VECTOR™

Positive Displacement Flowmeter

Description

The patented VECTOR™ Positive Displacement Flowmeter features a unique double helical three-lobe impeller design. The specially-shaped impellers add an advantage of high throughput at low RPM, while providing exceptional accuracy and long life. The meter is available in line sizes ranging from 1" to 4", measuring up to 700 GPM. The double helical nature of the impeller creates no axial, side or end loads, and uses a special gear design with large pockets between the impeller lobes. The impeller design creates low pressure drops and allows the flowmeter to be used with high- or low-viscosity liquids.

Features

- 1" to 4" line sizes
- Reference accuracy ±0.10% of rate
- Minimal moving parts
- Easy to install and maintain
- Handles viscosities up to 10,000 cP+
- Operating pressure up to 1,000 psig (6,894 kPa)*
- Operating temperatures up to 450° F (232° C)
- Up to 100:1 turndown ratio standard
- Wide range of applications
- Handles air purges
- Drain plug standard, sizes 2" and larger

Applications

- Hydrocarbons
- Fuel oils
- Lubricants
- Solvents
- Asphalt
- Polymers
- Edible oils

Protected by U.S. Patent: 5,415,041

Principle of Operation

VECTOR™ flowmeters use two rotating impellers driven by the flowing liquid. The ferrous gear lobe activates a non-intrusive sensor which generates a pulsed output signal. Each pulse represents a known volume of liquid that is captured in between the lobes of the impellers. A K-factor converts the pulses into engineering units for remote data collection and digital display.

Specifications

Operating Temperature Up to 450° F (232° C) based on materials of construction

Operating Pressure

Size 10, 15	1,000 psig max. (6,894 kPa)
150# RF Flange	275 psig max. (1,896 kPa)
300# RF Flange	720 psig max. (4,964 kPa)

Turndown Ratio
(model's max. rated flow ÷ its minimum flow rate)

Low viscosity fluids	20:1 standard
Medium/High viscosity fluids	100:1 standard

Repeatability ±0.10% of rate
(Reference Accuracy)

Note: Each flowmeter is individually calibrated on a ballistic calibrator traceable to NIST in the flow lab on a liquid representing the specific application.

Linearity

Typical	±0.25% of rate over 10:1 turndown
With enhanced signal conditioning	Up to ±0.1% of rate over 100:1 turndown

Output

(Refer to individual product sheets for complete specifications)
Sensors (1 required per meter)

Surface Reference Pickoff:	7–30 VDC square-wave pulse depending upon supply voltage, 3-wire
Signal Conditioners and Transmitters	Refer to individual product sheets available from Flow Technology

Materials of Construction

Body (Case)	Epoxy painted carbon steel, standard
Shafts	316 stainless steel, standard
Impellers	4140 Nitrided, standard
O-Rings	Viton® and Teflon®, standard
Bolts and Nuts	Grade 8 Black Oxide, standard
Bearings	440 C SS ball bearing, standard

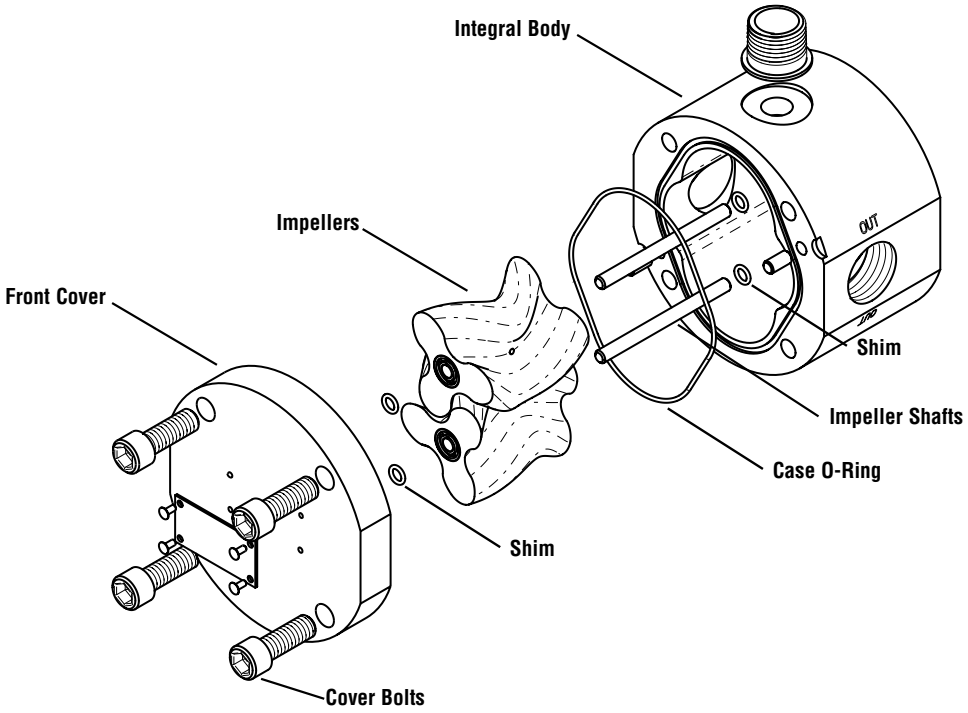
Model Specifications

Basic Model No.	Nominal Size	Maximum Flow Rate		Recommended Mesh Size		Weight					
						NPT		RF Flange			
	Standard Connection	GPM	L/min	Mesh	[Particle Dia.]	lbs	kg	150# lbs	150# kg	300# lbs	300# kg
V10	1" NPT	50	189	100	[0.006"]	16.2	7.4	21.2	9.6	-	-
V15	1 1/2" NPT	100	379	100	[0.006"]	28.6	13.0	36.6	16.6	-	-
V20	2" 150# RFF	200	757	100	[0.006"]	-	-	62.9	28.5	69.0	31.3
V30	3" 150# RFF	400	1514	100	[0.006"]	-	-	145.0	65.8	154.0	69.8
V40	4" 150# RFF	700	2650	100	[0.006"]	-	-	237.0	102.5	258.0	117.0

