Ultrasonic Sensors UTR Series

Detection and Measurement Solution for Various Materials and Surfaces

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Autonics

Detect and Measure Various Target Material with Ultrasonic Sensing

Cylindrical Ultrasonic Sensors UTR Series

The UTR series cylindrical ultrasonic sensors can detect and measure distance of objects by emitting and receiving high frequency sound waves and measuring the time lapse in between. Ultrasonic sensing method allows detection of various material and surface types with a maximum detection distance of up to 8 m.

The sensors also offer temperature tracking, detection width conversion, and other various functions to provide accurate and precise measurement. Ultrasonic sensors can be used in various applications including presence detection and liquid/solid/powder level measurement.

Features

- Detect and measure various material and surface types with ultrasonic sensing
- Sensing distance (by mount diameter)
  - M18 mm : 120 to 1,300 mm
  - M30 mm : 600 to 8,000 mm
- Temperature compensation (auto/manual) and detection width conversion function for high accuracy
- 316L stainless steel body for high corrosion resistance
- 360° ring type indicator to check operation status from any direction
- Digital output (Push-Pull) support
- IO-Link models, simultaneous digital and analog output models available
- Configure settings and monitor status with ultrasonic sensor programming units (UT-P)
- Dedicated software provided (atDistance)
- Protection structure: IP67 (IEC standard)

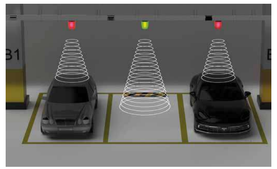
CE UKCA cULus LISTED

IO-Link

Applications

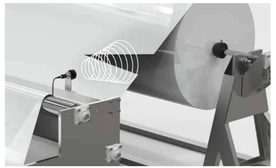
Object Detection

Users can detect the presence of objects regardless of transparency, color, pattern, and shape.



Space Detection

Users can get parking status information by detecting the presence of vehicles in the parking lots.



Break Detection

Users can detect the break of objects such as film, pulp, and textiles.

Transparent Object Detection

Users can detect the presence of transparent objects such as glass on the conveyor belt.

Crash Prevention

Users can detect presence or distance of objects by installing sensors in AGVs or AMRs.

Stretch Measurement

Users can measure the amount of stretch or speed of loops during tire or textile manufacturing process.

Main Features

1 Detect and Measure Various Material and Surface Types

Detect various materials including transparent or metallic objects, powder, or liquid, regardless of color, pattern, texture, or luster of the surfaces. Ultrasonic sensors can also be used to measure distance of target objects.

2 Long Sensing Distance up to 8 m

Long sensing distance up to 8 m allows application in difficult environments including high temperatures.

3 Ring Type Indicator and Display

360° ring type indicator to check operation status from any direction. Models with display panels show the current and parameter set values for user convenience.

4 High Accuracy of Detection

With the dedicated software, atDistance, users can set multiple functions such as temperature tracking, detection width conversion, measurement filter function, synchronization and multiplex function for high accuracy of detection.

5 316L Stainless Steel Body

316L stainless steel body offers high corrosion resistance ideal for various industries including food/beverage and pharmaceutical industries.

6 IO-Link Communication

IO-Link model allow users to check sensor status for convenient maintenance.

7 Ultrasonic Sensor Programming Units (Sold Separately)

Users can monitor the present values in real-time with the display of the ultrasonic sensor programming unit (UT-P). Some functions can be easily set with the buttons.

Specification

[Cylindrical Ultrasonic Sensors UTR Series]

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

UTRCM ❶ - ❷ ❸ ❹ - ❺ - ❻

❶ DIA. of mount
Number: DIA. of mount (unit: mm)

❷ Sensing distance
Number: Sensing distance (unit: mm)
Number + M: Sensing distance (unit: m)

❸ Output
No mark: Digital output
D: Digital + Analog output

❹ Analog output
No mark: current (4 – 20 mA)
B: Voltage (0 – 10 V) / current (4 – 20 mA)

❺ Display part
No mark: None
D: 3-digit display

❻ Communication output
No mark: Unsupported
IL2: IO-Link (COM2)

