FRISCH
ENGINEERED PRODUCTS INC.

CORPORATE OFFICE/PLANT
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Triple Offset Butterfly Valves

CORPORATE PROFILE

Since 1960s the Frisch name has been synonymous with great quality, innovative design, & timely customer service. Frisch's new ownership created a cohesive management team in 1998 comprised of leaders from the valve industry in management, marketing, engineering, and manufacturing.

Our Team merged the best of innovative ideas with a wealth of valve industry experience to create a powerful impetus moving our company forward.

The wide range of products we offer at Frisch speak for themselves. Custom engineered to meet each client's individual needs, Frisch stays on the leading edge to ensure every client is completely satisfied with the product they receive.

THE STRENGTHS OF OUR COMPANY:

- Custom Design and Fabrication to meet every clients individual requirements
- Focus is on Critical or Severe Service Applications
- Flexible Manufacturing Ability
- Diverse Metallurgical Expertise
- Great Products
- The latest Material Requirement Planning (MRP)
- Stringently enforced quality control program in conformance with the Latest ISO Requirements

5. TRIPLE OFFSET BUTTERFLY VALVE

- Triple offset geometry
- Sizes - 2" to 96" in Pressure Classes 125 to 1500 ANSI
- Service Temperatures from –320 to +1600°F
- Seat Design to Achieve 100% Bi-directional Shutoff
- Inherently Firesafe
- Excellent flow and throttling characteristics
- Can be custom designed to meet special face to face or bolting as required by each client

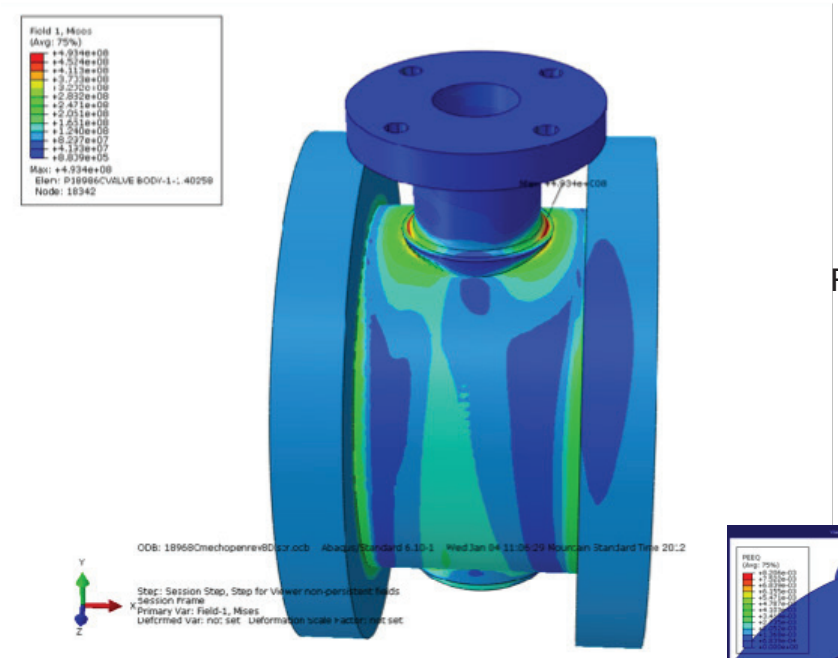
DESIGN STANDARDS DETAIL

- API 609 - 8th Edition
- ASME/ANSI B16.34 – 2017
- ASME B31.1 & B31.3 – 2018
- API 607 7th Edition Fire Rating
- NACE MR0175 – 2009 Corrosion Standard
- FCI 70-2, API 598 , MSS SP61 Leakage Standards
- ANSI B 16.5, B16.47, AWWA C207, DIN PN, JIS & other lange designs available,
- EPA21 is met with less than 50PPM fugitive emissions with advanced packing technology
- Finite Element design available for severe service

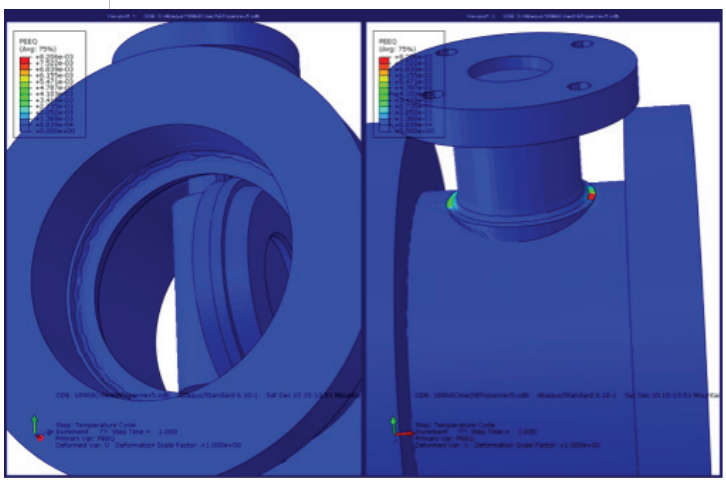
5. TRIPLE OFFSET BUTTERFLY VALVE

DESIGN STANDARDS DETAILS

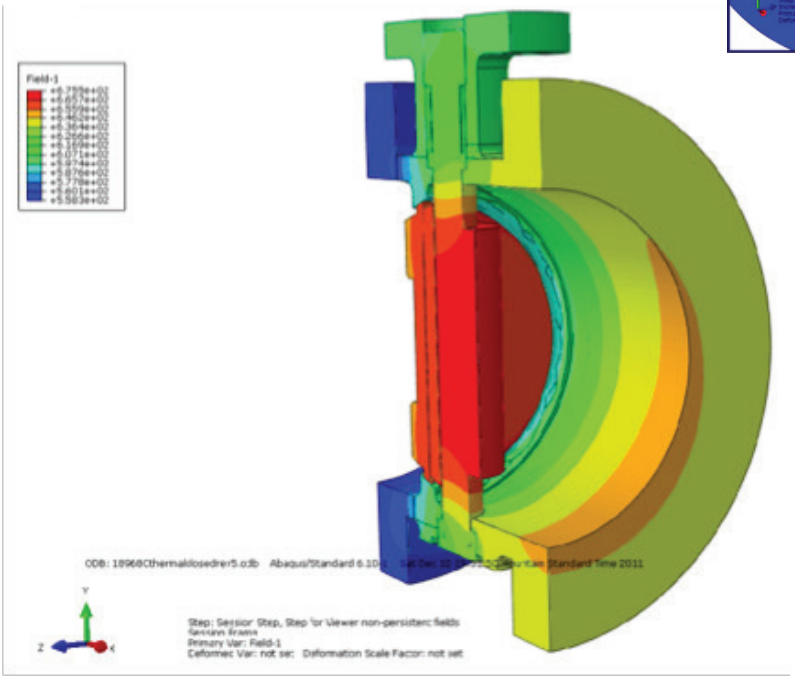
Finite Element design available for severe service applications



