



MK Series – Submittal/Technical Data

High Performance Butterfly Valves 2-Way & 3-Way – 2-1/2"- 20"

MK Series Butterfly Valves - Valve Body Specifications

Technical Specifications		
Service	Hot Water, Chilled Water, Condenser Water up to 50% Glycol & Steam	
Size Range	2-1/2" through 20" (DN 65 to 500)	
Body Style	Lug	2-Way – ANSI 150 and ANSI 300 Flanges 3-Way – ANSI 150 Flanges only
Flow Characteristics	Modified Equal Percentage	
Fluid Temperature Limits	Water -40 to 500°F (-40 to 260°C)	
Maximum Fluid Velocity	30 ft/second (9 m/second)	
Leakage	Bubble tight at rated maximum differential pressure	
Body Cold Working Pressure Ratings	ANSI 150	285 PSI (20 BAR)
	ANSI 300	740 PSI (50 BAR)
Close-Off Pressure Ratings	See pages MK-13 to MK-19 in the Technical Brochure	
Maximum Steam Pressure	On/Off Applications	150 PSI (10 BAR)
	Modulating Applications	50 PSI (3.5 BAR)
Materials (other materials available upon request)	Body	Carbon Steel
	Disc	316 Stainless Steel
	Seat	RPTFE
	Packing	PTFE (adjustable)
	Stem	17-4 Stainless Steel
	Tee	Ductile Iron (3-Way ANSI 150 valves only)
Weights	See Dimensions - Page MK-3 to MK-4	
Design Standard	API 609 Category B, ASME B16.34, ASME BPVC VIII, EN 593, EN 12516, MSS SP 68	
Face to Face	API 609 Category B, ASME B16.10, EN 558, ISO 5752	
Approvals	ABS Type, ATEX 2014/34/EU, Bureau Veritas Type, China Classification Society (CCS) Type, CRN, DNV, EC1935, TR CU	
Certifications	ANSI/NSF 61/372 (SS Bodies Only), CE: PED 2014/68/EU, SIL 3 Capable	

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Bray office. Bray, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

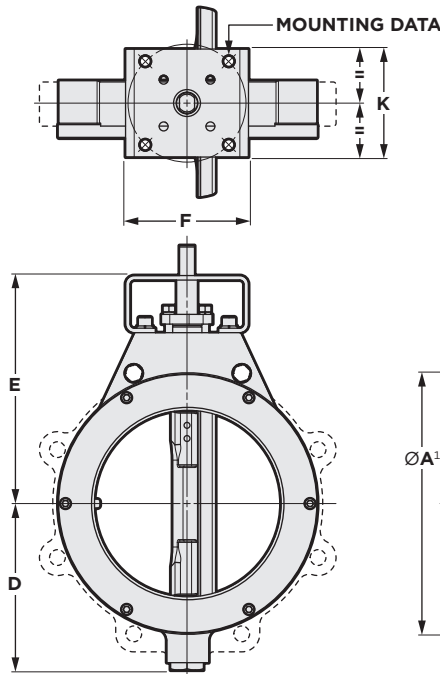
MK Series Butterfly Valves - Cv's at Various Angles of Openings

ANSI Class 150 - Low and Standard Pressure Cv Disc Values									
ANGLE OF DISC OPENING									
Valve Size	10°	20°	30°	40°	50°	60°*	70°	80°	90°
2.5"	3	8	16	30	50	78	100	136	160
3"	5	14	32	56	87	123	155	178	185
4"	10	31	63	115	175	250	315	365	375
5"	16	41	78	146	238	360	500	675	790
6"	35	81	140	218	330	510	750	1,070	1,350
8"	65	165	280	456	685	1,060	1,590	2,230	2,800
10"	100	250	450	700	1,050	1,630	2,430	3,450	4,300
12"	155	390	700	1,080	1,630	2,530	3,750	5,330	6,650
14"	175	450	810	1,250	1,890	2,900	4,300	6,100	7,650
16"	230	580	1,020	1,530	2,420	3,700	5,510	7,860	9,800
18"	170	500	1,180	2,220	3,520	5,100	6,960	9,100	10,500
20"	200	640	1,530	2,820	4,500	6,500	8,800	11,700	13,500

