



## Thru-beam sensor (pair)

### OBE1000-R2-SE0-L



- 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



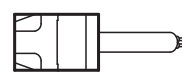
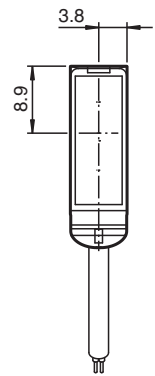
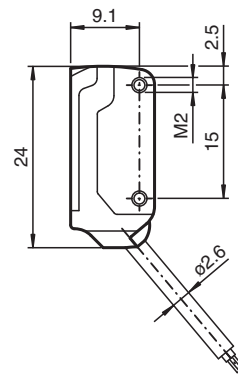
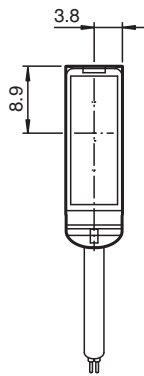
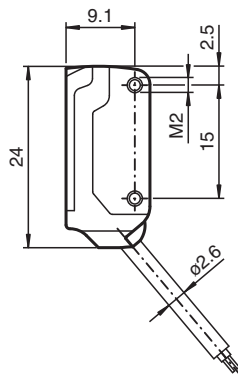
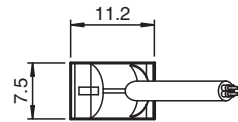
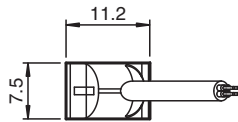
## Function

The R2 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.

## Dimensions

### Transmitter

### Receiver



Release date: 2022-08-25 Date of issue: 2022-08-25 Filename: 282038\_eng.pdf

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

Pepperl+Fuchs Group  
www.pepperl-fuchs.com

USA: +1 330 486 0001  
fa-info@us.pepperl-fuchs.com

Germany: +49 621 776 1111  
fa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091  
fa-info@sg.pepperl-fuchs.com

**PF** PEPPERL+FUCHS

## Technical Data

|   |                |  |   |
|---|----------------|--|---|
| <b>System components</b>                    |                |  |   |
| Emitter                                     |                |  | OBE10M-R2-L   |
| Receiver                                    |                |  | OBE1000-R2-E0-L   |
| <b>General specifications</b>               |                |  |   |
| 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 $\mu$ s   |
| 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   |
| Opening angle                               |                |  | approx. 0.5 °   |
| Optical face                                |                |  | frontal   |
| Ambient light limit                         |                |  | EN 60947-5-2 : 30000 Lux  |
| <b>Functional safety related parameters</b> |                |  |   |
| MTTF <sub>d</sub>                           |                |  | 806 a   |
| Mission Time (T <sub>M</sub> )              |                |  | 20 a  |
| Diagnostic Coverage (DC)                    |                |  | 0 %   |
| <b>Indicators/operating means</b>           |                |  |   |
| 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 operating reserve ; OFF when light beam is interrupted |
| <b>Electrical specifications</b>            |                |  |   |
| Operating voltage                           | U <sub>B</sub> |  | 12 ... 24 V   |
| No-load supply current                      | I <sub>0</sub> |  | Emitter: $\leq$ 10 mA<br>Receiver: $\leq$ 8 mA  |
| Protection class                            |                |  | III   |
| <b>Input</b>                                |                |  |   |
| Test input                                  |                |  | Test of switching function at 0 V   |
| Switching threshold                         |                |  | Teach-In input  |
| <b>Output</b>                               |                |  |   |
| Switching type                              |                |  | NO contact  |
| Signal output                               |                |  | 1 NPN 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 <sub>d</sub> |  | $\leq$ 1.5 V DC   |
| Switching frequency                         | f              |  | approx. 2 kHz   |
| Response time                               |                |  | 250 $\mu$ s   |
| <b>Conformity</b>                           |                |  |   |
| Product standard                            |                |  | EN 60947-5-2  |
| Laser safety                                |                |  | EN 60825-1:2007   |
| <b>Approvals and certificates</b>           |                |  |   |
| EAC conformity                              |                |  | TR CU 020/2011  |
| UL approval                                 |                |  | E87056 , cULus Recognized, Class 2 Power Source   |
| CCC approval                                |                |  | CCC approval / marking not required for products rated $\leq$ 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              |
| <b>Ambient conditions</b>                   |                |  |   |

