

# WALL-MOUNT CLAMP-ON ULTRASONIC FLOWMETER

Advanced Clamp-on Transit-time Technology for Accurate Flow Measurement

## Features and Benefits

- **Low cost**
- **High accuracy, better than  $\pm 1\%$**
- **NIST standard**
- **Noninvasive. No pipe disturbance. No moving parts. No pressure drop. No maintenance**
- **Easy and economical installation. No pipe cutting, no hole drilling**
- **Wide measurement range, 0.03 ~ 105ft/s (0.01 ~ 32m/s)**
- **Wide pipe size range, 1" ~ 240" (DN30 ~ DN6,000mm).**
- **Suitable for all commonly used pipe materials**
- **Signal quality tracking and self-adjusting capabilities automatically match transducer to pipe material**
- **Velocity, volumetric and totalized flow**
- **Easy to use and set up. Self-explanatory menu-driving programming**
- **Rich input and output functionalities**
- **Weather-resistant enclosure**
- **Ideal for both clean and opaque liquid flow measurements**



The OMNI-TUF-200F1B Wall-Mount Clamp-on Ultrasonic Flowmeter 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 self-adapting techniques allow the system to optimally adapt to different pipe materials automatically.

The flowmeters of the OMNI-TUF-200F1B is carefully designed so that their user-interfaces are self-explanatory and their operation is simple and easy. The unique clamp-on fixture design makes the installation very simple and no special skills or tools are required.

Due to the non-intrusive 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

- OMNI-TUF-200F1B - the standard model;

# Specifications

Main Unit	Repeatability	Better than 1%
	Accuracy	Better than $\pm 1\%$ for velocity above 0.6ft/s
	Response Time	0.5s
	Velocity	$\pm 0.03 \sim \pm 105$ ft/s ( $\pm 0.01 \sim \pm 32$ m/s), bi-directional.
	Display	LCD with backlight. 2x20 letters. Display instantaneous flow rate, accumulated flow rate (positive, negative and net rates), velocity, time, analog inputs, etc.
	Units	English (U.S.) or metric
	Signal Outputs	Current output: 4-20mA or 0-20mA. Impedance 0-1k. Accuracy 0.1%
		OCT output: pulse signal for accumulated flow rate (positive, negative and net rates); frequency signal for instantaneous flow rate (0~9,999Hz selectable)
		Relay: able to output 20 signals, such as no signal, reverse flow, etc.
		Sound alarm
	Signal Inputs	5 channel analog signal inputs (for signals such as temperature, pressure, liquid level, etc.)
Recording	Automatically record the following information: <ul style="list-style-type: none"> <li>• The totalizer data of the last 64 days / 64 months / 64 years;</li> <li>• The time and corresponding flow rate of the last 64 times of power on and off events. Allow manual or automatic flow loss compensation</li> <li>• The instrument working status of the last 64 days</li> </ul>	
Communication Interface	RS-232. RS-485 (optional) GPRS / GSM module for networking, remote monitoring and remote control (for model STUF-200FNB only)	
Enclosure	Protection Class: IP65 (NEMA 4X) Explosive Proof Class: ExdIIBT4 (for model STUF-200F2B only)	
Liquids	Liquid Types	Virtually all commonly used liquids (full pipe)
	Liquid Temp	32°F ~ 212°F (0°C ~ 100°C)
	Suspension concentration	< 1%, particle size smaller than 75um.
Pipe	Pipe Size	1" ~ 240" (DN30 ~ DN6,000mm )
	Pipe Material	All metals, most plastics, fiber glass, etc. Allow pipe liner.
	Straight Pipe Section	Longer than 15D, where D is pipe diameter. If a pump is near, the straight pipe section following the pump should be > 30D.
Cable	Shielded transducer cable. Standard length 15' (5m). Can be extended to 1640' (500m). Contact the manufacturer for longer cable requirement. Cable should not be laid in parallel with high-voltage power lines, neither should it be close to strong interference source such as power transformers.	
Environment	Temperature	Main unit: 0°F ~ 176°F (-30°C ~ 80°C) Transducer: -40°F ~ 212°F (-40°C ~ 100°C)
	Humidity	Main unit: 85% RH Transducer: water-immersible, water depth less than 10' (3m)
Power	AC: 110V / 220V, or, DC: 8VDC-36VDC	
Weight	OMNI-TUF-200F1B: 5lb (2.5kg)	

## Applications

The STUF-200FxB flowmeters 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 monitoring, high-pressure flow measurement, etc.



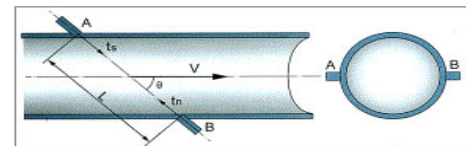
Benefited from our advanced digital signal processing technology, the flowmeter works reliably in both clean and opaque liquid flow. Examples of applicable liquids are:

- Water, including hot water, chilled water, city water, sea water, etc.
- Sewage, waste treatment, etc.
- Oil, including crude oil, 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.

