Audiowell International

Product Specification

US0075-001 Ultrasonic Liquid Flow Transducer (Plastic - 1 MHz)

Description

The Ultrasonic Flow Transducer is used as the core element of ultrasonic flow meters. Ultrasonic flow measurement uses the transit time principle, whereby opposite sending and receiving ultrasonic flow sensors are used to transmit signals through the flow. The signal travels faster when moving with the flow stream than it does against the flow stream. The difference between the two transit times is used to calculate the flow rate.

Features

- High sensitivity with receive signal rapidly reaching peak value for easy processing.
- Highly stable electrical performance at high and low temperature with zero flow drift.

Ordering Information

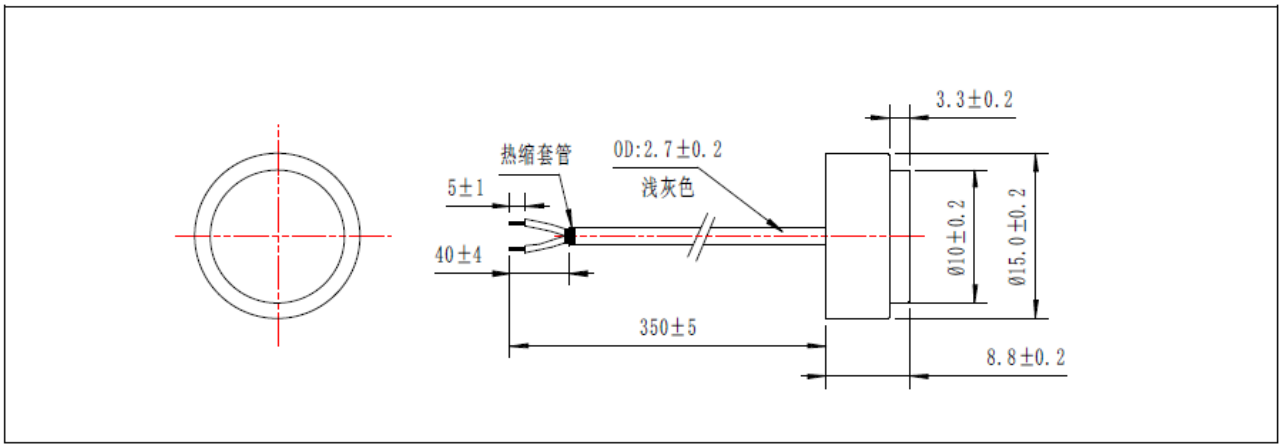
Part Number: US0075-001

Model Number: T/R1130-US0075L353-01

