



DATA SHEET

# WLG4SP-32162120A00

W4  
Photoelectric sensors

# SICK

Sensor Intelligence



Illustration may differ

PHOTOELECTRIC SENSORS

WLG4SP-32162120A00

ORDERING INFORMATION

| Type               | part no. |
|--------------------|----------|
| WLG4SP-32162120A00 | 1136379  |

Further device versions and accessories at [www.sick.com/W4](http://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, MultiMode                                                                            |
| MultiMode                                                                                       | 1 Highly-transparent objects<br>2 Semi-transparent objects<br>3 Opaque objects<br>4 Bottles/Trays<br>5 Check of foil tear<br>6 Manual (specific setting via IO-Link) |
| Sensing range                                                                                   |                                                                                                                                                                      |
| Sensing range min.                                                                              | 0 m                                                                                                                                                                  |
| Sensing range max.                                                                              | 7.1 m                                                                                                                                                                |
| Maximum distance range from reflector to sensor (operating reserve 1)                           | 0 m ... 7.1 m                                                                                                                                                        |
| Recommended distance range from reflector to sensor (operating reserve 3,75)                    | 0 m ... 5 m                                                                                                                                                          |
| Reference reflector                                                                             | Reflector PL80                                                                                                                                                       |
| Recommended sensing range for the best performance                                              | 0 m ... 5 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 <sub>U</sub> = +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 <sub>a</sub> = +25 °C                                                                                                                                 |
| Adjustment                                                                                      |                                                                                                                                                                      |
| Teach-Turn adjustment                                                                           | BluePilot                                                                                                                                                            |

|                      |            |                                                                                                                                          |
|----------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Display              | IO-Link    | Teach-in plus user mode selector<br>For configuring the sensor parameters and Smart Task functions                                       |
|                      | LED blue   | BluePilot: Mode display                                                                                                                  |
|                      | LED green  | Operating indicator<br>Static on: power on<br>Flashing: IO-Link mode                                                                     |
|                      | LED yellow | Status of received light beam<br>Static on: object not present<br>Static off: object present<br>Flashing: Below the 1.5 function reserve |
| Special features     |            | MultiMode                                                                                                                                |
| Special applications |            | Detecting objects wrapped in film, Detecting transparent objects                                                                         |

## SAFETY-RELATED PARAMETERS

|                   |             |
|-------------------|-------------|
| MTTF <sub>D</sub> | 1,590 years |
| DC <sub>avg</sub> | 0%          |

## COMMUNICATION INTERFACE

|                             |                                                                                                                                      |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| IO-Link                     | ✓, IO-Link V1.1                                                                                                                      |
| Data transmission rate      | COM2 (38,4 kBaud)                                                                                                                    |
| Cycle time                  | 2.3 ms                                                                                                                               |
| Process data length         | 16 Bit                                                                                                                               |
| Process data structure      | Bit 0 = switching signal Q <sub>L1</sub><br>Bit 1 = switching signal Q <sub>L2</sub><br>Bit 2 ... 15 = Current receiver level (live) |
| VendorID                    | 26                                                                                                                                   |
| DeviceID HEX                | 0x800321                                                                                                                             |
| DeviceID DEC                | 8389409                                                                                                                              |
| Compatible master port type | A                                                                                                                                    |
| SIO mode support            | Yes                                                                                                                                  |

## ELECTRONICS

|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supply voltage U <sub>B</sub> | 10 V DC ... 30 V DC <sup>1)</sup>                                                                                                                                                                                                                                                                                                                                                                                                          |
| Ripple                        | ≤ 5 V <sub>pp</sub>                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Usage category                | DC-12 (According to EN 60947-5-2)<br>DC-13 (According to EN 60947-5-2)                                                                                                                                                                                                                                                                                                                                                                     |
| Current consumption           | ≤ 20 mA, without load. At U <sub>B</sub> = 24 V                                                                                                                                                                                                                                                                                                                                                                                            |
| Protection class              | III                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Digital output                | Number 2<br>Type Push-pull: PNP/NPN<br>Switching mode Light/dark switching<br>Signal voltage PNP HIGH/LOW Approx. U <sub>B</sub> - 2.5 V / 0 V<br>Signal voltage NPN HIGH/LOW Approx. U <sub>B</sub> / < 2.5 V<br>Output current I <sub>max.</sub> ≤ 100 mA<br>Circuit protection outputs Reverse polarity protected<br>Overcurrent protected<br>Short-circuit protected<br>Response time ≤ 500 μs<br>Repeatability (response time) 150 μs |

<sup>1)</sup> Limit values.

