



# WTB9L-3P2291

W9

SMALL PHOTOELECTRIC SENSORS

**SICK**  
Sensor Intelligence.

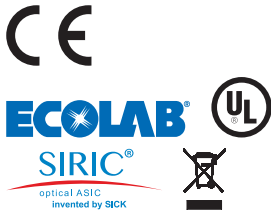


### Ordering information

| Type         | Part no. |
|--------------|----------|
| WTB9L-3P2291 | 1058150  |

Other models and accessories → [www.sick.com/W9](http://www.sick.com/W9)

Illustration may differ



### Detailed technical data

#### Features

|  |  |
|--|--|
| <b>Sensor/ detection principle</b>     | Photoelectric proximity sensor, Background suppression |
| <b>Dimensions (W x H x D)</b>          | 12.2 mm x 49.8 mm x 23.6 mm                            |
| <b>Housing design (light emission)</b> | Rectangular  |
| <b>Mounting hole</b>                   | M3   |
| <b>Sensing range max.</b>              | 25 mm ... 400 mm <sup>1)</sup>                         |
| <b>Sensing range</b>                   | 25 mm ... 400 mm <sup>1)</sup>                         |
| <b>Type of light</b>                   | Visible red light                                      |
| <b>Light source</b>                    | Laser <sup>2)</sup>                                    |
| <b>Light spot size (distance)</b>      | Ø 0.9 mm (230 mm)                                      |
| <b>Wave length</b>                     | 650 nm   |
| <b>Laser class</b>                     | 2 (IEC 60825-1 / CDRH 21 CFR 1040.10 & 1040.11)        |
| <b>Adjustment</b>                      | Potentiometer, 5 turns                                 |
| <b>Special applications</b>            | Detecting small objects                                |

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

<sup>2)</sup> Average service life: 50,000 h at T<sub>U</sub> = +25 °C.

## Mechanics/electronics

|   |   |
|---|---|
| <b>Supply voltage</b>                         | 10 V DC ... 30 V DC <sup>1)</sup>                     |
| <b>Ripple</b>                                 | < 5 V <sub>pp</sub> <sup>2)</sup>                     |
| <b>Current consumption</b>                    | 30 mA <sup>3)</sup>                                   |
| <b>Switching output</b>                       | PNP <sup>4)</sup>                                     |
| <b>Output function</b>                        | Complementary   |
| <b>Switching mode</b>                         | Light/dark switching <sup>4)</sup>                    |
| <b>Output current I<sub>max.</sub></b>        | ≤ 100 mA  |
| <b>Response time</b>                          | ≤ 1 ms <sup>5)</sup>                                  |
| <b>Switching frequency</b>                    | 500 Hz <sup>6)</sup>                                  |
| <b>Connection type</b>                        | Male connector M8, 4-pin                              |
| <b>Circuit protection</b>                     | A <sup>7)</sup><br>B <sup>8)</sup><br>C <sup>9)</sup> |
| <b>Protection class</b>                       | III   |
| <b>Weight</b>                                 | 13 g  |
| <b>Housing material</b>                       | Plastic, VISTAL®                                      |
| <b>Optics material</b>                        | Plastic, PMMA   |
| <b>Enclosure rating</b>                       | IP66<br>IP67<br>IP69K                                 |
| <b>Ambient operating temperature</b>          | -10 °C ... +50 °C                                     |
| <b>Ambient operating temperature extended</b> | -30 °C ... +55 °C <sup>10) 11)</sup>                  |
| <b>Ambient storage temperature</b>            | -30 °C ... +70 °C                                     |
| <b>UL File No.</b>                            | NRKH.E181493  |

<sup>1)</sup> Limit values when operated in short-circuit protected network: max. 8 A.

<sup>2)</sup> May not exceed or fall below U<sub>v</sub> tolerances.

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

<sup>4)</sup> Q = light switching.

<sup>5)</sup> Signal transit time with resistive load.

<sup>6)</sup> With light/dark ratio 1:1.

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

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

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

<sup>10)</sup> As of T<sub>a</sub> = 50 °C, a max. supply voltage V<sub>max.</sub> = 24 V and a max. load current I<sub>max.</sub> = 50 mA is permitted.

