Economical Ultrasonic Flowmeter

Special Features:

- Compact and robust design
- High accuracy, better than ±1%
- No moving parts, maintenance-free
- No pressure drop
- Bi-directional
- Wide measurement range, ±16m/s
- Built-in flow totalizers
- Large turn-down ratio
- Suitable for most pure liquids and liquids with minor particles
- Compatible with clamp-on, insertion and flow-cell transducers
- Pipe size selectable from DN10 to DN5000mm
- Automatically match transducer to liquid property with proprietary signal quality tracking and self-adaptation technology
- Local LCD display and 4 keys
- Optional PC Software for real-time data acquisition
- Isolated RS-485 interface with power surge protection. Supports MODBUS. Well suited for reliable flowmeter networking
- Optional input/output, such as isolated 4-20mA output, OCT output
- IP65 weather-proof enclosure
- Power supply 9~24VDC, less than 1.2Watt

Description:

The S301 ultrasonic flowmeter is an economical but robust flowmeter. It utilizes cutting-edge technologies, such as balanced ultrasound transmission, digital signal processing, self adaptation, etc., to achieve high performance.

The S301 can be equipped with a pair of clamp-on transducers to measure liquid flow rate from outside of a pipe non-intrusively. It can also be equipped with a pair of insertion transducers or a flow-cell transducer to measure liquid flow with excellent long-term stability and high accuracy.

- S301B clamp-on flowmeter
- S301C insertion flowmeter
- S301G flow-cell flowmeter

Due to the proprietary signal quality tracking and self-adaptation algorithm, S301 is able to tune itself to the optimal condition when the liquid property changes or different transducer is connected

S301 is encapsulated in a heavy-duty weather-proof metal enclosure for best protection. In this compact unit, there are one LCD and 4 keys for results display and local programming.

The S301 has a surge-protected, isolated RS485 interface with the MODBUS support. This feature makes it suitable for reliable flowmeter networking.

S301 can be equipped versatile input/output interfaces upon request, such as batch controller, thermal energy measurement, analog input,digital OCT output and 4-20mA output. These can be easily used by a host computer or PLC for process monitoring and control.

S301 can be widely used in water distribution network, fuel consumption monitoring, and other liquid flow applications where zero maintenance and high accuracy are crucial.

Economical Ultrasonic Flowmeter

Specifications:

MAIN UNIT

Repeatability	: Better than 0.2%
Accuracy	: ±1% of reading, plus ±0.006m/s in velocity when working with Omicron's transducers.Could be better for flow-cell transducer
Response Time	: 0.5s. Programmable up to 99s
Velocity	: -16 ~ +16m/s (-52 ~ +52 ft/s), bi-directional.
Display	: LCD with backlight. 2 x 20 letters. 4 tactile-feedback membrane keypad., displaying flow rate, totalizer values, velocity, time, analog inputs, temperature, thermal energy, etc.
Units	: English (U.S.) or metric
Signal Outputs	: Current output (optional): 4-20mA for flowrate, velocity or sound speed. Impedance 0-1k. Accuracy 0.1% OCT output (optional): one channel, 0.1A/24VDC. Relay (optional): 1A/125VAC or 2A/30VDC. Can be programmed as pulse signal for flow totalization (positive, negative and net rates), ON/OFF signal for relay drive or alarm drive, batch control, etc.
Signal Inputs	: Analog inputs (optional): 2 channels, 12bit. Can be used for signals such as temperature, pressure, liquid level, etc. These channels can be used as digital channels
Recording	: Automatically record the totalizer data of the last 64 days / 32 months Optional SD data logger (2GB space) or external USB data logger
Communication Interface	: RS-485 port. Support MODBUS protocol PC software (optional): software for real-time data acquisition RS485-USB converter (optional) RS485-Ether Converter (optional)
Enclosure	: Robust, NEMA4X (IP65) weather-proof metal enclosure

LIQUIDS

Liquid Types	: Virtually all commonly used liquids (full pipe)
Liquid Temp	: -20˚C ~ 100˚C or -20˚C ~ 155˚C, depending on transducer type
Suspension concentration	: <20,000ppm, or, < 2%, particle size smaller than 100um.