Electrical Specifications

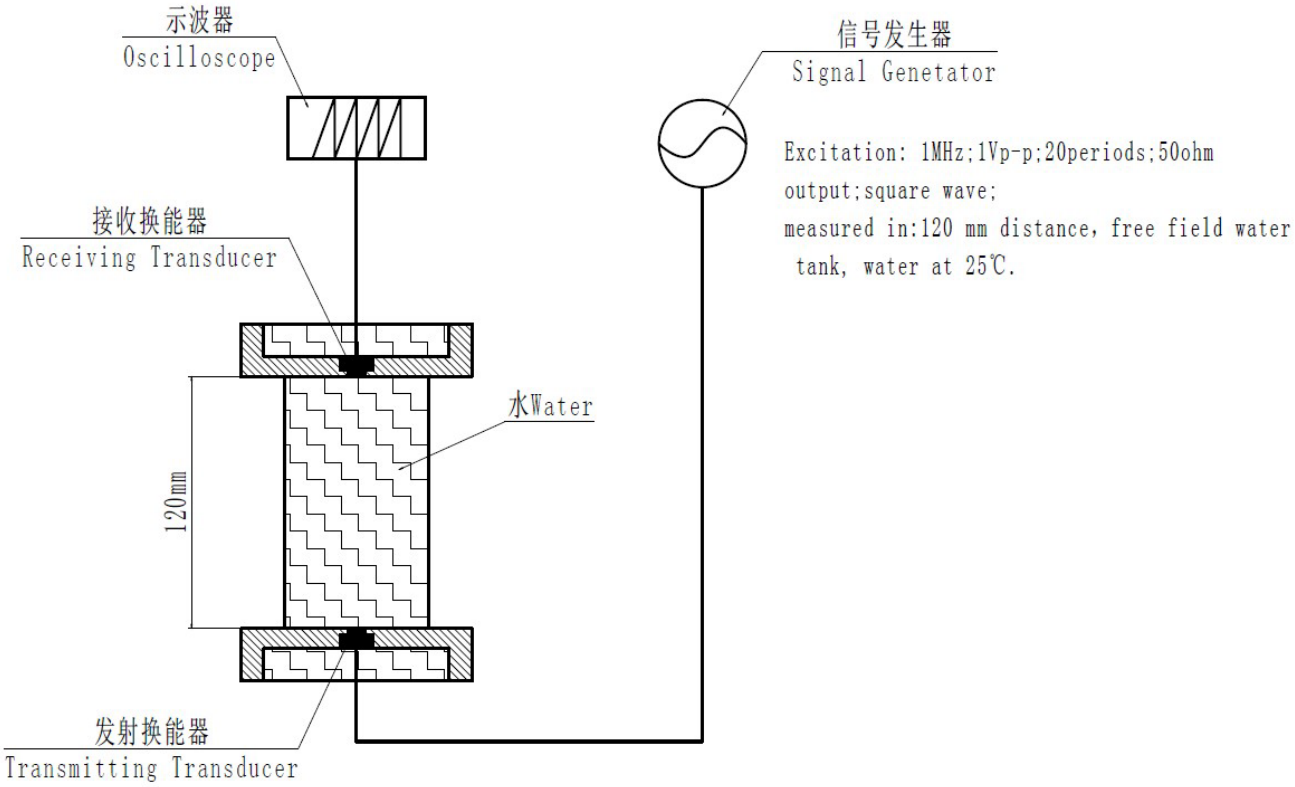
No.	Item	Specification	Unit	Test Condition: T = 25°C
1	Thick Resonant Frequency	1130 ± 30	KHz	Microtest 6632 Impedance Analyzer
2	Resonant Impedance	600 ± 250	Ω	Microtest 6632 Impedance Analyzer
3	Receive Signal Amplitude	290 ± 70	mV	Test Equipment: 1. Square Wave Generator: 1MHz/1.0Vpp/20Puls/square wave/ default at 0°/Output impedance 50Ω. 2. Oscilloscope: 10X probe.
4	Free Capacitance	400 ± 20%	pF	Digital electric bridge at 1000Hz/1V
5	Maximum Input Voltage	5	V_{PP}	At 1MHz
6	Maximum Pressure Rating	2.5	MPa	
7	Mean Time to Failure	5	years	At 1MHz/1V_{P-P}
8	Operating Temperature	+0.1～+90	°C	
9	Storage Temperature	-25～+90	°C	

Appearance and Dimensions (Units = mm)



Note: All materials comply with RoHS Standards with piezoelectric ceramic exempt from lead restriction.