<sup>2)</sup> This switching output must not be connected to another output.

|                                       |  |                                                                                                                        |
|---------------------------------------|--|------------------------------------------------------------------------------------------------------------------------|
| Switching frequency                   |  | 1,000 Hz                                                                                                               |
| Pin/Wire assignment                   |  |                                                                                                                        |
| Function of pin 4/black (BK)          |  | Digital output, light switching, object present → output Q <sub>OUT</sub> LOW <sup>2)</sup><br>IO-Link communication C |
| Function of pin 4/black (BK) – detail |  | The pin 4 function of the sensor can be configured<br>Additional possible settings via IO-Link                         |
| Function of pin 2/white (WH)          |  | Digital output, dark switching, object present → output Q <sub>OUT</sub> HIGH <sup>2)</sup>                            |
| Function of pin 2/white (WH) – detail |  | The pin 2 function of the sensor can be configured<br>Additional possible settings via IO-Link                         |

<sup>1)</sup> Limit values.

<sup>2)</sup> 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 M8 male connector, 4-pin, 114 mm |
| Connection detail                              |  |                                             |
| 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)                            |  | 77 mm                                       |
| Length of male connector                       |  | 37 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)<br>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<br>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                                                                      |

SMART TASK

|                 |  |                                                                 |
|-----------------|--|-----------------------------------------------------------------|
| Smart Task name |  | Base logics                                                     |
| Logic function  |  | Direct<br>AND<br>OR                                             |
| Timer function  |  | Deactivated<br>Switch-on delay<br>Off delay<br>ON and OFF delay |

<sup>1)</sup> Use of Smart Task functions without IO-Link communication (SIO mode).

|                     |                                                                                                       |
|---------------------|-------------------------------------------------------------------------------------------------------|
|                     | Impulse (one shot)                                                                                    |
| Inverter            | Yes                                                                                                   |
| Switching frequency | SIO Logic: 800 Hz <sup>1)</sup>                                                                       |
| Response time       | SIO Logic: 600 µs <sup>1)</sup>                                                                       |
| Repeatability       | SIO Logic: 200 µs <sup>1)</sup>                                                                       |
| Switching signal    | Switching signal Q <sub>LI</sub> Switching output<br>Switching signal $\bar{Q}_{LI}$ Switching output |

<sup>1)</sup> Use of Smart Task functions without IO-Link communication (SIO mode).

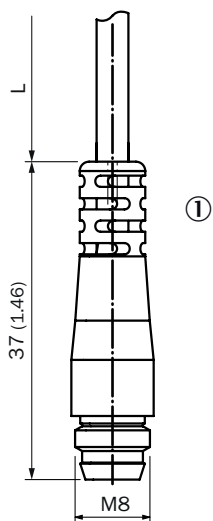
## DIAGNOSIS

|                                             |                 |                                      |
|---------------------------------------------|-----------------|--------------------------------------|
| Device temperature                          | Measuring range | Very cold, cold, moderate, warm, hot |
| Device status                               |                 | Yes                                  |
| Detailed device status                      |                 | Yes                                  |
| Operating hour counter                      |                 | Yes                                  |
| Operating hours counter with reset function |                 | Yes                                  |
| Quality of teach                            |                 | Yes                                  |
| Quality of run                              |                 | Yes, Contamination display           |

## CERTIFICATES

|                                                                       |   |
|-----------------------------------------------------------------------|---|
| EU declaration of conformity                                          | ✓ |
| UK declaration of conformity                                          | ✓ |
| ACMA declaration of conformity                                        | ✓ |
| Moroccan declaration of conformity                                    | ✓ |
| China RoHS                                                            | ✓ |
| China Compulsory Product Certification (CCC) exempt                   | ✓ |
| cULus certificate                                                     | ✓ |
| IO-Link certificate                                                   | ✓ |
| Photobiological safety (IEC EN 62471)                                 | ✓ |
| Information according to Art. 3 of Data Act (Regulation EU 2023/2854) | ✓ |

