Air Actuated Stainless Ball Valves

3-Piece Stainless Steel, V-Port
1/4" to 3" NPT

SERIES
5508
5509

Features– Valve

- Available in 30°, 60°, 90° V-port stainless steel ball
- Same pressure rating as our full port valves
- 316 stainless steel body, ball & stem
- 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

Features– Actuator

- Type IP66 & IP68 weatherproof actuator
- Rugged scotch yoke construction tested for 1 million+ cycles
- Anodized aluminum body with epoxy-polyester end covers
- Namur and ISO mounting standards
- Highly visible valve position indicator
- Actuator factory lubricated for normal lifetime

Features– Positioner

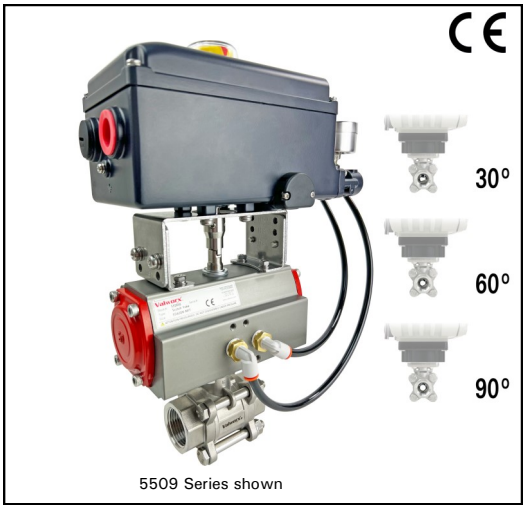
- Highly precise Linearity/ Hysteresis/Sensitivity +/- 0.5 % / +/-0.3% /+/-0.3% FS
- Multi-function LCD display including Target/input value, Limit Switch status, control status
- Auto-sensing rotation (clockwise or counter-clockwise)
- Direct drive output shaft—no linkages
- IP66 Weatherproof aluminum enclosure with anti-corrosion protection
- Universal Namur mounting bracket included
- Doubles as a limit switch with dome indicator and two limit switches to confirm valve position (5509 model)
- Installed, calibrated and tested

Applications

V-port ball valves are used in applications requiring finer flow control than standard ball valves. Modulating control (with an electro-pneumatic smart positioner) of water, air, oil and other media compatible with the materials of construction. Steam service up to 25 PSI with optional high temperature mounting kit. Suitable for vacuum service up to 29inchHg.

Operation

The digital smart positioner converts a 4-20mA signal to a proportional pneumatic output. This output is fed to the double acting air actuator which in turn controls the valve position and flow. The positioner provides fast and accurate response times from input change to valve movement. The double acting air actuator requires supply air to open, close and throttle the valve. Valve stays in last position upon loss of signal or loss of supply air.



5509 Series shown

Description

Valworx series 5508/5509 air actuated V-port ball valves are composed of a 316 stainless steel V-port valve, a scotch yoke air actuator and a digital smart positioner. The 316 stainless V-ball is available in three vertex angles (30&deg, 60&deg, 90&deg). All Valworx V-port valves have the same pressure rating as our full port valves.

Adjustable live loaded stem seal packing helps compensate for wear, pressure or temperature fluctuations, extending the cycle life of the valve. Heavy duty quarter turn actuators are designed for long life and tested for a minimum 1 million operations.

Series 5508 is the base model positioner. Series 5509 includes a dome indicator and two SPDT limit switches.

Standards– Valves

- Design: API 608
- Testing: API 598
- 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

Approvals– Actuators

- CE– MD 2006/42/CE
- EN ISO 12100:2010
- EN ISO 4414:2010

Approvals– Smart Positioner

- CE Conformance– EMC 2014/30/EU
- IEC 61508:2010 Parts 1 and 2
- Safety Integrity Level (SIL) 2 Capable with HFT=0
- Safety Integrity Level (SIL) 3 Capable with HFT=1

