



WLA16P-24161100A00

W16

SMALL PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

Type	Part no.
WLA16P-24161100A00	1221053

Other models and accessories → www.sick.com/W16

Detailed technical data

Features

Device type	Photoelectric sensors
Sensor/ detection principle	Photoelectric retro-reflective sensor, autocollimation
Dimensions (W x H x D)	20 mm x 55.7 mm x 42 mm
Housing design (light emission)	Rectangular
Sensing range max.	0 m ... 10 m ¹⁾
Type of light	Visible red light
Light source	PinPoint LED ²⁾
Light spot size (distance)	Ø 80 mm (5 m)
Wave length	635 nm
Adjustment	
	IO-Link For configuring the sensor parameters and Smart Task functions
Indication	
	LED blue BluePilot: Alignment aid
	LED green Operating indicator Static: power on Flashing: IO-Link mode

¹⁾ Reflector PL80A.

²⁾ Average service life: 100,000 h at T_J = +25 °C.

LED yellow	Status of received light beam Static: object not present Static off: object present Flashing: Below the 1.5 function reserve
Pin 2 configuration	External input, Teach-in, switching signal
Special applications	Detecting objects wrapped in film
Special features	Factory setting: Switch-on delay, 10 ms, Differs from the IO-Link (document no. 8021068)

1) Reflector PL80A.

2) Average service life: 100,000 h at $T_U = +25 \text{ °C}$.

Mechanics/electronics

Supply voltage	10 V DC ... 30 V DC ¹⁾
Ripple	$< 5 V_{pp}$
Current consumption	30 mA ²⁾ 50 mA ³⁾
Switching output	Push-pull: PNP/NPN
Output: Q_{L1} / C	Switching output or IO-Link mode
Output function	Factory setting: Pin 2 / white (MF): NPN normally open (dark switching), PNP normally closed (light switching), Pin 4 / black (QL1 / C): NPN normally closed (light switching), PNP normally open (dark switching), IO-Link
Switching mode	Dark/light switching
Signal voltage PNP HIGH/LOW	Approx. $V_S - 2.5 \text{ V} / 0 \text{ V}$
Signal voltage NPN HIGH/LOW	Approx. $V_S / < 2.5 \text{ V}$
Output current I_{max}	$\leq 100 \text{ mA}$
Response time	$\leq 500 \mu\text{s}$ ⁴⁾
Switching frequency	1,000 Hz ⁵⁾
Time functions	Deactivated On delay (factory setting) Off delay ON and OFF delay Impulse (one shot)
Delay time	Configurable via IO-Link, 0 ms ... 30,000 ms, 10 ms (factory setting)
Connection type	Male connector M12, 4-pin
Circuit protection	A ⁶⁾ B ⁷⁾ C ⁸⁾ D ⁹⁾
Protection class	III

1) Limit values.

2) 16 V DC ... 30 V DC, without load.

3) 10 V DC ... 16 V DC, without load.

4) Signal transit time with resistive load in switching mode. Different values possible in COM2 mode.

5) With light/dark ratio 1:1 in switching mode. Different values possible in IO-Link mode.

6) A = V_S connections reverse-polarity protected.

7) B = inputs and output reverse-polarity protected.

8) C = interference suppression.

9) D = outputs overcurrent and short-circuit protected.

10) Replaces IP69K with ISO 20653: 2013-03.

Weight	50 g
Polarisation filter	✓
Housing material	Plastic, VISTAL®
Optics material	Plastic, PMMA
Enclosure rating	IP66 (According to EN 60529) IP67 (According to EN 60529) IP69 (According to EN 60529) ¹⁰⁾
Ambient operating temperature	-40 °C ... +60 °C
Ambient temperature, storage	-40 °C ... +75 °C
UL File No.	NRKH.E181493 & NRKH7.E181493

¹⁾ Limit values.

²⁾ 16 V DC ... 30 V DC, without load.

³⁾ 10 V DC ... 16 V DC, without load.

⁴⁾ Signal transit time with resistive load in switching mode. Different values possible in COM2 mode.

