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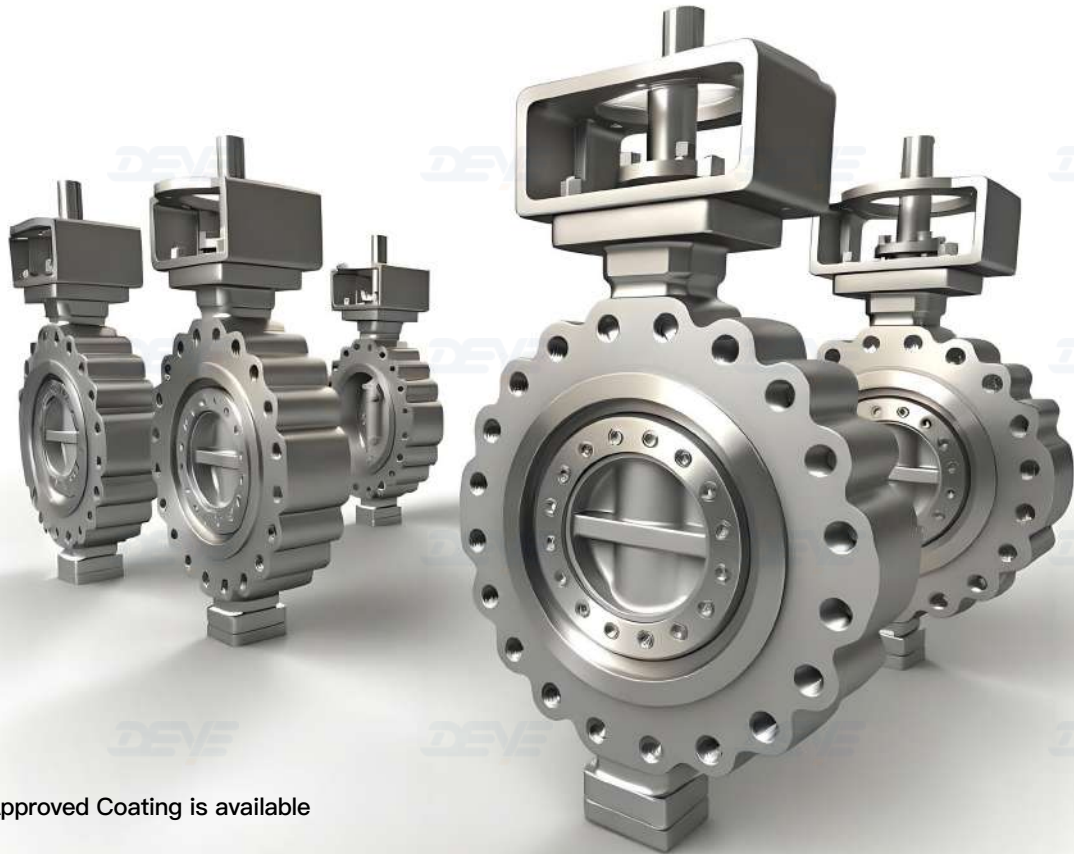
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High Performance Butterfly Valves

—Triple Offset Type and Double Offset Type



WRAS Approved Coating is available

Applications

High Pressure steam
Sea Water Desalination
Hot oil, petroleum refineries
Power generation
Chemical plants

Product Attributes

Bubble Tight Sealing
High Temperature Resistance
Low wear and low torque
Replaceable seat Rings
Fire Safe

