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# INSTRUCTIONS FOR SERIES 150 & 150K FLOWMETERS

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THIS BOOKLET CONTAINS PROPRIETARY INFORMATION OF  
ADVANCED SPECIALTY GAS EQUIPMENT CORP. AND IS PROVIDED  
TO THE PURCHASER SOLELY FOR USE IN CONJUNCTION WITH  
SERIES 150 & 150K FLOWMETERS.



Series 150 Single Tube Flowmeter  
with Optional Baseplate

## IMPORTANT

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These instructions are for experienced operators who know the general principles and safety precautions to be observed in handling specialty gases and operating gas regulation equipment. If you are not certain you fully understand the safety precautions for handling gases, we urge you to obtain and read the Material Safety Data Sheet (MSDS) for each gas being used.

Do not permit untrained persons to install, operate, or maintain this flowmeter. Do not attempt to install or operate this flowmeter until you have read and fully understand these instructions. If you do not fully understand these instructions, contact your Advanced Specialty Gas Equipment Distributor.

**Be sure this information reaches the operator. Your supplier has extra copies.**



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## **SAFETY PRECAUTIONS**

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Protect yourself and others. Read and understand the following instructions before attempting to use these flowmeters. Failure to understand and follow these instructions could result in serious personal injury and/or damage to equipment.

- Know and understand the physical and chemical properties of the gas being used.
- Observe general precautions for the use of gases.
- Observe safety precautions for the gas being used.
- Read and follow precautions on cylinder labels.
- Never use these flowmeters with gases not compatible with the materials of construction. The use of gases not compatible with the materials of construction may cause damage to equipment or injury to personnel.
- If flammable gases are used with these flowmeters, do not locate the flowmeters near open flames or any other source of ignition.
- If toxic or flammable gases are used with these flowmeters, emergency equipment applicable to the gases in use should be available in the operating area.
- Many gases can cause asphyxiation by displacing oxygen in the atmosphere. Make certain the area where flowmeters are operated is well ventilated. Provide a device to warn personnel of oxygen depletion in the work area.
- Do not release toxic or flammable gases in the vicinity of personnel. Use this equipment only in well ventilated areas. Vent gases to the outside atmosphere, and in an area away from personnel. Be sure that venting and disposal methods are in accordance with Federal, State and local requirements. Locate and construct vent lines to prevent condensation or gas accumulation. Be sure the vent outlet cannot be obstructed by rain, snow, ice, insects, birds, etc. Do not interconnect vent lines; if more than one vent is needed, use separate lines.
- Relief devices should be installed and properly vented in all gas handling systems to protect against overpressurization.
- Never use oil or grease on these flowmeters. Oil and grease are easily ignited and may combine violently with some gases under pressure.
- Never connect a flowmeter to a supply source having a pressure greater than the maximum rated pressure of the flowmeter. Refer to Product Specifications (page 9) for maximum inlet pressures.

## **MANUFACTURER STATEMENT**

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The information contained in this instruction booklet has been compiled by Advanced Specialty Gas Equipment Corp., (the Company), from what it believes are authoritative sources and is offered solely as a convenience to its customers. While the Company believes that this information is accurate and factual as of the date printed, the information including design specifications is subject to change without prior notice.

## **DESCRIPTION**

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

Two models are available:

- A single-tube model for monitoring one gas or liquid stream.
- A four-tube model (Series 150 only) for monitoring up to four gas or liquid streams simultaneously. The four flowmeter tubes are housed in a single unit with separate inlet and outlet ports for each tube.

Each model is available in three configurations (refer to Table 1, Pg. 11):

- Without metering valve(s).
- With standard needle-type metering valve(s).
- With high accuracy, non-rotating stem (NRS) metering valve(s).

Each tube comes standard with two floats (glass and stainless steel) which expand the range of the flowmeter. The linear scale (10–150 mm) allows each flowmeter to be used with a variety of gases via a calibration chart. Tube selection depends on the gas being metered and the range of flow rates required. See Tube Selection Table (pages 12–13).

## OPTIONAL EQUIPMENT

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Baseplate with Leveling Screws and Spirit Level (FM4702) – fits single-tube or four-tube models to permit bench use.

Inlet Filter – a two-micron in-line filter available in aluminum (FM4741) or Type 316 Stainless Steel (FM4746) for Series 150 Flowmeters. A Type 316 Stainless Steel two-micron in-line filter (SG6113) is available for Series 150K Flowmeters.

Aluminum Bezel (single-tube models only) (FM4710) – permits flush panel mounting of flowmeter.

Floats – Factory installed floats of Sapphire (S1000), Tantalum (T1000) and Carboloy (C1000) are available.

**Note:** The glass float may be replaced by Sapphire; the stainless steel float may be replaced by either Carboloy or Tantalum.

## INSTALLATION

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**WARNING:** Before attempting to install and operate these flowmeters, read and fully understand the safety precautions on page 3 in this booklet. Failure to follow the safety precautions may result in serious personal injury and/or damage to equipment.

1. Inspect the flowmeter for physical damage or contamination. Flowmeters are shipped completely assembled and tested and should not require tightening or adjustment before installation.
2. Flowmeters must be mounted within 6 degrees of true vertical with the inlet connection to the flowmeter at the bottom. Be sure that piping is adequately supported to prevent undue strain on the flowmeter.
3. A built-in metering valve may be provided to control the flow through the flowmeter. These control valves are designed for fine control. Although the valve will provide bubble-tight shut-off, excessive tightening may damage the valve seat and limit its effectiveness as a fine control valve. If tight shut-off is required, it is recommended that a separate shut-off valve be installed before the flowmeter.
4. The Series 150 Flowmeter can be mounted on the front of a panel by using the threaded fittings and locking nuts provided with each unit (see Fig. 3, pg. 32). With the use of an optional bezel (FM4710), the single tube flowmeters can be flush panel mounted (see Fig. 6, pg. 34). The Series 150K Flowmeter may be front panel mounted using predrilled holes on the rear of the flowmeter and self tapping screws (see Fig. 4, pg. 32).

## **OPERATION**

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**WARNING: DO NOT exceed pressure and temperature specifications during operation. Injury or death to personnel and/or damage to equipment may result. DO NOT operate the flowmeter under any circumstances if it is leaking or otherwise malfunctioning. Glass metering tubes may break and injure operating personnel. A customer supplied safety shield constructed of ½ inch acrylic plastic should be used when operating pressures exceed 50 psig.**

1. The flowmeter is ready for operation after it has been installed in the flow system and connections have been tested for leaks with nitrogen or air and either a soap solution, such as Snoop<sup>®</sup> or a gas leak detector. Do not exceed the flowmeter's maximum operating pressure and temperature (see pg. 9, "Specifications") during the leak test procedure. Vent all pressure from the system and repair any leaks before proceeding.
2. Gradually introduce gas or liquid into the flowmeter to prevent a pressure surge or thermal shock to the flowmeter. Do not exceed the flowmeter's maximum operating pressure and temperature (see pg. 9, "Specifications") during operation. If the flowmeter is equipped with a metering valve, adjust the valve to obtain the desired flow rate.
3. Select the appropriate calibration chart by matching the metered gas, float material and tube number of the unit in service with the information provided at the top of the chart. Note the scale reading marked by the center of the ball float on the metering tube. Locate the scale reading on the calibration chart and read the flow rate located directly across from the scale reading.

## **SHUTDOWN OR REMOVAL FROM SERVICE**

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1. Shut off the gas or liquid supply to the flowmeter. It should always be shut off when the system is not in use.

**WARNING: Hazardous gases must be discharged into a safety vent. Be sure to use a venting procedure that is environmentally acceptable and complies with Federal, State and local requirements.**

2. Vent the system to atmospheric pressure. If the flowmeter was used with a hazardous gas, purge the flowmeter and entire system with clean dry nitrogen gas. Continue purging until the hazardous gas level in the system is below the TLV for the gas.

## **DISASSEMBLY** (Fig. 1 or Fig. 2, see pages 30–31)

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1. Remove the front and back plates.
2. Loosen the seal spindle located at the top of the flowmeter by turning it counterclockwise with a  $\frac{1}{32}$  in. hex wrench. For Series 150K Flowmeters, use a  $\frac{3}{8}$  in. slotted screwdriver. Remove the tube from the meter housing.
3. The tube, float and float stops may be cleaned as a unit or may be disassembled for cleaning. Using a small hook, remove either of the Teflon<sup>®</sup> float stops from the metering tube and remove the float. Be careful not to chip the ends of the tube.
4. Remove the packing gaskets and grommets.
5. Remove the seal spindle, if necessary, by rotating it clockwise for the Series 150 Flowmeter and counterclockwise for the Series 150K Flowmeter. Do not remove the seal spindle unless the O-Ring which seals the spindle requires replacement. The O-Ring may be used as long as it is not torn or distorted.
6. Remove the metering valve assembly by turning the valve body counterclockwise. Remove and clean the valve seat, stem and packing.

**Note:** If the flowmeter is equipped with a filter, it may be necessary to change the element periodically. Unscrew the filter assembly and replace the element and the O-Ring seal.

## REASSEMBLY

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1. Use the reverse of steps 1 through 6 of the disassembly procedure to reassemble the meter. Note the following during reassembly:
  - Prior to installing the needle control valve assembly make certain that the valve stem is turned completely counterclockwise to prevent damage to the valve seat.
  - When replacing the packing gaskets in the flowmeter body, be sure the packing grommets are approximately  $\frac{1}{6}$  in. above the top of the packing gasket. Also, be certain the tube seats firmly on the packing gaskets and does not overlap onto the end block.
  - The seal spindle serves to radially compress the tube packing gasket and exert a uniform pressure on the metering tube to prevent any possibility of leakage. Do not over tighten the seal spindle. Damage to the equipment may result.
2. After the flowmeter has been reassembled, it is important that it be leak tested with nitrogen or air and either a soap solution, such as Snoop<sup>®</sup> or a gas leak detector. Do not exceed the flowmeter's maximum operating pressure and temperature during the leak test procedure. Vent all pressure from the system and repair any leaks before proceeding.

## CALIBRATION

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Flowmeters are calibrated using Air at normal temperature (70°F) and pressure (14.7 psia) to an accuracy of  $\pm 5\%$  of full scale from 10% to 100% of range. Calibrations for gases other than Air are mathematically derived from the Air calibration. Calibration charts for Air are provided in this booklet (pages 14–29). Calibration charts for many other gases and gas mixtures are available at no additional charge. The accuracy of this calibration is  $\pm 5\%$  of full scale.



## MAINTENANCE AND REPAIRS

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Periodically inspect the tube and float, and clean if necessary. Dirt or foreign materials adhering to the float or the inside of the tube may cause inaccuracy and sticking of the float. Borosilicate glass metering tubes and related parts may be cleaned ultrasonically or with a solvent that does not attack glass.

Repairs beyond those contained in this instruction booklet must be made by Advanced Specialty Gas Equipment Corp. who have the special tools, test equipment and trained personnel required to make a safe repair. Contact your Advanced Specialty Gas Equipment Distributor to arrange for repair.

*Warranty Repairs* are only available through Advanced Specialty Gas Equipment Corp., and will be performed at no charge for parts and labor. For information on warranty, see the last page of this instruction booklet.

*Non-Warranty Repairs* are available through your distributor. Upon receipt at the factory, the flowmeter will be inspected and you will be contacted by your distributor with a repair cost estimate. No item will be repaired until approval is received. There will be an evaluation charge assessed for equipment not repaired.

## SPECIFICATIONS

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Maximum Operating Pressure and Temperature	
Series 150	200 psig at 250°F
Series 150K	150 psig at 100°F
Minimum Operating Temperature	32°F
Accuracy	±5% of full scale (standard) from 10% to 100% of range. Optional ±1% of full scale calibration is available.
Repeatability	Within 0.5% of full scale
Tube Graduations	Millimeters (0-150)
Scale Length	150 millimeters
Available Ranges	See Tube Selection Table
Inlet and Outlet Connections	
Series 150	½ in. NPT female
Series 150K	¼ in. NPT female
Weight (approx.)	1 lb.

