Stainless Steel V-Port Ball Valves

3-Piece Body, 1000/800 PSI
1/4" to 3" NPT

SERIES
5531
5561
5591

Features

- Available in 30°, 60°, 90° V-port sizes
- Full pressure capability
- Factory-installed when ordered with a Valworx 3-piece ball valve
- Actuator ready ISO5211 direct mounting pad
- 316SS 3-piece investment cast body
- Swing-out center section
- RTFE (reinforced Teflon) ball seats
- Triple PTFE/Viton live loaded stem seals, adjustable
- Valves tested accordance with API 598/ EN12266-1
- For use in Valworx 3-piece ball valves only
- R5515xxyy where xx = Valve size; yy = 30°, 60°, 90°

Applications

Stainless steel V-port valves with PTFE/Viton seals are used for positioning control of water, air, oil, vacuum and other media compatible with the materials of construction. Unique 3-piece investment cast bolted body design offers the advantage of a swing-out body for easy inline maintenance. Valves can be direct mounted to air or electric actuators using the standard ISO5211 mounting pad, eliminating the need for extra mounting brackets and couplings. Suitable for vacuum service up to 29inHg.

V-port ball valves are used in applications requiring finer flow control than standard ball valves. For on/off applications use a regular full-port ball valve.

Operation

V-port valves are intended for use with Valworx 5618 Electronic Positioning System (EPS) actuators or 5610 multi-voltage actuators with Digital Positioning System (DPS) option. Valve position is controlled via a 4-20mA analog control signal.

Construction

Valve Body	316SS ASTM A351, CF8M
Ball	316SS CF8M
Stem	316SS
Ball Seats	RTFE (reinforced Teflon)
Stem Seals	PTFE, Viton
Hand Lever	304SS with vinyl cover
Belleville Washers/Adjust. Nut	304SS
Bolts, Washers and Nuts	304SS

Description

Investment cast 3-piece V-port stainless steel body/ball and stem. Adjustable live loaded stem seal packing helps compensate for wear, pressure or temperature fluctuations, extending the cycle life of the valve. Blow-out proof stem. Valve body held together with bolts for easy maintenance.

Solid, machined V-port 316 stainless steel ball provides better linearity for enhanced flow control. Note that total flow is significantly reduced in comparison to full port ball valves.

Standards

- Design: API 608
- Testing: API 598/ EN12266-1
- Threaded Connection:

ASME B1.20.1 (NPT)/ ISO 228-1/ BS21

- Pressure/Temperature Rating:

ASME B16.34

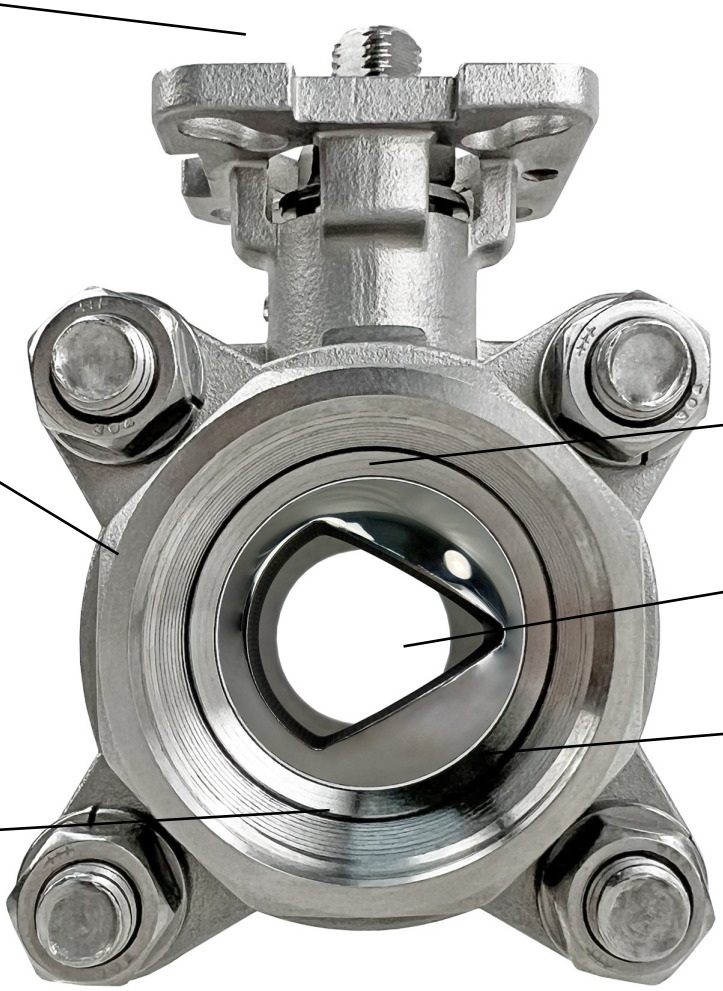
- Marking: MSS SP-25
- CE- PED 2014/68/UE

