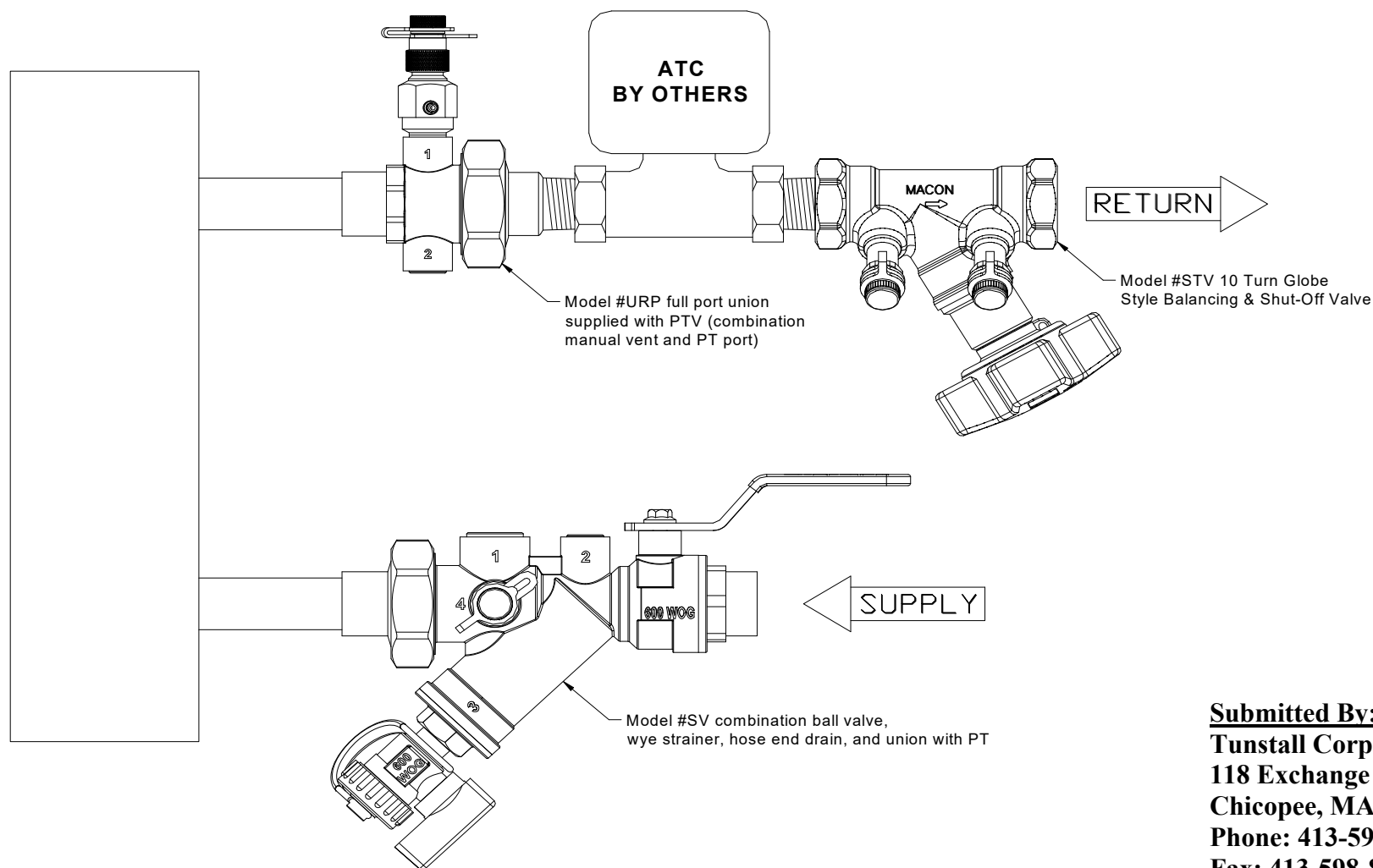


# Valve Package (Model # 2RS-CS)

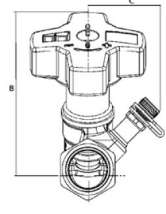
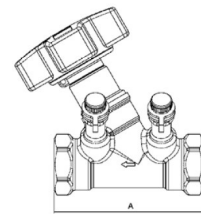
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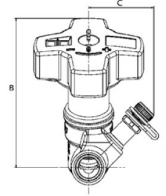
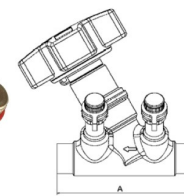
**Submitted By:**  
**Tunstall Corporation**  
118 Exchange Street  
Chicopee, MA 01013  
Phone: 413-594-8695  
Fax: 413-598-8109

**FEATURES**

- Accurate and precise flow measurement
- Accurate and precise flow balancing
- Positive Shut-off
- Offsetting Pressure/temperature ports, Self sealing with optional Drain Kits
- "Y" Pattern Globe style design
- Multi-turn, 360° handwheel with vernier scale and digital readout
- Built in memory stop
- Wide vairyety of accessories available



**STV Series**



**STVL Series**

SPECIFICATIONS	
Pressure Ratings:	300 psil (20 Bar)
Temperature Ratings:	-4°F to 248°F (-20°C to 120°C)
Body, Bonnet:	Dezincification Resistant Brass*
End Connections:	STV - Female, NPT STVL - Solder, SWT
Gaskets:	EPDM
Seat Seal	EPDM
Handwheel:	Polyamide Plastic (Blue)

\*The use of DZR Brass eliminates the use of dielectric fittings.

NOMINAL DIMENSIONS & WEIGHTS										Valve Selection Guide			
MODEL	SIZE			A Length	B Height	C PIT Offset	WEIGHT		Handwheel Turns		Min. Flow	Nominal Range of Flow	Max. Flow
	in	mm					lbs	kg					
STV-1/2 STVL-1/2	0.50"	15	in	3.39	3.74	1.57	1.2	0.53	10	<b>GPM</b>	<b>0.14</b>	<b>0.5 - 3.8</b>	<b>12.1</b>
			mm	86.11	95	40				<b>LPM</b>	<b>0.52</b>	<b>1.89 - 14.36</b>	<b>45.7</b>
STV-3/4 STVL-3/4	0.75"	20	in	3.54	3.74	1.65	1.3	0.58	10	<b>GPM</b>	<b>0.26</b>	<b>3.8 - 5.5</b>	<b>17.4</b>
			mm	89.92	95	42				<b>LPM</b>	<b>0.98</b>	<b>14.36 - 20.8</b>	<b>65.7</b>
STV-1 STVL-1	1.00"	25	in	4.02	3.78	1.73	1.7	0.77	10	<b>GPM</b>	<b>0.37</b>	<b>5.5 - 9.5</b>	<b>30.0</b>
			mm	102.11	96	44				<b>LPM</b>	<b>1.38</b>	<b>20.8 - 36</b>	<b>113.4</b>
STV-1-1/4 STVL-1-1/4	1.25"	32	in	4.72	3.78	1.85	2.7	1.20	10	<b>GPM</b>	<b>0.60</b>	<b>9.5 - 14</b>	<b>44.6</b>
			mm	119.89	96	47				<b>LPM</b>	<b>2.28</b>	<b>36 - 53</b>	<b>169.0</b>
STV-1-1/2 STVL-1-1/2	1.50"	40	in	5.20	4.25	1.93	3.3	1.50	10	<b>GPM</b>	<b>0.91</b>	<b>14 - 20</b>	<b>66.4</b>
			mm	132.08	108	49				<b>LPM</b>	<b>3.46</b>	<b>53 - 76</b>	<b>251.0</b>
STV-2 STVL-2	2.00"	50	in	STV/6.06 STVL/6.46	4.37	2.09	5.1	2.30	10	<b>GPM</b>	<b>1.52</b>	<b>20 - 33</b>	<b>107.2</b>
			mm	154/164	111	53				<b>LPM</b>	<b>5.76</b>	<b>76 - 125</b>	<b>406.0</b>

**FLOW CALCULATIONS**

The Minimum Flow is calculated from the minimum recommended pressure drop,  
1 ft WG (=3.0 kPa)

The Nominal Flow is from the maximum setting of the valve and the minimum recommended pressure drop,  
2 ft WG (=6.0 kPa)

The Maximum Flow is calculated from the maximum setting of the valve and the max pressure drop,  
20 ft WG (=60.0 kPa)

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

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Section: *Components* Bulletin-MB-STV-STVL-0816.02

# Pressure Drop Tables - Series STV / STVL - 0.50" to 2.00"

## Series STV & STVL 0.50" - 2.00"

This diagram details the relationship between flow, pressure drop and valve preset points. Use the diagram to select the correct valve size and corresponding handwheel setting to fulfill the application requirements.

Determine the required flow in the circuit (A) and the pressure drop (B). Draw a line between these two values. Read off the corresponding Cv value on the Cv scale.

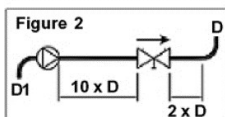
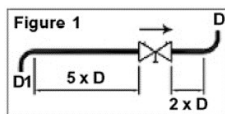
Determine the valve setting, in handwheel turns, by drawing a horizontal line (D) from the intersection point on the Cv scale to the corresponding valve setting position.

For the highest level of accuracy, it is recommended to choose a valve that has at least 3 open turns.

**Example:** A 1" valve is required to be open 8 turns for a Cv value of 7.5 at a flow rate of 10 gpm and a pressure drop of 4ft.

### Installation Recommendations

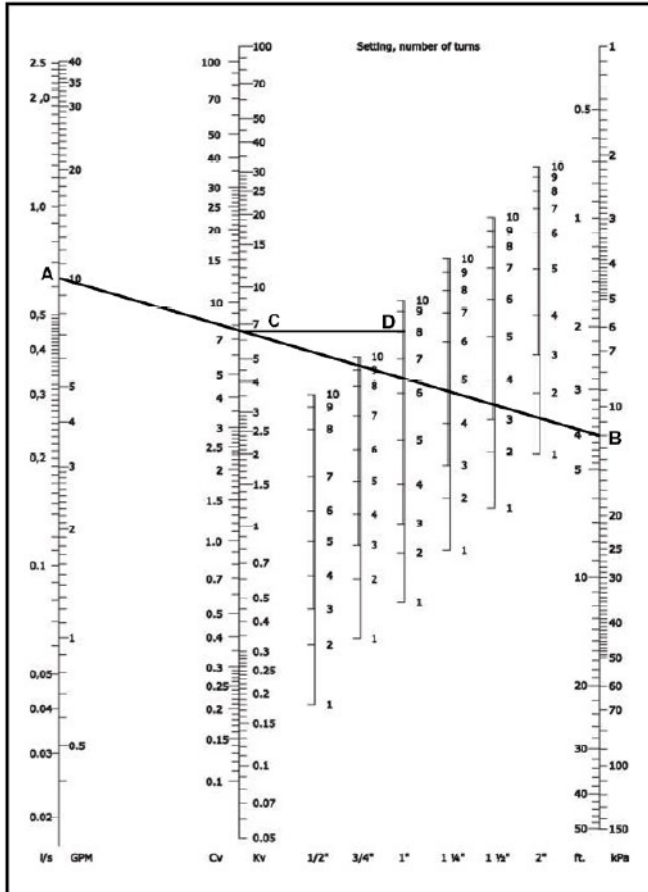
Install the valve in the correct flow direction according to the arrow on the valve body and the distance parameters detailed in Figure 1. (Note: D = pipe diameter).



For Series STVL, cover the valve body with a wet cloth when soldering to prevent premature deterioration of valve components.

When used with a pump, it is recommended to use a straight length of pipe totaling 10 x D (instead of 5 x D) upstream or downstream to avoid turbulence that will affect the measuring accuracy. See Figure 2.

Turbulence can influence the measurements by up to 20% if this recommendation is not followed.



### Cv Values for Valve Series STV / STVL

Flow coefficient values (Cv's) at various handwheel settings	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
Handwheel Setting	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50
1	0.21	0.39	0.56	0.92	1.39	2.32
1.5	0.29	0.56	0.75	1.28	1.97	3.25
2	0.37	0.70	0.89	1.53	2.38	4.18
2.5	0.44	0.82	1.04	1.80	2.78	5.10
3	0.52	0.96	1.19	2.09	3.25	6.03
3.2	0.56	1.02	1.28	2.26	3.48	6.50
3.4	0.59	1.09	1.39	2.44	3.71	6.96
3.6	0.63	1.16	1.51	2.67	4.06	7.54
3.8	0.67	1.23	1.62	2.90	4.41	8.12
4	0.72	1.31	1.74	3.13	4.76	8.82
4.2	0.77	1.39	1.91	3.42	5.10	9.74
4.4	0.81	1.48	2.09	3.71	5.57	10.70
4.6	0.87	1.58	2.26	4.06	6.03	11.70
4.8	0.93	1.68	2.44	4.41	6.61	12.80
5	1.00	1.80	2.67	4.76	7.19	13.80
5.2	1.07	1.91	2.90	5.16	7.77	15.00
5.4	1.14	2.03	3.19	5.57	8.35	16.00
5.6	1.21	2.16	3.48	5.97	8.93	17.20
5.8	1.28	2.30	3.83	6.38	9.63	18.30
6	1.36	2.44	4.18	6.84	10.30	19.40
6.2	1.44	2.60	4.47	7.25	11.00	20.40
6.4	1.52	2.76	4.76	7.66	11.80	21.50
6.6	1.62	2.96	5.10	8.12	12.50	22.50
6.8	1.74	3.16	5.54	8.58	13.20	23.50
7	1.88	3.36	5.80	9.05	13.90	24.60
7.2	2.06	3.60	6.15	9.51	14.60	25.50
7.4	2.26	3.83	6.50	9.98	15.30	26.40
7.6	2.49	4.06	6.84	10.40	15.90	27.40
7.8	2.73	4.27	7.19	10.80	16.50	28.20
8	2.96	4.47	7.54	11.30	17.10	29.00
8.2	3.13	4.63	7.89	11.70	17.60	29.90
8.4	3.29	4.78	8.24	12.20	18.20	30.70
8.6	3.42	4.93	8.58	12.60	18.80	31.60
8.8	3.54	5.08	8.87	13.00	19.40	32.40
9	3.65	5.22	9.16	13.30	19.80	33.20
9.2	3.77	5.36	9.40	13.70	20.30	33.90
9.4	3.87	5.50	9.63	14.20	20.90	34.60
9.6	3.98	5.64	9.86	14.50	21.50	35.30
9.8	4.06	5.78	10.00	14.80	22.00	36.00
10	4.12*	5.92*	10.2*	15.2*	22.6*	36.5*

\* Valve is fully open

### Flow Measurement & Accuracy

The measuring instrument connects to the test ports of the valve and is pre-programmed with Macon Balancing characteristics. The pressure drop and flow readings can be read off the display. If access to a Macon Balancing instrument is unavailable, other industry models are compatible. In addition, the flow can be determined using the pressure drop diagram that is included in the operating instructions with each Macon Balancing valve.

The accuracy is highest when the valve is fully open. Therefore, it is recommended to choose a valve that can be opened at least three turns at the calculated pre-setting value. Figure 3 represents the flow measurement deviation in relation to handwheel turns.

Figure 3

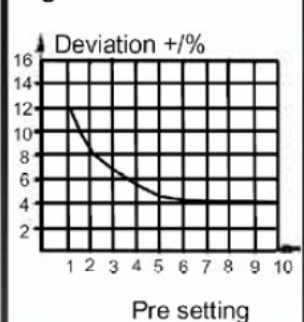


Figure 4

$$\text{Actual Flow} = \frac{q_{CBI}}{\sqrt{\gamma}}$$

Figure 5

$$C_v = 1.52 \frac{q}{\sqrt{\Delta p}}$$

q in GPM,  $\Delta p$  in Ft. of H<sub>2</sub>O

$$C_v = \frac{q}{\sqrt{\Delta p}}$$

q in GPM,  $\sqrt{p}$  in PSI

### Correction for Liquids

Applies to liquids other than water. Correct the measured flow (q) by the density ( $\gamma$ ) according to this formula. See Figure 4.

### Sizing a Balancing Valve

When the differential pressure and design flow are known, use this formula to calculate Cv value. See Figure 5.

### Memory Stop

1. Set valves to desired position.
2. Turn the inner stem with a 3 mm Allen wrench in a clockwise direction until it stops.

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.

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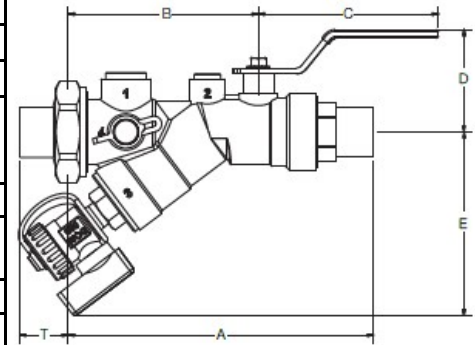
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Section: Components Bulletin-MB-STV-STVL-0816.02

Model SV is a combination ball valve, wye strainer and union. The 20 mesh stainless steel strainer is removable for cleaning and inspection. The ball valve has a chrome plated ball with Teflon seats, blowout proof stem with double EPDM O-ring seals. The union has an EPDM O-ring seal and tailpiece available in MNPT, FNPT and SWT end connections.

Standard features include Pressure/Temperature Port, Hose End Drain Valve and plugged Bypass Port.



SPECIFICATIONS	
Pressure Ratings:	600 PSI (4140 kPa)
Temperature Ratings:	250°F (121°C)
Body Material:	Forged Brass
End Connections:	Fixed End: DZR Brass - SWT & FNPT Brass - Press End Union End: Brass - SWT, FNPT, MNPT & Press End
Seals:	EPDM
Ball:	Chrome Plated Brass, full port, 100% positive shut off. Optional 316 Stainless Steel.
Stem:	Brass. Optional 316 Stainless Steel.
Handle:	Full size Zinc Plated lever w/Vinyl Grip
Available Options:	"PTV" combination PT & Air Vent, Automatic Air Vent, Handle and Port Extensions



NOMINAL DIMENSIONS & WEIGHTS															
MODEL	SIZE		Cv*		A		B	C	D	E	**T SWT	Bypass Port-In	Flow Range	WEIGHT	
	in	mm			FNPT	SWT								lbs	kg
SV1e-050	0.50"	15	5.5	in	4.74	4.88	2.99	2.33	1.73	3.53	0.83	.50	0.35 to 5.0 GPM	1.90	0.86
				mm	120.60	124.05	79.95	59.26	43.94	89.87	21.08				
SV1e-075	0.75"	20		in	4.77	5.22	2.99	2.33	1.73	3.53	0.98			2.67	1.21
				mm	121.36	132.66	79.95	59.26	43.94	89.87	24.89				
SV1e-100	1.00"	25		in	4.91	5.60	2.99	2.33	1.73	3.53	0.98			2.02	0.92
				mm	124.79	142.27	79.95	59.26	43.94	89.87	24.89				
SV2e-050	0.50"	15	7.0	in	5.71	5.95	3.86	3.66	2.08	3.72	0.92	.75	0.35 to 13.0 GPM	2.57	1.17
				mm	145.24	151.33	98.04	93.01	52.83	94.64	23.37				
SV2e-075	0.75"	20		in	5.75	6.20	3.86	3.66	2.08	3.72	1.43			2.61	1.18
				mm	146.10	157.56	98.04	93.01	52.83	94.64	36.32				
SV2e-100	1.00"	25		in	5.96	6.36	3.86	3.66	2.08	3.72	1.17			2.69	1.22
				mm	151.59	161.62	98.04	93.01	52.83	94.64	29.72				
SV2e-125	1.25"	32		in	6.14	6.69	3.86	3.66	2.08	3.72	1.50			2.92	1.32
				mm	156.03	170.00	98.04	93.01	52.83	94.64	38.10				
SV3-100	1.00"	25	25.0	in	8.60	9.44	5.62	5.03	2.26	4.78	1.41	.75	0.35 to 21.0 GPM	4.54	2.06
				mm	218.40	239.80	142.90	127.76	57.40	121.40	35.81				
SV3-125	1.25"	32		in	8.67	9.66	5.62	5.03	2.26	4.78	1.43			4.54	2.06
				mm	220.10	245.30	142.90	127.76	57.40	121.40	36.32				
SV3-150	1.50"	40		in	8.67	9.91	5.62	5.03	2.26	4.78	1.17			4.44	2.01
				mm	220.10	251.70	142.90	127.76	57.40	121.40	29.71				

## Components - Model SV - 0.50" to 2.00"

### NOMINAL DIMENSIONS & WEIGHTS (continued)



MODEL	SIZE		Cv*		A		B	C	D	E	**T SWT	Bypass Port-In	Flow Range	WEIGHT	
	in	mm			FNPT	SWT								lbs	kg
SV4-150	1.50"	40	68.0	in	9.37	9.91	7.44	5.66	2.83	5.31	1.59	1.25	22.0 to 70.0 GPM	8.72	3.96
				mm	238.00	251.71	188.98	143.76	71.88	134.87	40.38				
SV4-200	2.00"	50		in	9.56	10.35	7.44	5.66	2.83	5.31	1.50			9.42	4.27
				mm	232.16	262.89	188.98	143.76	71.88	134.87	38.10				

\* Cv values are for the body only without the screen inside.

