



## Retroreflective sensor (glass)

OBG5000-R100-E4F-V31



- Miniature design with versatile mounting options
- Detects transparent objects, i.e., clear glass, PET and transparent films
- 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

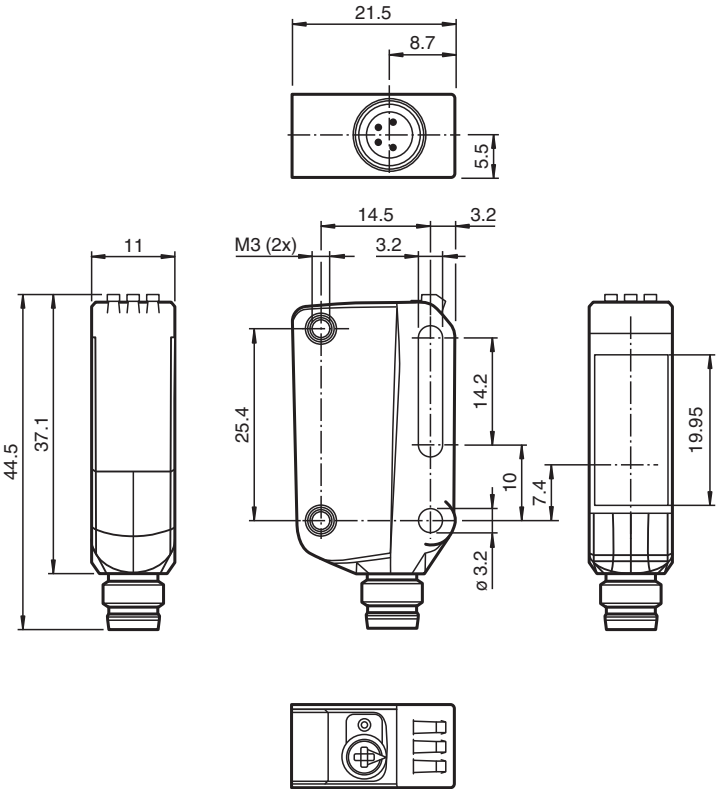
The R100 series miniature optical sensors are the first devices of their kind to offer an end-to-end solution in a small single standard design — from thru-beam sensor through to a distance measurement device. As a result of this design, the sensors are able to perform practically all standard automation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

The 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



Technical Data

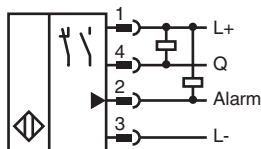
General specifications		
Effective detection range		0 ... 3.5 m in TEACH mode ; 0 ... 5 m at switch position "N"
Reflector distance		0 ... 3.5 m in TEACH mode ; 0 ... 5 m at switch position "N"
Threshold detection range		6 m
Reference target		H85-2 reflector
Light source		LED
Light type		modulated visible red light
LED risk group labelling		exempt group
Diameter of the light spot		approx. 170 mm at a distance of 3.5 m
Angle of divergence		approx. 5 °
Ambient light limit		EN 60947-5-2
Functional safety related parameters		
MTTF <sub>d</sub>		600 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		Yellow LED: Permanently lit - light path clear Permanently off - object detected Flashing (4 Hz) - insufficient operating reserve
Control elements		Teach-In key
Control elements		5-step rotary switch for operating modes selection

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

## Technical Data

Contrast detection levels		10 % - clean, water filled PET bottles 18 % - clear glass bottles 40 % - colored glass or opaque materials Adjustable via rotary switch
<b>Electrical specifications</b>		
Operating voltage	$U_B$	10 ... 30 V DC
Ripple		max. 10 %
No-load supply current	$I_0$	< 25 mA at 24 V supply voltage
Protection class		III
<b>Output</b>		
Pre-fault indication output		1 NPN function reserve output (alarm), short-circuit protected, reverse polarity protected, open collector
Switching type		The switching type of the sensor is adjustable. The default setting is: Q - Pin4: NPN normally open / dark-on Alarm output - Pin2: NPN normally closed
Signal output		1 NPN, 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	$U_d$	$\leq 1.5$ V DC
Switching frequency	$f$	500 Hz
Response time		1 ms
<b>Conformity</b>		
Communication interface		IEC 61131-9
Product standard		EN 60947-5-2
<b>Approvals and certificates</b>		
UL approval		E87056 , cULus Listed , class 2 power supply , type rating 1
<b>Ambient conditions</b>		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Storage temperature		-40 ... 70 °C (-40 ... 158 °F)
<b>Mechanical specifications</b>		
Housing width		11 mm
Housing height		44.5 mm
Housing depth		21.5 mm
Degree of protection		IP67 / IP69 / IP69K
Connection		M8 x 1 connector, 4-pin
Material		
Housing		PC (Polycarbonate)
Optical face		PMMA
Mass		approx. 10 g

## Connection



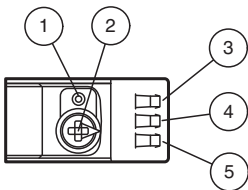
Connection Assignment



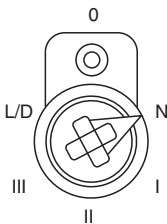
Wire colors in accordance with EN 60947-5-2

