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Ultrasonic Flow Meter

HM-2000S

Flow measurement principle

The HM-2000S ultrasonic flow meter is designed to measure the fluid velocity of liquid within a closed conduit. The transducers are a non-contacting, clamp-on type , which will provide benefits of non-fouling operation and easy installation.

The HM-2000S transit-time flow meter utilizes two transducers that function as both ultrasonic transmitters and receivers. The transducers are clamped on the outside of a closed pipe at a specific distance from each other. The transducers can be mounted in V-method where the sound transverses the pipe twice, or W-method where the sound transverses the pipe four times, or in Z-method where the transducers are mounted on opposite sides of the pipe and the sound crosses the pipe once. This selection of the mounting method depends on pipe and liquid characteristics. The flow meter operates by alternately transmitting and receiving a frequency modulated burst of sound energy between the two transducers and measuring the transit time that it takes for sound to travel between the two transducers. The difference in the transit time measured is directly and exactly related to the velocity of the liquid in the pipe, show as follows:

Application

The wall-mounting flow meter can be applied to a wide range of pipe flow measurements. Applicable liquids include pure liquids as well as liquid with small quantity of tiny particles.

Examples are:

★ 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.);
★ Chemicals (alcohol, acids, etc.);
★ Plant effluent;
★ Beverage, liquid food;
★ Ultra-pure liquids;
★ Solvents and other liquids

Identification

Each set of the flow meter has a unique product identification number or ESN (electronic serial number) written into the software that can only be modified with a special tool by the manufacturer. In case of any hardware failure, please provide this number which is located on menu window **M61** when contacting the manufacturer.

Specifications

◆ **Main unit**

Accuracy	: Better than ±1%
Repeatability	: Better than 0.2%
Velocity	: 0~30m/s
Measurement Period	: 500ms
Display	: LCD with backlight, display accumulated flow/heat, instantaneous flow /heat, velocity, time etc.
Output	
- Analogue output	: 4-20mA or 0-20mA current output. Impedance 0~1kΩ. Accuracy 0.1%.
- OCT output	: Frequency signal (1~9999HZ)
- Relay output	: over 20 source signal (no signal, reverse flow etc.)
- RS485 serial port	
Input	: Three analogue input
	: Three-wire PT100 resistor input (optional)
Other functions	: Automatically record the totalized data of the last 64 days / 64 months / 5 years; the power-on time and corresponding flow rate of the last 64 power on and off events. Allow manual or automatic flow loss compensation
	: The instrument working status of the last 64 days

◆ **Pipe**

Material	: Steel, stainless steel, cast iron, cement pipe, copper, PVC, aluminum, FRP etc. Liner is allowed
Size	: 15-6000mm

◆ **Liquid**

Types	: Water, sea water, industrial sewage, acid & alkali liquid, alcohol, beer, all kinds of oils which can transmit ultrasonic single uniform liquid
Temperature: Standard	: -30˚C - 90˚C ，High-temperature：-30˚C - 160˚C
Turbidity	: Less than 10000ppm, with a little bubble

- **Power Supply** : AC110/220V or DC24V
- **Power Consumption** : Less than 1.5W
- **Protocols** : MODBUS, M-BUS, Fuji extended protocol and other factory protocol

Optional Transducer

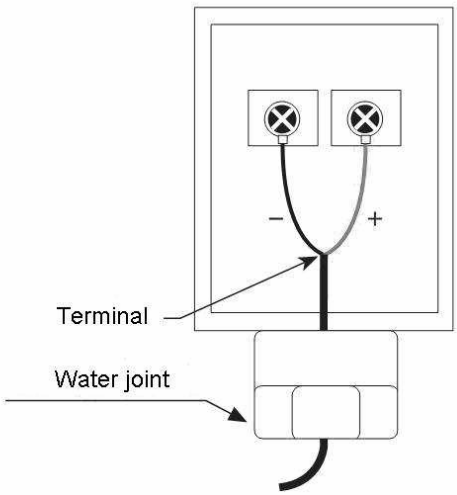
Standard Transducer

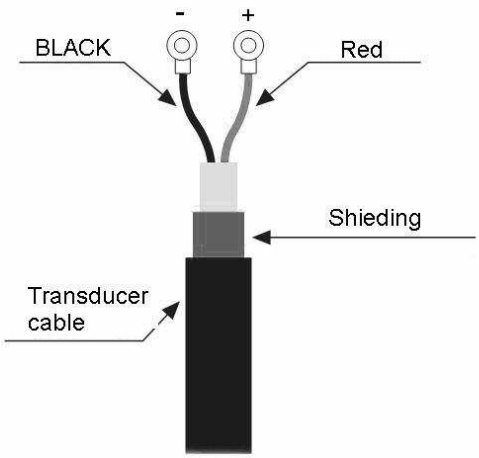
TS-1(Small Size)	Measuring Range	: DN15-100mm (1/2”-4”)
	Liquid Temperature	: -30℃～90℃
TM-1(Medium Size)	Measuring Range	: DN50-1000mm (2”-40”)
	Liquid Temperature	: -30℃～90℃
TL-1(Large Size)	Measuring Range	: DN300-6000mm (12”-240”)
	Liquid Temperature	: -30℃～90℃

