SICK.COM




DATA SHEET

# GL6L-F4211

G6
Photoelectric sensors

SICK Sensor Intelligence




Illustration may differ

# PHOTOELECTRIC SENSORS

# GL6L-F4211

## ORDERING INFORMATION

| Type | part no. |
|---|---|
| GL6L-F4211 | 1105823 |

Further device versions and accessories at www.sick.com/G6

## DETAILED TECHNICAL DATA

### FEATURES

| | |
|---|---|
| Functional principle | Photoelectric retro-reflective sensor |
| Sensing range | |
| Sensing range min. | 0.08 m |
| Sensing range max. | 12 m |
| Maximum distance range from reflector to sensor (operating reserve 1) | 0.08 m ... 12 m |
| Recommended distance range from reflector to sensor (operating reserve 2) | 0.08 m ... 10 m |
| Reference reflector | Reflector P250F |
| Recommended sensing range for the best performance | 0.08 m ... 4.2 m |
| Polarisation filter | Yes |
| Emitted beam | |
| Light source | Laser |
| Type of light | Visible red light |
| Shape of light spot | Point-shaped |
| Light spot size (distance) | Ø 3.5 mm (1,000 mm) |
| Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle) | < +/- 1.5° (at $T_U$ = +23 °C) |
| Key laser figures | |
| Normative reference | IEC 60825-1 / CDRH 21 CFR 1040.10 & 1040.11 |
| Laser class | 1 [1] |
| 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. | 3.5 mm, at 1 m distance (object with 90% remission factor (corresponds to standard white according to DIN 5033)) |
| Adjustment | |
| Potentiometer | For setting the sensing range |

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

| | |
|---|---|
| Operating mode switch | For inverting the switching function (light/dark switching) |
| Display | |
| LED green | Operating indicator<br>Static on: power on |
| LED yellow | Status of received light beam<br>Static on: object not present<br>Static off: object present |

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

## SAFETY-RELATED PARAMETERS

| | |
|---|---|
| $MTTF_D$ | 1,005 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 |
| Output current $I_{max.}$ | ≤ 100 mA [2] |
| Circuit protection outputs | Reverse polarity protected<br>Overcurrent protected<br>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 LOW |
| Function of pin 4/black (BK) – detail | The pin 4 function of the sensor can be switched<br>Additional possible settings via operating mode switch |
| Function of pin 2/white (WH) | Digital output, dark switching, object present → output $\bar{Q}$ HIGH |
| Function of pin 2/white (WH) – detail | The pin 2 function of the sensor can be switched<br>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.

## MECHANICS

| | |
|---|---|
| Housing | Rectangular |
| Dimensions (W x H x D) | 12 mm x 31.5 mm x 21 mm |
| Connection | Male connector M8, 4-pin |
| Material | |
| Housing | Plastic, ABS |
| Front screen | Plastic, PMMA |
| Cable | Plastic, PVC |
| Male connector | Metal, 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, 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 |

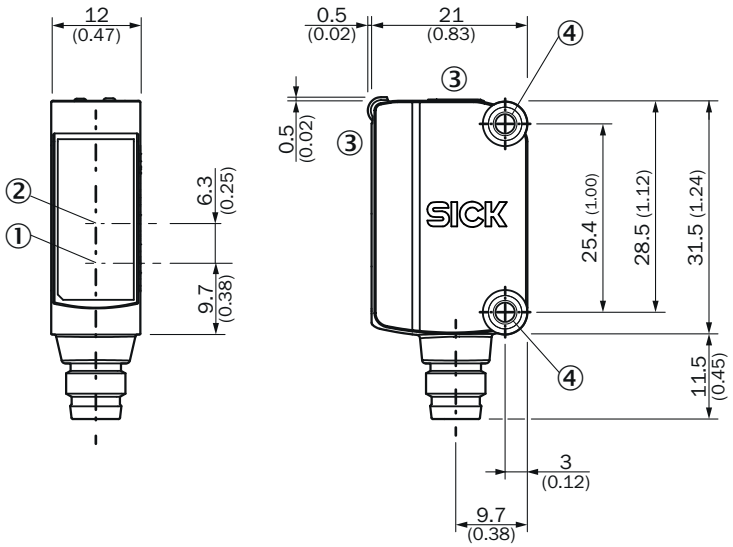
[1)] As of $T_a$ => 45 °C, a max. supply voltage $U_B$ = 24 V and a max. load current $I_{max.}$ = 50 mA is permitted.

[2)] Below $T_u$ = –20 °C, a warm-up time of 3 seconds is required.

## CERTIFICATES

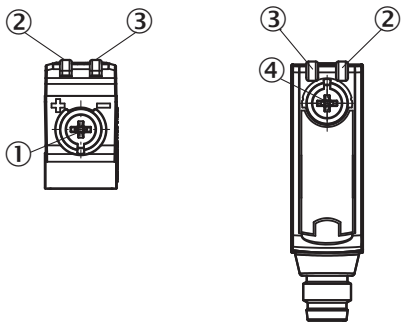
| | |
|---|---|
| EU declaration of conformity | ✓ |
| UK declaration of conformity | ✓ |
| ACMA declaration of conformity | ✓ |
| Moroccan declaration of conformity | ✓ |
| China RoHS | ✓ |
| China Compulsory Product Certification (CCC) exempt | ✓ |
| cULus certificate | ✓ |
| Laser safety (IEC 60825-1) declaration of manufacturer | ✓ |

## DIMENSIONAL DRAWING



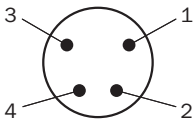

Dimensions in mm (inch)
① Center of optical axis, sender
② Center of optical axis, receiver
③ display and adjustment elements
④ Mounting holes M3

