

Vortex Flow Meter



The VF-2000 flow sensor offers a cost-effective instrument for the measurement of liquid flow. A simple and compact design makes the VF-2000 a good choice for the measurement of ultra-pure water, pure water, cooling water.

Operating Principle

A bluff body or shedder bar in the flow generates a street of vortices downstream. The VF-2000 flow sensor measures the flow rate by counting the number of vortices with a piezoelectric sensor.

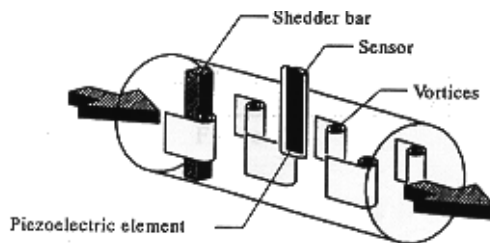


Figure 1.

Measurable Flow Range

Model	Flow range (in case of water)*	
	L/min	GPM
VF-20X1	0.5 to 4	0.13 to 1
VF-20X2	2 to 16	0.5 to 4
VF-20X3	4 to 40	1 to 10

VF-2000

Vortex flow Sensor for water

Features

- **Simple and Compact Design:** The VF-2000 flow sensor body and shedder bar (vortex generator) are molded as one component. This design approach has reduced the cost as well as the size and weight of the flowmeter. Sensor body is made of PPS (Polyphenylene Sulphide) and is designed to eliminate deposits.
- **No Maintenance Cost:** The VF-2000 has no moving parts, no maintenance is needed.
- **Low Pressure Loss:** A combination of straight flow path and shedder bar gives a lower pressure loss compared with other types of flowmeters
- **Display Model with Current and Alarm Output:** 3-digit LED display for flow rate, current output and alarm outputs (2-point) are provided in compact design.
- **CE Marking:** The VF-2000 meets the EC directive for CE mark.

Specifications

Measurable Fluid: Pure water, Water

Accuracy: $\pm 3\%$ FS*

Repeatability: $\pm 0.5\%$ FS

Fluid Pressure: 0 to 150 psig (0 to 1 Mpa)

Ambient Temperature: 32 to 122 F (0 to 50°C)

Power Supply:

Rated Voltage: 12 to 24 V DC

Operating Voltage: 10.8 to 26.4 V DC

Rated Power: 1 W (4 to 20 mA Output Model)
0.5W (Pulse Output Model)

Output :

4 to 20 mA (3 - wire):

Load 0 to 250 ohms at 12 V DC

250 to 600 ohms at 24 V DC

or Unscaled pulse output:

Open collector, Max. 10 mA / 30 V DC

Pulse duty factor: approx. 50%

Display: 3-digit LED for the flowrate

2 LEDs for Alarms (1,2)

Damping Time Constant: 1 sec (63% response)

Cable: 0.2 mm² X 3 C (AWG.24), 3 m

Outside diameter 3.5 mm (Soldered end finish)

Enclosure Classification: IP64

Minimum Straight Pipe Run: Upstream; 10D, Downstream: 5D
(D: Normal pipe size)

Process Connections: Taper Pipe Threads (JIS B 0203 / ISO 7/1)
VF-20X1: R3/8
VF-20X2 and VF-2003: R1/2

Materials:

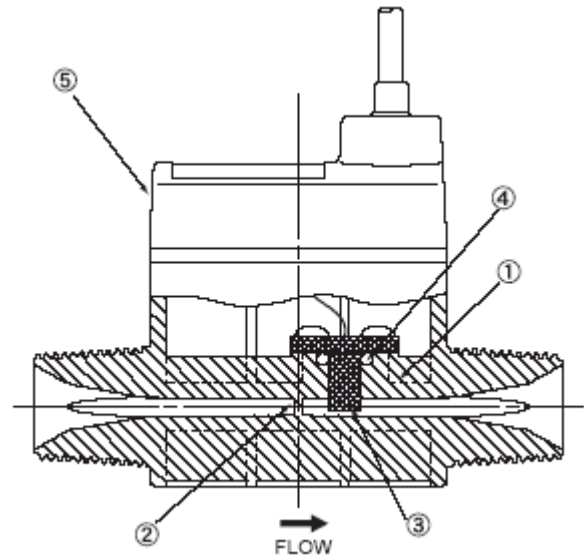
Parts		Materials
Wetted Part	Sensor Body	Polyphenylene sulphide (PPS)
	Sensor	Piezoelectric element molded with PPS
	O-ring	Viton
Cover		Poly-butylene trepthalate(PBT)
Cable sheath		Heat-resistant PVC

Output Frequency (for pulse output model)

Model	Output frequency (for flow rate 0 to 100%)*
VF-2021-XX1	0 to 800 Hz (0 to 4 L/min)
VF-2021-XX2	0 to 757 Hz (0 to 1 GPM)
VF-2022-XX1	0 to 800 Hz (0 to 16 L/min)
VF-2021-XX2	0 to 757 Hz (0 to 4 GPM)
VF-2023-XX1	0 to 584 Hz (0 to 40 L/min)
VF-2023-XX2	0 to 553 Hz (0 to 10 GPM)

* Conditions for calibration
Fluid : Water, Fluid temperature: 20° C,
Ambient temperature: 23° C, Supply voltage: 24 V DC

Construction

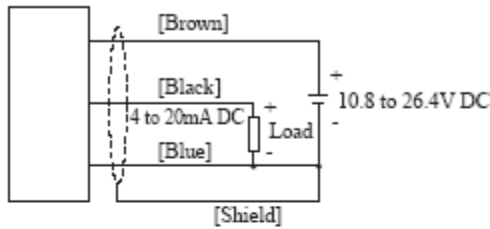


Part No.	Name
1	Sensor body
2	Shedder bar (cast with Sensor body)
3	Sensor
4	O-ring
5	Cover

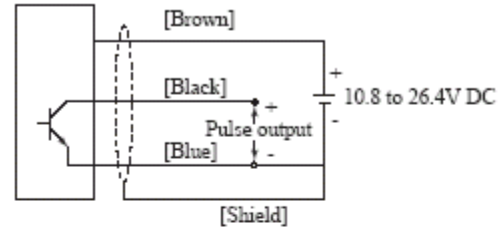
Vortex Flow Meter

Wiring Diagram

● Current Output Model (VF-201□)



● Pulse Output Model (VF-202□)



● Display / Current Output Model (VF-203□)

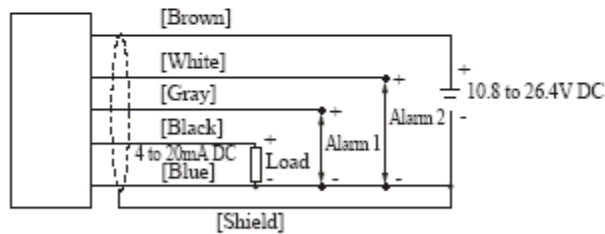


Figure 4

Load Resistance Range

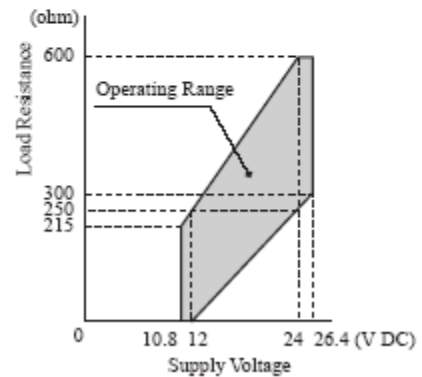
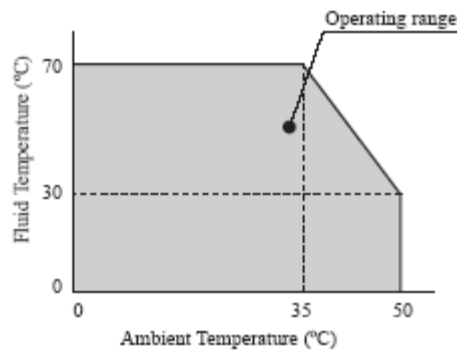


