



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 T _a = +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	< 5.94 mW
Average service life	100,000 h at T _a = +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 U_B connections, reverse polarity protected.

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 $T_a \Rightarrow 45 \text{ °C}$, a max. supply voltage $U_B = 24 \text{ V}$ and a max. load current $I_{max.} = 50 \text{ mA}$ is permitted.

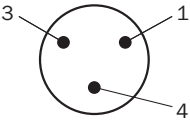
²⁾ Below $T_a = -20 \text{ °C}$ a warm-up time of 3 seconds is required.

Classifications

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

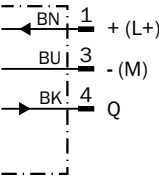
Connection type

Connector M8, 3-pin



Connection diagram

Cd-045



Truth table

PNP - light switching

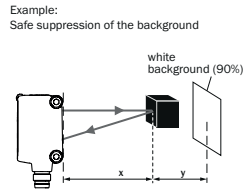
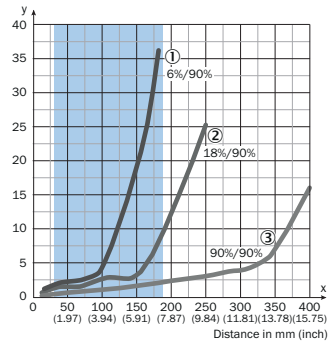
	Light switching Q (normally open)	
	Object not present → Output LOW	Object present → Output HIGH
Light receive	✗	✓
Light receive indicator	✗	●
Load resistance	✗	⚠

PNP - dark switching

	Dark switching Q̄ (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)

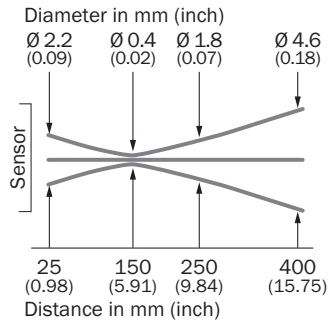


Black object (6% remission)
Set sensing range x = 150 mm. Needed minimum distance to white background y = 20 mm.

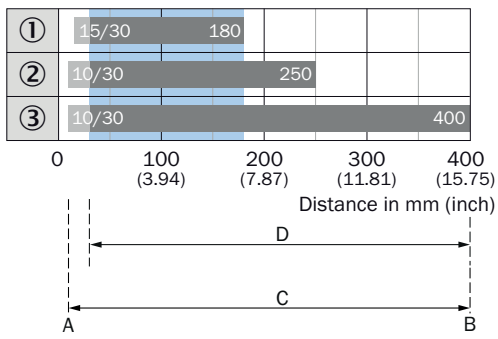
Recommended sensing range for the best performance

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

Light spot size



Sensing range diagram



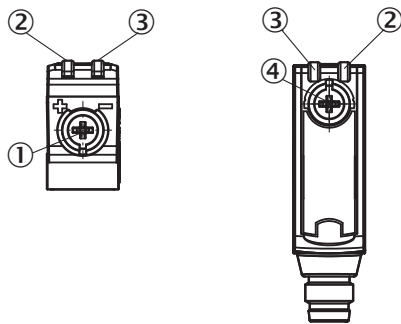
- A = Sensing range min. in mm
- B = Sensing range max. in mm
- C = Viewing range
- D = Adjustable switching threshold for background suppression

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

Adjustments

Display and adjustment elements



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

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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.

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