PIPES

Pipe Size	: DN10~ DN6,000mm (3/8" ~ 240"), depending on transducer type
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 upstream, the straight pipe section following the pump should be > 30D.

CABLES

Shielded transducer cable. Standard length 15' (5m). Can be extended to 330' (100m). Contact the manufacturer for longer cable requirement.

ENVIRONMENT

Temperature	: Main unit: -20˚C ~ 55˚C Transducer*: -20˚C ~ 150˚C depending on transducer type
Humidity	: Main unit: 85% RH Transducer*: water-immersible, water depth less than 10' (3m)

POWER

9~24VDC, 1.2W

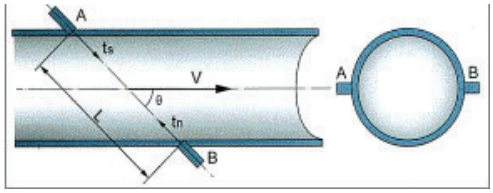
Economical Ultrasonic Flowmeter

Applications:

The S301 economical ultrasonic flowmeter is ideal for process control and flow measurement at fixed locations. Its long-term stability, zero maintenance, high-accuracy and plug and play feature 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 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

Measurement Principle:



The S301 flowmeter is based on transit-time measurement principle, as shown in the right figure.
A typical transit-time flow measurement system utilizes two transducers (A and B) that function as both ultrasonic transmitter and receiver. The two transducers are either clamped onto the outside of a pipe or inserted into the 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 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. After the velocity is measured, the flowmeter calculates the flowrate by multiplying the velocity with the cross-section area of the pipe.

Transducer Options:

1. Clamp-on type:
   -HFx: for pipe size DN15-DN25 (1/2"~1", 2MHz) *
   -S1x: for pipe size DN25-DN100 (1"~4") *
   -S1HTx: for pipe size DN25-DN100 (1"~4") with temperature up to 150°C*
   -M1: for pipe size DN50-DN700 (2"~28")
   -M1HT: for pipe size DN50-DN700 (2"~28") with temperature up to 150°C
   -L1: for pipe size DN300-DN6,000 (11"~240")
   * x represents pipe material: 0-Copper, 1-Tubing, 2-ANSI Plastic, 3-ANSI Metal

2. Insertion type:
   -IN: for pipe size of DN80 (3") and above
   -HOTTAP: hot-tapping tool for insertion transducer installation

3. Flow-cell type:
   -FC-DNxx: flow-cell transducer for pipe size DNxx (in mm)
   -FC-INxx: flow-cell transducer for pipe size INxx (in inch)

Economical Ultrasonic Flowmeter

HOW TO ORDER

Basic Model : S301

Transducer Type: B

B Clamp-on C Insertion G Flow-cell

Transducer Model: IB

Clamp-on: HFx, S1x, S1HTx, M1, M1HT, L1, where x represents pipe material: 0-Copper, 1-Tubing, 2-ANSI Plastic, 3-ANSI Metal
Insertion: IN
Insertion type with hot tapping tool: IN-HOTTAP
Flow-cell: 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

DNxxx (metric) or INxxx (English)

Transducer Cable Length: Mxxx

Mxxx - Cable length in meters
Fxxx – Cable length in ft

4-20mA Output: AO

AO – with 4-20mA output
Absent or NAO – without 4-20mA output

Other Options: SW

DLUSB – USB data logger (external, 4-20mA input)
DLSD – SD data logger (2GB)
SW – StufManagerTM PC software
485USB – RS485-USB converter
485E – RS485-Ethernet adapter

Ordering Example : S301 - B - IB - DNxxx - Mxxx - AO - SW