Model Number

OBE1000-R3-SE2-0,2M-V3-L

Laser thru-beam sensor

with 0.2 m fixed cable and M8 connector, 3-pin

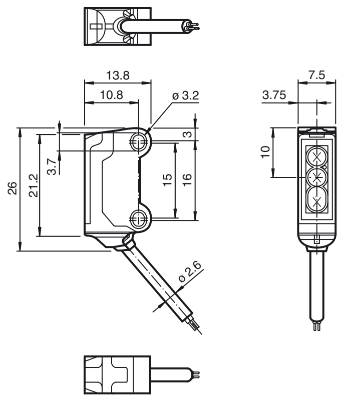
Features

- Ultra-small housing design
- DuraBeam Laser Sensors - durable and employable like an LED
- 45° cable outlet for maximum mounting freedom under extremely tight space constraints
- Improvement in machine availability with abrasion-resistant, antistatic glass front

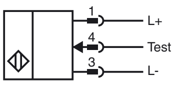
Product information

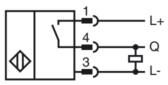
The R3 series nano sensor has been developed for a broad range of applications. It offers excellent durability and is exceptionally easy to install. The housing is compact and, with its 45° cable outlet, can be installed in the smallest spaces. New functional principles and functionality open up a range of new options. The DuraBeam laser sensors are durable and can be used in the same way as a standard sensor. The abrasion-resistant lens allows long operating times close to the moving object.

Dimensions

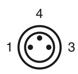


Electrical connection





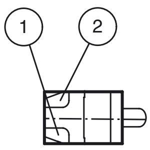
Pinout

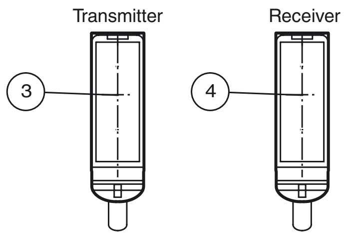


Wire colors in accordance with EN 60947-5-2

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

Indicators/operating means





1	Operating display	green
2	Signal display	yellow
3	Emitter	
4	Receiver	

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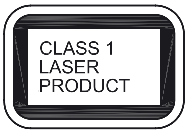
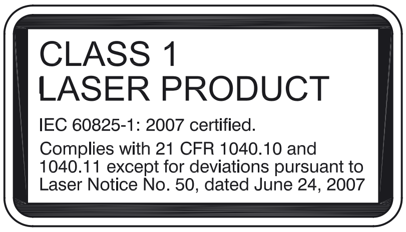
Technical data

System components		
Emitter		OBE10M-R3-0,2M-V3-L
Receiver		OBE1000-R3-E2-0,2M-V3-L
General specifications		
Effective detection range		0 ... 1 m
Threshold detection range		1.5 m
Light source		laser diode
Light type		modulated visible red light , 680 nm
Laser nominal ratings		
Note		LASER LIGHT , DO NOT STARE INTO BEAM
Laser class		1
Wave length		680 nm
Beam divergence		> 5 mrad
Pulse length		approx. 2 µs
Repetition rate		approx. 16.6 kHz
max. pulse energy		9.5 nJ
Diameter of the light spot		approx. 3 mm at a distance of 1000 mm
Angle of divergence		approx. 0.5 °
Optical face		frontal
Ambient light limit		EN 60947-5-2 : 30000 Lux
Functional safety related parameters		
$MTTF_d$		806 a
Mission Time (T_M)		20 a
Diagnostic Coverage (DC)		0 %
Indicators/operating means		
Operation indicator		LED green, statically lit Power on , short-circuit : LED green flashing (approx. 4 Hz)
Function indicator		Receiver: LED yellow, lights up when light beam is free, flashes when falling short of the stability control ; OFF when light beam is interrupted
Electrical specifications		
Operating voltage	U_B	12 ... 24 V
No-load supply current	I_0	Emitter: ≤ 10 mA Receiver: ≤ 8 mA
Protection class		III
Input		
Test input		Test of switching function at 0 V
Output		
Switching type		NO contact
Signal output		1 PNP output, short-circuit protected, reverse polarity protected, open collector
Switching voltage		max. 30 V DC
Switching current		max. 50 mA , resistive load
Voltage drop	U_d	≤ 1.5 V DC
Switching frequency	f	approx. 2 kHz
Response time		250 µs
Conformity		
Product standard		EN 60947-5-2
Laser safety		EN 60825-1:2007
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Storage temperature		-30 ... 70 °C (-22 ... 158 °F)
Mechanical specifications		
Housing width		7.5 mm
Housing height		26 mm
Housing depth		13.8 mm
Degree of protection		IP67
Connection		200 mm fixed cable with 3-pin, M8 x 1 connector
Material		
Housing		PC/ABS and TPU
Optical face		glass
Cable		PUR
Mass		approx. 10 g Per sensor
Cable length		200 mm

