

Flanged Vortex Plate

Model FVP General Specification

Product Features

- Our Inline meters can measure Steam, Gases or Liquids.
- Measures two times lower than any other Vortex Meter.
- Heavy Duty & Maintenance Free Design
- C&C Machined from one piece of solid stainless steel
- Absolutely NO o-rings or seals to wear or replace
- No leak paths
- No moving parts
- Sensors never touch process fluid
- Machined Radiuses Enhance Signal Quality
- No pins or screws to corrode and rust
- Can handle process pressure over 1000 psig
- Can handle process temperature up to 450 °F (standard) and 650 °F (high temp)
- Industry standard two wire 4-20 mA output signals



Accuracy • Reliability • Standardization • Low-Flow

Our NEW **Flanged Vortex Plate** Inline meter has a universal design which can be used in many types of process fluids including liquids, gases, and steam lines. No matter what the application, from super heated steam to super cold liquids, the same meter and electronics can be applied.

Over 30 years of experience has gone into the **Flanged Vortex Plate** meter body. The meter body is machined out of one piece of solid stainless steel stock. There are no o-rings, graph oil seals or gaskets to wear, fail or leak. The internals of the meter body have no holes to clog or edges to collect dirt or bacteria and there are of course, no moving parts.

The **Flanged Vortex Plate** element is machined into the body of the meter and its position is permanent and accurate. There are no pins holding in the element which can corrode or move. Machining the element into the body of the meter allowed for a more creative element and tail design. There are radiuses on all points between the element and the meter body which produces a more uniform signal with a high degree of accuracy.

The **Flanged Vortex Plate** dual sensor technology produces two independent vortex signals which allows for signal amplification and common mode noise reduction. Our sensors never touch the process fluid. Our crystal sensors are bonded behind a stainless steel wall. The electronics pick up the slightest pressure pulsations through the stainless steel wall generated by the vortices. This design allows our meters to have an extremely wide down while maintaining an almost unlimited upper end with a high pressure rating.

The **Flanged Vortex Plate** Flanged meter can be used as a standard flanged meter or sized to help measure your low flow applications. The vortex plate flanged meter can measure low flow rates 1 to 2 times lower than a standard inline vortex flow meter. No need to reduce your line sizes, the **FVP** will allow your customers to install a full size meter where other meters may require multiple line size reductions, in the end reducing installation costs.

Application Guide

Model	Liquid	Gas	Steam	Temperature Range		Maximum Pressure		Line Sizes	
				°F	°C	PSI	Bar	in	mm
VP	Yes	Yes	Yes	-250 to 650	-120 to 345	1000*	68.90	¾ to 8	18.75 to 200

NOTE: The same meter can be used in Steam, Gas and Liquids. The vortex plate and sensors are universal among all process fluid types.

* Sensor wall thicknesses can be changed for high pressure applications. Please consult your local sales rep or factory if your application is over 1000psi.

Performance Specifications

Accuracy (linear ranges)

Liquid.....± .5% of flow rate

Test conditions: Water at 65 °F (18.3 °C), 50 psig (3.4 bar)
with 10 pipe diameters upstream and 5 pipe diameters downstream

Gas.....± .5% of flow rate

Test conditions: Air at 65 °F (18.3 °C), 25 psig (1.7 bar)
with 10 pipe diameters upstream and 5 pipe diameters downstream

Steam.....± .5% of flow rate

Test conditions: Saturated Steam at 125 psig (8.6 bar)
with 10 pipe diameters upstream and 5 pipe diameters downstream

Repeatability.....± .25% of flow rate

Flow Rate

Adjustable from:

1 second
1 minute
1 hour
1 day

Response Time

1 – 1000 seconds

Analog Output

Calibrated to .001mA of reading

Operating Specifications

Linear Range

Reynolds number from 10,000 to 7,000,000

Measurement Range may vary depending on density

Measurable Flow Velocities

Liquid Flow	English	Metric
$V_{min.}$	1.32 ft/s	.402 m/s
$V_{max.}$	32 ft/s	9 m/s
Gas and Steam Flow	English	Metric
$V_{min.}$	$\sqrt[3]{\left(\frac{140}{\rho}\right)} \text{ ft/s}$	$\sqrt[3]{\left(\frac{143}{\rho}\right)} \text{ m/s}$
$V_{max.}$	300 ft/s	91 m/s
Where:	ρ = density (lb/ft ³)	ρ = density (kg/m ³)

Ambient Temperature Limit

32 to 145 °F (0 to 61 °C)

Ambient Humidity Limit

5 to 100% relative humidity non-condensing

Power Requirements

Standard

Isolated 14 – 36 VDC

Optional

110/220 VAC

Note: All power supplies come standard with NEMA 4X explosion proof enclosures and watertight multipole power connectors.

Output Signals

Analog

4 – 20 mA, 2 – wire system, auto digitally adjusted span

Display

6 Digits of Rate w/ Floating Decimal
Available in all Engineering Units

8 Digits of Total
Available in all Engineering Units

Serial Port

For Reading and Loading Operating Parameters

Microtel Smart TX (Local & Remote)

Operator Interface

Continuously displays both rate and total including all engineering units

2 lines, 16 characters each line, alphanumeric, reflective L.C.D. display

Field calibration with local keypad

Electronics are universal among all meter types

Diagnostics & Setup

Serial communication for computer Interface

Alphanumeric error messages displayed
For turbulent or erratic flow, flow above or below the calibrated range, and high flow or low flow cut off points

User of factory programmable parameters for sampling time, calibration, filtration, and units displayed through the serial communications port and keypad

Built in non-volatile memory for setup and calibration data, data logging information, as well as other parameters.

Over 20 year retention of flow information.

Materials

Wetted Parts of Meter

304L or 316L C&C Machined
Stainless Steel.

External Parts

304L or 316L C&C Machined
Stainless Steel.

Electrical Enclosure Specifications

Aluminum

NEMA 4X watertight and explosion proof requirements.

FM Approved
UL Classified
CSA Approved
For use in;

Class I, Groups B,C & D,
Class II, Groups E,F & G and
Class III hazardous locations as
defined by the National Electrical Codes
and Canadian Electrical Code.

Process Connection

Welded Flanged Connection
ANSI 150#, 300#, 600#, 900#,
1500#

Remote Mountable Electronics (Optional)

Available up to 300 ft (90.144m) from meter.
Uses Belden 22 gage shielded paired cable
UL approved. Provided with two watertight
mutipole power plugs.

Includes 383 Aluminum Enclosure.
Approved for NEMA 4X watertight and
explosion proof requirements.

Measurable Flow Rates w/ Low Flow Range Options

Water Minimum and Maximum Flow Rates ¹																
in. (mm)	3/4 (18.75)	1 (25)		1.5 (40)		2 (50)			3 (80)		4 (100)		6 (150)		8 (200)	
Model#	750	1000	1750	1500	1510	2000	2150	2100	3000	3200	4000	4300	6000	6400	8000	8600
gpm	1.70 40.50	2.90 67.30	1.72 40.48	7.25 165.20	2.89 67.28	12 276.50	7.24 165.20	2.89 67.29	27.10 620	12 276.50	45 1075	27.09 620	105 2440	45 1075	190 5460	105 2440
m ³ /h	.39 9.20	.65 15.40	.38 9.19	1.60 37.60	.64 15.39	2.70 63	1.59 37.60	.64 15.40	6 140.50	2.70 63	10.70 244.50	5.95 140.50	24 554	10.68 244.50	49 1120	24 554

