

Sizing Water Valves

Two Position Applications: The valve is normally sized to the pipe size with the largest Cv.

Modulating Applications: The valve should be sized to produce the required GPM flow at a pressure drop of 1 to 2 times the pressure drop across the coil at design flow.

Example: To select a VG1000 Series Ball Valve for a coil that requires 14 gpm at 5 psi pressure drop. The valve should be selected to provide 14 gpm with a pressure drop across the valve between 5 and 10 psi (one to two times the pressure drop across the coil at the required flow).

Solution: From the VG1000 Series Ball Valve table below, a 1/2 in., 4.7 Cv valve will provide 14.1 gpm flow at a pressure drop across the valve of 9 psi. This is the valve to be selected, as the valve will provide the needed flow with a pressure drop between one and two times the pressure drop across the coil at the required flow.

Flow Rates in GPM (Gallons Per Minute)

VG1000 Series Ball Valve

Cv	1.2	1.9	2.9	4.7	7.4	11.7	18.7	29.2	46.8	73.7
Pressure Drop (psi)	Flow Rate in gpm (Gallons Per Minute)									
1	1.2	1.9	2.9	4.7	7.4	11.7	18.7	29.2	46.8	73.7
2	1.7	2.7	4.1	6.6	10.5	16.5	26.4	41.3	66.2	104.2
3	2.1	3.3	5.0	8.1	12.8	20.3	32.4	50.6	81.1	127.7
4	2.4	3.8	5.8	9.4	14.8	23.4	37.4	58.4	93.6	147.4
5	2.7	4.2	6.5	10.5	16.5	26.2	41.8	65.3	104.6	164.8
6	2.9	4.7	7.1	11.5	18.1	28.7	45.8	71.5	114.6	180.5
7	3.2	5.0	7.7	12.4	19.6	31.0	49.5	77.3	123.8	195.0
8	3.4	5.4	8.2	13.3	20.9	33.1	52.9	82.6	132.4	208.5
9	3.6	5.7	8.7	14.1	22.2	35.1	56.1	87.6	140.4	221.1
10	3.8	6.0	9.2	14.9	23.4	37.0	59.1	92.3	148.0	233.1
11	4.0	6.3	9.6	15.6	24.5	38.8	62.0	96.8	155.2	244.4
12	4.2	6.6	10.0	16.3	25.6	40.5	64.8	101.2	162.1	255.3
13	4.3	6.9	10.5	16.9	26.7	42.2	67.4	105.3	168.7	265.7
14	4.5	7.1	10.9	17.6	27.7	43.8	70.0	109.3	175.1	275.8
15	4.6	7.4	11.2	18.2	28.7	45.3	72.4	113.1	181.3	285.4
16	4.8	7.6	11.6	18.8	29.6	46.8	74.8	116.8	187.2	294.8
17	4.9	7.8	12.0	19.4	30.5	48.2	77.1	120.4	193.0	303.9
18	5.1	8.1	12.3	19.9	31.4	49.6	79.3	123.9	198.6	312.7
19	5.2	8.3	12.6	20.5	32.3	51.0	81.5	127.3	204.0	321.3
20	5.4	8.5	13.0	21.0	33.1	52.3	83.6	130.6	209.3	329.6
21	5.5	8.7	13.3	21.5	33.9	53.6	85.7	133.8	214.5	337.7
22	5.6	8.9	13.6	22.0	34.7	54.9	87.7	137.0	219.5	345.7
23	5.8	9.1	13.9	22.5	35.5	56.1	89.7	140.0	224.4	353.5
24	5.9	9.3	14.2	23.0	36.3	57.3	91.6	143.1	229.3	361.1
25	6.0	9.5	14.5	23.5	37.0	58.5	93.5	146.0	234.0	368.5
26	6.1	9.7	14.8	24.0	37.7	59.7	95.4	148.9	238.6	375.8
27	6.2	9.9	15.1	24.4	38.5	60.8	97.2	151.7	243.2	383.0
28	6.3	10.1	15.3	24.9	39.2	61.9	99.0	154.5	247.6	390.0
29	6.5	10.2	15.6	25.3	39.9	63.0	100.7	157.2	252.0	396.9
30	6.6	10.4	15.9	25.7	40.5	64.1	102.4	159.9	256.3	403.7

Sizing Water Valves (Continued)
Flow Rates in GPM (Gallons Per Minute)
VG1000 Series Flanged Ball Valve

Cv	47	74	117	176	211
Pressure Drop (psi)	Flow Rate in gpm (Gallons Per Minute)				
1	47.0	74.0	117	176	211
2	66.5	105	165	249	298
3	81.4	128	203	305	365
4	94	148	234	352	422
5	105	165	262	394	472
6	115	181	287	431	517
7	124	196	310	466	558
8	133	209	331	498	597
9	141	222	351	528	633
10	149	234	370	557	667
11	156	245	388	584	700
12	163	256	405	610	731
13	169	267	422	635	761
14	176	277	438	659	789
15	182	287	453	682	817
16	188	296	468	704	844
17	194	305	482	726	870
18	199	314	496	747	895
19	205	323	510	767	920
20	210	331	523	787	944
21	215	339	536	807	967
22	220	347	549	826	990
23	225	355	561	844	1012
24	230	363	573	862	1034
25	235	370	585	880	1055
26	240	377	597	897	1076
27	244	385	608	915	1096
28	249	392	619	931	1117
29	253	399	630	948	1136
30	257	405	641	964	1156