Construction Features

Actuator ready ISO5211 mounting pad

RTFE (Reinforced Teflon) ball seats

Investment casting 316 stainless steel valve body and end caps



Triple PTFE/Viton live loaded stem seals

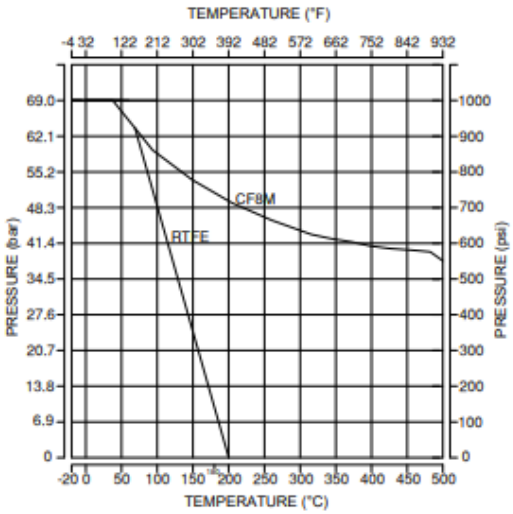
Machined 316SS ball available in 30°, 60° or 90°

3-piece design for easy removal & dis-assembly

Pressure-Temperature Range

Pressure Rating*: 1000 PSI (69 Bar) CWP non-shock 1/4" to 2" sizes
800 PSI (55 Bar) CWP non-shock 2-1/2" and 3" sizes
Vacuum 29inHg, Saturated Steam 125 PSI

Temperature Rating: -4 to 392° F (-20 to 200°C)



Specifications (English units)

Stock Number	Pipe Size (NPT)	Orifice Diameter (inch)	Cv (30/60/90)	Pressure*(PSI)	Torque (inch lbs)	ISO5211 Mount	Weight (lbs)
553102 556102 559102	1/4	0.5	2.0 4.5 5.7	1000	49.6	F03/F05	1.2
553103 556103 559103	3/8	0.5	2.2 4.9 6.2	1000	49.6	F03/F05	1.4
553104 556104 559104	1/2	0.6	2.4 5.5 6.9	1000	49.6	F03/F05	1.2
553106 556106 559106	3/4	0.8	2.9 6.4 14.0	1000	85.0	F03/F05	1.6
553108 556108 559108	1	1.0	4.8 10.1 29.0	1000	141.6	F03/F05	2.3
553110 556110 559110	1-1/4	1.3	13.2 24.5 55.0	1000	148.7	F03/F05	3.5
553112 556112 559112	1-1/2	1.5	16.1 37.1 78.0	1000	233.7	F05/F07	5.4
553116 556116 559116	2	2.0	26.2 61.0 135.0	1000	318.6	F05/F07	7.8
553120 556120 559120	2-1/2	2.6	49.0 89.4 218.0	800	495.6	F07/F10	16.7
553124 556124 559124	3	3.2	53.9 123.9 310.0	800	849.7	F07/F10	24.7

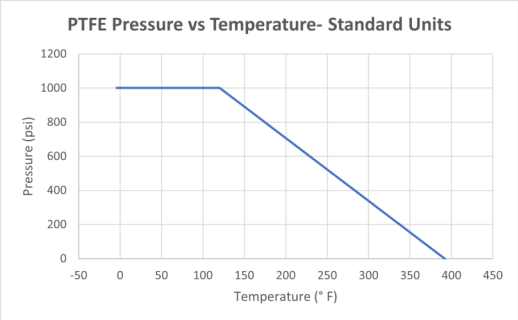
Cv = The GPM of water at 60° F that will pass through the valve with 1 PSI pressure drop