1. Standard conditions of 68 °F (20 °C) in schedule 40 pipe

☐ = Standard Range ☐ & ☐ = Low Flow Range Options

Measurable Flow Rates w/ Low Flow Range Options

Saturated Steam Minimum and Maximum Flow Rates (lb/hr)																
Pressure ² (Density) ³	3/4"	1"		1.5"		2"			3"		4"		6"		8"	
Model #	750	1000	1750	1500	1510	2000	2150	2100	3000	3200	4000	4300	6000	6400	8000	8600
5 (.0486)	7.4 132	12.40 220	7.38 132	30.60 537	12.39 220	51.25 901	30.60 537	12.40 220	110 2,005	51.25 901	200 3,500	110 2,005	450 7,920	200 3,500	960 16,200	450 7,920
50 (.1503)	15.80 410	26.40 676	15.78 410	65.25 1,616	26.39 676	105 2,775	65.24 1,616	26.40 676	240 6,210	105 2,775	420 11,000	240 6,210	960 24,500	420 11,000	1,950 53,200	960 24,500
100 (.2577)	22.80 702	38 1,158	22.78 702	92 2,850	37.98 1,158	150 4,760	92 2,850	38 1,158	340 10,650	150 4,760	598 18,550	340 10,650	1,375 42,000	598 18,550	2,780 98,700	1,375 42,000
150 (.3614)	28.50 980	47.50 1,630	28.48 980	110 4,000	47.48 1,630	190 6,670	110 4,000	47.50 1,630	425 15,000	190 6,670	760 26,000	425 15,000	1,710 58,900	760 26,000	3,600 128,000	1,710 58,900
200 (.4688)	34 1,270	55 2,110	33.98 1,270	135 5,190	54.98 2,110	230 8,660	135 5,190	55 2,110	519 19,360	230 8,660	898 33,700	519 19,360	1,998 76,380	898 33,700	2,300 167,000	1,998 76,380
300 (.6481)	42 1,760	70 3,000	41.98 1,760	170 7,200	69.98 3,000	280 12,000	170 7,200	70 3,000	640 26,800	280 12,000	1,100 46,600	640 26,800	2,540 106,000	1,100 46,600	6,300 220,000	2,540 106,000
400 (.8613)	50 2,330	85 3,880	49.98 2,330	198 9,530	84.98 3,880	340 15,900	198 9,530	85 3,880	775 35,600	340 15,900	1,355 61,900	775 35,600	3,010 140,500	1,355 61,900	7,200 330,000	3,010 140,500
500 (1.122)	61 3,023	99 4,906	61 3,023	250 12,390	99 4,906	418 20,710	250 12,390	99 4,906	996 49,361	418 20,710	1,627 80,634	996 49,361	3,688 182,777	1,627 80,634	8,960 403,000	3,688 182,777
1000 (2.279)	98 6,151	158 9,917	98 6,151	400 25,108	158 9,917	670 42,055	400 25,108	158 9,917	1,499 94,092	670 42,055	2,609 163,76	1,499 94,092	5,914 371,221	2,609 163,766	12,040 792,330	5,914 371,221

2. psig

3. lb/ft³

☐ = Standard Range

☐ & ☐ = Low Flow Range Options

Saturated Steam Minimum and Maximum Flow Rates (kg/hr)																
Pressure ⁴ (Density) ⁵	18.75 mm	25mm		40mm		50mm			75mm		100mm		150mm		200mm	
Model #	750	1000	1750	1500	1510	2000	2150	2100	3000	3200	4000	4300	6000	6400	8000	8600
.4 (.7779)	3.40 59.60	5.6 99.50	3.40 59.60	13.90 244	5.6 99.50	23.30 407	13.90 244	5.6 99.50	52 910	23.30 407	90.50 1,585	52 910	203 3,590	90.50 1,585	430 8,200	203 3,590
3.4 (2.372)	7.10 182	11.90 302	7.10 182	29.30 742	11.90 302	49 1,240	29.30 742	11.90 302	109 2,775	49 1,240	190 4,830	109 2,775	430 10,980	190 4,830	980 23,600	430 10,980
6.9 (4.127)	10.30 316	17.20 526	10.30 316	42.40 1,290	17.20 526	70.80 2,160	42.40 1,290	17.20 526	158 4,830	70.80 2,160	276 8,400	158 4,830	625 19,040	276 8,400	1,290 21,600	625 19,040
11 (6.125)	13.50 470	22.40 780	13.50 470	55.20 1,915	22.40 780	92.20 3,201	55.20 1,915	22.40 780	206 7,160	92.20 3,201	359 12,465	206 7,160	814 28,255	359 12,465	1,720 36,400	814 28,255
13.8 (7.508)	15.45 575	25.75 1002	15.45 575	63.2 2,350	25.75 1002	105 3,925	63.2 2,350	25.75 1002	236 8,777	105 3,925	411 15,280	236 8,777	933 34,640	411 15,280	2,225 68,700	933 34,640
20.7 (10.38)	19.20 795	31.90 1,321	19.20 795	78.50 3,246	31.90 1,321	131 5,425	78.50 3,246	31.90 1,321	293 12,135	131 5,425	510 21,120	293 12,135	1,150 47,885	510 21,120	2,430 102,000	1,150 47,885
27 (13.79)	23.20 1,056	38.60 1,756	23.20 1,056	94.90 4,320	38.60 1,756	158 7,210	94.90 4,320	38.60 1,756	354 16,130	158 7,210	617 28,070	354 16,130	1,400 63,640	617 28,070	3,100 138,600	1,400 63,640
34.5 (17.969)	27.66 1,370	44.89 2,224	27.66 1,370	113 5,619	44.89 2,224	189 9,392	113 5,619	44.89 2,224	451 22,385	189 9,392	737 36,568	451 22,385	1,672 82,892	737 36,568	4,063 182,766	1,672 82,892
69 (36.5)	44 2,789	71.65 4,497	44 2,789	181 11,386	71.65 4,497	303 19,072	181 11,386	71.65 4,497	679 42,672	303 19,072	1,183 74,270	679 42,672	2,682 168,35	1,183 74,270	5,460 359,333	2,682 168,354

4. bar

3. kg/m³

☐ = Standard Range

☐ & ☐ = Low Flow Range Options

Measurable Flow Rates w/ Low Flow Range Options

Natural Gas Minimum and Maximum Flow Rates (SCFM)¹

Pressure ² (Density) ³	3/4"	1"			1.5"		2"			3"		4"		6"		8"	
Model #	750	1000	1750	1500	1510	2000	2150	2100	3000	3200	4000	4300	6000	6400	8000	8600	
0 (.0330)	2.85 44.40	4.80 73.80	2.85 44.40	11.80 181.30	4.80 73.80	19.75 305	11.80 181.30	4.80 73.80	44 678	19.75 305	76.90 1,180	44 678	174 2675	76.90 1,180	380 6,300	174 2675	
50 (.1451)	7.75 196	12.90 325	7.75 196	31.70 798	12.90 325	53 1333	31.70 798	12.90 325	118 2,990	53 1333	198 5,200	118 2,990	467 11,770	198 5,200	1,060 24,600	467 11,770	
100 (.2573)	11.3 346	18.90 576	11.3 346	46.60 1,415	18.90 576	77.75 2,370	46.60 1,415	18.90 576	175 5,290	77.75 2,370	298 9,210	175 5,290	690 20,870	298 9,210	1,420 46,300	690 20,870	
150 (.3695)	14.40 510	24 830	14.40 510	58 2,035	24 830	98.90 3,400	58 2,035	24 830	220 7,595	98.90 3,400	385 13,202	220 7,595	870 29,980	385 13,202	1,830 72,400	870 29,980	
200 (.4816)	17.30 650	28.75 1,080	17.30 650	70.50 2,650	28.75 1,080	118 4,425	70.50 2,650	28.75 1,080	260 9,900	118 4,425	460 17,230	260 9,900	1,040 39,060	460 17,230	2,240 92,600	1,040 39,060	
300 (.7060)	22.30 950	37 1,580	22.30 950	90 3,885	37 1,580	150 6,485	90 3,885	37 1,580	340 14,510	150 6,485	590 25,250	340 14,510	1,340 57,250	590 25,250	2,040 138,400	1,340 57,250	
400 (.9303)	26.75 1,255	44.60 2,085	26.75 1,255	105 5,120	44.60 2,085	180 8,550	105 5,120	44.60 2,085	400 19,125	180 8,550	710 33,275	400 19,125	1,600 75,400	710 33,275	3,680 163,000	1,600 75,400	
500 (1.155)	30 1,555	525 2,585	30 1,555	125 6,350	525 2,585	210 10,610	125 6,350	525 2,585	470 23,730	210 10,610	820 41,300	470 23,730	1860 93,650	820 41,300	4,460 220,600	1860 93,650	
1000 (2.276)	48.70 3,075	80 5,100	48.70 3,075	198 12,550	80 5,100	330 20,900	198 12,550	80 5,100	740 46,780	330 20,900	1,290 81,420	740 46,780	2,930 184,600	1,290 81,420	7,200 406,400	2,930 184,600	

