Ultrasonic Flow Meter Online Measurement

MS UFM 3111



FEATURE

- Measurement Accuracy 1%
- Convertor protection Class IP 67, transducer Protection class IP 68
- Wide measurement range, pipe size from DN 15 mm To DN 6000 mm
- Three types installation method : Wall mounted, Din Rail Mounted, Explosion proof box mounted
- Connect the temperature transducer can finish the Heat /energy measurement

DESCRIPTION

MS UFM 3111 Flow Meter can be virtually applied to a wide range of long term online measurement. Convertor protection Class IP 67, transducer protection class IP 68. A variety of liquid applications can be accommodated: ultra-pure liquids, portable water, chemicals, raw sewage, reclaimed water, cooling water, river water, plant effluent etc.

PRINCIPLE

An Ultrasonic Flow Meter measures the velocity of a fluid with ultrasound to calculate volume flow. Using ultrasonic transducers, the flow meter can measure the average velocity along the path of an emitted beam of ultrasound, by averaging the difference in measured transit time between the pulses of ultrasound propagating into and against the direction of the flow or by measuring the frequency shift from the Doppler Effect. Ultrasonic Flow Meters are affected by the acoustic properties of the fluid and can be impacted by temperature, density, viscosity and suspended particulates depending on the exact flow meter.

An Ultrasonic Flow Meter construction can be done by using upstream and downstream transducers, sensor pipe and reflector. The working principle of ultrasonic flow meter is, it uses sound waves to resolve the velocity of a liquid within a pipe. There are two conditions in the pipe

like no flow and flowing. In the first condition, the frequencies of ultrasonic waves are transmitted into a pipe & its indications from the fluid are similar. In the second condition, the reflected wave's frequency is dissimilar because of the Doppler Effect.

Whenever the liquid flows in the pipe quickly, then the frequency shift can be increased linearly. The transmitter processes the signals from the wave & its reflections determine the flow rate. Transit time meters transmit & receive ultrasonic waves in both the directions within the pipe. At no-flow condition, the time taken to flow in between upstream & downstream in between the transducers is the same.
Under these two flowing conditions, the wave at upstream will flow with less speed than the downstream wave. As the liquid flows faster, the distinction between the up & downstream times raises. The times of the upstream & downstream processed by the transmitter to decide the flow rate.

TECHNICAL SPECIFICATION

Principle	: Transit-time Ultrasonic Flow Meter
Accuracy	: ± 1%
Display	: 2 x 20 Characters LCD Back Light
Signal output	: 1 way, 4 -20 mA output, electrical resistance 1K, Resistance 0 ~1K, accuracy 0.1% 1 way, OCT pulse Output (Pulse width ~1000 Ms Default is 200 mS 1 Way, Relay output
Signal Input	: 3 way, 4 to 20 mA input, Accuracy0.1%Aquisition Signal such as Temp. Pressure & Liquid Level
DATA Interface	: RS 485 Modbus
Pipe Installation Condition	
Pipe Material	: Steel, Stainless Steel, Cast Iron, Copper, Cement pipe, PVC, Aluminum, Glass Steel Product, Linear is allowed
Pipe Diameter	: 20~2000mm
Straight Pipe	: Transducer Installation should be satisfied upstream 10D Down steam 5D & 30 D from the pump.
Liquide Type	: Single Liquid can transmit sound wave such as water (Hot water, Chilled water, city water, sea water, waste Water etc.)
Sewage with small particle content	: oil (Crude Oil, lubricating oil, diesel oil, fuel oil, etc.) Chemical (alcohol etc.), plant effluent, Beverages, Ultrapure liquids etc.
Temperature	: -30~160°C

Turbidity	: No more than 10000ppm and less bubble
Flowrate	: 0 to ± 7 m/s
Working Environment:	
Temperature	: Convertor: -20~60°C: Flow Transducer: -30~60°C
Humidity:	
Convertor	: 85%RH
Flow Transducer	: can measure under water, water depth≤2 m (Transducers sealed with glue)
Power Supply	: DC 8 to 36 V or AC 85 to 264 (Optional)
Power Consumption	: 1.5W
Dimension	: 132 x 150 x 85 mm
Enclosure Protection Class	: IP 67 (As Per IEC 60529: 2013 Certified By Electrical Research and Development Association – Vadodara)

