



WLD4FP-221121A0ZZZ

W4

MINIATURE PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

Type	Part no.
WLD4FP-221121A0ZZZ	1121471

Other models and accessories → 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.	4.5 m
	Maximum distance range from reflector to sensor (operating reserve 1)	0.015 m ... 4.5 m
	Recommended distance range from reflector to sensor (operating reserve 3,75)	0.035 m ... 3.9 m
	Reference reflector	Reflector P250
	Recommended sensing range for the best performance	0.035 m ... 3.9 m
Polarisation filters		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 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 $T_a = +25^\circ\text{C}$
Adjustment	
None	–
Indication	
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

MTTF_D	1,390 years
DC_{avg}	0 %
T_M (mission time)	20 years (EN ISO 13849) Rate of use: 60 %

Electrical data

Supply voltage U_B	10 V DC ... 30 V DC ¹⁾
Ripple	$\leq 5\text{ V}_{pp}$
Usage category	DC-12 (According to EN 60947-5-2) DC-13 (According to EN 60947-5-2)
Current consumption	$\leq 20\text{ mA}$, without load. At $U_B = 24\text{ V}$
Protection class	III
Digital output	
Number	2 (Complementary)
Type	Push-pull: PNP/NPN
Signal voltage PNP HIGH/LOW	Approx. $U_B - 2.5\text{ V}$ / 0 V
Signal voltage NPN HIGH/LOW	Approx. U_B / $< 2.5\text{ V}$
Output current I _{max.}	$\leq 100\text{ mA}$
Circuit protection outputs	Reverse polarity protected Overcurrent protected Short-circuit protected
Response time	$\leq 500\text{ }\mu\text{s}$
Repeatability (response time)	$150\text{ }\mu\text{s}$ ²⁾
Switching frequency	$1,000\text{ Hz}$ ³⁾
Pin/Wire assignment	
Function of pin 4/black (BK)	Digital output, light switching, object present → output Q LOW
Function of pin 2/white (WH)	Digital output, dark switching, object present → output $\bar{Q}_{L1}$ HIGH

¹⁾ Limit values.

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

³⁾ With light/dark ratio 1:1.

Mechanical data

Housing	Rectangular
Design detail	Flat
Dimensions (W x H x D)	16 mm x 40.1 mm x 12.1 mm
Connection	Male connector M8, 4-pin
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) 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

Classifications

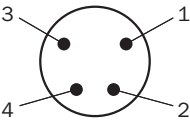
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eCl@ss 12.0	27270904
ETIM 5.0	EC002717
ETIM 6.0	EC002717
ETIM 7.0	EC002717
ETIM 8.0	EC002717

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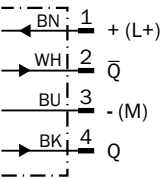
Connection type

Male connector M8, 4-pin



Connection diagram

Cd-083



Truth table

Push-pull: PNP/NPN - light switching Q

	Light switching 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	⚠	✗

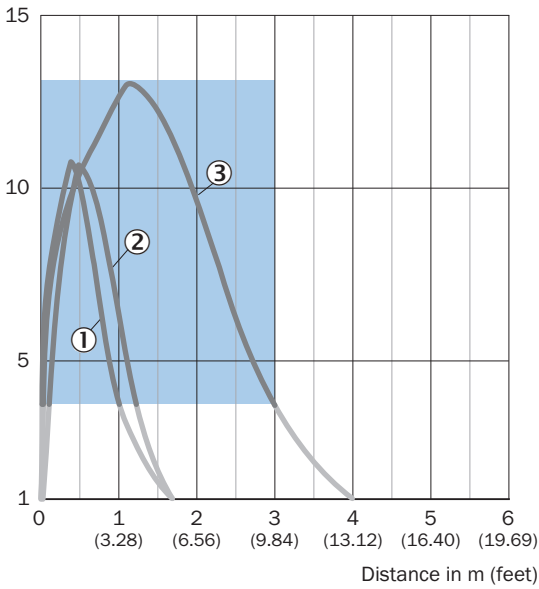
Push-pull: PNP/NPN – dark switching $\bar{Q}$

	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	✗	⚠

Characteristic curve

Reflective tape

Operating reserve

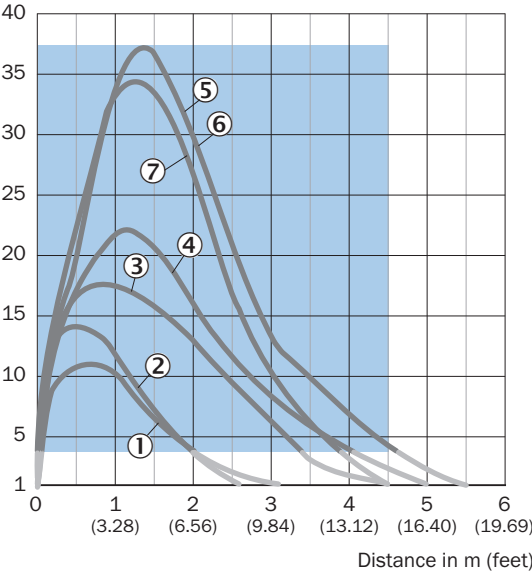


Recommended sensing range for the best performance

- ① Reflective tape REF-DG
- ② Reflective tape REF-IRF-56
- ③ Reflective tape REF-AC1000

Standard reflectors

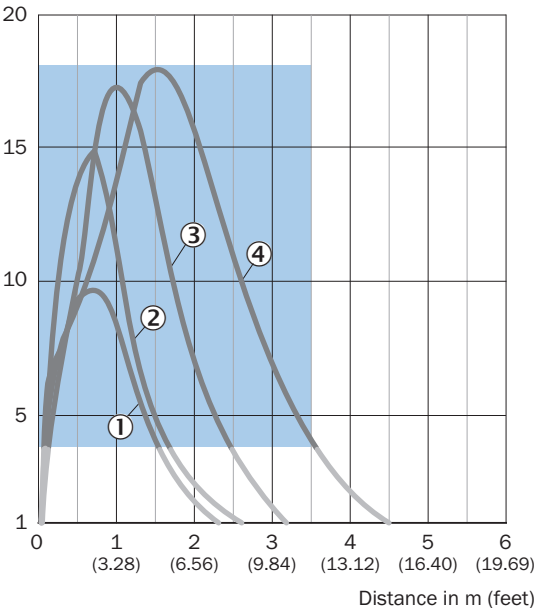
Operating reserve



- Recommended sensing range for the best performance
- ① Reflector PL22
 - ② Reflector PL20A
 - ③ Reflector PL30A
 - ④ Reflector PL40A
 - ⑤ Reflector PL80A
 - ⑥ Reflector C110A
 - ⑦ Reflector P250

Fine triple reflectors

Operating reserve

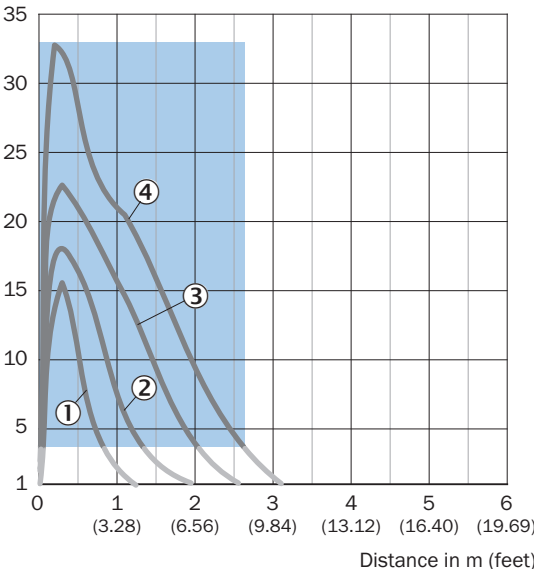


Recommended sensing range for the best performance

- ① PL10FH reflector
- ② PL10F reflector
- ③ Reflector PL20F
- ④ Reflector P250F

Chemical-resistant reflectors

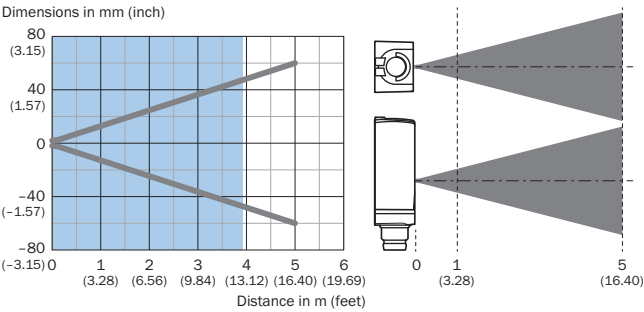
Operating reserve



Recommended sensing range for the best performance

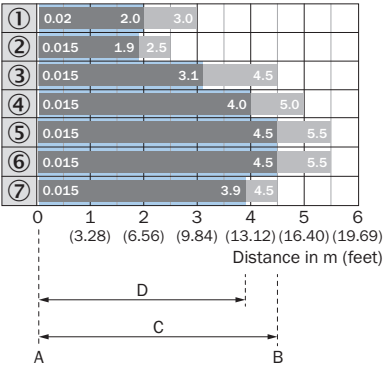
- ① PL10F CHEM reflector
- ② Reflector PL20 CHEM
- ③ Reflector P250 CHEM
- ④ Reflector P250H

