

## LL-STVL SERIES - Specifications

Connection	Solder, Sweat
Maximum Working Pressure	300 PSI/20 Bar (PN 20)
Operating Temperature Range	-22° F to 250° F (-30° C to 120° C)
Materials Of Construction	Body, Bonnet CW724R, CW511L
	Gaskets EPDM
	Seat Seal EPDM
	Handwheel Polyamide Plastic

## LL-STV SERIES - Specifications

Connection	NPT (Fem.)
Maximum Working Pressure	300 PSI/20 Bar (PN 20)
Operating Temperature Range	-22° F to 250° F (-30° C to 120° C)
Materials Of Construction	Body, Bonnet CW724R, CW511L
	Gaskets EPDM
	Seat Seal EPDM
	Handwheel Polyamide Plastic

LL-STVL						
Valve Size		Dimensions			Approx. Weight	Handwheel Turns
Nominal Dimension		Inches/MM				
in	mm	A - Length	B - Height	C - P/T Offset	lbs./kg	
1/2	DN 15	3.39 / 86	3.74 / 95	1.57 / 40	1.2 / 0.53	10
3/4	DN 20	3.54 / 90	3.74 / 95	1.65 / 42	1.3 / 0.58	10
1	DN 25	4.02 / 102	3.78 / 96	1.73 / 44	1.7 / 0.77	10
1 1/4	DN 32	4.72 / 120	3.78 / 96	1.85 / 47	2.7 / 1.2	10
1 1/2	DN 40	5.2 / 132	4.25 / 108	1.93 / 49	3.3 / 1.5	10
2	DN 50	6.06 / 154	4.37 / 111	2.09 / 53	5.1 / 2.3	10

LL-STV						
Valve Size		Dimensions			Approx. Weight	Handwheel Turns
Nominal Dimension		Inches/MM				
in	mm	A - Length	B - Height	C - P/T Offset	lbs./kg	
1/2	DN 15	3.39 / 86	3.74 / 95	1.57 / 40	1.2 / 0.53	
3/4	DN 20	3.54 / 90	3.74 / 95	1.65 / 42	1.3 / 0.58	
1	DN 25	4.02 / 102	3.78 / 96	1.73 / 44	1.7 / 0.77	
1 1/4	DN 32	4.72 / 120	3.78 / 96	1.85 / 47	2.7 / 1.2	
1 1/2	DN 40	5.2 / 132	4.25 / 108	1.93 / 49	3.3 / 1.5	
2	DN 50	6.06 / 154	4.37 / 111	2.09 / 53	5.1 / 2.3	

## Product Features

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

## Valve Selection Guide

Valve Size		Minimum Flow	Nominal Range of Flow	Maximum Flow
Nominal Dimensions				
Inches	mm	GPM/LPM	GPM/LPM	GPM/LPM
1/2	DN 15	0.14 / .52	0.5 - 3.8 / 1.89 - 14.36	12.1 / 45.7
3/4	DN 20	.26 / .98	3.8 - 5.5 / 14.36 - 20.8	17.4 / 65.7
1	DN 25	.37 / 1.38	5.5 - 9.5 / 20.8 - 36	30 / 113.4
1 1/4	DN 32	.60 / 2.28	9.5 - 14 / 36 - 53	44.6 / 169
1 1/2	DN 40	.91 / 3.46	14 - 20 / 53 - 76	66.4 / 251
2	DN 50	1.52 / 5.76	20 - 33 / 76 - 125	107.2 / 406

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

\*The wetted surface of this product contacted by consumable water contains less than one quarter of one percent (0.25%) of lead by weight. Certificate of compliance available upon request.

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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## PRESSURE DROP TABLES

