

Triple Offset Butterfly Valve

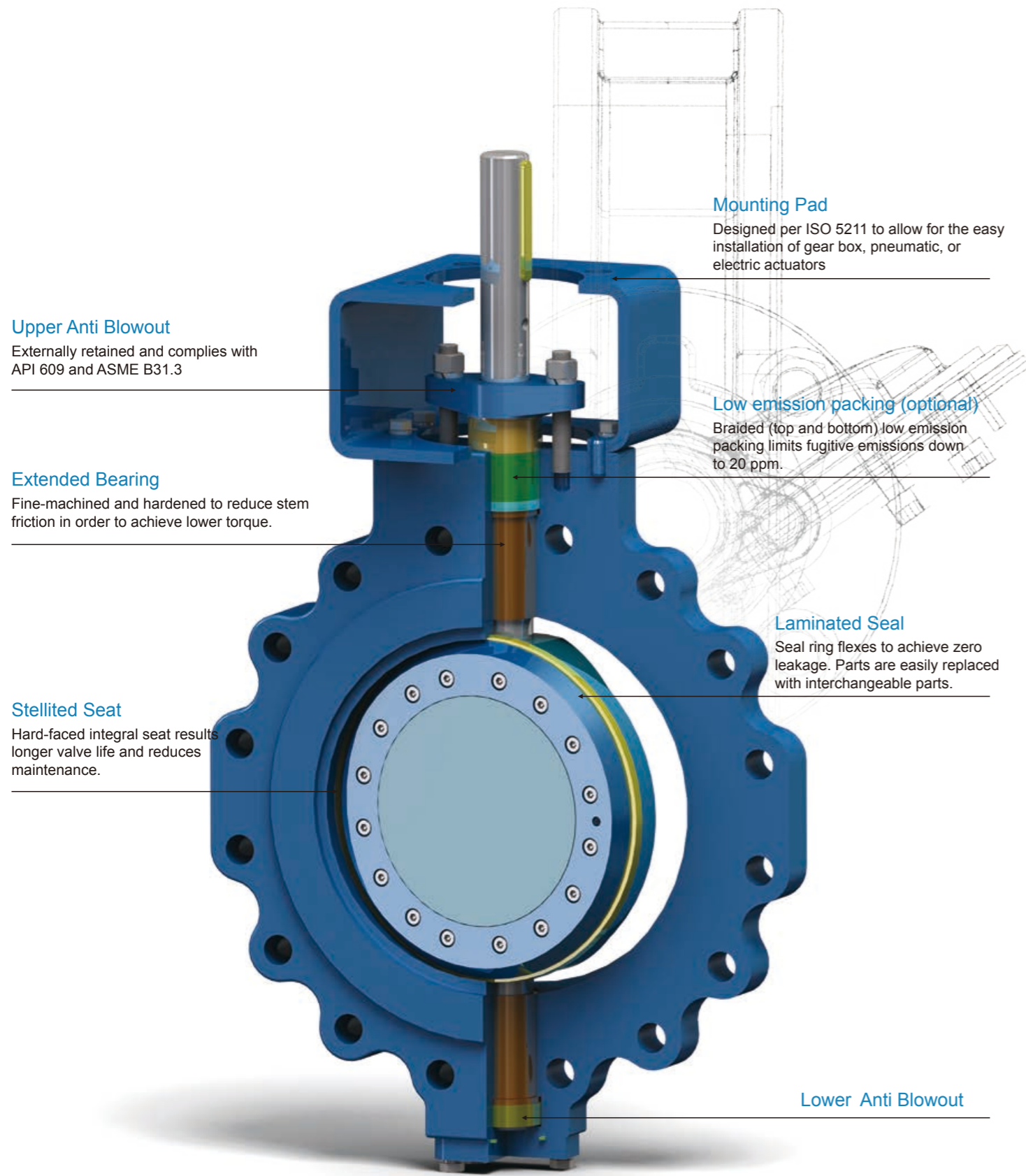
Design Features

RHINOFLEX

RHINOFLEX

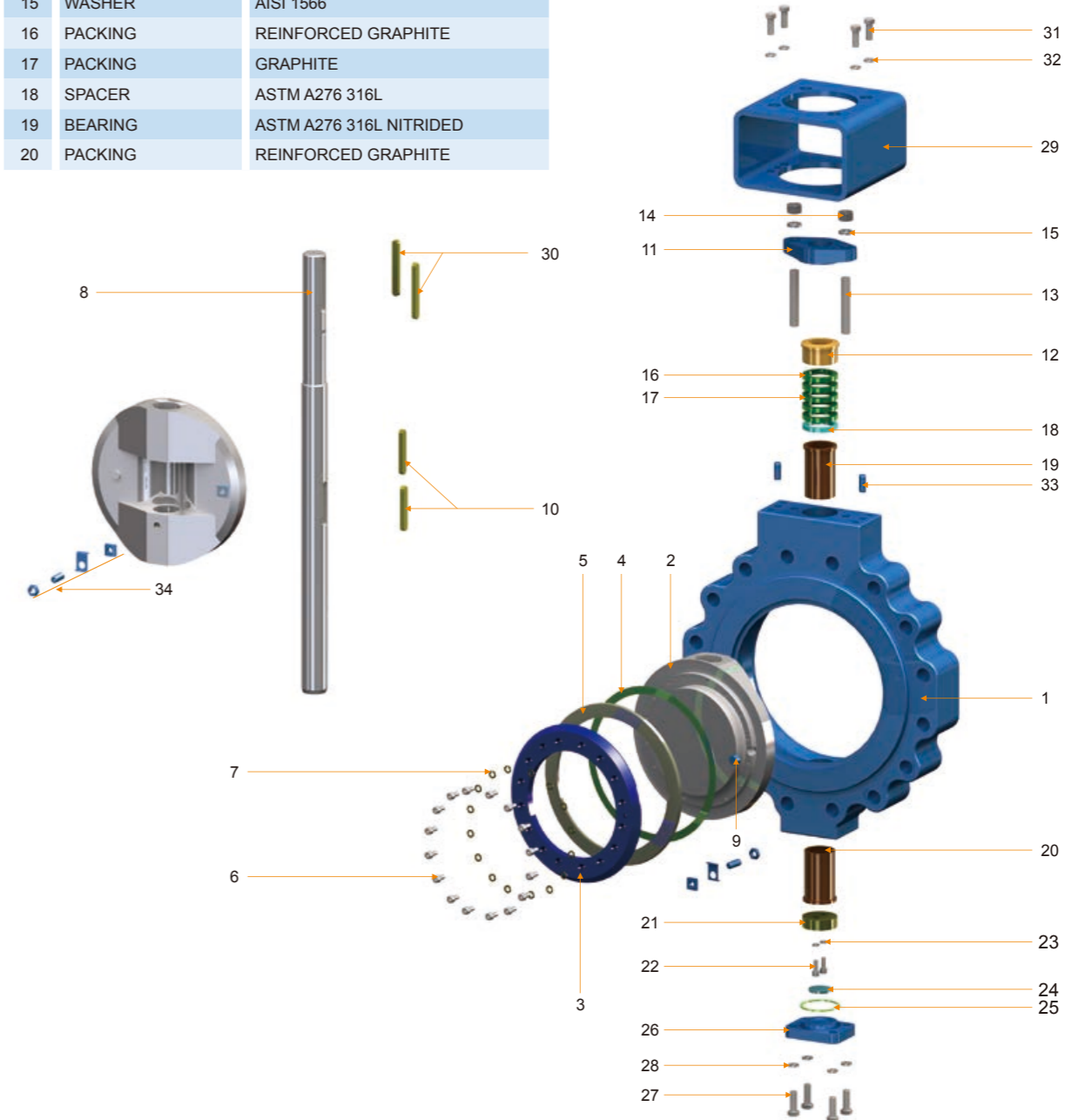
Triple Offset Butterfly Valve

Material Specifications



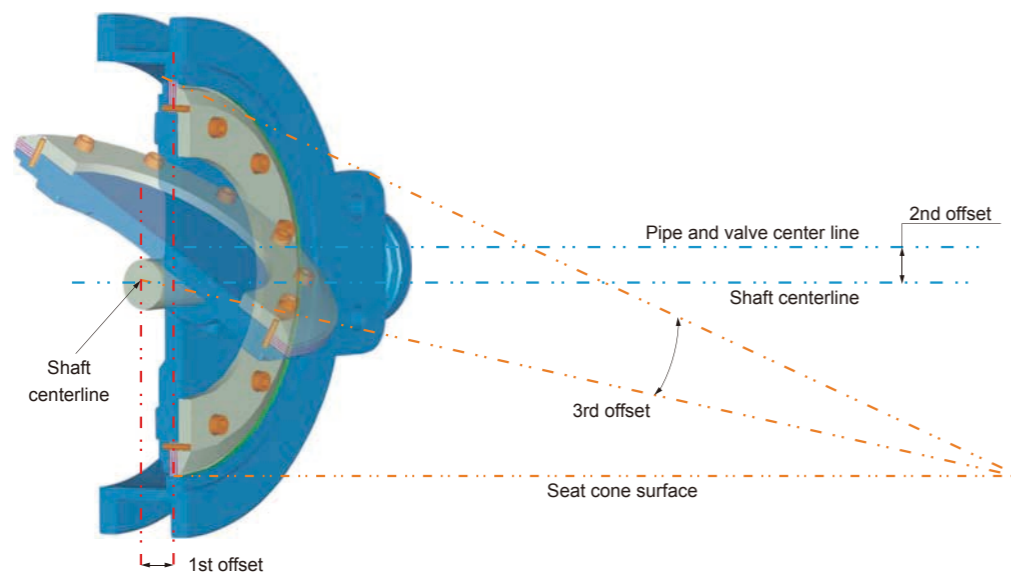
No.	Part	Standard Material
1	BODY	ASTM A216 WCB/STL.21 OVERLAY
2	DISC	ASTM A216 WCB
3	RING RETAINER	ASTM A105N NICKEL PLATED
4	GASKET	SPIRAL WOUND GRAPHITE/SS316L
5	SEAL RING	LAMINATED UNS31803+GRAPHITE
6	SCREW	ASTM A193 B8
7	WASHER	AISI 304
8	STEM	17-4PH
9	PIN	AISI 304
10	KEY	17-4PH
11	GLAND FLANGE	ASTM A216 WCB
12	PACKING FOLLOWER	ASTM A276 420
13	BOLT	ASTM A193 B7
14	NUT	ASTM A194 2H
15	WASHER	AISI 1566
16	PACKING	REINFORCED GRAPHITE
17	PACKING	GRAPHITE
18	SPACER	ASTM A276 316L
19	BEARING	ASTM A276 316L NITRIDED
20	PACKING	REINFORCED GRAPHITE

No.	Part	Standard Material
21	BLOWOUT PROOF BLOCK	ASTM A276 316L NITRIDED
22	BOLT	ASTM A193 B8
23	WASHER	AISI 304
24	THRUST BEARING	ASTM A276 316L NITRIDED
25	GASKET	SPIRAL WOUND GRAPHITE/SS316L
26	BOTTOM FLANGE	ASTM A105N
27	STUD	ASTM A193 B7
28	WASHER	AISI 1566
29	BRACKET	AISI 1020
30	KEY	AISI 1045
31	STUD	ASTM A193 B7
32	WASHER	AISI 1566
33	PIN	AISI 304
34	RETAINER DEVICE	AISI 316



Triple Offset Frictionless Design

- 1st offset: The stem shaft is offset from the sealing surface plane, allowing for a continuous engagement of the seating surface.
- 2nd offset: The stem shaft's rotation axis is offset from the center of the bore, removing contact between the seat and the seal ring through most of the disc's travel.
- 3rd offset: The conical seating surface is offset asymmetrically to eliminate friction during opening and closing.