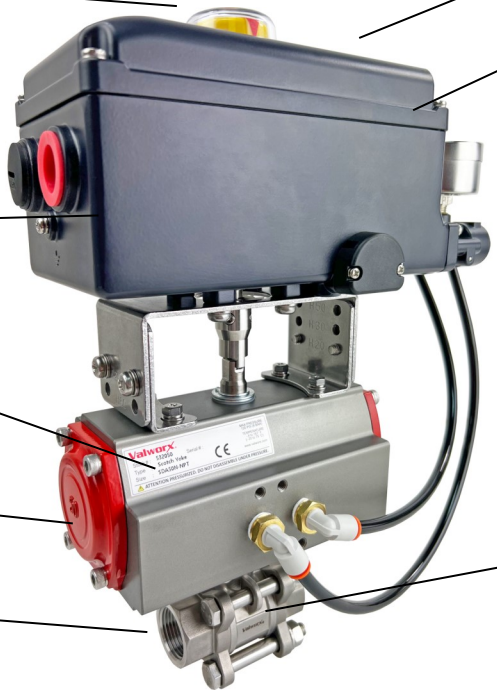
Features

Dome indicator (5509 series)

Multi-function LCD display

IP 66 weatherproof enclosure

Extruded aluminum body with 35 micron hard anodzing



Heavy duty rugged scotch yoke design

Anodized aluminum alloy covers with 40 micron polyester powder coating

V-port 316 stainless steel ball valve, repairable and easily removed from pipe line (30°, 60°, 90°)

Triple PTFE/ Viton live loaded stem seal design, adjustable

International standard ISO5211 valve mounting pad

Pressure-Temperature

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
25 PSI saturated steam with high temp kit
Vacuum 29inHg

Recommended Air Pilot Pressure: 58-87 PSI (4-6 Bar)

Max Air Pilot Pressure: 120 PSI

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

*See P/T Chart

Actuator Temperature Rating: -4 to 167° F (-20 to 75° C)

Positioner Temperature Range: Ambient Temperature—
22 to 176°F (-30 to 80°C)

Operating Temperature— -4 to 176°F (-20 to 80°C)

Optional Accessories

DMS: Direct Mount Solenoid
- pilot to electrically operate the ball valve
HTB: High Temperature Bracket
- increases media working temperature

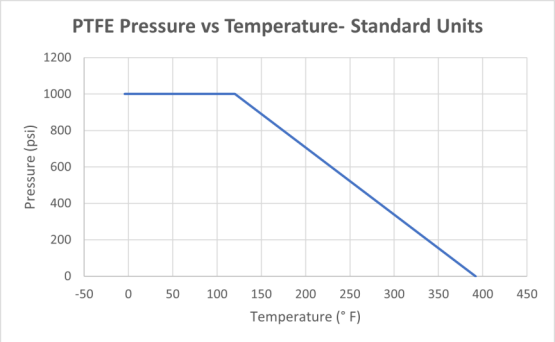
Specifications (English units)

Stock Number	Pipe Size (NPT)	Orifice Size (inch)	Pressure Max. (PSI)*	Cycle Time /90° (seconds)	Air Volume per Cycle (standard cubic inches)**	Pilot Air Port (NPT)
STAINLESS 3pc VALVE WITH DOUBLE ACTING ACTUATOR w/ DIGITAL SMART POSITIONER (529860 MODEL)						
550802	1/4	0.5	1000	0.3	146.5	1/4
550803	3/8	0.5	1000	0.3	146.5	1/4
550804	1/2	0.6	1000	0.3	146.5	1/4
550806	3/4	0.8	1000	0.3	146.5	1/4
550808	1	1.0	1000	0.3	146.5	1/4
550810	1-1/4	1.3	1000	0.3	146.5	1/4
550812	1-1/2	1.5	1000	0.4	219.7	1/4
550816	2	2.0	1000	0.4	219.7	1/4
550820	2-1/2	2.6	800	0.6	402.8	1/4
550824	3	3.2	800	0.6	402.8	1/4
STAINLESS 3pc VALVE WITH DOUBLE ACTING ACTUATOR w/ DIGITAL SMART POSITIONER + LIMIT SWITCH (529861 MODEL)						
550902	1/4	0.5	1000	0.3	146.5	1/4
550903	3/8	0.5	1000	0.3	146.5	1/4
550904	1/2	0.6	1000	0.3	146.5	1/4
550906	3/4	0.8	1000	0.3	146.5	1/4
550908	1	1.0	1000	0.3	146.5	1/4
550910	1-1/4	1.3	1000	0.3	146.5	1/4
550912	1-1/2	1.5	1000	0.4	219.7	1/4
550916	2	2.0	1000	0.4	219.7	1/4
550920	2-1/2	2.6	800	0.6	402.8	1/4
550924	3	3.2	800	0.6	402.8	1/4

