



**Model Number**

**UB250-F77-E3-V31**

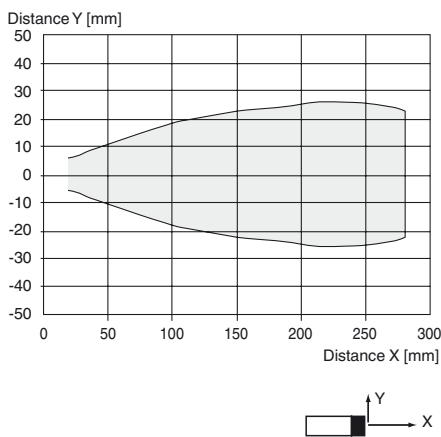
Ultrasonic direct detection sensor

**Features**

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

**Diagrams**

**Characteristic response curve**



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**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 $t_v$	≤ 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 PNP , NC contact
Rated operating current $I_o$	200 mA , short-circuit/overload protected
Voltage drop $U_d$	≤ 2 V
Switch-on delay $t_{on}$	≤ 50 ms
Repeat accuracy	± 1 mm
Switching frequency $f$	10 Hz
Range hysteresis $H$	typ. 2.5 mm
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

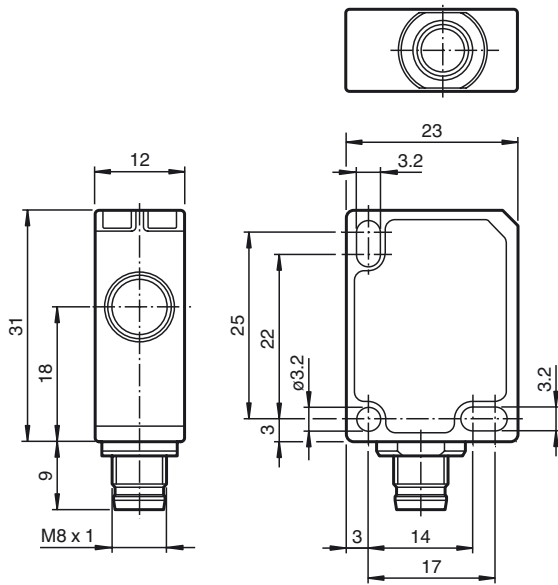
**Compliance with standards and directives**

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

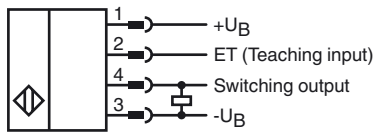
**Approvals and certificates**

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

**Dimensions**



**Electrical Connection**



**Pinout**



Wire colors in accordance with EN 60947-5-2

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

**Accessories**

**UB-PROG4-V31**

Programming unit for ultrasonic sensors with Teach-in input at pin 2

**OMH-ML7-01**

Mounting aid for ML7 and ML8 series, Mounting bracket

**V31-GM-2M-PVC**

Female cordset, M8, 4-pin, PVC cable

**V31-WM-2M-PVC**

Female cordset, M8, 4-pin, PVC cable

**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<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 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

**Safety Note**

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

