

**Main Line Supply Valve Calibration and Automated Assemblies Capabilities**

Main Line has a fully functional in house valve automation shop. This includes a fully operational 4 axis CNC mill. This enables Main Line to manufacture specialty brackets and standard brackets with the quickest lead time in the market.

**Quality Assurance is Our Commitment to You**

Main Line Supply is an ISO 9001:2015 registered company. Main Line Supply is fully capability of fulfilling any of your automation needs.

- Standard QR and Barcoding for traceability compliance
- Custom Manufacturing Capabilities
- More than 65 Years Experience in Valve Automation



**BALL VALVES**

- Apollo
- Sharpe
- J-Flow
- OVC
- Powell
- Worcester

**ACTUATORS**

- Apollo
- Rotork
- J-Flow
- Sharpe
- El-O-Matic
- Habonim

**PLUG VALVES**

- ChemValve
- Durco\*
- Tufline\*

**BUTTERFLY VALVES**

- Apollo
- Stockham
- OVC
- Powell
- Demco
- WKM

**V-BALL & GLOBE VALVES**

- Worcester
- J-Flow
- Sharpe
- Fisher Remanufactured
- Masonneilan Remanufactured

**REGULATORS**

- TLV
- Armstrong
- Watson McDaniel
- Remanufactured Fisher

**PINCH VALVES**

- Red Valve
- RF Valve

**DIAPHRAGM**

- GIE
- Spears

**SANITARY VALVES**

- Topline
- Dixon
- VNE
- Sharpe
- J-Flow

**KNIFE GATES**

- Keckley
- Fabri\*

**POSITIONERS**

- Westlock
- Siemens
- PMV
- J-Flow
- Rotork-YTC

**LIMIT SWITCHES**

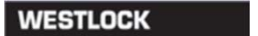
- J-Flow
- Westlock
- PMV
- Worcester

**SOLENOID VALVES**

- ASCO
- Crane
- Sharpe
- J-Flow
- Parker/Gold Ring
- Parker/Skinner

**SPECIALTY BRACKETS**

- In House 4-axis CNC Milling Machine



**Cincinnati**  
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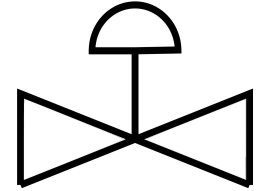
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**Valve Sizing Calculations for Liquid**

$$C_v = \frac{Q \sqrt{G}}{\sqrt{\Delta P}}$$

Cv - Flow coefficient  
 Q - Flow in GPM  
 ΔP - Differential Pressure  
 (Difference between inlet and outlet pressure) in PSI.  
 G - Specific Gravity (Taken from Properties of Liquids)