⁵⁾ With light/dark ratio 1:1 in switching mode. Different values possible in IO-Link mode.

⁶⁾ A = V_S connections reverse-polarity protected.

⁷⁾ B = inputs and output reverse-polarity protected.

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⁹⁾ D = outputs overcurrent and short-circuit protected.

¹⁰⁾ Replaces IP69K with ISO 20653: 2013-03.

Safety-related parameters

MTTF_D	693 years
DC_{avg}	0 %
T_M (mission time)	20 years

Communication interface

Communication interface	IO-Link V1.1
Communication Interface detail	COM2 (38,4 kBaud)
Cycle time	2.3 ms
Process data length	16 Bit
Process data structure	Bit 0 = switching signal Q _{L1} Bit 1 = switching signal Q _{L2} Bit 2 ... 15 = empty
VendorID	26
DeviceID HEX	0x80016C
DeviceID DEC	8388972

Smart Task

Smart Task name	Base logics
Logic function	Direct AND OR Window Hysteresis
Timer function	Deactivated

¹⁾ SIO Direct: sensor operation in standard I/O mode without IO-Link communication and without using internal sensor logic or time parameters (set to "direct"/"deactivated").

²⁾ SIO Logic: Sensor operation in standard I/O mode without IO-Link communication. Sensor-internal logic or timing parameters plus Automation Functions used.

³⁾ IOL: Sensor operation with full IO-Link communication and usage of logic, timing and Automation Function parameters.

	On delay Off delay ON and OFF delay Impulse (one shot)
Inverter	Yes
Switching frequency	SIO Direct: 1000 Hz ¹⁾ SIO Logic: 800 Hz ²⁾ IOL: 650 Hz ³⁾
Response time	SIO Direct: 500 µs ¹⁾ SIO Logic: 600 µs ²⁾ IOL: 750 µs ³⁾
Repeatability	SIO Direct: 150 µs ¹⁾ SIO Logic: 300 µs ²⁾ IOL: 750 µs ³⁾
Switching signal	
Switching signal Q _{L1}	Switching output
Switching signal Q _{L2}	Switching output

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³⁾ IOL: Sensor operation with full IO-Link communication and usage of logic, timing and Automation Function parameters.

Diagnosis

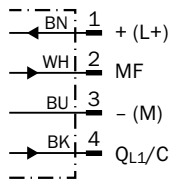
Status information	
Device status	Yes
Quality of teach	Yes
Quality of run	Yes, Contamination display

Classifications

ECl@ss 5.0	27270902
ECl@ss 5.1.4	27270902
ECl@ss 6.0	27270902
ECl@ss 6.2	27270902
ECl@ss 7.0	27270902
ECl@ss 8.0	27270902
ECl@ss 8.1	27270902
ECl@ss 9.0	27270902
ECl@ss 10.0	27270902
ECl@ss 11.0	27270902
ETIM 5.0	EC002717
ETIM 6.0	EC002717
ETIM 7.0	EC002717
ETIM 8.0	EC002717
UNSPSC 16.0901	39121528

Connection diagram

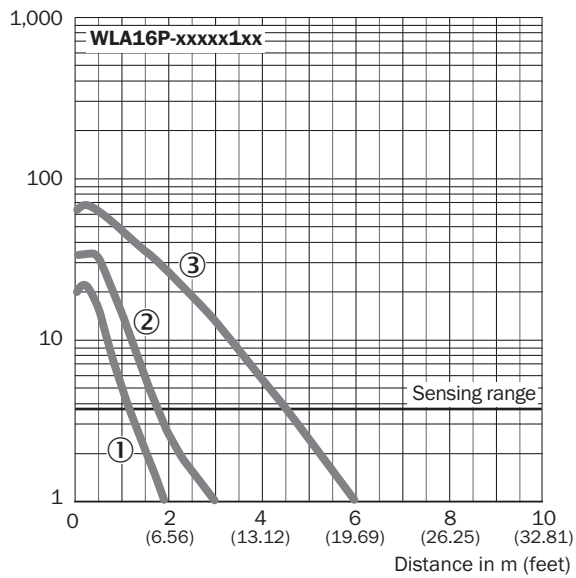
Cd-390



Characteristic curve

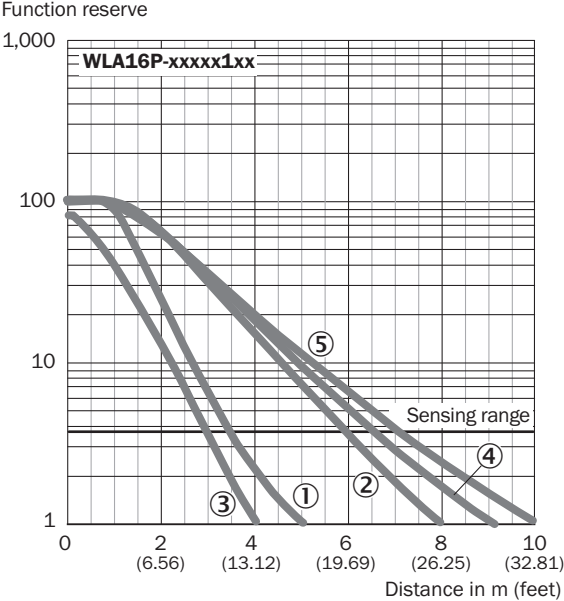
Reflective tape

Function reserve



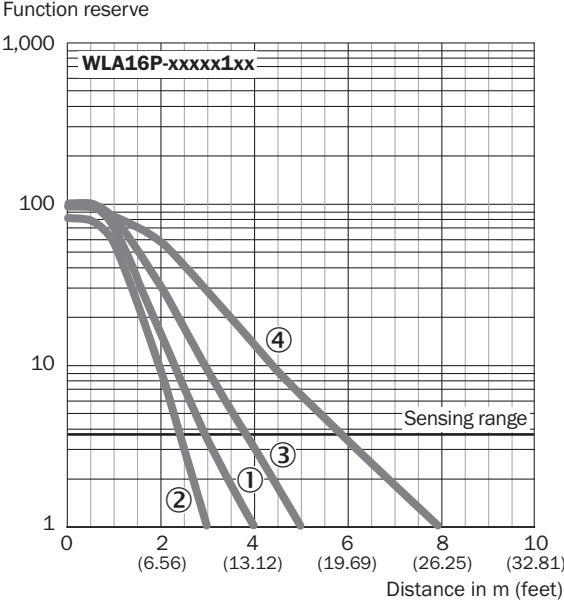
- ① Reflective tape REF-DG (50 x 50 mm)
- ② Reflective tape REF-IRF-56 (50 x 50 mm)
- ③ Reflective tape REF-AC1000 (50 x 50 mm)