* Pressure @ 0-100° F (reduced pressure at higher temperatures—see P/T chart)

• Torque at 0 PSI and 75°F

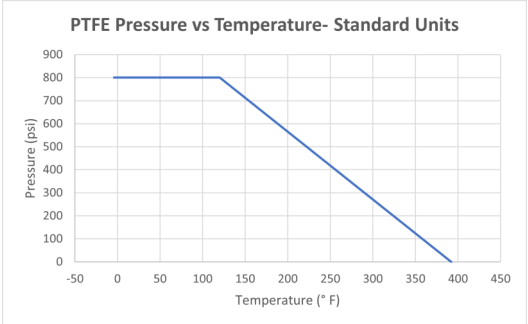
Pressure/Temp. Chart - 1000 PSI (69 Bar)

P/T Chart (PSI/°F)				
PSI	1000	1000	100	0
°F	-4	50	330	392



Pressure/Temp. Chart - 800 PSI (55 Bar)

P/T Chart (PSI/°F)				
PSI	800	800	100	0
°F	-4	50	330	392



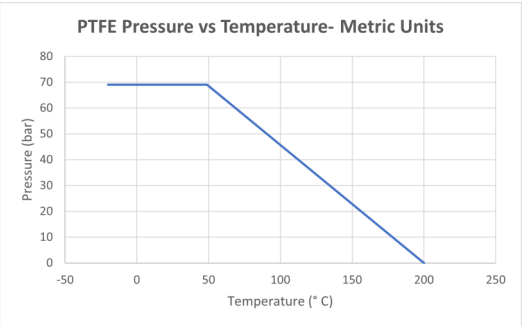
Specifications (Metric units)

Stock Number	Pipe Size (NPT)	Orifice Diameter (mm)	Kv (30/60/90)	Pressure* (Bar)	Torque (Nm)	ISO5211 Mount	Weight (Kg)
553102 556102 559102	1/4	11.5	1.7 3.9 4.9	69	5.6	F03/F05	0.5
553103 556103 559103	3/8	12.5	1.9 4.2 5.4	69	5.6	F03/F05	0.6
553104 556104 559104	1/2	15	2.1 4.8 6.0	69	5.6	F03/F05	0.5
553106 556106 559106	3/4	20	2.5 5.3 12.1	69	9.6	F03/F05	0.7
553108 556108 559108	1	25	4.2 8.7 25.1	69	16.0	F03/F05	1.0
553110 556110 559110	1-1/4	32	11.4 21.2 47.6	69	16.8	F03/F05	1.6
553112 556112 559112	1-1/2	38	13.9 32.1 67.5	69	26.4	F05/F07	2.5
553116 556116 559116	2	50	22.7 52.8 116.8	69	36.0	F05/F07	3.6
553120 556120 559120	2-1/2	65	42.7 77.3 188.6	55	56.0	F07/F10	7.6
553124 556124 559124	3	80	46.6 107.2 268.2	55	96.0	F07/F10	11.2

* Pressure range @ -18 to 38° C (reduced pressure for higher temperatures—see P/T chart)

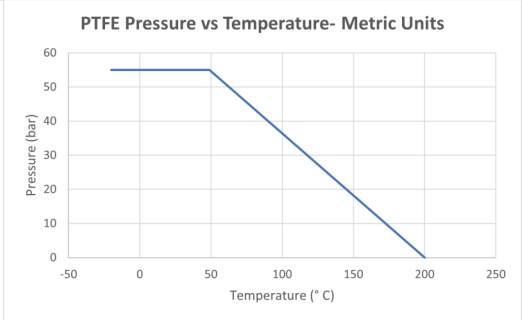
Pressure/Temp. Chart - 1000 PSI (69 Bar)

P/T Chart (BAR/°C)				
Bar	69	69	7	0
°C	-20	10	166	200



Pressure/Temp. Chart - 800 PSI (55 Bar)

