



## Model Number

**UB250-F77-E3-V31**

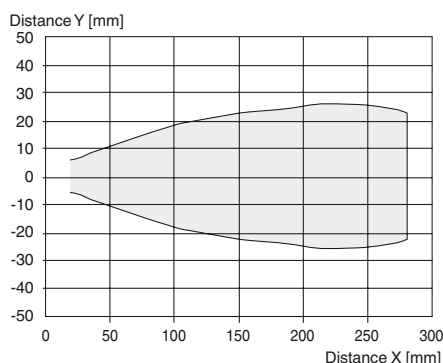
Ultrasonic direct detection sensor

## Features

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

## Diagrams

### Characteristic response curve



## Technical data

### General specifications

Sensing range	20 ... 250 mm
Adjustment range	45 ... 250 mm
Dead band	0 ... 20 mm
Standard target plate	20 mm x 20 mm
Transducer frequency	approx. 400 kHz

### Nominal ratings

Time delay before availability $t_v$	$\leq 150$ 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 $U_o$	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 $I_0$	$\leq 20$ 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 k $\Omega$
Pulse length	$\geq 3$ s

### Output

Output type	1 switch output PNP, NC contact
Rated operating current $I_e$	200 mA, short-circuit/overload protected
Voltage drop $U_d$	$\leq 2$ V
Switch-on delay $t_{on}$	$\leq 50$ ms
Repeat accuracy	$\pm 1$ mm
Switching frequency $f$	10 Hz
Range hysteresis $H$	typ. 2.5 mm
Off-state current $I_r$	$\leq 0.01$ 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 $\pm 1$ 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

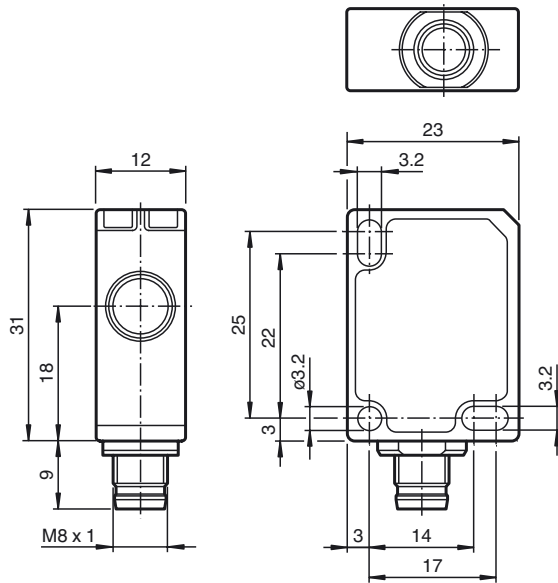
UL approval	cULus Listed, General Purpose
CCC approval	CCC approval / marking not required for products rated $\leq 36$ V

## 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 transmits ultrasonic packets in quick succession and responds to their reflection off the detected object. The sensor has a switch output. The switching point is programmable (Teach-In). Objects beyond the taught-in switching point are not detected (background suppression).

## Teach-In of Switching Point SP

To teach in a switching point, proceed as follows:

1. Connect the sensor and turn on the operating voltage.
2. Place the object to be detected at the required distance.
3. Connect the teach-in input (ET) to  $-U_B$ . 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  $-U_B$ . The switching point SP 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

unusable area	Sensing range		Output	LED
		Adjustment range		
			+U <sub>B</sub>	On
			-U <sub>B</sub>	Off
			Undefined	

● = Object position

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