



DATA SHEET

WLG12P-24162120A00ZDZZZZZZZZZZ1

W12
Photoelectric sensors

SICK Sensor Intelligence



Illustration may differ

PHOTOELECTRIC SENSORS

WLG12P-
24162120A00ZDZZZZZZZZ1

ORDERING INFORMATION

Type	part no.
WLG12P-24162120A00ZDZZZZZZZZ1	1146667

Further device versions and accessories at www.sick.com/W12



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 2 Semi-transparent objects 3 Opaque objects 4 Bottles/Trays 5 Check of foil tear 6 Manual (specific setting via IO-Link)
Sensing range	Sensing range min. Sensing range max. Maximum distance range from reflector to sensor (operating reserve 1) Recommended distance range from reflector to sensor (operating reserve 3,75) Reference reflector Recommended sensing range for the best performance 0 m 7.6 m 0 m ... 7.6 m 0 m ... 4.9 m Reflector PL80A 0 m ... 4.9 m
Polarisation filter	Yes
Emitted beam	Light source Type of light Shape of light spot Light spot size (distance) Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle) PinPoint LED Visible red light Point-shaped 70 mm (5 m) < +/- 1.5° (at T_U = +23 °C)
Key LED figures	Normative reference LED risk group marking Wave length Average service life EN 62471:2008-09 IEC 62471:2006, modified Free group 635 nm 100,000 h at T_a = +25 °C
Adjustment	Teach-Turn adjustment BluePilot

Display	IO-Link	Teach-in plus user mode selector For configuring the sensor parameters and Smart Task functions
	LED blue	BluePilot: Mode display
	LED green	Operating indicator Static on: power on Flashing: IO-Link mode
	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	1,467 years
DC _{avg}	0%
T _M (mission time)	20 years

COMMUNICATION INTERFACE

IO-Link		✓, IO-Link V1.1
	Data transmission rate	COM2 (38,4 kBaud)
	Cycle time	2.3 ms
	Process data length	8 Bit
	Process data structure	Bit 0 = switching signal
		Bit 1 = alarm QoR
		Bit 2 = switching signal Q _{L1}
		Bit 3 = switching signal Q _{L2}
		Bit 4 ... 7 = empty
	VendorID	26
	DeviceID HEX	0x800391
	DeviceID DEC	8389521
	Supported DeviceIDs for predecessor DEZ models	8388850
	Compatible master port type	A
	SIO mode support	Yes

ELECTRONICS

Supply voltage U _B	10 V DC ... 30 V DC ¹⁾
Ripple	≤ 5 V
Usage category	DC-12 (According to EN 60947-5-2) DC-13 (According to EN 60947-5-2)
Current consumption	≤ 40 mA, without load. At U _B = 24 V
Protection class	III
Digital output	
Number	2 (Complementary)
Type	Push-pull: PNP/NPN
Switching mode	Light/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	≤ 330 μs
Repeatability (response time)	100 μs

¹⁾ Limit values.

²⁾ This switching output must not be connected to another output.

Switching frequency		1,500 Hz
Pin/Wire assignment		
Function of pin 4/black (BK)		Digital output, light switching, object present → output Q _U LOW ²⁾ IO-Link communication C
Function of pin 4/black (BK) – detail		The pin 4 function of the sensor can be configured Additional possible settings via IO-Link
Function of pin 2/white (WH)		Digital output, dark switching, object present → output Q _U HIGH ²⁾
Function of pin 2/white (WH) – detail		The pin 2 function of the sensor can be configured Additional possible settings via IO-Link

¹⁾ Limit values.

²⁾ This switching output must not be connected to another output.

MECHANICS

Housing	Rectangular	
Dimensions (W x H x D)	15.6 mm x 49.5 mm x 43.1 mm	
Connection	Male connector M12, 4-pin	
Material		
	Housing	Metal, zinc diecast
	Front screen	Plastic, PMMA
	Male connector	Plastic, VISTAL®
Weight	Approx. 77 g	
Maximum tightening torque of the fixing screws	1.4 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	50 g, 11 ms (25 positive and 25 negative shocks along X, Y, Z axes, 150 total shocks (EN60068-2-27))
Vibration resistance	10 Hz ... 2,000 Hz (Amplitude 0.5 mm / 10 g, 20 sweeps per axis, for X, Y, Z axes, 1 octave/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 AND OR
Timer function	Deactivated Switch-on delay Off delay ON and OFF delay Impulse (one shot)
Inverter	Yes
Switching frequency	SIO Logic: 1300 Hz ¹⁾

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

²⁾ Use of Smart Task functions with IO-Link communication function.