## **MATERIALS OF CONSTRUCTION**

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Tubes	Borosilicate Glass with float stops of Teflon®
Floats	Borosilicate Glass and Type 316 Stainless Steel are standard; other materials are available as an option. (see Tube Selection Table and Optional Equipment)
End Blocks	See Table 1
Inlet/Outlet Adaptors	See Table 1
Side Plates	Aluminum
Back Plate	White Plastic
Front Plate	Clear Plastic
Seals and Packing	Viton® (other material available on special order)
Valve(s)	Models FM4302, FM4602 are Chrome-Plated Brass All Others are Type 316 Stainless Steel

**Table 1**

Series	Single Tube Flowmeter Part No.	Four Tube Flowmeter Part No.	End Blocks Material	Inlet/Outlet Adaptor Material
Without Metering Valve				
150	FM4300-(*)	FM4600-(**)	Aluminum	Aluminum
150	FM4310-(*)	FM4610-(**)	Type 316 SS	Type 316 SS
150K	FM4440-(*)	Not Available	Kynar®	None
With Standard Metering Valve				
150	FM4301-(*)	FM4601-(**)	Aluminum	Aluminum
150	FM4311-(*)	FM4611-(**)	Type 316 SS	Type 316 SS
150K	FM4441-(*)	Not Available	Kynar®	None
With High Accuracy (NRS) Metering Valve				
150	FM4302-(*)	FM4602-(**)	Aluminum	Aluminum
150	FM4312-(*)	FM4612-(**)	Type 316 SS	Type 316 SS
150K	FM4442-(*)	Not Available	Kynar®	None

\* Indicates tube number. See Tube Selection Table on the following page for ranges available.

\*\* Indicates the tube numbers in the order in which they are installed in the flowmeter, from left to right. Example: FM4601- 2314 for tube numbers 2,3,1,4. See Tube Selection Table on the following page for ranges available.

**Table 2, Replacement Metering Valves**

Flowmeter Tube No.	Standard Metering Valve Part No. (Size)	Chrome-Plated High Accuracy (NRS) Valve Part No. (Size)	316 Stn. Stl. High Accuracy (NRS) Valve Part No. (Size)
FM4331	0202-4113 (L)	0202-4080 (1)	0202-4086 (1)
FM4332	0202-4113 (L)	0202-4081 (2)	0202-4087 (2)
FM4333	0202-4113 (L)	0202-4082 (3)	0202-4088 (3)
FM4333A	0202-4113 (L)	0202-4083 (4)	0202-4089 (4)
FM4334	0202-4114 (M)	0202-4084 (5)	0202-4090 (5)
FM4334B	0202-4114 (M)	0202-4085 (6)	0202-4091 (6)
FM4335	0202-4115 (H)	0202-4085 (6)	0202-4091 (6)
FM4336	0202-4115 (H)	0202-4085 (6)	0202-4091 (6)

## TUBE SELECTION TABLE FOR SERIES 150 & 150K FLOWMETERS

Flow rates shown are maximum flow rates at 70°F and 14.7 psia.  
(Minimum flow rates = 1/10 of maximum)

Tube No.	Float Material*	Air		Argon		Carbon Dioxide		Helium	
		slpm	scfh	slpm	scfh	slpm	scfh	slpm	scfh
1	<b>Glass</b>	<b>0.050</b>	<b>0.106</b>	<b>0.041</b>	<b>0.087</b>	<b>0.059</b>	<b>0.125</b>	<b>0.045</b>	<b>0.095</b>
	Sapphire	0.077	0.163	0.063	0.134	0.088	0.186	0.071	0.150
	<b>316 Stn. Stl.</b>	<b>0.148</b>	<b>0.313</b>	<b>0.122</b>	<b>0.259</b>	<b>0.160</b>	<b>0.339</b>	<b>0.145</b>	<b>0.307</b>
	Carboloy	0.251	0.531	0.208	0.441	0.268	0.568	0.269	0.570
	Tantalum	0.274	0.580	0.227	0.481	0.293	0.621	0.299	0.634
2	<b>Glass</b>	<b>0.088</b>	<b>0.186</b>	<b>0.072</b>	<b>0.153</b>	<b>0.103</b>	<b>0.218</b>	<b>0.083</b>	<b>0.176</b>
	Sapphire	0.136	0.288	0.111	0.235	0.154	0.326	0.130	0.275
	<b>316 Stn. Stl.</b>	<b>0.258</b>	<b>0.546</b>	<b>0.213</b>	<b>0.451</b>	<b>0.278</b>	<b>0.589</b>	<b>0.262</b>	<b>0.555</b>
	Carboloy	0.439	0.929	0.363	0.769	0.446	0.945	0.483	1.02
	Tantalum	0.478	1.01	0.396	0.839	0.481	1.02	0.535	1.13
3	<b>Glass</b>	<b>0.380</b>	<b>0.805</b>	<b>0.318</b>	<b>0.674</b>	<b>0.358</b>	<b>0.759</b>	<b>0.494</b>	<b>1.05</b>
	Sapphire	0.518	1.10	0.433	0.918	0.482	1.02	0.759	1.61
	<b>316 Stn. Stl.</b>	<b>0.832</b>	<b>1.76</b>	<b>0.697</b>	<b>1.48</b>	<b>0.754</b>	<b>1.60</b>	<b>1.41</b>	<b>2.99</b>
	Carboloy	1.24	2.62	1.04	2.20	1.10	2.33	2.29	4.85
	Tantalum	1.33	2.82	1.11	2.35	1.17	2.48	2.47	5.23
A	<b>Glass</b>	<b>0.830</b>	<b>1.76</b>	<b>0.701</b>	<b>1.48</b>	<b>0.741</b>	<b>1.57</b>	<b>1.55</b>	<b>3.29</b>
	Sapphire	1.10	2.33	0.926	1.96	0.974	2.06	2.15	4.56
	<b>316 Stn. Stl.</b>	<b>1.69</b>	<b>3.58</b>	<b>1.42</b>	<b>3.02</b>	<b>1.47</b>	<b>3.12</b>	<b>3.44</b>	<b>7.30</b>
	Carboloy	2.44	5.17	2.06	4.37	2.11	4.49	5.16	11.0
	Tantalum	2.60	5.51	2.19	4.65	2.25	4.77	5.52	11.7
4	<b>Glass</b>	<b>2.37</b>	<b>5.02</b>	<b>2.00</b>	<b>4.24</b>	<b>2.06</b>	<b>4.37</b>	<b>5.03</b>	<b>10.7</b>
	Sapphire	3.08	6.52	2.60	5.51	2.68	5.68	6.69	14.2
	<b>316 Stn. Stl.</b>	<b>4.65</b>	<b>9.84</b>	<b>3.92</b>	<b>8.31</b>	<b>4.02</b>	<b>8.52</b>	<b>10.3</b>	<b>21.9</b>
	Carboloy	6.67	14.1	5.64	12.0	5.65	12.0	15.0	31.7
	Tantalum	7.09	15.0	5.99	12.7	5.97	12.7	15.9	33.7
B	<b>Glass</b>	<b>3.89</b>	<b>8.24</b>	<b>3.28</b>	<b>6.96</b>	<b>3.37</b>	<b>7.15</b>	<b>8.01</b>	<b>16.9</b>
	Sapphire	5.06	10.7	4.27	9.06	4.35	9.23	10.7	22.7
	<b>316 Stn. Stl.</b>	<b>7.61</b>	<b>16.1</b>	<b>6.44</b>	<b>13.6</b>	<b>6.34</b>	<b>13.4</b>	<b>16.7</b>	<b>35.4</b>
	Carboloy	10.65	22.6	9.03	19.1	8.79	18.6	24.5	51.9
	Tantalum	11.25	23.8	9.54	20.2	9.29	19.7	26.1	55.3
5	<b>Glass</b>	<b>8.68</b>	<b>18.4</b>	<b>7.34</b>	<b>15.6</b>	<b>7.39</b>	<b>15.7</b>	<b>19.3</b>	<b>40.0</b>
	Sapphire	11.2	23.7	9.46	20.1	9.47	20.1	25.3	53.6
	<b>316 Stn. Stl.</b>	<b>16.5</b>	<b>35.0</b>	<b>14.0</b>	<b>29.7</b>	<b>13.9</b>	<b>29.5</b>	<b>38.4</b>	<b>81.4</b>
	Carboloy	23.2	49.1	19.6	41.5	19.4	41.1	55.1	116.8
	Tantalum	24.5	51.9	20.8	44.1	20.5	43.4	58.5	124.0
6	<b>Glass</b>	<b>23.7</b>	<b>50.2</b>	<b>20.1</b>	<b>42.6</b>	<b>19.6</b>	<b>41.5</b>	<b>55.5</b>	<b>117.6</b>
	Sapphire	30.1	63.7	25.5	54.0	25.0	53.0	72.7	154.1
	<b>316 Stn. Stl.</b>	<b>43.7</b>	<b>92.5</b>	<b>37.0</b>	<b>78.4</b>	<b>36.5</b>	<b>77.4</b>	<b>109.4</b>	<b>321.8</b>
	Carboloy	61.1	129.3	51.8	109.8	50.9	107.9	153.2	324.7
	Tantalum	64.6	136.8	54.8	116.1	53.8	114.0	162.0	343.3

Flow capacities for gases not listed may be obtained from your Advanced Specialty Gas Equipment Distributor.

\*Series 150 & 150K flow tubes are supplied standard with both a glass and stainless steel float. Other float materials listed are optional

Hydrogen slpm scfh		Nitrogen slpm scfh		Oxygen slpm scfh		Water sccm	Replacement Tubes and Packing Part No.
0.101	0.214	0.051	0.108	0.044	0.093	0.551	FM4331
0.160	0.339	0.080	0.170	0.069	0.146	1.08	
0.323	0.685	0.152	0.322	0.133	0.282	2.56	
0.592	1.25	0.258	0.547	0.228	0.483	5.02	
0.653	1.38	0.282	0.598	0.249	0.528	5.58	
0.185	0.392	0.091	0.193	0.078	0.165	1.01	FM4332
0.288	0.610	0.140	0.297	0.121	0.256	1.96	
0.574	1.22	0.266	0.564	0.232	0.492	4.56	
1.04	2.20	0.451	0.956	0.398	0.843	8.80	
1.14	2.42	0.491	1.04	0.434	0.920	9.77	
1.03	2.18	0.389	0.824	0.351	0.744	5.94	FM4333
1.49	3.16	0.529	1.12	0.479	1.02	10.7	
2.53	5.36	0.849	1.80	0.771	1.63	20.9	
3.87	8.20	1.26	2.67	1.15	2.44	33.6	
4.16	8.82	1.35	2.86	1.23	2.61	36.2	
2.62	5.55	0.848	1.80	0.777	1.65	17.0	FM4333A
3.53	7.48	1.12	2.37	1.03	2.18	26.6	
5.55	11.8	1.72	3.64	1.58	3.35	46.6	
8.15	17.3	2.49	5.28	2.30	4.87	71.3	
8.70	18.4	2.64	5.60	2.44	5.17	76.4	
7.99	16.9	2.41	5.11	2.22	4.70	53.3	FM4334
10.5	22.2	3.14	6.65	2.89	6.12	80.2	
15.9	33.7	4.74	10.1	4.36	9.24	134.0	
22.8	48.4	6.81	14.4	6.27	13.3	199.7	
24.3	51.5	7.23	15.3	6.66	14.1	213.2	
12.9	27.3	3.96	8.39	3.65	7.73	85.4	FM4334B
17.0	36.0	5.15	10.9	4.76	10.1	129.8	
26.0	55.1	7.74	16.4	7.17	15.2	219.8	
37.4	79.3	10.8	22.9	10.1	21.4	328.6	
39.8	84.3	11.4	24.2	10.6	22.5	350.7	
29.9	63.4	8.85	18.8	8.16	17.3	202.1	FM4335
38.9	82.4	11.4	24.2	10.5	22.3	299.1	
58.4	123.8	16.8	35.7	15.6	33.0	492.8	
82.9	175.7	23.6	50.0	21.9	46.4	726.4	
87.9	186.3	25.0	53.0	23.2	49.2	773.4	
85.4	181.0	24.2	51.3	22.5	47.7	580.4	FM4336
110.0	233.1	30.6	64.8	28.5	60.4	853.1	
160.3	339.7	44.5	94.3	41.3	87.5	1362.0	
222.0	470.5	62.2	131.8	57.7	122.3	1952.0	
234.5	497.0	65.8	139.4	61.0	129.3	2069.0	

## CALIBRATION DATA – Tube Number FM4331

Metered Fluid	Float Material	Max. Flow	Min. Flow	Units
Air	Glass	49.68	2.89	Std. cu. cm./min.

