Diffuse mode sensor (PRT)

OQD8000-R300-2EP-V1-L

- Extremely long detection range paves the way for new applications
- Pulse Ranging Technology (PRT)
- Visible light source for easy alignment
- Minimal black-white difference
- Absolutely reliable background suppression

Diffuse sensor with measurement core technology

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.

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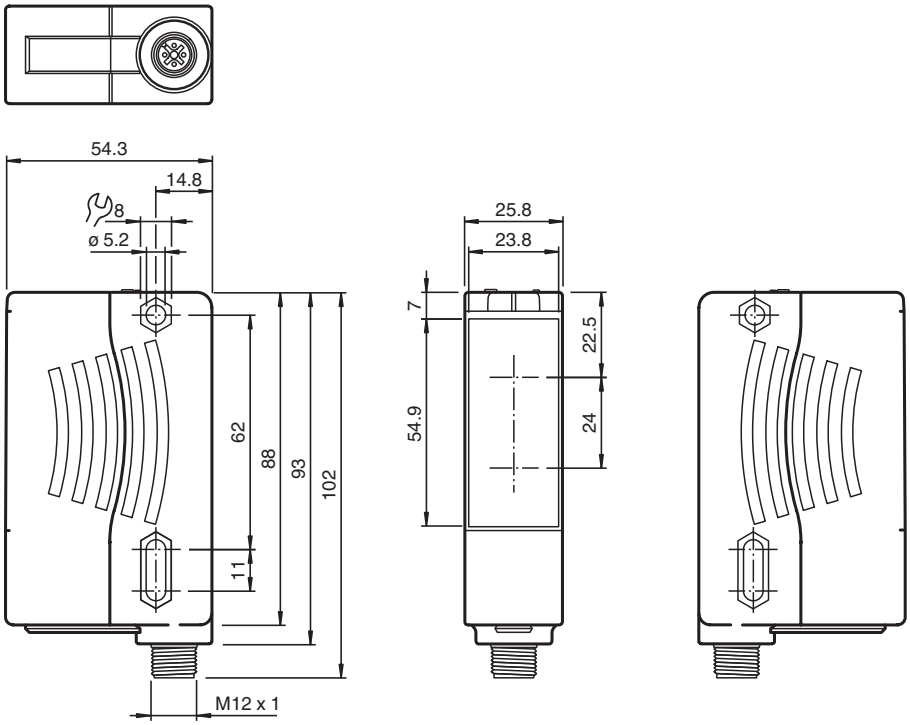
Dimensions



Technical Data

General specifications	
Detection range	0.03 ... 8 m
Adjustment range	0.05 ... 8 m
Reference target	Kodak white (90%)
Light type	modulated visible red light
Laser nominal ratings	
Note	LASER LIGHT , DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS
Laser class	1M
Wave length	660 nm
Beam divergence	< 25 mrad
Pulse length	4 ns
Repetition rate	250 kHz
max. pulse energy	< 2.4 nJ
Black-white difference (6 %/90 %)	< 0.5 %
Angle deviation	max. ± 2°
Measuring method	Pulse Ranging Technology (PRT)
Diameter of the light spot	vertical 60 mm , horizontal 30 mm at a distance of 2 m
Ambient light limit	50000 Lux
Functional safety related parameters	
$MTTF_d$	100 a
Mission Time (T_M)	10 a
Diagnostic Coverage (DC)	0 %

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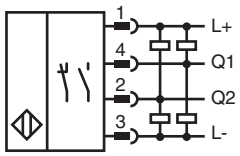
Technical Data

Indicators/operating means		
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 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
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC
Ripple		10 % within the supply tolerance
No-load supply current	I_0	≤ 80 mA / 24 V DC
Time delay before availability	t_v	< 0.7 s , for temperatures <-30°C compliance of the specification 5 mins after power on
Output		
Signal output		2 push-pull (4 in 1) outputs, short-circuit protected, reverse polarity protected
Switching voltage		max. 30 V DC
Switching current		max. 100 mA
Switching frequency	f	50 Hz
Response time		5 ms
Conformity		
Product standard		EN 60947-5-2
Laser safety		EN 60825-1:2014
Approvals and certificates		
UL approval		E87056 , cULus Listed , class 2 power supply , type rating 1
FDA approval		IEC 60825-1:2014 Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007
Ambient conditions		
Ambient temperature		-40 ... 55 °C (-40 ... 131 °F)
Storage temperature		-40 ... 70 °C (-40 ... 158 °F)
Mechanical specifications		
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

Connect the device as set out in the connection diagram.

