



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](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>Display</b>              |                                                                                                                                          |
| LED blue                    | BluePilot: Alignment aid                                                                                                                 |
| LED green                   | Operating indicator<br>Static on: power on                                                                                               |
| LED yellow                  | Status of received light beam<br>Static on: object not present<br>Static off: object present<br>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%          |

#### Electronics

|                                        |                                                                                                  |
|----------------------------------------|--------------------------------------------------------------------------------------------------|
| <b>Supply voltage <math>U_B</math></b> | 10 V DC ... 30 V DC <sup>1)</sup>                                                                |
| <b>Ripple</b>                          | $\leq 5\text{ V}_{pp}$                                                                           |
| <b>Usage category</b>                  | DC-12 (According to EN 60947-5-2)<br>DC-13 (According to EN 60947-5-2)                           |
| <b>Current consumption</b>             | $\leq 20\text{ mA}$ , without load. At $U_B = 24\text{ V}$                                       |
| <b>Protection class</b>                | III                                                                                              |
| <b>Digital output</b>                  |                                                                                                  |
| Number                                 | 1                                                                                                |
| Type                                   | Push-pull: PNP/NPN                                                                               |
| Switching mode                         | Dark switching                                                                                   |
| Signal voltage PNP HIGH/LOW            | Approx. $U_B - 2.5\text{ V}$ / $0\text{ V}$                                                      |
| Signal voltage NPN HIGH/LOW            | Approx. $U_B$ / $< 2.5\text{ V}$                                                                 |
| Output current $I_{max}$               | $\leq 100\text{ mA}$                                                                             |
| Circuit protection outputs             | Reverse polarity protected<br>Overcurrent protected<br>Short-circuit protected                   |
| Response time                          | $\leq 500\text{ }\mu\text{s}$                                                                    |
| Repeatability (response time)          | $150\text{ }\mu\text{s}$                                                                         |
| Switching frequency                    | 1,000 Hz                                                                                         |
| <b>Pin/Wire assignment</b>             |                                                                                                  |
| Function of pin 4/black (BK)           | Digital output, dark switching, object present $\rightarrow$ output $\bar{Q}$ HIGH <sup>2)</sup> |
| Function of pin 2/white (WH)           | <sup>2)</sup>                                                                                    |

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

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

Mechanics

|                                                       |                                        |
|-------------------------------------------------------|----------------------------------------|
| <b>Housing</b>                                        | Rectangular                            |
| <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>                                     | Cable with connector M8, 3-pin, 110 mm |
| <b>Connection detail</b>                              |                                        |
| Deep-freeze property                                  | Do not bend below 0 °C                 |
| Conductor size                                        | 0.14 mm <sup>2</sup>                   |
| Cable diameter                                        | Ø 3.4 mm                               |
| Length of cable (L)                                   | 77 mm                                  |
| <b>Material</b>                                       |                                        |
| Housing                                               | Plastic, VISTAL®                       |
| Front screen                                          | Plastic, PMMA                          |
| Cable                                                 | Plastic, PVC                           |
| 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)<br>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<br>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                                                                      |