<sup>11)</sup> Operation below T<sub>u</sub> -10 °C is possible if the sensor is already switched on at T<sub>u</sub> > -10 °C, then cools down, and the supply voltage is subsequently not switched off. Switching on below T<sub>u</sub> -10 °C is not permissible.

## Safety-related parameters

|                         |  |
|-------------------------|--|
| <b>MTTF<sub>D</sub></b> | 424 years (EN ISO 13849-1) <sup>1)</sup> |
| <b>DC<sub>avg</sub></b> | 0%                                       |

<sup>1)</sup> Mode of calculation: Parts-Count-calculation.

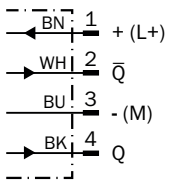
## Classifications

|                     |          |
|---------------------|----------|
| <b>ECl@ss 5.0</b>   | 27270904 |
| <b>ECl@ss 5.1.4</b> | 27270904 |

|                       |          |
|-----------------------|----------|
| <b>ECl@ss 6.0</b>     | 27270904 |
| <b>ECl@ss 6.2</b>     | 27270904 |
| <b>ECl@ss 7.0</b>     | 27270904 |
| <b>ECl@ss 8.0</b>     | 27270904 |
| <b>ECl@ss 8.1</b>     | 27270904 |
| <b>ECl@ss 9.0</b>     | 27270904 |
| <b>ECl@ss 10.0</b>    | 27270904 |
| <b>ECl@ss 11.0</b>    | 27270904 |
| <b>ETIM 5.0</b>       | EC002719 |
| <b>ETIM 6.0</b>       | EC002719 |
| <b>ETIM 7.0</b>       | EC002719 |
| <b>UNSPSC 16.0901</b> | 39121528 |

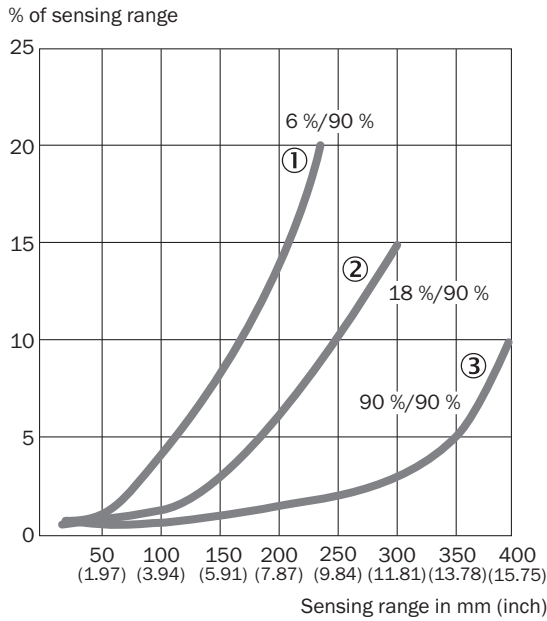
### Connection diagram

Cd-083



### Characteristic curve

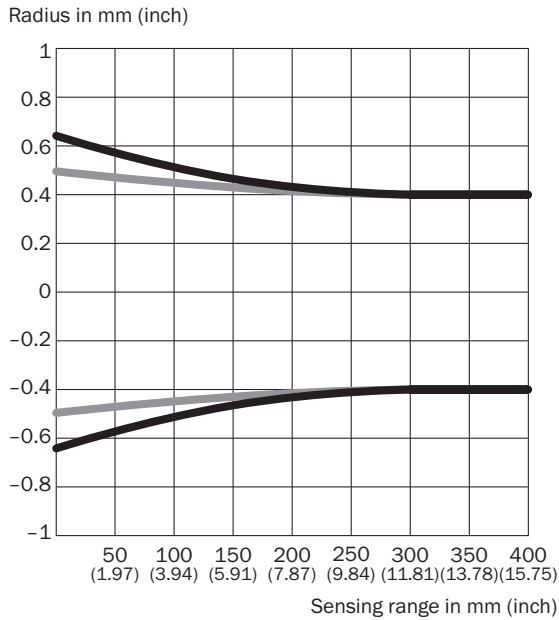
WTB9L-3, laser class 2



- ① Sensing range on black, 6% remission
- ② Sensing range on gray, 18 % remission
- ③ Sensing range on white, 90% remission

