



## Ultrasonic sensor

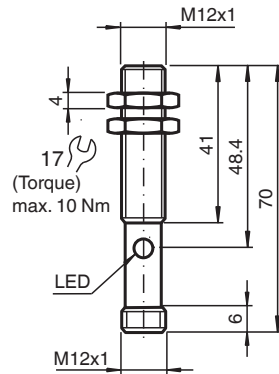
### UBH60/30-12GM-I-V1-Y266698

- Thickness measurement with analog output 4 ... 20 mA
- Extremely narrow projection cone
- Short response time
- Calibration of the reference distance via function input

Single head system



## Dimensions



## Technical Data

### General specifications

Measurement range		object thickness (d) : 0 ... 30 mm
Dead band		0 ... 15 mm
Reference distance	h	50 ... 60 mm
Standard target plate		10 mm x 10 mm
Transducer frequency		approx. 850 kHz
Response delay		approx. 12 ms

### Indicators/operating means

LED yellow		solid yellow: object in the evaluation range yellow, flashing: program function, object detected
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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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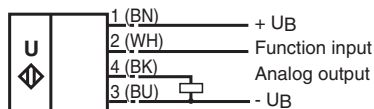
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## Technical Data

LED red	solid red: Error red, flashing: program function, object not detected	
<b>Electrical specifications</b>		
Operating voltage	$U_B$	10 ... 30 V DC , ripple 10 % <sub>SS</sub>
No-load supply current	$I_0$	≤ 30 mA
Time delay before availability	$t_v$	≤ 200 ms
<b>Input</b>		
Input type	1 function input 0-level: $-U_B$ or unwired 1-level: +4 V ... $+U_B$ input impedance: > 4.7 kΩ	
<b>Output</b>		
Output type	1 analog output 4 ... 20 mA	
Resolution	0.17 mm	
Deviation of the characteristic curve	± 1 % of full-scale value	
Repeat accuracy	± 0.5 % of full-scale value	
Load impedance	0 ... 300 Ohm	
<b>Compliance with standards and directives</b>		
Standard conformity		
Standards	EN IEC 60947-5-2:2020 IEC 60947-5-2:2019 EN 60947-5-7:2003 IEC 60947-5-7:2003	
<b>Approvals and certificates</b>		
UL approval	cULus Listed, Class 2 Power Source	
CCC approval	CCC approval / marking not required for products rated ≤36 V	
<b>Ambient conditions</b>		
Ambient temperature	-25 ... 70 °C (-13 ... 158 °F)	
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)	
<b>Mechanical specifications</b>		
Connection type	Connector plug M12 x 1 , 4-pin	
Housing diameter	12 mm	
Degree of protection	IP67	
<b>Material</b>		
Housing	brass, nickel-plated	
Transducer	epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT	
Mass	25 g	

## Connection

### Standard symbol/Connections:



Core colors in accordance with EN 60947-5-2.

## Connection Assignment

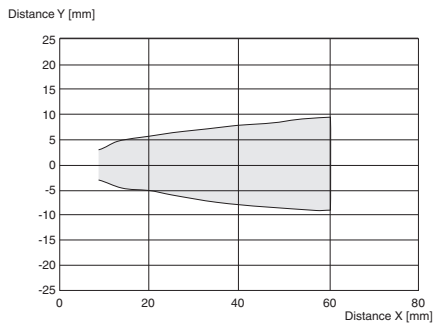


Wire colors in accordance with EN 60947-5-2

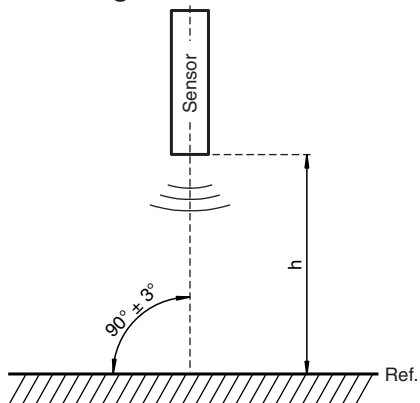
1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)