Light spot size



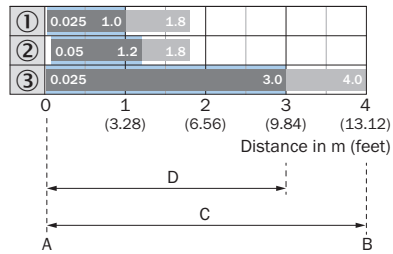
Sensing range diagram

Standard reflectors



- ① Reflector PL22
- ② Reflector PL20A
- ③ Reflector PL30A
- ④ Reflector PL40A
- ⑤ Reflector PL80A
- ⑥ Reflector C110A
- ⑦ Reflector P250

Reflective tape

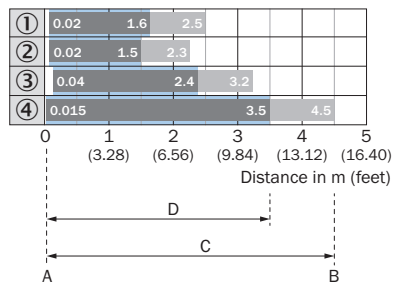


A = Sensing range min. in m
 B = Sensing range max. in m
 C = Maximum distance range from reflector to sensor (operating reserve 1)
 D = Recommended distance range from reflector to sensor (operating reserve 3.75)

Recommended sensing range for the best performance

- ① Reflective tape REF-DG (50 x 50 mm)
- ② Reflective tape REF-IRF-56
- ③ Reflective tape REF-AC1000

Fine triple reflectors

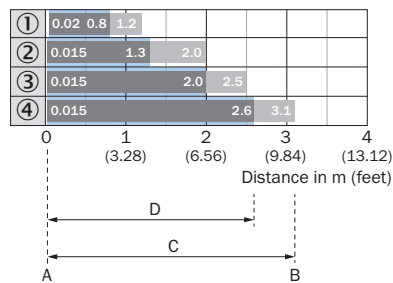


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Recommended sensing range for the best performance

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- ② PL10F reflector
- ③ Reflector PL20F
- ④ Reflector P250F

Chemical-resistant reflectors



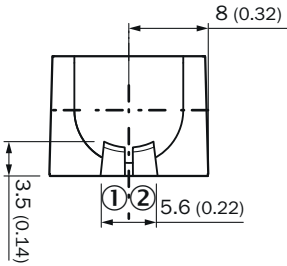
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Recommended sensing range for the best performance

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- ② Reflector PL20 CHEM
- ③ Reflector P250 CHEM
- ④ Reflector P250H

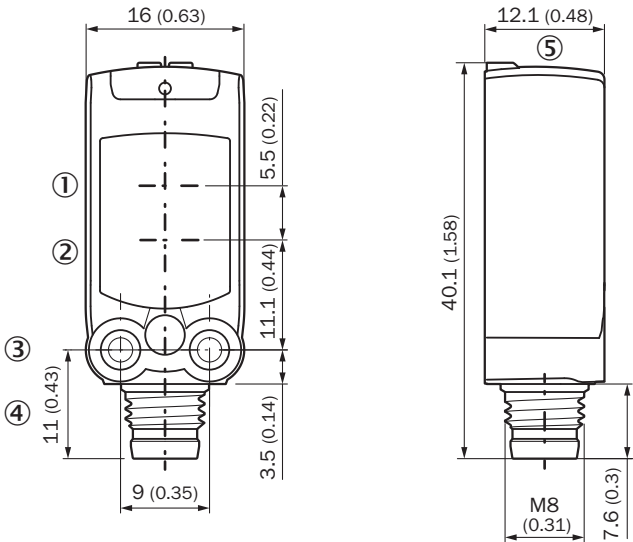
Adjustments

Display and adjustment elements



- ① LED green
- ② LED yellow

Dimensional drawing (Dimensions in mm (inch))



- ① Center of optical axis, sender
- ② Center of optical axis, receiver
- ③ M3 mounting hole
- ④ Connection
- ⑤ Display and adjustment elements

Recommended accessories

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

	Brief description	Type	Part no.
Mounting brackets and plates			
	Mounting bracket for wall mounting, Stainless steel 1.4571, mounting hardware included	BEF-W4-A	2051628

	Brief description	Type	Part no.
Plug connectors and cables			
	Head A: male connector, M8, 4-pin, straight Cable: unshielded	STE-0804-G	6037323
Reflectors			
	Fine triple reflector, screw connection, suitable for laser sensors, 20 mm x 32 mm, PM-MA/ABS, Screw-on, 2 hole mounting	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:

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