1. Standard conditions of 68 °F (20 °C) in schedule 40 pipe

2. psig

3. lb/ft³

☐ = Standard Range

☒ & ☐ = Low Flow Range Options

Natural Gas Minimum and Maximum Flow Rates (SCMM)⁴

Pressure ⁵ (Density) ⁶	18.75 mm	25mm			40mm		50mm			75mm		100mm		150mm		200mm	
Model #	750	1000	1750	1500	1510	2000	2150	2100	3000	3200	4000	4300	6000	6400	8000	8600	
0 (.5281)	.0819 1.256	.136 2.09	.0819 1.256	.334 5.13	.136 2.09	.559 8.58	.334 5.13	.136 2.09	1.25 19.20	.559 8.58	2.17 33.40	1.25 19.20	4.93 75.72	2.17 33.40	9.12 152.40	4.93 75.72	
3.4 (2.300)	.218 5.47	.363 9.10	.218 5.47	.890 22.35	.363 9.10	1.49 37.35	.890 22.35	.363 9.10	3.33 83.56	1.49 37.35	5.80 145.50	3.33 83.56	13.10 329.70	5.80 145.50	27.30 689.70	13.10 329.70	
6.9 (4.124)	.322 9.81	.536 16.32	.322 9.81	1.31 40.10	.536 16.32	2.20 66.98	1.31 40.10	.536 16.32	4.93 150	2.20 66.98	8.57 261	4.93 150	19.44 591.20	8.57 261	51.60 1,370	19.44 591.20	
11 (6.260)	.426 14.90	.708 24.77	.426 14.90	1.74 60.85	.708 24.77	2.91 101.70	1.74 60.85	.708 24.77	6.5 227.40	2.91 101.70	11.33 395.50	6.5 227.40	25.60 898	11.33 395.50	73.20 1,780	25.60 898	
13.8 (7.719)	.490 18.36	.815 30.55	.490 18.36	2 75.03	.815 30.55	3.34 125.40	2 75.03	.815 30.55	7.45 280.40	3.34 125.40	13.03 488.10	7.45 280.40	29.50 1,107	13.03 488.10	74 2,460	29.50 1,107	
20.7 (11.31)	.632 26.91	1.05 44.77	.632 26.91	2.58 110	1.05 44.77	4.31 1.83	2.58 110	1.05 44.77	9.66 411	4.31 1.83	16.81 715.50	9.66 411	38.12 1,622	16.81 715.50	86.20 4,220	38.12 1,622	
27.6 (14.91)	.76 35.46	1.26 59	.76 35.46	3.10 145	1.26 59	5.19 242.20	3.10 145	1.26 59	11.61 541.70	5.19 242.20	20.21 942.90	11.61 541.70	45.80 2,138	20.21 942.90	123 5,240	45.80 2,138	
34.5 (18.51)	.878 44.05	1.46 73.22	.878 44.05	3.58 180	1.46 73.22	5.90 301	3.58 180	1.46 73.22	13.41 672.30	5.90 301	23.34 1,170	13.41 672.30	52.95 2,653	23.34 1,170	146 5,720	52.95 2,653	
69 (36.48)	1.38 87.77	2.29 144.30	1.38 87.77	5.60 354.60	2.29 144.30	9.40 592.60	5.60 354.60	2.29 144.30	21.09 1,325	9.40 592.60	36.70 2,307	21.09 1,325	83.24 5,231	36.70 2,307	189 11,200	83.24 5,231	

4. Standard conditions of 68 °F (20 °C) in schedule 40 pipe

5. bar

6. kg/m³

☐ = Standard Range

☒ & ☐ = Low Flow Range Options

Measurable Flow Rates w/ Low Flow Range Options

Air Minimum and Maximum Flow Rates (SCFM)¹

Pressure ² (Density) ³	3/4"	1"		1.5"		2"			3"		4"		6"		8"	
Model #	750	1000	1750	1500	1510	2000	2150	2100	3000	3200	4000	4300	6000	6400	8000	8600
0 (0.0752)	2.19 44.36	3.65 73.80	2.19 44.36	8.98 181.30	3.65 73.80	15.01 303	8.98 181.30	3.65 73.80	33.57 678	15.01 303	58.43 1,180	33.57 678	132.50 2,675	58.43 1,180	279.40 3,560	132.50 2,675
50 (0.3312)	5.90 195	9.82 325	5.90 195	24.13 798	9.82 325	40.32 1,333	24.13 798	9.82 325	90.20 2,982	40.32 1,333	157 5,191	90.20 2,982	356 11,770	157 5,191	710 23,200	356 11,770
100 (0.5871)	8.60 346.10	14.30 576	8.60 346.10	35.35 1,415	14.30 576	59.08 2,365	35.35 1,415	14.30 576	132 5,287	59.08 2,365	230 9,203	132 5,287	521 20,866	230 9,203	1,080 44,300	521 20,866
150 (0.8430)	11.01 497	18.32 826.80	11.01 497	45 2,031	18.32 826.80	75.20 3,395	45 2,031	18.32 826.80	168.20 7,592	75.20 3,395	292.80 13,215	168.20 7,592	663 29,965	292.80 13,215	1,320 68,300	663 29,965
200 (1.0998)	13.14 5,050	21.86 1,078	13.14 5,050	53.70 2,650	21.86 1,078	89.75 4,425	53.70 2,650	21.86 1,078	200 9,897	89.75 4,425	349 17,226	200 9,897	790 39,060	349 17,226	1,502 92,600	790 39,060
300 (1.611)	16.96 950	28.20 1,580	16.96 950	69.30 3,881	28.20 1,580	115 6,485	69.30 3,881	28.20 1,580	259 14,507	115 6,485	450 25,250	259 14,507	1,022 57,248	450 25,250	2,300 123,000	1,022 57,248
400 (2.123)	20.39 1,251	33.90 2,082	20.39 1,251	83.32 5,115	33.90 2,082	139 8,546	83.32 5,115	33.90 2,082	311 19,116	139 8,546	542 33,275	311 19,116	1,229 75,440	542 33,275	2,750 145,300	1,229 75,440
500 (2.635)	23.55 1,553	39.15 2,585	23.55 1,553	96.23 6,348	39.15 2,585	160 10,607	96.23 6,348	39.15 2,585	359 23,726	160 10,607	626 41,300	359 23,726	1,415 93,635	626 41,300	3,240 209,600	1,415 93,635
1000 (5.194)	37.03 3,065	61.60 5,095	37.03 3,065	150 12,520	61.60 5,095	252 20,910	150 12,520	61.60 5,095	565 46,775	252 20,910	984 81,420	565 46,775	2,232 184,588	984 81,420	4,500 424,000	2,232 184,588

1. Standard conditions of 68 °F (20 °C) in schedule 40 pipe

2. psig

3. lb/ft³

 = Standard Range

 & = Low Flow Range Options

Air Minimum and Maximum Flow Rates (SCMM)⁴

Pressure ⁵ (Density) ⁶	18.75 mm	25mm		40mm		50mm			75mm		100mm		150mm		200mm	
Model #	750	1000	1750	1500	1510	2000	2150	2100	3000	3200	4000	4300	6000	6400	8000	8600
0 (1.205)	.062 1.25	.1035 2.09	.062 1.25	.254 5.134	.1035 2.09	.425 8.57	.254 5.134	.1035 2.09	.95 19.19	.425 8.57	1.65 33.40	.95 19.19	3.75 75.72	1.65 33.40	7.20 168	3.75 75.72
3.4 (5.248)	.742 5.47	.276 9.10	.742 5.47	.678 22.35	.276 9.10	1.13 37.35	.678 22.35	.276 9.10	2.53 83.56	1.13 37.35	4.41 145.40	2.53 83.56	10 329.70	4.41 145.40	22.30 675	10 329.70
6.9 (9.409)	.742 9.80	.407 16.32	.742 9.80	1.002 40.08	.407 16.32	1.67 66.98	1.002 40.08	.407 16.32	3.74 149.80	1.67 66.98	6.51 260.80	3.74 149.80	14.77 591.20	6.51 260.80	32.50 1,210	14.77 591.20
11 (14.28)	.323 14.89	.538 24.77	.323 14.89	1.32 60.85	.538 24.77	2.21 101.70	1.32 60.85	.538 24.77	4.94 227.40	2.21 101.70	8.60 396	4.94 227.40	19.50 197.60	8.60 396	43.60 412	19.50 197.60
13.8 (17.61)	0.372 18.36	.619 30.54	0.372 18.36	1.52 75.03	.619 30.54	2.52 125.40	1.52 75.03	.619 30.54	5.68 280.40	2.52 125.40	9.80 488.10	5.68 280.40	22.44 1,107	9.80 488.10	49.60 2,450	22.44 1,107
20.7 (25.82)	.480 26.95	.790 44.77	.480 26.95	1.96 110	.790 44.77	3.28 184	1.96 110	.790 44.77	7.34 412	3.28 184	12.78 715.50	7.34 412	28.96 1,622	12.78 715.50	62 3,580	28.96 1,622
27.6 (34.02)	.577 35.46	.960 59	.577 35.46	2.36 145	.960 59	3.94 242.20	2.36 145	.960 59	8.82 541.70	3.94 242.20	15.35 943	8.82 541.70	34.80 2,138	15.35 943	74 4,460	34.80 2,138
34.5 (42.22)	.667 44.05	1.11 73.22	.667 44.05	2.72 180	1.11 73.22	4.55 300.60	2.72 180	1.11 73.22	10.19 672.30	4.55 300.60	17.70 1,170	10.19 672.30	40.20 2,654	17.70 1,170	86.60 3,650	40.20 2,654
69 (83.24)	1.04 86.77	1.74 144.30	1.04 86.77	4.28 354.60	1.74 144.30	7.16 593	4.28 354.60	1.74 144.30	16.03 1,325	7.16 593	27.89 2,307	16.03 1,325	63.24 5,231	27.89 2,307	132 13,200	63.24 5,231

