

Flow Rate Monitoring – RFO and RFA Types

► 4.5 to 24 VDC Pulsed Output

GEMS Sensors popularized the RotorFlow's paddlewheel design by combining high visibility rotors with solid-state electronics that are packaged into compact, panel mounting housings. They provide accurate flow rate output with integral visual confirmation...all with an unprecedented price/performance ratio.

Typical Applications

- Water Purification/Dispensing Systems • Chemical Metering Equipment
- Lasers and Welders • Water Injection Systems
- Semiconductor Processing Equipment • Chillers and Heat Exchangers

Specifications

Wetted Materials	
Body	Brass, Stainless Steel or Polypropylene (Hydrolytically Stable, Glass Reinforced)
Rotor Pin	Ceramic
Rotor	PPS Composite, Black*
Lens	Polysulfone
O-Ring	Viton® (Alloy Bodies); Buna N (Polypropylene Body)
Low Flow Adaptor	Glass Reinforced Polypropylene
Operating Pressure, Maximum	
Brass or Stainless Steel Body	200 PSIG @ 70°F
Polypropylene Body	100 PSIG @ 70°F, 40 PSI Max. @ 180°F
Operating Temperature, Brass or Stainless Steel Body	-20°F to 212°F (-29°C to 100°C)
Polypropylene Body	-20°F to 180°F (-29°C to 82°C)
Electronics	150°F (65°C) Ambient
Viscosity, Maximum	200 SSU
Input Power	
RFO Type	4.5 VDC to 24 VDC
RFA Type	24 VDC, ±10%
Output Signal	
RFO Type	4.5 VDC to 24 VDC Pulse. Pulse Rate Dependent On Flow Rate, Port Size and Range.
RFA Type	0-10 VDC Analog Signal @ 1mA, Max.
Current Consumption	
RFO Type	8 mA, No Load
RFA Type	25 mA, Max.
Current Source Output, Max.	70 mA
Frequency Output Range	25 Hz (Low Flow) to 225 Hz (High Flow)
Accuracy	See Table. Page K-6
Electrical Termination	22 AWG PVC-Jacketed, 24" Cable. Color Coded: Red = +VDC; Black = Ground; White = Signal Output

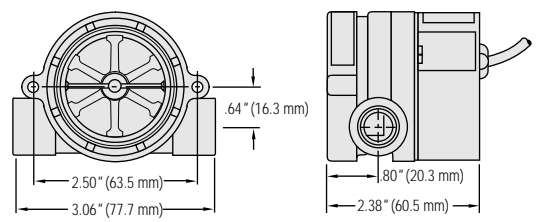
*Standard on Stainless Steel bodies.



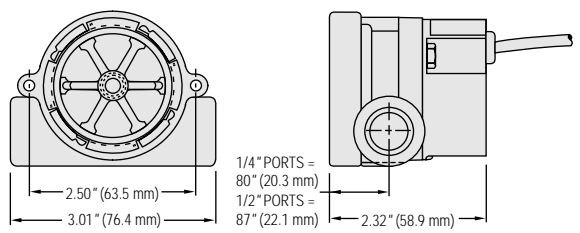
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Dimensions

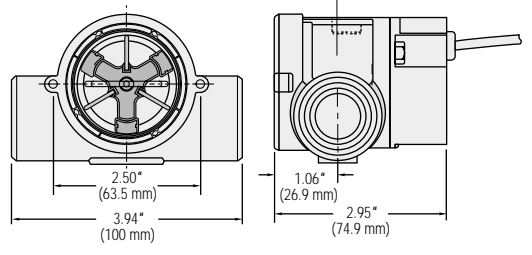
Polypropylene Bodies



Brass and Stainless Steel Bodies - .25" and .50" Ports



Brass Bodies – .75" and 1.00" NPT Ports



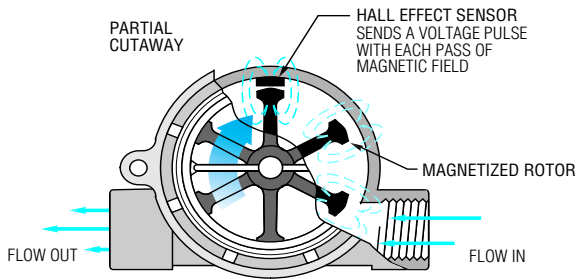
See Display and Power Accessories on Page J-9

Rate Meters and Totalizers complete your flow monitoring system.

High Resolution Black Rotor PPS composite. Each of the six rotor arms is magnetized.



