

Thru-beam sensor (pair)

OBE500-R2F-SE2-L

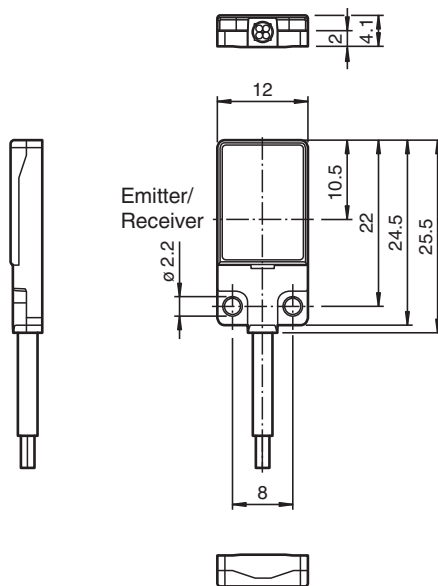


- Very flat design for direct mounting without mounting bracket
- DuraBeam Laser Sensors - durable and employable like an LED
- TEACH-IN
- Detection of partially transparent objects by teach-in
- Detection of small parts or flat objects from 0.25 mm

Thru-beam sensor, flat design, space-saving M2 mounting, 500 mm detection range, red light, dark on, PNP output, fixed cable



Dimensions



Technical Data

System components

Emitter	OBE500-R2F-S-L
Receiver	OBE500-R2F-E2-L

General specifications

Effective detection range	0 ... 500 mm
Threshold detection range	700 mm
Light source	LASER LIGHT
Light type	modulated visible red light , 680 nm

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

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Technical Data

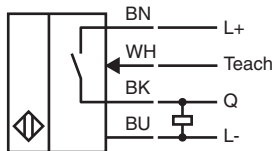
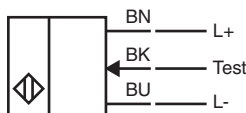
Laser nominal ratings		
Note		LASER LIGHT , DO NOT STARE INTO BEAM
Laser class		1
Wave length		680 nm
Beam divergence		> 5 mrad
Pulse length		approx. 3 μs
Repetition rate		approx. 16.6 kHz
max. pulse energy		8 nJ
Angle deviation		approx. 0.5 °
Object size		typ. starts from 0.5 mm ; typ. from 0.25 mm (after teach-in)
Diameter of the light spot		approx. 4 mm at a distance of 500 mm
Opening angle		approx. 1 °
Optical face		frontal
Ambient light limit		EN 60947-5-2 : 25000 Lux
Functional safety related parameters		
MTTF _d		806 a
Mission Time (T _M)		20 a
Diagnostic Coverage (DC)		0 %
Indicators/operating means		
Operation indicator		LED green, statically lit Power on , short-circuit : LED green flashing (approx. 4 Hz)
Function indicator		Receiver: LED yellow, lights up when light beam is free, flashes when falling short of the operating reserve ; OFF when light beam is interrupted
Electrical specifications		
Operating voltage	U _B	12 ... 24 V
No-load supply current	I ₀	Emitter: ≤ 10 mA Receiver: ≤ 8 mA
Protection class		III
Input		
Test input		Test of switching function at 0 V
Switching threshold		Teach-In input
Output		
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 _d	≤ 1.5 V DC
Switching frequency	f	approx. 2 kHz
Response time		250 μs
Conformity		
Product standard		EN 60947-5-2
Laser safety		EN 60825-1:2007
Approvals and certificates		
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
Ambient conditions		
Ambient temperature		-10 ... 60 °C (14 ... 140 °F)
Storage temperature		-20 ... 70 °C (-4 ... 158 °F)
Mechanical specifications		
Housing width		12 mm
Housing height		25.5 mm
Housing depth		4.1 mm
Degree of protection		IP67

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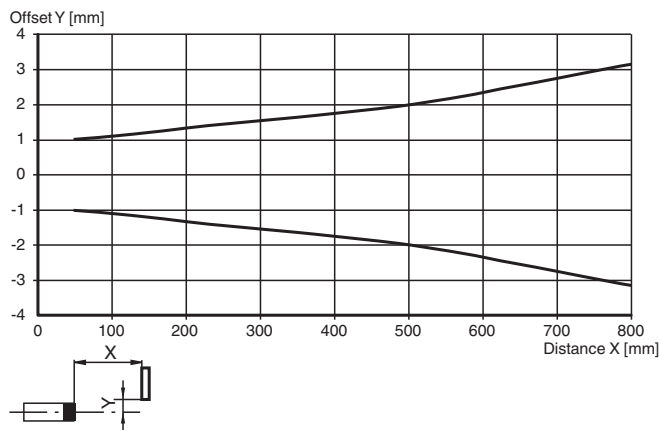
Connection	2 m fixed cable	
Material		
Housing	PC (Polycarbonate) and Stainless steel	
Optical face		PMMA
Cable	PUR	
Mass		approx. 20 g per sensor
Tightening torque, fastening screws	0.25 Nm	
Cable length		2 m

