



## Miniature Photoelectric Sensors W4S-3 Inox and Inox Hygiene

For reliable production under  
the harshest conditions

## W4S-3 3 Inox and Inox Hygiene: reliable, robust, and versatile

**Exterior – designed for the most demanding hygiene conditions. Inside – proven and innovative technologies that ensure the highest machine efficiency. With two compact stainless steel housings and a wide range of technologies and means of connection. These are the space-saving mini-sensors of the W4S-3 Inox and Inox Hygiene product families.**

### Maximum performance

The high-performance W4S-3 sensors owe their strength to the combination of established W4S-3 product family “best-in-class” optics, which can also reliably detect transparent objects. These miniature photoelectric sensors guarantee the highest level of switching reliability for the highest machine efficiency.

### Optimal resistance

With the washdown design of the Inox sensor, the W4S-3 product family has a housing that can withstand the most intense cleaning and disinfection procedures. Its material resistance to chemicals and its absolute impermeability ensure that it has a high availability even in harsh environments.



## From the design to the material – a clean, clever solution

### Housing design according to EHEDG guidelines

The housing design of the W4S-3 Inox Hygiene represents the ideal solution for modern packaging and processing machines in the area of commercial goods, such as food and medicine. Besides the design, the right material is critical: For both housing variants only selected high-performance plastics are used. In addition to their excellent chemical and thermal characteristics they are highly suited for coming into contact with food.



### Individual integration options

For every application area and every requirement – every user of the W4S-3 Inox and Inox Hygiene product families will find a suitable variant:

- Through-beam photoelectric sensors, photoelectric retro-reflective sensors or proximity sensors
- W4S-3 Inox with M12 adapter threads and mounting rods
- W4S-3 Inox Hygiene with D12 adapter shaft and hygienic mounting system
- M8 or M12 connection plug
- Cable variations with and without plug
- With and without teach-in button

### W4S-3 Inox and Inox Hygiene at a glance

- Washdown and Hygiene variants available
- Intelligent hygiene design, according to EHEDG guidelines
- High performance plastics, integrated into V4A/316L stainless steel housing
- Absolutely impermeable operating element via teach diaphragm
- High stability as per ECOLAB, as well as IP 69K, IP 68 and IP 67
- High-quality hygienic integration by means of two mounting systems without threads, mounting brackets or joints

## Perfection in a stainless steel housing: miniature photoelectric sensors W4S-3 Inox and Inox Hygiene



### Smooth stainless steel housing

The V4A/316L alloy is extremely durable, rust-free and has a long service life. Bacteria can not gain a hold on the smooth surfaces and cleaning agents run off slowly.

**For aggressive cleaning.**



### Sensor core with top features

SICK PinPoint technology for precise, active background suppression by means of two emitter LEDs and suppression of ambient light as well as transparent object detection.

**For the highest machine efficiency.**



### 500 variants

Enormous number of variants covering practically all requirements and customer wishes.

**For maximum flexibility.**



### PMMA front screen

Extremely resistant, especially coated PMMA front screen with perfect optical properties.

**For highly reliable functioning.**



## Intelligently designed down to the last detail



### Embedded indicator LED



Embedded flush in the surface indicator LEDs light up very brightly and are very visible.

**For the fastest detection possible.**

### Operator comfort included



Very comfortable control via cable and/or flush-integrated teach diaphragm for direct input. IO-Link-capable version allows trouble-free monitoring of processes.

**For the most comfortable operation.**

### Completely EHEDG compliant



Two innovative mounting concepts make completely edge-free mounting of the sensors possible.

**For absolutely hygienic systems.**

### M12 housing plug



For absolute impermeability at the interface between sensor and cable.

**For highest system availability.**

## The perfect sensor for industries with the highest hygiene demands

The long service life of the miniature photoelectric sensors W4S-3 Inox and Inox Hygiene in harsh environments ensures the production plant is highly available. And since these sensors no longer represent a critical monitoring point as per HACCP, they reduce the work required for bacteriological investigations.

### A compelling choice for the food and beverage industry

In the wet surroundings of machines and components, the W4S-3 Inox sensor proves its reliability and resistance in the production of food and beverages. The true challenge however is the daily high-pressure cleaning of the plant, which represents a high thermal and mechanical stress. In places where it is necessary to prevent bacteria and microorganisms through the use of chemicals, the W4S-3 Inox can be used without hesitation.





## Miniature photoelectric sensor W4S-3: hygiene design at its best



### Feels at home in the pharmaceutical industry

Disinfecting the machines daily is an absolutely basic prerequisite in the pharmaceutical industry. Cleaning agents and disinfectants used here require a high-quality stainless steel housing and maximum resistance. The long service life of the W4S-3 Inox and Inox Hygiene provides the basic conditions to ensure that the prescribed cleaning plans can be carried out without machine downtime.

### Meets solar industry requirements without difficulty

The core processes in the production of wafers require the highest level of robustness: on the one hand because sensors come into contact with acid when the ingots are divided, and on the other because of the moistening of the wafers during separation. The W4S-3 Inox easily withstand these influences. With this stainless steel sensor, plant downtimes and the associated maintenance and repair costs are a thing of the past.





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

### 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, black 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







Miniature photoelectric sensors

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W4S-3 Inox – highest reliability, maximum resistance and endless possibilities



### Product description

The W4S-3 INOX photoelectric sensor product family in Washdown design combines a rugged and watertight 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 avail-

ability due to water tight teach-in button 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)
- Modern electrical connection available – M12 connector with pin casting
- Resistant to a variety of common cleaning and disinfection agents
- PinPoint LED technology provides a highly visible laser-like light spot
- Teach-in via stainless steel pushbutton with a stainless steel membrane
- Remote monitoring and quick diagnostics via IO-Link (optional)

### 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
- Remote monitoring and quick diagnostics via IO-Link



**Stainless Steel**



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## Detailed technical data

	WTB4S-3V	WTF4S-3V	WL4S-3V	WSE4S-3V
Light spot (distance)	Ø 6.5 mm (150 mm) <sup>1)</sup> Ø 2.5 mm (100 mm) <sup>2)</sup> Ø 2.5 mm (50 mm) <sup>3)</sup>	Ø 6.5 mm (150 mm)	Ø 45 mm (1.5 m)	Ø 130 mm (2 m)
Housing design (light emission)	Cuboid, slim			
Light source <sup>4)</sup>	PinPoint LED			
Type of light	Visible red light			
Wavelength	650 nm			
Teach-in	Single teach-in button and/or teach-in via cable <sup>5)</sup>			-

<sup>1)</sup> At sensing distance max. ≤ 500 mm.

<sup>2)</sup> At sensing distance max. ≤ 280 mm.

<sup>3)</sup> At sensing distance max. ≤ 120 mm.

<sup>4)</sup> Average service life 100,000 h at T<sub>A</sub> = +25 °C.

<sup>5)</sup> Setting via cable (ET): connect white cable or PIN to L+ (PNP) or to M (NPN) in line with the desired sensitivity > 2 ... < 8 s or > 8 s.

## Mechanics/electronics

	WTB4S-3V	WTF4S-3V	WL4S-3V	WSE4S-3V
Supply voltage <sup>1)</sup>	10 V DC ... 30 V DC			
Residual ripple <sup>2)</sup>	< 5 V <sub>pp</sub>			
Power consumption <sup>3)</sup>	≤ 30 mA			
Power consumption, sender <sup>3)</sup>	-	-	-	≤ 20 mA
Power consumption, receiver <sup>3)</sup>	-	-	-	≤ 20 mA
Output current I <sub>max.</sub>	≤ 100 mA			
Response time	< 0.5 ms <sup>4)</sup>			
Switching frequency <sup>5)</sup>	1,000 Hz			
Connection type	Connector Cable with plug, 150 mm, PVC <sup>6)</sup> Connector, 4-pin Cable, 2 m, PVC, 0.14 mm <sup>2</sup> <sup>6)</sup> (depending on type)	Connector	Connector Cable with plug, 150 mm, PVC <sup>6)</sup> Cable, 2 m, PVC, 0.14 mm <sup>2</sup> <sup>6)</sup> Connector, PVC <sup>6)</sup> Cable, 5 m, PVC, 0.14 mm <sup>2</sup> <sup>6) 7)</sup> (depending on type)	Connector Cable, 2 m, PVC, 0.14 mm <sup>2</sup> <sup>6)</sup> Cable with plug, 150 mm, PVC <sup>6)</sup> (depending on type)
Circuit protection	A <sup>8)</sup> B <sup>9)</sup> C <sup>10)</sup>			
Protection class	III			
Weight				
Connector M8, 4-pin	40 g	40 g	40 g	-
Cable with plug, M12, 4-pin	60 g	60 g	-	60 g
Connector M8, 3-pin	40 g	40 g	-	40 g
Cable with plug, M8, 3-pin	50 g	50 g	-	50 g
Cable, 4-wire	80 g	80 g	-	-
Connector M12, 4-pin	45 g	60 g	-	45 g
Cable with plug, M8, 4-pin	50 g	-	-	-
Cable, 3-wire	80 g	80 g / 125 g <sup>11)</sup>	-	80 g / 125 g <sup>11)</sup>
Polarisation filter	-		✓	-

	WTB4S-3V	WTF4S-3V	WL4S-3V	WSE4S-3V
<b>IO-Link</b>	COM2	-		
<b>Housing material</b>	Stainless steel 316L/V4A			
<b>Enclosure rating</b>	IP 66, IP 67, IP 68, IP 69K <sup>12)</sup>	IP 66, IP 67, IP 68, IP 69K <sup>12)</sup>	IP 66, IP 67, IP 68, IP 69K <sup>12)</sup>	IP 66, IP 67, IP 68, IP 69K <sup>12)</sup>
<b>Test input sender off</b>	-			TE to 0 V
<b>Ambient temperature, operation</b>	-30 °C ... +70 °C <sup>13)</sup> -30 °C ... +60 °C			
<b>Ambient temperature, storage</b>	-30 °C ... +75 °C			

<sup>1)</sup> Limit values, reverse-polarity protected, operation in short-circuit protected network, max. 8 A.

<sup>2)</sup> May not exceed or fall short of  $V_S$ .

<sup>3)</sup> Without load.

<sup>4)</sup> Signal transit time with resistive load.

<sup>5)</sup> With light/dark ratio 1:1.

<sup>6)</sup> Do not bend below 0 °C.

<sup>7)</sup> Special cable lengths for WL4S-3F1432V (1055380).

<sup>8)</sup> A =  $V_S$  connections reverse-polarity protected.

<sup>9)</sup> B = inputs and output reverse-polarity protected.

<sup>10)</sup> C = interference suppression.

<sup>11)</sup> Sensor with cable, 3-wire, 5m.

<sup>12)</sup> Only in case of correctly mounted IP 69K connecting cable.

<sup>13)</sup> At  $V_S \leq 24$  V and  $I_A < 30$  mA.



## Ordering information

## WTB4S-3V

- **Sensor principle:** Photoelectric proximity sensor
- **Detection principle:** Background suppression

Sensing range max.	Sensing range	Switching output	Switching mode	Adjustment	IO-Link	Connection	Model name	Part no.
≤ 500 mm <sup>1)</sup>	10 mm ... 350 mm <sup>1)</sup>	PNP	Light-switching	Cable	-	Connector M8, 4-pin	WTB4S-3P2265V	1045091
						Cable with plug, M12, 4-pin	WTB4S-3P3465V	1046394
				Teach	-	Connector M8, 3-pin	WTB4S-3P2162V	1046384
						Cable with plug, M8, 3-pin	WTB4S-3P3162V	1046387
			Dark-switching	Cable	-	Connector M8, 4-pin	WTB4S-3F2265V	1048208
						Connector M8, 3-pin	WTB4S-3F2162V	1046389
				Teach	-	Cable with plug, M8, 3-pin	WTB4S-3F3162V	1046390
						Cable, 4-wire	WTB4S-3P1162V	1046388
			Complementary	Teach	-	Connector M8, 4-pin	WTB4S-3P2262V	1046383
						Connector M12, 4-pin	WTB4S-3P2462V	1054675
						Cable with plug, M8, 4-pin	WTB4S-3P3262V	1046385
						Cable with plug, M12, 4-pin	WTB4S-3P3462V	1046386
		Light-switching	Teach, cable	-	Connector M8, 4-pin	WTB4S-3P2264V	1047651	
					Cable with plug, M12, 4-pin	WTB4S-3P3464V	1048015	
			Complementary	Teach		Connector M8, 4-pin	WTB4SC-3P2262V	1045092
						Cable with plug, M12, 4-pin	WTB4SC-3P3462V	1046395
		NPN	Light-switching	Cable	-	Connector M8, 4-pin	WTB4S-3N2265V	1047620
						Connector M8, 3-pin	WTB4S-3N2162V	1046392
				Cable, 3-wire	WTB4S-3N1362V	1046393		
			Complementary	Teach	-	Cable, 4-wire	WTB4S-3N1162V	1046391
Connector M12, 4-pin	WTB4S-3N2462V					1054703		

Sensing range max.	Sensing range	Switching output	Switching mode	Adjustment	IO-Link	Connection	Model name	Part no.
≤ 280 mm <sup>1)</sup>	10 mm ... 150 mm <sup>1)</sup>	PNP	Light-switching	Teach, cable	-	Connector M8, 4-pin	WTB4S-3P2204VS02	1047652
				Cable	-	Connector M12, 4-pin	WTB4S-3P2205VS01	1046214
				Teach	-	Connector M8, 4-pin	WTB4S-3P2234VS05	1050833
			Dark-switching	Teach, cable	-	Connector M8, 4-pin	WTB4S-3F2234VS08	1053075
			Complementary	Teach	-	Connector M12, 4-pin	WTB4S-3P2402VS09	1054706
≤ 120 mm <sup>1)</sup>	10 mm ... 120 mm <sup>1)</sup>	PNP	Light-switching	Teach	-	Connector M8, 3-pin	WTB4S-3P2132V	1046397
						Cable with plug, M8, 3-pin	WTB4S-3P3132V	1046400
				Cable	-	Connector M8, 4-pin	WTB4S-3P2235V	1045093
						Cable with plug, M12, 4-pin	WTB4S-3P3435V	1046407
						Cable with plug, M12, 4-pin	WTB4S-3P3434V	1048016
			Dark-switching	Teach	-	Connector M8, 3-pin	WTB4S-3F2132V	1046404
						Cable with plug, M8, 3-pin	WTB4S-3F3132V	1046401
			Complementary	Teach	-	Cable, 4-wire	WTB4S-3P1132V	1046402
							Connector M8, 4-pin	WTB4S-3P2232V
						Cable with plug, M8, 4-pin	WTB4S-3P3232V	1046398
		WTB4S-3P3432V					1046399	
		Connector M12, 4-pin					WTB4S-3P2432V	1054672
		✓				Connector M8, 4-pin	WTB4SC-3P2232V	1046409
						Cable with plug, M12, 4-pin	WTB4SC-3P3432V	1046408
		NPN	Light-switching	Teach	-	Cable, 3-wire	WTB4S-3N1332V	1046406
						Connector M8, 3-pin	WTB4S-3N2132V	1046405
			Complementary	Teach	-	Cable, 4-wire	WTB4S-3N1132V	1046403
Connector M12, 4-pin	WTB4S-3N2432V					1054674		

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

## WL4S-3V

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

Sensing range max.	Sensing range	Switching output	Switching mode	Adjustment	Alarm output	Connection	Model name	Part no.
≤ 4 m <sup>1)</sup>	0 m ... 3 m <sup>1)</sup>	PNP	Light-switching	-	-	Cable with plug, M8, 3-pin	WL4S-3P3130V	1046414
						Connector M8, 3-pin	WL4S-3P2130V	1046413
						Cable, 3-wire	WL4S-3P1330V	1048044
			Dark-switching	-	-	Connector M8, 3-pin	WL4S-3F2130V	1045096
						Cable with plug, M8, 3-pin	WL4S-3F3130V	1046416
						Cable, 3-wire	WL4S-3F1330V	1046417
		Complementary	-	-	Connector M8, 4-pin	WL4S-3P2230V	1045095	
					Cable with plug, M12, 4-pin	WL4S-3P3430V	1046415	
					Connector M12, 4-pin	WL4S-3P2430V	1054707	
		NPN	Dark-switching	-	-	Connector M8, 3-pin	WL4S-3E2130V	1045097
						Cable with plug, M8, 3-pin	WL4S-3E3130V	1048046
						Cable, 3-wire	WL4S-3E1330V	1046420
			Complementary	-	-	Cable, 4-wire	WL4S-3N1130V	1046418
						Connector M12, 4-pin	WL4S-3N2430V	1054712

Sensing range max.	Sensing range	Switching output	Switching mode	Adjustment	Alarm output	Connection	Model name	Part no.			
≤ 5 m <sup>1)</sup>	0 m ... 3 m <sup>1)</sup>	PNP	Light-switching	Teach	-	Cable, 3-wire	WL4S-3P1332V	1046427			
						Connector M8, 3-pin	WL4S-3P2132V	1046424			
						Cable with plug, M8, 3-pin	WL4S-3P3132V	1046425			
			Dark-switching	Teach	-	Cable, 3-wire	WL4S-3F1332V	1046430			
						Connector M8, 3-pin	WL4S-3F2132V	1046428			
						Cable with plug, M8, 3-pin	WL4S-3F3132V	1046429			
						Connector M8, 4-pin	WL4S-3V2232V	1046422			
						Connector M8, 4-pin	WL4S-3P2232V	1046421			
						Connector M12, 4-pin	WL4S-3P2432V	1054715			
		Complementary	Teach	-	Cable with plug, M12, 4-pin	WL4S-3P3432V	1046426				
					NPN	Light-switching	Teach	-	Cable, 3-wire	WL4S-3N1332V	1046434
									Connector M8, 3-pin	WL4S-3N2132V	1046432
		Cable with plug, M8, 3-pin	WL4S-3N3132V	1046433							
		Dark-switching	Teach	-		Cable, 3-wire	WL4S-3E1332V	1046437			
						Connector M8, 3-pin	WL4S-3E2132V	1046435			
						Cable with plug, M8, 3-pin	WL4S-3E3132V	1046436			
		Complementary	Teach	-	Cable, 4-wire	WL4S-3N1132V	1046431				
					Connector M12, 4-pin	WL4S-3N2432V	1054722				

<sup>1)</sup> Relating to the reflector PL80A.