Sizing Water Valves (Continued)

Flow Rates in GPM (Gallons Per Minute)

VG2000 Series Flanged Cast Iron Globe Valve

Pipe Size	Two-Way					Three-Way				
	2-1/2"	3"	4"	5"	6"	2-1/2"	3"	4"	5"	6"
Cv	51	83	150	240	350	54	80	157	238	347
Pressure Drop (psi)	Flow Rate in gpm (Gallons Per Minute)									
1	51.0	83.0	150.0	240.0	350.0	54.0	80.0	157.0	238.0	347.0
2	72.1	117.4	212.1	339.4	495.0	76.4	113.1	222.0	336.6	490.7
3	88.3	143.8	259.8	415.7	606.2	93.5	138.6	271.9	412.2	601.0
4	102.0	166.0	300.0	480.0	700.0	108.0	160.0	314.0	476.0	694.0
5	114.0	185.6	335.4	536.7	782.6	120.7	178.9	351.1	532.2	775.9
6	124.9	203.3	367.4	587.9	857.3	132.3	196.0	384.6	583.0	850.0
7	134.9	219.6	396.9	635.0	926.0	142.9	211.7	415.4	629.7	918.1
8	144.2	234.8	424.3	678.8	989.9	152.7	226.3	444.1	673.2	981.5
9	153.0	249.0	450.0	720.0	1050.0	162.0	240.0	471.0	714.0	1041.0
10	161.3	262.5	474.3	758.9	1106.8	170.8	253.0	496.5	752.6	1097.3
11	169.1	275.3	497.5	796.0	1160.8	179.1	265.3	520.7	789.4	1150.9
12	176.7	287.5	519.6	831.4	1212.4	187.1	277.1	543.9	824.5	1202.0
13	183.9	299.3	540.8	865.3	1261.9	194.7	288.4	566.1	858.1	1251.1
14	190.8	310.6	561.2	898.0	1309.6	202.0	299.3	587.4	890.5	1298.4
15	197.5	321.5	580.9	929.5	1355.5	209.1	309.8	608.1	921.8	1343.9
16	204.0	332.0	600.0	960.0	1400.0	216.0	320.0	628.0	952.0	1388.0
17	210.3	342.2	618.5	989.5	1443.1	222.6	329.8	647.3	981.3	1430.7
18	216.4	352.1	636.4	1018.2	1484.9	229.1	339.4	666.1	1009.7	1472.2
19	222.3	361.8	653.8	1046.1	1525.6	235.4	348.7	684.3	1037.4	1512.5
20	228.1	371.2	670.8	1073.3	1565.2	241.5	357.8	702.1	1064.4	1551.8
21	233.7	380.4	687.4	1099.8	1603.9	247.5	366.6	719.5	1090.7	1590.2
22	239.2	389.3	703.6	1125.7	1641.6	253.3	375.2	736.4	1116.3	1627.6
23	244.6	398.1	719.4	1151.0	1678.5	259.0	383.7	752.9	1141.4	1664.2
24	249.8	406.6	734.8	1175.8	1714.6	264.5	391.9	769.1	1166.0	1699.9
25	255.0	415.0	750.0	1200.0	1750.0	270.0	400.0	785.0	1190.0	1735.0
26	260.0	423.2	764.9	1223.8	1784.7	275.3	407.9	800.5	1213.6	1769.4
27	265.0	431.3	779.4	1247.1	1818.7	280.6	415.7	815.8	1236.7	1803.1
28	269.9	439.2	793.7	1270.0	1852.0	285.7	423.3	830.8	1259.4	1836.2
29	274.6	447.0	807.8	1292.4	1884.8	290.8	430.8	845.5	1281.7	1868.7
30	279.3	454.6	821.6	1314.5	1917.0	295.8	438.2	859.9	1303.6	1900.6

Sizing Water Valves (Continued)
Flow Rates in GPM (Gallons Per Minute)
VG7000 Series Bronze Globe Valve

