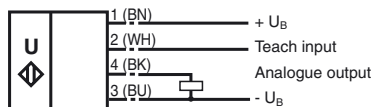**Ultrasonic sensor**

# UB300-18GM40-I-V1



## Features

- Short design, 40 mm
- Function indicators visible from all directions
- Analogue output 4 mA ... 20 mA
- Measuring window adjustable
- TEACH-IN input
- Temperature compensation

## Electrical connection

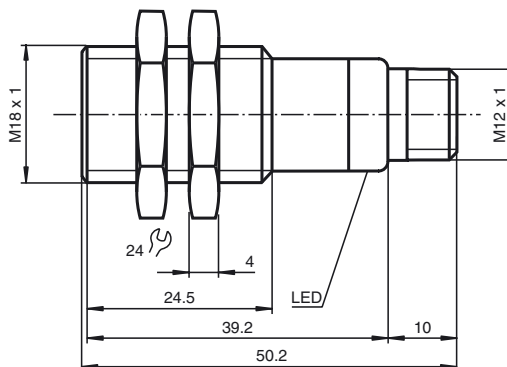**Standard symbol/Connections:**
(version I)



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

## Connector V1



# Dimensions



# Technical data  $C\epsilon$

**General specifications**

| | |
|---|---|
| Sensing range | 30 ... 300 mm |
| Adjustment range | 50 ... 300 mm |
| Unusable area | 0 ... 30 mm |
| Standard target plate | 100 mm x 100 mm |
| Transducer frequency | approx. 390 kHz |
| Response delay | approx. 30 ms |

**Indicators/operating means**

| | |
|---|---|
| LED yellow | permanently yellow: object in the evaluation range<br>yellow, 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 $I_0$ | $\leq$ 20 mA |

**Input**

| | |
|---|---|
| Input type | 1 TEACH-IN input<br>lower evaluation limit A1: -$U_B$ ... +1 V, upper evaluation limit A2: +4 V ... +$U_B$<br>input impedance: > 4.7 k$\Omega$, pulse duration: $\geq$ 1 s |

**Output**

| | |
|---|---|
| Output type | 1 analogue output 4 ... 20 mA, short-circuit/overload protected |
| Default setting | evaluation limit A1: 50 mm evaluation limit A2: 300 mm |
| Resolution | 0.4 mm at max. sensing range |
| Deviation of the characteristic curve | $\pm$ 1  % of full-scale value |
| Repeat accuracy | $\pm$ 0.5  % of full-scale value |
| Load impedance | 0 ... 300 Ohm |
| Temperature influence | $\pm$ 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 | IP67 |
| 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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### Adjusting the evaluation limits

The ultrasonic sensor features an analogue output with two teachable evaluation limits. 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. The lower evaluation limit A1 is taught with $-U_B$, A2 with $+U_B$.

Two different output functions can be set:
1. Analogue value increases with rising distance to object (rising ramp)
2. Analogue value falls with rising distance to object (falling ramp)

### TEACH-IN rising ramp (A2 > A1)
- Position object at lower evaluation limit
- TEACH-IN lower limit A1 with $-U_B$
- Position object at upper evaluation limit
- TEACH-IN upper limit A2 with $+U_B$

### TEACH-IN falling ramp (A1 > A2):
- Position object at lower evaluation limit
- TEACH-IN lower limit A2 with $+U_B$
- Position object at upper evaluation limit
- TEACH-IN upper limit A1 with $-U_B$

### Default setting

| | |
|---|---|
| A1: | unusable area |
| A2: | nominal sensing range |
| Mode of operation: | rising ramp |

### LED Displays

| Displays in dependence on operating mode | Red LED | Yellow LED |
|---|---|---|
| **TEACH-IN evaluation limit** | | |
| Object detected | off | flashes |
| No object detected | flashes | off |
| Object uncertain (TEACH-IN invalid) | on | off |
| Normal mode (evaluation range) | off | on |
| 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 BF18, BF18-F or BF 5-30 must be used.

In case of direct mounting of the sensor in a through hole using the steel nuts, it has to be fixed at the middle of the housing thread. If a fixation at the front end of the threaded housing is required, plastic nuts with centering ring (accessories) must be used.
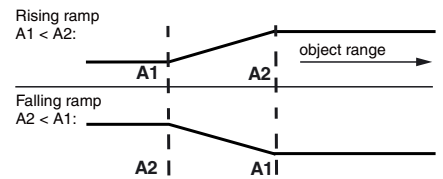
## Characteristic curves/additional information

### Characteristic response curve



Curve 1: flat surface 100 mm x 100 mm
Curve 2: round bar, Ø 25 mm
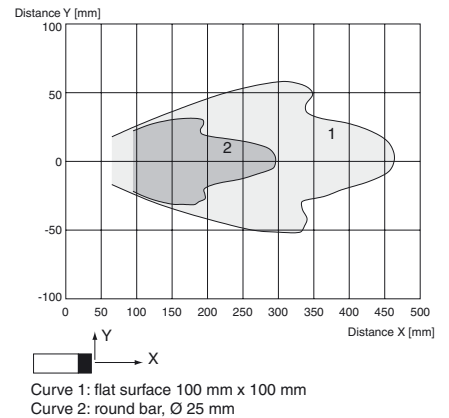
### Programmed analogue output function



## Accessories

UB-PROG2
Programming unit

OMH-04
Mounting aid

BF 18
Mounting flange

BF 18-F
Mounting flange

BF 5-30
Mounting flange

V1-G-2M-PVC
Cable connector

V1-W-2M-PUR
Cable connector