

Triple Off-Set Butterfly Valve



1. Overview

The triple offset butterfly valve is a high-performance derivative of butterfly valves, featuring a triple offset design of the valve stem. Compared with ordinary centerline butterfly valves, it has excellent sealing performance, wear resistance, small opening and closing torque, and a wider range of applicable working conditions.



2. Application

- Power Industry
- Petrochemical Industry
- Metallurgy Industry
- Water Treatment
- Gas Transmission
- Pharmaceutical Industry

3. Specifications

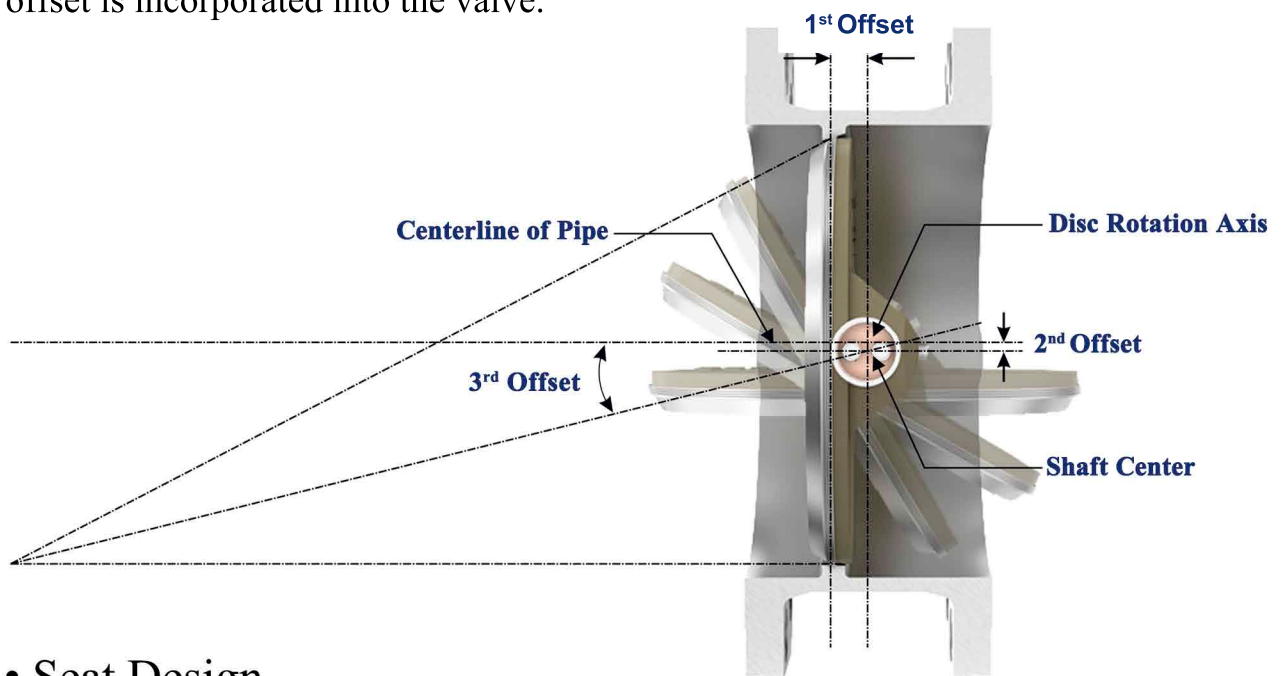
- Size: DN50 - DN2000 (2" - 80")
- Pressure Rating: PN6 - 100 (150 - 900LB)
- Design Standard: API 609, EN 593
- Connection: Flange, Wafer, Butt Weld, Lug
- Actuation: Manual, Pneumatic, Electric
- Temperature Range: -60°C to +400°C



4. Design Features

• Triple Offset Design

Double offset butterfly valves outperform centric and single offset types thanks to the disc's cam-type motion, yet they are not entirely friction-free. During roughly 50% of the operating stroke, the seal and valve seat make slight contact. Thus, they adopt soft sealing systems, which limit their high-temperature and high-pressure resistance. To resolve this issue, a third offset is incorporated into the valve.



• Seat Design

- (1) Normally unidirectional, optional bidirectional.
- (2) Solid metal-to-metal seat and laminated seat.
- (3) Maximum leakage class is Class VI (zero leakage).