Standard reflectors



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

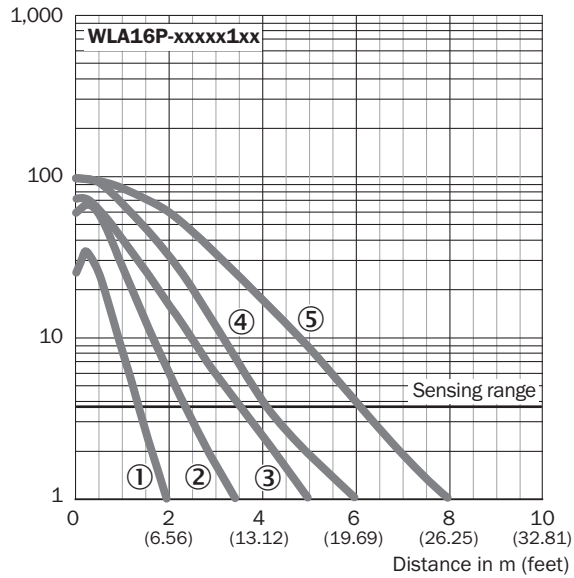
Fine triple reflectors



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

Chemical-resistant reflectors

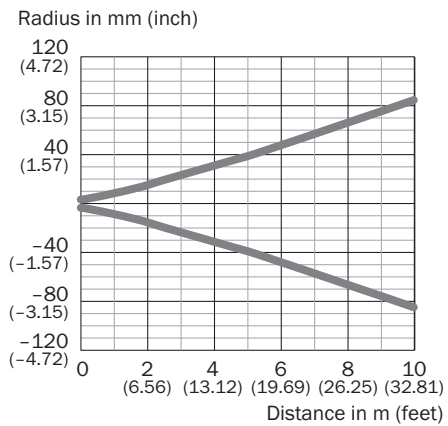
Function reserve



- ① PL10F CHEM reflector
- ② Reflector PL20 CHEM
- ③ Reflector P250 CHEM
- ④ Reflector P250H
- ⑤ Reflector PL40A Antifog

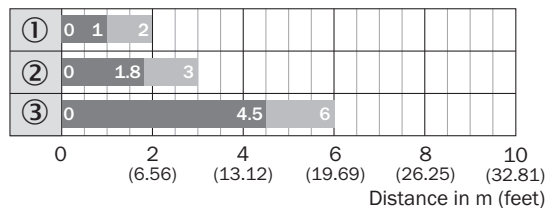
Light spot size

WLA16P-xxxxx1xx



Sensing range diagram

Reflective tape

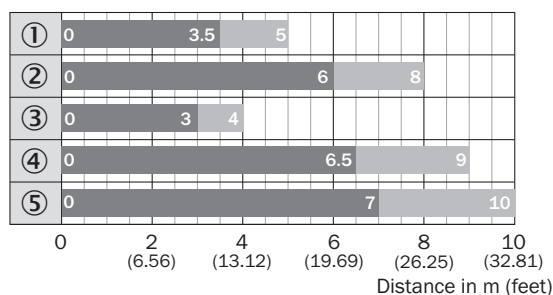


■ Sensing range ■ Sensing range typ. max.

WLA16P-xxxx1xx

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

Standard reflectors

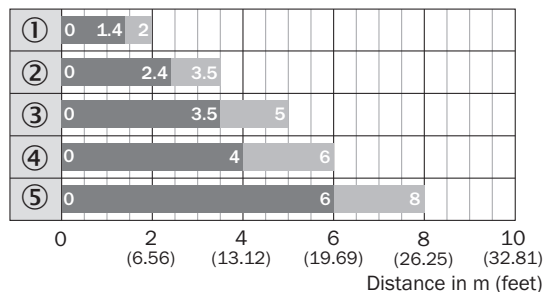


■ Sensing range ■ Sensing range typ. max.

WLA16P-xxxx1xx

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

Chemical-resistant reflectors

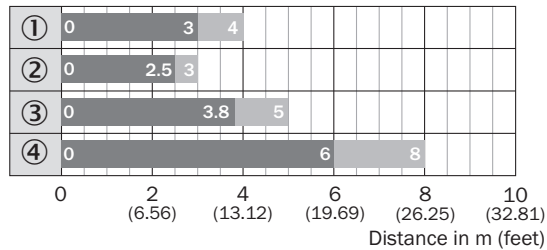


■ Sensing range ■ Sensing range typ. max.

WLA16P-xxxx1xx

- ① PL10F CHEM reflector
- ② Reflector PL20 CHEM
- ③ Reflector P250 CHEM
- ④ Reflector P250H
- ⑤ Reflector PL40A Antifog

Fine triple reflectors



■ Sensing range ■ Sensing range typ. max.

