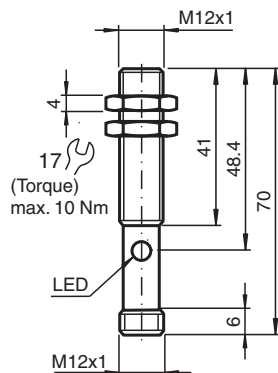# Ultrasonic sensor
UB400-12GM-U-V1

- Analog output 0 ... 10 V
- Measuring window adjustable
- 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	solid yellow: object in the evaluation range yellow, flashing: program function, object detected
LED red	solid red: Error red, flashing: program function, object not detected

Electrical specifications

Operating voltage	U_B	15 ... 30 V DC , ripple 10 %$_{SS}$
No-load supply current	I_0	≤ 30 mA

Input

Input type	1 program input lower evaluation limit A1: $-U_B$ ... +1 V, upper evaluation limit A2: +4 V ... $+U_B$ input impedance: > 4.7 kΩ, pulse duration: ≥ 1 s

Output

Output type	1 analog output 0 ... 10 V

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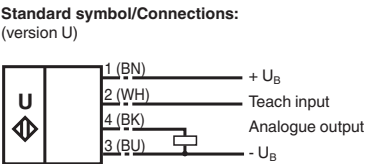Singapore: +65 6779 9091
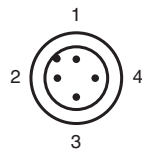fa-info@sg.pepperl-fuchs.com

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Technical Data

Resolution		0.17 mm
Deviation of the characteristic curve		± 1 % of full-scale value
Repeat accuracy		± 0.5 % of full-scale value
Load impedance		> 1 kOhm
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 EN 60947-5-7:2003 IEC 60947-5-7:2003
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 U)

1 (BN)   + U_B
2 (WH)   Teach input
4 (BK)   Analogue output
3 (BU)   - U_B

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

Connection Assignment

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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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)

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.

Characteristic Curve

Characteristic response curve

Curve 1: flat surface 100 mm x 100 mm
Curve 2: round bar, Ø 25 mm
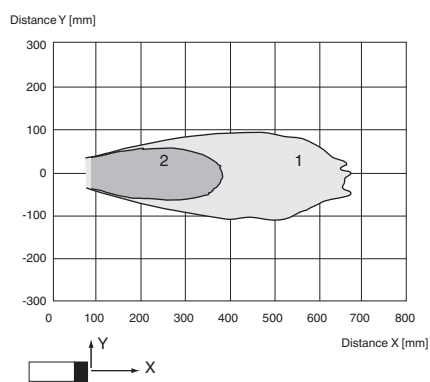
Programming the analog output mode
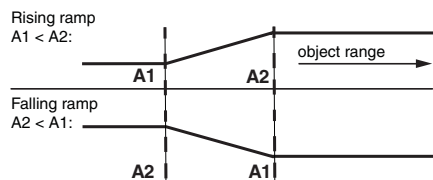
Programming

The sensor features a programmable analog output with two programmable evaluation boundaries. Programming the evaluation boundaries and the operating mode is done 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 recognized the target during the programming procedure.

Note:
Evaluation boundaries 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 evaluation boundaries later, the user may specify the desired values only after a new Power On.

Note:
If a programming adapter UB-PROG2 is used for the programming procedure, button A1 is assigned to $-U_B$ and button A2 is assigned to $+U_B$.

Programming the analog output
Rising ramp
1. Place the target at the near end of the desired evaluation range
2. Program the evaluation boundary by applying $-U_B$ to the Teach-In input (yellow LED flashes)

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

Programming

3. Disconnect the Teach-In input from $-U_B$ to save the evaluation boundary

4. Place the target at the far end of the desired evaluation range

5. Program the evaluation boundary by applying $+U_B$ to the Teach-In input (yellow LED flashes)

6. Disconnect the Teach-In input from $+U_B$ to save the evaluation boundary

Falling ramp

1. Place the target at the far end of the desired evaluation range

2. Program the evaluation boundary by applying $-U_B$ to the Teach-In input (yellow LED flashes)

3. Disconnect the Teach-In input from $-U_B$ to save the evaluation boundary

4. Place the target at the near end of the desired evaluation range

5. Program the evaluation boundary by applying $+U_B$ to the Teach-In input (yellow LED flashes)

6. Disconnect the Teach-In input from $+U_B$ to save the evaluation boundary

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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