



WTB4SP-21312120ZZZ

W4

MINIATURE PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

Type	Part no.
WTB4SP-21312120ZZZ	1139074

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

Detailed technical data

Features

Functional principle		Photoelectric proximity sensor
Functional principle detail		Background suppression
Sensing range		
	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
Emitted beam		
	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 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 T _a = +25 °C
Smallest detectable object (MDO) typ.	
	0.2 mm (At 180 mm distance)
	Object with 90% remission factor (complies with standard white according to DIN 5033)
Adjustment	
Teach-Turn adjustment	BluePilot: For setting the sensing range
Display	
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

MTTF_D	1,404 years
DC_{avg}	0%

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	≤ 20 mA, without load. At U _B = 24 V
Protection class	III
Digital output	
Number	1
Type	Push-pull: PNP/NPN
Switching mode	Dark 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	≤ 500 μs
Repeatability (response time)	150 μs
Switching frequency	1,000 Hz
Pin/Wire assignment	
Function of pin 4/black (BK)	Digital output, dark switching, object present → output $\bar{Q}$ LOW ²⁾
Function of pin 2/white (WH)	²⁾

¹⁾ Limit values.

²⁾ This switching output must not be connected to another output.

Mechanics

Housing	Rectangular
Design detail	Slim
Dimensions (W x H x D)	12.1 mm x 41.9 mm x 18.6 mm
Connection	Connector M8, 3-pin
Material	
Housing	Plastic, VISTAL®
Front screen	Plastic, PMMA
Male connector	Plastic, VISTAL®
Maximum tightening torque of the fixing screws	0.4 Nm

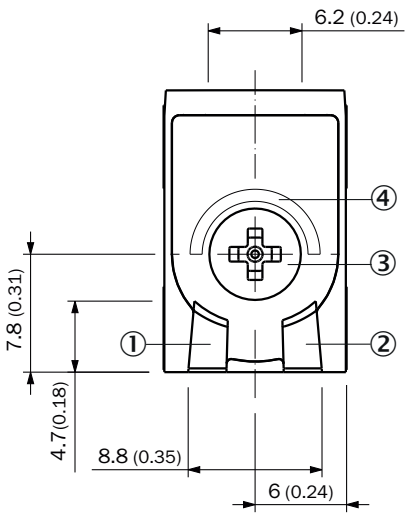
Ambient data

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

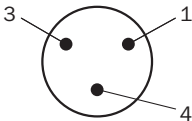
Classifications

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

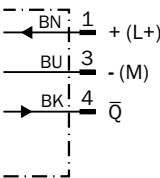
Adjustments



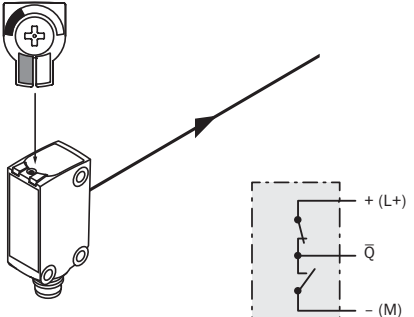
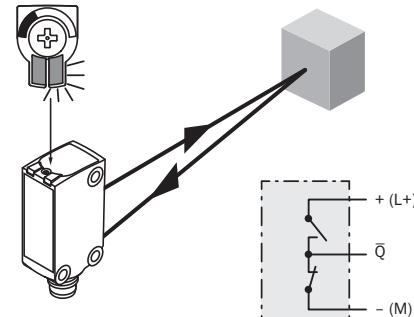
Connection type



