

FS/FM SERIES FLOW METER



FS SERIES FUEL SENSOR

High precision flowmeter capable of measuring various fuel flows

FS-1213 0.06 ~ 108L/h

FS-1214 0.3 ~ 600L/h

High accuracy

Low pressure loss

Wide range of flow rate

FM-100 FLOW METER

Multi-function digital indicator capable to be used on test bench

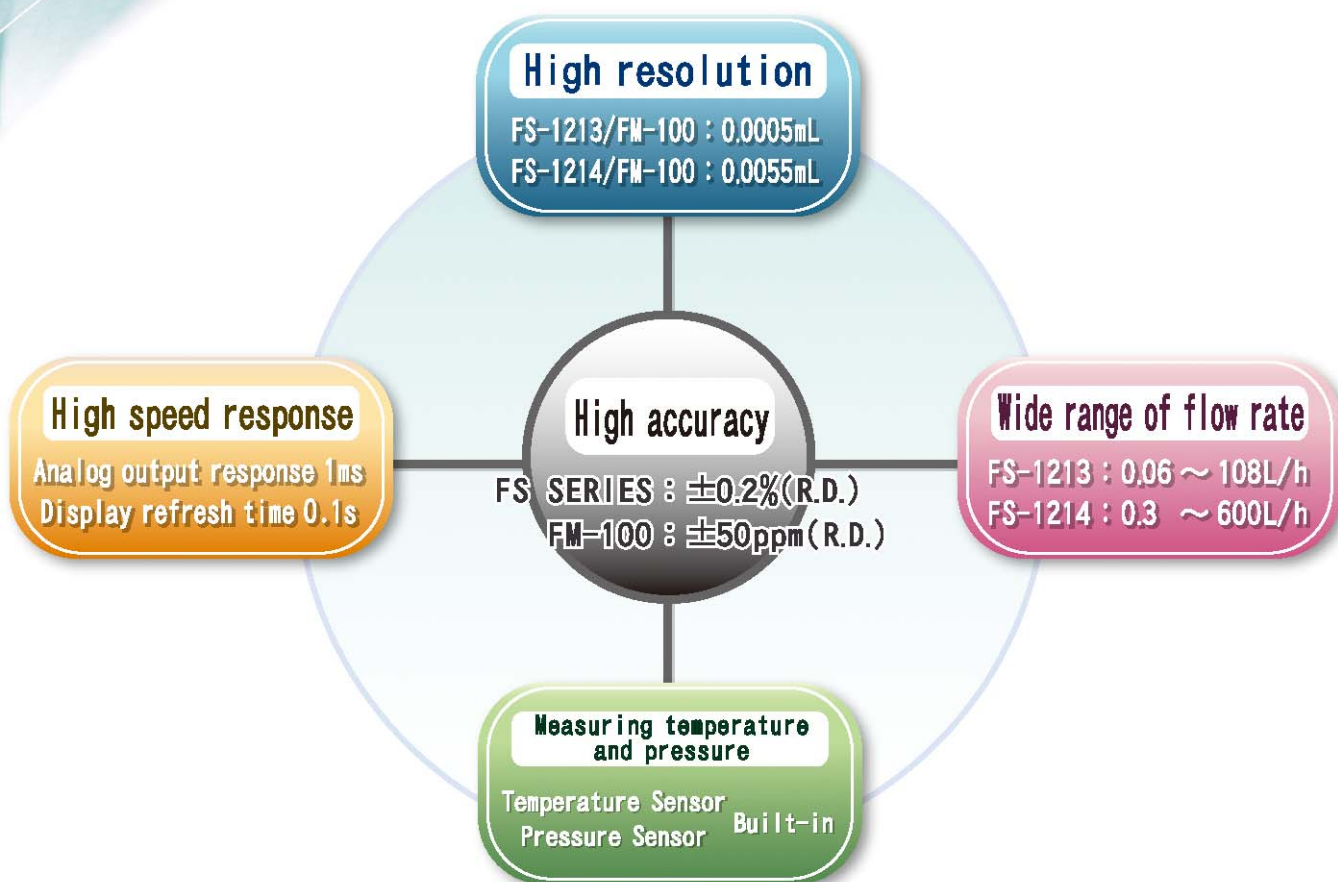
Compact and light weight

High speed analog output

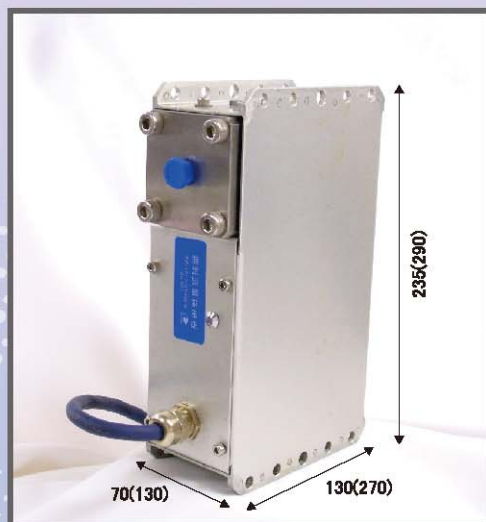
Pulse output for integrating measurement

USB data output of display value

Fuel flowmeter capable of precisely measuring a wide range from minute flows at idling to large flows at full throttling



FS SERIES FUEL SENSOR

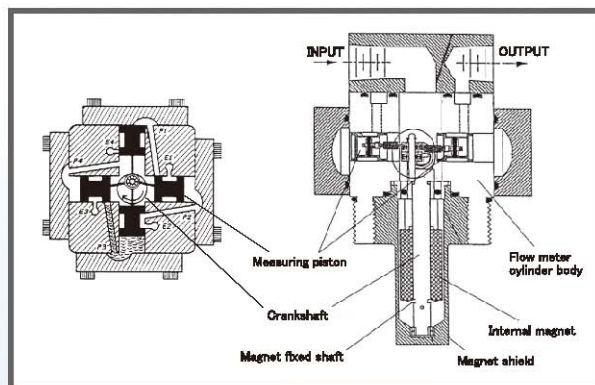


Dimensions : FS-1213(FS-1214)[mm]
The photo shows FS-1213

Fluids: Gasoline, Light oil, kerosene, etc.

Option: Corresponding Alcohol

- Built-in 10 μ m mesh filter
- Low pressure loss



Measuring principles

The measuring body is equipped with 4 cylinders and a piston arranged in a radial fashion. A rod is connected to the vertical crankshaft from the piston. The piston reciprocates via fluid energy and makes a stroke measurement. The reciprocating motion is converted to crankshaft rotation and its rotation is connected to a transmitter via magnetic coupling. A transmitter consisting of a hall element and a fast operation microprocessor generates pulses which are exactly proportional to the flow rate. It is possible to measure with extremely low leakage and high accuracy even in the micro watershed of low viscosity fluid, because there is little space between a cylinder and a piston.

Analog output

High speed analog output (Every 1ms)
 Capable of simultaneous outputs of 5 different kinds
 Instantaneous flowrate, Integrated flowrate, Average flowrate of
 accumulated time, Temperature, Pressure

Pulse output

1 pulse output per 0.1mL convenient for total integrating flow
 rate management

USB output

Possible to output the display value on PC
 (Refresh time 1s or 0.1s)

Start / Stop function

Possible to control Integration Start / Stop via external switch
 or trigger signal
 Possible to measure via built-in timer