	IOL: 1200 Hz ²⁾	
Response time	SIO Logic: 390 µs ¹⁾ IOL: 420 µs ²⁾	
Repeatability	SIO Logic: 140 µs ¹⁾ IOL: 170 µs ²⁾	
Switching signal	Switching signal Q _{L1} Switching signal Q̇ _{L1}	Switching output Switching output

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

²⁾ Use of Smart Task functions with IO-Link communication function.

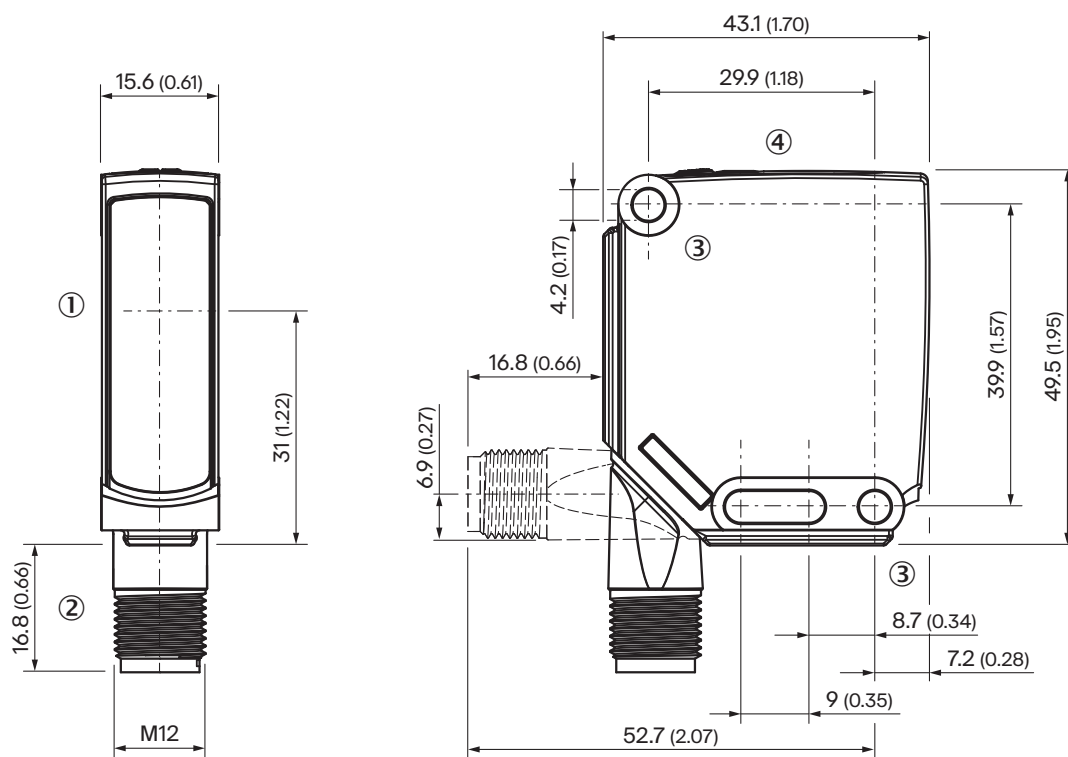
DIAGNOSIS

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

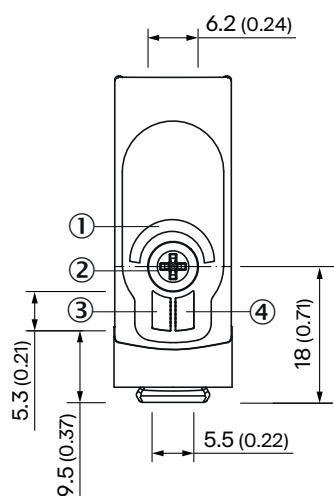
CERTIFICATES

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

DIMENSIONAL DRAWING, SENSOR

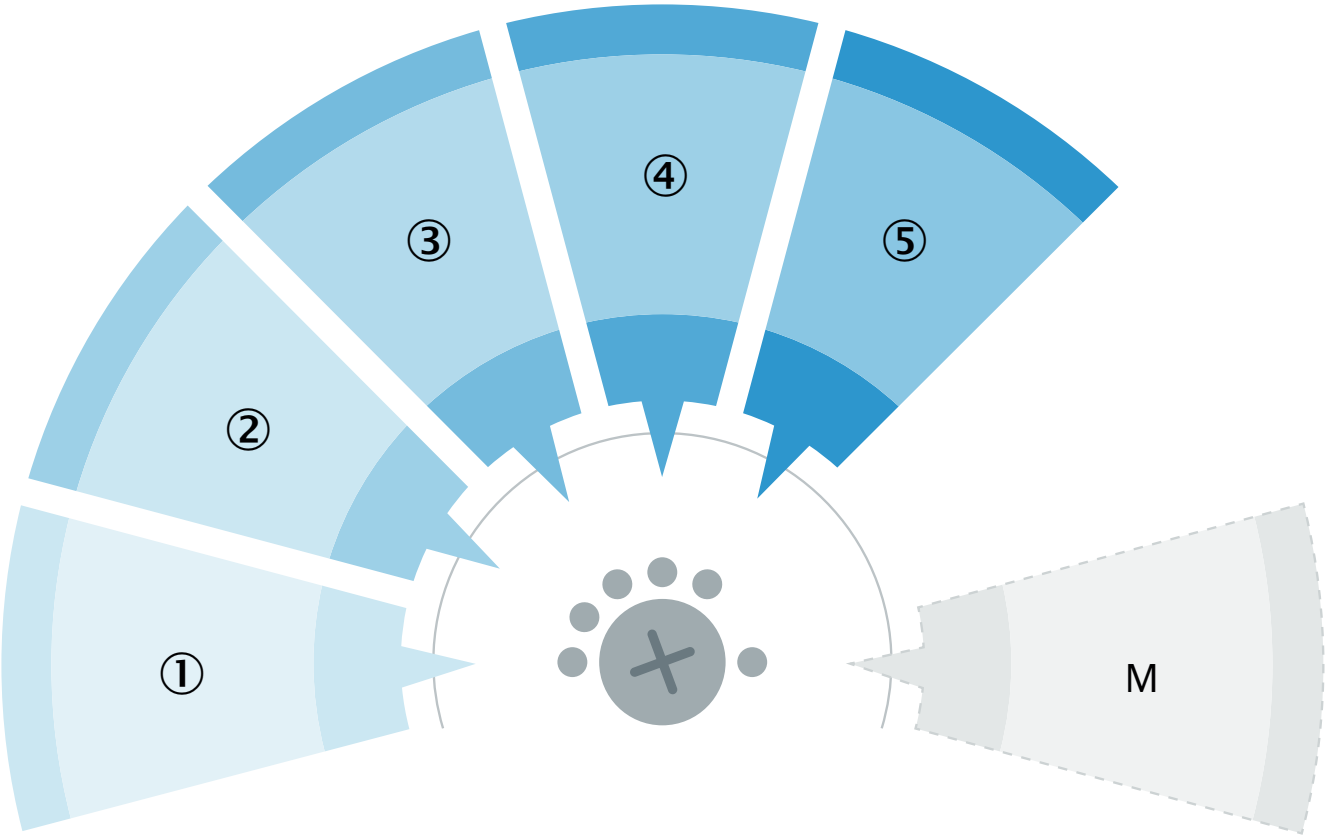


DISPLAY AND ADJUSTMENT ELEMENTS



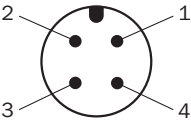
- ① LED blue
- ② Teach-Turn adjustment
- ③ LED green
- ④ LED yellow

DISPLAY AND SETTING DETAIL

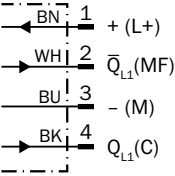


MultiMode settings		
1	Highly-transparent objects	Attenuation of > 10%:Highly transparent filmsGlass panes
2	Semi-transparent objects	Attenuation of > 18%:Transparent frosted glassThick, transparent films
3	Opaque objects	Attenuation of > 50%:Opaque objects
4	Bottles/Trays	Special mode for maximum reliability:BottlesTrays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