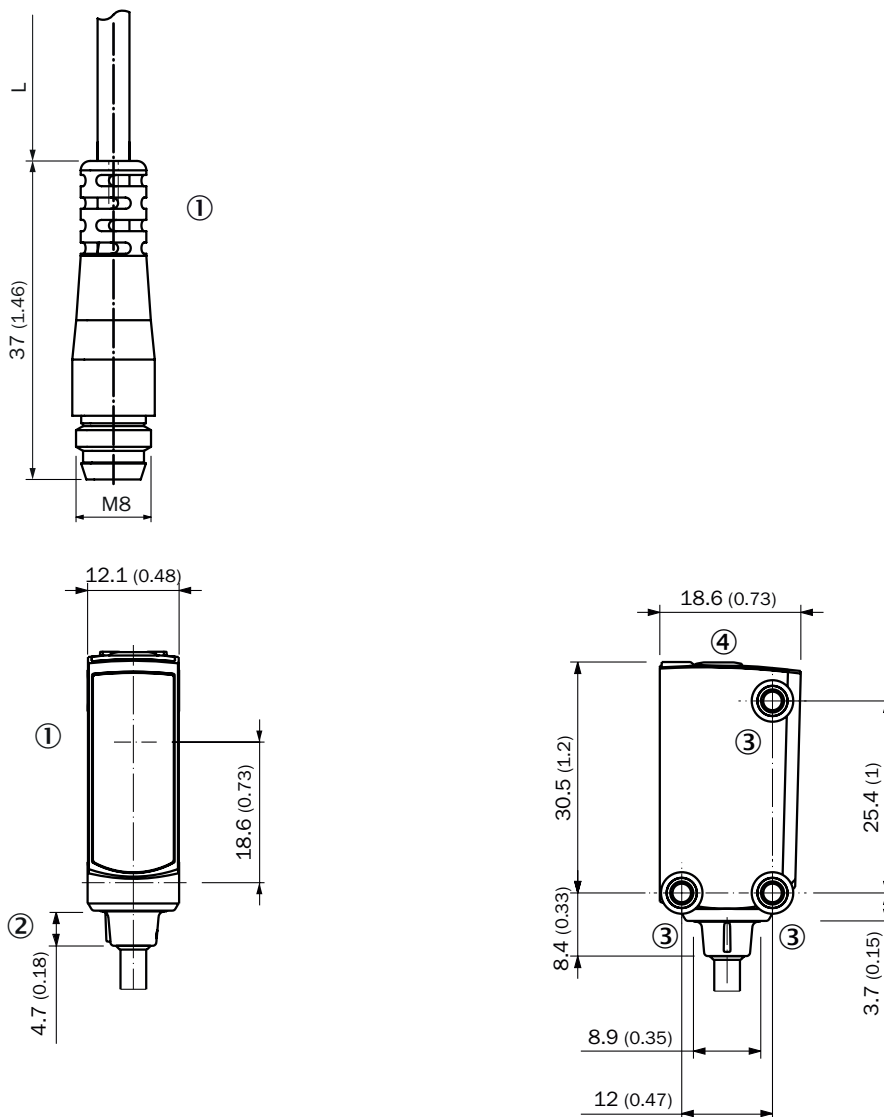
Classifications

|                     |          |
|---------------------|----------|
| <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 |

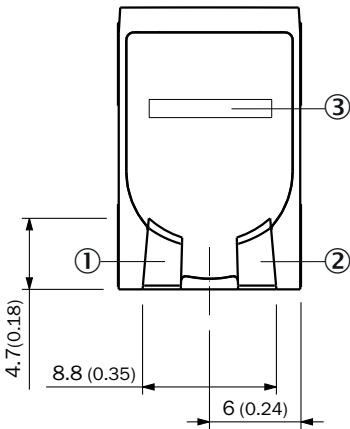
|                       |          |
|-----------------------|----------|
| <b>ETIM 5.0</b>       | EC002717 |
| <b>ETIM 6.0</b>       | EC002717 |
| <b>ETIM 7.0</b>       | EC002717 |
| <b>ETIM 8.0</b>       | EC002717 |
| <b>UNSPSC 16.0901</b> | 39121528 |

Maßzeichnung (Dimensions in mm (inch))

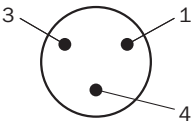
### Dimensional drawing (Dimensions in mm (inch))



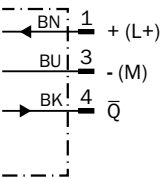
Adjustments



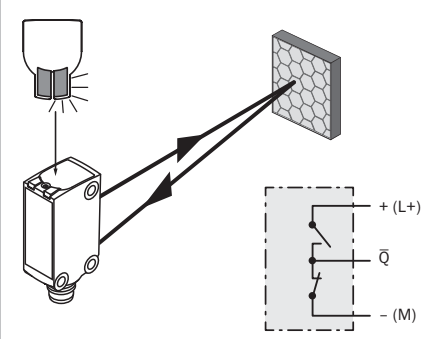
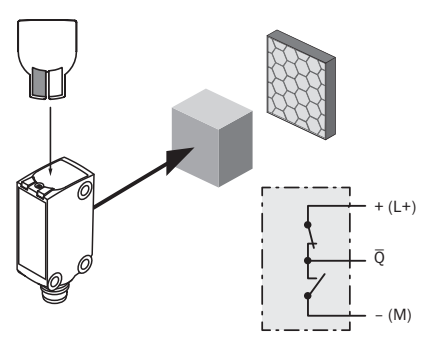
Connection type



