FLO-TITE™ valves & controls

Modulating Control-Ball Valve - V Series

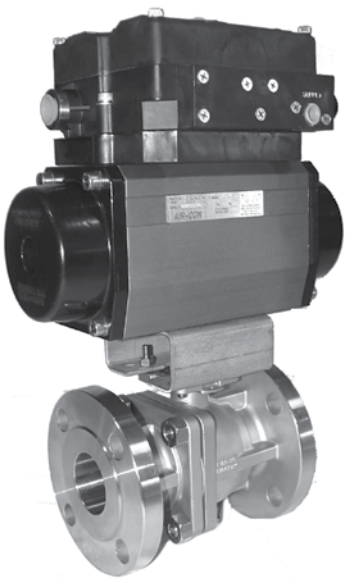
Models:

Flanged Ends 150 & 300
3PC Threaded, SW & BW

Modulating V-Ball Provides Accurate Control Of The Down Stream Flow Rates, From Simple On-off To Modulating Control Applications.

The throttling part of the Ball Valve is a solid SS Ball, not a seat insert like others

Flo-Tite's V-Ball Design Is Characterized To Meet All Custom Flow Requirements. A Unique Design that is Forgiving and Accommodating.



30° Port

60° Port

ADVANCED DESIGN FEATURES:

Sizes:1/2" - 12"

- Higher Flow Capacities
- Excellent Repeatability
- Bubble-Tight Shut-Off
- Controllable Flow Rates
- Non-Clogging Flow-Streams For General And Slurry Applications
- Compact Control Package
- High pressure drop capability with straight - through flow.
- Self-Compensating Live-Loaded Stem Packing
- Maintenance Is As Easy As Changing A Standard Seat
- High Temperature Ball Seats
- Pneumatically Or Electrically Controlled, 3-15 PSI or 4-20 MA
- Matched Ball and Stem
- Economical Low Operating Cost

Ball Valves Offer Higher Flow Capacities Than Comparable Globe Type Control Valves

Pneumatic and Electro-Pneumatic Positioners

The V Series Positioner is designed for simple and precise positioning of single and double acting pneumatic rotary actuators. The V Series offers reliable economical operation performance with a 20 year proven track record. Available in 4-20 MA or 3-15 PSI

- Modular/totally field upgradeable
- Corrosion & Vibration resistant
- Universal mounting flexibility
- Modular I/p converter
- Hazardous locations

Flow Characteristic

Appropriate flow characteristics for control elements can be solved by using the appropriate ball design. Linear - slotted seats from 0.0031 inches, 0.0630 inches and 0.1260 inches or any combination conforming to customer's requirement. Equal % - Triangular shape of 15˚, 30˚, 60˚, 90˚, and 120˚ are available with special combinations for custom flows.

Important information required to size control valves.

1. Type of media, ie liquid, gas or steam
2. What type of calculation 1, CV required given the rate thought the valve,2, flow rate given the CV
3. Flow rate, GPM, PPH, SCRM
4. Inlet pressure to valve (PSIG)
5. Outlet pressure from valve (PSIG)
6. Inlet temperature at valve
7. Specific gravity at valve
8. Media vapor pressure (PSIG)
9. Media critial pressure
10. Pipe size to valve
11. Pipe size from valve

Flo-tites V-Type control valves are designed to offer maximum C_v's which are substantially larger than other throttling globe type control valves. In many cases, half size pipeline valves can be used resulting in space reduction, reduced mantianence and delivering great cost reductions.

V-Ball Models

V1-5˚, V2-10˚, V3-15˚, V4-30˚, V5-60˚, V6-90˚, V7-120˚

Valve technical information can be found in the appropriate valve brochures as follows:
Flanged End pages 60, 61, 62, 63-07 - 3PC pages 45, 46, 47, 48-07

Positioner technical information can be found in tech bulletin page 169 -170.

