



## Distance sensor (PRT) OMR50M-R300-UEP-V1



- Pulse Ranging Technology (PRT)
- Analog output 0 ... 10 V
- Good alignability due to red transmission LED
- Reliable detection of reflecting metall objects

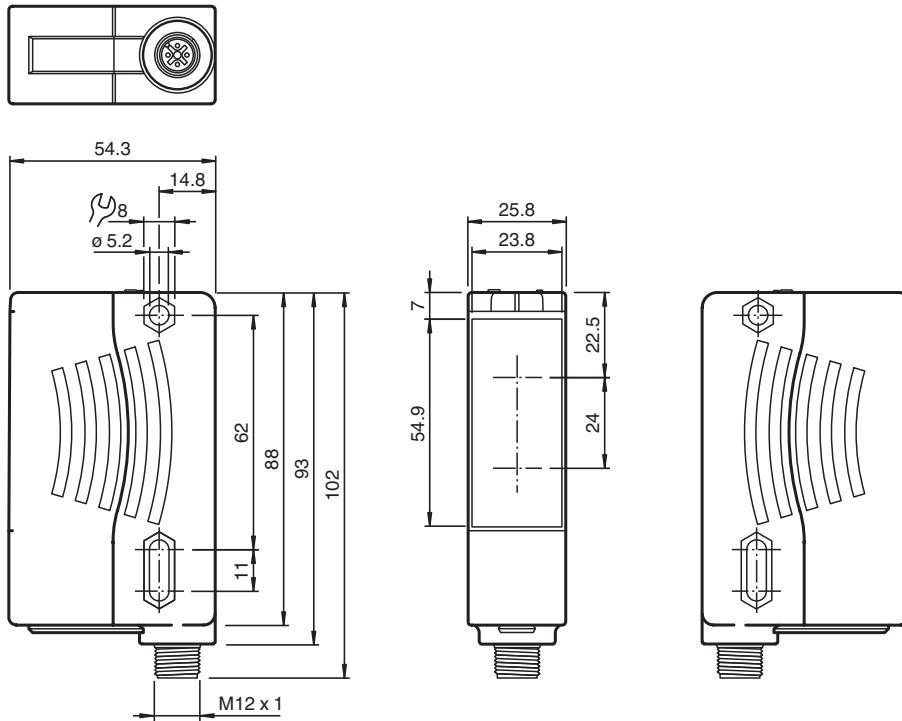
### Distance sensor (PRT)



### Function

The sensors in the R300 series represent a versatile product line and adopt various functional principles. All sensors operate using proven Pulse Ranging Technology (PRT) and are characterized by high sensing ranges and detection ranges. Contained within the compact housing of the 28 series of light barriers, the R300 offers all of the properties of PRT such as maximum reliability when detecting objects and immunity against ambient light and cross-talk. To achieve this, the sensors in the R300 series make use of a number of different kinds of measurement data. What's more, the sensors are equipped with red light that is safe for the human eye as standard, making it easier to align the devices, even across expansive work areas. These features, combined with an innovative and intuitive operating concept, provide solutions for conventional automation tasks delivering the highest level of performance.

### Dimensions



### Technical Data

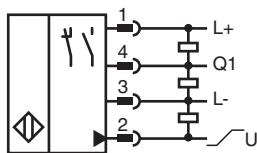
#### General specifications

|                           |              |
|---------------------------|--------------|
| Effective detection range | 0 ... 50 m   |
| Reflector distance        | 0.2 ... 50 m |

