



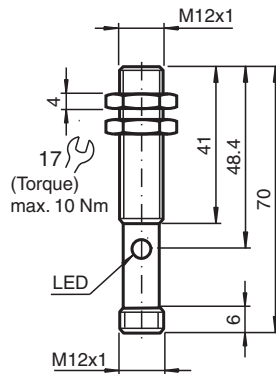
## Ultrasonic sensor UB120-12GM-U-V1

- Extremely narrow projection cone
- Analog output 0 ... 10 V
- Very small unusable area
- Measuring window adjustable
- Short response time

Single head system



### Dimensions



### Technical Data

#### 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
LED red	solid red: Error red, flashing: program function, object not detected

#### Electrical specifications

Operating voltage	$U_B$	15 ... 30 V DC , ripple 10 % <sub>SS</sub>
No-load supply current	$I_0$	≤ 30 mA

#### Input

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 k $\Omega$ , pulse duration: ≥ 1 s
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#### Output

Output type	1 analog output 0 ... 10 V
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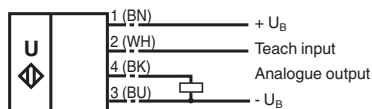
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## Technical Data

Resolution	0.17 mm
Deviation of the characteristic curve	± 1 % of full-scale value
Repeat accuracy	± 0.5 % of full-scale value
Load impedance	> 1 kOhm
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
Degree of protection	IP67
Material	
Housing	brass, nickel-plated
Transducer	epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
Mass	25 g
Dimensions	
Length	70 mm
Diameter	12 mm

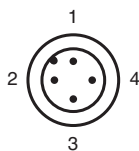
## Connection Assignment

Standard symbol/Connections:  
(version U)



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

## Connection Assignment



## Connection Assignment

Wire colors in accordance with EN 60947-5-2

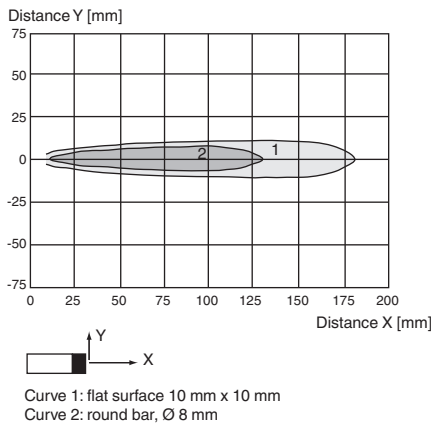
1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)

## Installation Conditions

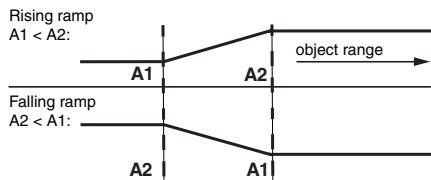
If the sensor is installed at places where the environment temperature can fall below 0 °C, for the sensors fixation, one of the mounting flanges BF 12, BF 12-F or BF 5-30 must be used. In case of direct mounting of the sensor in a through hole, it has to be fixed at the middle of the housing thread.

## Characteristic Curve

### Characteristic response curve



### Programming the analog output mode



## Programming

The sensor features a programmable analog output with two programmable evaluation boundaries. Programming the evaluation boundaries and the operating mode is done by applying the supply voltage  $-U_B$  or  $+U_B$  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 recognized the target during the programming procedure.

**Note:**

Evaluation boundaries may only be specified directly after Power on. A time lock secures the adjusted switching points against unintended modification 5 minutes after Power on. To modify the evaluation boundaries later, the user may specify the desired values only after a new Power On.

**Note:**

If a programming adapter UB-PROG2 is used for the programming procedure, button A1 is assigned to  $-U_B$  and button A2 is assigned to  $+U_B$ .

#### Programming the analog output

##### Rising ramp

- Place the target at the near end of the desired evaluation range
- Program the evaluation boundary by applying  $-U_B$  to the Teach-In input (yellow LED flashes)

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## Programming

3. Disconnect the Teach-In input from  $-U_B$  to save the evaluation boundary
4. Place the target at the far end of the desired evaluation range
5. Program the evaluation boundary by applying  $+U_B$  to the Teach-In input (yellow LED flashes)
6. Disconnect the Teach-In input from  $+U_B$  to save the evaluation boundary

### Falling ramp

1. Place the target at the far end of the desired evaluation range
2. Program the evaluation boundary by applying  $-U_B$  to the Teach-In input (yellow LED flashes)
3. Disconnect the Teach-In input from  $-U_B$  to save the evaluation boundary
4. Place the target at the near end of the desired evaluation range
5. Program the evaluation boundary by applying  $+U_B$  to the Teach-In input (yellow LED flashes)
6. Disconnect the Teach-In input from  $+U_B$  to save the evaluation boundary