



DATA SHEET

# WTB4FP-P02

W4  
Photoelectric sensors

## PHOTOELECTRIC SENSORS

## WTB4FP-P02

## ORDERING INFORMATION

| Type       | part no. |
|------------|----------|
| WTB4FP-P02 | 1126426  |

Further device versions and accessories at [www.sick.com/W4](http://www.sick.com/W4)



Illustration may differ

## DETAILED TECHNICAL DATA

## FEATURES

|                                       |   |   |
|---------------------------------------|---|---|
| Functional principle                  | Photoelectric proximity sensor  |   |
| Functional principle detail           | Background suppression  |   |
| Sensing range                         | Sensing range min.<br>Sensing range max.  | 4 mm<br>48 mm   |
| Emitted beam                          | Light source<br>Type of light<br>Shape of light spot<br>Light spot size (distance)<br>Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle) | PinPoint LED<br>Visible red light<br>Point-shaped<br>Ø 4.2 mm (130 mm)<br>< +/- 1.5° (at T <sub>0</sub> = +23 °C) |
| Key LED figures                       | Normative reference<br>LED risk group marking<br>Wave length<br>Average service life  | EN 62471:2008-09   IEC 62471:2006, modified<br>Free group<br>635 nm<br>100,000 h at T <sub>a</sub> = +25 °C       |
| Smallest detectable object (MDO) typ. | 0.2 mm, At 130 mm distance (object with remission factor of 90% (complies with standard white according to DIN 5033))   |   |
| Adjustment                            | None  | -   |
| Display                               | LED green<br>LED yellow   | Operating indicator<br>Static on: power on<br>Status of received light beam<br>Static on: object present          |

|                  |  |
|------------------|--|
|                  | Static off: object not present                                     |
| Special features | Fixed sensing range 48 mm<br>Foam protection frame on front screen |

## SAFETY-RELATED PARAMETERS

|                               |           |
|-------------------------------|-----------|
| MTTF <sub>D</sub>             | 642 years |
| DC <sub>avg</sub>             | 0 %       |
| T <sub>M</sub> (mission time) | 20 years  |

## ELECTRONICS

|                                 |  |
|---------------------------------|--|
| Supply voltage U <sub>B</sub>   | 10 V DC ... 30 V DC <sup>1)</sup>  |
| Ripple                          | ≤ 5 V <sub>pp</sub>  |
| Usage category                  | DC-12 (According to EN 60947-5-2)<br>DC-13 (According to EN 60947-5-2)         |
| Current consumption             | ≤ 25 mA, without load. At U <sub>B</sub> = 24 V                                |
| Protection class                | III  |
| Digital output                  |  |
| Number                          | 1  |
| Type                            | Push-pull: PNP/NPN   |
| Switching mode                  | Light switching  |
| Signal voltage PNP HIGH/LOW     | Approx. U <sub>B</sub> - 2.5 V / 0 V   |
| Signal voltage NPN HIGH/LOW     | Approx. U <sub>B</sub> / < 2.5 V   |
| Output current I <sub>max</sub> | ≤ 100 mA   |
| Circuit protection outputs      | Reverse polarity protected<br>Overcurrent protected<br>Short-circuit protected |
| Response time                   | ≤ 500 μs <sup>2)</sup>   |
| Repeatability (response time)   | 150 μs   |
| Switching frequency             | 1,000 Hz <sup>3)</sup>   |
| Pin/Wire assignment             |  |
| Function of pin 4/black (BK)    | Digital output, light switching, object present → output Q HIGH <sup>4)</sup>  |

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

<sup>2)</sup> Signal transit time with resistive load in switching mode.

<sup>3)</sup> With light/dark ratio 1:1.

<sup>4)</sup> This switching output must not be connected to another output.

## MECHANICS

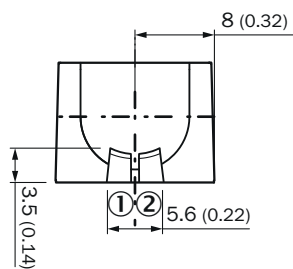
|                        |  |
|------------------------|--|
| Housing                | Rectangular                            |
| Design detail          | Flat                                   |
| Dimensions (W x H x D) | 16 mm x 40.1 mm x 12.1 mm              |
| Connection             | Cable with connector M8, 3-pin, 110 mm |
| Connection detail      |  |
| Deep-freeze property   | Do not bend below 0 °C                 |
| Conductor size         | 0.14 mm <sup>2</sup>                   |
| 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®                       |
| Weight                 | Approx. 30 g                           |

|  |        |
|--|--------|
| Maximum tightening torque of the fixing screws | 0.4 Nm |
|--|--------|

**AMBIENT DATA**

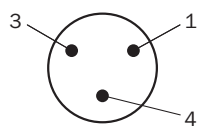
|                                     |   |
|-------------------------------------|---|
| Enclosure rating                    | IP66 (EN 60529)<br>IP67 (EN 60529)  |
| Ambient operating temperature       | -40 °C ... +60 °C   |
| Ambient temperature, storage        | -40 °C ... +75 °C   |
| Typ. Ambient light immunity         | Artificial light: ≤ 50,000 lx<br>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  |

