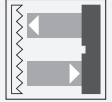




## Retroreflective sensor OBR2000-R2-E2-P-L



- 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

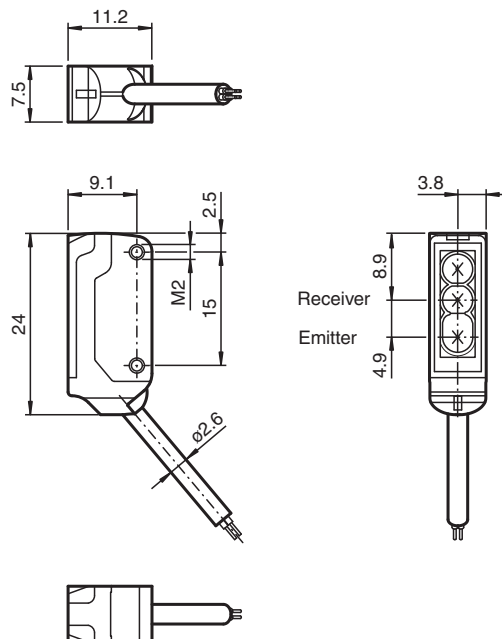
Laser retroreflective sensor, ultra-small design with M2 mounting, polarization filter, 2000 mm detection range, dark on, PNP output, 2 m fixed cable



### Function

The 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.

### Dimensions



### Technical Data

#### General specifications

|                           |                |
|---------------------------|----------------|
| Effective detection range | 0 ... 2 m      |
| Reflector distance        | 40 ... 2000 mm |
| Threshold detection range | 2.3 m          |
| Reference target          | H40 reflector  |

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

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**PEPPERL+FUCHS**

## Technical Data

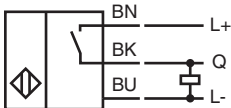
|                                             |                                      |                                                                                                                                               |
|---------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Light source                                | laser diode                          |                                                                                                                                               |
| Light type                                  |                                      | modulated visible red light , 680 nm                                                                                                          |
| Polarization filter                         |                                      | yes                                                                                                                                           |
| 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. 3 µs                                                                                                                                  |
| Repetition rate                             |                                      | approx. 16.6 kHz                                                                                                                              |
| max. pulse energy                           |                                      | 8 nJ                                                                                                                                          |
| Diameter of the light spot                  |                                      | approx. 35 mm at a distance of 2000 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>                           |                                      | 800 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                          |                                      | LED yellow: lights up when receiving the light beam ; 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>                       | < 10 mA                                                                                                                                       |
| Protection class                            |                                      | III                                                                                                                                           |
| <b>Output</b>                               |                                      |                                                                                                                                               |
| Switching type                              |                                      | NO contact / dark-on                                                                                                                          |
| 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 <sub>d</sub>                       | ≤ 1.5 V DC                                                                                                                                    |
| Switching frequency                         | f                                    | approx. 2 kHz                                                                                                                                 |
| Response time                               |                                      | 250 µs                                                                                                                                        |
| <b>Conformity</b>                           |                                      |                                                                                                                                               |
| Product standard                            |                                      | EN 60947-5-2                                                                                                                                  |
| Laser safety                                |                                      | EN 60825-1:2007                                                                                                                               |
| <b>Approvals and certificates</b>           |                                      |                                                                                                                                               |
| 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          |
| <b>Ambient conditions</b>                   |                                      |                                                                                                                                               |
| 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                                                                                                                               |
| Material                                    |                                      |                                                                                                                                               |
| Housing                                     |                                      | PC/ABS and TPU                                                                                                                                |

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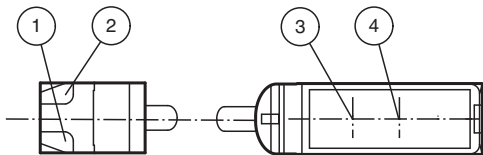
Technical Data

|              |                                                                 |
|--------------|-----------------------------------------------------------------|
| Optical face | PMMA                                                            |
| Cable        | PUR                                                             |
| Installation | Fixing screws , 2 x M2 allen head screws included with delivery |
| Mass         | approx. 20 g                                                    |
| Cable length | 2 m                                                             |

Connection

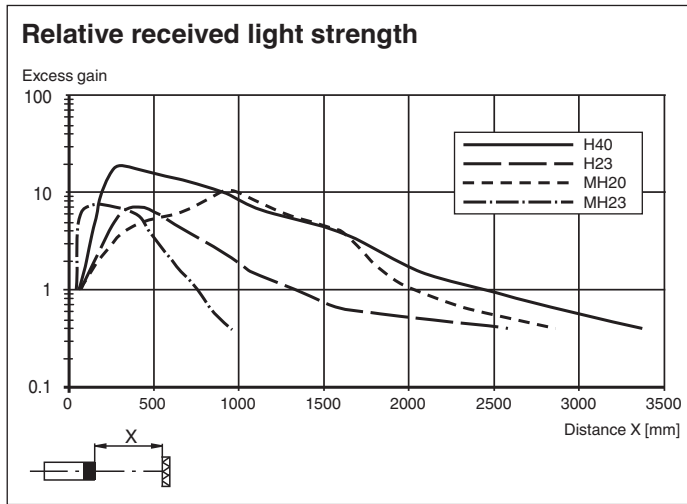


Assembly



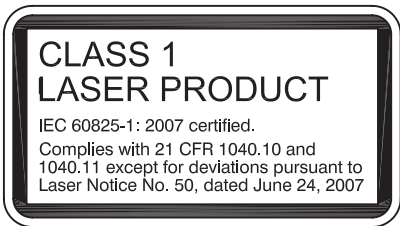
|   |                   |        |
|---|-------------------|--------|
| 1 | Operating display | green  |
| 2 | Signal display    | yellow |
| 3 | Emitter           |        |
| 4 | Receiver          |        |

Characteristic Curve



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Safety Information



Safety Information

Laser Class 1 Information

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.

Accessories

|                                                                                     |          |                                                                                     |
|-------------------------------------------------------------------------------------|----------|-------------------------------------------------------------------------------------|
|  | MH-R2-01 | Mounting aid for R2 series, Mounting bracket                                        |
|  | MH-R2-02 | Mounting aid for R2 series, Mounting bracket                                        |
|  | MH-R2-03 | Mounting aid for R2 series, Mounting bracket                                        |
|  | MH-R2-04 | Mounting aid for R2 series, Mounting bracket                                        |
|  | REF-H40  | Reflector, rectangular 47.5 mm x 23.5 mm, mounting holes, fixing strap              |
|  | REF-H23  | Reflector with mounting holes                                                       |
|  | REF-MH20 | Reflector with Micro-structure, rectangular 32 mm x 20 mm, mounting holes           |
|  | REF-MH23 | Reflector with Micro-structure, rectangular 23 mm x 13.8 mm, diagonal mounting hole |