



DATA SHEET

WLD4FP-P04

W4
Photoelectric sensors

SICK

Sensor Intelligence



Illustration may differ

PHOTOELECTRIC SENSORS

WLD4FP-P04

ORDERING INFORMATION

Type	part no.
WLD4FP-P04	1157623

Further device versions and accessories at www.sick.com/W4

DETAILED TECHNICAL DATA

FEATURES

Functional principle	Photoelectric retro-reflective sensor
Functional principle detail	With minimum distance to reflector (dual lens system)
Sensing range	
Sensing range min.	0 m
Sensing range max.	2.8 m
Maximum distance range from reflector to sensor (operating reserve 1)	0.015 m ... 2.8 m
Recommended distance range from reflector to sensor (operating reserve 3,75)	0.035 m ... 2.4 m
Reference reflector	Reflector P250
Recommended sensing range for the best performance	0.035 m ... 2.4 m
Polarisation filter	Yes
Emitted beam	
Light source	PinPoint LED
Type of light	Visible red light
Shape of light spot	Point-shaped
Light spot size (distance)	Ø 38 mm (1,000 mm)
Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle)	< +/- 1.5° (at T _U = +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
Adjustment	
None	-
Display	
LED green	Operating indicator Static on: power on
LED yellow	Status of received light beam Static on: object not present Static off: object present

	Flashing: Below the 1.5 function reserve
Special features	Masking on the front window lens

SAFETY-RELATED PARAMETERS

MTTF _D	1,390 years
DC _{avg}	0 %
T _M (mission time)	20 years

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	<table> <tr> <td>Number</td><td>1</td></tr> <tr> <td>Type</td><td>Push-pull: PNP/NPN</td></tr> <tr> <td>Switching mode</td><td>Dark switching</td></tr> <tr> <td>Signal voltage PNP HIGH/LOW</td><td>Approx. U_B - 2.5 V / 0 V</td></tr> <tr> <td>Signal voltage NPN HIGH/LOW</td><td>Approx. U_B / < 2.5 V</td></tr> <tr> <td>Output current I_{max}</td><td>≤ 100 mA</td></tr> <tr> <td>Circuit protection outputs</td><td>Reverse polarity protected Overcurrent protected Short-circuit protected</td></tr> <tr> <td>Response time</td><td>≤ 500 μs</td></tr> <tr> <td>Repeatability (response time)</td><td>150 μs ²⁾</td></tr> <tr> <td>Switching frequency</td><td>1,000 Hz ³⁾</td></tr> </table>	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 ²⁾	Switching frequency	1,000 Hz ³⁾
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Pin/Wire assignment																					
Function of pin 4/black (BK)	Digital output, dark 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.

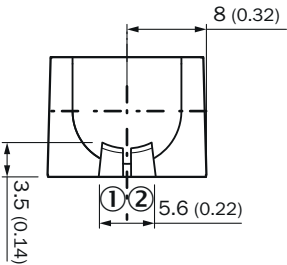
MECHANICS

Housing	Rectangular								
Design detail	Flat								
Dimensions (W x H x D)	16 mm x 40.1 mm x 12.1 mm								
Connection	Cable with connector M8, 3-pin, 110 mm								
Connection detail	<table> <tr> <td>Deep-freeze property</td><td>Do not bend below 0 °C</td></tr> <tr> <td>Conductor size</td><td>0.14 mm²</td></tr> <tr> <td>Cable diameter</td><td>Ø 3.4 mm</td></tr> <tr> <td>Length of cable (L)</td><td>77 mm</td></tr> </table>	Deep-freeze property	Do not bend below 0 °C	Conductor size	0.14 mm ²	Cable diameter	Ø 3.4 mm	Length of cable (L)	77 mm
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Material	<table> <tr> <td>Housing</td><td>Plastic, VISTAL®</td></tr> <tr> <td>Front screen</td><td>Plastic, PMMA</td></tr> <tr> <td>Cable</td><td>Plastic, PVC</td></tr> <tr> <td>Male connector</td><td>Plastic, VISTAL®</td></tr> </table>	Housing	Plastic, VISTAL®	Front screen	Plastic, PMMA	Cable	Plastic, PVC	Male connector	Plastic, VISTAL®
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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