Pipe Size	1/2"			3/4"	1"	1-1/4"	1-1/2"	2"
Cv	0.73	1.8	4.6	7.3	11.6	18.5	28.9	46.2
Pressure Drop (psi)	Flow Rate in gpm (Gallons Per Minute)							
1	0.7	1.8	4.6	7.3	11.6	18.5	28.9	46.2
2	1.0	2.5	6.5	10.3	16.4	26.2	40.9	65.3
3	1.3	3.1	8.0	12.6	20.1	32.0	50.1	80.0
4	1.5	3.6	9.2	14.6	23.2	37.0	57.8	92.4
5	1.6	4.0	10.3	16.3	25.9	41.4	64.6	103.3
6	1.8	4.4	11.3	17.9	28.4	45.3	70.8	113.2
7	1.9	4.8	12.2	19.3	30.7	48.9	76.5	122.2
8	2.1	5.1	13.0	20.6	32.8	52.3	81.7	130.7
9	2.2	5.4	13.8	21.9	34.8	55.5	86.7	138.6
10	2.3	5.7	14.5	23.1	36.7	58.5	91.4	146.1
11	2.4	6.0	15.3	24.2	38.5	61.4	95.9	153.2
12	2.5	6.2	15.9	25.3	40.2	64.1	100.1	160.0
13	2.6	6.5	16.6	26.3	41.8	66.7	104.2	166.6
14	2.7	6.7	17.2	27.3	43.4	69.2	108.1	172.9
15	2.8	7.0	17.8	28.3	44.9	71.7	111.9	178.9
16	2.9	7.2	18.4	29.2	46.4	74.0	115.6	184.8
17	3.0	7.4	19.0	30.1	47.8	76.3	119.2	190.5
18	3.1	7.6	19.5	31.0	49.2	78.5	122.6	196.0
19	3.2	7.8	20.1	31.8	50.6	80.6	126.0	201.4
20	3.3	8.0	20.6	32.6	51.9	82.7	129.2	206.6
21	3.3	8.2	21.1	33.5	53.2	84.8	132.4	211.7
22	3.4	8.4	21.6	34.2	54.4	86.8	135.6	216.7
23	3.5	8.6	22.1	35.0	55.6	88.7	138.6	221.6
24	3.6	8.8	22.5	35.8	56.8	90.6	141.6	226.3
25	3.7	9.0	23.0	36.5	58.0	92.5	144.5	231.0
26	3.7	9.2	23.5	37.2	59.1	94.3	147.4	235.6
27	3.8	9.4	23.9	37.9	60.3	96.1	150.2	240.1
28	3.9	9.5	24.3	38.6	61.4	97.9	152.9	244.5
29	3.9	9.7	24.8	39.3	62.5	99.6	155.6	248.8
30	4.0	9.9	25.2	40.0	63.5	101.3	158.3	253.0

Sizing Water Valves (Continued)

Flow Rates in GPM (Gallons Per Minute)

J Series Electric Zone Valve

Cv	JM Series Modulating					JS/JT Series On/Off					
	1	2	4	7.5	8	1	2.5	3.5	4	5	8
Pressure Drop (psi)	Flow Rate in gpm (Gallons Per Minute)										
1	1.0	2.0	4.0	7.5	8.0	1.0	2.5	3.5	4.0	5.0	8.0
2	1.4	2.8	5.7	10.6	11.3	1.4	3.5	4.9	5.7	7.1	11.3
3	1.7	3.5	6.9	13.0	13.9	1.7	4.3	6.1	6.9	8.7	13.9
4	2.0	4.0	8.0	15.0	16.0	2.0	5.0	7.0	8.0	10.0	16.0
5	2.2	4.5	8.9	16.8	17.9	2.2	5.6	7.8	8.9	11.2	17.9
6	2.4	4.9	9.8	18.4	19.6	2.4	6.1	8.6	9.8	12.2	19.6
7	2.6	5.3	10.6	19.8	21.2	2.6	6.6	9.3	10.6	13.2	21.2
8	2.8	5.7	11.3	21.2	22.6	2.8	7.1	9.9	11.3	14.1	22.6
9	3.0	6.0	12.0	22.5	24.0	3.0	7.5	10.5	12.0	15.0	24.0
10	3.2	6.3	12.6	23.7	25.3	3.2	7.9	11.1	12.6	15.8	25.3
11	3.3	6.6	13.3	24.9	26.5	3.3	8.3	11.6	13.3	16.6	26.5
12	3.5	6.9	13.9	26.0	27.7	3.5	8.7	12.1	13.9	17.3	27.7
13	3.6	7.2	14.4	27.0	28.8	3.6	9.0	12.6	14.4	18.0	28.8
14	3.7	7.5	15.0	28.1	29.9	3.7	9.4	13.1	15.0	18.7	29.9
15	3.9	7.7	15.5	29.0	31.0	3.9	9.7	13.6	15.5	19.4	31.0
16	4.0	8.0	16.0	30.0	32.0	4.0	10.0	14.0	16.0	20.0	32.0
17	4.1	8.2	16.5	30.9	33.0	4.1	10.3	14.4	16.5	20.6	33.0
18	4.2	8.5	17.0	31.8	33.9	4.2	10.6	14.8	17.0	21.2	33.9
19	4.4	8.7	17.4	32.7	34.9	4.4	10.9	15.3	17.4	21.8	34.9
20	4.5	8.9	17.9	33.5	35.8	4.5	11.2	15.7	17.9	22.4	35.8
21	4.6	9.2	18.3	34.4	36.7	4.6	11.5	16.0	18.3	22.9	36.7
22	4.7	9.4	18.8	35.2	37.5	4.7	11.7	16.4	18.8	23.5	37.5
23	4.8	9.6	19.2	36.0	38.4	4.8	12.0	16.8	19.2	24.0	38.4
24	4.9	9.8	19.6	36.7	39.2	4.9	12.2	17.1	19.6	24.5	39.2
25	5.0	10.0	20.0	37.5	40.0	5.0	12.5	17.5	20.0	25.0	40.0
26	5.1	10.2	20.4	38.2	40.8	5.1	12.7	17.8	20.4	25.5	40.8
27	5.2	10.4	20.8	39.0	41.6	5.2	13.0	18.2	20.8	26.0	41.6
28	5.3	10.6	21.2	39.7	42.3	5.3	13.2	18.5	21.2	26.5	42.3
29	5.4	10.8	21.5	40.4	43.1	5.4	13.5	18.8	21.5	26.9	43.1
30	5.5	11.0	21.9	41.1	43.8	5.5	13.7	19.2	21.9	27.4	43.8