OPTIONAL TRANSDUCER

Types	Picture	Spec.	Model	Measurement Range	Temperature	Dimension	
Clamp on		Small Size	TS-2	DN20~DN100	-30~90℃	45×25×32mm	
		Medium Size	TM-1	DN50~DN700	-30~90℃	64×39×44mm	
		Large Size	TL-1	DN300~DN6000	-30~90℃	97×54×53mm	
High temp clamp on		Small Size	TS-2-HT	DN20~DN100	-30~160℃	45×25×32mm	
		Medium Size	TM-1-HT	DN50~DN700	-30~160℃	64×39×44mm	
		Large Size	TL-1-HT	DN300~DN6000	-30~160℃	97×54×53mm	
Insertion		Standard	TC-1	DN80~DN6000	-30~160℃	190×80×55mm	
		Lengthen	TC-2	DN80~DN6000	-30~160℃	335×80×55mm	
Pipe		π type	G1	DN15~DN32	-30~160℃	SUS304 thread connection	Please refer to detailed pipe dimensions
		Standard	G2	DN40~DN1000	-30~160℃	carbon steel thread connection	

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OPTIONAL TEMPERATURE TRANSDUCER

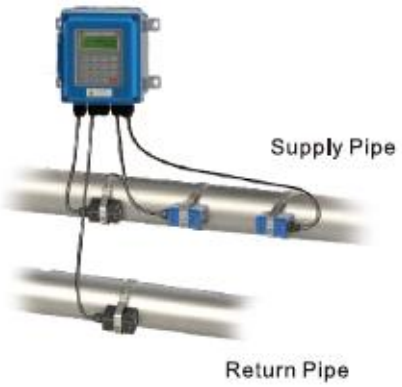
Picture	Specification	Model	Meas. Range	Temperature	Cut of water	Accuracy
	Clamp on temperature Transducer Pt100	CT-1	>DN50	-40~160℃	No	100℃ ± 0.8℃
	Insertion temperature Transducer Pt100	TCT-1	>DN50	-40~160℃	Yes	
	Insertion Pt100 Installation with pressure	PCT-1	>DN50	-40~160℃	No	
	Insertion Pt100 Small size pipe diameter	SCT-1	< DN50	-40~160℃	Yes	

OPTIONAL MEMORY CARD

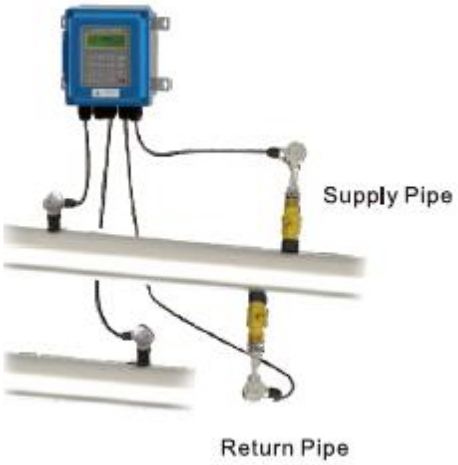
Convenience for long term and large data storage. Available to do the data processing like, tabulation, statistical data analysis, printing reports and production flow curve by using data software



MEASURING DIAGRAM

FLOW MEASUREMENT	HEAT MEASUREMENT	FEATURES
Clamp on 		• No need to cut off water, no pressure loss. • Connect clamp on temperature transducer, can finish the heat/energy Measurement. • Easy for Installation

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Insertion 		• No need to cut off water, no pressure loss, • Stable and reliable for long term operation. • Connect Pt 100 temperature transducer, can finish the heat/energy measurement.
Pipe 		• Need to cut off pipe • With high Accuracy and stability • Connect Pt 100 temperature transducer, can finish the heat/energy measurement

Supplied with

- Pair of clamp on Transducer suitable as per application
- Couplant,
- signal cable,
- steel belt,

Note: Due to continuous improvement in product, specifications & appearance may vary

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