



**Model Number**

**UB400-F77-E3-V31**

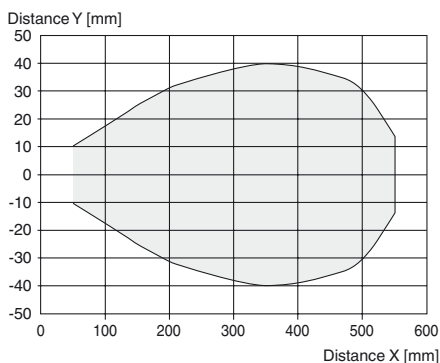
Ultrasonic direct detection sensor

**Features**

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

**Diagrams**

**Characteristic response curve**



**Technical data**

**General specifications**

|                       |                 |
|-----------------------|-----------------|
| Sensing range         | 25 ... 400 mm   |
| Adjustment range      | 40 ... 400 mm   |
| Dead band             | 0 ... 25 mm     |
| Standard target plate | 20 mm x 20 mm   |
| Transducer frequency  | approx. 300 kHz |

**Nominal ratings**

|                                      |          |
|--------------------------------------|----------|
| Time delay before availability $t_v$ | ≤ 150 ms |
|--------------------------------------|----------|

**Limit data**

|                          |            |
|--------------------------|------------|
| Permissible cable length | max. 300 m |
|--------------------------|------------|

**Indicators/operating means**

|            |  |
|------------|--|
| LED yellow | switching state and flashing: Teach-In |
|------------|--|

**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)<br>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 $I_e$ | 200 mA , short-circuit/overload protected |
| Voltage drop $U_d$            | ≤ 2 V                                     |
| Switch-on delay $t_{on}$      | ≤ 75 ms                                   |
| Repeat accuracy               | ± 1 mm                                    |
| Switching frequency $f$       | 5 Hz                                      |
| Range hysteresis $H$          | typ. 4 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<br>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 |

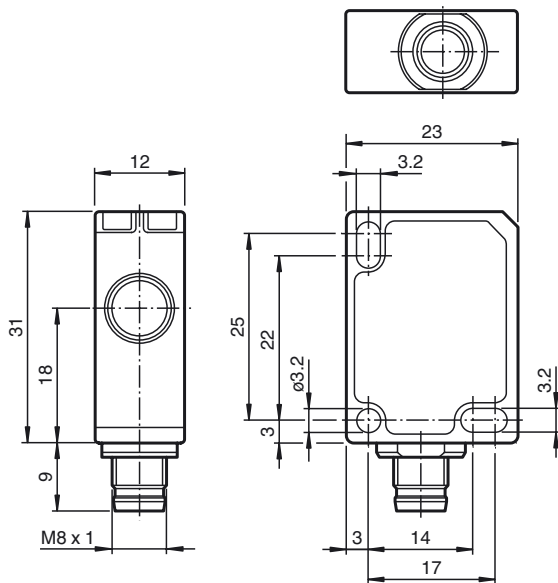
**Safety Note**



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

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**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 |   |           |     |
|               |                  | ● | $+U_B$    | On  |
|               | ●                |   | $-U_B$    | Off |
| ●             |                  |   | Undefined |     |

● = Object position

**Mounting instruction**

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

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