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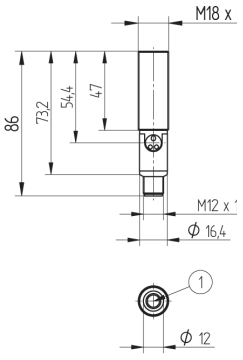
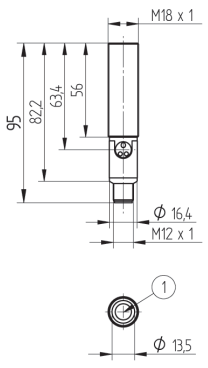
OPT2210



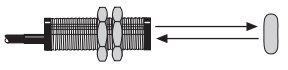
OPT2209



All dimensions in mm
① = Sensing face

OPERATING INSTRUCTIONS
OPT2209
OPT2210

Ultrasonic Reflex Sensor for Measuring Tasks



Ultrasonic Reflex Sensor

EU/UKCA Declaration of Conformity
The declaration of conformity can be found on our website at www.automationdirect.com in download area.

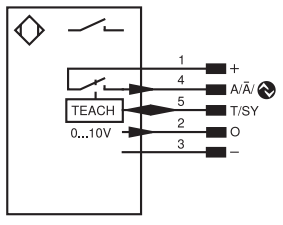
Bedienfeld am Empfänger
Control Panel on receiver
Panneau sur le récepteur

D12

01 = Switching Status Display
06 = Teach Button
79 = Run/Error Display

Connection Diagrams

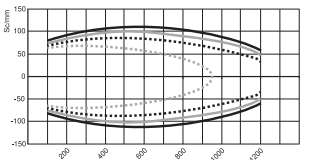
182



+ Supply Voltage "+"
– Supply Voltage "0 V"
A/Ā/ Switching Output (NO)/ Switching Output (NC)/IO-Link
T/SY Teach Input/Synchronization
O Analog output

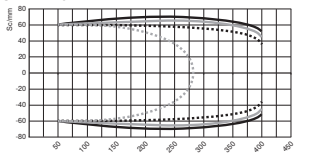
Sonic cone Diagrams

OPT2209



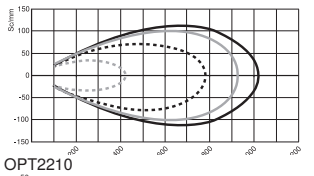
Measurement of the sonic cone on a 100 × 100 mm plate

OPT2210



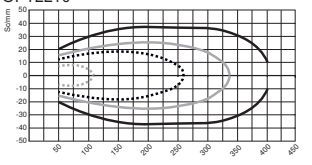
- Standard sonic cone
- Medium-width sonic cone
- Narrow sonic cone
- Extra-narrow sonic cone

OPT2209



Measurement of the sonic cone on a rod with a diameter of 27 mm

OPT2210



- Standard sonic cone
- Medium-width sonic cone
- Narrow sonic cone
- Extra-narrow sonic cone

Proper Use
This wenglor product has to be used according to the following functional principle:

Ultrasonic Reflex Sensors for Measuring Tasks
Ultrasonic reflex sensors with analog output can be adjusted using Teach-In, or externally via the IO-Link interface. If several Ultrasonic Reflex Sensors for Measuring Tasks are in operation in the immediate vicinity, you can choose the synchronous mode. In synchronous mode, all synchronized sensors send out ultrasound pulses simultaneously. As a result, object detection is possible over a wider area.

Safety Precautions
- This operating instruction is part of the product and must be kept during its entire service life.
- Read this operating instruction carefully before using the product.
- Installation, start-up and maintenance of this product should only be carried out by trained personnel.
- Tampering with or modifying the product is not permissible.
- Protect the product against contamination during start-up.
- Not a safety component in accordance with the EU Machinery Directive.

Technical Data

Service Life (Tu = 25 °C)	100000 h
Supply Voltage	18…30 V DC
Current Consumption (Ub = 24 V)	<30 mA
Opening Angle	<12°
Temperature Range	–30…60 °C
Switching Outputs	1
Switching Output Voltage Drop	<2,5 V
PNP Switching Output/Switching Current	100 mA
Analog Output	0…10 V
Synchronization	yes
Short Circuit Protection	yes
Reverse Polarity and Overload Protection	yes
IO-Link Version	1.0
Interface	IO-Link
Lockable	yes
Setting Method	Teach-In
Housing	Stainless Steel
Full Encapsulation	yes
Degree of Protection	IP67
Connection	M12 × 1
Protection Class	III
PNP NO/NC switchable	yes
IO-Link	yes
Analog Output	yes

Order-No.	OPT2210	OPT2209
Working Range*	50…400 mm	100…1200 mm
Measuring Range	350 mm	1100 mm
Linearity Deviation	5 mm	7 mm
Resolution	0,1 mm	0,2 mm
Switching Hysteresis	2 mm	10 mm
Ultrasonic Frequency	300 kHz	225 kHz
Default settings NO/NC	NO	NO

* When reading out the distance via IO-Link, the sensor displays the value 304 (OPT2210) or 13200 (OPT2209) in the process data if the measurement object is beyond the maximum working range. Below the mimimum working range, the process data can assume any values.