High-temperature Transducer

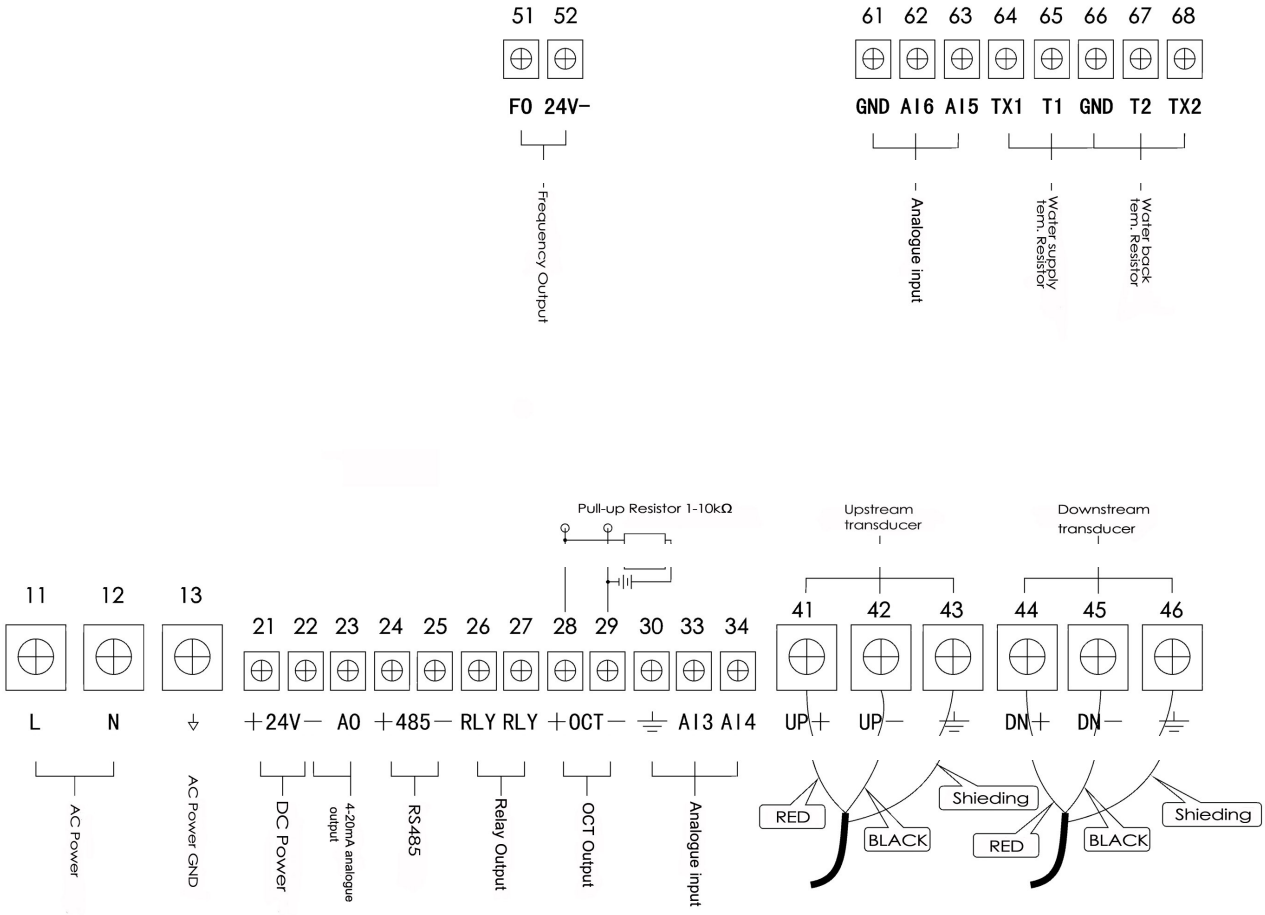
THS-1(Small Size)	Measuring Range	: DN15-100mm (1/2”-4”)
	Liquid Temperature	: -30℃～160℃
THM-1(Medium Size)	Measuring Range	: DN300-1000mm (12”-40”)
	Liquid Temperature	: -30℃～160℃

Wiring diagram of transducer





Wiring diagram



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