V-TYPE CONTROL VALVE FLOW COEFFICIENT C_v CHARTS

Full Port VF150/VF300 V200/300 VHPF40/VHPF50												
Valve Size	V-Port Angle	Percent and Angle of Ball Rotation										
		0% 0˚	10% 9˚	20% 18˚	30% 27˚	40% 36˚	50% 45˚	60% 54˚	70% 63˚	80% 72˚	90% 81˚	100% 90˚
1/2”	15 °	0	0.04	0.18	0.44	0.69	0.99	1.64	2.12	2.85	3.64	4.30
1/2”	30°	0	0.04	0.23	0.47	0.77	1.19	1.83	2.47	3.43	4.65	5.58
1/2”	60°	0	0.05	0.28	0.73	1.11	1.83	2.92	4.29	7.00	9.43	12.78
1/2”	90°	0	0.06	0.47	0.85	1.28	2.05	3.24	4.74	8.26	11.61	14.72
3/4”	15 °	0	0.05	0.24	0.56	0.90	1.34	2.15	2.75	3.76	4.75	5.56
3/4”	30°	0	0.07	0.30	0.61	0.99	1.57	2.42	3.25	4.52	6.12	7.34
3/4”	60°	0	0.08	0.35	0.93	1.46	2.42	3.85	5.64	9.21	12.41	16.28
3/4”	90°	0	0.09	0.59	1.11	1.69	2.69	4.27	6.24	10.85	15.28	19.39
1”	15 °	0	0.06	0.32	0.95	1.50	2.35	3.80	4.70	6.50	8.50	9.85
1”	30°	0	0.08	0.45	1.25	2.06	3.54	5.30	7.70	10.49	12.84	15.48
1”	60°	0	0.09	0.68	1.74	2.78	5.13	8.00	11.88	18.71	23.22	32.84
1”	90°	0	0.12	0.93	2.78	5.09	7.74	12.20	17.33	24.48	26.79	43.89
1-1/4”	15 °	0	0.03	0.27	0.83	1.65	2.79	4.09	5.88	7.99	10.84	12.85
1-1/4”	30°	0	0.06	0.48	1.37	2.47	4.12	6.08	8.82	11.76	14.87	17.39
1-1/4”	60°	0	0.07	0.67	2.04	3.41	6.47	10.80	15.39	22.35	33.37	44.20
1-1/4”	90°	0	0.09	0.78	2.92	5.41	10.23	17.28	19.48	34.93	51.76	66.00
1-1/2”	15 °	0	0.06	0.38	1.17	2.28	3.85	5.59	8.10	10.99	14.86	17.85
1-1/2”	30°	0	0.08	0.65	1.88	3.39	5.66	8.36	12.12	16.17	20.44	23.90
1-1/2”	60°	0	0.09	0.92	2.81	4.69	8.89	14.85	21.16	30.73	45.88	59.74
1-1/2”	90°	0	0.11	1.07	4.01	7.44	14.06	23.76	26.78	48.03	71.17	90.50
2”	15 °	0	0.06	0.69	2.26	4.45	7.30	10.68	15.40	21.39	28.75	35.05
2”	30°	0	0.09	1.18	3.79	7.53	12.26	17.83	26.44	36.45	48.09	55.92
2”	60°	0	0.11	1.51	5.80	10.39	20.60	33.98	48.75	69.04	104.23	136.50
2”	90°	0	0.17	1.89	7.28	13.58	25.38	42.30	55.56	87.04	129.75	167.34
2-1/2”	15 °	0	0.08	0.77	2.44	5.25	8.08	11.75	16.44	22.36	27.24	32.10
2-1/2”	30°	0	0.10	1.15	4.42	7.91	13.39	20.05	30.43	41.92	69.75	77.20
2-1/2”	60°	0	0.14	1.46	5.91	11.90	23.24	37.92	59.31	83.29	113.65	162.50
2-1/2”	90°	0	0.18	1.83	7.29	16.45	31.16	53.53	77.89	118.29	177.32	240.10
3”	15 °	0	0.08	0.92	2.98	6.65	9.60	13.50	19.62	26.69	31.80	38.40
3”	30°	0	0.13	1.20	4.15	9.49	15.96	26.78	38.91	53.31	69.77	85.91
3”	60°	0	0.16	2.89	6.70	15.82	29.36	46.32	73.60	106.74	149.88	193.20
3”	90°	0	0.21	4.12	8.65	21.09	41.09	69.27	105.91	161.04	237.23	359.21
4”	15 °	0	0.12	1.40	3.76	8.88	16.79	27.92	41.85	59.27	75.55	97.05
4”	30°	0	0.18	1.75	7.84	18.59	35.21	58.60	87.89	124.41	158.53	197.10
4”	60°	0	0.27	2.20	12.44	33.67	62.98	106.26	160.49	233.96	329.50	437.29
4”	90°	0	0.36	4.37	19.68	50.29	91.83	157.43	240.51	365.15	546.62	830.86
6”	15 °	0	0.21	2.50	6.66	15.79	29.88	49.74	74.56	105.55	134.48	172.05
6”	30°	0	0.30	3.12	13.97	33.15	62.70	104.37	156.53	221.56	282.33	349.70
6”	60°	0	0.47	5.41	22.15	59.97	112.16	189.24	285.82	416.68	586.83	800.80
6”	90°	0	0.68	7.79	35.05	89.56	163.55	280.37	428.34	650.32	973.50	1480.08
8”	15 °	0	0.34	4.25	11.33	26.86	50.80	84.60	126.88	395.08	503.40	292.35
8”	30°	0	0.50	5.32	23.77	56.35	106.70	177.62	266.39	377.06	480.47	595.20
8”	60°	0	0.80	6.66	23.81	102.06	190.87	322.06	486.41	709.11	998.69	1325.40
8”	90°	0	1.08	13.26	59.64	152.42	278.33	477.14	728.96	1106.69	1656.77	2518.20
10”	15 °	0	0.53	6.64	17.70	41.99	79.60	132.20	198.20	617.30	786.50	457.10
10”	30°	0	0.78	8.31	37.14	88.05	166.73	277.53	416.24	589.16	750.74	930.10
10”	60°	0	1.25	10.41	37.20	159.47	298.23	503.22	760.02	1107.99	1560.45	2070.90
10”	90°	0	1.67	20.72	93.20	238.16	434.90	745.53	1139.00	1729.20	2588.70	3934.65
12”	15 °	0	0.76	9.40	24.80	58.78	111.15	185.01	277.50	864.20	1101.07	640.50
12”	30°	0	1.09	11.63	52.00	123.27	233.42	388.54	582.73	824.82	1051.03	1301.81
12”	60°	0	1.74	14.57	52.08	223.25	417.52	704.51	1064.03	1551.19	2184.63	2910.26
12”	90°	0	2.31	30.00	132.10	338.40	610.80	1045.60	1600.20	2450.30	3640.20	5510.60