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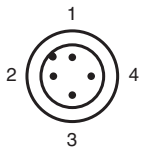
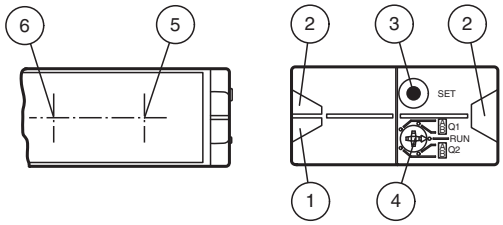
Connection Assignment



Wire colors in accordance with EN 60947-5-2

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

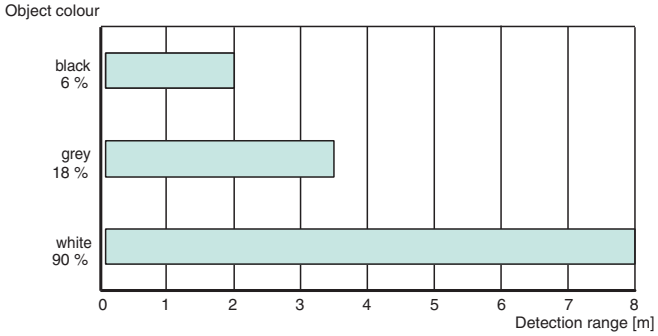
Assembly



1	Operating indicator	green
2	Signal indicator	yellow
3	Teach-in push button	
4	Mode rotary switch	
5	Emitter	
6	Receiver	

Characteristic Curve

Detection ranges



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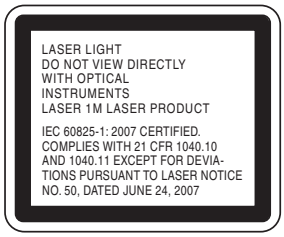
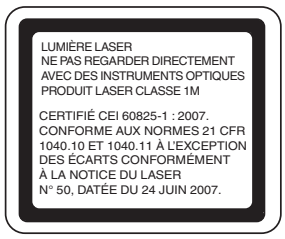
Safety Information





Safety Information

Laser Class 1M Information
The irradiation can lead to irritation especially in a dark environment. Do not point at people!
Caution: laser light, do not observe laser light with optical instruments such as magnifying glasses, microscopes, telescopes or binoculars.
Maintenance and repairs should only be carried out by authorized service personnel!
Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Accessories

	OMH-05	Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
	OMH-21	Mounting bracket: mounting aid for sensors in the RL* series
	OMH-22	Mounting aid for RL* series
	OMH-RLK29-HW	Mounting bracket for rear wall mounting
	OMH-K01	dove tail mounting clamp
	OMH-K03	dove tail mounting clamp
	OMH-VDM28-01	Metal enclosure for inserting protective panes or apertures
	OMH-VDM28-02	Mounting and fine adjustment device for sensors from the 28 series
	OMH-07-01	Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm

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Installation

Mounting

The sensors can be secured directly using thru-holes or using a mounting bracket or mounting clamp. Mounting brackets and clamping elements are available as accessories.
Ensure that the background is level to prevent the housing from becoming distorted when the fittings are tightened.
Secure the nut and screw with spring disks to prevent the sensor from becoming misaligned.

Additional Information

Adjustment

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

Adjust the sensor so that the laser point is on the center of the object.

Additional Information

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.

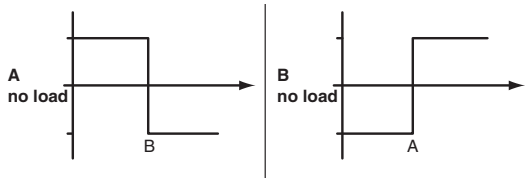
Teach-In

You can use the rotary switch to select the relevant switching threshold A and/or B for teaching in for switching signal **Q1 or Q2.** The yellow LEDs indicate the current state of the selected output.

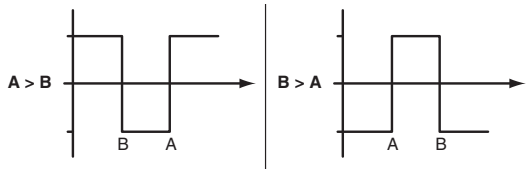
To teach in a switching threshold, press and hold the "SET" button until the yellow and green LEDs flash in phase (approx. 1 s). Teach-in starts when the "SET" button is released.
Successful Teach-in is indicated by the yellow and green LEDs flashing alternately (2.5 Hz). An unsuccessful Teach-in is indicated by the yellow and green LEDs rapidly flashing alternating flashing (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. The yellow and green LEDs flash alternately (2.5 Hz) to indicate that the reset has completed successfully.

Reset to factory settings:
No switching points are set at the factory. The outputs are deactivated.
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.

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