



Part Number: HS0002-002

Model Number: RC20/US0002-000

Overview

The Ultrasonic Heat Meter Body is comprised of a pair of ultrasonic flow sensors and a DN20 size brass pipe.

Acting as the signal transmitter of the Ultrasonic Heat Meter, the heat meter body is designed to supply precise, stable and continuous ultrasonic signals for the heat meter circuit.

In accordance to the “Professional Standard on Urban Construction of the The People’s Republic of China” (CJ128-2007) and the relevant regulations, Audiowell designs the family used ultrasonic heat meter body on the basis of comprehensive consideration of different demand in the world market. The ultrasonic flow sensors used have characteristics in high sensitivity, stable performance, low power consumption and so on.

Structure and Principle

Structure Composition: A pair of ultrasonic flow sensors and a brass pipe.

Technical Data

1. Electrical Specifications:

Item	Unit	Standard	Test Condition T=25 °C
Thick Resonant frequency (Fs)	KHz	975 ± 30	Agilent 4294A
Resonant impedance (R)	Ω	≤ 110	Agilent 4294A
Static capacitance (C ₀)	pF	1350 ± 20%	Digital Bridge At 1000Hz/1V

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.

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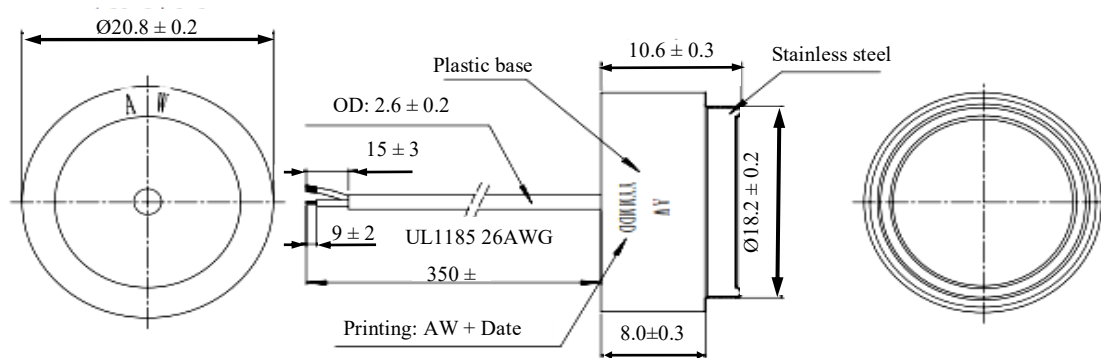
Technical Data

2. Technical Parameters:

Item	Unit	Standard
Nominal Diameter DN	mm	20
Installation Length (L)	mm	130
Connecting Thread (D)	British System	G1
Permanent Flow Rate Q (P)	m ³ /h	2.5
Max Flowrate Q (max)	m ³ /h	5
Min Flowrate Q (min)	m ³ /h	0.05
Ultimate pressure	MPa	1.6
Environmental Temperature	°C	5 ~ +55
Installation Position	Water Inlet	
Installation Mode	Threaded Connection	

Appearance and Dimensions (mm)

1. Sensor:



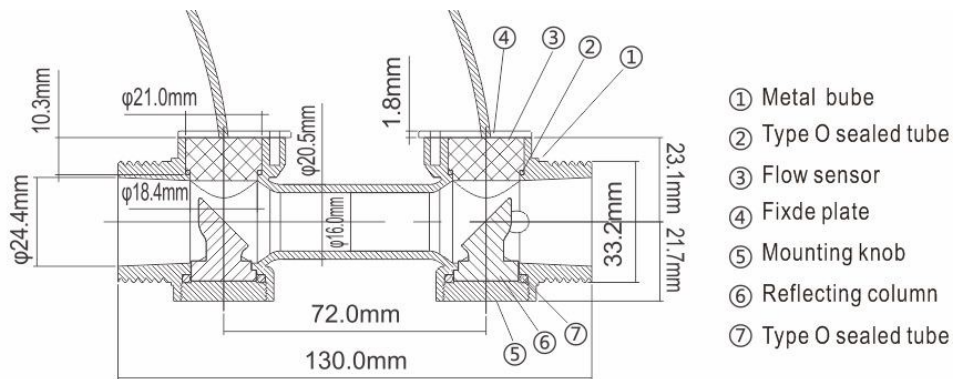
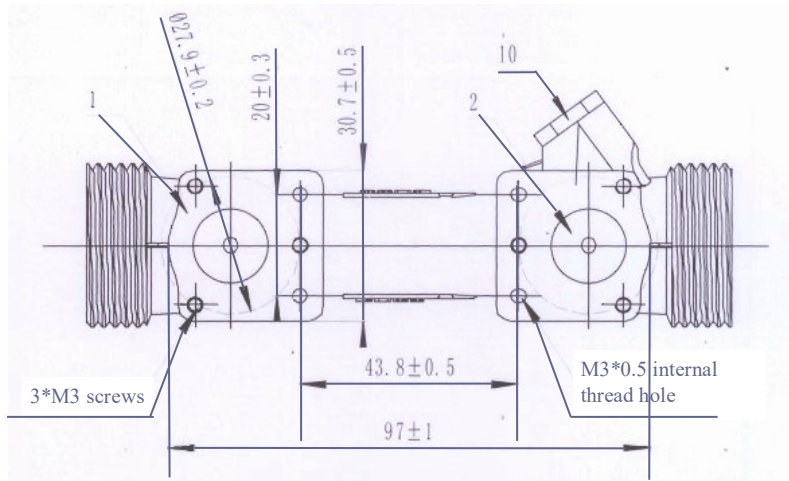
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Appearance and Dimensions (mm)

