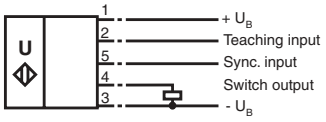
## Ultrasonic sensor
# UB4000-30GM-E2-V15

## Features

- Switch output
- 5 different output functions can be set
- TEACH-IN input
- Synchronisation options
- Deactivation option

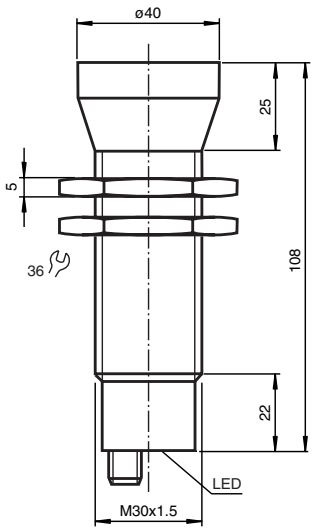
## Electrical connection

**Standard symbol/Connections:**
(version E2, pnp)




## Connector V15


## Dimensions

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## Technical data

| | |
|---|---|
| **General specifications** | |
| Sensing range | 500 ... 4000 mm |
| Unusable area | 0 ... 500 mm |
| Standard target plate | 100 mm x 100 mm |
| Transducer frequency | approx. 85 kHz |
| Response delay | approx. 280 ms |
| **Indicators/operating means** | |
| LED green | "Power on", TEACH-IN function object detected |
| LED yellow | indication of the switching state, TEACH-IN function-no object detected |
| LED red | "Error", object uncertain |
| **Electrical specifications** | |
| Operating voltage | 20 ... 30 V DC , ripple 10 $\%_{SS}$ |
| No-load supply current $I_0$ | ≤ 60 mA |
| **Input** | |
| Input type | 1 TEACH-IN input,<br>operating distance 1: -$U_B$ ... (-$U_B$ +2 V), operating distance 2: (+$U_B$ -2 V) ... +$U_B$ 1 synchronous input<br>level 0: -$U_B$ ... (-$U_B$ + 1 V), level 1: (-$U_B$ + 5 V) ... +$U_B$<br>Input impedance 27 kOhm |
| Pulse length | Synchronisation pulse: ≥ 100 µs<br>Synchronisation pulse pause: ≥ 100 µs |
| Synchronisation frequency | |
| Common mode operation | ≤ 20 Hz |
| Multiplex operation | ≤ 20/n Hz , n = number of sensors |
| **Output** | |
| Output type | 1 switch output E2/E3, pnp, normally open/closed, programmable |
| Repeat accuracy | ≤ 1 % |
| Rated operational current $I_e$ | 200 mA , short-circuit/overload protected |
| Voltage drop $U_d$ | ≤ 3 V |
| Switching frequency f | max. 1,7 Hz |
| Range hysteresis H | ≤ 1 % of the set operating distance |
| Temperature influence | 0,17 % / K |
| **Standard conformity** | |
| Standards | EN 60947-5-2 |
| **Climatic conditions** | |
| Ambient temperature | -25 ... 70 °C (248 ... 343 K) |
| Storage temperature | -40 ... 85 °C (233 ... 358 K) |
| **Mechanical specifications** | |
| Protection degree | IP65 |
| Connection type | connector V15 (M12 x 1), 5 pin |
| Material | |
| Housing | brass, nickel plated, plastic components PBT |
| Transducer | epoxy resin/hollow glass sphere mixture; polyurethane foam |
| Mass | 180 g |



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## Notes

### Function

**Synchronisation**

The sensor features a synchronisation input for the suppression of mutual interference. It can be synchronised by applying a square wave voltage. The falling edge of a synchronisation pulse at the synchronisation input starts a measuring cycle. A low level > 1 s or an open synchronisation input will result in the non-synchronised normal operation of the sensor. A high level at the synchronisation input disables the sensor. Synchronisation cannot be performed during TEACH-IN and vice versa. Two operating modes are possible:

1. Multiple sensors can be controlled by the same synchronisation signal. The sensors are synchronised.
2. The synchronisation pulses are sent cyclically to individual sensors. The sensors operate in multiplex mode.

**Setting the switching points**

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:

| Function | TEACH-IN procedure |
|---|---|
| Window mode, close function | - Set object to near switching point<br>- Teach switching point A1 with -UB<br>- Set object to far switching point<br>- Teach switching point A2 with +UB |
| Window mode, open function | - Set object to near switching point<br>- Teach switching point A2 with +UB<br>- Set object to far switching point<br>- Teach switching point A1 with -UB |
| 1 switching point, close function | - Set object to near switching point<br>- Teach switching point A2 with +UB<br>- Cover sensor or remove all objects from sensing range<br>- Teach switching point A1 with -UB |
| 1 switching point, open function | - Set object to near switching point<br>- Teach switching point A1 with -UB<br>- Cover sensor or remove all objects from sensing range<br>- Teach switching point A2 with +UB |
| Detection of object presence | - Cover sensor or remove all objects from sensing range<br>- Teach switching point A1 with -UB<br>- Teach switching point A2 with +UB |

Default setting of switching points: A1 = blind range, A2 = nominal distance

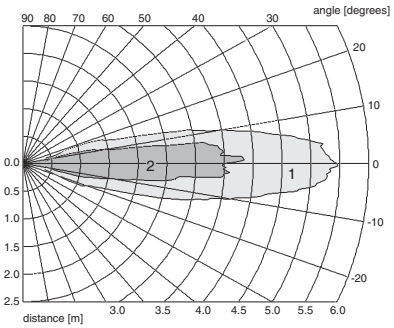
| Displays in dependence on operating mode | Green LED | Red LED | Yellow LED |
|---|---|---|---|
| Teach switching point<br>Object detected<br>No object detected<br>Object uncertain (TEACH-IN invalid) | <br>Flashing<br>Flashing<br>Off | <br>Off<br>Off<br>Flashing | <br>Off<br>On<br>Off |
| Normal operation | On | Off | Switching state |
| Interference (e.g. compressed air) | Off | Flashing | Previous state |

## Model number

**UB4000-30GM-E2-V15**

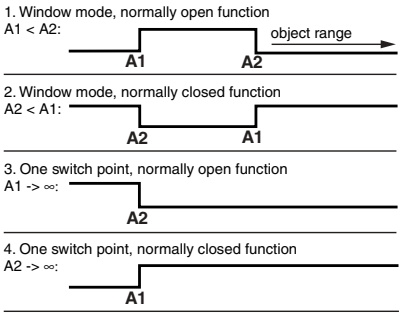
## Characteristic curves/additional information

### 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

### LED-Window