Electric Actuated Ball Valves– EPS Positioner

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

SERIES
5501
5502

Features

- Available in 30°, 60°, 90° V-port stainless steel ball
- 316SS 3-piece investment cast body
- Swing-out center section
- RTFE (reinforced Teflon) ball seats
- Triple PTFE/Viton live loaded stem seals, adjustable
- Highly visual dome style valve position indicator
- Rugged aluminum Type 4X weatherproof enclosure
- Heavy duty motors with overload protection
- Thermostatically controlled anti-condensation heater
- Manual override with end of travel mechanical stops
- Actuators CSA listed per UL429 and CSA C22.2

Description

Electric actuated 3-piece stainless steel V-port ball valves are investment cast with unrestricted flow and minimum pressure loss. Adjustable live loaded stem seal packing helps compensate for wear, pressure and/or temperature fluctuations, extending the cycle life of the valve. Rugged corrosion resistant electric actuator includes a manual override, thermostatically controlled anti-condensation heater, and over-torque protection.

V-port 316 stainless steel ball provides better linearity for enhanced flow control. Solid, machined construction for full pressure rating.

Applications

V-port ball valves are used in applications requiring finer flow control than standard ball valves. Modulating control (with EPS) 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. Actuator designed for 70% duty cycle.

Operation

Electric actuated valves with EPS- Electronic Positioning System provide an accurate valve positioning function whereby the movement of the actuator is controlled by 4-20mA input control signal. Any change in the control input signal results in a corresponding and proportional change in the position of the actuator. Flow is adjustable anywhere between 0-100%. Unique electronic positioning module is fully potted to help protect the electronics from vibration/moisture resistance. Power connections via included cable connector or optional 1/2" NPT conduit adapter.

Construction

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")
Gear Drive	Heavy duty alloy steel and aluminium bronze
Actuator Enclosure	Aluminum, polyester powder painted, Type 4X, IP67
Visual Valve Position Indicator	Clear polycarbonate cover, red/yellow open-closed
Fasteners	Stainless Steel

Approvals

Actuators

- CSA listed:
  - UL429
  - CSA C22.2 No. 139
  - Type 4X weatherproof enclosure
- CE conformance
  - ISO5211 mounting
  - IP67 weatherproof enclosure

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

Construction Features

Heavy duty integral motor design significantly reduces physical size of actuator

Rugged polyester powder coated aluminum corrosion resistant Type 4X weatherproof enclosure

Triple PTFE/Viton live loaded stem seals design, adjustable

316SS V-Port Ball and Stem, RTFE ball seats

Anti-Condensation Heater

Terminal Box, wire directly to terminal strip via included cable connector or optional 1/2" NPT conduit adapters.

Manual Override with protective cover

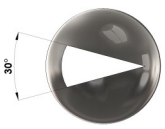
Self-locking all metal gear train, no additional brake required

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

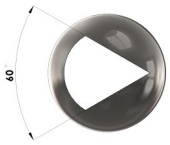
Visual Valve Position Indicator

V–Port Images

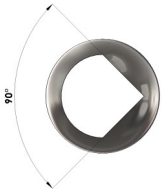
30°



60°



90°



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
Vacuum 29inHg, Saturated Steam 125 PSI

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

Actuator Temperature Rating: -13 to +131° F (-25 to 55° C)

*See P/T chart (pg 3 & 4)

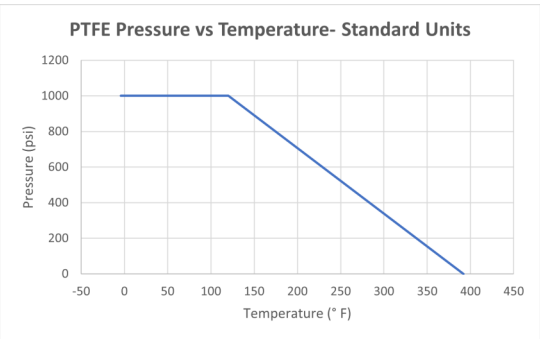
Specifications: Valves with EPS Positioner (English units)

Stock Number	Pipe Size (NPT)	Orifice Size (inch)	Pressure Max.(PSI)*	Cycle Time/90° (seconds)	Voltage	Current (amps)	Duty Cycle	Electrical Dwg.
120 VAC ELECTRIC ACTUATED 3-pc STAINLESS BALL VALVE with EPS POSITIONER 4-20mA input								
550102	1/4	0.5	1000	25/21	110 VAC,50/60Hz	0.27	70%	E
550103	3/8	0.5	1000	25/21	110 VAC,50/60Hz	0.27	70%	E
550104	1/2	0.6	1000	25/21	110 VAC,50/60Hz	0.27	70%	E
550106	3/4	0.8	1000	25/21	110 VAC,50/60Hz	0.27	70%	E
550108	1	1.0	1000	25/21	110 VAC,50/60Hz	0.27	70%	E
550110	1-1/4	1.3	1000	25/21	110 VAC,50/60Hz	0.27	70%	E
550112	1-1/2	1.5	1000	25/21	110 VAC,50/60Hz	0.27	70%	E
550116	2	2.0	1000	25/21	110 VAC,50/60Hz	0.27	70%	E
550117	2-1/2	2.6	800	30/25	110 VAC,50/60Hz	0.73	70%	E
550118	3	3.2	800	30/25	110 VAC,50/60Hz	0.73	70%	E
24 VDC ELECTRIC ACTUATED 3-pc STAINLESS BALL VALVE with EPS POSITIONER 4-20mA input								
550202	1/4	0.5	1000	30	DC24	1.0	70%	GEY
550203	3/8	0.5	1000	30	DC24	1.0	70%	GEY
550204	1/2	0.6	1000	30	DC24	1.0	70%	GEY
550206	3/4	0.8	1000	30	DC24	1.0	70%	GEY
550208	1	1.0	1000	30	DC24	1.0	70%	GEY
550210	1-1/4	1.3	1000	30	DC24	1.0	70%	GEY
550212	1-1/2	1.5	1000	30	DC24	1.0	70%	GEY
550216	2	2.0	1000	30	DC24	1.0	70%	GEY
550217	2-1/2	2.6	800	30	DC24	3.57	70%	GEY
550218	3	3.2	800	30	DC24	3.57	70%	GEY

* Pressure @ 100° F (see P/T chart for higher temperatures)

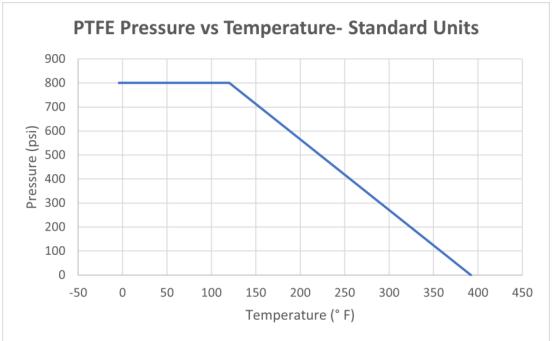
Pressure/Temperature Chart 1000 PSI (69 Bar)

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



Pressure/Temperature Chart 800 PSI (55 Bar)

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



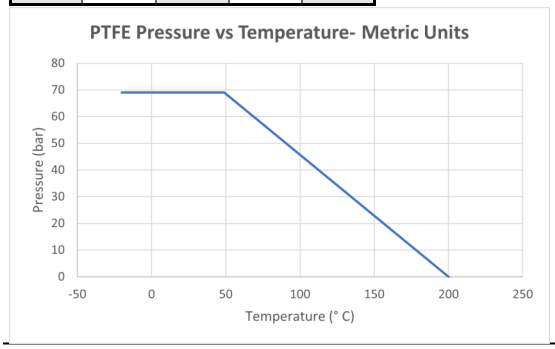
Specifications: Valves with EPS Positioner (Metric units)