## DIMENSIONAL DRAWING, CONNECTION

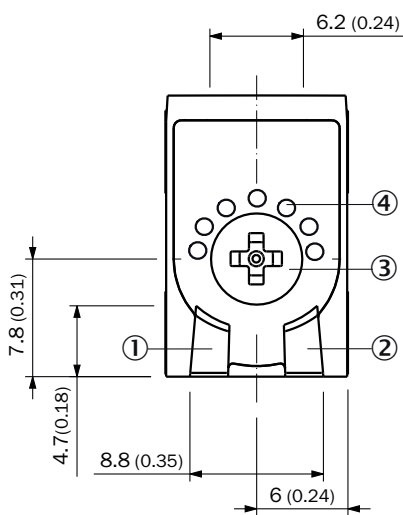


Dimensions in mm (inch)

For length of cable (L), see technical data

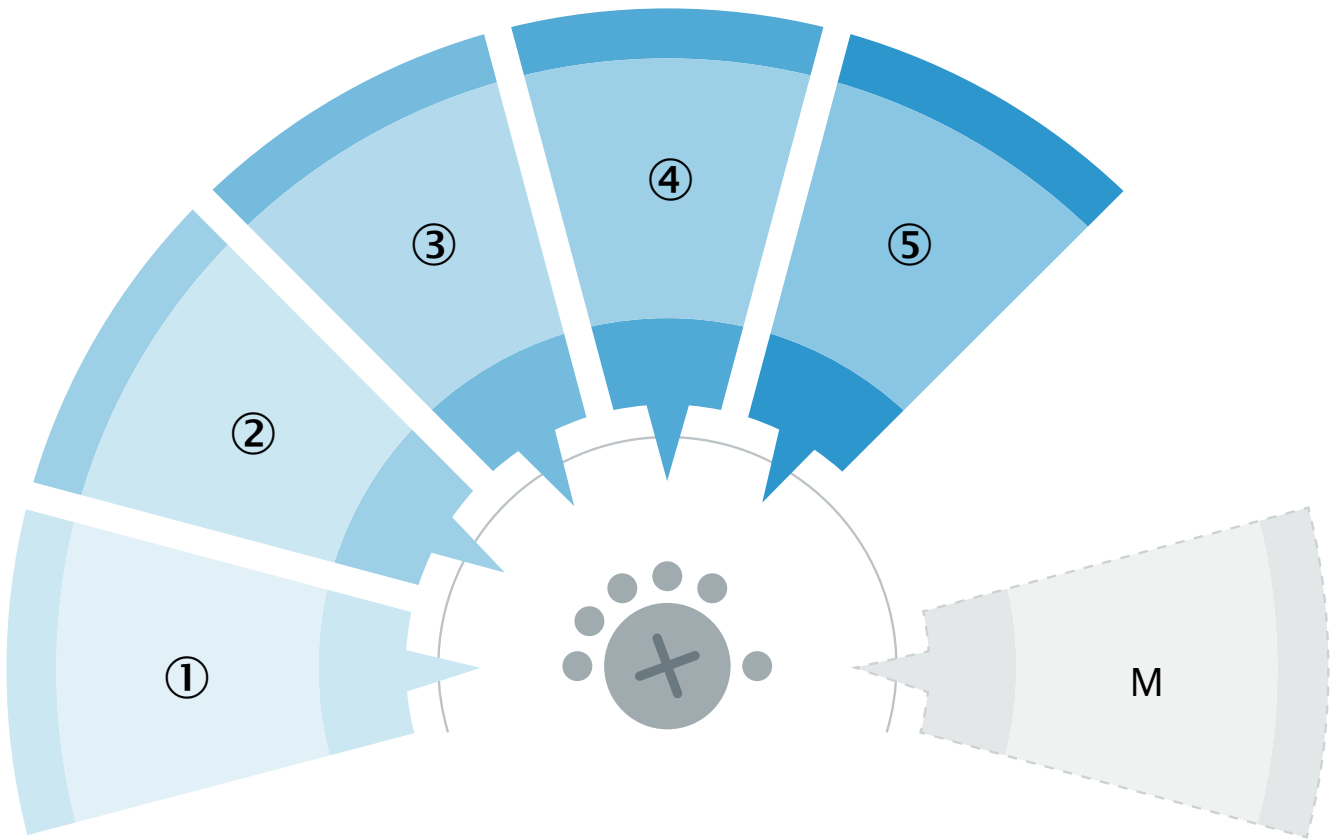
① cable with connector M8

## DISPLAY AND ADJUSTMENT ELEMENTS



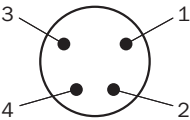
- ① LED green
- ② LED yellow
- ③ Teach-Turn adjustment
- ④ LED blue

DISPLAY AND SETTING DETAIL

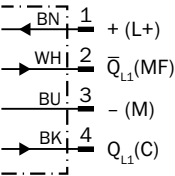


| MultiMode settings |                            |                                                                        |
|--------------------|----------------------------|------------------------------------------------------------------------|
| 1                  | Highly-transparent objects | Attenuation of > 10%:High-ly transparent filmsGlass panes              |
