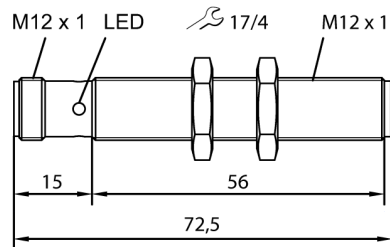


Ultrasonic Sensor Diffuse Mode Sensor RU20U-M12-AP6X2-H1141



- Smooth sonic transducer face
- Cylindrical housing M12, potted
- Connection via M12 × 1 male connector
- Teach range adjustable via connection cable
- Blind zone: 2.5cm
- Range: 20cm
- Resolution: 0.5mm
- Aperture angle of sonic cone: 9°
- Switching output, PNP, programmable via IO-Link
- NO/NC programmable
- IO-Link

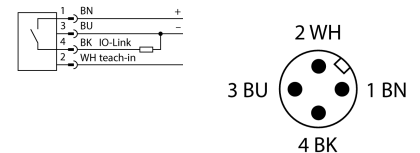
Type designation RU20U-M12-AP6X2-H1141
Ident-No. 100000278

Function Ultrasonic diffuse mode sensor
Range 25...200 mm
Resolution 0.5 mm
minimum measuring range 30 mm
minimum switching range 3 mm
Ultrasound frequency 400 kHz
Repeat accuracy 0.15 % of full scale
Linearity error ≤ ± 0.5 %
Edge lengths of the nominal actuator 10 mm
Approach speed ≤ 3 m/s
Pass speed ≤ 1.1 m/s

Operating voltage 10...30 VDC
Residual ripple 10 % U_{ss}
DC rated operational current ≤ 150 mA
No-load current I₀ ≤ 50 mA
Residual current ≤ 0.1 mA
Response time typical 50 ms
Readiness delay 300 ms
Communication protocol IO-Link
Output function NO/NC, PNP
Switching frequency 12.5 Hz
Hysteresis ≤ 3 mm
Voltage drop at I₀ ≤ 2.5 V
Short-circuit protection yes/ Cyclic
Reverse polarity protection yes
Wire breakage 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



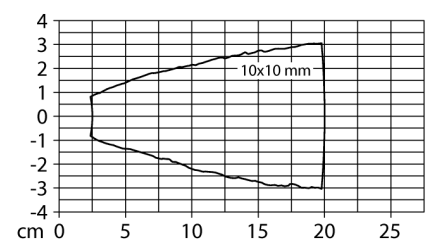
Functional principle

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

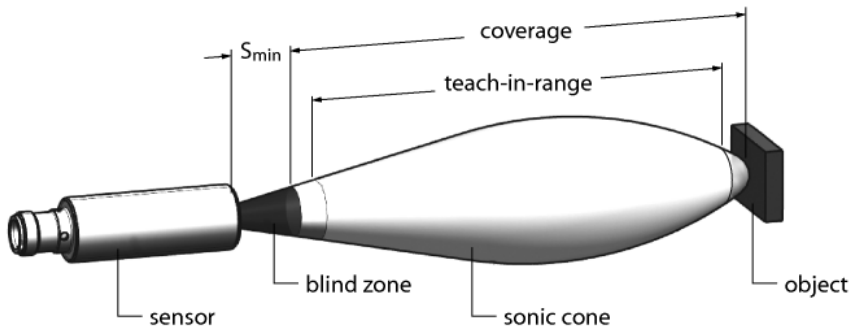


Ultrasonic Sensor Diffuse Mode Sensor RU20U-M12-AP6X2-H1141

Design	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
Switching state	LED, Yellow
Object detected	LED, Green

Ultrasonic Sensor Diffuse Mode Sensor RU20U-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.

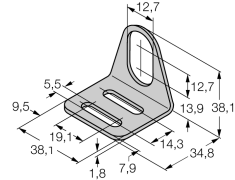
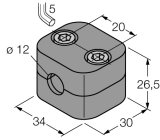
- Green: Object within the detection range but not in switching range
- Yellow: Object is within the switching range
- Off: Object is outside the detection range or signal loss

Ultrasonic Sensor

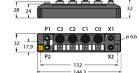
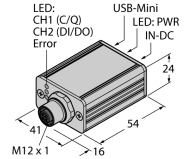
Diffuse Mode Sensor

RU20U-M12-AP6X2-H1141

Accessories

Type code	Ident-No.	Description	Dimension drawing
MW-12	6945003	Mounting bracket for threaded barrel sensors; material: Stainless steel A2 1.4301 (AISI 304)	
BSS-12	6901321	Mounting clamp for smooth and threaded barrel sensors; material: Polypropylene	

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	
VB2-SP1	A3501-29	Teach adapter	