<sup>2)</sup> Cable length: 5 m.



## WTF4S-3V

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** foreground suppression
- **Sensing distance max.:** ≤ 200 mm
- **Switching output:** PNP
- **Connection:** connector M8, 4-pin

Switching mode	Adjustment	Model name	Part no.
Light-switching	Cable	WTF4S-3P2265V	1045094
Complementary	Teach	WTF4S-3P2262V	1046410

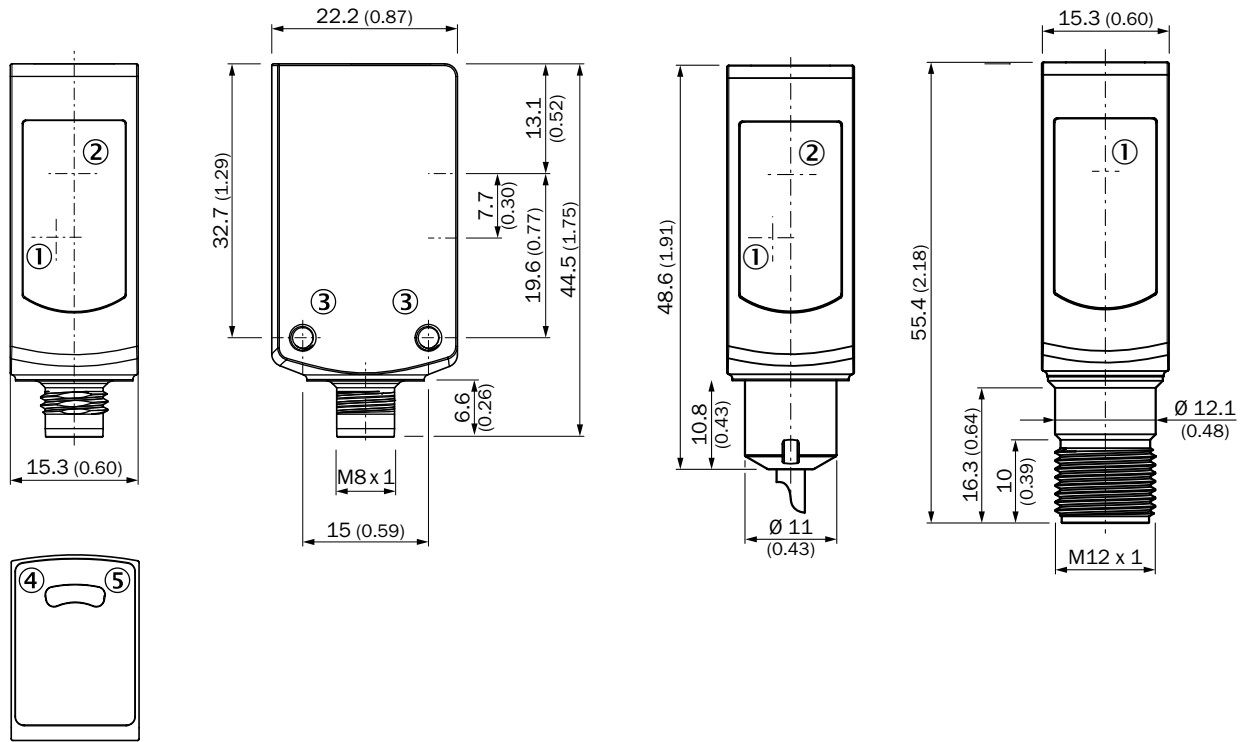
## WSE4S-3V

- **Sensor principle:** Through-beam photoelectric sensor
- **Sensing range max.:** ≤ 5 m
- **Adjustment:** no adjustment possibility

Sensing range	Switching output	Switching mode	Connection	Model name	Part no.
0 m ... 4.5 m	PNP	Light-switching	Cable, 3-wire	WSE4S-3P1330V	1052887
			Connector M8, 3-pin	WSE4S-3P2130V	1052893
			Cable with plug, M8, 3-pin	WSE4S-3P3130V	1052889
		Dark-switching	Cable, 3-wire	WSE4S-3F1330V	1052880
			Connector M8, 3-pin	WSE4S-3F2130V	1052891
			Cable with plug, M8, 3-pin	WSE4S-3F3130V	1052883
			Cable with plug, M12, 4-pin	WSE4S-3F3430V	1052885
		Complementary	Connector M12, 4-pin	WSE4S-3P2430V	1054784
		NPN	Light-switching	Cable, 3-wire	WSE4S-3N1330V
	Connector M8, 3-pin			WSE4S-3N2130V	1052878
	Dark-switching		Cable, 3-wire	WSE4S-3E1330V	1052869
			Connector M8, 3-pin	WSE4S-3E2130V	1052877
	Complementary		Connector M12, 4-pin	WSE4S-3N2430V	1054786

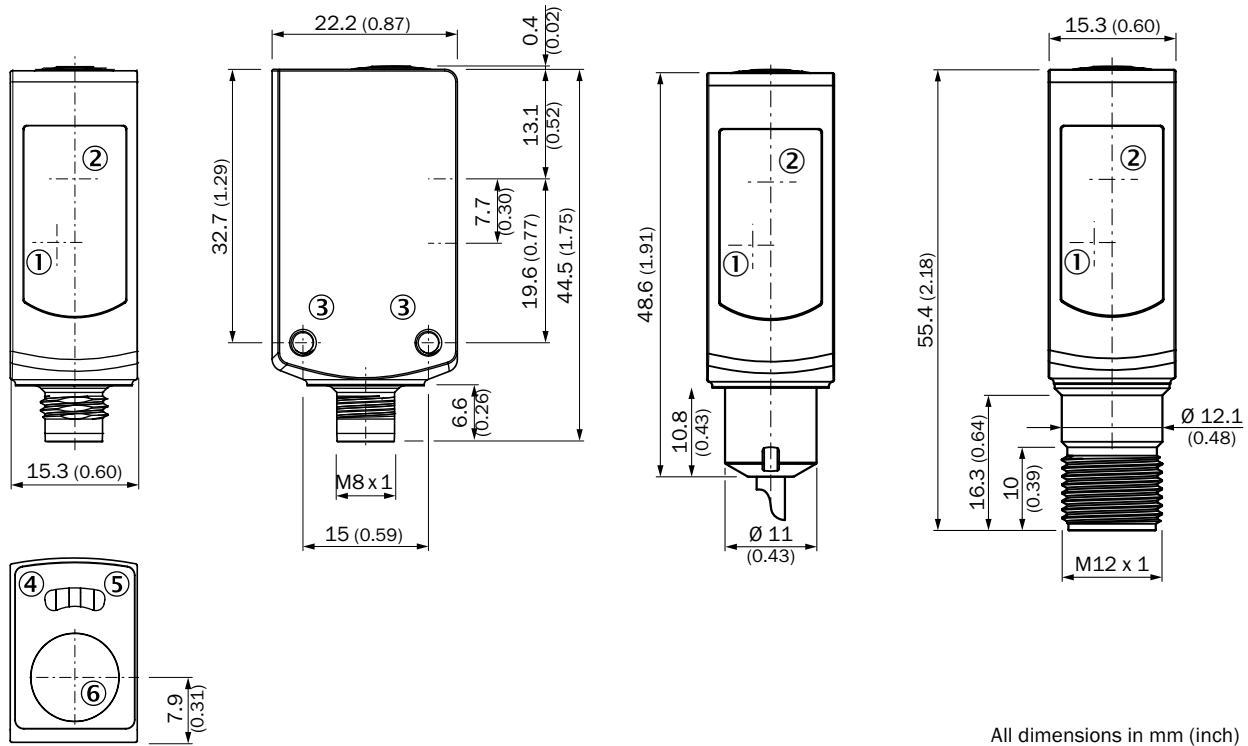
Dimensional drawings

WTB4S-3V, WTF4S-3V, no single teach-in button



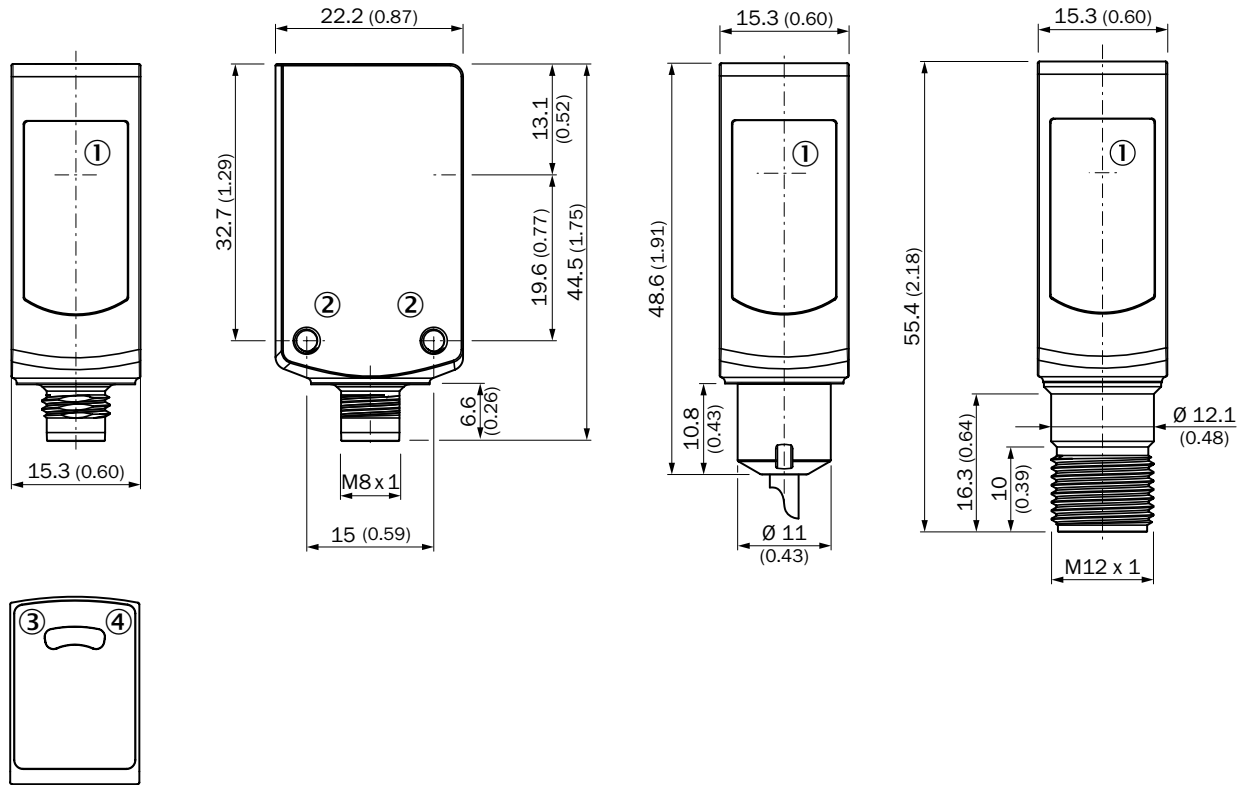
- ① Centre of receiver's optical axis
- ② Center of optical axis, sender
- ③ Threaded mounting hole M3
- ④ Status indicator LED, yellow: status of received light beam
- ⑤ Status indicator LED green: power on

**WTB4S-3V, WTF4S-3V, with 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

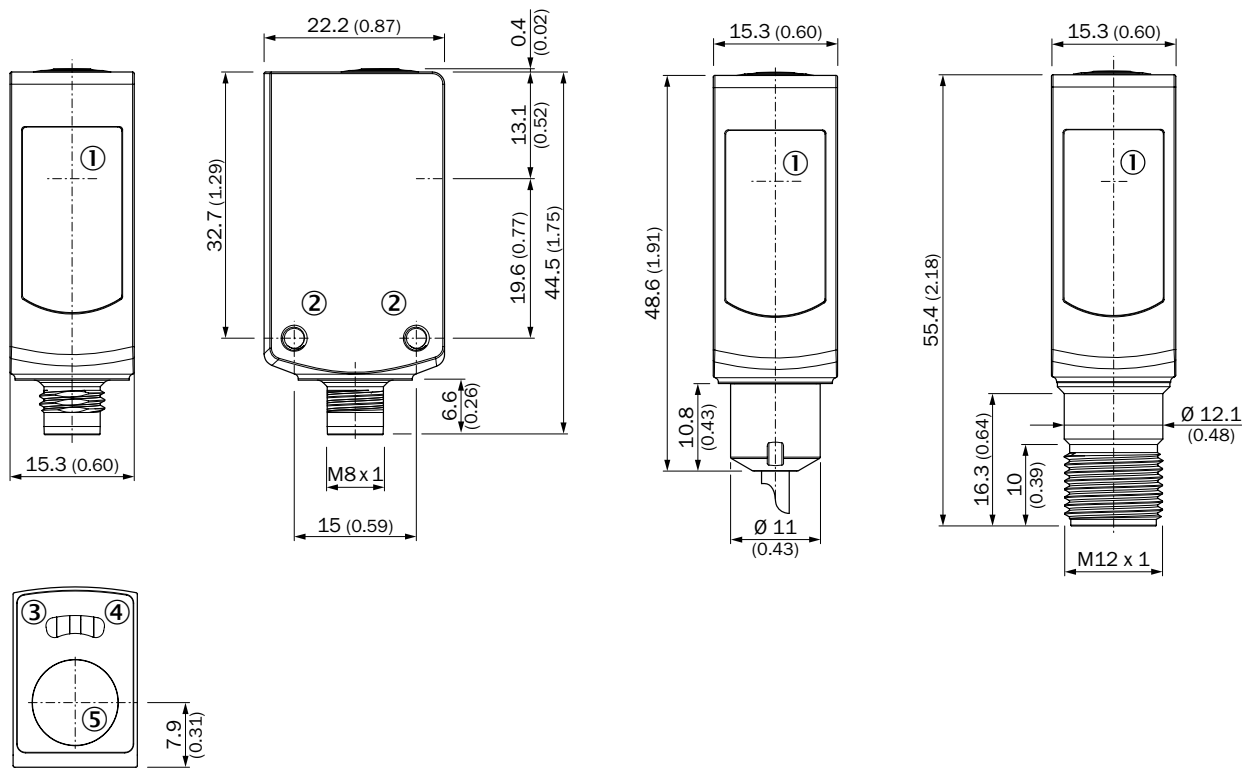
**WL4S-3V, WLG4S-3V, WSE4S-3V no single teach-in button**



