



DATA SHEET

# GSE6SI-1GA1217EZZZ

G6  
Photoelectric sensors

# SICK

Sensor Intelligence

PHOTOELECTRIC SENSORS

GSE6SI-1GA1217EZZZ

ORDERING INFORMATION

| Type               | part no. |
|--------------------|----------|
| GSE6SI-1GA1217EZZZ | 1135350  |

Further device versions and accessories at [www.sick.com/G6](http://www.sick.com/G6)



Illustration may differ



DETAILED TECHNICAL DATA

FEATURES

|  |                                   |  |
|--|-----------------------------------|--|
| Functional principle   | Through-beam photoelectric sensor |  |
| Sensing range  | Sensing range min.                | 0 m  |
|  | Sensing range max.                | 20 m   |
| Maximum distance range from receiver to sender (operating reserve 1)     | 0 m ... 20 m                      |  |
| Recommended distance range from receiver to sender (operating reserve 2) | 0 m ... 16 m                      |  |
| Recommended sensing range for the best performance                       | 0 m ... 16 m                      |  |
| Emitted beam   | Light source                      | LED  |
|  | Type of light                     | Infrared light   |
|  | Shape of light spot               | Rectangular  |
|  | Light spot size (distance)        | Ø 329 mm (10 m)  |
| Key LED figures  | Normative reference               | EN 62471:2008-09   IEC 62471:2006, modified                    |
|  | LED risk group marking            | Free group   |
|  | Wave length                       | 850 nm   |
|  | Average service life              | 100,000 h at T <sub>a</sub> = +25 °C                           |
| Adjustment   | Potentiometer                     | For setting the sensing range, 270°                            |
|  | 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 |

Static off: object present

**SAFETY-RELATED PARAMETERS**

|                               |             |
|-------------------------------|-------------|
| MTTF <sub>D</sub>             | 1,724 years |
| DC <sub>avg</sub>             | 0%          |
| T <sub>M</sub> (mission time) | 20 years    |

**ELECTRONICS**

|                                       |  |                              |  |                                       |  |                |                      |                             |                                   |                                  |                        |                            |  |               |                        |                     |                        |
|---------------------------------------|--|------------------------------|--|---------------------------------------|--|----------------|----------------------|-----------------------------|-----------------------------------|----------------------------------|------------------------|----------------------------|--|---------------|------------------------|---------------------|------------------------|
| Supply voltage U <sub>B</sub>         | 10 V DC ... 30 V DC <sup>1)</sup>  |                              |  |                                       |  |                |                      |                             |                                   |                                  |                        |                            |  |               |                        |                     |                        |
| Ripple                                | ≤ 5 V <sub>pp</sub>  |                              |  |                                       |  |                |                      |                             |                                   |                                  |                        |                            |  |               |                        |                     |                        |
| Usage category                        | DC-12 (According to EN 60947-5-2)<br>DC-13 (According to EN 60947-5-2)   |                              |  |                                       |  |                |                      |                             |                                   |                                  |                        |                            |  |               |                        |                     |                        |
| Current consumption                   | ≤ 30 mA, without load. At U <sub>B</sub> = 24 V  |                              |  |                                       |  |                |                      |                             |                                   |                                  |                        |                            |  |               |                        |                     |                        |
| Protection class                      | III  |                              |  |                                       |  |                |                      |                             |                                   |                                  |                        |                            |  |               |                        |                     |                        |
| Digital output                        | <table border="0"> <tr> <td>Number</td> <td>1</td> </tr> <tr> <td>Type</td> <td>PNP</td> </tr> <tr> <td>Switching mode</td> <td>Light/dark switching</td> </tr> <tr> <td>Signal voltage PNP HIGH/LOW</td> <td>Approx. U<sub>B</sub>-3 V / 0 V</td> </tr> <tr> <td>Output current I<sub>max.</sub></td> <td>≤ 100 mA <sup>2)</sup></td> </tr> <tr> <td>Circuit protection outputs</td> <td>Reverse polarity protected<br/>Overcurrent protected<br/>Short-circuit protected</td> </tr> <tr> <td>Response time</td> <td>≤ 625 μs <sup>3)</sup></td> </tr> <tr> <td>Switching frequency</td> <td>1,000 Hz <sup>4)</sup></td> </tr> </table> | Number                       | 1  | Type                                  | PNP  | Switching mode | Light/dark switching | Signal voltage PNP HIGH/LOW | Approx. U <sub>B</sub> -3 V / 0 V | Output current I <sub>max.</sub> | ≤ 100 mA <sup>2)</sup> | Circuit protection outputs | Reverse polarity protected<br>Overcurrent protected<br>Short-circuit protected | Response time | ≤ 625 μs <sup>3)</sup> | Switching frequency | 1,000 Hz <sup>4)</sup> |
| Number                                | 1  |                              |  |                                       |  |                |                      |                             |                                   |                                  |                        |                            |  |               |                        |                     |                        |
| Type                                  | PNP  |                              |  |                                       |  |                |                      |                             |                                   |                                  |                        |                            |  |               |                        |                     |                        |
| Switching mode                        | Light/dark switching   |                              |  |                                       |  |                |                      |                             |                                   |                                  |                        |                            |  |               |                        |                     |                        |
| Signal voltage PNP HIGH/LOW           | Approx. U <sub>B</sub> -3 V / 0 V  |                              |  |                                       |  |                |                      |                             |                                   |                                  |                        |                            |  |               |                        |                     |                        |
| Output current I <sub>max.</sub>      | ≤ 100 mA <sup>2)</sup>   |                              |  |                                       |  |                |                      |                             |                                   |                                  |                        |                            |  |               |                        |                     |                        |
| Circuit protection outputs            | Reverse polarity protected<br>Overcurrent protected<br>Short-circuit protected   |                              |  |                                       |  |                |                      |                             |                                   |                                  |                        |                            |  |               |                        |                     |                        |
| Response time                         | ≤ 625 μs <sup>3)</sup>   |                              |  |                                       |  |                |                      |                             |                                   |                                  |                        |                            |  |               |                        |                     |                        |
| Switching frequency                   | 1,000 Hz <sup>4)</sup>   |                              |  |                                       |  |                |                      |                             |                                   |                                  |                        |                            |  |               |                        |                     |                        |
| Pin/Wire assignment                   | <table border="0"> <tr> <td>Function of pin 4/black (BK)</td> <td>Digital output, light switching, object present → output Q LOW</td> </tr> <tr> <td>Function of pin 4/black (BK) – detail</td> <td>The pin 4 function of the sensor can be switched<br/>Additional possible settings via operating mode switch</td> </tr> </table>  | 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 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   |                              |  |                                       |  |                |                      |                             |                                   |                                  |                        |                            |  |               |                        |                     |                        |