Connection diagram

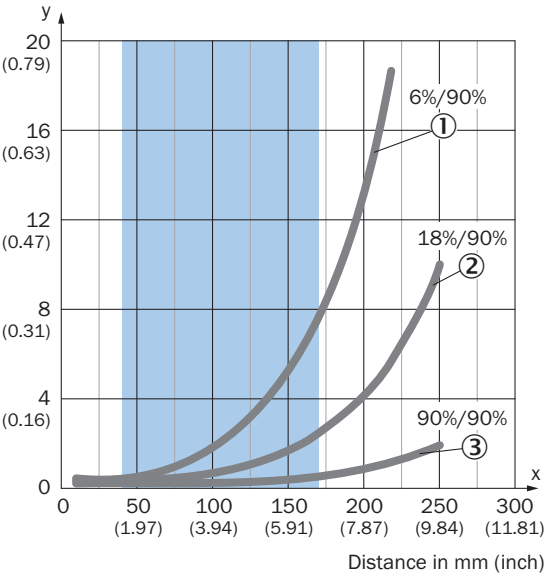


Truth table

	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	⚡	✗
		

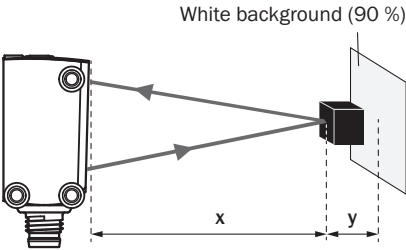
Characteristic curve

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



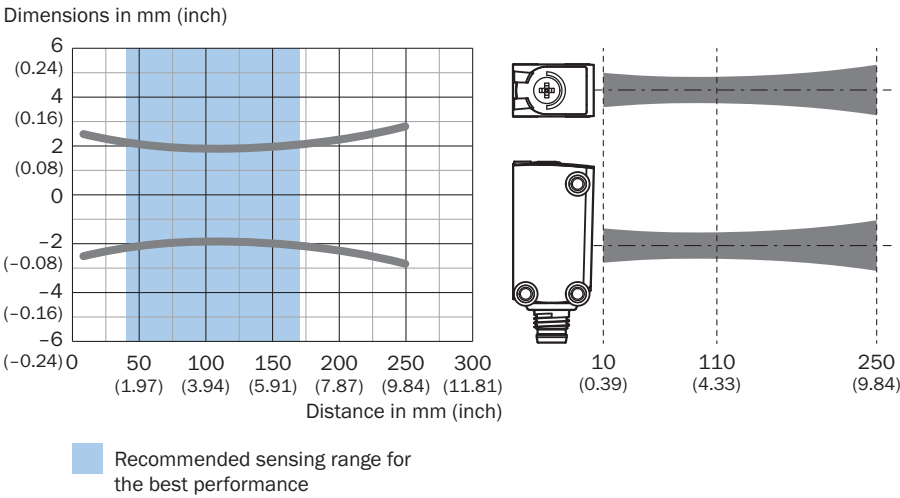
Recommended sensing range for the best performance

Example:
Safe suppression of the background

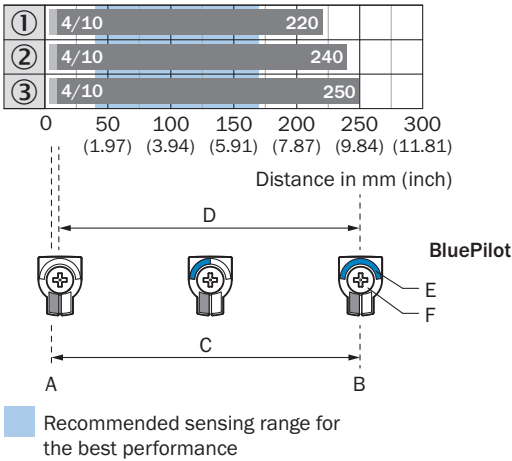


Black object (6 % remission factor)
Set sensing range $x = 150$ mm
Needed minimum distance to white background $y = 5.5$ mm

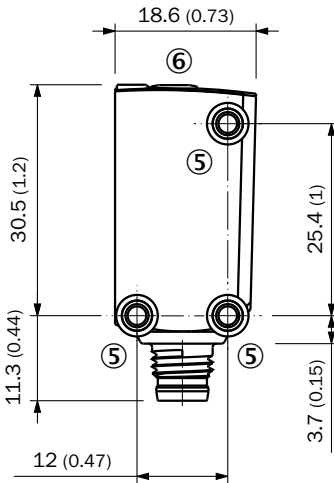
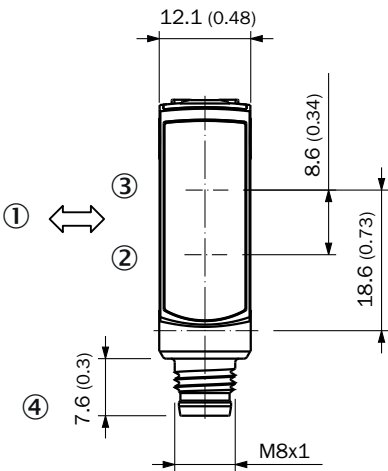
Light spot size



Sensing range diagram



Dimensional drawing (Dimensions in mm (inch))



SICK AT A GLANCE

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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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