

OI-TUF-2000 SERIES Clamp on type Ultrasonic Flowmeter



1. OI-TUF-2000 SERIES Clamp on type Ultrasonic Flowmeter



The clamp on type ultrasonic flowmeter is composed of converter with clamp on type sensor.

Simply attach the clamp on type sensor to the surface of the pipe to complete the flow measurement of various liquids, compared with the traditional flow meter, it does not need to cut off the tube, and the installation is convenient and fast, realizing the non-destructive installation.

1.1. Typical 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:

- Sewage with small particle content.
- Oil (crude oil, lubricating oil, diesel oil, fuel oil, etc.);
- Chemicals (alcohol, acids, etc.);
- Beverage, liquid food;
- Ultra-pure liquids;
- Solvents and other liquid



1.2. Types of Converter

| Items | Separated Mount | | | |
|---------|---|---|--|---|
| | Wall Mount OI-TUF-2000B | Wall mount OI-TUF-2000S | Explosion proof OI-TUF-2000D | Modular Mount OI-TUF-2000M |
| Picture |  |  |  |  |

1.3. Types of Flow Sensor

| Flow Transducer | Picture | Model | Measuring range | Temperature |
|---|---|------------------|-----------------|-------------|
| Clamp on |  | TS-2 (small) | DN25-100 | -30 ~ 90°C |
| | | TM-1 (medium) | DN50-700 | |
| | | TL-1 (large) | DN300-6000 | |
| High temp. Clamp on |  | TS-2-HT (small) | DN25-100 | -30 ~ 160°C |
| | | TM-1-HT (medium) | DN50-700 | |
| | | TL-1-HT (large) | DN300-6000 | |
| Mounting bracket Clamp on |  | HS (small) | DN15-DN100 | -30 ~ 90°C |
| | | HM (medium) | DN50-DN700 | |
| | | EB-1 (large) | >DN300 | |
| High temp Mounting bracket Clamp on |  | HS-HT (small) | DN15-DN100 | -30 ~ 160°C |
| | | HM-HT (medium) | DN50-300 | |
| | | EB-1-HT (large) | >DN300 | |

1.4. Basic Technical Data





| Items | | Specifications |
|--|--|---|
| Main unit | Accuracy | Better than $\pm 1\%$ |
| | Repeatability | Better than 0.2% |
| | Principle | Transit-time measuring principle |
| | 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 0~1k Ω . 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 totaliser 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 | |
| Pipe | Material | Steel, stainless steel, cast iron, cement pipe, copper, PVC, aluminum, FRP etc. Liner is allowed |
| | Size | 15-6000mm |
| | Straight pipe section | In the upstream it must be beyond 10D, in the downstream it must be beyond 5D, in the upstream the length must be beyond 30D fro the access of the pump. (D stands for pipe diameter) |
| 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 $^{\circ}$ C - 90 $^{\circ}$ C , High-temperature: -30 $^{\circ}$ C - 160 $^{\circ}$ C |
| | Turbidity | Less than 10000ppm, with a little bubble |
| | Flow Direction | Bi-directional measuring, net flow/heat measuring |
| Environment | Temperature | Main Unit: -30 $^{\circ}$ C - 80 $^{\circ}$ C |
| | | Transducer: -40 $^{\circ}$ C -110 $^{\circ}$ C , Temperature transducer: select on enquiry |
| | Humidity | Main Unit: 85% RH |
| Transducer: water-immersible, water depth less than 3m | | |
| Cable | Twisted Pair Line, standard length of 5m, can be extended to 500m (no recommended); Contact the manufacturer for longer cable requirement. RS-485 interface, transmission distance up to 1000m | |
| Power | AC220V or DC24V, 1.5W | |
| Protocols | MODBUS, M-BUS, Fuji extended protocol and other factory protocol | |

