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150 MM Variable Area Flowmeters

150 MM, Variable Area Flowmeters (Series 150)

Series 150 flowmeters offer an accurate yet economical means of measuring gas or liquid flow at low pressures and over a wide range of flow rates. Suitable for both plant and laboratory use, they are widely used in gas chromatography, atomic absorption spectroscopy and process control.



Standard Features

- Two (2) floats per tube expand range of flowmeter.
- Interchangeability of control valve and metering tube assemblies without disconnecting from the process piping.
- Rib-guided metering tube for maximum float stability and accuracy.
- Ceramic scales, with contrasting background for easy viewing, fired on metering tube.
- Ten-to-one (10:1) rangeability.
- Metering tubes sealed by compression.
- Metering tube assemblies contain float stops to prevent float loss during tube assembly removal.
- Available with or without a control valve.

Optional Features

- Sapphire, carboloy or tantalum floats allow range of flowmeter to be changed without replacing the tube.
- Baseplate with leveling screws permits bench use.
- High resolution control valve for precise flow control.

Calibration

Standard (+ 5% accuracy) calibraction is performed using Air at normal temperature (70 °F) and pressure (14.7 psia). Calibrations for gases other than air are mathemactically derived from the air calibration. Calibration charts for air are shipped with each flowmeter or replacement tube. Calib ration charts for many other gases and gas mixtures are available at no additional charge. Specify the required calibration charts when ordering. The accuracy od this calibration is +5% of full scale. All charts are supplied in metric flow metric flow increments (i.e. sccm or slpm) unless otherwise specified.

Specifications

- Scale
  Length: 150 mm
  Type: Fused on metering tube with contrasting yellow background
  Graduations: 0-150 mm with calibration data.
- Capacities
  Refer to Tube Selection Table
- Maximum Operating Pressure and Temperature Ratings:
  200 psig at temperatures up to 200 °F
- Performance
  Accuracy: ± 5% full scale. Accuracy specified for 100% to 10% of scale reading (10 to 1 rangeability)
  Repeatability: ± 0.25% of full scale reading
- Connections
  1/8" female NPT threaded adapters with locknuts for front panel mounting
- Approximate Weight
  1 lb.

Materials

- Metering Tube
  Borosilicate glass
- Floats
  Glass and 316 stainless steel (standard). Sapphire, carboloy and tantalum optionally available – refer to Tube Selection Table (below) and Optional Equipment
- **Float Stops**
  Teflon
- Structural Members
  Side Plates: Black anodized aluminum
  End Fittings: Black anodized aluminum or 316 stainless steel
- Structural Members (cont.)
  Metering Valve: Black anodized aluminum (standard cartridge valve only), brass/nickel-plated brass (high resolution control valve only) or 316 stainless steel
- Shields
  Window: Clear polycarbonate.
  Back: Opaque white polycarbonate
- Tube Packing and O-rings
  Viton® (optional materials available)

Viton® – DuPont Dow Elastomers L.L.C.

Tube Selection Table for Series 150 Flowmeters – Flow ranges shown are at 70° F and 14.7 PSIA

Tube Number	Float Material	Air (slpm)	Argon (slpm)	CO2 (slpm)	Helium (slpm)	Hydrogen (slpm)	Nitrogen (slpm)	Oxygen (slpm)	Water (cc/min)
1	Glass	.050	.042	.058	.047	.103	.052	.045	0.55
	Sapphire	.081	.065	.092	.077	.162	.084	.070	1.04
	316 SS	.150	.123	.160	.149	.323	.156	.135	2.50
	Carboloy	.263	.214	.268	.273	.606	.265	.235	5.30
	Tantalum	.300	.256	.280	.341	.726	.306	.281	6.60
2	Glass	.089	.077	.110	.091	.195	.095	.082	1.10