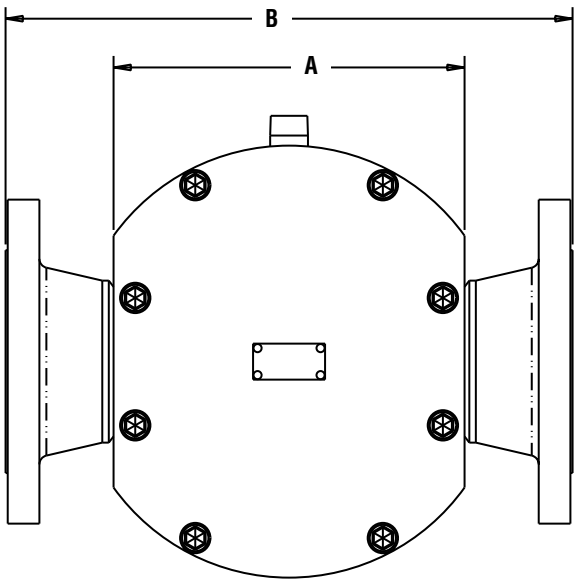
Dimensions

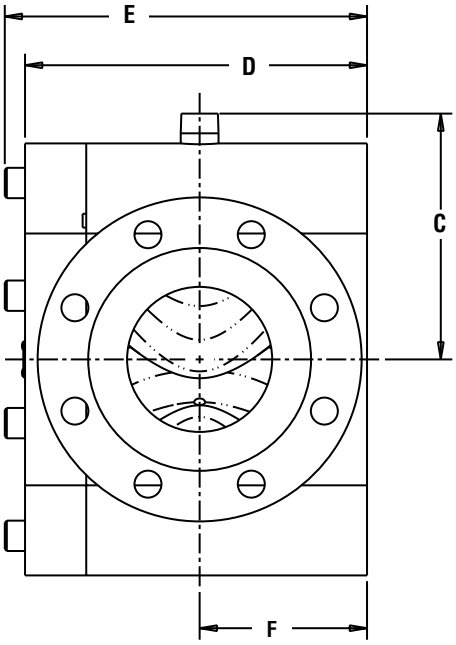
Basic Model No.	A (NPT)		B (RF Flange) 150#		B (RF Flange) 300#		C		D		E		F	
	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
V10	4.75	120.7	-	-	-	-	3.86	98.0	3.65	92.7	4.09	103.9	1.70	43.2
V15	5.50	139.7	-	-	-	-	4.36	110.7	4.65	118.0	5.51	140.0	2.20	55.9
V20	-	-	11.5	292.1	12.0	304.8	4.74	126.7	5.83	148.1	6.39	162.3	2.75	69.9
V30	-	-	14.0	355.6	14.74	374.4	6.36	161.5	7.50	190.5	8.00	203.2	3.60	91.4
V40	-	-	15.75	400.1	16.51	419.4	6.83	173.5	9.50	241.3	10.0	254.0	4.65	118.1

Flowmeter Assembly Diagrams



Dimensions





Model Numbering System

V □ □ I – □ □ □ □ □ □ – □ □ □ □ □ □

Basic Model No.

Nominal Size

10 = 1"
15 = 1 1/2"
20 = 2"
30 = 3"
40 = 4"

Meter Type

I = Industrial

Case Material

P = Epoxy Painted Carbon Steel *
0 = Specify

Shaft Material

1 = 316 SS *
0 = Specify

O-Ring Material

1 = Viton® *
2 = Buna N
6 = EPDM
9 = Teflon®
0 = Specify

Special Designator

000 = Standard Meter *

Connection Size

10 = 1"
15 = 1 1/2"
20 = 2"
30 = 3"
40 = 4"
00 = Specify

Connection Type

1 = NPT (Female) ◆
2 = 150# RF Flange +
6 = 300# RF Flange
0 = Specify

Clearance

M = Tight, Metal *
0 = Specify

Bearing Style

S = 440 C Stainless Steel Ball *
0 = Specify

Impeller Material

C = 4140 CS, Nitrided *
0 = Specify

Material Guide

Name	Description
316 SS	316 Stainless Steel
440 C	440 C Stainless Steel
Buna N	Nitrile
EPDM	Ethylene Propylene
Teflon®	Polytetrafluoroethylene, by DuPont (O-Ring Material)
Viton®	Fluorocarbon, by DuPont

Key

*	Standard Configuration
+	Standard on sizes 20, 30, 40
◆	Standard on sizes 10, 15

OEM Versions — On approved projects, Flow Technology flowmeters can be modified to meet the specific needs of an OEM application.

Specifications are for reference only and are subject to change without notice.

Local Representative:

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ISO 9001 REGISTERED

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