

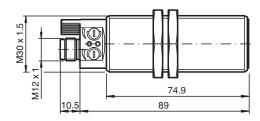
Ultrasonic sensor UC3500-30GM70-2E2R2-V15

- 2 switch outputs
- Synchronization options
- Temperature compensation
- Can be parameterized via the ULTRA-PROG-IR software and interface (accessories)

Ultrasonic direct detection sensor



Dimensions



Technical Data

General specifications		
Sensing range		200 3500 mm
Adjustment range		300 3500 mm
Dead band		0 200 mm
Standard target plate		100 mm x 100 mm
Transducer frequency		approx. 120 kHz
Response delay		≤ 150 ms
Nominal ratings		
Temperature drift		$\leq \pm 1.5$ % of full-scale value
Time delay before availability	t _v	≤ 175 ms
Limit data		
Permissible cable length		max. 300 m
Indicators/operating means		
LED yellow		solid Switching state switch output 1
LED green/yellow		yellow: switching state switch output 2 green: Teach-In
Potentiometer		Switching output 1 and Switching output 2 adjustable
Electrical specifications		
Rated operating voltage	U_{e}	24 V DC
Operating voltage	UB	12 30 V DC (including ripple)
Ripple		≤ 10 %
No-load supply current	I ₀	≤ 50 mA
Interface		
Interface type		Infrared
Mode		point-to-point connection

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

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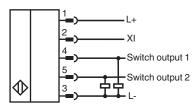
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Technical Data

