

SICK.COM



DATA SHEET

WLA4SP-31311100ZZZ

W4
Photoelectric sensors

SICK Sensor Intelligence

PHOTOELECTRIC SENSORS

WLA4SP-31311100ZZZ

ORDERING INFORMATION

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

Further device versions and accessories at www.sick.com/W4



Illustration may differ



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 filter | 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 T ₀ = +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 °C |
| Adjustment | | |

| | | |
|----------------------|-----------------------------------|--|
| | None | - |
| Display | 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% |

ELECTRONICS

| | | |
|-------------------------------|--|--|
| 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 Q̄ HIGH ²⁾ |

¹⁾ Limit values.

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

MECHANICS

| | | |
|------------------------|--|------------------------|
| 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 |
|--|--------|

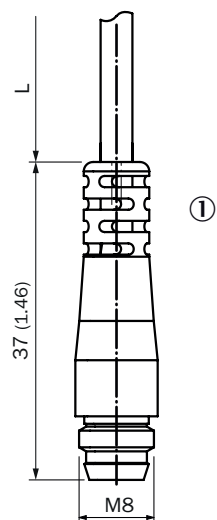
AMBIENT DATA

| | |
|-------------------------------------|---|
| 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 |

CERTIFICATES

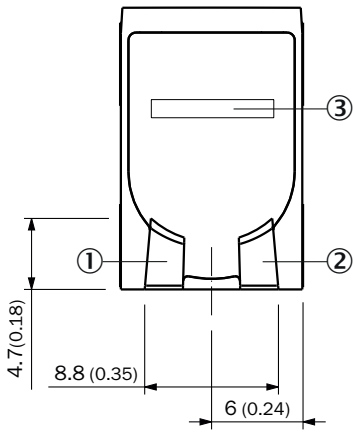
| | |
|------------------------------------|---|
| EU declaration of conformity | ✓ |
| UK declaration of conformity | ✓ |
| ACMA declaration of conformity | ✓ |
| Moroccan declaration of conformity | ✓ |
| China RoHS | ✓ |
| cULus certificate | ✓ |

DIMENSIONAL DRAWING, CONNECTION



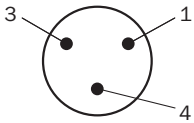
Dimensions in mm (inch)
 For length of cable (L), see technical data
 ① cable with connector M8

DISPLAY AND ADJUSTMENT ELEMENTS

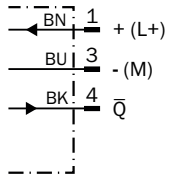


- ① LED green
- ② LED yellow
- ③ LED blue

CONNECTION TYPE CONNECTOR M8, 3-PIN



CONNECTION DIAGRAM CD-514

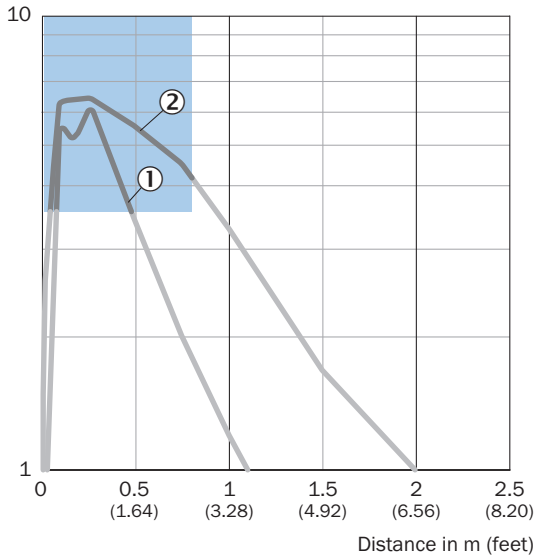


TRUTH TABLE PUSH-PULL: PNP/NPN - DARK SWITCHING \bar{Q}

| | 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

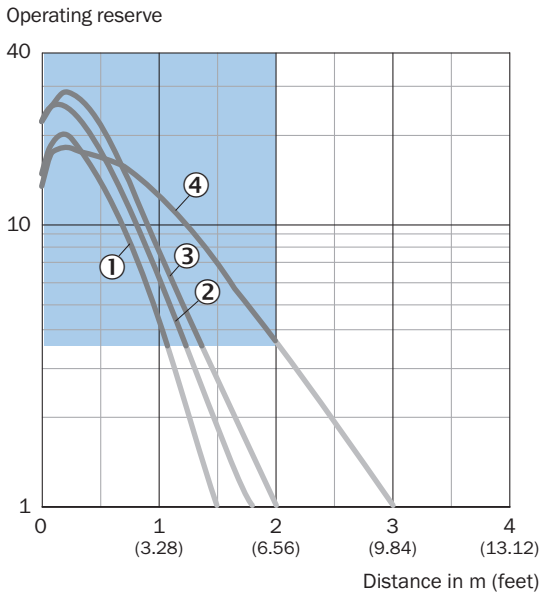
Operating reserve



Recommended sensing range for the best performance

- ① Reflector PL20 CHEM
- ② Reflector P250 CHEM

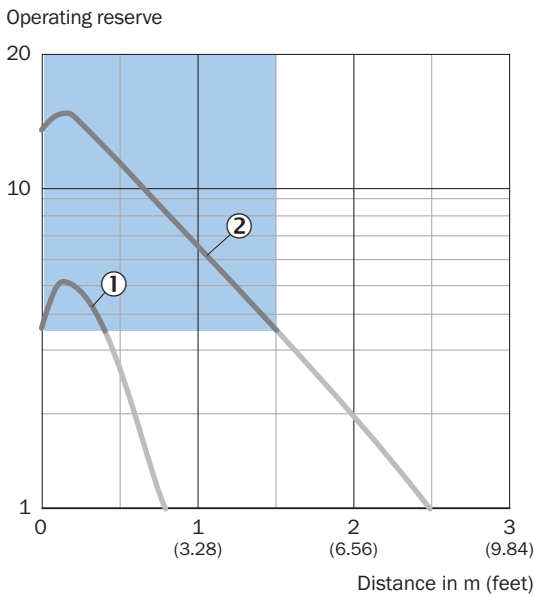
CHARACTERISTIC CURVE FINE TRIPLE REFLECTORS



Recommended sensing range for the best performance

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

CHARACTERISTIC CURVE REFLECTIVE TAPE

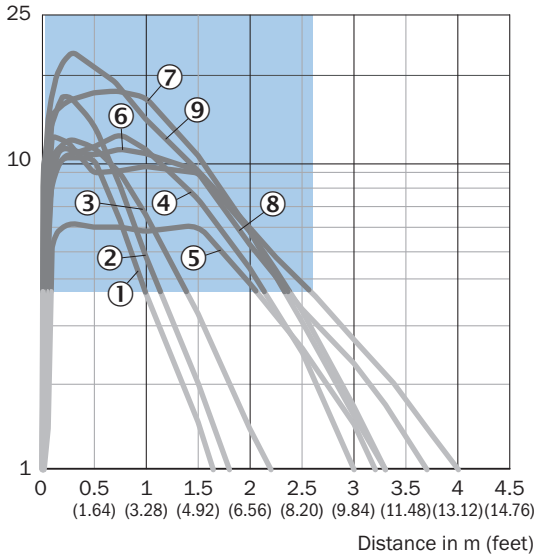


Recommended sensing range for the best performance

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

CHARACTERISTIC CURVE STANDARD REFLECTORS

Operating reserve

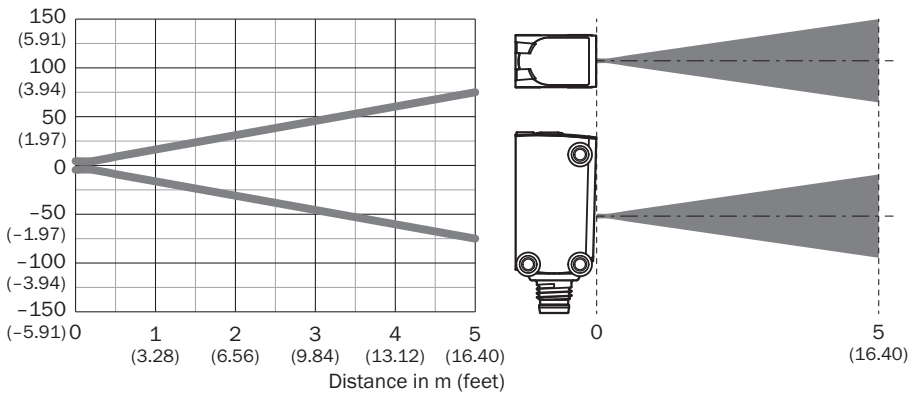


Recommended sensing range for the best performance

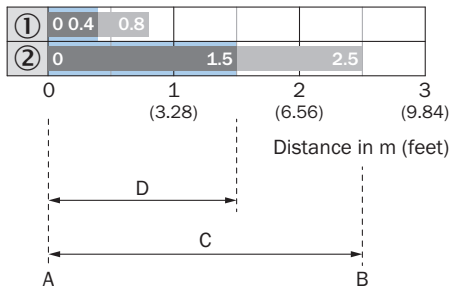
- ① Reflector PL20A
- ② reflector PL22-2
- ③ Reflector P250H
- ④ Reflector PL30A
- ⑤ Reflector PL40A Antifog
- ⑥ Reflector PL40A
- ⑦ Reflector P250
- ⑧ Reflector C110A
- ⑨ Reflector PL80A