Solid Metal To Metal Seat

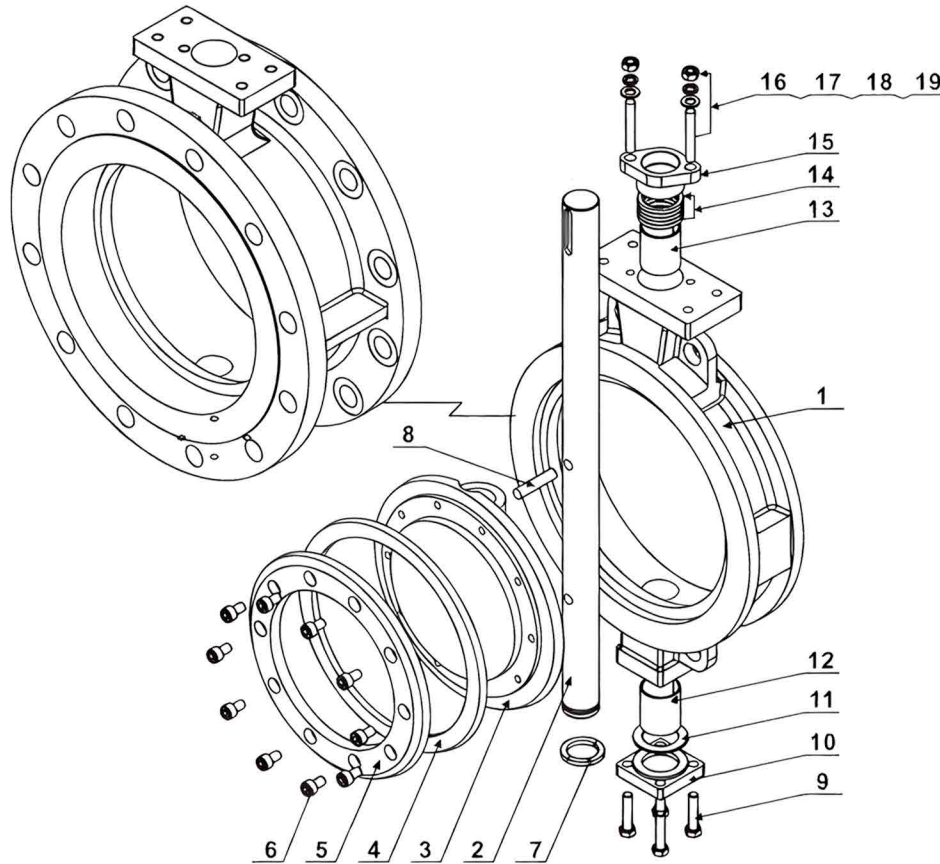


Laminated Sealing Seat



Class VI Leakage Rate

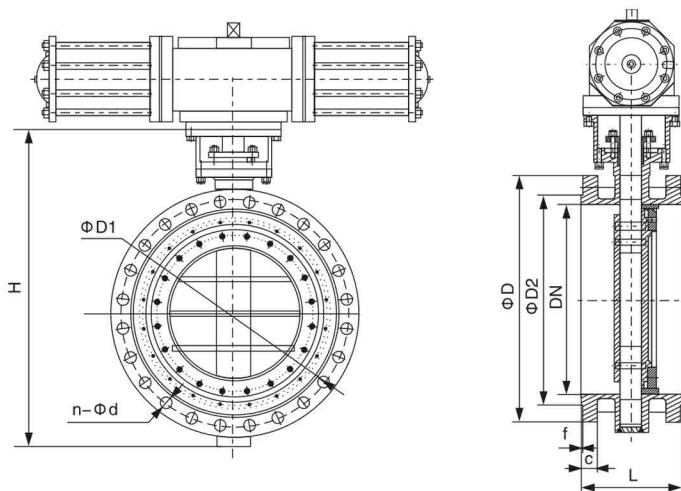
5. Valve Parts Materials



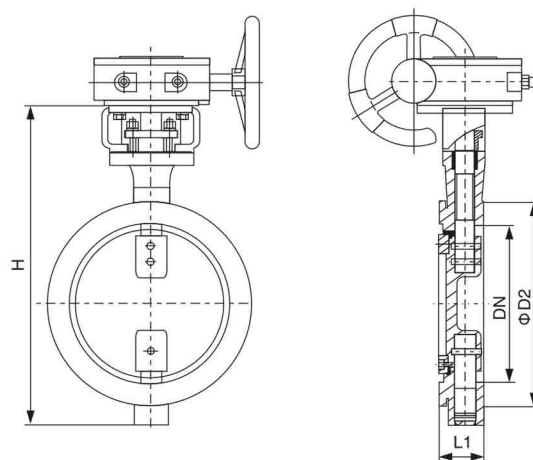
No.	Part Name	Standard Material	Optional Material
1	Body	316L, WCB	CF8, CF8M
2	Shaft	XM-19	17-4PH, SS304, SS316, SS410
3	Disc	CF3M	WCB, CF8, CF8M
4	Sealing Ring	316L + Graphite	PTFE
5	Retainer Flange	CF3M	Carbon Steel, SS304, SS316
6	Hexagon Bolt	SS304	SS316
7	Split Collar	SS304	SS316
8	Pin	SS316L	SS304, SS316
9	Hexagon Bolt	SS304	SS316
10	Blind Flange	CF8M, WCB	CF8, CF8M
11	Gasket	SS304	Spiral Wound Metal/Graphite
12	Self-Lubricating Bearing	SS304 + N	Composite Material
13	Self-Lubricating Bearing	SS304 + N	Composite Material
14	Packing	Graphite	PTFE
15	Gland	CF8M, WCB	WCB, CF8, CF8M
16	Stud	SS304	SS304
17	Washer	SS304	SS304
18	Spring Washer	SS304	SS304
19	Nut	SS304	SS304