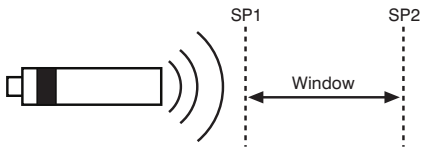
Set Filter	OPT2210			OPT2209		
	Reproducibility in mm	Response Time in ms	Switching Frequency in Hz	Reproducibility in mm	Response Time in ms	Switching Frequency in Hz
Filter 0 (default)	4	25	20	5	72	7
Filter 1	4	38	13,3	5	109	4,6
Filter 2	3	44	11,4	4	125	4
Filter 3	3	57	8,8	4	162	3,1
Filter 4	3	69	7,2	4	200	2,5
Filter 5	2	82	6,1	3	239	2,1
Filter 6	2	94	5,3	3	277	1,8
Filter 7	1	100	5	2	286	1,75

The warm-up phase takes approx. 30 minutes. At the beginning of this time, the linearity deviation and the reproducibility may deviate. During the warm-up phase, the values improve in the form of an exponential function until the technical data are achieved. The sensor works with an internal temperature compensation in order to compensate air temperature fluctuations. Via the IO link interface, you can also specify externally determined temperature values.

Mounting instructions
During mounting and operation of the sensors, the corresponding electrical and mechanical regulations, as well as safety regulations must be observed. The sensor must be protected from mechanical impact. The product has to be mounted so that the mounting position can not be changed.
- Make sure that the sensor is mounted in a mechanically secure fashion.
- If the object has smooth surfaces, the angle between the axis of the sound waves and the surface of the object should be 90° ±3°. The angle can be considerably larger in the case of rough object surfaces.
- In the blind spot between the sensor's active surface and the beginning of its working range, correct functioning of the sensor is not assured. No objects may be located in this area.
- The active surface of the sensor may not contact any other machine parts.

Initial Start-up

Window Teach, Normally Closed
- Press and hold the Teach-In key for at least 5 seconds (or connect the Teach-In input to 24 V), until the yellow LED starts to blink slowly.
- Align the sensor to the object.
- Position the object at the front point (SP1) of the window to be taught in. Press the Teach key for approx. 1 sec (or connect the Teach input to +24 V for approx. 1 sec.).
- Leave Teach-In Input open or clamped to 0 V.
- The yellow LED blinks rapidly.
- Position the object at the back point (SP2) of the window to be taught in. Press the Teach key for approx. 1 sec (or connect the Teach input to +24 V for approx. 1 sec.).
- Leave Teach-In Input open or clamped to 0 V.

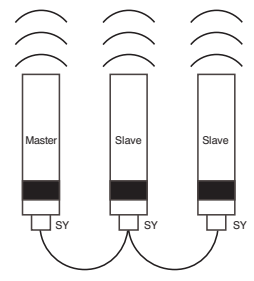


Window Teach, Normally Open
- Press and hold the Teach-In key for at least 5 seconds (or connect the Teach-In input to 24 V), until the LED starts to blink slowly.
- Align the sensor to the object.
- Position the object at the back point (SP2) of the window to be taught in. Briefly press the Teach-In key (or connect by briefly pressing the Teach-In input to 24 V).
- Leave Teach-In Input open or clamped to 0 V.
- The LED blinks rapidly.
- Position the object at the front point (SP1) of the window to be taught in. Briefly press the Teach-In key (or connect by briefly pressing the Teach-In input to 24 V).
- Leave Teach-In Input open or clamped to 0 V.

Switching NC/NO
Switching the NC/NO function is also possible via the window-Teach-In NO or Teach-In NC before the Foreground Teach-In or via the IO link.
NC: Teach-In SP1 → Teach-In SP2 → Foreground Teach-In
NO: Teach-In SP2 → Teach-In SP1 → Background Teach-In

Foreground Teach-In:
- Press and hold the Teach-In key for at least 5 seconds (or connect the Teach-In input to 24 V), until the yellow LED starts to blink slowly.
- Align the sensor to the object. Press the Teach key twice for approx. 1 sec (or connect the Teach input twice to +24 V for approx. 1 sec.).
- Leave Teach-In Input open or clamped to 0 V.
- The sensor's last used NC/NO settings are retained.

Synchronous Mode
In the synchronous operating mode, several sensors of the same type emit ultrasonic pulses simultaneously, in order to monitor a large detection area. All of the sensors are connected to each other via pin 5 (T/SY) to this end. One of the sensors is set up as the master via IO-Link, and all others are set up as slaves (see interface protocol).



Locking
If the Teach input is permanently connected to 18…30 V DC, the sensor is locked and protected against unintentional adjustment.

Settings via IO-Link
An IO-Link master with port Class A must be used, as for port Class A pin 5 is not connected.
- Teach-In
- Switch amongst Teach-In modes
- Disable the Teach-In key/lock
- Switch back and forth between NC and NO
- Adjust sonic cones
- Temperature interface
- Filter settings
- Restore default settings
- Adjust switching hysteresis
- Operating mode (Normal/Synchronous/Mute)

Causes for Triggering Error Indication (red LED)
- Too little ultrasonic is reflected
- Very small objects, or objects which do not reflect sound well (sound-absorbing objects), are located within the working range
- Incorrect installation
- Object outside of the working range
- Strong sources of ultrasound within the axis of the sound waves
- Strong air turbulence

Proper Disposal
wenglor sensoric GmbH does not accept the return of unusable or irreparable products. Respectively valid national waste disposal regulations apply to product disposal.