1.5. Model Selection Guide


| Model | Ultrasonic flowmeter type |
|---------------------------------------|---|
| OI-TUF-2000B | Wall Mount (Blue plastic case) |
| OI-TUF-2000S | Wall mount (White plastic case) |
| OI-TUF-2000D | Explosion proof |
| OI-TUF-2000M | Module Type |
| Optional Transducer (Multiple choice) | |
| -1 | TS-2 (Standard small) |
| -2 | TM-1 (Standard medium) |
| -3 | TL-1 (Standard large) |
| -4 | TS-2-HT (High temp. small) |
| -5 | TM-1-HT (High temp. medium) |
| -6 | TL-1-HT (High temp. large) |
| -7 | HS (Small mounting bracket) |
| -8 | HM (Medium mounting bracket) |
| -9 | EB-1 (Large mounting bracket) |
| -10 | HS-HT (Small high temp. mounting bracket) |
| -11 | HM-HT (Medium high temp. mounting bracket) |
| -12 | EB-1-HT (Larg high temp. mounting brackete) |
| Cable length | |
| -5 | 5m*2 (Standard) |
| -10 | 10m*2 |
| SD data memory card | |
| 1 | None |
| 2 | Yes |

2. OI-TUF-2000 Insertion type Ultrasonic Flowmeter

2.1 Types of Converter

| Items | Separated Mount | | | |
|---------|---|---|--|---|
| | Wall Mount OI-TUF-2000B | Wall mount OI-TUF-2000S | Explosion proof OI-TUF-2000D | Modular Mount OI-TUF-2000M |
| Picture |  |  |  |  |

2.2. Types of Flow Sensor

| | | | | |
|-----------|---|-----------------|------------|-------------|
| Insertion |  | TC-1 (standard) | DN50-6000 | -30 ~ 160°C |
| | | TC-2 (extended) | | |
| | | TP-1 (parallel) | DN200-6000 | |

2.3. Basic Technical Data

| Principle & Parameters | |
|--------------------------|--|
| Principle | Transit-time |
| Accuracy | Flow meter: $\pm 0.5\%$; Heat meter: $\pm 2.0\%$. |
| Output | 4~20mA analog |
| | OCT pulse |
| | Relay |
| Input | 3 way 4~20mA analog input, acquisition signal of press and liquid level. |
| | Achieve heat measurement by connecting PT100 temperature sensors |
| Interface | RS485; MODBUS |
| Pipe Material | Steel, stainless steel, cast iron, copper, PVC, aluminum, etc. |
| Caliber | DN50mm~DN6000mm |
| Straight Pipeline | Upstream: 10D; Downstream: 5D; From the pump: 30D (D means outer diameter) |
| Medium | Single liquid that can conduct sound wave, such as water($-30^{\circ}\text{C}\sim 160^{\circ}\text{C}$). |
| Velocity | -12m/s~12m/s |
| Special Cable | Shielded twisted-pair cable, length $\leq 50\text{m}$. |
| Temperature | Main unit: $-20^{\circ}\text{C}\sim 70^{\circ}\text{C}$; Transducers: $-30^{\circ}\text{C}\sim 160^{\circ}\text{C}$ |
| Protection Class | Main Unit: IP67; Sensors: IP68 |
| Power Supply | DC24V ; AC85~264V; 50Hz |
| Consumption | 1.5W |

