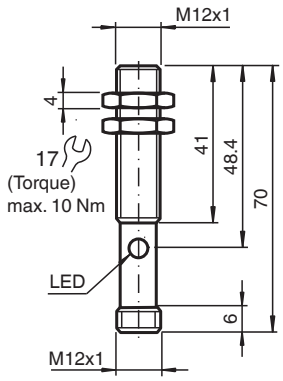
Ultrasonic sensor

UB120-12GM-U-V1

- Extremely narrow projection cone
- Analog output 0 ... 10 V
- Very small unusable area
- Measuring window adjustable
- Short response time

Single head system

Dimensions



Technical Data

General specifications		
Sensing range		15 ... 120 mm
Adjustment range		20 ... 120 mm
Dead band		0 ... 15 mm
Standard target plate		10 mm x 10 mm
Transducer frequency		approx. 850 kHz
Response delay		approx. 27 ms
Indicators/operating means		
LED yellow		solid yellow: object in the evaluation range yellow, flashing: program function, object detected

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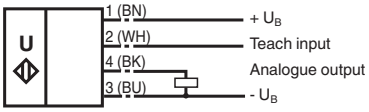
Technical Data

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
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
Housing diameter		12 mm
Degree of protection		IP67
Material		
Housing		brass, nickel-plated
Transducer		epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
Mass		25 g

Connection

Standard symbol/Connections:
(version U)



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

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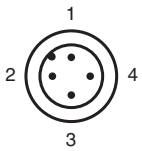
Connection Assignment

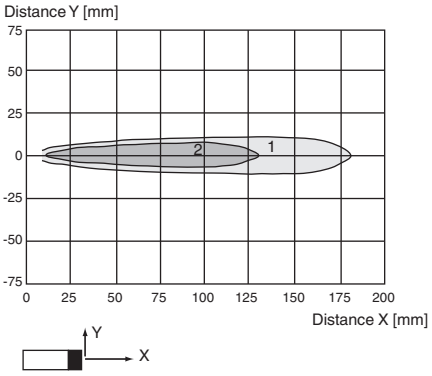


Wire colors in accordance with EN 60947-5-2

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

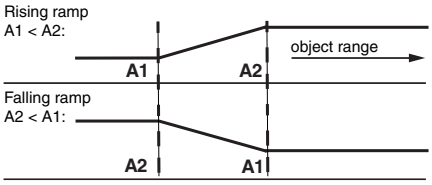
Characteristic Curve

Characteristic response curve



Curve 1: flat surface 10 mm x 10 mm
Curve 2: round bar, Ø 8 mm

Programming the analog output mode



Programming

Adjusting the evaluation limits
The ultrasonic sensor features a switch output with two teachable switching points. These are set by applying the supply voltage -UB or +UB 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 -UB, A2 with +UB.
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

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Programming

5. Detection of object presence

TEACH-IN window mode, normally-open function
- Set target to near switching point
- TEACH-IN switching point A1 with -UB
- Set target to far switching point
- TEACH-IN switching point A2 with +UB

TEACH-IN window mode, normally-closed function
- Set target to near switching point
- TEACH-IN switching point A2 with +UB
- Set target to far switching point
- TEACH-IN switching point A1 with -UB

TEACH-IN switching point, normally-open function
- Set target to near switching point
- TEACH-IN switching point A2 with +UB
- Cover sensor with hand or remove all objects from sensing range
- TEACH-IN switching point A1 with -UB

TEACH-IN switching point, normally-closed function
- Set target to near switching point
- TEACH-IN switching point A1 with -UB
- Cover sensor with hand or remove all objects from sensing range
- TEACH-IN switching point A2 with +UB

TEACH-IN detection of objects presence
- Cover sensor with hand or remove all objects from sensing range
- TEACH-IN switching point A1 with -UB
- TEACH-IN switching point A2 with +UB

LED Displays

Displays in dependence on operating mode	Red LED	Yellow LED
TEACH-IN switching point: Object detected No object detected Object uncertain (TEACH-IN invalid)	 off flashes on	 flashes off off
Normal operation	off	Switching state
Fault	on	Previous state

Accessories

	**UB-PROG2**	Programming unit
	**BF 5-30**	Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
	**BF 12**	Mounting flange, 12 mm
	**BF 12-F**	Plastic mounting adapter, 12 mm
	**V1-G-2M-PVC**	Female cordset single-ended M12 straight A-coded, 4-pin, PVC cable grey
	**V1-W-2M-PUR**	Female cordset single-ended M12 angled A-coded, 4-pin, PUR cable grey
	**UVW90-M12**	Ultrasonic -deflector
	**M12K-VE**	Plastic nuts with centering ring for the vibration-free mounting of cylindrical sensors

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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.

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