Connection diagram

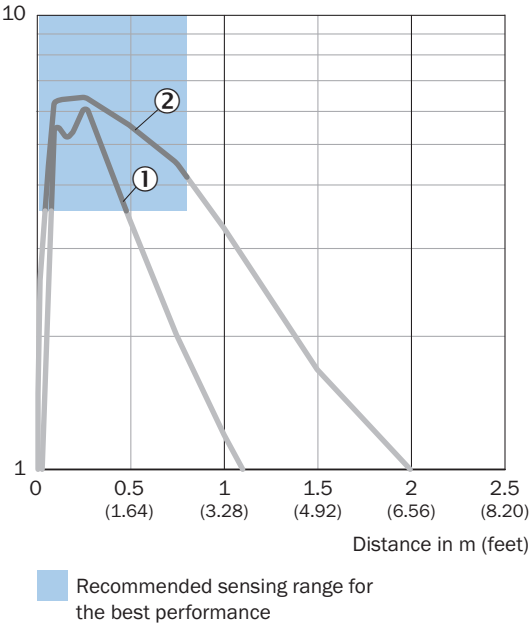


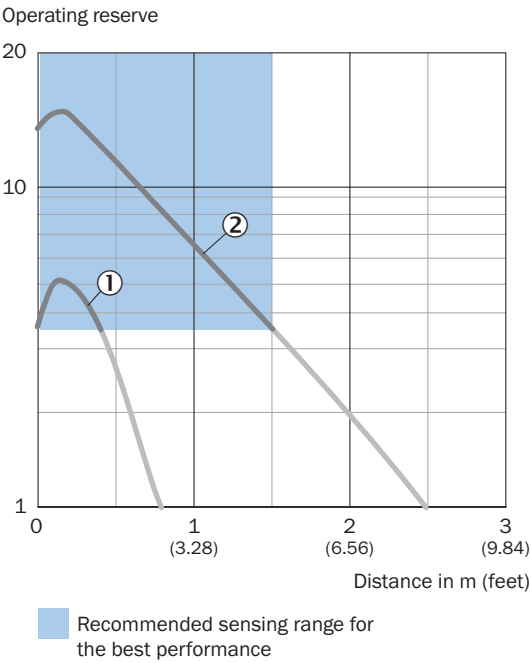
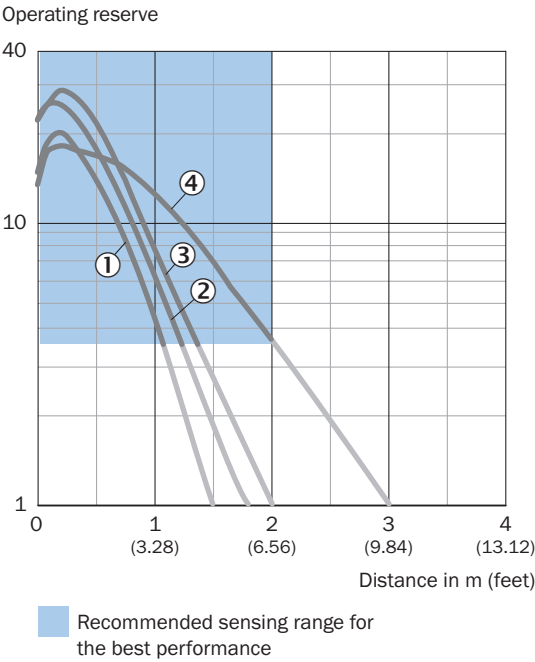
Truth table

|                         | 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    | ✗                                                                                       | ⚡                                                                                   |
|                         |        |  |