4. Standard conditions of 68 °F (20 °C) in schedule 40 pipe

5. bar

6. kg/m³

 = Standard Range

 & = Low Flow Range Options

Straight Run Piping Requirements

Straight Run Piping Requirements	Upstream	Downstream
One 90° elbow before the meter	10 D	5 D
Two 90° elbows before the meter	15 D	5 D
Two 90° elbows out of plane before the meter	30 D	5 D
Reduction before meter	10 D	5 D
Regulator or Valve partially closed before meter	30 D	5 D
Tee Connection before meter	30 D	5 D

D is equal to the internal diameter of the pipe. If there is not sufficient straight run of pipe a straightening plate or our Flanged Vortex Plate Flow Meter can be used to reduce the above lengths. Consult your local representative or factory regarding your application.

Other Installation Considerations

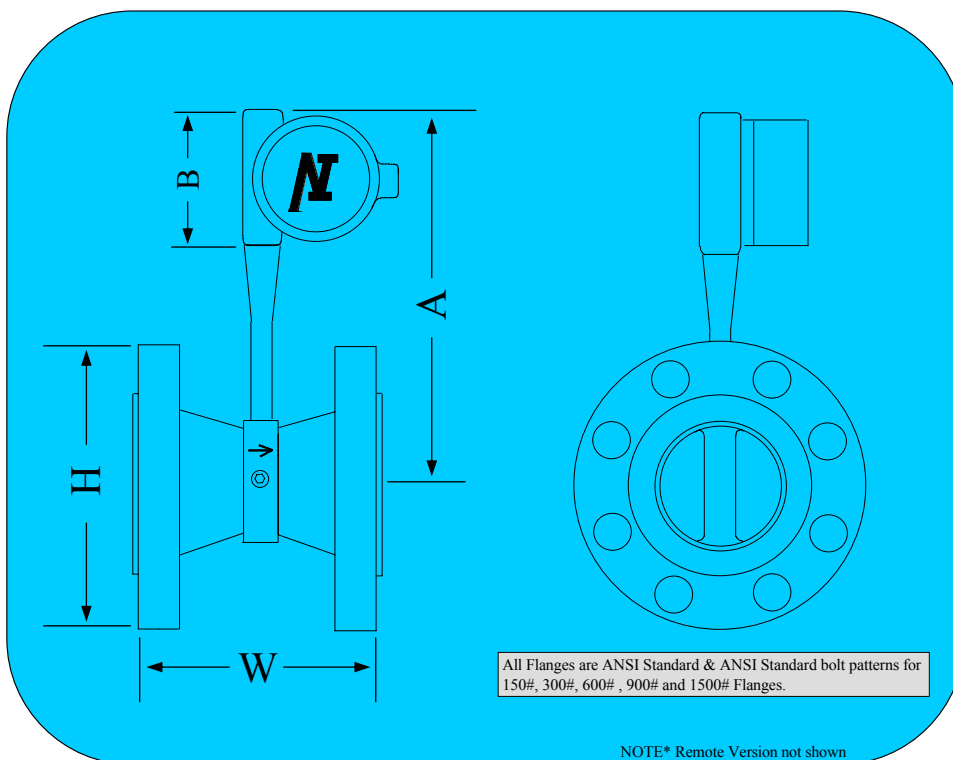
Meter Orientation

The VP can be installed in almost any orientation around the pipe. Vertically, horizontally or angled pipe sections are a good installation locations for the Vortex Plate. For liquid applications, the fluid must completely fill the pipe

Site Selection

The flow measurement location should be selected to minimize turbulence and swirl. The more laminar the flow profile the better the site location. The extent of the flow turbulence depends on what type of piping is upstream and downstream from the meter. (Please see straight run piping requirements above) Valves, elbows, regulators, pumps, tee connections, and other piping components may add disturbances to the flow.

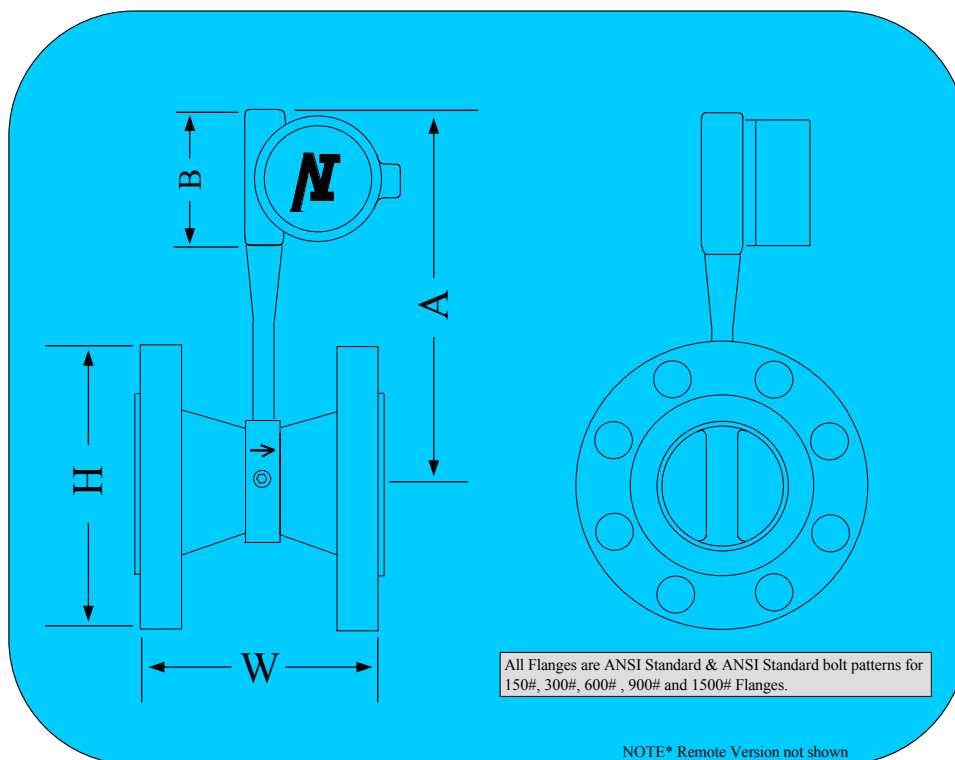
Flanged Vortex Plate Inline Flow Meter



Dimension Tables w/ ANSI Class 150 Flanges

Model #	Connection Size		H		W		A		B	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
FVP 750	0.75	19.05	3.88	98.55	4.87	123.69	11.63	295.4	5.00	127.00
FVP 1000	1.00	25.00	4.25	107.95	5.13	130.30	11.82	300.23	5.00	127.00
FVP 1750			4.25	107.95	5.13	130.30	11.63	295.4	5.00	127.00
FVP 1500	1.50	40.00	5.00	127.00	5.63	143.00	12.25	311.15	5.00	127.00
FVP 1510			5.00	127.00	5.63	143.00	11.82	300.23	5.00	127.00
FVP 2000	2.00	50.00	6.00	152.40	5.75	146.05	12.63	320.8	5.00	127.00
FVP 2150			6.00	152.40	5.75	146.05	12.25	311.15	5.00	127.00
FVP 2100			6.00	152.40	5.75	146.05	11.82	300.23	5.00	127.00
FVP 3000	3.00	75.00	7.50	190.50	6.75	171.45	13.25	336.55	5.00	127.00
FVP 3200			7.50	190.50	6.25	158.75	12.63	320.8	5.00	127.00
FVP 4000	4.00	100.00	9.00	228.60	7.50	190.50	14.00	355.6	5.00	127.00
FVP 4300			9.00	228.60	7.25	184.15	13.25	336.55	5.00	127.00
FVP 6000	6.00	150.00	11.00	279.40	9.00	228.60	15.00	381	5.00	127.00
FVP 6400			11.00	279.40	8.50	215.90	14.00	355.6	5.00	127.00
FVP 8000	8.00	200.00	13.50	342.90	10.00	254.00	15.00	381	5.00	127.00
FVP 8600			13.50	342.90	10.00	254.00	15.00	381	5.00	127.00