| 2                  | Semi-transparent objects   | Attenuation of > 18%:Transparent frosted glassThick, transparent films |
| 3                  | Opaque objects             | Attenuation of > 50%:Opaque objects                                    |
| 4                  | Bottles/Trays              | Special mode for maximum reliability:BottlesTrays                      |
| 5                  | Check of foil tear         | Special mode:Check of foil tear                                        |
| M                  | Manual                     | Custom configuration via IO-Link                                       |

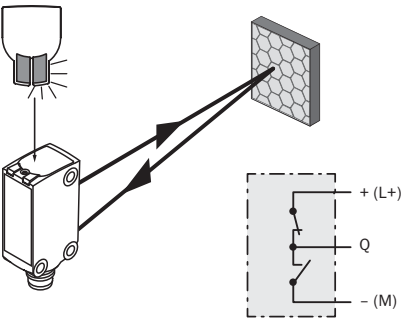
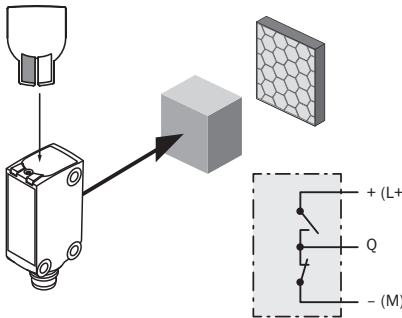
CONNECTION TYPE MALE CONNECTOR M8, 4-PIN



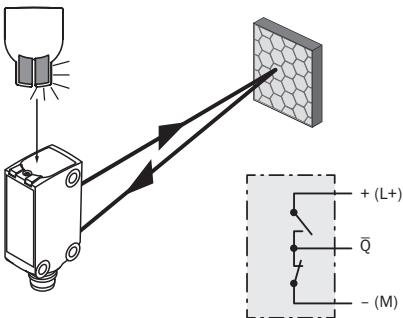
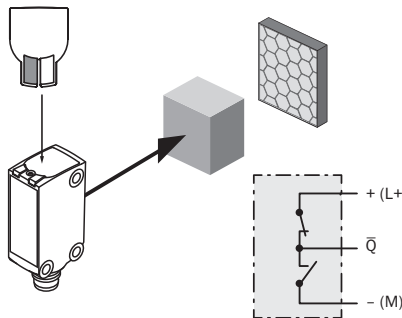
CONNECTION DIAGRAM CD-490