All dimensions in mm (inch)

- 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, WLG4S-3V, WSE4S-3V with single teach-in button**



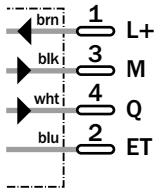
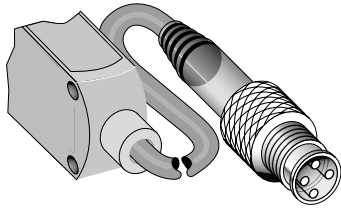
All dimensions in mm (inch)

- 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

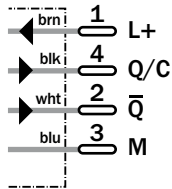
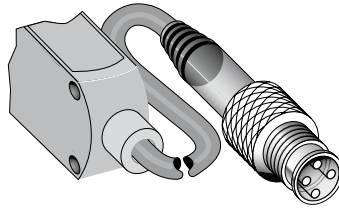
Connection type and diagram

WTB4-3V, WTF4-3V, WL4S-3V, WLG4S-3V

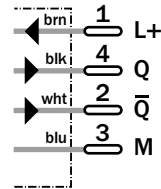
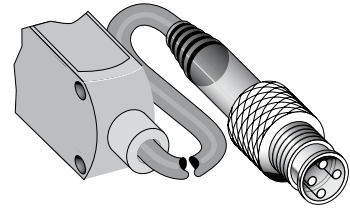
Teach-in via cable



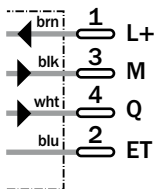
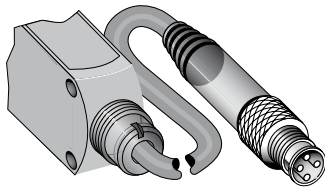
Single teach-in button + IO-Link



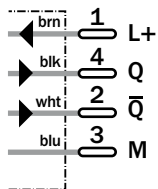
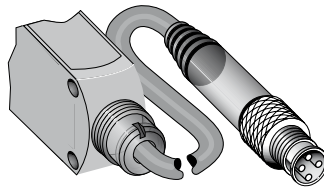
Single teach-in button or fix adjustment



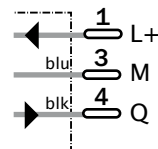
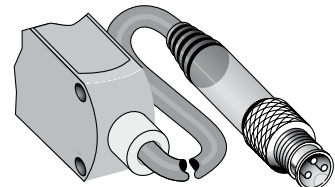
Teach-in via cable



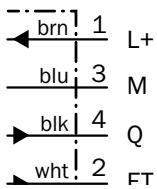
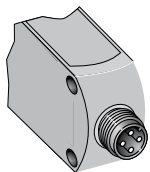
Single teach-in button or fix adjustment



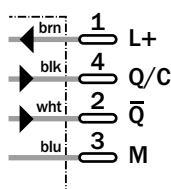
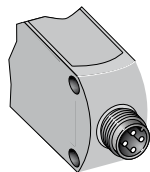
Single teach-in button or fix adjustment



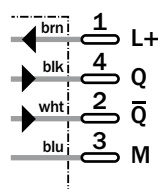
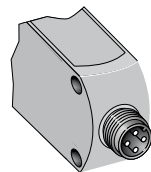
Teach-in via cable



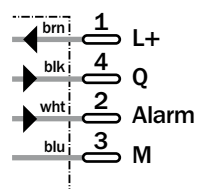
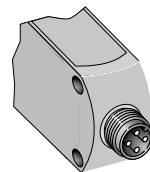
Single teach-in button + IO-Link



Single teach-in button or fix adjustment

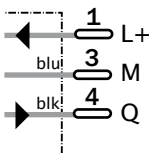
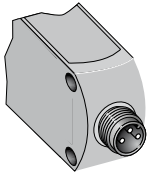


Single teach-in button + alarm output

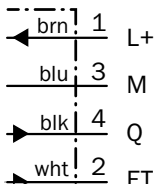
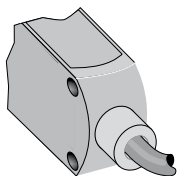




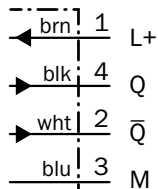
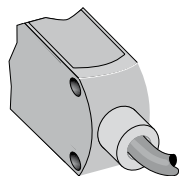
**Single teach-in button  
or fix adjustment**



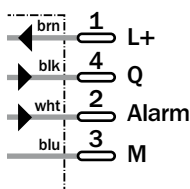
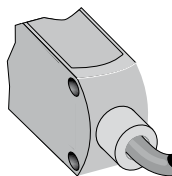
**Teach-in via cable**



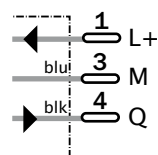
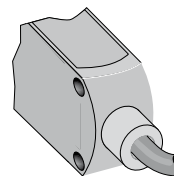
**Single teach-in button  
or fix adjustment**



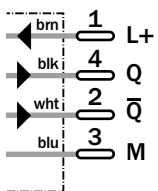
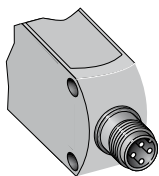
**Single teach-in button  
+ alarm output**



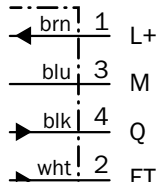
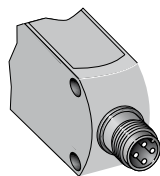
**Single teach-in button  
or fix adjustment**



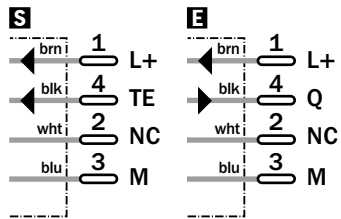
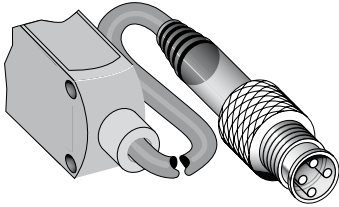
**Single teach-in button  
or fix adjustment**



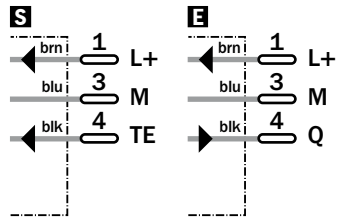
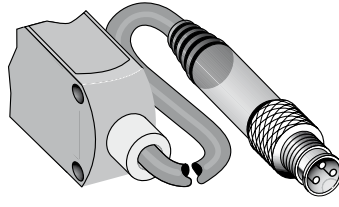
**Teach-in via cable**



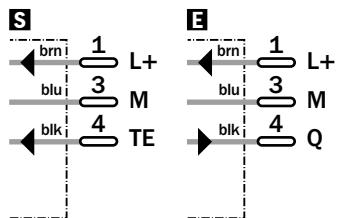
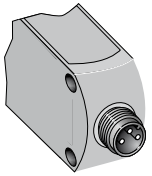
Fix adjustment + Test input



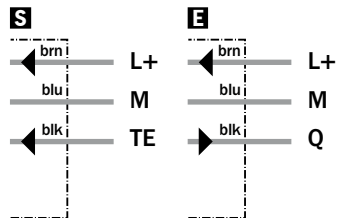
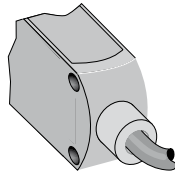
Fix adjustment + Test input



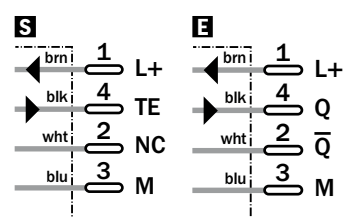
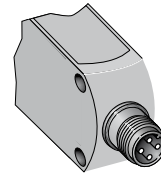
Fix adjustment + Test input



Fix adjustment + Test input



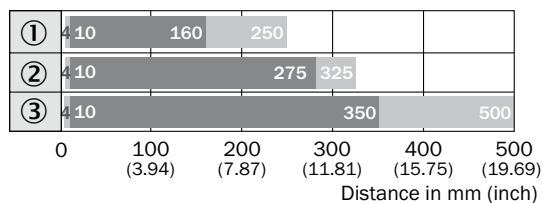
Fix adjustment + Test input



**S** Sender  
**E** Receiver

## Sensing distance

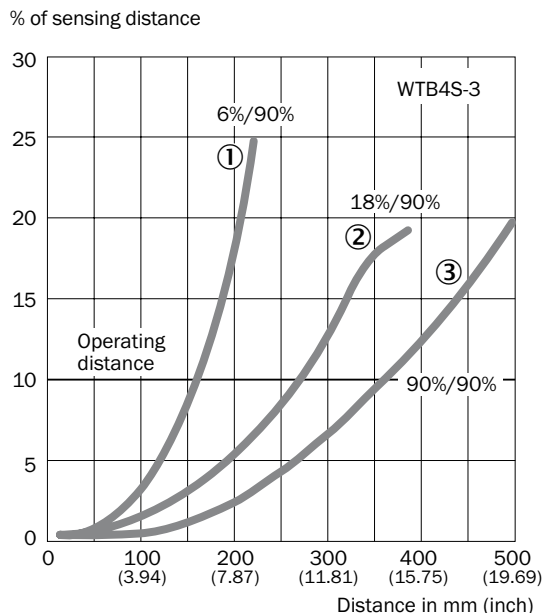
### WTB4S-3, sensing distance, 500 mm



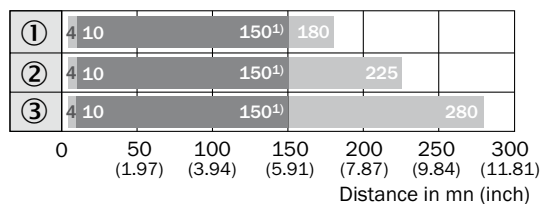
■ Operating distance    ■ Sensing distance typ. max.

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

### WTB4S-3, sensing distance, 500 mm



### WTB4S-3, sensing distance, 280 mm

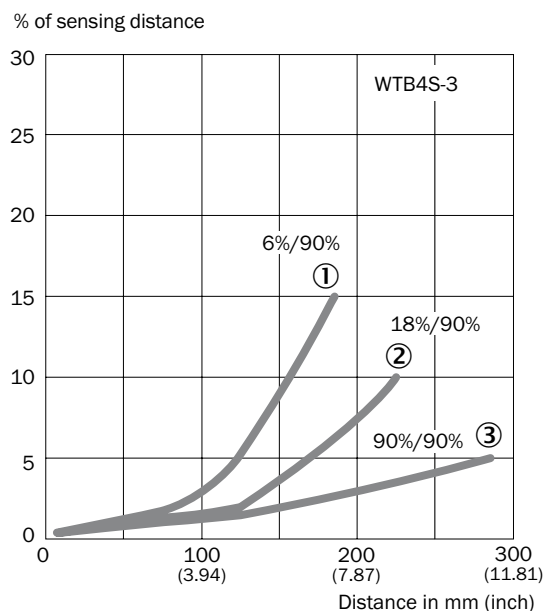


■ Operating distance    ■ Sensing distance typ. max.

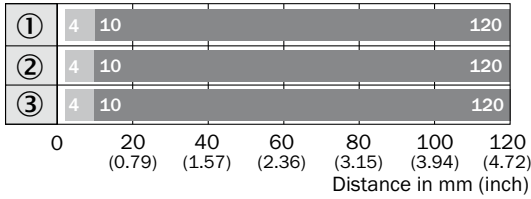
- ① Sensing distance on black, 6 % remission
- ② Sensing distance on grey, 18 % remission
- ③ Sensing distance on whitw, 90 % remission

<sup>1)</sup> Due to the focus of the light spot at 100 mm (3.94 inch)

### WTB4S-3, sensing distance, 280 mm



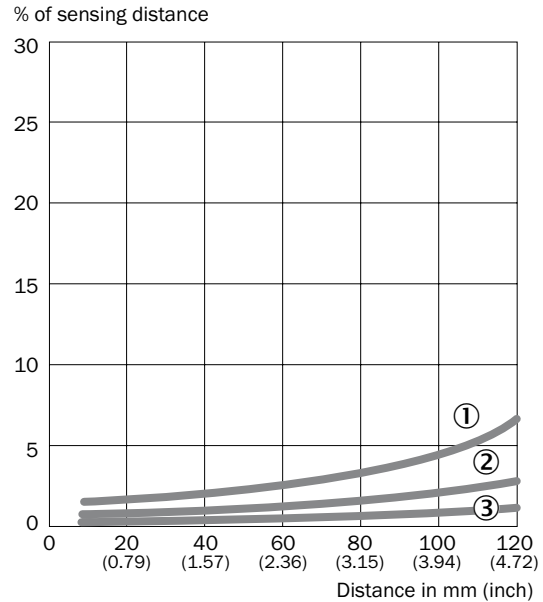
**WTB4S-3, sensing distance, 120 mm**



■ Operating distance ■ Sensing distance max. typ.

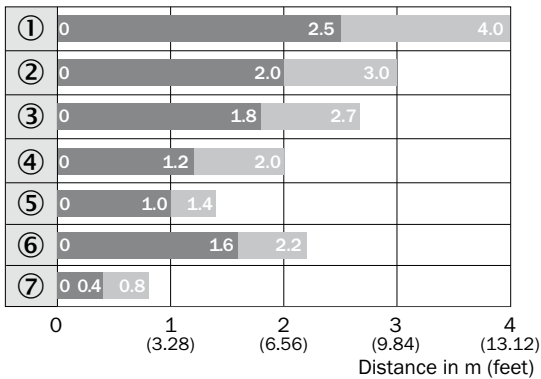
- ① Sensing distance on black, 6 % remission
- ② Sensing distance on grey, 18 % remission
- ③ Sensing distance on white, 90 % remission

**WTB4S-3, sensing distance, 120 mm**



**Sensing range**

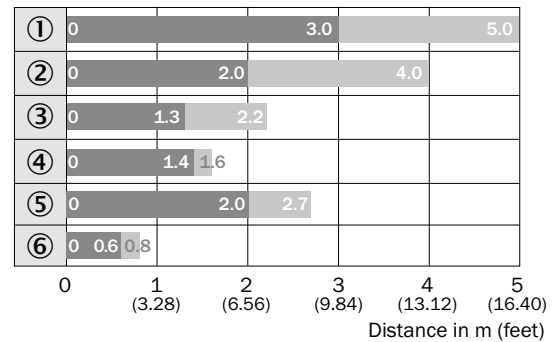
**WL4S-3, WLG4S-3, sensing range 4 m**



■ Operating range ■ Sensing range typ. max.

- ① Reflector type PL80A
- ② Reflector type PL250F
- ③ Reflector type PL40A
- ④ Reflector type PL20A
- ⑤ Reflector type PL10F
- ⑥ Reflector type P250 CHEM
- ⑦ Reflective tape REF-IRF-56

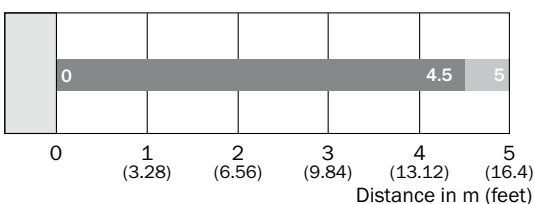
**WL4S-3, WLG4S-3, sensing range 5 m**



■ Operating range ■ Sensing range typ. max.

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

**WSE4S-3, sensing range 5 m**

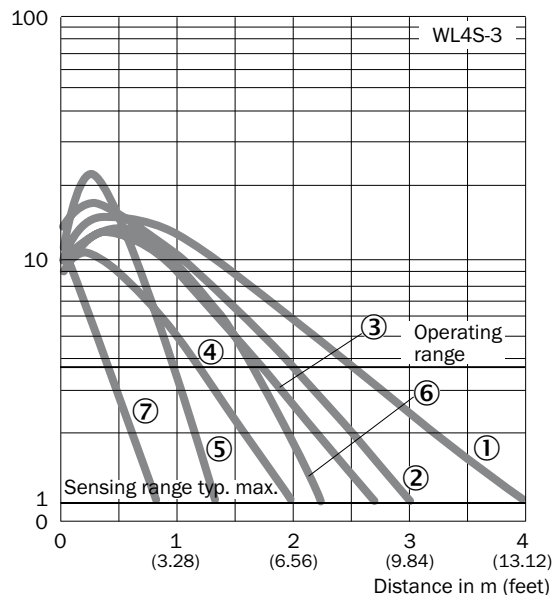


■ Operating range ■ Sensing range typ. max.

### Operating reserve

#### WL4S-3, WLG4S-3, sensing range 4 m

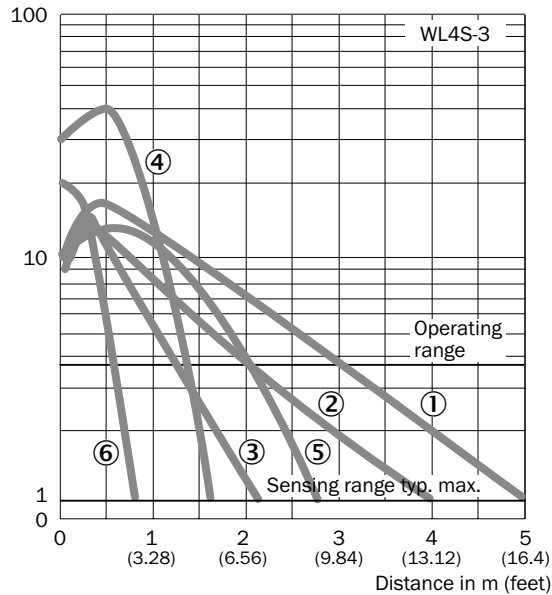
Operating reserve



- ① Reflector type PL80A
- ② Reflector type PL250F
- ③ Reflector type PL40A
- ④ Reflector type PL20A
- ⑤ Reflector type PL10F
- ⑥ Reflector type P250 CHEM
- ⑦ Reflective tape REF-IRF-56

#### WL4S-3, WLG4S-3, sensing range 5 m

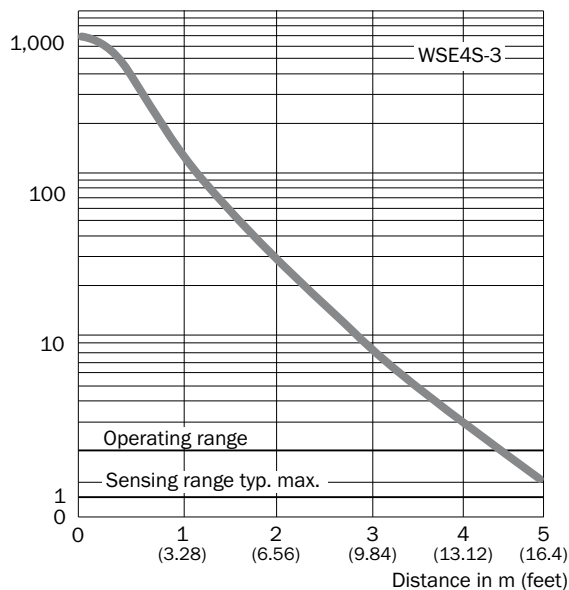
Operating reserve



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

#### WSE4S-3V, WSE4S-3H

Operating reserve





**W4S-3 Inox Glass – reliable detection of transparent objects**



**Stainless Steel**

**Additional information**

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Accessories .....	58
Special reflectors.....	62

**Product description**

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

features a compact design that saves space and ensures high plant availability due to watertight teach-in button with a stainless steel 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 stainless steel membrane
- Continuous threshold adjustment technology reliably detects objects in changing conditions

**Your benefits**

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

## Detailed technical data

Sensing range max. <sup>1)</sup>	0 m ... 5 m
Light spot (distance)	Ø 45 mm (1.5 m)
Sensing range <sup>1)</sup>	0 m ... 3 m
Signal attenuation min.	8%
Housing design (light emission)	Cuboid, slim
Light source <sup>2)</sup>	PinPoint LED
Type of light	Visible red light
Wavelength	650 nm
Teach-in	Single teach-in button and/or teach-in via cable <sup>3)</sup>

<sup>1)</sup> PL80A.

<sup>2)</sup> Average service life 100,000 h at  $T_A = +25\text{ °C}$ .

<sup>3)</sup> Setting via cable (ET): connect white cable or PIN to L+ (PNP) or to M (NPN) in line with the desired sensitivity > 2 ... < 8 s or > 8 s.

## Mechanics/electronics

Supply voltage <sup>1)</sup>	10 V DC ... 30 V DC
Residual ripple <sup>2)</sup>	< 5 V <sub>pp</sub>
Power consumption <sup>3)</sup>	≤ 30 mA
Output current I <sub>max.</sub>	≤ 100 mA
Response time <sup>4)</sup>	< 0.5 ms
Switching frequency <sup>5)</sup>	1,000 Hz
Connection type	Connector, 4-pin Cable with plug, 4-pin, 150 mm, PVC <sup>6)</sup> Cable, 4-wire, 2 m, PVC, 0.14 mm <sup>2</sup> <sup>6)</sup> (depending on type)
Circuit protection	A <sup>7)</sup> B <sup>8)</sup> C <sup>9)</sup>
Protection class	III
Weight	Connector M8, 4-pin 40 g Cable, 4-wire 80 g Connector M12, 4-pin 60 g Cable with plug, M12, 4-pin 60 g Cable with plug, M8, 4-pin 50 g
Polarisation filter	✓
Housing material	Stainless steel 316L/V4A
Enclosure rating	IP 66, IP 67, IP 68, IP 69K <sup>10)</sup>
Ambient temperature, operation	-30 °C ... +70 °C <sup>11)</sup> -30 °C ... +60 °C
Ambient temperature, storage	-30 °C ... +75 °C

<sup>1)</sup> Limit values, reverse-polarity protected, operation in short-circuit protected network, max. 8 A.

<sup>2)</sup> May not exceed or fall short of V<sub>S</sub>.

<sup>3)</sup> Without load.

<sup>4)</sup> Signal transit time with resistive load.

<sup>5)</sup> With light/dark ratio 1:1.

<sup>6)</sup> Do not bend below 0 °C.

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

<sup>8)</sup> B = inputs and outputs reverse-polarity protected.

<sup>9)</sup> C = interference suppression.

<sup>10)</sup> Only in case of correctly mounted IP 69K connecting cable.

<sup>11)</sup> At V<sub>S</sub> ≤ 24 V and I<sub>A</sub> < 30 mA.

## Ordering information

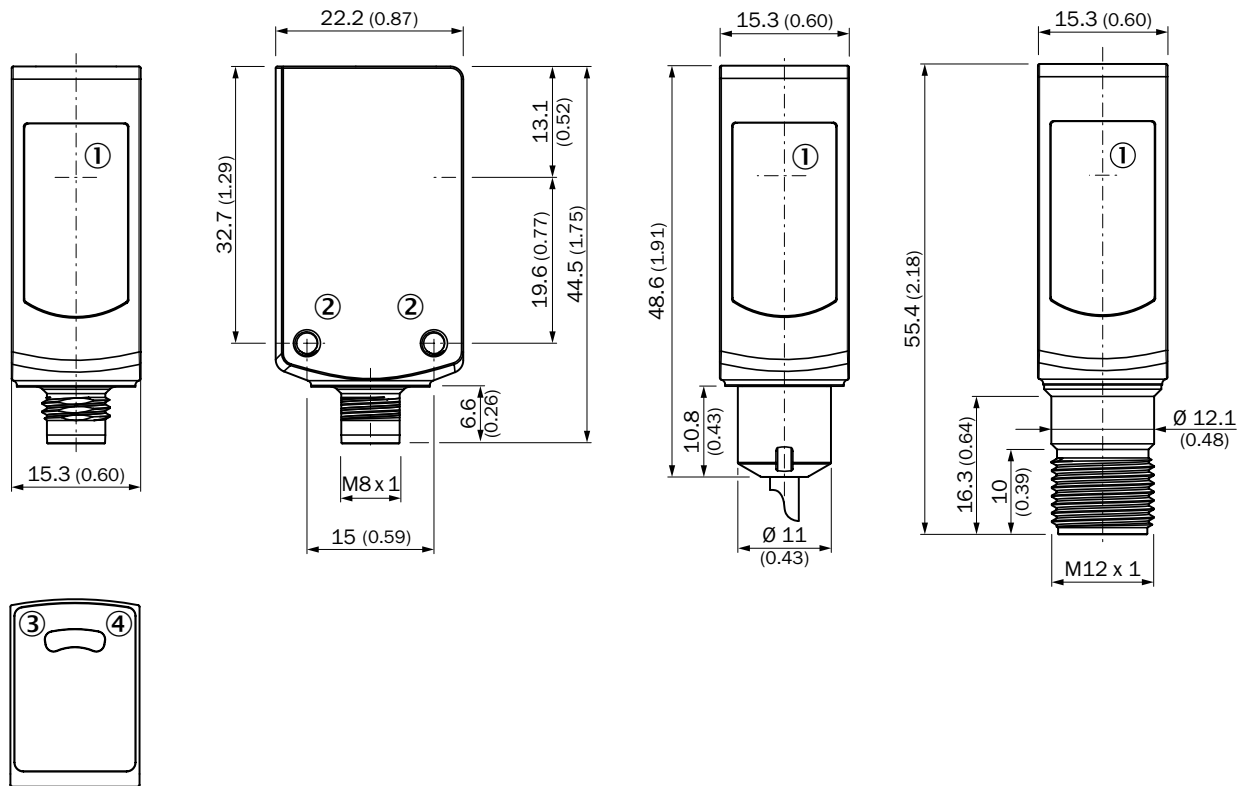
### WLG4S-3V

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

Switching output	Switching mode	Adjustment	Connection	Model name	Part no.
PNP	Dark-switching	Cable	Connector M8, 4-pin	WLG4S-3F2235V	1045098
		Teach	Connector M8, 4-pin	WLG4S-3V2232V	1046447
		Teach, cable	Connector M8, 4-pin	WLG4S-3F2234V	1047653
			Connector M12, 4-pin	WLG4S-3F2434V	1054727
	Complementary	Teach	Cable with plug, M12, 4-pin	WLG4S-3F3434V	1048024
			Cable, 4-wire	WLG4S-3P1132V	1055044
			Connector M8, 4-pin	WLG4S-3P2232V	1046446
			Connector M12, 4-pin	WLG4S-3P2432V	1054725
			Cable with plug, M8, 4-pin	WLG4S-3P3232V	1046448
			Cable with plug, M12, 4-pin	WLG4S-3P3432V	1046449
NPN	Dark-switching	Cable	Cable, 4-wire	WLG4S-3E1135V	1046438
		Teach, cable	Cable, 4-wire	WLG4S-3E1134V	1048027
	Complementary	Teach	Cable, 4-wire	WLG4S-3N1132V	1046450
			Connector M12, 4-pin	WLG4S-3N2432V	1054728

### Dimensional drawings

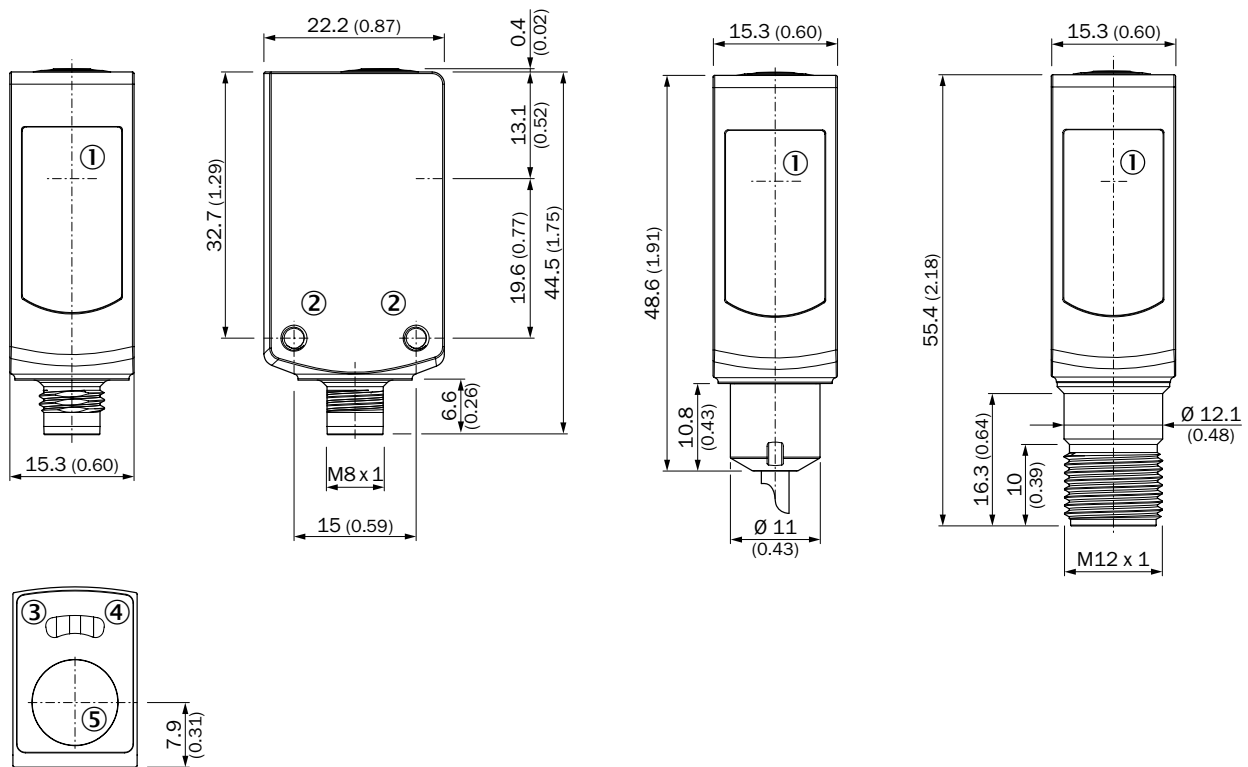
#### WLG4S-3V, no single teach-in button



All dimensions in mm (inch)

- 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, WLG4S-3V, with single teach-in button**



All dimensions in mm (inch)

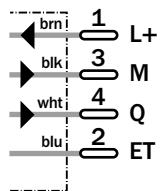
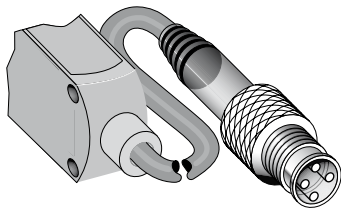
- ① Center of optical axis
- ② Threaded mounting hole M3
- ③ Status indicator LED, yellow: status of received light beam
- ④ Status indicator LED green: power on
- ⑤ Single teach-in button



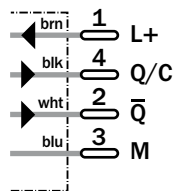
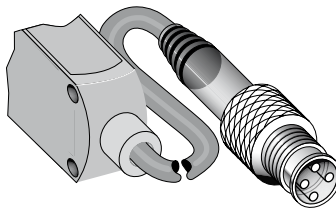
Connection type and diagram

WLG4S-3V

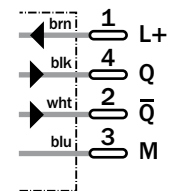
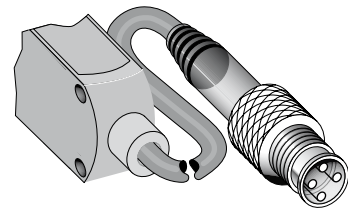
Teach-in via cable



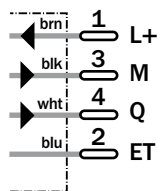
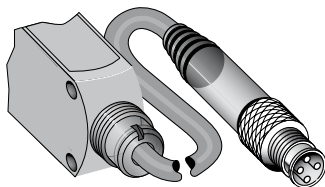
Single teach-in button + IO-Link



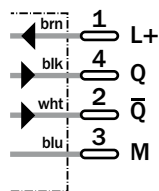
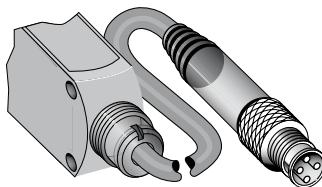
Single teach-in button or fix adjustment



