



# Triangulation sensor (BGS)

## OBT300-R100-E5-V31-L



- Miniature design with versatile mounting options
- DuraBeam Laser Sensors - durable and employable like an LED
- Extended temperature range  
-40 °C ... 60 °C
- High degree of protection IP69K
- External TEACH-IN

Laser diffuse mode sensor with adjustable background suppression



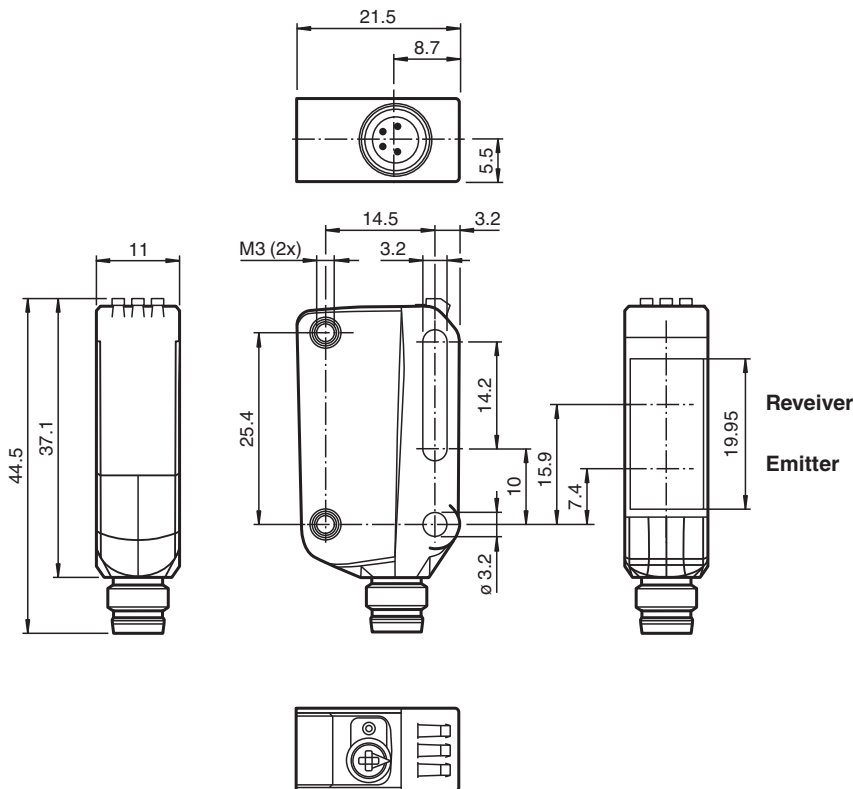
### Function

The R100 series miniature optical sensors are the first devices of their kind to offer an end-to-end solution in a small single standard design — from thru-beam sensor through to a distance measurement device. As a result of this design, the sensors are able to perform practically all standard automation tasks.

The DuraBeam laser sensors are durable and can be used in the same way as a standard sensor.

The use of Multi Pixel Technology gives the standard sensors a high level of flexibility and enables them to adapt more effectively to their operating environment.

### Dimensions



Release date: 2025-01-17 Date of issue: 2025-01-17 Filename: 267075-100428\_eng.pdf

