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TECHNICAL DATASHEET
CENTER LINE® - Resilient Seated Butterfly Valves
Now All Ductile Iron Body Standard on Series 200

INDEX:

Series 200	2-7
Series 210	8-11
Series 225-250	12-14
Series 800	15-16
Handles	17
Gear Operators	18-20
Figure Number Systems	21-24
Technical Data	25-28





Series 200 Overview

- Available in sizes 2" to 72".
- Available in Wafer and Lug style bodies (2" to 30").
- Double flange bodies available in sizes 28" to 72".
- Wafer bodies feature four (4) alignment holes.
- Pressure ratings for tight shutoff at temperatures up to the maximum limit of the seat material:
 - 2" to 12" - 200 psi.
 - 14" to 72" - 150 psi.
- Ideal for on-off or throttling services.
- Available with handles (2" to 12"), manual gear actuators (2" to 72"), and electric or pneumatic actuators (2" to 72").
- Refer to Crane automation bulletin for details for pneumatic and electric actuators.
- Designed to comply with MSS SP-67 and MSS SP-25.
- Compatible with ASME B16.1 and ASME B16.5 flanges (2" to 24") and ASME B16.47 Series A (MSS SP-44) flanges (28" to 72").
- Valves 2" to 20" meet the intent and have passed the AWWA C504-87, Section 5 proof of design tests.
- Type approval certification from ABS & USCG Category A for marine applications (2" to 24").
- Bi-directional dead-end service capability to 200 psi (2" to 12") and 150 psi (14" - 24") is standard on lug style valves.
- Operators mounted perpendicular to the pipeline.
- For bolting information, consult the Center Line Installation and Maintenance Manual.
- Vacuum Service Rating: zero leakage at 24" of mercury.
- Commercial cleaning available for Oxygen level 2 applications.
- CE/PED Certification available for sizes 2" to 24".

Valve Seating Torques (In-Lbs.) 2" to 30"

Valve Size	Standard Disc Differential Pressure								Undercut Differential Pressure	
	50 PSI ΔP Bushing		100 PSI ΔP Bushing		150 PSI ΔP Bushing		200 PSI ΔP Bushing		75 PSI ΔP Bushing	
	Bronze	PTFE	Bronze	PTFE	Bronze	PTFE	Bronze	PTFE	Bronze	PTFE
2"	106	100	117	106	129	111	140	117	-	-
2½"	152	150	166	163	181	176	195	189	-	-
3"	213	207	230	220	248	232	265	244	-	-
4"	321	290	386	323	450	357	515	390	-	-
5"	481	423	598	481	715	540	832	598	-	-
6"	692	599	878	691	1,063	783	1,248	875	-	-
8"	1,326	1,060	1,716	1,183	2,106	1,307	2,496	1,430	1,124	819
10"	2,239	1,671	3,010	1,872	3,780	2,074	4,550	2,275	1,363	909
12"	3,959	2,568	4,953	2,795	5,948	3,023	6,942	3,250	2,457	1,445
14"	4,881	2,640	6,226	3,070	7,570	3,500	-	-	4,400	2,300
16"	7,020	4,260	8,580	4,880	10,140	5,500	-	-	5,900	3,600
18"	10,105	6,287	12,202	7,243	14,300	8,200	-	-	8,300	5,500
20"	13,923	8,360	16,582	9,180	19,240	10,000	-	-	11,100	6,700
24"	23,617	15,427	26,953	16,813	30,290	18,200	-	-	17,300	12,100
30"	39,721	27,313	43,391	29,407	47,060	31,500	-	-	27,300	21,100

Valve Seating Torques (in-lbs), 28" to 72" Double Flanged

Valve Size	Standard Disc Differential Pressure		
	50 psi ΔP Wet	100 psi ΔP Wet	150 psi ΔP Wet
28"	34,030	38,180	41,502
30"	39,110	43,880	47,698
32"	50,040	56,145	61,028
36"	61,660	69,175	75,190
40"	81,720	91,690	99,660
42"	124,360	139,530	151,660
48"	171,320	192,210	208,925
42"	184,270	206,740	224,720
54"	204,672	229,630	249,600
60"	308,460	346,080	376,170
64"	377,400	423,430	460,250
66"	420,950	472,290	513,360
72"	505,150	566,750	616,030

All torques shown in these charts were derived from test data using water at 60°F. For torques using dry gases, multiply these numbers by 2.0. For torques involving other media, please consult the factory.

There is no safety factor included in the numbers shown on these charts. For actuator sizing, Crane recommends that these values be multiplied by 1.2 for single valve applications, or 2.0 for 3-way ("tee") applications.

Under certain conditions, hydrodynamic torque can meet or exceed seating and unseating torques. When designing valve systems, hydrodynamic torque must be considered to help assure correct selection for the application.

Series 200 Temperature Ratings and C_v Values

Seat Temperature Ratings

Seat Material	Temperature Ratings, °F
Buna-N	+10 to 180
EPDM (2" to 16")	-30 to 275
EPDM (18" & Above)	-30 to 225
Viton®	10 to 400

Although elastomers have an effective operating temperature range, when used in valves, these ranges may have to be modified. The temperature ranges shown in the table have been adjusted accordingly.

For Low Temperature: While the seat materials selected for use in Center Line butterfly valves are capable of withstanding lower temperatures without damage, the durometer of the elastomer is changed. This "hardening" of the seat may increase the operating torque beyond the structural limits of the stem and/or the disc to stem configuration.

For High Temperature: When using Viton®, the operating pressure of the valve is reduced above 275°F.

Field Replacement: Replacing seats in sizes 14" and above requires factory service.

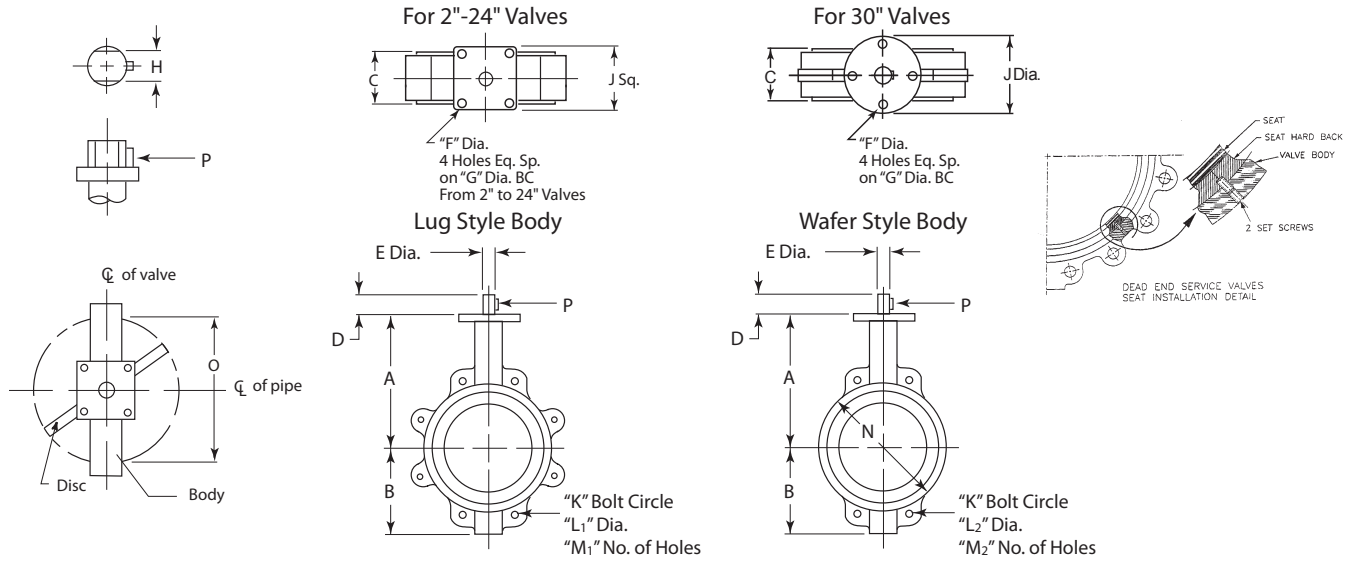
C_v Values – Valve Sizing Coefficients (US-GPM @ 1 psi ΔP), 2" to 30" Wafer and Lug Style Valves

Size	Degrees Open								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
2"	0.06	3	7	15	27	44	70	105	115
2-1/2"	0.10	6	12	25	45	75	119	178	196
3"	0.20	9	18	39	70	116	183	275	302
4"	0.30	17	36	78	139	230	364	546	600
5"	0.50	29	61	133	237	392	620	930	1,022
6"	0.80	45	95	205	366	605	958	1,437	1,579
8"	2	89	188	408	727	1,202	1,903	2,854	3,136
10"	3	151	320	694	1,237	2,047	3,240	4,859	5,340
12"	4	234	495	1,072	1,911	3,162	5,005	7,507	8,250
14"	6	338	715	1,549	2,761	4,568	7,230	10,844	11,917
16"	8	464	983	2,130	3,797	6,282	9,942	14,913	16,388
18"	11	615	1,302	2,822	5,028	8,320	13,168	19,752	21,705
20"	14	791	1,647	3,628	6,465	10,598	16,931	25,396	27,908
24"	22	1,222	2,587	5,605	9,989	16,528	26,157	39,236	43,116
30"	37	2,080	4,406	9,546	17,010	28,147	44,545	66,818	73,426

C_v Values – Valve Sizing Coefficients (US-GPM @ 1 psi ΔP), 28" to 72" Double-Flanged Valves

Size	Degrees Open								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
28"	35	1,743	3,479	6,349	12,385	23,176	35,987	52,685	57,456
30"	36	1,982	4,253	9,069	16,165	26,964	42,832	63,482	70,356
32"	44	2,295	4,637	10,763	18,073	30,120	48,394	69,115	81,245
36"	255	2,919	6,456	12,150	19,242	31,880	50,030	76,383	84,153
40"	283	3,984	7,959	14,895	23,059	34,636	52,806	81,490	116,275
42"	350	4,589	8,629	16,397	26,137	41,952	68,584	101,800	132,859
48"	449	5,210	11,420	21,383	29,143	49,380	88,505	134,833	146,688
52"	900	4,100	9,210	15,110	24,200	38,960	62,580	96,833	118,090
54"	1,299	5,904	13,158	21,594	34,583	55,671	89,411	138,334	168,700
60"	1,480	6,400	14,500	24,500	39,400	63,200	102,000	154,000	190,000
64"	1,518	6,938	15,979	27,797	40,399	64,573	104,725	162,868	203,290
66"	1,650	7,110	16,100	27,300	43,800	70,200	113,000	171,000	211,000
72"	1,900	8,220	13,600	31,500	50,700	81,200	131,000	198,000	244,000

Series 200 Dimensions



Dimensions 2" - 30" Wafer and Lug

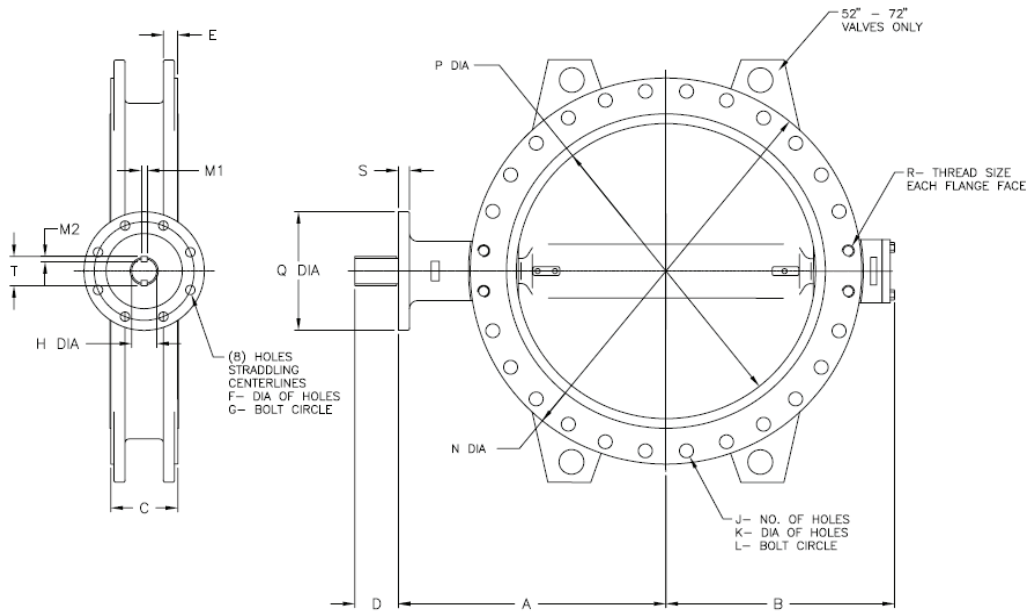
For installation and maintenance instructions, please refer to the IOM manual available at www.cranecpe.com