Fatigue Plot



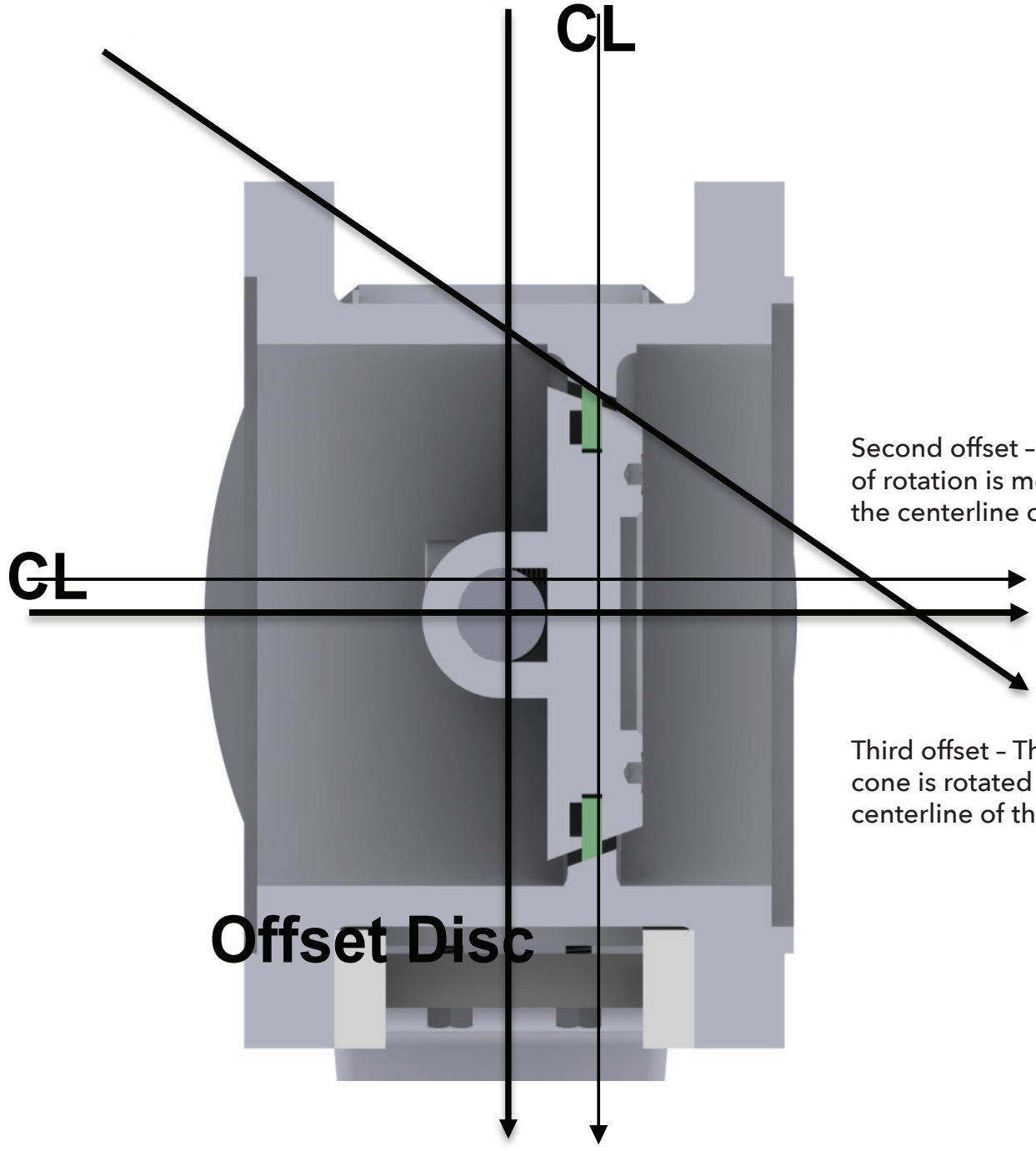
Strain Plots



Thermal Plot
- Section

5. TRIPLE OFFSET BFV

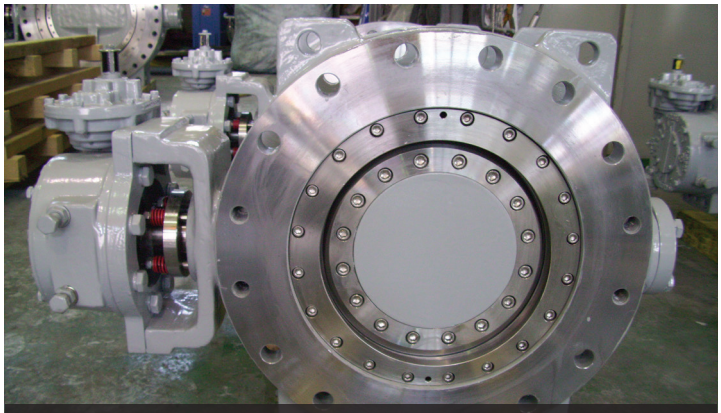
1st First offset -The center of rotation is moved back from the centerline of the valve disc



Second offset – The center of rotation is moved from the centerline of the body.

Third offset – The center of cone is rotated from the centerline of the body.

5. TRIPLE OFFSET BFV



16in ANSI 1500 MGO Triple Offset Valve

20in & 24in ANSI 150 Triple Offset Valves

30in ANSI 600 Triple Offset Valve

40in ANSI 150 Triple Offset Valves

TRIPLE OFFSET BUTTERLY VALVE TORQUE TABLE

VALVE SIZE	CLASS 150Lb(20 BAR G) PREFERRED DIRECTION	
	UNSEATING (N.m)	SEATING (N.m)
2	60	50
3	95	79
4	162	135
5	253	211
6	364	304
8	737	614
10	1187	989
12	1835	1524
14	2670	2225
16	3712	3094
18	4984	4153
20	6506	5422
24	10389	8658
28	15535	12946
30	18636	15530
32	22119	18433
36	30319	25265
40	40311	33592
42	46035	38363
48	66393	55327

VALVE SIZE	CLASS 300Lb(52 BAR G) PREFERRED DIRECTION	
	UNSEATING (N.m)	SEATING (N.m)
2	96	80
3	260	217
4	412	351
5	658	548
6	1028	857
8	1972	1643
10	3307	2756
12	5088	4240
14	7369	6141
16	10205	8504
18	13699	11375
20	17759	14799
24	28189	23491

VALVE SIZE	CLASS 600Lb(100 BAR G) PREFERRED DIRECTION	
	UNSEATING (N.m)	SEATING (N.m)
3	518	432
4	878	732
6	2132	1777
8	4069	3390
10	6791	5659
12	10404	8670
14	15012	12510
16	20719	17266
18	27630	23025
20	35850	29875
24	56634	47195

TRIPLE OFFSET BUTTERLY VALVE TORQUE TABLE

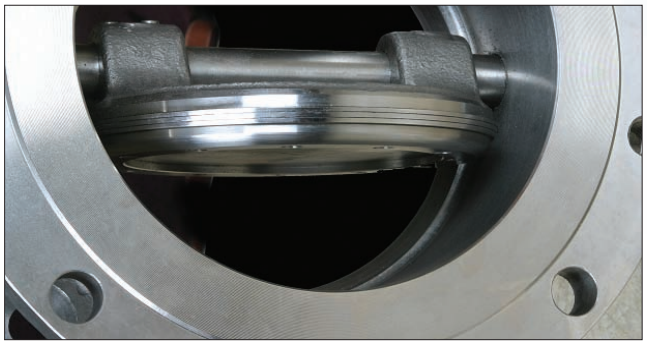
VALVE SIZE	CLASS 900Lb(150 BAR G) PREFERRED DIRECTION	
	UNSEATING (N.m)	SEATING (N.m)
3	777	647
4	1422	1185
6	3432	2860
8	6518	5432
10	10835	9029
12	16539	13782
14	23786	19822
16	32733	27278
18	43537	36281
20	56354	46962
24	88654	73879

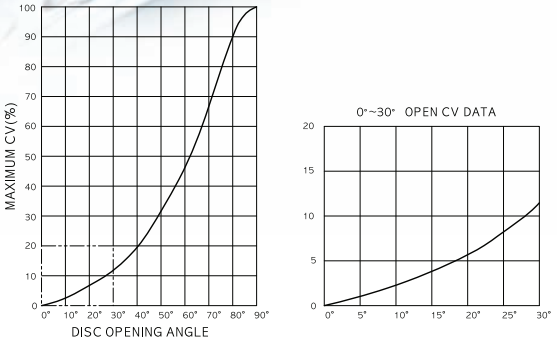
VALVE SIZE	CLASS 1500Lb(255 BAR G) PREFERRED DIRECTION	
	UNSEATING (N.m)	SEATING (N.m)
6	5835	4862
8	11080	7233
10	18417	15348
12	28112	23427
14	40430	33692
16	55635	46364
18	73997	61664
20	95777	79814
24	150660	125550

- Contact the sales office for torque figures not shown above.
- Frisch suggests a minumum of 20% Safety Factor on the above torques.
- Although the valves are suitable for Bi-Directional use, the offset geometry creates a Preferred direction of flow which if used(for uni-directional flow) can show a torque and actuator size reduction.
- Run torques are 40% of the Preferred direction Opening torque.
- Torques shown are valid for temperatures of -100℃(-148℉) to+538℃(+1000℉) For temperatures outside this range consult Frisch.
- Torques shown assume a maximum liquid velocity(pipe line) of 5 m/s. For higher liquid velocity, where hydrodynamic torque may need to be considered, consult Frisch.
- Please ensure that any actuator chosen to operate the Frisch valve is capable of supplying 5° over-travel and has mechanical limit stops controlling the closed position.
- Note that operators must be dowelled to the valve mounting plate. Dowels with be supplied with bare shaft valves but it is the purchasers responsibility to ensure separately purchased operators and mounting kits are machined to accommodate these dowels.
- If in doubt, contact the sales office.