Low Opening & Closing Torque

Rhinoflex TC Series butterfly valves combine the three offsets of the seating surface with the flexibility of graphite lamination to achieve a tight and uniform seal with a low required torque.

Zero Leakage

Laminated seal rings are designed to self align and allow valves to meet zero leakage per API 598.

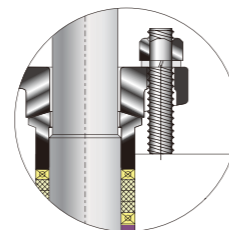
Fire Safe Design

Standard TC Series butterfly valves are not soft seated and can meet API 607 fire test requirements.

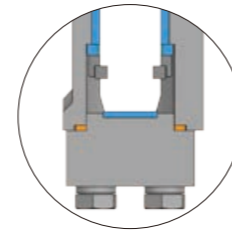
Anti-blowout Shaft

Double anti-blowout design satisfies API 609 and ASME B31.1 requirements through both internal and external stem retention.

Top Retention: Packing gland follower retains the stem integral collar.
Bottom Retention: T shaped attachment prevents stem blow-out.



Upper part retained



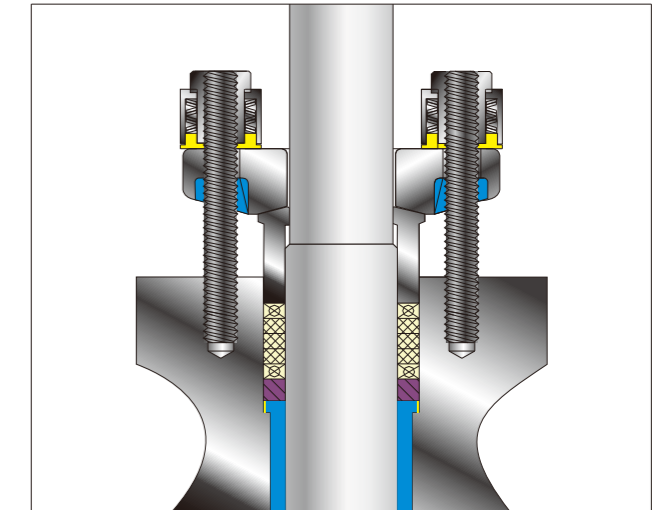
Lower part retained

Low Emission Shaft Seal

Rhinoflex can supply packing to limit fugitive emission rates down to 20 ppm*

- a.) Shaft is fully guided by shaft bearing & gland follower to reduce side load due to line pressure thrust.
- b.) The packing set is pre-compressed and is a combination of braided graphite rings and die formed flexible graphite rings.
- c.) Controlled Ra0.4~Ra0.8 finish on the shaft and Ra1.6 on the Stuffing box provides optimum packing and shaft sealing.
- d.) Optional Live Loaded gland flange available to provide constant packing compression to reduce fugitive emissions.
- e.) Optional shaft seal design available per Shell MESC 77/312 & TA-Luft.

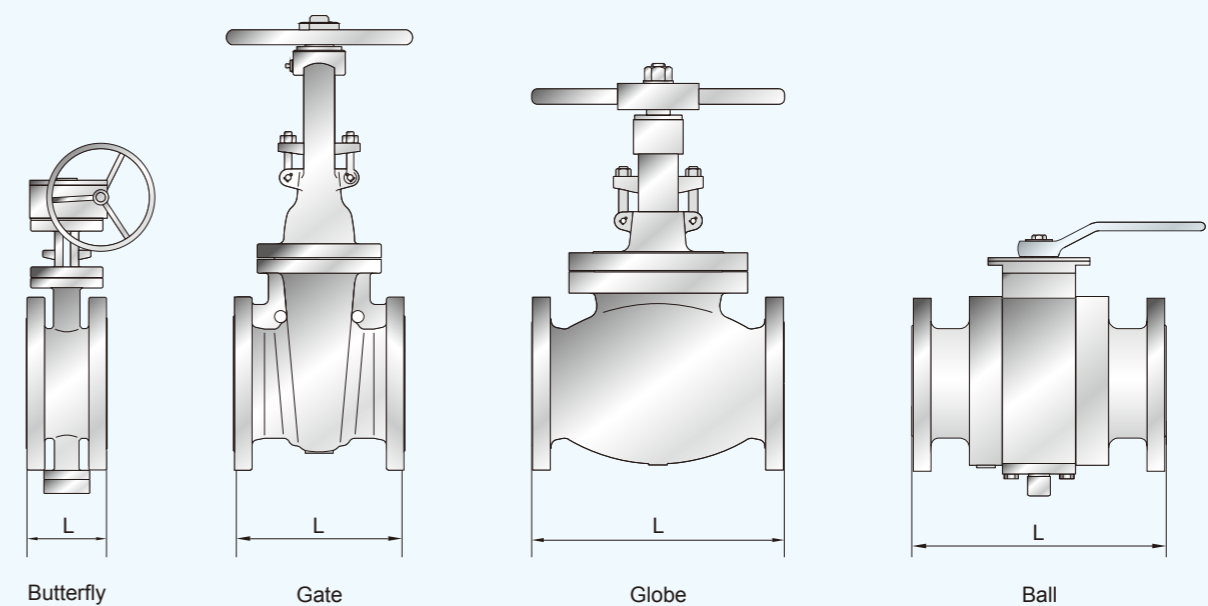
* 20ppm per sniffing method with helium gas.



Compact Design

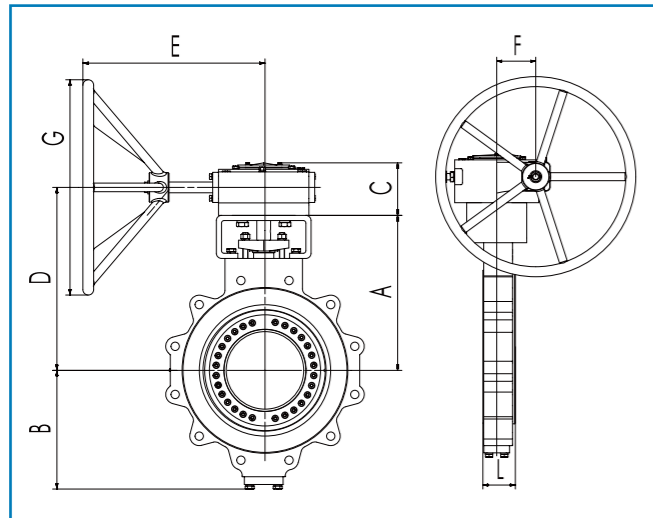
Rhinoflex triple offset butterfly valves are designed to API 609 and offers flow control solution in a compact design. The TC series provides a light weight solution to bulky gate, globe, and ball valves when space or weight are at a premium.

6" Valve	CLASS 150				CLASS 300				CLASS 600			
	Butterfly	Gate	Globe	Ball	Butterfly	Gate	Globe	Ball	Butterfly	Gate	Globe	Ball
Face to Face (mm)	140	267	406	394	140	403	445	403	210	559	559	559
Weight (kg)	49	77	100	190	70	144	168	211	140	234	284	248

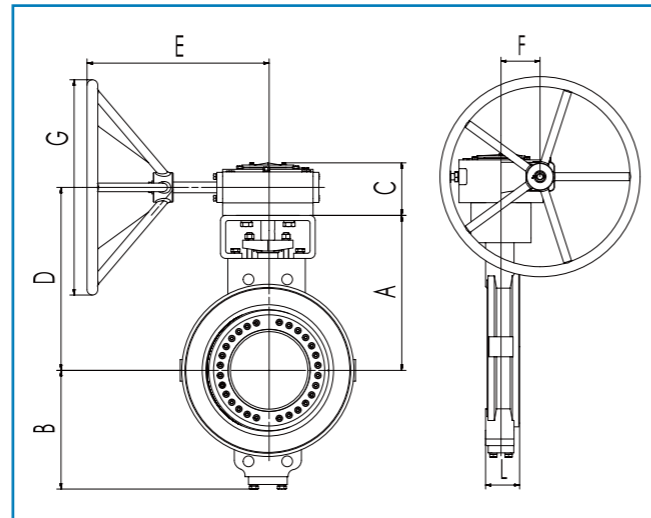


Triple Offset Butterfly Valve

Dimensions & Weights



Lug



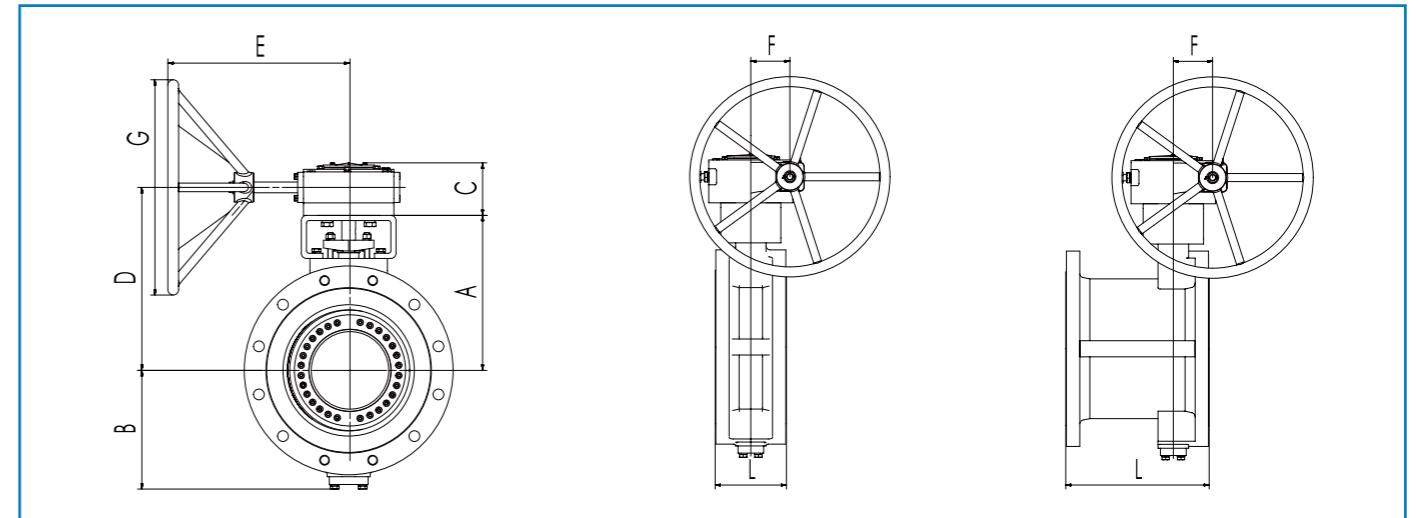
Wafer

Class 150 (inch)