Input/uppe 1 synchronization connection, bidirectional (Factory setting: synchronizad mode) / Teach-In input 0 Level ≤ 3 V 1 Level ≤ 15 V Input impedance typ. 900 Ω Number of sensors max. 10 Switching output 2 switch outputs PNP, NO (NC contact programmable) Output type 2 switch outputs PNP, NO (NC contact programmable) Default setting 200	Input/Output		
Teach-In inputTeach-In input0 Level $\leq 3V$ 1 Level $\geq 15 V$ Input impedancetyp. 900 Ω Number of sensorsmax. 10Switching output $\leq 15 V$ Output type2 switch outputs PNP, NO (NC contact programmable)Default setting $\equiv 3003800 mm$ (adjustable via potentiometer)Repeat accuracyR $\pm 5 mm$ Operating currentLLper 150 mA, short-circuit/overload protectedSwitching hysteresis $\equiv 35 mm$ (programmable)Othage dop $\leq 3 V$ Off-state current $\leq 10 \mu A$ Compliance with standards and directivesStandard conformityEN IEC 60947-5-2:2020StandardsEN IEC 60947-5-2:2020ApprovalcULus Listed, Class 2 Power SourceCCC approvalCC approval // marking not required for products rated $\leq 36 V$ Ambient conditions			1 synchronization connection, bidirectional (Factory setting: synchronized mode)/
1 Level \geq 15 VInput impedancekp. 900 ΩNumber of sensorsmax. 10Switching output3003300 mm (adjustable via potentiometer)Output type2 switch outputs PNP, NO (NC contact programmable)Default setting3003300 mm (adjustable via potentiometer)Repeat accuracyR ± 5 mmOperating ourrentl.Le per 150 mA , short-circuit/overload protectedSwitching frequency \leq 2 HzSwitching hysteresis35 mm (programmable)Voltage drop \leq 3 VOff-state ourrent \leq 10 µACompliance with standards and directivesStandard conformityEN IEC 60947-5-2:2020 IEC 60947-5-2:2020 IEC 60947-5-2:2020 IEC 60947-5-2:2019ApprovalcULus Listed, Class 2 Power SourceUL approvalcULus Listed, Class 2 Power SourceCC approvalcCC Capproval / marking not required for products rated \leq 36 VAmbient conditions10 85 °C (-40 185 °F)Shock resistance30 g., 11 ms periodVibration resistance10 55 Hz, Amplitude ± 1 mmMechanical specificationsIP65Materialepoxy resin/hollow glass sphere mixture; polyurethane foamInstallation positionap opositionMaterialiPas, nicki-lplatedTransducerepoxy resin/hollow glass sphere mixture; polyurethane foamInstallation positionap opositionMaterialiPositionInstallation positionap opositionMass140 gDimenter30 mm </td <td></td> <td></td> <td>Teach-In input</td>			Teach-In input
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Standard conformity Image: Construction of the construction	Off-state current		≤ 10 µA
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Storage temperature-40 85 °C (-40 185 °F)Shock resistance30 g , 11 ms periodVibration resistance10 55 Hz , Amplitude ± 1 mmMechanical specificationsConnector plug M12 x 1 , 5-pinConnection typeConnector plug M12 x 1 , 5-pinDegree of protectionIP65MaterialIP65Materialepoxy resin/hollow glass sphere mixture; polyurethane foamInstallation positionany positionMass140 gDimensions99.3 mmDiameter30 mm	Ambient conditions		
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Vibration resistance10 55 Hz , Amplitude ± 1 mmMechanical specificationsConnection typeConnector plug M12 x 1 , 5-pinDegree of protection10MaterialHousingbrass, nickel-platedTransducerepoxy resin/hollow glass sphere mixture; polyurethane foamInstallation position140 gDimensions99.3 mmDiameter30 mm	Storage temperature		-40 85 °C (-40 185 °F)
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Connection typeConnector plug M12 x 1 , 5-pinDegree of protectionIP65MaterialHousingbrass, nickel-platedTransducerepoxy resin/hollow glass sphere mixture; polyurethane foamInstallation positionany positionMass140 gDimensions99.3 mmDiameter30 mm	Vibration resistance		10 55 Hz , Amplitude ± 1 mm
Degree of protectionIP65MaterialIP65Housingbrass, nickel-platedTransducerepoxy resin/hollow glass sphere mixture; polyurethane foamInstallation positionany positionMass140 gDimensions99.3 mmDiameter30 mm	Mechanical specifications		
Material Housing brass, nickel-plated Transducer epoxy resin/hollow glass sphere mixture; polyurethane foam Installation position any position Mass 140 g Dimensions 99.3 mm Diameter 30 mm	Connection type		Connector plug M12 x 1 , 5-pin
Housingbrass, nickel-platedTransducerepoxy resin/hollow glass sphere mixture; polyurethane foamInstallation positionany positionMass140 gDimensionsLength99.3 mmDiameter30 mm	Degree of protection		IP65
Transducerepoxy resin/hollow glass sphere mixture; polyurethane foamInstallation positionany positionMass140 gDimensionsLength99.3 mmDiameter30 mm	Material		
Installation position any position Mass 140 g Dimensions	Housing		brass, nickel-plated
Mass 140 g Dimensions 99.3 mm Diameter 30 mm	Transducer		epoxy resin/hollow glass sphere mixture; polyurethane foam
Dimensions 99.3 mm Diameter 30 mm	Installation position		any position
Length 99.3 mm Diameter 30 mm	Mass		140 g
Diameter 30 mm	Dimensions		
	Length		99.3 mm
Construction type Cylindrical	Diameter		30 mm
	Construction type		Cylindrical

Connection



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

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2

Connection Assignment

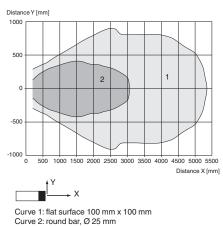


Wire colors in accordance with EN 60947-5-2

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

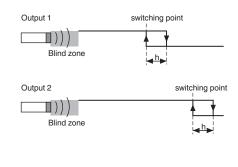
Characteristic Curve

Characteristic response curve



Switching outputs operating mode

Switching output mode



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

3

Indication

Displays and Controls

The sensor has two potentiometers and two display LEDs.