Approvals/Standards

Flanges to ANSI B16.5 as standard
Other flange Like EN1092-1

Quality

ISO 9001:2015 Quality Management
CE certificate

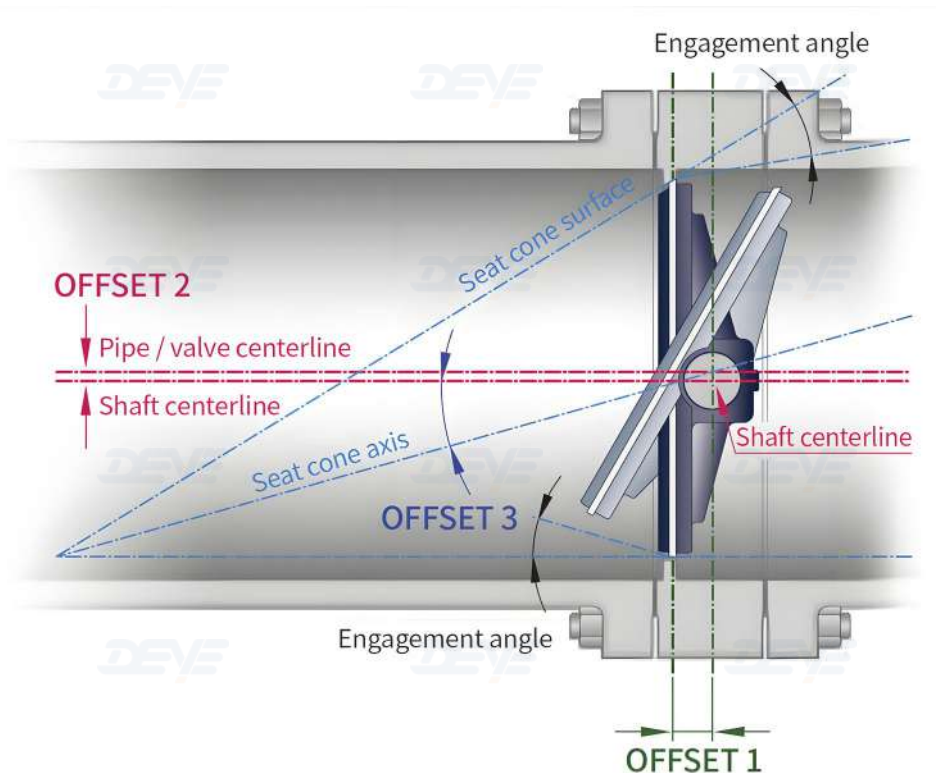


Triple Offset Butterfly valves. | Series

Triple Offset High Performance Butterfly Valve (TOV) is designed with three offsets so that when the valve starts to close, torque is the primary force to seat the valve. It means that the valve can increase the torque on the sealing surfaces such that a better seal can be realized. The seats are made of a laminate of stainless steel with graphite or metal to metal, and are commonly replaceable when required.

The TOV's disc acts like a cone being torqued into a circular seat to reach zero leakage even in metal seated. The three offsets designed into the valve stem and disc alignment allow it to rotate 90 degrees with the last degree of motion being a linear, straight forward cone movement. The body seat of the valve is not a perfect "cone", but rather it is offset and machined at an angle so the disc will align with no rubbing or sliding motion when seating. Triple offset valves can be manufactured in lug, wafer, flanged, and butt-weld configurations.

Geometric graph of Triple offset Design of the Butterfly valves



1st offset :

The eccentric shaft deflected from the center line of sealing surface

2nd offset:

The eccentric shaft deflected from pipe and center line of valve.

3rd offset:

The unique design of eccentric seal oblique cone and the angle of the centerline, makes the seat and sealing ring completely out from the door during the open and close.

This structure adopted the cam effect, completely eliminating the friction, avoiding the possibility of wear and leakage.

Structure Design of the TOV

© Metal to Metal Seat

The design meets the requirements of the latest edition of the API609 and BS EN593 standards. The maximum pressure is Class1500LB, Diameter DN80-2000. working temperature -196°C-600°C

Bracket designed according to ISO5211 standard, easy to install actuator

Double protection against stem blow off at both bottom and upper end of stem

Long bearing support design, precision bearings reduce stem friction coefficient, ensure low torque operation

Self Lubricating adjustable packing filter structure to meet ISO 15848 and API622 standards requirements