## DISPLAY AND ADJUSTMENT ELEMENTS

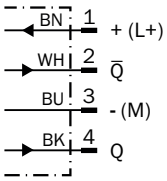



① Potentiometer
② LED yellow
③ LED green
④ operating mode switch

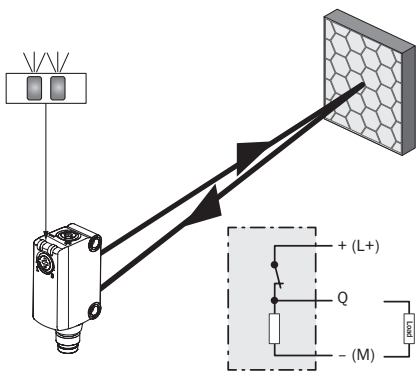
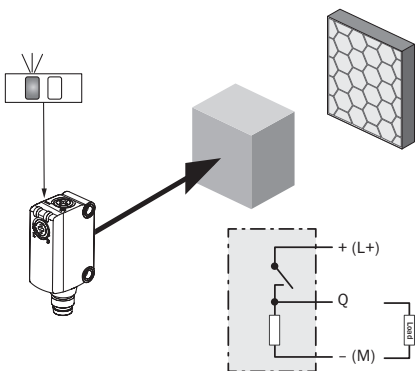
## CONNECTION TYPE MALE CONNECTOR M8, 4-PIN



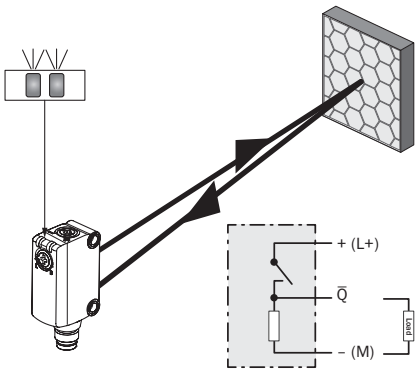
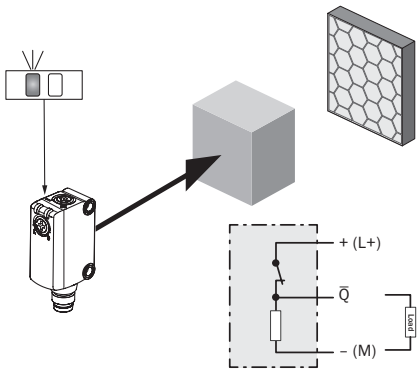

## CONNECTION DIAGRAM CD-084




## TRUTH TABLE PNP - LIGHT SWITCHING

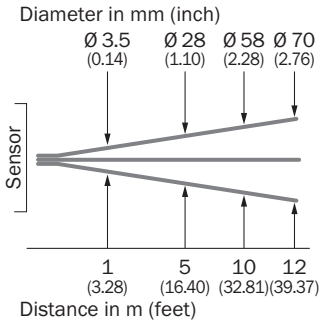
| | Light switching Q (normally closed) | |
|---|---|---|
| | Object not present ➜ Output HIGH | Object present ➜ Output LOW |
| Light receive | ✓ | ✗ |
| Light receive indicator | ☀ | ✗ |
| Load resistance | ⚠ | ✗ |
| |  |  |

### TRUTH TABLE PNP - DARK SWITCHING

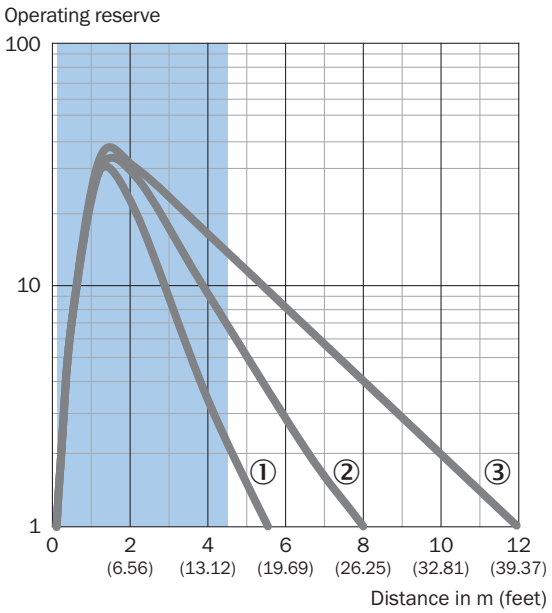
| | Dark switching $\overline{Q}$ (normally open) | |
|---|---|---|
| | Object not present ➜ Output LOW | Object present ➜ Output HIGH |
| Light receive | ✓ | ✗ |
| Light receive indicator | ☀ | ✗ |
| Load resistance | ✗ | ⚠ |
| |  |  |



### CHARACTERISTIC CURVE

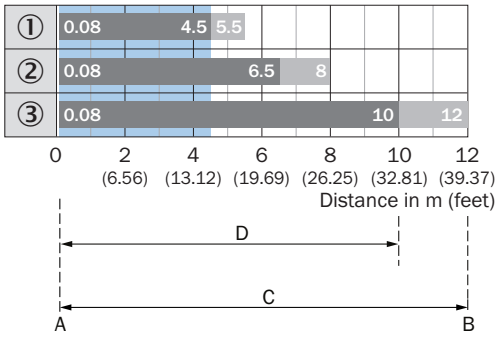


## CHARACTERISTIC CURVE




① PL10F reflector
② Reflector PL20F
③ Reflector P250F

## SENSING RANGE DIAGRAM




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 2)

Recommended sensing range for the best performance

① PL10F reflector
② Reflector PL20F
③ Reflector P250F

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/1105823

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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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