WLA4SP-21311100ZZZ

W4

PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.

WLA4SP-21311100ZZZ | W4

PHOTOELECTRIC SENSORS

Illustration may differ
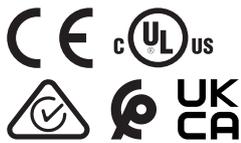
Ordering information

Type	part no.
WLA4SP-21311100ZZZ	1139131

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)
Sensing range	
Sensing range min.	0 m
Sensing range max.	4 m
Maximum distance range from reflector to sensor (operating reserve 1)	0 m … 4 m
Recommended distance range from reflector to sensor (operating reserve 3,75)	0 m … 2.6 m
Reference reflector	Reflector PL80
Recommended sensing range for the best performance	0 m … 2.6 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)	150 mm (5 m)
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 blue	BluePilot: Alignment aid
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 applications	Detecting objects wrapped in film

Safety-related parameters

$MTTF_D$	1,956 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 Q̄ HIGH [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

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

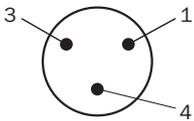| ETIM 8.0	EC002717
UNSPSC 16.0901	39121528

display and adjustment elements
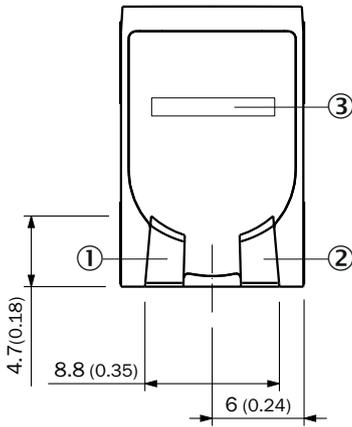
① LED green
② LED yellow
③ LED blue

Connection type Connector M8, 3-pin
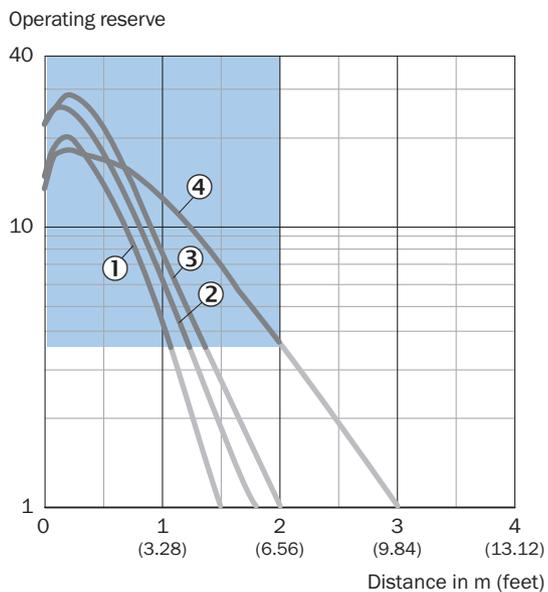
Connection diagram Cd-514

BN 1 + (L+)
BU 3 - (M)
BK 4 Q̄
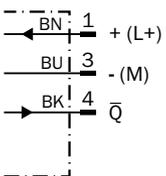
Truth table Push-pull: PNP/NPN – dark switching $\bar{Q}$

	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	✕	⚠

Characteristic curve Fine triple reflectors

Operating reserve

Distance in m (feet)