6. Valve Dimensions

Flange Type

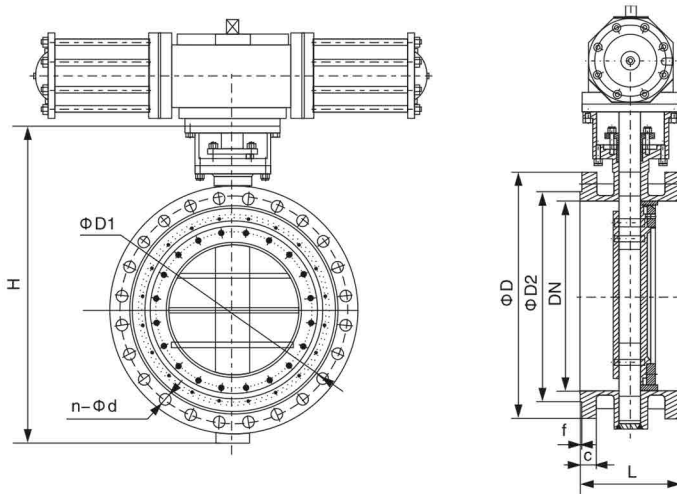


Wafer Type

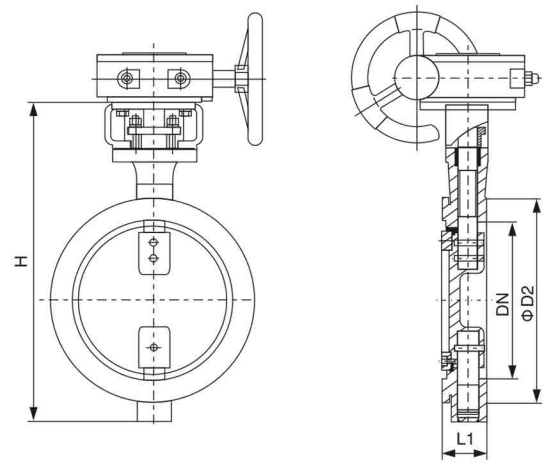


DN	PN6										WEIGHT			
	L	L1	L2	L3	D	D1	D2	C	H	N-d	Kg(L)	Kg(L1)	Kg(L2)	Kg(L3)
80	114	49	180	49	190	150	124	18	310	4-18	20	11	17	13
100	127	56	190	56	210	170	144	18	325	4-18	23	13	19	16
125	140	64	200	64	240	200	174	18	360	8-18	28	16	25	20
150	140	70	210	70	265	225	199	20	395	8-18	33	21	28	24
200	152	71	230	71	320	280	254	22	480	8-18	48	28	49	36
250	165	76	250	76	375	335	309	24	550	12-18	54	45	95	52
300	178	83	270	83	440	395	363	24	610	12-22	80	61	130	79
350	190	92	290	92	490	445	413	24	710	12-22	103	82	160	107
400	216	102	310	102	540	495	463	24	755	16-22	145	122	216	150
450	222	114	330	114	595	550	518	24	835	16-22	193	150	248	183
500	229	127	350	127	645	600	568	26	900	20-22	258	205	380	254
600	267	154	390	154	765	705	667	30	1060	20-26	302	300	495	398
700	292	165	430	165	860	810	772	26	1170	24-26	385	465	595	576
800	318	190	470	190	975	920	878	26	1320	24-30	525	570	740	690
900	330	203	510	203	1075	1020	978	26	1440	24-30	723	760	1230	870
1000	410	216	550	216	1175	1120	1078	26	1640	28-30	990	975	1450	1180
1200	470	254	630	254	1405	1340	1295	28	1720	32-33	1455	1250	2180	1490
1400	530	390	710	390	1630	1560	1510	32	2055	36-36	1860	1780	2980	2050
1600	600	440	790	440	1830	1760	1710	34	2185	40-36	2180	1990		
1800	670	490	870	490	2045	1970	1918	36	2390	44-39	3950			
2000	760	540	950	540	2265	2180	2125	38	2620	48-42				
2200	800	590	1000	590	2475	2390	2335	42	2980	52-42				
2400	850	650	1100	650	2685	2600	2545	44	3150	56-42				
2600	900	700	1200	700	2905	2810	2750	46	3320	60-48				
2800	950	760	1300	760	3115	3020	2960	48	3550	64-48				
3000	1000	810	1400	810	3315	3220	3160	50	3770	68-48				

