



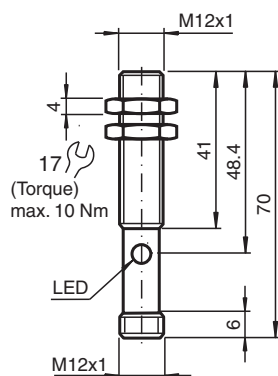
Ultrasonic sensor UB400-12GM-E5-V1

- Switching output
- 5 different output functions can be set
- Program input
- Temperature compensation

Single head system



Dimensions



Technical Data

General specifications

Sensing range	30 ... 400 mm
Adjustment range	50 ... 400 mm
Dead band	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: program function object detected
LED red	solid red: Error red, flashing: program function, object not detected

Electrical specifications

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

Input

Input type	1 program input operating distance 1: $-U_B ... +1$ V, operating distance 2: $+6$ V ... $+U_B$ input impedance: > 4,7 k Ω program pulse: ≥ 1 s
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Output

Output type	1 switch output PNP Normally open/closed , programmable
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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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 **PEPPERL+FUCHS**

Technical Data

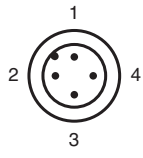
Rated operating current	I _e	100 mA , short-circuit/overload protected
Default setting		Switch point A1: 50 mm Switch point A2: 400 mm
Voltage drop	U _d	≤ 3 V
Repeat accuracy		≤ 1 %
Switching frequency	f	≤ 8 Hz
Range hysteresis	H	1 % of the set operating distance
Temperature influence		± 1.5 % of full-scale 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 , 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		70 mm
Diameter		12 mm

Connection Assignment

Standard symbol/Connections:
(version E5, pnp)

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

Connection Assignment



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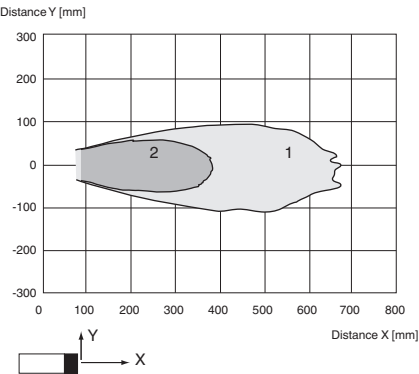
Connection Assignment

Wire colors in accordance with EN 60947-5-2

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

Characteristic Curve

Characteristic response curve



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

Programmable output modes

- 1. Window mode, normally open mode
 $A1 < A2$:
- 2. Window mode, normally closed mode
 $A2 < A1$:
- 3. One switch point, normally open mode
 $A1 \rightarrow \infty$:
- 4. One switch point, normally closed mode
 $A2 \rightarrow \infty$:
- 5. $A1 \rightarrow \infty$, $A2 \rightarrow \infty$: Object presence detection mode
Object detected: Switch output closed
No object detected: Switch output open

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Teach-In

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 $+U_B$

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

Additional Information

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.