



Retroreflective sensor (glass) OBG5000-R100-E5-V3



- Miniature design with versatile mounting options
- Detects transparent objects, i.e., clear glass, PET and transparent
- Two machines in one: clear object detection or reflection operating mode with long range
- High degree of protection IP69K

Retroreflective sensor with polarization filter for clear object detection







Function

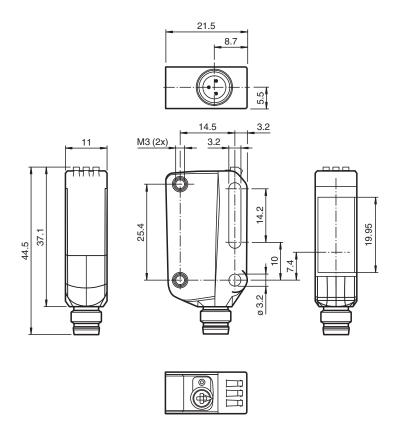
The R100 series miniature optical sensors are the first devices of their kind to offer an endto- end solution in a small single standard design from thru-beam sensor through to a distance measurement device. As a result of this design, the sensors are able to perform practically all standard automation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

The entire series enables sensors to communicate via IO-Link.

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

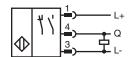


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General specifications	
Effective detection range	0 3.5 m in TEACH mode; 0 5 m at switch position "N"
Reflector distance	0 3.5 m in TEACH mode; 0 5 m at switch position "N"
Threshold detection range	6 m
Reference target	H85-2 reflector
Light source	LED
Light type	modulated visible red light
LED risk group labelling	exempt group
Diameter of the light spot	approx. 170 mm at a distance of 3.5 m
Opening angle	approx. 5 °
Ambient light limit	EN 60947-5-2
Functional safety related parameters	
MTTF _d	600 a
Mission Time (T _M)	20 a
Diagnostic Coverage (DC)	0 %
Indicators/operating means	
Operation indicator	Green LED: Permanently lit - power on Flashing (4 Hz) - short circuit
Function indicator	Yellow LED: Permanently lit - light path clear Permanently off - object detected Flashing (4 Hz) - insufficient operating reserve
Control elements	Teach-In key

Operating voltage U _B 10 30 V DC Ripple max. 10 % No-load supply current I ₀ < 25 mA at 24 V supply voltage	Technical Data		
18 % - clear glass bottles	Control elements		5-step rotary switch for operating modes selection
Operating voltage U _B 10 30 V DC Ripple max. 10 % No-load supply current Ig < 25 m Aa t 24 V supply voltage	Contrast detection levels		18 % - clear glass bottles 40 % - colored glass or opaque materials
Ripple	Electrical specifications		
No-load supply current In < 25 mA at 24 V supply voltage Protection class III Dutput Dutput Switching type The switching type of the sensor is adjustable. The default setting is: Q - Pin4* PNP normally open / dark-on Signal output 1 PNP, short-circuit protected, reverse polarity protected Switching current max. 30 V DC Switching current max. 100 mA , resistive load Usage category DC-12 and DC-13 Voltage drop U _d ≤ 1.5 V DC Switching frequency f 500 Hz Response time 1 ms Conformity Communication interface EN 60947-5-2 Approval EN 60947-5-2 Approvals and certificates EN 60947-5-2 UL approval E87056 , cULus Listed , class 2 power supply , type rating 1 Ambient conditions Ambient temperature -20 60 °C (-4 140 °F) Storage temperature 4-0 70 °C (-40 158 °F) Mechanical specifications 1 In m Housing depth 4-5 mm Louising depth 4-5 mm Degree of protection 1	Operating voltage	U _B	10 30 V DC
Protection class III Dutput The switching type of the sensor is adjustable. The default setting is: C - Pin4: PNP normally open / dark-on 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 _d ≤ 1.5 V DC Switching frequency f 500 Hz Response time 1 ms Conformity Communication interface IEC 61131-9 Product standard EN 60947-5-2 Approvals and certificates EN 60947-5-2 Ambient conditions E87056 , oULus Listed , class 2 power supply , type rating 1 Ambient temperature -20 60 °C (-4 140 °F) Storage temperature -20 60 °C (-4 140 °F) Mechanical specifications In m Housing width 1 1 mm Housing depth 21.5 mm Degree of protection IP67 / IP69 / IP69 K Connection M8 x 1 connector, 3-pin Material PMMA	Ripple		max. 10 %
Switching type The switching type of the sensor is adjustable. The default setting is: Q - Pir4: PNP normally open / darK-on Signal output 1 PNP, short-circuit protected, reverse polarity protected switching voltage max. 30 V DC max. 100 mA , resistive load Usage category DC-12 and DC-13 Voltage drop Ud ≤ 1.5 V DC Switching frequency f 500 Hz Response time 1 ms Conformity Communication interface Product standard Approvals and certificates UL approval Ambient conditions Ambient emperature Storage temperature Pd. 40 70 °C (-40 158 °F) Mechanical specifications Housing width Housing depth Degree of protection PMA Housing depth Housing Optical face PMMA PMA PMA PMA PMA PMA PMA PMA PMA P	No-load supply current	I ₀	< 25 mA at 24 V supply voltage
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Q - Pin4: PNP normally open / dark-on	Output		
Switching voltage max. 30 V DC Switching current max. 100 mA, resistive load Usage category DC-12 and DC-13 Voltage drop U _d ≤ 1.5 V DC Switching frequency f 500 Hz Response time 1 ms 1 ms Conformity Communication interface IEC 61131-9 Product standard EN 60947-5-2 4 moderate Approvals and certificates E87056, cULus Listed, class 2 power supply, type rating 1 Ambient conditions E87056, cULus Listed , class 2 power supply, type rating 1 Ambient temperature -20 60 °C (-4 140 °F) Storage temperature -40 70 °C (-40 158 °F) Mechanical specifications 11 mm Housing width 11 mm Housing depth 21.5 mm Degree of protection IP67 / IP69 / IP69 K Connection Ms x 1 connector, 3-pin Material PC (Polycarbonate) Optical face PMMA	Switching type		The switching type of the sensor is adjustable. The default setting is: Q - Pin4: PNP normally open / dark-on
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Housing width Housing height Housing depth Degree of protection Connection Material Housing PC (Polycarbonate) Optical face 11 mm 44.5 mm 21.5 mm IP67 / IP69 / IP69K Connector, 3-pin	Storage temperature		-40 70 °C (-40 158 °F)
Housing height 44.5 mm Housing depth 21.5 mm Degree of protection IP67 / IP69 / IP69 K Connection M8 x 1 connector, 3-pin Material Housing Optical face PMMA	Mechanical specifications		
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Connection M8 x 1 connector, 3-pin Material PC (Polycarbonate) Optical face PMMA	Housing depth		21.5 mm
Material Housing PC (Polycarbonate) Optical face PMMA	Degree of protection		IP67 / IP69 / IP69K
Housing PC (Polycarbonate) Optical face PMMA	Connection		M8 x 1 connector, 3-pin
Optical face PMMA	Material		
	Housing		PC (Polycarbonate)
Mass approx. 10 g	Optical face		PMMA
	Mass		approx. 10 g

