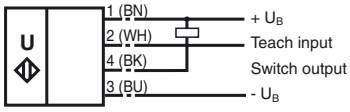
## Ultrasonic sensor
# UB400-12GM-E4-V1

## Features

- Switch output
- 5 different output functions can be set
- TEACH-IN input
- Temperature compensation

## Electrical connection

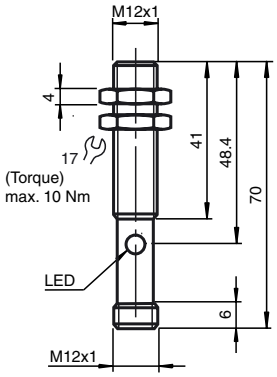
**Standard symbol/Connections:**
(version E4, npn)




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

## Connector V1


## Dimensions




## Technical data

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|---|---|
| **General specifications** | |
| Sensing range | 30 ... 400 mm |
| Adjustment range | 50 ... 400 mm |
| Unusable area | 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 | indication of the switching state<br>flashing: TEACH-IN function object detected |
| LED red | permanently red: Error<br>red, flashing: TEACH-IN function, object not detected |
| **Electrical specifications** | |
| Operating voltage | 10 ... 30 V DC , ripple 10 $\%_{SS}$ |
| No-load supply current $I_0$ | ≤ 30 mA |
| **Input** | |
| Input type | 1 TEACH_IN input<br>operating distance 1: -$U_B$ ... +1 V, operating distance 2: +6 V ... +$U_B$<br>input impedance: > 4,7 kΩ TEACH-IN pulse: ≥ 1 s |
| **Output** | |
| Output type | 1 switch output E4, npn NO/NC, parameterisable |
| Repeat accuracy | ≤ 1 % |
| Rated operational current $I_e$ | 100 mA , short-circuit/overload protected |
| Voltage drop $U_d$ | ≤ 3 V |
| Switching frequency f | ≤ 8 Hz |
| Range hysteresis H | 1 % of the set operating distance |
| Temperature influence | ± 1.5 % of full-scale value |
| **Standard conformity** | |
| Standards | EN 60947-5-2 |
| **Ambient conditions** | |
| Ambient temperature | -25 ... 70 °C (248 ... 343 K) |
| Storage temperature | -40 ... 85 °C (233 ... 358 K) |
| **Mechanical specifications** | |
| Protection degree | IP65 |
| Connection | V1 connector (M12 x 1), 4-pin |
| Material | |
| Housing | brass, nickel-plated |
| Transducer | epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT |
| Mass | 25 g |

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## Notes

### 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. LEDs indicate whether the sensor has recognised the target during the TEACH-IN procedure. 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

### LED Displays

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

### Installation conditions

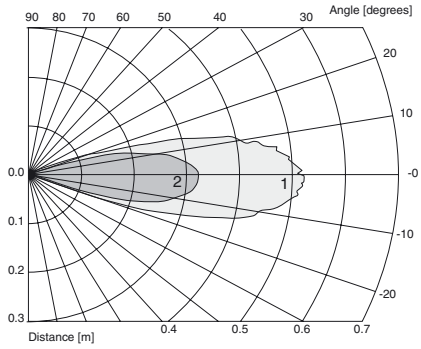
If the sensor is installed at places, where the environment temperature can fall below 0 °C, for the sensors fixation, one of the mounting flanges BF 12, BF 12-F or BF 5-30 must be used. In case of direct mounting of the sensor in a through hole, it has to be fixed at the middle of the housing thread.

## Model number

**UB400-12GM-E4-V1**

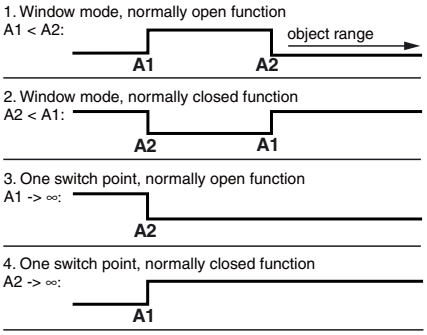
## Characteristic curves/additional information

### Characteristic response curves




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

### Programmed switching output function




5. A1 -> ∞, A2 -> ∞: Detection of object presence
Object detected: Switch output closed
No object detected: Switch output open

## Accessories

### Programming device

UB-PROG2

### Mounting aids/fixing flanges

BF 5-30
BF 12
BF 12-F

### Cable sockets*)

V1-G-2M-PVC
V1-W-2M-PUR

*) Additional cable sockets find in section „Accessories“.