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

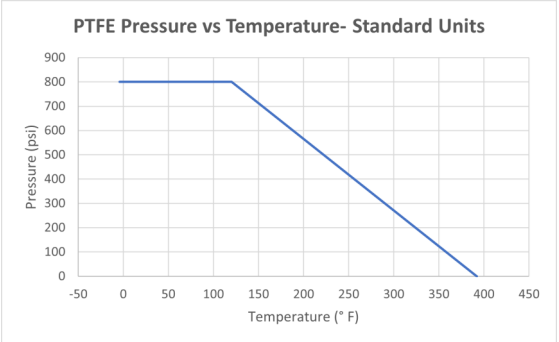
Pressure/Temp. Chart - 1000 PSI (69 Bar)

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



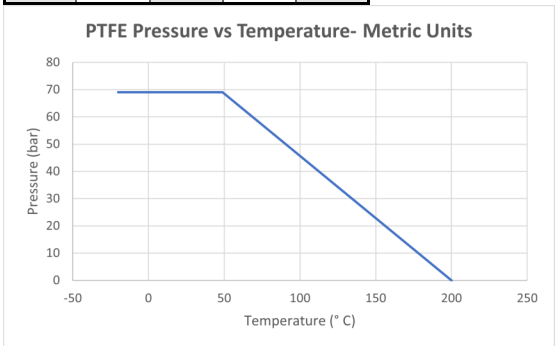
Specifications (Metric units)

Stock Number	Pipe Size (NPT)	Orifice Size (mm)	Pressure Max.(Bar)*	Cycle Time/90° (seconds)	Air Volume per Cycle (standard cubic liters)**	Pilot Air Port (NPT)
STAINLESS 3pc VALVE WITH DOUBLE ACTING ACTUATOR w/ DIGITAL SMART POSITIONER (529860 MODEL)						
550802	1/4	11.5	69	0.3	2.4	1/4
550803	3/8	12.5	69	0.3	2.4	1/4
550804	1/2	15.0	69	0.3	2.4	1/4
550806	3/4	20.0	69	0.3	2.4	1/4
550808	1	25.0	69	0.3	2.4	1/4
550810	1-1/4	32.0	69	0.3	2.4	1/4
550812	1-1/2	38.0	69	0.4	3.6	1/4
550816	2	50.0	69	0.4	3.6	1/4
550820	2-1/2	65.0	55	0.6	6.6	1/4
550824	3	80.0	55	0.6	6.6	1/4
STAINLESS 3pc VALVE WITH DOUBLE ACTING ACTUATOR w/ DIGITAL SMART POSITIONER + LIMIT SWITCH (529861 MODEL)						
550902	1/4	11.5	69	0.3	2.4	1/4
550903	3/8	12.5	69	0.3	2.4	1/4
550904	1/2	15.0	69	0.3	2.4	1/4
550906	3/4	20.0	69	0.3	2.4	1/4
550908	1	25.0	69	0.3	2.4	1/4
550910	1-1/4	32.0	69	0.3	2.4	1/4
550912	1-1/2	38.0	69	0.4	3.6	1/4
550916	2	50.0	69	0.4	3.6	1/4
550920	2-1/2	65.0	55	0.6	6.6	1/4
550924	3	80.0	55	0.6	6.6	1/4

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

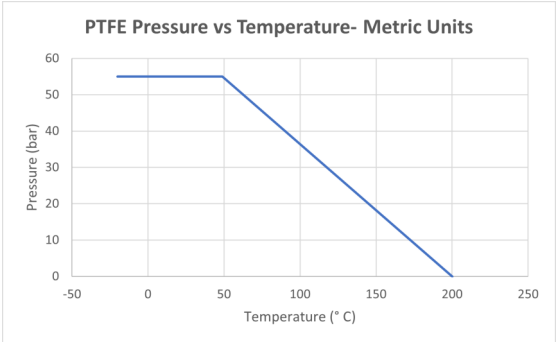
Pressure/Temp. Chart - 1000 PSI (69 Bar)

