



WLA4SP-3131100ZZZ

W4

MINIATURE PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.



Illustration may differ

Ordering information

| Type | Part no. |
|--------------------|----------|
| WLA4SP-31311100ZZZ | 1139129 |

Other models and accessories → www.sick.com/W4



Detailed technical data

Features

| | |
|---|---|
| Functional principle | Photoelectric retro-reflective sensor |
| Functional principle detail | Without reflector minimum distance (autocollimation/coaxial optics) |
| Sensing range | |
| 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 |
| Polarisation filters | Yes |
| Emitted beam | |
| 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) |
| Key LED figures | |

| | |
|-----------------------------|--|
| 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 $T_a = +25\text{ °C}$ |
| Adjustment | |
| None | - |
| Indication | |
| 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 |
| Special applications | Detecting objects wrapped in film |

Safety-related parameters

| | |
|-------------------------|-------------|
| MTTF_D | 1,956 years |
| DC_{avg} | 0% |

Electrical data

| | |
|-------------------------------------|--|
| Supply voltage U_B | 10 V DC ... 30 V DC ¹⁾ |
| Ripple | ≤ 5 V _{pp} |
| Usage category | DC-12 (According to EN 60947-5-2) DC-13 (According to EN 60947-5-2) |
| Current consumption | ≤ 20 mA, without load. At U _B = 24 V |
| Protection class | III |
| Digital output | |
| Number | 1 |
| Type | Push-pull: PNP/NPN |
| Switching mode | Dark switching |
| Signal voltage PNP HIGH/LOW | Approx. U _B -2.5 V / 0 V |
| Signal voltage NPN HIGH/LOW | Approx. U _B / < 2.5 V |
| Output current I _{max} | ≤ 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 |
| Pin/Wire assignment | |
| Function of pin 4/black (BK) | Digital output, dark switching, object present → output \bar{Q} HIGH ²⁾ |

¹⁾ Limit values.

²⁾ This switching output must not be connected to another output.

Mechanical data

| | |
|----------------|-------------|
| Housing | Rectangular |
|----------------|-------------|

| | |
|---|--|
| Design detail | Slim |
| Dimensions (W x H x D) | 12.1 mm x 41.9 mm x 18.6 mm |
| Connection | Cable with connector M8, 3-pin, 110 mm |
| Connection detail | |
| Deep-freeze property | Do not bend below 0 °C |
| Conductor size | 0.14 mm ² |
| Cable diameter | Ø 3.4 mm |
| Length of cable (L) | 77 mm |
| Material | |
| Housing | Plastic, VISTAL® |
| Front screen | Plastic, PMMA |
| Cable | Plastic, PVC |
| Male connector | Plastic, VISTAL® |
| Maximum tightening torque of the fixing screws | 0.4 Nm |

Ambient data

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

Classifications

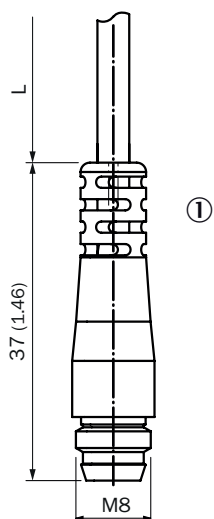
| | |
|---------------------|----------|
| ECLASS 5.0 | 27270902 |
| ECLASS 5.1.4 | 27270902 |
| ECLASS 6.0 | 27270902 |
| ECLASS 6.2 | 27270902 |
| ECLASS 7.0 | 27270902 |
| ECLASS 8.0 | 27270902 |
| ECLASS 8.1 | 27270902 |
| ECLASS 9.0 | 27270902 |
| ECLASS 10.0 | 27270902 |
| ECLASS 11.0 | 27270902 |
| ECLASS 12.0 | 27270902 |
| ETIM 5.0 | EC002717 |
| ETIM 6.0 | EC002717 |

| | |
|-----------------------|----------|
| ETIM 7.0 | EC002717 |
| ETIM 8.0 | EC002717 |
| UNSPSC 16.0901 | 39121528 |

Maßzeichnung (Dimensions in mm (inch))

Dimensional drawing (Dimensions in mm (inch))

