Fuji Electric

Innovating Energy Technology

Ultrasonic Flowmeters

For Liquids and for Air

From Air to Oil
Reliable Flow Measurement

21A1-E-0006a

Innovative Solutions for Various Applications

Spool Piece Ultrasonic Flowmeter for Liquids

NEW

High accuracy: ±0.2% of rate
Easy-to-operate
Low maintenance
Convenient configuration and data management from PC

Principle: transit time difference method with parallel three measuring paths *1

Applications

Reduction of water use in plant utilities, flow monitoring in filtration equipment, flow measurement on two pipes, liquid level monitoring in tanks

Introduction movie

Read the QR code with your smartphone or tablet.

Clamp-on Ultrasonic Flowmeter for Liquids

No piping work—cost saving
Installation available without interrupting the plant operation
Non-contact and low-maintenance sensor
Wide selection

Principle: transit time difference method*2

Applications

Flow measurement of ultra-pure water in semiconductor manufacturing plants, paint and coating material in painting process, water in air-conditioning systems, drainage

Ultrasonic Flowmeter for Air

No projections inside pipe—no pressure loss
Abundant applicable pipe diameters
Tolerant to oil mist—No need for filter such as mist separator

Principle: transit time difference method*2

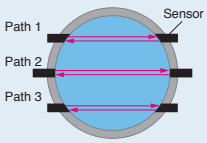
Applications

Visualization of the compressed air use, early detection of air leakage

Principle

***1: Transit time difference method with parallel three measuring paths**

Three parallel paths are arranged at selected positions to reduce the adverse effect of flow profile. By measuring the flow with the three paths simultaneously, and averaging them, the flowmeter obtains an accurate flow rate.



Flow velocity: $V = K \quad (T2 - T1)$

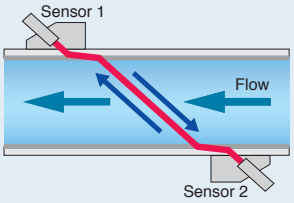
Pipe cross-sectional areas: $A = \frac{\varpi D^2}{4}$

Flow rate: $Q = A \quad V$

Pipe inner diameter	: D
Transit time with flow	: T_1
Transit time against flow	: T_2
Flow coefficient	: K

***2: Transit time difference method**

A pair of sensors installed on the outside wall of the pipe, facing each other slantingly. The sensors emit ultrasonic pulse in turn, and detect the transit time difference of the pulse, by which the flow rate is calculated.



Selection Guide for Liquid Applications

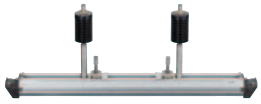
✓✓: best suitable ✓: suitable ×: not applicable

Fluid	Spool piece flowmeter (FST)	Clamp-on type					
		TIME DELTA-C (FSV, FSS)	TIME DELTA-C (FSV, FSS)	TIME DELTA-C (FSV, FSS)	M-Flow PW (FLR, FSS)	Portable type (FSC, FSS)	Duosonics (FSH, FSW)
		IP66	IP67	Advanced			
Clean liquid with no air bubbles	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
Sewage, drainage	✓	✓	✓	✓	✓	✓	✓✓
Viscous liquid	✓	✓	✓	✓	✓	✓	✓
Oil	✓	✓	✓	✓	✓	✓	✓
Corrosive liquid	✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
Polishing slurry	Conditionally applicable						✓
Fibrous slurry	Conditionally applicable						✓
Low-velocity fluid	Conditionally applicable	✓	✓	✓	✓	✓	✓
Pulsating fluid	×	Conditionally applicable					✓
High-temperature fluid	✓	✓	✓	✓	✓	✓	×
High-pressure fluid	✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓

*Measurement may be unavailable depending on conditions.

Clamp-on Detectors for Liquid Applications

For pipe diameters from 13 mm to 6000 mm

Model	FSSA	FSSD	FSSE	FSSH
	Easy installation	For small pipes	For large pipes	 For high temperature
Applicable transmitter Model	FLR FSV	FSC FSV	FSC FSV	FSC FSV
Diameter (mm)	25 to 225	13 to 100	200 to 6000	50 to 400
Fluid temperature (°C)	-20 to 100	-40 to 100	-40 to 80	-40 to 200

Model	FSSC (extendable rail type)		
	Normal (V method)	Extended (V method)	Separated (Z method)
Applicable transmitter Model	FSC, FLR, FSV		
Diameter (mm)	50 to 300	Up to 600	Up to 1200
Fluid temperature (°C)	-40 to 120		

Spool Piece Ultrasonic Flowmeter for Liquid Applications [FST]

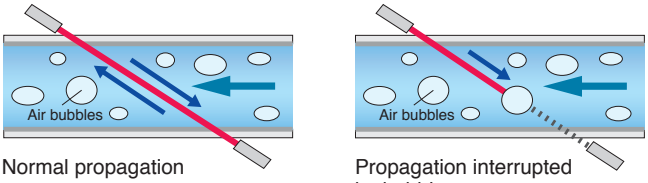
Three Pairs of Sensors Offer an Accuracy of ±0.2% of Rate

- For Precise Control and Improved Efficiency
- No Projections Inside Pipe—Low Maintenance

Superior Bubble Resistance

Fuji Electric's advanced anti-bubble measurement technology reduces the interference to ensure accurate measurements.

Signal averaging



Normal propagation

Propagation interrupted by bubbles

Measurement failure may occur.

By averaging a set of multiple measurements, precise signals can be obtained.

Improved Zero-Point Stability

Achieved by a combination of the advanced circuit design, the latest electronics, and innovative digital signal processing technology.

Improved Sensitivity

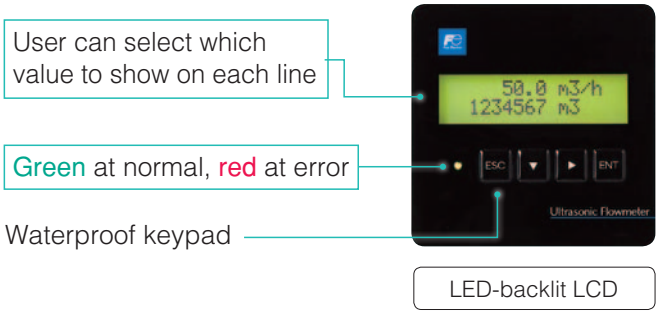
The newly developed high-sensitivity sensors and noise reduction technology result in improved signal-to-noise ratio.

Accepts Various Types of Fluid

FST can measure non-conductive fluids such as oil, purified water, or a mixture, with temperature ranging from -40°C to 150°C.