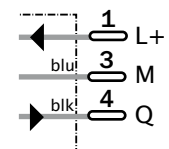
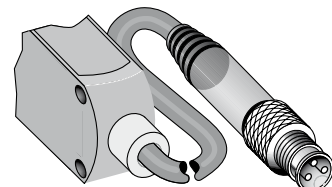
Teach-in via cable



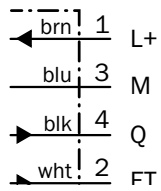
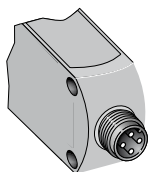
Single teach-in button or fix adjustment



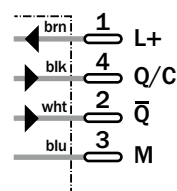
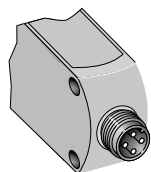
Single teach-in button or fix adjustment



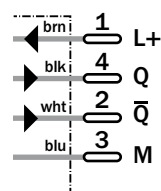
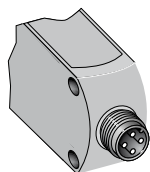
Teach-in via cable



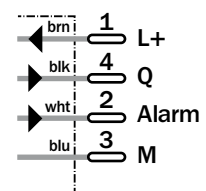
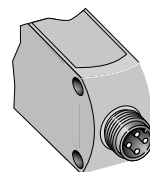
Single teach-in button + IO-Link



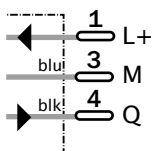
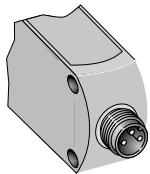
Single teach-in button or fix adjustment



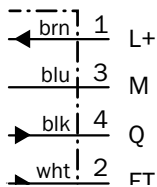
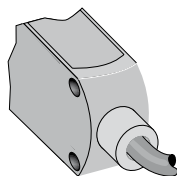
Single teach-in button + alarm output



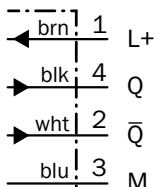
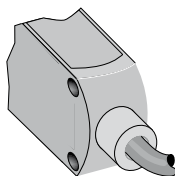
**Single teach-in button  
or fix adjustment**



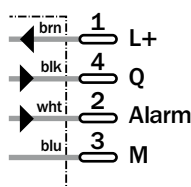
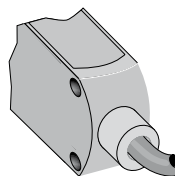
**Teach-in via cable**



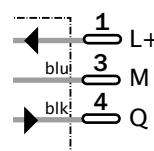
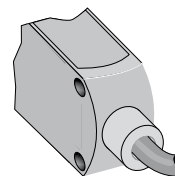
**Single teach-in button  
or fix adjustment**



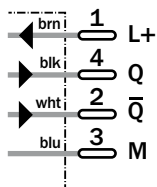
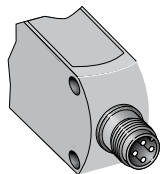
**Single teach-in button  
+ alarm output**



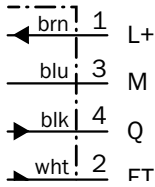
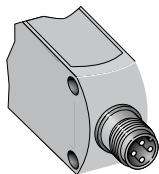
**Single teach-in button  
or fix adjustment**



**Single teach-in button  
or fix adjustment**

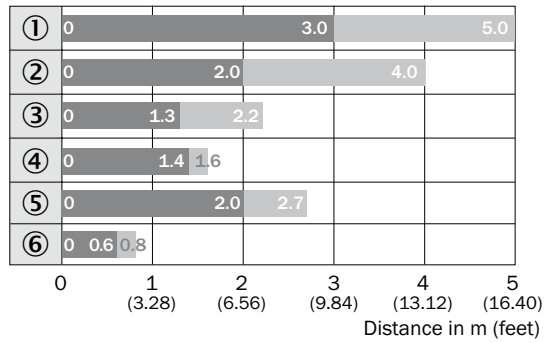


**Teach-in via cable**



### Sensing range

#### WL4S-3, WLG4S-3, sensing range 5 m

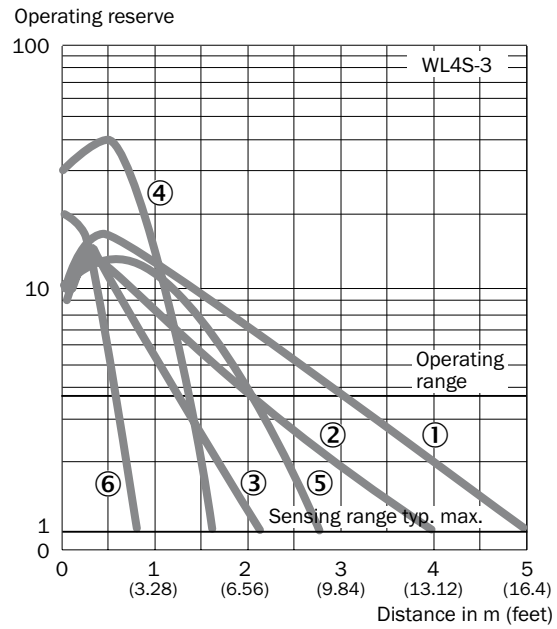


■ Operating range      ■ Sensing range typ. max.

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

### Operating reserve

#### WL4S-3, WLG4S-3, sensing range 5 m



W4S-3 Inox Hygiene – highest reliability, maximum resistance and endless possibilities















**Additional information**  
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**Product description**

The W4S-3 Inox Hygiene product family of photoelectric sensors combines hygienic requirements with best-in-class performance. These sensors are completely enclosed in a stainless steel housing and can be taught via a stainless steel teach-in button with a stainless steel membrane, an external teach wire or

IO-Link. With built-in protection 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
- PinPoint LED technology provides a highly visible laser-like light spot
- 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
- Remote monitoring and quick diagnostics via IO-Link (optional)

## Detailed technical data

	WTB4S-3H	WTF4S-3H	WL4S-3H	WSE4S-3H
Light spot (distance)	Ø 6.5 mm (150 mm) <sup>1)</sup> Ø 2.5 mm (100 mm) <sup>2)</sup> Ø 2.5 mm (50 mm) <sup>3)</sup>	Ø 6.5 mm (150 mm)	Ø 45 mm (1.5 m)	Ø 130 mm (2 m)
Housing design (light emission)	Cuboid, slim			
Light source <sup>4)</sup>	PinPoint LED			
Type of light	Visible red light			
Wavelength	650 nm			
Teach-in	Single teach-in button and/or teach-in via cable <sup>5)</sup>			-

<sup>1)</sup> At sensing distance max. ≤ 500 mm.

<sup>2)</sup> At sensing distance max. ≤ 280 mm.

<sup>3)</sup> At sensing distance max. ≤ 120 mm.

<sup>4)</sup> Average service life 100,000 h at T<sub>A</sub> = +25 °C.

<sup>5)</sup> setting via cable (ET): connect white cable or PIN to L+ (PNP) or to M (NPN) in line with the desired sensitivity > 2 ... < 8 s or > 8 s.

## Mechanics/electronics

	WTB4S-3H	WTF4S-3H	WL4S-3H	WSE4S-3H
Supply voltage	10 V DC ... 30 V DC <sup>1)</sup>			
Residual ripple <sup>2)</sup>	< 5 V <sub>pp</sub>			
Power consumption	≤ 30 mA <sup>3)</sup>			≤ 20 mA <sup>4)</sup>
Output current I <sub>max.</sub>	≤ 100 mA			
Response time <sup>5)</sup>	< 0.5 ms			
Switching frequency <sup>6)</sup>	1,000 Hz			
Connection type <sup>7)</sup>	Connector Cable with plug, 150 mm, PVC Cable, 2 m, PVC, 0.14 mm <sup>2</sup> (depending on type)	Cable with plug, 150 mm, PVC	Connector Cable with plug, 150 mm, PVC Cable, 2 m, PVC, 0.14 mm <sup>2</sup> (depending on type)	
Circuit protection	A <sup>8)</sup> B <sup>9)</sup> C <sup>10)</sup>			
Protection class	III			
Weight				
	Cable with plug, M8	50 g	50 g	50 g
	Connector M8	140 g <sup>11)</sup>	-	140 g <sup>11)</sup>
	Cable	80 g	-	80 g
			80 g / 125 g <sup>12)</sup>	80 g
Polarisation filter	-		✓	-
IO-Link	COM2	-		
Housing material	Stainless steel 316L/V4A			
Enclosure rating	IP 66 / IP 67 / IP 68 / IP 69K <sup>13)</sup> (depending on type)	IP 66 / IP 67 / IP 68 / IP 69K <sup>13)</sup>	IP 66 / IP 67 / IP 68 / IP 69K <sup>13)</sup> (depending on type)	IP 66 / IP 67 / IP 68 / IP 69K <sup>13)</sup>
Test input sender off	-			TE to 0 V
Ambient temperature, operation	-30 °C ... +70 °C <sup>14)</sup> -30 °C ... +60 °C			
Ambient temperature, storage	-30 °C ... +75 °C			

<sup>1)</sup> Limit values, reverse-polarity protected, operation in short-circuit protected network, max. 8 A.

<sup>2)</sup> Limit values, operation in short-circuit protected network max. 8 A.

<sup>3)</sup> May not exceed or fall short of V<sub>S</sub>.

<sup>4)</sup> Without load.

<sup>5)</sup> Sender.

<sup>6)</sup> Signal transit time with resistive load.

<sup>7)</sup> With light/dark ratio 1:1.

<sup>8)</sup> Do not bend below 0 °C.

<sup>9)</sup> A = V<sub>S</sub> connections reverse-polarity protected.

<sup>10)</sup> B = inputs and outputs reverse-polarity protected.

<sup>11)</sup> C = interference suppression.

<sup>12)</sup> Version with mechanical connection D12 adapter shaft.

<sup>13)</sup> Special version, sensor with cable, 5m.

<sup>14)</sup> At V<sub>S</sub> ≤ 24 V and I<sub>A</sub> < 30 mA.

## Ordering information

### WTB4S-3H

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

Sensing range max.	Sensing range	Switching output	Switching mode	Adjustment	IO-Link	Mechanical connection	Electrical connection	Model name	Part no.
≤ 500 mm <sup>1)</sup>	10 ... 350 mm <sup>1)</sup>	PNP	Light-switching	Cable	-	M12 adapter threads	Cable with plug, M8, 4-pin	WTB4S-3P3265H	1048102
				Teach, cable	-	M12 adapter threads	Cable with plug, M8, 4-pin	WTB4S-3P3264H	1048047
			Complementary	Teach	-	M12 adapter threads	Cable with plug, M8, 4-pin	WTB4S-3P3262H	1048094
					✓	M12 adapter threads	Cable with plug, M8, 4-pin	WTB4SC-3P3262H	1048108
		NPN	Light-switching	Cable	-	M12 adapter threads	Cable, 4-wire	WTB4S-3N1165H	1048107
				Complementary	Teach	-	M12 adapter threads	Cable, 4-wire	WTB4S-3N1162H
≤ 280 mm <sup>1)</sup>	10 ... 150 mm <sup>1)</sup>	PNP	Light-switching	Teach, cable	-	D12 adapter shaft	Cable with plug, M8, 4-pin	WTB4S-3P5204HS02	1054865
≤ 120 mm <sup>1)</sup>	10 ... 120 mm <sup>1)</sup>	PNP	Light-switching	Cable	-	M12 adapter threads	Cable with plug, M8, 4-pin	WTB4S-3P3235H	1048100
				Teach, cable	-	M12 adapter threads	Cable with plug, M8, 4-pin	WTB4S-3P3234H	1048097
			Complementary	Teach	-	M12 adapter threads	Cable with plug, M8, 4-pin	WTB4S-3P3232H	1048096
					-	M12 adapter threads	Connector M8, 4-pin	WTB4S-3P5232H	1054864
					✓	M12 adapter threads	Cable with plug, M8, 4-pin	WTB4SC-3P3232H	1048099
					-	M12 adapter threads	Cable, 4-wire	WTB4S-3N1135H	1048101
		NPN	Complementary	Teach	-	M12 adapter threads	Cable, 4-wire	WTB4S-3N1132H	1048098

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

### WTF4S-3H

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

Sensing range max.	Switching output	Switching mode	Adjustment	Mechanical connection	Electrical connection	Model name	Part no.
≤ 200 mm	PNP	Light-switching	Teach, cable	M12 adapter threads	Cable with plug, M8, 4-pin	WTF4S-3P3264H	1048109



## WL4S-3H

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation
- **Switching mode:** complementary

Sensing range max.	Sensing range	Switching output	Adjustment	Alarm output	Mechanical connection	Electrical connection	Model name	Part no.
≤ 4 m	0 ... 2,5 m <sup>1)</sup>	PNP	-	-	M12 adapter threads	Cable with plug, M8, 4-pin	WL4S-3P3230H	1048115
					D12 adapter shaft	Cable with plug, M8, 4-pin	WL4S-3P5230H	1057052
		NPN	-	-	M12 adapter threads	Cable, 4-wire	WL4S-3N1130H	1048116
≤ 5 m	0 ... 3 m <sup>1)</sup>	PNP	Teach	✓	M12 adapter threads	Cable with plug, M8, 4-pin	WL4S-3V3232H	1048118
				-	M12 adapter threads	Cable with plug, M8, 4-pin	WL4S-3P3232H	1048117
		NPN	Teach	-	M12 adapter threads	Cable, 4-wire	WL4S-3N1132H	1048119

<sup>1)</sup> Relating to the reflector PL80A.

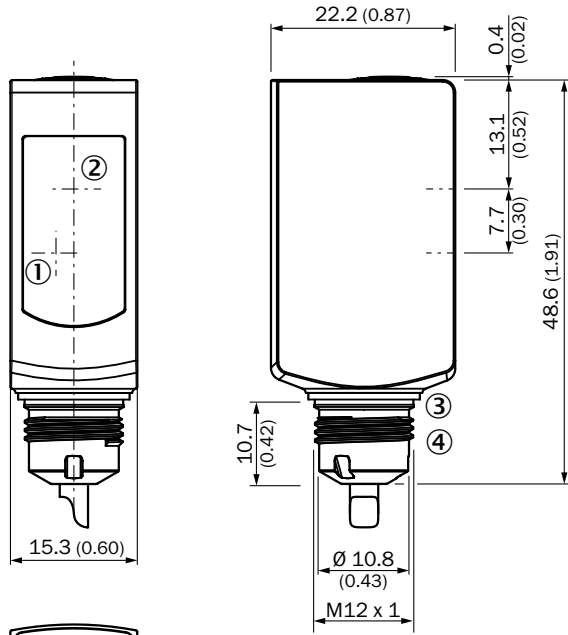
## WSE4S-3H

- **Sensor principle:** Through-beam photoelectric sensor
- **Sensing range max.:** ≤ 5 m
- **Adjustment:** no adjustment possibility

Switching output	Switching mode	Connection	Model name	Part no.
PNP	Dark-switching	Cable with plug, M8, 3-pin	WSE4S-3F3130H	1052888
	Light-switching	Cable with plug, M8, 3-pin	WSE4S-3P3130H	1052882
	Complementary	Cable with plug, M8, 4-pin	WSE4S-3P5230H	1054896
NPN	Dark-switching	Cable, 3-wire	WSE4S-3E1330H	1052873
		Cable with plug, M8, 3-pin	WSE4S-3E3130H	1052868
	Light-switching	Cable, 3-wire	WSE4S-3N1330H	1052870