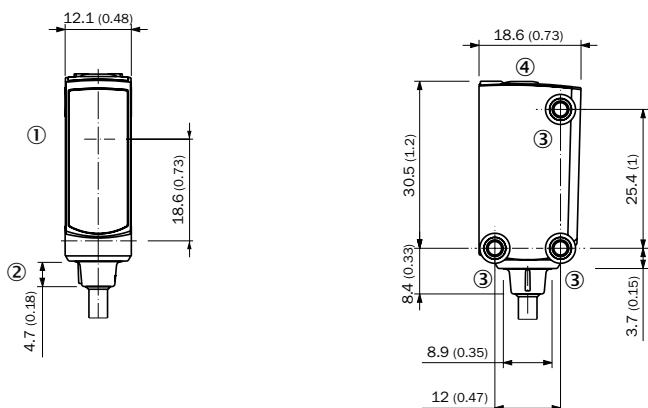
Dimensional drawing, connection



For length of cable (L), see technical data

① Cable with connector M8

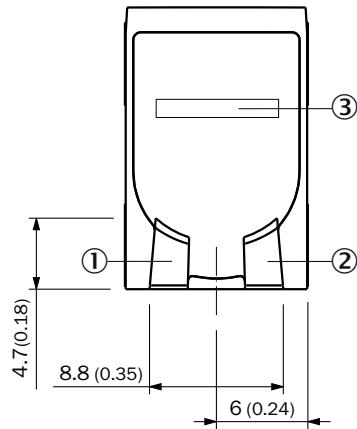
Dimensional drawing, sensor



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

Adjustments

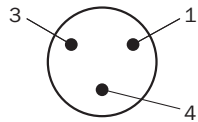
Display and adjustment elements



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

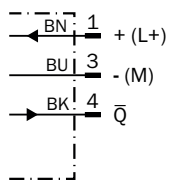
Connection type

Connector M8, 3-pin



Connection diagram

Cd-514



Truth table

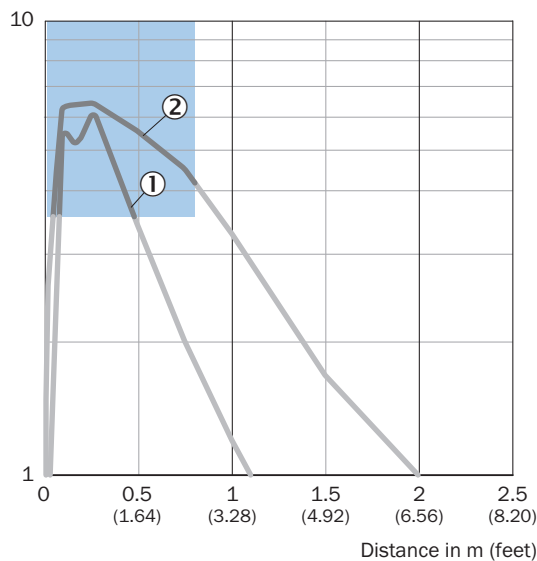
Push-pull: PNP/NPN – dark switching \bar{Q}