Connection



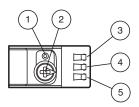
Connection Assignment



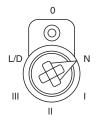
Wire colors in accordance with EN 60947-5-2

1 BN (brown) 3 BU (blue) 4 BK (black)

Assembly

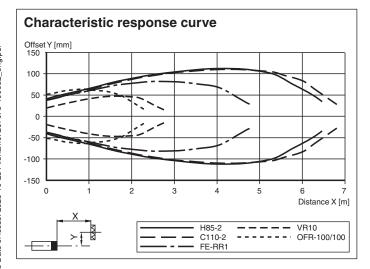


1	Teach-in button	
2	Mode rotary switch	
3	Operating indicator / dark on	
4	Signal indicator	
5	Operating indicator / light on	

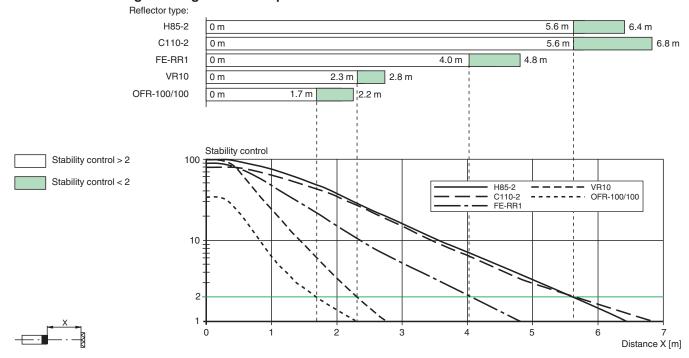


N	Normal mode	
- 1	10 % contrast detection	
Ш	18 % contrast detection	
III	40 % contrast detection	
L/D	Switching type	
0	Keylock	

Characteristic Curve



Relative received light strength in switch position "N"



Commissioning

Teach-in

Use the rotary switch to select the required operating mode: Normal mode (N) or contrast level I – III.

To teach in a threshold or activate an operating mode, press the "TI" button until the yellow and green LEDs flash in phase (approx. 1 s). Release the "TI" button. Teach-in starts.

Successful teach-in is indicated by alternating flashing (2.5 Hz) of the yellow and green LEDs. The sensor will now operate in the selected operating mode with the taught-in threshold.

An unsuccessful teach-in is indicated by rapidly alternating flashing (8 Hz) of the yellow and green LEDs. After an unsuccessful teach-in, the sensor continues to operate with the previous valid setting after the relevant visual fault signal is issued. Every taught-in switching threshold can be re-taught (overwritten) by pressing the "TI" button again.

Note: To ensure that the device functions reliably in Contrast mode, the device must be powered on at least 30 s before teach-in.

Setting the Device to Maximum Sensitivity

- Use the rotary switch to select the Normal mode (N) position.
- Press the "TI" button for > 4 s. The yellow and green LEDs will go out.
- Release the "TI" button.

The settings will be reset to maximum sensitivity. After successfully resetting, the yellow and green LEDs will flash alternately (2.5 Hz).

Switching between light on/dark on

- Use the rotary switch to select the light on/dark on (L/D) position.
- Press the "TI" button for > 1 s. The respective operating indicator LED (L/D) will illuminate green and the switching type will change.
- To reset the switching type, press the "TI" button for > 4 s.The respective operating indicator LED (L/D) will illuminate green and the operating indicator will be reset to the most recently active switching type.

Reset to Default Settings

- Use the rotary switch to select the O position.
- Press the "TI" button for > 10 s. The yellow and the green LEDs will both switch off.
- Release the "TI" button. The yellow LED is on. After resetting, the sensor will operate with the following default settings: