

High Performance Butterfly Valves



**2-Way & 3-Way
2-1/2" - 20"**

High Performance Butterfly Valves

Applications for Building Automation, Temperature Controls, HVAC

Two-Way and Three-Way Assemblies • Chilled Water • Hot Water • Steam • Special Applications

Bray MK Series High Performance Butterfly Valves ANSI Class 150 and 300

The Bray McCannalok MK Series high performance butterfly valves set the quality and design standard by which all other high performance valves are measured. The MK Series is ideally suited to high pressure, high temperature, and high cycle HVAC applications as well as mission critical HVAC applications.

Available in ANSI Class 150 ratings, both 2-way and 3-way, and ANSI Class 300 ratings in 2-way configurations, Bray's MK Series valves are provided with a wide variety of direct mount Bray electric and pneumatic actuators and accessories. All valves are tested for bubble tight close-off to API 598 standards at maximum rated differential pressure.



Features and Benefits:

Features	Benefits
Double offset stem/disc design	Reduced seat wear, zero leakage, and low torque
Blow-out proof stem	Safety and ease of use
Energized RTFE seat	Zero leakage, self adjusting for wear, and easily field replaceable
Pressure assisted, but not pressure dependent seat design	Optimal performance and sealing at high or low differential pressures
Adjustable PTFE packing	Packing can be adjusted while the valve is in service
Dead end rating equal to nominal Pressure rating	Allows the control valve to also function as an isolation valve

Recommended Specifications for Bray MK Series - High Performance Valves



Valve Type:

- Bray MK Series High Performance or approved equal.

Body:

- Shall be one piece wafer, lug or double flanged design with extended neck to allow for 2" of piping insulation.
- Material shall be Carbon Steel, Stainless Steel or other as specified.
- Flange hole drilling per international flange standard as specified.
- Provided with top and bottom stem bearings for stem support consisting of a 316 Stainless Steel shell with a TFE/glass fiber liner bearing surface.
- Equipped with an externally adjustable stem packing system that allows packing adjustment without removing the actuator.
- Internal over-travel stop shall be provided to prevent over-travel of the disc and minimize possible seat damage.

Disc:

- Material shall be Stainless Steel or other as specified.
- Disc edge shall be hand polished for minimum torque and maximum sealing capability.

Stem:

- Shall be a one-piece design.
- Material shall be a 17-4PH Stainless Steel or other as specified.
- Shall be provided with a blow-out proof stem retention system to assure full retention of the stem in the unlikely event of an internal stem failure

Seat:

- Design shall consist of a resilient energizer totally encapsulated by the PTFE seat.
- Seat retainer shall be full-faced and firmly attached by bolts located out side of the sealing area to protect them from corrosion.
- The seat assembly shall be locked in the body recess by the full-faced seat retainer.
- The seat shall be self-adjusting for wear and temperature changes.
- Shall easily field replaceable.

Pressure Ratings:

- Valve shall be rated for bi-directional tight shut-off at full pressure rating for liquid and de-rated for steam.
- Valve shall be tested to tight shut-off per API 598 requirements.

• Bi-directional Service (With downstream flanges and disc in closed position):

All Bray MK Series Valves ANSI 150

Liquid:

2 1/2" - 20" (65mm - 500mm)
285 psi (20 Bar)

Steam:

On/Off Application 150 psi (10 bar)
Modulating 50 psi (3.5 bar)

ANSI 300

Liquid:

2 1/2" - 20" (65mm - 500mm)
740 psi (50 Bar)

• Dead-End Service (No downstream flanges and disc in closed position):

All Bray MK Series Lug and Double Flanged Valves

ANSI 150

2 1/2" - 20" (65mm - 500mm)
285 psi (20 Bar)

ANSI 300

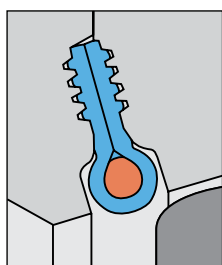
2 1/2" - 20" (65mm - 500mm)
740 psi (50 Bar)



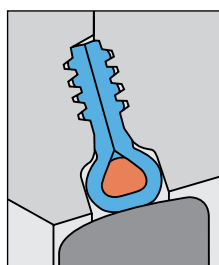
MK Series High Performance Butterfly Valve Specifications

Service	Hot Water, Chilled Water, Condenser Water, Steam	
Body Style	Lug, 2-way for ANSI 150 and ANSI 300 flanges; 3-way for ANSI 150 flanges only	
Size Range	2-1/2" through 20" (DN 50 to 500)	
Flow Characteristic	Modified Equal Percentage	
Close Off Pressure Liquid	ANSI 150	285 PSI (20 BAR)
	ANSI 300	740 PSI (50 BAR)
Max Steam Pressure	On/Off Applications	150 PSI (10 BAR)
	Modulating Applications	50 PSI (3.5 BAR)
Leakage	Bubble tight at rated maximum differential pressure	
Maximum Fluid Velocity	30 ft/second (9 m/second)	
Flow Coefficients	See Table on HB-6	
Fluid Temperature Limits	Water -40 to 500°F (-40 to 250°C)	
Materials (other materials available upon request)	Body	Carbon Steel
	Disc	316 Stainless Steel
	Seat	RTFE
	Packing	PTFE (adjustable)
	Stem	17-4 Stainless Steel
	Tee	Ductile Iron (3-Way ANSI 150 valves only)

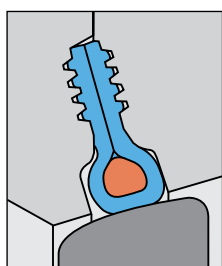
These performance specifications are nominal and conform to generally acceptable industry standards. Bray Controls is not liable for damages resulting from misapplication or misuse of its products.



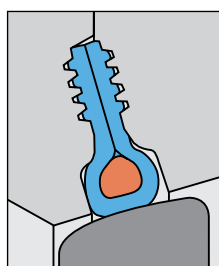
Seat uncompressed
as disc approaches.



Disc in closed position:
no line pressure.



Disc in closed position:
line pressure applied
from the left.

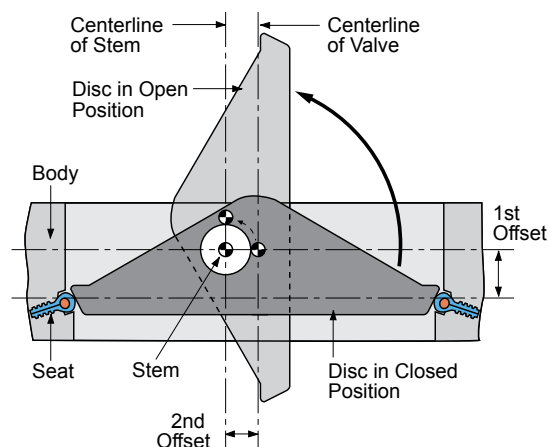
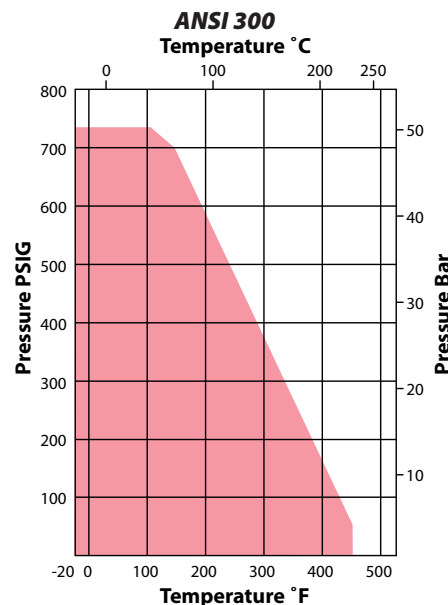
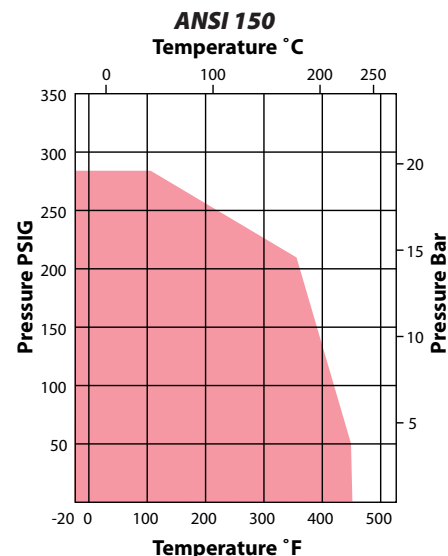


Disc in closed position:
line pressure applied
from the right.

*RTFE is the common designation for RPTFE as supplied by Bray.

For over 30 years the reliability of the Bray MK Series has been conclusively proven, both in lab tests and thousands of field applications. After a test of over 100,000 cycles at 720 psi, the seat remained in excellent condition, continuing to provide a bidirectional bubble-tight seal. Even after more than 878,000 cycles at 2 psi, the Series 40 still sealed bubble-tight in both directions.

