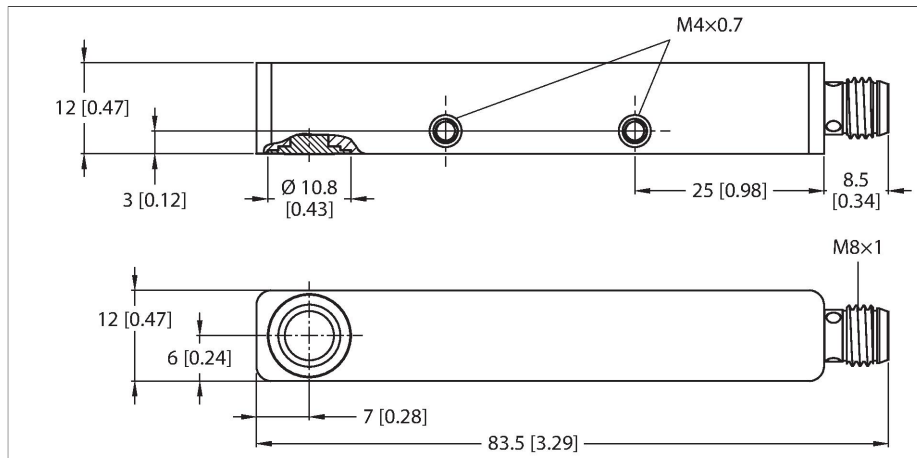


# RU40U-Q12S-UP8X-V1141

## Ultrasonic Sensor – Diffuse Mode Sensor



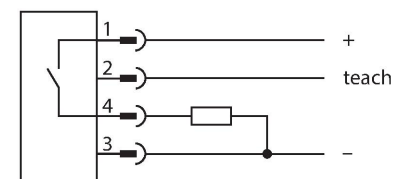
### Technical data

|                                |                                  |
|--------------------------------|----------------------------------|
| Type                           | RU40U-Q12S-UP8X-V1141            |
| ID                             | 100005610                        |
| <b>Ultrasonic data</b>         |                                  |
| Function                       | Proximity switch                 |
| Range                          | 40...400 mm                      |
| Resolution                     | 1 mm                             |
| Minimum switching range        | 5 mm                             |
| Ultrasound frequency           | 300 kHz                          |
| Repeat accuracy                | ≤ 0.125 % of full scale          |
| Temperature drift              | ± 1 % of full scale              |
| Linearity error                | ≤ ± 0.8 %                        |
| Approach speed                 | ≤ 3 m/s                          |
| Pass speed                     | ≤ 1 m/s                          |
| <b>Electrical data</b>         |                                  |
| Operating voltage              | 18...30 VDC                      |
| Residual ripple                | 10 % U <sub>ss</sub>             |
| No-load current                | ≤ 40 mA                          |
| Load resistance                | ≤ 1000 Ω                         |
| Residual current               | ≤ 0.1 mA                         |
| Response time typical          | < 100 ms                         |
| Readiness delay                | ≤ 300 ms                         |
| Communication protocol         | IO-Link                          |
| Output function                | NO/NC, PNP                       |
| Output 1                       | Switching output or IO-Link mode |
| Switching frequency            | ≤ 10 Hz                          |
| Hysteresis                     | ≤ 2 mm                           |
| Voltage drop at I <sub>o</sub> | ≤ 2 V                            |

### Features

- Smooth sonic transducer face
- Rectangular housing Q12S, potted
- Lateral light emission
- Connection via M8 × 1 male connector
- Teach range adjustable via connection cable or via IO-Link
- Blind zone: 4 cm
- Range: 40 cm
- Resolution: 1 mm
- Aperture angle of sonic cone: ±9 °
- Switching output, PNP
- NO/NC programmable
- IO-Link

### Wiring diagram



### Functional principle

Ultrasonic sensors capture a multitude of objects contactlessly and wear-free with ultrasonic waves. It does not matter whether the object is transparent or opaque, metallic or non-metallic, firm, liquid or powdery. Even environmental conditions such as spray, dust or rain hardly affect their function.

