



WTB4FP-213112A0ZZZ

W4

MINIATURE PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

| Type | Part no. |
|--------------------|----------|
| WTB4FP-213112A0ZZZ | 1120706 |

Other models and accessories → www.sick.com/W4

Detailed technical data

Features

| | |
|---|---|
| Functional principle | Photoelectric proximity sensor |
| Functional principle detail | Background suppression, NarrowBeam |
| Sensing range | |
| Sensing range min. | 4 mm |
| Sensing range max. | 56 mm |
| Minimum distance between set sensing range and background (black 6% / white 90%) | 0.5 mm, at a distance of 40 mm |
| Emitted beam | |
| Light source | PinPoint LED |
| Type of light | Visible red light |
| Shape of light spot | Point-shaped |
| Light spot size (distance) | Ø 2 mm (50 mm) |
| Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle) | < +/- 1.5° (at Ta = +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 Ta = +25 °C |
| Smallest detectable object (MDO) typ. | |

| | | |
|-----------------------------|------------|---|
| Adjustment | | 0.1 mm (At 50 mm distance (object with 90% remission (complies with standard white according to DIN 5033))) |
| | None | – |
| Display | LED green | Operating indicator Static on: power on |
| | LED yellow | Status of received light beam Static on: object present Static off: object not present |
| Special features | | Sensing range preset: 56 mm |
| Special applications | | Detecting flat objects, Detecting small objects |

Safety-related parameters

| | |
|-------------------------------------|--|
| MTTF_D | 663 years |
| DC_{avg} | 0 % |
| T_M (mission time) | 20 years (EN ISO 13849) Rate of use: 60 % |

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 | ≤ 25 mA, without load. At U _B = 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 _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 | ≤ 1,000 μs ²⁾ |
| Repeatability (response time) | 150 μs |
| Switching frequency | 500 Hz ³⁾ |
| Pin/Wire assignment | |
| Function of pin 4/black (BK) | Digital output, light switching, object present → output Q HIGH ⁴⁾ |

¹⁾ Limit values.

²⁾ Signal transit time with resistive load in switching mode.

³⁾ With light/dark ratio 1:1.

⁴⁾ 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 | Connector M8, 3-pin |
| Connection detail | |
| Deep-freeze property | Do not bend below 0 °C |
| Material | |
| Housing | Plastic, VISTAL® |
| Front screen | Plastic, PMMA |
| Male connector | Plastic, VISTAL® |
| Weight | Approx. 30 g |
| Maximum tightening torque of the fixing screws | 0.4 Nm |

Ambient data

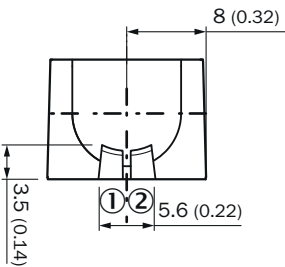
| | |
|--|---|
| Enclosure rating | IP66 (EN 60529) IP67 (EN 60529) |
| Ambient operating temperature | -40 °C ... +60 °C |
| Ambient temperature, storage | -40 °C ... +75 °C |
| Typ. Ambient light immunity | Artificial light: ≤ 50,000 lx Sunlight: ≤ 50,000 lx |
| Shock resistance | 30 g, 11 ms (3 positive 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 |

Classifications

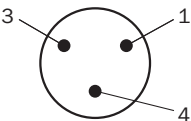
| | |
|---------------------|----------|
| ECLASS 5.0 | 27270904 |
| ECLASS 5.1.4 | 27270904 |
| ECLASS 6.0 | 27270904 |
| ECLASS 6.2 | 27270904 |
| ECLASS 7.0 | 27270904 |
| ECLASS 8.0 | 27270904 |
| ECLASS 8.1 | 27270904 |
| ECLASS 9.0 | 27270904 |
| ECLASS 10.0 | 27270904 |
| ECLASS 11.0 | 27270904 |
| ECLASS 12.0 | 27270903 |
| ETIM 5.0 | EC002719 |
| ETIM 6.0 | EC002719 |
| ETIM 7.0 | EC002719 |

