



WLF4FI-973121A0ZZZ  
W4

MINIATURE PHOTOELECTRIC SENSORS

**SICK**  
Sensor Intelligence.



Illustration may differ



Ordering information

Type	Part no.
WLF4FI-973121A0ZZZ	1124155

Other models and accessories → [www.sick.com/W4](http://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.	10 m
Maximum distance range from reflector to sensor (operating reserve 1)	0.4 m ... 10 m
Recommended distance range from reflector to sensor (operating reserve 3,75)	0.4 m ... 7 m
Reference reflector	Reflector PL80
Recommended sensing range for the best performance	0.4 m ... 7 m
Emitted beam	
Light source	PinPoint LED
Type of light	Infrared light
Shape of light spot	Point-shaped
Light spot size (distance)	Ø 40 mm (1,000 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	850 nm
Average service life	100,000 h at T <sub>a</sub> = +25 °C
<b>Adjustment</b>	
None	–
<b>Indication</b>	
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

### Safety-related parameters

<b>MTTF<sub>D</sub></b>	708 years
<b>DC<sub>avg</sub></b>	0 %
<b>T<sub>M</sub> (mission time)</b>	20 years (EN ISO 13849, rate of use: 60 %)

### 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	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 Overcurrent protected Short-circuit protected
Response time	≤ 500 μs
Repeatability (response time)	150 μs <sup>2)</sup>
Switching frequency	1,000 Hz <sup>3)</sup>
<b>Pin/Wire assignment</b>	
Function of pin 4/black (BK)	Digital output, light switching, object present → output Q LOW <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

<b>Housing</b>	Rectangular
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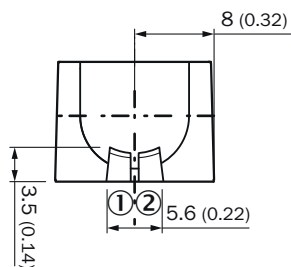
<b>Design detail</b>	Flat
<b>Dimensions (W x H x D)</b>	16 mm x 40.1 mm x 12.1 mm
<b>Connection</b>	Cable with connector M8, 3-pin, with knurled nuts, 338 mm
<b>Connection detail</b>	
Deep-freeze property	Do not bend below 0 °C
Conductor size	0.14 mm <sup>2</sup>
Cable diameter	Ø 3.4 mm
Length of cable (L)	300 mm
<b>Material</b>	
Housing	Plastic, VISTAL®
Front screen	Plastic, PMMA
Cable	Plastic, PVC
Male connector	Plastic, VISTAL®
<b>Weight</b>	Approx. 30 g
<b>Maximum tightening torque of the fixing screws</b>	0.4 Nm

## Ambient data

<b>Enclosure rating</b>	IP66 (EN 60529) IP67 (EN 60529) IP69 (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

## Adjustments

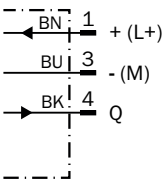
Display and adjustment elements



- ① LED green
- ② LED yellow

Connection diagram

Cd-045



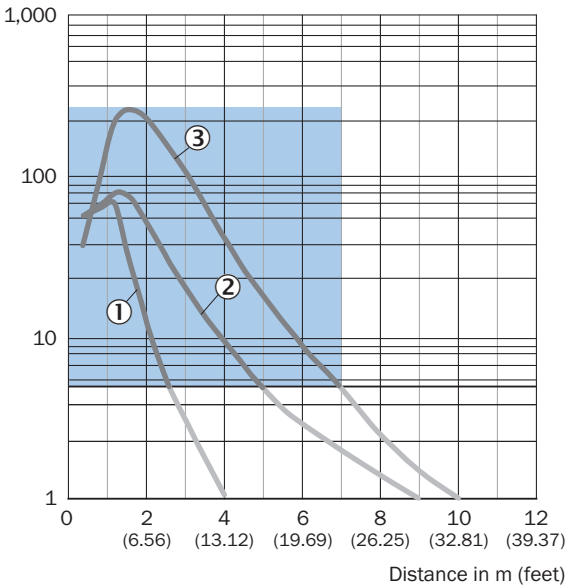
Truth table

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	✗	⚠

Characteristic curve

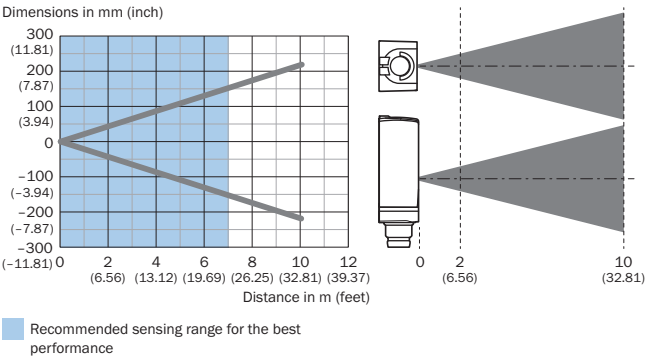
Operating reserve



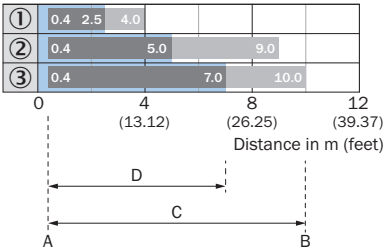
Recommended sensing range for the best performance

- ① Reflector PL80A
- ② Reflector PL30A
- ③ Reflective tape REF-DG

Light spot size



Sensing range diagram





A = Sensing range min. in m  
B = Sensing range max. in m  
C = Maximum distance range from reflector to sensor (operating reserve 1)  
D = Recommended distance range from reflector to sensor (operating reserve 3.75)

Recommended sensing range for the best performance

- ① Reflective tape REF-DG
- ② Reflector PL30A
- ③ Reflector PL80A

Recommended accessories

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

	Brief description	Type	Part no.
Mounting brackets and plates			
	<ul style="list-style-type: none"><li>• <b>Description:</b> Mounting bracket for wall mounting</li><li>• <b>Material:</b> Stainless steel</li><li>• <b>Details:</b> Stainless steel 1.4571</li><li>• <b>Items supplied:</b> Mounting hardware included</li><li>• <b>Suitable for:</b> W4S, W4F, W4S</li></ul>	BEF-W4-A	2051628
Others			
	<ul style="list-style-type: none"><li>• <b>Description:</b> Fine triple reflector, screw connection, suitable for laser sensors</li><li>• <b>Dimensions:</b> 20 mm 32 mm</li><li>• <b>Ambient operating temperature:</b> -30 °C ... +65 °C</li></ul>	PL10F	5311210

## 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)