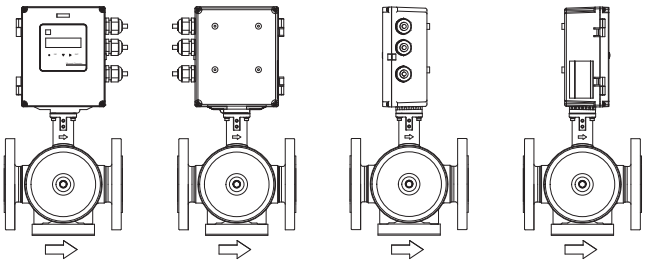
Backlit LCD and Front Panel Operation

Front keys allow you to configure parameters, enter piping conditions, or calculate sensor spacing, without opening the cover. Measurement results are shown on the 16-digit 2-line LCD in Japanese, English, German, French, or Spanish. Self-diagnosis function tells you if an error occurs.



Selectable Panel Position

You can select the most suitable panel position for your application.



11th code A 11th code B 11th code C 11th code D

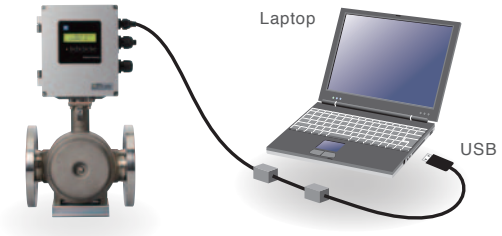
* ⇨ Indicates the flow direction.

Low Maintenance

The lack of projections inside keeps the pipe almost entirely free from contamination, thereby reducing maintenance work.

Convenient Configuration and Data Management from PC

Parameter loader software, provided as standard, allows parameter setting and measurement data acquisition on PC. RS-485 communication is optionally available.



*An RS232C to RS485 converter is required.
If your PC does not support the RS232C serial interface, a USB to RS232C converter is also required.

Flexible Output Terminal

Equipped with terminals for insulated 4–20 mA DC analog output, pulse output, and alarm output.

Reliability. Safety. Convenience.

Other useful functions include : zero point adjustment, damping, low flow cut-off, alarm contact output, output burnout, flow switch, total switch, unit selection, bi-directional range, auto-switchable two range.

Specifications

Principle	Transit time difference method Parallel 3-path
Pipe size	ϕ50 mm, ϕ80 mm, ϕ100 mm
Flange rating	JIS10K/JIS20K, ANSI 150/300, DIN PN16/40
Accuracy	±0.2% of rate (flow velocity: 1 m/s to 10 m/s)
Fluid pressure	Up to flange rating
Fluid temperature	-40°C to 150°C
Measurement range	Flow velocity: 0 to ±0.3…±10 m/s
Material	Flange: stainless steel 316L Short pipe: stainless steel 316L
Output signal	4–20 mA DC, total pulse, alarm output
Display	16-digit 2-line backlit LCD 2-color LED (green: normal, red: at error)
Functions	Zero point adjustment, damping, low-flow cutoff, alarm, output burnout, output limit, bi-directional range, automatic two ranges, flow switch, total switch, preset total, data backup at power outage
Communication	RS-485 (option)
Data backup at power outage	On nonvolatile memory
Power supply voltage	100–240 V AC, 50/60 Hz
Grounding	Class D grounding with ground resistance of 100 or less
Arrestor	Provided as standard, on power supply port and analog output port
Power consumption	Approx. 20 VA
Ambient temperature	-40°C to 60°C
Ambient humidity	90% RH or less
IP enclosure	IP66
Unit	Flow velocity: m/s Flow rate: L/s, L/min, L/h, L/d, kL/d, ML/d, m^3/s, m^3/min, m^3/h, m^3/d, km^3/d, Mm^3/d

Clamp-on Ultrasonic Flowmeters for Liquid Applications

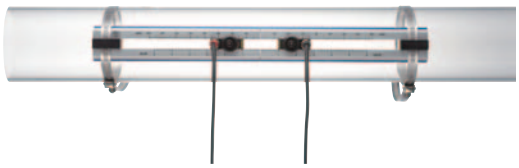
No Piping Work—Cost Saving

- Easy Installation Without Interrupting the Process
- Non-Contact and Low Maintenance Sensor

Flow Transmitters

Hardly Affected by Fluid Pressure and Temperature

The sensors placed on upstream and downstream emit ultrasonic pulse in turn, and detect the transit time difference of the pulse to calculate the flow rate. Highly accurate measurement can be obtained regardless of the type of fluid.

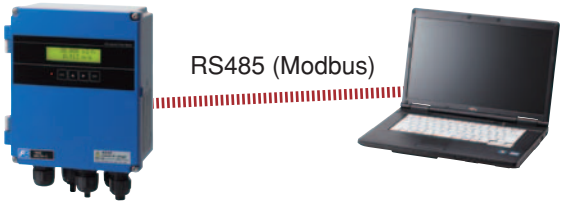


Fast Response Mode Delivers ≤ 0.2s Response Time

Allows you to take corrective actions quickly.

Convenient Configuration and Data Management from PC

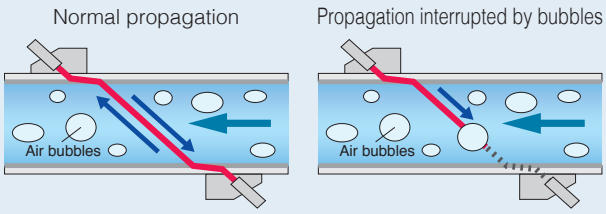
Parameter loader software, provided as standard, allows parameter setting and measurement data acquisition on PC.



Superior Bubble Resistance

Fuji Electric's advanced anti-bubble measurement technology reduces the interference to ensure accurate measurements.

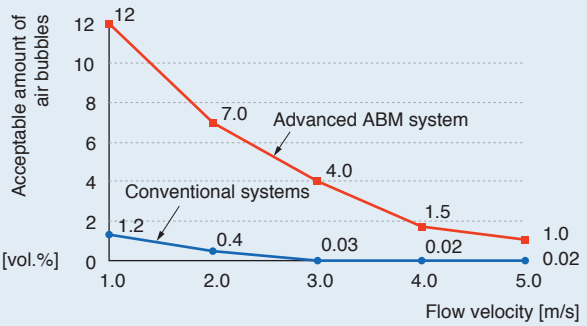
Signal averaging



Normal propagation

Measurement failure may occur.

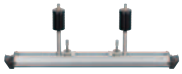
By averaging the results of 128 or 256 measurements, precise signals can be obtained.



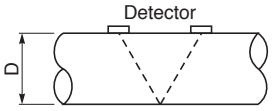
*Flowmeters indicate the volumetric flow rate which includes air bubbles.