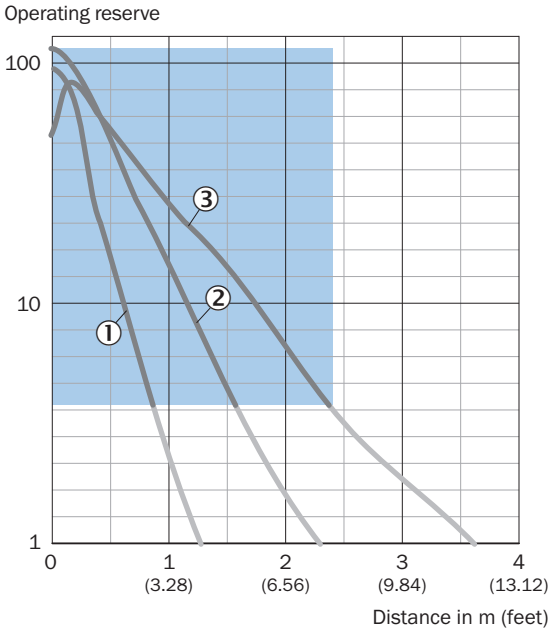
TRUTH TABLE PUSH-PULL: PNP/NPN - LIGHT SWITCHING Q

|                         | 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    | ⚡                                                                                 | ✗                                                                                  |
|                         |  |  |

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    | ✗                                                                                       | ⚡                                                                                    |
|                         |      |  |

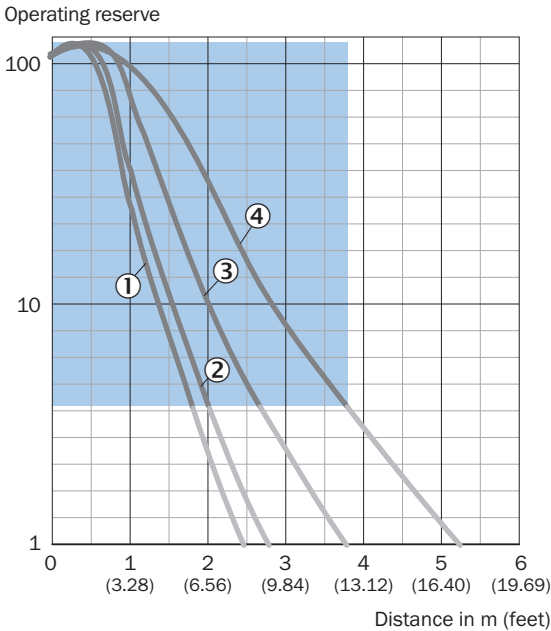
**CHARACTERISTIC CURVE CHEMICAL-RESISTANT REFLECTORS**



Recommended sensing range for the best performance

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

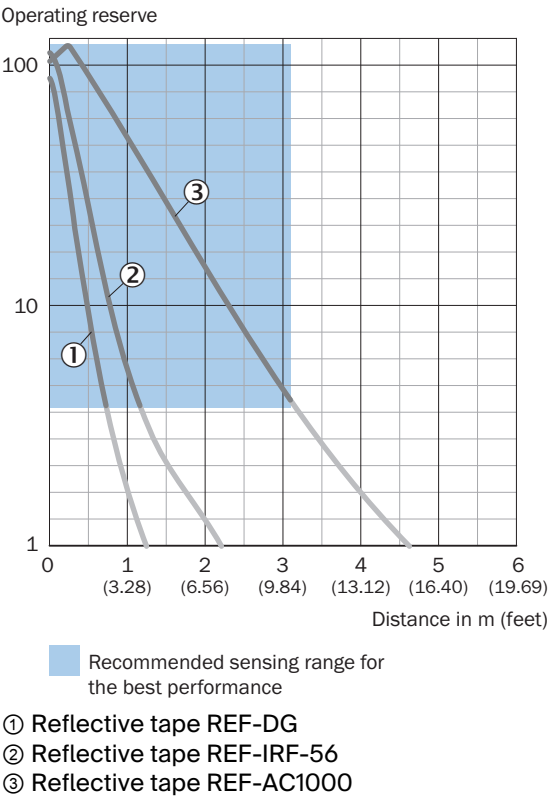
**CHARACTERISTIC CURVE FINE TRIPLE REFLECTORS**