Valve Size	A	B	C	D	E	F	G	H	J	K	L ₁	L ₂	M ₁	M ₂	N	O	P
2" in	6.38	3.19	1.88	1.25	0.50	0.38	2.76	0.39	2.75	4.75	5/8-11UNC	0.69	4	4	4.00	1.26	Woodruff #3
50 mm	161.93	80.96	47.63	31.75	12.70	9.53	70	10	69.85	120.65		17.46			101.60	32.00	
2-1/2" in	6.88	3.50	2.00	1.25	0.50	0.38	2.76	0.39	2.75	5.50	5/8-11UNC	0.69	4	4	4.75	1.83	Woodruff #3
65 mm	174.63	88.90	50.80	31.75	12.70	9.53	70	10	69.85	139.70		17.46			120.65	46.50	
3" in	7.12	3.75	2.00	1.25	0.50	0.38	2.76	0.39	2.75	6.00	5/8-11UNC	0.69	4	4	5.00	2.54	Woodruff #3
80 mm	180.98	95.25	50.80	31.75	12.70	9.53	70	10	69.85	152.40		17.46			127.00	64.50	
4" in	7.88	4.50	2.12	1.25	0.62	0.38	2.76	0.47	2.75	7.50	5/8-11UNC	0.69	8	4	6.25	3.54	Woodruff #9
100 mm	200.03	114.30	53.98	31.75	15.88	9.53	70	12	69.85	190.50		17.46			158.75	89.90	
5" in	8.38	5.00	2.38	1.25	0.75	0.38	2.76	0.55	2.75	8.50	3/4-10UNC	0.81	8	4	7.50	4.36	Woodruff #9
125 mm	212.73	127.00	60.33	31.75	19.05	9.53	70	14	69.85	215.90		20.64			190.50	110.70	
6" in	8.88	5.50	2.38	1.25	0.75	0.38	2.76	0.55	2.75	9.50	3/4-10UNC	0.81	8	4	8.38	5.72	Woodruff #9
150 mm	225.43	139.70	60.33	31.75	19.05	9.53	70	14	69.85	241.30		20.64			212.73	145.30	
8" in	10.25	6.88	2.50	1.75	0.88	0.44	4.02	0.67	3.75	11.75	3/4-10UNC	0.81	8	4	10.62	7.60	Woodruff #9
200 mm	260.35	174.63	63.50	44.45	22.23	11.11	102	17	95.33	298.45		20.64			269.88	193.00	
10" in	11.50	8.00	2.75	1.75	1.12	0.44	4.02	0.87	3.75	14.25	7/8-9UNC	0.94	12	4	12.88	9.50	Woodruff #15
250 mm	292.10	203.20	69.85	44.45	28.58	11.11	102	22	95.33	361.95		23.81			327.03	241.30	
12" in	13.25	9.62	3.12	1.75	1.25	0.44	4.02	0.95	3.75	17.00	7/8-9UNC	0.94	12	4	15.88	11.45	Woodruff #15
300 mm	336.55	244.48	79.38	44.45	31.75	11.11	102	24	95.33	431.80		23.81			403.23	290.80	
14" in	14.50	10.50	3.12	1.75	1.25	0.44	4.02	0.95	3.75	18.75	1-8UNC	1.06	12	4	17.12	12.78	Woodruff #15
350 mm	368.30	266.70	79.38	44.45	31.75	11.11	102	24	95.33	476.25		26.99			434.98	324.60	
16" in	15.75	12.88	3.50	2.00	1.31	0.88	6.50	1.06	6.50	21.25	1-8UNC	1.06	16	4	19.25	14.97	0.31" Sq x 1.75"
400 mm	400.05	327.02	88.90	50.80	33.34	22.23	165	27	165.10	539.75		26.99			488.95	380.20	
18" in	16.62	13.62	4.25	2.00	1.50	0.88	6.50	1.06	6.50	22.75	1-1/8-7UNC	1.25	16	4	21.25	16.83	0.38" Sq x 1.50"
450 mm	422.28	346.08	107.95	50.80	38.10	22.23	165	27	165.10	577.85		31.75			539.75	427.50	
20" in	18.88	15.12	5.38	2.75	1.62	0.88	6.50	1.26	6.50	25.00	1-1/8-7UNC	1.25	20	4	23.62	18.67	0.38" Sq x 1.75"
500 mm	479.43	384.18	136.53	63.50	41.28	22.23	165	32	165.10	635.00		31.75			650.88	474.20	
24" in	22.12	18.38	6.12	2.75	2.00	0.88	6.50	1.42	6.50	29.50	1-1/4-7UNC	1.38	20	4	27.88	22.62	0.50" Sq x 2.25"
600 mm	561.98	466.73	155.58	69.85	50.80	22.23	165	36	165.10	749.30		34.93			708.03	574.50	
30" in	25.50	24.75	6.75	3.25	2.50	0.88	8.50	N/A	11.25	36.00	1-1/4-7UNC	1.25	28	4	34.38	28.60	0.62" Sq x 2.62"
750 mm	647.70	628.65	171.45	82.55	63.50	22.23	215.9		285.75	914.40		31.75			873.13	726.40	

L1 and M1 refer to Lug style valves, L2 and M2 refer to Wafer Style. "C" dimension is listed with elastomer in the relaxed condition. Approximately 1/8" total compression is required for proper sealing with pipe flanges. Valves are designed for installation between ASME B16.1 Class 125 (Iron) and B16.5 Class 150 (Steel) flanges. Gaskets are not needed, and should not be used since the seat face seals against the mating flange. If the valve is to be installed in between any other flanges, consult your Center Line agent or the factory for additional information. Center Line recommends that a blind flange be used on end of line applications.

"O" dimension is the valve clearance dimension.

Series 200 Dimensions



*Dimensions: 28" to 72" Double Flanged

For installation and maintenance instructions, please refer to the IOM manual

Valve Size	A	B	C	D	E	F	G	H	J	K	L	M ₁ X M ₂	N	P	Q	R	S	T
28" in	24.6	24.6	6.5	2.6	2.1	0.7	10.0	2.5	24	1.4	34.0	0.71 x 0.43	36.5	27.4	11.8	(4) 1-1/4-7UNC	1.3	2.84
	626	624	165	66	54	18	254	63.4		35	863.4	18 X 11	927.1	695	300		33	72.2
30" in	26.0	22.0	6.6	2.6	2.1	0.7	10.0	2.5	24	1.4	36.0	0.71 x 0.43	38.7	29.4	11.8	(4) 1-1/4-7UNC	1.3	2.84
	660	560	167	66	54	18	254	63.4		35	914.4	18 X 11	984	746	300		33	72.2
32" in	26.2	26.5	7.5	4.6	2.4	0.7	10.0	2.5	24	1.6	38.5	0.79 x 0.47	41.7	31.4	11.8	(4) 1-1/2-6UNC	1.3	2.84
	666	672	190	118	60.3	18	254	63.4		41.3	978	20 x 12	1060	797	300		33	72.2
36" in	28.3	25.8	8.0	4.6	2.4	0.7	10.0	3.0	28	1.6	42.8	0.79 x 0.47	46.0	35.2	11.8	(4) 1-1/2-6UNC	1.3	3.32
	720	656	203	118	60.3	18	254	75		41.3	1086	20 x 12	1169	895	300		33	84.4
40" in	31.7	31.5	8.6	5.9	2.4	0.7	10.0	3.3	32	1.6	47.2	0.87 x 0.55	50.7	39.3	11.8	(4) 1-1/2-6UNC	1.5	3.77
	806	800	218	150	60.3	18	254	85		41.3	1200	22 x 14	1289	997	300		38	95.8
42" in	33.8	30.6	9.9	5.9	2.6	0.7	10.0	3.3	32	1.6	49.5	0.87 x 0.55	53.0	41.3	11.8	(4) 1-1/2-6UNC	1.4	3.77
	858	777	251	150	66	18	254	85		41.3	1257	22 x 14	1346	1048	300		35	95.8
48" in	37.0	34.0	10.9	5.9	2.8	0.9	11.7	4.1	40	1.6	56.0	1.10 x 0.63	59.5	47.2	13.8	(4) 1-1/2-6UNC	1.5	4.64
	941	864	276.4	150	70	22	298	105		41.3	1422	28 x 16	1511	1200	350		38	117.8
54" in	41.3	40.0	15.0	7.9	3.0	1.3	14.0	5.5	44	2.0	66.3	1.42 x 0.79	62.8	53.3	16.3	(4) 1-3/4-5UNC	1.8	6.14
	1050	1015	381	200	76	33	356	140		51	1683	36 x 20	1594	1353	415		45	156
60" in	44.5	43.0	15.0	9.8	3.1	1.3	14.0	6.3	52	2.0	73.0	1.57 x 0.87	69.3	59.3	16.3	(4) 1-3/4-5UNC	1.8	7.01
	1130	1091	381	250	79	33	356	160		51	1854	40 x 22	1759	1505	415		45	178
66" in	49.2	49.0	18.0	9.8	3.3	1.3	14.0	6.3	52	2.0	80.0	1.57 x 0.87	76.0	65.3	16.3	(4) 1-3/4-5UNC	1.8	7.01
	1250	1245	457	250	85	33	356	160		51	2032	40 x 22	1930	1658	415		45	178
72" in	53.5	51.6	18.0	11.0	3.5	1.5	16.0	7.1	60	2.0	86.5	1.77 x 0.98	82.5	71.3	18.7	(4) 1-3/4-5UNC	2.0	7.87
	1360	1310	457	280	89	39	406	180		51	2197	45 x 25	2096	1810	475		50	200

* Please note that dimensions apply to standard product only.

"P" dimension is the valve clearance (inside diameter of the pipe or mating flanges) dimension.

Series 200 Dimensions

Weights: 2" to 72" (Bare Stem)

		2"	2-1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"	30"	32"	36"	40"	42"
Wafer	lbs	6	7	10	13	18	20	32	42	70	95	117	165	275	440	-	740	-	-	-	-
	kg	2.7	3.2	4.5	5.9	8.2	9.1	14.5	19.1	31.7	43.1	53.1	74.8	124.7	199.6	-	335.7	-	-	-	-
Lug	lbs	7	8	14	26	28	31	49	72	105	155	195	230	396	610	-	1,050	-	-	-	-
	kg	3.2	3.6	6.4	11.8	12.7	14.1	22.2	32.7	47.6	70.3	88.5	104.3	179.6	276.7	-	476.3	-	-	-	-
Flanged	lbs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,175	1,219	1,528	1,954	2,145	2,500
	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	533	553	693	886	973	1,134

		48"	54"	60"	66"	72"
Wafer	lbs	-	-	-	-	-
	kg	-	-	-	-	-
Lug	lbs	-	-	-	-	-
	kg	-	-	-	-	-
Flanged	lbs	3,720	5,446	5,868	7,850	10,584
	kg	1,687	2,470	2,661	3,560	4,800

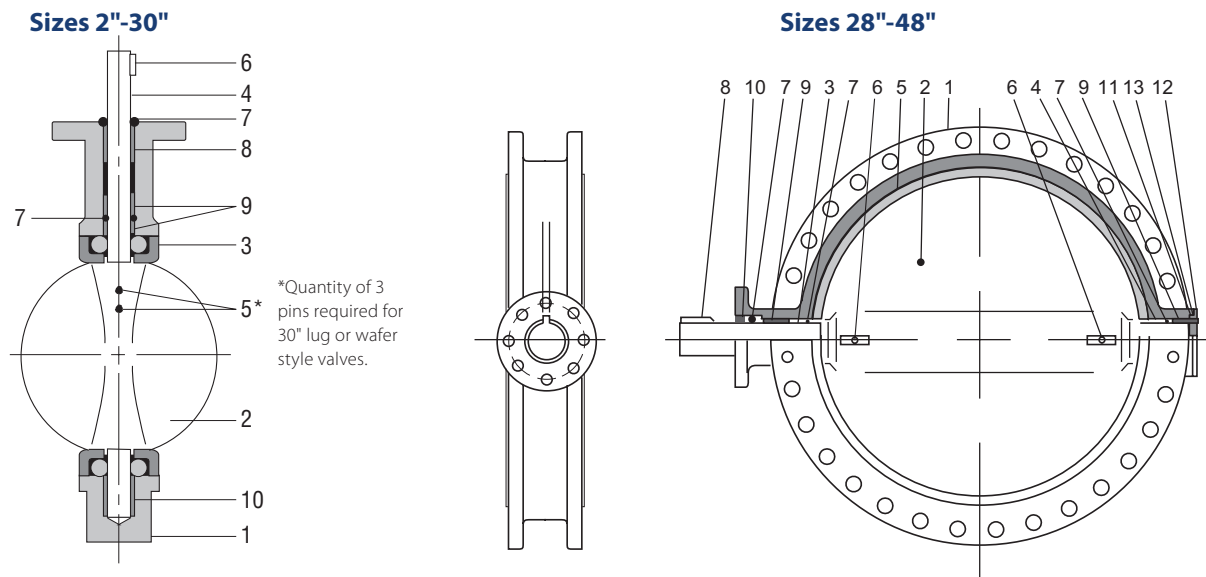
Weights: 28" - 48" Double Flanged (Gear Actuated)

	28"	30"	32"	36"	40"	42"	48"
lbs	1327	1372	1680	2130	2509	2864	4084
kg	602	622	762	966	1138	1299	1852

Weights: 54" - 72" Double Flanged (Gear Actuated)

	54"	60"	66"	72"
lbs	5810	6617	8600	11797
kg	2635	3001	3900	5350

Series 200 Materials of Construction



Bill of Materials 2" - 30"

Item	Description	Materials	Optional Materials
1	Body	Ductile Iron, A536 Grade 65-45-12 *	Ductile Iron, A395 Gr. 60-40-18
2	Disc	Ductile Iron, A536 Grade 65-45-12 **	Aluminum-Bronze, B148 Grade C954; 316 Stainless Steel, A351 Grade CF8M; Monel®, A494 Grade M30C
3	Seat	Buna-N or EPDM	Viton®
4	Shaft	416 Stainless Steel, A582 Type 416	316 Stainless Steel, A276/A479 Type 316; Monel®, B164 Type 400, Class B; 17-4PH Stainless Steel, A564 Type 630, Condition H1150
5	Taper Pins	416 Stainless Steel, A582 Type 416	316 Stainless Steel, A276/A479 Type 316; Monel®, B164 Type 400, Class B; 17-4PH Stainless Steel, A564 Type 630, Condition H1150
6	Key	Carbon Steel, AISI C1018	No Option Available
7	O-Ring	Buna-N	Viton®
8	Bushing	PTFE	Luberized Bronze
9	Bushing	PTFE	Luberized Bronze
10	Bushing	PTFE	Luberized Bronze

Monel® is a registered trademark of Special Metals Corporation™

Viton® is a registered trademark of DuPont™

Bill of Materials, 28" to 72"

Item	Description	Materials	Optional Materials
1	Body	Ductile Iron, A536 Grade 65-45-12 *	Ductile Iron, A395 Gr. 60-40-18
2	Disc	Ductile Iron, A536 Grade 65-45-12 **	Aluminum-Bronze, B148 Grade C954; 316 Stainless Steel, A351 Grade CF8M
3	Upper Shaft	416 Stainless Steel, A582 Type 416	316 Stainless Steel (standard with 316 Stainless Steel disc), A276/A479 Type 316
4	Lower Shaft	416 Stainless Steel, A582 Type 416	316 Stainless Steel (standard with 316 Stainless Steel disc), A276/A479 Type 316
5	Seat	Buna-N or EPDM	Viton®
6	Taper Pin	416 Stainless Steel, A582 Type 416	316 Stainless Steel, A276/A479 Type 316
7	O-Ring	Buna-N	No Option Available
8	Key	Carbon Steel, AISI C1018	No Option Available
9	Bushing	PTFE	Luberized Bronze
10	Bushing	PTFE	Luberized Bronze
11	Thrust Washer	PTFE	Luberized Bronze
12	End Plate	Ductile Iron, A536 Grade 65-45-12 *	No Option Available
13	O-Ring	Buna-N	No Option Available

* Ductile iron bodies are available with an optional epoxy coating.

