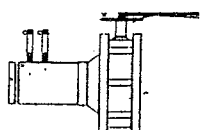
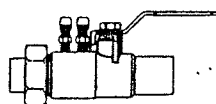


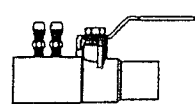
Model AF



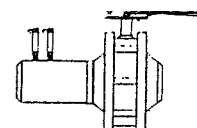
Model AG



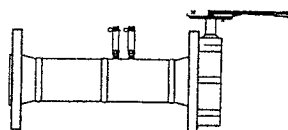
Model AP



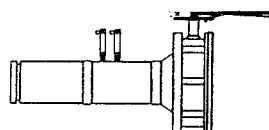
Model AS



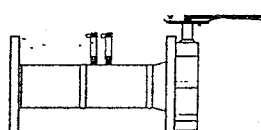
Model AW



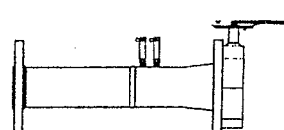
Model EF



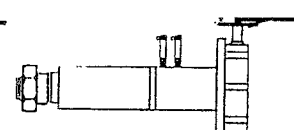
Model EG



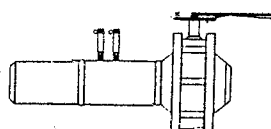
Model ER



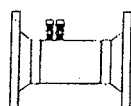
Model ES



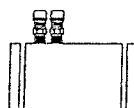
Model ET



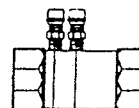
Model EW



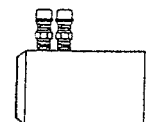
Model VF



Model VG



Model VT



Model VW

### Descriptions

#### Model AF 2" - 14"

150# flanged-end venturi with a lug butterfly valve attached to the downstream side. Pressure access ports are standard. Also, an infinite-position handle with memory stop through 6" with a gear operator 8" and up is standard. The assembly meets "Buy America" guidelines.

#### Model AG 2" - 14"

Grooved venturi on the entry with a lug butterfly valve mounted on the downstream exit end and a 150# grooved flange adapter, supplied loose, for attachment to the butterfly valve and downstream grooved pipe. Pressure access ports are standard. Also, an infinite-position handle with memory stop through 6" with a gear operator 8" and up is standard. The assembly meets "Buy America" guidelines.

#### Model AP 2 1/2"

- Venturi section • Ball valve • Port section
- Union • Directional flow • Memory stop
- Dual access ports • High / Low range for 1/2" & 3/4" • SWT or FPT (ball end) X SWT, FPT or MPT (union end)

#### Model AS 1/2" - 2"

One reduction size available on union end - SWT, FPT or MPT

- Venturi section • Ball valve • Port section
- Directional flow • Dual access ports
- Memory stop • High / Low range for 1/2" & 3/4" • FPT or SWT X FPT or SWT or 2 1/2" FPT X MPT

#### Model AW 2" - 14"

Weld-end venturi on the inlet with a lug type butterfly valve mounted to the downstream venturi flange, and a 150# weld-end flange mounted to the butterfly valve. Pressure access ports are standard. Also, an infinite-position handle with memory stop through 6" with a gear operator 8" and up is standard. The assembly meets "Buy America" guidelines.

#### Model EF 2" - 8"

Five pipe diameter inlet extension added to the model AF which provides adequate straight run when close coupled to control valves or pumps. • *Field installation requires two 150# mating flanges, nuts and bolts. The cap screws to mate with the butterfly are included.*



<b>Model EG</b> 2" - 8"	Five pipe diameter inlet extension added to the model AG which provides adequate straight run when close coupled to control valves or pumps. • <i>Field installation requires one standard grooved coupling for the upstream attachment.</i>	built-in five diameter inlet section along with a 150# R.F. flange and lug butterfly valve attached to the downstream side. Access ports and infinite-position handles with memory stop are standard.
<b>Model ER</b> 2 1/2" - 6"	Designed to flange directly to flanged ATC valves. The inlet flange has one-size reduction. The model has built-in five diameter inlet section along with a 150# R.F. flange and lug butterfly valve attached to the downstream side. Pressure access ports and an infinite position handle with memory stop are standard. This assembly meets "Buy America" guidelines.	<b>Model EW</b> 2" - 8" Five pipe diameter inlet extension added to the Model AW which provides adequate straight run when close-coupled to control valves or pumps. • <i>Field installation requires no additional material.</i>
<b>Model ES</b> 4" & 6"	Same description as Model ER but has a two-size inlet reduction.	<b>Model VF</b> 2" - 14" • Low loss steel venturi • Dual access ports • Flanged 150# ends
<b>Model ET</b> 2 1/2" - 4"	These AccuSetters have an inlet MPT to attach to threaded brass ATC valves with an integral dielectric union. The model has a	<b>Model VG</b> 2" - 14" • Low loss steel venturi • Dual access ports • Grooved ends
		<b>Model VT</b> 1/2" - 2 1/2" • Low loss brass venturi • Dual access ports • 1/2" - 2" FPT X FPT • 2 1/2" MPT x MPT
		<b>Model VW</b> 2" - 14" • Low loss steel venturi • Dual access ports • Schedule 40 weld ends