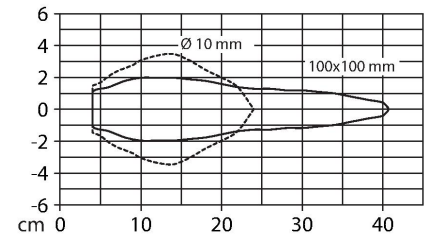
## Technical data

|                                      |                                                                         |
|--------------------------------------|-------------------------------------------------------------------------|
| Short-circuit protection             | yes                                                                     |
| Reverse polarity protection          | yes                                                                     |
| Setting option                       | Remote Teach<br>IO-Link                                                 |
| <b>IO-Link</b>                       |                                                                         |
| IO-Link specification                | V 1.1                                                                   |
| IO-Link port type                    | Class A                                                                 |
| Communication mode                   | COM 2 (38.4 kBaud)                                                      |
| Process data width                   | 16 bit                                                                  |
| Measured value information           | 15 bit                                                                  |
| Switchpoint information              | 1 bit                                                                   |
| Frame type                           | 2.2                                                                     |
| Minimum cycle time                   | 2 ms                                                                    |
| Function pin 4                       | IO-Link                                                                 |
| Function Pin 2                       | DI                                                                      |
| Maximum cable length                 | 20 m                                                                    |
| Profile support                      | Smart Sensor Profile                                                    |
| Included in the SIDI GSDML           | Yes                                                                     |
| <b>Mechanical data</b>               |                                                                         |
| Design                               | Rectangular, Q12                                                        |
| Radiation direction                  | side                                                                    |
| Dimensions                           | 82 x 12 x 12 mm                                                         |
| Housing material                     | Metal, AL, Anodized                                                     |
| Transducer material                  | Plastic, Epoxyd resin and PU foam                                       |
| Electrical connection                | Connector, M8 × 1, 4-wire                                               |
| Ambient temperature                  | -25...+70 °C                                                            |
| Storage temperature                  | -25...+70 °C                                                            |
| Pressure resistance                  | 0.5...5 bar                                                             |
| Protection class                     | IP67                                                                    |
| Switching state                      | LED, Yellow                                                             |
| <b>Tests/approvals</b>               |                                                                         |
| MTTF                                 | 575 years acc. to SN 29500 (Ed. 99) 40 °C                               |
| Declaration of conformity EN ISO/IEC | EN 60947-5-2                                                            |
| Shock test                           | Shock/vibration according to EN 60947-5-230 g, 11 ms/10...55 Hz, 1.0 mm |
| Approvals                            | CE<br>cULus                                                             |

The sonic cone diagram indicates the detection range of the sensor. In accordance with standard EN 60947-5-2, quadratic targets in a range of sizes (20 × 20 mm, 100 × 100 mm) and a round rod with a diameter of 27 mm are used.

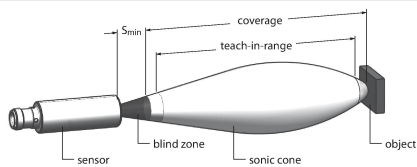
Important: The detection ranges for other targets may differ from those for standard targets due to the different reflection properties and geometries.

## Sonic Cone



Mounting instructions

Mounting instructions/Description



**Setting the switchpoint**  
The ultrasonic sensor features a switching output with a teachable switching point. The yellow LED indicates whether the sensor has detected the object.

One switching point is taught. This must be within the detection range. In this operating mode the background is suppressed.

- Teach
- Position the object at the beginning of the protection area
  - Bridge pin 2 (BK) with the Ub for 2–7 seconds
  - Place object at the end of the switching range
  - Bridge pin 2 (BK) with the Ub for 8–11 seconds

After a successful teach-in, the yellow LED flashes at 2 Hz and the sensor runs automatically in normal mode.

- LED response
- In normal operating mode, the LED signals the switching state of the sensor.
- Yellow: Object is within the switching range
  - Off: Object is outside the detection range or signal loss

Accessories

| Dimension drawing | Type                | ID      |                                                                                                                                                              |
|-------------------|---------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   | PKG4M-2/TEL         | 6625061 | Connection cable, M8 female connector, straight, 4-pin, cable length: 2 m, jacket material: PVC, black; cULus approval                                       |
|                   | PKW4M-2/TEL         | 6625067 | Connection cable, M8 female connector, angled, 4-pin, cable length: 2 m, jacket material: PVC, black; cULus approval                                         |
|                   | PKG4M-2-RSC4.4T/TXL | 6627063 | Extension cable, M8 female connector, straight, 4-pin to M12 male connector, straight, 4-pin, cable length: 2 m, jacket material: PUR, black; cULus approval |

Accessories

| Dimension drawing                                                                 | Type           | ID      |                                                                                                        |
|-----------------------------------------------------------------------------------|----------------|---------|--------------------------------------------------------------------------------------------------------|
|  | TBEN-S2-4IOL   | 6814024 | Compact multiprotocol I/O module, 4 IO-Link Master 1.1 Class A, 4 universal PNP digital channels 0.5 A |
|  | USB-2-IOL-0002 | 6825482 | IO-Link Master with integrated USB port                                                                |