■ Recommended sensing range for the best performance

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

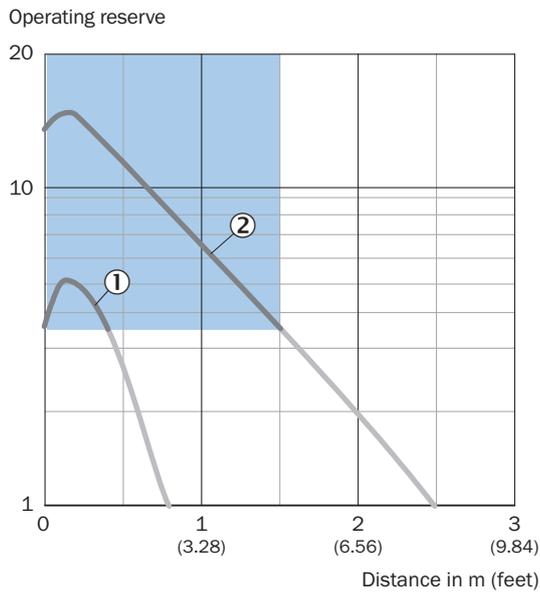## Characteristic curve Standard reflectors
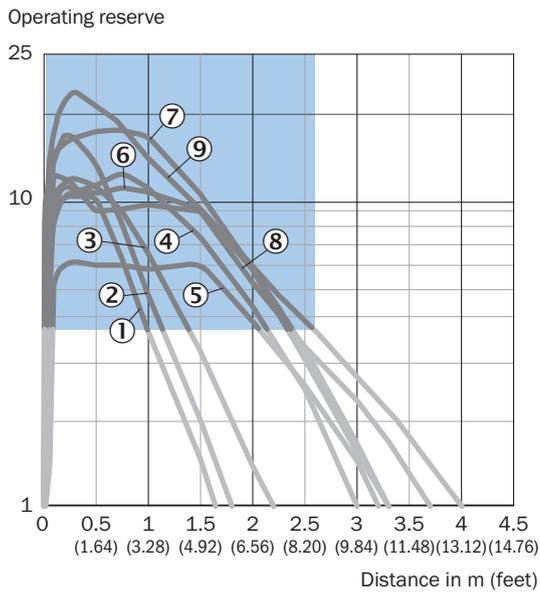
Operating reserve

Recommended sensing range for
the best performance

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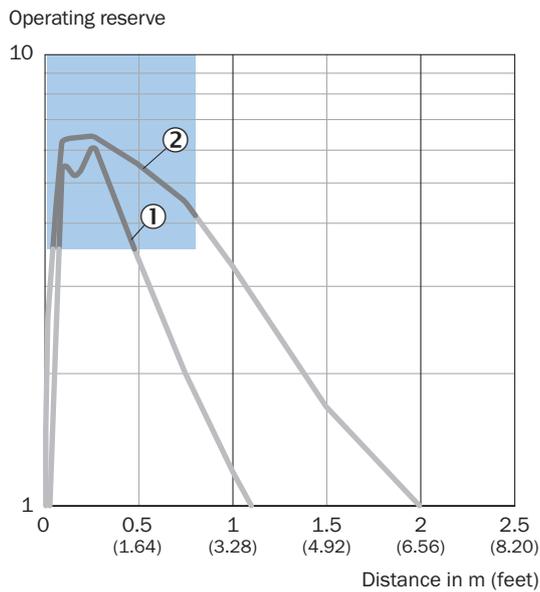⑦ Reflector P250
⑧ Reflector C110A
⑨ Reflector PL80A

Characteristic curve Reflective tape

Operating reserve

Distance in m (feet)

■ Recommended sensing range for
the best performance
① Reflective tape REF-IRF-56
② Reflective tape REF-AC1000
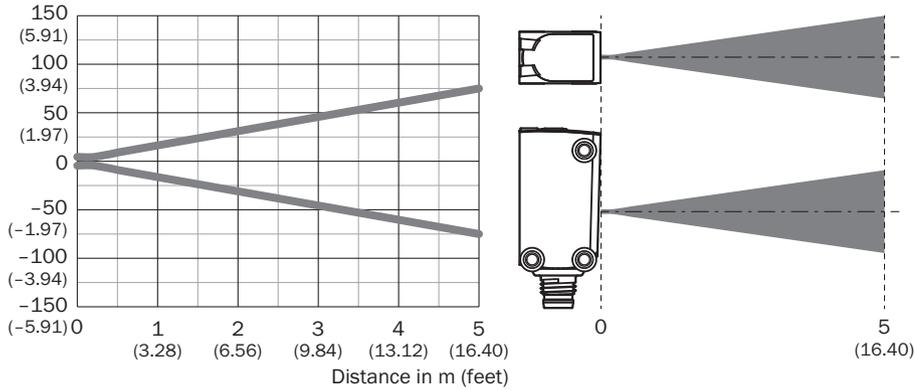
Characteristic curve Chemical-resistant reflectors

