



# WLA4SP-21312100ZZZ

W4

MINIATURE PHOTOELECTRIC SENSORS

**SICK**  
Sensor Intelligence.



Illustration may differ



### Ordering information

Type	Part no.
WLA4SP-21312100ZZZ	1139135

Other models and accessories → [www.sick.com/W4](http://www.sick.com/W4)

### Detailed technical data

#### Features

<b>Functional principle</b>	Photoelectric retro-reflective sensor
<b>Functional principle detail</b>	Without reflector minimum distance (autocollimation/coaxial optics)
<b>Sensing range</b>	
Sensing range min.	0 m
Sensing range max.	4 m
Maximum distance range from reflector to sensor (operating reserve 1)	0 m ... 4 m
Recommended distance range from reflector to sensor (operating reserve 3,75)	0 m ... 2.6 m
Reference reflector	Reflector PL80
Recommended sensing range for the best performance	0 m ... 2.6 m
<b>Polarisation filters</b>	Yes
<b>Emitted beam</b>	
Light source	PinPoint LED
Type of light	Visible red light
Shape of light spot	Point-shaped
Light spot size (distance)	150 mm (5 m)
Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle)	< +/- 1.5° (at Ta = +23 °C)
<b>Key LED figures</b>	

Normative reference	EN 62471:2008-09   IEC 62471:2006, modified
LED risk group marking	Free group
Wave length	635 nm
Average service life	100,000 h at $T_a = +25\text{ °C}$
<b>Adjustment</b>	
None	-
<b>Indication</b>	
LED blue	BluePilot: Alignment aid
LED green	Operating indicator Static on: power on
LED yellow	Status of received light beam Static on: object not present Static off: object present Flashing: Below the 1.5 function reserve
<b>Special applications</b>	Detecting objects wrapped in film

### Safety-related parameters

<b>MTTF<sub>D</sub></b>	1,956 years
<b>DC<sub>avg</sub></b>	0%

### Electrical data

<b>Supply voltage U<sub>B</sub></b>	10 V DC ... 30 V DC <sup>1)</sup>
<b>Ripple</b>	≤ 5 V <sub>pp</sub>
<b>Usage category</b>	DC-12 (According to EN 60947-5-2) DC-13 (According to EN 60947-5-2)
<b>Current consumption</b>	≤ 20 mA, without load. At U <sub>B</sub> = 24 V
<b>Protection class</b>	III
<b>Digital output</b>	
Number	1
Type	Push-pull: PNP/NPN
Switching mode	Light switching
Signal voltage PNP HIGH/LOW	Approx. U <sub>B</sub> -2.5 V / 0 V
Signal voltage NPN HIGH/LOW	Approx. U <sub>B</sub> / < 2.5 V
Output current I <sub>max</sub>	≤ 100 mA
Circuit protection outputs	Reverse polarity protected Overcurrent protected Short-circuit protected
Response time	≤ 500 μs
Repeatability (response time)	150 μs
Switching frequency	1,000 Hz
<b>Pin/Wire assignment</b>	
Function of pin 4/black (BK)	Digital output, light switching, object present → output Q <sub>L1</sub> LOW <sup>2)</sup>

<sup>1)</sup> Limit values.

<sup>2)</sup> This switching output must not be connected to another output.

### Mechanical data

<b>Housing</b>	Rectangular
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<b>Design detail</b>	Slim
<b>Dimensions (W x H x D)</b>	12.1 mm x 41.9 mm x 18.6 mm
<b>Connection</b>	Connector M8, 3-pin
<b>Material</b>	
Housing	Plastic, VISTAL®
Front screen	Plastic, PMMA
Male connector	Plastic, VISTAL®
<b>Maximum tightening torque of the fixing screws</b>	0.4 Nm

Ambient data

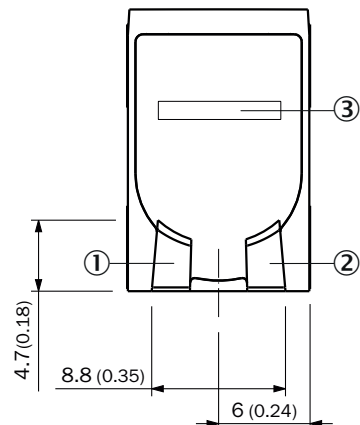
<b>Enclosure rating</b>	IP66 (EN 60529) IP67 (EN 60529)
<b>Ambient operating temperature</b>	-40 °C ... +60 °C
<b>Ambient temperature, storage</b>	-40 °C ... +75 °C
<b>Typ. Ambient light immunity</b>	Artificial light: ≤ 50,000 lx Sunlight: ≤ 50,000 lx
<b>Shock resistance</b>	30 g, 11 ms (3 positive and 3 negative shocks along X, Y, Z axes, 18 total shocks (EN60068-2-27))
<b>Vibration resistance</b>	10 Hz ... 1,000 Hz (Amplitude 1 mm, 3 x 30 min (EN60068-2-6))
<b>Air humidity</b>	35 % ... 95 %, relative humidity (no condensation)
<b>Electromagnetic compatibility (EMC)</b>	EN 60947-5-2
<b>Resistance to cleaning agent</b>	ECOLAB
<b>UL File No.</b>	NRKH.E181493 & NRKH7.E181493

Classifications

<b>ECLASS 5.0</b>	27270902
<b>ECLASS 5.1.4</b>	27270902
<b>ECLASS 6.0</b>	27270902
<b>ECLASS 6.2</b>	27270902
<b>ECLASS 7.0</b>	27270902
<b>ECLASS 8.0</b>	27270902
<b>ECLASS 8.1</b>	27270902
<b>ECLASS 9.0</b>	27270902
<b>ECLASS 10.0</b>	27270902
<b>ECLASS 11.0</b>	27270902
<b>ECLASS 12.0</b>	27270902
<b>ETIM 5.0</b>	EC002717
<b>ETIM 6.0</b>	EC002717
<b>ETIM 7.0</b>	EC002717
<b>ETIM 8.0</b>	EC002717
<b>UNSPSC 16.0901</b>	39121528

## Adjustments

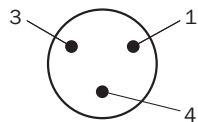
Display and adjustment elements



- ① LED green
- ② LED yellow
- ③ LED blue

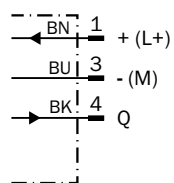
## Connection type

Connector M8, 3-pin



## Connection diagram

Cd-045



**Truth table**

Push-pull: PNP/NPN - light switching Q

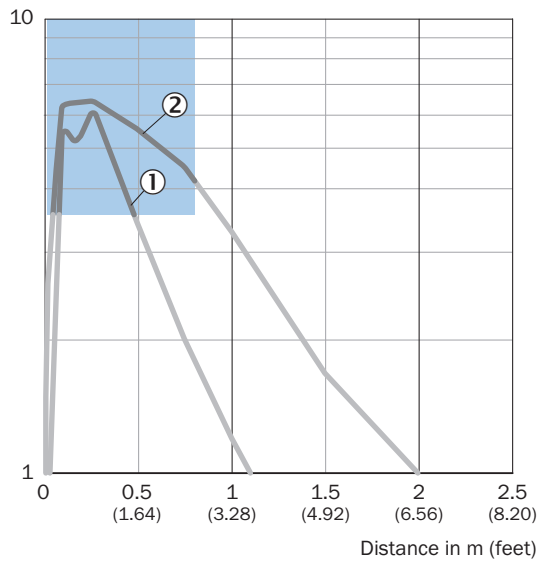
	Light switching Q (normally closed (upper switch), normally open (lower switch))	
	Object not present → Output HIGH	Object present → Output LOW
Light receive	✓	✗
Light receive indicator	☉	✗
Load resistance to L+	✗	⚠
Load resistance to M	⚠	✗

**Characteristic curve**

Chemical-resistant reflectors

Operating reserve

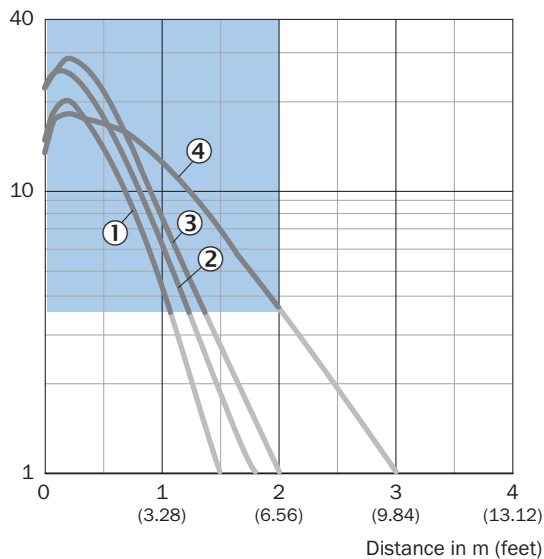


Recommended sensing range for the best performance

- ① Reflector PL20 CHEM
- ② Reflector P250 CHEM

Fine triple reflectors

Operating reserve

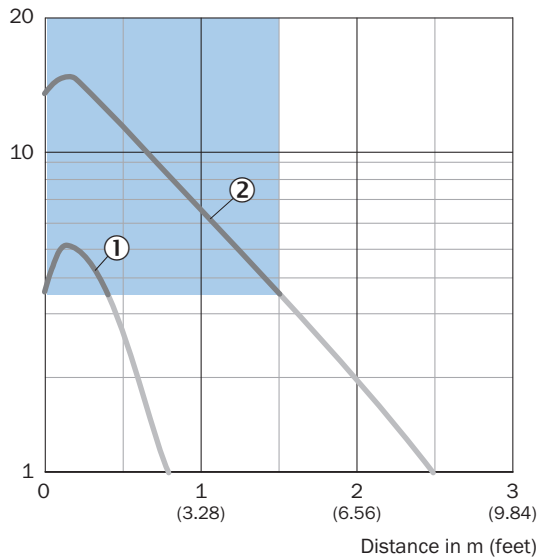


Recommended sensing range for the best performance

- ① PL10F reflector
- ② PL10FH-1 reflector
- ③ Reflector PL20F
- ④ Reflector P250F

Reflective tape

Operating reserve

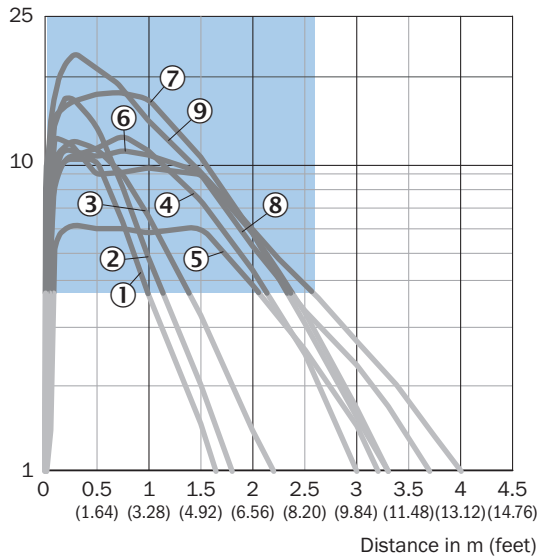


Recommended sensing range for the best performance

- ① Reflective tape REF-IRF-56
- ② Reflective tape REF-AC1000

Standard reflectors

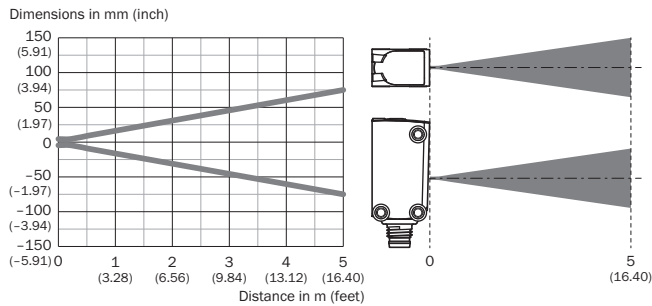
Operating reserve



Recommended sensing range for the best performance

- ① Reflector PL20A
- ② Reflector PL22-2
- ③ Reflector P250H
- ④ Reflector PL30A
- ⑤ Reflector PL40A Antifog
- ⑥ Reflector PL40A
- ⑦ Reflector P250
- ⑧ Reflector C110A
- ⑨ Reflector PL80A

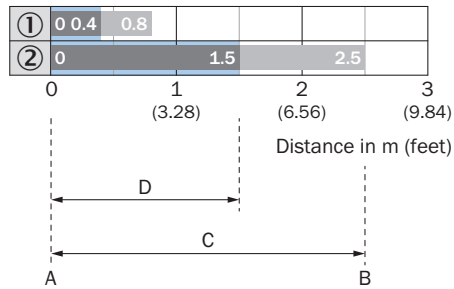
Light spot size







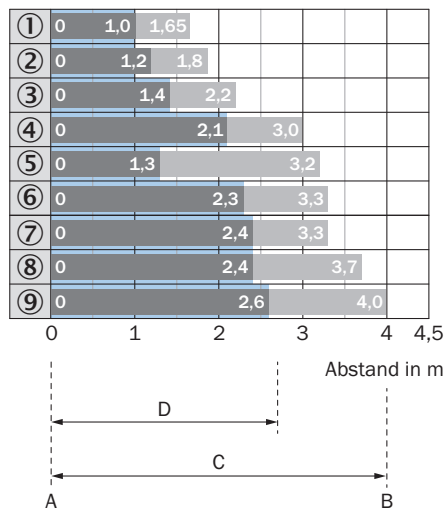
Reflective tape



Recommended sensing range for the best performance

1	Reflective tape REF-IRF-56
2	Reflective tape REF-AC1000
A	Sensing range min. in m
B	Sensing range max. in m
C	Maximum distance range from reflector to sensor (operating reserve 1)
D	Recommended distance range from reflector to sensor (operating reserve 3,75)

Standard reflectors



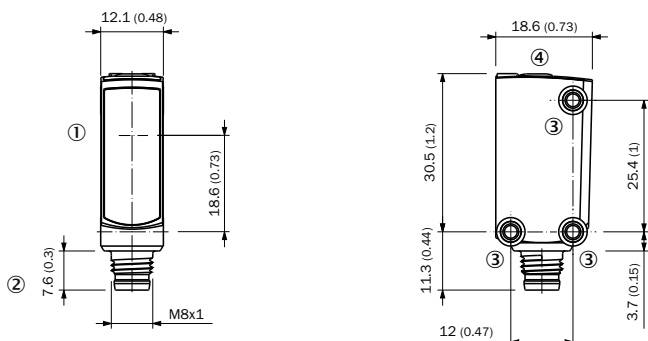
Empfohlener Schaltabstandsbereich für beste Performance

1	Reflector PL20A
2	Reflector PL22-2
3	Reflector P250H
4	Reflector PL30A
5	Reflector PL40A Antifog
6	Reflector PL40A
7	Reflector P250
8	Reflector C110A

9	Reflector PL80A
A	Sensing range min. in m
B	Sensing range max. in m
C	Maximum distance range from reflector to sensor (operating reserve 1)
D	Recommended distance range from reflector to sensor (operating reserve 3,75)

**Dimensional drawing** (Dimensions in mm (inch))

Dimensional drawing, sensor



- ① Center of optical axis
- ② Connection
- ③ M3 mounting hole
- ④ Display and adjustment elements

**Recommended accessories**

Other models and accessories → [www.sick.com/W4](http://www.sick.com/W4)

	Brief description	Type	Part no.
Reflectors			
	Rectangular, screw connection, 84 mm x 84 mm, PMMA/ABS, Screw-on, 2 hole mounting	PL80A	1003865

## SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

## WORLDWIDE PRESENCE:

Contacts and other locations –[www.sick.com](http://www.sick.com)