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



Specifications & Construction Table

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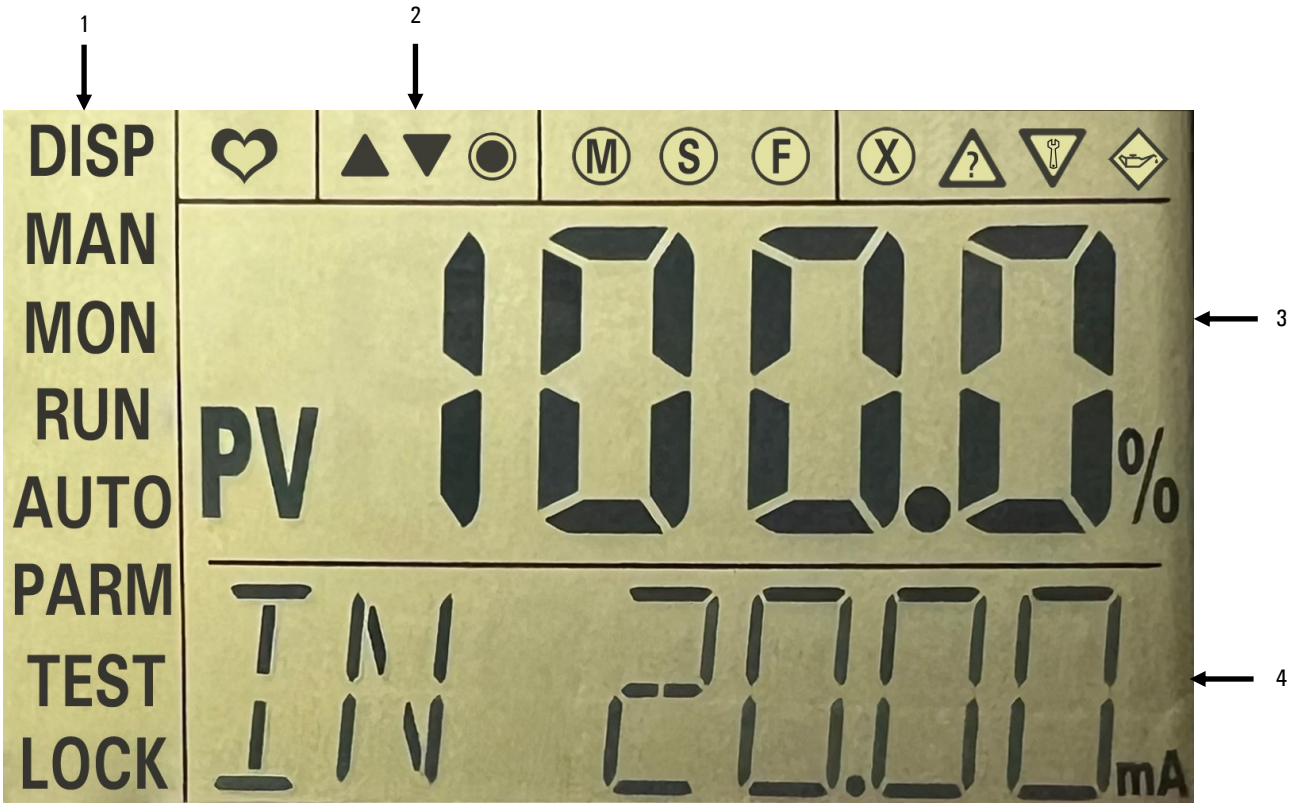
Valve and Actuator

Type	Air Actuated 3 Piece Stainless Ball Valves
Valve Body	316 Stainless Steel ASTM A351 CF8M
Ball/Stem	316 Stainless Steel
Ball Seats	RTFE (reinforced Teflon)
Stem Seals	PTFE/ Viton
Anti-Static Device	Ball to Stem (1/4"- 3") + Stem to Body (1-1/2"- 3")
Actuator Seals	NBR
Actuator Body/ End Covers	Hard anodized aluminium/ Polyester coasted aluminium
Position Indicator	Glass filled Polyamide
Fasteners	ASTM 304 Stainless Steel

