



# WTB4SP-1G312120ZZZ

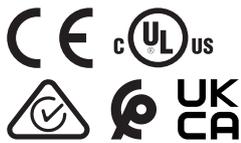
## W4

PHOTOELECTRIC SENSORS

**SICK**  
Sensor Intelligence.



Illustration may differ



### Ordering information

Type	part no.
WTB4SP-1G312120ZZZ	1139077

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

### Detailed technical data

#### Features

<b>Functional principle</b>	Photoelectric proximity sensor
<b>Functional principle detail</b>	Background suppression
<b>Sensing range</b>	
Sensing range min.	4 mm
Sensing range max.	250 mm
Adjustable switching threshold for background suppression	10 mm ... 250 mm
Reference object	Object with 90% remission factor (complies with standard white according to DIN 5033)
Minimum distance between set sensing range and background (black 6% / white 90%)	5 mm, at a distance of 150 mm
Recommended sensing range for the best performance	40 mm ... 170 mm
<b>Emitted beam</b>	
Light source	PinPoint LED
Type of light	Visible red light
Shape of light spot	Point-shaped
Light spot size (distance)	4 mm (150 mm)
Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle)	< +/- 1.5° (at T <sub>U</sub> = +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 <sub>a</sub> = +25 °C
<b>Smallest detectable object (MDO) typ.</b>	

		0.2 mm, At 180 mm distance
		Object with 90% remission factor (complies with standard white according to DIN 5033)
<b>Adjustment</b>	Teach-Turn adjustment	BluePilot For setting the sensing range
<b>Display</b>	LED blue	BluePilot: sensing range indicator
	LED green	Operating indicator Static on: power on
	LED yellow	Status of received light beam Static on: object present Static off: object not present

### Safety-related parameters

<b>MTTF<sub>D</sub></b>	1,404 years
<b>DC<sub>avg</sub></b>	0%

### Electronics

<b>Supply voltage U<sub>B</sub></b>	10 V DC ... 30 V DC <sup>1)</sup>
<b>Ripple</b>	≤ 5 V <sub>pp</sub>
<b>Usage category</b>	DC-12 (According to EN 60947-5-2) DC-13 (According to EN 60947-5-2)
<b>Current consumption</b>	≤ 20 mA, without load. At U <sub>B</sub> = 24 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 <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
	Overcurrent protected
	Short-circuit protected
	Response time ≤ 500 μs
	Repeatability (response time) 150 μs
	Switching frequency 1,000 Hz
<b>Pin/Wire assignment</b>	
	Function of pin 4/black (BK) Digital output, dark switching, object present → output $\bar{Q}$ LOW <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, 3-wire, 2 m
<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)	2 m
<b>Material</b>	
Housing	Plastic, VISTAL®
Front screen	Plastic, PMMA
Cable	Plastic, PVC
<b>Maximum tightening torque of the fixing screws</b>	0.4 Nm

### Ambient data

<b>Enclosure rating</b>	IP66 (EN 60529) 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 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

### Certificates

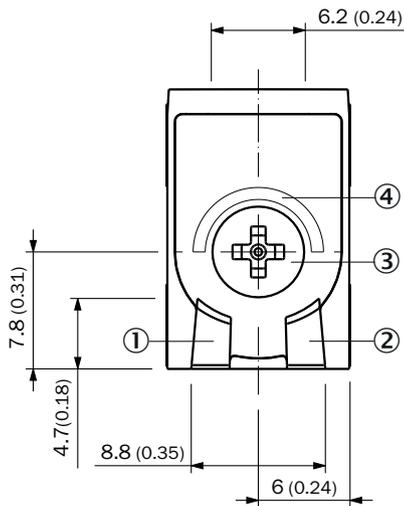
<b>EU declaration of conformity</b>	✓
<b>UK declaration of conformity</b>	✓
<b>ACMA declaration of conformity</b>	✓
<b>Moroccan declaration of conformity</b>	✓
<b>China RoHS</b>	✓
<b>cULus certificate</b>	✓

### Classifications

<b>ECLASS 5.0</b>	27270904
<b>ECLASS 5.1.4</b>	27270904
<b>ECLASS 6.0</b>	27270904
<b>ECLASS 6.2</b>	27270904
<b>ECLASS 7.0</b>	27270904
<b>ECLASS 8.0</b>	27270904
<b>ECLASS 8.1</b>	27270904
<b>ECLASS 9.0</b>	27270904
<b>ECLASS 10.0</b>	27270904