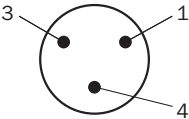
Enclosure rating	IP66 (EN 60529) IP67 (EN 60529) IP69 (EN 60529)
Ambient operating temperature	-40 °C ... +60 °C
Ambient temperature, storage	-40 °C ... +75 °C
Typ. Ambient light immunity	Artificial light: ≤ 50,000 lx Sunlight: ≤ 50,000 lx
Shock resistance	30 g, 11 ms (3 positive and 3 negative shocks 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

DISPLAY AND ADJUSTMENT ELEMENTS

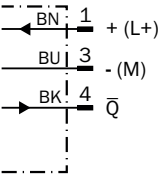


- ① LED green
- ② LED yellow

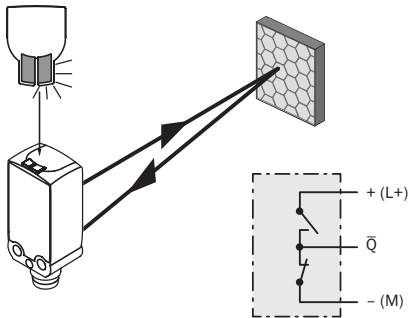
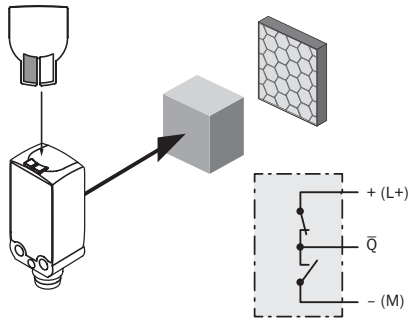
CONNECTION TYPE CONNECTOR M8, 3-PIN



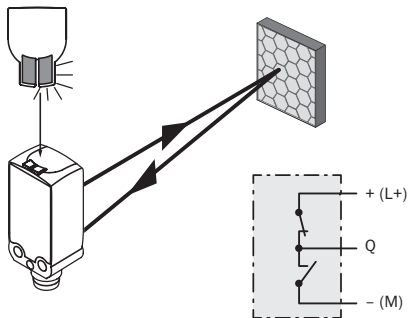
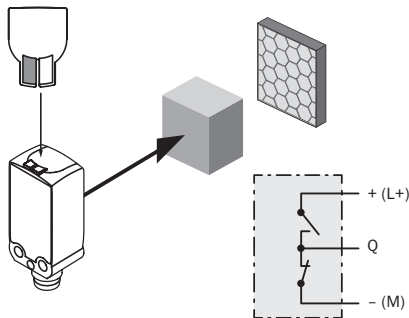
CONNECTION DIAGRAM CD-514



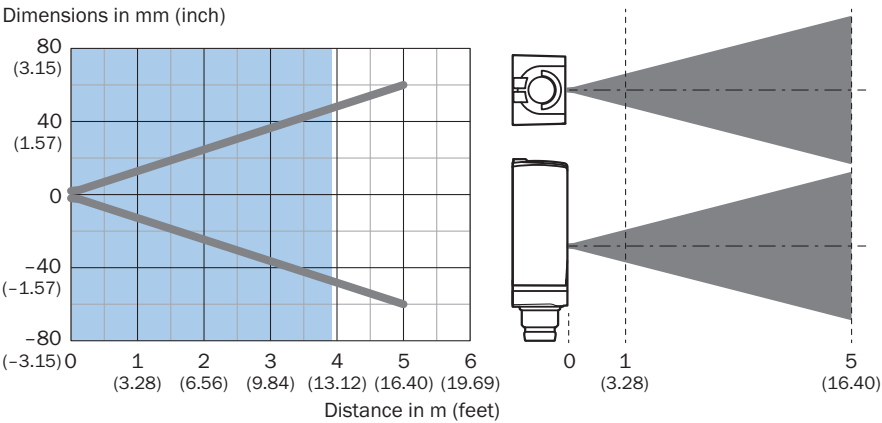
TRUTH TABLE PUSH-PULL: PNP/NPN - DARK SWITCHING $\bar{Q}$