Specification

Model	UTRCM18-1300-□	UTRCM18-1300D-□	UTRCM30-8M-□	UTRCM30-8MDB-□
Sensing distance	120 to 1300 mm		600 to 8000 mm	
Blind zone	0 to 120 mm		0 to 600 mm	
Foreground suppression	120 to 360 mm		600 to 1800 mm	
Max. Setting zone	1300 mm		8000 mm	
Transducer frequency	200 kHz		80 kHz	
Switching frequency	≤ 10 Hz		≤ 3 Hz	
Response time	≤ 100 ms		≤ 300 ms	
Hysteresis [02]	20mm		100 mm	
Standard sensing target: Aluminum	200 × 200 mm		500 × 500 mm	
Resolution (sampling period)	≥ 0.175 mm		≥ 0.180 mm	
Accuracy [02]	± 1 % F.S.		± 1 % F.S.	
Repeat accuracy	≤ 0.1 % F.S.		≤ 0.1 % F.S.	
Power supply	12 - 30 VDC⎓ (ripple P-P: ≤ 10 %)		12 - 30 VDC⎓ (ripple P-P: ≤ 10 %)	
Current consumption	≤ 45 mA (no load)		≤ 80 mA (no load)	
Digital output	Push-pull		Push-pull	
Load voltage	≤ 30 V		≤ 30 V	
Load current	≤ 100 mA		≤ 100 mA	
Residual voltage	≤ 3 V		≤ 3 V	
Analog output	-	[current output] DC 4 -20 mA	-	[voltage output] DC 0 - 10 V [current output] DC 4 - 20 mA
Load resistance	[voltage output] 12 - 30 VDC⎓: ≥ 100 kΩ [current output] 12 - 24 VDC⎓: ≤ 100 Ω / 20 - 30 VDC⎓: 100 to 500 Ω			
Protection circuit	Surge protection circuit, output short over current protection circuit, reverse polarity protection			
Insulation resistance	≥ 50 MΩ (500 VDC⎓ megger)			
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 min			
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours			
Shock	500 m/s² (≈ 50 G) in each X, Y, Z direction for 3 times			
Ambient temperature	-25 to 70 °C, storage: -40 to 85 °C (no freezing or condensation)			
Protection structure	IP67 (IEC standard)			
Connection	Connector models			
Connector spec.	M12 5-Pin plug connector			
Material	Case mount : SUS316L, body : PC / transducer: ceramic			
Certification	CE UL cULus IO-Link [03]			
Weight (packaged)	≈ 33 g (≈ 92 g)		≈ 214 g (≈ 310 g)	

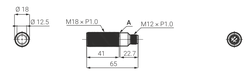
01) Set parameter or dedicated software (atDistance)
02) Ambient temperature 25 °C, temperatures characteristic ± 0.1 % F.S. / °C
03) It is applied to UTRCMC□□-□-IL2 model.

Dimensions

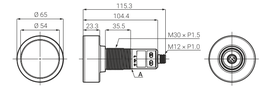
Unit: mm, For the detailed, follow the Autonics website.

A	Operation Indicator

■ UTRCM18



■ UTRCM30



Communication Interface

■ IO-Link

Version	Ver. 1.1
Class	Class A
Baud rate	COM 2 (38.4 kbps)
Min. cycle time	4 ms
Data length	PD: 4 byte, OD: 2 byte (M-sequence: TYPE_2_V)
Vendor ID	899 (0x383)

Software

■ atDistance

It is the monitoring data management program for installation of the ultrasonic sensor, parameter setting, and status information.

■ atIOLink

atIOLink with purposes for setting, diagnosis, and maintenance of IO-Link device via IODD file is provided as the Port and Device Configuration Tool (PDCT).

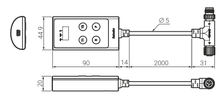
[Ultrasonic Sensors Programming Unit UT-P Series]

Specification

Model	UT-P
Power supply	External power: 12 - 30 VDC⎓ (ripple P-P: ≤ 10 %) USB power: 5 VDC⎓ USB bus power [01]
Current consumption [02]	≤ 25 mA (no load)
Functions	Real-time monitoring of sensing distance. Perform UTR Series functions and set parameters through the dedicated software (atDistance).
Protection circuit	Surge protection circuit, output short over current protection circuit, reverse polarity protection
Insulation resistance	≥ 50 MΩ (500 VDC⎓ megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 min
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient temperature	0 to 60 °C, storage: -40 to 85 °C (no freezing or condensation)
Ambient humidity	0 to 50 %RH, storage: 0 to 50 %RH (no freezing or condensation)
Protection structure	IP00 (IEC standard)
Connection	USB connector type models
Connector spec.	USB (mini-B type), M12 5-pin socket connector, M12 4-pin plug connector
Material	Case: PC, cable: PVC
Certification	CE EAC

01) USB bus Power is supplied from PC or USB host controller.
02) 3 sec after supplying power, up to 50 mA with button input.

Dimensions



Ferrite Core

- Wind the cable through the inside of the ferrite core three times and mount the ferrite core

Ultrasonic Sensors vs Photoelectric Sensors vs Laser Sensors vs Proximity Sensors

Item	Ultrasonic Sensors	Photoelectric Sensors	Laser Sensors	Proximity Sensors
Distance Measurement	○	×	○	×
Luster Detection	○	×	○	○
Transparent Objects Detection (Glass/Film)	○	×	×	△
Transparent Liquid Detection	○	×	×	△
Objects with Holes Detection	○	△	×	△
Uneven Objects Detection	○	△	△	△
Ambient Humidity	△	×	△	○
Against Water/Dust	Strong	Weak	Weak	Strong
Detection Area	Wide	Narrow	Narrow	Narrow

* This table is only for reference. Actual performance may differ depending on user environments.

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