



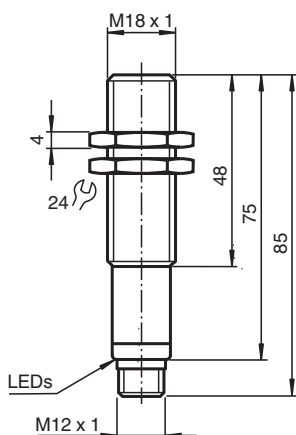
## Ultrasonic sensor UB500-18GM75-E6-V15

- 2 switch outputs
- 3 different output functions can be set
- Selectable sound lobe width
- Program input
- Temperature compensation
- Very small unusable area

Single head system



### Dimensions



### Technical Data

#### General specifications

|                       |                 |
|-----------------------|-----------------|
| Sensing range         | 30 ... 500 mm   |
| Adjustment range      | 50 ... 500 mm   |
| Dead band             | 0 ... 30 mm     |
| Standard target plate | 100 mm x 100 mm |
| Transducer frequency  | approx. 380 kHz |
| Response delay        | approx. 50 ms   |

#### Indicators/operating means

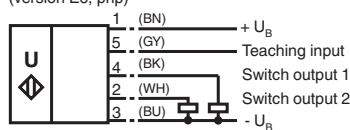
|            |   |
|------------|---|
| LED yellow | indication of the switching state<br>flashing: program function object detected |
|------------|---|

## Technical Data

|  |                |   |
|--|----------------|---|
| LED red                                  |                | "Error", object uncertain<br>in program function: No object detected  |
| Electrical specifications                |                |   |
| Operating voltage                        | U <sub>B</sub> | 10 ... 30 V DC , ripple 10 % <sub>SS</sub>  |
| No-load supply current                   | I <sub>0</sub> | ≤ 50 mA   |
| Input                                    |                |   |
| Input type                               |                | 1 program input,<br>operating range 1: -U <sub>B</sub> ... +1 V, operating range 2: +4 V ... +U <sub>B</sub><br>input impedance: > 4.7 kΩ; program pulse: ≥ 1 s |
| Output                                   |                |   |
| Output type                              |                | 2 switch outputs PNP, NO/NC, programmable   |
| Rated operating current                  | I <sub>e</sub> | 2 x 100 mA , short-circuit/overload protected   |
| Voltage drop                             | U <sub>d</sub> | ≤ 3 V   |
| Repeat accuracy                          |                | ≤ 1 %   |
| Switching frequency                      | f              | max. 8 Hz   |
| Range hysteresis                         | H              | 1 % of the set operating distance   |
| Temperature influence                    |                | ± 1.5 % of full-scale value   |
| Compliance with standards and directives |                |   |
| Standard conformity                      |                |   |
| Standards                                |                | EN IEC 60947-5-2:2020<br>IEC 60947-5-2:2019   |
| Approvals and certificates               |                |   |
| 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 ... 70 °C (-13 ... 158 °F)  |
| Storage temperature                      |                | -40 ... 85 °C (-40 ... 185 °F)  |
| Mechanical specifications                |                |   |
| Connection type                          |                | Connector plug M12 x 1 , 5-pin  |
| Housing diameter                         |                | 18 mm   |
| Degree of protection                     |                | IP67  |
| Material                                 |                |   |
| Housing                                  |                | brass, nickel-plated  |
| Transducer                               |                | epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT   |
| Mass                                     |                | 60 g  |
| Factory settings                         |                |   |
| Output 1                                 |                | Switching point: 50 mm<br>output function: Switch point operation mode<br>output behavior: NO contact   |
| Output 2                                 |                | Switching point: 500 mm<br>output function: Switch point operation mode<br>output behavior: NO contact  |
| Beam width                               |                | wide  |

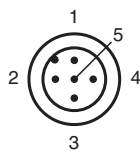
## Connection

### Standard symbol/Connections: (version E6, pnp)



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

Connection Assignment

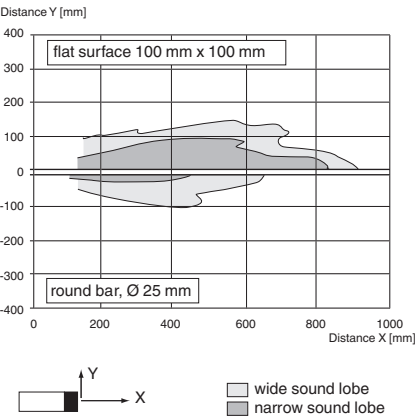


Wire colors in accordance with EN 60947-5-2

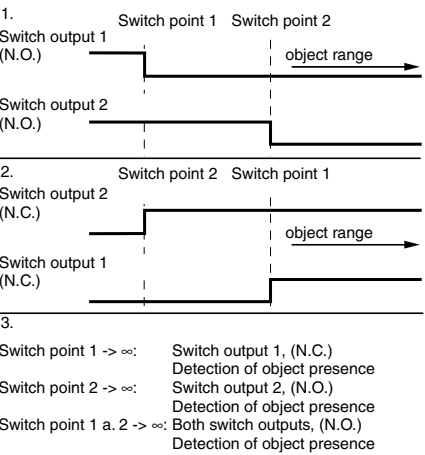
|   |    |         |
|---|----|---------|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue)  |
| 4 | BK | (black) |
| 5 | GY | (gray)  |