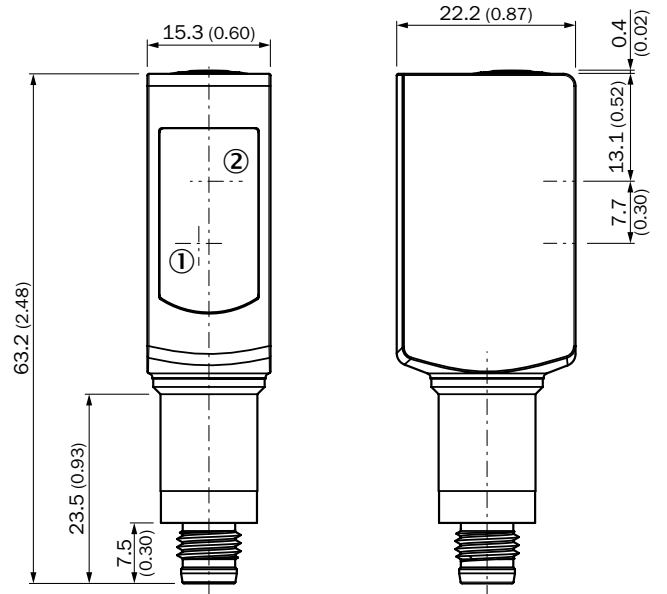
Dimensional drawings

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



All dimensions in mm (inch)

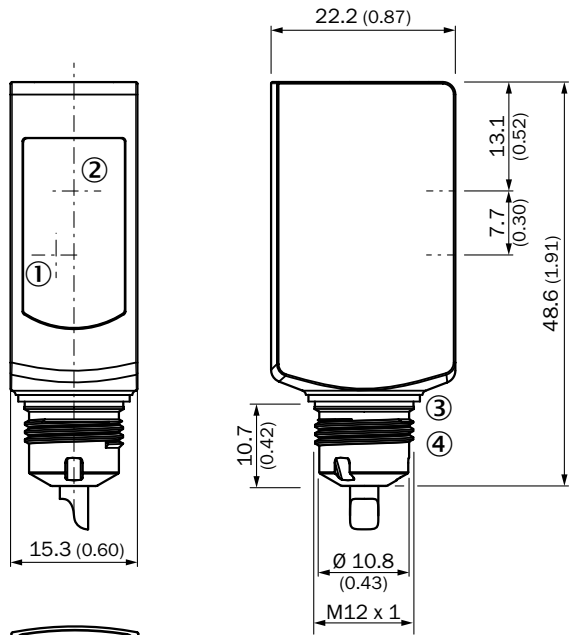
- ① Center of optical axis, receiver
- ② Center of optical axis, sender
- ③ Gasket (tightening torque 6 Nm)
- ④ Connection M12 plug
- ⑤ Status indicator LED, yellow: status of received light beam
- ⑥ Status indicator LED green: power on
- ⑦ Teach-in button



All dimensions in mm (inch)

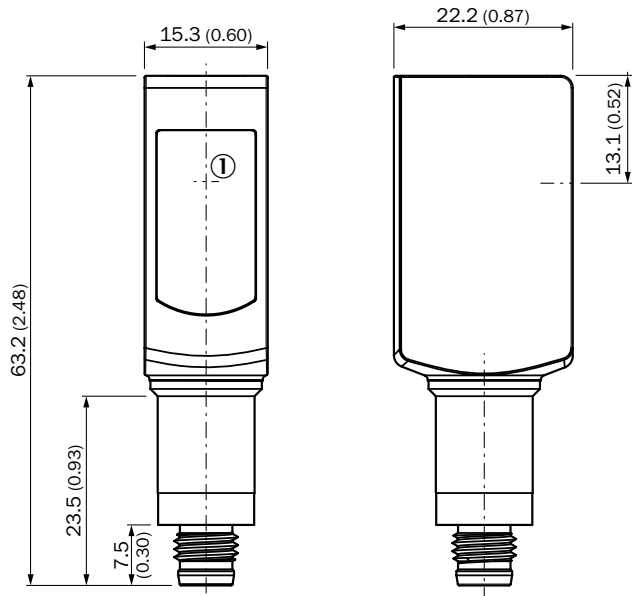
- ① Center of optical axis, receiver
- ② Center of optical axis, receiver
- ③ Status indicator LED, yellow: status of received light beam
- ④ Status indicator LED green: power on
- ⑤ Teach-in button

**WTB4S-3H, WTF4S-3H, no single teach-in button**



All dimensions in mm (inch)

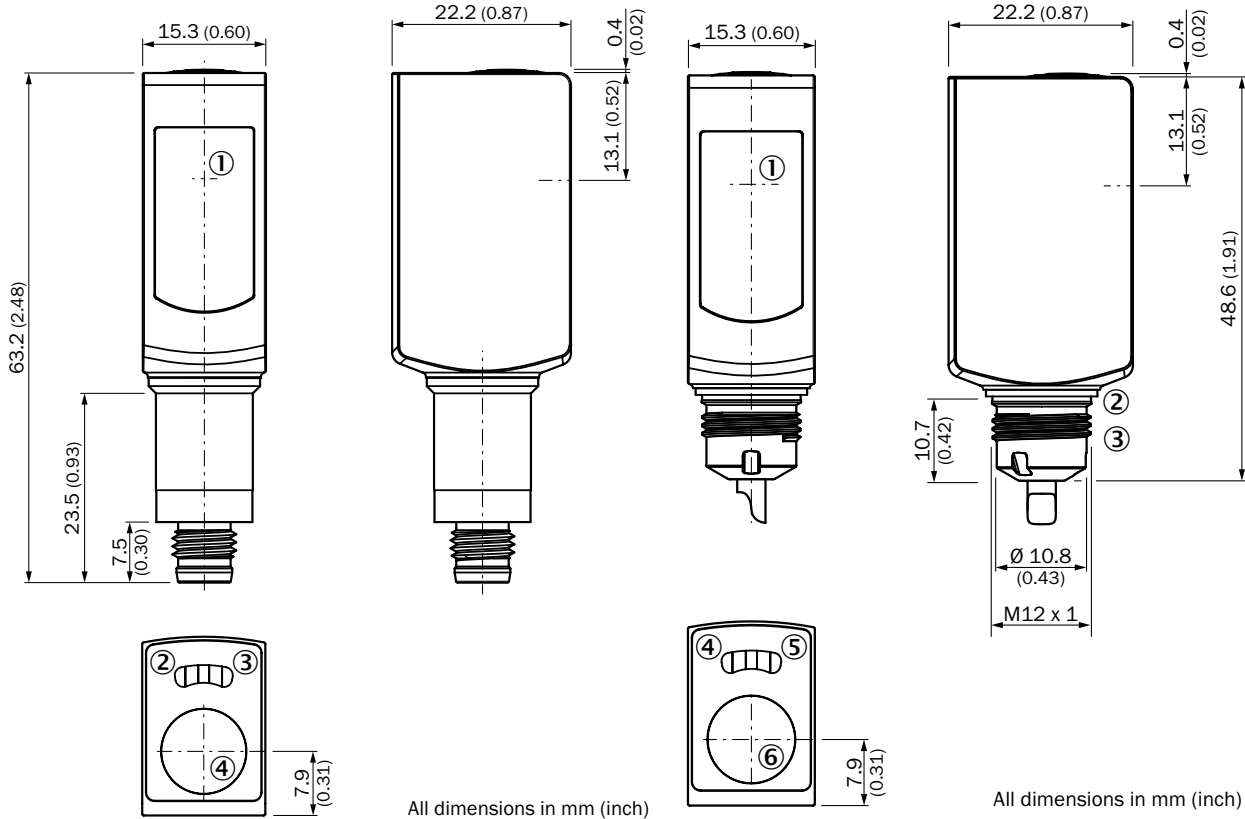
- ① Center of optical axis, receiver
- ② Center of optical axis, sender
- ③ Gasket (tightening torque 6 Nm)
- ④ Connection M12 plug
- ⑤ Status indicator LED, yellow: status of received light beam
- ⑥ Status indicator LED green: power on



All dimensions in mm (inch)

- ① Center of optical axis
- ② Status indicator LED, yellow: status of received light beam
- ③ SICK logo

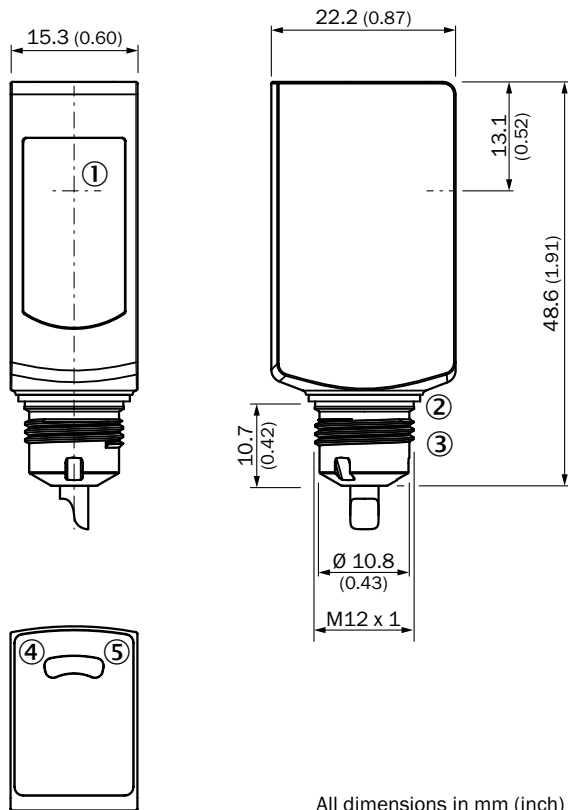
WL4S-3H, WLG4S-3H, with single teach-in button



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

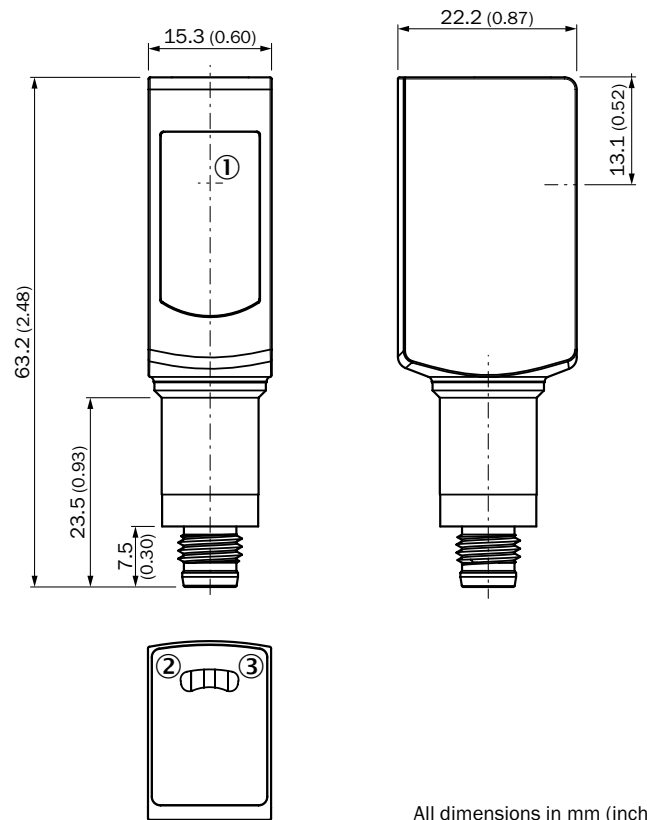
- ① Center of optical axis
- ② Gasket (tightening torque 6 Nm)
- ③ Connection M12 plug
- ④ Status indicator LED, yellow: status of received light beam
- ⑤ Status indicator LED green: power on
- ⑥ Teach-in button

**WL4S-3H, WLG4S-3H, WSE4S-3H, no single teach-in button**



All dimensions in mm (inch)

- ① centre of optical axis, sender (WS) and receiver (WE)
- ② Gasket (tightening torque 6 Nm)
- ③ Connection M12 plug
- ④ Status indicator LED, yellow: status of received light beam
- ⑤ Status indicator LED green: supply voltage active



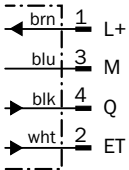
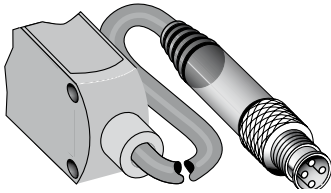
All dimensions in mm (inch)

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

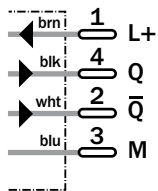
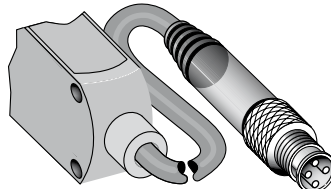
Connection type and diagram

WTB4-3H, WTF4S-3H, WL4S-3H, WLG4S-3H, WSE4S-3H

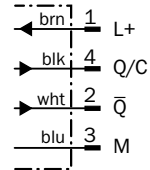
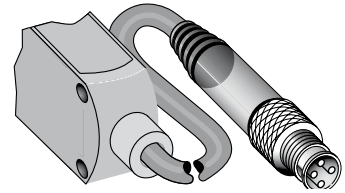
Teach-in via cable



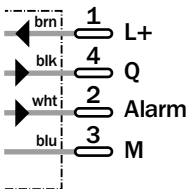
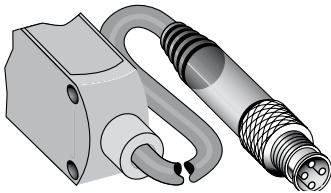
Single teach-in button or fix adjustment



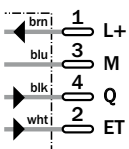
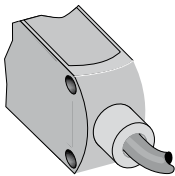
Single teach-in button + IO-Link



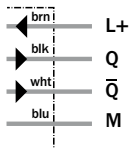
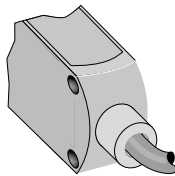
Single teach-in button + alarm output



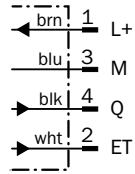
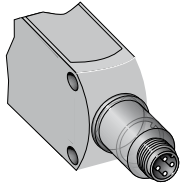
Teach-in via cable



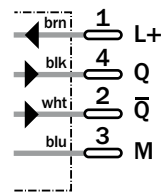
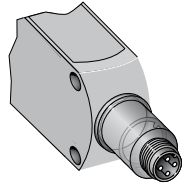
Single teach-in button or fix adjustment



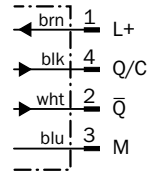
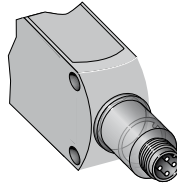
**Teach-in via cable**



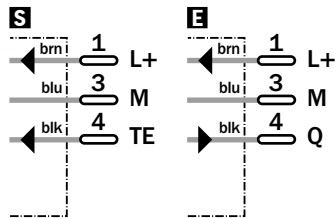
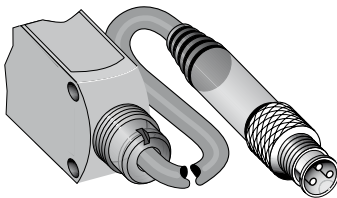
**Single teach-in button or fix adjustment**



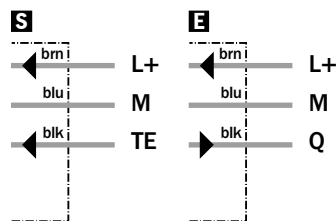
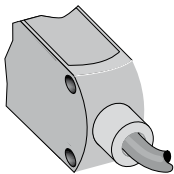
**Single teach-in button + IO-Link**



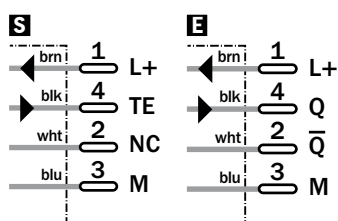
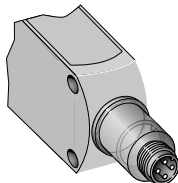
**Fix adjustment + Test input**



**Fix adjustment + Test input**



**Fix adjustment + Test input**

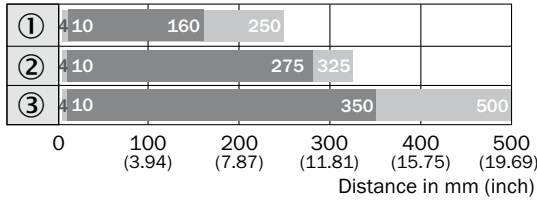


**S** Sender  
**E** Receiver



### Sensing distance

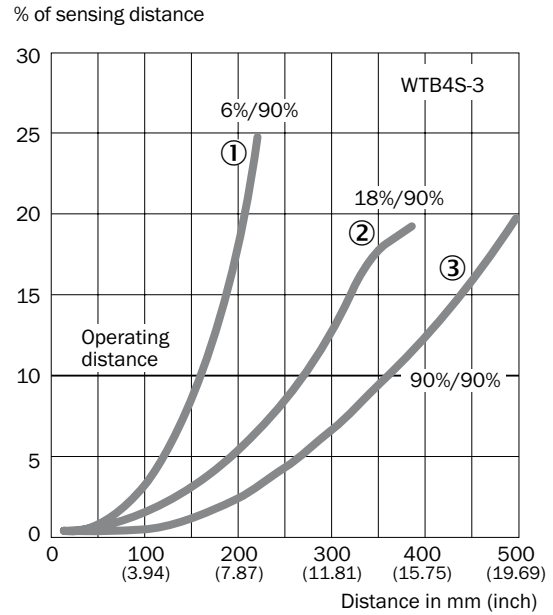
**WTB4S-3, sensing distance, 500 mm**



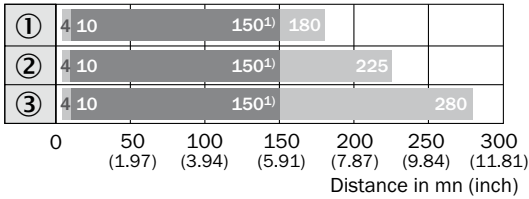
■ Operating distance    ■ Sensing distance typ. max.

