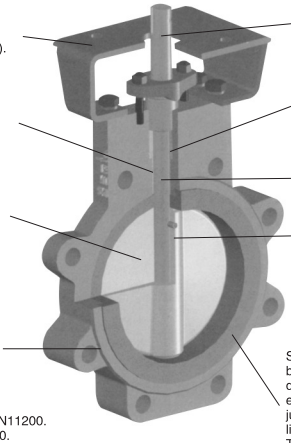
Design Characteristics of Resilient Seated Butterfly

Connecting Flange of Drive:
Applicable for manual, worm gear, electric and pneumatic connection devices (2"~24" to ISO5211).

Bushing: used as valve stem support, positive shaft correction and brake support. There are bushings of low friction coefficient at the two ends of stem to reduce the frictional force of stem and open–close torque of valve.

Disc: streamlined design of disc, the upper and lower stem ends in close contact with the seat to avoid medium leaking from the stem surface. Accurate disc excircle in precise match with the seat to ensure low open–close moment of valve and long service life of seat under the state of sealed. The shape of disc differs from the type of connection to the stem, and the flow coefficient of valve is closely associated with the structural type of disc.

Valve body, classified to the following according to structural types:
1. WS–four–lug shaftless body, applicable for DN50~DN600.
2. WL–lugless body, applicable for DN50~DN300
3. WF–single reinforcement body, applicable for DN550~DN1200.
4. WU–Unthreaded body, applicable for DN700~DN11200.
5. LL–lug wafer body, applicable for DN500~DN600.
6. LU–U screw body, applicable for DN700~DN1200.
7. TH–threaded body, applicable for DN50~DN150.
8. GR–clamped body, applicable for DN650~DN300.



Connection Structure of Stem Head:
According to the difference in driving mechamism, there may be key connected, opposite flat or square (flat or square applicable for 2"~24")

Stem seal: sealing material may be soft graphite, PTFE or rubber (O–ring) according to working conditions and medium.

Stem: for DN≤24", stem is one–shaft structure; for DN>24", stem is segmental (upper and lower shafts) structure. Stem and disc are connected by pin to guarantee the accurate position of disc switch.

Pin: to guarantee vibration protection, and the connection between shaft and disc, there are three types of connection between stem and disc.
1. Taper pin connection, applicable for DN50~DN1200.
2. Semi–shaft pinless connection, applicable for DN50~DN600.
3. Total–shaft pinless connection, applicable for DN50~DN300.

Seat: nonexpansion ,resistance against expansion and breakage. Pressure mould soft sealing material. The dovetail groove on the seat in contact with the body to ensure the seal between the seat and body, and that the just replace the seat directly, thus to improve the service lift of valve.
The structural types of our butterfly valve seat;
1. Dovetail Seat
2. Cylindrical Seat
3. Shoe–type Seat
4. Vulcanized Seat

Structural Type of Body

WS Four–lug Body

LU–U Screw Body

GR–Clamped Body

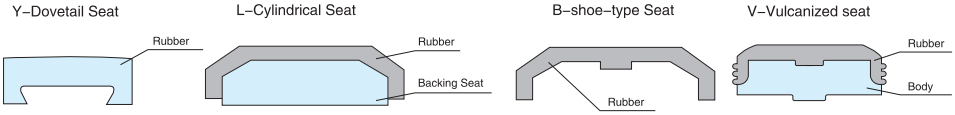
LL–Lug Wafer Body

WL–Lugless Body

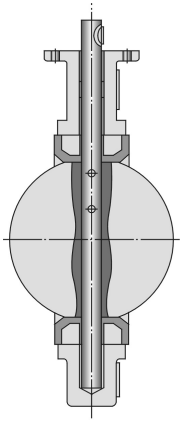
TH–Threaded Body

WU–Unthreaded Hole Body

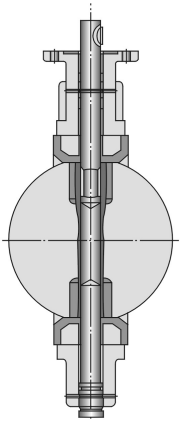
WF–Single Reinforcement Body



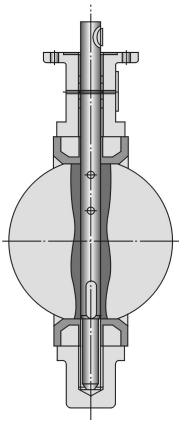
Connection Structure between Disc and valve shaft



C–Taper pin connection applicable for DN50~DN1200.