** Ductile iron discs are standard with an epoxy coating.

Series 210 Overview

- Available in sizes 2" to 72".
- Available with double-flanged style bodies.
- Pressure ratings for tight shutoff at temperatures up to the maximum limit of the seat material:
 - 3" to 14" - 232 psi.
 - 16" to 72" - 150 psi.
- Ideal for on-off or throttling services.
- Available with manual gear actuators (3" to 72") and electric or pneumatic actuators (3" to 72").
- Designed to comply with ANSI / AWWA C504 and MSS SP-25.
- The 3" valve size is compatible with ASME B16.1 Class 125 flanges.
- Valve sizes 4" through 24" are compatible with ASME B16.1 Class 125 and AWWA C207 Table 2 Class D flanges.
- Valve sizes 30" through 72" are compatible with AWWA C207 Table 2 Class D flanges.
- Face-to-face laying lengths per ANSI / AWWA C504, Table 1: Short Body.
- Pressure Class 150B per ANSI / AWWA C504.

Valve Seating Torques (in-lbs), 3" to 72"

Valve Size	Differential Pressure							
	50 PSI ΔP Bushing		100 PSI ΔP Bushing		150 PSI ΔP Bushing		232 PSI ΔP Bushing	
	Bronze	PTFE	Bronze	PTFE	Bronze	PTFE	Bronze	PTFE
3"	-	326	-	366	-	398	-	478
4"	-	450	-	505	-	549	-	637
6"	-	1,082	-	1,214	-	1,319	-	1,761
8"	-	1,800	-	2,019	-	2,195	-	2,921
10"	-	2,940	-	3,298	-	3,585	-	4,603
12"	-	4,231	-	4,747	-	5,160	-	6,603
14"	-	4,994	-	5,603	-	6,090	-	7,311
16"	6,851	-	7,687	-	8,355	-	-	-
18"	9,182	-	10,301	-	11,197	-	-	-
20"	12,251	-	13,745	-	14,940	-	-	-
24"	23,189	-	26,017	-	28,279	-	-	-
28"	34,032	-	38,182	-	41,502	-	-	-
30"	39,110	-	43,880	-	47,698	-	-	-
36"	61,660	-	69,175	-	75,190	-	-	-
42"	124,360	-	139,530	-	151,660	-	-	-
48"	171,320	-	192,210	-	208,930	-	-	-
54"	204,672	-	229,630	-	249,600	-	-	-
60"	308,460	-	346,080	-	376,170	-	-	-
66"	420,950	-	472,290	-	513,360	-	-	-
72"	505,150	-	566,750	-	616,030	-	-	-

All torques shown in these charts were derived from test data using water at 60°F.

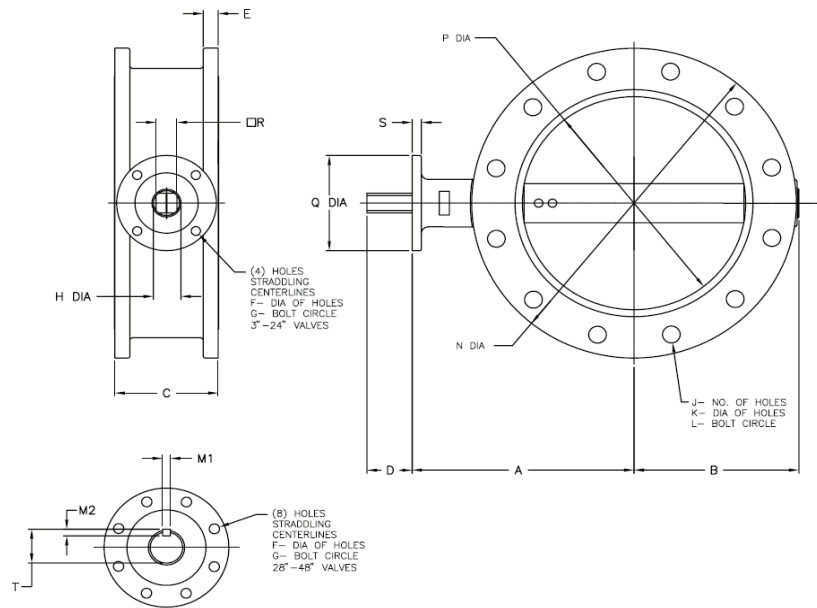
There is no safety factor included in the numbers shown in this chart. For actuator sizing, Crane recommends that these values be multiplied by 1.2 for single valve applications, or 2.0 for 3-way (tee) applications.

Under certain conditions, hydrodynamic torque can meet or exceed seating and unseating torques. When designing valve systems, hydrodynamic torque must be considered to help assure correct selection for the application.

Seat Temperature Rating

Seat Material	Temperature Ratings, °F
EPDM	+33 to 126

Series 210 Dimensions



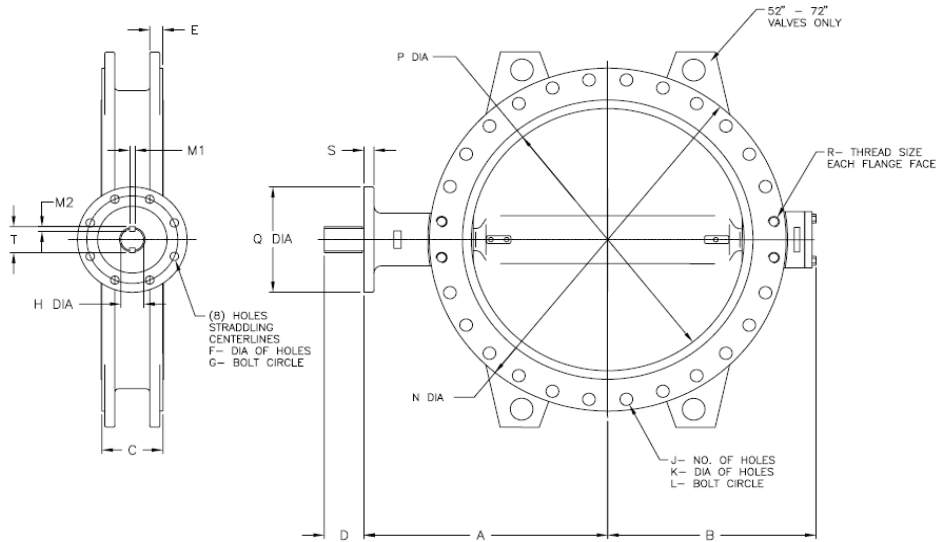
Dimensions, 3" to 48" Double Flanged to ANSI/AWWA C504

For installation and maintenance instructions, please refer to the IOM manual available at www.cranecpe.com

Valve Size	A	B	C	D	E	F	G	H	M ₁ X M ₂	P	Q	R (Sq)	S	T	AWWA C207, Table 2 Class D			
															J	K	L	N
3" in 80 mm	8.0 203	5.5 140	5.0 127	1.3 32	1.0 25.4	0.4 10	2.8 70	1.0 25.4	-	3.11 78.9	3.5 90	0.7 17	0.5 13	-	8	0.875 22	9.50 241.5	11.00 279
4" in 100 mm	9.3 235.5	6.7 170	6.0 152	1.8 45	1.1 28.5	0.5 12	4.0 102	1.1 28.6	-	4.09 104	4.9 125	0.9 22	0.6 14	-	8	0.875 22	11.75 298.5	13.50 343
6" in 150 mm	12.3 312	9.1 230	8.0 203	1.8 45	1.3 31.8	0.6 14	4.9 125	1.5 38.1	-	6.13 155.7	5.9 150	1.1 27	0.8 20	-	12	1.000 25	17.00 432	19.00 483
8" in 200 mm	13.5 343	10.1 256	8.0 203	1.8 45	1.4 35	0.6 14	4.9 125	1.8 44.5	-	7.98 202.7	5.9 150	1.3 32	0.8 20	-	12	1.125 29	18.75 477	21.00 533
10" in 250 mm	14.6 372	11.8 299	8.0 203	2.0 50	1.4 36.6	0.9 22	6.5 165	2.0 50.8	-	9.86 250.4	8.3 210	1.4 36	0.9 22	-	16	1.125 29	21.25 539.8	23.50 597
12" in 300 mm	15.8 402	12.9 327	8.0 203	2.0 50	1.6 39.7	0.9 22	6.5 165	2.3 57.2	-	11.87 301.6	8.3 210	1.7 42	0.9 22	-	16	1.250 32	22.75 578	25.00 635
14" in 350 mm	17.2 437	13.9 352	8.0 203	2.4 60	1.7 42.9	0.9 22	6.5 165	2.5 63.5	-	13.12 333.3	8.3 210	1.8 46	0.9 22	-	20	1.250 32	25.00 635	27.50 699
16" in 400 mm	19.6 498.5	16.5 420	8.0 203	2.8 70	1.9 47.7	0.9 22	6.5 165	3.0 76.2	-	15.34 389.7	8.3 210	2.2 55	0.9 22	-	20	1.375 35	29.50 749.5	32.00 813
18" in 450 mm	24.6 624	20.6 524	12.0 305	2.8 70	2.1 53.8	0.7 18	10.0 254	3.0 75	0.79 x 0.47 20 x 12	17.32 440	11.8 300	-	1.1 28	3.63 92.10	28	1.375 35	34.00 863.6	36.50 927
20" in 500 mm	26.0 660	22.2 563	12.0 305	3.7 95	2.1 53.8	0.7 18	10.0 254	3.0 75	0.79 x 0.47 20 x 12	19.35 491.6	11.8 300	-	1.3 33	3.63 92.10	28	1.375 35	36.00 914.4	38.75 984.3
24" in 600 mm	26.2 666	23.6 599	12.0 305	3.7 95	2.4 60	0.7 18	10.0 254	3.0 75	0.79 x 0.47 20 x 12	23.33 592.6	11.8 300	-	1.3 33	3.63 92.10	28	1.625 41	38.50 977.9	41.75 1061
30" in 750 mm	28.3 720	28.2 716	12.0 305	4.9 125	2.4 60	0.7 18	10.0 254	3.9 100	1.10 x 0.63 28 x 16	29.29 744	11.8 300	-	1.3 34	5.00 127.00	32	1.625 41	42.75 1086	46.00 1168.4
36" in 900 mm	31.7 806	29.0 737	12.0 305	5.1 130	2.4 60	0.7 18	10.0 254	4.5 115	1.26 x 0.71 32 x 18	34.04 864.5	11.8 300	-	1.4 35	4.37 111.00	36	1.625 41	47.25 1200	50.75 1290
42" in 1050 mm	34.1 865	31.5 801	12.0 305	5.9 150	2.6 66.5	0.9 22	11.7 298	4.5 115	1.26 x 0.71 32 x 18	40.51 1029	13.8 350	-	1.4 35	5.69 144.60	36	1.625 41	49.50 1258	53.00 1346.2
48" in 1200 mm	36.9 938	34.6 879	15.0 381	5.9 150	2.8 69.9	0.9 22	11.7 298	5.1 130	1.26 x 0.71 32 x 18	45.98 1168	13.8 350	-	1.5 38	6.46 164.16	44	1.625 41	56.00 1423	59.50 1511.3

*"P" dimension is the diameter of the disc.

Series 210 Dimensions



Dimensions, 54" to 72" Double Flanged to ANSI/AWWA C504

For installation and maintenance instructions, please refer to the IOM manual available at www.cranecpe.com

Valve Size	A	B	C	D	E	F	G	H	M ₁ X M ₂	P	Q	R	S	T	AWWA C207, Table 2 Class D			
															J	K	L	N
54" in	41.3	40.0	15.0	7.9	3.0	1.3	14.0	5.5	1.42 x 0.79	54.1	16.3	(4)	1.8	6.14	40	2.00	62.75	66.25
1350 mm	1050	1015	381	200	76	33	356	140	36 x 20	1375	415	1-3/4-5UNC	45	156		51	1593.9	1683
60" in	44.5	43.0	15.0	9.4	3.1	1.3	14.0	6.3	1.57 x 0.87	58.7	16.3	(4)	1.8	7.01	48	2.00	69.25	73.00
1500 mm	1130	1091	381	240	79	33	356	160	40 x 22	1491	415	1-3/4-5UNC	45	178		51	1759	1854
66" in	49.2	49.0	18.0	9.4	3.3	1.5	16.0	6.3	1.57 x 0.87	65.3	18.7	(4)	1.8	7.01	48	2.00	76.00	80.00
1650 mm	1250	1245	457	240	85	39	406	160	40 x 22	1658	475	1-3/4-5UNC	45	178		51	1930.4	2032
72" in	53.5	51.6	18.0	10.6	3.5	1.5	16.0	7.1	1.77 x 0.98	69.6	18.7	(4)	2.0	7.87	52	2.00	82.50	86.50
1800 mm	1360	1310	457	270	89	39	406	180	45 x 25	1769	475	1-3/4-5UNC	50	200		51	2095.5	2197

*"P" dimension is the diameter of the disc.