Valve Flow Coefficient (C_v):

Number of U.S. gallons per minute of 60˚F water that will flow through a valve with a one psi pressure drop.

Ball Valves have an inherent equal percentage characteristic flow curve which is very desirable for a majority of control applications. The standard and full round port valves as well as V-Ports exhibit equal percentage characteristics.

V-TYPE CONTROL VALVE FLOW COEFFICIENT C_V CHARTS

Model Standard Port VSF150 / VSF300												
Valve Size	V-Port Angle	Percent and Angle of Ball Rotation										
		0% 0°	10% 9°	20% 18°	30% 27°	40% 36°	50% 45°	60% 54°	70% 63°	80% 72°	90% 81°	100% 90°
3”	15 °	0	0.05	0.56	1.90	4.20	6.00	8.60	12.28	16.74	19.96	24.58
3”	30°	0	0.06	0.75	2.60	5.95	10.00	16.13	23.51	36.63	55.22	81.58
3”	60°	0	0.08	0.95	4.20	9.91	18.40	29.02	46.12	66.88	93.91	121.08
3”	90°	0	0.09	1.20	5.45	13.21	25.75	43.41	66.23	100.91	148.65	225.00
4”	15 °	0	0.06	0.23	1.58	2.50	4.56	8.25	11.96	18.68	27.95	41.58
4”	30°	0	0.08	0.44	1.89	4.62	9.18	16.13	23.51	36.63	55.22	81.76
4”	60°	0	0.11	1.03	4.59	11.34	24.68	37.37	54.47	84.86	127.91	189.91
4”	90°	0	0.15	1.85	8.27	20.41	37.05	66.98	98.04	150.50	230.34	340.87
6”	15 °	0	0.07	0.34	2.27	3.58	6.52	11.80	17.18	26.75	40.12	59.58
6”	30°	0	0.10	0.64	2.71	6.62	13.17	23.14	33.74	52.56	79.23	117.28
6”	60°	0	0.16	1.47	6.59	16.27	34.41	53.61	78.15	121.75	183.52	272.50
6”	90°	0	0.24	2.66	11.86	29.28	53.16	96.09	140.67	215.93	330.48	489.00
8”	15 °	0	0.16	0.76	5.26	8.35	15.25	27.40	39.88	62.04	93.40	138.35
8”	30°	0	0.24	1.48	6.29	15.39	30.59	53.77	78.38	122.11	184.07	272.47
8”	60°	0	0.35	3.45	15.30	37.79	82.27	124.55	181.38	282.85	426.36	633.00
8”	90°	0	0.47	6.18	27.55	68.02	123.50	223.25	326.80	501.66	767.79	1136.20
10”	15 °	0	0.35	1.45	10.25	16.24	29.30	53.50	77.66	120.90	182.30	269.40
10”	30°	0	0.44	2.89	12.88	31.75	57.72	104.71	152.63	237.80	358.46	530.63
10”	60°	0	0.67	6.66	29.79	73.59	160.21	242.53	353.57	550.82	830.28	1232.90
10”	90°	0	0.89	12.03	53.65	240.50	434.75	636.40	976.91	976.91	1495.20	2212.78
12”	15 °	0	0.60	2.80	19.75	31.20	56.60	102.80	149.40	232.60	350.50	520.20
12”	30°	0	0.80	5.56	24.79	61.12	111.11	201.57	293.81	457.77	690.04	1021.90
12”	60°	0	1.30	12.82	57.35	141.66	308.40	466.87	680.62	1060.33	1598.29	2373.30
12”	90°	0	1.73	24.10	104.30	465.10	838.10	1230.05	84.60	1900.10	2880.10	4300.50