1. Assembly dimensions:



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Notes:

1. Storage Conditions: -20°C ~ +80°C
2. Please take Anti-interference into consideration when designing driving circuit
3. Driving voltage is suggested to be lower than 5Vp-p
4. Maximum pressure endurance is 1.6MPa

Revision History:

Version	Date (MM/DD/YY)	DWN	Statement
A1.0	11/11/2013		Updated sensor drawing

TENTATIVE RELEASE:

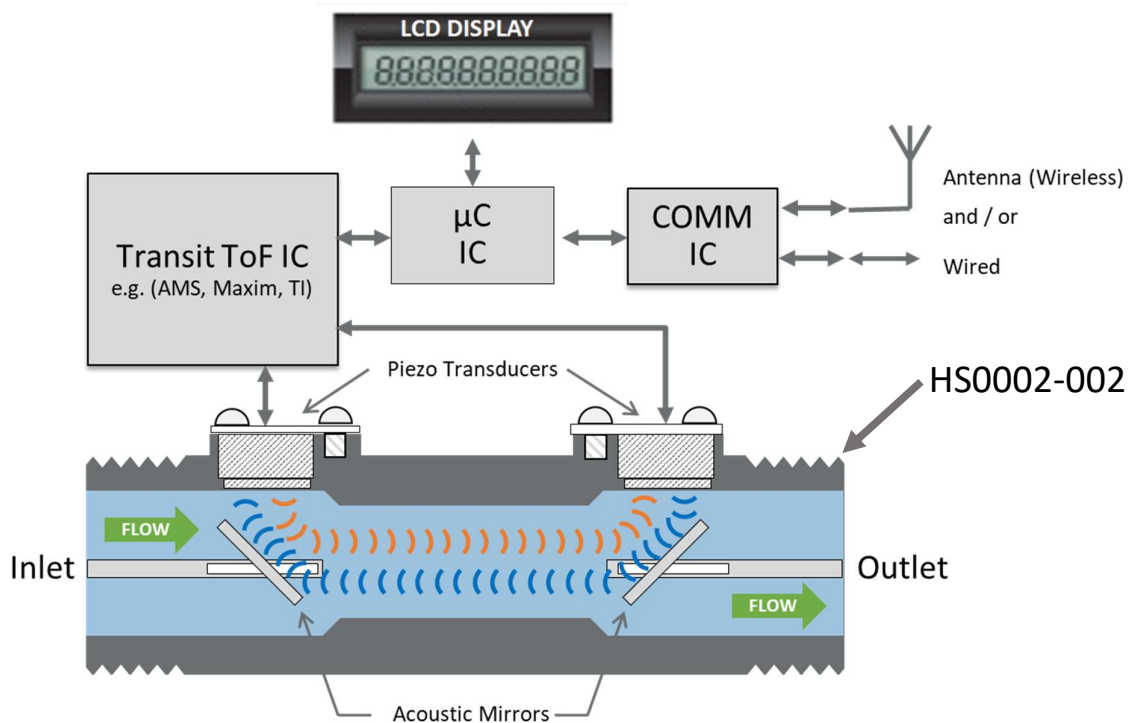
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Principle of Operation

Water flow measurement can be performed with the HS0002-002 using the Transit Time method. Using the Transit Time principle, a pair of transducers is used to send and receive an ultrasonic pulse train in opposite directions. The difference between the two transit times can be used to very accurately calculate the flow rate.

A typical meter system Using the HS0002-002 is depicted in the high-level block diagram below:



The following evaluation kits from ams, Maxim, and TI that are sold on Digikey can be used to directly connect to the HS0002-002 and begin evaluation of both the flow tube and the chosen transit ToF measurement IC:

ams TDC-GP30-F01:

<https://www.digikey.com/product-detail/en/ams/GP30-EVA-KIT-F01/GP30-EVA-KIT-F01-ND/7380318>

Maxim MAX35103:

<https://www.digikey.com/product-detail/en/maxim-integrated/MAX35103EVKIT/MAX35103EVKIT-ND/5396632>

TI MSP430FR6047:

<https://www.digikey.com/product-detail/en/texas-instruments/EVM430-FR6047/296-49383-ND/9371188>

All of the above IC manufacturers have ap notes and documentation that describes in detail the principles of transit time ultrasonic flow measurement as they apply to the IC supplied.