



Photoelectric sensors  
W9L-3, Photoelectric proximity sensor,  
Background suppression

WTB9L-3P2291



**Model Name** > [WTB9L-3P2291](#)  
**Part No.** > [1058150](#)



*Illustration may differ*

#### At a glance

- Tough VISTAL™ housing
- Precise laser light spot
- Laser classes 1 and 2 available
- Optimized SICK ASIC technology with second transmission LED
- Connections: M8 and M12 plugs, cable as well as cable with plug
- M3 hole pattern

#### Your benefits

Precise detection of small objects and object features

Detection of objects even through small openings

Less machine downtime due to stable VISTAL™ housing as well as impressive suppression of optical interference

The longest sensing ranges in its class

Best-in-class background suppression

Wide range of connection options

Multiple mounting options

Highly visible light spot simplifies alignment



#### Features

|                                  |                                                        |
|----------------------------------|--------------------------------------------------------|
| Sensor/detection principle:      | Photoelectric proximity sensor, Background suppression |
| Dimensions (W x H x D):          | 12.2 mm x 49.8 mm x 23.6 mm                            |
| Housing design (light emission): | Rectangular                                            |
| Mounting hole:                   | M3                                                     |
| Sensing range max.:              | 25 mm ... 400 mm <sup>1)</sup>                         |
| Sensing range:                   | 25 mm ... 400 mm <sup>2)</sup>                         |
| Type of light:                   | Visible red light                                      |
| Light source:                    | Laser <sup>3)</sup>                                    |
| Laser class:                     | 2, 2 (IEC 60825-1/CDRH 21 CFR 1040.10 & 1040.11)       |
| Adjustment:                      | Potentiometer, 5 turns                                 |
| Light spot size (distance):      | Ø 0.9 mm (230 mm)                                      |

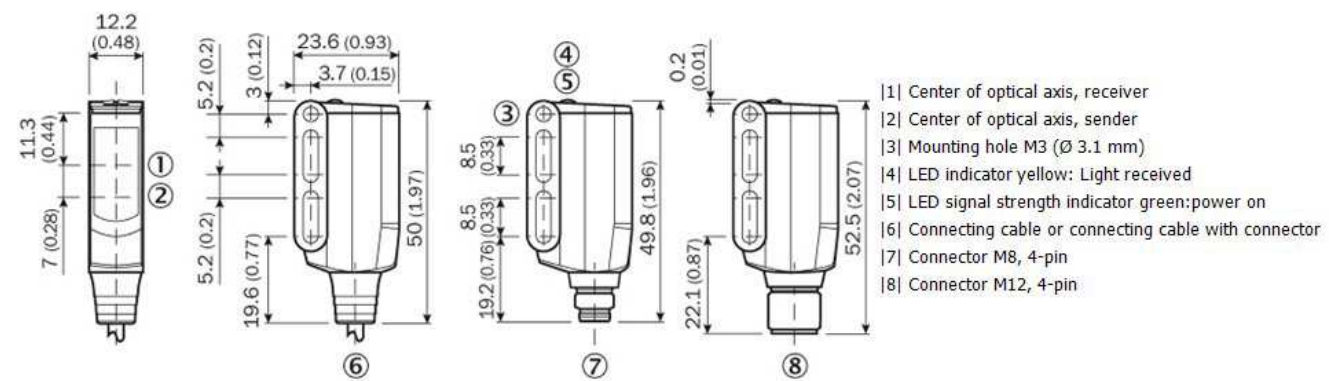
<sup>1) 2)</sup> Object with 90 % reflectance (referred to standard white, DIN 5033) <sup>3)</sup> Average service life 50,000 h at T<sub>A</sub> = +25 °C