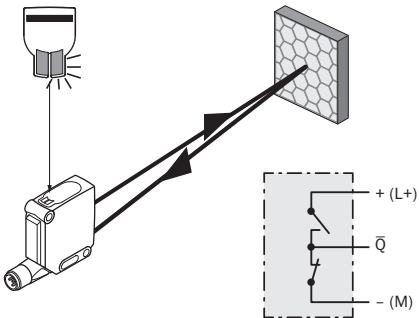
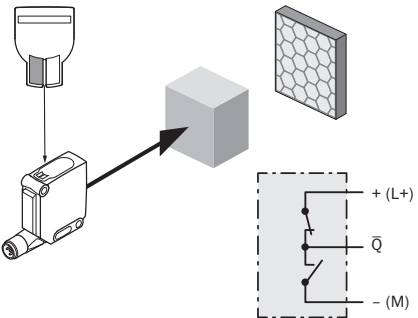
CONNECTION TYPE M12 MALE CONNECTOR, 4-PIN



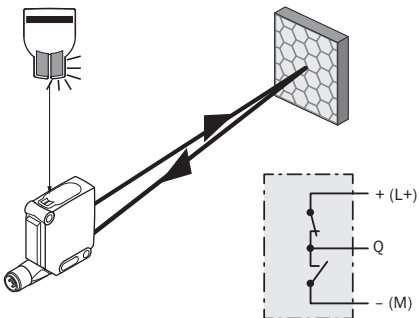
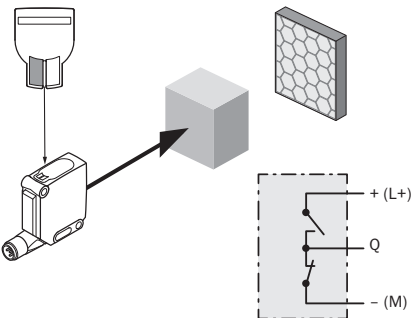
CONNECTION DIAGRAM CD-490



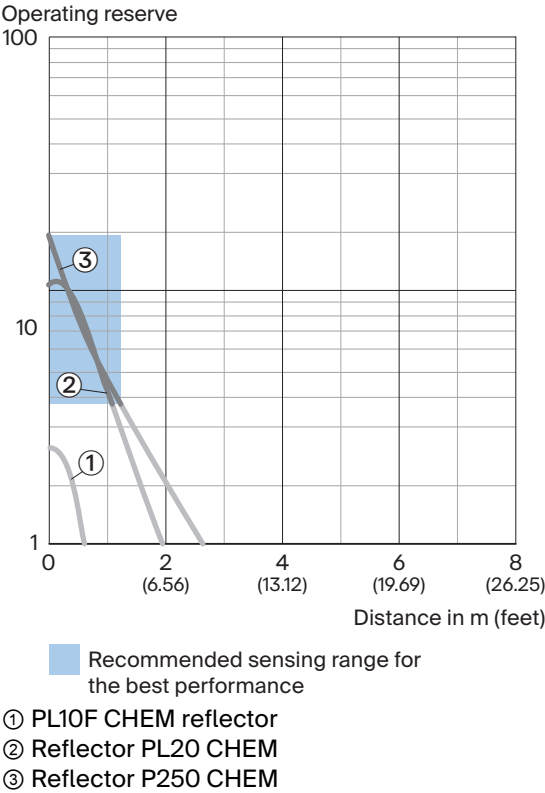
TRUTH TABLE PUSH-PULL: PNP/NPN - DARK SWITCHING $\bar{Q}$

