

# Ultrasonic sensor

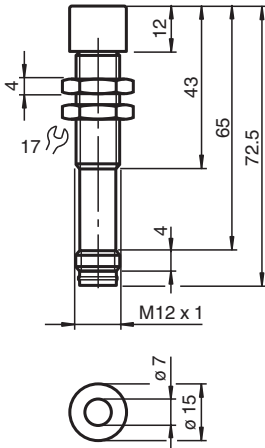
## UBC250-12GM-E5-V1



- High chemical resistance through PTFE coated transducer surface
- Stainless Steel enclosure
- 1 switch output
- Temperature compensation
- Programmable output functions
- Program input



### Dimensions



### Technical Data

#### General specifications

Sensing range	30 ... 250 mm
Adjustment range	50 ... 250 mm
Dead band	0 ... 30 mm
Standard target plate	100 mm x 100 mm
Transducer frequency	approx. 310 kHz
Response delay	approx. 50 ms

#### Electrical specifications

Operating voltage	$U_B$	10 ... 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 kΩ, pulse duration: ≥ 1 s
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#### Output

Output type	1 switch output PNP Normally open/closed , programmable
Rated operating current	$I_e$ 100 mA , short-circuit/overload protected
Default setting	Switch point A1: 50 mm Switch point A2: 250 mm

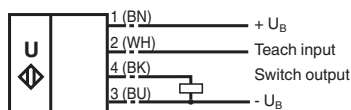
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## Technical Data

Voltage drop	$U_d$	$\leq 3\text{ V}$
Repeat accuracy		$\leq 1\ \%$
Switching frequency	$f$	$\leq 8\text{ Hz}$
Range hysteresis	$H$	1 % of the set operating distance
Temperature influence		$\pm 1.5\ \%$ 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
<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
Degree of protection		IP68 / IP69K
<b>Material</b>		
Housing		Stainless steel 1.4404 / AISI 316L O-ring for cover seal: Viton
Transducer		PTFE (diaphragm surface)
Mass		35 g
<b>Dimensions</b>		
Length		70 mm
Diameter		12 mm

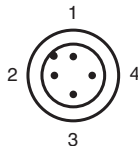
## Connection Assignment

Standard symbol/Connections:  
(version E5, pnp)



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

## Connection Assignment

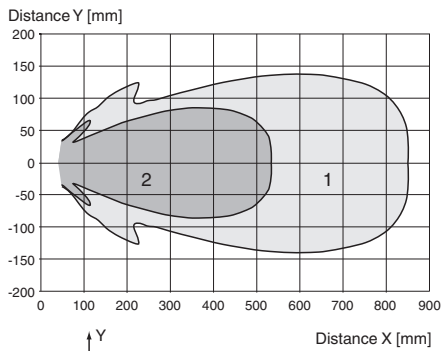


Wire colors in accordance with EN 60947-5-2

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

**Programmable output modes**

1. Window mode, normally open mode  
 $A1 < A2$ :
2. Window mode, normally closed mode  
 $A2 < A1$ :
3. One switch point, normally open mode  
 $A1 \rightarrow \infty$ :
4. One switch point, normally closed mode  
 $A2 \rightarrow \infty$ :
5.  $A1 \rightarrow \infty, A2 \rightarrow \infty$ : Object presence detection mode  
 Object detected: Switch output closed  
 No object detected: Switch output open

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## Additional Information

### Adjusting the switching points

The ultrasonic sensor features a switch output with two teachable switching points. These are set 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. Switching point A1 is taught with  $-U_B$ , A2 with  $+U_B$ .

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
5. Detection of object presence

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

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

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

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

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

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

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

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

### TEACH-IN detection of objects presence

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

### Default setting of switching points

A1 = blind range, A2 = nominal distance

## 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.

## Installation Conditions

### Note

If the sensor is used in an environment with strong electromagnetic interference, we recommend non-conductive mounting. For this, use the accompanying plastic nuts or the BF12 or BF12-F mounting flange.

Please observe proper application when using the accompanying plastic nuts. The hole for the sensor must be  $\geq 14$  mm.