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

Assembly



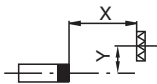
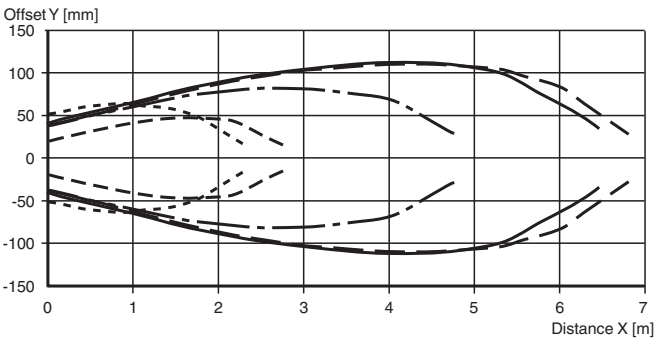
1	Teach-in button
2	Mode rotary switch
3	Operating indicator / dark on
4	Signal indicator
5	Operating indicator / light on



N	Normal mode
I	10 % contrast detection
II	18 % contrast detection
III	40 % contrast detection
L/D	Switching type
0	Keylock

Characteristic Curve

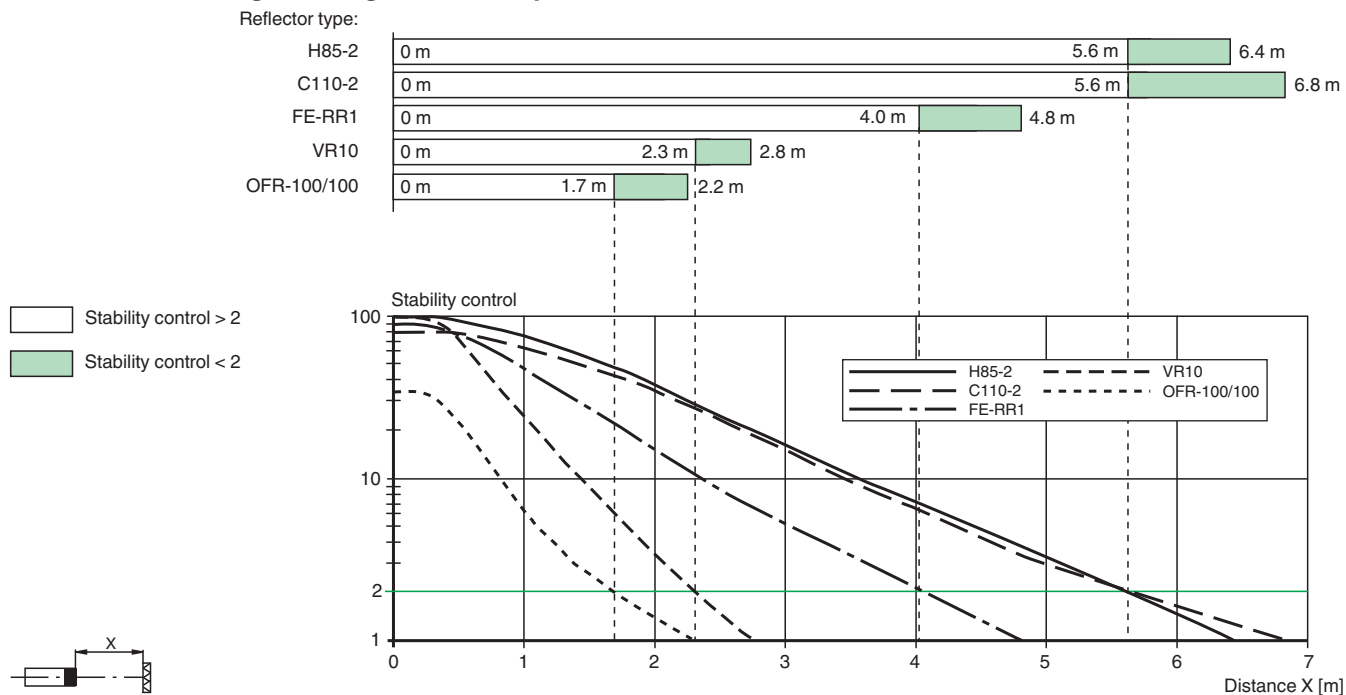
Characteristic response curve









—	H85-2	- - -	VR10
- - -	C110-2	- · - · -	OFR-100/100
- · - · -	FE-RR1		

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## Relative received light strength in switch position "N"



## Accessories

	<b>V31-WM-2M-PUR</b>	Female cordset single-ended, M8, 4-pin, PUR cable
	<b>V31-GM-2M-PUR</b>	Female cordset single-ended, M8, 4-pin, PUR cable
	<b>REF-H85-2</b>	Reflector, rectangular 84.5 mm x 84.5 mm, mounting holes
	<b>REF-H50</b>	Reflector, rectangular 51 mm x 61 mm, mounting holes, fixing strap
	<b>REF-H33</b>	Reflector with screw fixing
	<b>OFR-100/100</b>	Reflective tape 100 mm x 100 mm

## Settings

### 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:

- Normal mode (N)
- Maximum sensitivity adjustment
- Dark on
- Pin 2 (white core): antivalent switching output

## Accessories

Other suitable accessories can be found at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)