WLA16P-xxxx1xx

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

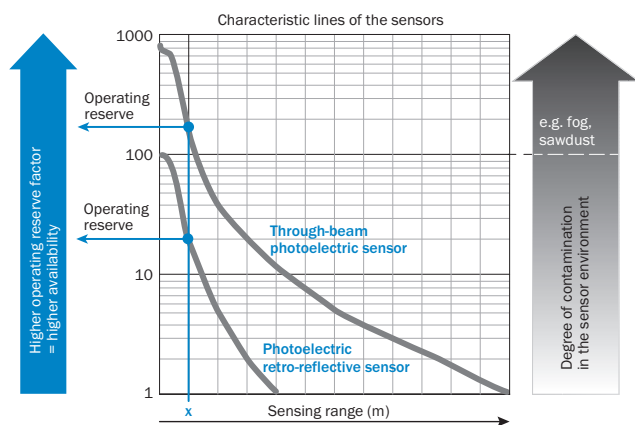
Functions

Operation note

BluePilot: Blue indicator LEDs with double benefits

<p>Easy and quick sensor alignment with the help of the LED indicator</p> <p>All blue LEDs illuminate</p> <ul style="list-style-type: none"> - optimum alignment - highest possible operating reserve 	<p>WLA photoelectric retro-reflection sensor alignment</p>
<p>Service note</p> <p>A reduction in sensor availability is displayed by a decrease of the blue LEDs.</p> <p>Possible causes:</p> <ul style="list-style-type: none"> a) insufficient alignment b) contamination of the optical surfaces c) particles in the light beam 	

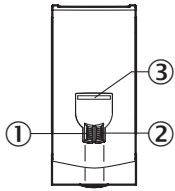
Operation note



At a sensing range of „x“ the photoelectric retro-reflective and through-beam photoelectric sensors have different operating reserves (see blue arrow). The higher the operating reserve factor, the better the sensor can compensate the contamination in the air or in the light beam and on the optical surfaces (front screen, reflector), i.e. the sensor has the maximum availability, otherwise the sensor switches due to pollution although there is no object in the path of the light beam.

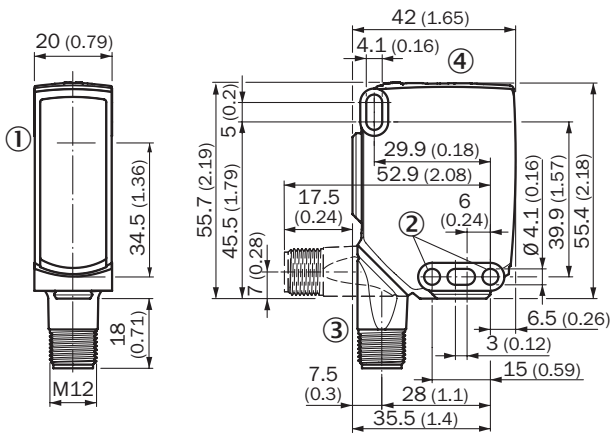
Adjustments

Display and adjustment elements



- ① LED indicator green
- ② LED indicator yellow
- ③ LED indicator blue

Dimensional drawing (Dimensions in mm (inch))






- ① Center of optical axis
- ② Mounting hole, Ø 4.1 mm
- ③ Connection
- ④ Display and adjustment elements

Recommended accessories

Other models and accessories → www.sick.com/W16

	Brief description	Type	Part no.
Universal bar clamp systems			
	Plate N02 for universal clamp bracket, Zinc plated steel (sheet), Zinc die cast (clamping bracket), Universal clamp (5322626), mounting hardware	BEF-KHS-N02	2051608
Mounting brackets and plates			
	Universal mounting bracket for reflectors, steel, zinc coated	BEF-WN-REFX	2064574
	Adapter for mounting W16 sensors in existing W14-2/W18-3 installations or L25 sensors in existing L28 installations, plastic, fastening screws included	BEF-AP-W16	2095677

	Brief description	Type	Part no.
Plug connectors and cables			
	Head A: female connector, M12, 4-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PVC, unshielded, 5 m	YF2A14-050VB3XLEAX	2096235
	Head A: male connector, M12, 4-pin, straight Head B: - Cable: unshielded	STE-1204-G	6009932
Reflectors			
	Rectangular, screw connection, 84 mm x 84 mm, PMMA/ABS, Screw-on, 2 hole mounting	PL80A	1003865

Recommended services

Additional services → www.sick.com/W16

	Type	Part no.
Function Block Factory		
<ul style="list-style-type: none"> Description: The Function Block Factory supports common programmable logic controllers (PLCs) from various manufacturers, such as Siemens, Beckhoff, Rockwell Automation and B&R. More information on the FBF can be found <a _blank"="" href="https://fbf.cloud.sick.com target=">here. 	Function Block Factory	On request

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