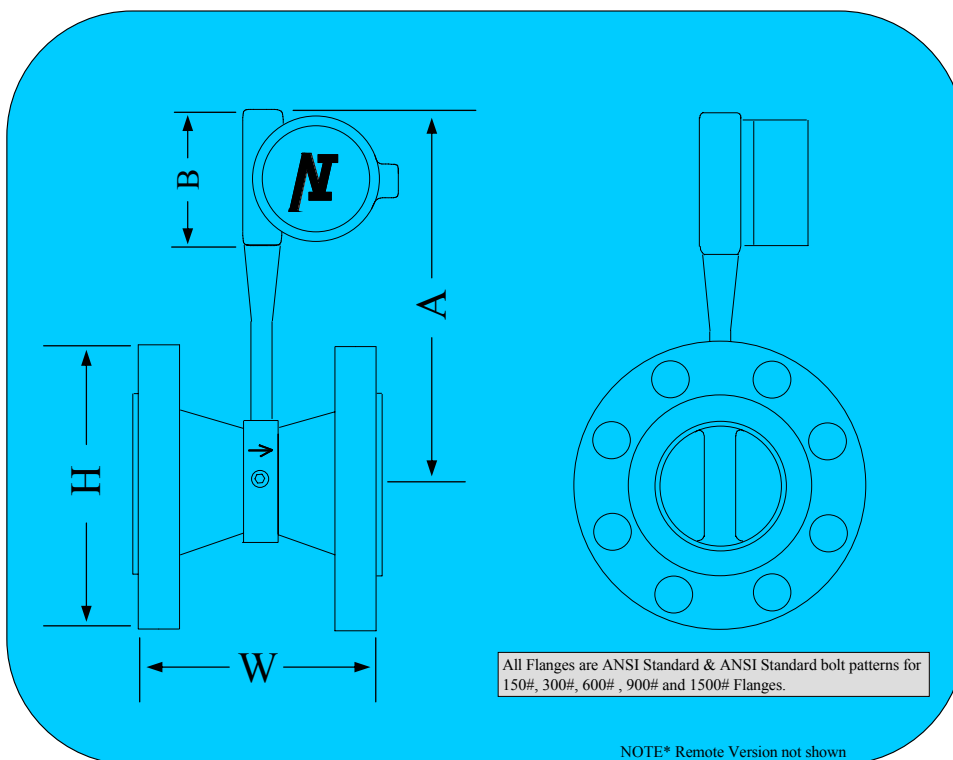
Flanged Vortex Plate Inline Flow Meter



Dimension Tables w/ ANSI Class 300 Flanges

Model #	Connection Size		H		W		A		B	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
FVP 750	0.75	19.05	4.62	117.35	5.25	133.35	11.63	295.4	5.00	127.00
FVP 1000	1.00	25.00	4.88	123.95	5.63	143.00	11.82	300.23	5.00	127.00
FVP 1750			4.88	123.95	5.63	143.00	11.63	295.4	5.00	127.00
FVP 1500	1.50	40.00	6.12	155.45	6.13	155.70	12.25	311.15	5.00	127.00
FVP 1510			6.12	155.45	6.13	155.70	11.82	300.23	5.00	127.00
FVP 2000	2.00	50.00	6.50	165.10	6.25	158.75	12.63	320.8	5.00	127.00
FVP 2150			6.50	165.10	6.25	158.75	12.25	311.15	5.00	127.00
FVP 2100			6.50	165.10	6.25	158.75	11.82	300.23	5.00	127.00
FVP 3000	3.00	75.00	8.25	209.55	7.49	190.24	13.25	336.55	5.00	127.00
FVP 3200			8.25	209.55	6.99	177.54	12.63	320.8	5.00	127.00
FVP 4000	4.00	100.00	10.10	256.54	8.26	209.80	14.00	355.6	5.00	127.00
FVP 4300			10.10	256.54	8.01	203.45	13.25	336.55	5.00	127.00
FVP 6000	6.00	150.00	12.50	317.50	9.76	247.90	15.00	381	5.00	127.00
FVP 6400			12.50	317.50	9.26	235.20	14.00	355.6	5.00	127.00
FVP 8000	8.00	200.00	15.00	381.00	10.76	273.30	15.00	381	5.00	127.00
FVP 8600			15.00	381.00	10.76	273.30	15.00	381	5.00	127.00

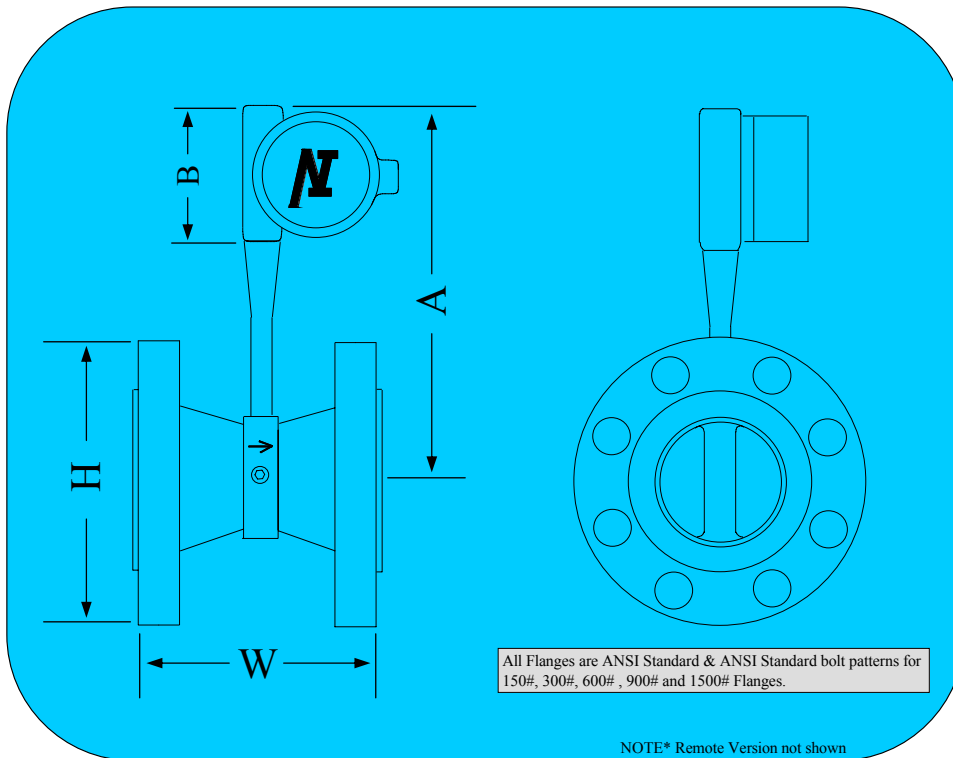
Flanged Vortex Plate Inline Flow Meter



Dimension Tables w/ ANSI Class 400 Flanges

Model #	Connection Size		H		W		A		B	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
FVP 750	0.75	19.05	4.62	117.34	4.87	123.70	11.63	295.4	5.00	127.00
FVP 1000	1.00	25.00	4.88	123.95	5.63	143.00	11.82	300.23	5.00	127.00
FVP 1750			4.88	123.95	5.63	143.00	11.63	295.4	5.00	127.00
FVP 1500	1.50	40.00	6.12	155.44	6.25	158.75	12.25	311.15	5.00	127.00
FVP 1510			6.12	155.44	6.25	158.75	11.82	300.23	5.00	127.00
FVP 2000	2.00	50.00	6.50	165.10	6.51	165.35	12.63	320.8	5.00	127.00
FVP 2150			6.50	165.10	6.51	165.35	12.25	311.15	5.00	127.00
FVP 2100			6.50	165.10	6.51	165.35	11.82	300.23	5.00	127.00
FVP 3000	3.00	75.00	8.25	209.55	7.75	196.85	13.25	336.55	5.00	127.00
FVP 3200			8.25	209.55	7.25	184.15	12.63	320.8	5.00	127.00
FVP 4000	4.00	100.00	10.00	254.00	8.50	215.90	14.00	355.6	5.00	127.00
FVP 4300			10.00	254.00	8.25	209.55	13.25	336.55	5.00	127.00
FVP 6000	6.00	150.00	12.50	317.50	10.12	257.04	15.00	381	5.00	127.00
FVP 6400			12.50	317.50	9.62	244.34	14.00	355.6	5.00	127.00
FVP 8000	8.00	200.00	15.00	381.00	11.24	285.50	15.00	381	5.00	127.00
FVP 8600			15.00	381.00	11.24	285.50	15.00	381	5.00	127.00

