



WL4SP-31312130ZZZ

W4

PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

Type	part no.
WLG4SP-31312130ZZZ	1140102

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

Detailed technical data

Features

Functional principle	Photoelectric retro-reflective sensor
Functional principle detail	Without reflector minimum distance (autocollimation/coaxial optics), ClearSens
Sensing range	
Sensing range min.	0 m
Sensing range max.	7.1 m
Recommended sensing range for the best performance	0 m ... 5 m
Emitted beam	
Light source	PinPoint LED
Type of light	Visible red light
Shape of light spot	Point-shaped
Light spot size (distance)	150 mm (5 m)
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 Ta = +25 °C
Adjustment	
Teach-in button	BluePilot: for sensitivity adjustment
Display	
LED blue	BluePilot: Alignment aid
LED green	Operating indicatorStatic 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 applications		Detecting objects wrapped in film, Detecting transparent objects

Safety-related parameters

MTTF_D	1,590 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	Light 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, light switching, object present → output Q _{L1} LOW 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	Cable with connector M8, 3-pin, 110 mm
Connection detail	
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
Material	

Housing	Plastic, VISTAL®
Front screen	Plastic, PMMA
Cable	Plastic, PVC
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

Certificates

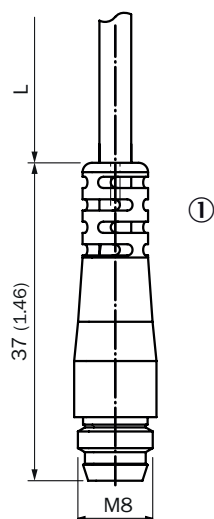
EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
Moroccan declaration of conformity	✓
China-RoHS	✓
cULus certificate	✓

Classifications

ECLASS 5.0	27270902
ECLASS 5.1.4	27270902
ECLASS 6.0	27270902
ECLASS 6.2	27270902
ECLASS 7.0	27270902
ECLASS 8.0	27270902
ECLASS 8.1	27270902
ECLASS 9.0	27270902
ECLASS 10.0	27270902
ECLASS 11.0	27270902
ECLASS 12.0	27270902
ETIM 5.0	EC002717
ETIM 6.0	EC002717
ETIM 7.0	EC002717

ETIM 8.0	EC002717
UNSPSC 16.0901	39121528

Dimensional drawing, connection

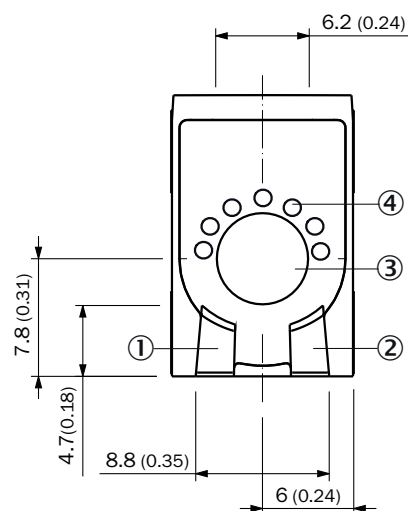


Dimensions in mm (inch)