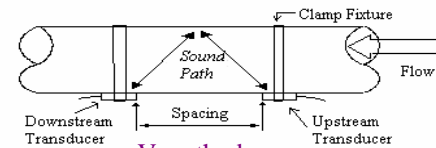
## Measurement Principles

The STUF-200FxB flowmeter is based on transit-time measurement principle, as shown in the following figure.

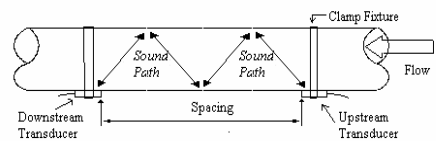
A typical transit-time flow measurement system utilizes two transducers (A and B) that function as both ultrasonic transmitter and receiver. The transducers are clamped on the outside of a closed pipe at a specific distance from each other. The flow meter operates by alternately transmitting and receiving a coded 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.



Z-method






V-method



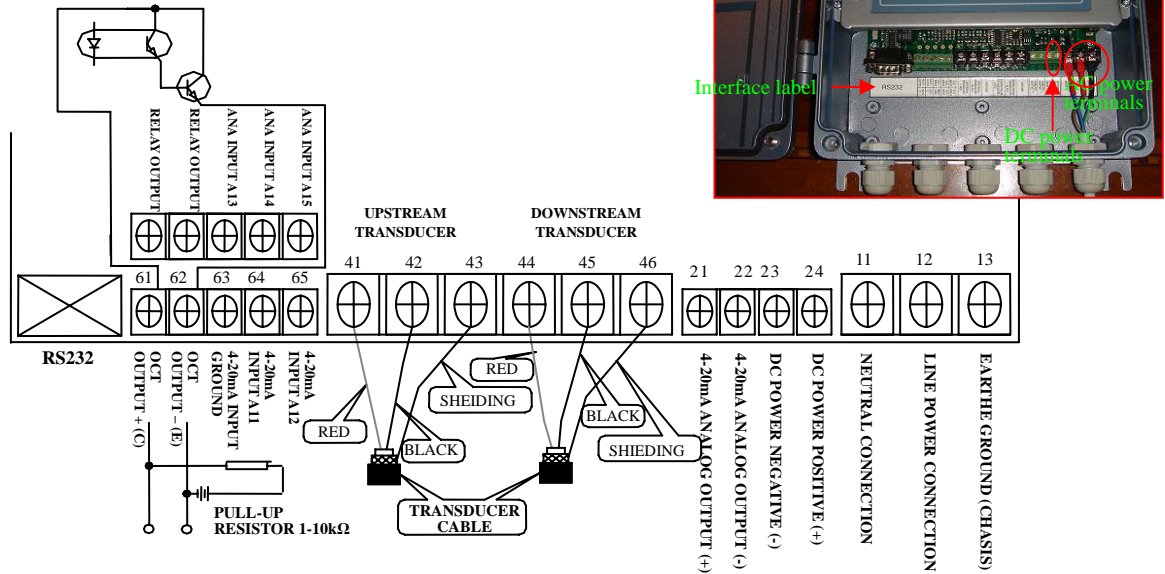
W-method

The transducers can be mounted in three methods, Z-method, V-method and W-method, depending on pipe size. Z-method is used for large pipe. The two transducers are installed on opposite sides of the pipe. V-method is used for medium size pipe. The two transducers are on the same side, thus, the sound transverses the flow twice. W-method is usually used for small pipe. The sound transverses across the flow four times.

## Transducer Options

	<p>Type S1: Small size transducer (magnetic) for pipe size 1" – 4" (DN30 – DN100mm)</p>
	<p>Type M1: Medium size transducer (magnetic) for pipe size 2" – 28" (DN50 – DN700mm)</p>
	<p>Type L1: Large size transducer (magnetic) for pipe size 11" – 240" (DN300 – DN6,000mm)</p>

# Wiring Diagram



# Model Selection

**TUF - 200F - 1B-□ - □ - □ - □**

<b>Main Unit</b> 1B – Standard	
<b>Transducer:</b> 1 – S1 type clamp-on (pipe size 1” - 4”) 2 – M1 type clamp-on (pipe size 2” – 28”) 3 – L1 type clamp-on (11” – 240”)	
<b>Pipe Size range:</b> N/A	
<b>Transducer Cable Length:</b> Cable length in meters. 10MT Standard Contact the manufacturer for cable over 500m	
<b>Power Supply</b> A – AC    B – Battery    D – DC(8-36V) A – Analogue Out    R-Relay Output	

Example: Model# TUF-200F1B2-x-10-DAR stands for wall-mount ultrasonic flowmeter, standard model, M1 type clamp-on transducer, transducer cable length 10m and DC power supply with analogue (4-20mA) and alarm relay.