

STUF-300FxC



General Purpose Wall Mount

# INSERTION ULTRASONIC FLOWMETER

*Transit-Time Technology for Accurate Flow Measurement*

## Features:

- Excellent long-term stability
- Strong signal strength and high signal quality, thus, robust performance
- No moving parts to wear out. Long life span
- No maintenance
- No pressure drop, no disturbance on the flow
- High accuracy, 1% or better
- Accuracy does not degrade over time, thus, no need for recalibration
- Hot-tapping installation. No need to shut down pipe flow during installation
- Bi-directional. Wide measurement range,  $\pm 16\text{m/s}$  ( $\pm 52\text{ft/s}$ )
- Applicable for pipe size DN280~6,000mm (3"~240")
- Suitable for all commonly used pipes
- Suitable for pure liquids and liquids with minor particles. No dependency on conductivity
- Proprietary low-voltage transmission and self-adaptation technologies. Automatically adapt to liquid property changes
- Built-in flow totalizers, batch controller and scheduler
- Isolated RS-485 interface with power surge protection. Support MODBUS protocol
- Optional thermal energy measurement functionality
- Optional GPRS/GSM module for remote flow monitoring
- Abundant inputs/outputs, isolated 4-20mA output, relay, pulse output, alarm output
- Easy to use and set up. Self-explanatory menu-driving programming
- NEMA 4X (IP65) Weather-resistant enclosure
- Low-power consumption, less than 1Watt



The STUF-300FxC Wall-Mount Insertion Ultrasonic Flowmeter is the first member of the 3rd generation ultrasonic flow meters from Shenitech. Compared to its predecessors, the 3rd generation ultrasonic flowmeters offer better performance and a richer feature set, all at a lower price.

The STUF-300FxC is designed to be installed at a fixed location for long-term flow measurement without maintenance. The insertion transducer also provides strong signal strength and excellent signal quality, which allows the flowmeter to measure not only pure liquid, but also liquids with some suspended particles. It utilizes cutting-edge technologies such as advanced transducer design, low voltage transmission, digital signal processing, self adaptation, etc., to achieve high performance.

As QUALITY is of crucial importance, all transducers are carefully paired, and all flowmeters are wet-calibrated in the factory to further assure the system accuracy and reliability.

STUF-300FxC provides versatile input/output interfaces, such as digital and relay outputs, batch control, alarm and flow totalizing, 4-20mA output, optional thermal energy measurement, which can be easily used by a host computer or a flow controller for process monitoring and control. Besides, the built-in isolated RS-485 port and the optional GPRS/GSM module make remote flow monitoring easy and reliable.

STUF-300FxC is an ideal choice for demanding applications where long-term stability, zero maintenance and high accuracy the most.

## Specifications:

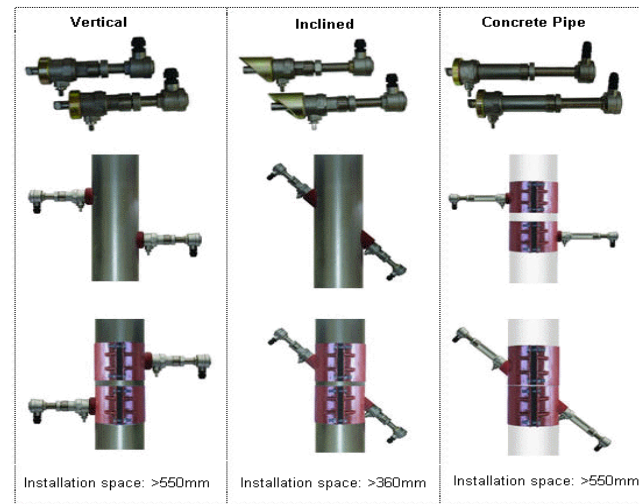
Main Unit	Repeatability	Better than 0.2%
	Accuracy	$\pm 1\%$ of reading, plus $\pm 0.006\text{m/s}$ ( $\pm 0.02\text{ft/s}$ ) in velocity Could be higher when in-situ calibration is available
	Response Time	0.5s. Configurable between 0.5s and 99s
	Velocity	-16 ~ +16m/s (-52 ~ +52 ft/s), bi-directional
	Display / Keypad	LCD with backlight. 2x20 letters. 4x4 tactile-feedback membrane keypad. 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 isolated output for flowrate, velocity or sound speed. Impedance 0-1k. Accuracy 0.1%
		OCT output: isolated Open Collector Transistor output. Up to 0.5A load Relay output: 1A@125VAC or 2A@30VDC Can be programmed as pulse signal for flow totalization; ON/OFF signal for relay drive or alarm drive; batch control
		Sound alarm
	Signal Inputs	RTD interface (STUF-300FRC only): two temperature channels able to accommodate two PT100 3-wire temperature sensors for thermal energy measurement. Analog input: one channel of 4-20mA input. Can be used for temperature, pressure or liquid level sensor
Recording	Automatically record the totalizer data of the last 128 days / 64 months / 5years Optional USB data logger available upon request	
Communication Interface	Isolated RS-485 with power surge protection. Support MODBUS protocol StufManager™ PC software for real-time data acquisition (optional) GPRS / GSM module for wireless networking, remote monitoring and remote control (STUF-300FnC only)	
Enclosure	Protection Class: IP65 (NEMA 4X) weather-resistant. Dimension: 230mm x 150mm x 75mm (9" x 5.9" x 3")	
Liquids	Liquid Types	Virtually all commonly used liquids (full pipe)
	Liquid Temp	-40°C ~ 155°C
	Suspension concentration	<20,000ppm, or, < 2%, particle size smaller than 100um.
Pipe	Pipe Size	DN80 ~ DN6,000mm (3" ~ 240")
	Pipe Material	All metals, most plastics, fiber glass, etc.
	Straight Pipe Section	Longer than 15D, where D is pipe diameter. If a pump or a valve is near upstream, the straight pipe section following the pump should be > 25D.
Cable	Shielded transducer cable. Standard length 15' (5m). Can be extended to 1640' (500m). Contact the manufacturer for longer cable requirement.	
	Environment	Temperature
Humidity		Main unit: 85% RH Transducer: water-immersible, water depth less than 10' (3m)
Power	DC: 12 ~ 24VDC, or, AC: 90 ~ 260VAC Power consumption: < 1W at 12VDC	
Weight	Main unit: 2kg (4lb) for standard version, 2.5kg (5lb) for network version	