Flange Type

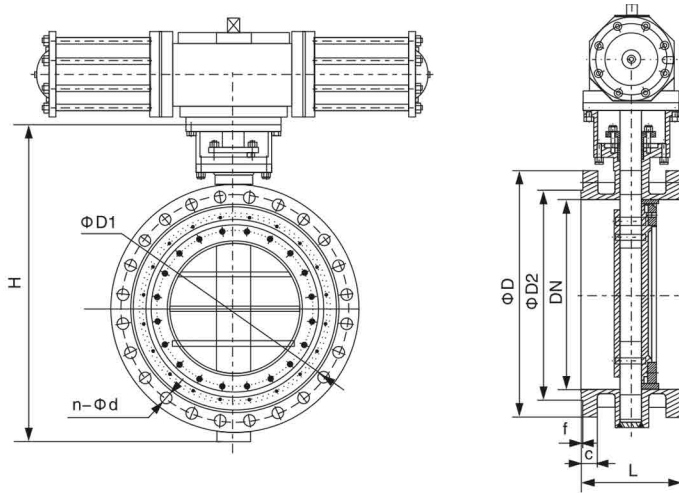


Wafer Type

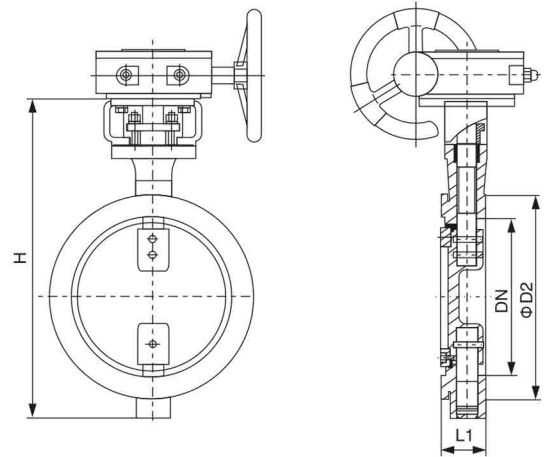


DN	PN16										WEIGHT			
	L	L1	L2	L3	D	D1	D2	C	H	N-d	Kg(L)	Kg(L1)	Kg(L2)	Kg(L3)
80	114	49	180	49	200	160	132	20	310	8-18	22	11	17	13
100	127	56	190	56	220	180	156	22	325	8-18	24	13	19	19
125	140	64	200	64	250	210	184	22	360	8-18	30	16	25	23
150	140	70	210	70	285	240	211	24	395	8-22	38	21	28	29
200	152	71	230	71	340	295	266	24	480	12-22	56	40	49	51
250	165	76	250	76	405	355	319	26	550	12-26	80	50	95	69
300	178	83	270	83	460	410	370	28	610	12-26	108	75	130	109
350	190	92	290	92	520	470	429	30	710	16-26	140	102	178	143
400	216	102	310	102	580	525	480	32	755	16-30	206	145	238	195
450	222	114	330	114	640	585	548	40	835	20-30	262	190	275	265
500	229	127	350	127	715	650	609	44	900	20-33	318	255	423	335
600	267	154	390	154	840	770	720	54	1060	20-36	470	360	550	460
700	292	165	430	165	910	840	794	40	1170	24-36	553	470	665	740
800	318	190	470	190	1025	950	901	42	1320	24-39	688	655	815	920
900	330	203	510	203	1125	1050	1001	44	1440	28-39	999	897	1360	1180
1000	410	216	550	216	1255	1170	1112	46	1640	28-42	1435	1132	1610	1320
1200	470	254	630	254	1485	1390	1328	52	1850	32-48	2200	1400	2415	1680
1400	530	390	710	390	1685	1590	1530	58	2040	36-48	3200	1900	3320	2160
1600	600	440	790	440	1930	1820	1750	64	2280	40-55	6000	2900		
1800	670	490	870	490	2130	2020	1950	68	2495	44-55	6900	4000		
2000	760	540	950	540	2345	2230	2150	70	2685	48-60	9100	5300		

Flange Type



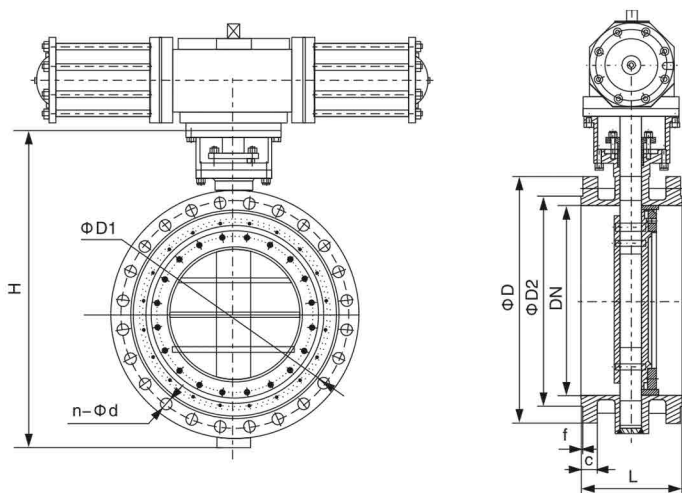
Wafer Type



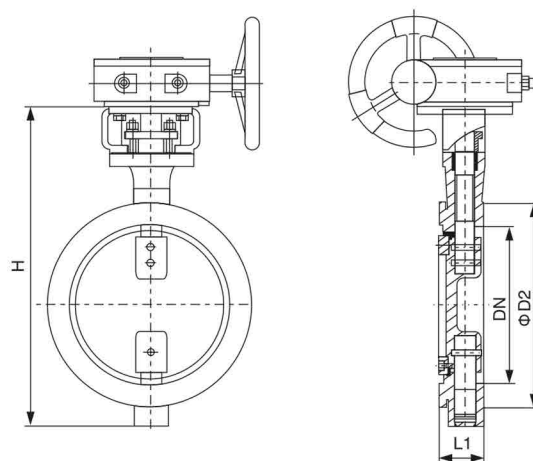
DN	PN40									
	L	L1	L2	L3	D	D1	D2	C	H	N-d
80	114	49	180	49	200	160	132	24	310	8-18
100	127	56	190	56	235	190	156	24	325	8-22
125	140	64	200	64	270	220	184	26	360	8-26
150	140	70	210	70	300	250	211	28	395	8-26
200	230	71	230	71	375	320	284	34	515	12-30
250	250	76	250	76	450	385	345	38	675	12-33
300	270	83	270	83	515	450	409	42	805	16-33
350	290	92	290	92	580	510	465	46	850	16-36
400	310	102	310	102	660	585	535	50	895	16-39
450	330	152	330	152	685	610	560	57	960	20-39
500	350	159	350	159	755	670	615	57	1030	20-42
600	390	181	390	181	890	795	735	72	1180	20-48

