STUF-300FxG

General Purpose Wall Mount

SHENITECH

FLOW-CELL ULTRASONIC FLOWMETER

Transit-Time Technology for Accurate Flow Measurement

Features:

flow-cell

- **High accuracy. Normally better than 1%. Could reach 0.5%**
- **Excellent long-term stability. No need for re-calibration**
- **Plug & play. All parameters are re-programmed**
- **No moving parts to wear out. Long life span**
- **Maintenance-free**
- **No pressure drop, no disturbance on the flow**
- **Strong signal strength and high signal quality, which leads to robust performance**
- **Bi-directional**
- **Large turndown ratio**
- **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, which make the flowmeter automatically adapt to liquid property changes**
- **Built-in flow totalizers, batch controller and scheduler**
- **Isolated RS-485 interface with power surge protection. Supports the MODBUS protocol**
- **Optional thermal energy measurement functionality**
- **Optional GPRS/GSM module for remote flow monitoring**
- **Abundant input/output, isolated 4-20mA output, relay, pulse output, alarm output**
- **NEMA 4X (IP65) weather-resistant enclosure**
- **Low-power consumption, less than 1Watt**

The STUF-300FxG Wall-mount Flow-cell Ultrasonic Flowmeter is the third member of the 3rd generation ultrasonic flow meters from Shenitech. Compared with its predecessors, the 3rd generation ultrasonic flowmeters offer better performance and a richer feature set, all at a lower price.

The STUF-300FxG flowmeter is designed for high accuracy, long-term stability and zero maintenance. Since all the parameters have been pre-programmed in the factory, the user just needs to put the flow-cell into their pipe line, and the flowmeter will be up and running right away.

STUF-300FxG utilizes cutting-edge technologies such as advanced transducer design, low voltage transmission, digital signal processing, self adaptation, etc., to achieve high performance. A pair of ultrasonic sensors have been pre-installed on the flow-cell, which maximally reduces the error caused by installation. The whole flow-cell transducer has been precisely wet-calibrated in the factory.

STUF-300FxG provides versatile input/output interfaces, such as digital and relay output, 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. In addition, the built-in isolated RS-485 port and the optional GPRS/GSM module make remote flow monitoring easy and reliable.

STUF-300FxG is an ideal choice for demanding applications where high accuracy, good long-term stability and zero maintenance are a must.

Specifications:

Main Unit	Repeatability	Better than 0.2%
	Accuracy	±1% of reading, plus ±0.006m/s (±0.02ft/s) in velocity Could be as high as ±0.5%
	Response Time	0.5s. Configurable between 0.5s and 99s
	Velocity	-10 ~ +10m/s (-33 ~ +33 ft/s), bi-directional
	Display / Keypad	LCD with backlight. 2 x 20 letters. 4 x 4 tactile-feedback membrane keypad. Displays 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-300FRG only): two temperature channels that can 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 records 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. Supports the MODBUS protocol StufManager™ PC software for real-time data acquisition (optional) GPRS / GSM module for wireless networking, remote monitoring and remote control (STUF-300FnG 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	DN10 ~ DN500mm (3/8" ~ 20")
	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 nearby 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	Main unit: -10˚C ~ 70˚C (14˚F ~ 158˚F)
		Transducer: -40˚C ~ 155˚C (-40˚F ~ 312˚)
	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: 2 kg (4 lbs) for standard version, 2.5 kg (5 lbs) for network version Transducer weight depends on flow-cell size	

Applications:

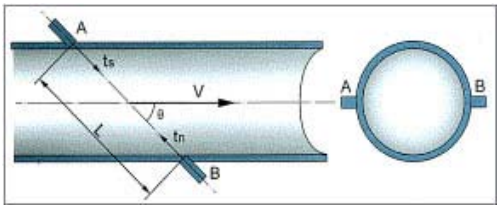
The STUF-300FxG advanced general purpose Wall-mount Insertion Ultrasonic Flowmeter is ideal for process control and flow measurement at fixed locations. Its long-term stability, zero maintenance and high-accuracy make it indispensable in applications such as chemical liquid processing, water treatment, 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:

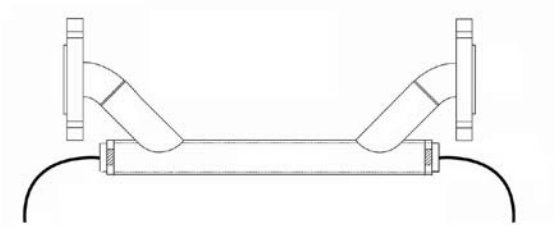
- Water management in buildings, metropolitans, water / wastewater treatment plants, irrigation systems, etc.
- Liquid process control in chemical plants and industrial automation. Chemicals include alcohol, glycol, acids, solvents, etc.
- Oil / fuel transfer or consumption monitoring. Oil includes crude 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-300FxG flowmeter is based on the transit-time measurement principle, as shown in the figures below.