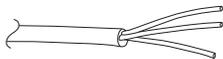
<b>ECLASS 11.0</b>	27270904
<b>ECLASS 12.0</b>	27270903
<b>ETIM 5.0</b>	EC002719
<b>ETIM 6.0</b>	EC002719
<b>ETIM 7.0</b>	EC002719
<b>ETIM 8.0</b>	EC002719
<b>UNSPSC 16.0901</b>	39121528

display and adjustment elements

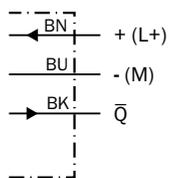


- ① LED green
- ② LED yellow
- ③ Teach-Turn adjustment
- ④ LED blue

Connection type Cable, 3-wire



Connection diagram Cd-513

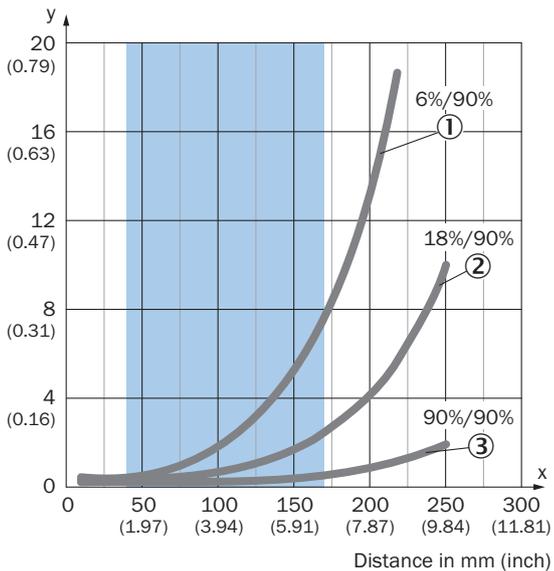


Truth table Push-pull: PNP/NPN – dark switching  $\bar{Q}$

	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	⚡	⊗

Characteristic curve

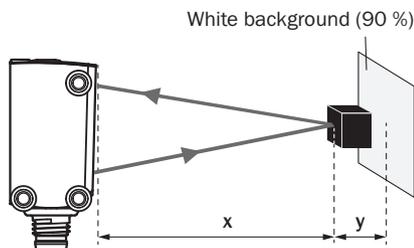
Minimum distance in mm (y) between the set sensing range and white background (90 % remission factor)



Recommended sensing range for the best performance

- ① Black object, 6% remission factor
- ② Gray object, 18% remission factor
- ③ White object, 90% remission factor

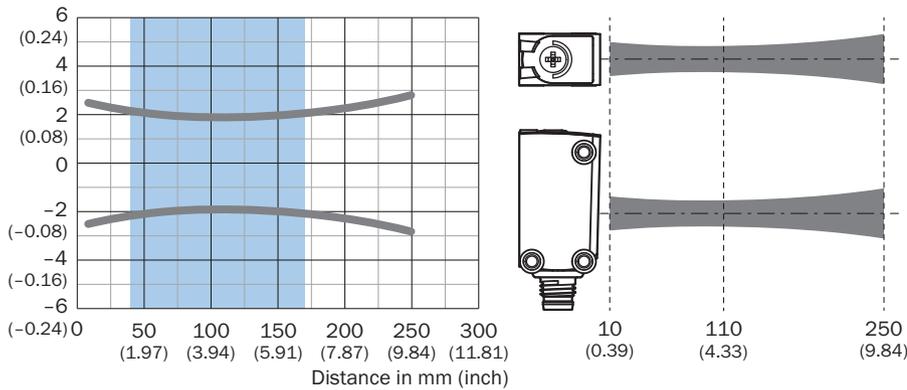
Example: Safe suppression of the background



Black object (6 % remission factor)  
 Set sensing range  $x = 150$  mm  
 Needed minimum distance to white background  $y = 5.5$  mm

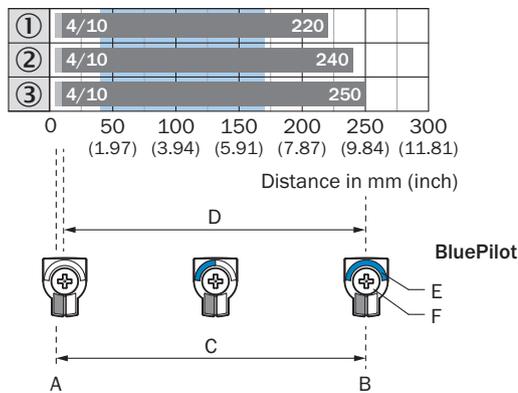
### Light spot size

Dimensions in mm (inch)



Recommended sensing range for the best performance

### Sensing range diagram



Recommended sensing range for the best performance

1	Black object, 6% remission factor
2	Gray object, 18% remission factor
3	White object, 90% remission factor
A	Sensing range min. in mm
B	Sensing range max. in mm
C	Field of view
D	Adjustable switching threshold for background suppression
E	Sensing range indicator
F	Teach-Turn adjustment



## 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)