



GTB6L-P3211

G6

MINIATURE PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

Type	Part no.
GTB6L-P3211	1117820

Other models and accessories → www.sick.com/G6

Detailed technical data

Features

Functional principle		Photoelectric proximity sensor
Functional principle detail		Background suppression
Sensing range		
	Sensing range min.	10 mm
	Sensing range max.	400 mm
	Adjustable switching threshold for background suppression	30 mm ... 400 mm
	Reference object	Object with 90% remission factor (complies with standard white according to DIN 5033)
	Minimum distance between set sensing range and background (black 6% / white 90%)	3 mm, at a distance of 75 mm
	Recommended sensing range for the best performance	30 mm ... 180 mm
Polarisation filters		No
Emitted beam		
	Light source	Laser
	Type of light	Visible red light
	Shape of light spot	Point-shaped
	Light spot size (distance)	Ø 0.4 mm (150 mm)
	Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle)	< +/- 1.5° (at Ta = +23 °C)
Key laser figures		
	Normative reference	IEC 60825-1 / CDRH 21 CFR 1040.10 & 1040.11
	Laser class	1
	Wave length	680 nm
	Pulse duration	2 µs
	Maximum pulse power	≤ 11.9 mW
	Average service life	100,000 h at Ta = +25 °C

Smallest detectable object (MDO) typ.		0.4 mm (at 150 mm distance (object with 90% remission (corresponds to standard white DIN 5033)))
Adjustment		
	Potentiometer	For setting the sensing range, 5 rotations
	Operating mode switch	For inverting the switching function (light/dark switching)
Indication		
	LED green	Operating indicator Static on: power on
	LED yellow	Status of received light beam Static on: object present Static off: object not present

Safety-related parameters

MTTF_D	662 years
DC_{avg}	0 %
T_M (mission time)	10 years (EN 60825-1)

Electrical data

Supply voltage U_B		10 V DC ... 30 V DC ¹⁾
Ripple		< 5 V _{pp}
Usage category		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	PNP
	Signal voltage PNP HIGH/LOW	Approx. U _B -3 V / 0 V
	Output current I _{max.}	≤ 100 mA ²⁾
	Circuit protection outputs	Reverse polarity protected Overcurrent protected Short-circuit protected
	Response time	≤ 625 μs
	Switching frequency	1,000 Hz ³⁾
Pin/Wire assignment		
	Function of pin 4/black (BK)	Digital output, light switching, object present → output Q HIGH
	Function of pin 4/black (BK) – detail	The pin 4 function of the sensor can be switched, Additional possible settings via operating mode switch

¹⁾ Limit values.²⁾ At U_B > 24 V, I max. = 50 mA.³⁾ With light/dark ratio 1:1.

Mechanical data

Housing	Rectangular
Dimensions (W x H x D)	12 mm x 31.5 mm x 21 mm
Connection	Connector M8, 3-pin
Material	

	Housing	Plastic, ABS
	Front screen	Plastic, PMMA
	Cable	PVC
	Male connector	Copper alloy (C3604 CUZN39PB3)
Weight		Approx. 60 g

Ambient data

Enclosure rating	IP67 (EN 60529)
Ambient operating temperature	-20 °C ... +50 °C ^{1) 2)}
Ambient temperature, storage	-40 °C ... +70 °C
Typ. Ambient light immunity	Sunlight: ≤ 13,000 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 ... 55 Hz (Amplitude 0.5 mm, 3x30 min (EN60068-2-6))
Air humidity	35 % ... 95 %, Relative humidity (no condensation)
Electromagnetic compatibility (EMC)	EN 60947-5-2
UL File No.	NRKH.E348498 & NRKH7.E348498

¹⁾ As of T_a => 45 °C, a max. supply voltage U_B = 24 V and a max. load current I_{max.} = 50 mA is permitted.

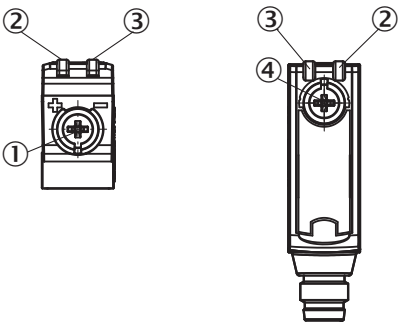
²⁾ Below T_a = -20 °C a warm-up time of 3 seconds is required.