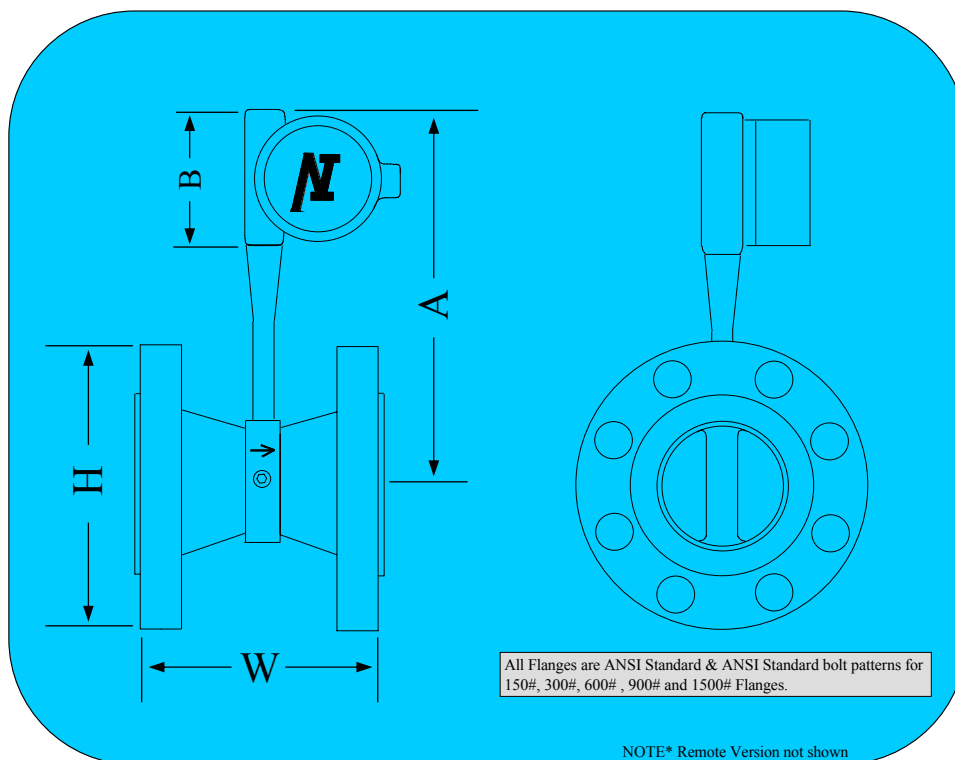
Flanged Vortex Plate Inline Flow Meter



Dimension Tables w/ ANSI Class 600 Flanges

Model #	Connection Size		H		W		A		B	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
FVP 750	0.75	19.05	4.62	117.34	5.25	133.35	11.63	295.4	5.00	127.00
FVP 1000	1.00	25.00	4.88	123.95	5.63	143.00	11.82	300.23	5.00	127.00
FVP 1750			4.88	123.95	5.63	143.00	11.63	295.4	5.00	127.00
FVP 1500	1.50	40.00	6.12	155.45	6.25	158.75	12.25	311.15	5.00	127.00
FVP 1510			6.12	155.45	6.25	158.75	11.82	300.23	5.00	127.00
FVP 2000	2.00	50.00	6.50	165.10	6.51	165.35	12.63	320.8	5.00	127.00
FVP 2150			6.50	165.10	6.51	165.35	12.25	311.15	5.00	127.00
FVP 2100			6.50	165.10	6.51	165.35	11.82	300.23	5.00	127.00
FVP 3000	3.00	75.00	8.25	209.55	7.75	196.85	13.25	336.55	5.00	127.00
FVP 3200			8.25	209.55	7.25	184.15	12.63	320.8	5.00	127.00
FVP 4000	4.00	100.00	10.75	273.05	9.50	241.30	14.00	355.6	5.00	127.00
FVP 4300			10.75	273.05	9.25	234.95	13.25	336.55	5.00	127.00
FVP 6000	6.00	150.00	14.00	355.60	11.24	285.49	15.00	381	5.00	127.00
FVP 6400			14.00	355.60	10.74	272.79	14.00	355.6	5.00	127.00
FVP 8000	8.00	200.00	16.50	419.10	12.50	317.50	15.00	381	5.00	127.00
FVP 8600			16.50	419.10	12.50	317.50	15.00	381	5.00	127.00

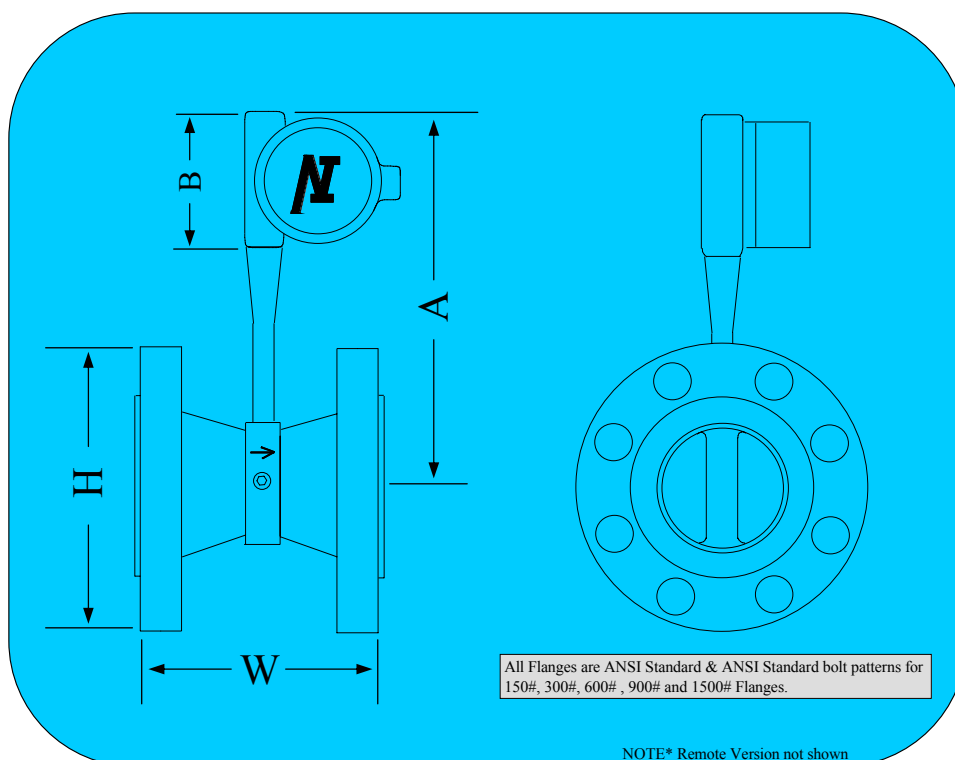
Flanged Vortex Plate Inline Flow Meter



Dimension Tables w/ ANSI Class 900 Flanges

Model #	Connection Size		H		W		A		B	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
FVP 750	0.75	19.05	5.13	130.30	6.25	158.75	11.63	295.4	5.00	127.00
FVP 1000	1.00	25.00	5.88	149.35	6.51	165.34	11.82	300.23	5.00	127.00
FVP 1750			5.88	149.35	6.51	165.34	11.63	295.4	5.00	127.00
FVP 1500	1.50	40.00	7.00	177.80	7.25	184.15	12.25	311.15	5.00	127.00
FVP 1510			7.00	177.80	7.25	184.15	11.82	300.23	5.00	127.00
FVP 2000	2.00	50.00	8.50	215.90	8.75	222.25	12.63	320.8	5.00	127.00
FVP 2150			8.50	215.90	8.75	222.25	12.25	311.15	5.00	127.00
FVP 2100			8.50	215.90	8.75	222.25	11.82	300.23	5.00	127.00
FVP 3000	3.00	75.00	9.50	241.30	9.25	234.95	13.25	336.55	5.00	127.00
FVP 3200			9.50	241.30	8.75	222.25	12.63	320.8	5.00	127.00
FVP 4000	4.00	100.00	11.50	292.10	10.50	266.70	14.00	355.6	5.00	127.00
FVP 4300			11.50	292.10	10.25	260.35	13.25	336.55	5.00	127.00
FVP 6000	6.00	150.00	15.00	381.00	13.00	330.20	15.00	381	5.00	127.00
FVP 6400			15.00	381.00	12.50	317.50	14.00	355.6	5.00	127.00
FVP 8000	8.00	200.00	18.50	469.90	14.76	374.90	15.00	381	5.00	127.00
FVP 8600			18.50	469.90	14.76	374.90	15.00	381	5.00	127.00