DN	PN100									
	L	L1	L2	L3	D	D1	D2	C	H	N-d
150	210	76	210	76	355	290	211	44	425	12-33
200	230	89	230	89	430	360	284	52	640	12-36
250	250	114	250	114	505	430	345	60	745	12-39
300	270	114	270	114	585	500	409	68	820	16-42
350	290	127	290	127	655	560	465	74	935	16-48
400	310	140	310	140	715	620	535	82	975	16-48
450	330	160	330	160	770	675	560	89	1110	20-48
500	350	170	350	170	870	760	615	94	1215	20-56
600	390	200	390	200	990	875	735	102	1300	20-62

Flange Type



Wafer Type



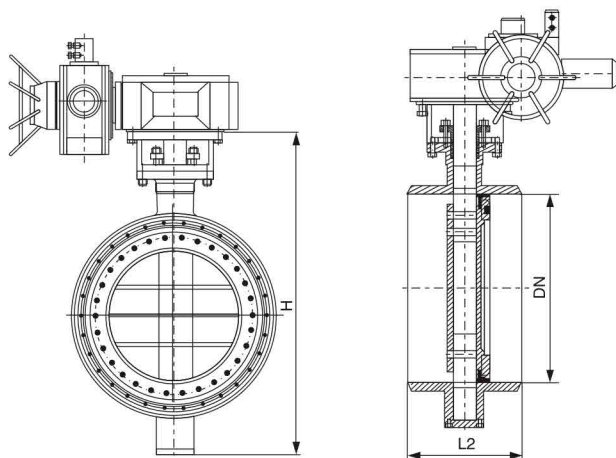
CLASS 300

In	DN	L	L1	L2	L3	D	D1	D2	C	H	N-d
3	80	180	48	180	48	210	168.3	127	29	310	8-22
4	100	190	54	190	54	255	200.0	157	32.2	325	8-22
5	125	200	56	200	56	280	235	186	35.4	360	8-22
6	150	210	59	210	59	320	269.9	216	37	430	12-22
8	200	230	73	230	73	380	330.2	270	41.7	535	12-26
10	250	250	83	250	83	445	387.4	324	48.1	695	16-29
12	300	270	92	270	92	520	450.8	381	51.3	805	16-32
14	350	290	117	290	117	585	514.4	413	54.4	880	20-32
16	400	310	133	310	133	650	571.5	470	57.6	930	20-35
18	450	330	149	330	149	710	628.6	533	60.8	990	24-35
20	500	350	159	350	159	775	685.8	584	64	1050	24-35
24	600	390	181	390	181	915	812.8	692	70.3	1230	24-41

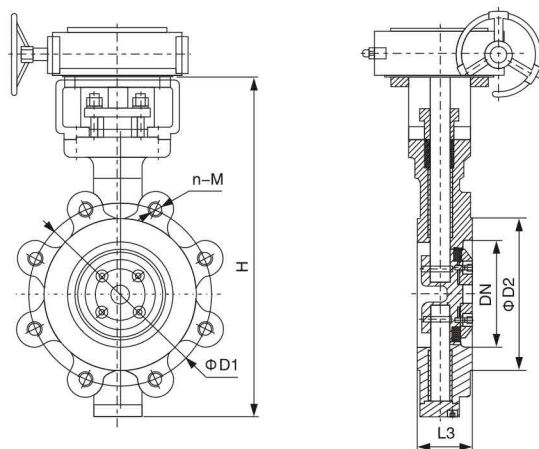
CLASS 900

In	DN	L	L1	L2	L3	D	D1	D2	C	H	N-d
6	150	225	104	225	104	380	317.5	216	62.6	525	12-32
8	200	275	112	275	112	470	393.7	270	70.5	660	12-38
10	250	325	135	325	135	545	469.9	324	76.9	735	16-39
12	300	375	170	375	170	610	533.4	381	86.4	820	20-39
14	350	425	173	425	173	640	558.8	413	92.8	870	20-41
16	400	475	210	475	210	705	616	470	95.9	965	20-45
18	450	500	228	500	228	785	685.8	533	108.6	1050	20-51
20	500	575	250	575	250	855	749.3	584	115	1175	20-54
24	600	675	275	675	275	1040	901.7	692	146.7	1330	20-67