P/T Chart (BAR/°C)				
Bar	55	55	7	0
°C	-20	10	166	200



CV vs Valve Position

Size	V	0	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
1/4"	30°	0.000	0.000	0.082	0.141	0.266	0.352	0.533	0.717	1.109	1.437	2.000
	60°	0.000	0.000	0.099	0.194	0.443	0.528	0.888	1.304	2.148	3.010	4.538
	90°	0.000	0.082	0.164	0.329	0.493	0.657	1.232	1.807	3.121	4.436	5.668
3/8"	30°	0.000	0.000	0.089	0.154	0.289	0.383	0.579	0.779	1.205	1.562	2.174
	60°	0.000	0.000	0.107	0.211	0.481	0.574	0.965	1.417	2.335	3.271	4.933
	90°	0.000	0.089	0.179	0.357	0.536	0.714	1.339	1.964	3.393	4.821	6.161
1/2"	30°	0.000	0.000	0.100	0.172	0.324	0.429	0.649	0.873	1.350	1.749	2.435
	60°	0.000	0.000	0.120	0.236	0.539	0.643	1.081	1.587	2.615	3.664	5.525
	90°	0.000	0.100	0.200	0.400	0.600	0.800	1.500	2.200	3.800	5.400	6.900
3/4"	30°	0.000	0.000	0.128	0.159	0.338	0.489	0.850	1.166	1.805	2.408	2.884
	60°	0.000	0.000	0.151	0.238	0.453	0.729	1.275	1.915	3.419	4.630	6.440
	90°	0.000	0.200	0.400	0.800	1.200	2.000	3.100	4.600	8.000	11.300	14.000
1"	30°	0.000	0.030	0.312	0.436	0.659	0.986	1.539	2.129	2.921	4.045	4.761
	60°	0.000	0.030	0.445	0.607	0.790	1.417	2.308	3.318	5.270	7.568	10.108
	90°	0.000	0.200	0.600	1.800	3.400	5.100	8.100	11.400	16.000	21.000	29.000
1-1/4"	30°	0.000	0.050	0.359	0.857	1.661	2.686	4.044	6.186	8.530	11.193	13.230
	60°	0.000	0.060	0.441	1.114	1.845	3.426	5.575	8.215	13.290	18.360	24.499
	90°	0.000	0.300	0.800	2.000	5.000	8.000	14.000	19.000	28.000	39.000	55.000
1-1/2"	30°	0.000	0.050	0.410	1.099	1.995	3.430	4.230	7.432	10.230	13.540	16.126
	60°	0.000	0.060	0.570	1.556	2.849	5.488	7.077	12.908	19.665	28.068	37.099
	90°	0.000	0.400	0.900	3.500	7.000	13.000	20.000	31.000	42.000	63.000	78.000
2"	30°	0.000	0.050	0.549	1.620	3.320	5.574	8.252	11.931	16.397	21.797	26.234
	60°	0.000	0.060	0.698	2.477	4.784	9.094	15.410	21.889	31.707	46.343	60.981
	90°	0.000	0.500	2.000	6.000	12.000	22.000	35.000	45.000	70.000	105.000	135.000
2-1/2"	30°	0.000	0.060	0.750	2.610	5.907	10.153	15.210	22.440	30.620	41.270	49.400
	60°	0.000	0.090	0.955	3.699	7.100	13.199	22.222	31.972	46.028	68.120	89.400
	90°	0.000	0.500	1.700	7.000	14.000	28.000	48.000	70.000	106.000	160.000	218.000
3"	30°	0.000	0.100	0.955	3.115	6.400	10.364	16.661	24.500	33.650	44.300	53.880
	60°	0.000	0.120	1.000	4.156	9.943	18.514	28.984	48.566	66.704	93.350	123.860
	90°	0.000	0.700	3.500	8.000	18.000	35.000	60.000	90.000	135.000	205.000	310.000

Cv = The GPM of water at 60° F that will pass through the valve with 1 PSI pressure drop

Positioning Actuators Specifications	5610 Series	5618 Series
Accuracy	3% F.S.	0.5% F.S.
Linearity	2% F.S.	0.5% F.S.
Deadband	3% F.S.	0.5%- 5% Adjustable
Resolution (4- 20mA)	Min 150 steps	Min 80 steps
Resolution (0- 10V)	Min 98 steps	N/A
Impedance	100 Ohm	180- 280 Ohm
Actuator Ordering Information	Factory installed accessory	Complete unit