<sup>1)</sup> Limit values.<sup>2)</sup> At U<sub>B</sub> > 24 V, I max. = 50 mA.<sup>3)</sup> Signal transit time with resistive load.<sup>4)</sup> With light/dark ratio 1:1.**MECHANICS**

|  |  |                      |                        |                |                      |                |              |                     |     |
|--|--|----------------------|------------------------|----------------|----------------------|----------------|--------------|---------------------|-----|
| Housing  | Rectangular  |                      |                        |                |                      |                |              |                     |     |
| Dimensions (W x H x D)                         | 12 mm x 31.6 mm x 21 mm  |                      |                        |                |                      |                |              |                     |     |
| Connection                                     | Cable, 3-wire, 2 m   |                      |                        |                |                      |                |              |                     |     |
| Connection detail                              | <table border="0"> <tr> <td>Deep-freeze property</td> <td>Do not bend below 0 °C</td> </tr> <tr> <td>Conductor size</td> <td>0.14 mm<sup>2</sup></td> </tr> <tr> <td>Cable diameter</td> <td>Ø 3.4 mm</td> </tr> <tr> <td>Length of cable (L)</td> <td>2 m</td> </tr> </table> | Deep-freeze property | Do not bend below 0 °C | Conductor size | 0.14 mm <sup>2</sup> | Cable diameter | Ø 3.4 mm     | Length of cable (L) | 2 m |
| Deep-freeze property                           | Do not bend below 0 °C   |                      |                        |                |                      |                |              |                     |     |
| Conductor size                                 | 0.14 mm <sup>2</sup>   |                      |                        |                |                      |                |              |                     |     |
| Cable diameter                                 | Ø 3.4 mm   |                      |                        |                |                      |                |              |                     |     |
| Length of cable (L)                            | 2 m  |                      |                        |                |                      |                |              |                     |     |
| Material                                       | <table border="0"> <tr> <td>Housing</td> <td>Plastic, ABS</td> </tr> <tr> <td>Front screen</td> <td>Plastic, PMMA</td> </tr> <tr> <td>Cable</td> <td>Plastic, PVC</td> </tr> </table>  | Housing              | Plastic, ABS           | Front screen   | Plastic, PMMA        | Cable          | Plastic, PVC |                     |     |
| Housing  | Plastic, ABS   |                      |                        |                |                      |                |              |                     |     |
| Front screen                                   | Plastic, PMMA  |                      |                        |                |                      |                |              |                     |     |
| Cable  | Plastic, PVC   |                      |                        |                |                      |                |              |                     |     |
| Weight   | Approx. 80 g   |                      |                        |                |                      |                |              |                     |     |
| Maximum tightening torque of the fixing screws | 0.4 Nm   |                      |                        |                |                      |                |              |                     |     |

