



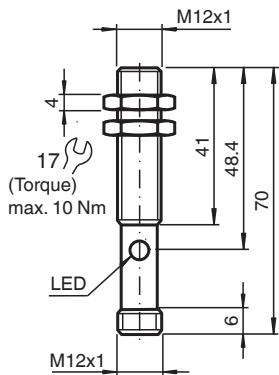
## Ultrasonic sensor UB120-12GM-I-V1

- Extremely narrow projection cone
- Analog output 4 mA ... 20 mA
- Very small unusable area
- Measuring window adjustable
- Short response time

Single head system



### Dimensions



### Technical Data

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#### General specifications

Sensing range	15 ... 120 mm
Adjustment range	20 ... 120 mm
Dead band	0 ... 15 mm
Standard target plate	10 mm x 10 mm
Transducer frequency	approx. 850 kHz
Response delay	approx. 27 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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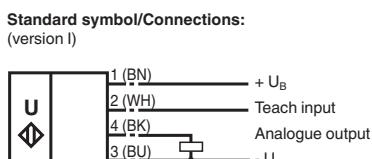
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## Technical Data

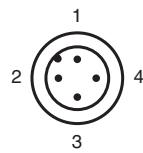
LED red	solid red: Error red, flashing: program function, object not detected	
<b>Electrical specifications</b>		
Operating voltage	$U_B$	10 ... 30 V DC, ripple 10 % <sub>SS</sub>
No-load supply current	$I_0$	$\leq 30 \text{ mA}$
<b>Input</b>		
Input type		1 program input lower evaluation limit A1: $-U_B \dots +1 \text{ V}$ , upper evaluation limit A2: $+4 \text{ V} \dots +U_B$ input impedance: $> 4.7 \text{ k}\Omega$ , pulse duration: $\geq 1 \text{ s}$
<b>Output</b>		
Output type		1 analog output 4 ... 20 mA
Resolution		0.17 mm
Deviation of the characteristic curve		$\pm 1 \text{ \%}$ of full-scale value
Repeat accuracy		$\pm 0.5 \text{ \%}$ of full-scale value
Load impedance		0 ... 300 Ohm
Temperature influence		$\pm 1.5 \text{ \%}$ 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 $\leq 36 \text{ V}$
<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
Material		
Housing		brass, nickel-plated
Transducer		epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
Mass		25 g

## Connection



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

## Connection Assignment

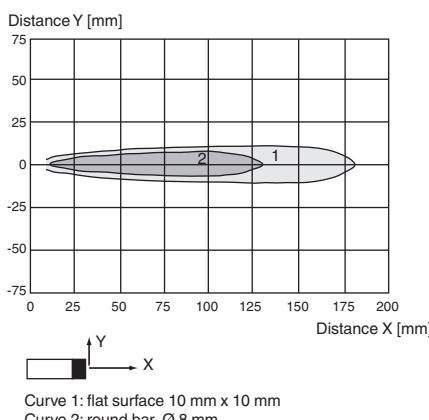


Wire colors in accordance with EN 60947-5-2

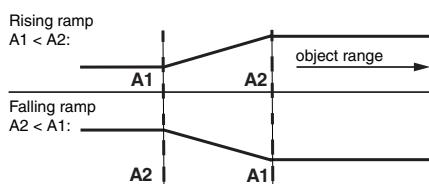
1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)

## Characteristic Curve

### Characteristic response curve



### 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

## 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

## 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.