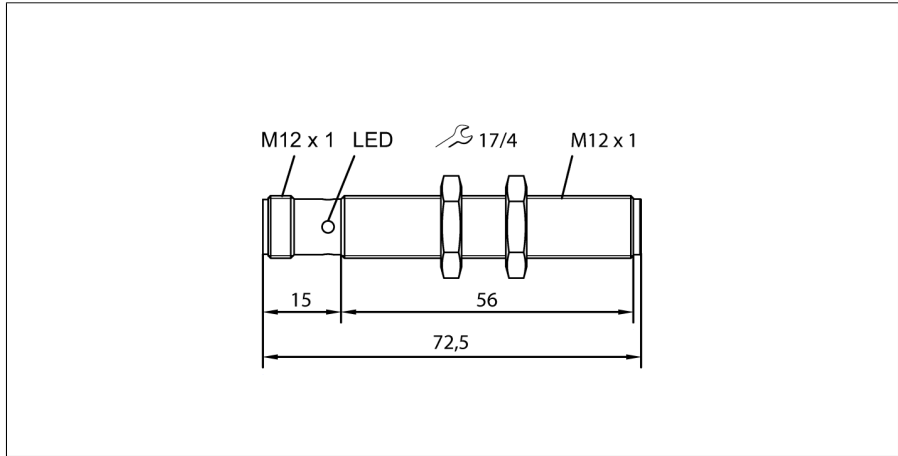


**Ultrasonic Sensor  
Diffuse Mode Sensor  
RU40U-M12-AP6X2-H1141**



- Smooth sonic transducer face
- Cylindrical housing M12, potted
- Connection via M12 × 1 male connector
- Teach range adjustable via connection cable
- Blind zone: 4cm
- Range: 40cm
- Resolution: 0.5mm
- Aperture angle of sonic cone: 15°
- Switching output, PNP, programmable via IO-Link
- NO/NC programmable
- IO-Link

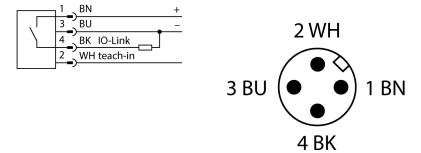
<b>Type designation</b>	RU40U-M12-AP6X2-H1141
Ident-No.	100000279

<b>Function</b>	Ultrasonic diffuse mode sensor
Range	40...400 mm
Resolution	0.5 mm
minimum measuring range	50 mm
minimum switching range	5 mm
Ultrasound frequency	300 kHz
Repeat accuracy	0.15 % of full scale
Linearity error	≤ ± 0.5 %
Edge lengths of the nominal actuator	20 mm
Approach speed	≤ 5 m/s
Pass speed	≤ 2.9 m/s

<b>Operating voltage</b>	10...30 VDC
Residual ripple	10 % U <sub>ss</sub>
DC rated operational current	≤ 150 mA
No-load current I <sub>0</sub>	≤ 50 mA
Residual current	≤ 0.1 mA
Response time typical	60 ms
Readiness delay	300 ms
Communication protocol	IO-Link
Output function	NO/NC, PNP
Switching frequency	10.4 Hz
Hysteresis	≤ 5 mm
Voltage drop at I <sub>L</sub>	≤ 2.5 V
Short-circuit protection	yes/ Cyclic
Reverse polarity protection	yes
Wire breakage protection	yes

<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 Profil
Included in the SIDI GSDML	Yes

**Wiring Diagram**



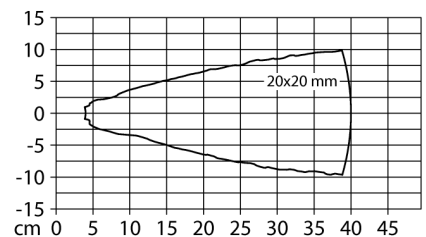
**Functional principle**

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-M12-AP6X2-H1141

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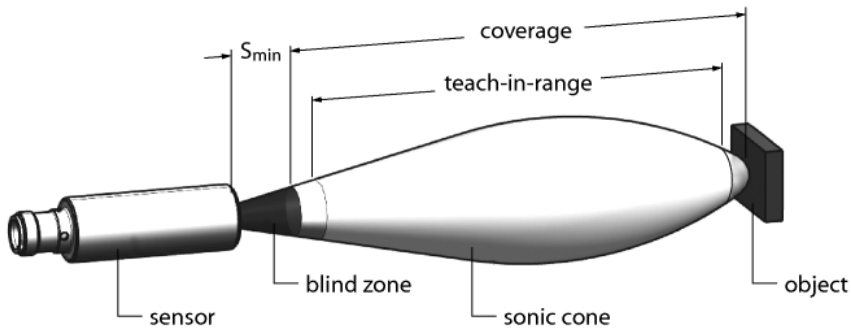
<b>Design</b>	Threaded barrel, M12
Radiation direction	straight
Dimensions	72.5 x Ø 12 mm
Housing material	Metal, CuZn, Chrome-plated
Transducer material	Plastic, Epoxyd resin and PU foam
Electrical connection	Connector, M12 × 1, 4-wire
Protection class	IP67
Ambient temperature	-10...+60 °C
Storage temperature	-40...+80 °C
Declaration of conformity EN ISO/IEC	EN 60947-5-2
Vibration resistance	IEC 60068-2
MTTF	377 years
MTTF note	acc. to SN 29500 (Ed. 99) 40 °C

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<b>Switching state</b>	LED, Yellow
Object detected	LED, Green

**Ultrasonic Sensor  
Diffuse Mode Sensor  
RU40U-M12-AP6X2-H1141**

Mounting instructions/Description



**Setting the switchpoint**

The ultrasonic sensor features a switching output with a teachable switching point. The green and yellow LEDs indicate whether the sensor has detected the object.

A switching point or a switching window is taught in. 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
  - Short-circuit pin 2 (WH) against Ub for 2–7 seconds to teach in an individual switching point or the beginning of the switching window
  - Place object at the end of the switching range
  - Short-circuit pin 2 (WH) against Ub for 8–11 seconds to teach in the end of the switching window
- After a successful teach-in, the yellow LED flashes at 2 Hz and the sensor runs automatically in normal mode.
- Optional: Short-circuit pin 2 (WH) against Ub for 12–17 seconds to switch between NC and NO function (no object required)
- Return to normal operating mode after 17 s or more.

**LED response**

In standard operating mode, the two LEDs indicate the switching state of the sensor.

- Green: Object within the detection range but not in switching range
- Yellow: Object is within the switching range
- Off: Object is outside the detection range or signal loss

