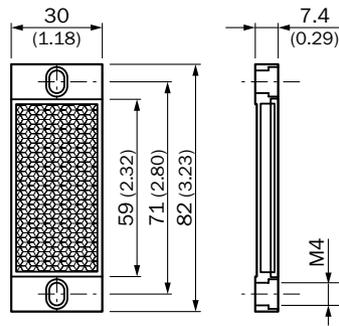
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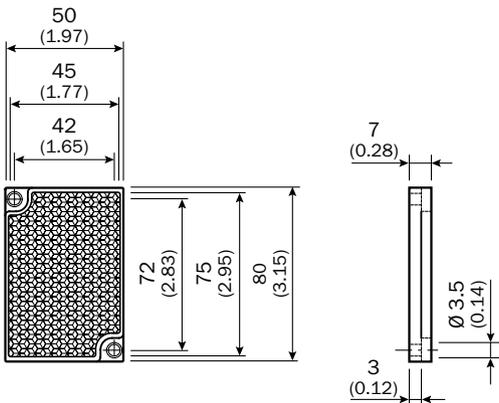
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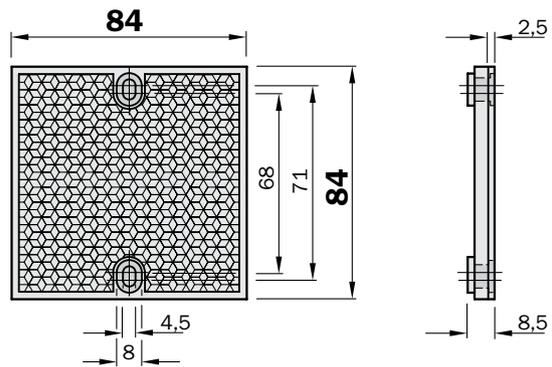
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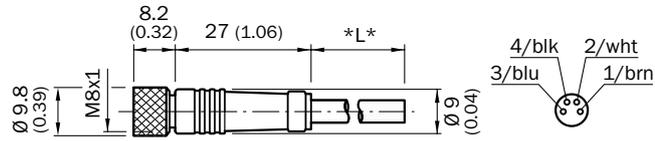
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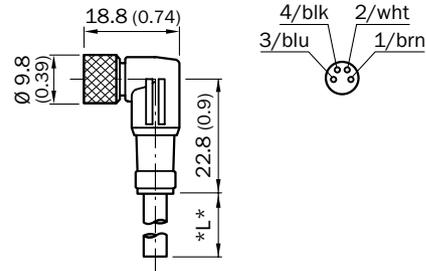
Dimensional drawings Plug connectors and cables

dimensions in mm (inch)

