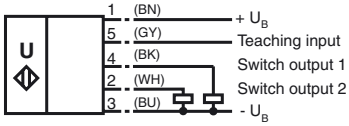
Ultrasonic sensor
UB500-18GM75-E6-V15

Features

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

Electrical connection

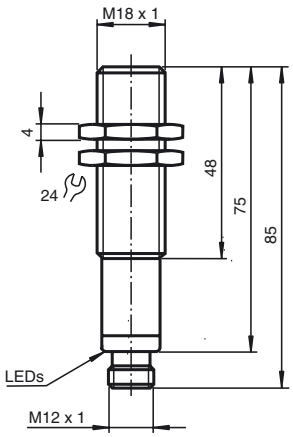
Standard symbol/Connections:
(version E6, pnp)



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

Connector V15

Dimensions



Technical data

CE

General specifications	
Sensing range	30 ... 500 mm
Adjustment range	50 ... 500 mm
Unusable area	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: TEACH-IN function object detected
LED red	"Error", object uncertain in TEACH-IN function: No object detected
Electrical specifications	
Operating voltage	10 ... 30 V DC , ripple 10 $\%_{SS}$
No-load supply current I_0	≤ 50 mA
Input	
Input type	1 TEACH-IN input, operating range 1: -U_B ... +1 V, operating range 2: +4 V ... +U_B input impedance: > 4.7 kΩ; TEACH-IN pulse: ≥ 1 s
Output	
Output type	2 switch outputs pnp, NO/NC, parameterisable
Repeat accuracy	≤ 1 %
Rated operational current I_e	2 x 100 mA , short-circuit/overload protected
Voltage drop U_d	≤ 3 V
Switching frequency f	max. 8 Hz
Range hysteresis H	1 % of the set operating distance
Temperature influence	± 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	IP65
Connection	connector V15 (M12 x 1), 5 pin
Material	
Housing	brass, nickel-plated
Transducer	epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
Mass	60 g

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2005-06-01

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Notes

Adjusting the switching points

The ultrasonic sensor features two switch outputs with one teachable switching point. The switching points 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. Switching point A1 is taught with $-U_B$, A2 with $+U_B$.

Three different output functions can be set:
1. normally-open function
2. normally-closed function
3. Detection of object presence

TEACH-IN normally-open function

Switching point for switch output 1 < switching point for switch output 2
- Set target of desired switching point for switch output 1
- TEACH-IN switching point for switch output 1 with $-U_B$
- Set target of desired switching point for switch output 2
- TEACH-IN switching point for switch output 2 with $+U_B$

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

TEACH-IN normally-closed function

Switching point for switch output 2 < switching point for switch output 1
- Set target of desired switching point for switch output 1
- TEACH-IN switching point for switch output 1 with $-U_B$
- Set target of desired switching point for switch output 2
- TEACH-IN switching point for switch output 2 with $+U_B$

Comments: 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.

TEACH-IN detection of object presence

- Cover the sensor with the palm, or remove all objects from the detection range of the sensor
- TEACH-IN switching point for switch output 1 with $-U_B$
- TEACH-IN switching point for switch output 2 with $+U_B$

Comments
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.

Default setting of switching points

Switch output 1: unusable area
Switch output 2: nominal sensing range

LED Displays

Displays in dependence on operating mode	Red LED	LED 1 yellow	LED 2 yellow
TEACH-IN switching point 1			
Object detected	off	flashes	off
No object detected	flashes	off	off
Object uncertain (TEACH-IN invalid)	on	off	off
TEACH-IN switching point 2:			
Object detected	off	off	flashes
no object detected	flashes	off	off
Object uncertain (TEACH-IN invalid)	on	off	off
Normal operation	off	switch state 1	switch state 2
Fault	on	previous state	previous state

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.

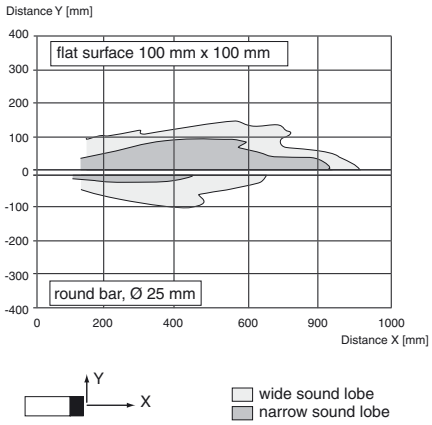
1. **Small angle sound cone**
- switch off the power supply
- connect the Teach-input wire to $-U_B$

Model number

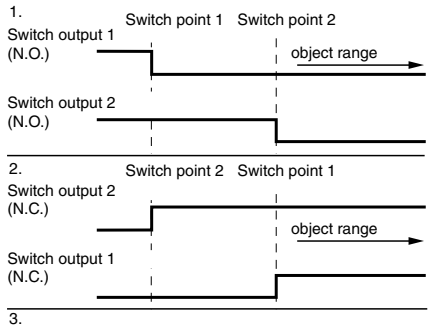
UB500-18GM75-E6-V15

Characteristic curves/additional information

Characteristic response curve



Programmed switching output function



Switch point 1 -> ∞: Switch output 1, (N.C.) Detection of object presence
Switch point 2 -> ∞: Switch output 2, (N.O.) Detection of object presence
Switch point 1 a. 2 -> ∞: Both switch outputs, (N.O.) Detection of object presence

Accessories

Programming device

UB-PROG3

Mounting aids/fixing flanges

OMH-04
BF 18
BF 18F
BF 5-30

Sound deflector

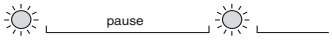
UVW90-K18

Cable sockets*)

V15-G-2M-PVC
V15-W-2M-PUR

*) For additional cable sockets see section „Accessories“.

- 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-input wire from $-U_B$ and the changing is saved



2. Wide angle sound cone

- switch off the power supply
- connect the Teach-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-input wire from $+U_B$ and the changing is saved

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.