For length of cable (L), see technical data

① cable with connector M8

display and adjustment elements



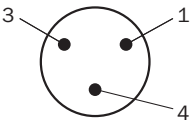
① LED green

② LED yellow

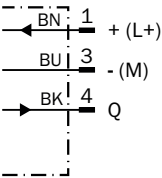
③ Teach-in button

④ LED blue

Connection type Connector M8, 3-pin



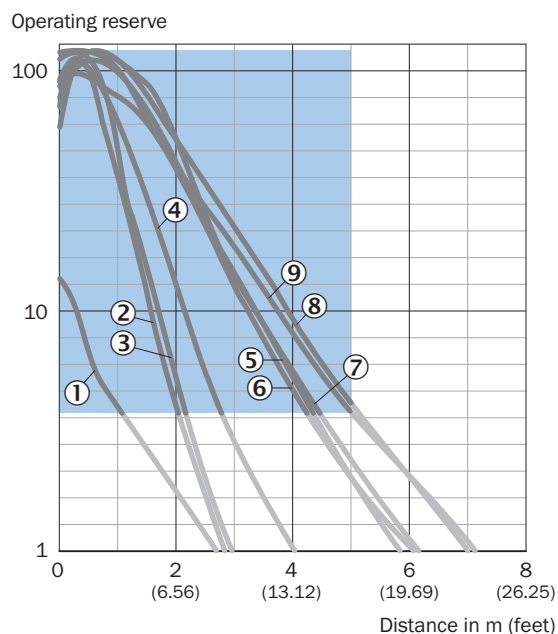
Connection diagram Cd-045



Truth table Push-pull: PNP/NPN - light switching Q

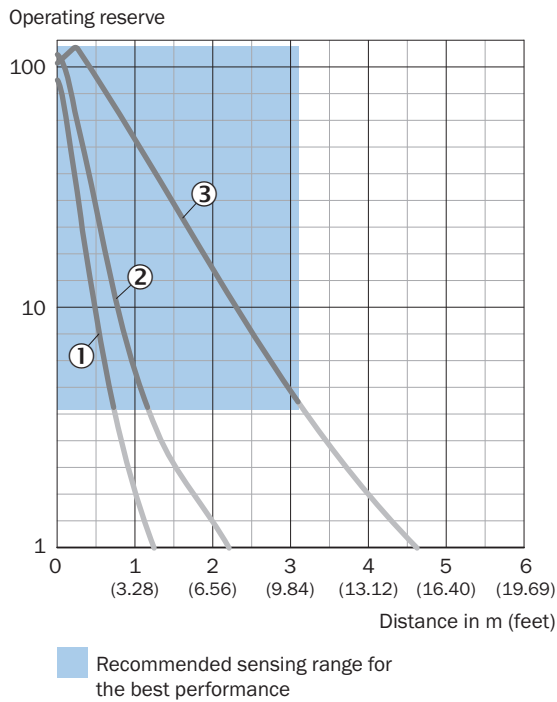
	Light switching Q (normally closed (upper switch), normally open (lower switch))	
	Object not present → Output HIGH	Object present → Output LOW
Light receive	✓	✗
Light receive indicator	☀	✗
Load resistance to L+	✗	⚡
Load resistance to M	⚡	✗
	A diagram showing a sensor emitting a light beam that hits a reflective surface and returns to the sensor. The output Q is connected to a switch that is normally closed (upper switch) and normally open (lower switch). The switch is connected to L+ and M. The output Q is HIGH when the object is not present.	A diagram showing a sensor emitting a light beam that hits a retro-reflective surface and returns to the sensor. The output Q is connected to a switch that is normally closed (upper switch) and normally open (lower switch). The switch is connected to L+ and M. The output Q is LOW when the object is present.

Characteristic curve Standard reflectors



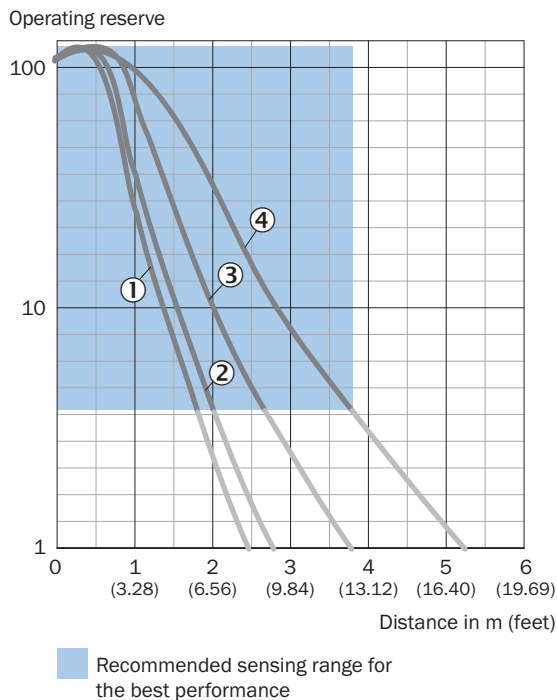
- ① Reflector PL40A Antifog
- ② Reflector PL20A
- ③ reflector PL22-2
- ④ Reflector P250H
- ⑤ Reflector P250
- ⑥ Reflector PL30A
- ⑦ Reflector PL40A
- ⑧ Reflector C110A
- ⑨ Reflector PL80A