Connection



Characteristic Curve

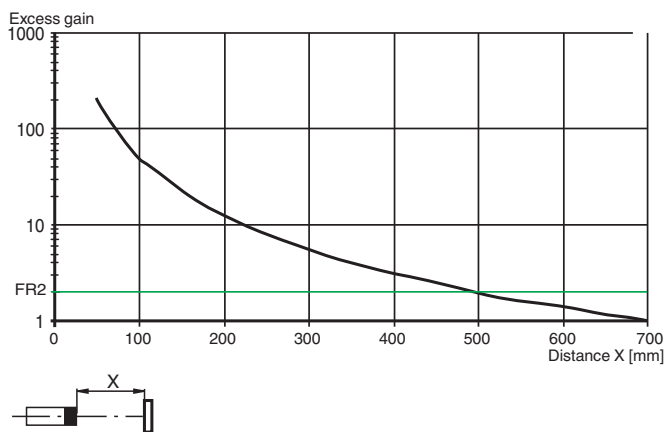
Characteristic response curve



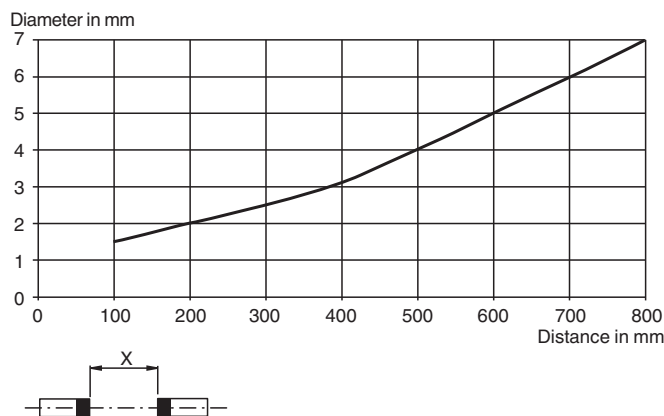
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Characteristic Curve

Relative received light strength



Light spot diameter



Safety Information



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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.

Teach-In

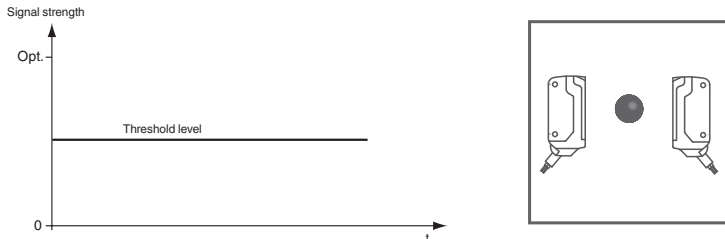
The thru-beam sensor enables the switching points to be taught in for optimum adaptation to specific applications. This eliminates the need for additional components such as apertures.

The sensitivity of the thru-beam sensor can be adjusted using three Teach-in methods:

Position Teach

When using this Teach-in method, the following settings are made on the thru-beam sensor:

- The gain is set to an optimum value
- The signal threshold is set to a minimum



Recommended application:

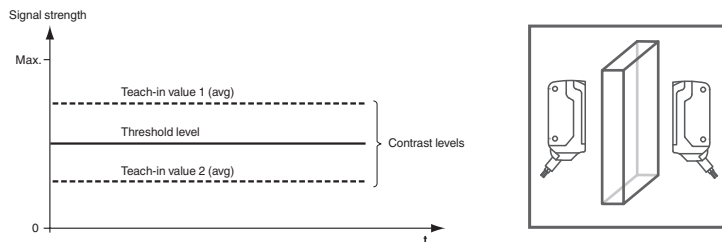
This method enables minuscule particles in the beam path to be detected, and provides exceptional positioning accuracy. Make sure that there are no objects in the beam path and that the sensor is connected to the power supply.

1. Connect the white cable on the receiver (WH/IN) to the blue cable (BU/0 V) on the receiver.
The green and yellow LED indicators flash simultaneously at 2.5 Hz
2. Disconnect the white cable on the receiver (WH/IN) from the blue cable (BU/0 V) on the receiver.
The green and yellow LED indicators flash alternately at 2.5 Hz
3. The end of the Teach-in process is indicated when the green LED indicator lights up static and yellow LED blinks.

Two-Point Teach-In

When using this Teach-in method, the following settings are made on the thru-beam sensor:

- The gain is set to an optimum value
- The signal threshold is set in the center between the two taught signal values



1. Make sure that there are no objects in the beam path and that the sensor is connected to the power supply.
2. Connect the white cable on the receiver (WH/IN) to the blue cable (BU/0 V) on the receiver.
The green and yellow LED indicators flash simultaneously at 2.5 Hz
3. Position the object in the beam path.
4. Disconnect the white cable on the receiver (WH/IN) from the blue cable (BU/0 V) on the receiver.
The green and yellow LED indicators flash alternately at 2.5 Hz
5. The end of the Teach-in process is indicated when the green LED indicator lights up static.

Maximum Teach-In

When using this Teach-in method, the following settings are made on the thru-beam sensor:

- The gain is set to a maximum
- The signal threshold is set to a minimum



Recommended application:

Enables an object to be detected with a high excess gain. This can be useful if there is severe environmental contamination or to achieve long operating times.

Make sure that there are no objects in the beam path and that the sensor is connected to the power supply.

6. Cover the receiver or transmitter.
7. Connect the white cable on the receiver (WH/IN) to the blue cable (BU/0 V) on the receiver.

The green and yellow LED indicators flash simultaneously at 2.5 Hz

8. Disconnect the white cable on the receiver (WH/IN) from the blue cable (BU/0 V) on the receiver.
The green and yellow LED indicators flash alternately at 2.5 Hz
9. The end of the Teach-in process is indicated when the green LED indicator lights up static.