## Characteristic Curve

### Characteristic response curve



### Mounting



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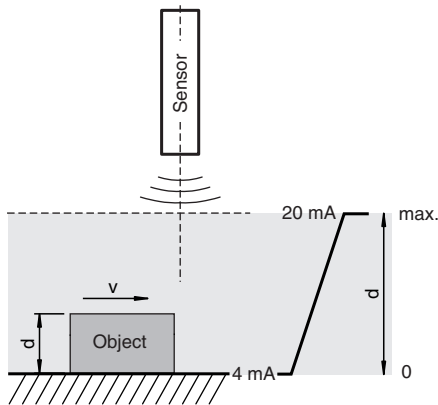
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




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## Characteristic Curve

### Normal mode



## Accessories

	<b>UB-PROG2</b>	Programming unit
	<b>BF 5-30</b>	Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
	<b>BF 12</b>	Mounting flange, 12 mm
	<b>BF 12-F</b>	Plastic mounting adapter, 12 mm
	<b>V1-G-2M-PVC</b>	Female cordset single-ended M12 straight A-coded, 4-pin, PVC cable grey
	<b>V1-W-2M-PUR</b>	Female cordset single-ended M12 angled A-coded, 4-pin, PUR cable grey
	<b>UVW90-M12</b>	Ultrasonic -deflector
	<b>M12K-VE</b>	Plastic nuts with centering ring for the vibration-free mounting of cylindrical sensors

**Additional Information**

**Functional description**

This sensor is used to measure the thickness of objects. It teaches itself by independently switching to a reference object. The distance  $h$  to this object serves as a reference distance and defines the object thickness  $0$  mm. This reference distance can be dynamically tracked in order to compensate for external influences. This guarantees a high measurement accuracy of the sensor over the entire temperature range.

**Automatic teach-in process**

Immediately after the supply voltage is connected, the sensor automatically references itself to the reference object and teaches in the distance as the reference distance. The distance  $h$  between the sensor surface and the reference object must lie within the valid range for the reference distance (see Technical Data). The sensor then immediately reverts to normal operation. If no reference object is detected, the red LED flashes (Fault).

**Normal operation**

In normal operation, the sensor outputs a value at the analog output, which is proportional to the thickness of the object. The object thickness  $0$  mm (measurement to the reference object) is represented in this by the minimum analog value and the largest measurable object thickness (see Technical Data) is represented by the maximum analog value.

**Manual tracking of the reference distance**

A manual tracking of the reference distance can be triggered by means of the functional input.

**Triggering the manual tracking:**

*(connect functional input to  $+U_B$ )*

The automatically during the start-up procedure adjusted reference distance can be overwritten during normal operation. Therefore the functional input has to be connected to  $+U_B$ . This causes the current measured distance to be taken as the new reference distance. After this manual replacement of the reference distance the functional input has to be disconnected or connected to  $-U_B$ , again.

**Manual tracking de-activated:**

*(Functional input unconnected or connected to  $-U_B$ )*

The sensor operates in normal operation mode with the last reference distance adjustment.

**Functional input**

The functional input can be used to trigger the manual reference distance tracking (see above).

**LED indicator**

Indication as a function of operating status	red LED	yellow LED
<b>Teach-in control limit:</b> No reference object detected or reference object at an incorrect distance	Flashes	Off
Normal operation: Measurement on object	Off	On
Measurement on reference	Off	Off
Fault	On	Last valid status

**Additional Information**

If the sensor is installed at places, where the environment temperature can fall below  $0$  °C, for the sensors fixation, one of the mounting flanges BF 12, BF 12-F or BF 5-30 must be used. In case of direct mounting of the sensor in a through hole, it has to be fixed at the middle of the housing thread.

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