TORQUE CONVERSION FACTORS				
N m	kN m	kgf m	lbf in	lbf ft
1	0.001	0.102	8.85	0.738
1000	1	101.972	8851	737.6
9.807	.0098	1	86.8	7.233
0.113	1.13 × 10-4	0.01155	1	0.083
1.356	0.0014	0.138	12	1

TRIPLE OFFSET BUTTERFLY VALVE 'CV' VALUES





FLOW GRAPH

150LB MANUAL GEAR OPERATING TYPE

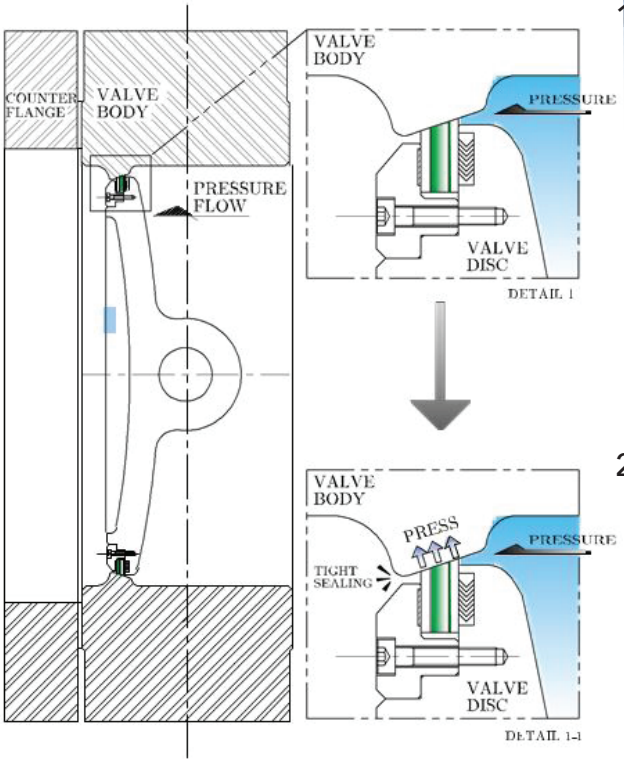
SIZE		5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°
mm	inch																		
80	3	1	6	14	23	31	39	47	54	62	71	82	96	112	128	143	156	163	165
100	4	2	12	26	42	57	72	85	98	113	130	150	176	205	234	262	285	299	302
150	6	16	31	45	59	76	101	134	178	233	297	369	448	531	616	698	758	796	800
200	8	30	57	82	108	140	185	246	327	427	544	676	821	974	1130	12810	1390	1460	1460
250	10	52	99	142	187	242	320	426	566	739	942	1170	1420	1690	1960	2220	2410	2530	2530
300	12	78	147	212	279	362	478	636	846	1100	1410	1750	2120	2520	2920	3310	3600	3780	3780
350	14	106	201	289	380	493	651	866	1150	1500	1920	2380	2890	3430	3980	4510	4890	5140	5140
400	16	165	313	451	594	769	1020	1350	1800	2350	2990	3720	4510	5350	6210	7040	7640	8020	8020
450	18	217	413	594	782	1010	1340	1780	2370	3090	3940	4890	5940	7050	8180	9270	10100	10600	10600
500	20	268	509	733	965	1250	1650	2200	2920	3820	4860	6040	7340	8710	10100	11400	12400	13000	13000
600	24	386	734	1060	1390	1800	2380	3170	4210	5500	7000	8700	10600	12500	14500	16500	17900	18800	18800
700	28	559	1060	1530	2010	2610	3450	4590	6100	7960	10100	12600	15300	18200	21100	23900	25900	27200	27200
750	30	630	1200	1720	2270	2940	3880	5160	6870	8960	11400	14200	17200	20400	23700	28900	29200	30700	30700
800	32	719	1370	19710	2590	3360	4440	5900	7840	10200	13000	16200	19700	23300	27100	30700	33300	35000	35000
900	36	884	1680	2420	3180	4120	5450	7250	9630	12600	16000	19900	24200	28700	33300	37700	40900	43000	43000
1000	40	1170	2220	3190	4210	5450	7210	9580	12700	16600	21200	26300	31900	37900	44000	49800	54100	56900	56900
1050	42	1230	2340	3370	4440	5760	7610	10100	13400	17600	22400	27800	33700	40000	46500	52600	57100	60000	60000
1200	48	1640	3120	4490	5920	7670	10100	13500	17900	23400	29800	37000	45000	53400	61900	70100	76100	80000	80000

300LB MANUAL GEAR OPERATING TYPE

SIZE		5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°
mm	inch																		
80	3	1	6	14	23	31	39	47	54	62	71	82	96	112	128	143	156	163	165
100	4	2	12	26	42	57	72	85	98	113	130	150	176	205	234	262	285	299	302
150	6	6	25	41	54	69	91	121	162	212	268	334	407	482	559	634	689	725	725
200	8	11	45	74	98	126	166	222	298	389	492	613	746	884	1030	1160	1260	1330	1330
250	10	19	82	135	178	229	301	402	540	705	891	1110	1350	1600	1860	2110	2290	2410	2410
300	12	29	122	202	266	342	450	601	807	1050	1330	1660	2020	2400	2780	3150	3420	3600	3600
350	14	39	167	274	363	466	613	818	1100	1430	1810	2260	2750	3260	3780	4290	4660	4900	4900
400	16	58	248	408	539	692	910	1220	1630	2130	2690	3360	4090	4840	5610	6370	6920	7280	7280
450	18	77	326	537	710	911	1200	1600	2150	2810	3550	4420	5380	6380	7400	83920	9110	9590	9590
500	20	95	403	663	876	1130	1480	1980	2650	3460	4380	5460	6640	7880	9130	10400	11300	11800	11800
600	24	136	580	955	1260	1620	2130	2850	3820	4990	6310	7860	9570	11300	13100	14900	16200	17100	17100
700	28	199	844	1390	1840	2360	3100	4150	5560	7260	9190	11400	13900	16500	19100	21700	23600	24800	24800
750	30	232	986	1620	2150	2750	3620	4840	6490	8480	10700	13400	16300	19300	22400	25400	27500	29000	29000
800	32	261	1110	1830	2420	3100	4080	5450	7310	9550	12100	15000	18300	21700	25200	28600	31000	32600	32600
900	36	332	1410	2320	3070	3940	5190	6930	9300	12100	15400	19100	23300	27600	32000	36300	39400	41500	41500
1000	40	399	1700	2790	3690	4740	6230	8330	11200	14600	18400	23000	28000	33200	38400	43600	47400	49900	49900
1050	42	457	1940	3200	4230	5430	7140	9540	12800	16700	21100	26300	32000	38000	44000	50000	54200	57100	57100
1200	48	480	2040	33600	4440	5700	7500	10000	13400	17500	22200	27700	33700	39900	46300	52500	57000	60000	60000