Positioner

Type	Positioner	Air Connections	1/4" NPT
Rotation	0-90º	Electrical Connection	1/2" NPT Conduit
Load Voltage	6.8 V	Linearity	+/- 0.5% F.S.
Input Signal	4-20mA DC (min. 3.6mA/ max. 50mA)	Hysteresis	+/- 0.3% F.S.
Output Signal	4-20mA @12-30VDC supply voltage	Sensitivity	+/- 0.3% F.S.
Impedance	340 +/-15 ohms	Repeatability	+/- 0.2% F.S
Flow Capacity	8.8 SCFM @ 20 PSI	Performance Characteristic	Linear, Shape (EQ%, Quick), User Set
Air Consumption	0.9 SCFM @ 20 PSI	Enclosure	Aluminum die-cast + Epoxy painted
Vibration	2G, 5 to 400 Hz	Enclosure Rating	IP66 weatherproof, General Purpose
Humidity	Dew point– 18°F or 10°C lower temperature of device	Limit Switch (*529861 Only)	2x SPDT max 5A @ 220 VAC
		Weight	5.5 lbs

Specifications– Positioner



DISP	Set display parameters
MAN	Run in manual mode
MON	Check status, error codes, run time and other parameters
RUN	Run as normal operation
AUTO	Auto calibration and initialization
PARM	Check internal parameters
TEST	Check initial set up
LOCK	Lock/Unlock display

1	Display Status
2	Control Status
3	PV & Temperature Display
4	SV & Parameter Display

CV vs Valve Position

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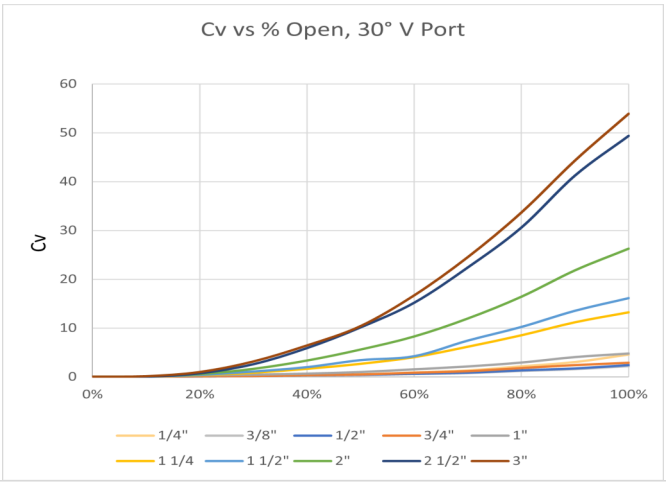
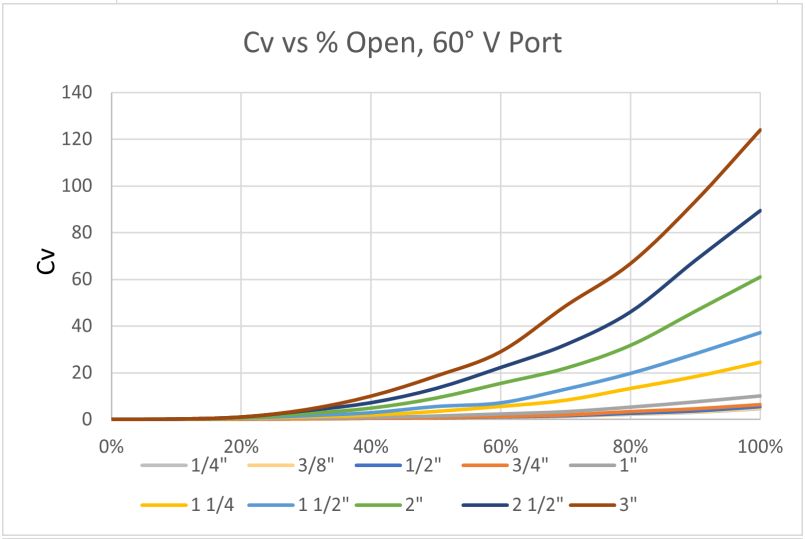
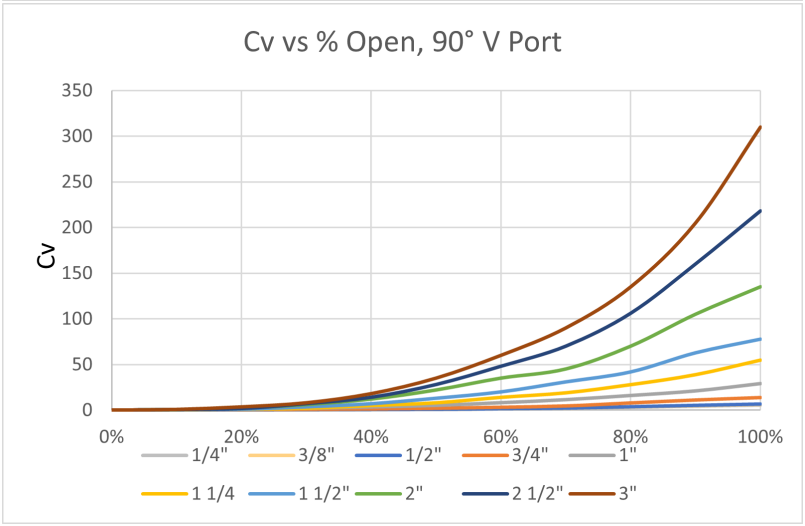
Size	V	0	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
1/4"	30°	0.000	0.000	0.082	0.141	0.266	0.352	0.533	0.717	1.109	1.437	2.000
	60°	0.000	0.000	0.099	0.194	0.443	0.528	0.888	1.304	2.148	3.010	4.538
	90°	0.000	0.082	0.164	0.329	0.493	0.657	1.232	1.807	3.121	4.436	5.668
3/8"	30°	0.000	0.000	0.089	0.154	0.289	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