Clamp-on Detectors for Liquid Applications

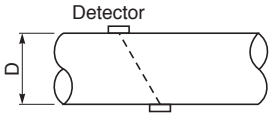
For pipe diameters from 13 mm to 6000 mm

Appearance	Type	Fluid temperature [°C]	Mounting method	Pipe inner diameter (mm) (13 25 50 100 200 250 300 400 600 1000 3000 6000)	Transmitter type
	FSSD	-40 to 100	V	13 Px, P, M 100	FSC,FSV
	FSSA	-20 to 100	V	25 P, M 225	FLR,FSV
	FSSC	-40 to 120	V	50 P, M 600 50 Px 300	FSC,FLR, FSV
			Z	200 P, M 1200 200 Px 400	
	FSSH	-40 to 200	V	50 Px, P, M 250	FSC,FSV
			Z	150 Px, P, M 400	
	FSSE	-40 to 80	V	200 Px, P, M 3000	FSC,FSV
			Z	200 Px, P, M 6000	

Mounting method : V method or Z method



V method



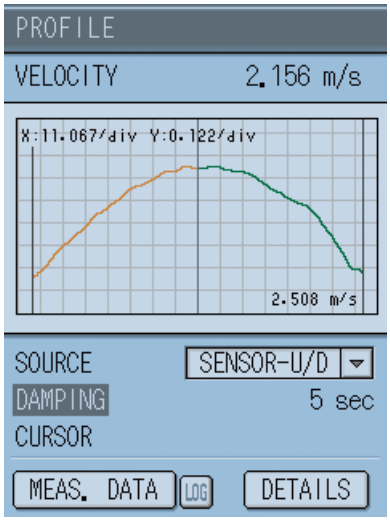
Z method

Classification of piping materials
- Px : PP, PVDF
- P : Plastic (PVC, etc.)
- M : Metallic piping (steel pipe, copper pipe, aluminum, etc.)

Real-Time Monitoring of Flow Profile

Useful for flow velocity analysis or laboratory tests

*Duosonics (FSH) and portable type (FSC) only

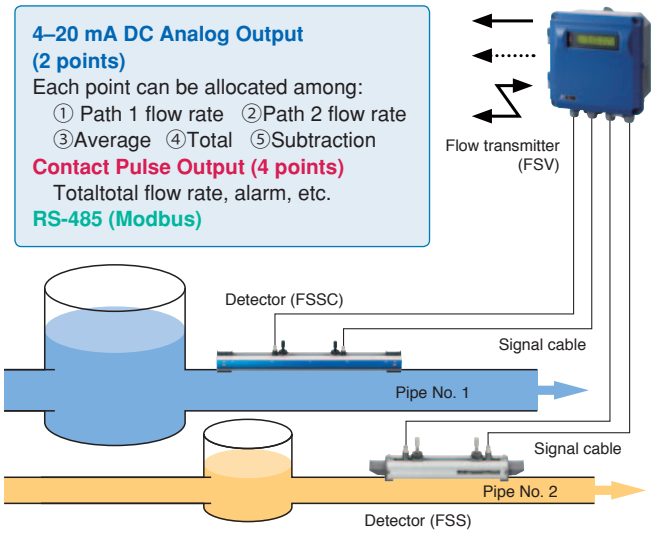


Portable type

Two Pipes Measurement by One Flowmeter

You can obtain the average value, the total value, and the subtraction value.

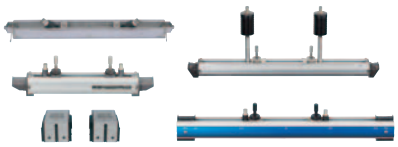
*TIME DELTA-C (FSV-2) advanced type only



High Accuracy and Wide Measuring Range

TIME DELTA-C

Flow transmitter: FSV Detector: FSS



Detector (FSS)

Flow transmitter (FSV)
IP66

Features

High Accuracy: ±1.0% of Rate*

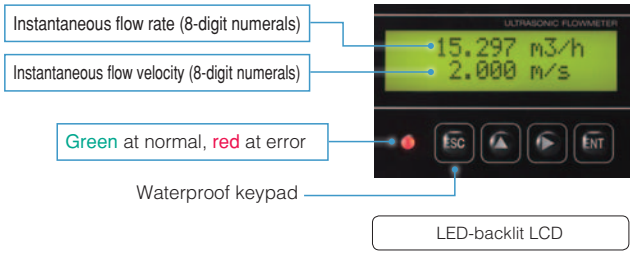
*For details, refer to the data sheet.

Wide Range of Detectors for Pipes 13–6000 mm

Including the extendable detector for pipe diameters from 50 mm to 1200 mm

Backlit LCD and Front Panel Operation

Front keys allow you to configure parameters, enter piping conditions, or calculate sensor spacing, without opening the cover.



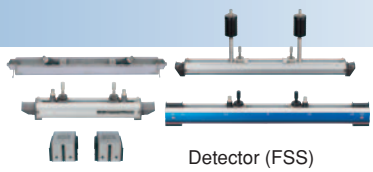
Specifications

	Model	Diameter (mm)	Fluid temperature (°C)
Detector	FSSA	25 to 225	-20 to 100
	FSSC	50 to 1200	-40 to 120
	FSSE	200 to 6000	-40 to 80
	FSSD	13 to 100	-40 to 100
	FSSH	50 to 400	-40 to 200
Measurement range	-32…0…+32 m/s (minimum 0.3 m/s)		
Response time	≤ 0.2 s		
Output signal	4–20 mA DC, pulse output, alarm output		
Communication	RS-485 (Modbus) option		
Accuracy	±1.0% of rate (depending on flow velocity and diameter)		
Power supply voltage	100–240 V AC or 20–30 V DC		
IP enclosure	IP66 or IP67		
Cable between detector and transmitter	≤ 150 m		

Configurable Among Three Different Ways to Suit Your Application

TIME DELTA-C advanced type

Flow transmitter: FSV Detector: FSS



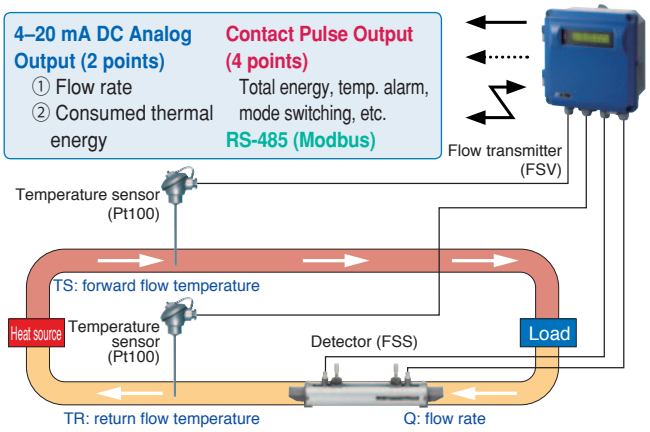
Detector (FSS)

Flow transmitter (FSV)
IP67

Select one of the following functions when you order.

1. Consumed Energy Calculation

A function to obtain thermal energies exchanged via fluid used in air-conditioning systems. The transmitter calculates the consumed thermal energy based on the forward flow temperature, the reverse flow temperature, and the flow rate.