### Model Designation Example:

**Model / Size**  
3/4" Low Flow AP Shown

**Options w/ Locations**  
Use for options that require specified locations.  
Dual P/T's @ 3:00 & 9:00 and Manual Air Vent @ 12:00 Shown

**APL075 - FS / 1/2FS - DP3&9, AV12 - MI**

**Connections**  
Ball valve end first. See specifications for available connections.  
Female Sweat X 1/2" Reduced Female Sweat Shown

**Options**  
Use for options that have specific locations.  
Metal ID Tag Shown

UL = ultra low flow range    L = low flow range    H = high flow range  
G = grooved    FS = female sweat    MS = male sweat    FT = female thread    MT = male thread    FL = flanged

<b>AA</b> Automatic Air Vent	<b>DN</b> Dielectric Nipple (MPT x MPT)	<b>MB</b> Mini Ball Blowdown, Drain or Gauge Cock	<b>RB</b> Reducing Bushing (M X F)
<b>AV</b> Manual Air Vent	<b>DP</b> Dual P/T Ports (in lieu of std. access ports)	<b>MI</b> Metal Tag	<b>RC</b> Reducing Coupling (F X F)
<b>BB</b> Ball Blowdown / Drain	<b>DX</b> Dual XL P/T Ports (in lieu of std. ports)	<b>MM</b> Adapter (MPT X MPT)	<b>SE</b> Stem Extender
<b>C2</b> 1/2" Accessory Port	<b>EM</b> Extended Handle with Memory Stop	<b>PI</b> Plastic Tag	<b>SF</b> Sweat Adapter (C X F)
<b>C3</b> 3/4" Accessory Port	<b>HA</b> Ball Valve	<b>PL</b> Plug	<b>SM</b> Sweat Adapter (C X M)
<b>C4</b> 1/4" Accessory Port for Steel Products	<b>HN</b> Hose End Drain Valve	<b>PM</b> Pair 1/4" Mini Ball Valves w/Refrigeration Quick Disconnect Fittings	<b>SN</b> Standard Nipple (M X M)
<b>CA</b> Compression Adapter	<b>HX</b> 3/4" Hose Adapter	<b>QD</b> Pair of 1/4" Mini Ball Valves w/Hydraulic Quick Discnt.	<b>SP</b> Specials (Consult Factory)
<b>CC</b> Cap & Chain			<b>T4</b> 1/4" Accessory Port
<b>DG</b> Dielectric Nipple (MPT x Grooved)			<b>TE</b> Piping Tee (F X F X F)
			<b>TH</b> Tee Handle

# Venturi & Accusetter Valves Installation, Operation and Maintenance

## Installation

Accusetters & Venturis are unidirectional, observe flow arrows. Models can be installed in horizontal or vertical lines.

### **Straight Run Requirements**

1. Some Accusetters have the necessary straight run length built-in and can be installed directly in front of 90° elbows or control valves. They are models AP, EF, EG, ER, ES, ET, EW and F.
2. All other models require three upstream pipe diameters from a 90° elbow and five pipe diameters from a modulating control valve. The downstream pipe diameters should ideally be two, however they can be eliminated in tight locations with only a small (2%) reduction in accuracy.

### **Tap Locations (Pressure Taps or P/T Ports)**

1. For portable D.P. metering, the taps can be pointing at any clock position except 6:00 (down).
2. For permanent installations, the ideal clock position for the taps are 4:00 or 5:00 to avoid trapping air in the impulse lines. A 3:00 position (level) is OK.
3. Options such as air vents should be up and drains down, otherwise the valve can be rotated so the handle and memory stop are convenient.
4. Insulation: On 1/2" to 2" brass products, the standard handle and taps will clear 1" thick insulation. For thicker insulation, a 1 1/2" handle or port extension is available. On 2 1/2" and larger steel products, the valve handle and pressure taps will clear 2 1/2" insulation.

### **Products With Butterfly Valves**

1. Assemble and tighten the flanges to the valve.
2. Align and place the assembly to the mating piping.
3. Tack weld the flange to the pipe.