LED 1 (yellow)	On/off: Switching state of switching output 1 Flashing: Error when setting the switching points (switching point 2 < switching point 1). This state only occurs in window function operating mode (2 switching points).	LED 1 potentiometer 2 connector yellow		
LED 2 (yellow)	On/off: Switching state of switching output 2 Flashing: Error when setting the switching points (switching point 2 < switching point 1). This state only occurs in window function operating mode (2 switching points).			
LED 2 (green)	approx. 500 ms on: Range limit taught in Off: Normal mode			
Potentiometer 1	Setting a switching point (Default setting: Setting the switching point of switching output 1)	potentiometer 1 LED 2 temperature yellow/green sensor		
Potentiometer 2	Setting a switching point (Default setting: Setting the switching point of switching output 2)			

Function

Setting the Sensor Using the Potentiometers

The sensor is equipped with two potentiometers. These potentiometers are assigned to the two switching outputs by default. The switching outputs operate in switching point mode by default. Potentiometer P1 is used to set the switching point on switching output 1. Potentiometer P2 is used to set the switching point on switching output 2.

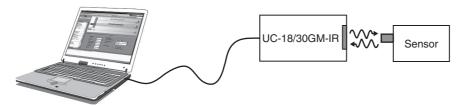
Note:

The function of the potentiometer can be altered using the ULTRA-PROG-IR software. As soon as a configuration has been changed, the potentiometer function selected using ULTRA-PROG-IR is activated.

Parameterization

Parameterization via ULTRA-PROG-IR

In order to be able to set the sensor parameters and adjust the sensor to the respective application, the sensor is able to communicate with a PC via the integrated infrared interface. The UC-18/30GM-IR interface cable is required to allow communication via this method. This cable is connected to an unused USB port on the PC.



The ULTRA-PROG-IR parameterization software is also required for setting the sensor parameters. The ULTRA-PROG-IR software can be downloaded for free from the www.pepperl-fuchs.com website. The software allows all open parameters to be set, including:

- All trip points and switching hystereses
- Output modes and behaviors
- Delay times
- Settings and setting ranges of the potentiometer .
- Settings for teach-in and synchronization
- Definition of blind zones
- Sensor modes and measurement methods
- Filtering measurement values
- The following service functions are also available:
- Observing and recording measurement values
- **Diagnosing interference reflections**

Teach-in

The sensor is equipped with a function input (XI). In order to teach in a limit value, this sensor must be parameterized as the Teach-in input using the ULTRA-PROG-IR parameterization software. This parameterization software allows you to specify what limit value is taught in.

Note:

The Teach-in function is not activated when the sensor is delivered.

Description of the Teach-in process:

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



Ultrasonic sensor

- 1. Position an object at the required distance.
- 2. Connect the Teach-in input to L-.
- The green LED lights up briefly after approx. 3 seconds. This indicates that the required distance has been successfully saved.
- 3. Disconnect the Teach-in input from L-.

Note:

If the Teach-in input remains connected to L-, the Teach-in process is repeated every 3 seconds.

Commissioning

Synchronization

The sensor features a function input (XI). Using the ULTRA-PROG-IR parameterization software, this function input can be configured as a synchronization input to suppress mutual interference from external ultrasonic signals. This is illustrated in the following description. If the synchronization input is not connected, the sensor operates with internally generated cycle pulses.

External synchronization

The sensor can be synchronized by applying external rectangular pulses. The pulse duration must be \geq 100 µs. Each rising pulse edge sends an individual ultrasonic pulse. If the signal at the synchronization input is high, the sensor reverts to the normal, unsynchronized operating mode. If a low signal is applied to the synchronization input, the sensor switches to standby. In this operating mode, the last recorded output statuses are retained.

Internal synchronization

Common mode operation

Up to ten sensors can be synchronized with each other. To do this, the synchronization inputs of the individual sensors are connected to each other. When configured in this state, all of the sensors send the ultrasonic signals together at the same time. The cycle rate corresponds to the cycle rate of the sensor with the lowest rate.

Multiplex mode

Up to ten sensors can work in multiplex mode; i.e. the sensors send their ultrasonic signals in succession. This prevents the sensor signals interfering with each other. In multiplex mode, the synchronization inputs of all sensors are connected to each other. An address must also be assigned to each sensor using the ULTRA-PROG-IR parameterization software, and the number of sensors to be synchronized must be determined. To start multiplex mode, all sensors are commissioned together by switching on the power supply.