Size	L				Valve Dimensions				Gear Dimensions			Approx. Weight (lb)				Gear Model
	Wafer	Lug	RF-S	RF-L	A	B	C	D	E	F	G	Wafer	Lug	RF-S	MA	
3"	1.89	1.89	4.49	7.99	7.60	5.25	2.64	8.86	6.06	1.97	7.99	30.9	35.3	50.6	55.0	SW2
4"	2.13	2.13	5.00	9.02	8.03	5.75	2.64	9.29	6.06	1.97	7.99	39.6	46.2	74.8	79.2	SW2
6"	2.24	2.24	5.51	10.51	9.49	7.32	3.54	11.26	9.06	2.48	11.81	66.0	77.2	116.8	132.0	SW7
8"	2.52	2.52	5.98	11.50	11.50	8.25	3.54	13.27	9.06	2.48	11.81	105.6	116.8	184.8	204.6	SW7
10"	2.80	2.80	6.50	12.99	13.27	9.67	3.82	15.12	10.63	3.15	15.75	136.4	156.5	242.0	290.4	SW10
12"	3.19	3.19	7.01	14.02	14.17	10.85	5.16	16.3	16.54	4.72	19.69	187.0	220.0	332.2	400.2	SW20
14"	3.62	3.62	7.48	15.00	16.89	11.95	5.16	19.02	16.54	4.72	19.69	275.0	330.0	467.4	518.1	SW20
16"	4.02	4.02	8.50	15.98	18.50	13.21	5.24	20.74	18.11	4.96	23.62	396.0	462.0	572.0	638.0	SW40
18"	4.49	4.49	8.74	17.01	22.56	14.85	5.24	24.8	18.11	4.96	23.62	572.0	607.2	720.9	809.1	SW40
20"	5.00	5.00	9.02	17.99	24.69	16.60	5.63	30.43	22.05	5.43	23.62	682.0	793.7	946.0	1047.2	SW60
24"	6.06	6.06	10.51	20.00	27.36	19.28	5.63	34.41	22.44	5.43	29.92	990.0	1221.0	1419.0	1573.0	SW90
28"	6.50	6.50	11.50		30.91	21.54	8.15	35.20	25.59	8.07	29.92					SW200
30"	7.48	7.48	12.52		30.16	21.81	8.15	34.45	25.59	8.07	29.92					SW200
32"	7.48	7.48	12.52		33.46	22.68	8.15	37.76	25.59	8.07	29.92					SW270
36"	7.99	7.99	12.99		39.76	25.59	9.41	44.41	27.17	9.09	29.92					SW300
40"	8.50	8.50	16.14		40.04	28.11	9.41	44.69	27.17	9.09	29.92					SW300
42"	9.02	9.02	16.14		40.04	29.17	9.41	44.69	24.41	9.09	29.92					SW400
48"	10.00	10.00	18.50		45.00	33.35	10.47	53.58	29.13	10.11	35.43					SW600

Triple Offset Butterfly Valve

Dimensions & Weights



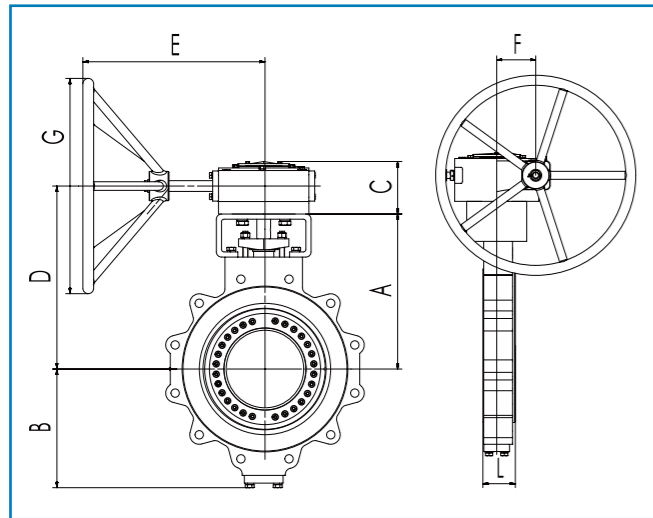
Flange

Class 150 (mm)

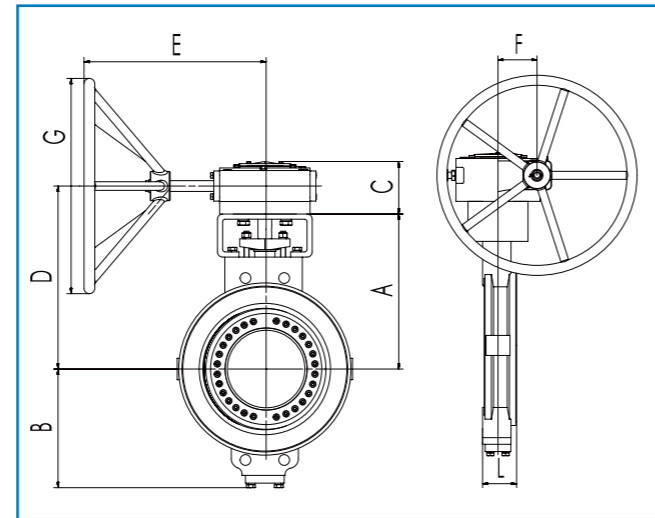
Size	L				Valve Dimensions				Gear Dimensions			Approx. Weight (kg)				Gear Model
	Wafer	Lug	RF-S	RF-L	A	B	C	D	E	F	G	Wafer	Lug	RF-S	RF-L	
DN80	48	48	114	203	193	133.4	67	225	154	50	203	14	16	23	25	SW2
DN100	54	54	127	229	204	146	67	236	154	50	203	18	21	34	36	SW2
DN150	57	57	140	267	241	186	90	286	230	63	300	30	35	53	60	SW7
DN200	64	64	152	292	292	209.6	90	337	230	63	300	48	53	84	93	SW7
DN250	71	71	165	330	337	245.6	97	384	270	80	400	62	71	110	132	SW10
DN300	81	81	178	356	360	275.6	131	414	420	120	500	85	100	151	182	SW20
DN350	92	92	190	381	429	303.6	131	483	420	120	500	125	150	212	235	SW20
DN400	102	102	216	406	470	335.6	133	527	460	126	600	180	210	260	290	SW40
DN450	114	114	222	432	573	377.1	133	630	460	126	600	260	276	327	367	SW40
DN500	127	127	229	457	627	421.6	143	773	560	138	600	310	360	430	475	SW60
DN600	154	154	267	508	695	489.6	143	874	570	138	760	450	555	645	715	SW90
DN700	165	165	292		785	547	207	894	650	205	760					SW200
DN750	190	190	318		766	554	207	875	650	205	760					SW200
DN800	190	190	318		850	576	207	959	650	205	760					SW270
DN900	203	203	330		1010	650	239	1128	690	231	760					SW300
DN950	216	216	410		973	706	239	1091	690	231	760					SW300
DN1050	229	229	410		1017	741	239	1135	620	231	760					SW400
DN1200	254	254	470		1143	847	266	1361	740	256.75	900					SW600

Triple Offset Butterfly Valve

Dimensions & Weights



Lug



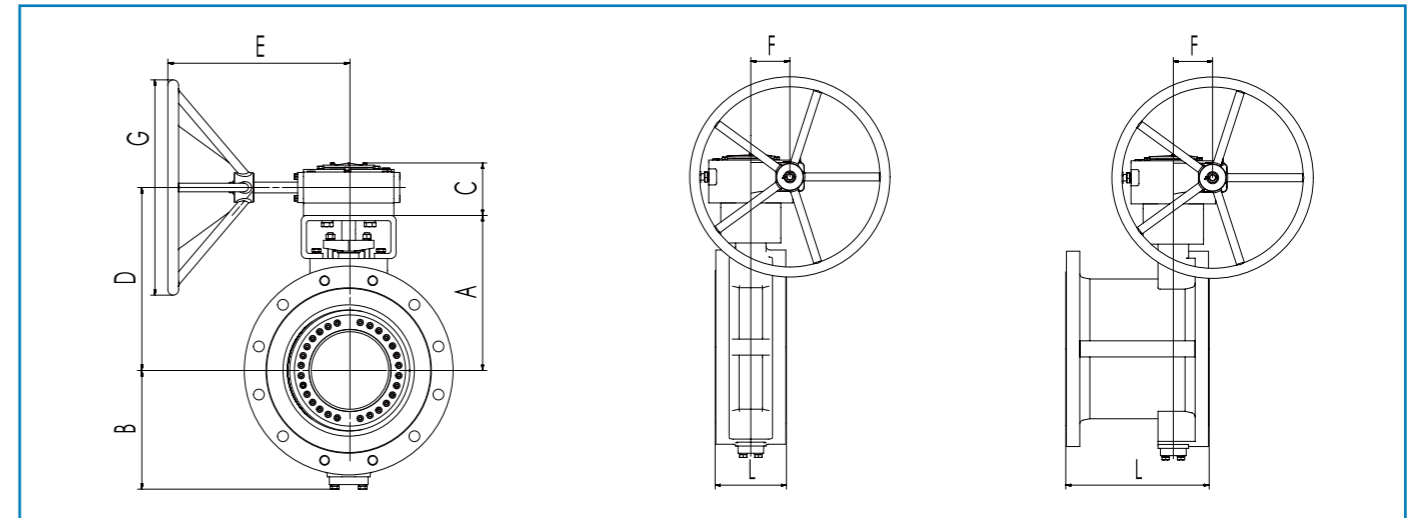
Wafer

Class 300 (inch)

