Diffuse mode sensor

OBD8000-R300-2P1-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
- Switch point adjustment with quick twist
- Absolutely reliable background suppression

Diffuse mode sensor

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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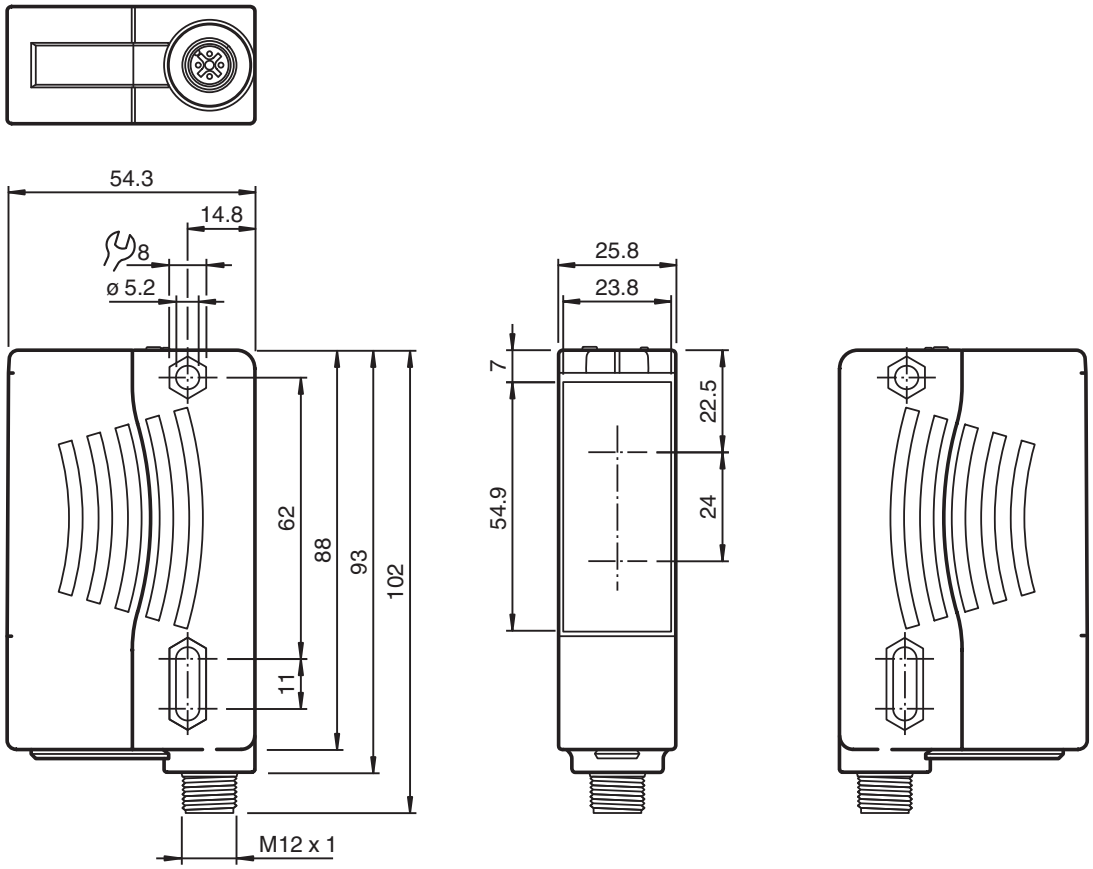
Dimensions



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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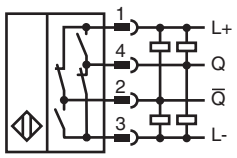
Technical Data

Indicators/operating means		
Operation indicator		LED green
Function indicator		2 LEDs yellow for switching state
Control elements		Sensing range adjuster
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		
Switching type		Q - Pin4: NPN normally closed / dark-on, PNP normally open / light-on /Q - Pin2: NPN normally open / light-on, PNP normally closed / dark-on
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



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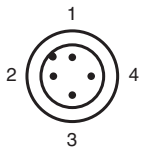
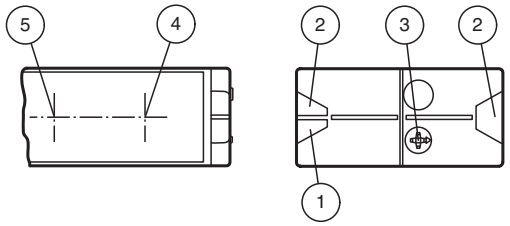
Connection Assignment



Wire colors in accordance with EN 60947-5-2

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

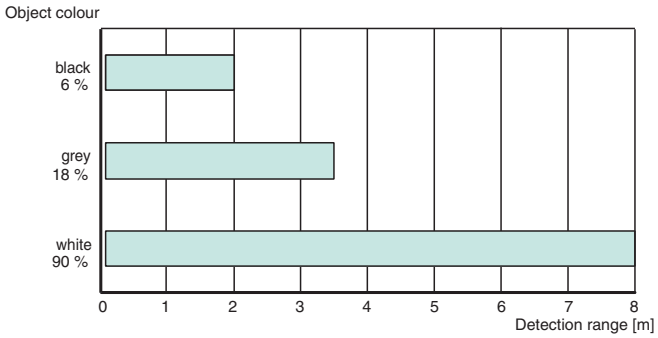
Assembly



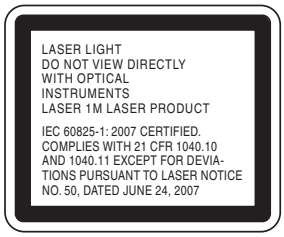
1	Operating indicator	green
2	Signal indicator	yellow
3	Sensing range adjuster	
4	Emitter	
5	Receiver	

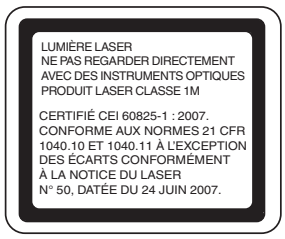
Characteristic Curve

Detection ranges



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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Intended Use

Mounting instructions:
The sensor can be mounted directly by means of 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 using spring disks 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 laser point is on the center of the target.

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.

Operating Concept

Activating the operating function:
Activate the operating function by turning the sensing range adjuster by more than 180°.
If no operation takes place within five minutes, the operating function will be deactivated.

Sensing range adjustment:
To increase the sensing range, turn the sensing range adjuster in a clockwise direction.
To reduce the sensing range, turn the sensing range adjuster in a counterclockwise direction.

To jump directly to the switch point, use the Quick Twist function. This function can be activated by quickly turning the sensing range adjuster. If Quick Twist was successful, the yellow LED will change status.
To make subsequent fine adjustments to the sensing range, turn the sensing range adjuster slowly.

As soon as the scanning range limit has been reached, the green and yellow LEDs will quickly flash alternately (approx. 8 Hz).

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