Weights: 3" - 72" Double Flanged to ANSI/AWWA C504 (Bare Stem)

	3"	4"	6"	8"	10"	12"	14"	16"
lbs	24	34	50	84	133	208	251	323
kg	11	15.5	22.8	38.3	60.3	94.5	113.9	146.3

	18"	20"	24"	28"	30"	36"	42"	48"
lbs	394	518	711	1,036	1,266	1,762	2,992	4,081
kg	178.7	235	322.6	470	574	799	1,357	1,851

	54"	60"	66"	72"
lbs	5,446	5,868	7,850	10,584
kg	2,470	2,661	3,560	4,800

Weights: 3" - 72" Double Flanged to AWWA C504 (Gear Actuated)

	3"	4"	6"	8"	10"	12"	14"	16"
lbs	34	44	60	105	153	235	278	404
kg	15.29	19.79	27.09	47.43	69.43	106.5	125.9	183.3

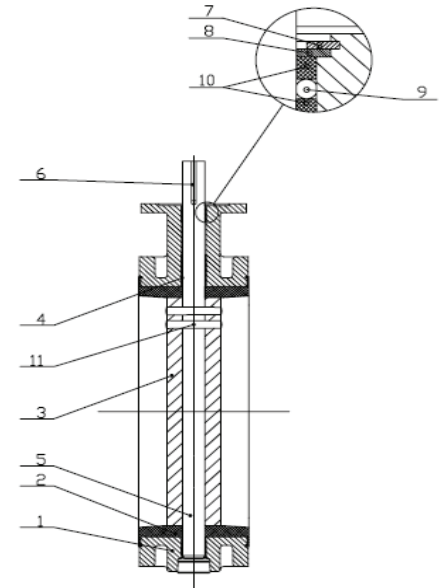
	18"	20"	24"	28"	30"	36"	42"	48"
lbs	476	600	804	1,188	1,418	1,938	3,356	4,445
kg	215.7	272	364.6	539	643	879	1,522	2,016

	54"	60"	66"	72"
lbs	5,810	6,617	8,600	11,797
kg	2,635	3,001	3,900	5,350

Series 210 Materials of Construction

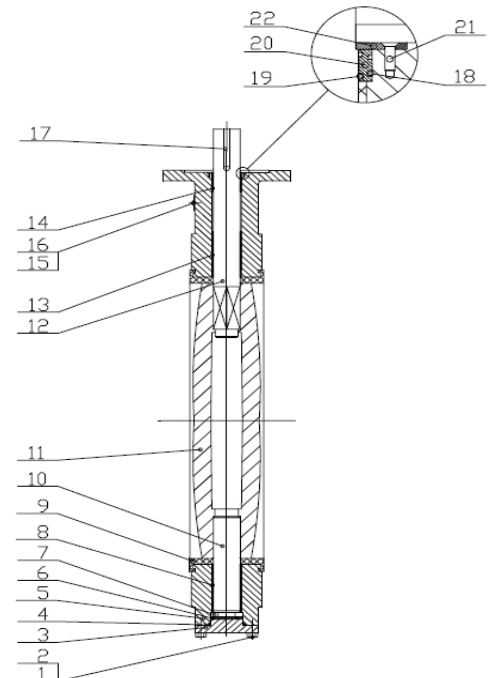
Bill of Materials: 3" - 14" Double Flanged to AWWA C504

Item	Description	Material	Optional Materials
1	Body	Ductile Iron (A536 65-45-12)	No Option Available
2	Seat	EPDM	No Option Available
3	Disc	A351 Gr. CF8M	B148 Gr. C95400
4	Bushing	PTFE	Aluminum-Bronze
5	Shaft	316 SS (A276 Gr. 316)	No Option Available
6	Key	1045 CS	No Option Available
7	Retaining Ring	A29 Gr. 1566 CS	No Option Available
8	Washer	304 SS (A276 Gr. 304)	No Option Available
9	O-Ring	Buna-N	No Option Available
10	Bushing	PTFE	Aluminum-Bronze
11	Taper Pin	316 SS (A276 Gr. 316)	No Option Available
12	Thread Plug	A29 Gr. 1045 CS	No Option Available



Bill of Materials: 16" - 24" Double Flanged to AWWA C504

Item	Description	Material	Optional Materials
1	Body	Ductile Iron (A536 65-45-12)	No Option Available
2	Seat	EPDM	No Option Available
3	Disc	A351 Gr. CF8M	Al-Br (B148 Gr. C95400)
4	Bushing	PTFE	Aluminum-Bronze
5	Shaft	316 SS (A276 Gr. 316)	No Option Available
6	Key	1045 CS	No Option Available
7	Retaining Ring	A29 Gr. 1566 CS	No Option Available
8	Washer	304 SS (A276 Gr. 304)	No Option Available
9	O-ring	Buna-N	No Option Available
10	Bushing	PTFE	Aluminum-Bronze
11	Taper Pin	316 SS (A276 Gr. 316)	No Option Available
12	O-ring	EPDM	No Option Available
13	Cover	Ductile Iron (A536 65-45-12)	No Option Available
14	Hex Head Bolt	A2-70 SS	No Option Available



Bill of Materials: 28" - 72" Double Flanged to AWWA C504

Item	Description	Material	Optional Materials
1	Hex Head Bolt	A2-70 SS	No Option Available
2	Washer	A2-70 SS	No Option Available
3	End Cover	Ductile Iron (A536 65-45-12)	No Option Available
4	O-ring	EPDM	No Option Available
5	Body	Ductile Iron (A536 65-45-12)	No Option Available
6	Washer	A29 Gr. 1045	No Option Available
7	Thrust Bearing	Bearing Steel	No Option Available
8	Lower Bushing	Al-Br (B148 Gr. C95400)	No Option Available
9	Seat	EPDM	No Option Available
10	Lower Shaft	316 SS (A276 Gr. 316)	No Option Available
11	Disc	A351 Gr. CF8M	Al-Br (B148 Gr. C95400)
12	Upper Shaft	316 SS (A276 Gr. 316)	No Option Available
13	Upper Bushing	Al-Br (B148 Gr. C95400)	No Option Available
14	Upper Bushing	Al-Br (B148 Gr. C95400)	No Option Available
15	Identification Plate	Brass	No Option Available
16	Plate Rivets	Stainless Steel	No Option Available
17	Key	1045 CS	No Option Available
18	O-ring	EPDM	No Option Available
19	O-ring	EPDM	No Option Available
20	Gland	Al-Br (B148 Gr. C95400)	No Option Available
21	Screw	A2-70 SS	No Option Available
22	Gland Cap	304 SS (A276 Gr. 304)	No Option Available

Series 225 - 250 Overview

- Available in sizes 2" to 24".
- Pressure Rating: 285 psi at 100°F. Pressure/Temperature rating above 100°F with downstream flange installed. Available option: Bi-directional dead-end service capability without downstream flange to 200 psi (2" to 12") and 150 psi (14" to 24").
- Available in Wafer or Lug style body.
- Wafer body features four alignment holes.
- Available in ASME Class 300 Lug Body bolt pattern (2" to 12"). Series 225 only.
- Ideal for on-off or throttling services.
- Available with handles (2" to 6"), manual gear operators, electric actuators and pneumatic actuators (2" to 24").
- Refer to Crane automation bulletin for details of pneumatic and electric actuators.

Valve Seating Torques (in-lbs.)

Valve Size	Standard Disc Differential Pressure				
	50 PSI	100 PSI	150 PSI	200 PSI	285 PSI
2"	136	142	148	154	164
2 1/2"	152	160	168	176	189
3"	224	229	234	239	247
4"	380	392	404	416	436
5"	451	477	503	529	572
6"	875	946	1016	1087	1206
8"	1476	1559	1642	1726	1867
10"	2451	2613	2775	2937	3213
12"	3900	4111	4323	4534	4893
14"	5189	5467	5744	6022	6494
16"	10,985	11,569	12,154	12,738	13,732
18"	13,946	14,688	15,431	16,173	17,434
20"	14,695	15,478	16,260	17,043	18,373
24"	29,738	31,321	32,903	34,486	37,176

All torques shown on the chart were derived from test data using water at 60°F. For torques using dry gases, multiply these numbers by 2.0. For torques involving other media, please consult the factory.

There is no safety factor included in the numbers shown on this chart. For actuator sizing, Center Line recommends that these values be multiplied by 1.2 for single valve applications, or 2.0 for 3-way ("tee") applications.

Under certain conditions, hydrodynamic torque can meet or exceed seating and unseating torques. When designing valve systems, hydrodynamic torque must be considered to help assure correct selection for the application.

Although elastomers have an effective operating temperature range, when used in valves, these ranges may have to be

- Compatible with ASME B16.1 Class 125 (Iron) and ASME B16.5 Class 150 (Steel) flanges or optional Class 300 (Steel) Lug only.
- Valves 14" and larger are rated at a maximum 150 psi when a companion flange is not used in dead end service.
- For bolting information, consult the Center Line Installation and Maintenance Manual.
- Vacuum Service Rating: zero leakage at 24" of mercury.
- Commercial cleaning available for Oxygen level 2.
- Type approval certification from ABS for Marine applications (2" to 24").
- CE/PED Certification available for sizes 2" to 24".

Seat Temperature Ratings

Material	Temperature Rating °F
Buna-N	+10 to 180
EPDM (2"-16")	-30 to 275
EPDM (18"-24")	-30 to 225
Viton®	+10 to 400

modified. The temperature ranges shown in the table have been adjusted accordingly.

For Low Temperature: While the seat materials selected for use in Center Line butterfly valves are capable of withstanding lower temperatures without damage, the durometer of the elastomer is changed. This "hardening" of the seat may increase the operating torque beyond the structural limits of the stem and/or the disc to stem configuration.

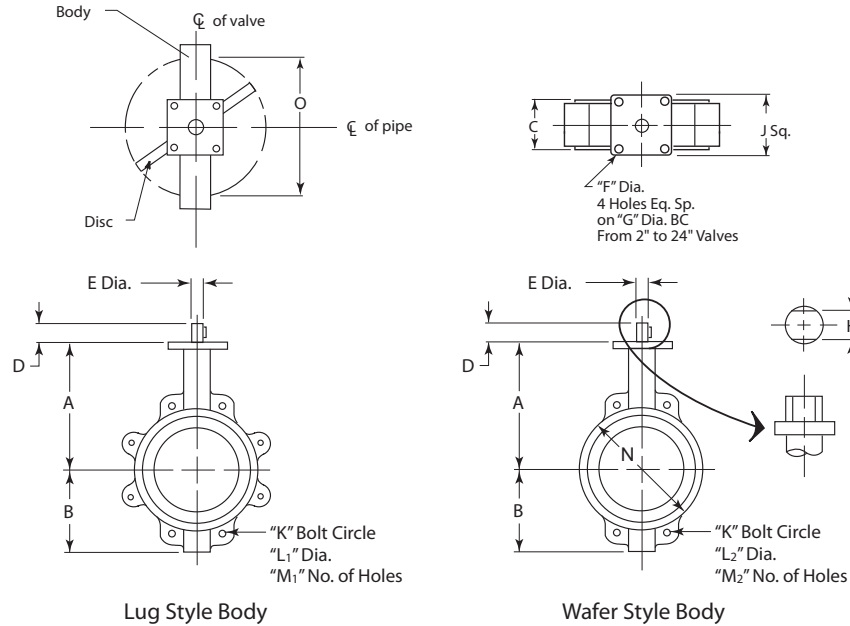
For High Temperature: When using Viton®, the operating pressure of the valve is reduced above 275°F.

Field Replacement: Replacing seats in sizes 14" and above requires factory service.

CV Values – Valve Sizing Coefficients (US-GPM @ 1 psi ΔP)

Size	10°	20°	30°	40°	50°	60°	70°	80°	90°
2"	0.06	3	7	15	27	44	70		115
2 1/2"	0.10	6	12	25	45	75	119	178	196
3"	0.20	9	18	39	70	116	183	275	302
4"	0.30	17	36	78	139	230	364	546	600
5"	0.50	29	61	133	237	392	620	930	1022
6"	0.80	34	94	153	257	422	706	1154	1320
8"	2	56	154	251	422	693	1158	1892	2165
10"	3	87	238	385	654	1073	1794	2931	3353
12"	4	153	417	681	1145	1879	3142	5132	5827
14"	6	183	500	816	1372	2252	3765	6150	7037
16"	8	271	740	1208	2031	3333	5573	9104	10,416
18"	11	318	867	1417	2382	3909	6535	10,676	12,215
20"	14	415	1133	1851	3112	5107	8538	13,948	15,959
24"	22	543	1482	2421	4069	6678	11,165	18,240	20,869

Series 225 - 250 Dimensions

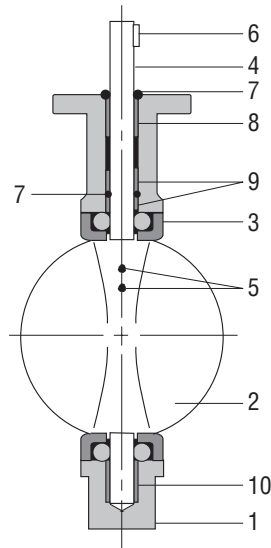


Dimensions and Weights

For installation and maintenance instructions, please refer to the IOM manual available at WWW.CRANECPE.COM