| | |
|----------------|----------|
| ETIM 8.0 | EC002719 |
| UNSPSC 16.0901 | 39121528 |

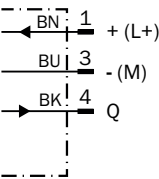
Adjustments



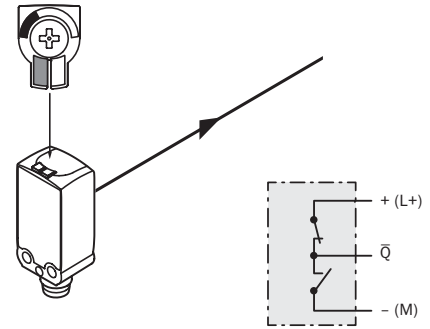
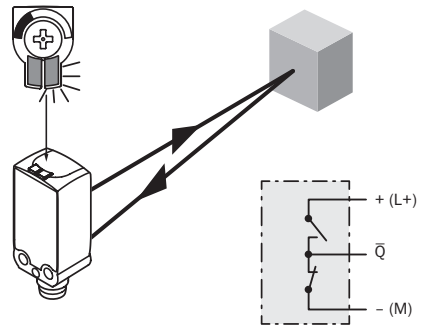
Connection type

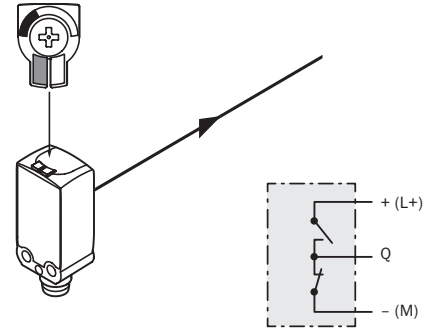
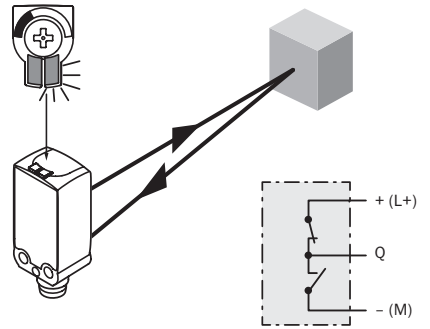


Connection diagram



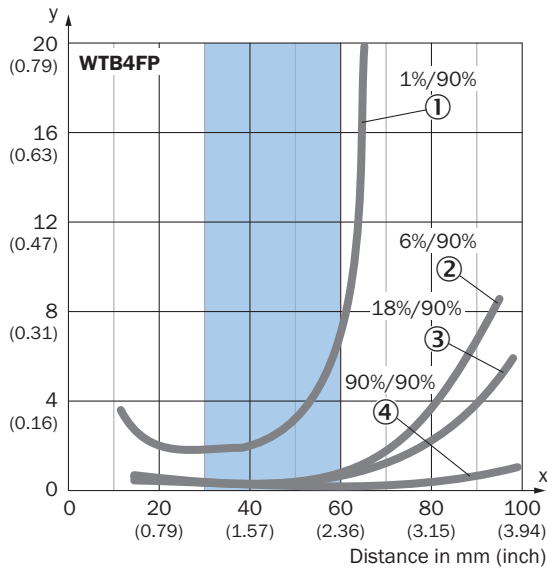
Truth table

| | Dark switching \bar{Q} (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 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 | ✗ | ⚡ |
| |  |  |

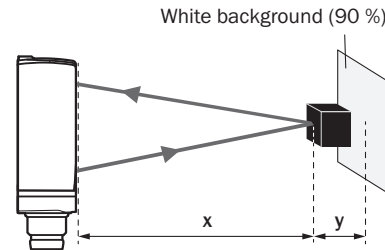
Characteristic curve

Minimum distance in mm (y) between the set sensing range and white background (90 % remission)



Recommended sensing range for the best performance

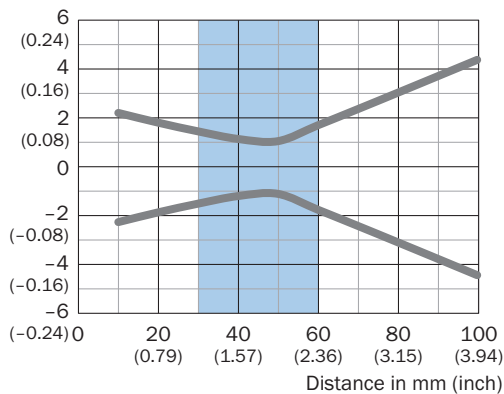
Example:
Safe suppression of the background