Specifications (CV)





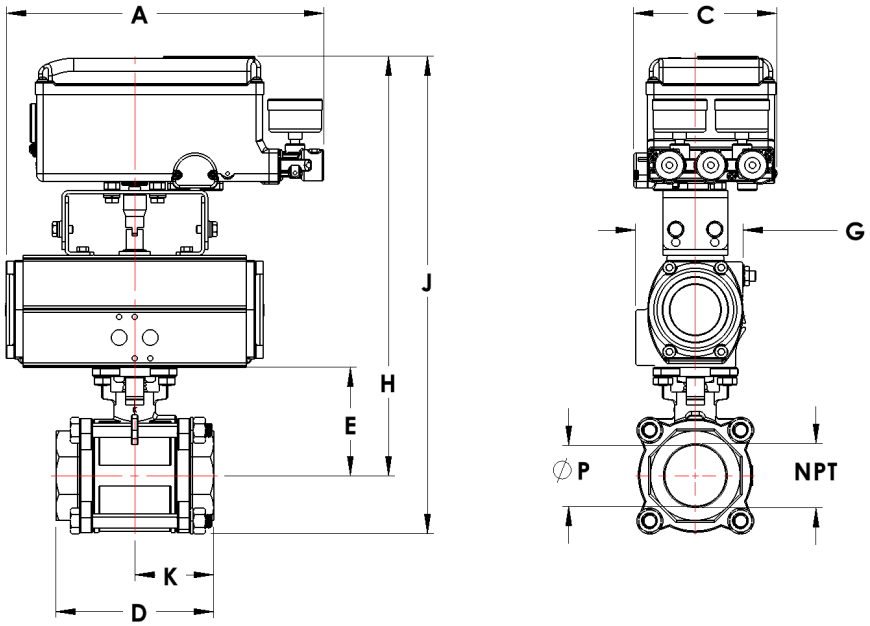


Polynomial Best Fit Cv = Ax2 + Bx + C where x = % open			
30°	**A**	**B**	**C**
1/4	2.5142	-0.6735	0.0601
3/8	2.7329	-0.7323	0.0655
1/2	3.0597	-0.8189	0.0732
3/4	3.7579	-0.8844	0.0566
1	5.5478	-0.8243	0.0903
1 1/4	15.9160	-2.4360	0.0835
1 1/2	19.9630	-3.6943	0.1823
2	31.0550	-4.5772	0.1215
2 1/2	60.1080	-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	7.3027	-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