Float Type:	Spherical	Metering Density:	0.00120 gms/cc
Std. Conditions:	1 Atmos. & 70°F	Float Density:	2.54000 gms/cc
Perf. Curve No.:	1.	Density @ Std. Cond.:	0.00120 gms/cc
Metering Temp.:	70°F	Metering Viscosity:	0.01812 cP
Metering Pressure:	0.0 psig		

Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)
150.0	49.68	113.0	33.33	76.0	19.17	39.0	8.77
149.0	49.32	112.0	32.93	75.0	18.82	38.0	8.54
148.0	48.97	111.0	32.52	74.0	18.48	37.0	8.30
147.0	48.61	110.0	32.11	73.0	18.12	36.0	8.08
146.0	48.25	109.0	31.69	72.0	17.77	35.0	7.85
145.0	47.89	108.0	31.26	71.0	17.41	34.0	7.64
144.0	47.52	107.0	30.83	70.0	17.05	33.0	7.43
143.0	47.15	106.0	30.38	69.0	16.69	32.0	7.23
142.0	46.77	105.0	29.92	68.0	16.34	31.0	7.04
141.0	46.38	104.0	29.46	67.0	15.99	30.0	6.85
140.0	45.98	103.0	28.99	66.0	15.64	29.0	6.69
139.0	45.57	102.0	28.52	65.0	15.30	28.0	6.54
138.0	45.15	101.0	28.06	64.0	14.97	27.0	6.39
137.0	44.71	100.0	27.59	63.0	14.66	26.0	6.24
136.0	44.27	99.0	27.12	62.0	14.35	25.0	6.09
135.0	43.81	98.0	26.66	61.0	14.06	24.0	5.95
134.0	43.29	97.0	26.21	60.0	13.78	23.0	5.81
133.0	42.77	96.0	25.76	59.0	13.52	22.0	5.66
132.0	42.25	95.0	25.33	58.0	13.28	21.0	5.52
131.0	41.72	94.0	24.91	57.0	13.03	20.0	5.37
130.0	41.19	93.0	24.50	56.0	12.80	19.0	5.22
129.0	40.65	92.0	24.11	55.0	12.56	18.0	5.07
128.0	40.12	91.0	23.73	54.0	12.33	17.0	4.91
127.0	39.60	90.0	23.38	53.0	12.10	16.0	4.74
126.0	39.08	89.0	23.06	52.0	11.88	15.0	4.57
125.0	38.56	88.0	22.76	51.0	11.65	14.0	4.41
124.0	38.06	87.0	22.46	50.0	11.42	13.0	4.25
123.0	37.57	86.0	22.17	49.0	11.19	12.0	4.08
122.0	37.10	85.0	21.88	48.0	10.95	11.0	3.91
121.0	36.64	84.0	21.60	47.0	10.71	10.0	3.74
120.0	36.20	83.0	21.31	46.0	10.46	9.0	3.57
119.0	35.77	82.0	21.03	45.0	10.21	8.0	3.40
118.0	35.35	81.0	20.74	44.0	9.97	7.0	3.23
117.0	34.94	80.0	20.45	43.0	9.73	6.0	3.06
116.0	34.53	79.0	20.14	42.0	9.49	5.0	2.89
115.0	34.13	78.0	19.83	41.0	9.25		
114.0	33.73	77.0	19.51	40.0	9.01		

## CALIBRATION DATA – Tube Number FM4331

Metered Fluid	Float Material	Max. Flow	Min. Flow	Units
Air	316 SS	147.8	9.3	Std. cu. cm./min.

Float Type:	Spherical	Metering Density:	0.00120 gms/cc
Std. Conditions:	1 Atmos. & 70°F	Float Density:	8.04000 gms/cc
Perf. Curve No.:	1.	Density @ Std. Cond.:	0.00120 gms/cc
Metering Temp.:	70°F	Metering Viscosity:	0.01812 cP
Metering Pressure:	0.0 psig		

Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)
150.0	147.8	113.0	101.7	76.0	60.7	39.0	28.1
149.0	146.9	112.0	100.5	75.0	59.6	38.0	27.3
148.0	145.9	111.0	99.2	74.0	58.5	37.0	26.6
147.0	144.9	110.0	98.0	73.0	57.3	36.0	25.9
146.0	144.0	109.0	96.7	72.0	56.2	35.0	25.2
145.0	143.0	108.0	95.5	71.0	55.1	34.0	24.5
144.0	142.0	107.0	94.2	70.0	53.9	33.0	23.9
143.0	140.9	106.0	93.0	69.0	52.8	32.0	23.2
142.0	139.9	105.0	91.7	68.0	51.7	31.0	22.6
141.0	138.8	104.0	90.5	67.0	50.6	30.0	22.1
140.0	137.8	103.0	89.3	66.0	49.5	29.0	21.6
139.0	136.7	102.0	88.1	65.0	48.4	28.0	21.1
138.0	135.5	101.0	86.9	64.0	47.4	27.0	20.6
137.0	134.3	100.0	85.7	63.0	46.4	26.0	20.1
136.0	133.1	99.0	84.5	62.0	45.4	25.0	19.6
135.0	131.9	98.0	83.3	61.0	44.5	24.0	19.2
134.0	130.5	97.0	82.1	60.0	43.6	23.0	18.7
133.0	129.1	96.0	81.0	59.0	42.8	22.0	18.3
132.0	127.7	95.0	79.8	58.0	42.0	21.0	17.8
131.0	126.2	94.0	78.7	57.0	41.3	20.0	17.3
130.0	124.8	93.0	77.6	56.0	40.6	19.0	16.8
129.0	123.3	92.0	76.5	55.0	39.8	18.0	16.3
128.0	121.8	91.0	75.4	54.0	39.1	17.0	15.8
127.0	120.4	90.0	74.4	53.0	38.4	16.0	15.3
126.0	118.9	89.0	73.4	52.0	37.7	15.0	14.8
125.0	117.5	88.0	72.4	51.0	37.0	14.0	14.2
124.0	116.1	87.0	71.5	50.0	36.3	13.0	13.7
123.0	114.7	86.0	70.5	49.0	35.6	12.0	13.2
122.0	113.3	85.0	69.6	48.0	34.9	11.0	12.6
121.0	112.0	84.0	68.6	47.0	34.1	10.0	12.1
120.0	110.7	83.0	67.7	46.0	33.4	9.0	11.5
119.0	109.4	82.0	66.7	45.0	32.6	8.0	11.0
118.0	108.1	81.0	65.8	44.0	31.8	7.0	10.4
117.0	106.8	80.0	64.8	43.0	31.1	6.0	9.9
116.0	105.5	79.0	63.8	42.0	30.3	5.0	9.3
115.0	104.2	78.0	62.8	41.0	29.6		
114.0	103.0	77.0	61.7	40.0	28.8		

## CALIBRATION DATA – Tube Number FM4332

Metered Fluid	Float Material	Max. Flow	Min. Flow	Units
Air	Glass	88.23	0.50	Std. cu. cm./min.

Float Type:	Spherical	Metering Density:	0.00120 gms/cc
Std. Conditions:	1 Atmos. & 70°F	Float Density:	2.54000 gms/cc
Perf. Curve No.:	2.	Density @ Std. Cond.:	0.00120 gms/cc
Metering Temp.:	70°F	Metering Viscosity:	0.01812 cP
Metering Pressure:	0.0 psig		

Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)
150.0	88.23	113.0	47.95	76.0	21.17	39.0	6.58
149.0	86.91	112.0	47.13	75.0	20.62	38.0	6.34
148.0	85.60	111.0	46.30	74.0	20.15	37.0	6.10
147.0	84.29	110.0	45.48	73.0	19.69	36.0	5.86
146.0	82.98	109.0	44.66	72.0	19.23	35.0	5.63
145.0	81.68	108.0	43.83	71.0	18.78	34.0	5.39
144.0	80.39	107.0	43.01	70.0	18.34	33.0	5.15
143.0	79.10	106.0	42.18	69.0	17.90	32.0	4.91
142.0	77.82	105.0	41.35	68.0	17.47	31.0	4.66
141.0	76.55	104.0	40.55	67.0	17.03	30.0	4.41
140.0	75.30	103.0	39.76	66.0	16.60	29.0	4.19
139.0	74.06	102.0	38.96	65.0	16.17	28.0	3.96
138.0	72.83	101.0	38.17	64.0	15.73	27.0	3.74
137.0	71.63	100.0	37.38	63.0	15.30	26.0	3.52
136.0	70.43	99.0	36.60	62.0	14.86	25.0	3.31
135.0	69.26	98.0	35.82	61.0	14.41	24.0	3.09
134.0	68.16	97.0	35.05	60.0	13.96	23.0	2.88
133.0	67.06	96.0	34.28	59.0	13.54	22.0	2.68
132.0	65.99	95.0	33.52	58.0	13.12	21.0	2.48
131.0	64.92	94.0	32.77	57.0	12.69	20.0	2.29
130.0	63.86	93.0	32.02	56.0	12.27	19.0	2.11
129.0	62.82	92.0	31.29	55.0	11.86	18.0	1.93
128.0	61.79	91.0	30.56	54.0	11.45	17.0	1.77
127.0	60.77	90.0	29.84	53.0	11.04	16.0	1.62
126.0	59.75	89.0	29.17	52.0	10.64	15.0	1.48
125.0	58.75	88.0	28.50	51.0	10.25	14.0	1.36
124.0	57.76	87.0	27.84	50.0	9.86	13.0	1.25
123.0	56.78	86.0	27.19	49.0	9.49	12.0	1.15
122.0	55.80	85.0	26.54	48.0	9.13	11.0	1.06
121.0	54.83	84.0	25.91	47.0	8.78	10.0	0.96
120.0	53.87	83.0	25.28	46.0	8.44	9.0	0.87
119.0	53.01	82.0	24.67	45.0	8.12	8.0	0.78
118.0	52.15	81.0	24.06	44.0	7.85	7.0	0.69
117.0	51.30	80.0	23.46	43.0	7.58	6.0	0.59
116.0	50.45	79.0	22.87	42.0	7.32	5.0	0.50
115.0	49.62	78.0	22.29	41.0	7.07		
114.0	48.78	77.0	21.73	40.0	6.82		



## CALIBRATION DATA – Tube Number FM4332

Metered Fluid	Float Material	Max. Flow	Min. Flow	Units
Air	316 SS	258.1	1.6	Std. cu. cm./min.