## Mechanics/electronics

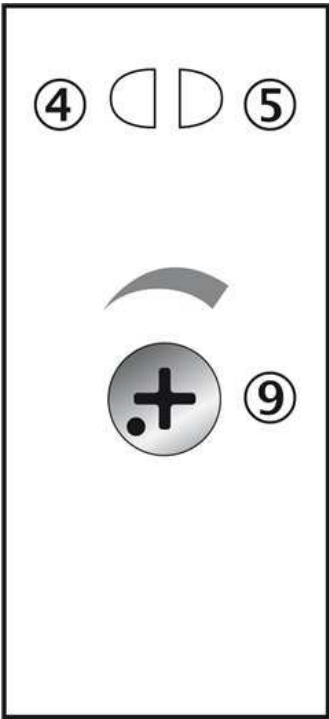
|                                          |                                      |
|------------------------------------------|--------------------------------------|
| Supply voltage:                          | 10 V DC ... 30 V DC <sup>1)</sup>    |
| Ripple:                                  | < 5 Vpp <sup>2)</sup>                |
| Power consumption:                       | ≤ 30 mA <sup>3)</sup>                |
| Output type:                             | PNP <sup>4)</sup>                    |
| Output function:                         | Complementary                        |
| Switching mode:                          | Light/dark switching <sup>5)</sup>   |
| Output current I <sub>max</sub> :        | ≤ 100 mA                             |
| Response time:                           | ≤ 1 ms <sup>6)</sup>                 |
| Switching frequency:                     | 500 Hz <sup>7)</sup>                 |
| Connection type:                         | Connector M8, 4-pin                  |
| Circuit protection:::                    | A, B, C <sup>8) 9) 10)</sup>         |
| Protection class:                        | III                                  |
| Weight:                                  | 13 g                                 |
| Optics material:                         | PMMA                                 |
| Enclosure rating:                        | IP 66<br>IP 67<br>IP 69K             |
| Ambient operating temperature:           | -10 °C ... +50 °C                    |
| Ambient storage temperature:             | -30 °C ... +70 °C                    |
| Ambient operating temperature extended:: | -30 °C ... +55 °C <sup>11) 12)</sup> |
| UL File No.:                             | NRKH.E181493                         |
| Housing material:                        | Plastic, VISTAL                      |

<sup>1)</sup> Limit values, operation in short-circuit protected network max. 8 A <sup>2)</sup> May not exceed or fall short of V<sub>S</sub> tolerances <sup>3)</sup> Without load <sup>4) 5)</sup> Q = light-switching <sup>6)</sup> Signal transit time with resistive load <sup>7)</sup> With light/dark ratio 1:1 <sup>8)</sup> A = V<sub>S</sub> connections reverse-polarity protected <sup>9)</sup> B = inputs and output reverse-polarity protected <sup>10)</sup> C = interference suppression <sup>11)</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>12)</sup> Using the sensor below T<sub>a</sub> = -10 °C is possible, if the sensor is turned on at T<sub>a</sub> > -10 °C, then the environment cools down and the sensor is not disconnected from the supply voltage during the whole time. It is not allowed to turn on the sensor below T<sub>a</sub> = -10 °C