2. Simultaneous Flow Measurement of Two Pipes with One Transmitter

Allows cost reduction.

3. Two Measuring Paths for One Pipe

Highly accurate measurement can be provided even if the flow is uneven.

Specifications

Consumed energy calculation version

Output signal	4–20 mA DC: 2 points (flow rate, consumed energy) Contact output: 4 points (total energy, mode switching, temp. alarm, etc.)

Two pipes measurement version

Output signal	4–20 mA DC: 2 points (path1, path2, average, total, subtraction) Contact output: 4 points (flow rate total pulse, instantaneous flow rate pulse, alarm, etc.)

Two-path for one pipe version

Output signal	4–20 mA DC: 2 points (path1, path2, average) Contact output: 4 points (flow rate total pulse, instantaneous flow rate pulse, alarm, etc.)

Detector	FSS	ϕ 13 mm to 6000 mm
Measurement range	-32…0…+32 m/s (minimum 0.3 m/s)	
Accuracy	±1.0 % of rate (depending on flow velocity and diameter)	
Power supply voltage	100–240 V AC, 50/60 Hz	

Compact and Lightweight

M-Flow PW

Flow transmitter: FLR Detector: FSS

Detector (FSSC)

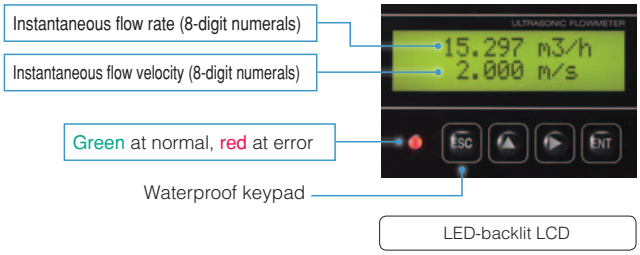
Detector (FSSA)

Flow transmitter (FLR)

Features

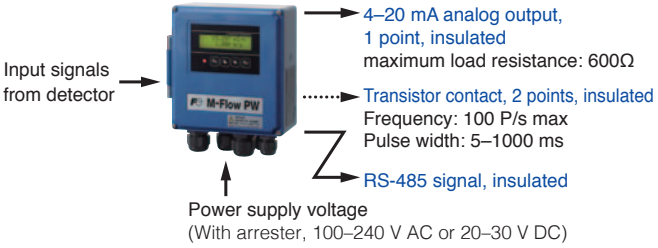
Backlit LCD and Front Panel Operation

Front keys allow you to configure parameters, enter piping conditions, or calculate sensor spacing, without opening the cover.



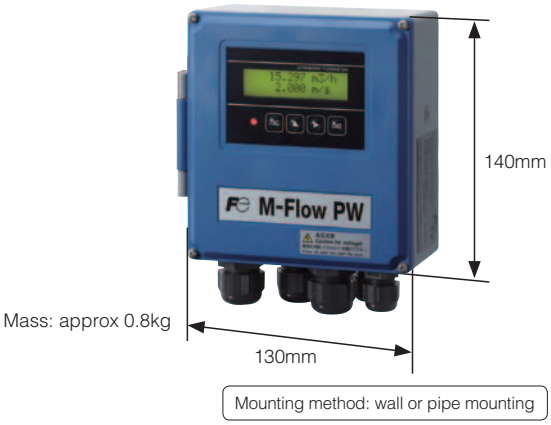
Analog and Digital Communication

Equipped with an analog output terminal, two transistor contacts, and an RS-485 communication interface.



Compact Design

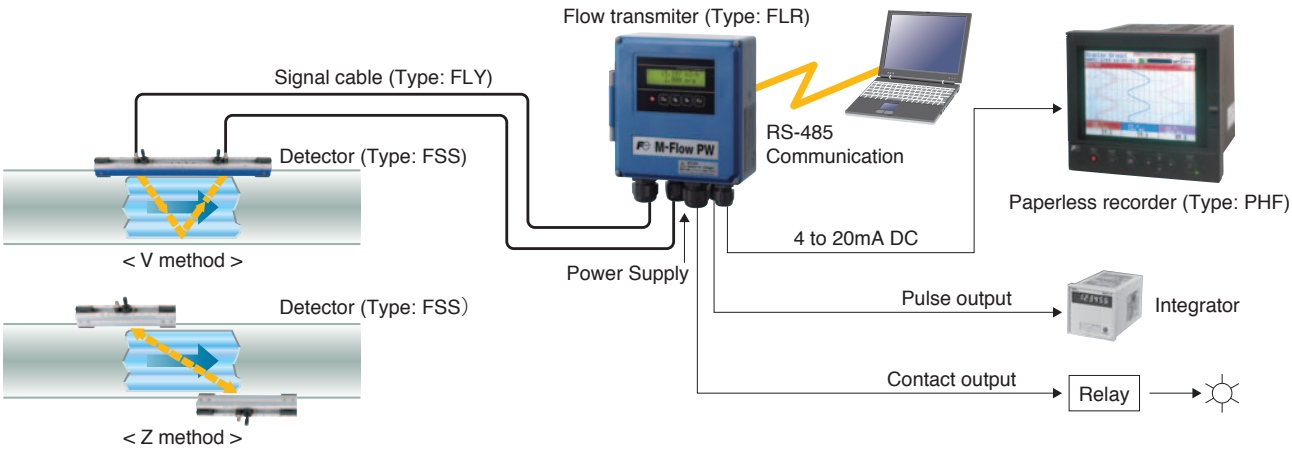
W13 × H14 × D6.9 mm, only a quarter in volume of conventional models. It can be easily installed in a small space.



Specifications

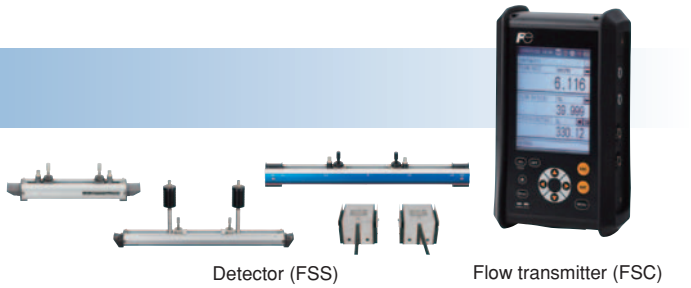
Detector	Model	Diameter (mm)	Fluid temperature (°C)
	FSSA	25 to 225	-20 to 100
	FSSC	50 to 1200	-40 to 120
Measurement range	-10…0…10 m/s (minimum 0.3 m/s)		
Response time	≤ 0.2 s		
Output signal	4–20 mA DC, pulse output, alarm output		
Communication	RS-485 (Modbus) option		
Accuracy	±1.5% of rate (1.0% of rate is available on request)		
Power supply voltage	100–240 V AC or 20–30 V DC		
IP enclosure	IP65		
Cable between detector and transmitter	≤ 60 m		

Example of system configuration



Portable Type

Flow transmitter: FSC Detector: FSS or FSD



Features

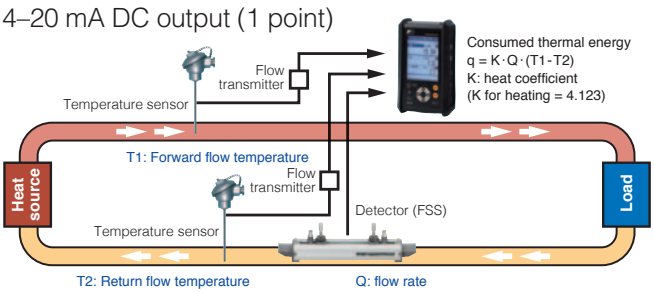
Easy Measurement Anytime and Anywhere

Handy and battery-driven design allows you to take measurement when and where needed.