Temperature compensation

Possible to adjust a volume shift of fluid due to temperature
 change

FM-100 Front



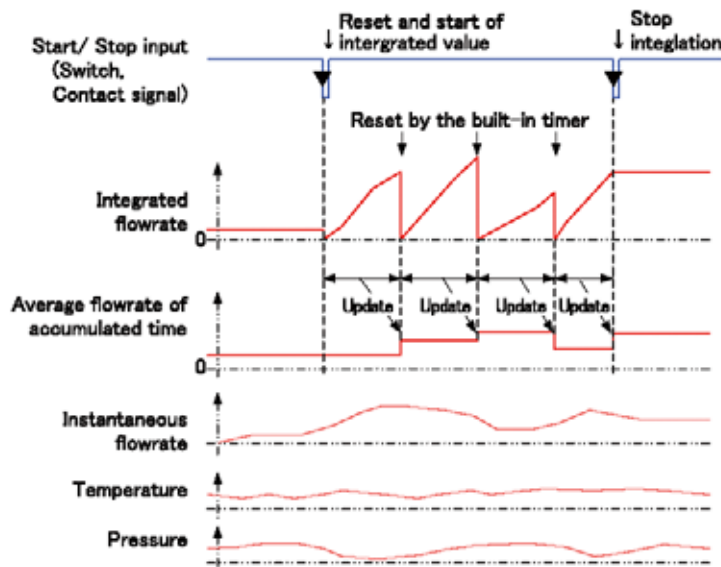
Dimensions : [mm]

FM-100 Rear



※FT-100 is required for measuring temperature
 and pressure.

Usage examples of FM-100

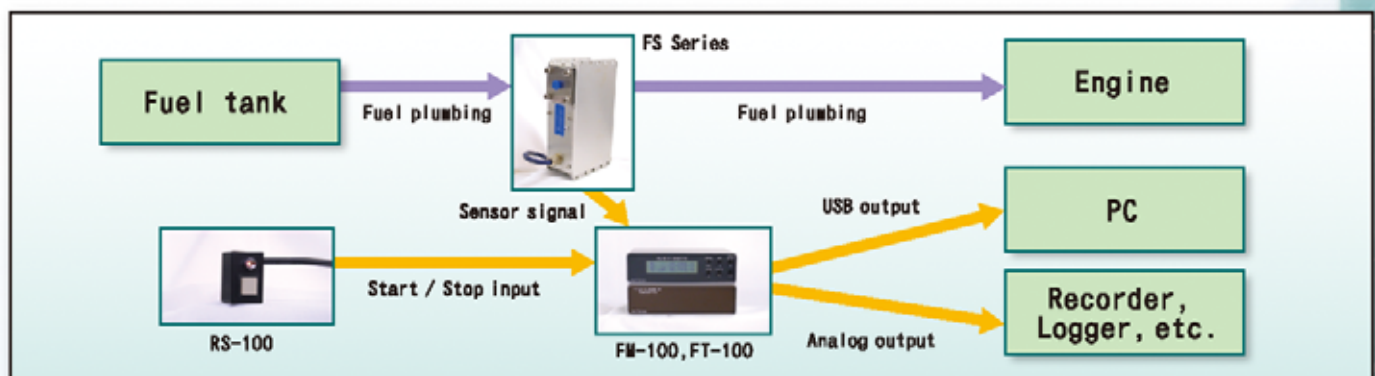


Automatic measurement with time-up function

If the integrating time is preset for 20 seconds,
 it is still possible to measure repeatedly the
 integrating flow rate every 20 seconds and the
 average flow rate for 20 seconds.

Constant real time measurement of instantaneous
 flow rate, temperature and pressure

Configuration example



■ FUEL SENSOR Specifications

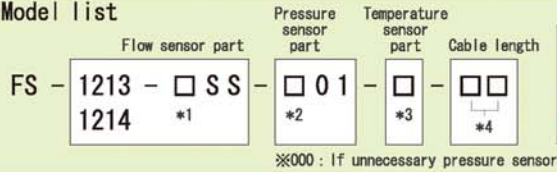
■ FS-1213

Flow Measurement Range	0.001 to 1.8L/min(0.06 to 108L/h)
Accuracy	±0.2%(RD) or less
Minimum resolution	0.001mL(1000P/mL)
Pressure	1MPa(max.)
Fluids temperature	-40 to 105°C
Port size(s)	Rc1/4
Material	
Chassis	A5052
Detection part	Sensor:SUS303,SUS440C O-ring:VITON
Filter part	Filter:SUS304 Filter Plate:A2017(SUS304) O-ring:VITON
Fittings	SUS304
External dimensions	130mm(W)x235mm(H)x70mm(D) excluding external accessories.
Weight	Approx.3kg