TRIPLE OFFSET BUTTERFLY VALVE Cv #600										
SIZE		10°	20°	30°	40°	50°	60°	70°	80°	90°
3	80A	3.5	11.7	23.9	39.1	63.7	98	157.9	200.2	223.9
4	100A	5	18	37	60	98	151	244	309	346
5	125A	9	29	59	96	157	241	388	492	550
6	150A	13	43	87	142	231	356	573	727	813
8	200A	22	70	140	223	351	508	829	1064	1213
10	250A	34	107	208	345	535	789	1278	1651	1875
12	300A	47	145	296	491	760	1125	1822	2367	2688
14	350A	56	188	395	647	1028	1560	2654	3395	3765
16	400A	94	274	524	859	1360	2070	3419	4349	4873
18	450A	123	361	683	1121	1774	2714	4484	5752	6441
20	500A	170	482	920	1508	2387	3663	6041	7729	8660
22	550A	208	594	1133	1861	2944	4508	7435	9512	10669
24	600A	252	723	1379	2268	3588	5481	9041	11568	12985
26	650A	306	877	1672	2752	4352	6649	10967	14033	15752
28	700A	352	1010	1926	3168	5011	7656	12628	16158	18136
30	750A	414	1187	2264	3725	5892	9001	14847	18997	21323
32	800A	469	1344	2564	4218	6671	10193	16812	21512	24145
34	850A	525	1504	2868	4719	7463	11403	18808	24065	27012
36	900A	589	1688	3219	5296	8376	12797	21108	27009	30316
38	950A	659	1886	3598	5920	9362	14303	23592	30188	33884
40	1000A	714	2044	3900	6416	10148	15504	25573	32722	36728
42	1050A	801	2294	4375	7199	11386	17396	28693	36714	41209
44	1100A	881	2525	4815	7923	12531	19145	31578	40405	45353
46	1150A	966	2766	5276	8682	13730	20978	34601	44273	49694
48	1200A	1038	2973	5670	9330	14755	22543	37183	47577	53403
50	1250A	1129	3234	6169	10151	16054	24528	40457	51767	58106

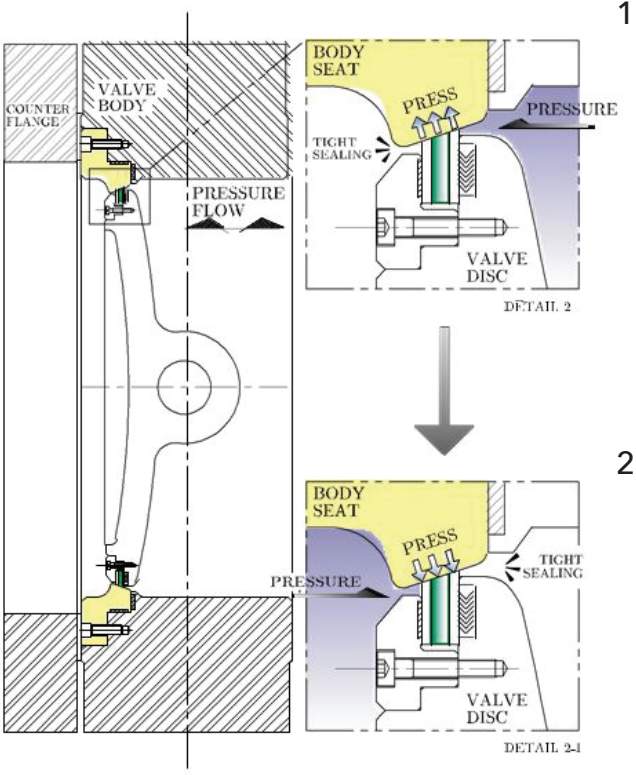
UNI-DIRECTION DESIGN



1. The seal is installed in the disc as shown in Detail 1. There is little movement of the seal and low torque is required for seating.

2. Pressure forces the seal tight to the valve body as shown in Detail 1-1.

BI-DIRECTION DESIGN



1. As shown in Detail 2, both the body and disc contain seats. Sealing is provide by the close contact between the body seat and disc seat.

2. Detail 2-1 shows that tight sealing is maintained even in the reverse direction of flow due to the close contact between the body seat and the disc seat.

Features

- Zero leakage
- Metal seated
- Bi-directional
- Inherently Fire safe
- Low operating torques
- Torque seated
- Continued sealing through thermal cycling
- Zero seat/seal friction
- Extended service life
- Excellent flow and throttling characteristics
- Excellent control of fugitive emissions
- Quarter turn operation

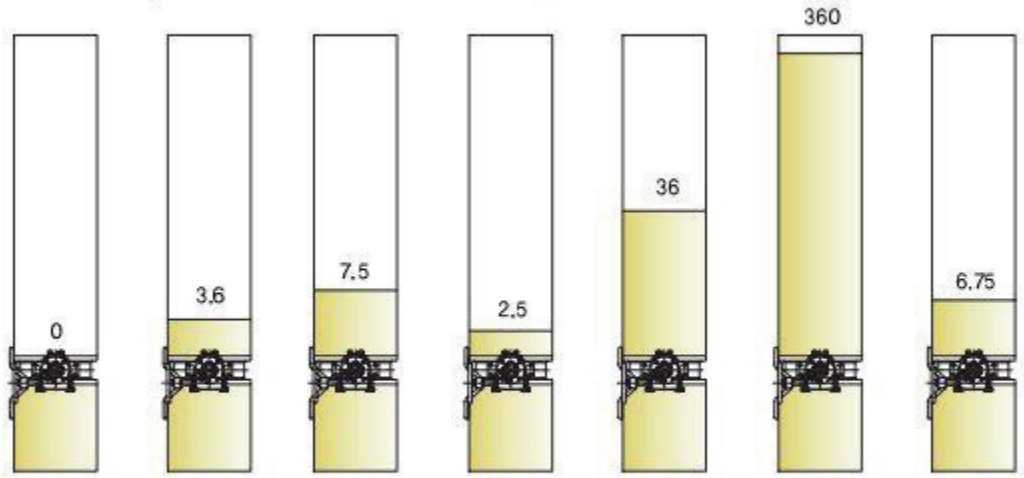
Features

- Design: ASME/ANSI B16. 34, API 609, BS 5155, DIN 3840, JIS
- Fire Safe: API 607, API 6FA, BS 6755
- Pressure Temperature ratings: ASME/ANSI B16.34
- Body & Seat Pressure Test: API Std. 598, API 6D, ISO 5208
- Seat leakage test: ANSI B16.104 class VI
- Flange drilling: ANSI B16.5, ANSI B16.47, MSS SP-44, DIN, JIS, BS
- Face to Face: ISO 5752, ANSI B16.10, API 609, BS 5155
- Marking: MSS SP-25

LEAKAGE RATE BY STANDARD

■GAS TEST

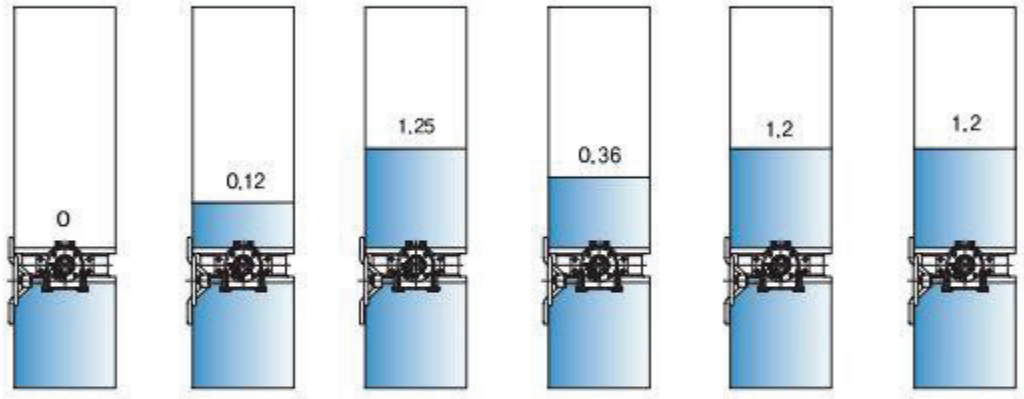
Valve Size:200mm, Unit:cc/min



Std	ISO 5208 RATE A	ISO 5208 RATE B	API 598	API 598	ISO 5208 RATE C	ISO 5208 RATE D	ANSI B 16, 105 CLASS VI
Press	6±1bar	6±1bar	4~7bar	4~7bar	6±1bar	6±1bar	