Release date: 2022-08-25 Date of issue: 2022-08-25 Filename: 282038\_eng.pdf

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

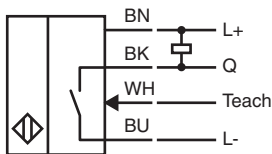
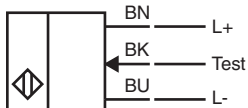
Pepperl+Fuchs Group  
www.pepperl-fuchs.comUSA: +1 330 486 0001  
fa-info@us.pepperl-fuchs.comGermany: +49 621 776 1111  
fa-info@de.pepperl-fuchs.comSingapore: +65 6779 9091  
fa-info@sg.pepperl-fuchs.com

**PEPPERL+FUCHS**

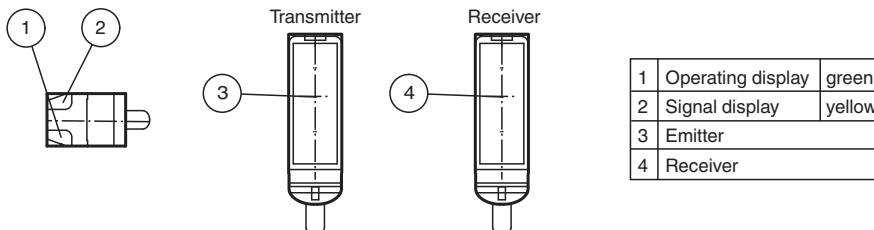
## Technical Data

|                                  |   |
|----------------------------------|---|
| Ambient temperature              | -20 ... 60 °C (-4 ... 140 °F)                                   |
| Storage temperature              | -30 ... 70 °C (-22 ... 158 °F)                                  |
| <b>Mechanical specifications</b> |   |
| Housing width                    | 7.5 mm  |
| Housing height                   | 24 mm   |
| Housing depth                    | 11.2 mm   |
| Degree of protection             | IP67  |
| Connection                       | 2 m fixed cable   |
| <b>Material</b>                  |   |
| Housing                          | PC/ABS and TPU  |
| Optical face                     | glass   |
| Cable                            | PUR   |
| Installation                     | Fixing screws , 2 x M2 allen head screws included with delivery |
| Mass                             | approx. 20 g per sensor   |
| Cable length                     | 2 m   |

## Connection

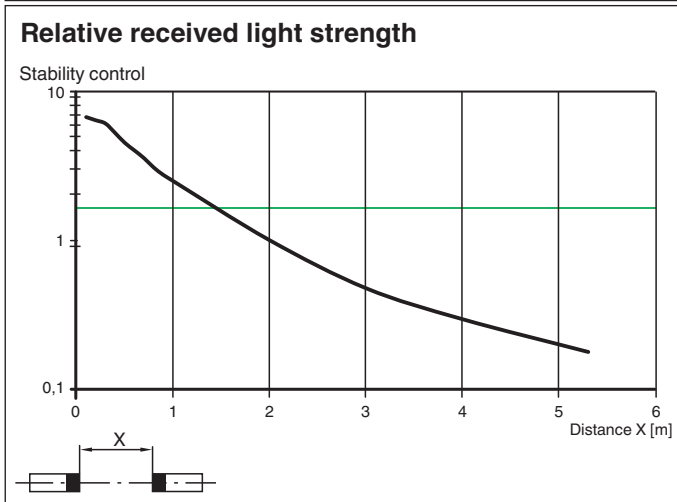
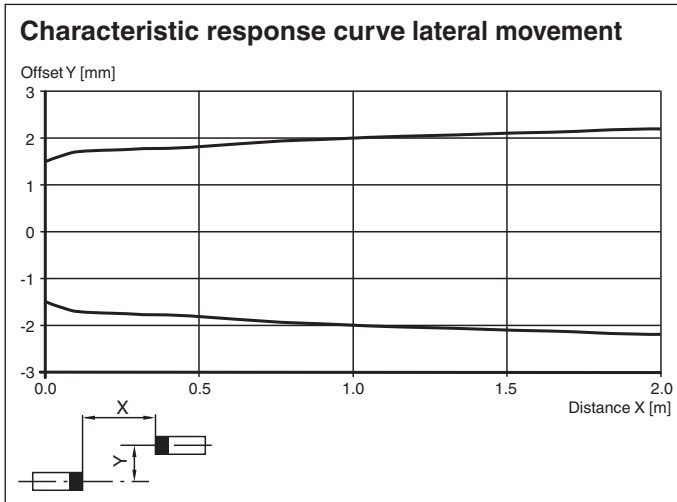


