



GTB6L-F2211

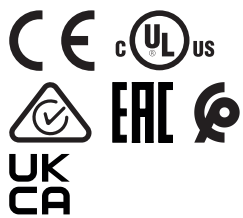
G6

PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

Type	part no.
GTB6L-F2211	1107210

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
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 ¹⁾

¹⁾ Do not intentionally look into the laser beam. Never point the laser beam at people's eyes.

Wave length	680 nm
Pulse duration	2 µs
Maximum pulse power	≤ 11.9 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 factor (corresponds to standard white according to DIN 5033))
Adjustment	
Potentiometer	For setting the sensing range, 5 rotations
Operating mode switch	For inverting the switching function (light/dark switching)
Display	
LED green	Operating indicator Static on: power on
LED yellow	Status of received light beam Static on: object present Static off: object not present

¹⁾ Do not intentionally look into the laser beam. Never point the laser beam at people's eyes.

Safety-related parameters

MTTF_D	662 years
DC_{avg}	0 %
T_M (mission time)	10 years

Electronics

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	2 (Complementary)
Type	PNP
Switching mode	Light/dark switching
Signal voltage PNP HIGH/LOW	Approx. U _B -3 V / 0 V
Signal voltage NPN HIGH/LOW	Approx. U _B / ≤ 3 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⁾

¹⁾ Limit values.

²⁾ At U_B > 24 V, I max. = 50 mA.

³⁾ With light/dark ratio 1:1.

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
Function of pin 2/white (WH)	Digital output, dark switching, object present → output $\bar{Q}$ LOW
Function of pin 2/white (WH) – detail	The pin 2 function of the sensor can be switched
	Additional possible settings via operating mode switch

¹⁾ Limit values.

²⁾ At $U_B > 24\text{ V}$, $I_{\text{max.}} = 50\text{ mA}$.

³⁾ With light/dark ratio 1:1.

Mechanics

Housing	Rectangular
Dimensions (W x H x D)	12 mm x 31.5 mm x 21 mm
Connection	Cable, 4-wire, 2 m
Connection detail	
Deep-freeze property	Do not bend below 0 °C
Conductor size	0.14 mm ²
Cable diameter	Ø 8 mm
Length of cable (L)	2 m
Material	
Housing	Plastic, ABS
Front screen	Plastic, PMMA
Cable	Plastic, PVC
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, 3 x 30 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 $I_{\text{max.}} = 50\text{ mA}$ is permitted.

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

Certificates

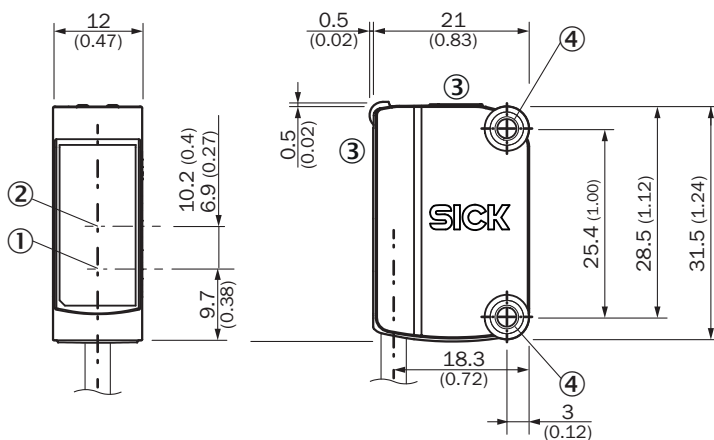
EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
Moroccan declaration of conformity	✓

China RoHS	✓
cULus certificate	✓
EAC certificate / DoC	✓
Laser safety (IEC 60825-1) declaration of manufacturer	✓

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

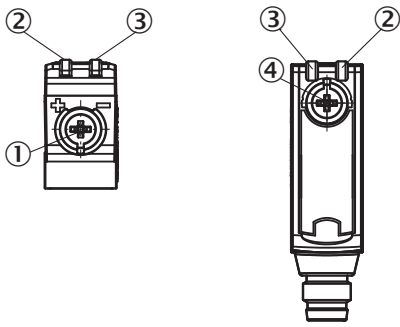
Dimensional drawing



Dimensions in mm (inch)

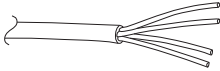
- ① Center of optical axis, sender
- ② Center of optical axis, receiver
- ③ display and adjustment elements
- ④ Mounting holes M3

display and adjustment elements

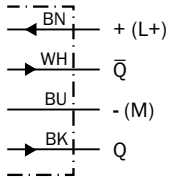


- ① Potentiometer
- ② LED yellow
- ③ LED green
- ④ operating mode switch

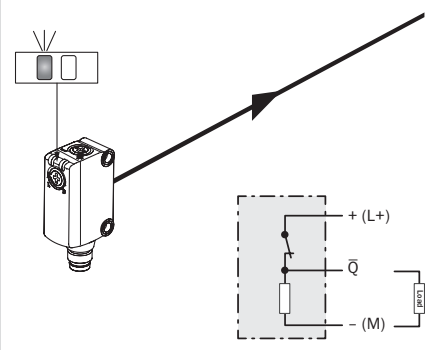
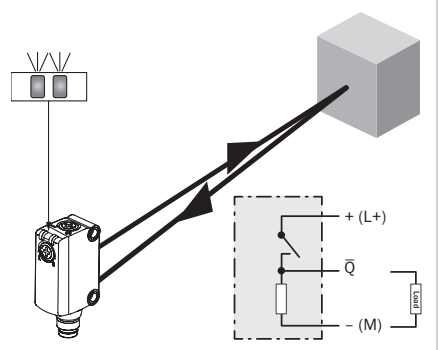
Connection type Cable, 4-wire



