



DATA SHEET

# GTB6SP-31A1116EZZZ

G6  
Photoelectric sensors

**SICK** Sensor Intelligence

## PHOTOELECTRIC SENSORS

## GTB6SP-31A1116EZZZ

## ORDERING INFORMATION

Type	part no.
GTB6SP-31A1116EZZZ	1141181

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



Illustration may differ



## DETAILED TECHNICAL DATA

## FEATURES

Functional principle	Photoelectric proximity sensor	
Functional principle detail	Background suppression	
Sensing range	Sensing range min.	5 mm
	Sensing range max.	400 mm
Adjustable switching threshold for background suppression	35 mm ... 400 mm	
Minimum distance between set sensing range and background (black 6% / white 90%)	5 mm, at a distance of 120 mm	
Recommended sensing range for the best performance	35 mm ... 140 mm	
Emitted beam	Light source	PinPoint LED
	Type of light	Visible red light
	Shape of light spot	Point-shaped
	Light spot size (distance)	Ø 5.6 mm (150 mm)
Key LED figures	Normative reference	EN 62471:2008-09   IEC 62471:2006, modified
	LED risk group marking	Free group
	Wave length	640 nm
	Average service life	100,000 h at T <sub>a</sub> = +25 °C
Smallest detectable object (MDO) typ.	Object with 90% remission factor (complies with 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

**SAFETY-RELATED PARAMETERS**

MTTF <sub>D</sub>	3,564 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) DC-13 (According to EN 60947-5-2)																
Current consumption	≤ 20 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 Overcurrent protected 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 Overcurrent protected Short-circuit protected	Response time	≤ 625 μs <sup>3)</sup>	Switching frequency	1,000 Hz <sup>4)</sup>
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<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.

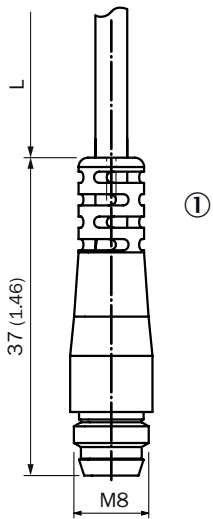
<sup>4)</sup> With light/dark ratio 1:1.

**MECHANICS**

Housing	Rectangular								
Dimensions (W x H x D)	12 mm x 31.6 mm x 21 mm								
Connection	Cable with connector M8, 3-pin, 300 mm								
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>300 mm</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)	300 mm
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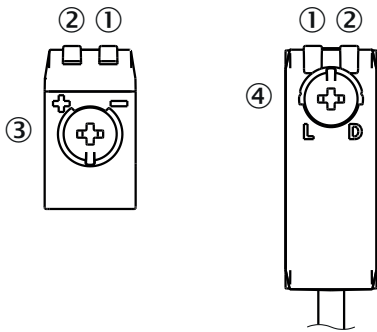


**DIMENSIONAL DRAWING, CONNECTION**



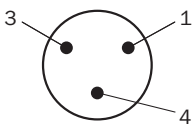
Dimensions in mm (inch)  
 For length of cable (L), see technical data  
 ① cable with connector M8

**DISPLAY AND ADJUSTMENT ELEMENTS**

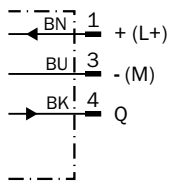


- ① LED green
- ② LED yellow
- ③ Potentiometer
- ④ operating mode switch

**CONNECTION TYPE CONNECTOR M8, 3-PIN**



**CONNECTION DIAGRAM CD-045**



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

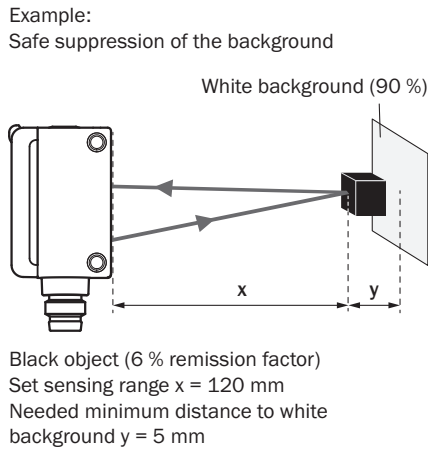
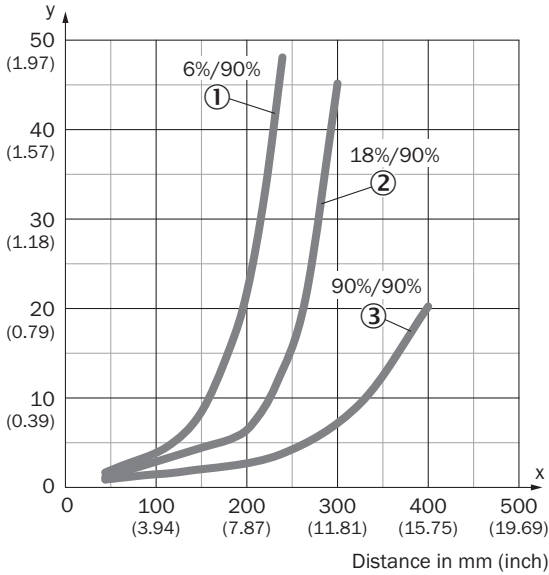
	Dark switching $\bar{Q}$ (normally open)	
	Object not present → Output LOW	Object present → Output HIGH
Light receive	✓	✗
Light receive indicator	☀	✗
Load resistance	✗	⚡

TRUTH TABLE PNP - LIGHT SWITCHING Q

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

**CHARACTERISTIC CURVE**

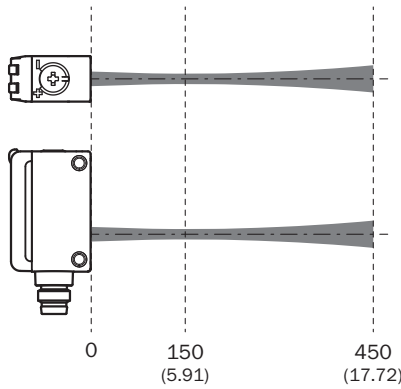
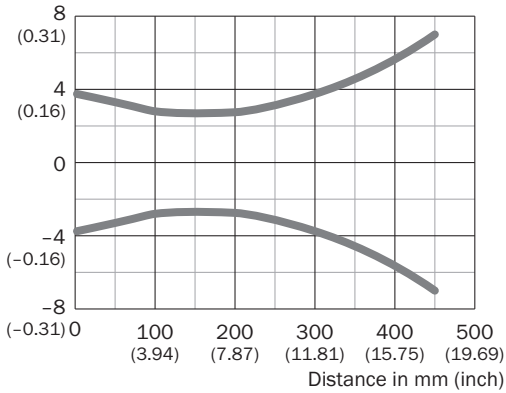
Minimum distance in mm (y) between the set sensing range and white background (90 % remission factor)



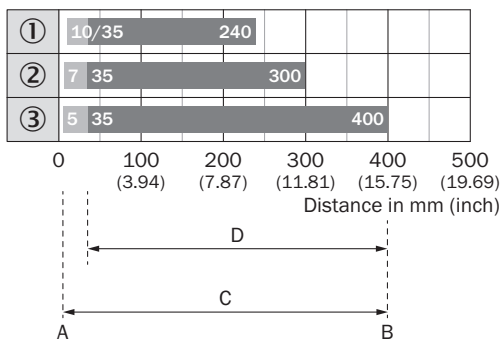
- ① Black object, 6% remission factor
- ② Gray object, 18% remission factor
- ③ White object, 90% remission factor

**LIGHT SPOT SIZE**

Dimensions in mm (inch)



**SENSING RANGE DIAGRAM**



1	Black object, 6% remission factor
2	Gray object, 18% remission factor
3	White object, 90% remission factor
A	Sensing range min. in mm
B	Sensing range max. in mm
C	Maximum distance range from sensor to object
D	Recommended distance range from sensor to object

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/1141181](http://www.sick.com/1141181)



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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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Sensor Intelligence