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

**WTB4S-3, sensing distance, 500 mm**



**WTB4S-3, sensing distance, 280 mm**

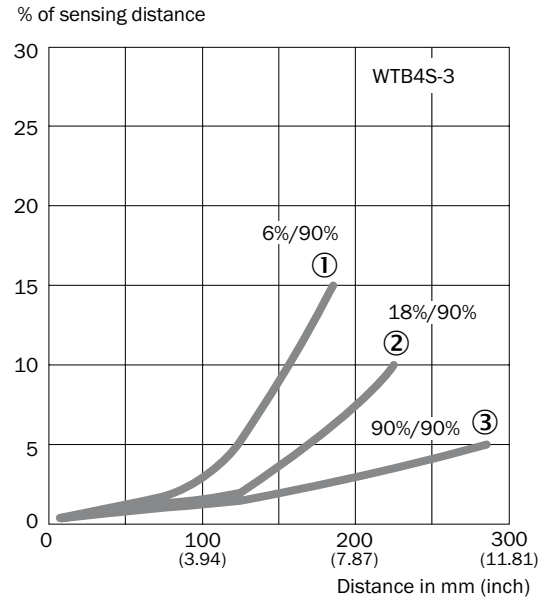


■ Operating distance    ■ Sensing distance typ. max.

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

<sup>1)</sup> Due to the focus of the light spot at 100 mm (3.94 inch)

**WTB4S-3, sensing distance, 280 mm**



**WTB4S-3, sensing distance, 120 mm**

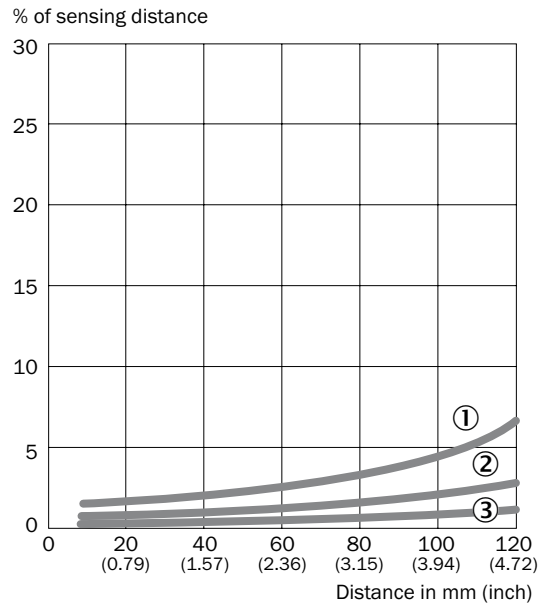
①	4	10	120
②	4	10	120
③	4	10	120

0      20      40      60      80      100      120  
 (0.79) (1.57) (2.36) (3.15) (3.94) (4.72)  
 Distance in mm (inch)

■ Operating distance    ■ Sensing distance max. typ.

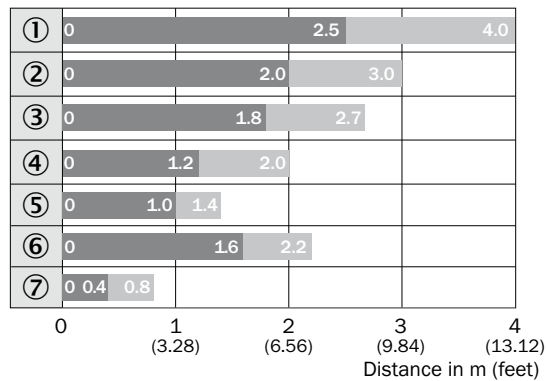
- ① Sensing distance on black, 6 % remission
- ② Sensing distance on grey, 18 % remission
- ③ Sensing distance on white, 90 % remission

**WTB4S-3, sensing distance, 120 mm**



Sensing range

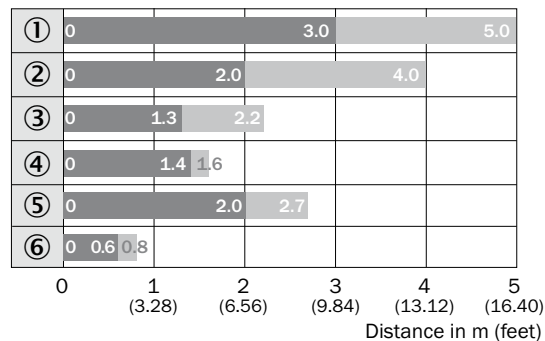
WL4S-3, WLG4S-3, sensing range 4 m



■ Operating range ■ Sensing range typ. max.

- ① Reflector type PL80A
- ② Reflector type PL250F
- ③ Reflector type PL40A
- ④ Reflector type PL20A
- ⑤ Reflector type PL10F
- ⑥ Reflector type P250 CHEM
- ⑦ Reflective tape REF-IRF-56

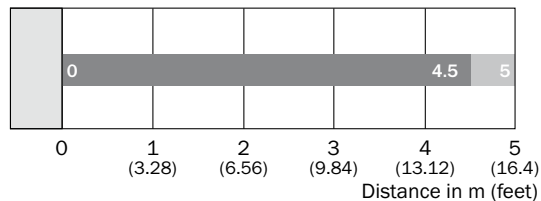
WL4S-3, WLG4S-3, sensing range 5 m



■ Operating range ■ Sensing range typ. max.

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

WSE4S-3, sensing range 5 m

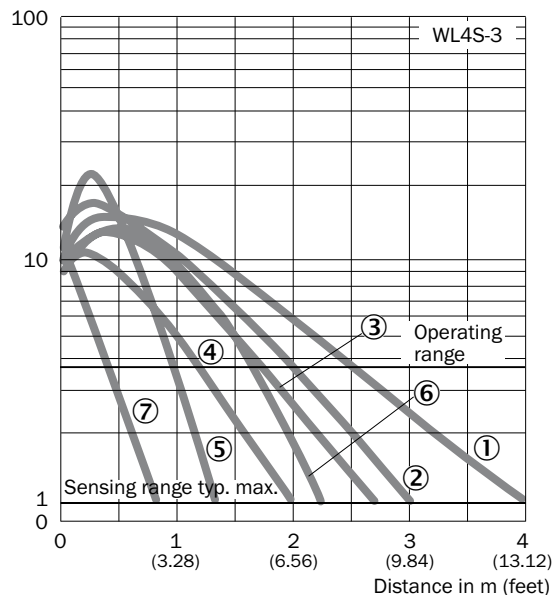


■ Operating range ■ Sensing range typ. max.

### Operating reserve

#### WL4S-3, WLG4S-3, sensing range 4 m

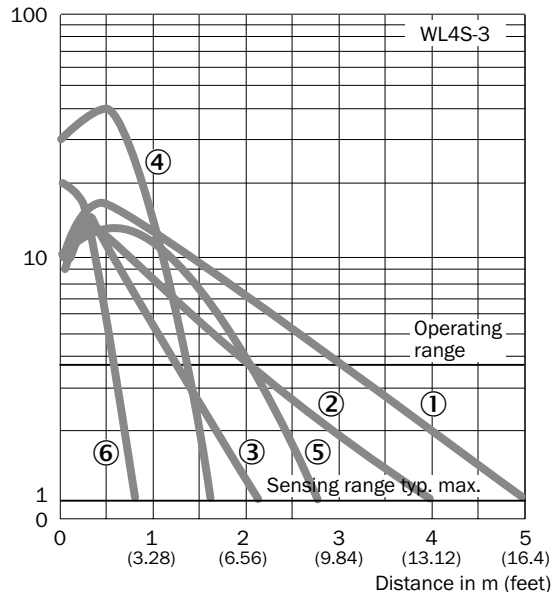
Operating reserve



- ① Reflector type PL80A
- ② Reflector type PL250F
- ③ Reflector type PL40A
- ④ Reflector type PL20A
- ⑤ Reflector type PL10F
- ⑥ Reflector type P250 CHEM
- ⑦ Reflective tape REF-IRF-56

#### WL4S-3, WLG4S-3, sensing range 5 m

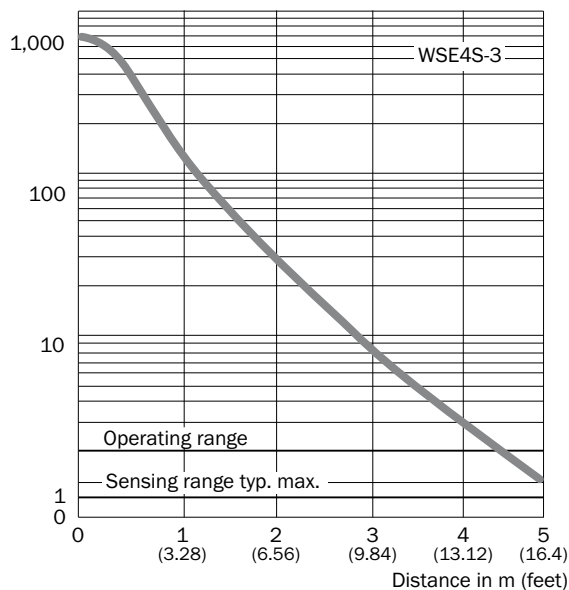
Operating reserve



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

#### WSE4S-3V, WSE4S-3H

Operating reserve



W4S-3 Inox Hygiene Glass – reliable detection of transparent objects



**Stainless Steel**

**Additional information**

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Special reflectors.....	62

**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 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-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

**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)

## Detailed technical data

Light spot (distance)	Ø 45 mm (1.5 m)
Sensing range <sup>1)</sup>	0 m ... 3 m
Signal attenuation min.	8%
Housing design (light emission)	Cuboid, slim
Light source <sup>2)</sup>	PinPoint LED
Type of light	Visible red light
Wavelength	650 nm
Teach-in	Single teach-in button and/or teach-in via cable <sup>3)</sup>

<sup>1)</sup> PL80A.

<sup>2)</sup> Average service life 100,000 h at  $T_A = +25\text{ °C}$ .

<sup>3)</sup> setting via cable (ET): connect white cable or PIN to L+ (PNP) or to M (NPN) in line with the desired sensitivity > 2 ... < 8 s or > 8 s.

## Mechanics/electronics

Supply voltage <sup>1)</sup>	10 V DC ... 30 V DC
Residual ripple <sup>2)</sup>	< 5 V <sub>pp</sub>
Power consumption <sup>3)</sup>	≤ 30 mA
Output current I <sub>max.</sub>	≤ 100 mA
Response time <sup>4)</sup>	< 0.5 ms
Switching frequency <sup>5)</sup>	1,000 Hz
Connection type <sup>6)</sup>	Connector Cable with plug, 4-pin, 150 mm, PVC Cable, 4-wire, 2 m, PVC, 0.14 mm <sup>2</sup> (depending on type)
Circuit protection	A <sup>7)</sup> B <sup>8)</sup> C <sup>9)</sup>
Protection class	III
Weight	Cable with plug, M8, 4-pin 50 g Cable, 4-wire 80 g Connector, M8, 4-wire 140 g <sup>10)</sup>
Polarisation filter	✓
Housing material	Edelstahl 316L/V4A
Enclosure rating	IP 66, IP 67, IP 68, IP 69K <sup>11)</sup>
Ambient temperature, operation	-30 °C ... +70 °C <sup>12)</sup> -30 °C ... +60 °C
Ambient temperature, storage	-30 °C ... +75 °C

<sup>1)</sup> Limit values, reverse-polarity protected, operation in short-circuit protected network, max. 8 A.

<sup>2)</sup> May not exceed or fall short of  $V_S$ .

<sup>3)</sup> Without load.

<sup>4)</sup> Signal transit time with resistive load.

<sup>5)</sup> With light/dark ratio 1:1.

<sup>6)</sup> Do not bend below 0 °C.

<sup>7)</sup> A =  $V_S$  connections reverse-polarity protected.

<sup>8)</sup> B = inputs and outputs reverse-polarity protected.

<sup>9)</sup> C = interference suppression.

<sup>10)</sup> Version with mechanical connection D12 adapter shaft.

<sup>11)</sup> Only in case of correctly mounted IP 69K connecting cable.

<sup>12)</sup> At  $V_S \leq 24\text{ V}$  and  $I_A < 30\text{ mA}$ .

## Ordering information

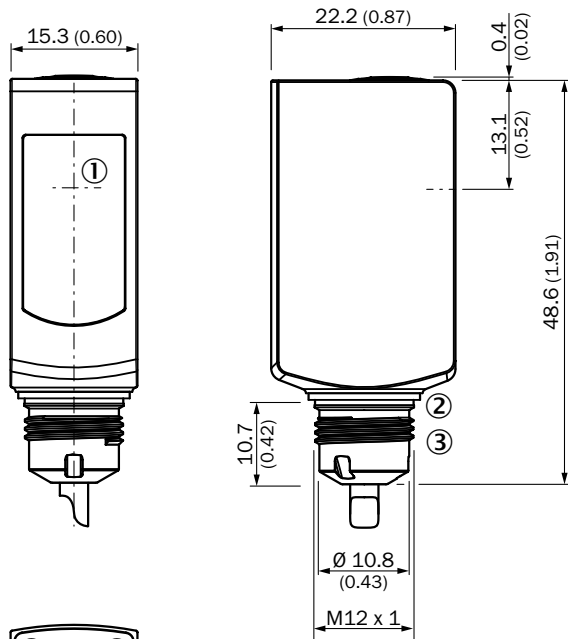
- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** autocollimation
- **Sensing range max.:** ≤ 5 m

Switching output	Switching mode	Adjustment	Alarm output	Mechanical connection	Electrical connection	Model name	Part no.
PNP	Complementary	Teach	-	M12 adapter threads	Cable with plug, M8, 4-pin	WLG4S-3P3232H	1048120
			-	M12 adapter threads	Cable with plug, M8, 4-pin	WLG4S-3P5232H	1057053
	Dark-switching	Teach, cable	-	D12 adapter shaft	Cable with plug, M8, 4-pin	WLG4S-3F3234H	1048121
		Teach	-	M12 adapter threads	Cable with plug, M8, 4-pin	WLG4S-3V3232H	1048122
		Teach, cable	✓	M12 adapter threads	Cable with plug, M8, 4-pin	WLG4S-3F3234HS01	1048535
NPN	Complementary	Teach	-	M12 adapter threads	Cable, 4-wire	WLG4S-3N1132H	1048123
	Dark-switching	Teach, cable	-	M12 adapter threads	Cable, 4-wire	WLG4S-3E1134H	1048124
		Cable	-	M12 adapter threads	Cable, 4-wire	WLG4S-3E1135H	1048126



