



Ultrasonic sensor

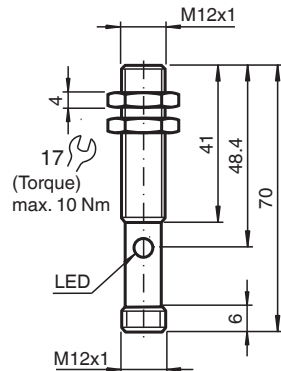
UBH60/30-12GM-I-V1-Y266698

- 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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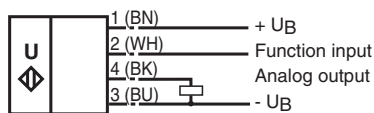
PF PEPPERL+FUCHS

Technical Data

LED red	solid red: Error red, flashing: program function, object not detected	
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC , ripple 10 % _{SS}
No-load supply current	I_0	≤ 30 mA
Time delay before availability	t_v	≤ 200 ms
Input		
Input type	1 function input 0-level: $-U_B$ or unwired 1-level: +4 V ... $+U_B$ input impedance: > 4.7 kΩ	
Output		
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	
Compliance with standards and directives		
Standard conformity		
Standards	EN 60947-5-2:2007+A1:2012 IEC 60947-5-2:2007 + A1:2012 EN 60947-5-7:2003 IEC 60947-5-7:2003	
Approvals and certificates		
UL approval	cULus Listed, Class 2 Power Source	
CCC approval	CCC approval / marking not required for products rated ≤36 V	
Ambient conditions		
Ambient temperature	-25 ... 70 °C (-13 ... 158 °F)	
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)	
Mechanical specifications		
Connection type	Connector M12 x 1 , 4-pin	
Degree of protection	IP67	
Material		
Housing	brass, nickel-plated	
Transducer	epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT	
Mass	25 g	

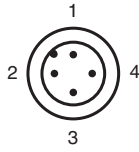
Connection

Standard symbol/Connections:



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

Connection Assignment

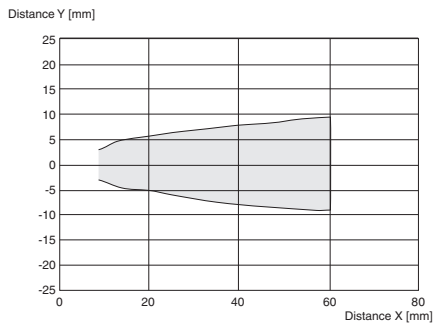


Wire colors in accordance with EN 60947-5-2

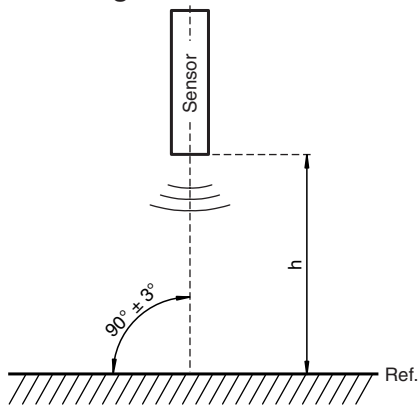
1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)

Characteristic Curve

Characteristic response curve

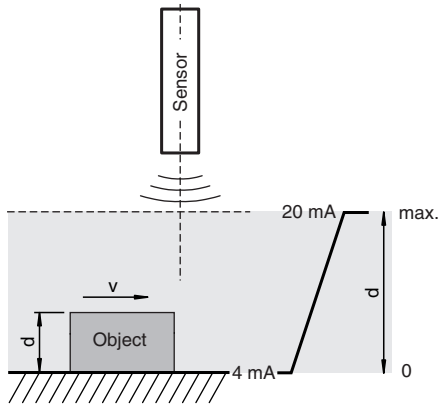


Mounting



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Normal mode



Accessories

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

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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
Teach-in control limit: 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

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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