MACON® BALANCING

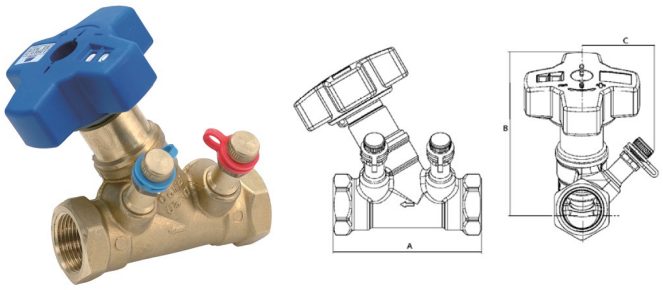
Model STV / STVL

0.50" to 2.00"
Submittal Data

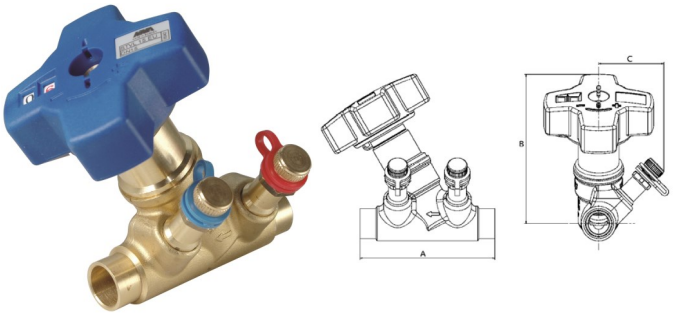
CIRCUIT SETTER

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, 360º handwheel with vernier scale and digital readout
- Built in memory stop
- Wide vairety of accessories available



STV Series



STVL Series

SPECIFICATIONS	
Pressure Ratings:	300 psil (20 Bar)
Temperature Ratings:	-4ºF to 248ºF (-20ºC to 120ºC)
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	**GPM**	**0.14**	**0.5 - 3.8**	**12.1**
			mm	86.11	95	40				LPM	0.52	1.89 - 14.36	45.7
STV-3/4 STVL-3/4	0.75"	20	in	3.54	3.74	1.65	1.3	0.58	10	**GPM**	**0.26**	**3.8 - 5.5**	**17.4**
			mm	89.92	95	42				LPM	0.98	14.36 - 20.8	65.7
STV-1 STVL-1	1.00"	25	in	4.02	3.78	1.73	1.7	0.77	10	**GPM**	**0.37**	**5.5 - 9.5**	**30.0**
			mm	102.11	96	44				LPM	1.38	20.8 - 36	113.4
STV-1-1/4 STVL-1-1/4	1.25"	32	in	4.72	3.78	1.85	2.7	1.20	10	**GPM**	**0.60**	**9.5 - 14**	**44.6**
			mm	119.89	96	47				LPM	2.28	36 - 53	169.0
STV-1-1/2 STVL-1-1/2	1.50"	40	in	5.20	4.25	1.93	3.3	1.50	10	**GPM**	**0.91**	**14 - 20**	**66.4**
			mm	132.08	108	49				LPM	3.46	53 - 76	251.0
STV-2 STVL-2	2.00"	50	in	STV/6.06 STVL/6.46	4.37	2.09	5.1	2.30	10	**GPM**	**1.52**	**20 - 33**	**107.2**
			mm	154/164	111	53				LPM	5.76	76 - 125	406.0

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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CIRCUIT SETTER

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

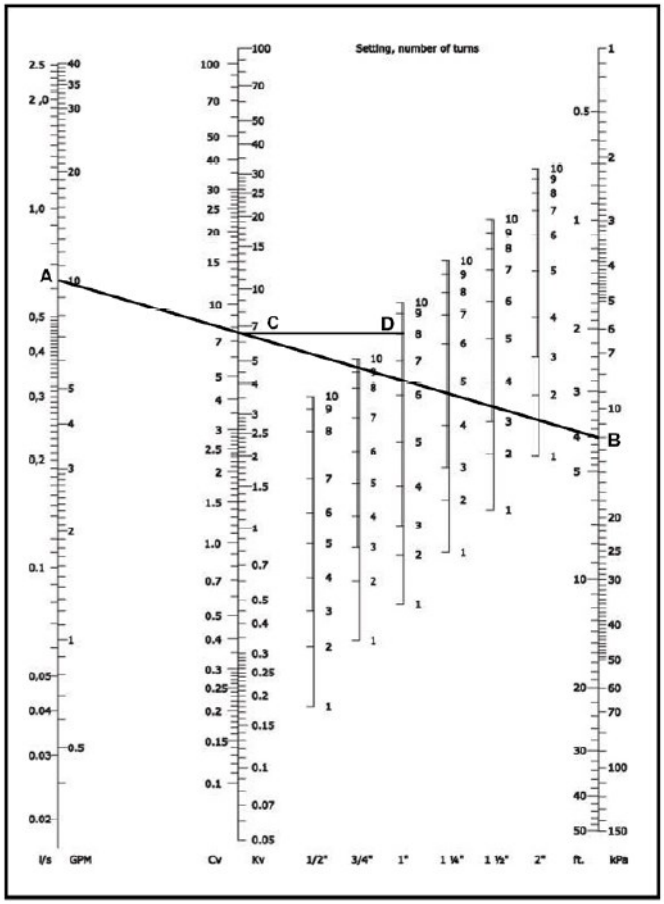
Series STV & STVL 0.50" - 2.00"

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.



Cv Values for Valve Series STV / STVL

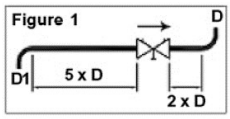
Flow coefficient values (CV's) at various handwheel settings						
Handwheel Setting	1/2" DN 15	3/4" DN 20	1" DN 25	1-1/4" DN 32	1-1/2" DN 40	2" DN 50
1	0.21	0.39	0.56	0.92	1.39	2.32
1.5	0.29	0.56	0.75	1.28	1.97	3.25
2	0.37	0.70	0.89	1.53	2.38	4.18
2.5	0.44	0.82	1.04	1.80	2.78	5.10
3	0.52	0.96	1.19	2.09	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*

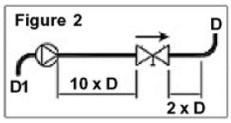
* Valve is fully open

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.

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.

Correction for Liquids

Applies to liquids other than water. Correct the measured flow (q) by the density (ϒ) 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.

Figure 3

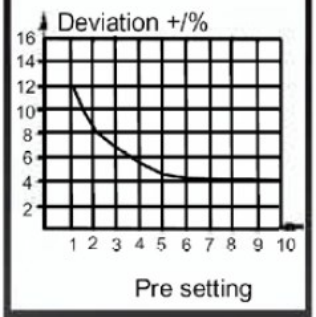


Figure 4

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

Figure 5

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

q in GPM, Δ p in Ft. of H2O

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

q in GPM, √ p in PSI

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