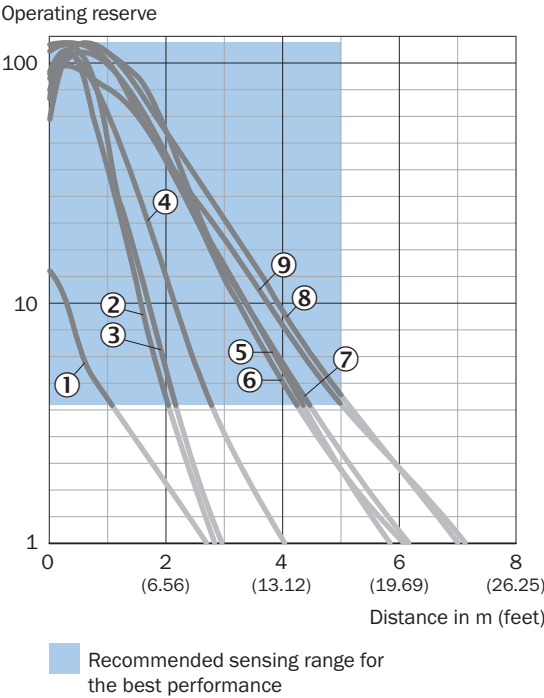
Recommended sensing range for the best performance

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

CHARACTERISTIC CURVE REFLECTIVE TAPE

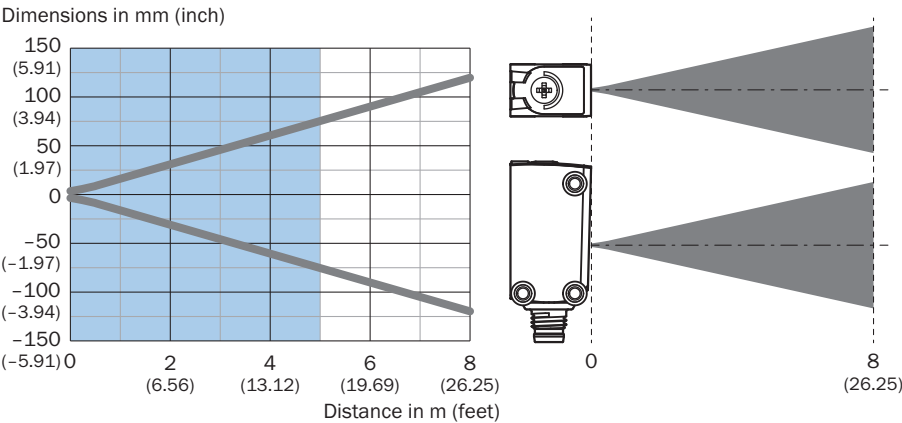


CHARACTERISTIC CURVE STANDARD REFLECTORS

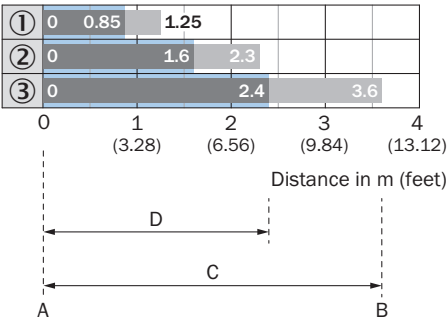


- ① Reflector PL40A Antifog
- ② Reflector PL20A
- ③ reflector PL22-2
- ④ Reflector P250H
- ⑤ Reflector P250
- ⑥ Reflector PL30A
- ⑦ Reflector PL40A
- ⑧ Reflector C110A
- ⑨ Reflector PL80A

LIGHT SPOT SIZE



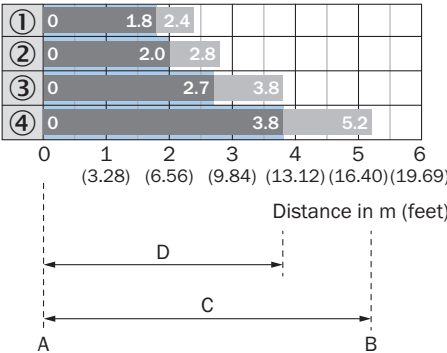
SENSING RANGE DIAGRAM CHEMICAL-RESISTANT REFLECTORS



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 reflector to sensor (operating reserve 3,75) |