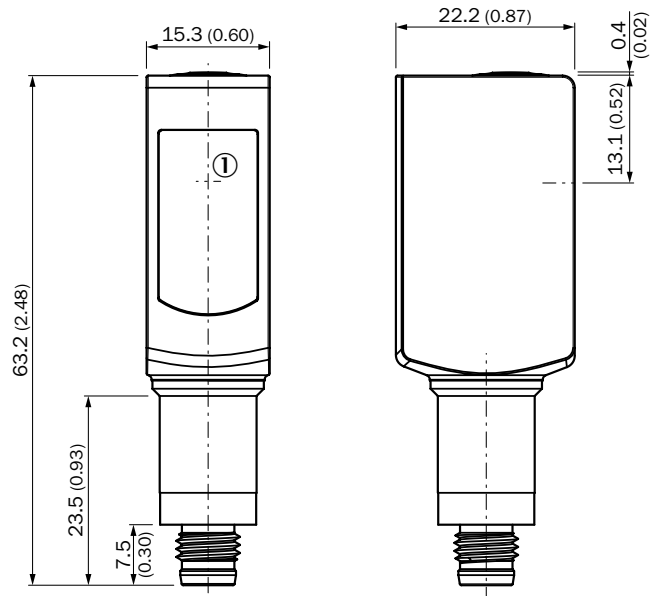
### Dimensional drawings

#### WL4S-3H, WLG4S-3H, with single teach-in button



All dimensions in mm (inch)

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



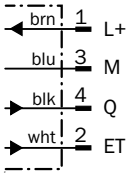
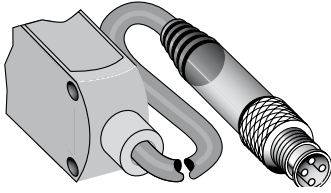
All dimensions in mm (inch)

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

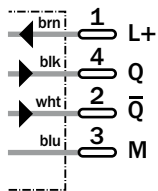
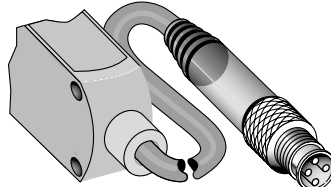
Connection type and diagram

WLG4S-3H

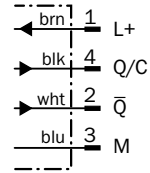
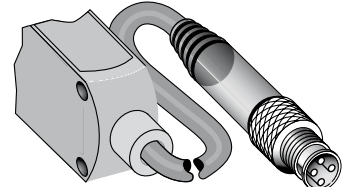
Teach-in via cable



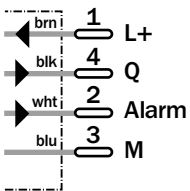
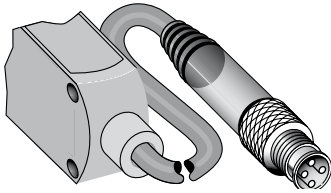
Single teach-in button or fix adjustment



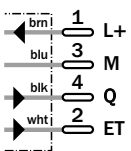
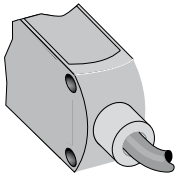
Single teach-in button + IO-Link



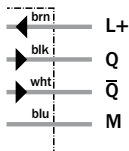
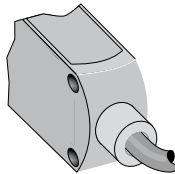
Single teach-in button + alarm output



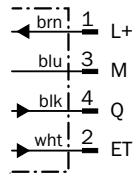
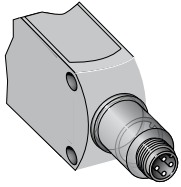
Teach-in via cable



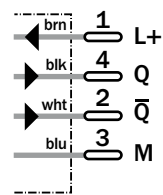
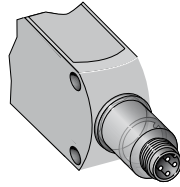
Single teach-in button or fix adjustment



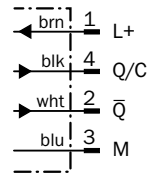
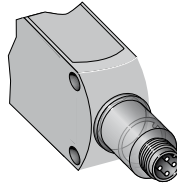
**Teach-in via cable**



**Single teach-in button  
or fix adjustment**

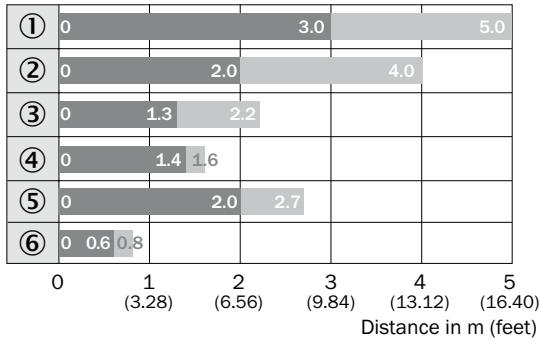


**Single teach-in button  
+ IO-Link**



### Sensing range

**WL4S-3, WLG4S-3, sensing range 5 m**



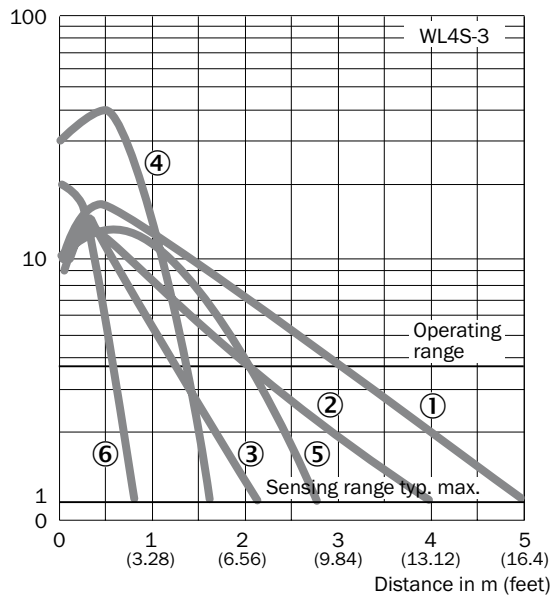
■ Operating range      ■ Sensing range typ. max.

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

## Operating reserve

### WL4S-3, WLG4S-3, sensing range 5 m

Operating reserve






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

Accessories







Tube base

Mounting system type	Model name	Part no.	W4S-3 Inox	W4S-3 Inox Glas	W4S-3 Inox Hygiene	W4S-3 Inox Hygiene Glas
Tube base	BEF-MR18G-NA	4065853	-	-	●	●

Mounting brackets/plates



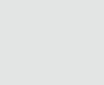

Figure	Mounting system type	Description	Material	Model name	Part no.	W4S-3 Inox	W4S-3 Inox Glas	W4S-3 Inox Hygiene	W4S-3 Inox Hygiene Glas
	Protective housings	Protective housings floor mounted	Stainless steel (1.4571)	BEF-SW-W4S	2051497	●	●	-	-
	Mounting bracket	Mounting Brackets wall mounted	Stainless steel (1.4571)	BEF-W4-A	2051628	●	●	-	-
		Mounting Brackets floor mounted	Stainless steel (1.4571)	BEF-W4-B	2051630	●	●	-	-

Terminal and alignment brackets

Figure	Mounting system type	Description	Material	Model name	Part no.				
						W4S-3 Inox	W4S-3 Inox Glass	W4S-3 Inox Hygiene	W4S-3 Inox Hygiene Glass
	Universal bar clamps	Universal bar clamp for sensor mounting plates	Zinc diecast	BEF-KHS-KH3	5322626	●	●	-	-
		Plate N02N for universal bar clamp	Plate: Stainless steel (1.4571), Clamp: Stainless steel (1.4408)	BEF-KHS-N02N	2051618	●	●	-	-
		Mounting rod straight	Stainless steel (1.4571)	BEF-MS12G-NA	4058914	●	●	-	-
				BEF-MS12G-NB	4058915	●	●	-	-
		Mounting rod L-shaped	Stainless steel (1.4571)	BEF-MS12L-NA	4058912	●	●	-	-
				BEF-MS12L-NB	4058913	●	●	-	-
		Mounting rod Z-shaped	Stainless steel (1.4571)	BEF-MS12Z-NA	4058916	●	●	-	-
			Steel, zinc coated	BEF-MS12Z-NB	4058917	●	●	-	-
	Rod mounting clamp	Aluminium	BEF-RMC-D12	5321878	●	●	-	-	








Plug connectors and cables

Figure	Connection type	Connector type	Enclosure rating	Flying leads	Sheath material	Cable length	Model name	Part no.					W4S-3 Inox	W4S-3 Inox Glass	W4S-3 Inox Hygiene	W4S-3 Inox Hygiene Glass			
													●	●	●	●			
	Connector M8, 3-pin	Female connector	IP 69K	Straight	PVC	2 m	DOL-0803-G02MN	6033664	●	●	●	●	●	●	●	●			
						5 m	DOL-0803-G05MN	6033665	●	●	●	●	●	●					
						10 m	DOL-0803-G10MN	6033666	●	●	●	●	●	●					
				Angled	PVC	2 m	DOL-0803-W02MN	6033667	●	●	●	●	●	●	●	●	●	●	●
						5 m	DOL-0803-W05MN	6033668	●	●	●	●	●	●	●	●	●		
						10 m	DOL-0803-W10MN	6033669	●	●	●	●	●	●	●	●	●	●	
	Connector M8, 4-pin	Female connector	IP 69K	Straight	PVC	5 m	DOL-0804-G05MN	6033671	●	●	●	●	●	●	●	●			
						10 m	DOL-0804-G10MN	6033672	●	●	●	●	●	●	●	●			
				Angled	PVC	2 m	DOL-0804-W02MN	6033673	●	●	●	●	●	●	●	●	●	●	
						5 m	DOL-0804-W05MN	6033674	●	●	●	●	●	●	●	●	●		
						10 m	DOL-0804-W10MN	6033675	●	●	●	●	●	●	●	●	●		
						25 m	DOL-1204-G25MN	6028134	●	●	●	●	●	●	●	●	●		
	Connector M8, 4-pin	Female connector	IP 69K	Straight	PVC	2 m	DOL-1204-G02MN	6028128	●	●	●	●	●	●	●	●			
						5 m	DOL-1204-G05MN	6028130	●	●	●	●	●	●	●	●			
						10 m	DOL-1204-G10MN	6028132	●	●	●	●	●	●	●	●			
				Angled	PVC	2 m	DOL-1204-W02MN	6028129	●	●	●	●	●	●	●	●	●	●	
						5 m	DOL-1204-W05MN	6028131	●	●	●	●	●	●	●	●	●		
						10 m	DOL-1204-W10MN	6028133	●	●	●	●	●	●	●	●	●		
	Connector M8, 4-pin Female connector M12, 4-pin	Connector, Female connector	IP 69K	Connector straight, Female connector angled	PVC	2 m	DSL-1204-B02MN	6028198	●	●	●	●	●	●	●	●			
						5 m	DSL-1204-B05MN	6028199	●	●	●	●	●	●	●	●			
						0,6 m	DSL-1204-B0M6N	6028197	●	●	●	●	●	●	●	●			
				Connector straight, Female connector straight	PVC	2 m	DSL-1204-G02MN	6028195	●	●	●	●	●	●	●	●	●		
						5 m	DSL-1204-G05MN	6028196	●	●	●	●	●	●	●	●	●		
						0,6 m	DSL-1204-G0M6N	6028194	●	●	●	●	●	●	●	●	●		

Special accessories

	Part no.	W4S-3 Inox	W4S-3 Inox Glass	W4S-3 Inox Hygiene	W4S-3 Inox Hygiene Glass
Testbox	6038940	●	●	●	●

Reflectors

Figure	Enclosure rating	Model name	Part no.	W4S-3 Inox	W4S-3 Inox Glass	W4S-3 Inox Hygiene	W4S-3 Inox Hygiene Glass
	IP 67: EN 60529, IP 69K: EN 40050	P250 CHEM	5321097	●	●	●	●
	IP 69K	P250H	5315124	●	●	●	●
	IP 67: EN 60529, IP 69K: EN 40050	PL10F CHEM	5321636	●	●	●	●
	IP 67: EN 60529, IP 69K: EN 40050	PL20 CHEM	5321089	●	●	●	●
	-	PL40A Antifog	5322011	●	●	●	●

## PxxxCHEM – Assessment of chemical stress by TÜV Rheinland (Rhineland technical testing authority)

Liquid tested	Substance group/ component parts	Assessment after (composition, color)		
		1 day	7 days	14 days
Acetaldehyde	Aldehydes	0	0	0
Acetone	Ketones	1 (softening of surface)	1 (softening of surface)	1 (softening of surface)
Formic acid	Organic acids	0	0	0
Benzene	Aromat. hydrocarbon	0	0	1 (opacity)
1,3-Butanediol	Polyalcohols	0	0	0
Butylamine	Amines	0	0	0
Chlorobenzene	Chlor., aromat. hydro- carbon	0	0	0
Chloroform	CHC	0	0	0
Chlorosulfonic acid	Acid chlorides	0	0	0
Diesel fuel	Fuels	0	0	0
Diethyl ether	Ether	0	0	0
Dimethylformamide	Amides	0	0	0
Dimethyl sulfate	Ester	0	0	0
Glacial acetic acid	Organic acids	0	0	1 (slight fissures)
Acetic acid 10 %	Organic acids	0	0	0
Ethanol	Alcohols	0	0	1 (slight color change)
Ethylene glycol	Polyalcohols	0	0	0
Formaldehyde 37 %	Aldehydes	0	0	0
Heating oil EL	Fuels	0	0	0
Isopropanol	Alcohols	0	0	0
Kerosene	Fuels	0	0	0
m-Cresol	Phenols	0	0	0
Methanol	Alcohols	0	0	1 (opacity)
n-Heptane	hydrocarbon	0	0	0
Sodium hydroxide 10 %	Alkalis	0	0	0
Salt acid 20 %	Inorganic acids	0	0	0
Sulfuric acid 98 %	Inorganic acids	0	0	0
1, 1, 2, 2 Tetrachloroethane	Chlorinated hydrocarbon	0	0	0
Tetrachloromethane	Chlorinated hydrocarbon	0	0	0
Toluol	Aromat. hydrocarbon	0	0	0
Hydrogen peroxide (H <sub>2</sub> O <sub>2</sub> ), 10%	–	0	0	0
Cleaning agent Medicine <sup>a</sup>	–	0	0	0
Cleaning agent Food <sup>a</sup>	–	0	0	0

0 = no change

1 = slight change (description required)

2 = significant change (description required)

a = Lysoformin<sup>®</sup> 3000 (contents: glyoxal, glutaral, didecyltrimethylammonium chloride)

b = Bio Tec detergent (contents: alkylbenzene sulfonate, alkyl ether sulfate)

Measured values were taken from the inspection report by TÜV Rheinland (Rhineland technical testing authority) (Test no. 620/434628).

## PxxxCHEM – Resistant to ECOLAB cleaning agent

### Implementation:

- Immersion of the CHEM reflectors in various cleaning solutions and concentrates
- Temperature: +60 or +80 °C
- Duration: 2 weeks
- After 2 weeks, the reflectors are rinsed with DI water and optically and gravimetrically assessed.

Product/concentration	T [°C]	Suitability
P3-cosa CIP 72	60	+
P3-cosa CIP 77	80	+
P3-cosa CIP 90	80	+
P3-cosa CIP 92	80	+
P3-cosa CIP 95	80	+
P3-cosa PUR 80	80	+
P3-cosa PUR 83	80	+
P3-cosa PUR 84	80	+
P3-cosa PUR 85	80	+
P3-cosa PUR 88	80	+
P3-cosa FOAM 40	80	+
P3-cosa DES	80	+
P3-cosa FLUX 22	80	+
P3-cosa FLUX 33	80	+
P3-cosa FLUX 44	80	+
P3-cosa FLUX 55*	80	0

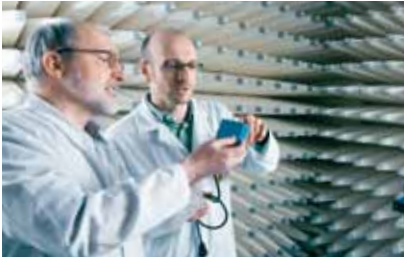
+ = suitable

0 = suitable in certain conditions

- = unsuitable

\* = contains nitric acid

## SICK at a glance



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- Accident and operator protection with sensors, safety software and services
- Automatic identification with bar code and RFID readers
- Laser measurement technology for detecting the volume, position and contour of people and objects
- Complete system solutions for analysis and flow measurement of gases and liquids



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