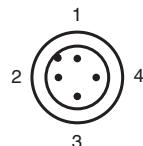
## Technical Data

|   |   |
|---|---|
| Reference target                            | 3 x REF-H100  |
| Light source                                | LED   |
| Light type                                  | modulated visible red light   |
| LED risk group labelling                    | exempt group  |
| Angle deviation                             | max. $\pm 2^\circ$  |
| Measuring method                            | Pulse Ranging Technology (PRT)  |
| Diameter of the light spot                  | approx. 16 cm x 18 cm at a distance of 10 m   |
| Ambient light limit                         | 50000 Lux   |
| Resolution                                  | 12 bit, however > 0.5 mm  |
| <b>Functional safety related parameters</b> |   |
| MTTF <sub>d</sub>                           | 100 a   |
| Mission Time (T <sub>M</sub> )              | 10 a  |
| Diagnostic Coverage (DC)                    | 0 %   |
| <b>Indicators/operating means</b>           |   |
| Operation indicator                         | LED green   |
| Function indicator                          | 2 LEDs yellow for switching state   |
| Teach-In indicator                          | Teach-In: LED green/yellow equiphase flashing; 2.5 Hz<br>Teach Error: LED green/yellow non equiphase flashing; 8.0 Hz               |
| Control elements                            | 5-step rotary switch for operating modes selection (threshold setting and operating modes)  |
| Control elements                            | Switch for setting the threshold values   |
| <b>Electrical specifications</b>            |   |
| Operating voltage                           | U <sub>B</sub> 10 ... 30 V DC   |
| Ripple                                      | 10 % within the supply tolerance  |
| No-load supply current                      | I <sub>0</sub> $\leq 80$ mA / 24 V DC   |
| Time delay before availability              | t <sub>v</sub> < 0.7 s, for temperatures <-30°C compliance of the specification 5 mins after power on                               |
| <b>Output</b>                               |   |
| Signal output                               | 1 push-pull (4 in 1) output, short-circuit protected, reverse polarity protected, overvoltage protected, 1 analog output 0 ... 10 V |
| Switching voltage                           | max. 30 V DC  |
| Switching current                           | max. 100 mA   |
| Measurement output                          | 1 analog output 0 V ... 10 V ; R <sub>min</sub> = 1 k $\Omega$  |
| Switching frequency                         | f 50 Hz   |
| Response time                               | 5 ms  |
| <b>Conformity</b>                           |   |
| Product standard                            | EN 60947-5-2  |
| <b>Measurement accuracy</b>                 |   |
| Repeat accuracy                             | < 5 mm  |
| <b>Approvals and certificates</b>           |   |
| UL approval                                 | E87056, cULus Listed, class 2 power supply, type rating 1   |
| <b>Ambient conditions</b>                   |   |
| Ambient temperature                         | -40 ... 55 °C (-40 ... 131 °F)  |
| Storage temperature                         | -40 ... 70 °C (-40 ... 158 °F)  |
| <b>Mechanical specifications</b>            |   |
| Housing width                               | 25.8 mm   |
| Housing height                              | 88 mm   |
| Housing depth                               | 54.3 mm   |
| Degree of protection                        | IP67  |
| Connection                                  | 4-pin, M12 x 1 connector  |
| Material                                    |   |
| Housing                                     | Plastic ABS   |
| Optical face                                | PMMA  |
| Mass  | 90 g  |

## Connection



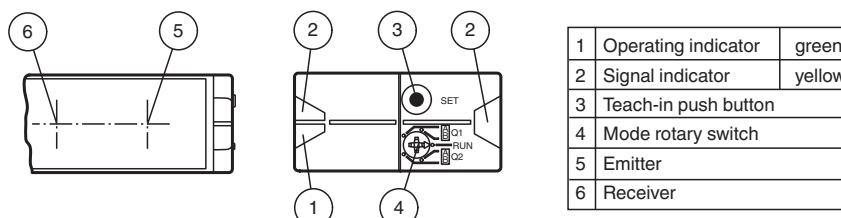
## Connection Assignment



Wire colors in accordance with EN 60947-5-2

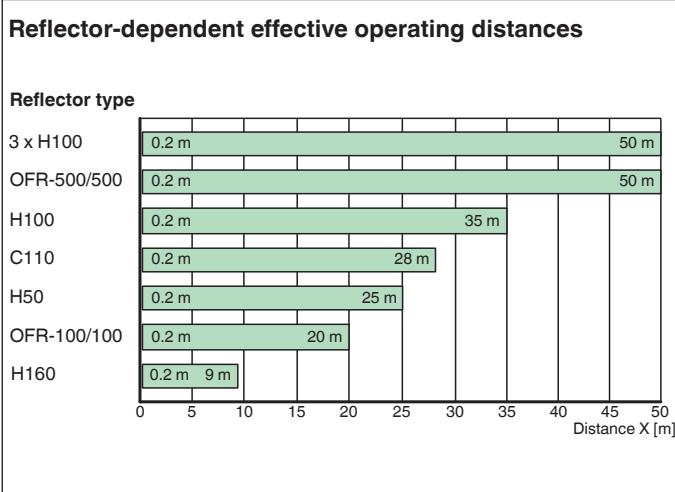
|   |    |         |
|---|----|---------|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue)  |
| 4 | BK | (black) |