Operating reserve

Distance in m (feet)

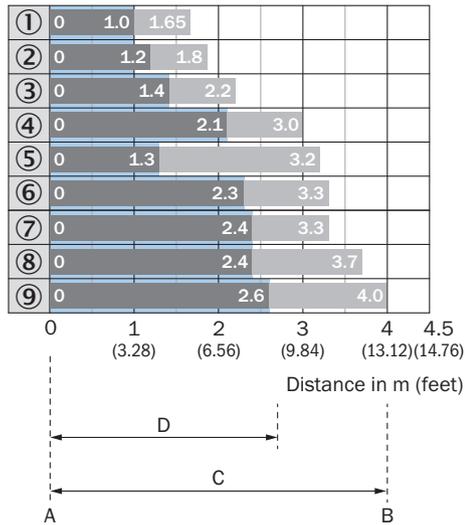■ Recommended sensing range for
the best performance

① Reflector PL20 CHEM
② Reflector P250 CHEM

Light spot size

Dimensions in mm (inch)

Distance in m (feet)

Sensing range diagram Standard reflectors

Distance in m (feet)

■ Recommended sensing range for the best performance

1	Reflector PL20A
2	Reflector PL22-2
3	Reflector P250H
4	Reflector PL30A
5	Reflector PL40A Antifog
6	Reflector PL40A
7	Reflector P250
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 reflector to sensor (operating reserve 3,75)

Sensing range diagram Reflective tape

Distance in m (feet)

Recommended sensing range for the best performance
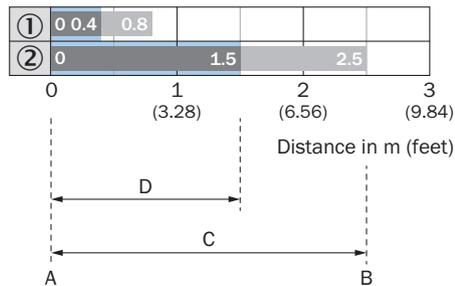
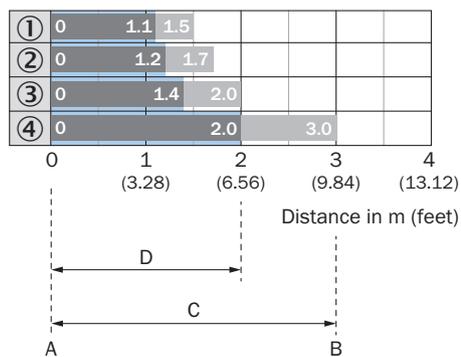|	
1	Reflective tape REF-IRF-56
2	Reflective tape REF-AC1000
A	Sensing range min. in m
B	Sensing range max. in m
C	Maximum distance range from reflector to sensor (operating reserve 1)
D	Recommended distance range from reflector to sensor (operating reserve 3,75)

Sensing range diagram Fine triple reflectors

Distance in m (feet)

Recommended sensing range for the best performance

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

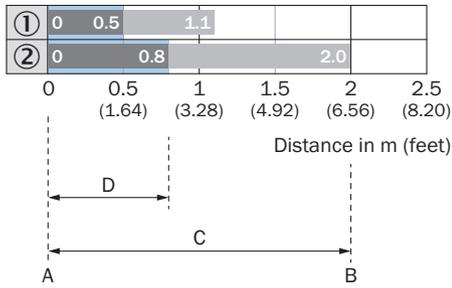|			
	A		Sensing range min. in m
	B		Sensing range max. in m
	C		Maximum distance range from reflector to sensor (operating reserve 1)
	D		Recommended distance range from reflector to sensor (operating reserve 3,75)