Receive Signal Measuring Method



Environmental Testing

Environmental Tests

Test Item	Test Procedure	Acceptance Criteria
Low Temperature Storage Test	1. Place the transducer in a non-operating environment of -40℃ ± 3℃ for 96h. 2. After placing transducer at room temperature for 24h, test transducer operation.	Meet ① and ②
High Temperature Storage Test	1. Place the transducer in a non-operating environment of +90℃ ± 2℃ for 96h. 2. After placing transducer at room temperature for 24h, test transducer operation.	Meet ① and ②
Low Temperature Operation Test	1. Place the transducer in an operating environment of -25℃ ± 3℃ for 2h. 2. After placing transducer at room temperature for 24h, test transducer operation.	Meet ① and ②
High Temperature Operation Test	1. Place the transducer in an operating environment of +90℃ ± 2℃ for 2h. 2. After placing transducer at room temperature for 24h, test transducer operation.	Meet ① and ②
Cyclic Damp Heat Test	1. Repeat the following for 6 cycles: a. Place the transducer for 1h @25 ± 3℃, 95%HR b. Increase to 55 ± 3℃ within 3h and hold for 9 ± 0.5h c. Decrease to 25 ± 3℃ within 3h and hold for 9 ± 0.5h 2. After placing transducer at room temperature for 24h, test transducer operation.	Meet ① and ②
Vibration Test	1. Sweep frequency range 10Hz~55Hz, amplitude 1.5mm, sweep frequency 1oct/min, vibration in X, Y, Z directions for 2h. 2. After placing transducer at room temperature for 24h, test transducer operation.	Meet ① and ③
Rapid Temperature Change Test	1. Repeat the following for 100 cycles a. Place the transducer for 0.5h @ -20℃±3℃ b. Increase to +70℃ ± 2℃ within 3mins and hold for 0.5h c. Decrease to -20℃ ± 3℃ 2. After placing transducer at room temperature for 24h, test transducer operation.	Meet ① and ②
Drop Test	1. Perform 4 drops from a drop height of 50 ± 5 mm. 2. After placing transducer at room temperature for 4h, test transducer operation.	Meet ① and ③
Static Pressure Test	1. Place transducer in a flow condition and slowly increase to 4.8Mpa and hold for 15mins. 2. After placing transducer at room temperature for 4h, test transducer operation.	Meet ① and ③
Burst Pressure Test	1. Apply a water pressure of 6Mpa to the transducer for 1 min. 2. After placing transducer at room temperature for 4h, test transducer operation.	No damage (breakthrough)

Environmental Tests (cont'd)

Test Item	Test Procedure	Acceptance Criteria
Water Hammer Test	1. Test with pressure variation from 0.5Mpa to 2.4Mpa for 100,000 cycles. 2. After placing transducer at room temperature for 4h, test transducer operation.	Meet ① and ④
Endurance Test	1. Test with duty cycle 20 ~ 80℃ during 4000 cycles (90s insulation time, 10s conversion time. 2. After placing transducer at room temperature for 24h, test transducer operation.	Meet ① and ④
Constant Damp Heat Test	1. Apply 85℃ ± 2℃ @ 85%RH to the transducer for 240h 2. After placing transducer at room temperature for 24h, test transducer operation.	Meet ① and ④

Environmental Test Acceptance Criteria

No.	Description
①	No abnormal changes in appearance, no deformation, cracking, corrosion, excessive glue etc.
②	Fr2 varies ± 1.50%, Zr2 varies within ± 30%, capacitance varies within ± 20%, amplitude varies within ± 15%.
③	Fr2, Zr2, capacitance and amplitude within specification.
④	Amplitude variation within ±15%.

Packaging for Shipping

PCS / CTN	Carton 123 (mm)	Carton 125 (mm)	Gross weight (kg)	Net Weight (kg)
720	440 x 320 x 35	44 x 32 x29	5.0	3.5

Precautions

1. The product can only be used for liquid medium, not for air medium.
2. It is recommended to incorporate an anti-interference function in the drive circuit.
3. To prevent accidents caused by work failure, the failure prevention function should be added in the design of secondary products.
4. To prevent the sensor from malfunctioning, working failure or performance degradation, avoid using this product under the following or similar conditions:
   a. Strong shock or vibration.
   b. Soluble organic matter environment
   c. Application of an input voltage outside of the specified maximum range.

Revision History

Revision Number	Revision Date	Description	Pages Changed
A1	2022-1-19	New Standard Specification	-

Contacts

For pricing, delivery, and detailed ordering information please contact:

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Tentative Release

This specification is based on design objectives and is strictly Preliminary and subject to change. Test data may exist, but this specification is subject to change based on the results of additional testing and evaluation. Application specific specifications will be produced for approval prior to production product being released.

⚠ WARNING

This product can expose you to chemicals including Lead, Chromium (hexavalent compounds) and Phthalates (DEHP) which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov