



**Model Number**

**UB250-F77-F-V31**

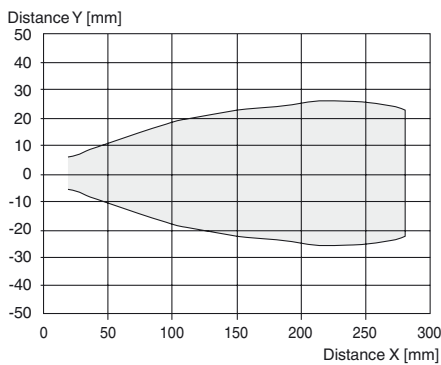
Ultrasonic direct detection sensor

**Features**

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

**Diagrams**

**Characteristic response curve**



**Technical data**

**General specifications**

Sensing range	35 ... 250 mm
Unusable area	0 ... 35 mm
Standard target plate	20 mm x 20 mm
Transducer frequency	approx. 400 kHz
Response delay	≤ 50 ms

**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	object inside the scanning range
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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 $I_0$	≤ 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	≥ 3 s

**Output**

Output type	Frequency output, PNP
Rated operating current $I_o$	100 mA, short-circuit/overload protected
Resolution	Standard 2 Hz / mm
Repeat accuracy	± 2.5 %
Off-state current $I_r$	≤ 0.01 mA
Output frequency	frequency : 70 ... 500 Hz (35 ... 250 Hz), adjustable
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**

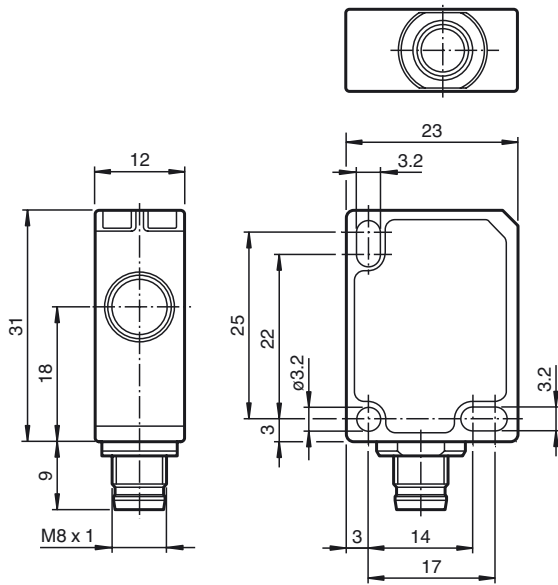
Standard conformity	
Standards	EN 60947-5-2:2007 IEC 60947-5-2:2007

**Approvals and certificates**

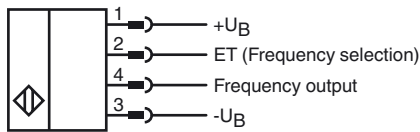
UL approval	cULus Listed, General Purpose
CSA approval	cCSAus Listed, General Purpose
CCC approval	CCC approval / marking not required for products rated ≤36 V

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**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)

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**Accessories**

**UB-PROG4-V31**

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

**OMH-ML7-01**

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 packages in quick succession and responds to their reflection off the detected object. It has a frequency output that delivers a square wave signal. The frequency of this signal changes linearly with the distance of the object. Two frequency ranges are available.

**Description of the Frequency Selection**

Proceed as follows to select the frequency range:

**Standard frequency 70 ... 500 Hz**

1. Connect terminal ET to +U<sub>B</sub> or leave it open.
2. Switch on the operating voltage.
3. The sensor will be ready for operation after 3 seconds.

**Low frequency 35 ... 250 Hz**

1. Connect terminal (ET) to -U<sub>B</sub>.
2. Switch on the operating voltage.
3. The sensor will be ready for operation after 3 seconds.

ET	unusable area	Sensing range 35 ... 250 mm	> 250 mm or no object
Open or +U <sub>B</sub>	Undefined	70 ... 500 Hz	500 Hz
-U <sub>B</sub>	Undefined	35 ... 250 Hz	250 Hz

**Note:**

Switching the potential on ET during operation will not change the frequency range.

**Safety Note**



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

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