Float Type:	Spherical	Metering Density:	0.00120 gms/cc
Std. Conditions:	1 Atmos. & 70°F	Float Density:	8.04000 gms/cc
Perf. Curve No.:	2.	Density @ Std. Cond.:	0.00120 gms/cc
Metering Temp.:	70°F	Metering Viscosity:	0.01812 cP
Metering Pressure:	0.0 psig		

Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)
150.0	258.1	113.0	145.8	76.0	64.3	39.0	20.6
149.0	254.7	112.0	143.2	75.0	62.6	38.0	19.8
148.0	251.3	111.0	140.7	74.0	61.1	37.0	19.1
147.0	247.9	110.0	138.1	73.0	59.7	36.0	18.3
146.0	244.5	109.0	135.6	72.0	58.3	35.0	17.6
145.0	241.1	108.0	133.0	71.0	56.9	34.0	16.8
144.0	237.7	107.0	130.5	70.0	55.6	33.0	16.1
143.0	234.4	106.0	128.0	69.0	54.2	32.0	15.3
142.0	231.0	105.0	125.5	68.0	52.9	31.0	14.6
141.0	227.7	104.0	123.1	67.0	51.5	30.0	13.8
140.0	224.4	103.0	120.8	66.0	50.2	29.0	13.1
139.0	221.1	102.0	118.4	65.0	48.9	28.0	12.4
138.0	217.9	101.0	116.1	64.0	47.6	27.0	11.7
137.0	214.7	100.0	113.7	63.0	46.3	26.0	11.0
136.0	211.5	99.0	111.4	62.0	45.0	25.0	10.4
135.0	208.3	98.0	109.1	61.0	43.6	24.0	9.7
134.0	205.2	97.0	106.8	60.0	42.3	23.0	9.0
133.0	202.2	96.0	104.5	59.0	41.1	22.0	8.4
132.0	199.2	95.0	102.3	58.0	39.8	21.0	7.8
131.0	196.2	94.0	100.0	57.0	38.6	20.0	7.2
130.0	193.2	93.0	97.8	56.0	37.4	19.0	6.6
129.0	190.2	92.0	95.6	55.0	36.2	18.0	6.1
128.0	187.3	91.0	93.4	54.0	35.0	17.0	5.6
127.0	184.4	90.0	91.2	53.0	33.9	16.0	5.1
126.0	181.4	89.0	89.1	52.0	32.7	15.0	4.7
125.0	178.6	88.0	87.1	51.0	31.6	14.0	4.3
124.0	175.7	87.0	85.0	50.0	30.5	13.0	4.0
123.0	172.8	86.0	83.0	49.0	29.4	12.0	3.6
122.0	169.9	85.0	81.0	48.0	28.3	11.0	3.3
121.0	167.1	84.0	79.0	47.0	27.3	10.0	3.0
120.0	164.3	83.0	77.1	46.0	26.3	9.0	2.7
119.0	161.6	82.0	75.1	45.0	25.3	8.0	2.5
118.0	158.9	81.0	73.3	44.0	24.5	7.0	2.2
117.0	156.3	80.0	71.4	43.0	23.7	6.0	1.9
116.0	153.6	79.0	69.6	42.0	22.9	5.0	1.6
115.0	151.0	78.0	67.8	41.0	22.1		
114.0	148.4	77.0	66.0	40.0	21.3		

## CALIBRATION DATA – Tube Number FM4333

Metered Fluid	Float Material	Max. Flow	Min. Flow	Units
Air	Glass	380.2	5.6	Std. cu. cm./min.

Float Type:	Spherical	Metering Density:	0.00120 gms/cc
Std. Conditions:	1 Atmos. & 70°F	Float Density:	2.54000 gms/cc
Perf. Curve No.:	3.	Density @ Std. Cond.:	0.00120 gms/cc
Metering Temp.:	70°F	Metering Viscosity:	0.01812 cP
Metering Pressure:	0.0 psig		

Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)
150.0	380.2	113.0	262.6	76.0	136.0	39.0	41.4
149.0	377.1	112.0	259.6	75.0	132.8	38.0	39.6
148.0	373.9	111.0	256.5	74.0	129.9	37.0	37.8
147.0	370.7	110.0	253.4	73.0	126.9	36.0	36.1
146.0	367.5	109.0	250.2	72.0	123.9	35.0	34.4
145.0	364.3	108.0	247.0	71.0	121.0	34.0	32.8
144.0	361.1	107.0	243.7	70.0	118.1	33.0	31.2
143.0	358.0	106.0	240.4	69.0	115.2	32.0	29.6
142.0	354.8	105.0	237.0	68.0	112.3	31.0	28.1
141.0	351.6	104.0	233.4	67.0	109.4	30.0	26.6
140.0	348.3	103.0	229.8	66.0	106.6	29.0	25.4
139.0	345.1	102.0	226.2	65.0	103.7	28.0	24.2
138.0	341.9	101.0	222.5	64.0	100.9	27.0	23.1
137.0	338.7	100.0	218.8	63.0	98.1	26.0	22.0
136.0	335.4	99.0	215.2	62.0	95.3	25.0	20.9
135.0	332.2	98.0	211.5	61.0	92.5	24.0	19.9
134.0	328.9	97.0	207.8	60.0	89.7	23.0	18.9
133.0	325.6	96.0	204.1	59.0	87.1	22.0	17.9
132.0	322.3	95.0	200.5	58.0	84.5	21.0	16.9
131.0	319.0	94.0	196.9	57.0	81.9	20.0	16.0
130.0	315.7	93.0	193.3	56.0	79.3	19.0	15.1
129.0	312.4	92.0	189.7	55.0	76.7	18.0	14.2
128.0	309.1	91.0	186.2	54.0	74.2	17.0	13.3
127.0	305.9	90.0	182.8	53.0	71.7	16.0	12.4
126.0	302.6	89.0	179.3	52.0	69.2	15.0	11.6
125.0	299.4	88.0	175.8	51.0	66.7	14.0	11.0
124.0	296.2	87.0	172.4	50.0	64.3	13.0	10.3
123.0	293.0	86.0	169.0	49.0	61.9	12.0	9.7
122.0	289.9	85.0	165.6	48.0	59.6	11.0	9.1
121.0	286.7	84.0	162.2	47.0	57.3	10.0	8.5
120.0	283.6	83.0	158.9	46.0	55.0	9.0	7.9
119.0	280.6	82.0	155.5	45.0	52.8	8.0	7.4
118.0	277.6	81.0	152.2	44.0	50.8	7.0	6.8
117.0	274.6	80.0	149.0	43.0	48.8	6.0	6.2
116.0	271.6	79.0	145.7	42.0	46.9	5.0	5.6
115.0	268.6	78.0	142.5	41.0	45.0		
114.0	265.6	77.0	139.2	40.0	43.2		

## CALIBRATION DATA – Tube Number FM4333

Metered Fluid	Float Material	Max. Flow	Min. Flow	Units
Air	316 SS	831.7	17.8	Std. cu. cm./min.

Float Type:	Spherical	Metering Density:	0.00120 gms/cc
Std. Conditions:	1 Atmos. & 70°F	Float Density:	8.04000 gms/cc
Perf. Curve No.:	3.	Density @ Std. Cond.:	0.00120 gms/cc
Metering Temp.:	70°F	Metering Viscosity:	0.01812 cP
Metering Pressure:	0.0 psig		

Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)
150.0	831.7	113.0	598.2	76.0	353.6	39.0	124.6
149.0	825.5	112.0	591.9	75.0	347.1	38.0	119.6
148.0	819.3	111.0	585.6	74.0	340.7	37.0	114.8
147.0	813.1	110.0	579.2	73.0	334.3	36.0	110.0
146.0	806.9	109.0	572.8	72.0	327.8	35.0	105.3
145.0	800.8	108.0	566.3	71.0	321.4	34.0	100.7
144.0	794.6	107.0	559.7	70.0	314.9	33.0	96.2
143.0	788.4	106.0	553.1	69.0	308.4	32.0	91.7
142.0	782.1	105.0	546.4	68.0	301.9	31.0	87.3
141.0	775.9	104.0	539.5	67.0	295.5	30.0	83.0
140.0	769.7	103.0	532.6	66.0	289.0	29.0	79.4
139.0	763.4	102.0	525.7	65.0	282.5	28.0	75.9
138.0	757.1	101.0	518.8	64.0	276.0	27.0	72.4
137.0	750.8	100.0	511.8	63.0	269.5	26.0	69.0
136.0	744.5	99.0	504.8	62.0	263.0	25.0	65.7
135.0	738.1	98.0	497.9	61.0	256.5	24.0	62.4
134.0	731.7	97.0	490.9	60.0	250.0	23.0	59.3
133.0	725.3	96.0	484.0	59.0	243.4	22.0	56.2
132.0	718.8	95.0	477.1	58.0	236.9	21.0	53.1
131.0	712.4	94.0	470.3	57.0	230.3	20.0	50.2
130.0	705.9	93.0	463.5	56.0	223.8	19.0	47.3
129.0	699.4	92.0	456.8	55.0	217.3	18.0	44.5
128.0	693.0	91.0	450.1	54.0	210.9	17.0	41.8
127.0	686.5	90.0	443.6	53.0	204.5	16.0	39.2
126.0	680.1	89.0	437.0	52.0	198.1	15.0	36.6
125.0	673.7	88.0	430.6	51.0	191.8	14.0	34.6
124.0	667.3	87.0	424.1	50.0	185.6	13.0	32.6
123.0	660.9	86.0	417.7	49.0	179.5	12.0	30.7
122.0	654.6	85.0	411.3	48.0	173.4	11.0	28.8
121.0	648.2	84.0	404.9	47.0	167.4	10.0	27.0
120.0	642.0	83.0	398.5	46.0	161.6	9.0	25.1
119.0	635.7	82.0	392.1	45.0	155.8	8.0	23.3
118.0	629.5	81.0	385.8	44.0	150.4	7.0	21.5
117.0	623.2	80.0	379.4	43.0	145.1	6.0	19.7
116.0	617.0	79.0	373.0	42.0	139.8	5.0	17.8
115.0	610.8	78.0	366.5	41.0	134.7		
114.0	604.5	77.0	360.1	40.0	129.6		

## CALIBRATION DATA – Tube Number FM4333A

Metered Fluid	Float Material	Max. Flow	Min. Flow	Units
Air	Glass	832.5	5.8	Std. cu. cm./min.

Float Type:	Spherical	Metering Density:	0.00120 gms/cc
Std. Conditions:	1 Atmos. & 70°F	Float Density:	2.54000 gms/cc
Perf. Curve No.:	4.	Density @ Std. Cond.:	0.00120 gms/cc
Metering Temp.:	70°F	Metering Viscosity:	0.01812 cP
Metering Pressure:	0.0 psig		

Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)
150.0	832.5	113.0	626.9	76.0	407.0	39.0	157.5
149.0	826.9	112.0	621.1	75.0	401.0	38.0	150.4
148.0	821.3	111.0	615.3	74.0	395.0	37.0	143.4
147.0	815.7	110.0	609.4	73.0	389.0	36.0	136.5
146.0	810.0	109.0	603.6	72.0	383.0	35.0	129.7
145.0	804.4	108.0	597.8	71.0	377.0	34.0	122.9
144.0	798.8	107.0	592.0	70.0	370.9	33.0	116.3
143.0	793.2	106.0	586.2	69.0	364.8	32.0	109.8
142.0	787.6	105.0	580.4	68.0	358.7	31.0	103.4
141.0	782.1	104.0	574.5	67.0	352.6	30.0	97.1
140.0	776.5	103.0	568.6	66.0	346.4	29.0	91.3
139.0	771.0	102.0	562.7	65.0	340.1	28.0	85.6
138.0	765.4	101.0	556.8	64.0	333.8	27.0	80.1
137.0	759.9	100.0	550.9	63.0	327.4	26.0	74.6
136.0	754.4	99.0	545.0	62.0	320.9	25.0	69.3
135.0	749.0	98.0	539.1	61.0	314.3	24.0	64.1
134.0	743.6	97.0	533.1	60.0	307.7	23.0	59.1
133.0	738.2	96.0	527.2	59.0	300.8	22.0	54.3
132.0	732.8	95.0	521.3	58.0	293.8	21.0	49.6
131.0	727.4	94.0	515.4	57.0	286.7	20.0	45.1
130.0	722.0	93.0	509.4	56.0	279.6	19.0	40.8
129.0	716.7	92.0	503.4	55.0	272.5	18.0	36.7
128.0	711.3	91.0	497.5	54.0	265.3	17.0	32.8
127.0	705.9	90.0	491.5	53.0	258.2	16.0	29.2
126.0	700.4	89.0	485.5	52.0	251.0	15.0	25.7
125.0	695.0	88.0	479.4	51.0	243.8	14.0	23.4
124.0	689.5	87.0	473.4	50.0	236.6	13.0	21.1
123.0	684.0	86.0	467.4	49.0	229.4	12.0	19.1
122.0	678.5	85.0	461.3	48.0	222.2	11.0	17.1
121.0	672.9	84.0	455.3	47.0	215.1	10.0	15.2
120.0	667.3	83.0	449.2	46.0	207.9	9.0	13.3
119.0	661.5	82.0	443.2	45.0	200.8	8.0	11.5
118.0	655.8	81.0	437.1	44.0	193.5	7.0	9.7
117.0	650.1	80.0	431.1	43.0	186.3	6.0	7.8
116.0	644.3	79.0	425.1	42.0	179.0	5.0	5.8
115.0	638.5	78.0	419.0	41.0	171.8		
114.0	632.7	77.0	413.0	40.0	164.6		

## CALIBRATION DATA – Tube Number FM4333A

Metered Fluid	Float Material	Max. Flow	Min. Flow	Units
Air	316 SS	1693	19	Std. cu. cm./min.

Float Type:	Spherical	Metering Density:	0.00120 gms/cc
Std. Conditions:	1 Atmos. & 70°F	Float Density:	8.04000 gms/cc
Perf. Curve No.:	4.	Density @ Std. Cond.:	0.00120 gms/cc
Metering Temp.:	70°F	Metering Viscosity:	0.01812 cP
Metering Pressure:	0.0 psig		

Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)
150.0	1693	113.0	1302	76.0	882	39.0	394
149.0	1682	112.0	1291	75.0	871	38.0	380
148.0	1671	111.0	1280	74.0	859	37.0	366
147.0	1661	110.0	1269	73.0	848	36.0	352
146.0	1650	109.0	1258	72.0	836	35.0	338
145.0	1640	108.0	1247	71.0	825	34.0	324
144.0	1629	107.0	1236	70.0	813	33.0	310
143.0	1618	106.0	1225	69.0	801	32.0	296
142.0	1608	105.0	1214	68.0	790	31.0	282
141.0	1597	104.0	1202	67.0	778	30.0	267
140.0	1587	103.0	1191	66.0	766	29.0	253
139.0	1576	102.0	1179	65.0	753	28.0	239
138.0	1566	101.0	1168	64.0	741	27.0	225
137.0	1555	100.0	1156	63.0	729	26.0	211
136.0	1545	99.0	1144	62.0	716	25.0	197
135.0	1534	98.0	1133	61.0	703	24.0	183
134.0	1524	97.0	1121	60.0	690	23.0	170
133.0	1513	96.0	1109	59.0	676	22.0	157
132.0	1503	95.0	1098	58.0	662	21.0	144
131.0	1492	94.0	1086	57.0	648	20.0	132
130.0	1482	93.0	1075	56.0	634	19.0	121
129.0	1471	92.0	1063	55.0	620	18.0	110
128.0	1461	91.0	1052	54.0	605	17.0	99
127.0	1450	90.0	1040	53.0	591	16.0	89
126.0	1440	89.0	1029	52.0	577	15.0	80
125.0	1429	88.0	1018	51.0	563	14.0	73
124.0	1419	87.0	1007	50.0	548	13.0	67
123.0	1408	86.0	995	49.0	534	12.0	60
122.0	1398	85.0	984	48.0	520	11.0	54
121.0	1387	84.0	973	47.0	506	10.0	48
120.0	1377	83.0	962	46.0	492	9.0	42
119.0	1366	82.0	950	45.0	478	8.0	36
118.0	1356	81.0	939	44.0	464	7.0	31
117.0	1345	80.0	928	43.0	450	6.0	25
116.0	1334	79.0	916	42.0	436	5.0	19
115.0	1323	78.0	905	41.0	422		
114.0	1313	77.0	894	40.0	408		

## CALIBRATION DATA – Tube Number FM4334

Metered Fluid	Float Material	Max. Flow	Min. Flow	Units
Air	Glass	2371	45	Std. cu. cm./min.

Float Type:	Spherical	Metering Density:	0.00120 gms/cc
Std. Conditions:	1 Atmos. & 70°F	Float Density:	2.54000 gms/cc
Perf. Curve No.:	5.	Density @ Std. Cond.:	0.00120 gms/cc
Metering Temp.:	70°F	Metering Viscosity:	0.01812 cP
Metering Pressure:	0.0 psig		

Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)
150.0	2371	113.0	1936	76.0	1397	39.0	747
149.0	2361	112.0	1924	75.0	1382	38.0	727
148.0	2351	111.0	1912	74.0	1367	37.0	707
147.0	2341	110.0	1899	73.0	1352	36.0	687
146.0	2330	109.0	1886	72.0	1336	35.0	667
145.0	2320	108.0	1873	71.0	1321	34.0	647
144.0	2310	107.0	1859	70.0	1306	33.0	627
143.0	2299	106.0	1846	69.0	1290	32.0	607
142.0	2289	105.0	1831	68.0	1274	31.0	587
141.0	2278	104.0	1816	67.0	1258	30.0	567
140.0	2267	103.0	1801	66.0	1242	29.0	547
139.0	2257	102.0	1786	65.0	1226	28.0	527
138.0	2245	101.0	1770	64.0	1210	27.0	507
137.0	2234	100.0	1755	63.0	1194	26.0	487
136.0	2223	99.0	1739	62.0	1177	25.0	467
135.0	2211	98.0	1723	61.0	1160	24.0	447
134.0	2198	97.0	1708	60.0	1144	23.0	426
133.0	2186	96.0	1692	59.0	1126	22.0	406
132.0	2173	95.0	1676	58.0	1108	21.0	386
131.0	2160	94.0	1661	57.0	1090	20.0	365
130.0	2147	93.0	1646	56.0	1072	19.0	345
129.0	2134	92.0	1631	55.0	1054	18.0	324
128.0	2121	91.0	1616	54.0	1035	17.0	303
127.0	2108	90.0	1601	53.0	1017	16.0	282
126.0	2095	89.0	1587	52.0	998	15.0	261
125.0	2083	88.0	1572	51.0	980	14.0	240
124.0	2070	87.0	1558	50.0	961	13.0	218
123.0	2057	86.0	1543	49.0	942	12.0	197
122.0	2045	85.0	1529	48.0	923	11.0	175
121.0	2033	84.0	1514	47.0	905	10.0	153
120.0	2021	83.0	1500	46.0	886	9.0	132
119.0	2009	82.0	1485	45.0	867	8.0	110
118.0	1997	81.0	1471	44.0	847	7.0	88
117.0	1985	80.0	1456	43.0	827	6.0	66
116.0	1973	79.0	1442	42.0	807	5.0	45
115.0	1961	78.0	1427	41.0	787		
114.0	1949	77.0	1412	40.0	767		

## CALIBRATION DATA – Tube Number FM4334

Metered Fluid	Float Material	Max. Flow	Min. Flow	Units
Air	316 SS	4656	137	Std. cu. cm./min.

Float Type:	Spherical	Metering Density:	0.00120 gms/cc
Std. Conditions:	1 Atmos. & 70°F	Float Density:	8.04000 gms/cc
Perf. Curve No.:	5.	Density @ Std. Cond.:	0.00120 gms/cc
Metering Temp.:	70°F	Metering Viscosity:	0.01812 cP
Metering Pressure:	0.0 psig		

Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)	Scale Reading	Flow (sccm)
150.0	4656	113.0	3813	76.0	2784	39.0	1530
149.0	4636	112.0	3790	75.0	2754	38.0	1492
148.0	4616	111.0	3766	74.0	2724	37.0	1454
147.0	4596	110.0	3742	73.0	2693	36.0	1416
146.0	4576	109.0	3718	72.0	2663	35.0	1378
145.0	4556	108.0	3693	71.0	2632	34.0	1340
144.0	4536	107.0	3667	70.0	2601	33.0	1302
143.0	4515	106.0	3642	69.0	2569	32.0	1264
142.0	4494	105.0	3615	68.0	2538	31.0	1227
141.0	4474	104.0	3587	67.0	2506	30.0	1189
140.0	4452	103.0	3559	66.0	2475	29.0	1152
139.0	4431	102.0	3531	65.0	2443	28.0	1114
138.0	4409	101.0	3502	64.0	2411	27.0	1076
137.0	4387	100.0	3473	63.0	2379	26.0	1039
136.0	4365	99.0	3444	62.0	2346	25.0	1001
135.0	4342	98.0	3415	61.0	2314	24.0	962
134.0	4317	97.0	3386	60.0	2281	23.0	924
133.0	4293	96.0	3357	59.0	2247	22.0	885
132.0	4268	95.0	3328	58.0	2213	21.0	846
131.0	4243	94.0	3299	57.0	2179	20.0	806
130.0	4218	93.0	3271	56.0	2145	19.0	766
129.0	4193	92.0	3242	55.0	2110	18.0	725
128.0	4168	91.0	3214	54.0	2076	17.0	683
127.0	4143	90.0	3186	53.0	2041	16.0	641
126.0	4118	89.0	3158	52.0	2006	15.0	598
125.0	4093	88.0	3129	51.0	1971	14.0	553
124.0	4069	87.0	3101	50.0	1935	13.0	507
123.0	4044	86.0	3072	49.0	1900	12.0	461
122.0	4021	85.0	3044	48.0	1864	11.0	415
121.0	3997	84.0	3016	47.0	1828	10.0	369
120.0	3974	83.0	2987	46.0	1792	9.0	322
119.0	3951	82.0	2959	45.0	1756	8.0	276
118.0	3928	81.0	2930	44.0	1719	7.0	229
117.0	3905	80.0	2901	43.0	1681	6.0	183
116.0	3882	79.0	2872	42.0	1643	5.0	137
115.0	3859	78.0	2843	41.0	1605		
114.0	3836	77.0	2814	40.0	1568		

## CALIBRATION DATA – Tube Number FM4334B

Metered Fluid	Float Material	Max. Flow	Min. Flow	Units
Air	Glass	3.894	0.032	Std. liters/min.