## Assembly



Release date: 2022-08-25 Date of issue: 2022-08-25 Filename: 282038\_eng.pdf

**Characteristic Curve**







**Safety Information**



Release date: 2022-08-25 Date of issue: 2022-08-25 Filename: 282038\_eng.pdf

**Accessories**

|   |                 |  |
|---|-----------------|--|
|  | <b>MH-R2-01</b> | Mounting aid for R2 series, Mounting bracket |
|  | <b>MH-R2-02</b> | Mounting aid for R2 series, Mounting bracket |
|  | <b>MH-R2-03</b> | Mounting aid for R2 series, Mounting bracket |
|  | <b>MH-R2-04</b> | Mounting aid for R2 series, Mounting bracket |

Release date: 2022-08-25 Date of issue: 2022-08-25 Filename: 282038\_eng.pdf

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

Pepperl+Fuchs Group  
www.pepperl-fuchs.com

USA: +1 330 486 0001  
fa-info@us.pepperl-fuchs.com

Germany: +49 621 776 1111  
fa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091  
fa-info@sg.pepperl-fuchs.com

**Teach-In**

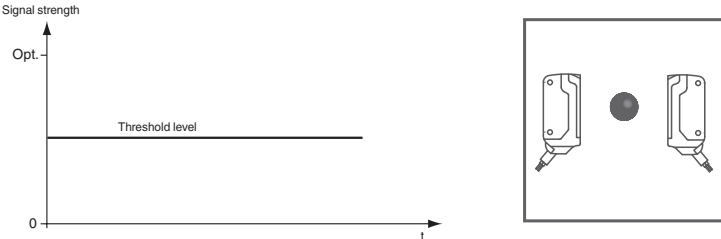
The thru-beam sensor enables the switching points to be taught in for optimum adaptation to specific applications. This eliminates the need for additional components such as apertures.

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:

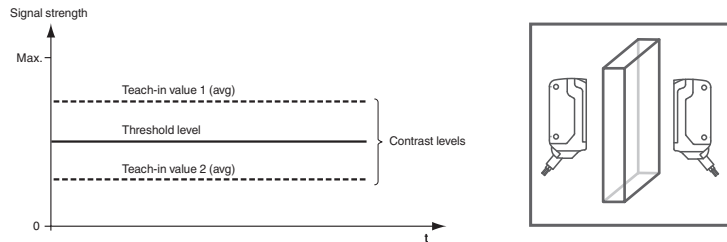
This method enables minuscule particles in the beam path to be detected, and provides exceptional positioning accuracy. Make sure that there are no objects in the beam path and that the sensor is connected to the power supply.

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

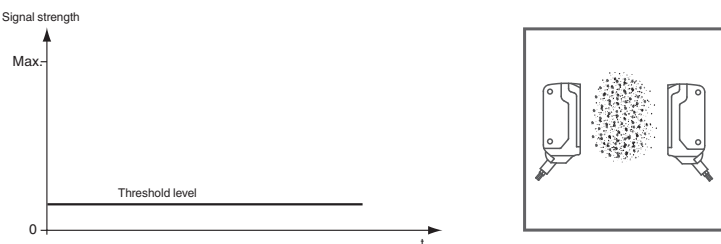


1. Make sure that there are no objects in the beam path and that the sensor is connected to the power supply.
2. Connect the white cable on the receiver (WH/IN) to the blue cable (BU/0 V) on the receiver.  
The green and yellow LED indicators flash simultaneously at 2.5 Hz
3. Position the object in the 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.

Release date: 2022-08-25 Date of issue: 2022-08-25 Filename: 282038\_eng.pdf

## Thru-beam sensor (pair)

OBE1000-R2-SE0-L

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.