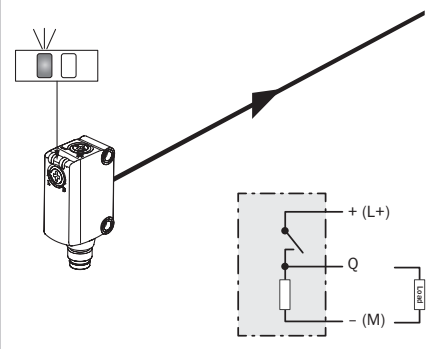
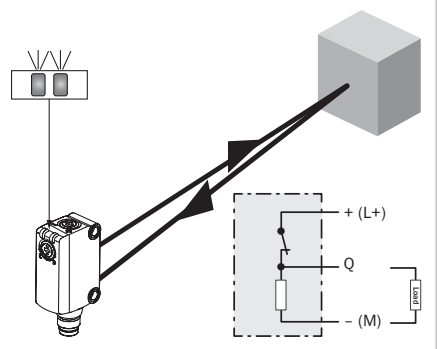
Connection diagram Cd-094



Truth table PNP - dark switching

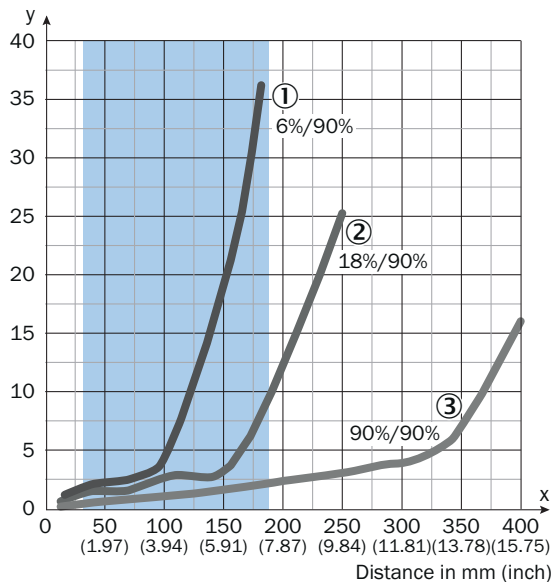
	Dark switching $\bar{Q}$ (normally closed)	
	Object not present → Output HIGH	Object present → Output LOW
Light receive	✗	✓
Light receive indicator	✗	☀
Load resistance	⚡	✗
		

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	✗	⚡
		

Characteristic curve

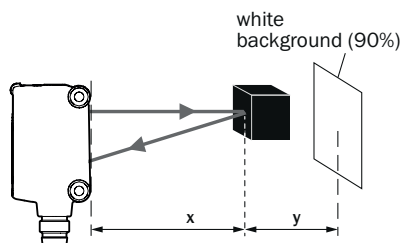
Minimum distance in mm (y) between the set sensing range (x) and white background (90% remission)



Recommended sensing range for the best performance

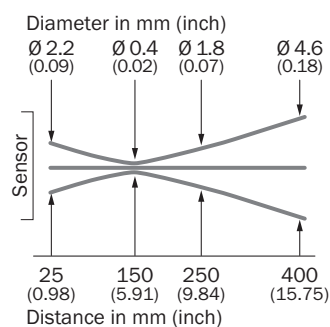
- ① Black object, 6% remission factor
- ② Gray object, 18% remission factor
- ③ White object, 90% remission factor

Example:
Safe suppression of the background

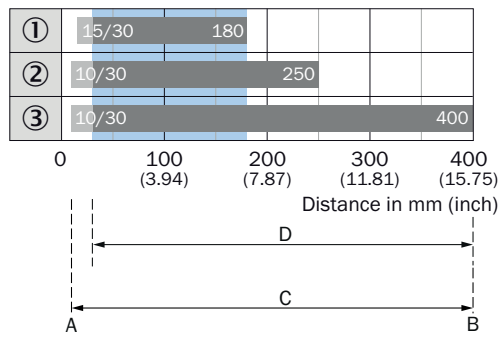


Black object (6% remission)
Set sensing range $x = 150$ mm. Needed minimum distance to white background $y = 20$ mm.

Light spot size



Sensing range diagram



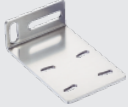
A = Sensing range min. in mm
B = Sensing range max. in mm
C = Viewing range
D = Adjustable switching threshold for background suppression

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

Recommended accessories

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

	Brief description	Type	part no.
Mounting systems			
	Description: Clamp bar to fix G6 sensors on rods of 12 mm, clamp-on design up to 4 mm wall thickness Material: Steel Details: Aluminum (clamp bar), stainless steel (bracket) Items supplied: Clamp bar mounting and clamp function, mounting bracket, mounting hardware	BEF-KHS-IS12G6	2086865
	Description: Mounting bracket for wall mounting Material: Stainless steel Details: Stainless steel Items supplied: Mounting hardware included Suitable for: W8, W8G, W8 Laser, W8 Inox, G6, G6 Inox, W100 Laser, W100-2, KTM Core, KTM Prime, CSM, LUTM, W4S	BEF-W100-A	5311520
	Material: Stainless steel Details: Stainless steel (1.4301) Suitable for: W4S, W4S	BEF-WN-G6	2062909
connectors and cables			
	Connection type head A: Male connector, M8, 4-pin, straight, A-coded Description: Unshielded Connection systems: Screw-type terminals Permitted cross-section: 0.14 mm² ... 0.5 mm²	STE-0804-G	6037323

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