Size	L				Valve Dimensions				Gear Dimensions			Approx. Weight (lb)				Gear Model
	Wafer	Lug	RF-S	RF-L	A	B	C	D	E	F	G	Wafer	Lug	RF-S	RF-L	
3"	1.89	1.89	4.49	11.10	7.68	5.33	2.64	8.94	6.06	1.97	7.99	33.1	37.5	61.7	72.8	SW2
4"	2.13	2.13	5.00	12.01	8.50	6.22	3.54	10.27	9.06	2.48	7.99	41.8	48.4	90.2	107.8	SW4
6"	2.32	2.32	5.51	15.87	12.52	7.70	3.54	14.29	9.06	2.48	11.81	92.4	105.6	165.0	224.4	SW7
8"	2.87	2.87	5.98	16.50	13.98	8.88	3.82	15.83	10.63	3.15	15.75	136.4	158.7	242.0	308.0	SW10
10"	3.27	3.27	6.50	17.99	15.43	10.50	5.24	17.67	18.11	4.96	23.62	211.2	257.4	363.0	473.0	SW40
12"	3.62	3.62	7.01	19.76	17.13	11.85	5.24	19.37	18.11	4.96	23.62	286.0	352.0	488.4	649.0	SW40
14"	4.61	4.61	7.48	30.00	21.73	13.51	5.63	27.48	22.05	5.43	23.62	462.0	627.0	737.0	1001.0	SW60
16"	5.24	5.24	8.50	32.99	23.15	14.89	5.63	30.20	22.05	5.43	23.62	638.0	837.8	959.0	1291.9	SW70
18"	5.87	5.87	8.74	35.98	24.41	16.42	6.61	32.13	22.05	5.43	27.56	781.0	1045.0	1157.4	1631.4	SW100
20"	6.26	6.26	9.02	39.02	25.75	17.48	8.15	30.04	25.59	8.07	29.92	1133.0	1441.0	1617.0	2167.0	SW200
24"	7.13	7.13	10.51	45.00	28.70	20.44	8.15	32.99	25.59	8.07	29.92	1430.0	1995.2	2257.5	3141.6	SW200
30"	9.02	9.02	12.52		35.94	24.67	9.41	44.53	24.41	9.09	29.92					SW400
32"	9.49	9.49	12.52		36.22	24.61	10.47	44.53	29.13	10.11	35.43					SW600
36"	9.49	9.49	12.99		39.57	27.36	10.47	48.15	29.13	10.11	35.43					SW600
40"	11.81	11.81	16.14		40.63	29.72	10.47	49.21	29.13	10.11	35.43					SW600

Triple Offset Butterfly Valve

Dimensions & Weights



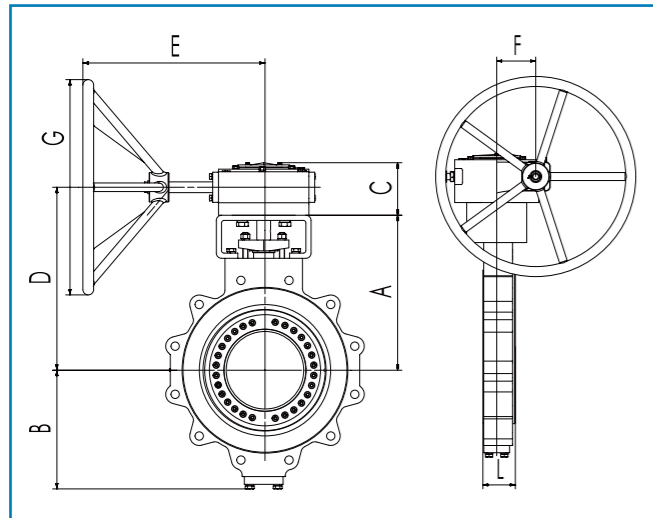
Flange

Class 300 (mm)

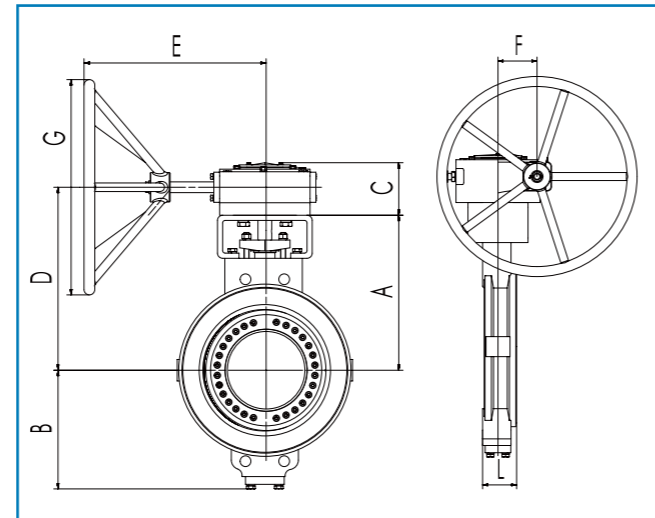
Size	L				Valve Dimensions				Gear Dimensions			Approx. Weight (kg)				Gear Model
	Wafer	Lug	RF-S	RF-L	A	B	C	D	E	F	G	Wafer	Lug	RF-S	RF-L	
DN80	48	48	114	282	195	135.4	67	227	154	50	203	15	17	28	33	SW2
DN100	54	54	127	305	216	158	90	261	230	63	203	19	22	41	49	SW4
DN150	59	59	140	403	318	195.6	90	363	230	63	300	42	48	75	102	SW7
DN200	73	73	152	419	355	225.6	97	402	270	80	400	62	72	110	140	SW10
DN250	83	83	165	457	392	266.6	133	449	460	126	600	96	117	165	215	SW40
DN300	92	92	178	502	435	301.1	133	492	460	126	600	130	160	222	295	SW40
DN350	117	117	190	762	552	343.1	143	698	560	138	600	210	285	335	455	SW60
DN400	133	133	216	838	588	378.1	143	767	560	138	600	290	380	435	586	SW70
DN450	149	149	222	914	620	417.1	168	816	560	138	700	355	475	525	740	SW100
DN500	159	159	229	991	654	444.1	207	763	650	205	760	515	655	735	985	SW200
DN600	181	181	267	1143	729	519.1	207	838	650	205	760	650	905	1024	1425	SW200
DN750	229	229	318		913	626.5	239	1131	620	231	760					SW400
DN800	241	241	318		920	625	266	1131	740	256.75	900					SW600
DN900	241	241	330		1005	695	266	1223	740	256.75	900					SW600
DN1000	300	300	410		1032	755	266	1250	740	256.75	900					SW600

Triple Offset Butterfly Valve

Dimensions & Weights



Lug



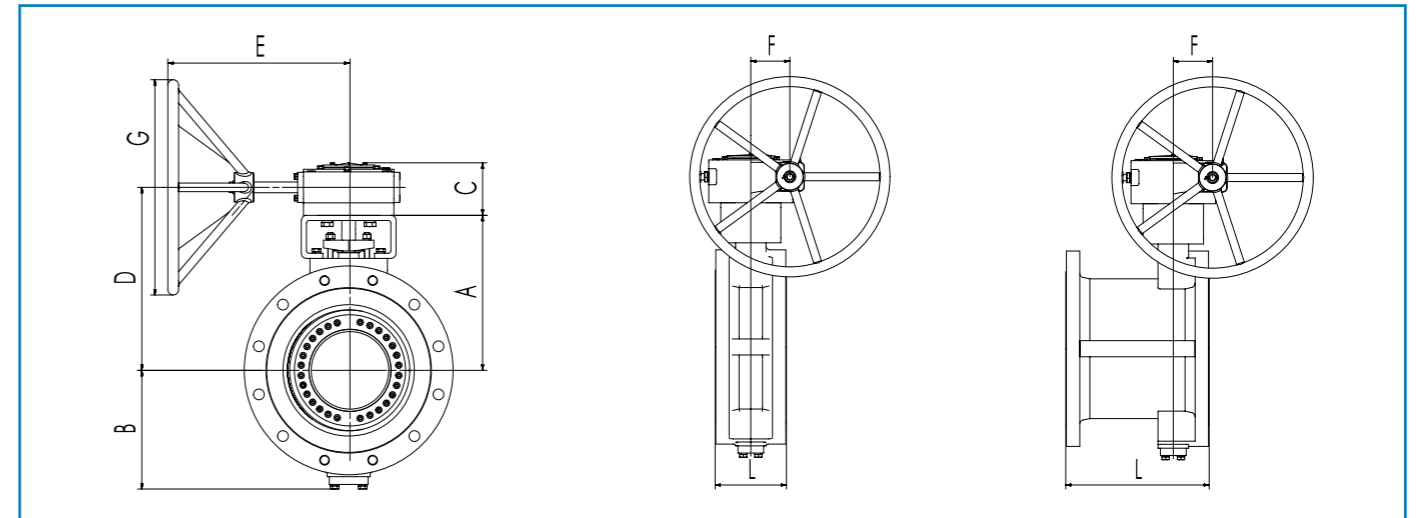
Wafer

Class 600 (inch)

Size	L				Valve Dimensions				Gear Dimensions			Approx. Weight (lb)				Gear Model
	Wafer	Lug	RF-S	RF-L	A	B	C	D	E	F	G	Wafer	Lug	RF-S	RF-L	
4"	2.52	2.52	7.48	17.01	11.54	3.25	3.54	13.31	9.06	2.48	11.81	83.60	105.82	171.96	198.42	SW7
6"	3.07	3.07	8.27	22.01	13.70	9.14	5.16	15.83	16.54	4.72	19.69	171.60	205.03	308.65	374.79	SW20
8"	4.02	4.02	9.06	25.98	15.12	10.24	5.24	17.24	18.11	4.96	23.62	253.00	308.65	453.20	616.00	SW40
10"	4.61	4.61	9.84	30.98	20.24	12.22	5.63	25.98	22.05	5.43	23.62	418.00	529.11	748.00	990.00	SW60
12"	5.51	5.51	10.63	32.99	21.97	14.16	6.61	29.69	22.05	5.43	27.56	616.00	770.00	976.80	1320.00	SW100
14"	6.10	6.10	11.42	35.00	22.56	14.69	6.61	30.28	21.65	5.43	29.92	704.00	1146.40	1263.25	1829.83	SW130
16"	7.01	7.01	12.20	39.02	24.25	16.28	8.15	28.54	25.59	8.07	29.92	943.80	1399.93	1532.21	2204.62	SW200
18"	7.87	7.87	12.99	42.99	28.86	18.27	9.41	33.50	27.17	9.09	29.92	1227.60	1851.90	2336.90	3130.60	SW300
20"	8.50	8.50	13.78	47.01	29.65	19.67	9.41	38.23	24.41	9.09	29.92	1601.60	2400.83	2788.84	3858.09	SW400
24"	9.13	9.13	15.35	55.00	33.66	22.13	9.41	42.24	24.41	9.09	29.92	2189.00	3048.99	3622.19	4916.30	SW400

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Dimensions & Weights

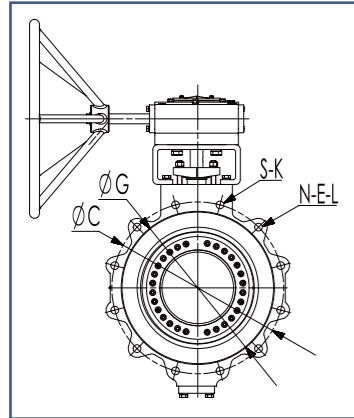


Flange

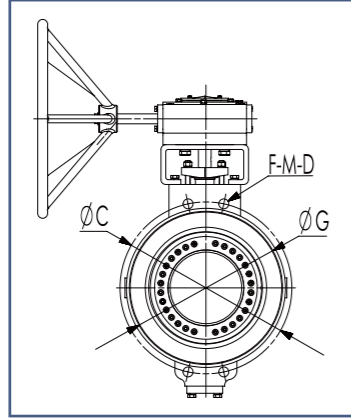
Class 600 (mm)