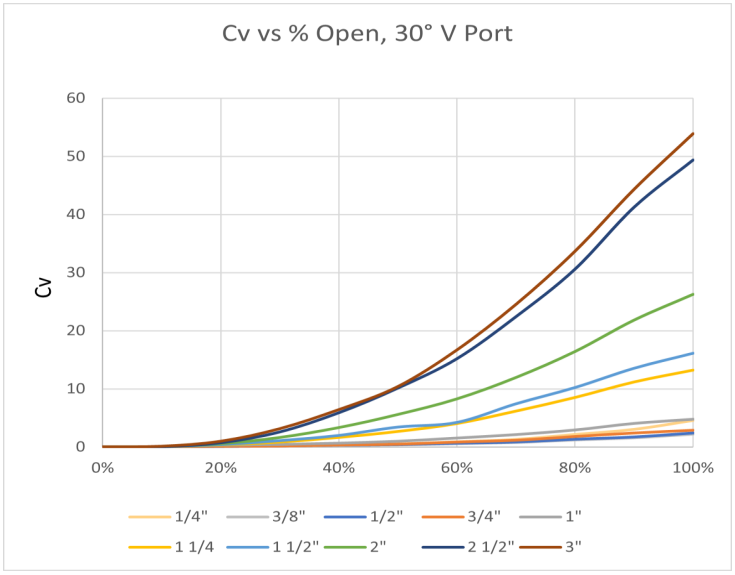
V–Port Images

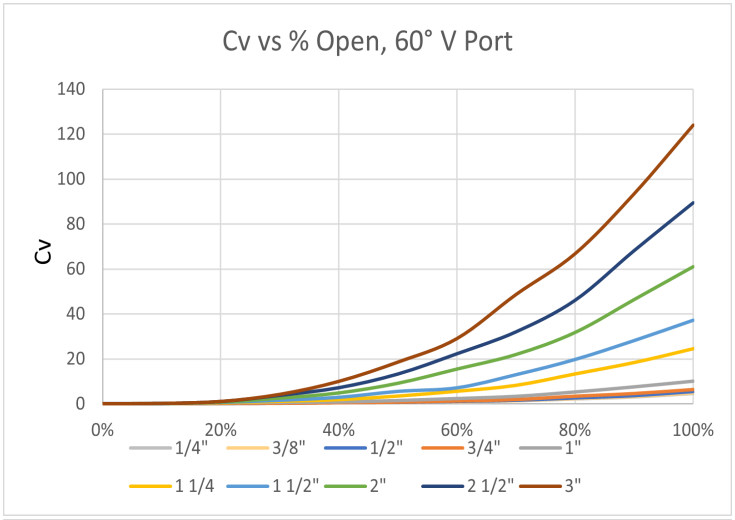
30°

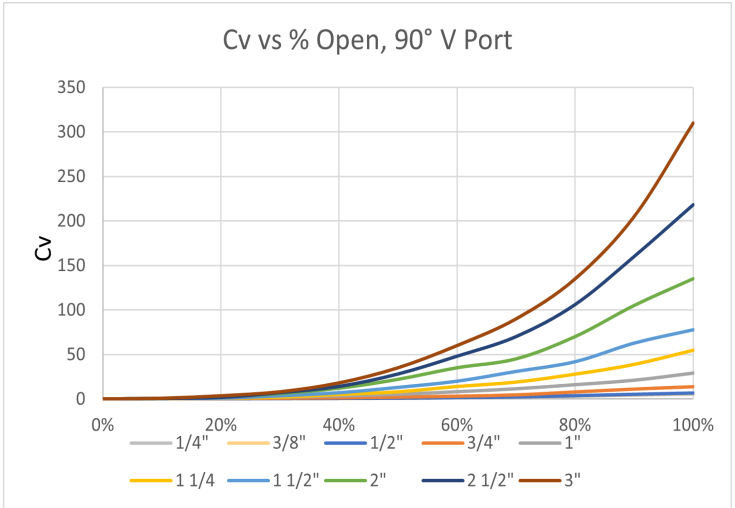
60°

90°

Specifications (CV)