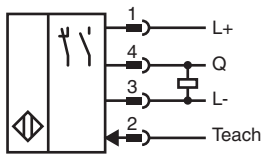
## Technical Data

General specifications		
Detection range		7 ... 300 mm
Detection range min.		7 ... 25 mm
Detection range max.		7 ... 300 mm
Adjustment range		25 ... 300 mm
Reference target		standard white, 100 mm x 100 mm
Light source		laser diode
Light type		modulated visible red light
Laser nominal ratings		
Note		LASER LIGHT , DO NOT STARE INTO BEAM
Laser class		1
Wave length		680 nm
Beam divergence		> 5 mrad d63 < 1 mm in the range of 150 mm ... 250 mm
Pulse length		3 $\mu$ s
Repetition rate		approx. 13 kHz
max. pulse energy		10.4 nJ
Black-white difference (6 %/90 %)		< 5 % at 150 mm
Diameter of the light spot		approx. 1 mm at a distance of 200 mm
Opening angle		approx. 0.3 °
Ambient light limit		EN 60947-5-2 : 40000 Lux
Functional safety related parameters		
MTTF <sub>d</sub>		560 a
Mission Time (T <sub>M</sub> )		20 a
Diagnostic Coverage (DC)		0 %
Indicators/operating means		
Operation indicator		Green LED: Permanently lit - power on Flashing (4 Hz) - short circuit
Function indicator		LED yellow: constantly on - object detected constantly off - object not detected
Control elements		Light-on/dark-on changeover switch
Control elements		Sensing range adjuster
Electrical specifications		
Operating voltage	U <sub>B</sub>	10 ... 30 V DC
Ripple		max. 10 %
No-load supply current	I <sub>0</sub>	< 20 mA at 24 V supply voltage
Protection class		III
Output		
Switching type		The switching type of the sensor is adjustable. The default setting is: Q - Pin4: PNP normally open / light-on Teach input - Pin2: High-active input
Signal output		1 PNP, short-circuit protected, reverse polarity protected
Switching voltage		max. 30 V DC
Switching current		max. 100 mA , resistive load
Usage category		DC-12 and DC-13
Voltage drop	U <sub>d</sub>	≤ 1.5 V DC
Switching frequency	f	1650 Hz
Response time		300 $\mu$ s
Conformity		
Communication interface		IEC 61131-9
Product standard		EN 60947-5-2
Laser safety		EN 60825-1:2014
Approvals and certificates		
UL approval		E87056 , cULus Listed , class 2 power supply , type rating 1

## Technical Data

FDA approval	IEC 60825-1:2014 Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3 as described in Laser Notice 56, dated May 8, 2019.
<b>Ambient conditions</b>	
Ambient temperature	-40 ... 60 °C (-40 ... 140 °F)
Storage temperature	-40 ... 70 °C (-40 ... 158 °F)
<b>Mechanical specifications</b>	
Degree of protection	IP67 / IP69 / IP69K
Connection	M8 x 1 connector, 4-pin
Material	
Housing	PC (Polycarbonate)
Optical face	PMMA
Mass	approx. 10 g
Dimensions	
Height	44.5 mm
Width	11 mm
Depth	21.5 mm

