



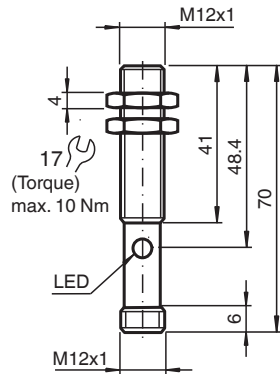
# Ultrasonic sensor UB400-12GM-I-V1

- Analog output 4 mA ... 20 mA
- Measuring window adjustable
- Program input
- Temperature compensation

Single head system



## Dimensions



## Technical Data

### General specifications

Sensing range	30 ... 400 mm
Adjustment range	50 ... 400 mm
Dead band	0 ... 30 mm
Standard target plate	100 mm x 100 mm
Transducer frequency	approx. 310 kHz
Response delay	approx. 50 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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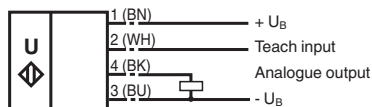
**PF** PEPPERL+FUCHS

## Technical Data

LED red	solid red: Error red, flashing: program function, object not detected	
<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
<b>Input</b>		
Input type		1 program input lower evaluation limit A1: $-U_B ... +1$ V, upper evaluation limit A2: $+4$ V ... $+U_B$ input impedance: > 4.7 kΩ, pulse duration: ≥ 1 s
<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 Ω at $U_B > 10$ V; 0 ... 500 Ω at $U_B > 15$ V
Temperature influence		± 1.5 % of full-scale value
<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:  
(version I)



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

## Connection Assignment

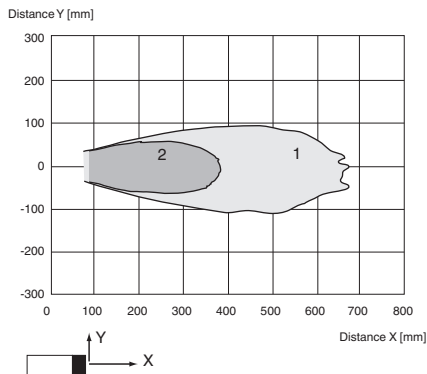


Wire colors in accordance with EN 60947-5-2

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

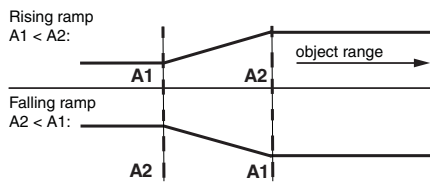
## Characteristic Curve

### Characteristic response curve



Curve 1: flat surface 100 mm x 100 mm  
Curve 2: round bar, Ø 25 mm

### Programming the analog output mode



## Programming

### Adjusting the evaluation limits

The ultrasonic sensor features a switch output with two teachable switching points. These are set by applying the supply voltage -UB or +UB to the TEACH-IN input. The supply voltage must be applied to the TEACH-IN input for at least 1 s. LEDs indicate whether the sensor has recognised the target during the TEACH-IN procedure. Switching point A1 is taught with -UB, A2 with +UB.

Five different output functions can be set:

1. Window mode, normally-open function
2. Window mode, normally-closed function
3. One switching point, normally-open function
4. One switching point, normally-closed function

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## Programming

5. Detection of object presence

**TEACH-IN window mode, normally-open function**

- Set target to near switching point
- TEACH-IN switching point A1 with -UB
- Set target to far switching point
- TEACH-IN switching point A2 with +UB

**TEACH-IN window mode, normally-closed function**

- Set target to near switching point
- TEACH-IN switching point A2 with +UB
- Set target to far switching point
- TEACH-IN switching point A1 with -UB

**TEACH-IN switching point, normally-open function**

- Set target to near switching point
- TEACH-IN switching point A2 with +UB
- Cover sensor with hand or remove all objects from sensing range
- TEACH-IN switching point A1 with -UB

**TEACH-IN switching point, normally-closed function**

- Set target to near switching point
- TEACH-IN switching point A1 with -UB
- Cover sensor with hand or remove all objects from sensing range
- TEACH-IN switching point A2 with +UB









**TEACH-IN detection of objects presence**

- Cover sensor with hand or remove all objects from sensing range
- TEACH-IN switching point A1 with -UB
- TEACH-IN switching point A2 with +UB

**LED Displays**

Displays in dependence on operating mode	Red LED	Yellow LED
<b>TEACH-IN switching point:</b> Object detected No object detected Object uncertain (TEACH-IN invalid)	off flashes on	flashes off off
Normal operation	off	Switching state
Fault	on	Previous state

## 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

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## 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.