Consumed Energy Calculation

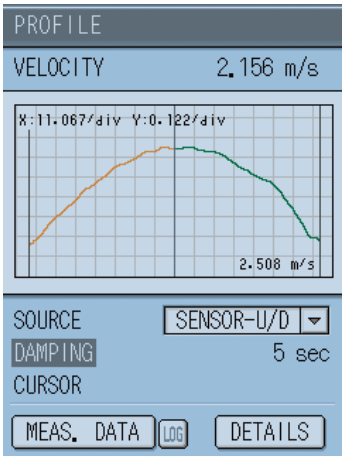
A function to obtain thermal energies exchanged via fluid used in air-conditioning systems. The transmitter calculates the consumed thermal energy based on the forward flow temperature, the return flow temperature, and the flow rate.

4–20 mA DC output (1 point)



Real-Time Monitoring of Flow Profile

Using the flow transmitter FSC in combination with the optional pulse doppler detector (FSD) enables real-time monitoring of flow profile (option).



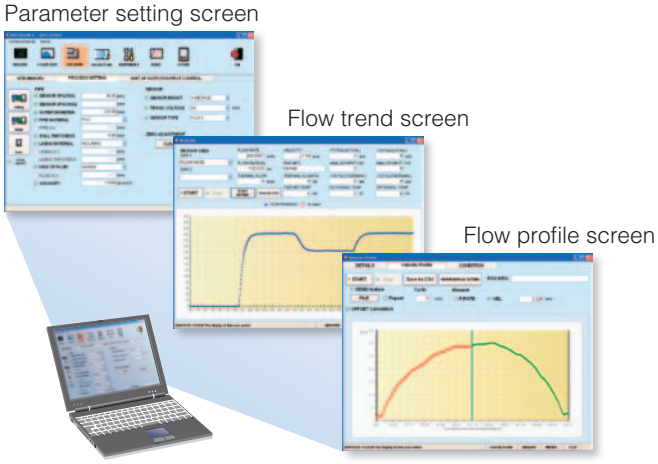
Flow profile indication

Data Management on PC

Data in SD card can be transmitted to your PC through a USB cable.

Loader software provided

Parameter setting screen



Carrying Case

The dedicated case accommodates all the necessary equipment including:

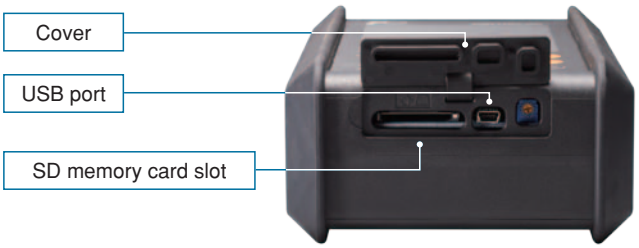
- Flow transmitter
- Detector (FSSC or FSSD)
- Acoustic coupler (silicone grease)
- Signal cable
- Analog I/O cable
- Strap
- AC power adapter
- Power cable
- Mounting belt
- USB cable
- CD-ROM (instruction manual, parameter loader software)

Carrying case

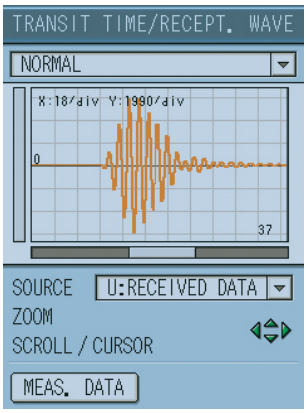
Data Storage on SD Card

The transmitter automatically saves the measured data on SD memory card at user-specified cycle. You can also send the data through USB port to your PC.

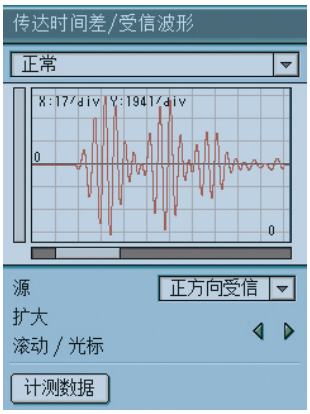
For example, a 512 MB memory card can store the data of two years' worth (at a data save cycles of 30 s, 14 kinds of data). SD card up to 8 GB can be used.



Multilingual Display

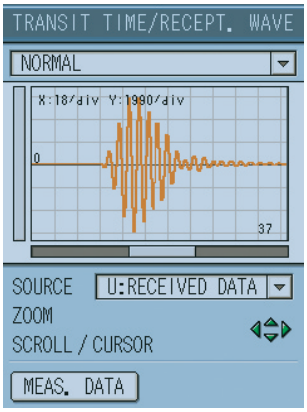


English

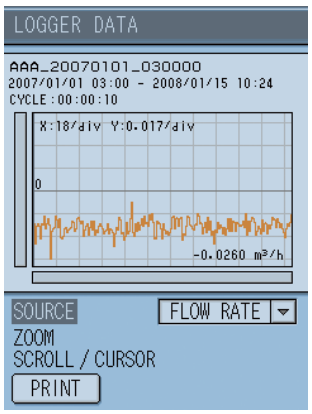


Chinese

Easy-to-See LCD



Received waveform



Logger data

Easy-to-Mount Detector

Mounting detector requires no tools. You can start measurement anytime.

12 Hours of Continuous Operation with Built-in Battery

FSC can serve long hours of outdoor measurement.

On-Site Printing

You can print out the measured data or screenshot by the dedicated printer (option).