3. OI-TUF-2000 Ultrasonic heat meter.

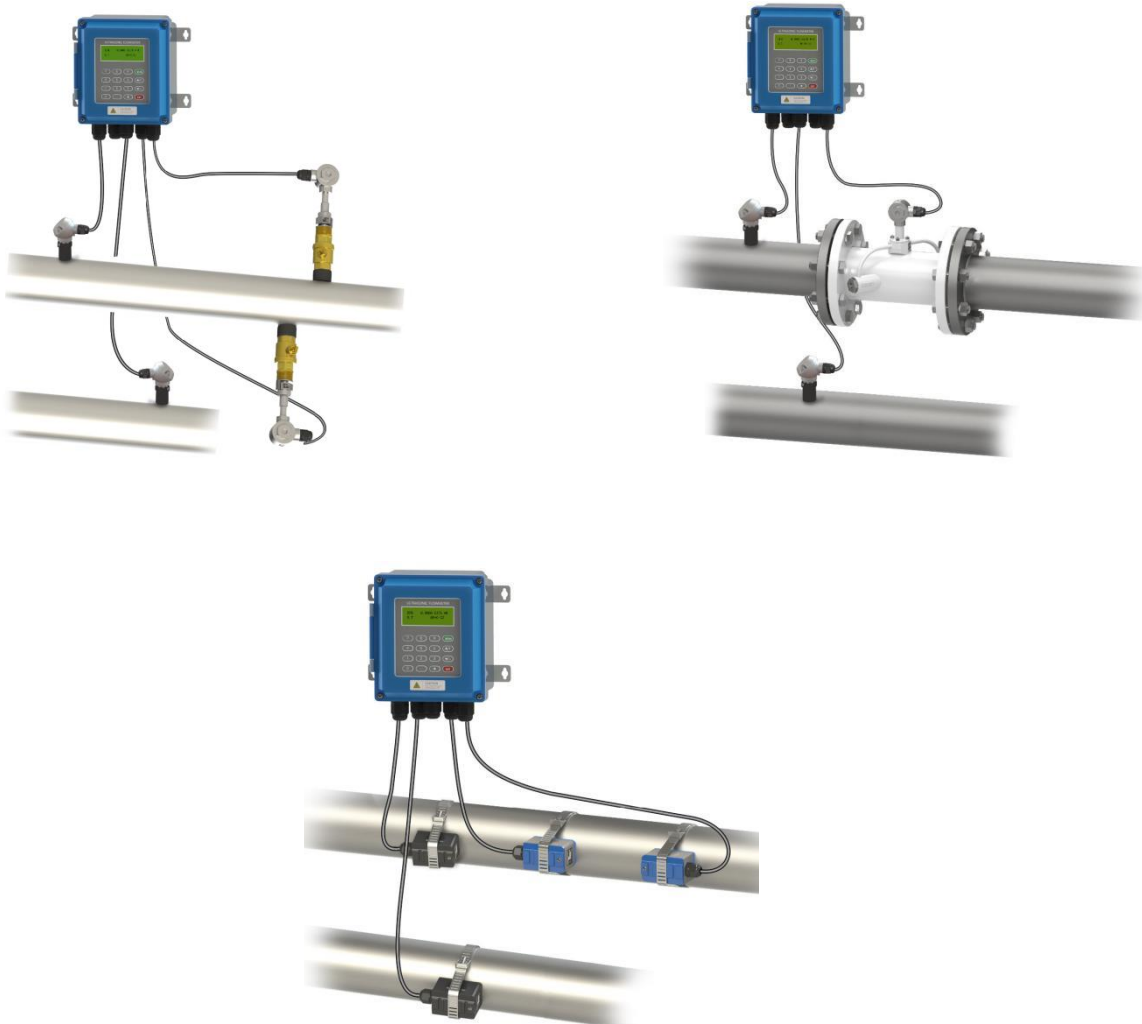
Easy installation.

High accuracy within $\pm 1\%$

High protection class: Main unit: IP67; Transducers: IP68

Multiple output of 4-20mA, OCT pulse and relay; RS485 interface, support Modbus

Achieve heat measurement by connecting 3-wired heat transducers PT100.



3.1. Temperature Transducers

| Temperature Transducer | Picture | Model | Measuring range | Temperature | Cutoff water |
|--------------------------|---|-------|-----------------|-------------|--------------|
| Clamp on |  | CT-1 | \geq DN50 | -40 ~ 160°C | No need |
| Insertion |  | TCT-1 | \geq DN50 | -40 ~ 160°C | Need |
| Insertion under pressure |  | PCT-1 | \geq DN50 | -40 ~ 160°C | No need |
| Insertion small sizes |  | SCT-1 | $<$ DN50 | -40 ~ 160°C | Need |