Dimensional drawing

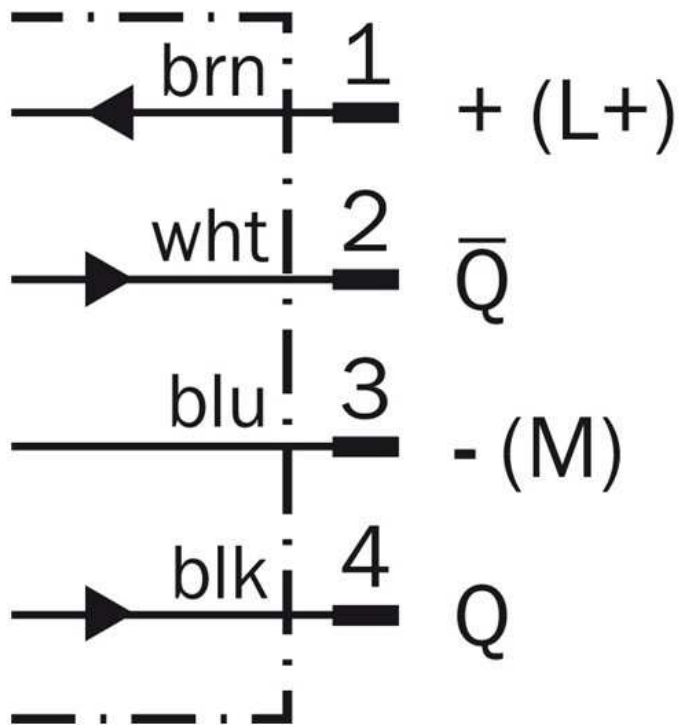


Adjustments possible

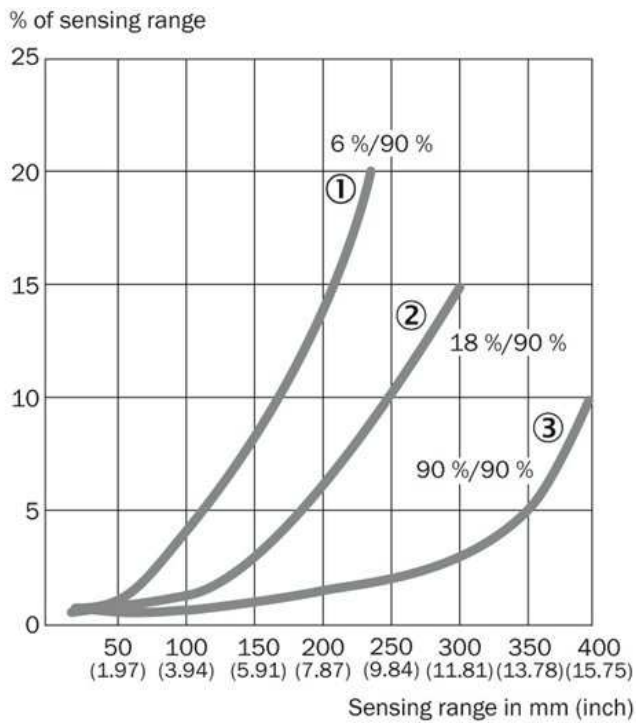


- ④ LED indicator yellow: Light received
- ⑤ LED signal strength indicator green:power on
- ⑨ Sensing range adjustment

## Connection diagram

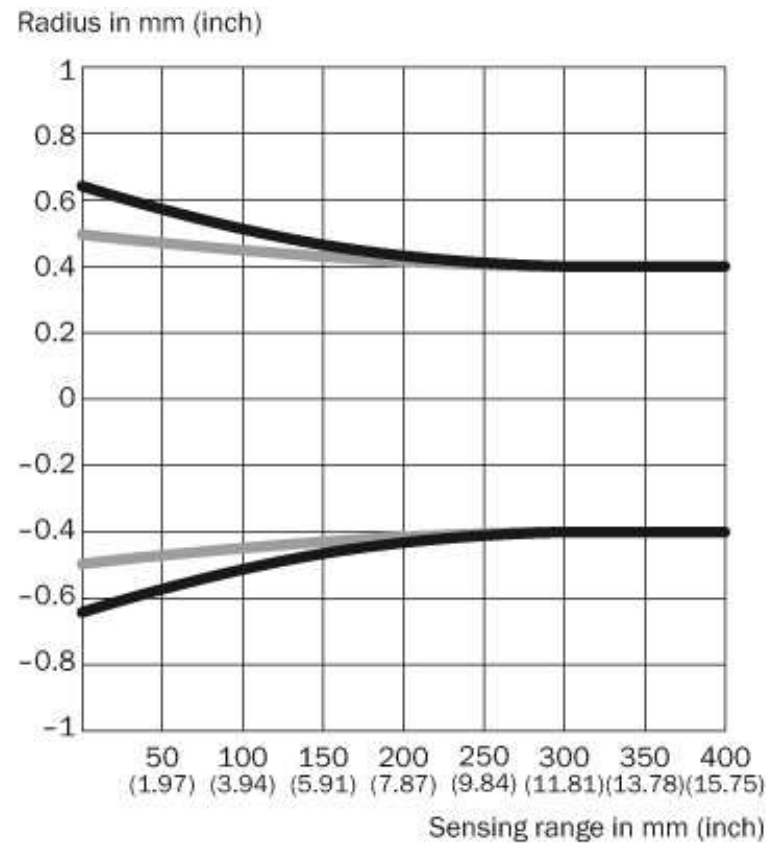


## Characteristic curve



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

Light spot size



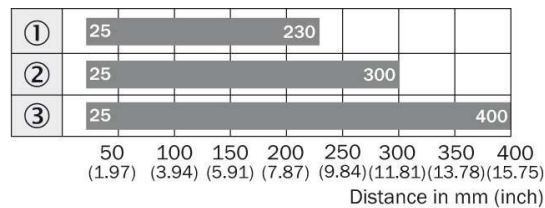
Dimensions in mm (inch)

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

Vertical

Horizontal

Sensing range diagram



Sensing range typ. max.

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