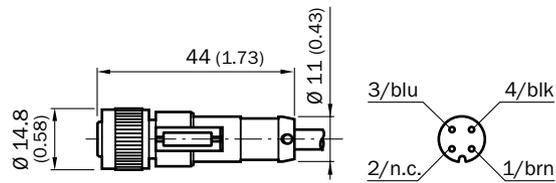
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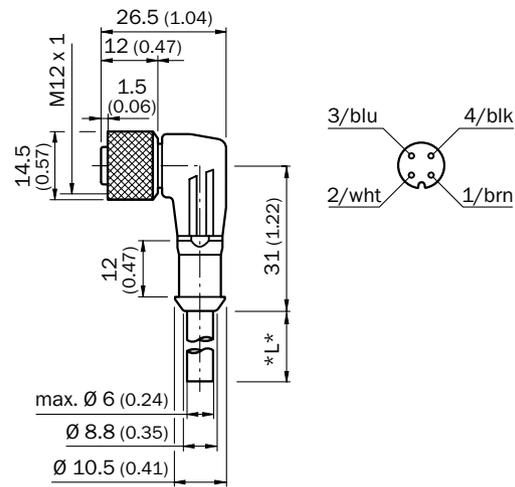
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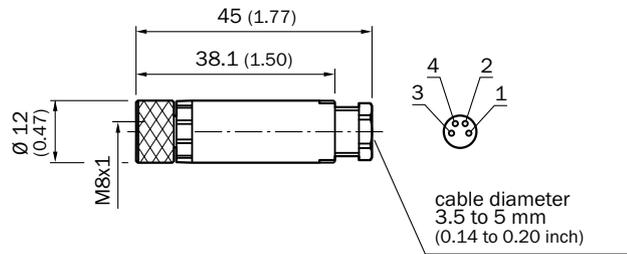
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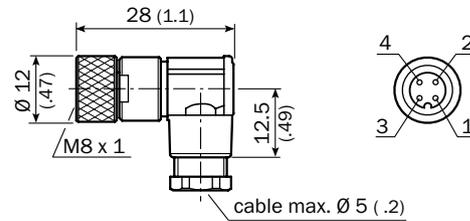
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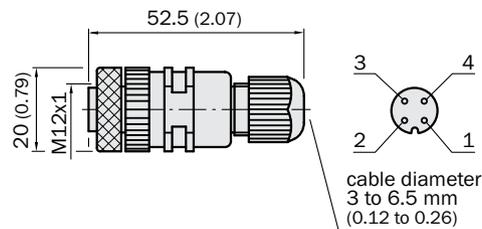
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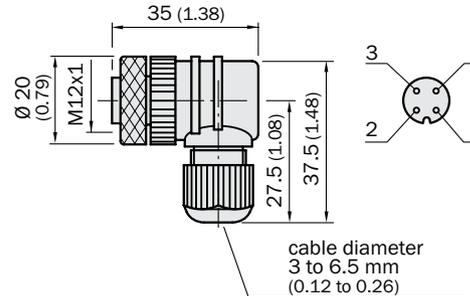
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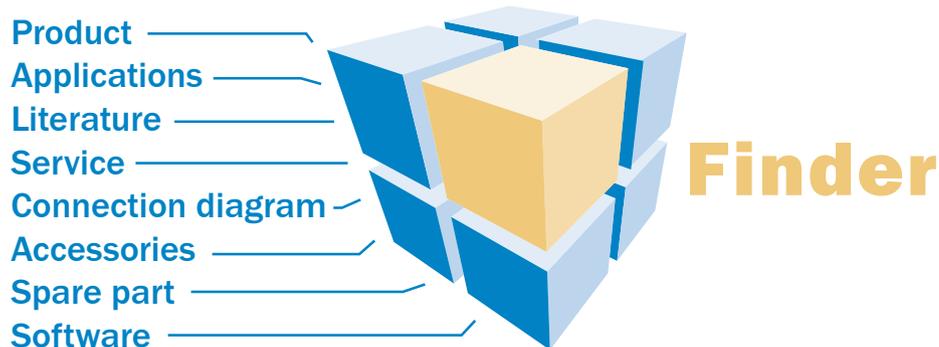
DOS-1204-G



DOS-1204-W



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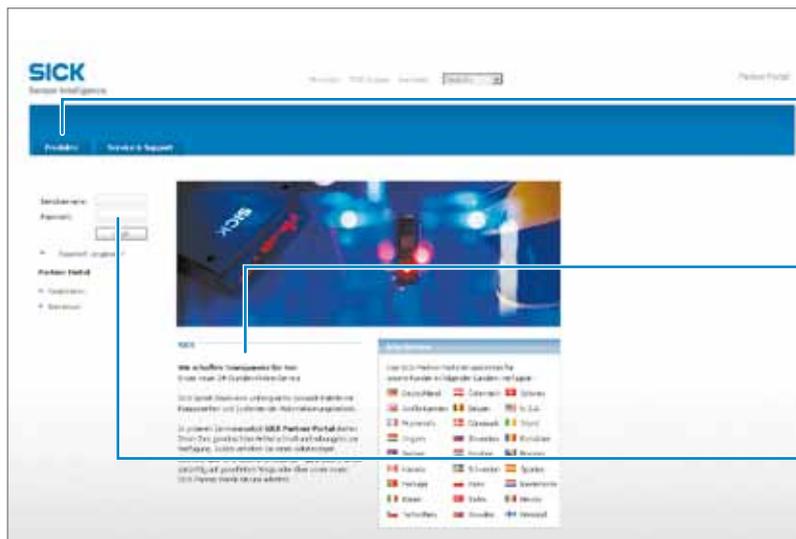
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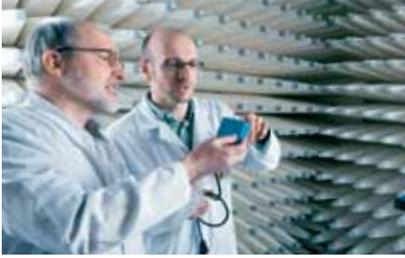
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