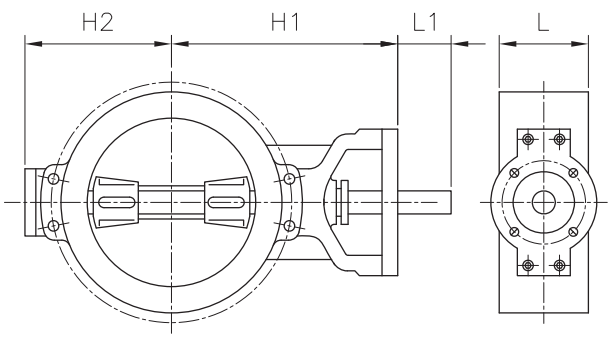
■HYDROSTATIC TEST

Valve Size:200mm, Unit:cc/min

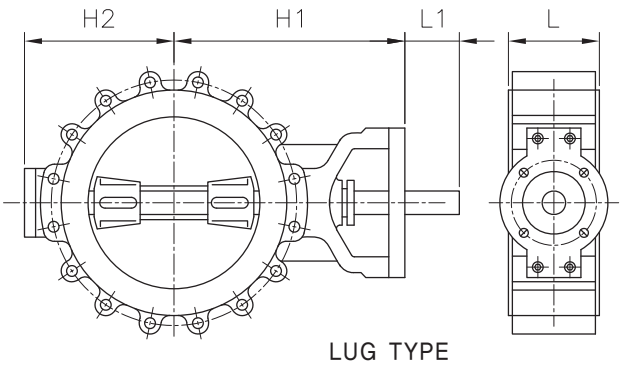


Std	ISO 5208 RATE A	ISO 5208 RATE B	API 598	ISO 5208 RATE C	ISO 5208 RATE D	ANSI B 16, 105 CLASS VI
Press	Max. working Pressure×1.1	Max. working Pressure×1.1	Design Pressure ×1.1	Max. working Pressure×1.1	Max. working Pressure×1.1	Max. working Pressure(20bar)

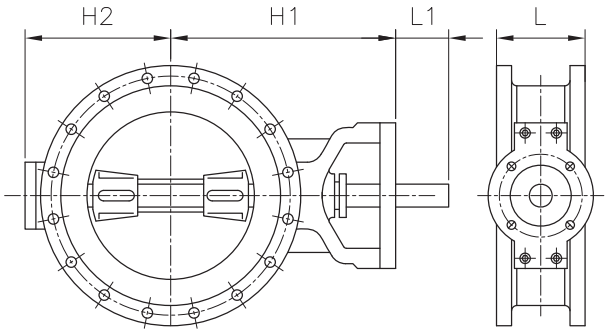
TRIPLE OFFSET BUTTERLY VALVE DIMENSION TABLE (mm)



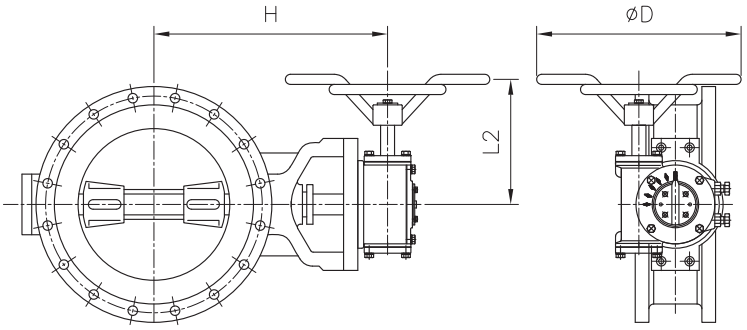
WAFER TYPE



LUG TYPE



DOUBLE FLANGE TYPE

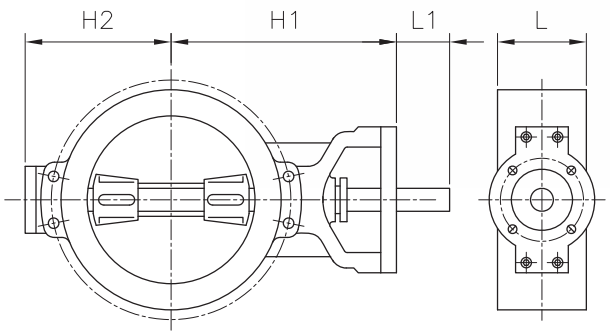


MANUAL GEAR OP

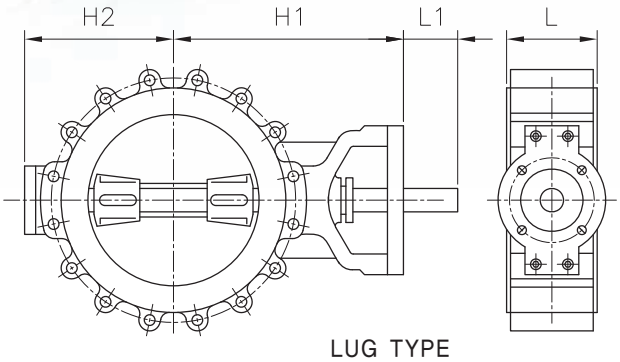
150LB MANUAL GEAR OPERATING TYPE

SIZE		H	H1	H2	L1	1 L (F TO F)			L2	ØD	※WEIGHT:Kg(APPROX)		
mm	inch	APPROX	APPROX	APPROX		WAFER	LUG	FLANGE			WAFER	LUG	FLANGE
80	3		165	127	35	48	48	114	206	300	20	21	32
100	4		200	150	35	54	54	127	206	300	20	21	37
150	6	300	245	180	35	57	57	140	206	300	20	22	48
200	8	310	260	195	35	64	64	152	206	300	45	47	89
250	10	335	285	225	65	71	71	165	206	300	57	61	112
300	12	390	335	265	80	81	81	178	230	400	85	91	161
350	14	420	365	290	80	92	92	190	230	400	133	142	228
400	16	500	435	340	80	102	102	216	279	450	186	199	303
450	18	515	452	360	80	114	114	222	279	450	213	229	364
500	20	565	500	395	80	127	127	229	312	560	334	364	499
600	24	635	570	465	110	154	154	267	312	560	455	492	699
700	28	775	685	570	130	165	165	292	371	630	718	777	860
750	30	785	695	600	130	165	165	318	371	630	864	934	1085
800	32	840	750	630	130	190	190	318	425	710	1090	1119	1241
900	36	910	820	690	160	200	200	330	425	710	1418	1553	1716
1000	40	925	835	720	175	216	216	410	425	710	1743	1943	2208
1050	42	980	860	750	175	251	251	410	513	800	2108	2343	2488
1200	48	1140	1020	845	200	276	276	470	513	800	3004	3284	3440

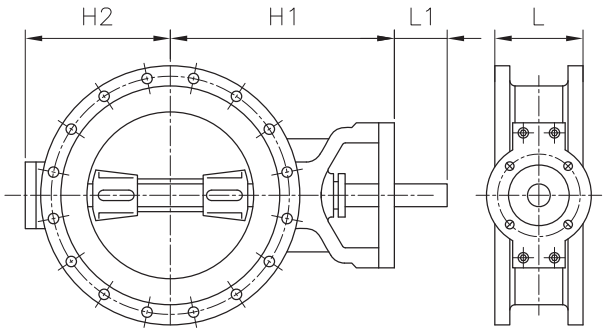
FLANGE RATING-ACCORDING TO ANSI B 16.5/ASME 16.47 SERIES "A" & "B"/DIN/BS/JIS/USER SPEC
※1 FACE TO FACE DIMENSION-ACCORDING TO MAKER STANDARD.
※2 EXCEPT ACTUATOR



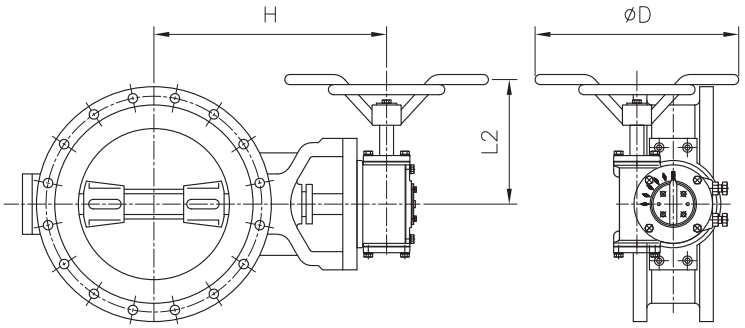
WAFER TYPE



LUG TYPE



DOUBLE FLANGE TYPE

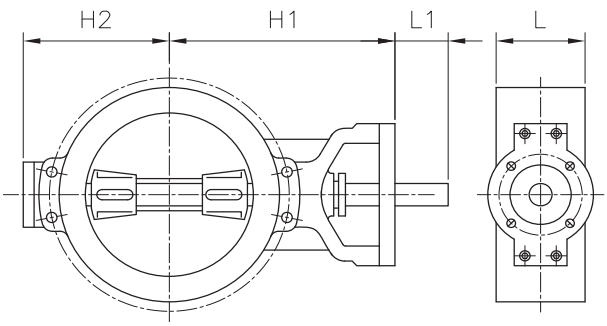


MANUAL GEAR OP

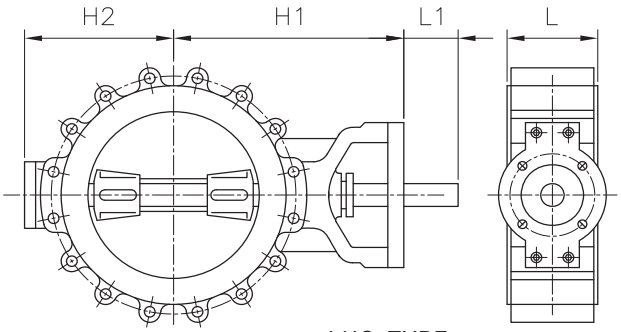
300LB MANUAL GEAR OPERATING TYPE

SIZE		H	H1	H2	L1	1 L (F TO F)			L2	ØD	※WEIGHT:Kg(APPROX)		
mm	inch	APPROX	APPROX	APPROX		WAFER	LUG	FLANGE			WAFER	LUG	FLANGE
80	3		165	127	35	40	48	114	206	300	20	21	36
100	4		200	151	35	54	54	127	206	300	20	21	46
150	6	330	280	199	65	59	59	140	206	300	36	39	76
200	8	350	295	218	80	73	73	152	230	400	51	56	93
250	10	395	340	251	80	83	83	165	230	400	100	112	164
300	12	450	395	296	80	92	92	178	230	400	134	150	222
350	14	490	425	331	80	117	117	190	279	450	196	229	298
400	16	545	480	377	110	133	133	216	279	450	232	277	357
450	18	605	540	410	110	149	149	222	312	560	360	433	499
500	20	645	580	440	130	159	159	229	312	560	457	549	621
600	24	740	650	515	130	181	181	267	371	630	670	805	916
700	28	910	820	640	200	229	229	292	371	630	1193	1363	1417
750	30	940	850	690	200	241	241	318	425	710	1463	1658	1715
800	32	970	880	720	200	241	241	318	425	710	1661	1856	1957
900	36	1050	960	780	200	260	260	330	425	710	2281	2511	2590
1000	40	1110	990	800	200	300	300	410	513	800	2214	2425	2585
1050	42	1160	1050	840	200	300	300	410	513	800	2439	2649	2849
1200	48	1270	1150	950	250	320	320	470	536	900	3384	3684	4106

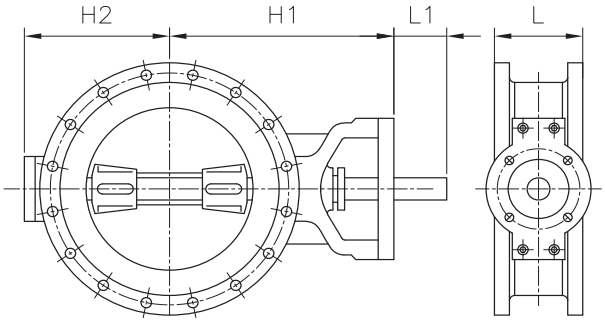
FLANGE RATING-ACCORDING TO ANSI B 16.5/ASME 16.47 SERIES "A" & "B"/DIN/BS/JIS/USER SPEC
※1 FACE TO FACE DIMENSION-ACCORDING TO MAKER STANDARD.
※2 EXCEPT ACTUATOR



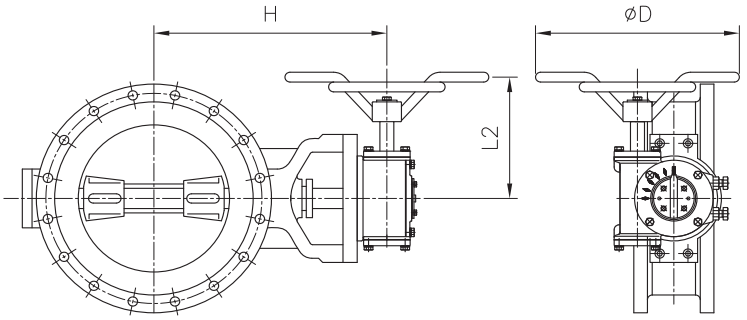
WAFER TYPE



LUG TYPE



DOUBLE FLANGE TYPE

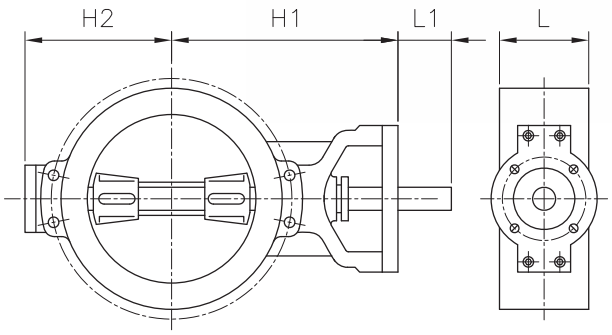


MANUAL GEAR OP

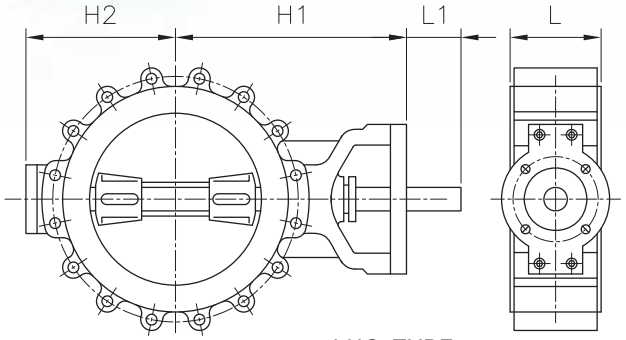
600LB MANUAL GEAR OPERATING TYPE

SIZE		H	H1	H2	L1	1 L (F TO F)			L2	ØD	※WEIGHT:Kg(APPROX)		
mm	inch	APPROX	APPROX	APPROX		WAFER	LUG	FLANGE			WAFER	LUG	FLANGE
80	3		210	154	45	54	54	180	230	400	15	16	43
100	4		215	166	45	64	64	190	230	400	28	30	69
150	6	365	310	238	80	78	78	210	230	400	65	72	135
200	8	380	325	248	80	102	102	230	230	400	92	102	162
250	10	465	400	316	80	117	117	250	279	450	134	187	268
300	12	520	455	349	110	140	140	270	312	560	224	259	369
350	14	535	470	374	110	155	155	290	312	560	285	329	364
400	16	675	585	474	130	178	178	310	371	630	455	520	632
450	18	715	625	476	130	200	200	330	371	630	555	635	739
500	20	760	670	504	130	216	216	350	425	710	694	804	879
600	24	840	750	55	180	232	232	390	425	710	1093	1243	1423
700	28	PLEASE CONTACT THE SALES OFFICE.											
750	30												
800	32												
900	36												
1000	40												
1050	42												
1200	48												

