



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

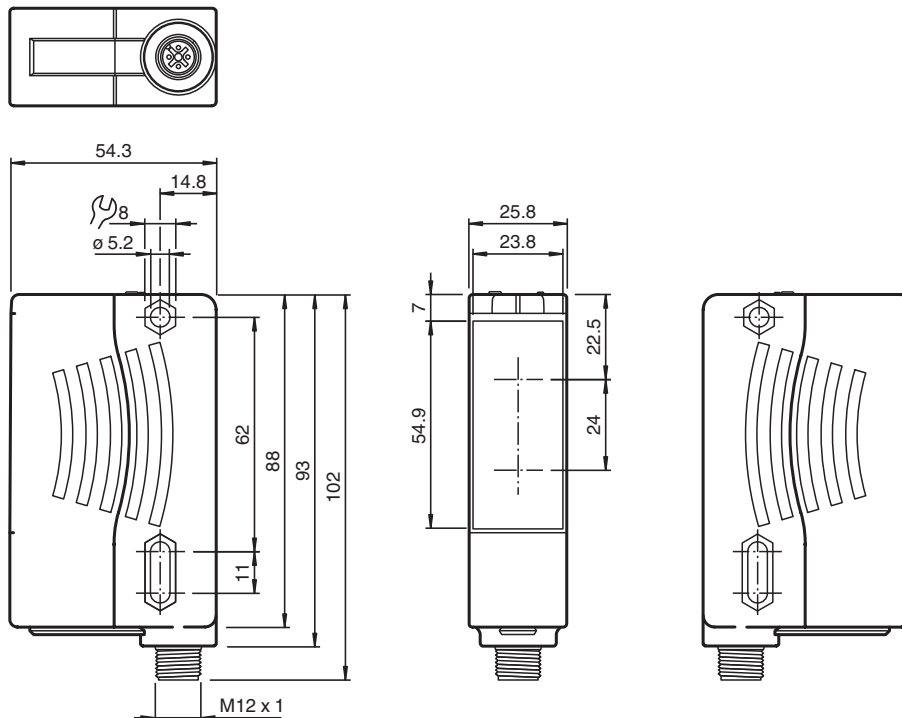
Diffuse mode sensor



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.

Dimensions



Technical Data

General specifications

Detection range	0.03 ... 8 m
Adjustment range	0.05 ... 8 m

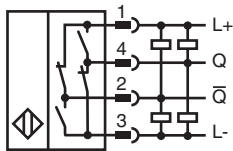
Technical Data

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. $\pm 2^\circ$	
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 %	
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 conformance with IEC 60825-1 Ed. 3 as described in Laser Notice 56, dated May 8, 2019.	
Ambient conditions		
Ambient temperature	-40 ... 55 °C (-40 ... 131 °F)	
Storage temperature	-40 ... 70 °C (-40 ... 158 °F)	
Mechanical specifications		
Degree of protection	IP67	
Connection	4-pin, M12 x 1 connector	
Material		
Housing	Plastic ABS	
Optical face	PMMA	

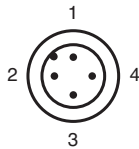
Technical Data

Mass	90 g
Dimensions	
Height	88 mm
Width	25.8 mm
Depth	54.3 mm

Connection Assignment



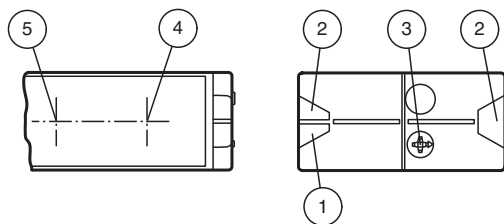
Connection Assignment



Wire colors in accordance with EN 60947-5-2

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

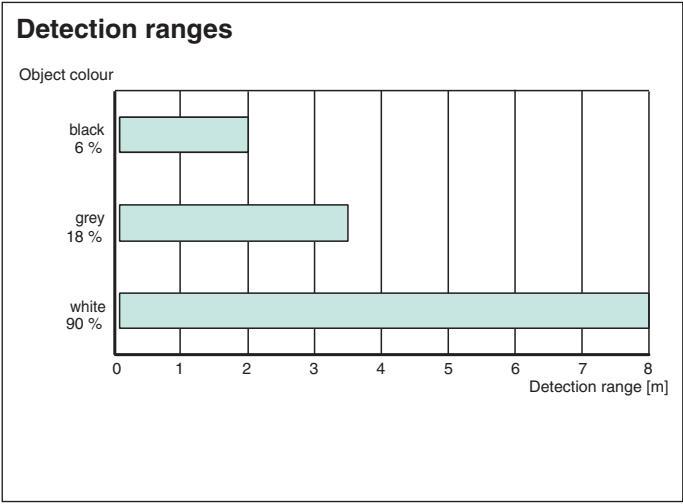
Assembly



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

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Characteristic Curve



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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).