## Applications:

The STUF-300FxC advanced general purpose wall-mount Insertion Ultrasonic Flowmeter is ideal for process control and flow measurement at fixed locations. Its long-term stability, zero maintenance and high-accuracy make it indispensable in applications such as chemical liquid processing, water treatment, municipal water distribution, and other challenging flow measurement applications. Benefited from our advanced self-adaptation and digital signal processing technologies, the flowmeter works reliably in both clean and opaque liquid flow.

Applications include:

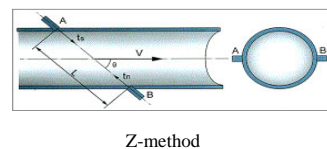
- Water management in buildings, metropolitans, water / wastewater treatment plants, irrigation systems, etc.
- Liquid process control in chemical plants and industrial automation. Chemicals include alcohol, glycol, acids, solvents, etc.
- Oil / fuel transfer. Oil includes crude oil, diesel oil, fuel oil, lubricating oil, hydraulic oil
- Efficiency monitoring and improvement of liquid-based heating / cooling systems, including solar/geothermal systems.
- Beverage, food and pharmaceutical processors where non-contact is a must
- Remote flow monitoring network



## Measurement Principle:

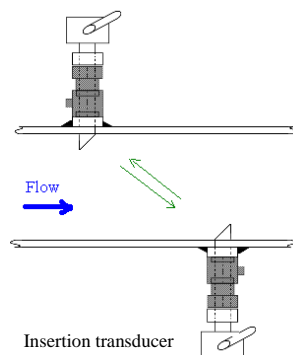
The STUF-300FxC flowmeter is based on transit-time measurement principle.

A typical transit-time flow measurement system utilizes two transducers (A and B) that function as both ultrasonic transmitter and receiver. The transducers are inserted into pipe wall 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.



The transducers can be mounted by V-method for medium-size pipe or by Z-method for large-size pipe. In either case, the transducer heads must face each other so one transducer can receive the ultrasound pulse which is sent by another transducer and travels across the flow.

To install the transducer, you need to drill a hole on the pipe for each transducer. You may use the hot-taping tool supplied by Shenitech to mount the transducer if the pipe material and pipe inside pressure are allowed. In this case, there is no need to shut down the pipe line. Otherwise, cold-tapping must be used to permanently mounting the transducers.



## Model Selection:

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<b>Model:</b> 1 – Standard model    2 – Explosive-proof n – GSM/GPRS-enabled model R – Thermal energy model	←
<b>Transducer:</b> V – Vertical transducer type (installation spacing: ≥550mm) I – Inclined transducer type (installation spacing: ≥360mm)	←
<b>Installation Tool:</b> HOT – With hot-taping tool SD – With saddle	←
<b>Pipe Size:</b> DNxxx (metric) or INxxx (English)	←
<b>Transducer Cable Length:</b> Mxxx – Cable length in meters Fxxx – Cable length in feet	←
<b>4-20mA Output:</b> AO – With 4-20mA output NAO or absent – No 4-20mA output	←
<b>Other Options:</b> RL – With relay    DL – USB data logger (external) SW – StufManager™ PC software 485USB – RS485-USB converter	←

Example: Model# STUF-300F1C-V-HOT-DN100-M5-AO-RL-SW stands for standard main unit, vertical-mounting type insertion transducer with for pipe size DN100mm, hot-taping tool, 5 meter transducer cable, 4-20mA output, relay outputs and StufManager™ software. If you prefer to work with English system for the model number, please put "IN" (for inch) or "F" (for feet) right before the dimension values. For example, the above model# in English system will be: STUF-300F1C-V-HOT-IN4-F15-AO-RL-SW.

## Transducer Options:

Insertion transducers are applicable for DN80 (3") or bigger pipes only.

Hot-tapping installation tool should be ordered separately.

For metal pipe, you may use welding to join the hot-taping base. For other pipes, you may need to order saddle for the installation.

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