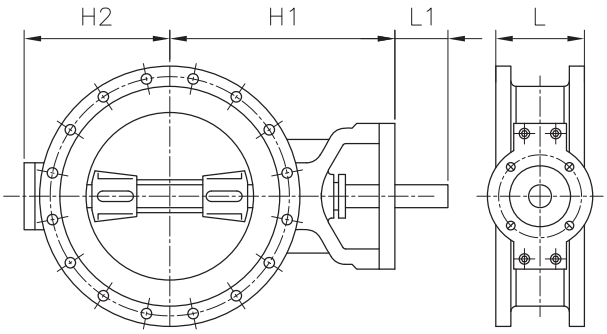
FLANGE RATING-ACCORDING TO ANSI B 16.5/ASME 16.47 SERIES "A" & "B"/DIN/BS/JIS/USER SPEC
※1 FACE TO FACE DIMENSION-ACCORDING TO MAKER STANDARD.
※2 EXCEPT ACTUATOR



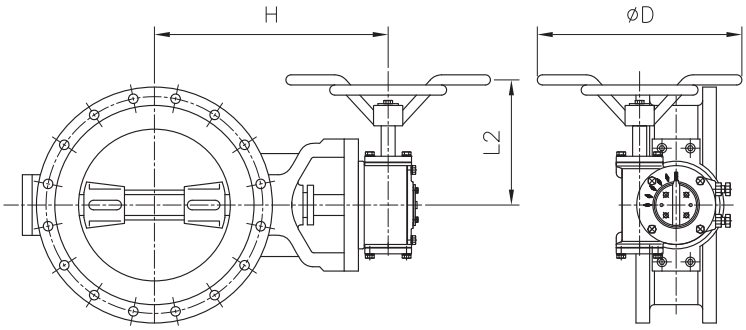
WAFER TYPE



LUG TYPE



DOUBLE FLANGE TYPE



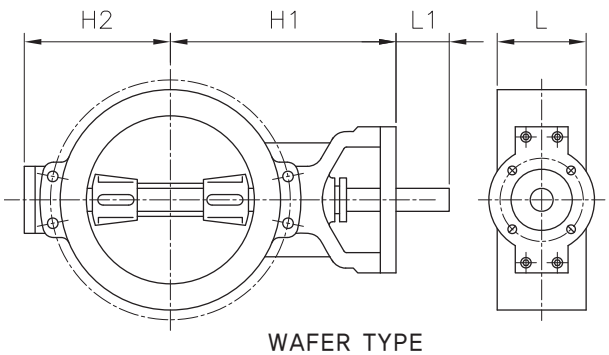
MANUAL GEAR OP

900LB MANUAL GEAR OPERATING TYPE

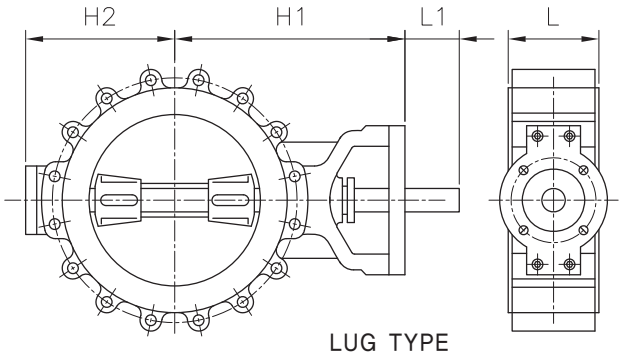
SIZE		H	H1	H2	L1	1 L (F TO F)			L2	ØD	※WEIGHT:Kg(APPROX)		
mm	inch	APPROX	APPROX	APPROX		WAFER	LUG	FLANGE			WAFER	LUG	FLANGE
150	6	400	335	238	80	104	104	250	279	450	89	100	184
200	8	445	380	281	80	112	112	310	312	560	134	151	256
250	10	500	435	358	110	135	135	350	312	560	224	256	425
300	12	590	500	383	110	170	170	380	371	630	298	352	496
350	14	635	545	419	130	173	173	400	371	630	376	440	656
400	16	730	640	455	130	210	210	430	425	710	570	663	834
450	18	780	690	503	180	228	228	460	425	710	691	824	1044
500	20	830	710	550	180	250	250	490	513	800	905	1069	1273
600	24	950	820	656	200	275	275	530	513	800	1317	1704	2506
700	28	PLEASE CONTACT THE SALES OFFICE.											
750	30												
800	32												
900	36												
1000	40												
1050	42												
1200	48												

FLANGE RATING-ACCORDING TO ANSI B 16.5/ASME 16.47 SERIES "A" & "B"/DIN/BS/JIS/USER SPEC
※1 FACE TO FACE DIMENSION-ACCORDING TO MAKER STANDARD.
※2 EXCEPT ACTUATOR

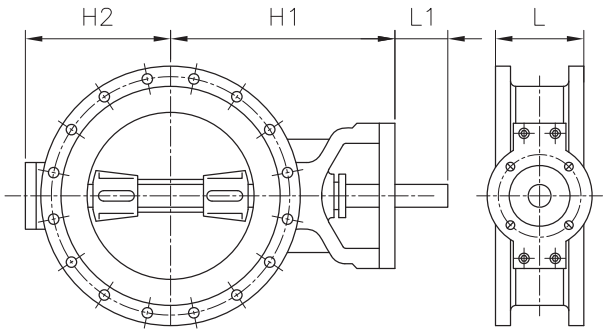
TRIPLE OFFSET BUTTERLY VALVE DIMENSION TABLE (mm)



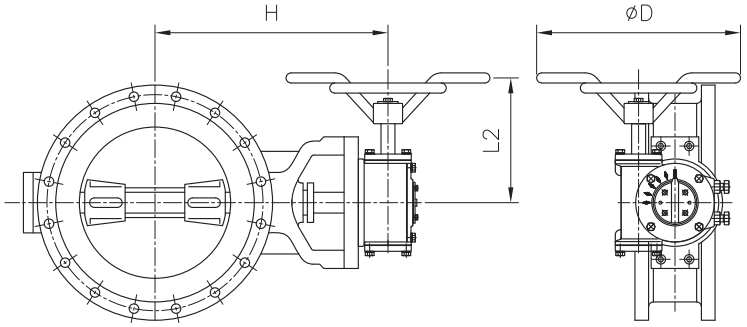
WAFER TYPE



LUG TYPE



DOUBLE FLANGE TYPE



MANUAL GEAR OP

1500LB MANUAL GEAR OPERATING TYPE

SIZE		H APPROX	H1 APPROX	H2 APPROX	L1	1 L (F TO F)			L2	ØD	※WEIGHT : Kg(APPROX)		
mm	inch					WAFER	LUG	FLANGE			WAFER	LUG	FLANGE
150	6	435	370	257	110	160	160	290	312	560	124	175	207
200	8	520	430	307	110	180	180	330	371	630	202	237	406
250	10	630	540	371	130	200	200	390	371	630	282	379	646
300	12	665	575	414	130	230	230	430	425	710	360	605	842
350	14	740	650	493	180	250	250	470	425	710	589	849	1163
400	16	820	700	530	200	265	265	510	513	800	614	995	1476
450	18	920	800	591	200	300	300	550	513	800	992	1478	1968
500	20	975	850	664	200	340	340	630	536	900	1597	2248	2782
600	24	1125	1000	780	250	400	400	710	536	900	1792	3021	4288
700	28	PLEASE CONTACT THE SALES OFFICE.											
750	30												
800	32												
900	36												
1000	40												
1050	42												
1200	48												

FLANGE RATING-ACCORDING TO ANSI B 16.5/ASME 16.47 SERIES "A" & "B"/DIN/BS/JIS/USER SPEC
※1 FACE TO FACE DIMENSION-ACCORDING TO MAKER STANDARD.
※2 EXCEPT ACTUATOR

INDUSTRIES SERVED

1. SULPHURIC ACID PLANTS

- Bypass Air to SO2 Converter
- Waste Heat Isolation
- Main Blower Discharge Isolation
- Pre-Heat Duct Isolation for Start-up
- Pass 1, 2, 3, & 4 Converter Heat Up Duct
- Cold HEX to Process Air Preheater
- CIP outlet to CIP Inlet