Size	L				Valve Dimensions				Gear Dimensions			Approx. Weight (kg)				Gear Model
	Wafer	Lug	RF-S	RF-L	A	B	C	D	E	F	G	Wafer	Lug	RF-S	RF-L	
DN100	64	64	190	432	293	82.6	90	338	230	63	300	38	48	78	90	SW7
DN150	78	78	210	559	348	232.1	131	402	420	120	500	78	93	140	170	SW20
DN200	102	102	230	660	384	260.1	133	438	460	126	600	115	140	206	280	SW40
DN250	117	117	250	787	514	310.5	143	660	560	138	600	190	240	340	450	SW60
DN300	140	140	270	838	558	359.6	168	754	560	138	700	280	350	444	600	SW100
DN350	155	155	290	889	573	373	168	769	550	138	760	320	520	573	830	SW130
DN400	178	178	310	991	616	413.5	207	725	650	205	760	429	635	695	1000	SW200
DN450	200	200	330	1092	733	464	239	851	690	231	760	558	840	1060	1420	SW300
DN500	216	216	350	1194	753	499.5	239	971	620	231	760	728	1089	1265	1750	SW400
DN600	232	232	390	1397	855	562	239	1073	620	231	760	995	1383	1643	2230	SW400

End Connection Dimensions



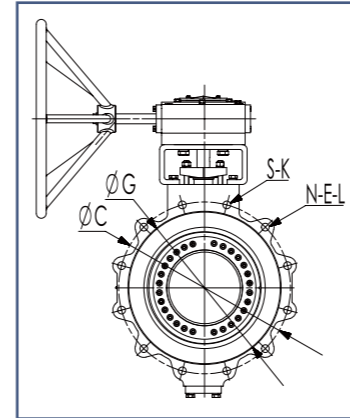
Lug



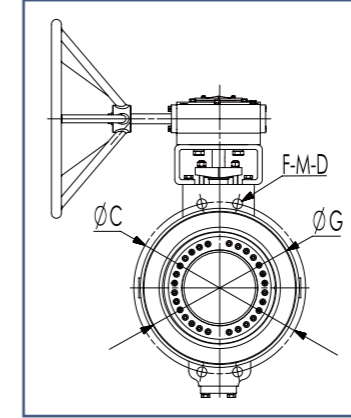
Wafer

Wafer	Lug	
G	G	Raised Face Facing Diameter
C	C	Bolting Circle Diameter
N	N	Total Flange Bolt Holes Quantity
F	S	Special Bolt Holes Quantity
M	E	Standard Bolt Hole/Thread Callout
D	L	Effective Thread/Hole Depth
	K	Shortened Thread Depth

End Connection Dimensions



Lug



Wafer

Wafer	Lug	
G	G	Raised Face Facing Diameter
C	C	Bolting Circle Diameter
N	N	Total Flange Bolt Holes Quantity
F	S	Special Bolt Holes Quantity
M	E	Standard Bolt Hole/Thread Callout
D	L	Effective Thread/Hole Depth
	K	Shortened Thread Depth

Class 150 (Lug and Wafer)

Size		G		C		F	M	D		N	E	L		S	K	
inch	mm	inch	mm	inch	mm			inch	mm			inch	mm		inch	mm
3"	80	5.00	127	6.00	152.5		NONE	NONE		4	5/8-11UNC-2B	full thread	NONE	NONE	NONE	
4"	100	6.18	157	7.50	190.5	4	Φ19	through hole		8	5/8-11UNC-2B	full thread	NONE	NONE	NONE	
6"	150	8.50	216	9.51	241.5	4	Φ21	through hole		8	3/4-10UNC-2B	full thread	NONE	NONE	NONE	
8"	200	10.63	270	11.75	298.5	4	Φ22	through hole		8	3/4-10UNC-2B	full thread	NONE	NONE	NONE	
10"	250	12.76	324	14.25	362	4	Φ25	through hole		12	7/8-9UNC-2B	full thread	NONE	NONE	NONE	
12"	300	15.00	381	17.01	432	4	Φ25	through hole		12	7/8-9UNC-2B	1.30 33	NONE	NONE	NONE	
14"	350	16.26	413	18.74	476	4	Φ29	through hole		12	1-8UNC-2B	1.30 33	NONE	NONE	NONE	
16"	400	18.50	470	21.24	539.5	4	1-8UNC-2B	0.67 17		16	1-8UNC-2B	1.50 38	4	0.67	17	
18"	450	20.98	533	22.76	578	4	1-1/8-8UN-2B	0.79 20		12	1-1/8-8UN-2B	1.50 38	4	0.79	20	
20"	500	22.99	584	25.00	635	4	1-1/8-8UN-2B	0.79 20		16	1-1/8-8UN-2B	1.69 43	4	0.79	20	
24"	600	27.24	692	29.51	749.5	4	1-1/8-8UN-2B	0.87 22		16	1-1/8-8UN-2B	1.89 48	4	0.87	22	

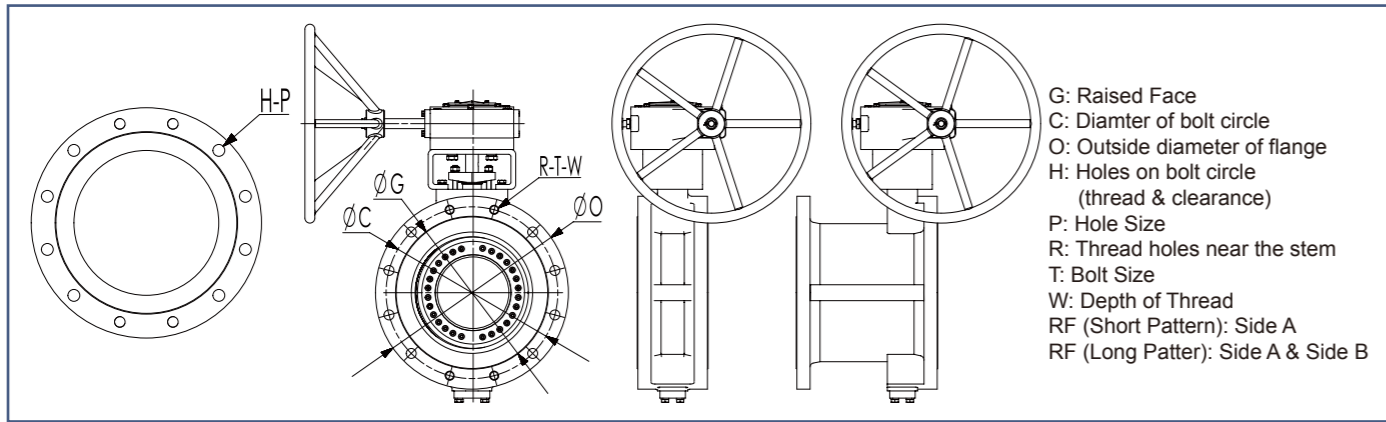
Class 600 (Lug and Wafer)

Size		G		C		F	M	D		N	E	L		S	K	
inch	mm	inch	mm	inch	mm			inch	mm			inch	mm		inch	mm
4"	100	6.18	157	8.50	216	4	7/8-9UNC-2B	0.59 15		4	7/8-9UNC-2B	full thread	4	0.59	15	
6"	150	8.50	216	11.50	292	4	1-8UNC-2B	0.67 17		8	1-8UNC-2B	full thread	4	0.67	17	
8"	200	10.63	270	13.74	349	4	1-1/8-8UN-2B	0.79 20		8	1-1/8-8UN-2B	full thread	4	0.79	20	
10"	250	12.76	324	17.01	432	4	1-1/4-8UN-2B	0.87 22		12	1-1/4-8UN-2B	1.89 48	4	0.87	22	
12"	300	15.00	381	19.25	489	4	1-1/4-8UN-2B	0.87 22		16	1-1/4-8UN-2B	1.89 48	4	0.87	22	
14"	350	16.26	413	20.75	527	4	1-3/8-8UN-2B	0.94 24		16	1-3/8-8UN-2B	1.77 45	4	0.94	24	
16"	400	18.50	470	23.74	603	4	1-1/2-8UN-2B	0.98 25		16	1-1/2-8UN-2B	2.24 57	4	0.98	25	
18"	450	20.98	533	25.75	654	4	1-5/8-8UN-2B	1.06 27		16	1-5/8-8UN-2B	2.44 62	4	1.06	27	
20"	500	22.99	584	28.50	724	4	1-5/8-8UN-2B	1.06 27		20	1-5/8-8UN-2B	2.44 62	4	1.06	27	
24"	600	27.24	692	32.99	838	4	1-7/8-8UN-2B	1.26 32		20	1-7/8-8UN-2B	2.83 72	4	1.26	32	

Class 300 (Lug and Wafer)

Size		G		C		F	M	D		N	E	L		S	K	
inch	mm	inch	mm	inch	mm			inch	mm			inch	mm		inch	mm
3"	80	5.00	127	6.63	168.5	4	3/4-10UNC-2B	0.51 13		4	3/4-10UNC-2B	full thread	4	0.51	13	
4"	100	6.18	157	7.87	200	2	Φ22	through hole		8	3/4-10UNC-2B	full thread	NONE	NONE	NONE	
6"	150	8.50	216	10.63	270	4	Φ22	through hole		12	3/4-10UNC-2B	full thread	NONE	NONE	NONE	
8"	200	10.63	270	12.99	330	4	Φ25	through hole		12	7/8-9UNC-2B	full thread	NONE	NONE	NONE	
10"	250	12.76	324	15.26	387.5	4	1-8UNC-2B	0.67 17		12	1-8UNC-2B	full thread	4	0.67	17	
12"	300	15.00	381	17.76	451	4	1-1/8-8UN-2B	0.79 20		12	1-1/8-8UN-2B	full thread	4	0.79	20	
14"	350	16.26	413	20.26	514.5	4	1-1/8-8UN-2B	0.79 20		16	1-1/8-8UN-2B	1.69 43	4	0.79	20	
16"	400	18.50	470	22.50	571.5	4	1-1/4-8UN-2B	0.87 22		16	1-1/4-8UN-2B	1.89 48	4	0.87	22	
18"	450	21.02	534	24.76	629	4	1-1/4-8UN-2B	0.87 22		20	1-1/4-8UN-2B	1.89 48	4	0.87	22	
20"	500	22.99	584	27.01	686	4	1-1/4-8UN-2B	0.87 22		20	1-1/4-8UN-2B	1.89 48	4	0.87	22	
24"	600	27.24	692	32.01	813	4	1-1/2-8UN-2B	0.98 25		20	1-1/2-8UN-2B	2.24 57	4	0.98	25	

End Connection Dimensions



RF

G: Raised Face
 C: Diameter of bolt circle
 O: Outside diameter of flange
 H: Holes on bolt circle
 (thread & clearance)
 P: Hole Size
 R: Thread holes near the stem
 T: Bolt Size
 W: Depth of Thread
 RF (Short Pattern): Side A
 RF (Long Patter): Side A & Side B

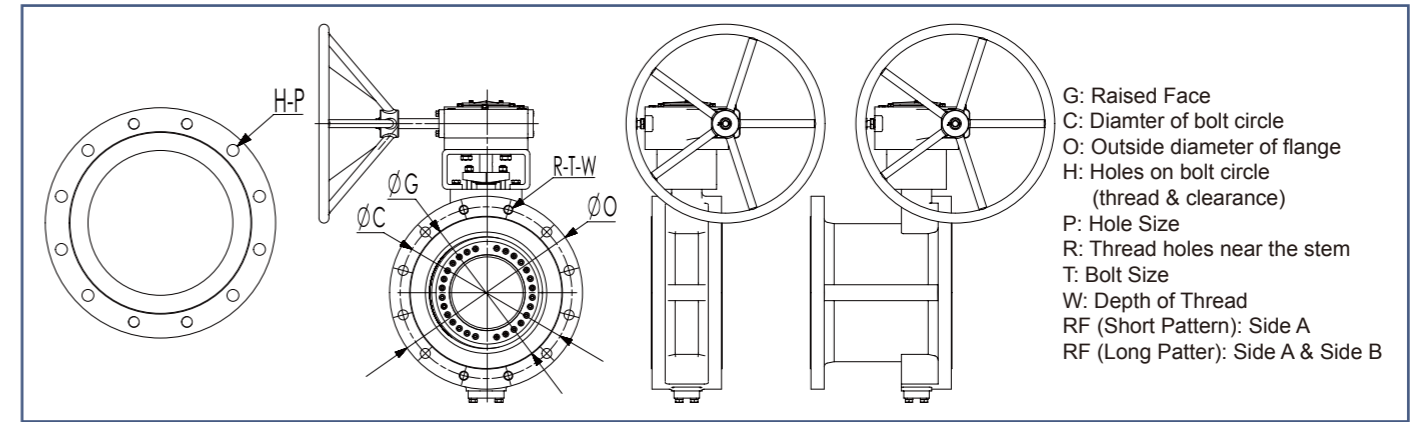
Class 150 (RF)

Size		G		C		O		R	T	W		H	P
inch	mm	inch	mm	inch	mm	inch	mm			inch	mm		
3"	80	5.00	127	6.00	152.5	7.48	190					4	Φ19
4"	100	6.18	157	7.50	190.5	9.02	229	4	3/4-10UNC-2B	0.79	20	4	Φ19
6"	150	8.50	216	9.51	241.5	10.98	279	4	3/4-10UNC-2B	0.94	24	4	Φ22
8"	200	10.63	270	11.75	298.5	13.58	345	4	7/8-9UNC-2B	0.94	24	4	Φ22
10"	250	12.76	324	14.25	362	15.98	406	4	1-8UNC-2B	1.10	28	8	Φ25
12"	300	15.00	381	17.01	432	19.02	483	4	1-1/8-8UN-2B	1.26	32	8	Φ25
14"	350	16.26	413	18.74	476	21.06	535	4	1-1/8-8UN-2B	1.26	32	8	Φ29
16"	400	18.50	470	21.24	539.5	23.50	597	4	1-1/4-8UN-2B	1.57	40	12	Φ29
18"	450	20.98	533	22.76	578	25.00	635	4	1-1/4-8UN-2B	1.42	36	12	Φ32
20"	500	22.99	584	25.00	635	27.48	698	4	1-1/4-8UN-2B	1.42	36	16	Φ32
24"	600	27.24	692	29.51	749.5	32.01	813	4	1-1/2-8UN-2B	1.57	40	16	Φ35

Class 300 (RF)

Size		G		C		O		R	T	W		H	P
inch	mm	inch	mm	inch	mm	inch	mm			inch	mm		
3"	80	5.00	127	6.63	168.5	8.27	210	4	3/4 10UNC-2B	0.94	24	4	Φ22
4"	100	6.18	157	7.87	200	10.00	254	4	3/4-10UNC-2B	0.94	24	4	Φ22
6"	150	8.50	216	10.63	270	12.60	320	4	3/4-10UNC-2B	0.94	24	8	Φ22
8"	200	10.63	270	12.99	330	14.96	380	4	7/8-9UNC-2B	1.06	27	8	Φ25
10"	250	12.76	324	15.26	387.5	17.52	445	4	1-8UNC-2B	1.18	30	12	Φ29
12"	300	15.00	381	17.76	451	20.51	521	4	1-1/8-8UN-2B	1.42	36	12	Φ32
14"	350	16.26	413	20.26	514.5	23.03	585	4	1-1/8-8UN-2B	1.34	34	16	Φ32
16"	400	18.50	470	22.50	571.5	25.51	648	4	1-1/4-8UN-2B	1.57	40	16	Φ35
18"	450	21.02	534	24.76	629	27.99	711	4	1-1/4-8UN-2B	1.57	40	20	Φ35
20"	500	22.99	584	27.01	686	30.51	775	6	1-1/4-8UN-2B	1.57	40	18	Φ35
24"	600	27.24	692	32.01	813	36.02	915	6	1-1/2-8UN-2B	1.89	48	18	Φ41

End Connection Dimensions



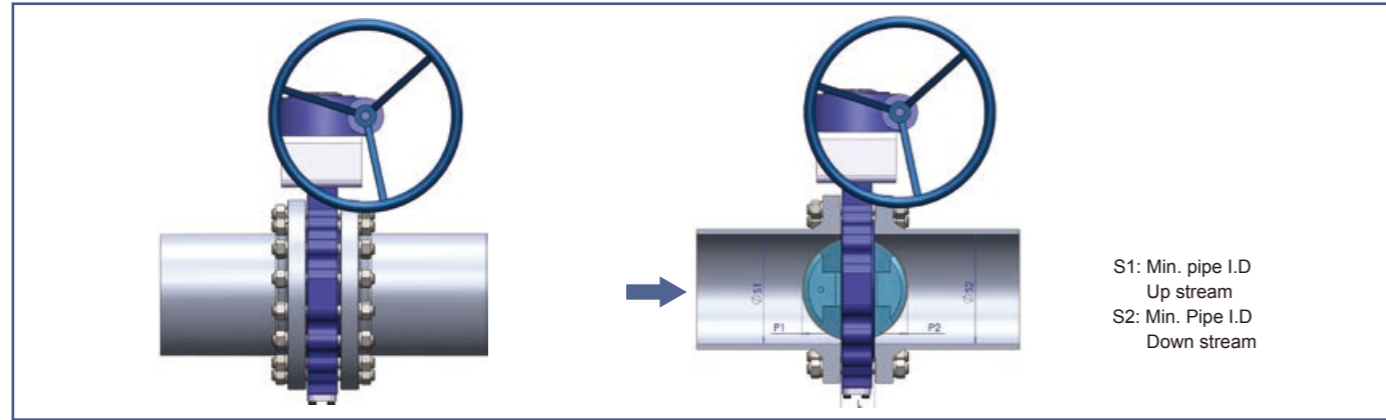
RF

G: Raised Face
 C: Diameter of bolt circle
 O: Outside diameter of flange
 H: Holes on bolt circle
 (thread & clearance)
 P: Hole Size
 R: Thread holes near the stem
 T: Bolt Size
 W: Depth of Thread
 RF (Short Pattern): Side A
 RF (Long Patter): Side A & Side B

Class 600 (RF)

Size		G		C		O		R	T	W		H	P
inch	mm	inch	mm	inch	mm	inch	mm			inch	mm		
4"	100	6.18	157	8.50	216	10.75	273	4	7/8-9UNC-2B	1.10	28	4	Φ25
6"	150	8.50	216	11.50	292	14.02	356	4	1-8UNC-2B	1.26	32	8	Φ29
8"	200	10.63	270	13.74	349	16.50	419	4	1-1/8-8UN-2B	1.42	36	8	Φ32
10"	250	12.76	324	17.01	432	20.00	508	4	1-1/4-8UN-2B	1.57	40	12	Φ35
12"	300	15.00	381	19.25	489	22.01	559	4	1-1/4-8UN-2B	1.57	40	16	Φ35
14"	350	16.26	413	20.75	527	23.82	605	4	1-3/8-8UN-2B	1.89	48	16	Φ38
16"	400	18.50	470	23.74	603	26.97	685	4	1-1/2-8UN-2B	1.81	46	16	Φ41
18"	450	20.98	533	25.75	654	29.33	745	4	1-5/8-8UN-2B	2.05	52	16	Φ45
20"	500	22.99	584	28.50	724	32.01	813	6	1-5/8-8UN-2B	2.83	72	18	Φ45
24"	600	27.24	692	32.99	838	37.01	940	4	1-7/8-8UN-2B	2.28	58	20	Φ51

Min. Pipe I.D. for Disc Clearance



Class 150

Size		L		S1		S2		P1		P2	
inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
3"	80	1.89	48	2.68	68	1.46	37	0.83	21	0.16	4
4"	100	2.13	54	3.74	95	2.99	76	1.22	31	0.63	16
6"	150	2.24	57	5.55	141	5.12	130	2.01	51	1.46	37
8"	200	2.52	64	7.48	190	7.01	178	2.87	73	2.20	56
10"	250	2.80	71	9.37	238	8.94	227	3.70	94	3.03	77
12"	300	3.19	81	11.34	288	10.94	278	4.57	116	3.78	96
14"	350	3.62	92	12.36	314	11.89	302	4.88	124	4.09	104
16"	400	4.02	102	14.21	361	13.74	349	5.59	142	4.80	122
18"	450	4.49	114	16.22	412	15.63	397	6.50	165	5.47	139
20"	500	5.00	127	17.80	452	17.20	437	7.05	179	6.02	153
24"	600	6.06	154	21.69	551	21.14	537	8.50	216	7.48	190

