



**GTB6SP-31A1116EZZZ**

G6

**PHOTOELECTRIC SENSORS**

**SICK**  
Sensor Intelligence.



## Ordering information

Type	part no.
GTB6SP-31A1116EZZZ	1141181

Other models and accessories → [www.sick.com/G6](http://www.sick.com/G6)

Illustration may differ



## Detailed technical data

## Features

<b>Functional principle</b>	Photoelectric proximity sensor
<b>Functional principle detail</b>	Background suppression
<b>Sensing range</b>	
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
<b>Emitted beam</b>	
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)
<b>Key LED figures</b>	
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 $T_a = +25$ °C
<b>Smallest detectable object (MDO) typ.</b>	Object with 90% remission factor (complies with standard white according to DIN 5033)
<b>Adjustment</b>	
Potentiometer	For setting the sensing range, 5 rotations

<b>Display</b>	Operating mode switch	For inverting the switching function (light/dark switching)
	LED green	Operating indicatorStatic on: power on
	LED yellow	Status of received light beamStatic on: object presentStatic off: object not present

## Safety-related parameters

<b>MTTF<sub>D</sub></b>	3,564 years
<b>DC<sub>avg</sub></b>	0%
<b>T<sub>M</sub> (mission time)</b>	20 years

## Electronics

<b>Supply voltage U<sub>B</sub></b>	10 V DC ... 30 V DC <sup>1)</sup>
<b>Ripple</b>	≤ 5 V <sub>pp</sub>
<b>Usage category</b>	DC-12 (According to EN 60947-5-2) DC-13 (According to EN 60947-5-2)
<b>Current consumption</b>	Without load. At U <sub>B</sub> = 24 V
<b>Protection class</b>	III
<b>Digital output</b>	
Number	1
Type	PNP
Switching mode	Light 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>
<b>Pin/Wire assignment</b>	
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

<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

<b>Housing</b>	Rectangular
<b>Dimensions (W x H x D)</b>	12 mm x 31.6 mm x 21 mm
<b>Connection</b>	Cable with connector M8, 3-pin, 300 mm
<b>Connection detail</b>	
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
<b>Material</b>	Housing	Plastic, ABS
	Front screen	Plastic, PMMA
	Cable	Plastic, PVC
	Male connector	Metal, copper alloy (C3604 CUZN39PB3)
<b>Weight</b>	Approx. 16 g	
<b>Maximum tightening torque of the fixing screws</b>	0.4 Nm	

## Ambient data

<b>Enclosure rating</b>	IP67 (EN 60529)
<b>Ambient operating temperature</b>	-30 °C ... +55 °C
<b>Ambient temperature, storage</b>	-40 °C ... +70 °C
<b>Typ. Ambient light immunity</b>	Sunlight: ≤ 30,000 lx
<b>Shock resistance</b>	30 g, 11 ms (3 positive and 3 negative shocks along X, Y, Z axes, 18 total shocks (EN60068-2-27))
<b>Vibration resistance</b>	10 Hz ... 55 Hz (Amplitude 0.5 mm, 3 x 30 min (EN60068-2-6))
<b>Air humidity</b>	35 % ... 95 %, relative humidity (no condensation)
<b>Electromagnetic compatibility (EMC)</b>	EN 60947-5-2
<b>UL File No.</b>	NRKH.E348498 & NRKH7.E348498

## Certificates

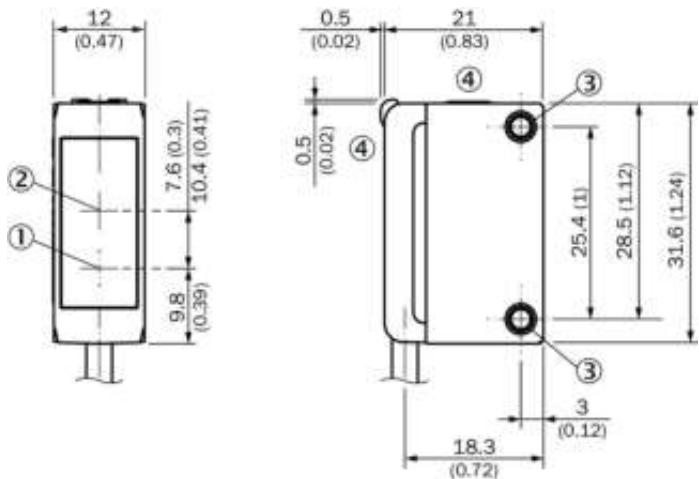
<b>EU declaration of conformity</b>	✓
<b>UK declaration of conformity</b>	✓
<b>ACMA declaration of conformity</b>	✓
<b>Moroccan declaration of conformity</b>	✓
<b>China-RoHS</b>	✓
<b>cULus certificate</b>	✓