Characteristic curve Reflective tape



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

Characteristic curve Fine triple reflectors

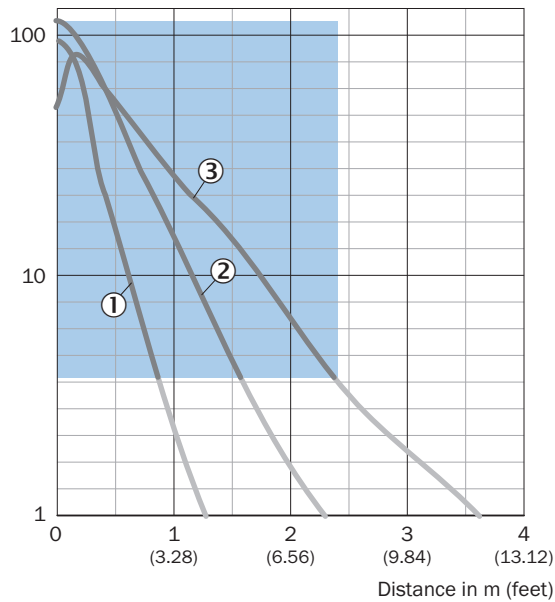


- ① PL10F reflector
- ② PL10FH-1 reflector

- ③ Reflector PL20F
- ④ Reflector P250F

Characteristic curve Chemical-resistant reflectors

Operating reserve

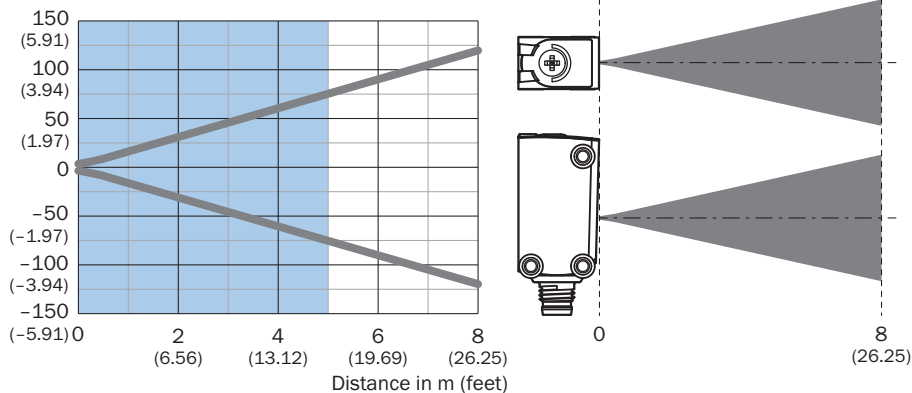


Recommended sensing range for the best performance

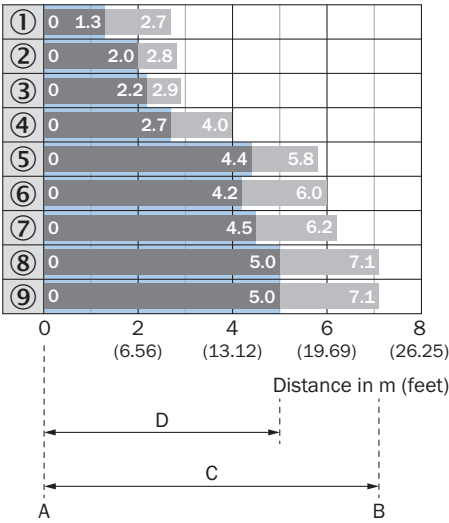
- ① PL10F CHEM reflector
- ② Reflector PL20 CHEM
- ③ Reflector P250 CHEM

Light spot size

Dimensions in mm (inch)



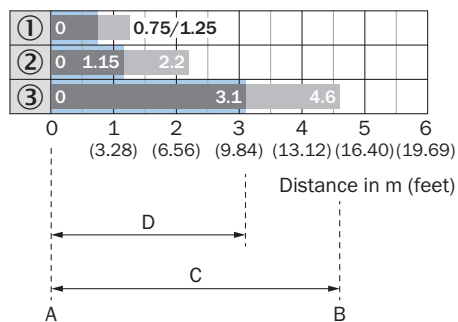
Sensing range diagram Standard reflectors