Pressure/Temperature Charts

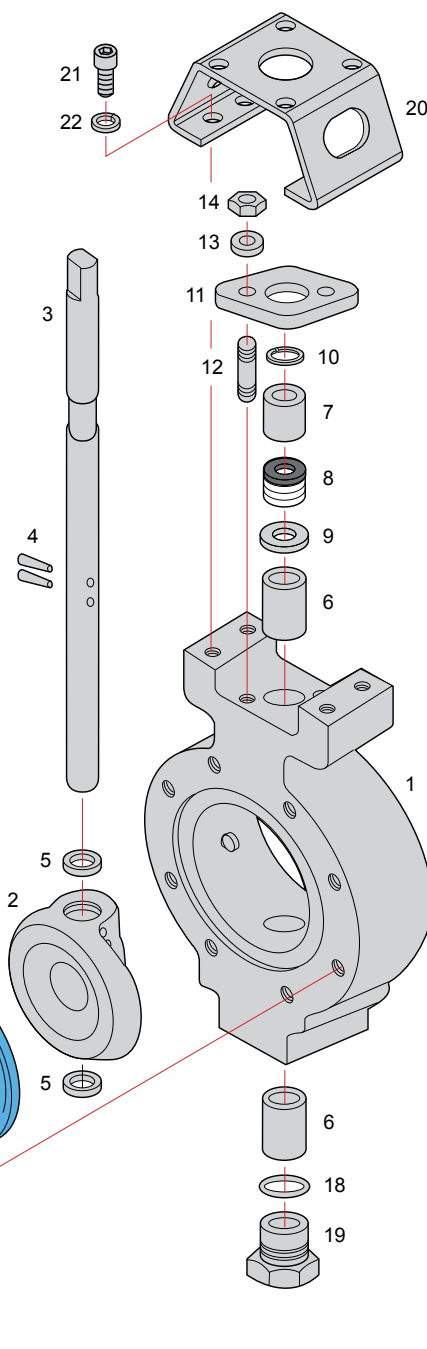
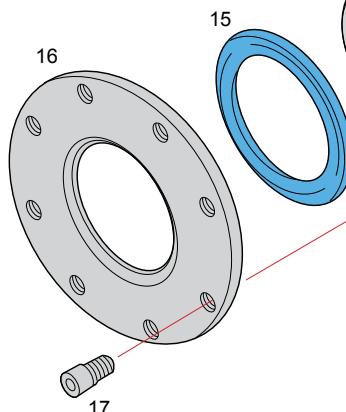
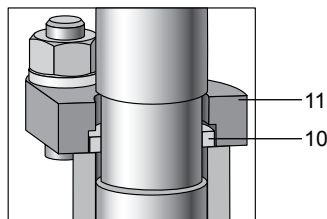


MATERIALS OF CONSTRUCTION

Item	Name	Material
1	Body	Stainless Steel, ASTM A351 GR CF8M Carbon Steel, ASTM A216 GR WCB /A516 GR 70
2	Disc	Stainless Steel, ASTM A351 GR CF8M – Standard with Electroless Nickel Plating on disc edge – FIRE SAFE
3	Stem	17-4 PH SS, ASTM A564-Type 630
4	Taper Pins	17-4 PH SS, ASTM A564-Type 630
5	Disc Spacers	316 Stainless Steel, ASTM 276 Type 316
6	Bearing Assembly	316 Stainless Steel with TFE & Glass Fabric Liner
7	Gland Ring	316 Stainless Steel, ASTM 276 Type 316
8	Stem Seal	PTFE rings plus 1 Carbon Fiber ring – Standard Valve Flexible Graphite rings – FIRE SAFE
9	Thrust Washer	316 Stainless Steel, ASTM 276 Type 316
10	Retaining Ring	18-8 Stainless Steel
11	Gland Retainer	316 Stainless Steel, ASTM A351 CF8M Carbon Steel, ASTM A216 GR WCB /A516 GR 70
12	Stud	316 Stainless Steel, ASTM A193-B8M
13	Lock Washers	18-8 Stainless Steel
14	Hex Nut	18-8 Stainless Steel
15	Seat Assembly	RTFE [^] with Silicone Rubber Energizer
16	Seat Retainer Plate	Stainless Steel, ASTM A351 CF8M /A240-316 Carbon Steel, ASTM A216 GR WCB /A516 GR 70
17	Cap Screws	18-8 Stainless Steel Alloy Steel
18	Gasket	PTFE – Standard Valve Flexible Graphite – FIRE SAFE
19	Locating Plug	316 Stainless Steel, ASTM 276 Type 316/A240-316 Carbon Steel, Phosphate Coated
20	Mounting Plate	18-8 Stainless Steel Carbon Steel, Phosphate Coated
21	Cap Screws	18-8 Stainless Steel Alloy Steel
22	Lock Washers	18-8 Stainless Steel Alloy Steel

Not Shown: Belleville Washer and Grounding Washer: 18-8 Stainless Steel, for 14"– 54" Class 150, 14"–48" Class 300

[^] RTFE is supplied by Bray as RPTFE (reinforced polytetrafluoroethylene).
 Other materials are available, please consult factory for your specific application.

**Exploded View
Series 40**

Blow-Out Proof Stem


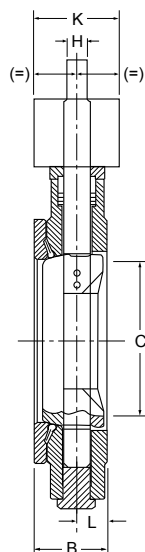
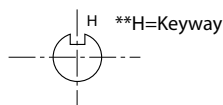
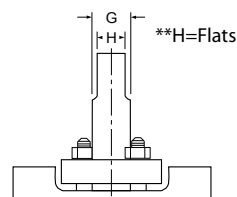
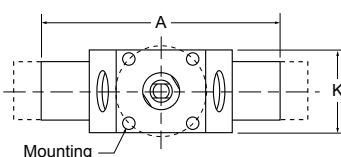
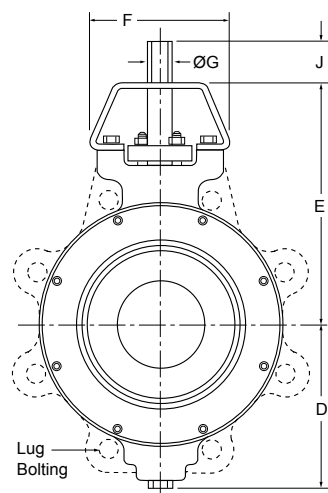
ANSI 150 Cv Values

Valve Size		Disc Position (degrees)								
in.	mm.	90°	80°	70°	60°	50°	40°	30°	20°	10°
2-1/2	65	160	136	100	78	50	30	16	8	3
3	80	185	178	155	123	87	56	32	14	5
4	100	375	365	315	250	175	115	63	31	10
5	125	790	675	500	360	238	146	78	41	16
6	150	1350	1070	750	510	330	218	140	81	35
8	200	2800	2230	1590	1060	685	456	280	165	65
10	250	4300	3450	2430	1630	1050	700	450	250	100
12	300	6650	5330	3750	2530	1630	1080	700	390	155
14	350	7650	6100	4300	2900	1890	1250	810	450	175
16	400	9800	7860	5510	3700	2420	1530	1020	580	230
18	450	10500	9100	6960	5100	3520	2220	1180	500	170
20	500	13500	11700	8800	6500	4500	2820	1530	640	200

ANSI 300 Cv Values

Valve Size		Disc Position (degrees)								
in.	mm.	90°	80°	70°	60°	50°	40°	30°	20°	10°
2-1/2	65	160	136	100	78	50	30	16	8	3
3	80	185	178	155	123	87	56	32	14	5
4	100	375	365	315	250	175	115	63	31	10
5	125	790	675	500	360	238	146	78	41	16
6	150	1000	875	710	530	370	240	138	79	26
8	200	2000	1720	1360	950	630	405	240	121	47
10	250	2650	2250	1740	1200	780	510	295	150	61
12	300	4000	3400	2500	1690	1100	710	430	220	92
14	350	4100	3500	2600	1770	1200	830	490	240	100
16	400	7800	6540	4550	2970	1840	1160	730	420	180
18	450	9500	8000	6170	4530	3110	1970	1080	440	94
20	500	11000	9570	7300	5400	3720	2330	1250	530	110

Cv is defined as the volume of water in U.S.G.P.M. that will flow through a given restriction or valve opening with a pressure drop of one (1) p.s.i. at room temperature. Recommended control angles are between 25°–70° open. Preferred angle for control valve sizing is 60°–65° open.



†C dimension is absolute minimum pipe ID at valve face (without gasket).

ANSI 150 - WAFER DATA

Valve Size		A	B	C‡	D	E	F	Mounting Data			G	H**	J	K	L	Weights
In.	mm.							BCD	No. Holes	Hole Dia.						Wafer
2-1/2	65	4.75	1.88	2.28	3.81	6.38	4.36	2.76	4	0.38	0.63	0.43	1.25	2.50	0.77	14
3	80	5.25	1.88	2.86	4.09	6.63	4.36	2.76	4	0.38	0.63	0.43	1.25	2.50	0.77	16
4	100	6.75	2.03	3.72	4.71	7.50	4.36	2.76	4	0.38	0.63	0.43	1.25	2.50	0.75	21
5	125	7.62	2.23	4.80	5.07	7.50	5.12	2.76	4	0.38	0.75	0.51	1.25	4.50	0.94	26
6	150	8.62	2.23	5.88	5.57	8.00	5.12	2.76	4	0.38	0.75	0.51	1.25	4.50	0.94	33
8	200	10.81	2.40	7.80	6.94	9.50	5.12	4.92	4	0.53	0.87	0.63	1.25	4.50	0.94	46
10	250	13.06	2.75	9.78	8.56	10.75	6.12	4.92	4	0.53	1.18	0.87	2.00	4.50	1.07	80
12	300	15.50	3.08	11.74	10.18	12.25	6.12	4.92	4	0.53	1.18	0.87	2.00	4.50	1.13	123
14	350	17.50	3.73	12.90	11.95	14.50	7.75	4.92	4	0.53	1.38	.39x.39	2.00	6.50	1.42	208
16	400	19.81	4.11	14.68	12.94	17.75	10.38	6.50	4	0.81	1.97	.47x.39	2.50	6.50	1.66	315
18	450	21.41	4.61	16.60	14.15	20.00	10.38	6.50	4	0.81	1.97	.47x.39	2.50	6.50	1.86	411
20	500	23.68	5.03	18.50	15.26	22.75	10.38	6.50	4	0.81	2.50	.62x.62	4.00	6.50	2.06	533

ANSI 300 - WAFER DATA

Valve Size		A	B	C‡	D	E	F	Mounting Data			G	H**	J	K	L	Weights
In.	mm.							BCD	No. Holes	Hole Dia.						Wafer
2-1/2	65	4.75	1.88	2.28	3.81	6.38	4.36	2.76	4	0.38	0.63	0.43	1.25	2.50	0.77	14
3	80	5.25	1.88	2.86	4.09	6.63	4.36	2.76	4	0.38	0.63	0.43	1.25	2.50	0.77	16
4	100	6.75	2.03	3.72	4.71	7.50	4.36	2.76	4	0.38	0.63	0.43	1.25	2.50	0.75	21
5	125	8.25	2.23	4.80	5.13	8.00	5.12	2.76	4	0.38	0.75	0.51	1.25	4.50	0.94	33
6	150	8.88	2.42	5.75	6.25	8.75	5.12	4.92	4	0.53	0.87	0.63	1.25	4.50	0.97	40
8	200	10.94	2.82	7.45	7.55	10.00	6.12	4.92	4	0.53	1.18	0.87	2.00	4.50	1.10	63
10	250	13.26	3.28	9.32	9.36	11.38	6.12	4.92	4	0.53	1.38	0.39	2.00	4.50	1.28	105
12	300	15.57	3.62	11.31	10.89	13.50	7.75	4.92	4	0.53	1.38	0.39	2.00	6.50	1.40	181
14	350	17.90	4.66	11.38	12.50	18.25	10.38	6.50	4	0.81	1.97	.47x.39	2.50	6.50	2.13	330
16	400	19.94	5.35	14.31	13.88	21.00	10.38	6.50	4	0.81	2.50	.62x.62	4.00	6.50	2.50	456
18	450	22.00	5.98	15.00	15.43	21.00	15.38	10.00	8	0.67	2.50	.62x.62	4.00	11.75	2.65	605
20	500	24.10	6.34	16.50	16.80	22.25	15.38	10.00	8	0.67	3.00	.75x.75	4.00	11.75	2.90	780

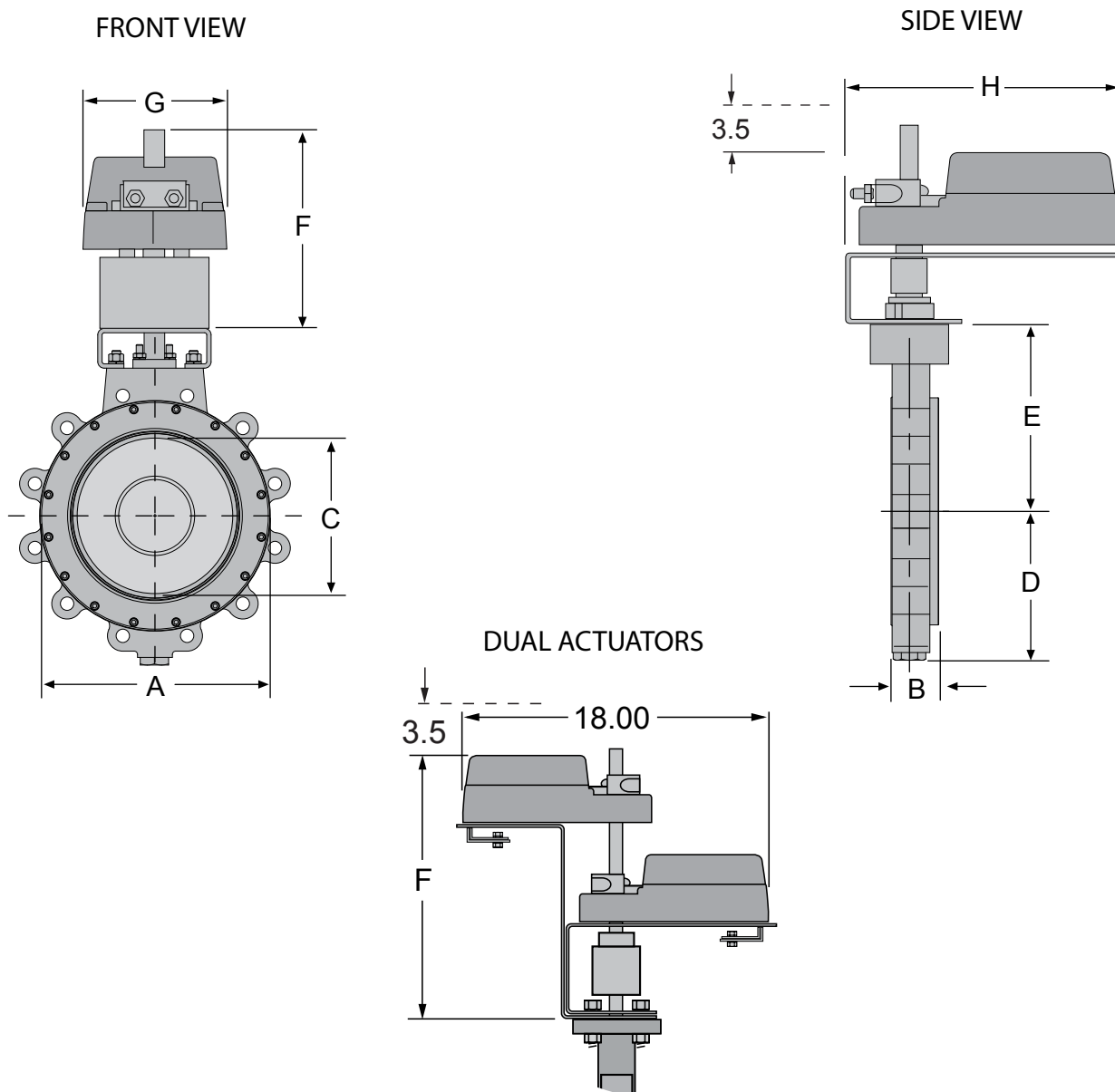
ANSI 150 - LUG DATA

Valve Size		A	B	C‡	D	E	F	Mounting Data			G	H**	J	K	L	Lug Bolt Data			Weights
In.	mm.							BCD	No. Holes	Hole Dia.						BCD	No. Holes	Hole Dia.	
2-1/2	65	4.75	1.88	2.28	3.81	6.38	4.36	2.76	4	0.38	0.63	0.43	1.25	2.50	0.77	5.50	4	5/8-11	12
3	80	5.25	1.88	2.86	4.09	6.63	4.36	2.76	4	0.38	0.63	0.43	1.25	2.50	0.77	6.00	4	5/8-11	14
4	100	6.72	2.03	3.72	4.71	7.50	4.36	2.76	4	0.38	0.63	0.43	1.25	2.50	0.75	7.50	8	5/8-11	23
5	125	7.62	2.23	4.80	5.07	7.50	5.12	2.76	4	0.38	0.75	0.51	1.25	4.50	0.94	8.50	8	3/4-10	30
6	150	8.62	2.23	5.88	5.57	8.00	5.12	2.76	4	0.38	0.75	0.51	1.25	4.50	0.94	9.50	8	3/4-10	35
8	200	10.81	2.40	7.80	6.94	9.50	5.12	4.92	4	0.53	0.87	0.63	1.25	4.50	0.94	11.75	8	3/4-10	55
10	250	13.06	2.75	9.78	8.56	10.75	6.12	4.92	4	0.53	1.18	0.87	2.00	4.50	1.07	14.25	12	7/8-9	92
12	300	15.50	3.08	11.74	10.18	12.25	6.12	4.92	4	0.53	1.18	0.87	2.00	4.50	1.13	17.00	12	7/8-9	136
14	350	17.50	3.73	12.90	11.95	14.50	7.75	4.92	4	0.53	1.38	.39x.39	2.00	6.50	1.42	18.75	12	1-8	268
16	400	19.50	4.11	14.68	12.94	17.75	10.38	6.50	4	0.81	1.97	.47x.39	2.50	6.50	1.66	21.25	16	1-8	400
18	450	21.38	4.61	16.60	14.15	20.00	10.38	6.50	4	0.81	1.97	.47x.39	2.50	6.50	1.86	22.75	16	1 1/8-8	510
20	500	23.62	5.03	18.50	15.26	22.75	10.38	6.50	4	0.81	2.50	.62x.62	4.00	6.50	2.06	25.00	20	1 1/8-8	650

ANSI - LUG DATA

Valve Size		A	B	C#	D	E	F	Mounting Data			G	H**	J	K	L	Lug Bolt Data			Weights
In.	mm.							BCD	No. Holes	Hole Dia.						BCD	No. Holes	Hole Dia.	
2-1/2	65	4.75	1.88	2.28	3.81	6.38	4.36	2.76	4	0.38	0.63	0.43	1.25	2.50	0.77	5.88	8	¾-10	18
3	80	5.25	1.88	2.86	4.09	6.63	4.36	2.76	4	0.38	0.63	0.43	1.25	2.50	0.77	6.63	8	¾-10	25
4	100	6.72	2.03	3.72	4.71	7.50	4.36	2.76	4	0.38	0.63	0.43	1.25	2.50	0.75	7.88	8	¾-10	30
5	125	8.25	2.23	4.80	5.13	8.00	5.12	2.76	4	0.38	0.75	0.51	1.25	4.50	0.94	9.25	8	¾-10	40
6	150	8.88	2.42	5.75	6.25	8.75	5.12	4.92	4	0.53	0.87	0.63	1.25	4.50	0.97	10.62	12	¾-10	54
8	200	10.94	2.82	7.56	7.55	10.00	6.12	4.92	4	0.53	1.18	0.87	2.00	4.50	1.10	13.00	12	7/8-9	98
10	250	13.26	3.28	9.44	9.36	11.38	6.12	4.92	4	0.53	1.38	0.39	2.00	4.50	1.28	15.25	16	1-8	152
12	300	15.57	3.62	11.31	10.89	13.50	7.75	4.92	4	0.53	1.38	0.39	2.00	6.50	1.40	17.75	16	1 1/8-8	238
14	350	17.24	4.66	11.38	12.50	18.25	10.38	6.50	4	0.81	1.97	.47x.39	2.50	6.50	2.13	20.25	20	1 1/8-8	458
16	400	19.50	5.35	14.31	13.88	21.00	10.38	6.50	4	0.81	2.50	.62x.62	4.00	6.50	2.50	22.50	20	1 1/8-8	640
18	450	21.38	5.98	15.00	15.43	21.00	15.38	10.00	8	0.67	2.50	.62x.62	4.00	11.75	2.65	24.75	24	1 1/8-8	868
20	500	23.76	6.34	16.50	16.80	22.25	15.38	10.00	8	0.67	3.00	.75x.75	4.00	11.75	2.90	27.00	24	1 1/8-8	1063

Dimensions are in inches and weights in lbs.



ANSI 150

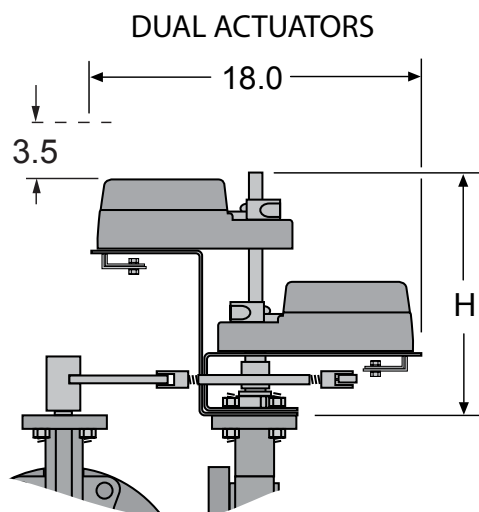
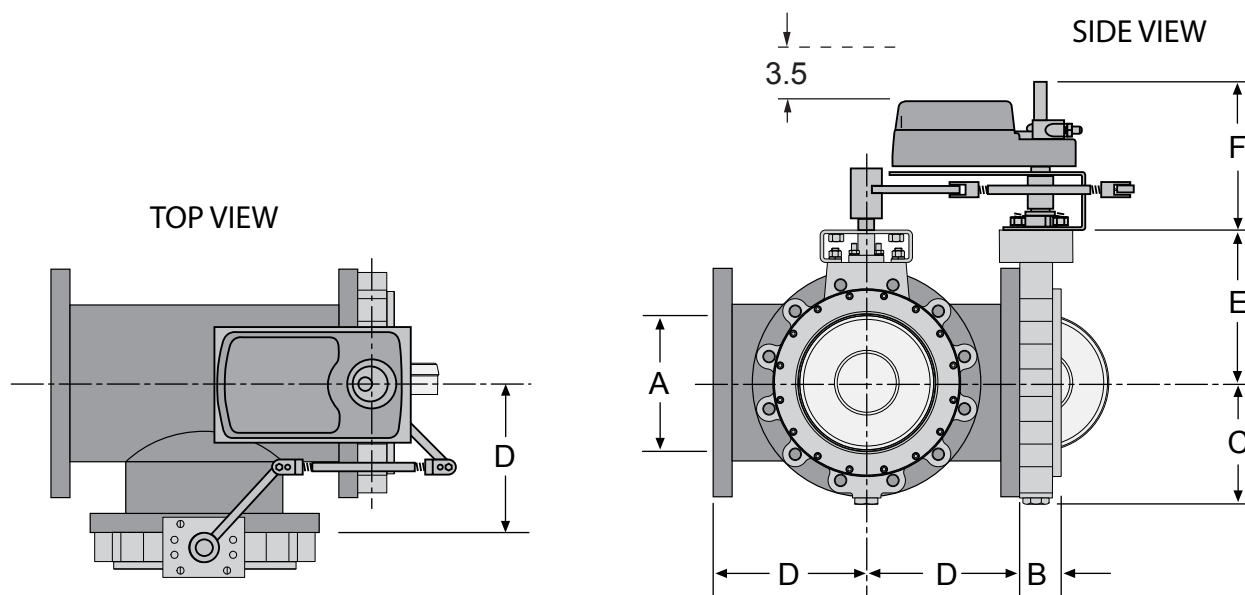
2-WAY - DIMENSIONS, 2-1/2" - 4" — ELECTRIC ACTUATORS — HIGH PERFORMANCE

BFV VALVE MODEL NUMBER	Connection		Cv 90°	Cv 60°	Please reference illustration above						Lug Bolting Data		
					A	B	C	D	E		BC	Holes	Threads
	in.	mm											
MKL2-_025	2-1/2	65	160	78	4.75	1.88	2.28	3.81	6.38	5.50	4	5/8-11	
MKL2-_030	3	80	185	123	5.25	1.88	2.86	4.09	6.63	6.00	4	5/8-11	
MKL2-_040	4	100	375	250	6.72	2.03	3.72	4.71	7.50	7.50	8	5/8-11	

└ N=Normally Open / C=Normally Closed

ACTUATOR DATA

ACTUATOR MODEL NUMBER	Please reference illustration above		
	F	G	H
DS-180	7.43	4.00	10.96
DC-310	7.43	3.95	10.96
Dual DS180	11.83	4.00	18.00
Dual DC 310	11.41	3.95	18.00



ANSI 150

3-WAY-DIMENSIONS, 2-1/2"-4" — ELECTRIC ACTUATORS — HIGH PERFORMANCE

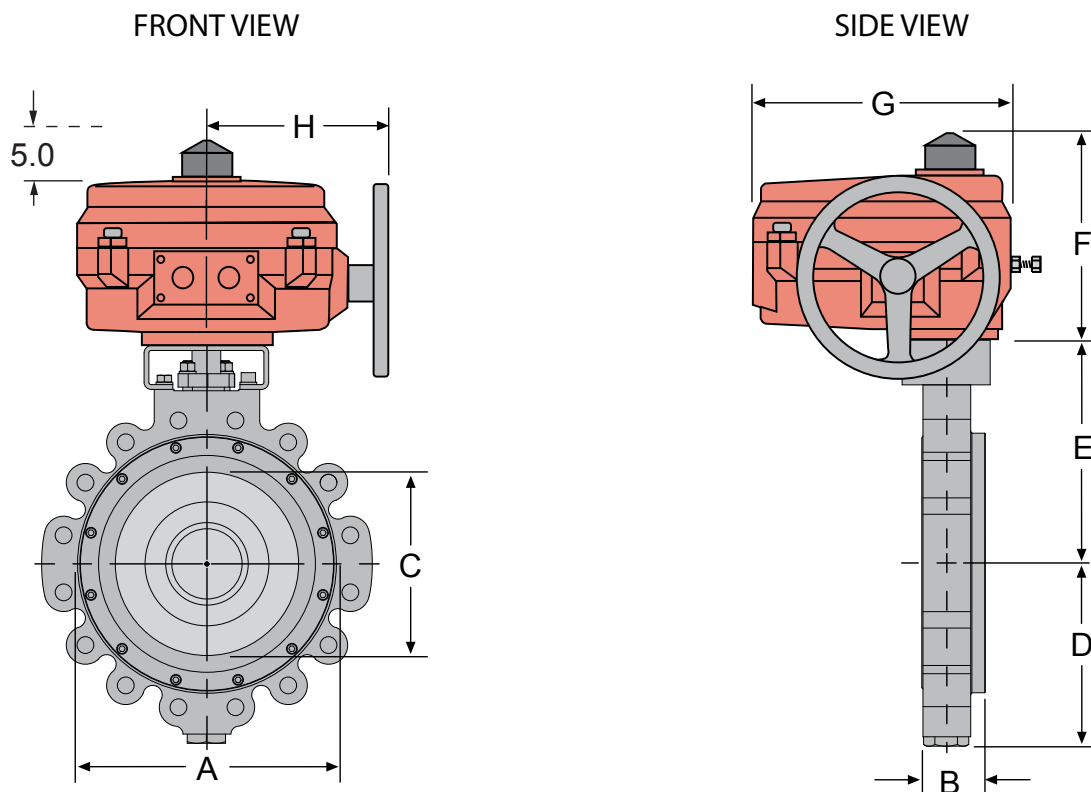
BFV VALVE MODEL NUMBER	Connection		Cv 90°	Cv 60°	Please reference illustration above								
					A	B	C	D	E	F	Lug Bolting Data		
	in.	mm									BC	Holes	Threads
MKL3-X025	2-1/2	65	160	78	2.50	1.88	3.81	5.00	6.38	7.43	5.50	4	5/8-11
MKL3-X030	3	80	185	123	3.00	1.88	4.09	5.50	6.63	7.43	6.00	4	5/8-11
MKL3-X040	4	100	375	250	4.00	2.03	4.71	6.50	7.50	7.43	7.50	8	5/8-11

└ Configuration Number for 3-Way

DIMENSIONS, 2-1/2"-6" — ACTUATOR DATA

ACTUATOR MODEL NUMBER	H	ACTUATOR MODEL NUMBER	H
DS-180 Dual Act.	11.83	DC-310 Dual Act.	11.41

Please reference illustration above



ANSI 150

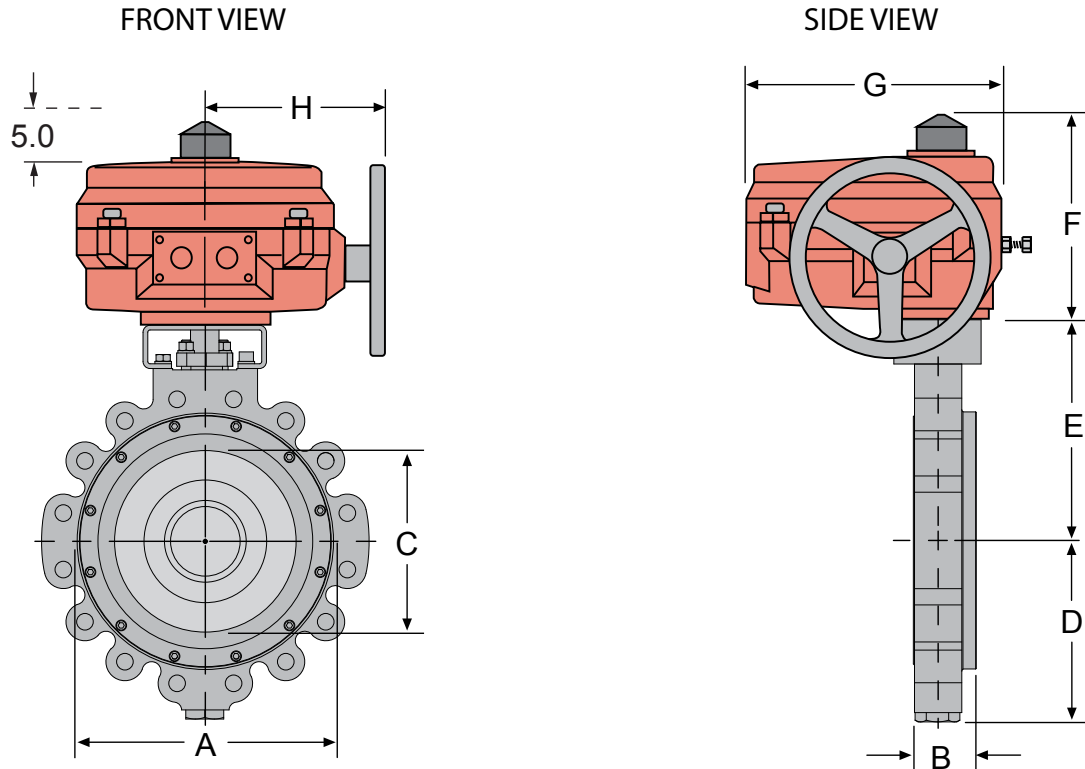
2-WAY - DIMENSIONS, 2-1/2" - 20" — ELECTRIC ACTUATORS — HIGH PERFORMANCE

BFV VALVE MODEL NUMBER	Connection		Cv 90°	Cv 60°	Please reference illustration above					Lug Bolting Data		
					A	B	C	D	E	BC	Holes	Threads
	in.	mm										
MKL2-_025	2-1/2	65	160	78	4.75	1.88	2.28	3.81	6.38	5.50	4	5/8-11
MKL2-_030	3	80	185	123	5.25	1.88	2.86	4.09	6.63	6.00	4	5/8-11
MKL2-_040	4	100	375	250	6.72	2.03	3.72	4.71	7.50	7.50	8	5/8-11
MKL2-_050	5	125	790	360	7.62	2.23	4.80	5.07	7.50	8.50	8	3/4-10
MKL2-_060	6	150	1350	510	8.62	2.23	5.88	5.57	8.00	9.50	8	3/4-10
MKL2-_080	8	200	2800	1060	10.81	2.40	7.80	6.94	9.50	11.75	8	3/4-10
MKL2-_100	10	250	4300	1630	13.06	2.75	9.78	8.56	10.75	14.25	12	7/8-9
MKL2-_120	12	300	6650	2530	15.50	3.08	11.74	10.18	12.25	17.00	12	7/8-9
MKL2-_140	14	350	7650	2900	17.50	3.73	12.90	11.95	14.50	18.75	12	1-8
MKL2-_160	16	400	9800	3700	19.50	4.11	14.68	12.94	17.75	21.25	16	1-8
MKL2-_180	18	450	10500	5100	21.38	4.61	16.60	14.15	20.00	22.75	16	1-1/8-8
MKL2-_200	20	500	13500	6500	23.62	5.03	18.50	15.26	22.75	25.00	20	1-1/8-8

└ N=Normally Open / C=Normally Closed

ACTUATOR DATA

ACTUATOR MODEL NUMBER	Please reference illustration above		
	F	G	H
70-0061	6.70	7.50	5.80
70-0121/0201	8.10	10.10	7.80
70-0301/0501/0651	8.80	12.10	9.50
70-1300/1800	12.50	18.80	9.50
AU-2130	12.70	27.30	26.00
AU-4068	12.30	31.60	28.90


ANSI 300
2-WAY-DIMENSIONS, 2-1/2"- 20" — ELECTRIC ACTUATORS — HIGH PERFORMANCE

BFV VALVE MODEL NUMBER	Connection in. mm		Cv 90°	Cv 60°	Please reference illustration above							
					A	B	C	D	E	Lug Bolting Data		
										BC	Holes	Threads
MKL2-_253	2-1/2	65	160	78	4.75	1.88	2.28	3.81	6.38	5.88	8	3/4-10
MKL2-_033	3	80	185	123	5.25	1.88	2.86	4.09	6.63	6.63	8	3/4-10
MKL2-_043	4	100	375	250	6.72	2.03	3.72	4.71	7.50	7.88	8	3/4-10
MKL2-_053	5	125	790	360	8.25	2.23	4.80	5.13	8.00	9.25	8	3/4-10
MKL2-_063	6	150	1000	530	8.88	2.42	5.75	6.25	8.75	10.62	12	3/4-10
MKL2-_083	8	200	2000	950	10.94	2.82	7.56	7.55	10.00	13.00	12	7/8-9
MKL2-_103	10	250	2650	1200	13.26	3.28	9.44	9.36	11.38	15.25	16	1-8
MKL2-_123	12	300	4000	1690	15.57	3.62	11.31	10.89	13.50	17.75	16	1-1/8-8
MKL2-_143	14	350	4100	1770	17.24	4.66	11.38	12.50	18.25	20.25	20	1-1/8-8
MKL2-_163	16	400	7800	2970	19.50	5.35	14.31	13.88	21.00	22.50	20	1-1/4-8
MKL2-_183	18	450	9500	4530	21.38	5.98	15.00	15.43	21.00	24.75	24	1-1/4-8
MKL2-_203	20	500	11000	5400	23.76	6.34	16.50	16.80	22.25	27.00	24	1-1/4-8

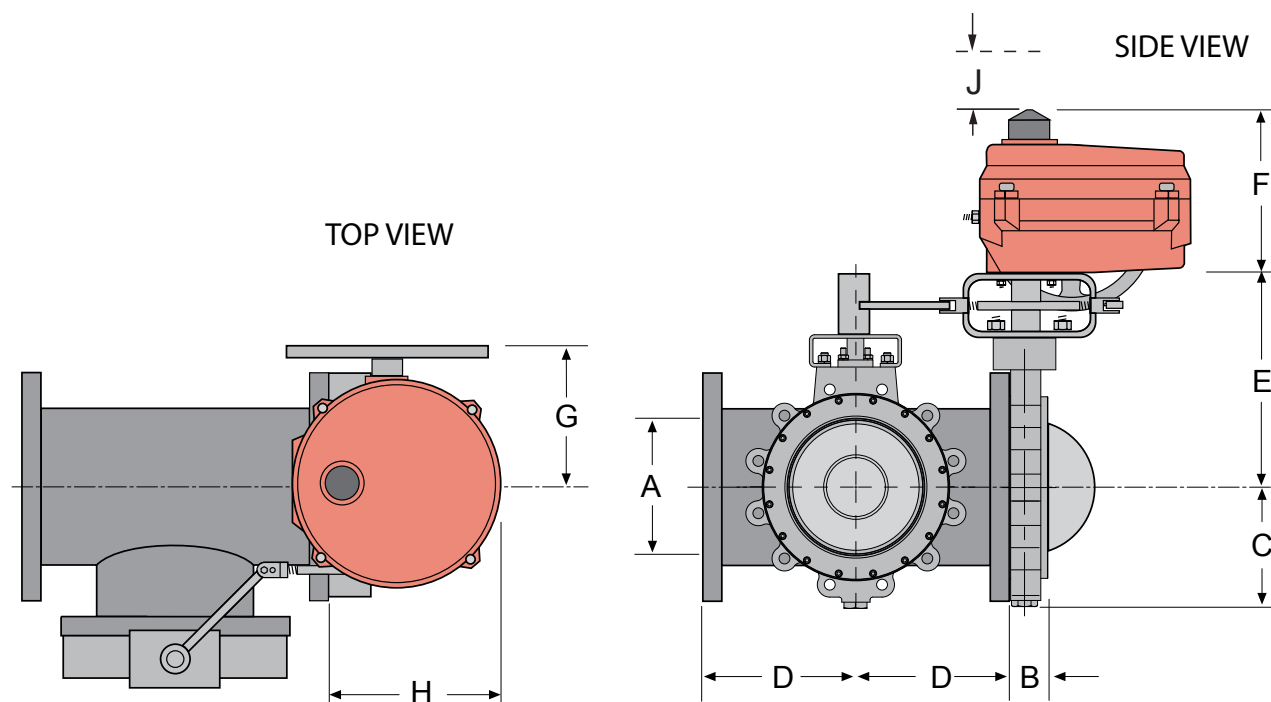
— N=Normally Open / C=Normally Closed

ACTUATOR DATA

ACTUATOR MODEL NUMBER	Please reference illustration above		
	F	G	H
70-0121	8.10	10.10	7.80
70-0301/0651	8.80	12.10	9.50
70-1300/1800	12.50	18.80	9.50
AU-4068	12.30	31.60	28.90
AU-7080	12.30	31.60	31.90

Butterfly Valves 3-Way - Industrial Electric Actuators Dimensions

HP Butterfly Valves



ANSI 150

3-WAY - DIMENSIONS, 2-1/2" - 20" — ELECTRIC ACTUATORS — HIGH PERFORMANCE

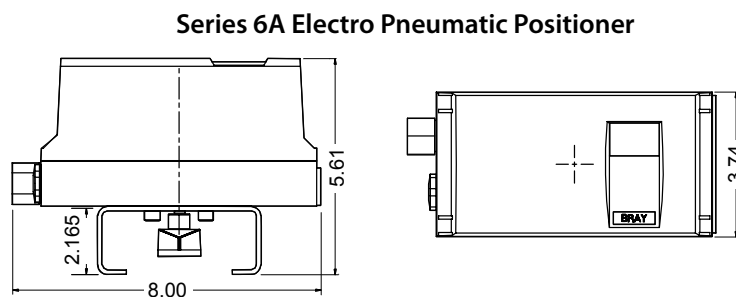
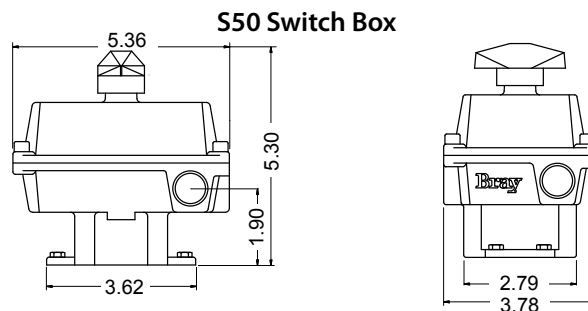
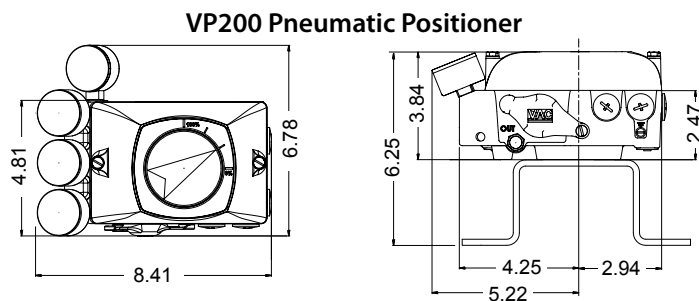
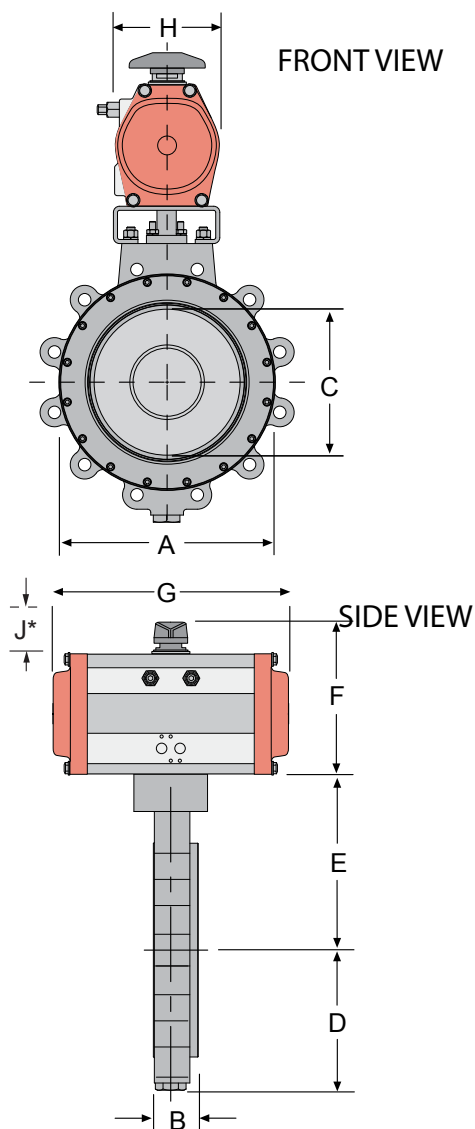
BFV VALVE MODEL NUMBER	Connection		Cv 90°	Cv 60°	Please reference illustration above					Lug Bolting Data		
					A	B	C	D	E	BC	Holes	Threads
	in.	mm										
MKL3-X025	2-1/2	65	160	78	2.50	1.88	3.81	5.00	9.38	5.50	4	5/8-11
MKL3-X030	3	80	185	123	3.00	1.88	4.09	5.50	9.63	6.00	4	5/8-11
MKL3-X040	4	100	375	250	4.00	2.03	4.71	6.50	10.50	7.50	8	5/8-11
MKL3-X050	5	125	790	360	5.00	2.23	5.07	7.50	10.50	8.50	8	3/4-10
MKL3-X060	6	150	1350	510	6.00	2.23	5.57	8.00	11.00	9.50	8	3/4-10
MKL3-X080	8	200	2800	1060	8.00	2.40	6.94	9.00	13.50	11.75	8	3/4-10
MKL3-X100	10	250	4300	1630	10.00	2.75	8.56	11.00	14.75	14.25	12	7/8-9
MKL3-X120	12	300	6650	2530	12.00	3.08	10.18	12.00	16.25	17.00	12	7/8-9
MKL3-X140	14	350	7650	2900	13.25	3.73	11.95	14.00	20.50	18.75	12	1-8
MKL3-X160	16	400	9800	3700	15.25	4.11	12.94	15.00	23.75	21.25	16	1-8
MKL3-X180	18	450	10500	5100	17.25	4.61	14.15	16.50	26.00	22.75	16	1-1/8-8
MKL3-X200	20	500	13500	6500	19.25	5.03	15.26	18.00	28.75	25.00	20	1-1/8-8

└ Configuration Number for 3-Way

ACTUATOR DATA

ACTUATOR MODEL NUMBER	Please reference illustration above			
	F	G	H	J
70-0061	6.70	5.80	6.80	5.00
70-0121/0201	8.10	10.10	7.80	5.00
70-0501/0651	8.80	12.10	9.50	5.00
70-1300	12.50	18.80	9.50	5.00
AU-2130	12.70	26.00	26.00	7.00
AU-4068	12.30	28.90	28.90	7.00

High Performance Butterfly Valves



ANSI 150

2-WAY-DIMENSIONS, 2-1/2"- 20" — PNEUMATIC ACTUATORS — HIGH PERFORMANCE

BFV VALVE MODEL NUMBER	Connection		Cv 90°	Cv 60°	Please reference illustration above							Lug Bolting Data		
					A	B	C	D	E	J*		BC	Holes	Threads
	in.	mm												
MKL2-_025	2-1/2	65	160	78	4.75	1.88	2.28	3.81	6.38	1.50		5.50	4	5/8-11
MKL2-_030	3	80	185	123	5.25	1.88	2.86	4.09	6.63	1.50		6.00	4	5/8-11
MKL2-_040	4	100	375	250	6.72	2.03	3.72	4.71	7.50	1.50		7.50	8	5/8-11
MKL2-_050	5	125	790	360	7.62	2.23	4.80	5.07	7.50	1.50		8.50	8	3/4-10
MKL2-_060	6	150	1350	510	8.62	2.23	5.88	5.57	8.00	1.50		9.50	8	3/4-10
MKL2-_080	8	200	2800	1060	10.81	2.40	7.80	6.94	9.50	1.50		11.75	8	3/4-10
MKL2-_100	10	250	4300	1630	13.06	2.75	9.78	8.56	10.75	2.50		14.25	12	7/8-9
MKL2-_120	12	300	6650	2530	15.50	3.08	11.74	10.18	12.25	2.50		17.00	12	7/8-9
MKL2-_140	14	350	7650	2900	17.50	3.73	12.90	11.95	14.50	2.50		18.75	12	1-8
MKL2-_160	16	400	9800	3700	19.50	4.11	14.68	12.94	17.75	2.50		21.25	16	1-8
MKL2-_180	18	450	10500	5100	21.38	4.61	16.60	14.15	20.00	3.00		22.75	16	1-1/8-8
MKL2-_200	20	500	13500	6500	23.62	5.03	18.50	15.26	22.75	3.00		25.00	20	1-1/8-8

— N=Normally Open / C=Normally Closed

J* = Height required for Actuator removal

NON-SPRING RETURN ACTUATORS

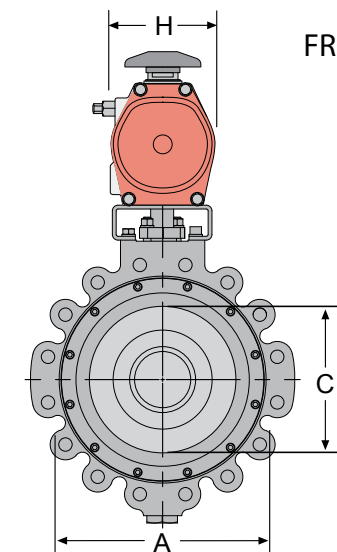
ACTUATOR MODEL NUMBER	Please reference illustration above		
	F	G	H
92-083	5.43	7.40	4.07
92-093	5.78	8.59	4.44
92-119	7.28	11.90	5.15
92-128	8.09	12.31	5.58
92-160	9.36	15.54	7.17
92-210	11.62	19.57	8.97
92-255	13.49	28.78	10.79

SPRING RETURN ACTUATORS

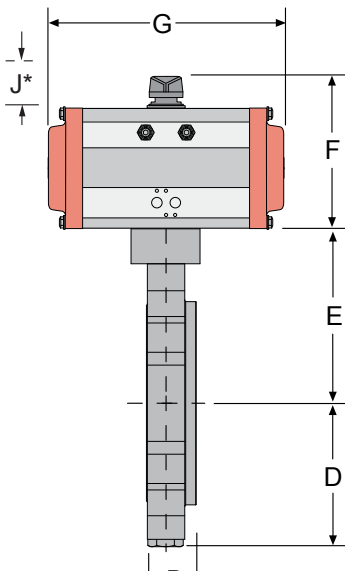
ACTUATOR MODEL NUMBER	Please reference illustration above		
	F	G	H
93-083X	5.43	7.40	4.07
93-093X	5.78	8.59	4.44
93-119X	7.28	11.90	5.15
93-128X	8.09	12.31	5.58
93-160X	9.36	15.54	7.17
93-210X	11.62	19.57	8.97
93-255X	13.49	28.78	10.79

Butterfly Valves 2-Way - ANSI 300- Pneumatic Actuators Dimensions

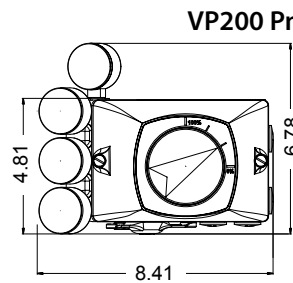
HP Butterfly Valves



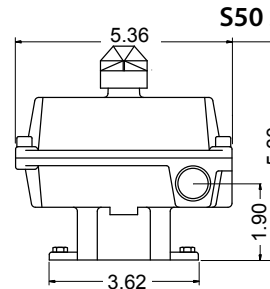
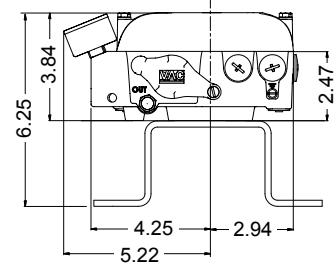
FRONT VIEW



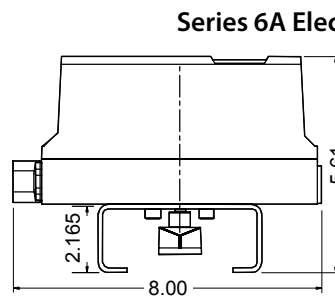
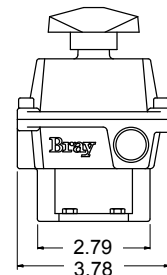
SIDE VIEW