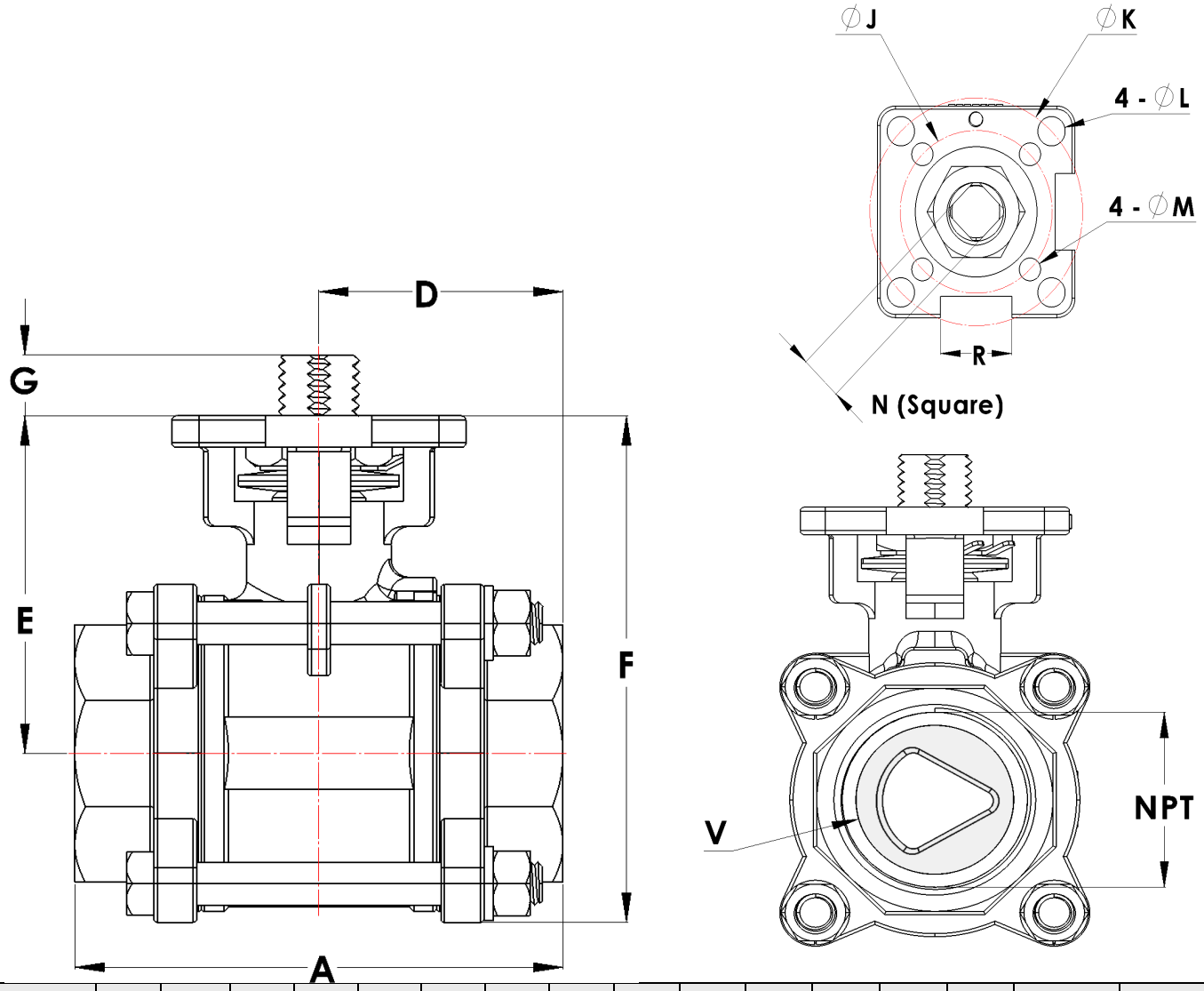






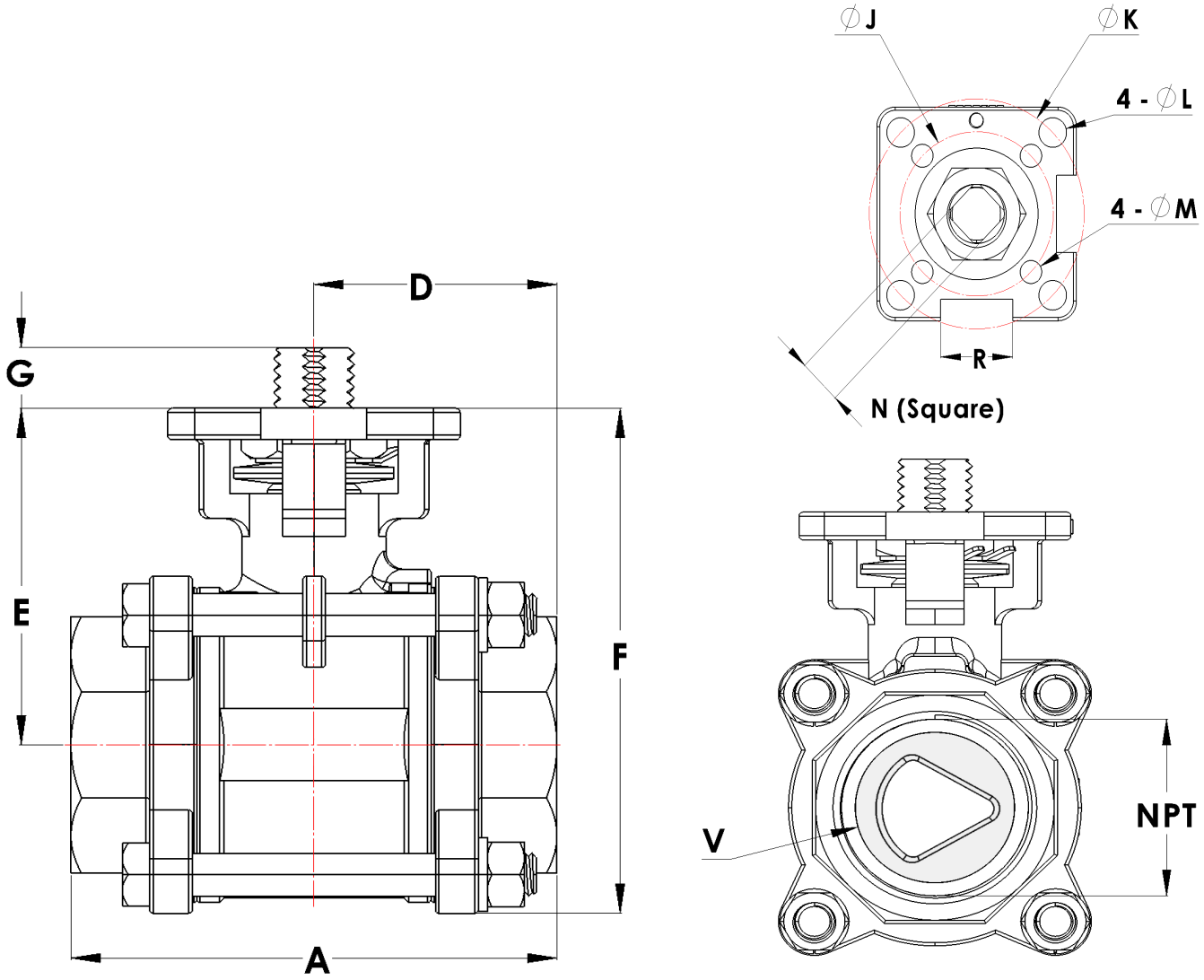
Polynomial Best Fit Cv = Ax2 + Bx + C (where x = % open)			
30°	**A**	**B**	**C**
1/4	2.5142	-0.6735	0.0601
3/8	2.7329	-0.7323	0.0655
1/2	3.0597	-0.8189	0.0732
3/4	3.7579	-0.8844	0.0566
1	5.5478	-0.8243	0.0903
1 1/4	15.9160	-2.4360	0.0835
1 1/2	19.9630	-3.6943	0.1823
2	31.0550	-4.5772	0.1215
2 1/2	60.1080	-10.0700	0.2174
3	65.6310	-11.3300	0.3235
60°	**A**	**B**	**C**
1/4	6.7175	-2.7591	0.2241
3/8	73.027	-3.0000	0.2435
1/2	8.1790	-3.3599	0.2728
3/4	9.9126	-4.0308	0.2960
1	14.6730	-5.3902	0.4561
1 1/4	35.8110	-12.8860	0.8933
1 1/2	55.2470	-20.5430	1.4205
2	86.4620	-28.9610	1.8044
2 1/2	127.4300	-43.2490	2.7312
3	174.7300	-56.8050	3.1735
90°	**A**	**B**	**C**
1/4	8.6168	3.33148	0.2769
3/8	9.3662	3.6033	0.3010
1/2	10.4900	-4.0350	0.3371
3/4	20.9210	-7.5844	0.6154
1	36.3520	-5.3902	0.4561
1 1/4	76.3400	-25.9400	1.8056
1 1/2	108.1000	-32.3910	1.9378
2	190.7900	-63.7020	4.3916
2 1/2	329.2900	-129.2100	8.7343
3	478.5200	-208.7300	15.5370