Flanged Vortex Plate Inline Flow Meter



Dimension Tables w/ ANSI Class 1500 Flanges

Model #	Connection Size		H		W		A		B	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
FVP 750	0.75	19.05	5.13	130.30	6.25	158.75	11.63	295.4	5.00	127.00
FVP 1000	1.00	25.00	5.88	149.35	6.51	165.35	11.82	300.23	5.00	127.00
FVP 1750			5.88	149.35	6.51	165.35	11.63	295.4	5.00	127.00
FVP 1500	1.50	40.00	7.00	177.80	7.25	184.15	12.25	311.15	5.00	127.00
FVP 1510			7.00	177.80	7.25	184.15	11.82	300.23	5.00	127.00
FVP 2000	2.00	50.00	8.50	215.90	8.75	222.25	12.63	320.8	5.00	127.00
FVP 2150			8.50	215.90	8.75	222.25	12.25	311.15	5.00	127.00
FVP 2100			8.50	215.90	8.75	222.25	11.82	300.23	5.00	127.00
FVP 3000	3.00	75.00	10.50	266.70	10.51	266.95	13.25	336.55	5.00	127.00
FVP 3200			10.50	266.70	10.01	254.25	12.63	320.8	5.00	127.00
FVP 4000	4.00	100.00	12.25	311.15	11.26	286.00	14.00	355.6	5.00	127.00
FVP 4300			12.25	311.15	11.01	279.65	13.25	336.55	5.00	127.00
FVP 6000	6.00	150.00	15.50	393.70	15.50	393.70	15.00	381	5.00	127.00
FVP 6400			15.50	393.70	15.00	381.00	14.00	355.6	5.00	127.00
FVP 8000	8.00	200.00	19.00	482.60	18.76	476.50	15.00	381	5.00	127.00
FVP 8600			19.00	482.60	18.76	476.50	15.00	381	5.00	127.00

Weight Tables for Flanged Vortex Plate Inline Flow Meter

ANSI Class 150 Flanges

Model #	Connection Size		Total Weight	
	in.	mm	lbs.	kg.
FVP 750	0.75	19.05	8.75	3.97
FVP 1000	1.00	25.00	10.00	4.54
FVP 1750			9.75	4.42
FVP 1500	1.50	40.00	13.50	6.12
FVP 1510			13.00	5.90
FVP 2000	2.00	50.00	18.50	8.39
FVP 2150			17.50	7.94
FVP 2100			17.00	7.71
FVP 3000	3.00	75.00	33.50	15.19
FVP 3200			29.50	13.38
FVP 4000	4.00	100.00	49.00	22.22
FVP 4300			43.50	19.73
FVP 6000	6.00	150.00	76.00	34.47
FVP 6400			68.00	30.84
FVP 8000	8.00	200.00	107.00	48.53
FVP 8600			107.00	48.53

ANSI Class 300 Flanges

Model #	Connection Size		Weight	
	in.	mm	lbs.	kg.
FVP 750	0.75	19.05	10.75	4.88
FVP 1000	1.00	25.00	13.00	5.90
FVP 1750			12.75	5.78
FVP 1500	1.50	40.00	19.50	8.84
FVP 1510			19.00	8.62
FVP 2000	2.00	50.00	22.50	10.20
FVP 2150			21.50	9.75
FVP 2100			21.00	9.52
FVP 3000	3.00	75.00	46.50	21.09
FVP 3200			42.50	19.27
FVP 4000	4.00	100.00	69.00	31.29
FVP 4300			63.50	28.80
FVP 6000	6.00	150.00	106.00	48.07
FVP 6400			96.00	43.54
FVP 8000	8.00	200.00	161.00	73.02
FVP 8600			124.00	56.24

ANSI Class 600 Flanges

Model #	Connection Size		Total Weight	
	in.	mm	lbs.	kg.
FVP 750	0.75	19.05	11.75	5.33
FVP 1000	1.00	25.00	13.00	5.90
FVP 1750			12.75	5.78
FVP 1500	1.50	40.00	21.50	9.75
FVP 1510			21.00	9.52
FVP 2000	2.00	50.00	26.50	12.02
FVP 2150			25.50	11.56
FVP 2100			25.00	11.34
FVP 3000	3.00	75.00	46.50	21.09
FVP 3200			42.50	19.27
FVP 4000	4.00	100.00	90.00	40.82
FVP 4300			84.50	38.32
FVP 6000	6.00	150.00	169.00	76.64
FVP 6400			162.00	73.47
FVP 8000	8.00	200.00	247.00	112.02
FVP 8600			247.00	112.02

ANSI Class 900 Flanges

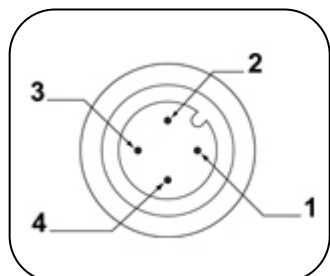
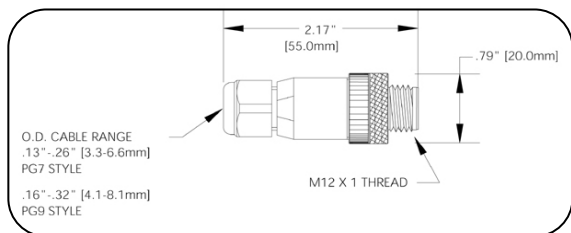
Model #	Connection Size		Total Weight	
	in.	mm	lbs.	kg.
FVP 750	0.75	19.05	18.75	8.16
FVP 1000	1.00	25.00	22.00	9.97
FVP 1750			21.75	9.86
FVP 1500	1.50	40.00	33.50	15.19
FVP 1510			33.00	14.96
FVP 2000	2.00	50.00	54.50	24.71
FVP 2150			53.50	24.26
FVP 2100			53.00	24.03
FVP 3000	3.00	75.00	68.50	31.06
FVP 3200			64.50	29.25
FVP 4000	4.00	100.00	118.00	53.51
FVP 4300			112.50	51.02
FVP 6000	6.00	150.00	243.00	110.20
FVP 6400			236.00	107.03
FVP 8000	8.00	200.00	397.00	180.05
FVP 8600			397.00	180.05

Multi Pole Power Plug



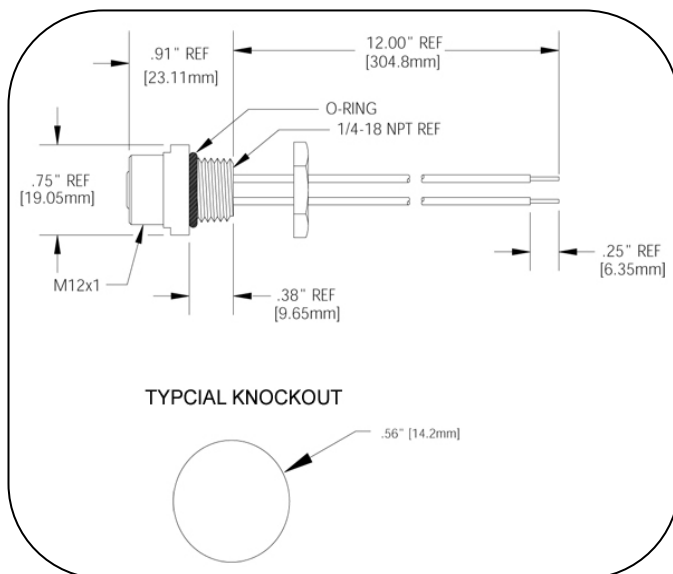
Our weather proof multi pole connector virtually eliminates wiring errors in the field. Simply plug the connector into the top of the NEMA 4 enclosure and screw it down for a dust free and water tight connection. This design saves the customer time and money because our electronics package never comes out of the enclosure. No internal wiring is required and no connecting of hard to reach terminal blocks. This design also allows for a conduit connection to be screwed over the power plug for power plant and explosion proof requirements. Simply plug and play!