### Light spot size

WTB9L-3, laser class 2



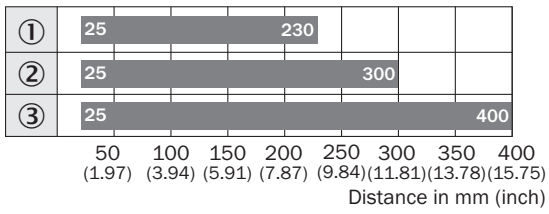
#### Dimensions in mm (inch)

| Sensing range                   | Vertical      | Horizontal    |
|---------------------------------|---------------|---------------|
| <b>50 mm</b><br><b>(1.97)</b>   | 1.2<br>(0.05) | 1.0<br>(0.04) |
| <b>100 mm</b><br><b>(3.94)</b>  | 1.1<br>(0.04) | 1.0<br>(0.04) |
| <b>200 mm</b><br><b>(7.87)</b>  | 0.9<br>(0.04) | 0.9<br>(0.04) |
| <b>400 mm</b><br><b>(15.75)</b> | 0.8<br>(0.03) | 0.8<br>(0.03) |

- Vertical
- Horizontal

### Sensing range diagram

WTB9L-3, laser class 2

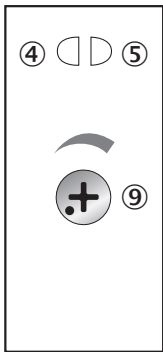


■ Sensing range typ. max.

- ① Sensing range on black, 6% remission
- ② Sensing range on gray, 18 % remission
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### Adjustments possible

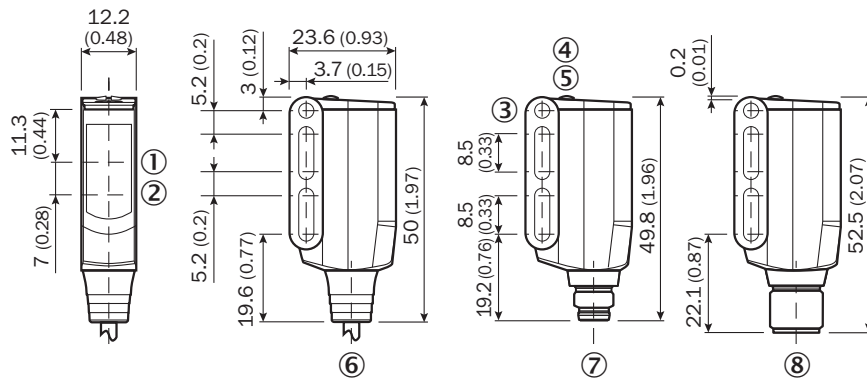
Potentiometer



- ④ LED indicator yellow: Status of received light beam
- ⑤ LED indicator green: power on
- ⑨ Adjustment of sensing range

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




WTB9L-3



- ① Center of optical axis, receiver
- ② Center of optical axis, sender
- ③ Mounting hole M3 (Ø 3.1 mm)
- ④ LED indicator yellow: Status of received light beam
- ⑤ LED indicator green: power on
- ⑥ Connecting cable or connecting cable with connector
- ⑦ Male connector M8, 4-pin
- ⑧ Male connector M12, 4-pin

**Recommended accessories**

Other models and accessories → [www.sick.com/W9](http://www.sick.com/W9)

|   | Brief description  | Type               | Part no. |
|---|--|--------------------|----------|
| <b>Mounting brackets and plates</b>   |  |                    |          |
|  | Mounting bracket, steel, zinc coated, mounting hardware included   | BEF-WN-W9-2        | 2022855  |
| <b>Plug connectors and cables</b>   |  |                    |          |
|  | Head A: female connector, M8, 4-pin, straight, A-coded<br>Head B: Flying leads<br>Cable: Sensor/actuator cable, PVC, unshielded, 5 m | YF8U14-050VA3XLEAX | 2095889  |
|  | Head A: male connector, M8, 4-pin, straight<br>Head B: -<br>Cable: unshielded  | STE-0804-G         | 6037323  |

## 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)