Approvals and certificates	
UL approval	E87056 , cULus Recognized, Class 2 Power Source
CCC approval	CCC approval / marking not required for products rated ≤36 V
FDA approval	IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007

Laserlabel





Accessories

V3-WM-2M-PUR
Female cordset single-ended, M8, 3-pin, PUR cable

MH-R3-01
Mounting aid for sensors from the R3 series, mounting bracket

MH-R3-02
Mounting aid for sensors from the R3 series, mounting bracket

MH-R3-03
Mounting aid for sensors from the R3 series, mounting bracket

MH-R3-04
Mounting aid for sensors from the R3 series, mounting bracket

Other suitable accessories can be found at www.pepperl-fuchs.com

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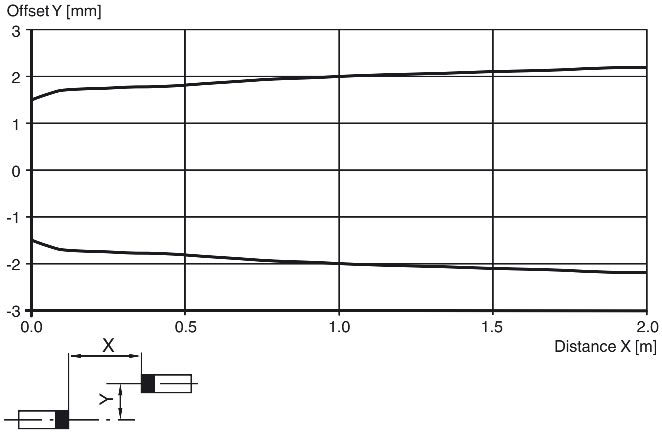
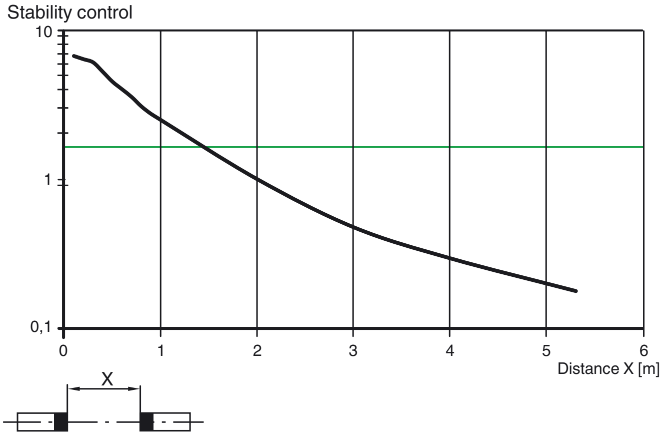
Curves/Diagrams

Characteristic response curve lateral movement



Relative received light strength



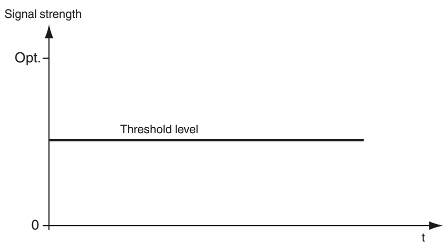
Teach-In Methods

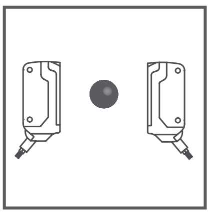
The thru-beam sensor enables the switching points to be taught in for optimum adaptation to specific applications. This eliminates the need for additional components such as apertures.