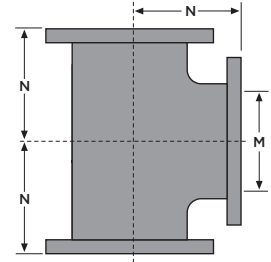
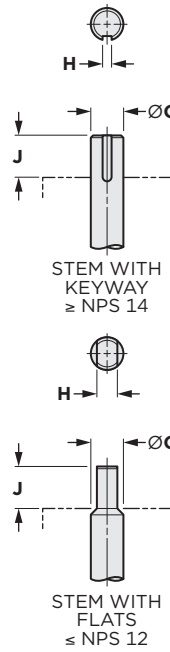
ANSI Class 300 - Low and Standard Pressure Cv Disc Values									
ANGLE OF DISC OPENING									
Valve Size	10°	20°	30°	40°	50°	60°*	70°	80°	90°
2.5"	3	8	16	30	50	78	100	136	160
3"	5	14	32	56	87	123	155	178	185
4"	10	31	63	115	175	250	315	365	375
5"	16	41	78	146	238	360	500	675	790
6"	26	79	138	240	370	530	710	875	1,000
8"	47	121	240	405	630	950	1,360	1,720	2,000
10"	61	150	295	510	780	1,200	1,740	2,250	2,650
12"	92	220	430	710	1,100	1,690	2,500	3,400	4,000
14"	100	240	490	830	1,200	1,770	2,600	3,500	4,100
16"	180	420	730	1,160	1,840	2,970	4,550	6,540	7,800
18"	94	440	1,080	1,970	3,110	4,530	6,170	8,000	9,500
20"	110	530	1,250	2,330	3,720	5,400	7,300	9,570	11,000

* When selecting a butterfly valve for a modulating application, use a valve where the calculated Cv falls between 0 - 60 degrees.

MK Series Butterfly Valves - Valve Dimensions



STEM DETAILS



TEE DIMENSIONS - in. (mm)			WEIGHT lbs
Size	M	N	
2	2.0 (51)	4.5 (114)	19
2.5	2.5 (64)	5.0 (127)	27
3	3.0 (76)	5.5 (140)	39
4	4.0 (102)	6.5 (165)	62
5	5.0 (127)	7.5 (191)	79
6	6.0 (152)	8.0 (203)	96
8	8.0 (203)	9.0 (229)	155
10	10.0 (254)	11.0 (279)	270
12	12.0 (305)	12.0 (305)	380
14	14.0 (356)	14.0 (356)	435
16	16.0 (406)	15.0 (381)	550
18	18.0 (457)	16.5 (419)	665
20	20.0 (508)	18.0 (457)	855

NOTES

- > Additional flange drilling options available.
- > Weights are for cast steel bodies, except when noted.
- 1 Dimension A is diameter of raised face flange.
- 2 Dimension C is absolute minimum pipe ID at valve face (without gasket).
- 3 Flame cut body weights. Flame cut steel and stainless steel bodies vary. Consult Bray factory.

Tee weight is the weight of the Tee alone. For 3-Way assemblies add the weight of two lug valves.

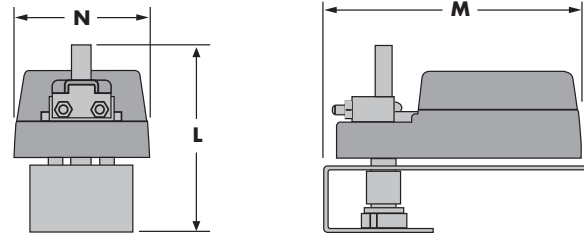
ANSI CLASS 150 (Series 41) DIMENSIONS - in.												Mounting Data			WEIGHT lbs	
Size	ØA¹	B	ØC²	D	E	F	ØG	H	J	K	L	Bolt Circle	Hole Qty	Hole Dia	Wafer	Lug
2 ½	4.75	1.88	2.32	3.82	6.38	4.36	0.63	0.43	1.25	2.50	0.77	2.76	4	0.38	11	13
3	5.25	1.88	2.90	4.10	6.63	4.36	0.63	0.43	1.25	2.50	0.77	2.76	4	0.38	13	15
4	6.72	2.03	3.83	4.72	7.50	4.36	0.63	0.43	1.25	2.50	0.75	2.76	4	0.38	20	23
5	7.62	2.23	4.81	5.07	7.50	5.12	0.75	0.51	1.25	4.50	0.94	4.92	4	0.53	27	32
6	8.62	2.23	5.88	5.57	8.00	5.12	0.75	0.51	1.25	4.50	0.94	4.92	4	0.53	32	36
8	10.81	2.40	7.94	6.94	9.50	5.12	0.88	0.63	1.25	4.50	0.94	4.92	4	0.53	48	54
10	13.06	2.75	10.02	8.56	10.75	6.12	1.18	0.87	2.00	4.50	1.07	4.92	4	0.53	79	93
12	15.42	3.08	11.87	10.18	12.25	6.12	1.18	0.87	2.00	4.50	1.13	4.92	4	0.53	118	134
14	17.24	3.73	13.00	11.95	14.50	7.75	1.38	.39 x .39	2.00	6.50	1.42	4.92	4	0.53	211	221
16	19.50	4.11	14.75	13.10	11.75	10.38	1.97	.47 x .39	2.50	6.50	1.66	6.50	4	0.81	314	337
18	21.38	4.61	16.62	14.37	20.00	10.38	1.97	.47 x .39	2.50	6.50	1.86	6.50	4	0.81	404	429
20	23.62	5.03	18.50	15.55	22.75	10.38	2.50	.63 x .63	4.00	6.50	2.06	6.50	4	0.81	533	568

ANSI CLASS 300 (Series 43) DIMENSIONS - in.												Mounting Data			WEIGHT lbs	
Size	ØA¹	B	ØC²	D	E	F	ØG	H	J	K	L	Bolt Circle	Hole Qty	Hole Dia	Wafer	Lug
2 ½	4.75	1.88	2.32	3.82	6.38	4.36	0.63	0.43	1.25	2.50	0.77	2.76	4	0.38	11	13
3	5.25	1.88	2.90	4.10	6.63	4.36	0.63	0.43	1.25	2.50	0.77	2.76	4	0.38	13	15
4	6.72	2.03	3.83	4.72	7.50	4.36	0.63	0.43	1.25	2.50	0.75	2.76	4	0.38	20	23
5	8.25	2.23	4.81	5.07	8.00	5.12	0.75	0.51	1.25	4.50	0.94	4.92	4	0.53	33	39
6	8.88	2.42	5.76	6.25	8.75	5.12	0.87	0.63	1.25	4.50	0.99	4.92	4	0.53	41	51
8	10.94	2.82	7.63	7.55	10.00	6.12	1.18	0.87	2.00	4.50	1.10	4.92	4	0.53	69	83
10	13.26	3.28	9.50	9.36	11.38	6.12	1.38	.39 x .39	2.00	4.50	1.28	4.92	4	0.53	114	137
12	15.42	3.62	11.37	10.89	13.50	7.75	1.38	.39 x .39	2.00	6.50	1.40	4.92	4	0.53	173	210
14	17.27	4.66	11.50	12.50	18.25	10.38	1.97	.47 x .39	2.50	6.50	2.13	6.50	4	0.81	333	445
16	19.50	5.35	14.38	14.18	21.00	10.38	2.50	.63 x .63	4.00	6.50	2.50	6.50	4	0.81	454	531
18	21.38	5.98	15.25	15.43	21.00	15.38	2.50	.63 x .63	4.00	11.75	2.65	10.00	8	0.67	609	753
20	23.76	6.33	16.50	16.80	22.25	15.38	3.00	.75 x .75	4.00	11.75	2.90	10.00	8	0.67	783	960

MK Series Butterfly Valves - Actuator Dimensions

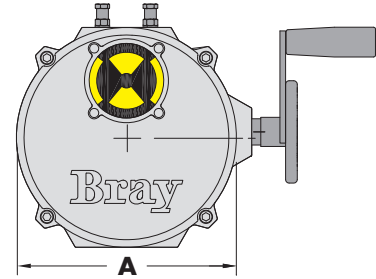
COMMERCIAL ACTUATOR DIMENSIONS — in. (mm)

Actuator Model Number	L	M	N	Weight lbs. (kg)
DS-180 Series	7.4 (188)	11.0 (279)	4.0 (102)	6.4 (2.9)
DC-310 Series	7.4 (188)	11.0 (279)	4.0 (102)	4.4 (2.0)
Tandem DS-180 Series	11.8 (300)	18.0 (457)	4.0 (102)	12.8 (5.8)
Tandem DC-310 Series	11.4 (290)	18.0 (457)	4.0 (102)	808 (4.0)



INDUSTRIAL ACTUATOR DIMENSIONS — in. (mm)

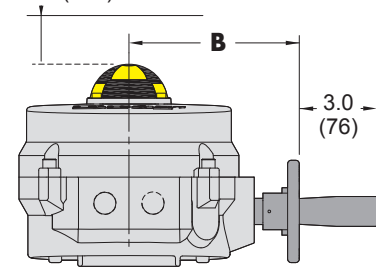
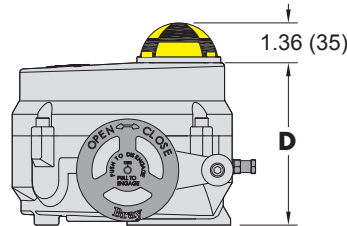
Actuator Model Number	A	B	D		Weight lbs. (kg)
			2-Way	3-Way	
70-0081	7.5 (191)	5.8 (147)	5.6 (141)	8.6 (218)	13 (6)
70-0121/0201/E301	10.1 (256)	7.8 (198)	6.6 (168)	10.7 (273)	28 (13)
70-0501/0651	12.1 (308)	9.5 (241)	7.2 (183)	13.2 (335)	48 (22)
70-1300/1800	12.1 (308)	9.5 (241)	12.5 (316)	20.5 (521)	118 (54)
AU-2130	29.9 (759)	28.9 (734)	12.7 (323)	22.3 (566)	158 (72)
AU-4068	32.9 (836)	28.9 (734)	12.3 (312)	22.3 (566)	181 (82)



ALLOW 4.0 (102) FOR COVER REMOVAL

NOTES

Dimensions for 3-Way include bracket.
Dimensions are approximate.



PNEUMATIC ACTUATOR DIMENSIONS — in. (mm)

Actuator Model Number	L	M	N	F	G	H	Weight lbs. (kg)	
							Double Acting	Spring Return
92/93-083	4.1 (104)	7.4 (188)	5.4 (137)	8.4 (213)	4.5 (114)	13.3 (338)	6.3 (3)	8.1 (4)
92/93-093	4.4 (112)	9.1 (231)	5.8 (147)	8.8 (224)	5.5 (140)	14.9 (378)	8.5 (4)	10.8 (5)
92/93-119	5.2 (132)	12.4 (325)	7.3 (185)	11.4 (290)	8.0 (203)	19.9 (505)	16.9 (8)	22.3 (10)
92/93-128	5.6 (142)	12.8 (734)	8.1 (2.6)	12.2 (310)	8.0 (203)	19.9 (505)	21.0 (10)	27.6 (13)
92/93-160	7.2 (183)	15.5 (394)	9.4 (239)	13.5 (343)	10.5 (267)	26.6 (676)	38.8 (18)	53.2 (24)
92/93-210	9.0 (229)	19.6 (498)	11.6 (295)	17.6 (447)	13.8 (351)	33.1 (841)	77.8 (35)	109.6 (50)
92/93-255	10.8 (274)	28.8 (732)	13.5 (343)	19.5 (495)	13.8 (351)	33.1 (841)	167.0 (76)	210.8 (96)

Allow 3.0" for Series 92/93 actuator removal