Stock Number	Pipe Size (NPT)	Orifice Size (mm)	Pressure Max.(Bar)*	Cycle Time/90° (seconds)	Voltage	Current (amps)	Duty Cycle	Electrical Dwg.
120 VAC ELECTRIC ACTUATED STAINLESS BALL VALVE with EPS POSITIONER 4-20mA input								
550102	1/4	11.5	69	25/21	110 VAC,50/60Hz	0.27	70%	E
550103	3/8	12.5	69	25/21	110 VAC,50/60Hz	0.27	70%	E
550104	1/2	15.0	69	25/21	110 VAC,50/60Hz	0.27	70%	E
550106	3/4	20.0	69	25/21	110 VAC,50/60Hz	0.27	70%	E
550108	1	25.0	69	25/21	110 VAC,50/60Hz	0.27	70%	E
550110	1-1/4	32.0	69	25/21	110 VAC,50/60Hz	0.27	70%	E
550112	1-1/2	38.0	69	25/21	110 VAC,50/60Hz	0.27	70%	E
550116	2	50.0	69	25/21	110 VAC,50/60Hz	0.27	70%	E
550117	2-1/2	65.0	55	30/25	110 VAC,50/60Hz	0.73	70%	E
550118	3	80.0	55	30/25	110 VAC,50/60Hz	0.73	70%	E
24 VDC ELECTRIC ACTUATED STAINLESS BALL VALVE with EPS POSITIONER 4-20mA input								
550202	1/4	11.5	69	30	DC24	1.0	70%	GEY
550203	3/8	12.5	69	30	DC24	1.0	70%	GEY
550204	1/2	15.0	69	30	DC24	1.0	70%	GEY
550206	3/4	20.0	69	30	DC24	1.0	70%	GEY
550208	1	25.0	69	30	DC24	1.0	70%	GEY
550210	1-1/4	32.0	69	30	DC24	1.0	70%	GEY
550212	1-1/2	38.0	69	30	DC24	1.0	70%	GEY
550216	2	50.0	69	30	DC24	1.0	70%	GEY
550217	2-1/2	65.0	55	30	DC24	3.57	70%	GEY
550218	3	80.0	55	30	DC24	3.57	70%	GEY

* Pressure @ 70° C (see P/T chart for higher temperatures)

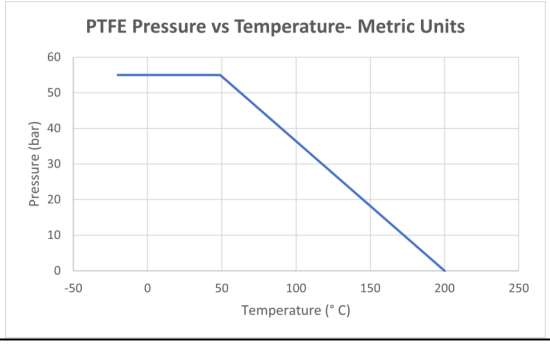
Pressure/Temperature Chart 1000 PSI (69 Bar)

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



Pressure/Temperature Chart 800 PSI (55 Bar)

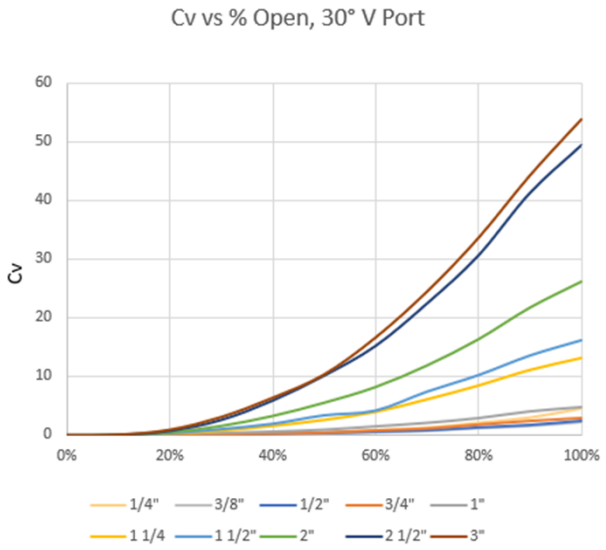
P/T Chart (BAR/°C)				
Bar	55	55	7	0
°C	-20	10	166	200

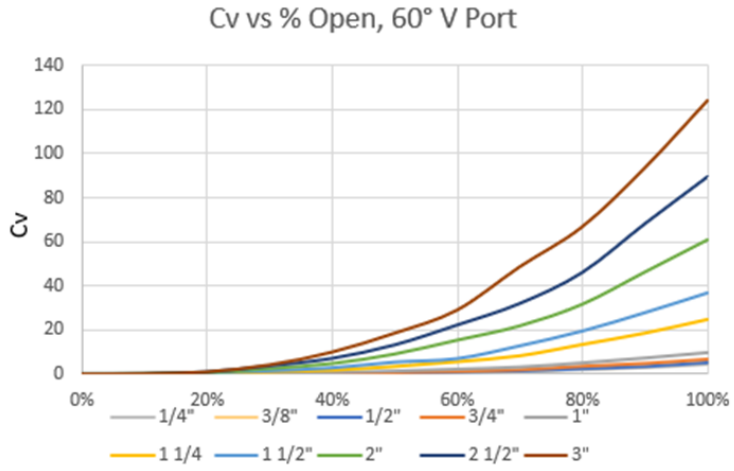


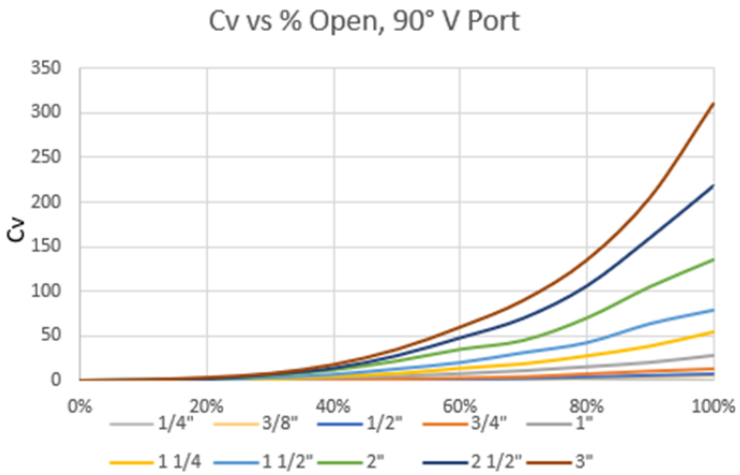
CV vs Valve Position

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

Specifications (CV)



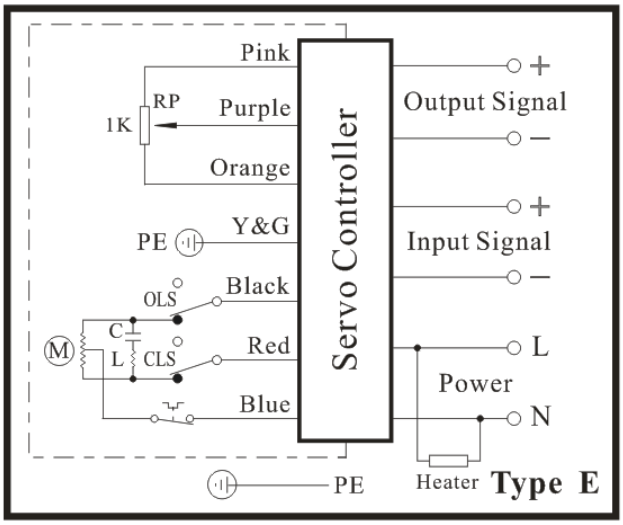




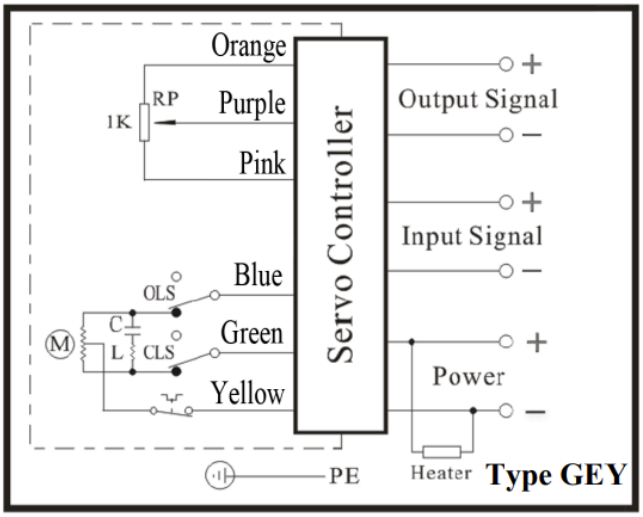
Polynomial Best Fit			
Cv = Ax2 + Bx + C			
where x = % open			
30°	**A**	**B**	**C**
1/4	2.5142	-0.6735	0.0601
3/8	2.7329	-0.7323	0.0655
1/2	3.0597	-0.8189	0.0732
3/4	3.7579	-0.8844	0.0566
1	5.5478	-0.8243	0.0903
1 1/4	15.9160	-2.4360	0.0835
1 1/2	19.9630	-3.6943	0.1823
2	31.0550	-4.5772	0.1215
2 1/2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

Electrical Wiring

Valves with EPS Positioners
AC Voltages



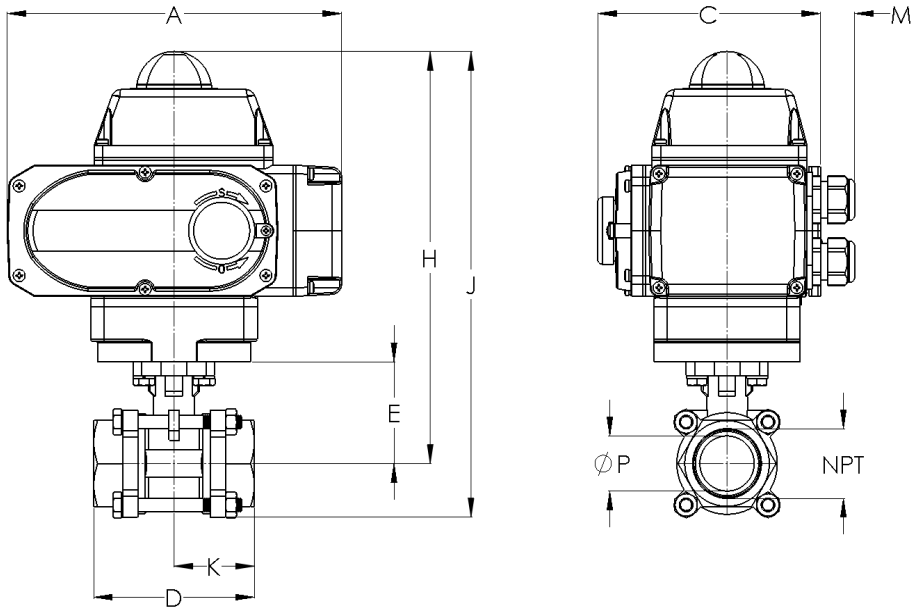
Valves with EPS Positioners
DC Voltages



Positioning Actuators Specifications

	5618 Series
Accuracy	0.5% F.S.
Linearity	0.5% F.S.
Deadband	0.5%- 5% Adjustable
Resolution (4- 20mA)	Min 80 steps
Resolution (0- 10V)	N/A
Impedance	180- 280 Ohm
Actuator Ordering Information	Complete unit

Dimensions:



Pipe Size (NPT)		A	C	D	E	H	J	K	M	P	Weight (AC/DC)
1/4	inch	6.4	4.7	2.5	1.5	7.7	8.6	1.4	1.0	0.5	7.3 lb
	mm	162.0	118.5	63.5	37.0	195.6	218.4	36.3	25.0	11.5	3.3 kg
3/8	inch	6.4	4.7	2.5	1.5	7.7	8.6	1.3	1.0	0.5	7.3 lb
	mm	162.0	118.5	63.5	37.0	195.6	218.4	31.8	25.0	12.5	3.3 kg
1/2	inch	6.4	4.7	2.5	1.5	7.7	8.6	1.3	1.0	0.6	7.1 lb
	mm	162.0	118.5	63.5	37.0	195.6	218.4	31.8	25.0	15.0	3.2 kg
3/4	inch	6.4	4.7	2.9	1.8	8.0	8.8	1.4	1.0	0.8	7.5 lb
	mm	162.0	118.5	72.5	45.0	203.2	223.5	36.3	25.0	20.0	3.4 kg
1	inch	6.4	4.7	3.2	2.1	8.3	9.4	1.6	1.0	1.0	8.0 lb
	mm	162.0	118.5	81.0	53.5	210.8	238.8	40.5	25.0	25.0	3.6 kg
1-1/4	inch	6.4	4.7	3.7	2.3	8.5	9.8	1.9	1.0	1.3	8.3 lb
	mm	162.0	118.5	94.5	59.0	215.9	248.9	47.3	25.0	32.0	3.8 kg
1-1/2	inch	6.4	4.7	4.3	2.9	9.1	10.6	2.1	1.0	1.5	10.3 lb
	mm	162.0	118.5	108.0	74.8	231.1	269.2	54.0	25.0	38.0	4.7 kg
2	inch	6.4	4.7	4.8	3.3	9.5	11.3	2.4	1.0	2.0	12.9 lb
	mm	162.0	118.5	122.0	83.5	241.3	287.0	61.0	25.0	50.0	5.9 kg
2-1/2	inch	10.1	6.4	6.2	4.3	12.8	15.0	3.1	1.0	2.6	35.9 lb
	mm	255.5	161.5	158.0	109.0	325.1	381.0	79.0	25.0	65.0	16.3 kg
3	inch	10.1	6.4	7.5	4.7	13.2	15.8	3.7	1.0	3.2	43.2 lb
	mm	255.5	161.5	190.0	118.0	335.3	401.3	95.0	25.0	80.0	19.6 kg