Specifications

Detector	Model	Diameter (mm)	Fluid temperature (°C)
	FSSD	13 to 100	-40 to 100
	FSSC	50 to 1200	-40 to 120
	FSSH	50 to 400	-40 to 200
	FSSE	200 to 6000	-40 to 80
Measurement range	-32…0…32 m/s (minimum 0.3 m/s)		
Response time	≤ 1 s		
Analog output	4–20 mA DC		
Analog input	4–20 mA DC/1–5 V DC		
Accuracy	±1.0 % of rate (depending on flow velocity)		
Power supply voltage	Built-in rechargeable battery (battery life: 12 hours)		
SD card (option)	512 MB (stores 2 years' worth data)		
Others	Parameter loader software (provided as standard)		
Option	Flow velocity profile display, printer		

Hybrid type

Duosonics

Flow transmitter: FSH Detector: FSW

Detector (FSW) Flow transmitter (FSH)

Features

High Accuracy: ±0.5% to ±1.0% of Rate

±0.5% of rate in the pulse doppler method
±1.0% of rate in the transit time method

High-Speed Response

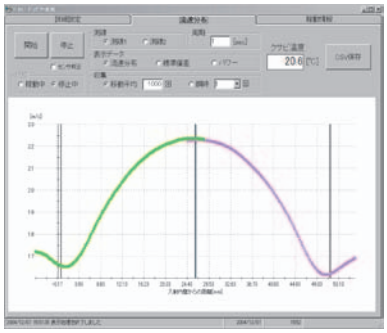
0.2s (Pulse Doppler method):
0.5s (Transit time method)

Hybrid Technology

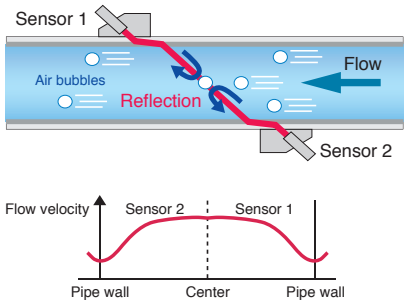
FSH switches between the pulse doppler method and the transit time difference method according to the fluid being measured. This enables FSH to measure a wide range of fluid, including fluid which contains air bubbles or particles.

Real-Time Monitoring of Flow Profile

By connecting FSH with PC, you can monitor the flow profile in real-time (option).



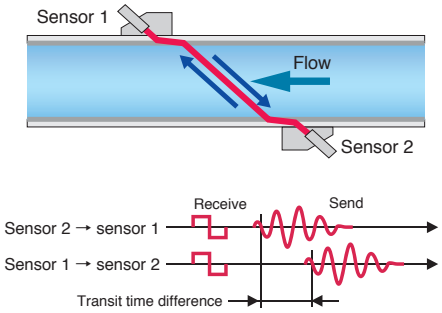
[Pulse doppler method]



The frequency of ultrasonic pulses reflected by air bubbles or solid particles changes according to the flow velocity. The pulse doppler flowmeter uses this frequency shift to determine the flow profile and flow rate.

Automatic switching according to flow conditions

[Transit time method]



The sensors placed on upstream and downstream emit ultrasonic pulse in turn, and detect the transit time difference of the pulse to calculate the flow rate.

Applications

- Yogurt, Dressing, Juice with Pulp
- Sugar Liquid, Milk
- Crude Oil
- Wastewater/Sewage Monitoring
- Paint
- …and other Challenging Industrial Applications.

Specifications

	Model	Diameter (mm)	Fluid temperature (°C)
Detector	FSWS12	40 to 200	-40 to 100
	FSWS21	100 to 400	-40 to 80
	FSWS40	200 to 500	-40 to 80
	FSWS50	500 to 1000	-40 to 80
Measurement range	-4…0…+32 m/s (minimum 0.3 m/s)		
Response time	≤ 0.2 s		
Output signal	4–20 mA DC, pulse output, alarm output		
Communication	RS-485 or RS-232C		
Accuracy	±0.5% to ±1.0% of rate		
Power supply voltage	100–240 V AC or 20–30 V DC		
IP enclosure	IP67		
Cable between detector and transmitter	≤ 150 m		

Ideal for Compressor Control

Ultrasonic Flowmeter for Air

Non-Intrusive Design Free From Pressure Loss

- For Pipe Diameters from 25 mm to 200 mm
- No Need for Oil Mist Separator

No Energy Loss

Non-intrusive ultrasonic sensor causes no pressure loss

Tolerant to Oil Mist

With no moving parts, FWD is robust, and requires no filters.

Battery-Powered Version Available

The version equipped with a lithium-ion battery (10-year life) greatly lightens the installation work.

Flow rate Conversion

Measured flow rate can be converted into a flow rate under normal conditions of a temperature of 0 degree C (273.15 K) and an absolute pressure of 1 atm or user-defined conditions.

Bi-Directional Flow Measurement

FWD can measure the air transfered between facilities, and the air flow in loop piping system.

Product Variations

FWD

For small diameter pipes

Diameter:
25 mm, 32 mm
Process Connection:
ø25 mm: Rc1
ø32 mm: Rc1-1/4

For medium diameter pipes

Diameter:
40, 50, 65, 80 mm
Process Connection:
Wafer (between JIS10K flanges)

For large pipes

Diameter:
100, 150, 200 mm
Process Connection:
JIS10K flange

Specifications

Model	FWD			
Pipe diameter (mm)	25, 32, 40, 50, 65, 80, 100, 150, 200			
Power supply voltage	24 V DC ±10% or built-in lithium-ion battery (battery life: approx. 10 years under the temperature of 20°C)			
Target fluid	Air (mainly factory air) or N_2 (pipe diameter 25–80 mm)			
Fluid temperature	-10°C to 60°C, RH 90% or less			
Operating pressure	<1 MPa (gauge pressure)			
Range (actual flow rate) Accuracy	Diameter (mm)	Range (m^3/h)	Accuracy	
			±2.0% of rate	±5.0% of rate
	25	±0.6–35	±3.5–35 m^3/h	±0.6–3.5 m^3/h
	32	±1.1–65	±6.5–65 m^3/h	±1.1–6.5 m^3/h
	40	±1.3–80	±8–80 m^3/h	±1.3–8 m^3/h

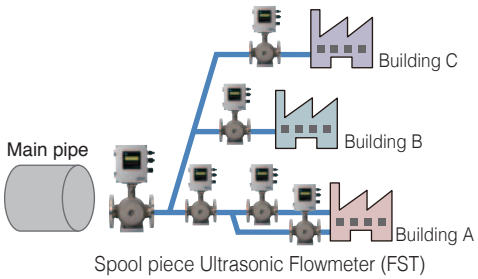
Range (actual flow rate) Accuracy	Diameter (mm)	Range (m^3/h)	Accuracy	
			±2.0% of rate	±5.0% of rate
	50	±2.5–150	±15–150 m^3/h	±2.5–15 m^3/h
	65	±4–240	±24–240 m^3/h	±4–24 m^3/h
	80	±5–300	±30–300 m^3/h	±5–30 m^3/h
	100	±10–500	±50–500 m^3/h	±10–50 m^3/h
	150	±24–1200	±120–1200 m^3/h	±24–120 m^3/h
	200	±40–2000	±200–2000 m^3/h	±40–200 m^3/h
Output signal	4–20 mA DC, pulse output (2 points) *Unavailable for battery-powered version.			
Straight run requirements	ø25 mm and 32 mm: ≥20D on inlet side and ≥5D on outlet side ø40–200 mm: ≥10D on inlet side and ≥5D on outlet side			
Installation location	Indoor or outdoor (IP64 equivalent)			

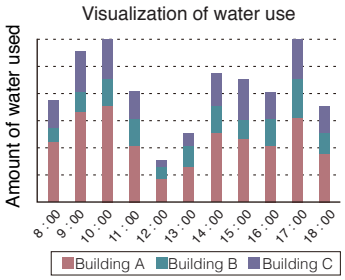
Applications

[Spool Piece Ultrasonic Flowmeter]

Reduction of Water Used in Plant Utilities

Visual depiction of a facility's water use results in more effective management of water consumption.