Classifications

ECLASS 5.0	27270904
ECLASS 5.1.4	27270904
ECLASS 6.0	27270904
ECLASS 6.2	27270904
ECLASS 7.0	27270904
ECLASS 8.0	27270904
ECLASS 8.1	27270904
ECLASS 9.0	27270904
ECLASS 10.0	27270904
ECLASS 11.0	27270904
ECLASS 12.0	27270903
ETIM 5.0	EC002719
ETIM 6.0	EC002719
ETIM 7.0	EC002719
ETIM 8.0	EC002719
UNSPSC 16.0901	39121528

Adjustments

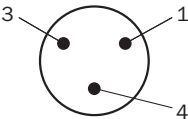
Display and adjustment elements



- ① Potentiometer
- ② LED yellow
- ③ LED green
- ④ Operating mode switch

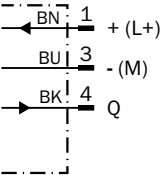
Connection type

Connector M8, 3-pin



Connection diagram

Cd-045



Truth table

PNP - light switching

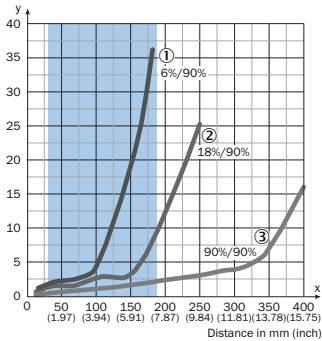
	Light switching Q (normally open)	
	Object not present → Output LOW	Object present → Output HIGH
Light receive	✗	✓
Light receive indicator	✗	☼
Load resistance	✗	⚠

PNP - dark switching

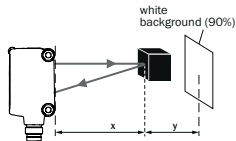
	Dark switching \bar{Q} (normally closed)	
	Object not present → Output HIGH	Object present → Output LOW
Light receive	⊗	⊙
Light receive indicator	⊗	⊙
Load resistance	⚠	⊗

Characteristic curve

Minimum distance in mm (y) between the set sensing range (x) and white background (90% remission)



Example:
Safe suppression of the background

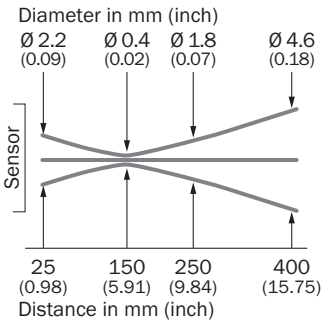


Black object (6% remission)
Set sensing range $x = 150$ mm. Needed
minimum distance to white background $y = 20$ mm.

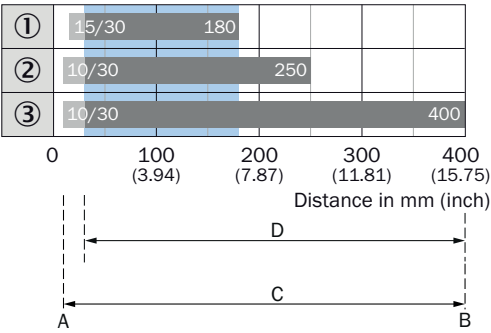
Recommended sensing range for the best performance

- ① Black object, 6% remission factor
- ② Gray object, 18% remission factor
- ③ White object, 90% remission factor

Light spot size



Sensing range diagram

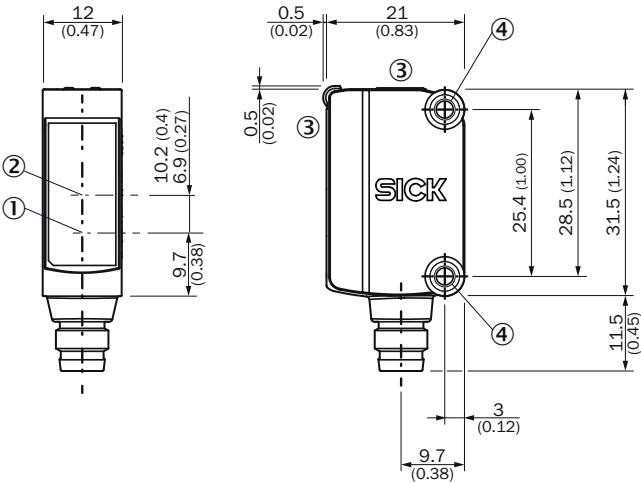


A = Sensing range min. in mm
B = Sensing range max. in mm
C = Viewing range
D = Adjustable switching threshold for background suppression

Recommended sensing range for the best performance

- ① Black object, 6% remission factor
- ② Gray object, 18% remission factor
- ③ White object, 90% remission factor



Dimensional drawing (Dimensions in mm (inch))



- ① Center of optical axis, sender
- ② Center of optical axis, receiver
- ③ Display and adjustment elements
- ④ Mounting holes M3

Recommended accessories

Other models and accessories → www.sick.com/G6

	Brief description	Type	Part no.
Universal bar clamp systems			
	Clamp bar to fix G6 sensors on rods of 12 mm, clamp-on design up to 4 mm wall thickness, aluminum (clamp bar), stainless steel (bracket), clamp bar mounting and clamp function, mounting bracket, mounting hardware	BEF-KHS-IS12G6	2086865
Mounting brackets and plates			
	Stainless steel (1.4301)	BEF-WN-G6	2062909

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