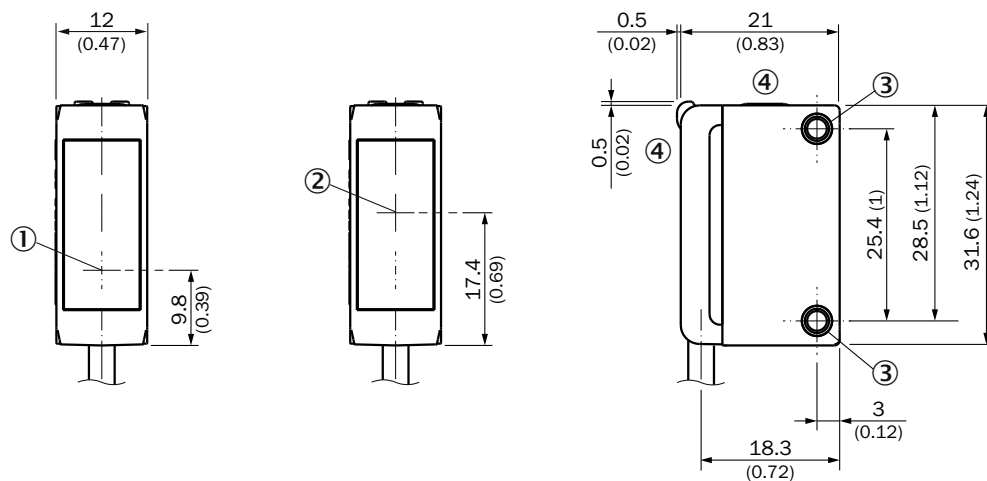
**AMBIENT DATA**

|                                     |   |
|-------------------------------------|---|
| Enclosure rating                    | IP67 (EN 60529)   |
| Ambient operating temperature       | -30 °C ... +55 °C   |
| Ambient temperature, storage        | -40 °C ... +70 °C   |
| Typ. Ambient light immunity         | Sunlight: ≤ 30,000 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  |

**CERTIFICATES**

|                                    |   |
|------------------------------------|---|
| EU declaration of conformity       | ✓ |
| UK declaration of conformity       | ✓ |
| ACMA declaration of conformity     | ✓ |
| Moroccan declaration of conformity | ✓ |
| China RoHS                         | ✓ |
| cULus certificate                  | ✓ |

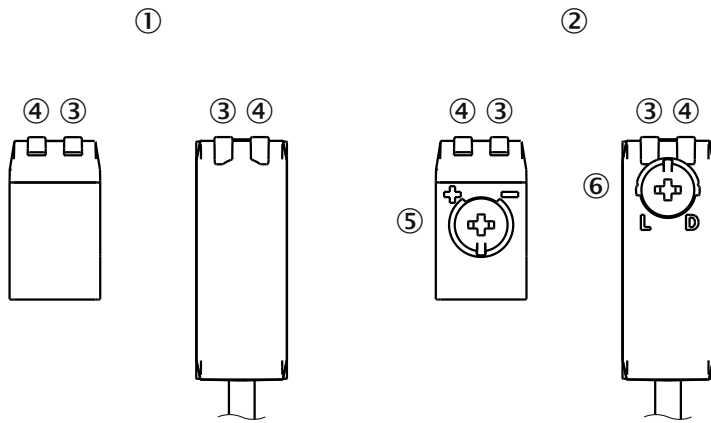
**DIMENSIONAL DRAWING**



Dimensions in mm (inch)