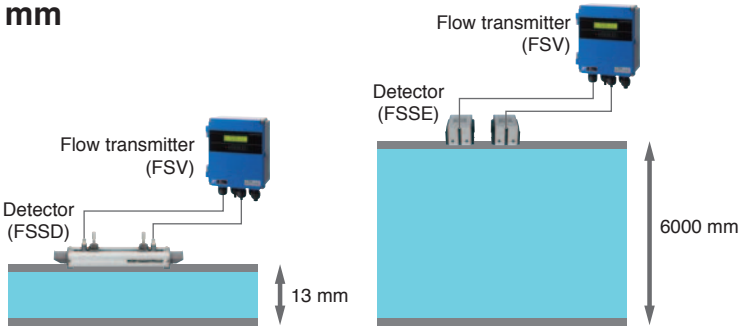




[Recommended Model: TIME DELTA-C]

For Large Diameter Pipes up to 6000 mm

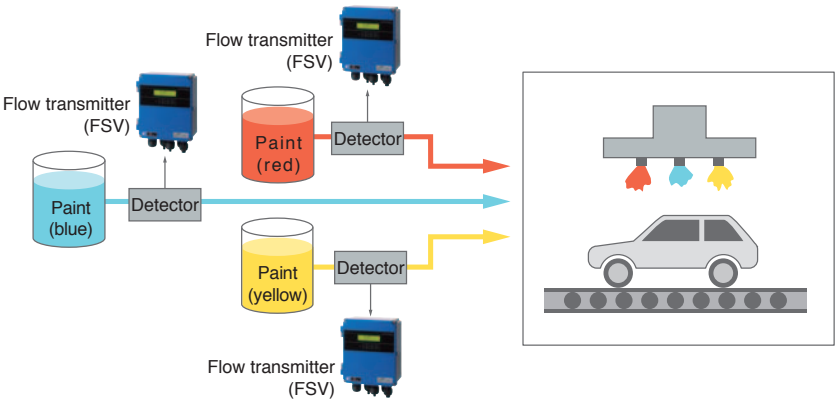
The price of clamp-on ultrasonic flowmeters is stable regardless of pipe diameters, and lower than that of electromagnetic flowmeters if the pipe diameter is 200 mm or larger.



[Recommended Model: TIME DELTA-C]

Paint Flow Measurement

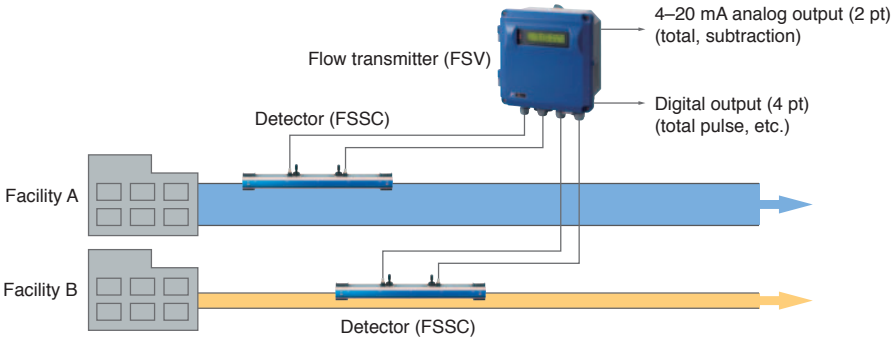
Suitable for high viscosity fluids such as paint or coating materials.



[TIME DELTA-C Advanced]

Drainage Monitoring

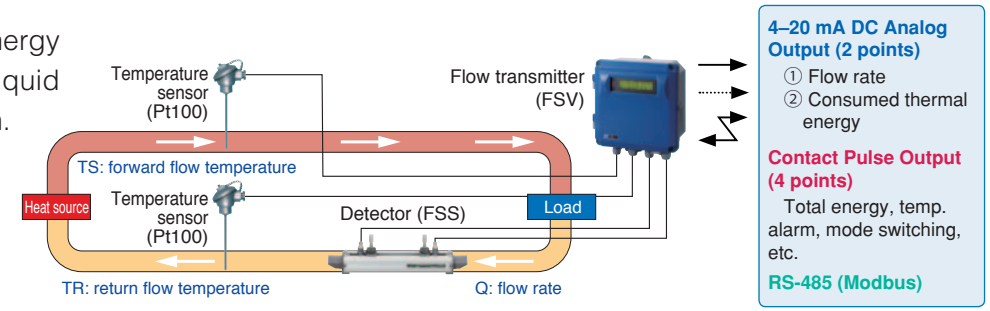
Measures the flow rates of two separate pipes, and calculates the total value and the subtracted value.



[TIME DELTA-C Advanced]

Energy Consumption in Air-Conditioning Systems

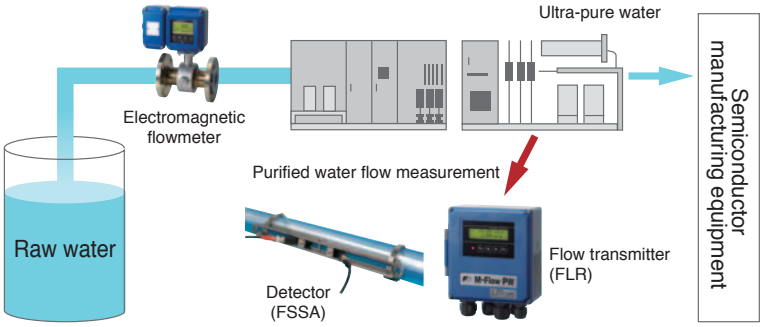
Calculates the thermal energy received and sent with liquid in air-conditioning system.



[Recommended Model: M-Flow PW]

Water Purifying System in Semiconductor Industry

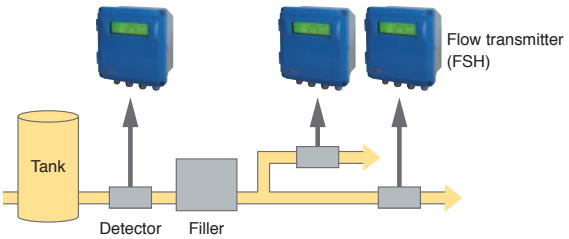
Non-contact sensor can prevent the purified water from being affected by metallic ions.