Z-method for large pipe

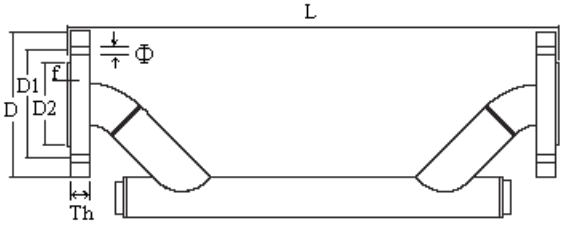


Pi-method for small

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 onto 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 it takes for sound to travel between the two transducers. The difference in the transit time measured is directly related to the velocity of the liquid in the pipe.

Transducer Options:

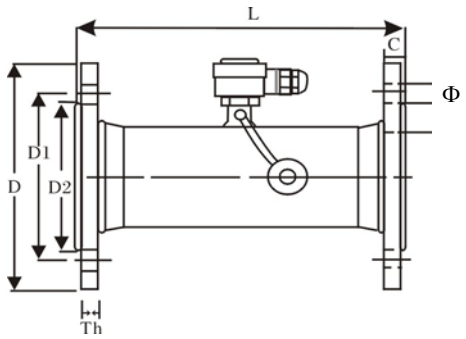
Pi-type Flow-cell Transducer



Rated Pressure: 2.5MPa

Pipe OD DN (mm)	Length L (mm)	Flange**				Sealing face	
		D (mm)	D1 (mm)	N-ϕ	Th (mm)	D2 (mm)	f (mm)
15	320	95	65	14×4	14	45	2
20	360	105	75	14×4	16	55	2
25	390	115	85	14×4	18	65	3
32	450	135	100	18×4	18	78	3
40	500	145	110	18×4	20	85	3

Standard-type Flow-cell Transducer



Rated Pressure: 1.6MPa

Pipe OD DN (mm)	Length L (mm)	Flange				Sealing face	
		D (mm)	D1 (mm)	N-ϕ	Th (mm)	D2 (mm)	f (mm)
50	200	160	125	18×4	22	100	3
65	200	180	145	18×4	24	120	3
80	225	195	160	18×8	24	135	3
100	250	215	180	18×8	26	155	3
125	250	245	210	18×8	28	185	3
150	300	280	240	23×8	28	210	3
200	350	335	295	23×12	30	265	3
250	450	405	355	25×12	32	320	3
300	500	460	410	25×12	32	375	4
350	550	530	470	25×16	34	435	4
400	600	580	525	30×16	38	485	4
450	700	640	585	30×20	42	545	4

Note:

1. *Higher pressure rating is available upon request.*
2. *Both threading and flange joints are available upon request. If threading joint, please specify NPT or BSP.*
3. *The flow-cell body is made from cast iron with coating. Stainless-steel or plastic making is available upon request.*
4. *Larger flow-cell transducers can be made upon request.*

Model Selection:

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Model:
1 – Standard model 2 – Enhanced Enclosure
n – GSM/GPRS-enabled model
R – Thermal Energy Model

Transducer:
1B – Pi-type flow-cell transducer with BST thread joint
1N – Pi-type flow-cell transducer with NPT thread joint
1F – Pi-type flow-cell transducer with flange joint
2F – Standard-type flow-cell transducer with flange joint

Pipe Size:
DNxxx (metric) or INxxx (English)

Transducer Cable Length:
Mxx - Cable length in meters Fxx – Cable length in feet

4-20mA Output:
AO – With 4-20mA output
NAO or absent – No 4-20mA output

Other Options:
RL – With relay DL – USB data logger (external)
SW – StufManager™ PC software
485USB – RS485-USB converter

Example**:**
Model# STUF-300F1G-1B-DN25-M5-AO-RL stands for standard main unit, pi-type transducer with BSP threading for pipe size DN25mm, 5 meter transducer cable, 4-20mA output and relay output.
If you prefer to work with the English system for the model number, please put “IN” (for inch) or “F” (for foot) right before the dimension values. For example, the above model# in the English system will be:
STUF-300F1G-1B-IN1-F15-AO-RL.

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