2. SOUR GAS PROCESSING

- Bypass Air to SO2 Converter
- Waste Heat Isolation
- Sulphreen Train Switching
- Reaction Furnace Hot Gas Bypass Temperature Control
- Liquid Sulphur Feed Isolation
- Acid Gas Isolation Valves
-

3. OIL REFINERIES

- SRU
- Waste Heat Boiler Isolation
- Reaction Furnace Hot Gas Bypass Temperature Control
- Turbo Expander Inlet Control & Bypass Isolation
- Coker Dump Valve
- CO Boiler Isolation
- RCCU/FCCU Isolation Valves

4. POWER PLANTS/CO-GEN PLANTS

- Waste Heat Boiler Isolation
- Dry Scrubber Isolation
- Fly Ash Isolation
- NO Emission Control System Isolation
- Flue Gas Isolation & Control
- Steam Isolation & Control

5. STEEL MILLS & SMELTERS

- Waste Heat Boiler Isolation
- Blast Furnace Gases Isolation
- Emission Control System Isolation
- Flue Gas Isolation & Control

FRISCH'S CORPORATE COMMITMENTS

WE SUSTAIN AND RETAIN employee excellence and commitment through ownership, education, and training.

WE WILL NEVER compromise quality.

WE WILL ALWAYS uphold our commitment to low cost manufacturing.

ENSURE ON-TIME DELIVERY of valves our customers can depend on.

PRODUCTS

Frisch valves and dampers include a wide variety of types and sizes of **butterfly, angle, diverter, guillotine, gate, and refractory lined** designs. Valve seats and seals of creative design configurations progress from swing-through for precise **low pressure flow** control to machined hard faced seats for **very tight shutoff** to FCI 70.2 Class V.

Sizes: 2" to 144" for the products listed to the right
Pressure Classes to ANSI 1500
Services temperatures from -400°F to 3000°F

We manufacture the following products:

Butterfly Valves
Rubber Seated, Metal Seated, Swing Through

Guillotine Dampers
Round, Rectangular, Zero Leak, Refractory Lined

Slide Gate Valves
Parallel, Wedge Type, Refractory Lined

Multi Blade Dampers
Parallel or Opposed Blade, Refractory Lined

Angle Valves
Metal Seated, Refractory Lined

Diverters & Mixing Valves
Y or T Configurations, 2, 3, or 4 Way

FRISCH FIGURE NUMBER SYSTEM

	VALVE TYPE	DESIGN PRESSURE	BODY END STYLE	BODY MATERIAL	TRIM AREA
Eg.:	20	0010	- RF	-AA	-AE

Butterfly Valve, designed for 10 PSI @ 800°F, with Raised Face Flanged Ends, Body is Carbon Steel, and Trim is 304 Stainless Steel

FRISCH VALVE TYPE

20 - Concentric Butterfly Valve or Damper
21 - Butterfly - O-Ring Single Offset
22 - Butterfly - Double Offset
23 - Triple Offset Valve
24 - Unassigned
25 - Refractory Lined Butterfly
30 - Plug/Jug Valve
31 - Poppet Valve
35 - Refractory Lined jug Valve
40 - Unassigned
50 - Multi Blade Louver
55 - Multi Blade Refractory Lined Louver
60 - Flex Wedge Gate Valve
62 - Double Block & Bleed Gate Valve
65 - Refractory Lined Gate Valve
70 - Check (discontinued)
80 - Diverter - T
85 - Diverter - T - Refractory
90 - Diverter - Y
95 - Diverter - Y - Refractory

DESIGN PRESSURE

0001- 1- 9999 Psig

BODY END CONNECTION/ BODY STYLE

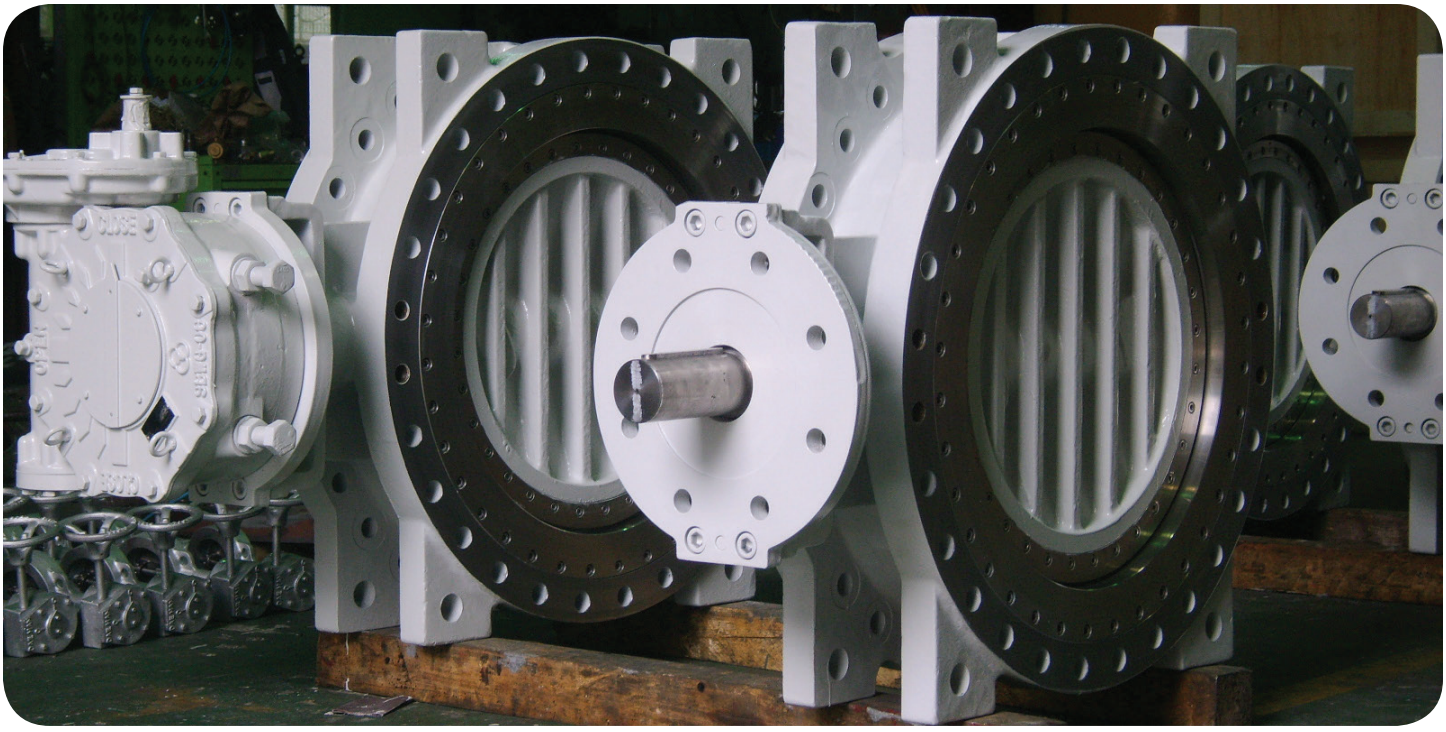
BW - Buttweld Ends
FF - Flat Face Flange
RF - Raised Face Flange
RT - Ring Type Joint Flange
LG - Lugged Body
WF - Wafer Flange
ZZ - Other - Specify

BODY MATERIAL

AA - A36/44W Carbon Steel
AB - A516GR70/A216WCB/A105
AC - A387GR11/A217WC6/A182F11
AD - A387GR22/A217WC9/A182F22
AE - A240T304/A351CF8/A182F304
AF - A240T304H/A351CF8/A182F304H
AG - A240T316/A351CF8M/A182F316
AH - A240T347/A351CF8C/A182F347
AI - Inconel 625/A494CW6MC/B564NO6625
ZZ - Other - Specify

TRIM MATERIAL

Same Code As Body



CORPORATE OFFICE

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