Float Type:	Spherical	Metering Density:	0.00120 gms/cc
Std. Conditions:	1 Atmos. & 70°F	Float Density:	2.54000 gms/cc
Perf. Curve No.:	6.	Density @ Std. Cond.:	0.00120 gms/cc
Metering Temp.:	70°F	Metering Viscosity:	0.01812 cP
Metering Pressure:	0.0 psig		

Scale Reading	Flow (slpm)	Scale Reading	Flow (slpm)	Scale Reading	Flow (slpm)	Scale Reading	Flow (slpm)
150.0	3.894	113.0	2.887	76.0	1.876	39.0	0.851
149.0	3.865	112.0	2.859	75.0	1.847	38.0	0.823
148.0	3.836	111.0	2.831	74.0	1.817	37.0	0.796
147.0	3.807	110.0	2.804	73.0	1.787	36.0	0.768
146.0	3.779	109.0	2.776	72.0	1.756	35.0	0.741
145.0	3.750	108.0	2.747	71.0	1.725	34.0	0.714
144.0	3.721	107.0	2.719	70.0	1.694	33.0	0.687
143.0	3.693	106.0	2.690	69.0	1.663	32.0	0.660
142.0	3.664	105.0	2.662	68.0	1.632	31.0	0.634
141.0	3.636	104.0	2.632	67.0	1.601	30.0	0.608
140.0	3.608	103.0	2.602	66.0	1.571	29.0	0.582
139.0	3.580	102.0	2.572	65.0	1.540	28.0	0.556
138.0	3.552	101.0	2.542	64.0	1.511	27.0	0.530
137.0	3.524	100.0	2.512	63.0	1.482	26.0	0.505
136.0	3.497	99.0	2.482	62.0	1.453	25.0	0.480
135.0	3.470	98.0	2.453	61.0	1.426	24.0	0.455
134.0	3.444	97.0	2.423	60.0	1.399	23.0	0.430
133.0	3.417	96.0	2.394	59.0	1.373	22.0	0.405
132.0	3.391	95.0	2.366	58.0	1.347	21.0	0.381
131.0	3.365	94.0	2.337	57.0	1.321	20.0	0.357
130.0	3.339	93.0	2.309	56.0	1.296	19.0	0.333
129.0	3.313	92.0	2.282	55.0	1.271	18.0	0.309
128.0	3.287	91.0	2.255	54.0	1.246	17.0	0.286
127.0	3.261	90.0	2.229	53.0	1.221	16.0	0.263
126.0	3.235	89.0	2.204	52.0	1.197	15.0	0.240
125.0	3.209	88.0	2.180	51.0	1.172	14.0	0.218
124.0	3.183	87.0	2.155	50.0	1.146	13.0	0.197
123.0	3.156	86.0	2.131	49.0	1.121	12.0	0.176
122.0	3.130	85.0	2.107	48.0	1.095	11.0	0.156
121.0	3.103	84.0	2.083	47.0	1.069	10.0	0.135
120.0	3.077	83.0	2.059	46.0	1.042	9.0	0.114
119.0	3.050	82.0	2.034	45.0	1.015	8.0	0.094
118.0	3.023	81.0	2.009	44.0	0.988	7.0	0.073
117.0	2.996	80.0	1.984	43.0	0.961	6.0	0.053
116.0	2.969	79.0	1.958	42.0	0.933	5.0	0.032
115.0	2.942	78.0	1.931	41.0	0.906		
114.0	2.914	77.0	1.904	40.0	0.878		



## CALIBRATION DATA – Tube Number FM4334B

Metered Fluid	Float Material	Max. Flow	Min. Flow	Units
Air	316 SS	7.619	0.102	Std. liters/min.

Float Type:	Spherical	Metering Density:	0.00120 gms/cc
Std. Conditions:	1 Atmos. & 70°F	Float Density:	8.04000 gms/cc
Perf. Curve No.:	6.	Density @ Std. Cond.:	0.00120 gms/cc
Metering Temp.:	70°F	Metering Viscosity:	0.01812 cP
Metering Pressure:	0.0 psig		

Scale Reading	Flow (slpm)	Scale Reading	Flow (slpm)	Scale Reading	Flow (slpm)	Scale Reading	Flow (slpm)
150.0	7.619	113.0	5.710	76.0	3.715	39.0	1.777
149.0	7.568	112.0	5.659	75.0	3.660	38.0	1.725
148.0	7.517	111.0	5.607	74.0	3.606	37.0	1.673
147.0	7.466	110.0	5.556	73.0	3.552	36.0	1.621
146.0	7.415	109.0	5.503	72.0	3.497	35.0	1.570
145.0	7.364	108.0	5.451	71.0	3.443	34.0	1.519
144.0	7.312	107.0	5.397	70.0	3.388	33.0	1.468
143.0	7.261	106.0	5.344	69.0	3.333	32.0	1.418
142.0	7.210	105.0	5.289	68.0	3.279	31.0	1.369
141.0	7.158	104.0	5.233	67.0	3.224	30.0	1.320
140.0	7.107	103.0	5.177	66.0	3.170	29.0	1.273
139.0	7.055	102.0	5.120	65.0	3.116	28.0	1.226
138.0	7.003	101.0	5.064	64.0	3.063	27.0	1.179
137.0	6.952	100.0	5.007	63.0	3.010	26.0	1.133
136.0	6.900	99.0	4.950	62.0	2.957	25.0	1.087
135.0	6.848	98.0	4.893	61.0	2.905	24.0	1.040
134.0	6.795	97.0	4.836	60.0	2.853	23.0	0.994
133.0	6.742	96.0	4.780	59.0	2.802	22.0	0.947
132.0	6.690	95.0	4.724	58.0	2.751	21.0	0.900
131.0	6.637	94.0	4.668	57.0	2.701	20.0	0.853
130.0	6.585	93.0	4.613	56.0	2.651	19.0	0.806
129.0	6.532	92.0	4.558	55.0	2.601	18.0	0.757
128.0	6.479	91.0	4.504	54.0	2.550	17.0	0.709
127.0	6.427	90.0	4.451	53.0	2.500	16.0	0.660
126.0	6.375	89.0	4.398	52.0	2.450	15.0	0.610
125.0	6.322	88.0	4.345	51.0	2.400	14.0	0.560
124.0	6.270	87.0	4.293	50.0	2.349	13.0	0.509
123.0	6.218	86.0	4.240	49.0	2.299	12.0	0.459
122.0	6.167	85.0	4.188	48.0	2.248	11.0	0.408
121.0	6.115	84.0	4.136	47.0	2.196	10.0	0.357
120.0	6.064	83.0	4.084	46.0	2.144	9.0	0.306
119.0	6.014	82.0	4.032	45.0	2.092	8.0	0.255
118.0	5.963	81.0	3.980	44.0	2.040	7.0	0.204
117.0	5.913	80.0	3.928	43.0	1.987	6.0	0.153
116.0	5.862	79.0	3.875	42.0	1.935	5.0	0.102
115.0	5.811	78.0	3.822	41.0	1.882		
114.0	5.761	77.0	3.769	40.0	1.830		

## CALIBRATION DATA – Tube Number FM4335

Metered Fluid	Float Material	Max. Flow	Min. Flow	Units
Air	Glass	8.695	0.094	Std. liters/min.

Float Type:	Spherical	Metering Density:	0.00120 gms/cc
Std. Conditions:	1 Atmos. & 70°F	Float Density:	2.54000 gms/cc
Perf. Curve No.:	7.	Density @ Std. Cond.:	0.00120 gms/cc
Metering Temp.:	70°F	Metering Viscosity:	0.01812 cP
Metering Pressure:	0.0 psig		

Scale Reading	Flow (slpm)	Scale Reading	Flow (slpm)	Scale Reading	Flow (slpm)	Scale Reading	Flow (slpm)
150.0	8.695	113.0	6.490	76.0	4.293	39.0	2.089
149.0	8.639	112.0	6.428	75.0	4.233	38.0	2.026
148.0	8.584	111.0	6.366	74.0	4.172	37.0	1.964
147.0	8.528	110.0	6.305	73.0	4.111	36.0	1.901
146.0	8.473	109.0	6.243	72.0	4.049	35.0	1.838
145.0	8.417	108.0	6.182	71.0	3.988	34.0	1.775
144.0	8.361	107.0	6.121	70.0	3.927	33.0	1.712
143.0	8.305	106.0	6.060	69.0	3.866	32.0	1.648
142.0	8.249	105.0	5.999	68.0	3.805	31.0	1.585
141.0	8.193	104.0	5.940	67.0	3.744	30.0	1.521
140.0	8.136	103.0	5.880	66.0	3.683	29.0	1.455
139.0	8.079	102.0	5.820	65.0	3.622	28.0	1.389
138.0	8.021	101.0	5.761	64.0	3.562	27.0	1.323
137.0	7.963	100.0	5.701	63.0	3.502	26.0	1.257
136.0	7.905	99.0	5.642	62.0	3.443	25.0	1.192
135.0	7.846	98.0	5.583	61.0	3.384	24.0	1.127
134.0	7.786	97.0	5.524	60.0	3.326	23.0	1.062
133.0	7.725	96.0	5.465	59.0	3.268	22.0	0.999
132.0	7.664	95.0	5.406	58.0	3.210	21.0	0.936
131.0	7.602	94.0	5.347	57.0	3.153	20.0	0.874
130.0	7.541	93.0	5.288	56.0	3.096	19.0	0.813
129.0	7.479	92.0	5.229	55.0	3.039	18.0	0.754
128.0	7.418	91.0	5.170	54.0	2.982	17.0	0.696
127.0	7.356	90.0	5.112	53.0	2.924	16.0	0.639
126.0	7.294	89.0	5.054	52.0	2.867	15.0	0.585
125.0	7.232	88.0	4.996	51.0	2.809	14.0	0.533
124.0	7.171	87.0	4.938	50.0	2.752	13.0	0.483
123.0	7.109	86.0	4.880	49.0	2.694	12.0	0.433
122.0	7.047	85.0	4.822	48.0	2.635	11.0	0.384
121.0	6.986	84.0	4.764	47.0	2.576	10.0	0.336
120.0	6.924	83.0	4.705	46.0	2.517	9.0	0.288
119.0	6.862	82.0	4.647	45.0	2.457	8.0	0.240
118.0	6.800	81.0	4.589	44.0	2.396	7.0	0.191
117.0	6.738	80.0	4.530	43.0	2.335	6.0	0.143
116.0	6.676	79.0	4.471	42.0	2.274	5.0	0.094
115.0	6.613	78.0	4.412	41.0	2.212		
114.0	6.551	77.0	4.352	40.0	2.151		

## CALIBRATION DATA – Tube Number FM4335

Metered Fluid	Float Material	Max. Flow	Min. Flow	Units
Air	316 SS	16.56	0.31	Std. liters/min.

Float Type:	Spherical	Metering Density:	0.00120 gms/cc
Std. Conditions:	1 Atmos. & 70°F	Float Density:	8.04000 gms/cc
Perf. Curve No.:	7.	Density @ Std. Cond.:	0.00120 gms/cc
Metering Temp.:	70°F	Metering Viscosity:	0.01812 cP
Metering Pressure:	0.0 psig		

Scale Reading	Flow (slpm)	Scale Reading	Flow (slpm)	Scale Reading	Flow (slpm)	Scale Reading	Flow (slpm)
150.0	16.56	113.0	12.54	76.0	8.39	39.0	4.26
149.0	16.46	112.0	12.43	75.0	8.28	38.0	4.15
148.0	16.36	111.0	12.31	74.0	8.16	37.0	4.03
147.0	16.26	110.0	12.20	73.0	8.05	36.0	3.92
146.0	16.16	109.0	12.09	72.0	7.93	35.0	3.80
145.0	16.06	108.0	11.97	71.0	7.82	34.0	3.68
144.0	15.96	107.0	11.86	70.0	7.70	33.0	3.57
143.0	15.85	106.0	11.74	69.0	7.59	32.0	3.45
142.0	15.75	105.0	11.63	68.0	7.47	31.0	3.34
141.0	15.65	104.0	11.52	67.0	7.36	30.0	3.22
140.0	15.55	103.0	11.41	66.0	7.25	29.0	3.10
139.0	15.45	102.0	11.29	65.0	7.13	28.0	2.99
138.0	15.34	101.0	11.18	64.0	7.02	27.0	2.87
137.0	15.24	100.0	11.07	63.0	6.91	26.0	2.75
136.0	15.13	99.0	10.96	62.0	6.80	25.0	2.64
135.0	15.03	98.0	10.85	61.0	6.69	24.0	2.52
134.0	14.92	97.0	10.73	60.0	6.58	23.0	2.40
133.0	14.81	96.0	10.62	59.0	6.47	22.0	2.29
132.0	14.70	95.0	10.51	58.0	6.36	21.0	2.17
131.0	14.58	94.0	10.40	57.0	6.25	20.0	2.06
130.0	14.47	93.0	10.29	56.0	6.15	19.0	1.94
129.0	14.36	92.0	10.18	55.0	6.04	18.0	1.82
128.0	14.25	91.0	10.07	54.0	5.93	17.0	1.71
127.0	14.14	90.0	9.95	53.0	5.83	16.0	1.59
126.0	14.02	89.0	9.84	52.0	5.72	15.0	1.47
125.0	13.91	88.0	9.73	51.0	5.61	14.0	1.36
124.0	13.80	87.0	9.62	50.0	5.51	13.0	1.24
123.0	13.69	86.0	9.51	49.0	5.40	12.0	1.12
122.0	13.57	85.0	9.40	48.0	5.29	11.0	1.01
121.0	13.46	84.0	9.29	47.0	5.18	10.0	0.89
120.0	13.35	83.0	9.18	46.0	5.07	9.0	0.77
119.0	13.23	82.0	9.06	45.0	4.95	8.0	0.66
118.0	13.12	81.0	8.95	44.0	4.84	7.0	0.54
117.0	13.00	80.0	8.84	43.0	4.73	6.0	0.43
116.0	12.89	79.0	8.73	42.0	4.61	5.0	0.31
115.0	12.77	78.0	8.62	41.0	4.50		
114.0	12.66	77.0	8.50	40.0	4.38		

## CALIBRATION DATA – Tube Number FM4336

Metered Fluid	Float Material	Max. Flow	Min. Flow	Units
Air	Glass	23.87	0.39	Std. liters/min.