Dimensions



- 1 = Ground
- 2 = none
- 3 = Negative
- 4 = Positive

Note: All wiring of plugs is done at factory location



Specifications

Mechanical

Contact Carrier - Polyurethane (PUR)
Pin Contact - Copper Alloy
Contact Plating - Gold over nickel
Body - Polyamide
Grommet - Nitrile
Termination - Screw
Conductor size - #26AWG to #18AWG
Cable Range - .13" - .26" (3.3mm - 6.6mm)
O-ring - Viton
Coupling nut - Nickel Plated Brass

Environmental

Protection - IP68, NEMA 6P
Ambient Operating Temperature - -25C to 85C

Electrical

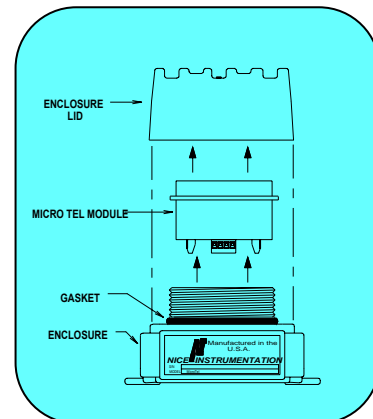
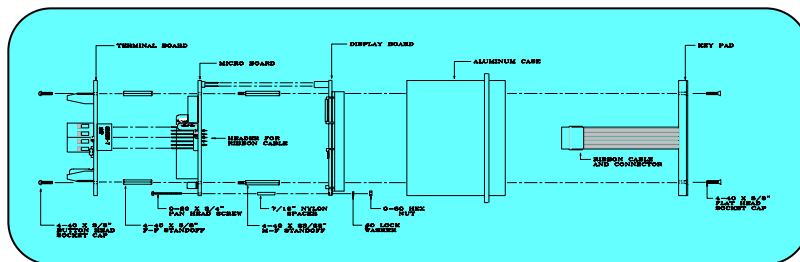
Voltage Rating - 250V AC/DC
Amperage - 4A

Certifications

UL - UL Classified, File #E152210
CSA - cCSAus, LR6837

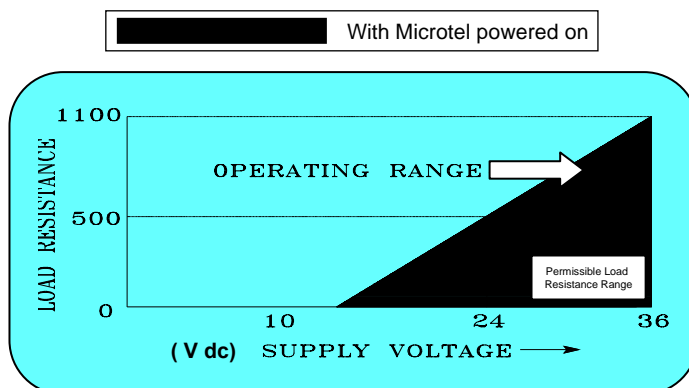
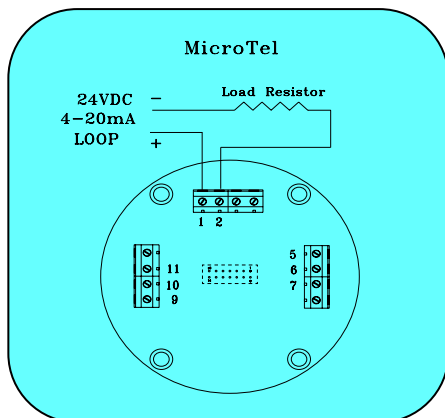
Dimensions and Weights

Microtel Assembly

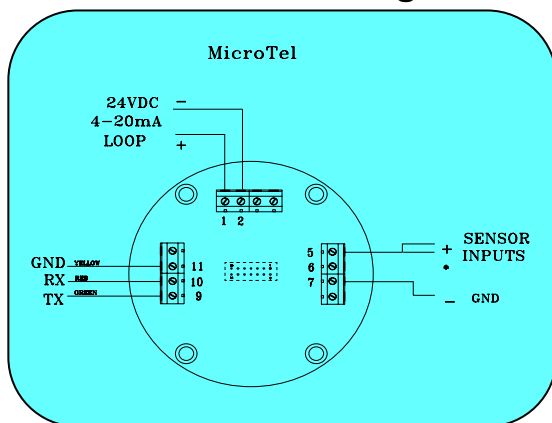


Internal Wiring Diagrams

Microtel Load Resistance



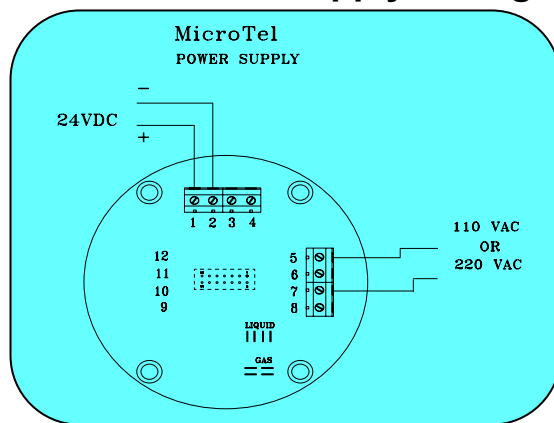
Microtel Internal Wiring



VDC Power: Analog Output

Scalable 4-20mA output, complete 2 wire device. Load resistor may be installed on supply or return line. $V_s = 14-36$ VDC. See graph above.

Microtel Power Supply Wiring



VAC Power: Analog Output

Scalable 4-20mA output, complete 2 wire device. Load resistor may be installed on supply or return line.

Model # FVP-XXX(X)-X-XX(X)-XX

Category	Description	Suffix Codes				
Model	Flanged Vortex Plate Inline Flow Meter - (Steam, Gas & Liquids) Mounting Assembly, Alignment Pin, NEMA 4 Enclosure	FVP	—	—	—	—
Model Number	Standard line sizes ¾" up to 8" 750, 1000, 1500, 2000, 3000, 4000, 6000, 8000 For Low-Flow Models see flow charts	— —	750 8000	— —	— —	— —
Microtel Transmitter Display	Local w/ rate and total Remote w/ rate and total (comes with 30' of cable – up to 300')	— —	— —	L R	— —	— —
Power Supply	Standard 24 V dc input Integral 110 V ac input Integral 220 V ac input	— — —	— — —	— — —	24 110 220	— — —
-250 to 450 °F (-120 to 235 °C)	Standard Temperature -250 to 450 °F (Steam, Gas & Liquids)	—	—	—	—	LT
-250 to 650 (-120 to 345 °C)	High Temperature -250 to 650 °F (Steam, Gas & Liquids)	—	—	—	—	HT

Notes:

1. Your registered representative will use Nice Instrumentation Vortex Sizing Application to determine precise scaling factor for your application.
2. The Standard remote option comes with 30 feet of cable, extra cable available up to 300 feet from meter.
3. Unit has 4-20mA output
4. Enclosure for local and remote display is NEMA 4X watertight and explosion proof requirements.

FM Approved
UL Classified
CSA Approved
For use in;
Class I, Groups B,C & D,
Class II, Groups E,F & G and
Class III hazardous locations as
defined by the National Electrical Codes
and Canadian Electrical Code.

Nice Vortex Sizing Program for precise application sizing

Please specify the following information with your order:

- Fluid Type
- Min – Max operating flow rate
- Operating Temperature
- Operating Pressure
- Flange Class

Other Products from...



**Remote Low Profile Insertion
Vortex**



Nice Instrumentation, Inc.
999 Route 9
Parlin, NJ 08859

Phone: 1-732-952-5324
Fax: 1-732-727-8911

sales@niceinstrumentation.com
www.niceinstrumentation.com



Low Profile Insertion Vortex

- Alignment Pin & Mounting assembly
- Solid stainless steel construction



Vortex Plate

- Worlds only $\frac{3}{4}$ " thin vortex plate
- Solid stainless steel construction

