Gentos Measurement & Control Co., Ltd.

pFlow

F2 Clip-On Ultrasonic Flow Sensor



Gentos Measurement & Control Co., Ltd.
12/F, Block A5. Nanshan Ipark, No.1001 College Rd.
Nanshan District, 518055,Shenzhen, China
Tel: 86-755-2674 5999 ext. 8036
Fax: 86-755-26745333
E-mail:tanya@gentos.com.cn
Website:www.pflowmeters.com

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


Step1: Take out the device


Step2: Clip the upper and base bracket on the pipe


Step3: Tighten the screw


Step4: Power on and start measurement

Product Model

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

Specifications

A — **Pipe Material (4 modes)**

1	PVC (Plastic)
2	Carbon Steel (Galvanized steel)
3	Stainless Steel
4	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 siza DN20, PVC pipe.