	Sapphire	.144	.116	.168	.143	.311	.145	.127	2.15
	316 SS	.278	.227	.298	.271	.580	.280	.245	4.90
	Carboloy	.473	.399	.480	.519	1.11	.485	.442	10.0
	Tantalum	.560	.466	.514	.632	1.32	.570	.520	12.0
3	Glass	.365	.300	.360	.390	.840	.380	.326	4.70
	Sapphire	.514	.440	.449	.620	1.30	.541	.488	10.0
	316 SS	.835	.714	.750	1.18	2.35	.860	.800	19.0
	Carboloy	1.25	1.05	1.10	2.16	3.84	1.29	1.18	36.0
	Tantalum	1.37	1.17	1.19	2.45	4.30	1.40	1.28	41.0
A	Glass	.850	.709	.755	1.50	2.65	.860	.786	16.0
	Sapphire	1.10	.942	.980	2.00	3.54	1.15	1.00	27.0
	316 SS	1.70	1.44	1.40	3.50	5.60	1.73	1.58	46.0
	Carboloy	2.43	2.00	2.14	5.10	8.10	2.40	2.32	73.0
	Tantalum	2.62	2.24	2.27	5.60	8.80	2.60	2.50	81.0
4	Glass	2.34	1.90	2.06	5.00	7.80	2.40	2.33	55.0
	Sapphire	3.08	2.63	2.69	6.70	10.3	3.12	2.90	79.0
	316 SS	4.64	3.80	4.00	10.3	15.5	4.70	4.36	132
	Carboloy	6.60	5.50	5.60	15.0	22.6	6.70	6.20	200
	Tantalum	7.00	6.00	6.07	16.0	23.7	7.10	6.60	214
B	Glass	3.80	3.20	3.40	8.20	12.8	3.90	3.55	87.0
	Sapphire	5.07	4.30	4.40	10.8	16.3	5.10	4.80	126
	316 SS	7.58	6.50	6.45	16.9	25.5	7.80	7.20	210
	Carboloy	10.8	9.40	9.12	24.5	38.1	11.1	10.6	330
	Tantalum	11.5	10.0	9.69	26.4	41.1	12.0	11.2	353
5	Glass	7.70	6.51	6.50	16.5	26.0	7.60	7.00	173
	Sapphire	9.64	8.26	8.30	21.8	33.5	10.0	9.19	260
	316 SS	14.3	12.2	12.0	31.2	47.0	15.2	13.3	420
	Carboloy	20.1	17.2	17.1	47.6	71.3	20.6	19.1	625
	Tantalum	22.0	18.5	18.0	51.0	76.2	22.4	20.9	680
6	Glass	23.3	20.0	19.9	1	1	1	1	1
	Sapphire	30.5	26.0	25.9	2	2	2	2	2
	316 SS	45.0	38.0	37.4	3	3	3	3	3
	Carboloy	61.7	53.4	52.1	4	4	4	4	4
	Tantalum	65.4	56.4	55.2	5	5	5	5	5

Flow capacities for gases not listed may be obtained by contacting your local representative.
* Series 150 flow tubes are supplied standard with both a glass and 316 SS float.
Other float materials are optional. See Optional Equipment below.

Ordering Information

Equipment

Single (1)-Tube Flowmeter Part Number	Configuration	End Blocks Material	Valve Assembly Materials	Inlet/Outlet Adaptor Material
PRSFM4300-( )	Without Valve	Aluminum	Not Applicable	Aluminum
PRSFM4310-( )	Without Valve	316 Stainless Steel (SS)	Not Applicable	316 Stainless Steel (SS)
PRSFM4301-( )	With Standard Cartridge Valve	Aluminum	Aluminum	Aluminum
PRSFM4311-( )	With Standard Cartridge Valve	316 Stainless Steel (SS)	316 Stainless Steel (SS)	316 Stainless Steel (SS)
PRSFM4302-( )	With High Resolution Control Valve	Aluminum	Brass, nickel-plated brass and Aluminum 316 stainless steel	Aluminum
PRSFM4312-( )	With High Resolution Control Valve	316 Stainless Steel (SS)	316 Stainless Steel (SS)	316 Stainless Steel (SS)

Note: Where ( ) is indicated "Single (1) - Tube Flowmeter Part Number", complete the part number by inserting applicable tube number from Tube Selection Table on page F??. Example: PRSFM4300-1. Order by complete part number.

Part Numbers for Optional Float Materials

Part Number	Description
PRS-102-8-SP	Sapphire Float – Tube Numbers 1,2,3,A,4,B
PRS-102-3-SP	Sapphire Float – Tube Numbers 5,6
PRS-102-10-CB	Carboloy Float – Tube Numbers 1,2,3,A,4,B
PRS-102-5-CB	Carboloy Float – Tube Numbers 5,6
PRS-102-9-TA	Tantalum Float – Tube Numbers 1,2,3,A,4,B
PRS-102-4-TA	Tantalum Float – Tube Numbers 5,6

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