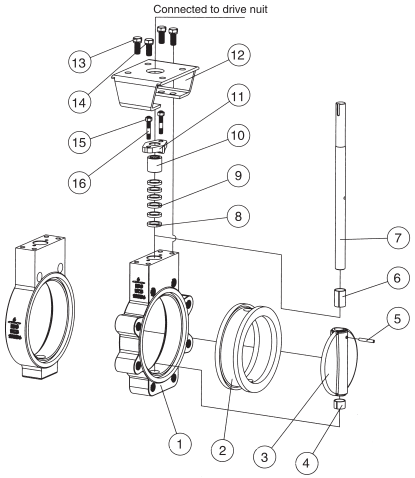


S–Semi–shaft pinless connection applicable for DN50~DN600.



T–Total–shaft pinless connection applicable for DN50~DN300.

Structural Explosion Diagram of Centered Seal Butterfly Valve



Materials List

No.	Part Name	Materials	Opptional Materials
1	Body	Cast Iron	Ductile Iron
2	Seat	NBR or EPDM	Neoprene, VITON, PTFE
3	Disc	Ductile Iron	Aluminum Bronze, SS, Monel
4	Bushing	PTFE	Luberized Bronze
5	Pin	–	Monel
6	Bushing	PTFE	Luberized Bronze
7	Stem	–	316, Monel
8	Packing Seat	–	–
9	Packing	Graphite	
10	Packing Bushing	–	SS
11	Gland	Carbon Steel	SS
12	Yoke	Carbon Steel	–
13	Bolts	–	SS
14	Gasket	Carbon Steel	SS
15	Stud	–	SS
16	Nut	–	SS

1. Pressure and temperature rating of casing material referred to Appendix F
2. Chemical compositions and mechanical property of casing material referred to Appendix G
3. Trim materials and recommended service coverage referred to Appendix E

Technical Specification

Design Standard		API609, MSS SP–67		
Pressure–Temperature Rating		API609		
Face–Face		API609		
Flange Ends		ASME B16.1/B16.5/B16.47/BS4504		
Inspection & Test		API598		
Nominal Pressure (MPa)		CLASS 125	CLASS 150	CLASS 250
Test Pressure (MPa)	Shell Test	1.55	2.94	3.11
	High Pressure Seal Test	1.13	2.16	2.28
	Low Pressure Seal Test	0.6	0.6	0.6
Applicable Temperature		–10℃~120℃ Different raw material for different work temperature		
Applicable Medium		Water, oil, gas and other causticity medium (Different raw material for different medium)		

Resiluent Seated Butterfly Product Line

Size (mm)	Pressure		
NPS	CLASS 125	CLASS 150	CLASS 250
2"	●/△/★/☆	●/△/★/☆	●/△/★/☆
2 1/2"	●/△/★/☆	●/△/★/☆	●/△/★/☆
3"	●/△/★/☆	●/△/★/☆	●/△/★/☆
4"	●/△/★/☆	●/△/★/☆	●/△/★/☆
5"	●/△/★/☆	●/△/★/☆	●/△/★/☆
6"	●/△/★/☆	●/△/★/☆	●/△/★/☆
8"	△/★/☆	△/★/☆	△/★/☆
10"	△/★/☆	△/★/☆	△/★/☆
12"	△/★/☆	△/★/☆	△/★/☆
14"	△/★/☆	△/★/☆	△/★/☆
16"	△/★/☆	△/★/☆	△/★/☆
18"	△/★/☆	△/★/☆	△/★/☆
20"	△/★/☆	△/★/☆	△/★/☆
24"	△/★/☆	–	–
28"	△/★/☆	–	–
30"	△/★/☆	–	–
32"	△/★/☆	–	–
36"	△/★/☆	–	–
40"	△/★/☆	–	–
42"	△/★/☆	–	–
48"	△/★/☆	–	–

Note: ●Stands for handle operated valves △Stands for gearbox operated valves
☆Stands for air operated valves ★Stands for electrically operated valves
–Stands for no option of this
Those not covered in the table can be custom made to users' requirements.

Resiluent Seated Butterfly Torques (NM)

Size (mm)	Pressure				
NPS	50PSI	100PSI	150PSI	200PSI	285PSI
2"	16	17	18	19	20
2 1/2"	22	24	25	26	28
3"	30	31	33	35	37
4"	42	45	49	52	58
5"	65	71	76	82	91
6"	99	107	115	123	136
8"	167	176	186	195	211
10"	277	295	313	331	363
12"	440	464	488	512	553
14"	586	618	649	680	734
16"	1241	1307	1373	1439	1551
18"	1576	1660	1744	1827	1970
20"	1660	1749	1837	1926	2076
24"	3360	3539	3718	3896	4200
28"	3752	4213	4581	–	–
30"	4488	4903	5317	–	–
32"	5128	5548	6031	–	–
36"	6462	6878	7360	–	–
40"	7787	8366	8925	–	–
42"	7880	8432	9023	–	–
48"	10801	11732	12554	–	–