Inches / mm	A	B	C	D	E	F	G	H	J	K	300# K	L ₁	300# L ₂	M ₁	300# M ₁	M ₂	N	Wafer	Lug	300# Lug	O	
2" 50	6 ³ / ₈ 161.93	3 ³ / ₁₆ 80.96	1 ⁷ / ₈ 47.63	1 ¹ / ₄ 31.75	1 ¹ / ₂ 12.70	3 ³ / ₈ 9.53	2.76 70	0.39 10	2 ³ / ₄ 69.85	4 ³ / ₄ 120.65	5 127.00	5 ⁵ / ₈ -11	5 ⁵ / ₈ -11	11 ¹ / ₁₆ 17.46	4	4	4	4	6 lbs. 2.72 kg	9 lbs. 4.08 kg	9 lbs. 4.08 kg	1.26 32.0
2 1/2" 65	6 ⁷ / ₈ 174.63	3 ¹ / ₂ 88.90	2 50.80	1 ¹ / ₄ 31.75	1 ¹ / ₂ 12.70	3 ³ / ₈ 9.53	2.76 70	0.39 10	2 ³ / ₄ 69.85	5 ¹ / ₂ 139.70	5 ⁷ / ₈ 149.23	5 ⁵ / ₈ -11	3 ³ / ₄ -10	11 ¹ / ₁₆ 17.46	4	8	4	4 ³ / ₄	7 lbs. 3.18 kg	13 lbs. 5.90 kg	13 lbs. 5.90 kg	1.83 46.5
3" 80	7 ¹ / ₈ 180.98	3 ³ / ₄ 95.25	2 50.80	1 ¹ / ₄ 31.75	1 ¹ / ₂ 12.70	3 ³ / ₈ 9.53	2.76 70	0.39 10	2 ³ / ₄ 69.85	6 152.40	6 ⁵ / ₈ 168.28	5 ⁵ / ₈ -11	3 ³ / ₄ -10	11 ¹ / ₁₆ 17.46	4	8	4	5	10 lbs. 4.54 kg	14 lbs. 6.35 kg	14 lbs. 6.35 kg	2.54 64.5
4" 100	7 ⁷ / ₈ 200.03	4 ¹ / ₂ 114.30	2 ¹ / ₈ 53.98	1 ¹ / ₄ 31.75	1 ⁵ / ₈ 15.88	3 ³ / ₈ 9.53	2.76 70	0.47 12	2 ³ / ₄ 69.85	7 ¹ / ₂ 190.50	7 ⁷ / ₈ 200.03	5 ⁵ / ₈ -11	3 ³ / ₄ -10	11 ¹ / ₁₆ 17.46	8	8	4	6 ¹ / ₄	13 lbs. 5.90 kg	19 lbs. 8.62 kg	24 lbs. 10.89 kg	3.54 89.9
5" 125	8 ³ / ₈ 212.73	5 127.00	2 ³ / ₈ 60.33	1 ¹ / ₄ 31.75	3 ³ / ₄ 19.05	3 ³ / ₈ 9.53	2.76 70	0.55 14	2 ³ / ₄ 69.85	8 ¹ / ₂ 215.90	9 ¹ / ₄ 234.95	5 ⁵ / ₈ -11	3 ³ / ₄ -10	13 ¹ / ₁₆ 20.64	8	8	4	7 ¹ / ₂	18 lbs. 8.16 kg	22 lbs. 9.98 kg	29 lbs. 13.15 kg	4.36 110.7
6" 150	8 ⁷ / ₈ 225.43	5 ¹ / ₂ 139.70	2 ³ / ₈ 60.33	1 ¹ / ₄ 31.75	3 ³ / ₄ 19.05	3 ³ / ₈ 9.53	2.76 70	0.55 17	2 ³ / ₄ 69.85	9 ¹ / ₂ 241.30	10 ⁵ / ₈ 269.88	5 ⁵ / ₈ -11	3 ³ / ₄ -10	13 ¹ / ₁₆ 20.64	8	12	4	8 ³ / ₈	21 lbs. 9.53 kg	31 lbs. 14.06 kg	38 lbs. 17.24 kg	5.74 145.8
8" 200	10 ¹ / ₄ 260.35	6 ⁷ / ₈ 174.63	2 ¹ / ₂ 63.50	1 ³ / ₄ 44.45	7 ⁸ / ₈ 22.23	7 ¹ / ₁₆ 11.11	4.02 102	0.67 17	3 ³ / ₄ 95.33	11 ³ / ₄ 298.45	13 330.20	5 ⁵ / ₈ -11	3 ³ / ₄ -10	13 ¹ / ₁₆ 20.64	8	12	4	10 ⁵ / ₈	34 lbs. 15.42 kg	49 lbs. 22.23 kg	67 lbs. 30.39 kg	7.63 193.8
10" 250	11 ¹ / ₂ 292.10	8 203.20	2 ³ / ₄ 69.85	1 ³ / ₄ 44.45	1 ¹ / ₂ 28.58	7 ¹ / ₁₆ 11.11	4.02 102	0.87 22	3 ³ / ₄ 95.33	14 ¹ / ₄ 361.95	15 ¹ / ₄ 387.35	7 ⁷ / ₈ -9	1-8	15 ¹ / ₁₆ 23.81	12	16	4	12 ⁷ / ₈	45 lbs. 20.41 kg	62 lbs. 28.12 kg	100 lbs. 45.36 kg	9.54 242.3
12" 300	13 ¹ / ₄ 336.55	9 ⁵ / ₈ 244.48	3 ¹ / ₈ 79.38	1 ³ / ₄ 44.45	1 ¹ / ₄ 31.75	7 ¹ / ₁₆ 11.11	4.02 102	0.95 24	3 ³ / ₄ 95.33	17 431.80	17 ³ / ₄ 450.85	7 ⁷ / ₈ -9	1 ¹ / ₈ -7	15 ¹ / ₁₆ 23.81	12	16	4	15 ⁷ / ₈	74 lbs. 33.57 kg	105 lbs. 47.63 kg	144 lbs. 65.32 kg	11.5 292.1
14" 350	14 ¹ / ₂ 368.30	11 279.00	3 ¹ / ₈ 79.38	1 ³ / ₄ 44.45	1 ¹ / ₄ 31.75	7 ¹ / ₁₆ 11.11	4.02 102	0.95 24	3 ³ / ₄ 95.33	18 ³ / ₄ 476.25	-	1-8	-	1 ¹ / ₁₆ 26.99	12	-	4	17 ⁵ / ₈	109 lbs. 49.44 kg	178 lbs. 80.74 kg	-	12.81 325.4
16" 400	15 ³ / ₄ 400.05	12 305.00	3 ¹ / ₂ 88.90	2 50.80	1 ³ / ₁₆ 33.34	7 ³ / ₈ 22.23	6.50 165	1.06 27	6 ¹ / ₂ 165.10	21 ¹ / ₄ 539.75	-	1-8	-	1 ¹ / ₁₆ 26.99	16	-	4	20 ¹ / ₄	135 lbs. 61.24 kg	224 lbs. 101.60 kg	-	15 381.0
18" 450	16 ⁵ / ₈ 422.28	13 ¹ / ₄ 336.55	4 ¹ / ₄ 107.95	2 50.80	1 ³ / ₈ 41.28	7 ³ / ₈ 22.23	6.50 165	1.26 32	6 ¹ / ₂ 165.10	22 ³ / ₄ 577.85	-	1 ¹ / ₈ -7	-	1 ¹ / ₄ 31.75	16	-	4	21 ¹ / ₂	190 lbs. 86.18 kg	265 lbs. 120.20 kg	-	16.87 428.5
20" 500	18 ⁷ / ₈ 479.43	14 ⁵ / ₈ 371.48	5 ³ / ₈ 136.53	2 ¹ / ₂ 63.50	1 ³ / ₈ 41.28	7 ³ / ₈ 22.23	6.50 165	1.26 32	6 ¹ / ₂ 165.10	25 635.00	-	1 ¹ / ₈ -7	-	1 ¹ / ₈ -7	20	-	4	23 ³ / ₄	316 lbs. 143.34 kg	455 lbs. 206.38 kg	-	18.69 474.7
24" 600	22 ¹ / ₈ 561.98	18 457.20	6 ¹ / ₈ 155.58	2 ³ / ₄ 69.85	3 76.20	7 ³ / ₈ 22.23	6.50 165	2.36 60	6 ¹ / ₂ 165.10	29 ¹ / ₂ 749.30	-	1 ¹ / ₄ -7	-	1 ¹ / ₄ -7	20	-	4	27 ⁷ / ₈	506 lbs. 229.52 kg	702 lbs. 318.42 kg	-	22.57 573.3

Series 225 - 250 Materials of Construction



Bill of Materials (Series 225)

Item	Description	Materials	Optional Materials
1	Body	Ductile Iron (A536 65-45-12)	Ductile Iron (A395 60-40-18)
2	Disc	Ductile Iron† (A536 65-45-12)	Aluminum Bronze (B148-C954), 316 SS (A351-CF8M), Monel® (A494-M30C)
3	Seat	Buna-N or EPDM	Viton®
4	Shaft	416 Stainless Steel (A582-416)	2"-12": 17-4 PH (A564-630/1150), Monel™ (ASTM B164-K400 CL-B)
5	Taper Pin	416 Stainless Steel (A582-416)	17-4 PH (A564-630/1150), Monel™ (ASTM B164-K400 CL-B)
6	Key	Carbon Steel	No Option Available
7	O-Ring	Buna-N	Viton®
8	Bushing	PTFE	No Option Available
9	Bushing	PTFE	No Option Available
10	Bushing	PTFE	No Option Available

†ENP plated for 2" - 12" valves

Bill of Materials (Series 250)

Item	Description	Materials	Optional Materials
1	Body	Carbon Steel (A216 GR.WCB)	316SS (A351 GR.CF8M) Carbon Steel (A-216 GR.WCB Impact Tested)*
2	Disc	316 Stainless (A351-CF8M)	Aluminum Bronze (B148-C954), Monel™ (A494-M30C)
3	Seat	Buna-N or EPDM	Viton®
4	Shaft	316 SS (A276/A479-316)	17-4 PH (A564-630/1150), Monel™ (ASTM B164-K400 CL-B)
5	Taper Pin	316 SS (A276/A479-316)	17-4 PH (A564-630/1150), Monel™ (ASTM B164-K400 CL-B)
6	Key	Carbon Steel	No Option Available
7	O-Ring	Buna-N	Viton®
8	Bushing	PTFE	No Option Available
9	Bushing	PTFE	No Option Available
10	Bushing	PTFE	No Option Available

*Center Line Series 250 Carbon Steel valves with CE marking are good to 0°F for non-impact tested bodies and -20°F for impact tested carbon steel bodies.

Series 800 Overview

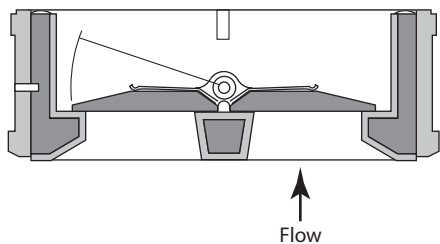
- Available in sizes 2" to 20".
- Only fully elastomer lined check valve available.
- Bubble-tight shutoff from 25 to 150 psi ΔP. Lower minimum pressure available on request.
- Wide range of available elastomers; Buna-N or EPDM standard.
- Check valves compatible with ASME B16.1, Class 125 (Iron) or B16.5, Class 150 (Steel) flanges.
- Use of dual springs distributes the load force evenly across each plate, resulting in quick response to flow reversal.
- Commercial cleaning available for Oxygen level 2.
- CE/PED Certification available for sizes 2" to 24".

Liner Temperature Ratings

Material	Temperature Ratings °F
Buna-N (Standard)	+10 to 180
EPDM (Standard)	-30 to 275
Viton®	+10 to 400

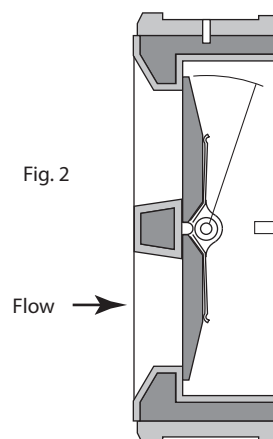
Some flow media may further restrict the published temperature limits and/or significantly reduce seat life. Consult factory for additional information.

Fig. 1



For flow going up recommended installation sizes:
2" - 20". For flow going down, consult factory.

Fig. 2



Valve should be installed with shaft in the vertical position in a horizontal pipe. This view rotated 90° for pictorial clarity.

CV Values – Valve Sizing Coefficients (US-GPM @ 1ΔP)

Valve Size	C _v	Cracking Pressure To Open Valve (Inches of Water Column)*		
		Figure 1	Figure 2	Figure 3
2"	36	14	10	5
2½"	62	18	12	6
3"	123	11	7	2
4"	281	10	6	2
5"	522	14	10	6
6"	1033	12	8	5
8"	2158	12	9	5
10"	3368	14	13	8
12"	5068	15	10	6
14"	6465	20	12	6
16"	9172	20	12	6
18"	12,853	16	10	–
20"	17,398	24	16	–

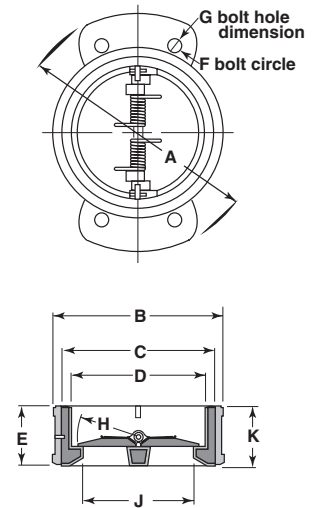
*Figures are approximate. 1" of water column = .036 psi.

Series 800 Dimensions and Materials of Construction

Dimensions (in [mm]) and Weights (lbs [kg])

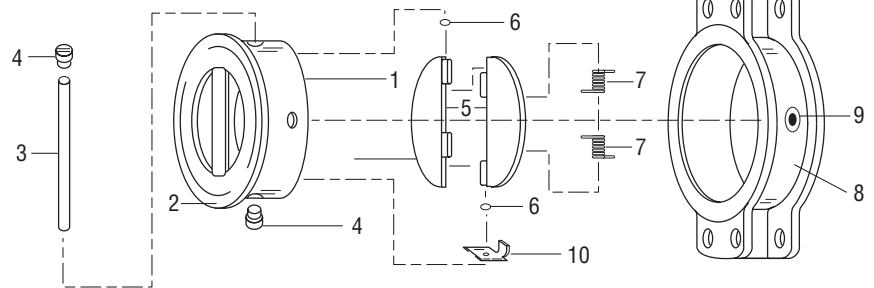
For installation and maintenance instructions, please refer to the IOM manual

Valve Size	A	B	C	D	E	F	G	H	J	K	Weight
2 (50)	6.25 (158.75)	4.35 (110.49)	3.34 (84.14)	2.62 (66.68)	2.00 (51.00)	4.81 (122.17)	0.82 (20.80)	1.12 (47.63)	1.88 (47.63)	2.12 (53.98)	5 (2.27)
2 1/2 (65)	7.00 (177.80)	5.13 (130.30)	3.9 (98.43)	3.12 (79.38)	2.00 (51.00)	5.63 (143.00)	0.82 (20.80)	1.44 (36.51)	2.31 (58.74)	2.12 (53.98)	6 (2.72)
3 (80)	7.50 (190.50)	5.50 (139.70)	4.56 (115.89)	3.62 (92.08)	2.00 (51.00)	6.20 (157.48)	0.88 (22.35)	1.62 (41.28)	2.75 (69.85)	2.12 (53.98)	8 (3.63)
4 (100)	9.25 (234.95)	5.75 (146.05)	5.62 (142.88)	4.62 (117.48)	2.37 (60.19)	7.28 (184.91)	0.94 (23.87)	2.12 (53.98)	3.44 (87.31)	2.50 (63.50)	15 (6.81)
5 (125)	10.62 (269.88)	7.62 (193.68)	6.75 (171.45)	5.69 (144.46)	2.50 (63.50)	8.44 (214.37)	0.88 (22.35)	2.66 (67.47)	4.44 (112.71)	2.62 (66.68)	20 (9.08)
6 (150)	12.00 (304.80)	8.75 (222.25)	7.88 (200.03)	6.75 (171.45)	3.00 (76.20)	9.44 (239.77)	0.88 (22.35)	3.16 (80.17)	5.56 (141.29)	3.12 (79.38)	26 (11.80)
8 (200)	14.50 (368.30)	10.62 (269.88)	10.00 (254.00)	8.75 (222.25)	3.75 (95.25)	11.66 (296.16)	0.91 (23.11)	4.16 (105.57)	7.56 (192.09)	3.88 (98.43)	43 (19.52)
10 (250)	16.88 (428.63)	13.25 (336.55)	12.12 (307.98)	10.88 (276.23)	3.86 (98.04)	14.06 (357.12)	1.14 (28.95)	5.12 (130.18)	9.06 (230.19)	4.00 (101.60)	58 (26.33)
12 (300)	19.50 (495.30)	16.00 (406.40)	14.38 (365.13)	12.88 (327.03)	5.00 (127.00)	16.14 (409.95)	1.02 (25.90)	6.25 (158.75)	10.81 (274.64)	5.12 (130.18)	100 (45.40)
14 (350)	22.50 (571.50)	17.00 (431.80)	15.62 (396.88)	14.12 (358.78)	7.00 (177.80)	18.65 (473.71)	1.72 (43.68)	6.75 (171.45)	12.06 (306.39)	7.12 (180.98)	135 (61.29)
16 (400)	24.88 (631.83)	20.12 (511.18)	17.75 (450.85)	16.12 (409.58)	6.25 (158.75)	21.25 (539.75)	1.06 (26.99)	7.75 (196.85)	14.00 (355.60)	6.38 (161.93)	170 (77.18)
18 (450)	25.25 (641.35)	21.50 (546.10)	20.00 (508.00)	18.12 (460.37)	7.13 (181.10)	22.75 (577.85)	1.19 (30.16)	8.75 (222.25)	16.00 (406.14)	7.25 (184.15)	220 (99.88)
20 (500)	27.50 (698.50)	23.50 (596.90)	21.88 (555.62)	20.12 (511.17)	8.38 (212.72)	25.00 (635.00)	1.19 (30.16)	9.75 (247.65)	18.12 (469.90)	8.50 (215.90)	287 (130.30)



Notes: Preferred mounting of check valves of any manufacturer is 8 pipe diameters downstream from the pump discharge or pipe elbow. If this is not feasible, the valve should be mounted downstream as far as possible. This recommendation is not exclusive to Center Line valves, but common practice in valve and piping engineering. Its purpose is to reduce the likelihood of turbulent flow through the valve, which could shorten valve life due to component vibration.