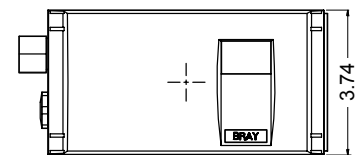
VP200 Pneumatic Positioner



S50 Switch Box



Series 6A Electro Pneumatic Positioner



ANSI 300

2-WAY-DIMENSIONS, 2-1/2"- 20" — PNEUMATIC ACTUATORS — HIGH PERFORMANCE

BFV VALVE MODEL NUMBER	Connection in. mm		Cv 90°	Cv 60°	Please reference illustration above							Lug Bolting Data		
					A	B	C	D	E	J*		BC	Holes	Threads
MKL2-_253	2-1/2	65	160	78	4.75	1.88	2.28	3.81	6.38	1.50		5.88	8	3/4-10
MKL2-_033	3	80	185	123	5.25	1.88	2.86	4.09	6.63	1.50		6.63	8	3/4-10
MKL2-_043	4	100	375	250	6.72	2.03	3.72	4.71	7.50	1.50		7.88	8	3/4-10
MKL2-_053	5	125	790	360	8.25	2.23	4.80	5.13	8.00	1.50		9.25	8	3/4-10
MKL2-_063	6	150	1000	530	8.88	2.42	5.75	6.25	8.75	1.50		10.62	12	3/4-10
MKL2-_083	8	200	2000	950	10.94	2.82	7.56	7.55	10.00	1.50		13.00	12	7/8-9
MKL2-_103	10	250	2650	1200	13.26	3.28	9.44	9.36	11.38	2.50		15.25	16	1-8
MKL2-_123	12	300	4000	1690	15.57	3.62	11.31	10.89	13.50	2.50		17.75	16	1-1/8-8
MKL2-_143	14	350	4100	1770	17.24	4.66	11.38	12.50	18.25	2.50		20.25	20	1-1/8-8
MKL2-_163	16	400	7800	2970	19.50	5.35	14.31	13.88	21.00	2.50		22.50	20	1-1/4-8

N=Normally Open / C=Normally Closed

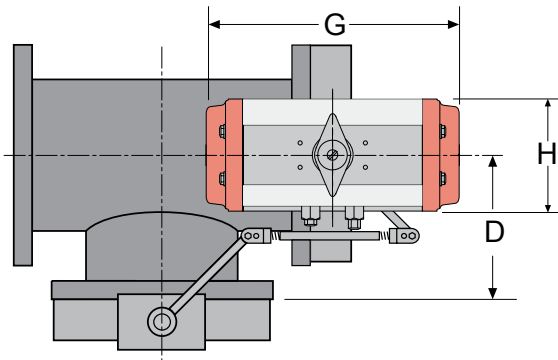
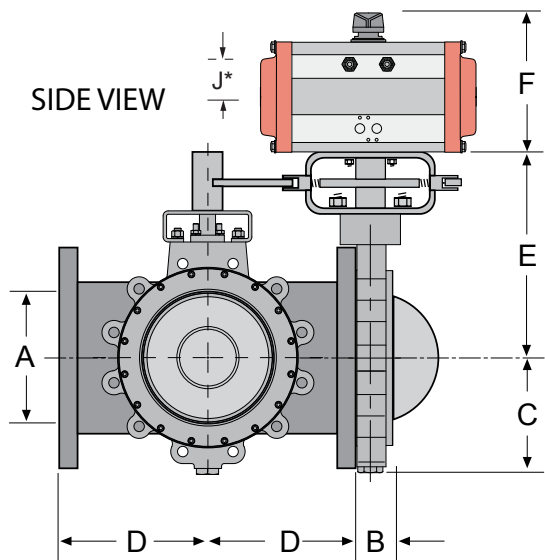
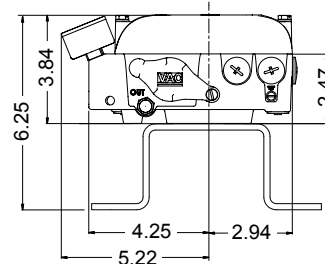
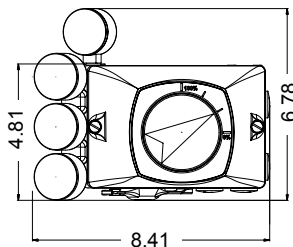
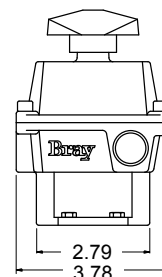
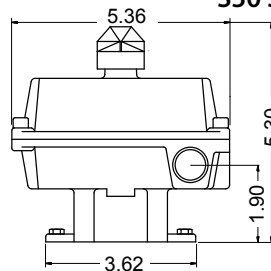
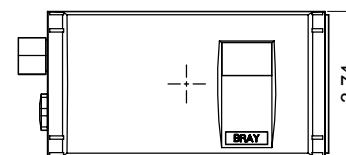
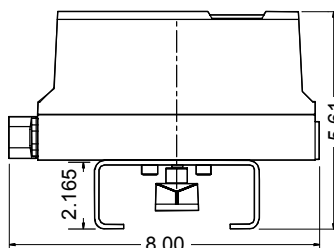
J* = Height required for Actuator removal

Non-Spring Return Actuators

ACTUATOR MODEL NUMBER	Please reference illustration above		
	F	G	H
92-083	5.43	7.40	4.07
92-093	5.78	8.59	4.44
92-119	7.28	11.90	5.15
92-128	8.09	12.31	5.58
92-160	9.36	15.54	7.17
92-210	11.62	19.57	8.97
92-255	13.49	28.78	10.79

Spring Return Actuators

ACTUATOR MODEL NUMBER	Please reference illustration above		
	F	G	H
93-119X	7.28	11.90	5.15
93-160X	9.36	15.54	7.17
93-210X	11.62	19.57	8.97
93-255X	13.49	28.78	10.79

TOP VIEW

SIDE VIEW

VP200 Pneumatic Positioner

S50 Switch Box

Series 6A Electro Pneumatic Positioner


ANSI 150

3-WAY - DIMENSIONS, 2-1/2" - 20" — PNEUMATIC ACTUATORS — HIGH PERFORMANCE

BFV VALVE MODEL NUMBER	Connection		Cv 90°	Cv 60°	Please reference illustration above							Lug Bolting Data		
					A	B	C	D	E	J*				
	in.	mm										BC	Holes	Threads
MKL3-X025	2-1/2	65	160	78	2.50	1.88	3.81	5.00	9.38	1.50		5.50	4	5/8-11
MKL3-X030	3	80	185	123	3.00	1.88	4.09	5.50	9.63	1.50		6.00	4	5/8-11
MKL3-X040	4	100	375	250	4.00	2.03	4.71	6.50	10.50	1.50		7.50	8	5/8-11
MKL3-X050	5	125	790	360	5.00	2.23	5.07	7.50	10.50	1.50		8.50	8	3/4-10
MKL3-X060	6	150	1350	510	6.00	2.23	5.57	8.00	11.00	1.50		9.50	8	3/4-10
MKL3-X080	8	200	2800	1060	8.00	2.40	6.94	9.00	13.50	1.50		11.75	8	3/4-10
MKL3-X100	10	250	4300	1630	10.00	2.75	8.56	11.00	14.75	2.50		14.25	12	7/8-9
MKL3-X120	12	300	6650	2530	12.00	3.08	10.18	12.00	16.25	2.50		17.00	12	7/8-9
MKL3-X140	14	350	7650	2900	13.25	3.73	11.95	14.00	20.50	2.50		18.75	12	1-8
MKL3-X160	16	400	9800	3700	15.25	4.11	12.94	15.00	23.75	2.50		21.25	16	1-8
MKL3-X180	18	450	10500	5100	17.25	4.61	14.15	16.50	26.00	3.00		22.25	16	1-1/8-8
MKL3-X200	20	500	13500	6500	19.25	5.03	15.26	18.00	28.75	3.00		25.00	20	1-1/8-8

Configuration Number for 3-Way

J* = Height required for Actuator removal

NON-SPRING RETURN ACTUATORS

ACTUATOR MODEL NUMBER	Please reference illustration above		
	F	G	H
92-083	5.43	7.40	4.07
92-119	7.28	11.90	5.15
92-128	8.09	12.31	5.58
92-160	9.36	15.54	7.17
92-210	11.62	19.57	8.97
92-255	13.49	28.78	10.79

SPRING RETURN ACTUATORS

ACTUATOR MODEL NUMBER	Please reference illustration above		
	F	G	H
93-0934	5.78	8.59	4.44
93-1193	7.28	11.90	5.15
93-1284	8.09	12.31	5.58
93-1603	9.36	15.54	7.17
93-2103	11.62	19.57	8.97
93-255X	13.49	28.78	10.79

High Performance ANSI Class 150, Electric 2-Way

Actuator Model No.					Seat Retainer UPSTREAM		Seat Retainer DOWNSTREAM	
Valve Size (in)	Cv 90°	Cv 60°	Valve Model No.	Close-Off PSI	On/Off	Modulating	On/Off	Modulating
					Model	Model	Model	Model
2.5	160	78	MKL2-C025	285	70-0061	70-0061SV	70-0061	70-0061SV
3	185	123	MKL2-C030	285	70-0061	70-0061SV	70-0061	70-0061SV
4	375	250	MKL2-C040	285	70-0061	70-0061SV	70-0061	70-0061SV
5	790	360	MKL2-C050	285	70-0121	70-0121SV	70-0121	70-0121SV
6	1350	510	MKL2-C060	285	70-0121	70-0121SV	70-0121	70-0121SV
8	2800	1060	MKL2-C080	285	70-0201	70-0201SV	70-0301	70-0301SV
10	4300	1630	MKL2-C100	285	70-0301	70-0301SV	70-0501	70-0501SV
12	6650	2530	MKL2-C120	285	70-0501	70-0501SV	70-0651	70-0651SV
14	7650	2900	MKL2-C140	285	70-0651	70-0651SV	70-1300	70-1300SV
16	9800	3700	MKL2-C160	285	70-1300	70-1300SV	70-1800	70-1800SV
18	10500	5100	MKL2-C180	285	70-1800	70-1800SV	AU-4068	AU-4068SV
20	13500	6500	MKL2-C200	285	AU-2130	AU-2130SV	AU-4068	AU-4068SV

In accordance with the performance charts shown on Page HB-4,
close-off pressure will change for fluid temperatures above 100°F

High Performance ANSI Class 300, Electric 2-Way

Actuator Model No.					Seat Retainer UPSTREAM		Seat Retainer DOWNSTREAM	
Valve Size (in)	Cv 90°	Cv 60°	Valve Model No.	Close-Off PSI	On/Off	Modulating	On/Off	Modulating
					Model	Model	Model	Model
2.5	160	78	MKL2-C253	740	70-0061	70-0061SV	70-0121	70-0121SV
3	185	123	MKL2-C033	740	70-0061	70-0061SV	70-0121	70-0121SV
4	375	250	MKL2-C043	740	70-0121	70-0121SV	70-0121	70-0121SV
5	790	360	MKL2-C053	740	70-0201	70-0201SV	70-0301	70-0301SV
6	1000	530	MKL2-C063	740	70-0301	70-0301SV	70-0301	70-0301SV
8	2000	950	MKL2-C083	740	70-0501	70-0501SV	70-0651	70-0651SV
10	2650	1200	MKL2-C103	740	70-1300	70-1300SV	70-1300	70-1300SV
12	4000	1690	MKL2-C123	740	70-1300	70-1300SV	70-1800	70-1800SV
14	4100	1170	MKL2-C143	740	70-1800	70-1800SV	AU-4068	AU-4068SV
16	7800	2970	MKL2-C163	740	AU-4068	AU-4068SV	AU-7080	AU-7080SV
18	9500	4530	MKL2-C183	740	AU-4068	AU-4068SV	AU-7080	AU-7080SV
20	11000	5400	MKL2-C203	740	AU-7080	AU-7080SV	AU-7080	AU-7080SV

In accordance with the performance charts shown on Page HB-4,
close-off pressure will change for fluid temperatures above 100°F

ON/OFF

High Performance ANSI Class 150, Electric 3-Way						
Actuator Model No.					Series 70	AU Series
Valve Size (in)	Cv 90°	Cv 60°	Valve Model No.	Close-Off PSI	<i>On/Off</i> Model	<i>On/Off</i> Model
2.5	160	78	MKL3-X025	250	70-0061	
3	185	123	MKL3-X030	250	70-0061	
4	375	250	MKL3-X040	250	70-0121	
5	790	360	MKL3-X050	250	70-0121	
6	1350	510	MKL3-X060	250	70-0121	
8	2800	1060	MKL3-X080	250	70-0201	
10	4300	1630	MKL3-X100	250	70-0501	
12	6650	2530	MKL3-X120	250	70-0651	
14	7650	2900	MKL3-X140	250	70-1300	
16	9800	3700	MKL3-X160	250		AU-2130
18	10500	5100	MKL3-X180	250		AU-4068
20	13500	6500	MKL3-X200	250		AU-4068

X = Configuration Number for 3-Way

In accordance with the performance charts shown on Page HB-4,
close-off pressure will change for fluid temperatures above 100°F

MODULATING

High Performance ANSI Class 150, Electric 3-Way						
Actuator Model No.					Series 70	AU Series
Valve Size (in)	Cv 90°	Cv 60°	Valve Model No.	Close-Off PSI	<i>Modulating</i> Model	<i>Modulating</i> Model
2.5	160	78	MKL3-X025	250	70-0061SV	
3	185	123	MKL3-X030	250	70-0061SV	
4	375	250	MKL3-X040	250	70-0121SV	
5	790	360	MKL3-X050	250	70-0121SV	
6	1350	510	MKL3-X060	250	70-0121SV	
8	2800	1060	MKL3-X080	250	70-0201SV	
10	4300	1630	MKL3-X100	250	70-0501SV	
12	6650	2530	MKL3-X120	250	70-0651SV	
14	7650	2900	MKL3-X140	250	70-1300SV	
16	9800	3700	MKL3-X160	250		AU-2130SV
18	10500	5100	MKL3-X180	250		AU-4068SV
20	13500	6500	MKL3-X200	250		AU-4068SV

X = Configuration Number for 3-Way

In accordance with the performance charts shown on Page HB-4,
close-off pressure will change for fluid temperatures above 100°F

High Performance ANSI Class 150, 2-Way, Pneumatic Double Acting

Actuator Model No.					Seat Retainer UPSTREAM Model	Seat Retainer DOWNSTREAM Model
Valve Size (in)	Cv 90°	Cv 60°	Valve Model No.	Close-Off PSI		
2.5	160	78	MKL2-C025	285	92-083	92-083
3	185	123	MKL2-C030	285	92-083	92-083
4	375	250	MKL2-C040	285	92-083	92-083
5	790	360	MKL2-C050	285	92-093	92-119
6	1350	510	MKL2-C060	285	92-093	92-119
8	2800	1060	MKL2-C080	285	92-119	92-119
10	4300	1630	MKL2-C100	285	92-128	92-160
12	6650	2530	MKL2-C120	285	92-160	92-210
14	7650	2900	MKL2-C140	285	92-210	92-210
16	9800	3700	MKL2-C160	285	92-210	92-255
18	10500	5100	MKL2-C180	285	92-255	92-255
20	13500	6500	MKL2-C200	285	92-255	92-255

Actuators sized for 80 PSI Air Supply

In accordance with the performance charts shown on Page HB-4,
close-off pressure will change for fluid temperatures above 100°F

High Performance ANSI Class 300, 2-Way, Pneumatic Double Acting

Actuator Model No.					Seat Retainer UPSTREAM Model	Seat Retainer DOWNSTREAM Model
Valve Size (in)	Cv 90°	Cv 60°	Valve Model No.	Close-Off PSI		
2.5	160	78	MKL2-C253	740	92-083	92-083
3	185	123	MKL2-C033	740	92-083	92-093
4	375	250	MKL2-C043	740	92-083	92-093
5	790	360	MKL2-C053	740	92-119	92-128
6	1000	530	MKL2-C063	740	92-119	92-160
8	2000	950	MKL2-C083	740	92-160	92-160
10	2650	1200	MKL2-C103	740	92-210	92-210
12	4000	1690	MKL2-C123	740	92-210	92-255
14	4100	1770	MKL2-C143	740	92-255	92-255
16	7800	2970	MKL2-C163	740	92-255	

Actuators sized for 80 PSI Air Supply

In accordance with the performance charts shown on Page HB-4,
close-off pressure will change for fluid temperatures above 100°F

High Performance ANSI Class 150, 2-Way, Pneumatic Spring Return

Actuator Model No.					Seat Retainer UPSTREAM Model	Seat Retainer DOWNSTREAM Model
Valve Size (in)	Cv 90°	Cv 60°	Valve Model No.	Close-Off PSI		
2.5	160	78	MKL2-_025	285	93-834	93-835
3	185	123	MKL2-_030	285	93-834	93-836
4	375	250	MKL2-_040	285	93-836	93-936
5	790	360	MKL2-_050	285	93-1194	93-1196
6	1350	510	MKL2-_060	285	93-1195	93-1285
8	2800	1060	MKL2-_080	285	93-1604	93-1605
10	4300	1630	MKL2-_100	285	93-2103	93-2105
12	6650	2530	MKL2-_120	285	93-2105	93-2553
14	7650	2900	MKL2-_140	285	93-2553	93-2555
16	9800	3700	MKL2-_160	285	93-2555	

Actuators sized for 80 PSI Air Supply N = Normally Open / C = Normally Closed
 In accordance with the performance charts shown on Page HB-4,
 close-off pressure will change for fluid temperatures above 100°F

High Performance ANSI Class 300, 2-Way, Pneumatic Spring Return

Actuator Model No.					Seat Retainer UPSTREAM Model	Seat Retainer DOWNSTREAM Model
Valve Size (in)	Cv 90°	Cv 60°	Valve Model No.	Close-Off PSI		
2.5	160	78	MKL2-_253	740	93-1193	93-1194
3	185	123	MKL2-_033	740	93-1193	93-1194
4	375	250	MKL2-_043	740	93-1194	93-1196
5	790	360	MKL2-_053	740	93-1604	93-2103
6	1000	530	MKL2-_063	740	93-2103	93-2104
8	2000	950	MKL2-_083	740	93-2104	93-2106
10	2650	1200	MKL2-_103	740	93-2553	93-2555
12	4000	1690	MKL2-_123	740	93-2555	

Actuators sized for 80 PSI Air Supply N = Normally Open / C = Normally Closed
 In accordance with the performance charts shown on Page HB-4,
 close-off pressure will change for fluid temperatures above 100°F

High Performance ANSI Class 150, 3-Way, Pneumatic Double Acting

Actuator Model No.

Valve Size (in)	Cv 90°	Cv 60°	Valve Model No.	Close-Off PSI	Series 92 Model
2.5	160	78	MKL3-X025	250	92-083
3	185	123	MKL3-X030	250	92-083
4	375	250	MKL3-X040	250	92-083
5	790	360	MKL3-X050	250	92-119
6	1350	510	MKL3-X060	250	92-119
8	2800	1060	MKL3-X080	250	92-128
10	4300	1630	MKL3-X100	250	92-160
12	6650	2530	MKL3-X120	250	92-210
14	7650	2900	MKL3-X140	250	92-210
16	9800	3700	MKL3-X160	250	92-255
18	10500	5100	MKL3-X180	250	92-255
20	13500	6500	MKL3-X200	250	92-255

Actuators sized for 80 PSI Air Supply X = Configuration Number for 3-Way
 In accordance with the performance charts shown on Page HB-4,
 close-off pressure will change for fluid temperatures above 100°F

High Performance ANSI Class 150, 3-Way, Pneumatic Spring Return

Actuator Model No.

Valve Size (in)	Cv 90°	Cv 60°	Valve Model No.	Close-Off PSI	Series 93 Model
2.5	160	78	MKL3-X025	250	93-934
3	185	123	MKL3-X030	250	93-934
4	375	250	MKL3-X040	250	93-1193
5	790	360	MKL3-X050	250	93-1284
6	1350	510	MKL3-X060	250	93-1603
8	2800	1060	MKL3-X080	250	93-2103
10	4300	1630	MKL3-X100	250	93-2552
12	6650	2530	MKL3-X120	250	93-2553
14	7650	2900	MKL3-X140	250	93-2553

Actuators sized for 80 PSI Air Supply X = Configuration Number for 3-Way
 In accordance with the performance charts shown on Page HB-4,
 close-off pressure will change for fluid temperatures above 100°F