Sensing range diagram Chemical-resistant reflectors

Recommended sensing range for the best performance

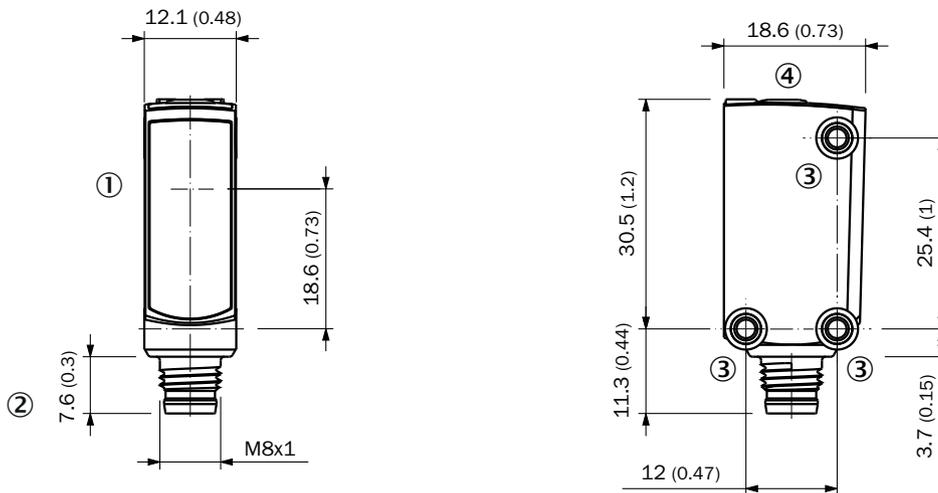|			
	1		Reflector PL20 CHEM
	2		Reflector P250 CHEM
	A		Sensing range min. in m
	B		Sensing range max. in m
	C		Maximum distance range from reflector to sensor (operating reserve 1)
	D		Recommended distance range from reflector to sensor (operating reserve 3,75)

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
Mounting systems			
	• **Description:** Plate N08 for universal clamp bracket • **Material:** Steel, zinc diecast • **Details:** Zinc plated steel (sheet), Zinc die cast (clamping bracket) • **Items supplied:** Universal clamp (5322626), mounting hardware • **Usable for:** W100, W150, W4S, W4F, W8, W9-3, W8G, W8 Laser, W8 Inox, G6, W100 Laser, W100-2, W10, G6 Inox, RAY10, W4SLG-3, W9, GR18, MultiPulse, Reflex Array, MultiLine, LUT3, KT5, KT8, KT10, CS8	BEF-KHS-N08	2051607
	• **Material:** Stainless steel • **Details:** Stainless steel (1.4301) • **Suitable for:** W4S, W4S	BEF-WN-G6	2062909
connectors and cables			
	• **Connection type head A:** Female connector, M8, 3-pin, straight, A-coded • **Connection type head B:** Flying leads • **Signal type:** Sensor/actuator cable • **Cable:** 5 m, 3-wire, PVC • **Description:** Sensor/actuator cable, unshielded • **Application:** Uncontaminated zones, Zones with chemicals	YF8U13-050VA1XLEAX	2095884
	• **Connection type head A:** Female connector, M8, 3-pin, straight, A-coded • **Connection type head B:** Flying leads • **Signal type:** Sensor/actuator cable • **Cable:** 5 m, 3-wire, PUR, halogen-free • **Description:** Sensor/actuator cable, unshielded • **Application:** Drag chain operation, Zones with oils and lubricants, Robot, Drag chain operation	YF8U13-050UA1XLEAX	2094788
	• **Connection type head A:** Male connector, M8, 3-pin, straight, A-coded • **Description:** Unshielded • **Connection systems:** Screw-type terminals • **Permitted cross-section:** 0.14 mm² … 0.5 mm²	STE-0803-G	6037322

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."

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