



**Model Number**

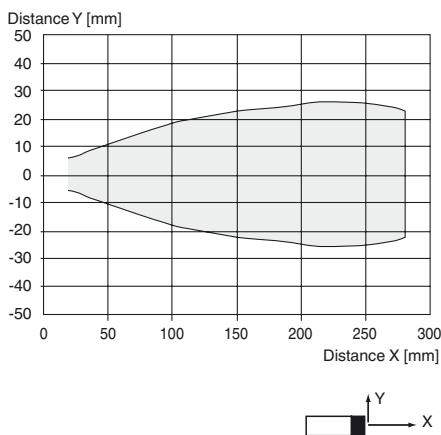
**UBR250-F77-E1-V31**  
 Reflex ultrasonic sensor

**Features**

- Miniature design
- Program input
- Degree of protection IP67
- Switching status indicator, yellow LED

**Diagrams**

**Characteristic response curve**



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**Technical data**

**General specifications**

Sensing range	0 ... 250 mm
Adjustment range	53 ... 250 mm
Standard target plate	20 mm x 20 mm
Transducer frequency	approx. 400 kHz

**Nominal ratings**

Time delay before availability $t_v$	≤ 150 ms
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**Limit data**

Permissible cable length	max. 300 m
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**Indicators/operating means**

LED yellow	switching state and flashing: Teach-In
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**Electrical specifications**

Rated operating voltage $U_e$	24 V DC
Operating voltage $U_B$	20 ... 30 V DC , ripple 10 % <sub>SS</sub> ; 12 ... 20 V DC sensitivity reduced to 90 %
No-load supply current $I_0$	≤ 20 mA

**Input**

Input type	1 program input
Level	low level : 0 ... 0.7 V (Teach-In active) high level : $U_B$ or open input (Teach-In inactive)
Input impedance	16 kΩ
Pulse length	≥ 3 s

**Output**

Output type	1 switch output E1, NPN, NC
Rated operating current $I_e$	200 mA , short-circuit/overload protected
Voltage drop $U_d$	≤ 2 V
Switch-on delay $t_{on}$	≤ 50 ms
Switching frequency $f$	10 Hz
Off-state current $I_r$	≤ 0.01 mA
Temperature influence	+ 0.17 %/K

**Ambient conditions**

Ambient temperature	-25 ... 70 °C (-13 ... 158 °F)
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)
Shock resistance	30 g , 11 ms period
Vibration resistance	10 ... 55 Hz , Amplitude ± 1 mm

**Mechanical specifications**

Connection type	M8 x 1 connector , 4-pin
Degree of protection	IP67
Material	
Housing	Polycarbonate
Transducer	epoxy resin/hollow glass sphere mixture; polyurethane foam
Installation position	any position
Mass	10 g
Tightening torque, fastening screws	max. 0.2 Nm

**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**

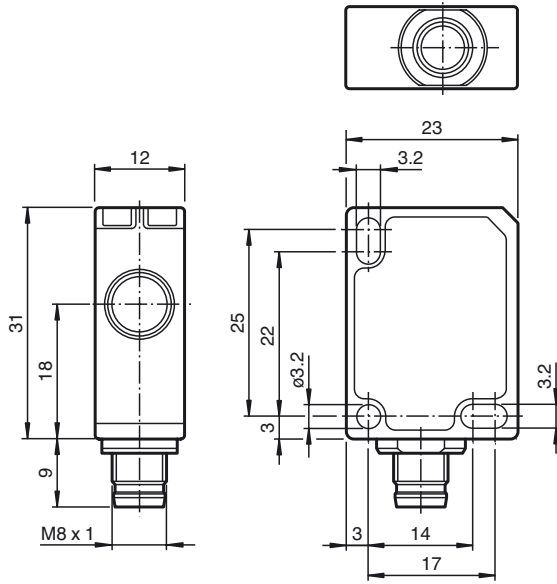
UL approval	cULus Listed, General Purpose
CCC approval	CCC approval / marking not required for products rated ≤36 V

**Safety Note**



The use of this device in applications, where the safety of persons depends from the devices function, is not allowed!

**Dimensions**



**Description of Sensor Function**

The ultrasonic sensor works like a retroreflective sensor. It transmits ultrasonic packages in quick succession and responds to their reflection off a reference object at a defined distance. The distance T to the reference object can be taught in. The sensor has a switch output. This output switches if the reference object is not detected, which happens when another object is located between the sensor and the reference object. The limit of the switching range is derived as follows: T - 5 %.

**Notes**

- The distance T of the reference object must not be changed during operation. If the distance T changes, it will have to be taught-in again.
- The reference object must not be removed during operation.

**Teach-In the Distance to the Reference Object**

Proceed as follows to teach in the distance T to the reference object:

1. Connect the sensor and turn on the operating voltage.
2. Place the reference object at the required distance.
3. Connect the teach-in input (ET) to -U<sub>B</sub>. This can be done using the pushbutton or the controller.  
The LED will start flashing after 3 seconds to indicate that the sensor is ready to start the teach-in process (\*).
4. Disconnect the teach-in input (ET) with -U<sub>B</sub>. The distance T to the reference object has now been taught in (\*).

(\* ) If no object is detected within the sensing range of the sensor, the sensor will start flashing at a faster rate. The switching point remains unchanged.

**Switching characteristics and display LED**

Sensing range			Output	LED
Adjustment range				
	5% of T	Reference object (position T)	+U <sub>B</sub>	On
			-U <sub>B</sub>	Off
			-U <sub>B</sub>	Off

● = Object position

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