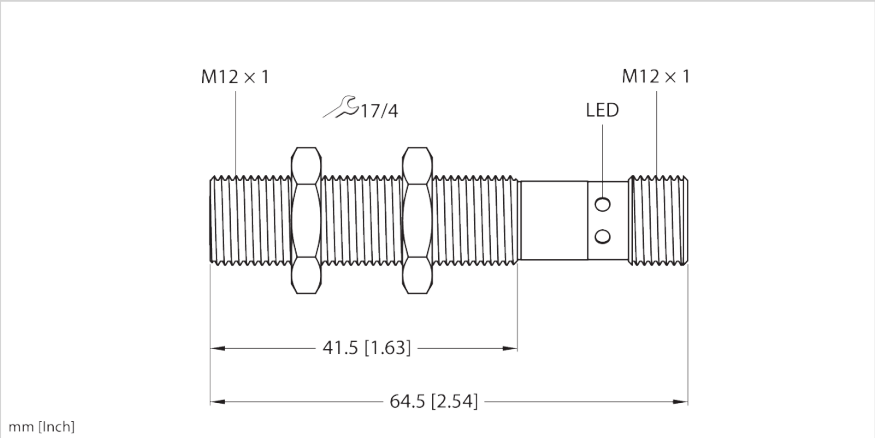
RU40U-M12-UPN8X2-H1141

Ultrasonic sensor
Diffuse-mode sensor



Typ	RU40U-M12-UPN8X2-H1141
Ident-No.	100052189

Technical data

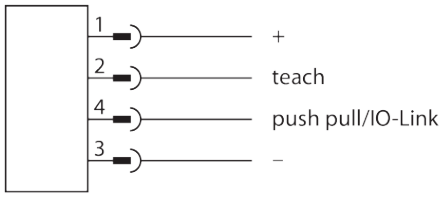
General data	
Approach speed	≤5 m/s
Detection type	contactless
Measuring principle	Ultrasonic
Measuring principle	Contactless
Operating mode	Time-of-Flight
Pass speed	≤ 2,9 m/s
Application area	
Pressure resistance	0.5…5 bar
Detection area/measuring range	
Edge lengths of the nominal actuator	20 mm
Range	40...400 mm
Ultrasound frequency	300 kHz
Power supply	
Operating voltage U_B	18...30 VDC
Voltage drop at I_e	≤ 2 V
Electrical data	
No-load current	40 mA

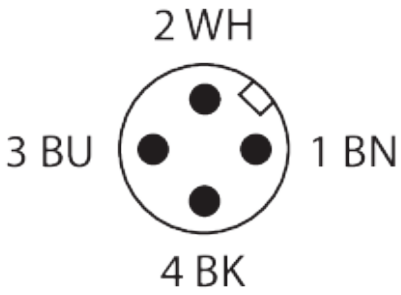
Features

- Smooth sonic transducer face
- Cylindrical housing, M12, potted
- Connection via M12 × 1 male connector
- Teach range adjustable via connection cable
- Blind zone: 4 cm
- Range: 40 cm
- Resolution: 1 cm
- Narrow sonic cone
- Switching output, PNP/NPN, programmable
- NO/NC parameterizable
- IO-Link

