Model Number

UB400-F77-F-V31

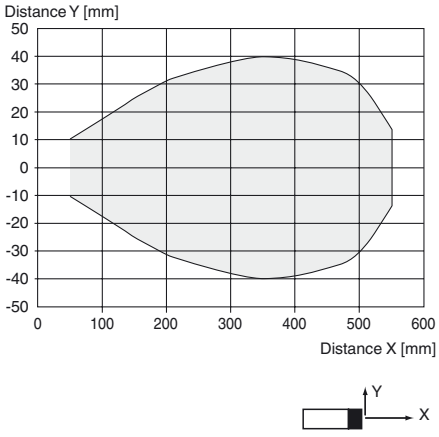
Ultrasonic direct detection sensor

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	40 ... 400 mm
Dead band	0 ... 40 mm
Standard target plate	20 mm x 20 mm
Transducer frequency	approx. 300 kHz
Response delay	≤ 75 ms
Nominal ratings	
Time delay before availability t_v	≤ 150 ms
Limit data	
Permissible cable length	max. 300 m
Indicators/operating means	
LED yellow	object inside the scanning range
Electrical specifications	
Rated operating voltage U_e	24 V DC
Operating voltage U_B	20 ... 30 V DC , ripple 10 %$_{SS}$; 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	Frequency output , PNP
Rated operating current I_e	100 mA , short-circuit/overload protected
Voltage drop U_d	≤ 2 V
Resolution	Standard 2 Hz / mm
Repeat accuracy	± 2.5 %
Off-state current I_r	≤ 0.01 mA
Output frequency	frequency : 80 ... 800 Hz (40 ... 400 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 + 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

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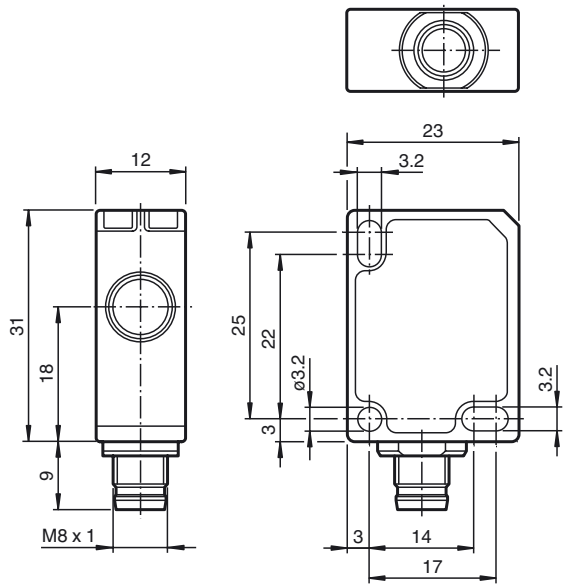
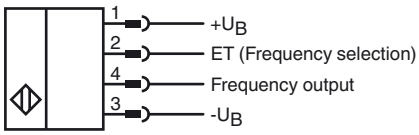
Dimensions



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 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 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 80 ... 800 Hz

1. Connect terminal ET to $+U_B$ or leave it open.
2. Switch on the operating voltage.
3. The sensor will be ready for operation after 3 seconds.

Low frequency 40 ... 400 Hz

1. Connect terminal (ET) to $-U_B$.
2. Switch on the operating voltage.
3. The sensor will be ready for operation after 3 seconds.

ET	unusable area	Sensing range 40 ... 400 mm	> 400 mm or no object
Open or $+U_B$	Undefined	80 ... 800 Hz	800 Hz
$-U_B$	Undefined	40 ... 400 Hz	400 Hz

Note:

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

Mounting instruction

If the sensor is operated at temperatures below 0 °C, use the supplied distance plate. Only use the two rearmost mounting holes (located opposite to the transducer) for mounting the sensor.

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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