## Classifications

<b>ECLASS 5.0</b>	27270904
<b>ECLASS 5.1.4</b>	27270904
<b>ECLASS 6.0</b>	27270904
<b>ECLASS 6.2</b>	27270904
<b>ECLASS 7.0</b>	27270904
<b>ECLASS 8.0</b>	27270904
<b>ECLASS 8.1</b>	27270904
<b>ECLASS 9.0</b>	27270904
<b>ECLASS 10.0</b>	27270904
<b>ECLASS 11.0</b>	27270904
<b>ECLASS 12.0</b>	27270903
<b>ETIM 5.0</b>	EC002719
<b>ETIM 6.0</b>	EC002719

<b>ETIM 7.0</b>	EC002719
<b>ETIM 8.0</b>	EC002719
<b>UNSPSC 16.0901</b>	39121528

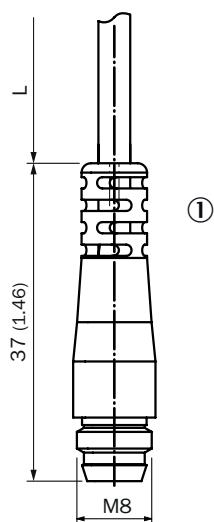
### Dimensional drawing



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

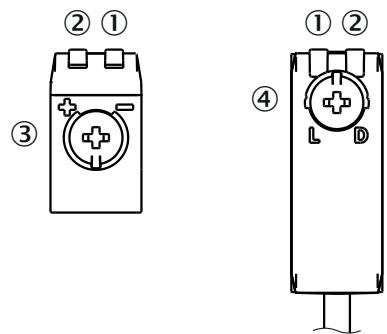
### Dimensional drawing, connection



Dimensions in mm (inch)

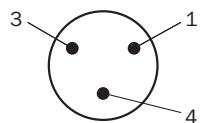
For length of cable (L), see technical data  
① cable with connector M8

## display and adjustment elements

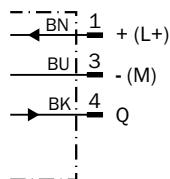


- ① LED green
- ② LED yellow
- ③ Potentiometer
- ④ operating mode switch

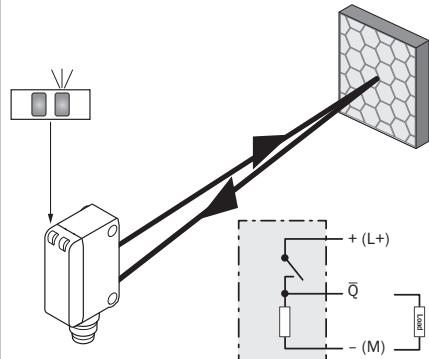
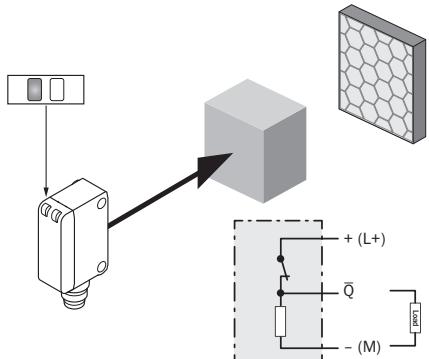
## Connection type Connector M8, 3-pin



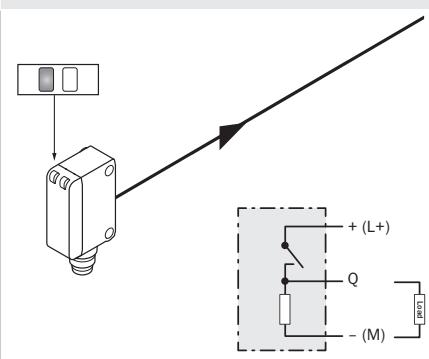
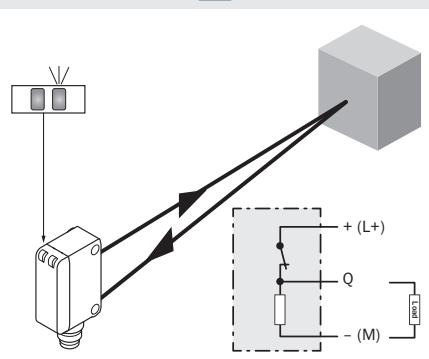
## Connection diagram Cd-045



Truth table PNP - dark switching  $\bar{Q}$ 

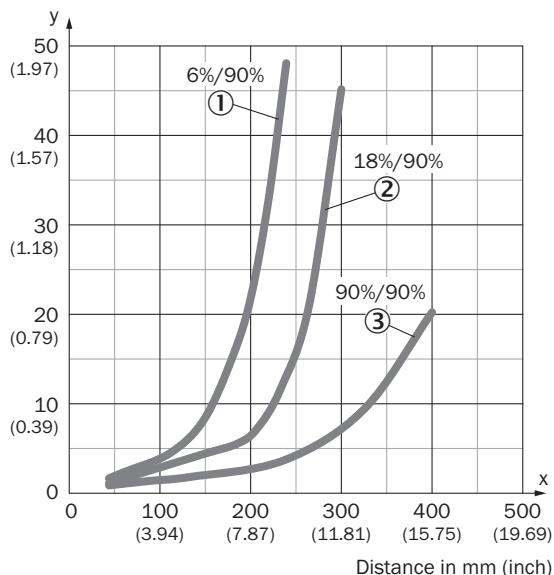
Dark switching $\bar{Q}$ (normally open)		
	Object not present → Output LOW	Object present → Output HIGH
Light receive	✓	✗
Light receive indicator	✗	✗
Load resistance	✗	⚡
		

## Truth table PNP - light switching Q

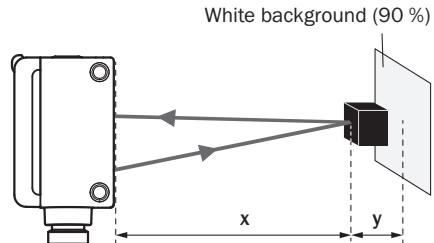
Light switching Q (normally open)		
	Object not present → Output LOW	Object present → Output HIGH
Light receive	✗	✓
Light receive indicator	✗	✗
Load resistance	✗	⚡
		

## Characteristic curve

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



Example:  
Safe suppression of the background

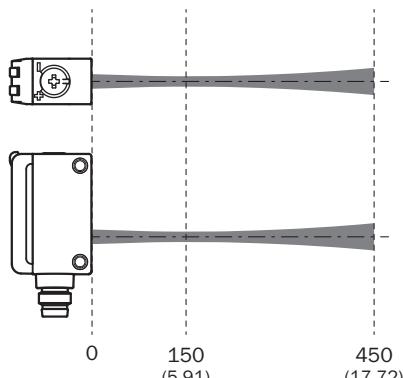
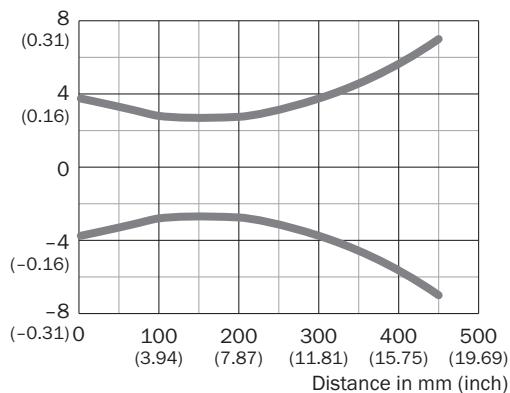


Black object (6 % remission factor)  
Set sensing range  $x = 120$  mm  
Needed minimum distance to white background  $y = 5$  mm

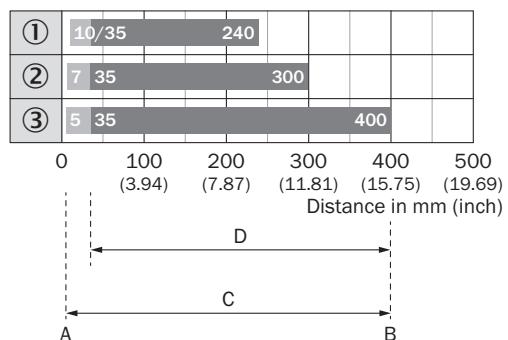
- ① Black object, 6% remission factor
- ② Gray object, 18% remission factor
- ③ White object, 90% remission factor

## 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

## Recommended accessories

Other models and accessories → [www.sick.com/G6](http://www.sick.com/G6)

	Brief description	Type	part no.
Mounting systems			
	<ul style="list-style-type: none"><li><b>Description:</b> Clamp bar to fix G6 sensors on rods of 12 mm, clamp-on design up to 4 mm wall thickness</li><li><b>Material:</b> Steel</li><li><b>Details:</b> Aluminum (clamp bar), stainless steel (bracket)</li><li><b>Items supplied:</b> Clamp bar mounting and clamp function, mounting bracket, mounting hardware</li></ul>	BEF-KHS-IS12G6	2086865
	<ul style="list-style-type: none"><li><b>Material:</b> Stainless steel</li><li><b>Details:</b> Stainless steel (1.4301)</li><li><b>Suitable for:</b> W4S</li></ul>	BEF-WN-G6	2062909

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