Sizing Water Valves (Continued)
Flow Rates in GPM (Gallons Per Minute)
VF4, VF5 and VF6 Series M9000 and D-3000 Actuated Butterfly Valves

Pipe Size	Cv at 70° Open for Modulating Service							
	2"	2-1/2"	3"	4"	5"	6"	8"	10"
Cv	105	156	240	423	656	941	1660	2560
Pressure Drop (psi)	Flow Rate in gpm (Gallons Per Minute)							
1	105	156	240	423	656	941	1,660	2,560
2	149	221	339	598	928	1,331	2,348	3,620
3	182	270	416	733	1,136	1,630	2,875	4,434
4	210	312	480	846	1,312	1,882	3,320	5,120
5	235	349	537	946	1,467	2,104	3,712	5,724
6	257	382	588	1,036	1,607	2,305	4,066	6,271
7	278	413	635	1,119	1,736	2,490	4,392	6,773
8	297	441	679	1,196	1,855	2,662	4,695	7,241
9	315	468	720	1,269	1,968	2,823	4,980	7,680
10	332	493	759	1,338	2,075	2,976	5,249	8,095
11	348	517	796	1,403	2,176	3,121	5,506	8,491
12	364	540	831	1,465	2,273	3,260	5,750	8,868
13	379	563	865	1,525	2,365	3,393	5,985	9,230
14	393	584	898	1,583	2,455	3,521	6,211	9,579
15	407	604	930	1,638	2,541	3,645	6,429	9,915
16	420	624	960	1,692	2,624	3,764	6,640	10,240
17	433	643	990	1,744	2,705	3,880	6,844	10,555
18	446	662	1,018	1,795	2,783	3,992	7,043	10,861
19	458	680	1,046	1,844	2,859	4,102	7,236	11,159
20	470	698	1,073	1,892	2,934	4,208	7,424	11,449
21	481	715	1,100	1,938	3,006	4,312	7,607	11,731
22	493	732	1,126	1,984	3,077	4,414	7,786	12,008
23	504	748	1,151	2,029	3,146	4,513	7,961	12,277
24	514	764	1,176	2,072	3,214	4,610	8,132	12,541
25	525	780	1,200	2,115	3,280	4,705	8,300	12,800
26	535	795	1,224	2,157	3,345	4,798	8,464	13,054
27	546	811	1,247	2,198	3,409	4,890	8,626	13,302
28	556	826	1,270	2,238	3,471	4,979	8,784	13,546
29	565	840	1,292	2,278	3,533	5,067	8,939	13,786
30	575	854	1,315	2,317	3,593	5,154	9,092	14,022

Sizing Water Valves (Continued)

Flow Rates in GPM (Gallons Per Minute)

VF4 and VF5 Series M9000 Actuated Butterfly Valves

Pipe Size	Cv at 90° Open for On/Off Service					
	2"	2-1/2"	3"	4"	5"	6"
Cv	159	266	457	860	1320	2020
Pressure Drop (psi)	Flow Rate in gpm (Gallons Per Minute)					
1	159	266	457	860	1,320	2,020
2	225	376	646	1,216	1,867	2,857
3	275	461	792	1,490	2,286	3,499
4	318	532	914	1,720	2,640	4,040
5	356	595	1,022	1,923	2,952	4,517
6	390	652	1,119	2,107	3,233	4,948
7	421	704	1,209	2,275	3,492	5,344
8	450	752	1,293	2,432	3,734	5,713
9	477	798	1,371	2,580	3,960	6,060
10	503	841	1,445	2,720	4,174	6,388
11	527	882	1,516	2,852	4,378	6,700
12	551	922	1,583	2,979	4,573	6,998
13	573	959	1,648	3,101	4,759	7,283
14	595	995	1,710	3,218	4,939	7,558
15	616	1,030	1,770	3,331	5,112	7,823
16	636	1,064	1,828	3,440	5,280	8,080
17	656	1,097	1,884	3,546	5,443	8,329
18	675	1,129	1,939	3,649	5,600	8,570
19	693	1,160	1,992	3,749	5,754	8,805
20	711	1,190	2,044	3,846	5,903	9,034
21	729	1,219	2,094	3,941	6,049	9,257
22	746	1,248	2,144	4,034	6,191	9,475
23	763	1,276	2,192	4,124	6,331	9,688
24	779	1,303	2,239	4,213	6,467	9,896
25	795	1,330	2,285	4,300	6,600	10,100
26	811	1,356	2,330	4,385	6,731	10,300
27	826	1,382	2,375	4,469	6,859	10,496
28	841	1,408	2,418	4,551	6,985	10,689
29	856	1,433	2,461	4,631	7,108	10,878
30	871	1,457	2,503	4,710	7,230	11,064

Sizing Water Valves (Continued)
Flow Rates in GPM (Gallons Per Minute)
VFX- Series Standard Performance Butterfly Valves

Pipe Size	Cv at 70° Open for Modulating Service												
	2"	2-1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"
Cv	84	163	267	496	775	1,025	1,862	2,948	4,393	5,939	7,867	10,065	12,535
Pressure Drop (psi)	Flow Rate in gpm (Gallons Per Minute)												
	1	84	163	267	496	775	1,025	1,862	2,948	4,393	5,939	7,867	10,065
2	119	231	378	701	1,096	1,450	2,633	4,169	6,213	8,399	11,126	14,234	17,727
3	146	282	463	859	1,342	1,775	3,225	5,106	7,609	10,287	13,626	17,433	21,711
4	168	326	534	992	1,550	2,050	3,724	5,896	8,786	11,878	15,734	20,130	25,070
5	188	365	597	1,109	1,733	2,292	4,164	6,592	9,823	13,280	17,591	22,506	28,029
6	206	399	654	1,215	1,898	2,511	4,561	7,221	10,761	14,548	19,270	24,654	30,704
7	222	431	706	1,312	2,051	2,712	4,926	7,800	11,623	15,713	20,814	26,630	33,165
8	238	461	755	1,403	2,192	2,899	5,267	8,338	12,425	16,798	22,251	28,468	35,454
9	252	489	801	1,488	2,325	3,075	5,586	8,844	13,179	17,817	23,601	30,195	37,605
10	266	516	844	1,569	2,451	3,241	5,888	9,322	13,892	18,781	24,878	31,828	39,639
11	279	541	886	1,645	2,570	3,400	6,176	9,777	14,570	19,697	26,092	33,382	41,574
12	291	565	925	1,718	2,685	3,551	6,450	10,212	15,218	20,573	27,252	34,866	43,423
13	303	588	963	1,788	2,794	3,696	6,714	10,629	15,839	21,413	28,365	36,290	45,196
14	314	610	999	1,856	2,900	3,835	6,967	11,030	16,437	22,222	29,436	37,660	46,902
15	325	631	1,034	1,921	3,002	3,970	7,212	11,418	17,014	23,002	30,469	38,982	48,548
16	336	652	1,068	1,984	3,100	4,100	7,448	11,792	17,572	23,756	31,468	40,260	50,140
17	346	672	1,101	2,045	3,195	4,226	7,677	12,155	18,113	24,487	32,437	41,499	51,683
18	356	692	1,133	2,104	3,288	4,349	7,900	12,507	18,638	25,197	33,377	42,702	53,182
19	366	711	1,164	2,162	3,378	4,468	8,116	12,850	19,149	25,888	34,292	43,872	54,639
20	376	729	1,194	2,218	3,466	4,584	8,327	13,184	19,646	26,560	35,182	45,012	56,058
21	385	747	1,224	2,273	3,552	4,697	8,533	13,509	20,131	27,216	36,051	46,124	57,443
22	394	765	1,252	2,326	3,635	4,808	8,734	13,827	20,605	27,856	36,900	47,209	58,794
23	403	782	1,281	2,379	3,717	4,916	8,930	14,138	21,068	28,482	37,729	48,270	60,116
24	412	799	1,308	2,430	3,797	5,022	9,122	14,442	21,521	29,095	38,540	49,308	61,409
25	420	815	1,335	2,480	3,875	5,125	9,310	14,740	21,965	29,695	39,335	50,325	62,675
26	428	831	1,361	2,529	3,952	5,227	9,494	15,032	22,400	30,283	40,114	51,322	63,916
27	437	847	1,387	2,577	4,027	5,326	9,675	15,318	22,827	30,860	40,878	52,299	65,134
28	445	863	1,413	2,625	4,101	5,424	9,853	15,599	23,246	31,426	41,628	53,259	66,329
29	452	878	1,438	2,671	4,174	5,520	10,027	15,876	23,657	31,983	42,365	54,202	67,503
30	460	893	1,462	2,717	4,245	5,614	10,199	16,147	24,062	32,529	43,089	55,128	68,657

Sizing Water Valves (Continued)

Flow Rates in GPM (Gallons Per Minute)

VFx- Series Standard Performance Butterfly Valves

Pipe Size	Cv at 90° Open for On/Off Service												
	2"	2-1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"
Cv	144	282	461	841	1,376	1,850	3,316	5,430	8,077	10,538	13,966	17,214	22,339
Pressure Drop (psi)	Flow Rate in gpm (Gallons Per Minute)												
1	144	282	461	841	1,376	1,850	3,316	5,430	8,077	10,538	13,966	17,214	22,339
2	204	399	652	1,189	1,946	2,616	4,690	7,679	11,423	14,903	19,751	24,344	31,592
3	249	488	799	1,457	2,383	3,204	5,744	9,405	13,990	18,252	24,190	29,816	38,692
4	288	564	922	1,682	2,752	3,700	6,632	10,860	16,154	21,076	27,932	34,428	44,678
5	322	631	1,031	1,881	3,077	4,137	7,415	12,142	18,061	23,564	31,229	38,492	49,952
6	353	691	1,129	2,060	3,371	4,532	8,123	13,301	19,785	25,813	34,210	42,166	54,719
7	381	746	1,220	2,225	3,641	4,895	8,773	14,366	21,370	27,881	36,951	45,544	59,103
8	407	798	1,304	2,379	3,892	5,233	9,379	15,358	22,845	29,806	39,502	48,689	63,184
9	432	846	1,383	2,523	4,128	5,550	9,948	16,290	24,231	31,614	41,898	51,642	67,017
10	455	892	1,458	2,660	4,351	5,850	10,486	17,171	25,542	33,324	44,164	54,435	70,642
11	478	935	1,529	2,789	4,564	6,136	10,998	18,009	26,788	34,951	46,320	57,092	74,090
12	499	977	1,597	2,913	4,767	6,409	11,487	18,810	27,980	36,505	48,380	59,631	77,385
13	519	1,017	1,662	3,032	4,961	6,670	11,956	19,578	29,122	37,995	50,355	62,066	80,544
14	539	1,055	1,725	3,147	5,149	6,922	12,407	20,317	30,221	39,430	52,256	64,409	83,585
15	558	1,092	1,785	3,257	5,329	7,165	12,843	21,030	31,282	40,814	54,090	66,670	86,519
16	576	1,128	1,844	3,364	5,504	7,400	13,264	21,720	32,308	42,152	55,864	68,856	89,356
17	594	1,163	1,901	3,468	5,673	7,628	13,672	22,389	33,302	43,449	57,583	70,975	92,106
18	611	1,196	1,956	3,568	5,838	7,849	14,069	23,038	34,268	44,709	59,253	73,033	94,776
19	628	1,229	2,010	3,666	5,998	8,064	14,454	23,669	35,207	45,934	60,876	75,034	97,373
20	644	1,261	2,062	3,761	6,154	8,274	14,830	24,284	36,121	47,127	62,458	76,983	99,903
21	660	1,292	2,113	3,854	6,306	8,478	15,196	24,883	37,014	48,291	64,000	78,885	102,370
22	675	1,323	2,162	3,945	6,454	8,677	15,553	25,469	37,885	49,428	65,506	80,741	104,779
23	691	1,352	2,211	4,033	6,599	8,872	15,903	26,041	38,736	50,539	66,979	82,555	107,134
24	706	1,382	2,258	4,120	6,741	9,063	16,245	26,602	39,569	51,625	68,419	84,331	109,438
25	720	1,410	2,305	4,205	6,880	9,250	16,580	27,150	40,385	52,690	69,830	86,070	111,695
26	734	1,438	2,351	4,288	7,016	9,433	16,908	27,688	41,185	53,734	71,213	87,775	113,907
27	748	1,465	2,395	4,370	7,150	9,613	17,230	28,215	41,969	54,757	72,570	89,447	116,077
28	762	1,492	2,439	4,450	7,281	9,789	17,547	28,733	42,740	55,762	73,901	91,088	118,207
29	776	1,519	2,483	4,529	7,410	9,963	17,857	29,241	43,496	56,749	75,209	92,700	120,299
30	789	1,545	2,525	4,606	7,537	10,133	18,163	29,741	44,240	57,719	76,495	94,285	122,356

Sizing Water Valves (Continued)
Flow Rates in GPM (Gallons Per Minute)
VFX- Series High Performance Class 150 Butterfly Valves

Pipe Size	Cv at 70° Open for Modulating Service									
	2-1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"
Cv	100	155	315	500	750	1,590	2,430	3,750	3,400	5,510
Pressure Drop (psi)	Flow Rate in gpm (Gallons Per Minute)									
1	100	155	315	500	750	1,590	2,430	3,750	3,400	5,510
2	141	219	446	707	1,061	2,249	3,437	5,303	4,808	7,792
3	173	269	546	866	1,299	2,754	4,209	6,495	5,889	9,544
4	200	310	630	1,000	1,500	3,180	4,860	7,500	6,800	11,020
5	224	347	704	1,118	1,677	3,555	5,434	8,385	7,603	12,321
6	245	380	772	1,225	1,837	3,895	5,952	9,186	8,328	13,497
7	265	410	833	1,323	1,984	4,207	6,429	9,922	8,996	14,578
8	283	438	891	1,414	2,121	4,497	6,873	10,607	9,617	15,585
9	300	465	945	1,500	2,250	4,770	7,290	11,250	10,200	16,530
10	316	490	996	1,581	2,372	5,028	7,684	11,859	10,752	17,424
11	332	514	1,045	1,658	2,488	5,273	8,059	12,437	11,277	18,275
12	346	537	1,091	1,732	2,598	5,508	8,418	12,990	11,778	19,087
13	361	559	1,136	1,803	2,704	5,733	8,762	13,521	12,259	19,867
14	374	580	1,179	1,871	2,806	5,949	9,092	14,031	12,722	20,617
15	387	600	1,220	1,937	2,905	6,158	9,411	14,524	13,168	21,340
16	400	620	1,260	2,000	3,000	6,360	9,720	15,000	13,600	22,040
17	412	639	1,299	2,062	3,092	6,556	10,019	15,462	14,019	22,718
18	424	658	1,336	2,121	3,182	6,746	10,310	15,910	14,425	23,377
19	436	676	1,373	2,179	3,269	6,931	10,592	16,346	14,820	24,018
20	447	693	1,409	2,236	3,354	7,111	10,867	16,771	15,205	24,642
21	458	710	1,444	2,291	3,437	7,286	11,136	17,185	15,581	25,250
22	469	727	1,478	2,345	3,518	7,458	11,398	17,589	15,947	25,844
23	480	743	1,511	2,398	3,597	7,625	11,654	17,984	16,306	26,425
24	490	759	1,543	2,450	3,674	7,789	11,905	18,371	16,657	26,993
25	500	775	1,575	2,500	3,750	7,950	12,150	18,750	17,000	27,550
26	510	790	1,606	2,550	3,824	8,107	12,391	19,121	17,337	28,096
27	520	805	1,637	2,598	3,897	8,262	12,627	19,486	17,667	28,631
28	529	820	1,667	2,646	3,969	8,414	12,858	19,843	17,991	29,156
29	539	835	1,696	2,693	4,039	8,562	13,086	20,194	18,310	29,672
30	548	849	1,725	2,739	4,108	8,709	13,310	20,540	18,623	30,180

Sizing Water Valves (Continued)

Flow Rates in GPM (Gallons Per Minute)

VFX- Series High Performance Class 150 Butterfly Valves

Pipe Size	Cv at 90° Open for On/Off Service									
	2-1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"
Cv	160	185	375	790	1,350	2,800	4,300	6,650	7,650	9,800
Pressure Drop (psi)	Flow Rate in gpm (Gallons Per Minute)									
1	160	185	375	790	1,350	2,800	4,300	6,650	7,650	9,800
2	226	262	530	1,117	1,909	3,960	6,081	9,405	10,819	13,859
3	277	320	650	1,368	2,338	4,850	7,448	11,518	13,250	16,974
4	320	370	750	1,580	2,700	5,600	8,600	13,300	15,300	19,600
5	358	414	839	1,767	3,019	6,261	9,615	14,870	17,106	21,914
6	392	453	919	1,935	3,307	6,859	10,533	16,289	18,739	24,005
7	423	490	992	2,090	3,572	7,408	11,377	17,594	20,240	25,928
8	453	523	1,061	2,235	3,818	7,920	12,162	18,809	21,638	27,719
9	480	555	1,125	2,370	4,050	8,400	12,900	19,950	22,950	29,400
10	506	585	1,186	2,498	4,269	8,854	13,598	21,029	24,191	30,990
11	531	614	1,244	2,620	4,477	9,287	14,262	22,056	25,372	32,503
12	554	641	1,299	2,737	4,677	9,700	14,896	23,036	26,500	33,948
13	577	667	1,352	2,848	4,868	10,096	15,504	23,977	27,583	35,334
14	599	692	1,403	2,956	5,051	10,477	16,089	24,882	28,624	36,668
15	620	717	1,452	3,060	5,229	10,844	16,654	25,755	29,628	37,955
16	640	740	1,500	3,160	5,400	11,200	17,200	26,600	30,600	39,200
17	660	763	1,546	3,257	5,566	11,545	17,729	27,419	31,542	40,406
18	679	785	1,591	3,352	5,728	11,879	18,243	28,214	32,456	41,578
19	697	806	1,635	3,444	5,885	12,205	18,743	28,987	33,346	42,717
20	716	827	1,677	3,533	6,037	12,522	19,230	29,740	34,212	43,827
21	733	848	1,719	3,620	6,187	12,831	19,705	30,474	35,057	44,909
22	751	868	1,759	3,705	6,332	13,133	20,169	31,191	35,882	45,966
23	767	887	1,798	3,789	6,474	13,428	20,622	31,892	36,688	46,999
24	784	906	1,837	3,870	6,614	13,717	21,066	32,578	37,477	48,010
25	800	925	1,875	3,950	6,750	14,000	21,500	33,250	38,250	49,000
26	816	943	1,912	4,028	6,884	14,277	21,926	33,909	39,008	49,970
27	831	961	1,949	4,105	7,015	14,549	22,344	34,554	39,751	50,922
28	847	979	1,984	4,180	7,144	14,816	22,754	35,189	40,480	51,857
29	862	996	2,019	4,254	7,270	15,079	23,156	35,811	41,197	52,775
30	876	1,013	2,054	4,327	7,394	15,336	23,552	36,424	41,901	53,677

Sizing Water Valves (Continued)
Flow Rates in GPM (Gallons Per Minute)
VFx- Series High Performance Class 300 Butterfly Valves

	Cv at 70° Open for Modulating Service								
Pipe Size	2-1/2"	3"	4"	5"	6"	8"	10"	12"	14"
Cv	100	155	315	500	710	1,360	1,740	2,500	2,400
Pressure Drop (psi)	Flow Rate in gpm (Gallons Per Minute)								
1	100	155	315	500	710	1,360	1,740	2,500	2,400
2	141	219	446	707	1,004	1,923	2,461	3,536	3,394
3	173	269	546	866	1,230	2,356	3,014	4,330	4,157
4	200	310	630	1,000	1,420	2,720	3,480	5,000	4,800
5	224	347	704	1,118	1,588	3,041	3,891	5,590	5,367
6	245	380	772	1,225	1,739	3,331	4,262	6,124	5,879
7	265	410	833	1,323	1,879	3,598	4,604	6,614	6,350
8	283	438	891	1,414	2,008	3,847	4,922	7,071	6,788
9	300	465	945	1,500	2,130	4,080	5,220	7,500	7,200
10	316	490	996	1,581	2,245	4,301	5,502	7,906	7,590
11	332	514	1,045	1,658	2,355	4,511	5,771	8,292	7,960
12	346	537	1,091	1,732	2,460	4,711	6,028	8,660	8,314
13	361	559	1,136	1,803	2,560	4,904	6,274	9,014	8,653
14	374	580	1,179	1,871	2,657	5,089	6,511	9,354	8,980
15	387	600	1,220	1,937	2,750	5,267	6,739	9,683	9,295
16	400	620	1,260	2,000	2,840	5,440	6,960	10,000	9,600
17	412	639	1,299	2,062	2,927	5,607	7,174	10,308	9,896
18	424	658	1,336	2,121	3,012	5,770	7,382	10,607	10,182
19	436	676	1,373	2,179	3,095	5,928	7,585	10,897	10,461
20	447	693	1,409	2,236	3,175	6,082	7,782	11,180	10,733
21	458	710	1,444	2,291	3,254	6,232	7,974	11,456	10,998
22	469	727	1,478	2,345	3,330	6,379	8,161	11,726	11,257
23	480	743	1,511	2,398	3,405	6,522	8,345	11,990	11,510
24	490	759	1,543	2,450	3,478	6,663	8,524	12,247	11,758
25	500	775	1,575	2,500	3,550	6,800	8,700	12,500	12,000
26	510	790	1,606	2,550	3,620	6,935	8,872	12,748	12,238
27	520	805	1,637	2,598	3,689	7,067	9,041	12,990	12,471
28	529	820	1,667	2,646	3,757	7,196	9,207	13,229	12,700
29	539	835	1,696	2,693	3,824	7,324	9,370	13,463	12,924
30	548	849	1,725	2,739	3,889	7,449	9,530	13,693	13,145

Sizing Water Valves (Continued)

Flow Rates in GPM (Gallons Per Minute)

VFx- Series High Performance Class 300 Butterfly Valves

Pipe Size	Cv at 90° Open for On/Off Service								
	2-1/2"	3"	4"	5"	6"	8"	10"	12"	14"
Cv									
Pressure Drop (psi)	Flow Rate in gpm (Gallons Per Minute)								
1	160	185	375	790	1,000	2,000	2,650	4,000	3,900
2	226	262	530	1,117	1,414	2,828	3,748	5,657	5,515
3	277	320	650	1,368	1,732	3,464	4,590	6,928	6,755
4	320	370	750	1,580	2,000	4,000	5,300	8,000	7,800
5	358	414	839	1,767	2,236	4,472	5,926	8,944	8,721
6	392	453	919	1,935	2,450	4,899	6,491	9,798	9,553
7	423	490	992	2,090	2,646	5,292	7,011	10,583	10,318
8	453	523	1,061	2,235	2,828	5,657	7,495	11,314	11,031
9	480	555	1,125	2,370	3,000	6,000	7,950	12,000	11,700
10	506	585	1,186	2,498	3,162	6,325	8,380	12,649	12,333
11	531	614	1,244	2,620	3,317	6,633	8,789	13,267	12,935
12	554	641	1,299	2,737	3,464	6,928	9,180	13,856	13,510
13	577	667	1,352	2,848	3,606	7,211	9,555	14,422	14,062
14	599	692	1,403	2,956	3,742	7,483	9,915	14,967	14,593
15	620	717	1,452	3,060	3,873	7,746	10,263	15,492	15,105
16	640	740	1,500	3,160	4,000	8,000	10,600	16,000	15,600
17	660	763	1,546	3,257	4,123	8,246	10,926	16,492	16,080
18	679	785	1,591	3,352	4,243	8,485	11,243	16,971	16,546
19	697	806	1,635	3,444	4,359	8,718	11,551	17,436	17,000
20	716	827	1,677	3,533	4,472	8,944	11,851	17,889	17,441
21	733	848	1,719	3,620	4,583	9,165	12,144	18,330	17,872
22	751	868	1,759	3,705	4,690	9,381	12,430	18,762	18,293
23	767	887	1,798	3,789	4,796	9,592	12,709	19,183	18,704
24	784	906	1,837	3,870	4,899	9,798	12,982	19,596	19,106
25	800	925	1,875	3,950	5,000	10,000	13,250	20,000	19,500
26	816	943	1,912	4,028	5,099	10,198	13,512	20,396	19,886
27	831	961	1,949	4,105	5,196	10,392	13,770	20,785	20,265
28	847	979	1,984	4,180	5,292	10,583	14,023	21,166	20,637
29	862	996	2,019	4,254	5,385	10,770	14,271	21,541	21,002
30	876	1,013	2,054	4,327	5,477	10,955	14,515	21,909	21,361