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

Characteristic curve

Chemical-resistant reflectors

Operating reserve

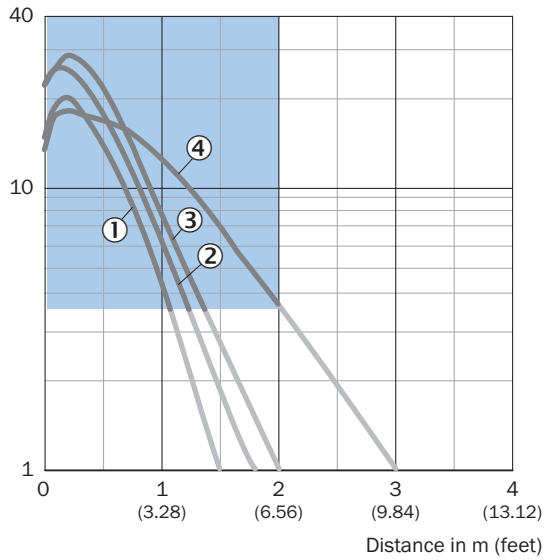


Recommended sensing range for the best performance

- ① Reflector PL20 CHEM
- ② Reflector P250 CHEM

Fine triple reflectors

Operating reserve

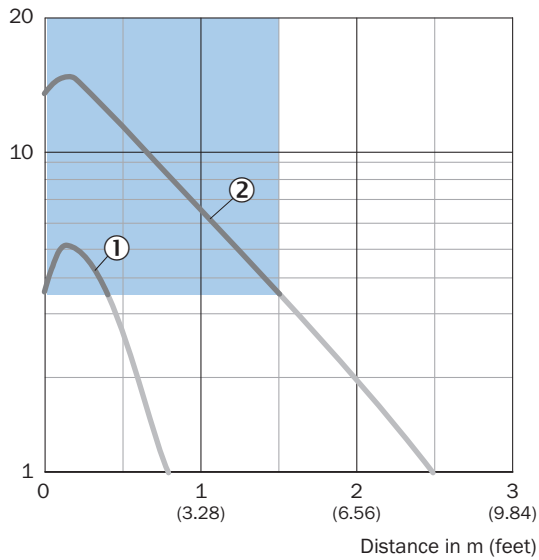


Recommended sensing range for the best performance

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

Reflective tape

Operating reserve

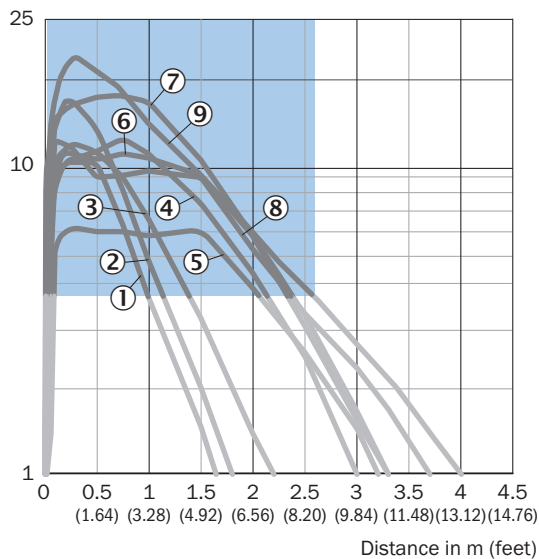


Recommended sensing range for the best performance

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

Standard reflectors

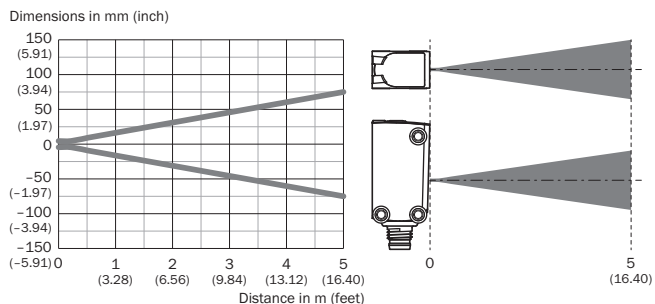
Operating reserve



Recommended sensing range for the best performance

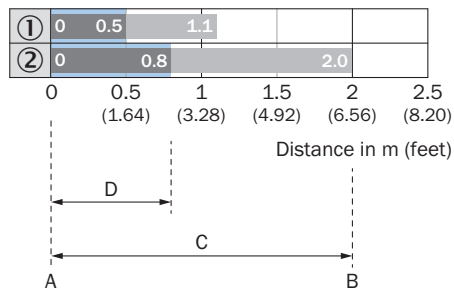
- ① Reflector PL20A
- ② Reflector PL22-2
- ③ Reflector P250H
- ④ Reflector PL30A
- ⑤ Reflector PL40A Antifog
- ⑥ Reflector PL40A
- ⑦ Reflector P250
- ⑧ Reflector C110A
- ⑨ Reflector PL80A

Light spot size



Sensing range diagram

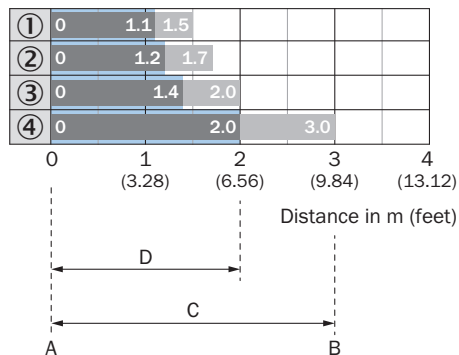
Chemical-resistant reflectors



Recommended sensing range for the best performance

| | |
|---|--|
| 1 | Reflector PL20 CHEM |
| 2 | Reflector P250 CHEM |
| 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) |

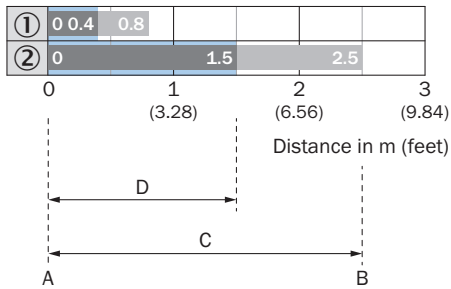
Fine triple reflectors



Recommended sensing range for the best performance

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

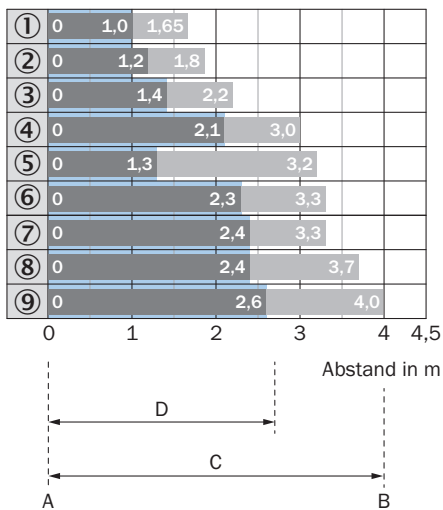
Reflective tape



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) |

Recommended accessories

Other models and accessories → 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:

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