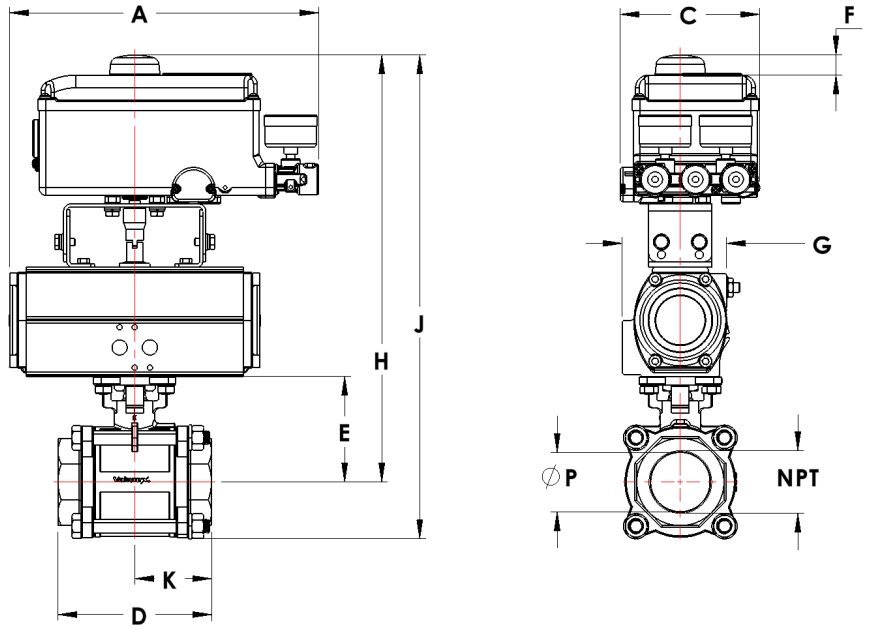
90°	**A**	**B**	**C**
1/4	8.6168	-3.33148	0.2769
3/8	9.3662	-3.6033	0.3010
1/2	10.4900	-4.0350	0.3371
3/4	20.9210	-7.5844	0.6154
1	36.3520	-5.3902	0.4561
1 1/4	76.3400	-25.9400	1.8056
1 1/2	108.1000	-32.3910	1.9378
2	190.7900	-63.7020	4.3916
2 1/2	329.2900	-129.2100	8.7343
3	478.5200	-208.7300	15.5370

Dimensions: 5508 Series



Pipe Size (NPT)		A	C	D	E	G	H	J	K	P	A & B Ports (NPT)	Weight
1/4	inch	8.9	4.3	2.5	1.5	2.9	10.9	11.8	1.4	0.5	1/4	10.3 lb
	mm	226.0	110.0	63.5	37.0	73.7	276.9	299.7	35.0	11.5	-	4.7 kg
3/8	inch	8.9	4.3	2.5	1.5	2.9	10.9	11.8	1.3	0.5	1/4	10.5 lb
	mm	226.0	110.0	63.5	37.0	73.7	276.9	299.7	32.4	12.5	-	4.8 kg
1/2	inch	8.9	4.3	2.5	1.5	2.9	10.9	11.8	1.3	0.6	1/4	10.3 lb
	mm	226.0	110.0	63.5	37.0	73.7	276.9	299.7	32.4	15.0	-	4.7 kg
3/4	inch	8.9	4.3	2.9	1.8	2.9	11.2	12.0	1.4	0.8	1/4	10.7 lb
	mm	226.0	110.0	72.5	45.0	73.7	284.5	304.8	36.3	20.0	-	4.9 kg
1	inch	8.9	4.3	3.2	21	3.5	11.5	12.6	1.6	1.0	1/4	11.4 lb
	mm	226.0	110.0	81.0	53.5	88.9	292.1	320.0	40.5	25.0	-	5.2 kg
1-1/4	inch	8.9	4.3	3.7	2.3	3.5	11.7	13.0	1.9	1.3	1/4	12.6 lb
	mm	226.0	110.0	94.5	59.0	88.9	297.2	330.2	47.3	32.0	-	5.7 kg
1-1/2	inch	8.9	4.3	4.3	2.9	3.5	12.0	14.5	2.1	1.5	1/4	16.5 lb
	mm	226.0	110.0	108.0	74.8	88.9	304.8	368.3	54.0	38.0	-	7.5 kg
2	inch	8.9	4.3	4.8	3.3	3.9	12.4	16.2	2.4	2.0	1/4	18.9 lb
	mm	226.0	110.0	121.5	83.5	99.1	314.9	411.5	60.8	50.0	-	8.6 kg
2-1/2	inch	8.9	4.3	6.2	4.3	3.9	15.1	17.3	3.1	2.6	1/4	31.3 lb
	mm	226.0	110.0	157.5	108.8	99.1	383.5	439.4	78.8	66.0	-	14.2 kg
3	inch	8.9	4.3	7.5	4.7	5.9	15.5	18.1	3.7	3.2	1/4	39.3 lb
	mm	226.0	110.0	190.0	118.3	149.9	393.7	459.7	95.0	81.3	-	17.9 kg