Dimensions: (inches)



Pipe NPT	A	B	C	D	E	F	G	J	K	L	M	N	P	R	ISO	Weight (lb)
1/4	2.5	4.4	2.9	1.4	1.5	2.4	0.3	1.4	2.0	0.3	0.2	0.4	0.5	0.9	F03/F05	1.2
3/8	2.5	4.4	2.9	1.3	1.5	2.4	0.3	1.4	2.0	0.3	0.2	0.4	0.5	0.9	F03/F05	1.4
1/2	2.5	4.4	2.9	1.3	1.5	2.4	0.3	1.4	2.0	0.3	0.2	0.4	0.6	0.9	F03/F05	1.2
3/4	2.9	4.4	3.2	1.4	1.8	2.6	0.3	1.4	2.0	0.3	0.2	0.4	0.8	1.1	F03/F05	1.6
1	3.2	5.4	3.7	1.6	2.1	3.2	0.4	1.4	2.0	0.3	0.2	0.4	1.0	1.4	F03/F05	2.3
1-1/4	3.7	7.3	3.9	1.9	2.3	3.6	0.5	1.4	2.0	0.3	0.2	0.4	1.3	1.8	F03/F05	3.5
1-1/2	4.3	7.8	4.5	2.1	2.9	4.4	0.5	2.0	2.8	0.4	0.3	0.6	1.5	2.1	F05/F07	5.4
2	4.8	7.8	4.9	2.4	3.3	5.1	0.5	2.0	2.8	0.4	0.3	0.6	2.0	2.6	F05/F07	7.8
2-1/2	6.2	10.5	6.1	3.1	4.3	6.5	0.7	2.8	4.0	0.4	0.4	0.7	2.7	3.4	F07/F10	16.7
3	7.5	10.5	6.7	3.7	4.7	7.3	0.6	2.8	4.0	0.4	0.4	0.7	3.2	4.1	F07/F10	24.7

Dimensions: (mm)



Pipe NPT	A	B	C	D	E	F	G	J	K	L	M	N	P	R	ISO	Weight (kg)
1/4	63.5	112.0	73.0	35.0	37.0	60.0	8.5	36.0	50.0	7.0	6.0	9.0	11.5	24.5	F03/F05	0.6
3/8	63.5	112.0	73.0	32.4	37.0	60.0	8.5	36.0	50.0	7.0	6.0	9.0	12.5	24.5	F03/F05	0.6
1/2	63.5	112.0	73.0	32.4	37.0	60.0	7.0	36.0	50.0	7.0	6.0	9.0	15.0	24.5	F03/F05	0.5
3/4	72.5	112.0	80.8	36.3	45.0	70.1	8.0	36.0	50.0	7.0	6.0	9.0	20.0	27.5	F03/F05	0.7
1	81.0	136.0	90.5	40.5	53.5	81.3	9.3	36.0	50.0	7.0	6.0	9.0	25.0	36.0	F03/F05	1.0
1-1/4	94.5	185.0	98.7	47.3	59.0	92.5	13.5	36.0	50.0	7.0	6.0	9.0	32.0	44.5	F03/F05	1.6
1-1/2	108.0	197.9	115.0	54.0	74.8	112.2	13.5	50.0	70.0	9.0	7.0	14.0	38.0	54.0	F05/F07	2.5
2	121.5	197.9	124.0	60.8	83.5	128.5	13.5	50.0	70.0	9.0	7.0	14.0	50.0	65.5	F05/F07	3.6
2-1/2	157.5	267.0	155.0	78.8	108.8	166.0	17.5	70.0	102.0	12.0	10.0	17.0	65.0	87.5	F07/F10	7.6
3	190.0	267.0	174.5	95.0	118.3	185.0	16.0	70.0	102.0	12.0	10.0	17.0	80.0	104.0	F07/F10	11.2