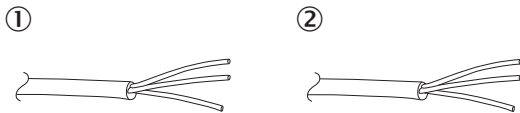
- ① Center of optical axis, sender
- ② Center of optical axis, receiver
- ③ Mounting holes M3
- ④ display and adjustment elements

**DISPLAY AND ADJUSTMENT ELEMENTS**



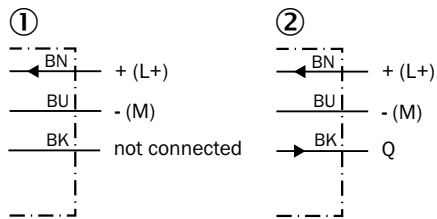
- ① sender
- ② receiver
- ③ LED green
- ④ LED yellow
- ⑤ Potentiometer
- ⑥ operating mode switch

**CONNECTION TYPE CABLE, 3-WIRE**



- ① sender
- ② receiver

**CONNECTION DIAGRAM CD-049**



- ① sender
- ② receiver

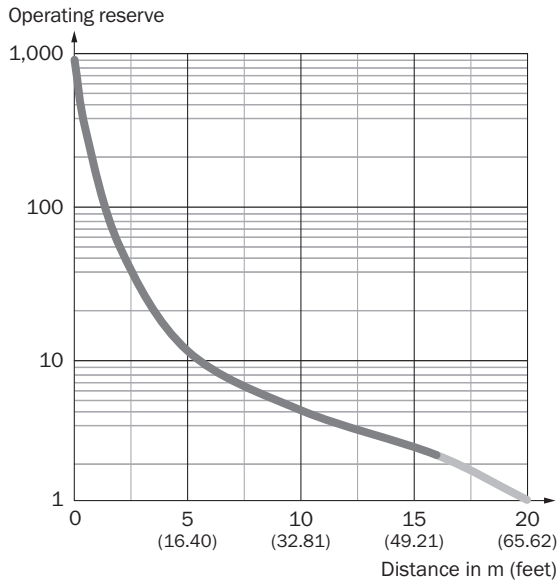
TRUTH TABLE PNP - DARK SWITCHING  $\bar{Q}$

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

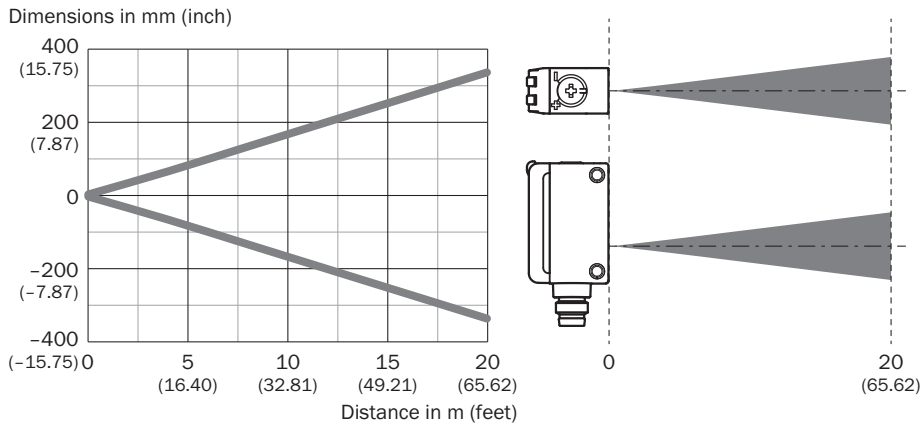
TRUTH TABLE PNP - LIGHT SWITCHING Q

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

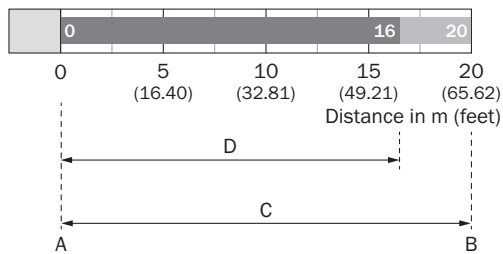
**CHARACTERISTIC CURVE**



**LIGHT SPOT SIZE**



**SENSING RANGE DIAGRAM**



|   |  |
|---|--|
| A | Sensing range min. in m                            |
| B | Sensing range max. in m                            |
| C | Maximum distance range from receiver to sender     |
| D | Recommended distance range from receiver to sender |

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/1135350](http://www.sick.com/1135350)



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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

**SICK**  
Sensor Intelligence