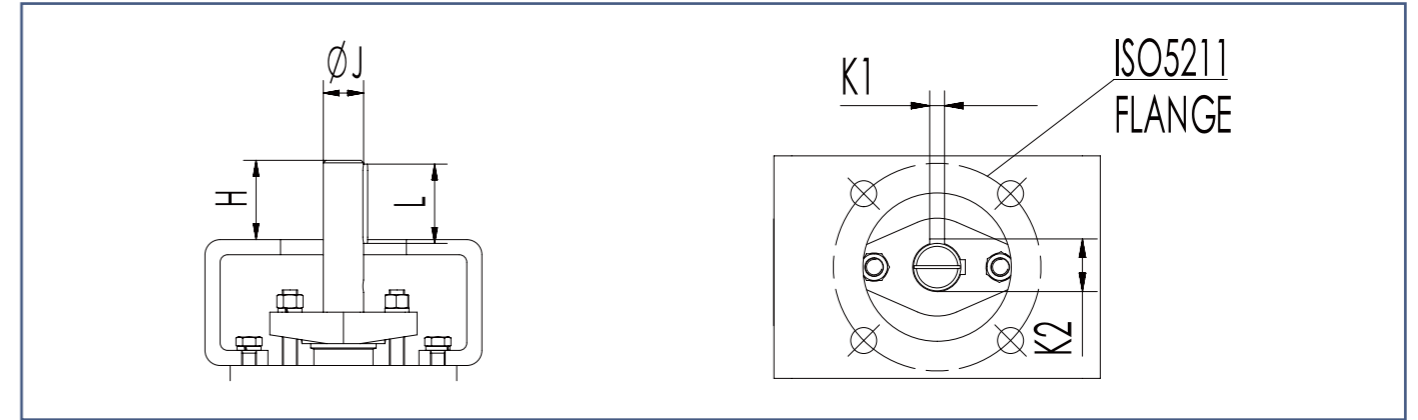
Class 300

Size		L		S1		S2		P1		P2	
inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
3"	80	1.89	48	2.68	68	1.46	37	0.83	21	0.16	4
4"	100	2.13	54	3.74	95	2.99	76	1.22	31	0.63	16
6"	150	2.32	59	5.55	141	5.04	128	2.01	51	1.42	36
8"	200	2.87	73	7.40	188	6.81	173	2.76	70	2.01	51
10"	250	3.27	83	9.29	236	8.82	224	3.50	89	2.76	70
12"	300	3.62	92	11.30	287	10.87	276	4.33	110	3.58	91
14"	350	4.61	117	12.13	308	11.69	297	4.33	110	3.62	92
16"	400	5.24	133	13.98	355	13.15	334	5.08	129	4.02	102
18"	450	5.87	149	15.55	395	14.65	372	5.63	143	4.49	114
20"	500	6.26	159	17.36	441	16.54	420	6.34	161	5.20	132
24"	600	7.13	181	21.14	537	20.51	521	7.72	196	6.81	173

Class 600

Size		L		S1		S2		P1		P2	
inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
4"	100	2.52	64	3.70	94	2.72	69	1.06	27	0.43	11
6"	150	3.07	78	5.63	143	4.88	124	1.73	43.84	1.10	28
8"	200	4.02	102	7.05	179	6.30	160	2.05	52	1.50	38
10"	250	4.61	117	8.90	226	8.19	208	2.76	70	2.09	53
12"	300	5.51	140	10.55	268	9.92	252	3.15	80	2.56	65
14"	350	6.10	155	11.50	292	10.51	267	3.50	89	2.60	66
16"	400	7.01	178	13.19	335	11.93	303	4.06	103	2.91	74
18"	450	7.87	200	14.33	364	13.54	344	4.17	106	3.46	88
20"	500	8.50	216	15.91	404	15.04	382	4.69	119	3.90	99
24"	600	9.13	232	19.84	504	18.82	478	6.34	161	5.28	134

Dimensions of Top Flange



Class 150

Size		H		J		K1		K2		L		ISO 5211
inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	
3"	80	1.30	33	0.63	16	0.20	5	0.71	18	1.26	32	F10
4"	100	1.54	39	0.71	18	0.24	6	0.81	20.5	1.42	36	F10
6"	150	1.61	41	0.87	22	0.31	8	1.00	25.5	1.57	40	F10
8"	200	2.28	58	1.02	26	0.31	8	1.14	29	2.20	56	F12
10"	250	2.28	58	1.10	28	0.31	8	1.22	31	2.20	56	F12
12"	300	2.48	63	1.26	32	0.39	10	1.38	35	2.48	63	F14
14"	350	2.83	72	1.38	35	0.39	10	1.50	38	2.76	70	F16
16"	400	4.06	103	1.57	40	0.47	12	1.69	43	3.94	100	F16
18"	450	4.45	113	1.77	45	0.55	14	1.91	48.5	4.33	110	F25
20"	500	4.41	112	1.97	50	0.55	14	2.11	53.5	4.33	110	F25
24"	600	4.45	113	2.36	60	0.71	18	2.52	64	4.33	110	F25

Class 300

Size		H		J		K1		K2		L		ISO 5211
inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	
3"	80	1.30	33	0.63	16	0.20	5	0.71	18	1.26	32	F10
4"	100	1.46	37	0.71	18	0.24	6	0.81	20.5	1.42	36	F10
6"	150	1.89	48	1.02	26	0.31	8	1.14	29	1.77	45	F12
8"	200	2.28	58	1.10	28	0.31	8	1.22	31	2.20	56	F12
10"	250	2.87	73	1.38	35	0.39	10	1.50	38	2.76	70	F16
12"	300	4.06	103	1.57	40	0.47	12	1.69	43	3.94	100	F16
14"	350	4.45	113	1.97	50	0.55	14	2.11	53.5	4.33	110	F25
16"	400	4.41	112	2.17	55	0.63	16	2.32	59	4.33	110	F25
18"	450	5.63	143	2.36	60	0.71	18	2.52	64	5.51	140	F25
20"	500	6.26	159	2.76	70	0.79	20	2.93	74.5	6.30	160	F30
24"	600	6.42	163	3.15	80	0.87	22	3.35	85	6.30	160	F30

Class 600

Size		H		J		K1		K2		L		ISO 5211
inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	
4"	100	2.17	55	1.02	26	0.31	8	1.14	29	2.20	56	F12
6"	150	2.68	68	1.38	35	0.39	10	1.50	38	2.76	70	F16
8"	200	4.41	112	1.57	40	0.47	12	1.69	43	3.94	100	F16
10"	250	4.45	113	1.97	50	0.55	14	2.11	53.5	4.33	110	F25
12"	300	4.45	113	2.36	60	0.71	18	2.52	64	4.33	110	F25
14"	350	5.71	145	2.56	65	0.71	18	2.72	69	5.51	140	F25
16"	400	6.22	158	2.95	75	0.79	20	3.13	79.5	6.30	160	F30
18"	450	6.89	175	3.35	85	0.87	22	3.54	90	7.09	180	F35
20"	500	7.28	185	3.74	95	0.98	25	3.94	100	7.09	180	F35
24"	600	8.03	204	4.53	115	1.26	32	4.80	122	8.27	210	F35

Valve Operating Torque

Class 150 (Preferred Direction, Shaft Side)

Valve Nominal Diameter		Running Torque		Operating Pressure															
				0.6MPa (87psi)				1.0MPa (145psi)				1.6MPa (232psi)				2.0MPa (290psi)			
				Start to Open		End to Close		Start to Open		End to Close		Start to Open		End to Close		Start to Open		End to Close	
in	mm	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft
3"	80	35	26	95	70	95	70	95	70	95	70	95	70	95	70	95	70	95	70
4"	100	43	32	120	89	120	89	120	89	120	89	120	89	120	89	120	89	120	89
6"	150	61	45	163	120	185	137	163	120	185	137	200	148	185	137	227	168	185	137
8"	200	95	70	205	151	290	214	205	151	290	214	290	214	290	214	330	244	290	214
10"	250	139	103	384	283	535	395	464	342	535	395	541	399	535	395	541	399	535	395
12"	300	217	160	666	492	770	568	770	568	770	568	849	627	770	568	849	627	770	568
14"	350	283	209	705	520	934	689	834	616	934	689	976	720	934	689	1090	804	934	689
16"	400	340	251	874	645	1215	897	874	645	1215	897	1194	881	1215	897	1408	1039	1215	897
18"	450	504	372	1021	754	1450	1070	1365	1007	1450	1070	1882	1389	1450	1070	2227	1644	1450	1070
20"	500	815	601	1557	1149	1786	1318	2052	1514	1786	1318	2794	2062	1786	1318	3289	2427	1786	1318
24"	600	1138	840	2321	1713	2584	1907	3111	2296	2584	1907	4295	3170	2584	1907	5084	3752	2584	1907
28"	700	1942	1433	3788	2796	4493	3316	5019	3704	4493	3316	6865	5067	4493	3316	8096	5975	4493	3316
30"	750	2192	1618	4357	3216	5914	4365	5801	4281	5914	4365	7966	5879	5914	4365	9410	6945	5914	4365
32"	800	3265	2410	5945	4388	7275	5369	7731	5706	7275	5369	10410	7683	7275	5369	12196	9001	7275	5369
36"	900	3638	2685	6667	4920	9819	7247	8685	6410	9819	7247	11713	8645	9819	7247	13732	10135	9819	7247
40"	1000	4445	3281	8630	6369	15324	11310	11419	8428	15324	11310	15604	11516	15324	11310	18393	13575	15324	11310
42"	1050	4878	3600	9589	7077	17623	13006	12730	9395	17623	13006	17441	12872	17623	13006	20582	15190	17623	13006
48"	1200	6813	5028	15304	11295	24232	17884	20965	15473	24232	17884	29455	21739	24232	17884	35116	25917	24232	17884

Class 150 (Bidirectional)

Valve Nominal Diameter		Running Torque		Operating Pressure															
				0.6MPa (87psi)				1.0MPa (145psi)				1.6MPa (232psi)				2.0MPa (290psi)			
				Start to Open		End to Close		Start to Open		End to Close		Start to Open		End to Close		Start to Open		End to Close	
in	mm	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft
3"	80	35	26	95	70	95	70	95	70	95	70	105	77	120	89	120	89	120	89
4"	100	43	32	120	89	120	89	120	89	150	111	120	89	175	129	120	89	175	129
6"	150	61	45	250	185	250	185	250	185	250	185	290	214	280	207	335	247	310	229
8"	200	95	70	256.25	189	385	284	256.25	189	435	321	362.5	268	508	375	412.5	304	560	413
10"	250	139	103	480	354	640	472	580	428	720	531	676.25	499	840	620	676.25	499	921	680
12"	300	217	160	832.5	614	918	678	962.50	710	1040	768	1061.25	783	1223	903	1061.25	783	1345	993
14"	350	283	209	880	649	934	689	1020	753	1135	838	1167.5	862	1437	1061	1232.5	910	1638	1209
16"	400	340	251	1092.5	806	1303	962	1092.5	806	1579	1165	1492.5	1102	1993	1471	1760	1299	2270	1675
18"	450	504	372	1276.25	942	1856	1370	1706.25	1259	2283	1685	2352.5	1736	2922	2157	2783.75	2055	3349	2472
20"	500	815	601	1946.25	1436	2688	1984	2565	1893	3293	2430	3492.5	2578	4201	3100	4111.25	3034	4807	3548
24"	600	1138	840	2901.25	2141	4016	2964	3888.75	2870	4971	3669	5368.75	3962	6403	4726	6355	4690	7358	5430
28"	700	1942	1433	4735	3495	6200	4576	6273.75	4630	7666	5658								
30"	750	2192	1618	5446.25	4020	7568	5585	7251.25	5352	9325	6882								
32"	800	3265	2410	7431.25	5485	9884	7295	9663.75	7132	12054	8896								
36"	900	3638	2685	8333.75	6151	13402	9891	10856.25	8012	16731	12348								
40"	1000	4445	3281	10787.5	7962	16483	12165	14273.75	10535	21368	15770								
42"	1050	4878	3600	11986.25	8846	19431	14341	15912.5	11744	24127	17807								
48"	1200	6813	5028	19130	14119	27389	20214	26206.25	19341	32546	24020								