### Series LL-STVL/STV 1/2" - 2"

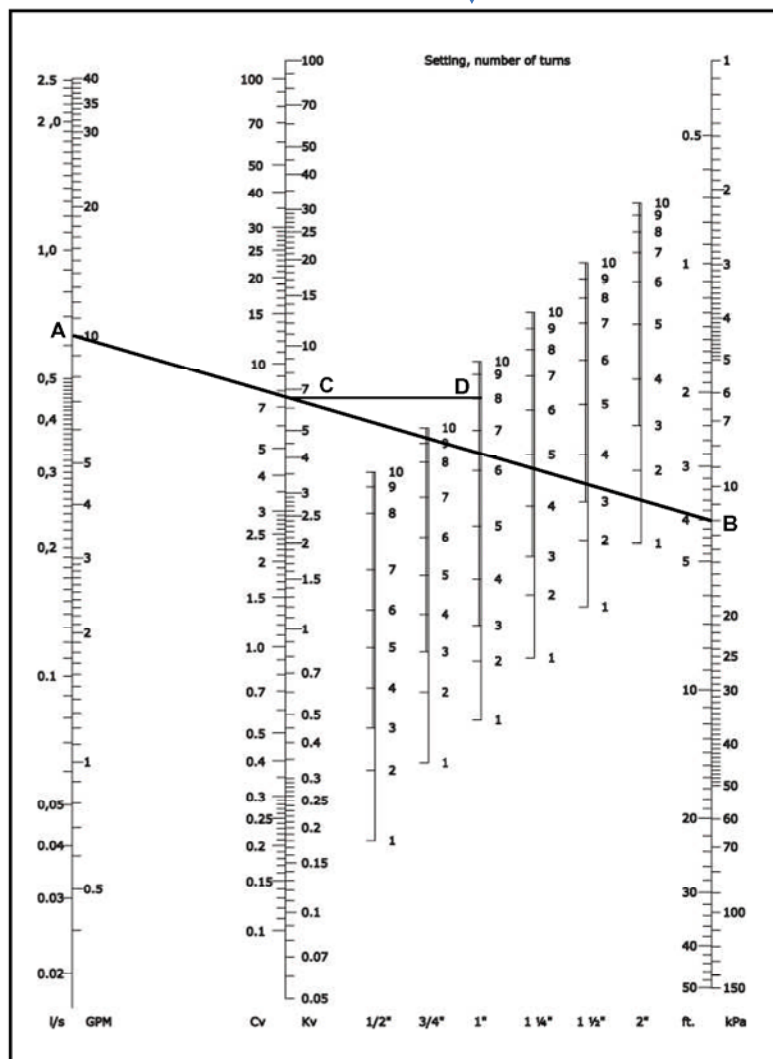
This diagram details the relationship between flow, pressure drop and valve preset points. Use the diagram to select the correct valve size and corresponding handwheel setting to fulfill the application requirements.

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 (C).

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 4 ft.



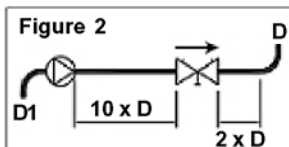
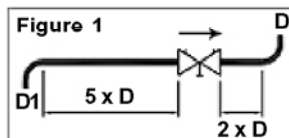
### CV Values for Valve Series LL-STVL/STV

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	0.7	0.89	1.53	2.38	4.18
2.5	0.44	0.82	1.04	1.8	2.78	5.1
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	6.5
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	2.9	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	5.1	9.74
4.4	0.81	1.48	2.09	3.71	5.57	10.7
4.6	0.87	1.58	2.26	4.06	6.03	11.7
4.8	0.93	1.68	2.44	4.41	6.61	12.8
5	1	1.8	2.67	4.76	7.19	13.8
5.2	1.07	1.91	2.9	5.16	7.77	15
5.4	1.14	2.03	3.19	5.57	8.35	16
5.6	1.21	2.16	3.48	5.97	8.93	17.2
5.8	1.28	2.3	3.83	6.38	9.63	18.3
6	1.36	2.44	4.18	6.84	10.3	19.4
6.2	1.44	2.6	4.47	7.25	11	20.4
6.4	1.52	2.76	4.76	7.66	11.8	21.5
6.6	1.62	2.96	5.1	8.12	12.5	22.5
6.8	1.74	3.16	5.54	8.58	13.2	23.5
7	1.88	3.36	5.8	9.05	13.9	24.6
7.2	2.06	3.6	6.15	9.51	14.6	25.5
7.4	2.26	3.83	6.5	9.98	15.3	26.4
7.6	2.49	4.06	6.84	10.4	15.9	27.4
7.8	2.73	4.27	7.19	10.8	16.5	28.2
8	2.96	4.47	7.54	11.3	17.1	29
8.2	3.13	4.63	7.89	11.7	17.6	29.9
8.4	3.29	4.78	8.24	12.2	18.2	30.7
8.6	3.42	4.93	8.58	12.6	18.8	31.6
8.8	3.54	5.08	8.87	13	19.4	32.4
9	3.65	5.22	9.16	13.3	19.8	33.2
9.2	3.77	5.36	9.4	13.7	20.3	33.9
9.4	3.87	5.5	9.63	14.2	20.9	34.6
9.6	3.98	5.64	9.86	14.5	21.5	35.3
9.8	4.06	5.78	10	14.8	22	36
10	4.12*	5.92*	10.2*	15.2*	22.6*	36.5*

\* Valve is fully open

### 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 standard 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.

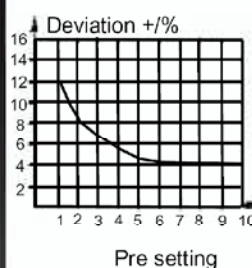
### Correction For Liquids

Applies to liquids other than water. Correct the measured flow (q) by the density (γ) according to this formula.

### Sizing a Balancing Valve

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

Figure 3



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

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

q in GPM, Δp in Ft. of H2O

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

q in GPM, √p in PSI