Description

The **BSUF-TTPM panel-mount Clamp-on Ultrasonic Flow meter** provides abundant capabilities for accurate liquid flow measurement from outside of a pipe. It utilizes state-of-the-art technologies on ultrasonic transmission /receiving, digital signal processing and transit- time measurement. The proprietary signal quality tracking and selfadapting technologies allow system to optimally adapt to different pipe materials automatically.

The flow meters of the BSUF-TTCL family are carefully designed so that their user-interfaces are self-explan atory and their operation is simple and easy. The unique clamp-on fixture design makes the installation very simp le and no special skills or tools are required.

Due to the non-invasive nature of the clamp-on technology, there is no pressure drop, no moving parts, no leaks, no risk of contamination, no risk of corrosion, no pressure dependency.

Features

- Cost effective and versatile
- High accuracy, better than 1.0% read
- Noninvasive, no moving parts, no pressure drop, no maintenance
- Easy and economical installation, no pipe cutting
- Wide measurement range, 0.03~40ft/s (0.01~12m/s)
- Wide pipe size range, 1/ 2~80 inches (DN 15~2000mm)
- Suitable for all commonly used pipe materials
- Signal quality tracking and self-adjusting capabilities
- automatically match transducer to pipe materials
- Velocity, volumetric and totalized flow display
- Rich input and output functionalities
- Ideal for both clean and opaque liquid flow measurements,
- In fact, most any liquid containing less than 5% total suspended solids (TSS) or aeration.
- Bi-directional. Totalizer for net, positive and negative flow display

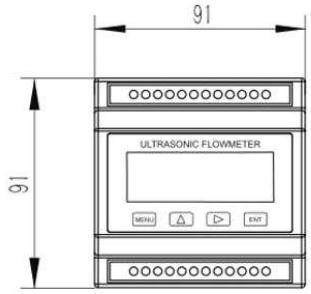
Applications

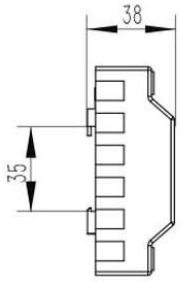
The BSUF-TTPM flow meters are ideal for process-control or flow measurement at fixed locations. Their non-invasive nature makes them indispensable in applications such as chemical liquid processing, hygienic process monit oring,high-pres sure flow measurement, etc. Benefited from our advanced digital signal processing technology, the flow meter works reliably in both clean and opaque liquid flow.

Examples of applicable liquids are:

- Water, including hot water, chilled water, city water, sea water, etc.
- Secondary sewage, waste treatment, etc.
- Oil, including lubricating oil, diesel oil, fuel oil, etc.
- Chemicals, including alcohol, acids, etc.
- Solvents
- Beverage, food and pharmaceutical processors where non-contact is a must.
- HVAC, energy measurement system, etc.

Dimensions





mm

- Built-in magnet, easy to be absorbed on pipe
- Protection Level: IP68
- Measuring range: DN32~DN6000
- Temperature range: -30~90℃

Type	Model	Measuring Range	Temperature	Dimension
Small Size	TS-2	DN32~DN100	-30~90℃	45×25×28mm
Medium Size	TM-1	DN50~DN700	-30~90℃	64×39×44mm
Large Size	TL-1	DN300~DN6000	-30~90℃	97×54×53mm

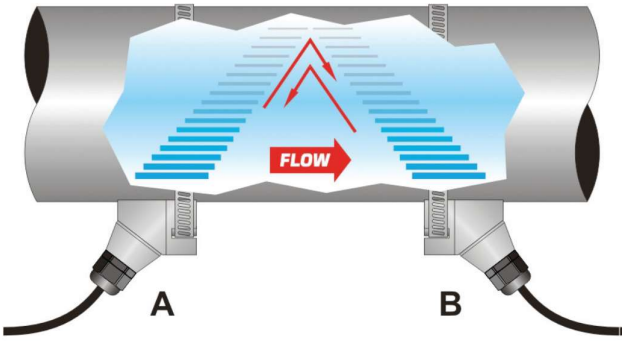
High Temperature Clamp on Transducer

- Built-in magnet, easy to be absorbed on pipe
- Protection Level: IP68
- Measuring range: DN32~DN6000
- Temperature range: -30~160℃

Type	Model	Measuring Range	Temperature	Dimension
Small Size	TS-2-HT	DN15~DN100	-30~160℃	45×25×28mm
Medium Size	TM-1-HT	DN50~DN700	-30~160℃	64×39×44mm
Large Size	TL-1-HT	DN300~DN6000	-30~160℃	97×54×53mm

DESCRIPTION	SPECIFICATION
Liquid Types	Virtually most any liquid containing less than 5% total suspended solids (TSS) or aeration.
Power	14-28 VDC @3VA max.
Velocity	0.03…40ft/s(0.01…12m/s), bi-directional
Signal Outputs	**Current output:** 4…20mA Impedance 0…1k ohms, accuracy 0.1% **OCT output:** pulse signal for, flow rate, total flow (positive , negative and net flow) and one relay
Display	LCD with backlight. 2 20 letters. Display flow rate, total flow (positive, negative and net flow), velocity, time, etc.
Units	English (U.S.) or metric
Enclosure	Protection Class : IP20
Temperature	-20°C to 60°C for display
Communication Interface	RS-485 – MODBUS
Transducer	Automatically record the following information: The instrument working status of the last 64 days
Line Sizes	(Std) 2 to 40 inches [50 to 1000 mm] pipe I.D, 12-80 inches (300- 2000 mm) and 1/2” to 2 inches (15…50 mm)opt.
Transducer to Transmitter Distance	Shielded transducer cable. Standard length 20 (6m). Can be extended to 990 (300 m).
Weight	BSUF-TTPM 0,25 kg
Repeatability	Better than 0.5% read
Accuracy	Better than 1.0 % read for velocity above 1.0 ft/s
Response Time	0.5s
Pipe Material	All metals, most plastics, fiber glass, etc., allow pipe liner.
Straight Pipe Section	Section Longer than 8D, where D is pipe diameter. If a pump is near, the straight pipe section following the pump should be >15D.

Measuring Principle



Reflect-Mode Configuration
Transit Time

BSUF-TTPM transit time flow meters utilize two transducers, shown as elements A and B in Figure 1, which 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-mode as shown in Figure 1, W-mode where the sound transverses the pipe four times, or in Z -mode where the transducers are mounted on opposite sides of the pipe. This selection is based 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. The burst is first transmitted in the direction of fluid flow and then against fluid flow. Since sound energy in a moving liquid is carried faster when it travels in the direction of fluid flow (downstream) than it does when it travels agains t fluid flow (upstrea m), a differential in the times of flight will occur. If the fluid is not moving, the time of flight difference will be zero and the flow meter will indicate zero flow. The sounds time of flight is accur ately measured in both directions and the difference in time of flight is calculated. The liquid velocity (V) inside the pipe can be related to the difference in time of flight (dt) through the following equation: V = K*D*dt, where K is a constant and D is the distance between the transducers.

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