Valve Operating Torque

Class 300 (Preferred Direction, Shaft Side)

Valve Nominal Diameter		Running Torque		Operating Pressure															
				1.0MPa (145psi)				2.5MPa (363psi)				4.0MPa (580psi)				5.1MPa (740psi)			
				Start to Open		End to Close		Start to Open		End to Close		Start to Open		End to Close		Start to Open		End to Close	
in	mm	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft
3"	80	42	31	95	70	95	70	95	70	95	70	120	89	95	70	144	106	95	70
4"	100	52	38	100	74	150	111	131	97	150	111	184	136	150	111	223	165	150	111
6"	150	100	74	166	123	253	187	291	215	253	187	415	306	253	187	507	374	253	187
8"	200	137	101	294	217	542	400	527	389	542	400	760	561	542	400	931	687	542	400
10"	250	262	193	479	354	860	635	873	644	860	635	1266	934	860	635	1555	1148	860	635
12"	300	408	301	950	701	1123	829	1182	872	1123	829	1687	1245	1123	829	2058	1519	1123	829
14"	350	978	722	1410	1041	1550	1144	2304	1700	1550	1144	3198	2360	1550	1144	3854	2844	1550	1144
16"	400	1163	858	1760	1299	1952	1441	2948	2176	1952	1441	4135	3052	1952	1441	5005	3694	1952	1441
18"	450	1366	1008	2158	1593	2712	2002	3689	2723	2712	2002	5220	3853	2712	2002	6343	4681	2712	2002
20"	500	1705	1258	3053	2253	3043	2246	5075	3746	3043	2246	7097	5238	3043	2246	8580	6332	3043	2246
24"	600	2627	1939	4078	3010	5318	3925	6911	5101	5318	3925	9744	7191	5318	3925	11821	8724	5318	3925
28"	700	3890	2871	6365	4698	9349	6900	11047	8153	9349	6900	15730	11609	9349	6900	19164	14144	9349	6900
30"	750	4860	3587	8342	6157	13137	9696	14780	10908	13137	9696	21218	15660	13137	9696	25939	19144	13137	9696
32"	800	5358	3954	8754	6461	16357	12072	15185	11207	16357	12072	21617	15954	16357	12072	26334	19435	16357	12072
36"	900	7000	5166	11540	8517	22720	16768	20102	14836	22720	16768	28663	21154	22720	16768	34941	25788	22720	16768
40"	1000	8214	6062	15424	11383	28482	21021	28291	20880	28482	21021	41159	30377	28482	21021	50595	37341	28482	21021

Class 300 (Bidirectional)

Valve Nominal Diameter		Running Torque		Operating Pressure															
				1.0MPa (145psi)				2.5MPa (363psi)				4.0MPa (580psi)				5.1MPa (740psi)			
				Start to Open		End to Close		Start to Open		End to Close		Start to Open		End to Close		Start to Open		End to Close	
in	mm	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft
3"	80	42	31	95	70	95	70	120	89	120	89	150	111	156	115	180	133	185	137
4"	100	52	38	125	92	150	111	163.75	121	186	137	230	170	252	186	278.75	206	301	222
6"	150	100	74	207.50	153	253	187	363.75	268	406	300	518.75	383	560	413	633.75	468	673	497
8"	200	137	101	367.50	271	542	400	658.75	486	766	565	950	701	1059	782	1163.75	859	1273	940
10"	250	262	193	598.75	442	860	635	1091.25	805	1248	921	1582.50	1168	1735	1280	1943.75	1435	2092	1544
12"	300	408	301	1187.50	876	1123	829	1477.50	1090	1780	1314	2108.75	1556	2435	1797	2572.50	1899	2916	2152
14"	350	978	722	1762.50	1301	1550	1144	2880	2126	3025	2233	3997.50	2950	4099	3025	4817.50	3555	4886	

Valve Operating Torque

Class 600 (Preferred Direction, Shaft Side)

Valve Nominal Diameter		Running Torque		Operating Pressure															
				2.5MPa (363psi)				5.0MPa (725psi)				7.5MPa (1088psi)				10.2MPa (1479psi)			
				Start to Open		End to Close		Start to Open		End to Close		Start to Open		End to Close		Start to Open		End to Close	
in	mm	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft
3"	80	92	68	127	94	170	125	165	122	170	125	202	149	170	125	243	179	170	125
4"	100	125	92	177	131	320	236	250	185	320	236	323	238	320	236	402	297	320	236
6"	150	327	241	464	342	645	476	656	484	645	476	848	626	645	476	1056	779	645	476
8"	200	510	376	830	613	1132	835	1236	912	1132	835	1643	1213	1132	835	2081	1536	1132	835
10"	250	1223	903	1694	1250	2214	1634	2371	1750	2214	1634	3048	2250	2214	1634	3778	2788	2214	1634
12"	300	1707	1260	2190	1616	2943	2172	3243	2393	2943	2172	4295	3170	2943	2172	5432	4009	2943	2172
14"	350	1978	1460	2973	2194	3893	2873	4298	3172	3893	2873	5623	4150	3893	2873	7053	5205	3893	2873
16"	400	2912	2149	4566	3370	5758	4250	6705	4949	5758	4250	8844	6527	5758	4250	11154	8232	5758	4250
18"	450	4893	3611	7260	5358	8779	6479	10443	7707	8779	6479	13625	10056	8779	6479	17062	12592	8779	6479
20"	500	6040	4458	9119	6730	10965	8093	13204	9745	10965	8093	17288	12759	10965	8093	21700	16015	10965	8093
24"	600	8700	6421	13740	10141	14122	10423	20231	14931	14122	10423	26722	19722	14122	10423	33732	24895	14122	10423

Class 600 (Bidirectional)

Valve Nominal Diameter		Running Torque		Operating Pressure															
				2.5MPa (363psi)				5.0MPa (725psi)				7.5MPa (1088psi)				10.2MPa (1479psi)			
				Start to Open		End to Close		Start to Open		End to Close		Start to Open		End to Close		Start to Open		End to Close	
in	mm	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft	N.m	lbf.ft
3"	80	92	68	158.75	117	170	125	206.25	152	208	154	252.50	186	262	193	303.75	224	321	237
4"	100	125	92	221.25	163	320	236	312.50	231	347	256	403.75	298	448	331	502.50	371	558	412
6"	150	327	241	580	428	645	476	820	605	912	673	1060	782	1180	871	1320	974	1469	1084
8"	200	510	376	1037.50	766	1132	835	1545	1140	1665	1229	2053.75	1516	2197	1621	2601.25	1920	2772	2046
10"	250	1223	903	2117.50	1563	2214	1634	2963.75	2187	3107	2293	3810	2812	4000	2952	4722.50	3485	4964	3664
12"	300	1707	1260	2737.50	2020	2943	2172	4053.75	2992	4309	3180	5368.75	3962	5676	4189	6790	5011	7151	5278
14"	350	1978	1460	3716.25	2743	3893	2873	5372.50	3965	5601	4134	7028.75	5187	7308	5394	8816.25	6507	9153	6755
16"	400	2912	2149	5707.50	4212	5758	4250	8381.25	6186	8394	6195	11055	8159	11030	8141	13942.50	10290	13877	10242
18"	450	4893	3611	9075	6698	8779	6479	13053.75	9634	12595	9296	17031.25	12570	16411	12112	21327.50	15740	20532	15153
20"	500	6040	4458	11398.75	8413	10965	8093	16505	12181	15819	11675	21610	15949	20674	15258	27125	20019	25916	19127
24"	600	8700	6421	17175	12676	16750	12362	25288.75	18664	24495	18078	33402.50	24652	32240	23794	42165	31119	40605	29968

Notes:

- 1) Torques shown are based on ambient temperature
- 2) Torques shown in this table are to be used as a guide for actuator selection. A safety factor of 1.3~1.5 is recommended for actuator sizing.
- 3) It is recommended that a margin of 5 should be kept for adjustment at opening and closing position of the actuator.

Flow Coefficient (C_v Value)

Class 150

Size		Disc Opening Angle								
in	mm	10°	20°	30°	40°	50°	60°	70°	80°	90°
3"	80	6	16	24	35	51	75	112	144	160
4"	100	12	29	44	64	93	136	203	261	290
6"	150	32	79	119	174	253	371	553	711	790
8"	200	58	146	219	321	467	686	1022	1314	1460
10"	250	101	253	380	557	810	1189	1771	2277	2530
12"	300	159	398	597	876	1274	1871	2786	3582	3980
14"	350	222	556	834	1223	1779	2613	3892	5004	5560
16"	400	318	794	1191	1747	2541	3732	5558	7146	7940
18"	450	382	956	1434	2103	3059	4493	6692	8604	9560
20"	500	544	1360	2040	2992	4352	6392	9520	12240	13600
24"	600	752	1880	2820	4136	6016	8836	13160	16920	18800
28"	700	1072	2680	4020	5896	8576	12596	18760	24120	26800
30"	750	1228	3070	4605	6754	9824	14429	21490	27630	30700
32"	800	1400	3500	5250	7700	11200	16450	24500	31500	35000
36"	900	1720	4300	6450	9460	13760	20210	30100	38700	43000
40"	1000	2276	5690	8535	12518	18208	26743	39830	51210	56900
42"	1050	2468	6170	9255	13574	19744	28999	43190	55530	61700
48"	1200	3240	8100	12150	17820	25920	38070	56700	72900	81000

Class 300

Size		Disc Opening Angle								
in	mm	10°	20°	30°	40°	50°	60°	70°	80°	90°
3"	80	6	16	24	35	51	75	112	144	160
4"	100	12	29	44	64	93	136	203	261	290
6"	150	32	79	119	174	253	371	553	711	790
8"	200	53	133	200	293	426	625	931	1197	1330
10"	250	84	211	317	464	675	992	1477	1899	2110
12"	300	146	365	548	803	1168	1716	2555	3285	3650
14"	350	185	462	693	1016	1478	2171	3234	4158	4620
16"	400	251	628	942	1382	2010	2952	4396	5652	6280
18"	450	344	859	1289	1890	2749	4037	6013	7731	8590
20"	500	418	1045	1568	2299	3344	4912	7315	9405	10450
24"	600	651	1628	2442	3582	5210	7652	11396	14652	16280
28"	700	936	2340	3510	5148	7488	10998	16380	21060	23400
30"	750	1160	2900	4350	6380	9280	13630	20300	26100	29000
32"	800	1304	3260	4890	7172	10432	15322	22820	29340	32600
36"	900	1660	4150	6225	9130	13280	19505	29050	37350	41500
40"	1000	1996	4990	7485	10978	15968	23453	34930	44910	49900