■ FS-1214

Flow Measurement Range	0.005 to 10L/min(0.3 to 600L/h)
Accuracy	±0.2%(RD) or less
Minimum resolution	0.01mL(1000P/mL)
Pressure	1MPa(max.)
Fluids temperature	-40 to 105°C
Port size(s)	Rc3/8
Material	
Chassis	A5052
Detection part	Sensor:SUS303,SUS440C O-ring:VITON
Filter part	Filter:SUS304 Filter plate:A2017(SUS304) O-ring:VITON
Fittings	SUS304
External dimensions	270mm(W)x290mm(H)x130mm(D) excluding external accessories.
Weight	Approx.6.5kg

■ Model list



*1...Fluid types	S:Gasoline, Light oil, etc. A:Corresponding Alcohol
*2...Temperature range	8:-20 to 80°C C:-20 to 120°C
*3...Temperature sense part	N: Without T: With
*4...Cable length	02:2m 10:10m

■ FM-100 FLOW METER Specifications

Display	
Display method	Character LCD,16 characters × 2 lines,Character High approx.5.6mm, green backlight
Displayable range	Instantaneous flowrate / Average flowrate of accumulated time:-99.999 to 999.999L/h Integrated flowrate:-99999.999 to 999999.999L or mL Pressure:0.0 to 1000.0kPa Temperature:-20.0 to +80.0°C (Sampling rate:Approx. 0.8sec)
Display refresh time	0.1s or 1.0s
Accuracy	without Sensor Accuracy Instantaneous flowrate / Average flowrate of accumulated time:±50ppm(RD) ±1digit Integrated flowrate:±1digit Pressure:±0.5kPa Temperature:±0.5°C
External trigger input	
Number of inputs	1
Input method	Contact signal
Power supply for sensor	+12V
Switch input	
Number of inputs	1
Input method	Contact signal
Power supply for sensor	+12V
Pulse output	
Number of outputs	1(BNC)
Output method	10P/mL(1 pulse per integrated flowrate 0.1mL)
Output voltage	0-5V(Voltage drop:0.5V max. Load resistance1kΩ)

Voltage output	
Number of outputs	5(BNC)
Output method	Instantaneous flowrate / Average flowrate of accumulated time / Integrated flowrate / Pressure / Temperature
Output voltage	±10V
Accuracy	without sensor accuracy Instantaneous flowrate / Average flowrate of accumulated time / Integrated flowrate:±0.1%(FS) Pressure:±0.15%(FS) Temperature:±0.6%(FS)
Refresh time	Instantaneous flowrate:1ms Average flowrate of accumulated time:Integrated flowrate measurement per once Integrated flowrate:Integrated flowrate measurement per once or 1ms Pressure:Approx.50ms Temperature:Approx.0.8s
Moving average	Instantaneous flowrate:1 to 999 / Pressure:1 to 40
Permissible load impedance	10kΩ
General specification	
Isolation	Power input / Sensor power output & Signal input / Analog Output
Power supply	9 to 32VDC, 5W(max.)
External dimensions	140mm(W)x40mm(H)x100mm(D) excluding external accessories.
Weight	Approx.480g
Ambient operating temperature	0 to 40°C(with no condensation)
Accessories	AC adapter(1), DC plug cable(1), Rubber feet(4)

※ FT-100 is required for measuring temperature and pressure.

■ FT-100 FLOW METER TRANSMITTER Specifications

External dimensions	140mm(W)x40mm(H)x100mm(D) excluding external accessories.
Weight	Approx.300g
Ambient operating temperature	0 to 40°C(with no condensation)

※ RS-100 Start / Stop switch(Optional)

※ Possible to customize upon your requests

The specifications and appearances specified in the catalog are subject to changes due to product improvements without notice.

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