Butt Weld Type

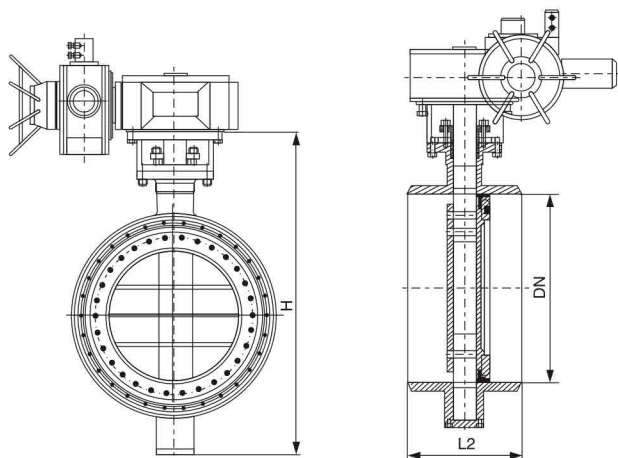


Lug Type

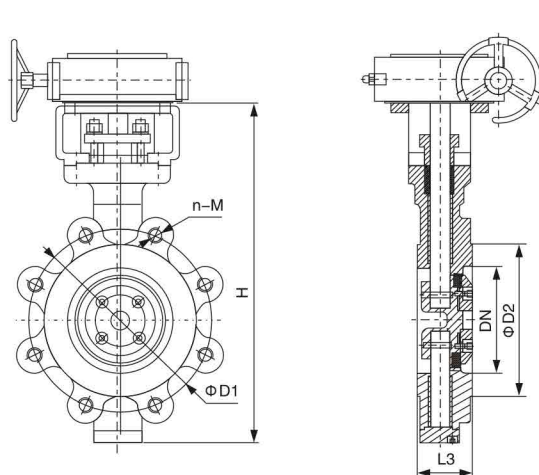


DN	PN10										WEIGHT			
	L	L1	L2	L3	D	D1	D2	C	H	N-d	Kg(L)	Kg(L1)	Kg(L2)	Kg(L3)
80	114	49	180	49	200	160	132	20	310	8-18	22	11	17	13
100	127	56	190	56	220	180	156	22	325	8-18	24	13	19	19
125	140	64	200	64	250	210	184	22	360	8-18	30	16	25	23
150	140	70	210	70	285	240	211	24	395	8-22	38	21	28	29
200	152	71	230	71	340	295	266	24	480	8-22	56	28	49	51
250	165	76	250	76	395	350	319	26	550	12-22	70	45	95	69
300	178	83	270	83	445	400	370	26	610	12-22	92	61	130	109
350	190	92	290	92	505	460	429	26	710	16-22	115	82	178	143
400	216	102	310	102	565	515	480	26	755	16-26	169	122	238	195
450	222	114	330	114	615	565	530	28	835	20-26	220	150	275	265
500	229	127	350	127	670	620	582	28	900	20-26	265	205	423	335
600	267	154	390	154	780	725	682	34	1060	20-30	399	300	550	460
700	292	165	430	165	895	840	794	34	1170	24-30	489	465	665	740
800	318	190	470	190	1015	950	901	36	1320	24-33	652	570	815	920
900	330	203	510	203	1115	1050	1001	38	1440	28-33	880	760	1360	1180
1000	410	216	550	216	1230	1160	1112	38	1640	28-36	1215	975	1610	1320
1200	470	254	630	254	1455	1380	1328	44	1720	32-39	1790	1250	2415	1680
1400	530	390	710	390	1675	1590	1530	48	2010	36-42	2480	1780	3320	2160
1600	600	440	790	440	1915	1820	1750	52	2255	40-48	3220	2640		
1800	670	490	870	490	2115	2020	1950	56	2480	44-48	4350			
2000	760	540	950	540	2325	2230	2150	60	2660	48-48	5600			