These dimensions reflect the universal bolting pattern valve.



Bill of Materials

Item	Description	Materials	Optional Materials
1	Valve Body	Ductile Iron	No option available
2	Liner (Molded to Item 1)	Buna-N or EPDM	Viton®
3	Shaft	316 Stainless Steel	No option available
4	Shaft Plug (Qty. 2)	316 Stainless Steel	No option available
5	Plate (Qty. 2)	2" 316 Stainless Steel 2 1/2" -5" Aluminum Bronze	2"-12" Monel® 2 1/2"-12" 316 Stainless Steel 6"-20" Aluminum Bronze
6	Thrust Washer (Qty. 4)	PTFE	No option available
7	Spring (Qty. 2)	316 Stainless Steel	No option available
8	Alignment Body	Ductile Iron	No option available
9	Set Screw	Carbon Steel	No option available
10	Plate Travel Stop	316 Stainless Steel (14"-20")	No option available

* Items 1 and 2 must be ordered together.

Handle Features and Dimensions

Handles are available for on/off and throttling control of Center Line resilient seated butterfly valves. These handles can be used for manual actuation of 2" to 12" valves at 200 psi and for 2" to 6" valves at 285 psi. For valves larger than 8", excessive operator effort and extreme handle reaction to internal valve forces are possible. In these cases, a gear operator is recommended for safe operation.

Features

The rugged construction of Center Line handles makes them ideally suited for manually actuating smaller valves. The latchplate permits the valve to be locked in any of the 10 positions on DIT handles or in any position on IOL handles.

Specifications

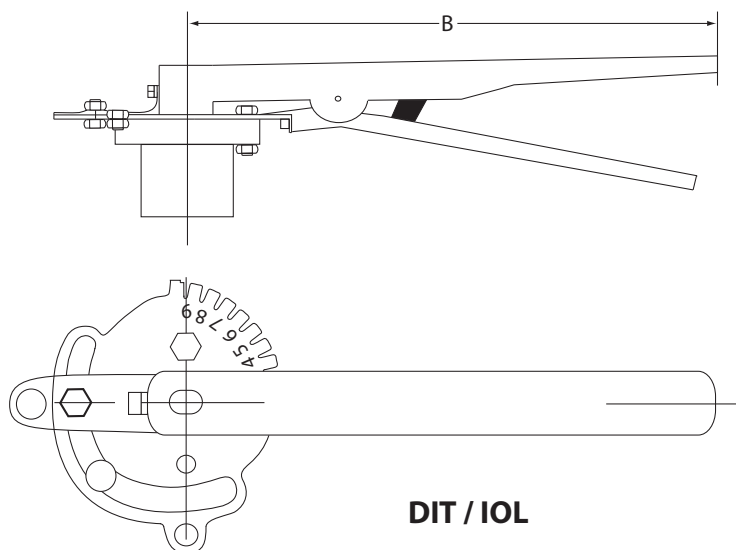
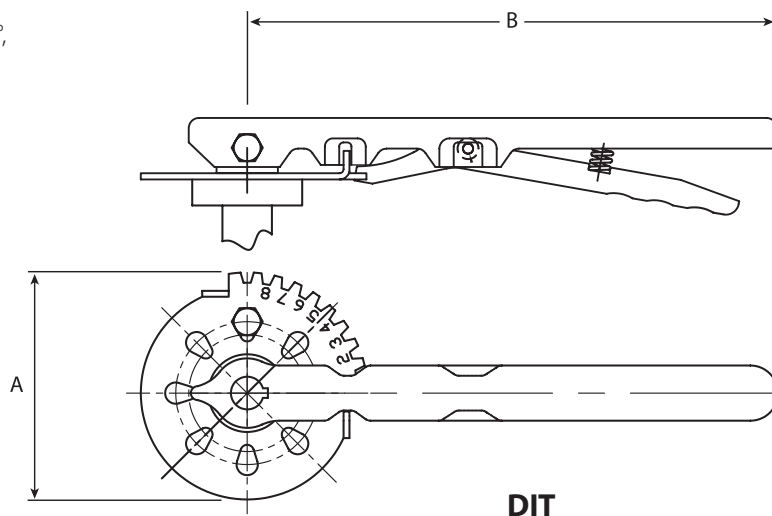
DIT: Mechanically locks the valve in any of the 10 positions from 0° to 90° in 10° increments

DIT/IOL: Can hold the valve in intermediate positions (32°, 68°, etc.) and can also be locked in 0° and 90° positions

Dimensions and Weights

Valve Size		A	B	Weight DIT / IOL	
2-6	in.	2.25	10.5	1.8	2.0
50-150	mm	57.15	266.7	0.8	0.9
8-12	in.	3.34	14.0	4.0	-
200-300	mm	84.84	355.6	1.8	-

Plates are adaptable for ISO or standard mounting flange.



Gear Operators Features and Dimensions

Gear operators can be used for on/off and throttling control of Center Line resilient seated butterfly valves. All models are weatherproof and usable for above ground service. Consult factory for buried service gears. For manual operation of valves, gear operators are required for valves 14" and larger and are recommended for valves 8" and larger.

Features

Gear operators from Center Line are 90° manual actuators, and they come with a handwheel, chainwheel, or square nut input device. The durable housing completely encloses the worm gear (on the input shaft) and the segment gear (on the output). Adjustable stops are standard and factory set when installed at the factory. Fully adjustable memory stops are available as an

option. A position indicator is standard on all models for above ground service.

Specifications

Operation: Handwheel or chainwheel or 2" square nut. Input shaft extension available.

Mounting: Available with bolt patterns and bore/keyway for direct mount to all 2" through 72" Center Line resilient seated butterfly valves. Dual bolt patterns on many gear sizes accommodate different pad designs. Gears are drilled with ISO patterns through 24".

Consult factory for 30" and above.

Dimensions and Weights

Valve Size (Drawing No. 1)	A	A1	C	D	E	F	G	H	Ø1	J	ØK	M	P	Q	Ø	ØD2	ØE	Wt. lbs / kg
2-4 in.	8.25	6.18	6.42	3.54	1.77	1.10	1.73	2.95	0.63	0.79	0.20	1.54	2.91	5.00	5.91	4.13	1.50	10.7
50-100 mm	209.6	157.0	163.1	89.9	45.0	27.9	43.9	74.9	16.0	20.1	5	39.1	73.9	127.0	150	104.9	38.1	4.9
5-6 in.	7.89	5.83	6.42	3.54	1.77	1.10	1.73	2.95	0.63	1.34	0.20	1.54	2.91	5.00	7.87	4.13	1.50	11.8
125-150 mm	200.4	148.1	163.1	89.9	45.0	27.9	43.9	74.9	16.0	34.0	5	39.1	73.9	127.0	200	104.9	38.1	5.4
8-10 in.	12.32	9.37	10.55	4.92	2.48	1.46	2.32	5.91	0.75	1.34	0.24	1.63	3.37	6.89	11.81	5.91	1.50	23.4
200-250 mm	312.9	238.0	268.0	125.0	63.0	37.1	58.9	150.1	19.1	34.0	6	41.4	85.6	175.0	300	150.1	38.1	10.6
12-14 in.	11.99	8.80	10.35	5.51	3.07	1.52	2.70	4.96	0.75	1.34	0.24	1.83	3.33	7.78	11.81	6.38	1.50	27.6
300-350 mm	304.5	223.5	262.9	140.0	78.0	38.6	68.6	126.0	19.1	34.0	6	46.5	84.6	197.6	300	162.1	38.1	12.5
16 in.	12.34	9.00	10.35	6.69	3.07	1.52	2.70	4.96	0.75	1.34	0.24	1.55	3.35	7.78	17.72	6.69	2.05	37.5
400 mm	313.4	228.6	262.9	169.9	78.0	38.6	68.6	126.0	19.1	34.0	6	39.4	85.1	197.6	450	169.9	52.1	17.0
18 in.	15.98	10.87	13.54	8.27	4.72	1.54	4.02	5.51	0.98	1.34	0.31	2.40	5.04	11.42	17.72	10.24	2.05	73.9
450 mm	405.9	276.1	343.9	210.1	119.9	39.1	102.1	140.0	24.9	34.0	8	61.0	128.0	290.1	450	260.1	52.1	33.5

Valve Size (Drawing No. 2)	A	B	C	D	E	F	Ø	Ø1	Ø2	Wt. lbs / kg
20 in.	7.28	6.30	4.33	18.62	4.53	2.48	17.72	0.98	0.31	121
500 mm	184.9	160.0	110.0	472.9	115.1	63.0	450	24.9	8	54.9
24 in.	7.28	6.30	4.92	19.69	4.72	2.48	17.72	0.98	0.31	132
600 mm	184.9	160.0	125.0	500.1	119.9	63.0	450	24.9	8	59.9
30 in.	10.43	6.50	6.30	21.46	5.04	3.07	17.72	0.98	0.31	198
750 mm	264.9	165.1	160.0	545.1	128.0	78.0	450	24.9	8	90
30 (DF) in.	9.61	6.10	5.71	20.67	5.51	-	13.78	0.83	0.24 *	154
750 mm	244	155	145	525	140	-	350	21	6 *	70
36 (DF) in.	11.26	7.76	6.30	24.41	5.51	-	13.78	0.83	0.24 *	205
900 mm	286	197	160	620	140	-	350	21	6 *	93
42 (DF) in.	11.26	7.76	6.30	24.41	5.51	-	13.78	0.83	0.24 *	205
1050 mm	286	197	160	620	140	-	350	21	6 *	93
48 (DF) in.	12.56	9.06	7.09	26.48	7.05	-	15.75	0.83	0.24 *	227
1200 mm	319	230	180	673	179	-	400	21	6 *	103
54 (DF) in.	14.65	10.39	8.86	31.20	7.40	-	17.72	1.10	0.32 *	368
1350 mm	372	264	225	792	188	-	450	28	8 *	167
60 (DF) in.	16.14	11.81	10.63	36.61	7.99	-	19.69	1.10	0.32 *	487
1500 mm	410	300	270	930	203	-	500	28	8 *	221
66 (DF) in.	20.00	14.49	12.40	42.05	9.06	-	23.62	1.77	0.47 *	1,235
1650 mm	508	368	315	1068	230	-	600	45	12 *	560
72 (DF) in.	20.00	14.49	12.40	42.05	9.06	-	23.62	1.77	0.47 *	1,235
1800 mm	508	368	315	1068	230	-	600	45	12 *	560

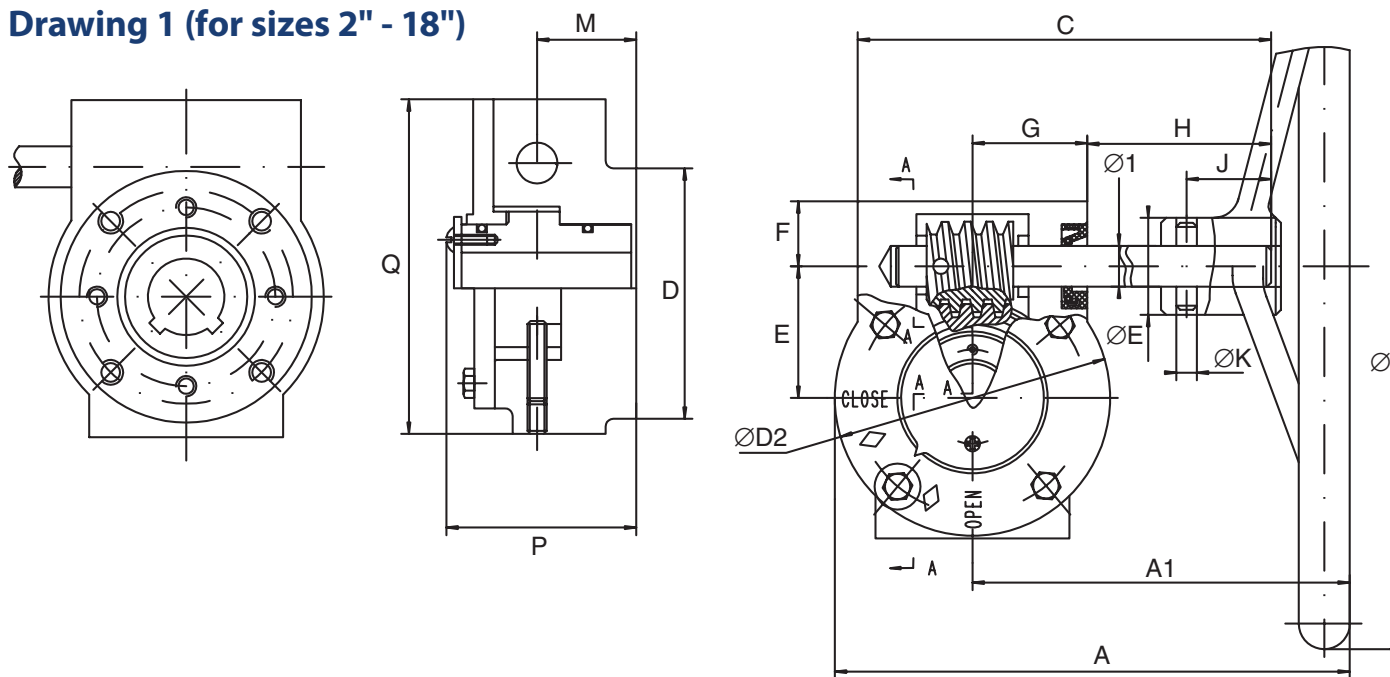


(DF) - Double flanged valves.