	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	✗	⚡
		

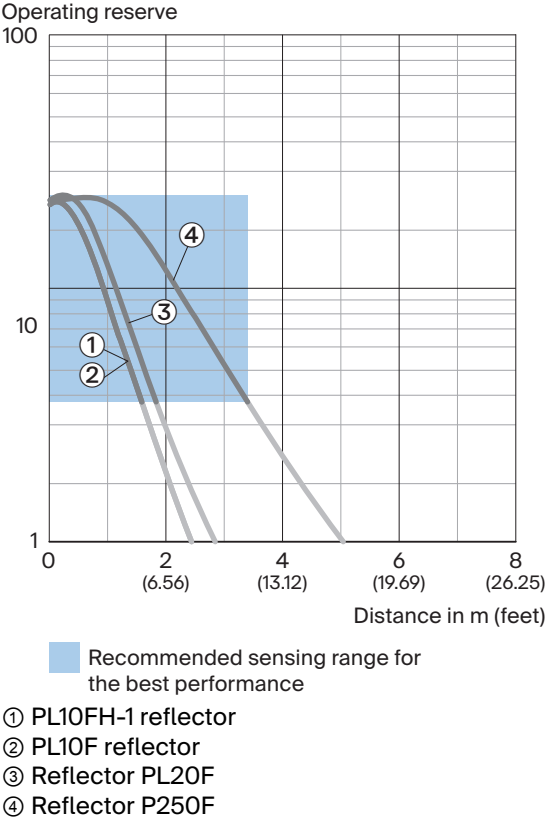
TRUTH TABLE PUSH-PULL: PNP/NPN - LIGHT SWITCHING Q

	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	⚡	✗
		

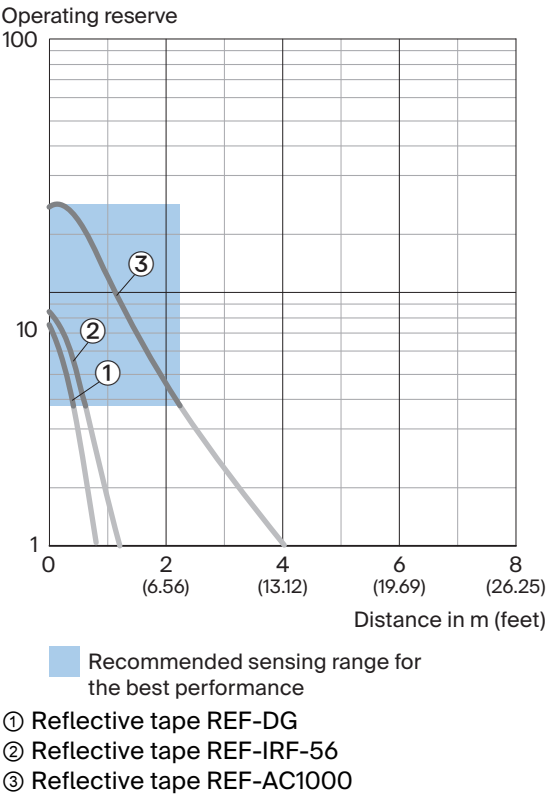
CHARACTERISTIC CURVE CHEMICAL-RESISTANT REFLECTORS



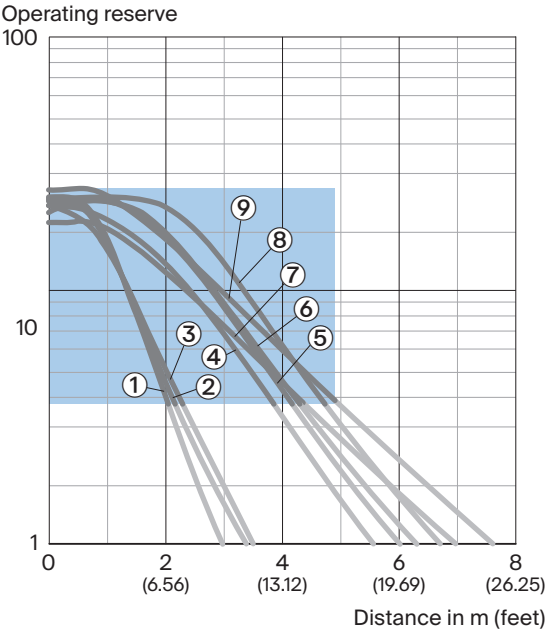
CHARACTERISTIC CURVE FINE TRIPLE REFLECTORS



CHARACTERISTIC CURVE REFLECTIVE TAPE



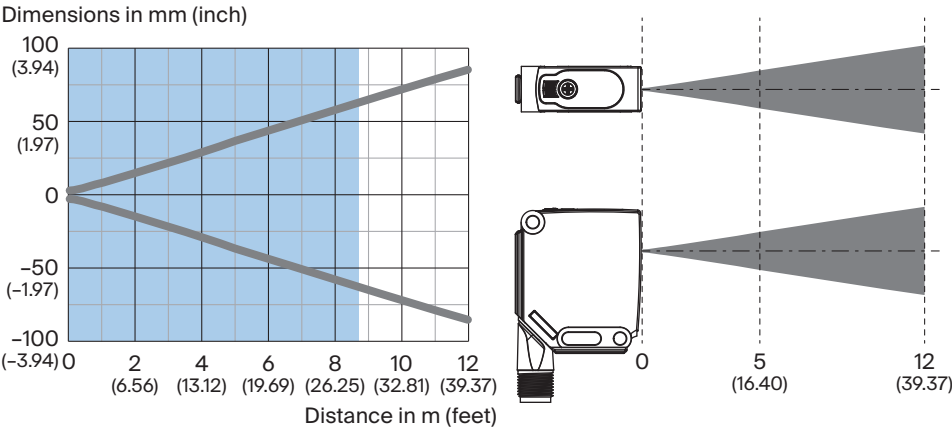
CHARACTERISTIC CURVE STANDARD REFLECTORS



Recommended sensing range for the best performance

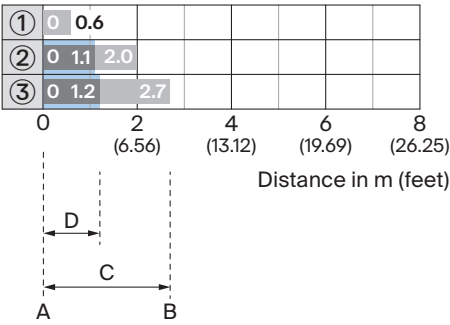
- ① reflector PL22-2
- ② Reflector P250H
- ③ Reflector PL20A
- ④ Reflector PL30A
- ⑤ Reflector P250
- ⑥ Reflector PL40A
- ⑦ Reflector PL40A Antifog
- ⑧ Reflector C110A
- ⑨ Reflector PL80A

LIGHT SPOT SIZE



Recommended sensing range for the best performance

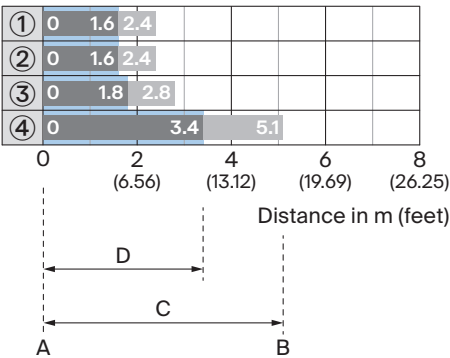
SENSING RANGE DIAGRAM CHEMICAL-RESISTANT REFLECTORS



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)

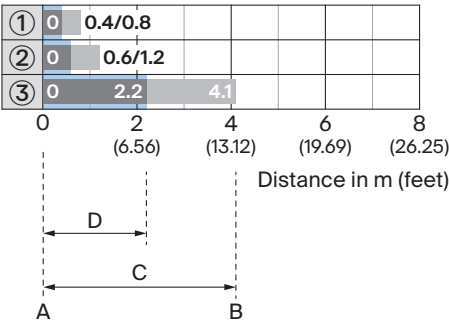
SENSING RANGE DIAGRAM FINE TRIPLE REFLECTORS



Recommended sensing range for the best performance

1	PL10FH-1 reflector
2	PL10F 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)

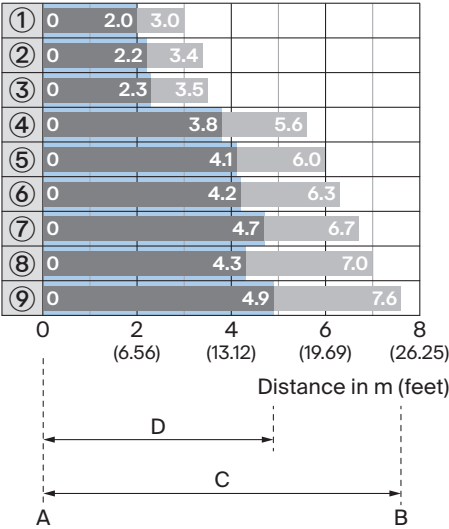
SENSING RANGE DIAGRAM REFLECTIVE TAPE



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 PL22-2
2	Reflector P250H
3	Reflector PL20A
4	Reflector PL30A
5	Reflector P250
6	Reflector PL40A
7	Reflector PL40A Antifog
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)

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/1146667



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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

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