## Connection



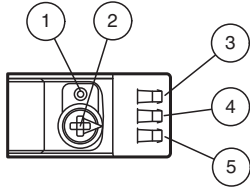
## Connection Assignment



Wire colors in accordance with EN 60947-5-2

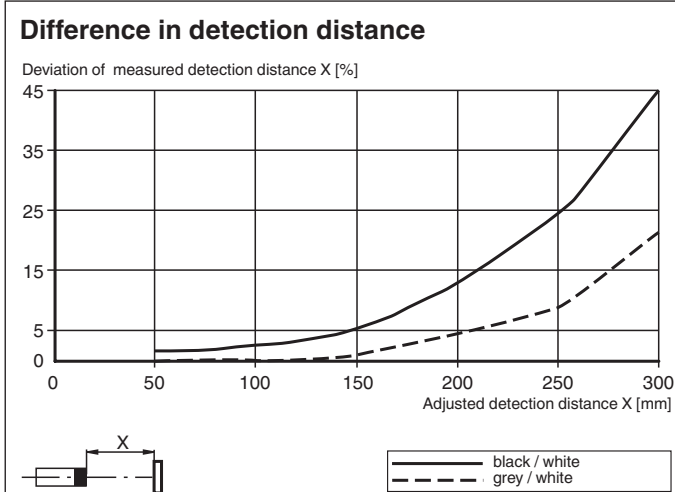
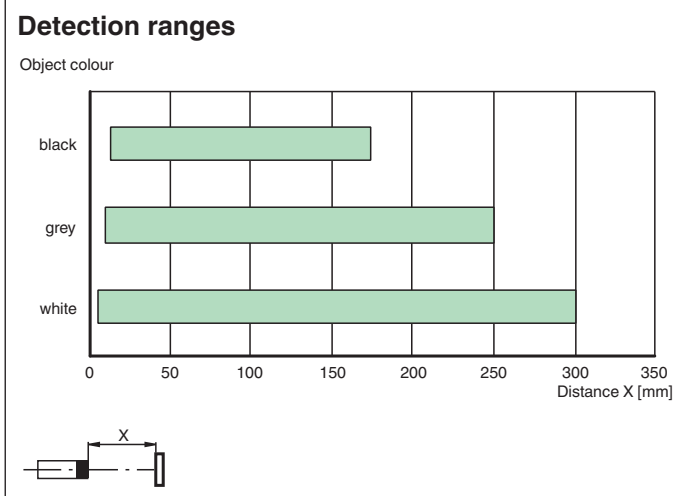
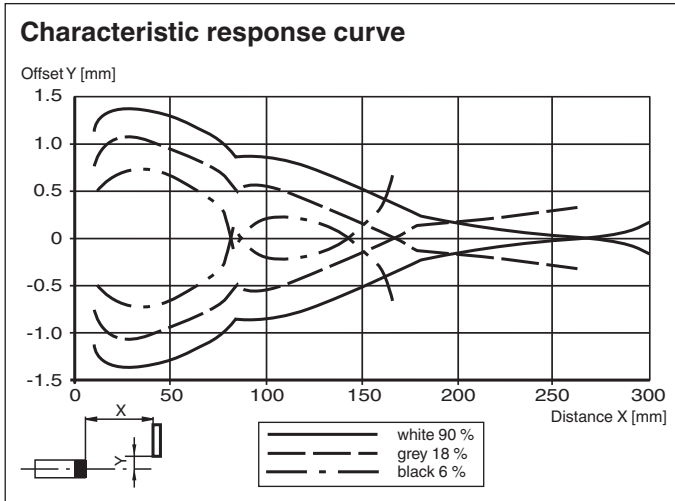
1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)

**Assembly**



1	Light-on / dark-on changeover switch
2	Sensing range adjuster
3	Operating indicator / dark on
4	Signal indicator
5	Operating indicator / light on

**Characteristic Curve**



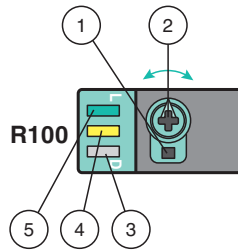
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**Safety Information**



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## Configuration



- 1 - Light-on / dark-on changeover switch
- 2 - Sensing range / sensitivity adjuster
- 3 - Operating indicator / dark on
- 4 - Signal indicator
- 5 - Operating indicator / light on

To unlock the adjustment functions turn the sensing range /sensitivity adjuster for more than 180 degrees.

### Sensing Range / Sensitivity

Turn sensing range / sensitivity adjuster clockwise to increase sensing range / sensitivity.

Turn sensing range / sensitivity adjuster counter clockwise to decrease sensing range / sensitivity.

If the end of the adjustment range is reached, the signal indicator starts flashing with 8 Hz.

### Light-on / Dark-on Configuration

Press the light-on / dark-on changeover switch for more than 1 second (less than 4 seconds). The light-on / dark-on mode changes and the operating indicators are activated accordingly.

If you press the light-on / dark-on changeover switch for more than 4 seconds, the light-on /dark-on mode changes back to the original setting. On release of the light-on / dark-on changeover switch the current state is activated.

### Restore Factory Settings

Press the light-on / dark-on changeover switch for more than 10 seconds (less than 30 seconds) until all LEDs turn off. On release of the light-on / dark-on changeover switch the signal indicator turns on. After 5 seconds the sensor resumes operation with factory default settings.

After 5 minutes of inactivity the sensing range / sensitivity adjustment is locked. In order to reactivate the sensing range / sensitivity adjustment, turn the sensing range /sensitivity adjuster for more than 180 degrees.

### Factory setting

- Maximum sensing range
- Light on