## Assembly



## Characteristic Curve

Release date: 2023-04-05 Date of issue: 2023-04-05 Filename: 297740\_eng.pdf



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

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## Accessories

|   |                     |   |
|---|---------------------|---|
|    | <b>OMH-05</b>       | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm           |
|    | <b>OMH-07-01</b>    | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm           |
|    | <b>OMH-21</b>       | Mounting bracket: mounting aid for sensors in the RL* series            |
|    | <b>OMH-22</b>       | Mounting aid for RL* series   |
|    | <b>OMH-VDM28-01</b> | Metal enclosure for inserting protective panes or apertures             |
|    | <b>OMH-VDM28-02</b> | Mounting and fine adjustment device for sensors from the 28 series      |
|    | <b>OMH-RLK29-HW</b> | Mounting bracket for rear wall mounting                                 |
|    | <b>OMH-K01</b>      | dove tail mounting clamp  |
|    | <b>OMH-K03</b>      | dove tail mounting clamp  |
|  | <b>V1-G-2M-PUR</b>  | Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable grey |
|  | <b>V1-W-2M-PUR</b>  | Female cordset single-ended M12 angled A-coded, 4-pin, PUR cable grey   |

## Additional Information

### Intended Use

#### Mounting instructions:

The sensor can be mounted directly with thru-holes or by using a fixing bracket or mounting clamp (not included in the scope of delivery).

Ensure that the surface is level in order to prevent the housing from becoming distorted when the fittings are tightened. It is advisable to secure the nuts and screws to prevent the sensor from being misaligned.

#### Connection:

Connect the device as set out in the connection diagram.

#### Adjustment:

The green LED lights up when the operating voltage is applied.

Adjust the sensor so that the light spot is on the center of the reflector.

### Installation Note

A pressure equalization membrane is fitted on the sensor nameplate.

When mounting, make sure that the pressure equalization membrane is not sealed off.

#### Teach-in

Use the rotary switch for switching signal **Q1** to select the relevant switching threshold

A and/or B to teach in.

The yellow LEDs indicate the current state of the selected output.

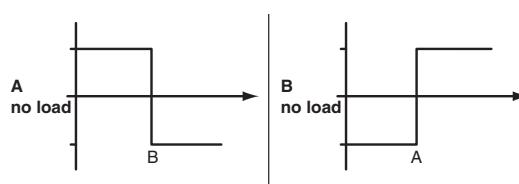
To teach in a switching threshold, press and hold the "SET" button until the yellow and green LEDs flash in phase (approx. 1 s). Teach-in starts when the "SET" button is released.

Successful Teach-in is indicated by the yellow and green LEDs flashing alternately (2.5 Hz). An unsuccessful Teach-in is indicated by the yellow and green LEDs rapidly flashing alternately (8 Hz).

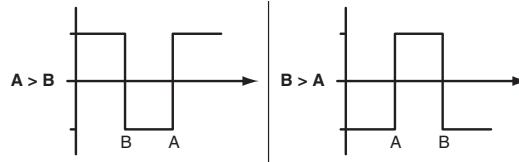
After an unsuccessful Teach-in, the sensor continues to operate with the previous valid setting after the relevant visual fault signal is issued.

Different switching modes can be defined by teaching in the relevant distance data for switching thresholds A and B.

Single-point operation:



Window operation:



Every taught-in switching threshold can be retaught (overwritten) by pressing the "SET" button again.

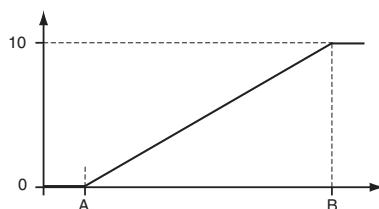
A taught-in value can be reset by pressing the "SET" button for > 4 s. The yellow and green LEDs go out simultaneously to indicate that this procedure has been completed. The reset process starts when the "SET" button is released. A successful reset is indicated by the yellow and green LEDs flashing alternately (2.5 Hz). The minimum and maximum values for analog output **Q2** are taught in in the same way as for the switching output:

The following values apply: A = 0 V

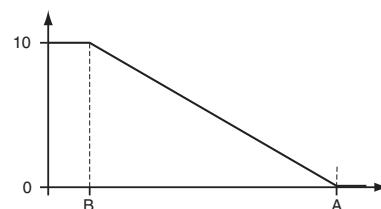
B = 10 V

This provides three different options for operation:

**A < B -> rising slope**



**A > B -> falling slope**



#### Resetting to Factory Settings:

Factory settings can be restored by pressing the "SET" button for > 10 s with the rotary switch in the "Run" position. The yellow

and green LEDs go out simultaneously to indicate that this procedure has been completed. The reset starts when the "SET" button is released. The green LED lights up to indicate that the reset has completed successfully. After completing the reset, the sensor will immediately function with the factory settings.