



**Model Number**

**UB120-12GM-E4-V1**

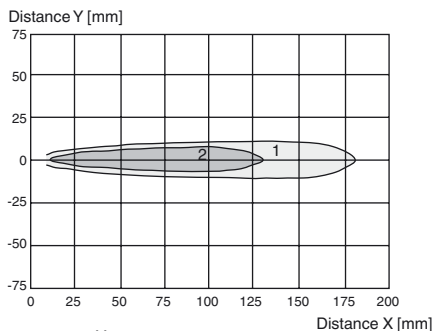
Single head system

**Features**

- Extremely narrow projection cone
- Switch output
- Very small unusable area
- 5 different output functions can be set
- Short response time

**Diagrams**

**Characteristic response curve**



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

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**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. 9 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 % <sub>SS</sub>
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 kΩ program pulse: ≥ 1 s
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**Output**

Output type	1 switch output NPN Normally open/closed , programmable
Rated operating current $I_e$	100 mA , short-circuit/overload protected
Default setting	Switch point A1: 20 mm Switch point A2: 120 mm
Voltage drop $U_d$	≤ 3 V
Repeat accuracy	≤ 1 %
Switching frequency f	≤ 52 Hz
Range hysteresis H	1 % of the set operating distance
Temperature influence	± 1.5 % of full-scale value

**Ambient conditions**

Ambient temperature	-25 ... 70 °C (-13 ... 158 °F)
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)

**Mechanical specifications**

Connection type	Connector 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

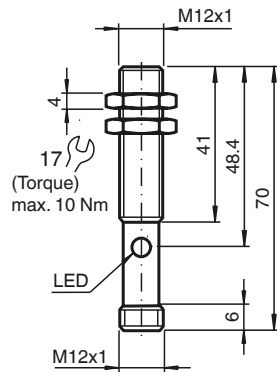
**Compliance with standards and directives**

Standard conformity	
Standards	EN 60947-5-2:2007+A1:2012 IEC 60947-5-2:2007 + A1:2012

**Approvals and certificates**

UL approval	cULus Listed, Class 2 Power Source
CCC approval	CCC approval / marking not required for products rated ≤36 V

**Dimensions**



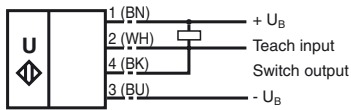
**Additional Information**

**Programmable output modes**

1. Window mode, normally open mode  
 $A1 < A2$ : object distance →
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

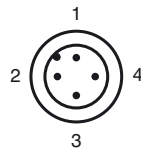
**Electrical Connection**

Standard symbol/Connections:  
 (version E4, npn)



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

**Pinout**



Wire colors in accordance with EN 60947-5-2

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

**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**

Mounting flange with dead stop, 12 mm

**V1-G-2M-PVC**

Female cordset, M12, 4-pin, PVC cable

**V1-W-2M-PUR**

Female cordset, M12, 4-pin, PUR cable

**UVW90-M12**

Ultrasonic -deflector

**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
<b>TEACH-IN switching point:</b>		
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.

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