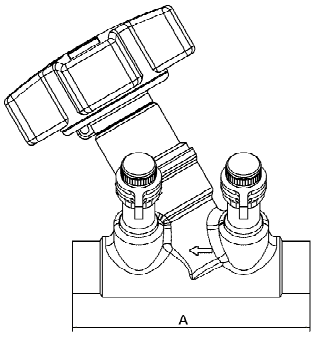
Date: _____

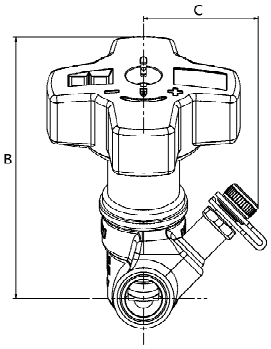
Job Name: _____

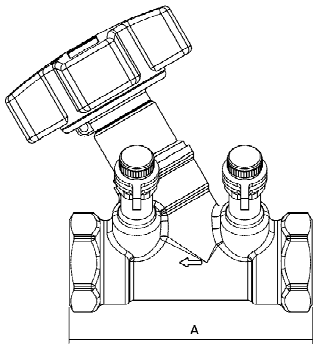
Contractor: _____

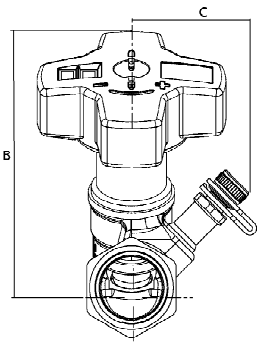
MACON BALANCING MMA

STVL / STV Series
Submittal Data









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*	*Dezincification Resistant Brass*
	Gaskets	*EPDM*
	Seat Seal	*EPDM*
	Handwheel	*Polyamide Plastic*

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*	*Dezincification Resistant Brass*
	Gaskets	*EPDM*
	Seat Seal	*EPDM*
	Handwheel	*Polyamide Plastic*

STVL

Valve Size		Dimensions			Approx. Weight	Handwheel Turns
Nominal Dimensions		Inches/mm				
Inches	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	**6.46** / 164	**4.37** / 111	**2.09** / 53	**5.1** / 2.3	10

STV

Valve Size		Dimensions			Approx. Weight	Handwheel Turns
Nominal Dimensions		Inches/mm				
Inches	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

Product 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 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)

Tunstall Corporation
118 Exchange Street · Chicopee, MA 01013

Phone: (413) 594-8695 · Fax: (413) 598-8109
www.tunstall-inc.com

PRESSURE DROP TABLES

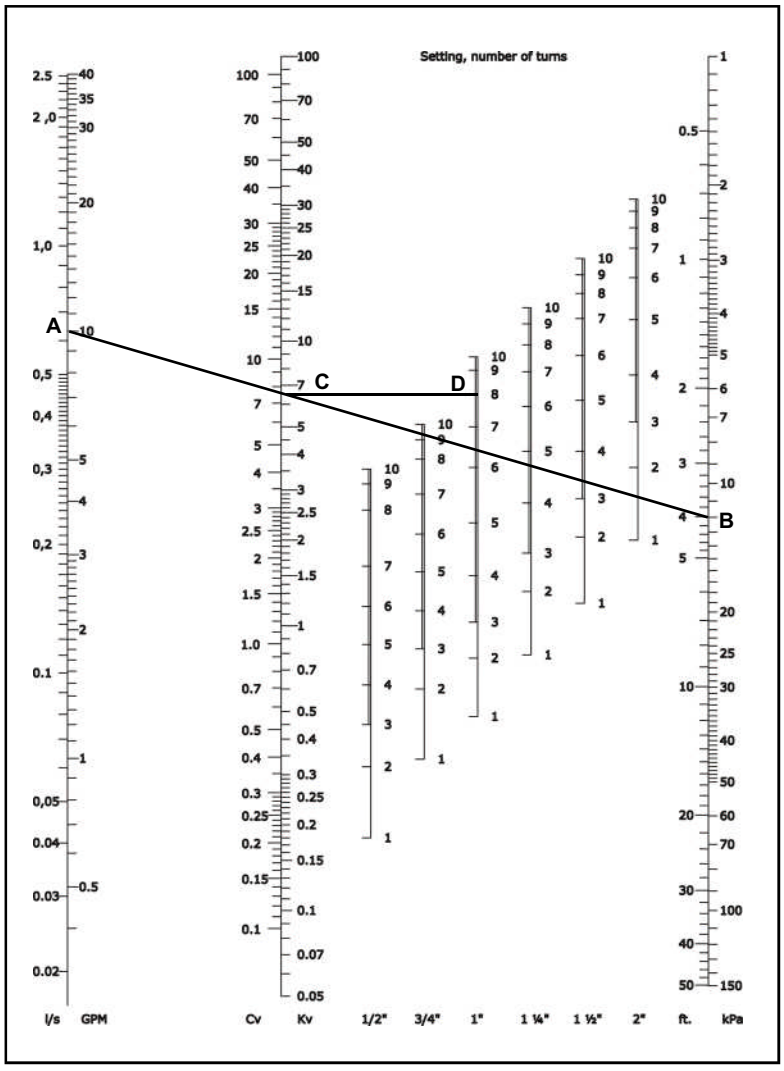
Series STVL & STV, 1/2" - 2"

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 STVL, STV

Flow coefficient values (Cvs) 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).

Figure 1

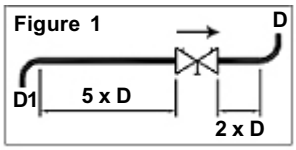
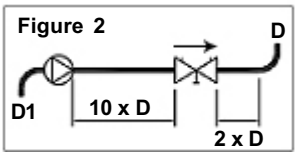


Figure 2



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.

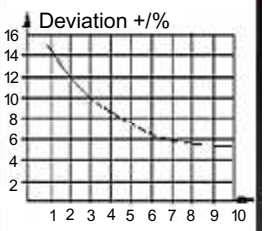
Flow Measurement & Accuracy
The measuring instrument connects to the test ports of the valve and is pre-programmed with Macon Balancing characteristics. The pressure drop and flow readings can be read off the display. If access to a Macon Balancing instrument is unavailable, other industry standard models 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



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

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

q in GPM, Δ p in Ft. of H2O

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

q in GPM, √ p in PSI

Tunstall Corporation
118 Exchange Street · Chicopee, MA 01013
Phone: (413) 594-8695 · Fax: (413) 598-8109
www.tunstall-inc.com