**Valve Sizing Calculations for Steam**

**SATURATED STEAM**

**SATURATED STEAM TABLE**

**SUBCRITICAL FLOW**

When ΔP is less than  $F_L^2 (P_1/2)$

$$C_v = \frac{W}{2.1 \sqrt{\Delta P (P_1 + P_2)}}$$

**CRITICAL FLOW**

When ΔP is more than  $F_L^2 (P_1/2)$

$$C_v = \frac{W}{1.83 F_L P_1}$$

**SUPERHEATED STEAM**

**SUBCRITICAL FLOW**

When ΔP is less than  $F_L^2 (P_1/2)$

$$C_v = \frac{W(1 + 0.0007 T_{sh})}{2.1 \sqrt{\Delta P (P_1 + P_2)}}$$

**CRITICAL FLOW**

When ΔP is more than  $F_L^2 (P_1/2)$

$$C_v = \frac{W(1 + 0.0007 T_{sh})}{1.83 F_L P_1}$$

	Col. 1 Gauge Pressure	Col. 2 Absolute Pressure (psia)	Col. 3 Steam Temp. (°F)	Col. 4 Heat of Sat. Liquid (Btu/lb)	Col. 5 Latent Heat (Btu/ lb)	Col. 6 Total Heat of Steam (Btu/lb)	Col. 7 Specific Volume of Sat. Liquid (cu ft/lb)	Col. 8 Specific Volume of Sat. Steam (cu ft/lb)
Inches of Vacuum	29.743	0.08854	32.00	0.00	1075.8	1075.8	0.016022	3306.00
	29.515	0.2	53.14	21.21	1063.8	1085.0	0.016027	1526.00
	27.886	1.0	101.74	69.70	1036.3	1106.0	0.016136	333.60
	19.742	5.0	162.24	130.13	1001.0	1131.0	0.016407	73.52
	9.562	10.0	193.21	161.17	982.1	1143.3	0.016590	38.42
	7.536	11.0	197.75	165.73	979.3	1145.0	0.016620	35.14
	5.490	12.0	201.96	169.96	976.6	1146.6	0.016647	32.40
	3.454	13.0	205.88	173.91	974.2	1148.1	0.016674	30.06
	1.418	14.0	209.56	177.61	971.9	1149.5	0.016699	28.04
	0.0	14.696	212.00	180.07	970.3	1150.4	0.016715	26.80
PSIG	1.3	16.0	216.32	184.42	967.6	1152.0	0.016746	24.75
	2.3	17.0	219.44	187.56	965.5	1153.1	0.016768	23.39
	5.3	20.0	227.96	196.16	960.1	1156.3	0.016830	20.09
	10.3	25.0	240.07	208.42	952.1	1160.6	0.016922	16.30
	15.3	30.0	250.33	218.82	945.3	1164.1	0.017004	13.75
	20.3	35.0	259.28	227.91	939.2	1167.1	0.017078	11.90
	25.3	40.0	267.25	236.03	933.7	1169.7	0.017146	10.50
	30.3	45.0	274.44	243.36	928.6	1172.0	0.017209	9.40
	40.3	55.0	287.07	256.30	919.6	1175.9	0.017325	7.79
	50.3	65.0	297.97	267.50	911.6	1179.1	0.017429	6.66
	60.3	75.0	307.60	277.43	904.5	1181.9	0.017524	5.82
	70.3	85.0	316.25	286.39	897.8	1184.2	0.017613	5.17
	80.3	95.0	324.12	294.56	891.7	1186.2	0.017696	4.65
	90.3	105.0	331.36	302.10	886.0	1188.1	0.017775	4.23
	100.0	114.7	337.90	308.80	880.0	1188.8	0.017850	3.88
	110.3	125.0	344.33	315.68	875.4	1191.1	0.017922	3.59
	120.3	135.0	350.21	321.85	870.6	1192.4	0.017991	3.33
	125.3	140.0	353.02	324.82	868.2	1193.0	0.018024	3.22
	130.3	145.0	355.76	327.70	865.8	1193.5	0.018057	3.11
	140.3	155.0	360.50	333.24	861.3	1194.6	0.018121	2.92
	150.3	165.0	365.99	338.53	857.1	1195.6	0.018183	2.75
	160.3	175.0	370.75	343.57	852.8	1196.5	0.018244	2.60
	180.3	195.0	379.67	353.10	844.9	1198.0	0.018360	2.34
	200.3	215.0	387.89	361.91	837.4	1199.3	0.018470	2.13
	225.3	240.0	397.37	372.12	828.5	1200.6	0.018602	1.92
	250.3	265.0	406.11	381.60	820.1	1201.7	0.018728	1.74
		300.0	417.33	393.84	809.0	1202.8	0.018896	1.54
		400.0	444.59	424.00	780.5	1204.5	0.019340	1.16
		450.0	456.28	437.20	767.4	1204.6	0.019547	1.03
		500.0	467.01	449.40	755.0	1204.4	0.019748	0.93
	600.0	486.21	471.60	731.6	1203.2	0.02013	0.77	
	900.0	531.98	526.60	668.8	1195.4	0.02123	0.50	
	1200.0	567.22	571.70	611.7	1183.4	0.02232	0.36	
	1500.0	596.23	611.60	556.3	1167.9	0.02346	0.28	
	1700.0	613.15	636.30	519.6	1155.9	0.02428	0.24	
	2000.0	635.82	671.70	463.4	1135.1	0.02565	0.19	
	2500.0	668.13	730.60	360.5	1091.1	0.02860	0.13	
	2700.0	679.55	756.20	312.1	1068.3	0.03027	0.11	
	3206.2	705.40	902.70	0.0	902.7	0.05053	0.05	

Cv = valve coefficient  
 FL = pressure recovery factor  
 Gg = gas specific gravity (air = 1.0)  
 P1 = absolute upstream pressure, psia  
 P2 = absolute downstream pressure, psia

ΔP = pressure drop P1 – P2, psi  
 q = gas flow rate at 14.7 psia and 60°F, scfh  
 T = flow temperature, °R(460 + °F)  
 Tsh = steam superheat, °F  
 W = flow rate, pounds per hr

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