Float Type:	Spherical	Metering Density:	0.00120 gms/cc
Std. Conditions:	1 Atmos. & 70°F	Float Density:	2.54000 gms/cc
Perf. Curve No.:	8.	Density @ Std. Cond.:	0.00120 gms/cc
Metering Temp.:	70°F	Metering Viscosity:	0.01812cP
Metering Pressure:	0.0 psig		

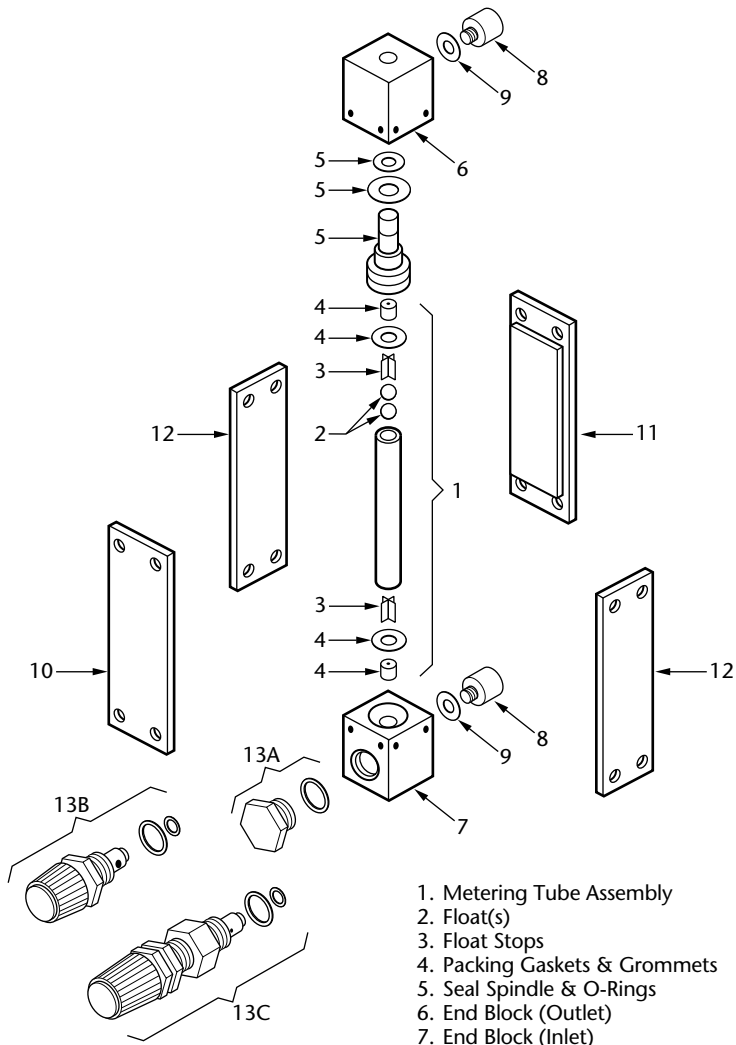
Scale Reading	Flow (slpm)	Scale Reading	Flow (slpm)	Scale Reading	Flow (slpm)	Scale Reading	Flow (slpm)
150.0	23.87	113.0	16.67	76.0	10.35	39.0	4.74
149.0	23.66	112.0	16.49	75.0	10.20	38.0	4.61
148.0	23.44	111.0	16.31	74.0	10.04	37.0	4.49
147.0	23.22	110.0	16.12	73.0	9.89	36.0	4.36
146.0	23.01	109.0	15.94	72.0	9.74	35.0	4.22
145.0	22.79	108.0	15.76	71.0	9.59	34.0	4.09
144.0	22.58	107.0	15.59	70.0	9.44	33.0	3.95
143.0	22.37	106.0	15.41	69.0	9.30	32.0	3.81
142.0	22.15	105.0	15.24	68.0	9.15	31.0	3.67
141.0	21.94	104.0	15.07	67.0	9.00	30.0	3.52
140.0	21.74	103.0	14.90	66.0	8.85	29.0	3.37
139.0	21.53	102.0	14.74	65.0	8.69	28.0	3.22
138.0	21.32	101.0	14.57	64.0	8.54	27.0	3.07
137.0	21.12	100.0	14.41	63.0	8.38	26.0	2.92
136.0	20.92	99.0	14.24	62.0	8.23	25.0	2.76
135.0	20.73	98.0	14.08	61.0	8.07	24.0	2.61
134.0	20.54	97.0	13.91	60.0	7.91	23.0	2.46
133.0	20.35	96.0	13.74	59.0	7.74	22.0	2.31
132.0	20.17	95.0	13.58	58.0	7.58	21.0	2.17
131.0	19.98	94.0	13.41	57.0	7.41	20.0	2.03
130.0	19.80	93.0	13.24	56.0	7.24	19.0	1.89
129.0	19.62	92.0	13.07	55.0	7.08	18.0	1.75
128.0	19.44	91.0	12.90	54.0	6.91	17.0	1.63
127.0	19.26	90.0	12.73	53.0	6.75	16.0	1.50
126.0	19.07	89.0	12.56	52.0	6.58	15.0	1.39
125.0	18.89	88.0	12.38	51.0	6.42	14.0	1.28
124.0	18.71	87.0	12.21	50.0	6.26	13.0	1.18
123.0	18.53	86.0	12.04	49.0	6.11	12.0	1.07
122.0	18.34	85.0	11.86	48.0	5.96	11.0	0.97
121.0	18.15	84.0	11.69	47.0	5.81	10.0	0.88
120.0	17.97	83.0	11.52	46.0	5.66	9.0	0.78
119.0	17.78	82.0	11.35	45.0	5.52	8.0	0.68
118.0	17.60	81.0	11.18	44.0	5.39	7.0	0.58
117.0	17.41	80.0	11.01	43.0	5.25	6.0	0.49
116.0	17.23	79.0	10.84	42.0	5.12	5.0	0.39
115.0	17.04	78.0	10.68	41.0	5.00		
114.0	16.86	77.0	10.51	40.0	4.87		

## CALIBRATION DATA – Tube Number FM4336

Metered Fluid	Float Material	Max. Flow	Min. Flow	Units
Air	316 SS	43.79	1.01	Std. liters/min.

Float Type:	Spherical	Metering Density:	0.00120 gms/cc
Std. Conditions:	1 Atmos. & 70°F	Float Density:	8.04000 gms/cc
Perf. Curve No.:	8.	Density @ Std. Cond.:	0.00120 gms/cc
Metering Temp.:	70°F	Metering Viscosity:	0.01812 cP
Metering Pressure:	0.0 psig		

Scale Reading	Flow (slpm)	Scale Reading	Flow (slpm)	Scale Reading	Flow (slpm)	Scale Reading	Flow (slpm)
150.0	43.79	113.0	31.32	76.0	19.72	39.0	9.25
149.0	43.43	112.0	30.98	75.0	19.42	38.0	8.99
148.0	43.06	111.0	30.64	74.0	19.12	37.0	8.74
147.0	42.69	110.0	30.31	73.0	18.82	36.0	8.49
146.0	42.33	109.0	29.98	72.0	18.52	35.0	8.23
145.0	41.96	108.0	29.66	71.0	18.23	34.0	7.97
144.0	41.60	107.0	29.34	70.0	17.93	33.0	7.72
143.0	41.24	106.0	29.02	69.0	17.64	32.0	7.46
142.0	40.89	105.0	28.71	68.0	17.35	31.0	7.19
141.0	40.53	104.0	28.42	67.0	17.06	30.0	6.93
140.0	40.18	103.0	28.12	66.0	16.77	29.0	6.66
139.0	39.83	102.0	27.83	65.0	16.48	28.0	6.40
138.0	39.48	101.0	27.54	64.0	16.19	27.0	6.14
137.0	39.14	100.0	27.25	63.0	15.90	26.0	5.87
136.0	38.80	99.0	26.96	62.0	15.61	25.0	5.61
135.0	38.47	98.0	26.67	61.0	15.31	24.0	5.35
134.0	38.15	97.0	26.38	60.0	15.02	23.0	5.09
133.0	37.84	96.0	26.08	59.0	14.73	22.0	4.83
132.0	37.52	95.0	25.79	58.0	14.44	21.0	4.57
131.0	37.21	94.0	25.49	57.0	14.15	20.0	4.32
130.0	36.90	93.0	25.19	56.0	13.86	19.0	4.07
129.0	36.59	92.0	24.88	55.0	13.58	18.0	3.83
128.0	36.28	91.0	24.57	54.0	13.29	17.0	3.59
127.0	35.97	90.0	24.25	53.0	13.00	16.0	3.36
126.0	35.65	89.0	23.92	52.0	12.72	15.0	3.13
125.0	35.34	88.0	23.60	51.0	12.43	14.0	2.91
124.0	35.02	87.0	23.27	50.0	12.15	13.0	2.69
123.0	34.70	86.0	22.94	49.0	11.87	12.0	2.48
122.0	34.37	85.0	22.62	48.0	11.60	11.0	2.27
121.0	34.04	84.0	22.29	47.0	11.32	10.0	2.06
120.0	33.71	83.0	21.96	46.0	11.05	9.0	1.85
119.0	33.37	82.0	21.63	45.0	10.78	8.0	1.64
118.0	33.03	81.0	21.30	44.0	10.52	7.0	1.43
117.0	32.69	80.0	20.98	43.0	10.27	6.0	1.22
116.0	32.34	79.0	20.66	42.0	10.01	5.0	1.01
115.0	32.00	78.0	20.34	41.0	9.76		
114.0	31.66	77.0	20.03	40.0	9.50		



- 1. Metering Tube Assembly
  - 2. Float(s)
  - 3. Float Stops
  - 4. Packing Gaskets & Grommets
  - 5. Seal Spindle & O-Rings
  - 6. End Block (Outlet)
  - 7. End Block (Inlet)
  - 8. Inlet & Outlet Adaptors
  - 9. Adaptor O-Rings
  - 10. Front Plate
  - 11. Back Plate
  - 12. Side Plates
- 3 Available Configurations (Specify One Only) {
- 13A. Valve Plug Assembly
  - 13B. Standard Valve Assembly
  - 13C. High Accuracy (NRS) Valve Assembly