Recommended sensing range for the best performance

1	Reflector PL40A Antifog
2	Reflector PL20A
3	Reflector PL22-2
4	Reflector P250H
5	Reflector P250
6	Reflector PL30A
7	Reflector PL40A
8	Reflector C110A
9	Reflector PL80A
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 re- flector to sensor (operating reserve 3,75)

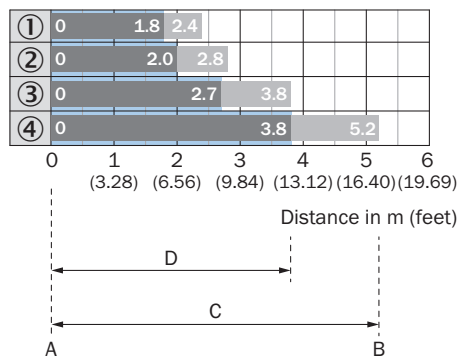
Sensing range diagram Reflective tape



Recommended sensing range for the best performance

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

Sensing range diagram Fine triple reflectors

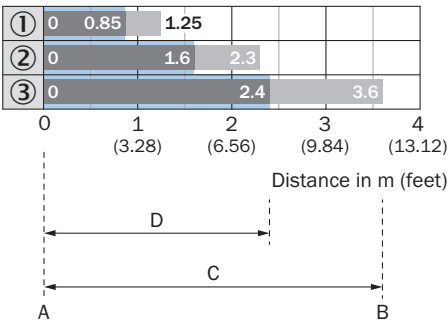


Recommended sensing range for the best performance

1	PL10F reflector
2	PL10FH-1 reflector
3	Reflector PL20F
4	Reflector P250F
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 re- flector to sensor (operating reserve 3,75)

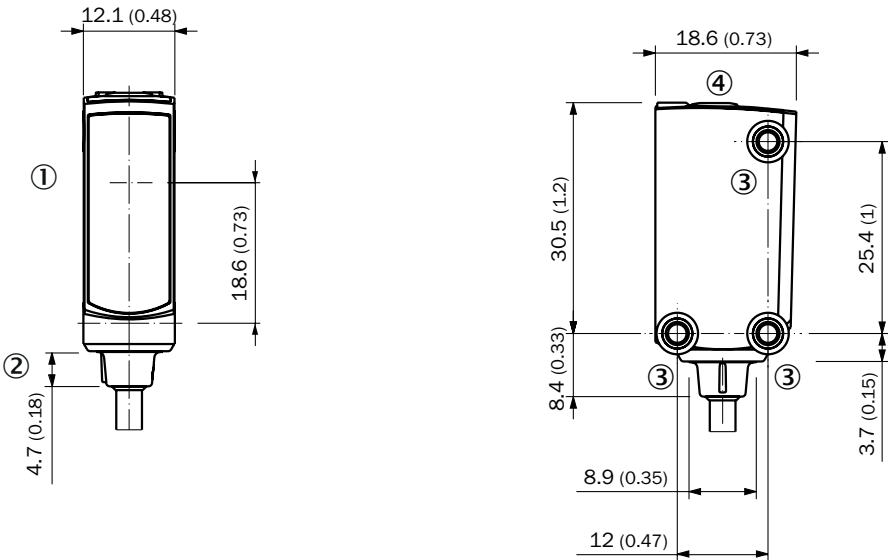
Sensing range diagram Chemical-resistant reflectors



Recommended sensing range for the best performance

1	PL10F CHEM reflector
2	Reflector PL20 CHEM
3	Reflector P250 CHEM
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 re- flector to sensor (operating reserve 3,75)

Dimensional drawing, sensor



Dimensions in mm (inch)

- ① Center of optical axis
- ② Connection
- ③ M3 mounting hole
- ④ display and adjustment elements

Recommended accessories

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

	Brief description	Type	part no.
reflectors and optics			
	• Description: Rectangular, screw connection • Dimensions: 84 mm 84 mm • Ambient operating temperature: -30 °C ... +65 °C	PL80A	1003865

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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