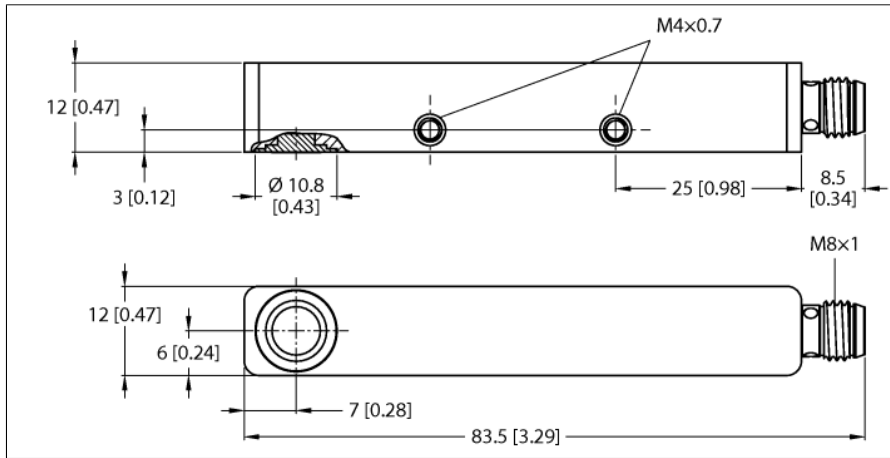


**Ultrasonic Sensor**  
**Diffuse Mode Sensor**  
**RU40U-Q12S-UP8X-V1141**



- 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

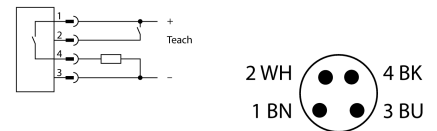
**Type designation** RU40U-Q12S-UP8X-V1141  
**Ident-No.** 100005610

**Function** Ultrasonic diffuse mode sensor  
**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

**Operating voltage** 18...30 VDC  
**Residual ripple** 10 %  $U_s$   
**No-load current  $I_0$**  ≤ 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  $I_L$**  ≤ 2 V  
**Short-circuit protection** yes  
**Reverse polarity protection** yes

**IO-Link**  
**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 Profil  
**Included in the SIDI GSDML** Yes

**Wiring Diagram**



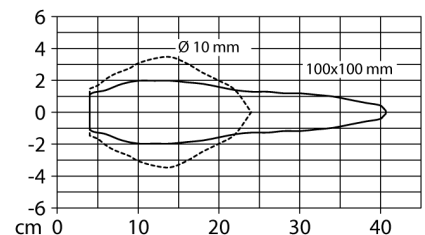
**Functional principle**

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.

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 x 20 mm, 100 x 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**



# Ultrasonic Sensor

## Diffuse Mode Sensor

### RU40U-Q12S-UP8X-V1141

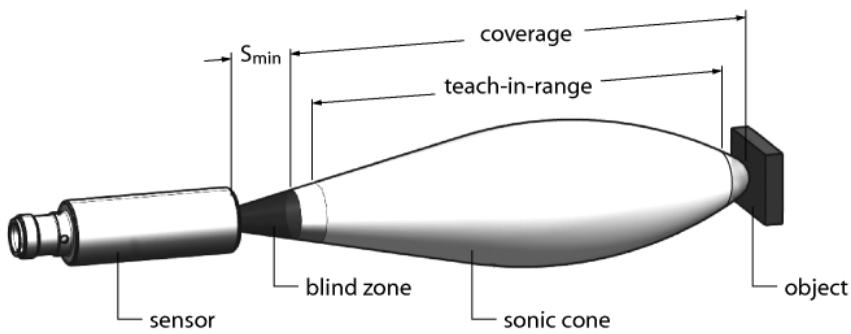
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<b>Design</b>	Rectangular, Q12
Radiation direction	side
Dimensions	82 x 12 x 12 mm
Housing material	Metal, AL, Anodized
Transducer material	Plastic, Epoxyd resin and PU foam
Electrical connection	Connector, M8 x 1, 4-wire
Protection class	IP67
Ambient temperature	-10...+70 °C
Storage temperature	-10...+70 °C
Declaration of conformity EN ISO/IEC	EN 60947-5-2
MTTF note	acc. to SN 29500 (Ed. 99) 40 °C

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<b>Switching state</b>	LED, Yellow
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**Ultrasonic Sensor  
Diffuse Mode Sensor  
RU40U-Q12S-UP8X-V1141**



**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**

- Connect the teach adapter TX1-Q20L60 between the sensor and connection cable
- Position the object at the beginning of the protection area
- Press the button for 2 - 7 sec against Ub
- Place object at the end of the switching range
- Press the button against 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.

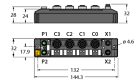
**LED response**

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

**Ultrasonic Sensor  
Diffuse Mode Sensor  
RU40U-Q12S-UP8X-V1141**

**Function accessories**

Type code	Ident-No.	Description	Dimension drawing
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	