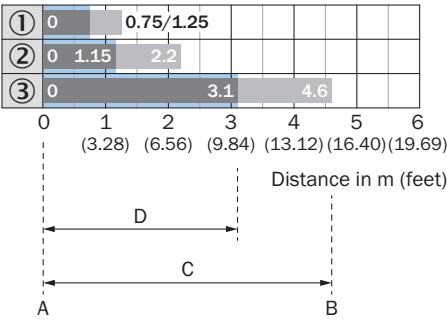
SENSING RANGE DIAGRAM FINE TRIPLE REFLECTORS



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 reflector to sensor (operating reserve 3,75) |

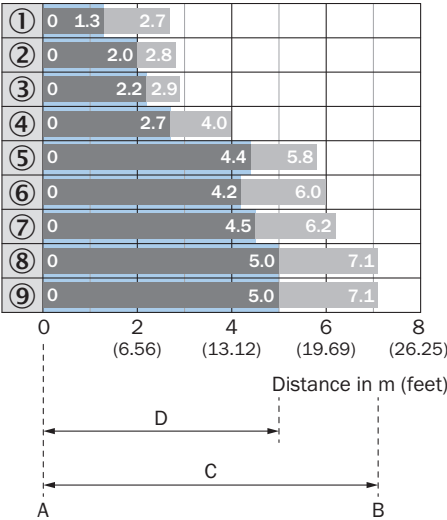
SENSING RANGE DIAGRAM REFLECTIVE TAPE



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) |

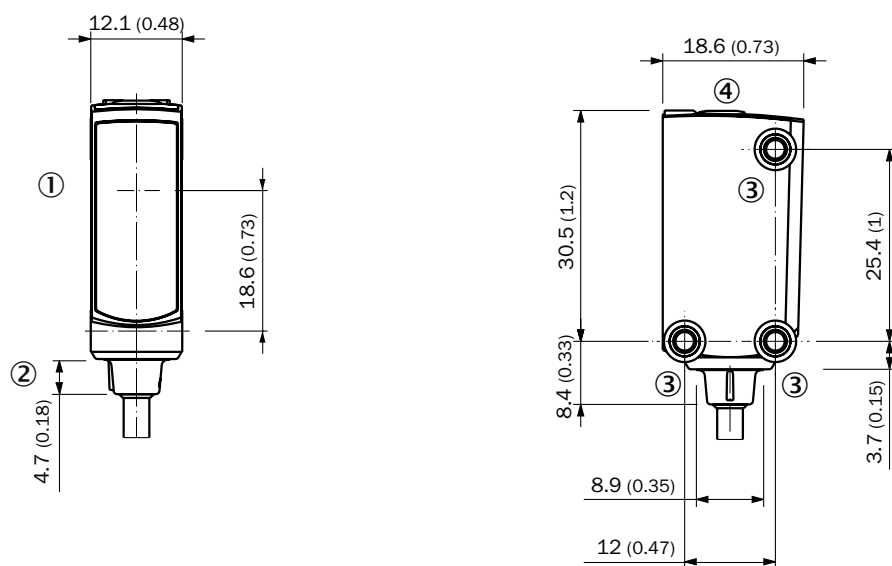
SENSING RANGE DIAGRAM STANDARD REFLECTORS



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 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

Further information as well as suitable accessories, example applications and downloads such as CAD dimensional models, operating instructions and software can be found at [www.sick.com/1136379](http://www.sick.com/1136379)



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# SICK AT A GLANCE

SICK is a leading global technology company for intelligent sensors and integrated solutions in industrial automation. Our technologies set benchmarks, making your industrial processes more efficient, safer and more sustainable – both in logistics and manufacturing operations.

SICK combines sensor intelligence with industry expertise and certified consulting services. We provide the ideal foundation for scalable as well as tailor-made automation solutions and create added value along the entire value chain. Our close partnerships with our customers are more than just a promise: Together, we optimize productivity, improve quality, protect health and safety, and help build a sustainable future. All with empathy and trust.

Since 1946, we have been developing innovative technologies with passion and a pioneering spirit. With a global network in around 40 countries, SICK has a global presence and is always close by. The company's headquarters are located in Waldkirch near Freiburg, Germany. Our customers benefit from our understanding of both local and global requirements, which enables us to deliver tailor-made solutions

**SICK**  
Sensor Intelligence