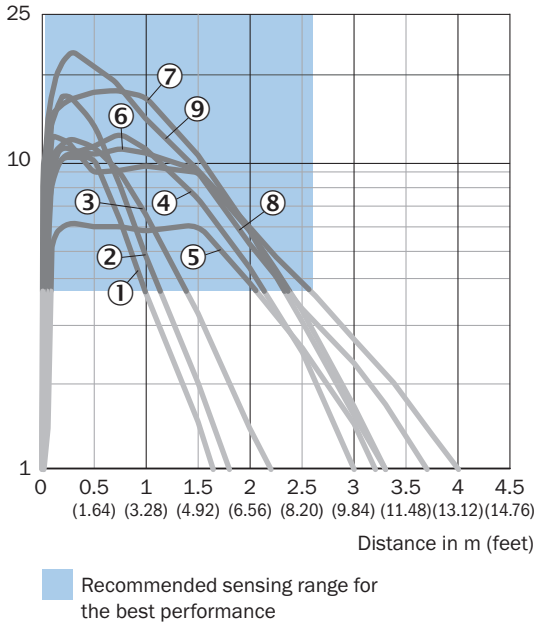
Characteristic curve

Operating reserve



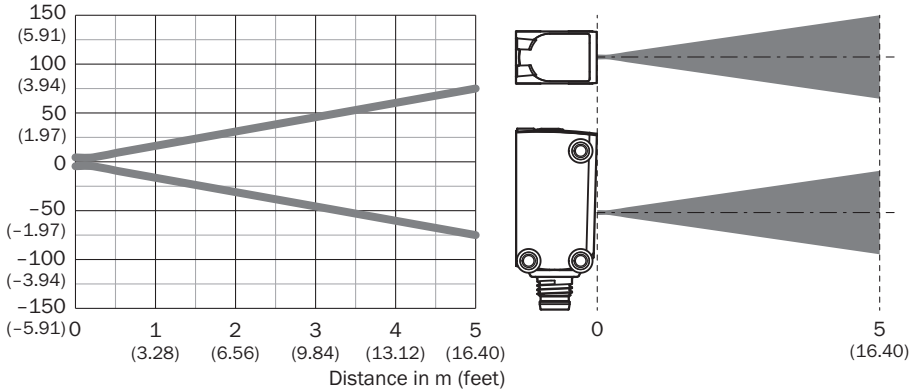


Operating reserve

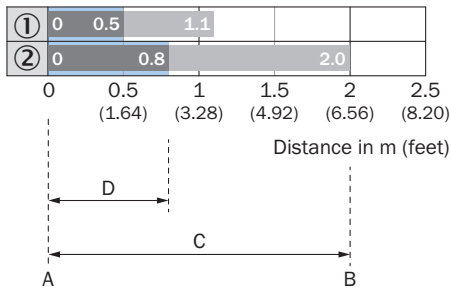


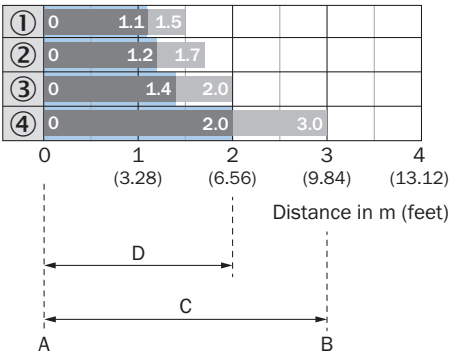
Light spot size

Dimensions in mm (inch)

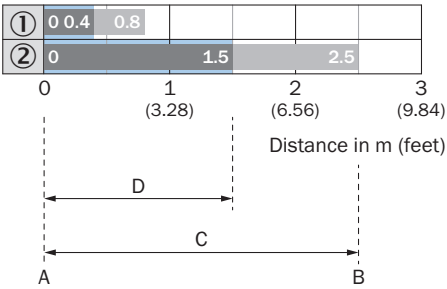


Sensing range diagram

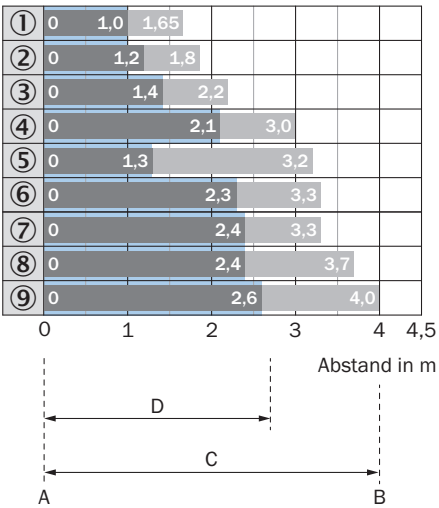




Recommended sensing range for the best performance



Recommended sensing range for the best performance



Empfohlener Schaltabstandsbereich für beste Performance

Recommended accessories

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

|                                                                                   | Brief description                                                                                                                                                                                              | Type  | Part no. |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------|
| Others                                                                            |                                                                                                                                                                                                                |       |          |
|  | <ul style="list-style-type: none"><li>• <b>Description:</b> Rectangular, screw connection</li><li>• <b>Dimensions:</b> 84 mm 84 mm</li><li>• <b>Ambient operating temperature:</b> -30 °C ... +65 °C</li></ul> | 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)