Recomendations

Control Valves work best in the rotary range of about 65˚ - 75˚. After computing the required C_v choose the valve that has a rated C_v (Full open) at least 20% larger than your computed C_v.

Select the smallest valve possible for the application. Oversizing reduces the usefull range in which the valve positioner will operate. Use the largest acuator feasible for the valve size chosen, This increases the positioning accuracy of the valve positioner.

ROUND PORT BALL VALVE FLOW COEFFICIENT C_V CHARTS

Standard Port Models SF150 / SF300											
Valve Size	Percent and Angle of Ball Rotation										
	0% 0°	10% 9°	20% 18°	30% 27°	40% 36°	50% 45°	60% 54°	70% 63°	80% 72°	90% 81°	100% 90°
2”	0	0	1.5	10.0	22.5	36.6	52.4	70.7	87.0	105.0	124
2 -1/2”	0	0	7.5	26.6	51.9	80.0	111.6	144.2	177.4	209.8	245
3”	0	0	11.9	40.5	78.0	121.0	167.9	217.0	266.6	314.9	364
4”	0	0	20.5	74.2	145.9	228.5	318.9	413.6	509.2	602.7	698
6”	0	3.5	56.8	139.6	243.6	361.4	488.3	619.6	750.8	877.7	995
8”	0	8.3	129.9	322.7	562.4	835.0	1128.3	1431.8	1735.3	2028.9	2309
10”	0	55.5	299.5	646.6	1065.0	1534.2	2033.9	2547.3	3057.8	3548.9	4000
12”	0	138.7	625.0	1299.2	2107.5	3005.0	3960.9	4939.3	5911.1	6844.4	7708

Full Port Models F150 / F300											
Valve Size	Percent and Angle of Ball Rotation										
	0% 0°	10% 9°	20% 18°	30% 27°	40% 36°	50% 45°	60% 54°	70% 63°	80% 72°	90% 81°	100% 90°
1/2”	0	0	0	0.7	3.9	8.0	12.9	17.6	24.3	29.6	34
3/4”	0	0	0	2.6	7.9	14.5	21.7	29.7	38.0	46.2	57
1”	0	0	1.3	8.9	19.4	32.7	46.8	61.9	77.0	92.6	105
1-1/4”	0	0	5.8	20.7	41.3	65.6	91.9	119.3	147.2	174.5	208
1-1/2”	0	0	3.6	22.7	50.7	83.9	120.8	159.7	199.4	238.4	277
2”	0	0	15.5	54.8	106.6	166.8	232.0	300.4	369.5	437.0	510
2-1/2”	0	0	25.8	87.6	168.6	262.5	363.9	470.2	577.5	682.3	785
3”	0	0	33.8	123.7	242.7	380.8	531.5	689.3	848.7	1004.5	1155
4”	0	7.6	118.9	296.2	516.2	766.5	1035.8	1314.3	1592.7	1861.8	2115
6”	0	40.5	224.3	631.8	1149.9	1746.3	2392.5	3064.2	3738.8	4393.3	5050
8”	0	63.7	600.7	1416.3	2418.3	3552.3	4768.2	6023.1	7275.9	8485.1	9640
10”	0	184.2	1085.2	2381.6	3950.9	5712.4	7591.5	9523.9	11447.0	13298.4	15000
12”	0	140.0	1320.0	3048.2	5290.0	7775.5	10434.0	13200.6	15940.2	18570.1	21060

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