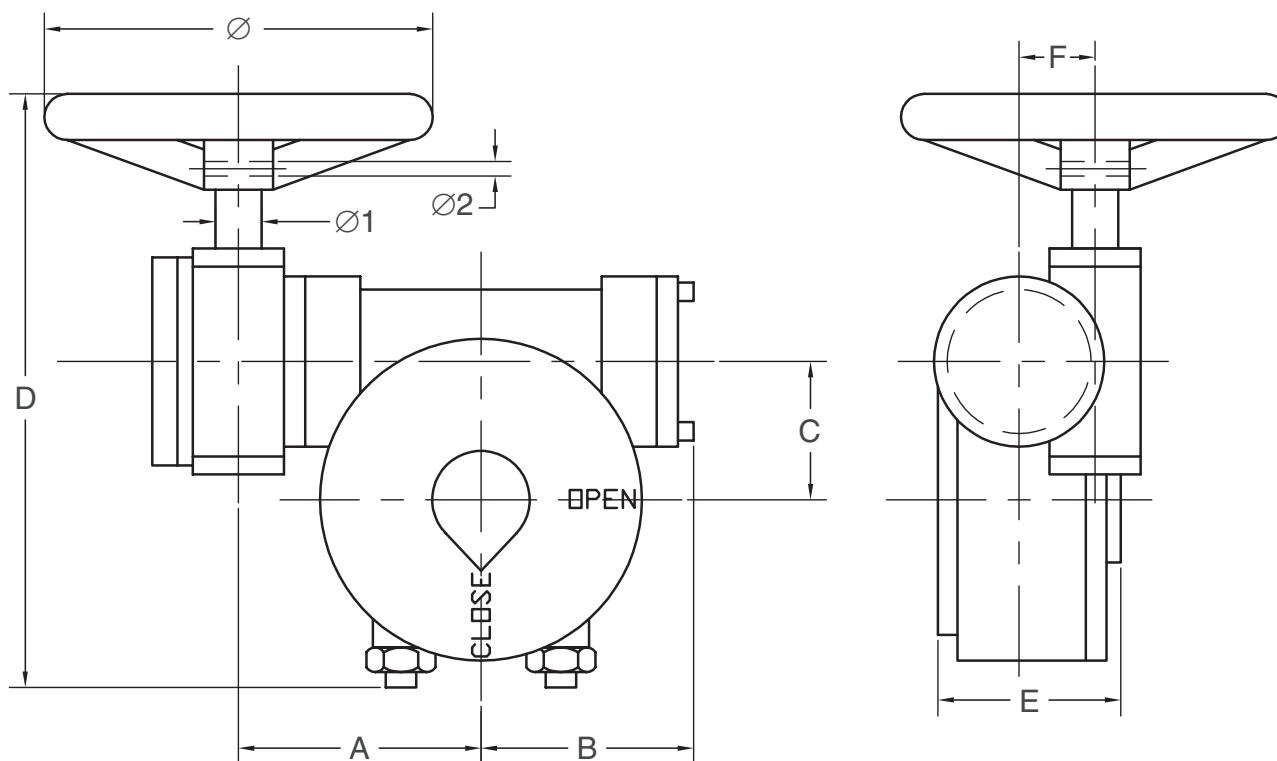
* - Square key dimension.

Gear Operators Dimensions

Drawing 1 (for sizes 2" - 18")

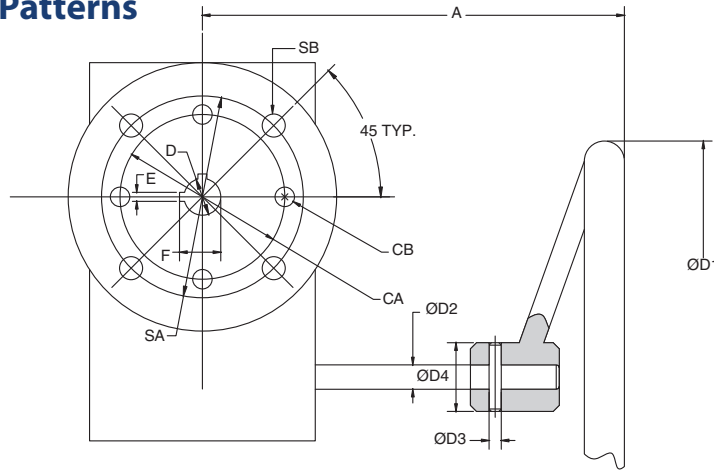


Drawing 2 (for sizes 20" and larger)



Gear Operators Dimensions

Gear Operator Drilling Patterns



Dimensions

Valve Size	Operator Model	CA	CB	SA	SB	D	ØD1	ØD2	ØD3	ØD4	A	E	F
2 in	SJ24	2.25	M6-P1	2.76	M8-P1.25	0.50	11.81	0.75	0.24	1.50	9.37	0.13	0.56
50 mm		57.15											
2-1/2 in	SJ24	2.25	M6-P1	2.76	M8-P1.25	0.50	11.81	0.75	0.24	1.50	9.37	0.13	0.56
65 mm		57.15											
3 in	SJ24	2.25	M6-P1	2.76	M8-P1.25	0.50	11.81	0.75	0.24	1.50	9.37	0.13	0.56
80 mm		57.15											
4 in	SJ24	2.75	M8-P1.25	2.76	M8-P1.25	0.63	11.81	0.75	0.24	1.50	9.37	0.19	0.72
100 mm		69.85											
5 in	SJ24	2.75	M8-P1.25	2.76	M8-P1.25	0.75	11.81	0.75	0.24	1.50	9.37	0.19	0.84
125 mm		69.85											
6 in	SJ24	2.75	M8-P1.25	2.76	M8-P1.25	0.75	11.81	0.75	0.24	1.50	9.37	0.19	0.84
150 mm		69.85											
8 in	SJ30	3.50	M12-P1.75	4.02	M10-P1.5	0.87	11.81	0.75	0.24	1.50	8.89	0.19	0.97
200 mm		88.90											
10 in	SJ30	3.50	M12-P1.75	4.02	M10-P1.5	1.13	11.81	0.75	0.24	1.50	8.89	0.25	1.25
250 mm		88.90											
12 in	SJ50	4.25	M12-P1.75	4.02	M10-P1.5	1.25	11.81	0.75	0.24	1.50	8.89	0.25	1.39
300 mm		107.95											
14 in	SJ50	4.25	M12-P1.75	4.02	M10-P1.5	1.25	11.81	0.75	0.24	1.50	8.89	0.25	1.39
350 mm		107.95											
16 in	SJ50	6.25	M18-P2.5	6.50	M20-P2.5	1.31	17.72	0.98	0.32	1.99	10.90	0.31	1.49
400 mm		158.75											
18 in	SJ80	6.25	M18-P2.5	6.50	M20-P2.5	1.50	17.72	0.98	0.32	1.99	10.90	0.38	1.69
450 mm		158.75											
18 **	XJ300	6.25	M18-P2.5	6.50	M20-P2.5	1.63	17.72	0.98	0.32	1.99	12.64	0.38	1.81
450 **		158.75											
20 in	XJ300	6.25	M18-P2.5	6.50	M20-P2.5	1.63	17.72	0.98	0.32	1.99	12.64	0.38	1.81
500 mm		158.75											
24 in	XJ300	8.50	M20-P2.5	6.50	M20-P2.5	2.00	17.72	0.98	0.32	1.99	13.19	0.50	2.24
600 mm		215.90											
24 **	XJ400	8.50	M20-P2.5	6.50	M20-P2.5	3.00	17.72	0.98	0.32	1.99	13.19	0.75	3.34
600 **		215.90											

* Dimensions CA and CB are for older style Center Line butterfly valves with round actuator mounting pads.

** Center Line Series 225/250 butterfly valves.

Series 200 Figure Number System

Series 200 1 1 2 3 4 5 6 7 8 9 — 10

1. Size	Code	5. Disc	Code	9. Actuator	Code
2"	02	316 SS (CF8M)	4	Handle (10 positions)	2
2½"	25	Ductile Iron (2" - 72")	5	Infinite/Lockable (2"-6")	3
3"	03	Aluminum-Bronze (2" - 72")	6	Infinite (8")	4
to	- - -	Monel® 400 (M30-C) (2" - 30")	7	Gear Operator	5
72"	72			Pneumatic Double Acting	6
				Pneumatic SR Fail Close (FCW)	7
				Pneumatic SR Fail Open (FCCW)	8
				Electric	9
				Gear Operator with Memory Stop	G
				Buried Gear / 2" Square Drive Nut	C
				Gear Operator with Chain Wheel	U
				None	X
2. Series/Style	Code	6. Shaft	Code	10. Special Features	Code
Wafer (2"-30")	A	416 SS	1	CE Marked - Non-Impact Tested	P
Lug/Deadend (2"-30")	C	316 SS ¹	4		
Flange (28"-72")	D	Monel® 400 (2" - 30")	7		
		17-4PH Cond. H1150 SS (2" - 30")	9		
		¹ Standard with 316 SS disc only.			
3. Body	Code	7. Bushing	Code		
Epoxy Coated DI (A536) (2" - 12")	V	Bronze ²	0		
Ductile Iron (A536) (14" - 72")	2	PTFE	3		
Ductile Iron (A395) (2" - 30")	G				
		² Standard on 52" - 72" valve sizes			
4. Pressure	Code	8. Seat / Liner	Code		
200 PSI (2"-12")	0	Buna-N	1		
75 PSI Undercut (8" - 30")	3	EPDM	5		
150 PSI (14" - 72")	6	Viton® (400°F)	6		

Note: For ASTM material designations, see Bill-of-Materials on page 7

Series 210 Figure Number System

Series 210 1 1 2 3 4 5 6 7 8 9 — 10

1. Size	Code	5. Disc	Code	9. Actuator	Code
3"	03	316 SS (CF8M)	4	Handle (10 positions)	2
4"	04	Aluminum-Bronze	6	Infinite/Lockable (2"-6")	3
6"	06			Infinite (8")	4
8"	08			Gear Operator	5
to	---			Pneumatic Double Acting	6
72"	72			Pneumatic SR Fail Close (FCW)	7
				Pneumatic SR Fail Open (FCCW)	8
				Electric	9
				Gear Operator with Memory Stop	G
				Buried Gear / 2" Square Drive Nut	C
				Gear Operator with Chain Wheel	U
				None	X
2. Series/Style	Code	6. Shaft	Code	10. Special Features	Code
Double Flanged)	S	316 SS	4	CE Marked - Non-Impact Tested	P
3. Body	Code	7. Bushing	Code		
Epoxy Coated DI (A536)	V	Aluminum-Bronze (3" - 72")	0		
Ductile Iron (A536)	2	PTFE (3" - 24")	3		
4. Pressure	Code	8. Seat / Liner	Code		
232 PSI (3" - 14")	0	EPDM	5		
150 PSI (16" - 72")	6				

Note: For ASTM material designations, see Bill-of-Materials on page 11

Series 225 Figure Number System

Series 225 1 1 2 3 4 5 6 7 8 9 — 10

1. Size	Code	5. Disc	Code	9. Actuator	Code
2"	02	316 SS (CF8M)	4	Handle (10 positions)	2
2½"	25	Ductile Iron (2" - 24")	5	Infinite/Lockable (2"-6")	3
3"	03	Aluminum-Bronze (2" - 24")	6	Infinite (8")	4
to	- - -	Monel® 400 (M30-C) (2" - 30")	7	Gear Operator	5
24"	24			Pneumatic Double Acting	6
				Pneumatic SR Fail Close (FCW)	7
				Pneumatic SR Fail Open (FCCW)	8
				Electric	9
				Gear Operator with Memory Stop	G
				Buried Gear / 2" Square Drive Nut	C
				Gear Operator with Chain Wheel	U
				None	X

2. Series/Style	Code	6. Shaft	Code
Wafer	J	416 SS	1
Lug	K	316 SS ²	4
Lug/Deadend	L	Monel® 400 (2"-30")	7
Lug ASME Class 300	M	17-4PH Cond. H1150 SS	9
Lug ASME Class 300 / Deadend	N		

² Standard with 316 SS disc only.

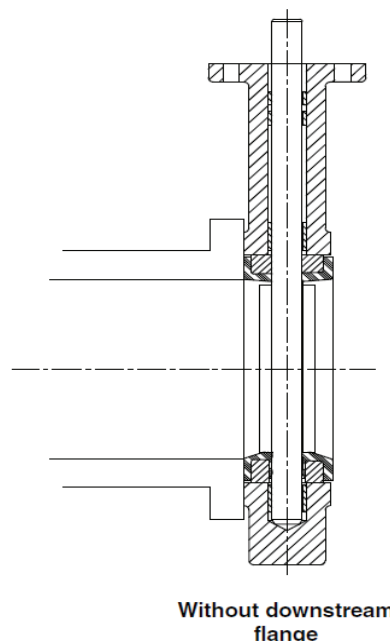
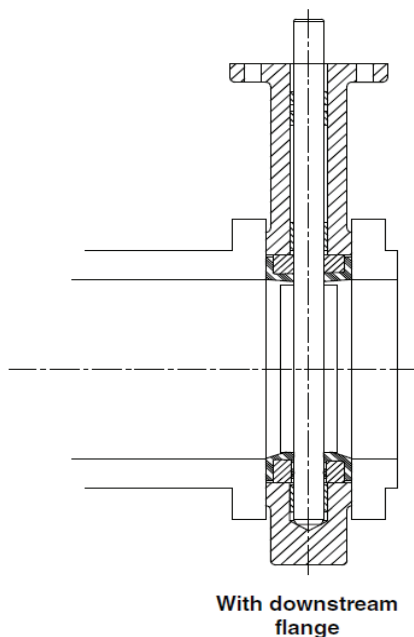
3. Body	Code	7. Bushing	Code
Epoxy Coated DI (A536)	V	PTFE	3
Ductile Iron (A536)	2		
Ductile Iron (A395)	G		

4. Pressure	Code	8. Seat / Liner	Code
200 PSI (2"-12") ¹	0	Buna-N	1
285 PSI	5	EPDM	5
150 PSI Deadend (14" - 24") ¹	6	Viton® (400°F)	6

10. Special Features	Code
Custom Product	D
CE Marked - Non-Impact Tested	P

¹ Rating refers to deadend service without a downstream flange. For more information, refer to the drawings below and the second bullet point on page 12.