The sensitivity of the thru-beam sensor can be adjusted using three Teach-in methods:

Position Teach

When using this Teach-in method, the following settings are made on the thru-beam sensor:
- The gain is set to an optimum value
- The signal threshold is set to a minimum





Recommended application:
This method enables minuscule particles in the beam path to be detected, and provides exceptional positioning accuracy.
Make sure that there are no objects in the beam path and that the sensor is connected to the power supply.

1. Connect the white cable on the receiver (WH/IN) to the blue cable (BU/0 V) on the receiver.
   The green and yellow LED indicators flash simultaneously at 2.5 Hz
2. Disconnect the white cable on the receiver (WH/IN) from the blue cable (BU/0 V) on the receiver.
   The green and yellow LED indicators flash alternately at 2.5 Hz
3. The end of the Teach-in process is indicated when the green LED indicator lights up static and yellow LED blinks.

Two-Point Teach-In

When using this Teach-in method, the following settings are made on the thru-beam sensor:
- The gain is set to an optimum value
- The signal threshold is set in the center between the two taught signal values

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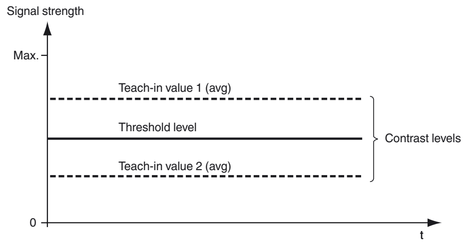
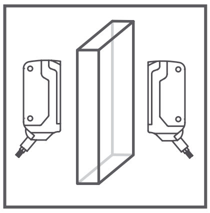
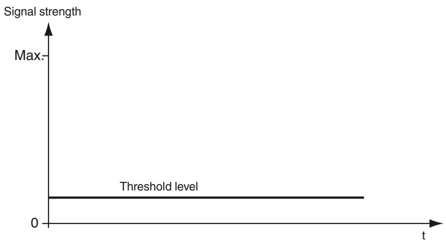


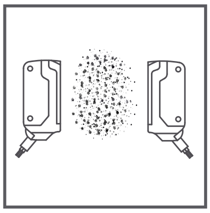


1. Make sure that there are no objects in the beam path and that the sensor is connected to the power supply.
2. Connect the white cable on the receiver (WH/IN) to the blue cable (BU/0 V) on the receiver.
   The green and yellow LED indicators flash simultaneously at 2.5 Hz
3. Position the object in the beam path.
4. Disconnect the white cable on the receiver (WH/IN) from the blue cable (BU/0 V) on the receiver.
   The green and yellow LED indicators flash alternately at 2.5 Hz
5. The end of the Teach-in process is indicated when the green LED indicator lights up static.

Maximum Teach-In

When using this Teach-in method, the following settings are made on the thru-beam sensor:
- The gain is set to a maximum
- The signal threshold is set to a minimum





Recommended application:
Enables an object to be detected with a high excess gain. This can be useful if there is severe environmental contamination or to achieve long operating times.
Make sure that there are no objects in the beam path and that the sensor is connected to the power supply.

6. Cover the receiver or transmitter.
7. Connect the white cable on the receiver (WH/IN) to the blue cable (BU/0 V) on the receiver.
   The green and yellow LED indicators flash simultaneously at 2.5 Hz
8. Disconnect the white cable on the receiver (WH/IN) from the blue cable (BU/0 V) on the receiver.
   The green and yellow LED indicators flash alternately at 2.5 Hz
9. The end of the Teach-in process is indicated when the green LED indicator lights up static.

Laser notice laser class 1

- The irradiation can lead to irritation especially in a dark environment. Do not point at people!
- Maintenance and repairs should only be carried out by authorized service personnel!
- Attach the device so that the warning is clearly visible and readable.
- The warning accompanies the device and should be attached in immediate proximity to the device.
- Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

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