**DISPLAY AND ADJUSTMENT ELEMENTS**

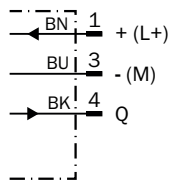


- ① LED green
- ② LED yellow

**CONNECTION TYPE CONNECTOR M8, 3-PIN**



**CONNECTION DIAGRAM CD-045**



TRUTH TABLE PUSH-PULL: PNP/NPN - LIGHT SWITCHING Q

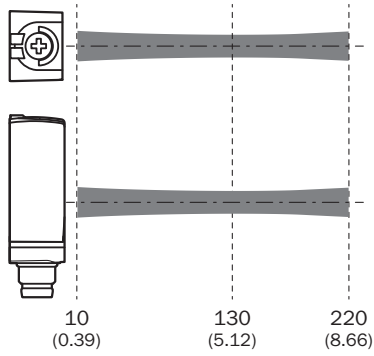
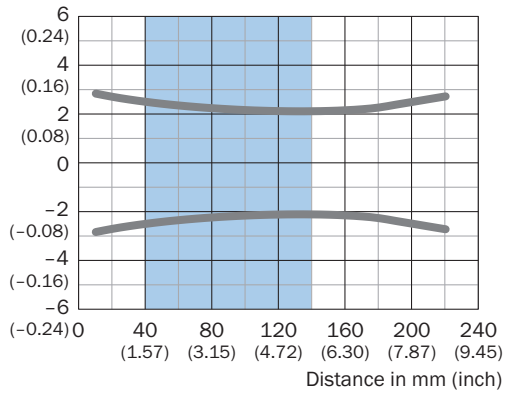
|                         | Light switching Q (normally open (upper switch), normally closed (lower switch)) |                              |
|-------------------------|--|------------------------------|
|                         | Object not present → Output LOW  | Object present → Output HIGH |
| Light receive           | ✗  | ✔                            |
| Light receive indicator | ✗  | ☀                            |
| Load resistance to L+   | ⚡  | ✗                            |
| Load resistance to M    | ✗  | ⚡                            |
|                         |  |                              |

TRUTH TABLE PUSH-PULL: PNP/NPN - DARK SWITCHING Q̄

|                         | Dark switching Q̄ (normally closed (upper switch), normally open (lower switch)) |                             |
|-------------------------|--|-----------------------------|
|                         | Object not present → Output HIGH   | Object present → Output LOW |
| Light receive           | ✗  | ✔                           |
| Light receive indicator | ✗  | ☀                           |
| Load resistance to L+   | ✗  | ⚡                           |
| Load resistance to M    | ⚡  | ✗                           |
|                         |  |                             |

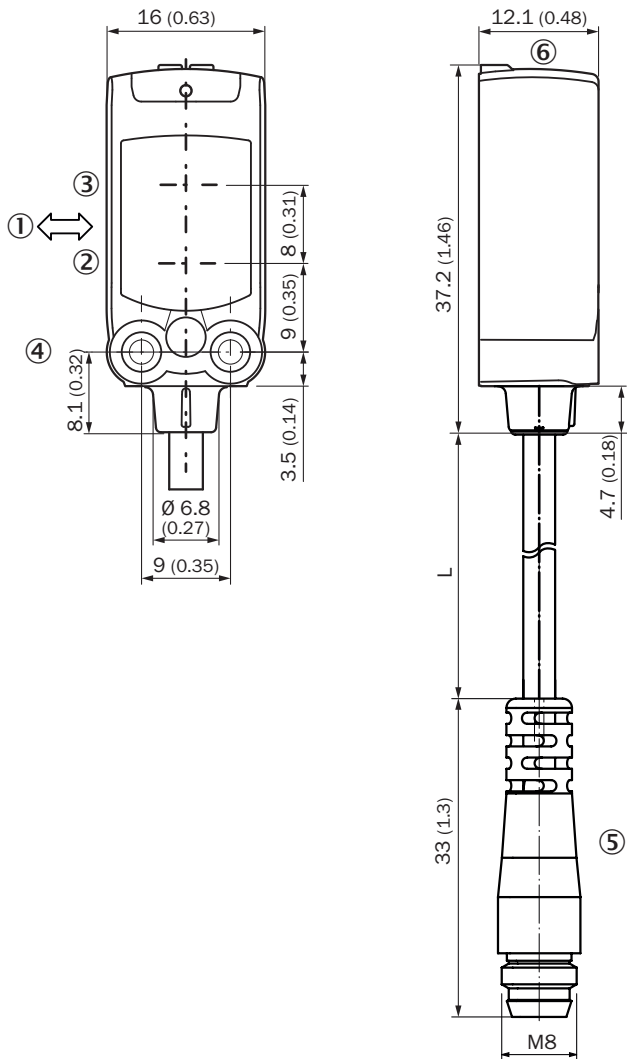
**LIGHT SPOT SIZE**

Dimensions in mm (inch)



Recommended sensing range for the best performance

**DIMENSIONAL DRAWING**



Dimensions in mm (inch)

For length of cable (L), see technical data

- ① Standard direction of the material being detected
- ② Center of optical axis, sender
- ③ Center of optical axis, receiver
- ④ M3 mounting hole
- ⑤ cable with connector M8
- ⑥ 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/1126426](http://www.sick.com/1126426)



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Sensor Intelligence