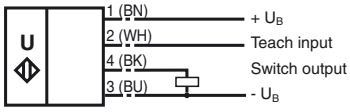
Ultrasonic sensor
UB400-12GM-E5-V1

Features

- Switch output
- 5 different output functions can be set
- TEACH-IN input
- Temperature compensation

Electrical connection

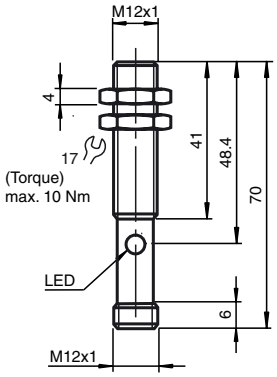
Standard symbol/Connections:
(version E5, pnp)



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

Connector V1

Dimensions



Technical data

CE

General specifications	
Sensing range	30 ... 400 mm
Adjustment range	50 ... 400 mm
Unusable area	0 ... 30 mm
Standard target plate	100 mm x 100 mm
Transducer frequency	approx. 310 kHz
Response delay	approx. 50 ms
Indicators/operating means	
LED yellow	indication of the switching state flashing: TEACH-IN function object detected
LED red	permanently red: Error 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	≤ 30 mA
Input	
Input type	1 TEACH_IN input operating distance 1: -U_B ... +1 V, operating distance 2: +6 V ... +U_B input impedance: > 4,7 kΩ TEACH-IN pulse: ≥ 1 s
Output	
Output type	1 switch output E5, pnp NO/NC, parameterisable
Repeat accuracy	≤ 1 %
Rated operational current I_e	100 mA , short-circuit/overload protected
Voltage drop U_d	≤ 3 V
Switching frequency f	≤ 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	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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Notes

Adjusting the switching points

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

Five different output functions can be set

1. Window mode, normally-open function
2. Window mode, normally-closed function
3. one switching point, normally-open function
4. one switching point, normally-closed function
5. Detection of object presence

TEACH-IN window mode, normally-open function

- Set target to near switching point
- TEACH-IN switching point A1 with $-U_B$
- Set target to far switching point
- TEACH-IN switching point A2 with $+U_B$

TEACH-IN window mode, normally-closed function

- Set target to near switching point
- TEACH-IN switching point A2 with $+U_B$
- Set target to far switching point
- TEACH-IN switching point A1 with $-U_B$

TEACH-IN switching point, normally-open function

- Set target to near switching point
- TEACH-IN switching point A2 with $+U_B$
- Cover sensor with hand or remove all objects from sensing range
- TEACH-IN switching point A1 with $-U_B$

TEACH-IN switching point, normally-closed function

- Set target to near switching point
- TEACH-IN switching point A1 with $-U_B$
- Cover sensor with hand or remove all objects from sensing range
- TEACH-IN switching point A2 with $+U_B$

TEACH-IN detection of objects presence

- Cover sensor with hand or remove all objects from sensing range
- TEACH-IN switching point A1 with $-U_B$
- TEACH-IN switching point A2 with $+U_B$

Default setting of switching points

A1 = blind range, A2 = nominal distance

LED Displays

Displays in dependence on operating mode	Red LED	Yellow LED
TEACH-IN switching point:		
Object detected	off	flashes
No object detected	flashes	off
Object uncertain (TEACH-IN invalid)	On	off
Normal operation	off	Switching state
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 BF 12, BF 12-F or BF 5-30 must be used. In case of direct mounting of the sensor in a through hole, it has to be fixed at the middle of the housing thread.

Model number

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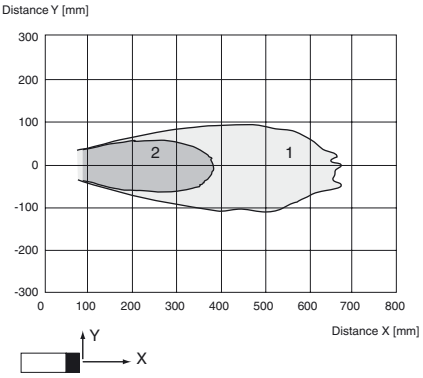
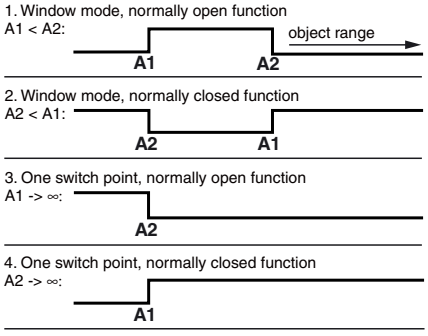
Characteristic curves/additional information

Characteristic response curve



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

Programmed switching output function



5. A1 -> ∞, A2 -> ∞: Detection of object presence
Object detected: Switch output closed
No object detected: Switch output open

Accessories

Programming device

UB-PROG2

Mounting aids/fixing flanges

BF 5-30
BF 12
BF 12-F

Cable sockets*)

V1-G-2M-PVC
V1-W-2M-PUR

*) Additional cable sockets find in section „Accessories“.