**Warning: Do not finish welding the flanges to the pipe with the valve bolted between the flanges. This will result in serious heat damage to the valve seat.**

4. Remove the flange bolting and valve from between the flanges.
5. Finish welding the flanges to the pipe and allow the flanges to cool completely before proceeding.
6. Install valve. Do not use flange gaskets. The molded valve gasket will seal against standard ANSI flanges.
7. Turn disk to full open position. Center valve and hand tighten bolts.

8. Slowly close to check for adequate disk clearance.
9. Return disk to full open position and cross-tighten all bolts.

## Operation

1. The flow is determined by measuring the differential pressure (D.P.) across the high (Red) and low (Green) taps of the venturi. Convert the measured D.P. to inches W.C. and use the appropriate chart to read the GPM.

Request the proper chart from the selection below:

<u>Chart Form*</u>	<u>Models</u>
<b>F192</b>	AP, AS, F, VT
<b>F193</b>	AF, AG, AW, EF, EG, ER, EW, VF, VG, VW
<b>F239</b>	ES, ET

2. Accusetters are equipped with a downstream throttling valve to adjust the flow. (Not Model F, see #4) Slowly close the valve while reading the D.P. gauge until the desired GPM is reached. Set the memory stop so the handle position is maintained even if the valve is temporary closed.
3. The meter used to measure the D.P. must be used in accordance with the specific instructions for that meter. All meters require purging of the air from the hoses. Also, care should be taken to attach the high pressure hose to the upstream tap (Red) and the low pressure hose to the other (Green) tap.
4. The Model F is installed on the supply side of the coil. The Model F ball valve is not used for throttling. Use the isolation ball valve on the return side; slowly close it until the desired GPM is reached. Set the memory stop on the handle.

## Maintenance

1. There is no periodic maintenance required on any of the venturis.
2. Products with ball valves may have a stem packing gland to prevent leaking at the stem. Tighten the stem packing nut in 1/4 turn increments until the leak stops.

\* Call FDI for more information.

Troubleshooting GuidePossible CausePossible Solution• PROBLEM: D.P. Gauge Reading Zero or Very Low

- |  |  |
|--|--|
| 1) Valves closed on hoses or gauge                 | 1) Open all high & low impulse line valves   |
| 2) Zeroing manifold valve is open                  | 2) Close by-pass or zero valve.  |
| 3) High & low impulse hoses reversed               | 3) Switch hoses.   |
| 4) Impulse ports clogged                           | 4) Clean out P/T port or pressure ports.   |
| 5) No water flow                                   | 5) Make sure pipeline valves are open.   |
| 6) Defective D.P. meter                            | 6) Use another meter or verify with the difference in pressure gauge readings on each port.  |
| 7) Beta ratio too high<br>or wrong AccuSetter used | 7) Verify flow using D.P. across the wide-open ATC valve. Also check tag & location numbers. |

• PROBLEM: D.P. Gauge Reading Too High

- |   |  |
|---|--|
| 1) Circuit unbalanced.                              | 1) Reduce flow by slowly closing ball or butterfly valve in the circuit. |
| 2) Valve is closed on the low-pressure impulse line | 2) Open all impulse lines.   |
| 3) Low (downstream) pressure or P/T port clogged    | 3) Clean ports.  |
| 4) Wrong product placed in circuit                  | 4) Check model, tag and location number.                                 |

Differential Pressure: Inches W.C. (cont.)

Flow GPM	Models											
	500H	600L	600H	800L	800H	1000L	1000H	1200L	1200H	1400L	1400H	1600L
775	88	106	27	35		16						
800	94	113	29	38		17						
825	100	120	31	40		18						
850	106	127	33	42		20						
875	112	135	35	45	10	21						
900	119	143	37	47	11	22						
925	126	151	39	50	11	23						
950	133	159	41	53	12	24						
975	140	167	43	56	13	26						
1000	147	176	46	59	13	27						
1100	178	213	55	71	16	33		11				
1200	212	253	66	84	19	39		13				
1300	248	297	77	99	22	46	11	16				
1400	288	345	89	115	26	53	12	18		10		
1500	331	396	103	132	30	61	14	21		11		
1600	376	450	117	150	34	69	16	24	11	13		
1700	425		132	169	38	78	18	27	12	14		10
1800	476		148	190	43	88	20	30	14	16	10	12
1900			165	212	48	98	23	33	15	18	11	13
2000			183	235	53	109	25	37	17	20	12	14
2200			221	284	64	131	30	44	20	24	15	17
2400			263	338	76	156	36	53	24	29	17	21
2600			309	396	89	183	42	62	28	34	21	24
2800			358	460	104	213	49	72	33	39	24	28
3000			411		119	244	56	83	38	45	27	32
3200			467		135	278	64	94	43	51	31	37
3400					153	314	72	106	48	58	35	42
3600					171	352	81	119	54	65	39	47
3800					191	392	90	133	60	72	44	52
4000					212	434	100	147	67	80	49	58
4200					233	479	110	162	74	88	54	64
4400					256		121	178	81	97	59	70
4600					280		132	194	88	106	64	76
4800					305		144	212	96	115	70	83
5000					331		156	230	105	125	76	90
5500					400		189	278	127	151	92	109
6000					476		225	331	151	180	109	130
6500							264	388	177	211	128	152
7000							306	450	205	245	149	176
7500							352		235	282	171	203
8000							400		268	320	194	230
8500							452		302	362	219	260
9000									339	405	246	292
9500									377	452	274	325
10000									418	500	304	360
10500									461		335	397
11000											367	436
11500											401	476
12000											437	
12500											474	

Model	200L	200H	250L	250H	300L	300H	400L	400H	500L	500H	600L
FF	86.5	143.6	138.4	311.4	282	580	519	709	692	1427	1304

Model	600H	800L	800H	1000L	1000H	1200L	1200H	1400L	1400H	1600L
FF	2560	2259	4758	3322	6920	5709	8460	7733	9930	9117



# Steel Models: VW, VG, VF, AW, AG, AF, EW, EG, EF, ER

Venturi GPM Flow versus Differential Pressure 16 to 775 GPM

Differential Pressure: Inches W.C.

Flow GPM	Models												
	200L	200H	250L	250H	300L	300H	400L	400H	500L	500H	600L	600H	800L
16	10												
18	13												
20	16												
22	19												
24	23												
26	27	10	11										
28	31	11	12										
30	36	13	14										
32	41	15	16										
34	46	17	18										
36	52	19	20										
38	58	21	23										
40	64	23	25										
42	71	26	28										
44	77	28	30										
46	85	31	33										
48	92	33	36										
50	100	36	39										
55	121	44	47		11								
60	144	52	56	11	14								
65	169	61	66	13	16								
70	196	71	77	15	18								
75	225	82	88	17	21								
80	256	93	100	20	24								
85	289	105	113	22	27								
90	324	118	127	25	30								
95	361	131	141	28	34		10						
100	400	145	156	31	38		11						
110	484	176	189	37	46	11	13						
120		209	225	44	54	13	16						
130		245	264	52	64	15	19	10	11				
140		285	306	60	74	17	22	12	12				
150		327	352	69	85	20	25	13	14				
160		372	400	79	96	23	28	15	16				
170		420	452	89	109	26	32	17	18				
180		470		100	122	29	36	19	20				
190				111	136	32	40	21	23				
200				123	151	36	44	24	25				
220				149	182	43	54	29	30				
240				178	217	51	64	34	36		10		
260				209	254	60	75	40	42	10	12		
280				242	295	70	87	47	49	12	14		
300				278	339	80	100	54	56	13	16		
325				326	396	94	117	63	66	16	19		
350				378	461	109	136	73	77	18	22		
375				434		125	156	84	88	21	25		
400				494		143	178	95	100	24	28		
425						161	201	107	113	27	32		11
450						180	225	120	127	30	36		12
475						201	251	134	141	33	40	10	13
500						223	278	149	156	37	44	11	15
525						246	306	164	172	40	48	13	16
550						270	336	180	189	44	53	14	18
575						295	367	197	207	49	58	15	19
600						321	400	214	225	53	63	16	21
625						348	434	232	244	57	69	18	23
650						376	469	251	264	62	74	19	25
675						406		271	285	67	80	21	27
700						437		291	306	72	86	22	29
725						468		313	329	77	92	24	31
750								335	352	83	99	26	33
775								357	375	88	106	27	35

## Notes:

1. Permanent pressure loss equals 10 percent of differential pressure.
2. The recommended ranges are shown in bold. All differentials have been rounded to the nearest inch.
3. Generally, the recommended low ΔP signal is 24" so it can be read on most HVAC instruments. D.P.'s below 12" are not accurate on some sizes.
4. The upper D.P. limit is an effort to minimize the permanent pressure loss which is 10 percent of the D.P. signal. Any venturi can be operated above the recommended range if the permanent pressure drop is acceptable.
5. The D.P.'s in the table were calculated using the following formula:  $D.P. = \left( \frac{GPM \cdot 17.3}{\dots} \right)^2$

For EF flow factors, see reverse