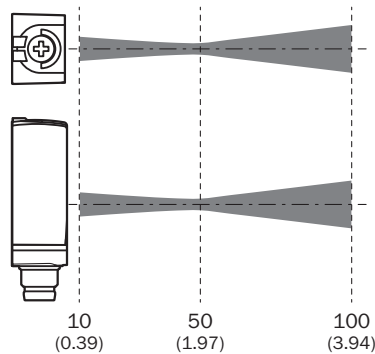
Black object (6 % remission)
Set sensing range $x = 40$ mm
Needed minimum distance to white background $y = 0.5$ mm

Light spot size

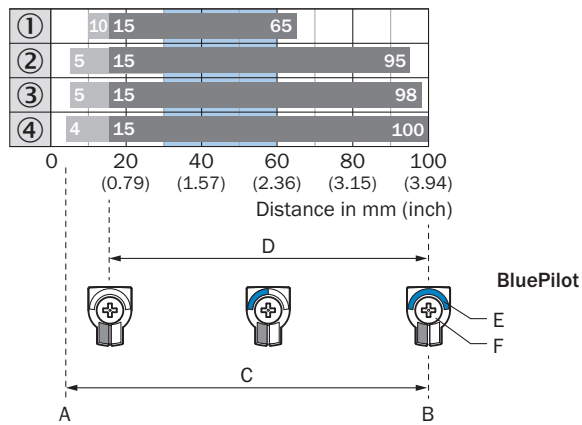
Dimensions in mm (inch)



Recommended sensing range for the best performance



Sensing range diagram



A = Sensing range min. in mm

B = Sensing range max. in mm

C = Viewing range

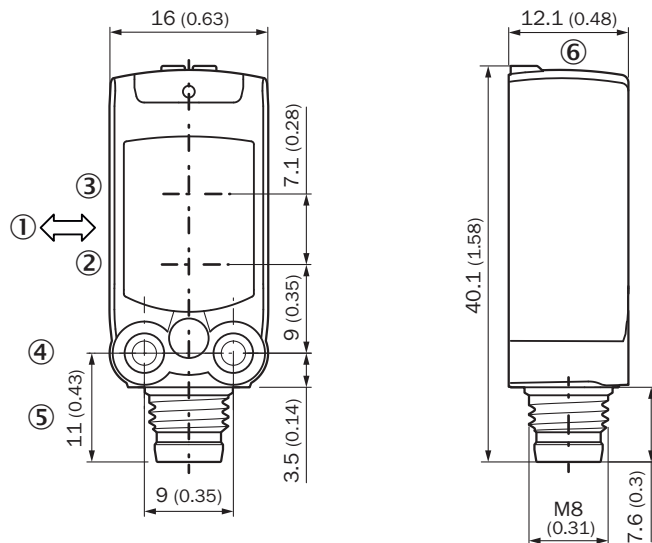
D = Adjustable switching threshold for background suppression

E = Sensing range indicator

F = Teach-Turn adjustment




Recommended sensing range for the best performance

Dimensional drawing (Dimensions in mm (inch))



Recommended accessories

Other models and accessories → www.sick.com/W4

| | Brief description | Type | Part no. |
|---|--|--------------------|----------|
| Mounting brackets and plates | | | |
|  | <ul style="list-style-type: none"> • Description: Mounting bracket for wall mounting • Material: Stainless steel • Details: Stainless steel 1.4571 • Items supplied: Mounting hardware included • Suitable for: W4S, W4F, W4S | BEF-W4-A | 2051628 |
| Others | | | |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M8, 3-pin, straight, A-coded • Connection type head B: Flying leads • Signal type: Sensor/actuator cable • Cable: 5 m, 3-wire, PVC • Description: Sensor/actuator cable, unshielded • Application: Zones with chemicals, Uncontaminated zones | YF8U13-050VA1XLEAX | 2095884 |
|  | <ul style="list-style-type: none"> • Connection type head A: Male connector, M8, 3-pin, straight, A-coded • Description: Unshielded • Connection systems: Screw-type terminals • Permitted cross-section: 0.14 mm² ... 0.5 mm² | STE-0803-G | 6037322 |

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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.”

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