Note: For ASTM material designations, see Bill-of-Materials on page 14



Series 250 Figure Number System

Series 250 1 1 2 3 4 5 6 7 8 9 — 10

1. Size	Code	5. Disc	Code	9. Actuator	Code
2"	02	316 SS (CF8M)	4	Handle (10 positions)	2
2½"	25	Aluminum-Bronze	6	Infinite/Lockable (2"-6")	3
3"	03	Monel® 400 (M30-C)	7	Infinite (8")	4
to	---			Gear Operator	5
24"	24			Pneumatic Double Acting	6
				Pneumatic SR Fail Close (FCW)	7
				Pneumatic SR Fail Open (FCCW)	8
				Electric	9
				Gear Operator with Memory Stop	G
				Buried Gear / 2" Square Drive Nut	C
				Gear Operator with Chain Wheel	U
				None	X
2. Series/Style	Code	6. Shaft	Code	10. Special Features	Code
Wafer	2	416 SS	1	Custom Product	D
Lug	4	316 SS ¹	4	CE Marked - Non-Impact Tested	P
Lug / Deadend	6	Monel® 400	7	CE Marked - Impact Tested	C
		17-4PH Cond. H1150 SS	9		
		¹ Standard with 316 SS disc only.			
3. Body	Code	7. Bushing	Code		
Carbon Steel (non-impact tested)	3	PTFE	3		
316 SS (CF8M)	4				
4. Pressure	Code	8. Seat / Liner	Code		
200 PSI Deadend (2" - 12")	0	Buna-N	1		
285 PSI	5	EPDM	5		
150 PSI Deadend (14" - 24")	6	Viton® (400°F)	6		

Note: For ASTM material designations, see Bill-of-Materials on page 14

Series 800 Figure Number System

Series 800 1 1 2 3 4 5 6 7 8 9 — 10

1. Size	Code	4. Pressure	Code	7. Springs	Code
2"	02	150 PSI	6	316 SS	D
2½"	25			Monel® 400	7
3"	03				
to	---				
20"	20				
2. Series/Style	Code	5. Plate	Code	8. Seat / Liner	Code
Wafer	R	316 SS (CF8M) (2" - 14")	4	Buna-N	1
		Aluminum-Bronze (2-1/2" - 20")	6	EPDM	5
				Viton®	0
3. Body	Code	6. Shaft	Code	10. Special Features	Code
Ductile Iron (A536)	1	416 SS	4	CE Marked - Non-Impact Tested	P
		Monel® 400	7		

Technical Data

The nomograph on the next page gives the relationships of valve size, flow, velocity, and pressure drop for various disc positions.

Sample Calculation, Liquid (see black line on chart)

Given:

Water (1.0 specific gravity) at 60°F is flowing through a 6-inch valve at a rate of 1000 gpm.

Find:

Line velocity (ft./sec.) and pressure drop when valve is in full-open (disc at 90°) position.

Solution:

From the 6-inch valve size at lower left of nomograph, go diagonally up to the intersecting horizontal line for 1000 gpm. From that point, proceed directly down to determine line velocity as 11 ft./sec.

For pressure drop, return to the 1000 gpm intersection and continue up vertically to "90° disc open" intersecting diagonal line. From this point, go horizontally to the left to determine pressure drop as 0.5 psi.

Sample Calculation, Gas (see gray line on chart)

Given:

Gas (0.8 lb/cu. ft. density) is flowing through an 8-inch valve at a rate of 1500 cu. ft./min.

Find:

Line velocity (ft./min.) and pressure drop when valve is in full-open (disc at 90°) position.

Solution:

From 8-inch valve size at lower left of nomograph, go diagonally up to the intersecting horizontal line for 1500 cu. ft./min. From that point, proceed directly down to the bottom line of the nomograph to determine line velocity as 4000 ft./min.

For pressure drop, return to the 1500 cu. ft./min. intersection and continue up vertically to "90° disc open" intersecting diagonal line. From this point, go horizontally to the left to determine pressure drop as 17 psi. Now, convert pressure drop to gas by dividing gas density by liquid density and multiplying by 17.

General Notes

- Liquid flow data is based on pressure drop and flow rate with viscosity similar to water at 60°F using flow coefficient.

$$\frac{0.8}{62.34} \times 17.0 = 0.22 \text{ psi}$$

- Velocities for liquids with densities similar to water should be less than 16 ft./sec.
- Nomograph flow rate for gases is in cubic feet per minute (CFM) at flowing conditions. To convert flow rate from standard cubic feet per minute to CFM, use the following formula:
- Gas density in lbs./cu. ft. equals:

$$\text{CFM} = \frac{(\text{SCFM} \times 14.7) \times (460 + ^\circ\text{F})}{(\text{line pressure, psia}) \times 520}$$

$$\frac{\left(\frac{270 \times}{\text{line pressure, psia}} \right) \times \left(\frac{\text{specific gravity of gas (relative to air)}}{460 + ^\circ\text{F}} \right)}$$

Size	C _v at Full-Open
2"	115
2½"	196
3"	302
4"	600
5"	1022
6"	1579
8"	3136
10"	5340
12"	8250
14"	11917
16"	16388
18"	21705
20"	27908
24"	43116
30"	73426

Definitions

C_v = Flow coefficient for valves; expresses flow rate in gallons per minute of 60°F water with 1.0 psi pressure drop across valve.

K = resistance coefficient.

$$\mathbf{K} = d \sqrt{\frac{29.9}{C_v}}$$

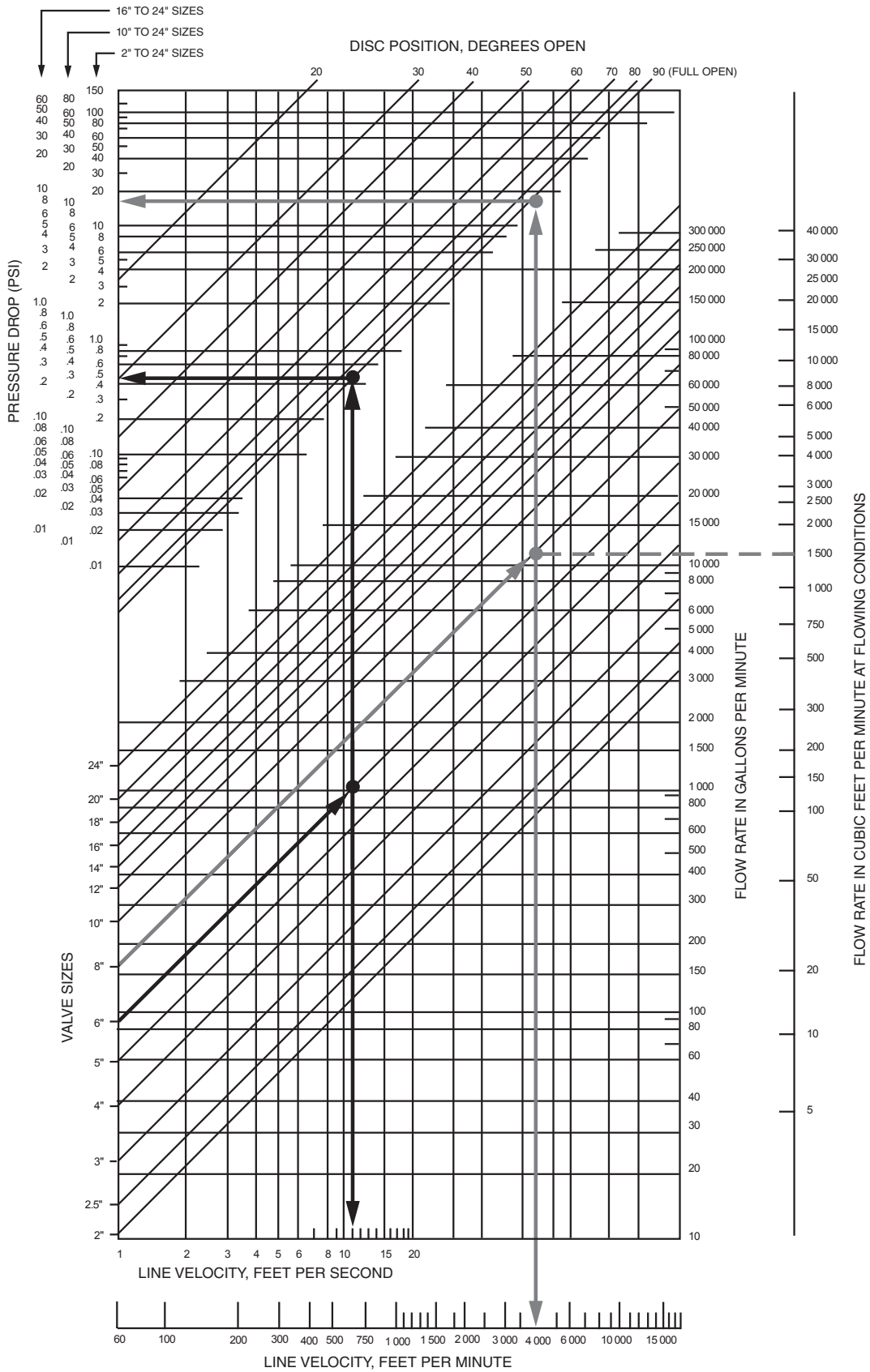
P = weight density of fluid, in pounds per cubic foot.

d = internal diameter of Schedule 40 pipe, in inches.

Q = rate of flow, in gallons per minute.

ΔP = differential pressure, in pounds per square inch gauge.

Technical Data



Technical Data

Seat Temperature Ratings and Application Information

Elastomer	Continuous Temp Range	Description
Buna-N	+10°F to 180°F	<p>Also known as Nitrile or NBR. Buna-N is a good, general purpose material for most general services such as water at ambient temperatures, vacuum, compressed air, salt solutions, alkaline solutions and aliphatic hydrocarbons (saturated and unsaturated).</p> <p>Buna-N is not recommended for strong oxidizing agents, nitrated hydrocarbons, Ketones, acetates, phenols, aldehydes or for gasolines with additives. Also, Buna-N can swell in hot water applications, and increase operating torque.</p>
EPDM	-30°F to 275°F	<p>EPDM is a synthetic rubber suitable for many general purpose applications with higher temperature requirements. It is acceptable for hot and chilled water, glycols, detergents, phosphate esters, Ketones and alcohols.</p> <p>EPDM is not suitable for any hydrocarbon-based oils and lubricants, or in compressed air systems with hydrocarbons.</p>
Viton®	+10°F to 400°F	<p>Viton® is a fluoroelastomer with exceptional resistance to oils and chemicals at higher temperatures. Viton® is suitable for hydrocarbons, and has a greater chemical resistance than Buna-N. Viton® can also be recommended for mineral acids, dilute and concentrated solutions and alcohols.</p> <p>Viton® is not recommended for higher temperature water and steam applications as it has a tendency to swell. Also, Viton® hardens at the lower end of the temperature range, which can increase operation torque.</p>

Crane is pleased to offer other seat materials upon request. Please consult your sales representative or the factory for availability and application information.

Technical Data Valve Torque Tables

Maximum Allowable Shaft Torque (MAST) Values

All MAST values are in inch-pounds

Center Line Series 200 Resilient Seated Butterfly Valves

Shaft Material	CL ID No.	Nominal Shaft Diameter										
		0.500"	0.625"	0.750"	0.875"	1.125"	1.250"	1.312"	1.500"	1.625"	2.000"	2.500"
316 SS	4	213	414	748	1,210	2,503	3,566	3,960	5,672	8,039	13,450	31,285
416 SS	1	462	899	1,620	2,623	5,424	7,726	8,579	12,290	17,418	29,141	67,785
17-4 PH, Cond. H1 150 SS	9	747	1,453	2,617	4,237	8,762	12,482	13,859	19,853	28,137	47,074	109,499
Monel® 400	7	284	553	997	1,614	3,337	4,755	5,279	7,563	10,719	17,933	41,715

Series 200 Valve Sizes	Nominal Shaft Diameter											
	0.500"	0.625"	0.750"	0.875"	1.125"	1.250"	1.312"	1.500"	1.625"	2.000"	2.500"	
	2"	4"	5"	8"	10"	12"	16"	18"	20"	24"	30"	
	2½"	-	6"	-	-	-	-	-	-	-	-	
3"	-	-	-	-	-	-	-	-	-	-		

Center Line Series 225/250 Resilient Seated Butterfly Valves

Shaft Material	CL ID No.	Nominal Shaft Diameter									
		0.500"	0.625"	0.750"	0.875"	1.125"	1.250"	1.250"	1.312"	1.625"	3.000"
316 SS	4	213	414	748	1,210	2,503	3,566	3,630	4,667	8,306	53,591
416 SS	1	462	899	1,620	2,623	5,424	7,726	7,866	10,114	17,996	116,114
17-4 PH, Cond. H1 150 SS	9	747	1,453	2,617	4,237	8,762	12,482	12,706	16,338	29,070	187,568
Monel® 400	7	284	553	997	1,614	3,337	4,755	4,840	6,223	11,074	71,454

Series 225/250 Valve Sizes	Nominal Shaft Diameter										
	0.500"	0.625"	0.750"	0.875"	1.125"	1.250"	1.250"	1.312"	1.625"	3.000"	
	2"	4"	5"	8"	10"	12"	14"	16"	18"	24"	
	2½"	-	6"	-	-	-	-	-	20"	-	
3"	-	-	-	-	-	-	-	-	-		

Notes:

1. Torque values are calculated based on a maximum stress level equal to 56% of the yield strength of the material, with a 5% safety factor included.
2. MAST values apply to shaft materials at ambient temperature.



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