LIGHT SPOT SIZE

Dimensions in mm (inch)



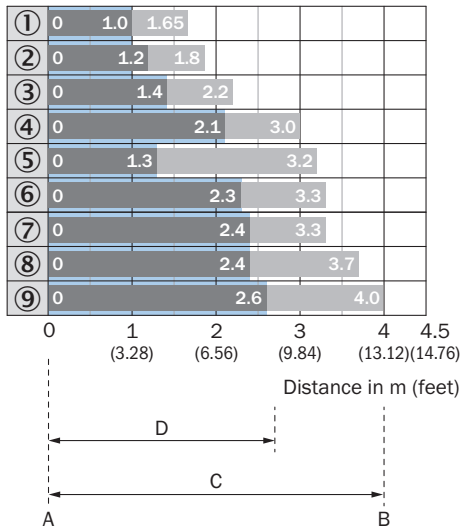
SENSING RANGE DIAGRAM REFLECTIVE TAPE



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) |

SENSING RANGE DIAGRAM STANDARD REFLECTORS

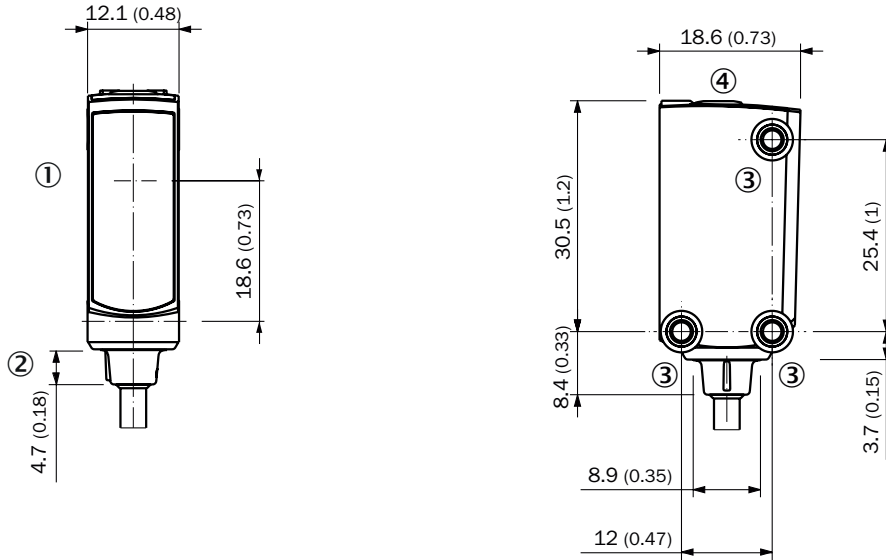


Recommended sensing range for the best performance

| | |
|---|-------------------------|
| 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 |
| 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, SENSOR



Dimensions in mm (inch)

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

Further information as well as suitable accessories, example applications and downloads such as CAD dimensional models, operating instructions and software can be found at www.sick.com/1139129



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SICK AT A GLANCE

SICK is a leading global technology company for intelligent sensors and integrated solutions in industrial automation. Our technologies set benchmarks, making your industrial processes more efficient, safer and more sustainable – both in logistics and manufacturing operations.

SICK combines sensor intelligence with industry expertise and certified consulting services. We provide the ideal foundation for scalable as well as tailor-made automation solutions and create added value along the entire value chain. Our close partnerships with our customers are more than just a promise: Together, we optimize productivity, improve quality, protect health and safety, and help build a sustainable future. All with empathy and trust.

Since 1946, we have been developing innovative technologies with passion and a pioneering spirit. With a global network in around 40 countries, SICK has a global presence and is always close by. The company's headquarters are located in Waldkirch near Freiburg, Germany. Our customers benefit from our understanding of both local and global requirements, which enables us to deliver tailor-made solutions

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