



Ultrasonic sensor

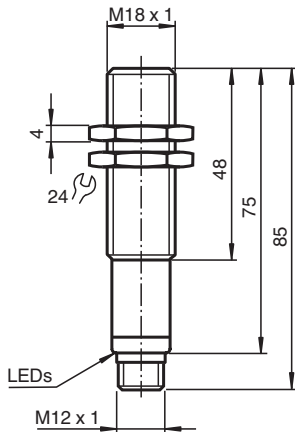
UB500-18GM75-E23-V15

- 2 switch outputs
- 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 flashing: program function object detected |
| LED red | "Error", object uncertain in program function: No object detected |

Electrical specifications

| | | |
|------------------------|-------|--|
| Operating voltage | U_B | 10 ... 30 V DC , ripple 10 % _{SS} |
| No-load supply current | I_0 | ≤ 50 mA |

Input

| | |
|------------|---|
| Input type | 1 program input, operating range 1: $-U_B ... +1$ V, operating range 2: $+4$ V ... $+U_B$ input impedance: > 4.7 kΩ; program pulse: ≥ 1 s |
|------------|---|

Output

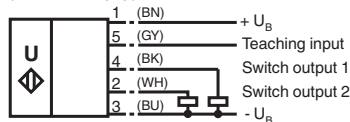
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Technical Data

| | | |
|---|-------|--|
| Output type | | 2 switch outputs PNP, NO/NC |
| Rated operating current | I_e | 2 x 100 mA , short-circuit/overload protected |
| Voltage drop | U_d | ≤ 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 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 |
| Degree of protection | | IP67 |
| Material | | |
| Housing | | brass, nickel-plated |
| Transducer | | epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT |
| Mass | | 60 g |
| Dimensions | | |
| Length | | 85 mm |
| Diameter | | 18 mm |
| Factory settings | | |
| Output 1 | | Switching point: 50 mm output function: Switch point operation mode output behavior: NO contact |
| Output 2 | | Switching point: 500 mm output function: Switch point operation mode output behavior: NC contact |
| Beam width | | wide |

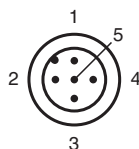
Connection Assignment

Standard symbol/Connections:
(version E23, pnp)



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

Connection Assignment



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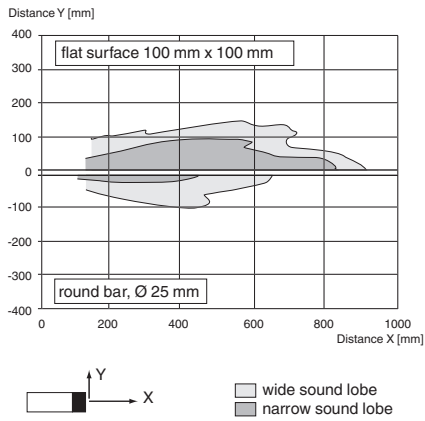
Connection Assignment

Wire colors in accordance with EN 60947-5-2

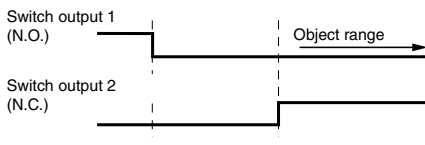
| | | |
|---|----|---------|
| 1 | BN | (brown) |
| 2 | WH | (white) |
| 3 | BU | (blue) |
| 4 | BK | (black) |
| 5 | GY | (gray) |

Characteristic Curve

Characteristic response curve



Programmed switching output function



- Switch point 1 $\rightarrow \infty$: Switch output 1, (N.O.)
Detection of object presence
- Switch point 2 $\rightarrow \infty$: Switch output 2, (N.C.)
Detection of object presence

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Programming procedure

The sensor features two switch outputs with one programmable switch point, each. Programming the switch points is done by applying the supply voltage $-U_B$ (switch output 1) or $+U_B$ (switch output 2) 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:

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

Switch point for 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 Teach-In input (corresponding yellow LED flashes)
3. Disconnect the Teach-In input from $-U_B$ to save the switch point

Switch point for switch output 2

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

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 Teach-In input (red LED flashes)
3. Disconnect the Teach-In input from $-U_B$
4. Apply $+U_B$ to the Teach-In input (red LED flashes)
5. Disconnect the Teach-In 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 |
|--|---------|---------------------------|---------------------------|
| During Normal operation | | | |
| Proper operation | Off | Switching state output 1 | Switching state output 2 |
| Interference (e.g. compressed air) | On | remains in previous state | remains in previous state |
| Programming of output 1 | | | |
| Object detected | Off | Flashes | Off |
| No object detected | Flashes | Off | Off |
| Object uncertain (programming invalid) | On | Off | Off |
| Programming of output 2 | | | |
| 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.

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