\*\* Please reference the tailpiece data sheet #Bulletin-MB-TP for other sizes and connections.

***Dimensions not for construction purposes unless certified by factory.***

### STANDARD COMPONENTS

	<b>PT</b>	Pressure/Temperature test port with brass body, dual durometer EPDM core, threaded brass cap with O-ring seal and neoprene retainer strap. Accepts standard 1/8" (4mm) gauge adapter or thermometer stem. Rated to 500 PSI (3450 kPa) and 275°F (135°C)
	<b>DV</b>	Drain valve with forged brass body, chrome plated ball, Teflon seats, double EPDM O-ring stem seals, aluminum handle, 3/4" hose connection with cap and plastic retainer strap. Rated to 600 PSI (4140 kPa) WOG and 250°F (121°C)

Please reference data sheet #Bulletin-MB-Accessories for optional accessories.

STRAINERS

Optional features and accessories available for this Macon product are an extra charge, and not included in the standard model price.  
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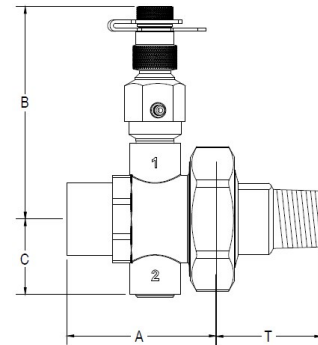


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Section: Components Bulletin-MB-SV-0915.05



Model URP Union offers numerous End Connections pressure/temperature measurement and vent. The union has an EPDM O-ring seal and tailpiece available in MNPT, FNPT, SWT and Press End connections.

Standard features include "PTV" Combination PT and Air Vent.




SPECIFICATIONS	
Pressure Ratings:	600 PSI (4140 kPa)
Temperature Ratings:	250°F (121°C)
Body Material:	Forged Brass
End Connections:	Brass - Fixed End: SWT, FNPT & Press End Union End: SWT, FNPT, MNPT & Press End
Seals:	EPDM
Available Options:	"DV" Drain Valve

NOMINAL DIMENSIONS & WEIGHTS											
MODEL	SIZE			A			B	C	*T MNPT	WEIGHT	
	in	mm		FNPT	MNPT	SWT				lbs	kg
URP-038	0.375"	10	in	N/A	N/A	1.88	2.78	0.84	N/A	0.76	0.35
			mm	N/A	N/A	47.68	70.61	21.34	N/A		
URP-050	0.50"	15	in	1.90	2.25	1.88	2.78	0.84	1.50	0.86	0.39
			mm	48.26	57.23	47.75	70.25	21.34	38.10		
URP-075	0.75" R	20	in	1.98	2.19	2.12	2.78	0.84	1.55	0.79	0.36
			mm	50.29	55.65	53.85	70.61	21.34	39.37		
URP-100	1.00"	25	in	2.15	N/A	2.28	3.02	1.08	1.75	1.16	0.53
			mm	54.61	N/A	57.91	76.65	27.43	44.72		
URP-125	1.25"	32	in	2.39	N/A	2.56	3.39	1.46	1.80	2.20	1.00
			mm	60.71	N/A	65.02	86.18	37.08	45.72		
URP-150	1.50"	40	in	2.39	N/A	2.69	3.39	1.46	1.80	2.42	1.10
			mm	60.71	N/A	68.32	86.18	37.08	45.72		
URP-200	2.00"	50	in	2.49	N/A	3.03	3.70	1.76	1.98	3.42	1.55
			mm	63.25	N/A	76.96	94.08	44.70	50.17		

\* Please reference the tailpiece data sheet #Bulletin-MB-TP for other sizes and connections.

**Dimensions not for construction purposes unless certified by factory.**

#### STANDARD COMPONENTS

	<b>PTV</b>	Combination manual air vent and pressure/temperature test port with brass body, dual durometer EPDM core, blowout-proof stem, side discharge vent with 1/8" (4mm) hose barb, threaded brass cap with O-ring seal and neoprene retainer strap. Accepts standard 1/8" (4mm) gauge adapter or thermometer stem. Rated to 250 PSI (1725 kPa) and 250°F (121°C)
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Please reference data sheet #Bulletin-MB-Accessories for optional accessories.

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