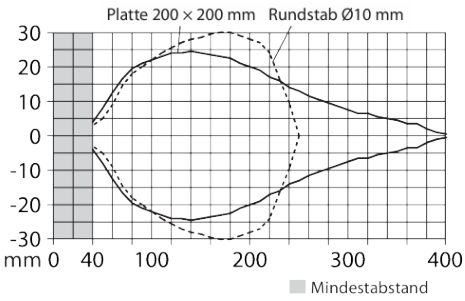
Technical data

Output function	4-wire, NO/NC, PNP/NPN
Short-circuit protection	yes/Cyclic
Wire break/reverse polarity protection	yes/yes
DC rated operational current	≤ 150 mA
Readiness delay	≤300 ms
Residual current	≤ 0,1 mA
Residual ripple	≤ 10 % U_{SS}
Residual ripple	<10 % u_{SS}
Switching frequency	≤10 Hz
Interfaces	
Communication protocol	IO-Link
Accuracy/deviation	
Resolution	1 mm
Linearity error	≤ ±0,4 %
Hysteresis	≤ 20 mm
Repeat accuracy	≤ 0,15 % v. E.
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
Switching point information	1 bit
Frame type	2.2
Minimum cycle time	2 ms
Function Pin 2	DI
Function pin 4	IO-Link
Maximum cable length	20 m
Profile support	Smart Sensor Profile
Included in the SIDI GSDML	Yes
Mechanical data	
Design	Threaded barrel, M12
Construction type designation	M12
Dimensions	12 mm x 65 mm
Housing material	Metal, CuZn, Chrome-plated
Active area material	Epoxy
Max. tightening torque of housing nut	20 Nm





Sonic Cone



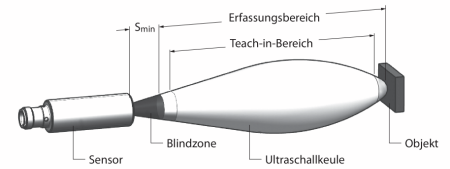
Functional principle

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 × 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.

Technical data

Electrical connection	Connector, M12 × 1
Thread length	41,5 mm
Thread size	M12 x 1
Radiation direction	straight
Transducer material	Plastic, Epoxyd resin and PU foam
Environmental conditions	
Ambient temperature	-25...+70 °C
Storage temperature	-40…+80 °C
Protection class	IP67
Tests/approvals	
Declaration of conformity EN ISO/IEC	EN 60947-5-2
MTTF	acc. to SN 29500 (Ed. 99) 40 °C
Displays/controls	
Switching state	LED, Yellow
Setting 1	teach-in function

Installation instructions



Installation information:

Setting the switching point

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

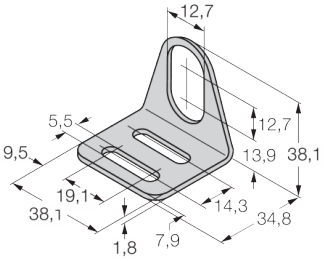
Teach

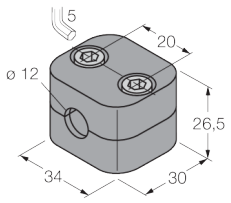
• Position the object at the beginning of the switching range
• Short-circuit pin 2 (WH) against Ub for 2…7 seconds to teach in an individual switching point or the beginning of the switching window
• Position the object at the end of the switching range
• Short-circuit pin 2 (WH) against Ub for 8…11 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 seconds or more

LED response

In normal 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 within the switching range
• Off: object outside the detection range or signal loss

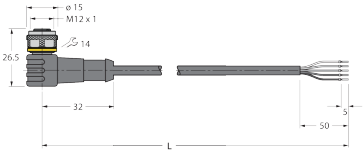
Mounting accessories

MW12	6945003
	Mounting bracket for threaded barrel sensors; material: Stainless steel A2 1.4301 (AISI 304)

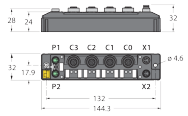
#	6901321
	Mounting clamp for smooth and threaded barrel sensors; material: Polypropylene

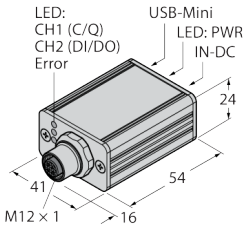
Connectivity accessories

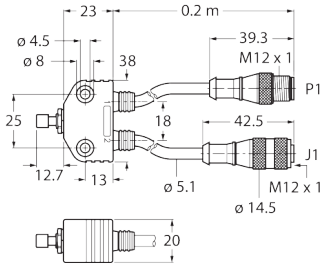
RKC4.5T-2/TEL	6625016
	Connection cable, M12 female connector, straight, 5-pin, cable length: 2 m, jacket material: PVC, black; cULus approval

WKC4.5T-2/TEL	6625028
	Connection cable, M12 female connector, angled, 5-pin, cable length: 2 m, jacket material: PVC, black; cULus approval

Functional accessories

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