Characteristic Curve

Characteristic response curve










Programmed switching output function



Accessories

|  |                 |   |
|--|-----------------|---|
|  | <b>UB-PROG3</b> | Programming unit  |
|  | <b>OMH-04</b>   | Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm |

## Accessories

|   |                     |   |
|---|---------------------|---|
|  | <b>BF 18</b>        | Mounting flange, 18 mm  |
|  | <b>BF 18-F</b>      | Plastic mounting adapter, 18 mm   |
|  | <b>BF 5-30</b>      | Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm       |
|  | <b>UVW90-K18</b>    | Ultrasonic -deflector   |
|  | <b>M18K-VE</b>      | Plastic nuts with centering ring for the vibration-free mounting of cylindrical sensors |
|  | <b>V15-G-2M-PVC</b> | Female cordset single-ended M12 straight A-coded, 5-pin, PVC cable grey                 |
|  | <b>V15-W-2M-PUR</b> | Female cordset single-ended M12 angled A-coded, 5-pin, PUR cable grey                   |

## Programming

### Programming procedure

The sensor features two programmable switch outputs with one programmable switch point, each. Programming the switch point and the operating mode is done by applying the supply voltage  $-U_B$  or  $+U_B$  to the Program input. The supply voltage must be applied to the Program input for at least 1 s. LEDs indicate whether the sensor has recognized the target during the programming procedure.

#### Note:

Switching points 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 switching points later, the user may specify the desired values only after a new Power On.

#### Note:

If a programming adapter UB-PROG3 is used for the programming procedure, button A1 is assigned to  $-U_B$  and button A2 is assigned to  $+U_B$ .

### Programming switch outputs

#### Normally open (NO) output

The switch point of switch output 1 has to be closer to the sensor than the switch point of switch output 2

1. Place the target at the desired switch point position of switch output 1
2. Program the switch point by applying  $-U_B$  to the Program input (corresponding yellow LED flashes)
3. Disconnect the Program input from  $-U_B$  to save the switch point
4. Place the target at the desired switch point position of switch output 2
5. Program the switch point by applying  $+U_B$  to the Program input (corresponding yellow LED flashes)
6. Disconnect the Program input from  $+U_B$  to save the switch point

**Note:** The order doesn't make any difference. If you want, you can set only one switching point.

#### Normally closed (NC) output

The switch point of switch output 2 has to be closer to the sensor than the switch point of switch output 1

1. Place the target at the desired switch point position of switch output 1
2. Program the switch point by applying  $-U_B$  to the Program input (corresponding yellow LED flashes)
3. Disconnect the Program input from  $-U_B$  to save the switch point
4. Place the target at the desired switch point position of switch output 2
5. Program the switch point by applying  $+U_B$  to the Program input (corresponding yellow LED flashes)
6. Disconnect the Program input from  $+U_B$  to save the switch point

**Note:** The order doesn't make any difference. If you want, you can set only one switching point. If both switching points are equal, the sensor works in close function.

### Programming detection of object presence

1. Cover the sensor face with hand or remove all objects from sensing range
2. Apply  $-U_B$  to the Program input (red LED flashes)
3. Disconnect the Program input from  $-U_B$
4. Apply  $+U_B$  to the Program input (red LED flashes)
5. Disconnect the Program input from  $+U_B$

**Note:** Only one switch output can be configured for detection of presence of objects. If the sensor detects an object within the maximum detection range, the switch output switches.

### Adjusting the sound cone characteristics:

The ultrasonic sensor enables two different shapes of the sound cone, a wide angle sound cone and a small angle sound cone.

#### 1. Small angle sound cone

- switch off the power supply
- connect the Teach-In input wire to  $-U_B$
- switch on the power supply
- the red LED flashes once with a pause before the next.
- yellow LED: permanently on: indicates the presence of an object or disturbing object within the sensing range
- disconnect the Teach-In input wire from  $-U_B$  and the changing is saved



#### 2. Wide angle sound cone

- switch off the power supply
- connect the Teach-In input wire with  $+U_B$
- switch on the power supply
- the red LED double-flashes with a long pause before the next.
- yellow LED: permanently on: indicates an object or disturbing object within the sensing range
- disconnect the Teach-In input wire from  $+U_B$  and the changing is saved



## Factory Setting

**Factory settings**

See technical data.

**Indication**

The sensor provides LEDs to indicate various conditions.

|  | Red LED | Yellow LED 1                 | Yellow LED 2                 |
|--|---------|------------------------------|------------------------------|
| <b>During Normal operation</b>         |         |                              |                              |
| Proper operation                       | Off     | Switching state<br>output 1  | Switching state<br>output 2  |
| Interference (e.g. compressed air)     | On      | remains in previous<br>state | remains in previous<br>state |
| <b>Programming of output 1</b>         |         |                              |                              |
| Object detected                        | Off     | Flashes                      | Off                          |
| No object detected                     | Flashes | Off                          | Off                          |
| Object uncertain (programming invalid) | On      | Off                          | Off                          |
| <b>Programming of output 2</b>         |         |                              |                              |
| Object detected                        | Off     | Off                          | Flashes                      |
| No object detected                     | Flashes | Off                          | Off                          |
| Object uncertain (programming invalid) | On      | Off                          | Off                          |

**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.