Operating Principle

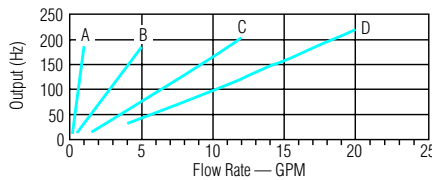


1. As liquid passes through the RotorFlow body, the magnetic rotor spins at a rate proportional to flow. This causes a series of magnetic fields (the rotor vanes) to excite the Hall Effect sensor, producing a series of voltage pulses.
2. The output pulses (RFO) are at the same voltage level as the input (4.5 - 24 VDC) with a frequency proportional to the flow rate. The output signal can be utilized by digital rate meters totalizers or other electronic controllers. RFA Type analog sensors condition the output signal to 0-10 VDC.
3. RotorFlow Indicators may be mounted with flow entering either port. Performance is optimized by positioning ports at the top of the unit, in a horizontal plane.

Frequency vs. Flow Rate-Typical

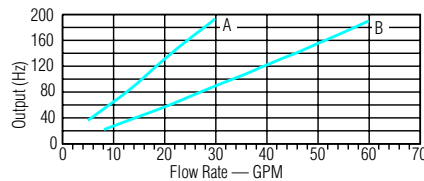
1/4" and 1/2" Port Sizes

- A = 1/4" Port with Low Flow Adapter
- B = 1/4" Port —Standard
- C = 1/2" Port with Low Flow Adapter
- D = 1/2" Port —Standard



3/4" and 1" Port Sizes

- A = 3/4" Port
- B = 1" Port



How To Order

For standard configurations, specify Part Number based on desired body material and port size.

Body Material	Port Size NPT	Flow Ranges – GPM		Part Number	
		Low* Range (Accuracy)	Standard Range (Accuracy)	RFO Pulsed Output	RFA Analog Output
Polypropylene	.25"	0.1 to 1.0 (±7.0%)	0.5 to 5.0 (±7.0%)	155421 ⚡	Consult Factory for Part Number
	.50"	1.5 to 12.0 (±7.0%)	4.0 to 20.0 (±15.0%)	155481 ⚡	
Brass	.25"	0.1 to 1.0 (±7.0%)	0.5 to 5.0 (±7.0%)	156261 ⚡	
	.50"	1.5 to 12.0 (±7.0%)	4.0 to 20.0 (±15.0%)	156262 ⚡	
	.75"	–	5.0 to 30.0 (±10.0%)	194761 ⚡	
Stainless Steel	1.00"	–	8.0 to 60.0 (±15.0%)	194762 ⚡	
	9/16"-18**	0.1 to 1.0 (±7.0%)	0.5 to 5.0 (±7.0%)	165071 ⚡	
	.50"	1.5 to 12.0 (±7.0%)	4.0 to 20.0 (±15.0%)	165075 ⚡	
	.75"	–	5.0 to 30.0 (±10.0%)	194763	
	1.00"	–	8.0 to 60.0 (±15.0%)	194764	

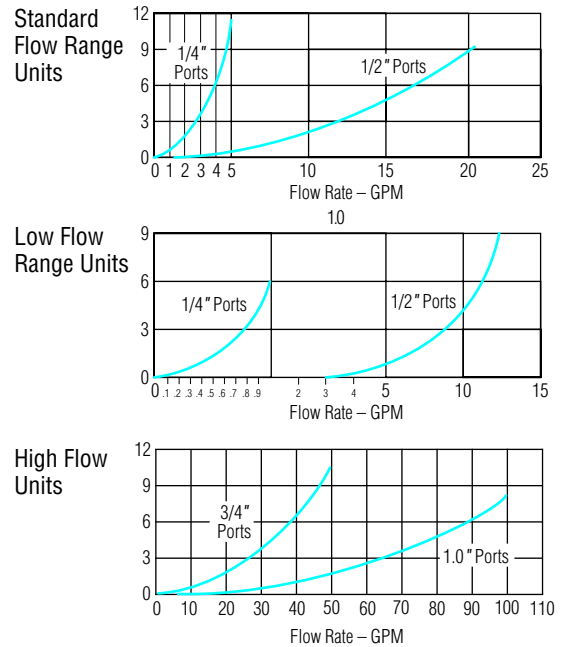
Note: Improved accuracy can be achieved by calibrating the individual RFO unit with the external controller or indicator.

*With use of Low Flow Adapter supplied. See Page J-7 for more information.

**Straight thread with O-ring seal.

⚡ – Stock Items.

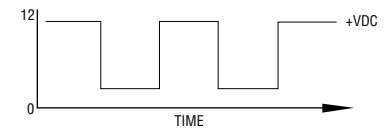
Pressure Drop-Typical



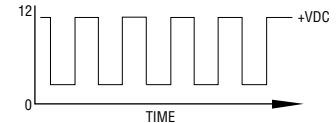
Signal Output

Output signal for RFO Types is an on/off pulse of the DC voltage supplied to the unit, it is compatible with all digital logic families. Input voltage range is 4.5 to 24 VDC. Frequency of the output pulse is proportional to the flow rate and ranges from approximately 25 Hz at low flow to 225 Hz at high flow.

Example:
Low Flow



High Flow



Note: Consult factory for flow rate/frequency curves.