[Duosonics]

Cooking Oil Production Line

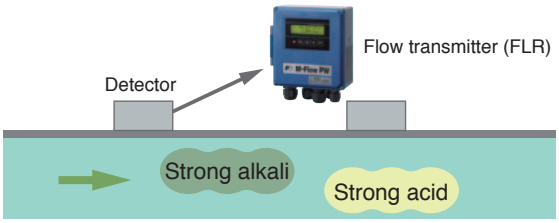
Lower maintenance compared to mechanical flowmeters or Coriolis flowmeters



[Recommended Model: M-Flow PW]

Corrosive Fluid

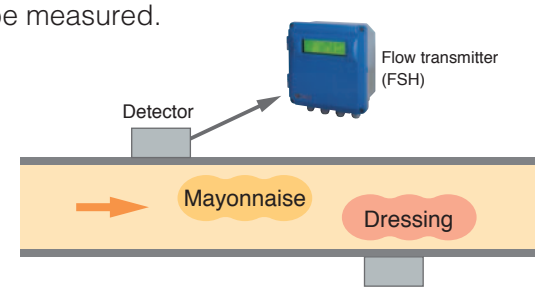
Ultrasonic flowmeters can take measurement on glass, metallic, and plastic pipes.



[Duosonics]

Mayonnaise and Dressing

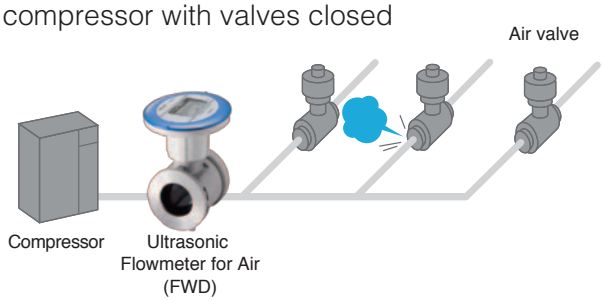
Even a high viscosity and low velocity fluid can be measured.



[Ultrasonic Flowmeter for Air]

Air Leakage Monitoring

Detects the air leakage by operating a compressor with valves closed



Specifications

	[For liquid] Spool piece	[For liquid] Clamp-on					[For air]
		TIME DELTA-C	TIME DELTA-C advanced type	M-Flow PW	Portable type	Duosonics	
Flow transmitter	FST	FSV	FSV	FLR	FSC	FSH	FWD
Detector		FSS	FSS	FSS	FSS	FSW	
Appearance							
Principle	Transit time difference					Pulse doppler + Transit time difference	Transit time difference
Bubble resistance	✓	✓	✓	✓	✓	✓✓	——
Pipe size (Fluid temperature)	50 mm 80 mm 100 mm (-40°C to 150°C)	FSSA 25–225 mm (-20°C to 100°C)	FSSA 25–225 mm (-20°C to 100°C)	FSSA 25–225 mm (-20°C to 100°C)	FSSD 13–100 mm (-40°C to 100°C)	FSWS12 40–200 mm (-40°C to 100°C)	25 mm 32 mm 40 mm 50 mm 65 mm 80 mm 100 mm 150 mm 200 mm (-10°C to 60°C)
		FSSD 50–1200 mm (-40°C to 120°C)	FSSD 50–1200 mm (-40°C to 120°C)	FSSD 50–1200 mm (-40°C to 120°C)	FSSD 50–1200 mm (-40°C to 120°C)	FSWS21 100–400 mm (-40°C to 80°C)	
		FSSE 200–6000 mm (-40°C to 80°C)	FSSE 200–6000 mm (-40°C to 80°C)	——	FSSE 200–6000 mm (-40°C to 80°C)	FSWS40 200–500 mm (-40°C to 80°C)	
		FSSD 13–100 mm (-40°C to 100°C)	FSSD 13–100 mm (-40°C to 100°C)	——	FSSH 50–400 mm (-40°C to 200°C)	FSWS50 500–1000 mm (-40°C to 80°C)	
		FSSH 50–400 mm (-40°C to 200°C)	FSSH 50–400 mm (-40°C to 200°C)	——	——	——	
Measurement range	±10 m/s (0.3 m/s min.)	±32 m/s (0.3 m/s min.)		±10 m/s (0.3 m/s min.)	±32 m/s (0.3 m/s min.)	±4 m/s (0.3 m/s min.) ±32 m/s (0.3 m/s min.) in transit time difference method	±2000 m^3/h (0.6 m^3/h min.)
Number of path	3 (in parallel)	1	1 or 2	1	1	1 or 2	1
Consumed energy calculation	——	——	✓ (RTD is not provided)	——	✓ (Temperature sensor and signal converter are not provided)	——	——
Response time	1.2 s	≤ 0.2 s			≤ 1 s	≤ 0.2 s (Pulse doppler method)	≤ 0.5 s
4–20 mA output	✓	✓	✓	✓	✓	✓	✓
Pulse output	✓	✓	✓	✓	——	✓	✓
Alarm output	✓	✓	✓	✓	——	✓	✓
Communication	RS-485				SD card, USB port	RS-485/RS-232C	——
Accuracy	±0.2% of rate	±1.0% of rate		±1.5% of rate (±1.0% of rate version available)	±1.0% of rate	±0.5% to ±1.0% of rate	±2.0% of rate
Power supply voltage	100–240 V AC, 50/60 Hz	100–240 V AC, 50/60 Hz or 20–30 V DC	100–240 V AC 50/60Hz	100–240 V AC, 50/60 Hz or 20–30 V DC	100–240 V AC, 50/60 Hz Built-in battery	100–240 V AC, 50/60 Hz or 20–30 V DC	Lithium-ion battery or 24 V DC
Cable between detector and transmitter	Not required	≤ 150 m		≤ 60 m	≤ 150 m		Not required
Display	Character LCD with back light				Graphic LCD with back light	Graphic LCD with back light	Character LCD
Transmitter dimensions H x W x D (in mm)	——	170 × 142 × 70	240 × 247 × 134	140 × 137 × 68	210 × 120 × 65	240 × 247 × 134	——
Transmitter weight	10.5 kg–23.5 kg	1.5 kg	5.0 kg	0.8 kg	1.0 kg	5.0 kg	1.1 kg–24.1 kg

✓✓: best suitable ✓: suitable

Find out more about our ultrasonic flowmeters.

Ultrasonic Flowmeters - Fuji Electric

https://www.fujielectric.com/products/instruments/products/flow_ultra/top.html

⚠ Caution on Safety

Before using products in this catalog, be sure to read their instruction manuals.

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