Dimensions: 5509 Series



Pipe Size		A	C	D	E	F	G	H	J	K	P	A & B Ports	Weight
1/4	inch	8.9	4.3	2.5	1.5	1.5	2.9	10.9	11.8	1.4	0.5	1/4	10.3 lb
	mm	226.0	110.0	63.5	37.0	37.8	73.7	276.9	299.7	35.0	11.5	-	4.7 kg
3/8	inch	8.9	4.3	2.5	1.5	1.5	2.9	10.9	11.8	1.3	0.5	1/4	10.5 lb
	mm	226.0	110.0	63.5	37.0	37.8	73.7	276.9	299.7	32.4	12.5	-	4.8 kg
1/2	inch	8.9	4.3	2.5	1.5	1.5	2.9	10.9	11.8	1.3	0.6	1/4	10.3 lb
	mm	226.0	110.0	63.5	37.0	37.8	73.7	276.9	299.7	32.4	15.0	-	4.7 kg
3/4	inch	8.9	4.3	2.9	1.8	1.5	2.9	11.2	12.0	1.4	0.8	1/4	10.7 lb
	mm	226.0	110.0	72.5	45.0	37.8	73.7	284.5	304.8	36.3	20.0	-	4.9 kg
1	inch	8.9	4.3	3.2	21	1.5	3.5	11.5	12.6	1.6	1.0	1/4	11.4 lb
	mm	226.0	110.0	81.0	53.5	37.8	88.9	292.1	320.0	40.5	25.0	-	5.2 kg
1-1/4	inch	8.9	4.3	3.7	2.3	1.5	3.5	11.7	13.0	1.9	1.3	1/4	12.6 lb
	mm	226.0	110.0	94.5	59.0	37.8	88.9	297.2	330.2	47.3	32.0	-	5.7 kg
1-1/2	inch	8.9	4.3	4.3	2.9	1.5	3.5	12.0	14.5	2.1	1.5	1/4	16.5 lb
	mm	226.0	110.0	108.0	74.8	37.8	88.9	304.8	368.3	54.0	38.0	-	7.5 kg
2	inch	8.9	4.3	4.8	3.3	1.5	3.9	12.4	16.2	2.4	2.0	1/4	18.9 lb
	mm	226.0	110.0	121.5	83.5	37.8	99.1	314.9	411.5	60.8	50.0	-	8.6 kg
2-1/2	inch	8.9	4.3	6.2	4.3	1.5	3.9	15.1	17.3	3.1	2.6	1/4	31.3 lb
	mm	226.0	110.0	157.5	108.8	37.8	99.1	383.5	439.4	78.8	66.0	-	14.2 kg
3	inch	8.9	4.3	7.5	4.7	1.5	5.9	15.5	18.1	3.7	3.2	1/4	39.3 lb
	mm	226.0	110.0	190.0	118.3	37.8	149.9	393.7	459.7	95.0	81.3	-	17.9 kg