Figure 5

Fluid and Ambient Temperature Range

(only for Display type VF-203□)

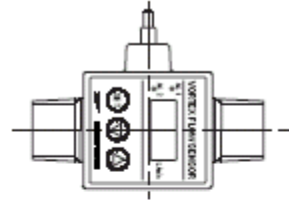
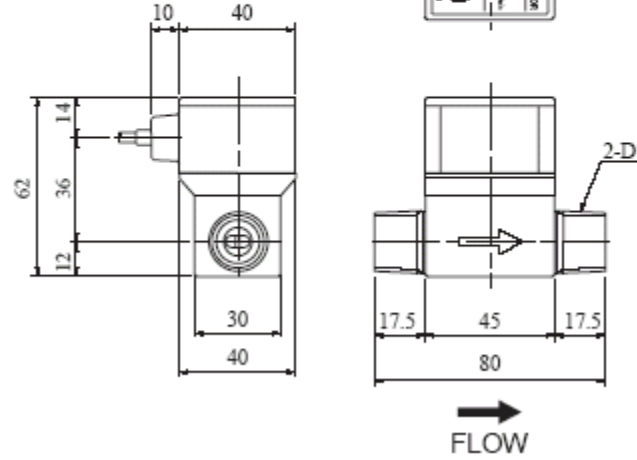
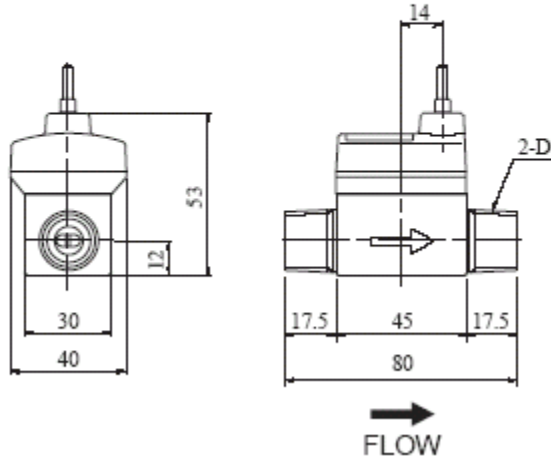


Outline Dimensions

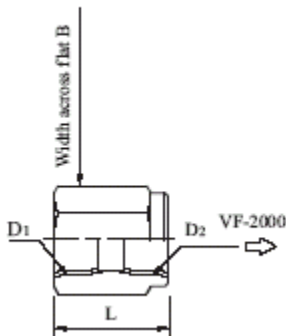
●VF-201□

●VF-202□

●VF-203□



Adapter



Model	L	B	D1	D2	Mass(g)/1pc.
VF-201□	28	22	Rc3/8 or 3/8NPT	Rc3/8	50
VF-202□	33	27	Rc1/2 or 1/2NPT	Rc1/2	85
VF-203□					

Ordering Information

Model Code						Description
VF-20	X	X	-F	0	X	
Type/Output	1					Current: 4 to 20 mA DC
	2					Pulse: Open collector (Unscaled)
	3					Display: Flowrate (3-digit LED), Alarm (2 LED) Current Output: 4 to 20 mA Alarm Output: Open collector (2 points)
Nominal Size:	1					6 mm: 0.5 - 4 L/min or 0.13 - 1 GPM; 3/8"
Flow Range:	2					10 mm: 2 - 16 L/min or 0.5 - 4 GPM; 1/2"
Connection Size	3					15 mm: 4 - 40 L/min or 1 - 10 GPM; 1/2"
O - ring Material			- F			Viton
Process Connection				0		Taper Pipe Threads R3/8 or R1/2 (JIS B 0203 / ISO 7/1)
Flow Unit					1	L/min
					2	GPM