

F2 Clip-On Ultrasonic Flow Sensor



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Product Overview



F2 adopts the ultrasonic transit time measurement principle, combined with Gentos patented flow algorithm technology, it realizes accurate measurement of the fluid flow in the pipe. The product is all-in-one and clip-on structure design, which is simple and convenient to install. Only four steps are needed all along. The installation process requires no contact with fluid media and no need to shut down the flow. This product is suitable for measuring pure water, softened water, and recycled water. It is particularly suitable for embedded use in water treatment application equipment.

► Product Features

- Easy installation, no pipe rework or damage
- No adjustment, clip on to measure
- RS485 communication interface
- 4~20mA output
- LCD display screen
- Protection level: IP54

► Application and Industry

Water treatment and distribution, pharmaceutical, inland aquaculture, heating and cooling circuits, swimming pools and irrigation systems, fire-fighting installations, automotive industry and energy plants.



► Principle of Ultrasonic Flow Sensor

The ultrasonic flow sensor adopts the Transit Time measurement principle. It uses an ultrasonic signal from the transducer to travel in a flowing fluid, the velocity of sound wave increases parallel to the flow direction and decreases opposite to the flow direction. The transmission times are different at the same propagation distance, the flow rate of the fluid is measured according to the relationship between the difference of the transit time and the flow rate of the measured fluid.

The flow velocity of the fluid is different at different locations within the pipe, the flow rate in the center of the tube is faster than that near the wall of the pipe. The flow velocity distribution of a fluid in a pipe can be expressed in terms of flow velocity section distribution diagrams.

By setting the flow sensor and considering the influence of cross-sectional distribution of flow velocity, the average flow velocity can be calculated and the volume flow of the fluid is derived from the cross-sectional area of the pipe.

$$V = \frac{MD}{\sin 2\theta} \times \frac{\Delta T}{T_{up} \cdot T_{down}}$$

Note

V: Fluid Velocity

M: Times of ultrasonic reflections

D: Pipe diameter

θ : The angle between the ultrasonic signal and the fluid

T_{up} : Time of the upstream transducer transmitting a signal upstream

T_{down} : Time of the downstream transducer transmitting a signal downstream

$\Delta T = T_{down} - T_{up}$

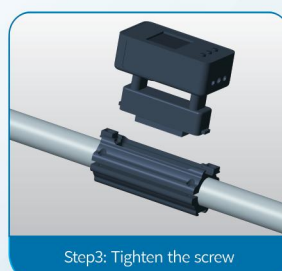
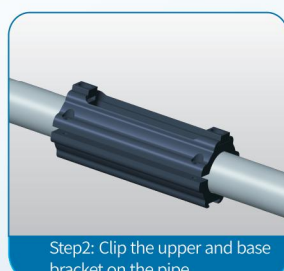
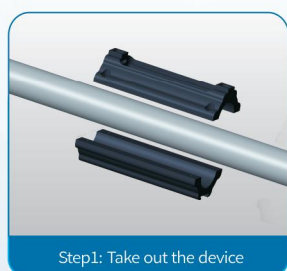


► Installation Method

All-in-one design, easy to install

No need to break pipe or shut down

Simple setting and clip on for measurement



Format of Selection Model: F2 Format: A-B

Model

F2

Description of Transmitter

Model Name:	F2 Clip-on Ultrasonic Flow Sensor	Installation Method:	Clamp on
Velocity Range:	0.1~5m/s	Protection Level:	IP54
Accuracy:	±2% (0.5~5.0m/s)	Pipe Material:	Carbon Steel, Stainless Steel, Copper, PVC
Measuring Medium:	Water	Communication Interface:	RS485 with Modbus/Fuji Protocol
Fluid Temperature	0°C~60°C (32°F~140°F)	Power Supply:	10~36VDC/500mA
Ambiend Temperature:	-10°C ~ 50°C (14°F~122°F)	Cable Length:	6.6ft (2m)
Keyboard:	3 keys	Humidity:	relative humidity 0~99%, no condensation
Display:	1.44" LCD screen; resolution: 128*128		

Specifications

A

- 1
- 2
- 3
- 4

Pipe Material (4 modes)

- PVC (Plastic)
- Carbon Steel (Galvanized steel)
- Stainless Steel
- Copper (Brass)

B

Pipe Size

Pipe OD Range

For Pipe Material (PVC, Carbon Steel, Stainless Steel)

Nominal		Outer Diameter	
Metric	Inch	Metric	Inch
DN20	3/4"	21~29mm	0.827"-1.142"
DN25	1"	28~36mm	1.102"-1.417"
DN32	1-1/4"	35~43mm	1.378"-1.693"
DN40	1-1/2"	46~54mm	1.811"-2.126"
DN50	2"	59~67mm	2.323"-2.638"
DN65	2-1/2"	72~80mm	2.835"-3.150"
DN80	3"	83~91mm	3.268"-3.583"

For Pipe Material (Copper)

Nominal		Outer Diameter	
Metric	Inch	Metric	Inch
DN25	3/4"	21~29mm	0.827"-1.142"
DN32	1" or 1-1/4"	28~36mm	1.102"-1.417"
DN40	1-1/2"	35~43mm	1.378"-1.693"
DN50	2"	46~54mm	1.811"-2.126"
DN65	2-1/2"	59~67mm	2.323"-2.638"
DN80	3"	72~80mm	2.835"-3.150"

Selection Sample: Model: F2-1-DN20

Description: Model F2 with RS485 and 4~20mA outputs, applied to pipe size DN20, PVC pipe.