Butt Weld Type

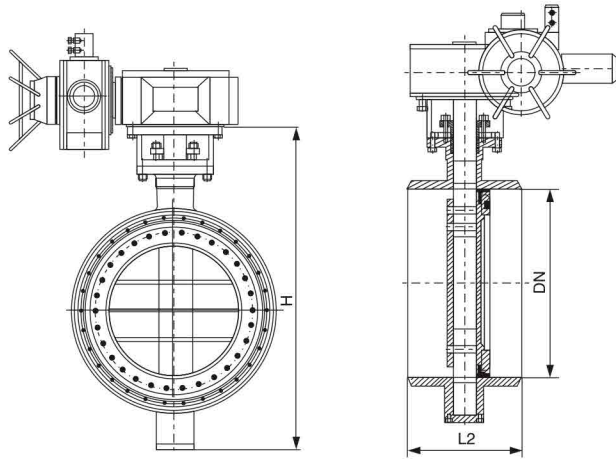


Lug Type

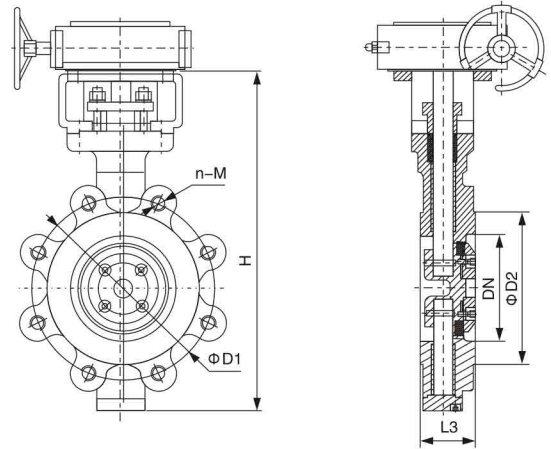


DN	PN25										WEIGHT			
	L	L1	L2	L3	D	D1	D2	C	H	N-d	Kg(L)	Kg(L1)	Kg(L2)	Kg(L3)
80	114	49	180	49	200	160	132	24	310	8-18	23	11	17	13
100	127	56	190	56	235	190	156	24	325	8-22	25	13	19	19
125	140	64	200	64	270	220	184	26	360	8-26	34	16	25	23
150	140	70	210	70	300	250	211	28	395	8-26	42	21	28	29
200	152	71	230	71	360	310	274	30	480	12-26	58	40	49	51
250	165	76	250	76	425	370	330	32	550	12-30	90	50	95	69
300	178	83	270	83	485	430	389	34	610	16-30	120	75	130	109
350	190	92	290	92	555	490	448	38	710	16-33	170	102	178	143
400	216	102	310	102	620	550	503	40	755	16-36	235	145	238	195
450	222	114	330	114	670	600	548	46	835	20-36	285	190	275	265
500	229	127	350	127	730	660	609	48	900	20-36	385	255	423	335
600	267	154	390	154	845	770	720	58	1060	20-39	580	360	550	460
700	292	165	430	165	960	875	820	50	1170	24-42	705	470	665	740
800	318	190	470	190	1085	990	928	54	1320	24-48	970	655	815	920
900	330	203	510	203	1185	1090	1028	58	1440	28-48	1225	897	1360	1180
1000	410	216	550	216	1320	1210	1140	62	1640	28-55	1680	1132	1610	1320
1200	470	254	630	254	1530	1420	1350	70	1850	32-55	2450	1580	2415	1680
1400	530	390	710	390	1755	1640	1560	76	2040	36-60	3600	2100	3320	2160

Butt Weld Type

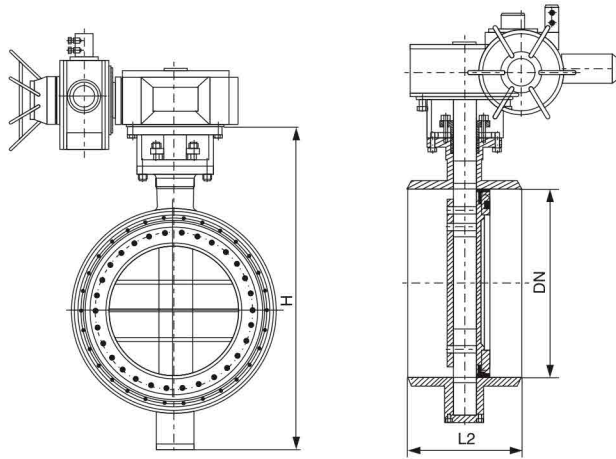


Lug Type

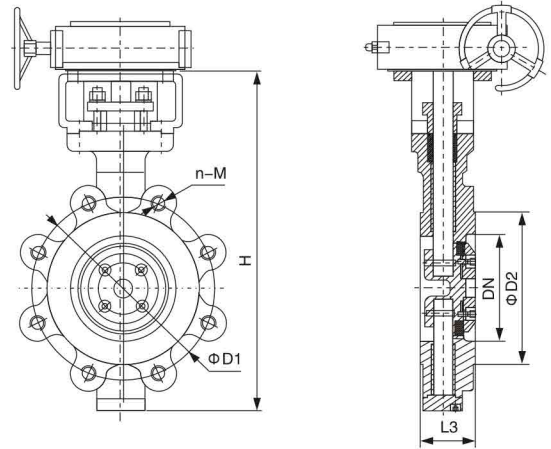


DN	PN63									
	L	L1	L2	L3	D	D1	D2	C	H	N-d
80	180	64	180	64	215	170	132	28	310	8-22
100	190	64	190	64	250	200	156	30	325	8-26
125	200	70	200	70	295	240	184	34	360	8-30
150	210	76	210	76	345	280	211	36	430	8-33
200	230	89	230	89	415	345	284	42	535	12-36
250	250	114	250	114	470	400	345	46	695	12-36
300	270	114	270	114	530	460	409	52	805	16-36
350	290	127	290	127	600	525	465	56	880	16-39
400	310	140	310	140	670	585	535	60	930	16-42
450	330	160	330	160	715	630	560	64	990	20-42
500	350	170	350	170	800	705	615	68	1050	20-48
600	390	200	390	200	930	820	735	76	1230	20-56

Butt Weld Type

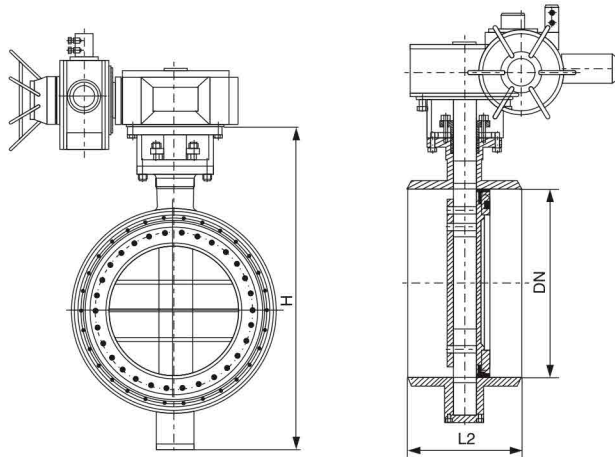


Lug Type

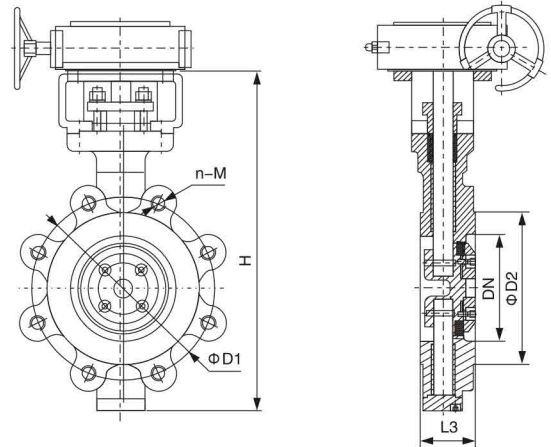


CLASS 150											
In	DN	L	L1	L2	L3	D	D1	D2	C	H	N-d
3	80	114	48	180	48	190	152.4	127	24.3	310	4-19
4	100	127	54	190	54	230	190.5	157	24.3	325	8-19
5	125	140	56	200	56	255	215.9	186	24.3	360	8-22
6	150	140	57	210	57	280	241.3	216	26.9	395	8-22
8	200	152	64	230	64	345	298.5	270	29	480	8-22
10	250	165	71	250	71	405	362.0	324	30.6	550	12-26
12	300	178	81	270	81	485	431.8	381	32.2	610	12-26
14	350	190	92	290	92	535	476.3	413	35.4	710	12-29
16	400	216	102	310	102	595	539.8	470	37	755	16-29
18	450	222	114	330	114	635	577.9	533	40.1	835	16-32
20	500	229	127	350	127	700	635.0	584	43.3	900	20-32
24	600	267	154	390	154	815	749.3	692	48.1	1060	20-35
28	700	292	165	430	165	925	863.6	800	71.9	1170	28-35
32	800	318	190	470	190	1060	977.9	914	81.4	1320	28-41
36	900	330	203	510	203	1170	1085.8	1022	90.9	1440	32-41
40	1000	410	216	550	216	1290	1200.2	1124	90.9	1640	36-41
48	1200	470	254	630	254	1510	1422.4	1359	108.4	1850	44-41
56	1400	530	390	710	390	1745	1651.0	1575	124.3	2040	48-48

Butt Weld Type



Lug Type



CLASS 600											
In	DN	L	L1	L2	L3	D	D1	D2	C	H	N-d
6	150	210	78	210	78	355	292.1	216	54.7	425	12-29
8	200	230	102	230	102	420	349.2	270	62.6	640	12-32
10	250	250	117	250	117	510	431.8	324	70.5	745	16-35
12	300	270	140	270	140	560	489	381	73.7	820	20-35
14	350	290	155	290	155	605	527	413	76.9	935	20-38
16	400	310	178	310	178	685	603.2	470	83.2	975	20-41
18	450	330	200	330	200	745	654	533	89.6	1110	20-45
20	500	350	216	360	216	815	723.9	584	95.9	1215	24-45
24	600	390	232	390	232	940	838.2	692	108.6	1300	24-51

CLASS 1500											
In	DN	L	L1	L2	L3	D	D1	D2	C	H	N-d
6	150	350	160	350	160	395	317.5	216	89.6	550	12-38
8	200	400	180	400	180	485	393.7	270	99.1	690	12-45
10	250	450	200	450	200	585	482.6	324	115	780	12-51
12	300	500	230	500	230	675	571.5	381	130.9	905	16-54
14	350	550	250	550	250	750	635	413	140.4	990	16-60
16	400	600	265	600	265	825	704.8	470	153.1	1085	16-67
18	450	650	300	650	300	915	774.7	533	169	1180	16-73
20	500	700	340	700	340	985	831.8	584	184.8	1290	16-80
24	600	800	400	800	400	1170	990.6	692	210.2	1450	16-92

7. Valve Cv&Flow Characteristics

Cv Value

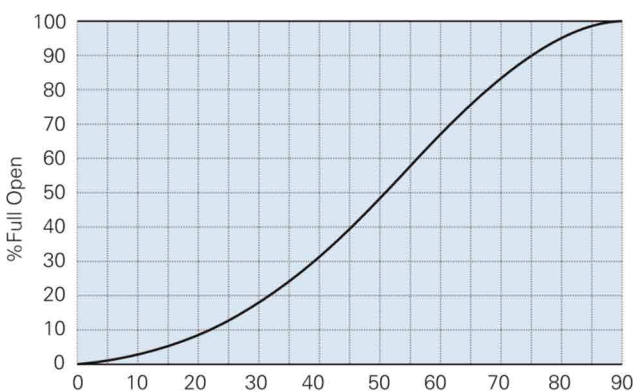
Class 150

Size Mm	In	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°
80	3	1	6	14	23	31	39	47	54	62	71	82	96	112	128	143	156	163	163
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	796
200	8	30	57	82	108	140	185	246	327	427	544	676	821	974	1130	1280	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	2100	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	1970	2590	3360	4440	5900	7840	10200	13000	16200	19700	23300	27100	30700	33300	35000	35000
900	36	884	1680	2420	3180	4210	5450	7250	9630	12600	16000	19900	24200	28700	33300	49800	40900	43000	43000
1000	40	1170	2220	3190	4210	5450	7210	9580	12700	16600	21200	26300	31900	37900	44000	52600	54100	56900	56900
1050	42	1230	2340	3370	4440	5760	7610	10100	13400	17600	22400	27800	33700	40000	46500	57100	57100	60000	60000
1200	48	1640	3120	4490	5920	7670	1010	13500	17900	23400	29800	37000	45000	53400	61900	70100	76100	80000	80000

Cv Value

Class 300

Size Mm	In	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°
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	8390	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	3360	4440	5700	7500	10000	13400	17500	22200	27700	33700	39900	46300	52500	57000	60000	60000



Flow Characteristics

For control applications wide variety of actuators and accessories can of be provided.

At moderate pressure drop conditions,turndown approaching 100 to 1 can be achieved because of the camming action of the disc opening.

The disc lifts off the seat very quickly and an equal precentage control curve if produced between 15° to 75°