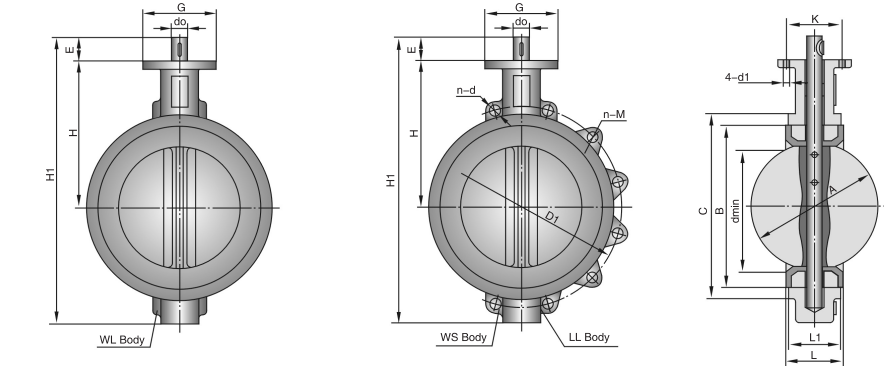
Flow Coefficients (Cv Values)

The flow coefficient of valve is closely associated with the structure of disc. We produce the following two types of commonly used disc structure, used for reference to choose the flow coefficient of valve.

Table of Flow Coefficient of Taper Pin Connection Disc and Total–shaft Pinless Butterfly Valves

NPS	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	1022
6"	0.80	34	95	153	257	422	706	1154	1579
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	10416
18"	11	318	867	1417	2382	3909	6535	10676	12215
20"	14	415	1133	1851	3112	5107	8538	13948	15959
24"	22	541	1482	2421	4069	6678	11165	18240	20869
28"	36	1813	3639	6636	10000	19449	22768	34898	49500
30"	37	2080	4406	9546	17010	28147	44545	66818	73426
32"	45	2387	4791	8736	13788	20613	31395	48117	38250
36"	260	3050	6730	12740	20220	32500	52500	79600	87500
40"	284	4183	8395	15307	24159	36166	55084	84425	119750
42"	350	4095	9040	17108	27150	43640	70500	106890	117500
48"	455	5365	11840	22400	30600	51200	92300	140000	154000

Note: For sizes and classes not shown, please contact our Sales Depatrment

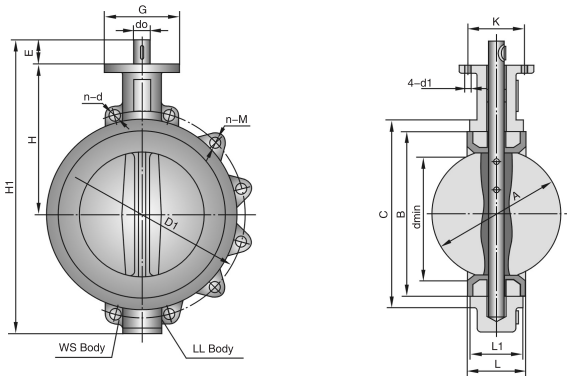


Structure of Taper Pin Connection Butterfly Valve (DN50~DN300)

Main Outline Dimensions

NPS		2"	2½"	3"	4"	5"	6"	8"	10"	12"
L_1		43	46	46	52	56	56	60	68	78
L		47	50	50	56	60	60	64	72	82
A		53	64.5	78.8	104	123.3	156	202.5	250.5	301.6
B		76	89	104	135	159	189	238.5	292	345
C		89	108	120	150	181	208	260	320	375
dmin		32.3	46.1	64.4	86.3	110.6	134.8	192.4	241.7	291.8
D_1	CLASS 125	120.5	139.5	152.5	190.5	216	241.5	298.5	362	432
	CLASS 150	106.5	125.5	144.5	176.5	211.5	246.5	303.5	357.5	418
n–d	CLASS 125	4–19	4–19	4–19	8–19	8–22	8–22	8–22	12–25	12–25
	CLASS 150	8–19	8–22	8–22	8–22	8–22	12–22	12–25	+16–29	16–32
n–M	CLASS 125	4–5/8	4–5/8	4–5/8	8–5/8	8–3/4	8–3/4	8–3/4	12–7/8	12–7/8
	CLASS 150	8–5/8	8–3/4	8–3/4	8–3/4	8–3/4	12–3/4	12–7/8	16–1	16–1 1/8
E		32	32	32	32	32	32	45	45	45
H	Long neck	161	175	181	200	213	226	260	292	337
	Short neck	100	113	124	152	152	165	205	253	277
H_1	Long neck	273	296	308	346	372	397	480	540	624
	Short neck	212	234	251	298	311	336	425	495	564
do		12.7	12.7	12.7	15.9	19.0	19.0	22.2	28.6	31.7
K		50	50	50	70	70	70	102	102	102
G		78	78	78	92	92	92	125	125	140

Note: Dimensions for mounting flange above mentioned conform BS4504, and top mounting conform to ISO5211. When requied, standards form other countries or any special requirements are also available.



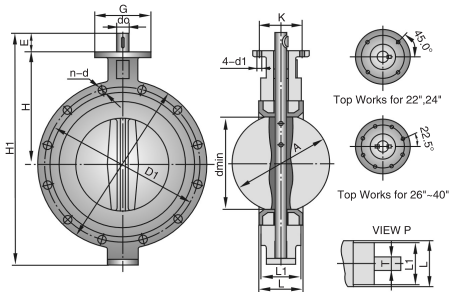
Structure of Taper Pin Connection Butterfly Valve (DN350~DN600)

Main Outline Dimensions

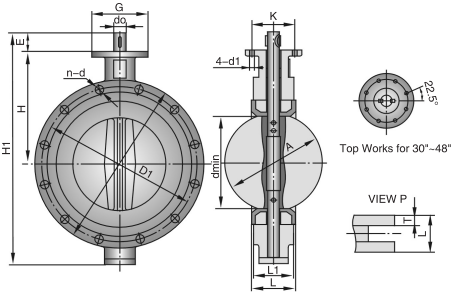
NPS		14"	16"	18"	20"	24"
L_1		76.5	85.7	104.6	130.3	151.4
L		80	90	109	135	156
A		333.3	389.6	440.5	491.6	592.5
B		375.1	439.5	490.5	535.4	654
C		405	470	521	565	693
dmin		322	379.1	426.8	472.7	571.6
D_1	CLASS 125	476	540	578	635	749.5
	CLASS 150	481.5	535	592.5	649.5	768.5
n–d	CLASS 125	12–29	16–29	16–32	20–32	20–35
	CLASS 150	20–32	20–35	24–35	24–35	24–41
n–M	CLASS 125	12–1	16–1	16–1 1/8	20–1 1/8	20–1 1/4
	CLASS 150	20–1 1/8	20–1 1/4	24–1 1/8	24–1 1/4	24–1 1/2
E	CLASS 125	45	72	72	82	82
	CLASS 150	45	72	72	82	82
		368	400	422	480	562
H_1	CLASS 125	680	781	822	916	1103
	CLASS 150	680	781	822	916	1103
Do	CLASS 125	42.9	50.6	54	63.4	75
	CLASS 150	42.9	50.6	54	63.4	75
K		102	140	140	140	165
G		140	197	197	197	276

Note: Dimensions for mounting flange above mentioned conform BS4504, and top mounting conform to ISO5211. When requied, standards form other countries or any special requirements are also available.

Main Outline Dimensions



Structure of Single Flange
Butterfly Valve (DN550~DN1000)



Structure of U–type
Butterfly Valve (DN750~DN1200)

Single Flange Butterfly Valve

NPS	L	L_1	D	D_1	dmin	n–d	G	K	n–d_1	do	T	H	H_1	E	Weight (kg)
22"	156	151.4	745	680	529.9	20–33	276	165	4–22	51	30	537	972	66	175
24"	156	151.4	824	725	571.6	20–31	276	165	4–22	51	30	562	1021	66	188
26"	171	165	845	780	625.9	24–33	300	254	8–18	64	30	591	1063	66	271
28"	169	163	895	840	675.6	24–31	300	254	8–18	64	30	624	1144	66	284
32"	195	188	1015	950	772.1	24–34	300	254	8–18	64	30	672	1263	66	368
34"	211	203	1070	1000	796.2	28–33	300	254	8–18	75	47	695	1294	118	685
40"	224	216	1230	1160	940.5	28–37	300	254	8–18	85	50	800	1521	141	864

Note: Dimensions for mounting flange above mentioned conform BS4504 PN10, and top mounting conform to ISO5211. When requied, standards form other countries or any special requirements are also available.

U–Section Butterfly Valve

NPS	L	L_1	D	D_1	dmin	n–d	G	K	n–d_1	do	T	H	H_1	E	Weight (kg)
30"	173	167	984	914.4	725.5	28–$1^1/_4$	300	200	8–18	64	54	54	1286	66	367
36"	211	203	1168	1085.8	840.5	32–$1^1/_5$	300	200	8–18	75	61	61	1494	118	591
42"	261	251	1346	1257.3	999	36–$1^1/_2$	300	200	8–18	95	67	67	1785	150	811
48"	266	276	1511	1422.4	1126.6	44–$1^1/_2$	350	200	8–22	105	70	70	1955	150	1823

Note: Dimensions for mounting flange above mentioned conform ANSI B16.1 CLASS 125, and top mounting conform to ISO5211. When requied, standards form other countries or any special requirements are also available.