	Dark switching $\bar{Q}$ (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 - LIGHT SWITCHING Q

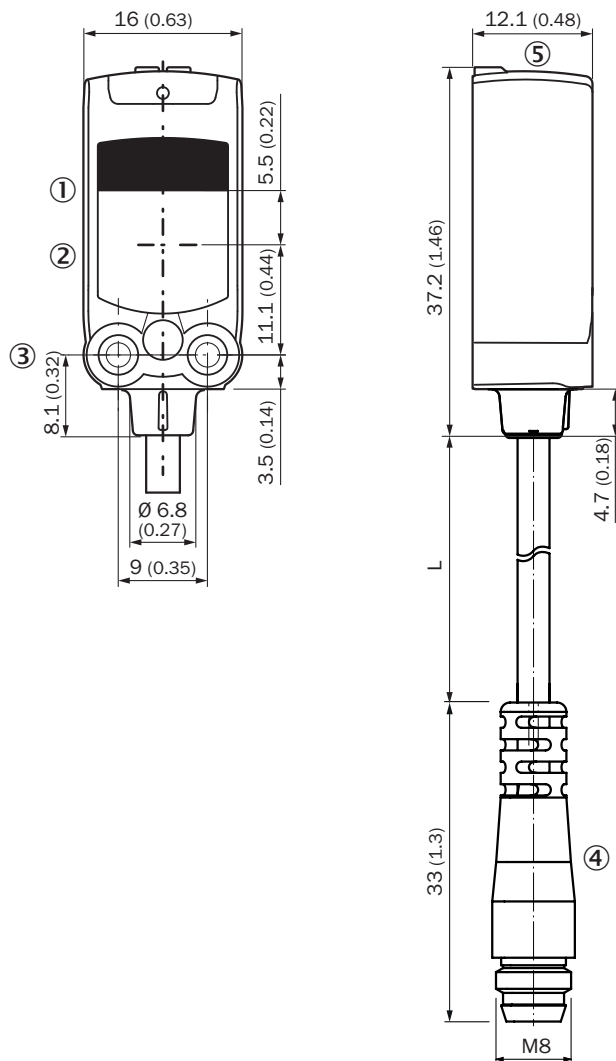
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Load resistance to L+	✗	⚡
Load resistance to M	⚡	✗
		

LIGHT SPOT SIZE



Recommended sensing range for the best performance

DIMENSIONAL DRAWING



Dimensions in mm (inch)

For length of cable (L), see technical data

- ① Center of optical axis, sender
- ② Center of optical axis, receiver
- ③ M3 mounting hole
- ④ cable with connector M8
- ⑤ 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/1157623



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SICK AT A GLANCE

SICK is a leading global technology company for intelligent sensors and integrated solutions in industrial automation. Our technologies set benchmarks, making your industrial processes more efficient, safer and more sustainable – both in logistics and manufacturing operations.

SICK combines sensor intelligence with industry expertise and certified consulting services. We provide the ideal foundation for scalable as well as tailor-made automation solutions and create added value along the entire value chain. Our close partnerships with our customers are more than just a promise: Together, we optimize productivity, improve quality, protect health and safety, and help build a sustainable future. All with empathy and trust.

Since 1946, we have been developing innovative technologies with passion and a pioneering spirit. With a global network in around 40 countries, SICK has a global presence and is always close by. The company's headquarters are located in Waldkirch near Freiburg, Germany. Our customers benefit from our understanding of both local and global requirements, which enables us to deliver tailor-made solutions

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