



## Ultrasonic sensor

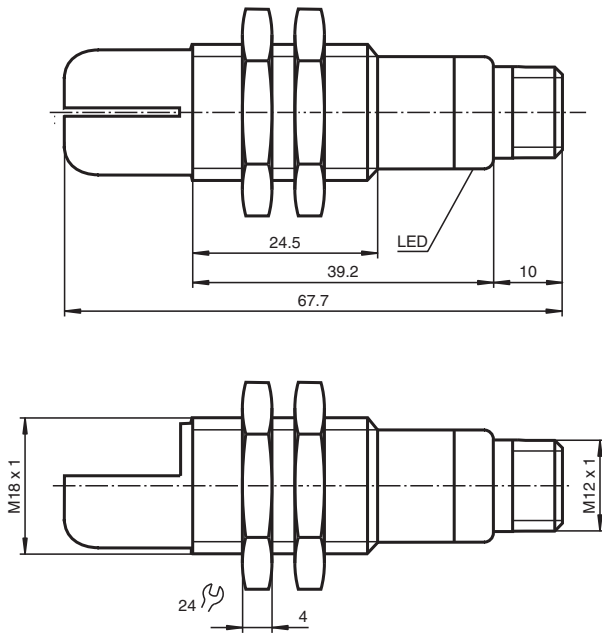
UB500-18GM40A-I-V1-Y70103911

- Short design, 40 mm
- Function indicators visible from all directions
- Analog output 4 mA ... 20 mA
- Measuring window adjustable
- Program input
- Temperature compensation
- Customer-specific configuration

Single head system



### Dimensions



### Technical Data

#### General specifications

|                       |                 |
|-----------------------|-----------------|
| Sensing range         | 40 ... 500 mm   |
| Adjustment range      | 40 ... 500 mm   |
| Dead band             | 0 ... 35 mm     |
| Standard target plate | 100 mm x 100 mm |
| Transducer frequency  | approx. 390 kHz |
| Response delay        | approx. 50 ms   |

#### Indicators/operating means

|            |   |
|------------|---|
| LED green  | Power on  |
| LED yellow | solid yellow: object in the evaluation range<br>yellow, flashing: program function, object detected |
| LED red    | solid red: Error<br>red, flashing: program function, object not detected                            |

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## Technical Data

### Electrical specifications

|                        |       |  |
|------------------------|-------|--|
| Operating voltage      | $U_B$ | 10 ... 30 V DC , ripple 10 % <sub>SS</sub> |
| No-load supply current | $I_0$ | ≤ 20 mA                                    |

### Input

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

### Output

|                                       |   |
|---------------------------------------|---|
| Output type                           | 1 analog output 4 ... 20 mA, short-circuit/overload protected             |
| Default setting                       | evaluation limit A1: 40 mm evaluation limit A2: 420 mm                    |
| Resolution                            | 0.4 mm at max. sensing range  |
| Deviation of the characteristic curve | ± 2 % of full-scale value   |
| Repeat accuracy                       | ± 1 % of full-scale value   |
| Load impedance                        | 0 ... 300 $\Omega$ at $U_B > 10$ V;<br>0 ... 500 $\Omega$ at $U_B > 15$ V |
| Temperature influence                 | ± 3 % of full-scale value   |

### Compliance with standards and directives

|                     |  |
|---------------------|--|
| Standard conformity |  |
| Standards           | EN IEC 60947-5-2:2020<br>IEC 60947-5-2:2019<br>EN 60947-5-7:2003<br>IEC 60947-5-7:2003 |

### Approvals and certificates

|                |  |
|----------------|--|
| EAC conformity | TR CU 020/2011<br>TR CU 037/2016                             |
| UL approval    | cULus Listed, Class 2 Power Source                           |
| CCC approval   | CCC approval / marking not required for products rated ≤36 V |

### Ambient conditions

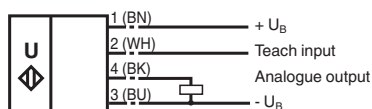
|                     |                                |
|---------------------|--------------------------------|
| Ambient temperature | -25 ... 50 °C (-13 ... 122 °F) |
| Storage temperature | -40 ... 85 °C (-40 ... 185 °F) |

### Mechanical specifications

|                      |   |
|----------------------|---|
| 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               | 57 mm   |
| Diameter             | 18 mm   |

## Connection Assignment

Standard symbol/Connections:  
(version I)



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

## Connection Assignment

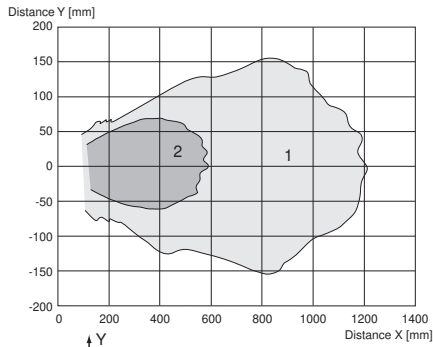


Wire colors in accordance with EN 60947-5-2

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

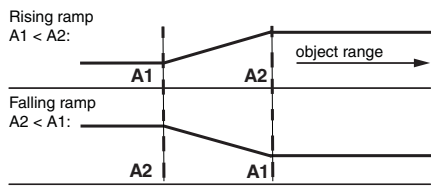
## Characteristic Curve

### Characteristic response curve



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

### Programmed analogue output function



A1 -> ∞, A2 -> ∞: Detection of object presence

Object detected: 20 mA  
No object detected: 4 mA

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## Programming

### Programming procedure

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

1. Place the target at the near 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 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