Figure 1 - Series 150 Flowmeter Assembly

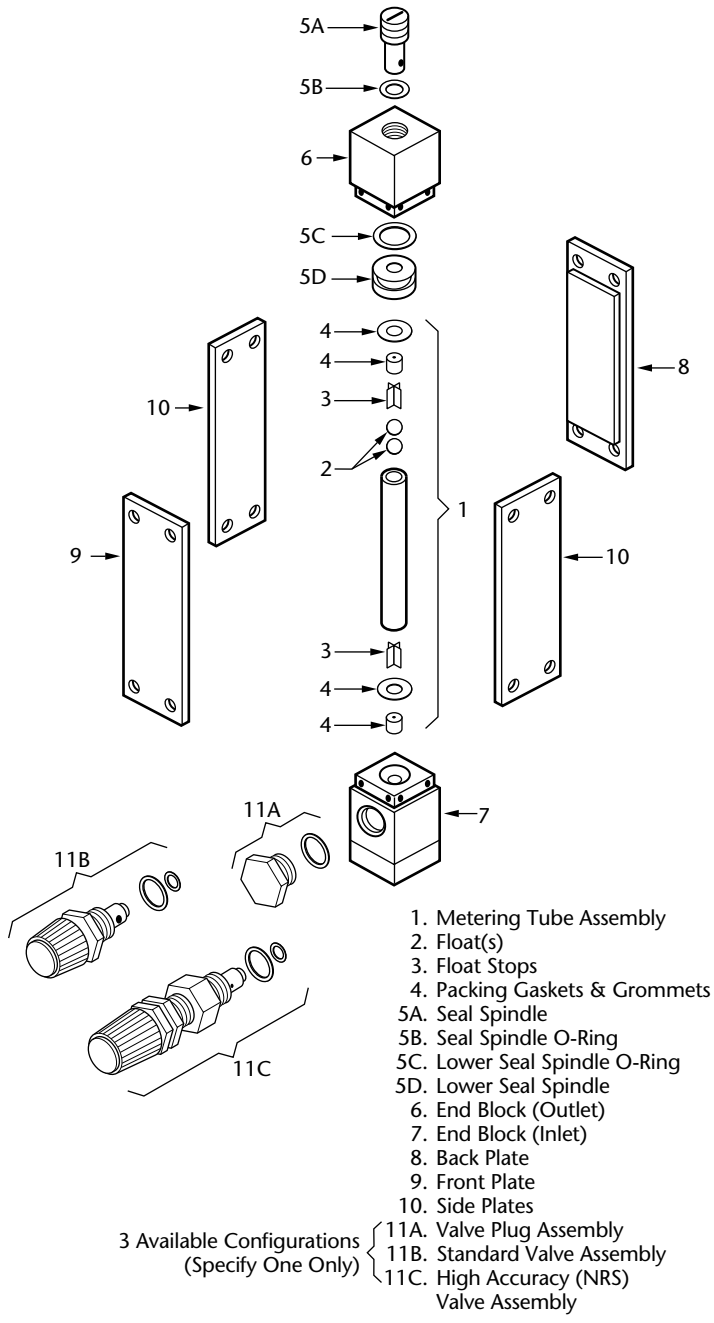


Figure 2 - Series 150K Flowmeter Assembly

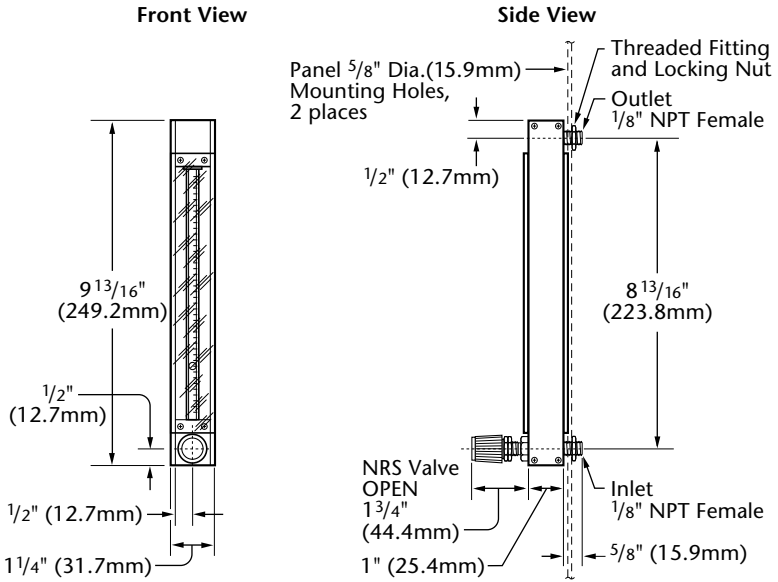


Figure 3 - Series 150 Single Tube Flowmeter Dimensions

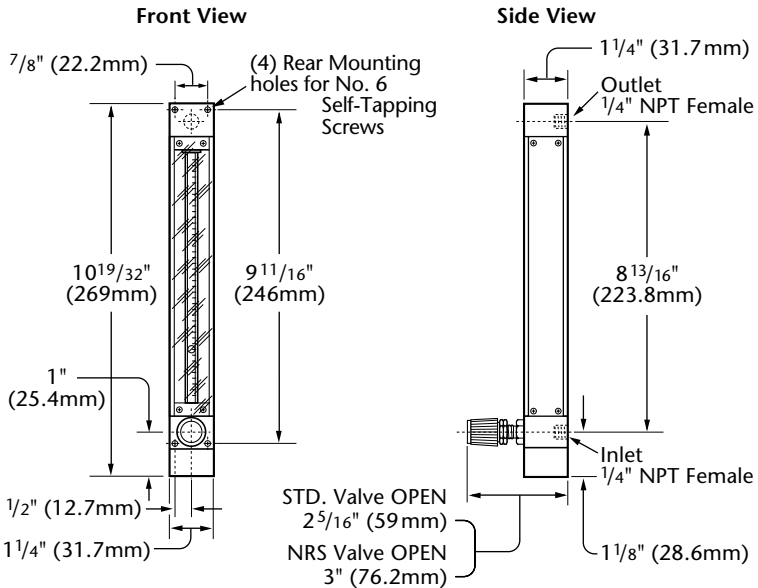
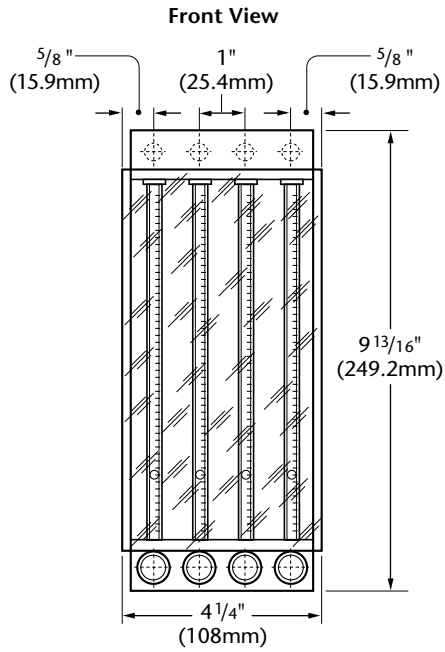


Figure 4 - Series 150K Single Tube Flowmeter Dimensions





*Figure 5 - Series 150 Four Tube Flowmeter Dimensions*

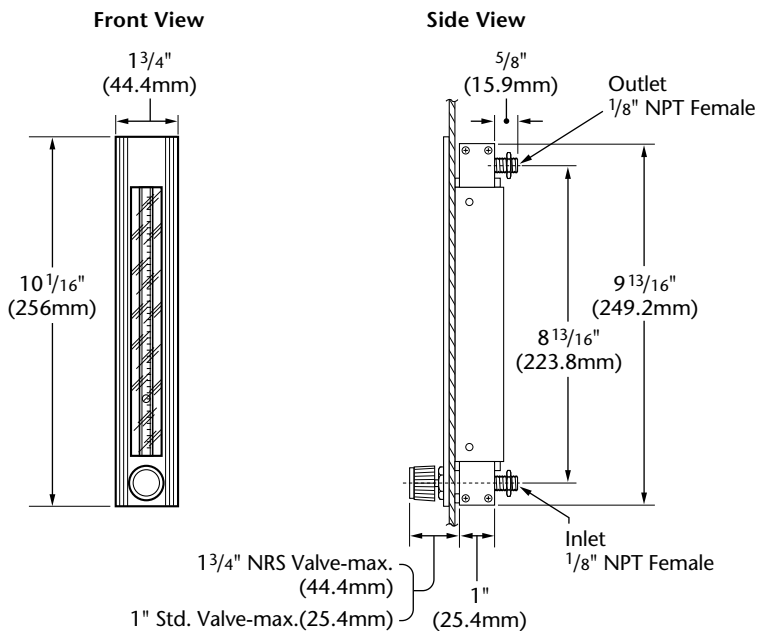


Figure 6 - Series 150 Single Tube Flowmeter Dimensions with Optional Aluminum Bezel (FM 4710)

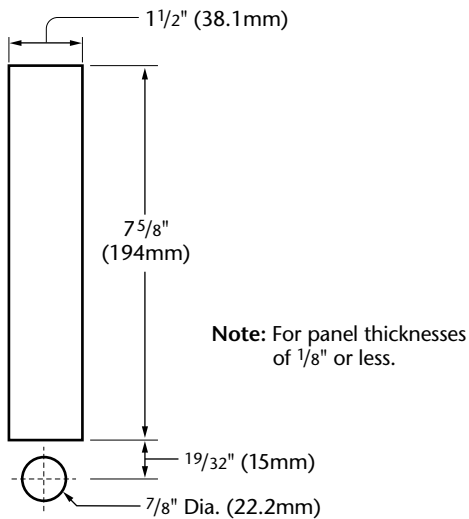


Figure 7 - Panel Cutout Dimensions for Series 150 Single Tube Flowmeter with Optional Aluminum Bezel (FM 4710)

## **WARRANTY**

---

Advanced Specialty Gas Equipment Corp.,(the Company), warrants to the initial purchaser of each flowmeter described herein, that such equipment will be free from defects in material and workmanship which result in breakdown or failure under normal use during a period of 12 months from date of shipment by the Company if used and maintained according to Advanced Specialty Gas Equipment written instructions. This warranty does not cover damage or malfunction due to corrosion. Purchaser is aware that this equipment is designed for specific applications and that using this equipment with the wrong or improperly purged gas or at the wrong pressure may damage or corrode the unit and cause personal injury. This warranty does not cover damage or malfunction due to corrosion. Purchaser must confirm that this equipment is compatible with the gas being passed through it. If there is any doubt about compatibility, consult your Advanced Specialty Gas Equipment Corp. distributor.

The Company's liability under this warranty shall be limited to the repair, or at its option, replacement or refund of the purchase price, of such equipment which proves to be defective, provided; however, that this warranty shall only apply if the purchaser (1) gives the Company written notice within ten (10) days after discovery of such defect, (2) immediately on discovery of the claimed defect, discontinues all use of such equipment, and (3) returns such equipment freight prepaid to plant of manufacture.

THERE ARE NO EXPRESS WARRANTIES OTHER THAN THOSE SPECIFIED HEREIN. NO WARRANTIES BY ADVANCED SPECIALTY GAS EQUIPMENT CORP.(OTHER THAN WARRANTY OF TITLE AS PROVIDED IN THE UNIFORM COMMERCIAL CODE) SHALL BE IMPLIED OR OTHERWISE CREATED UNDER ANY APPLICABLE LAW, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY AND WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. No claim against the Company of any kind, whether as to equipment delivery or for nondelivery of equipment and whether or not based on contract, warranty, negligence, strict liability in tort or otherwise, shall be greater in amount than the purchase price of the equipment in respect of which such claim is made. Without limiting the generality of the foregoing, Advanced Specialty Gas Equipment Corp. shall not be liable for any special, indirect, or consequential damage, such as failure of parts resulting from corrosion.

If it is determined by Advanced Specialty Gas Equipment Corp. that the equipment is to be repaired or replaced under the terms of this warranty, the cost of returning said equipment to the initial purchaser will be paid by the Company. If, however, equipment returned to the Company in connection with a claim under this warranty is found by the Company not to be defective hereunder, then such equipment will be returned to the initial purchaser, shipping charges collect, and additionally, a service charge will be paid by the purchaser to the Company to cover the cost of handling and testing such equipment.



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