Use 17-4 PH or XM-19 integral high strength stainless steel stem

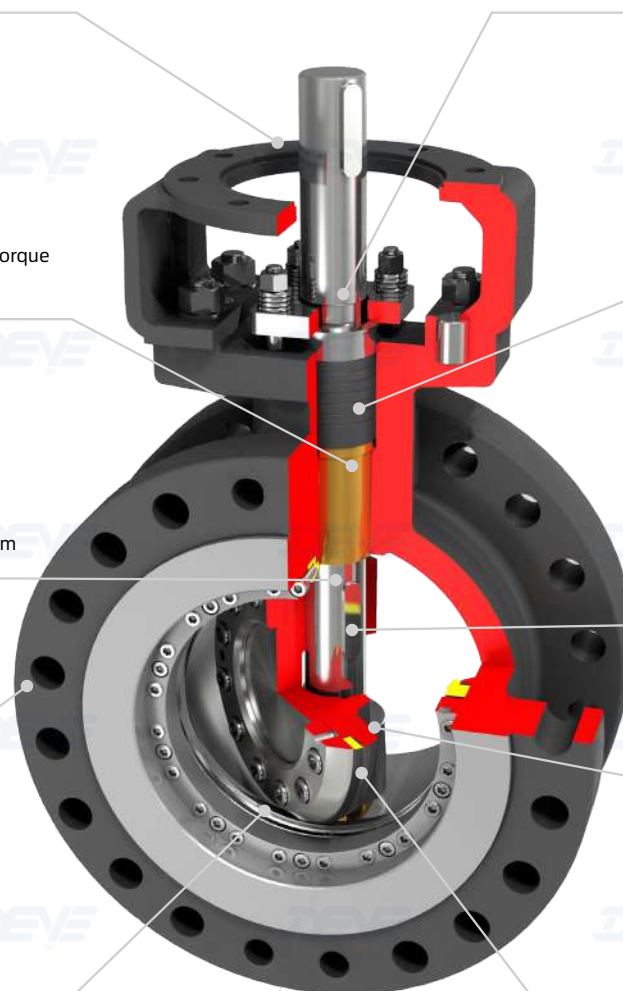
Reliable flat key connections with a strength greater than 10% of the pin connection embedded in the stem

Body wall thickness design meets API 600 standard requirements and can be used as a replacement for API 600 gate valves

Eccentric Disc design reduce the connection area of disc and seat to reduce the wear and torque

Replaceable body seat ring for easy maintenance and improve valve service life

Replaceable disc seal ring, with material SS304 overlay STL Bubble tight seal to achieve zero leakage



Structure of the TOV

© Laminated Seal

Anti-blow out shaft

The shoulder on the shaft that bears against the gland as well as the thrust plate attached to the shaft make it blow out proof.

Shaft
packing
part



Bi-directional bubble-tight sealing

Note: The laminated disc seat ring is replaceable, but body seat ring is unreplaceable. which can only be renewed by welding.

Advantages of the tripe offset design

◎ Bi-directional bubble-tight sealing

Triple-offset Butterfly Valves are torque-seated valves where bubble-tight sealing is achieved when the laminar seal flexes and generates a compressive force all around the hard-faced body seat. metal to metal seat design are also achieve the bubble tight seal for its precise control on the seat grinding.

◎ Replaceable Metal-to-Metal Seats

For the metal to metal seat design, both body seat ring and disc seat rings are replaceable, the two rings can be ordered as spare parts. The laminar seal of Triple-offset Butterfly Valves are also designed to be replaceable at site. Disc seals can be ordered by providing valve details such as size, class and valve serial number. But the integral hard faced body seat ring can't be ordered as spare parts, it can only be renewed by re-depositing stellite.

◎ Anti Fugitive Emission Design

Triple-offset Butterfly Valves meet the Fugitive Emission Test requirement of ISO 15848. This is achieved by employing high-integrity graphite gland packing and a gasket between bottom cover and body.

◎ Fire Safe:

The metal-seated structure meets API 607 fire safety standards, enhancing safety. The Butterfly valves are engineered to maintain the seal functionality even under extreme temperatures, ensuring no leakage under inflammable substances, thus minimizing the risk of fire spread and explosions.

Design Specifications

Valve Design & Pressure Temperature Rating: API609&ASME B16.34

Fire Tested: API 6FA/API 607

Actuator Mounting: ISO 521 1

Face to Face: API 609, ASME B16.10, ISO 5752

Seat Testing: API 598, ISO 5258

Flange Drilling: ASME B16.5, ASME B16.47A/B

Valve Marking: MSS-SP-25, ASME B16.34

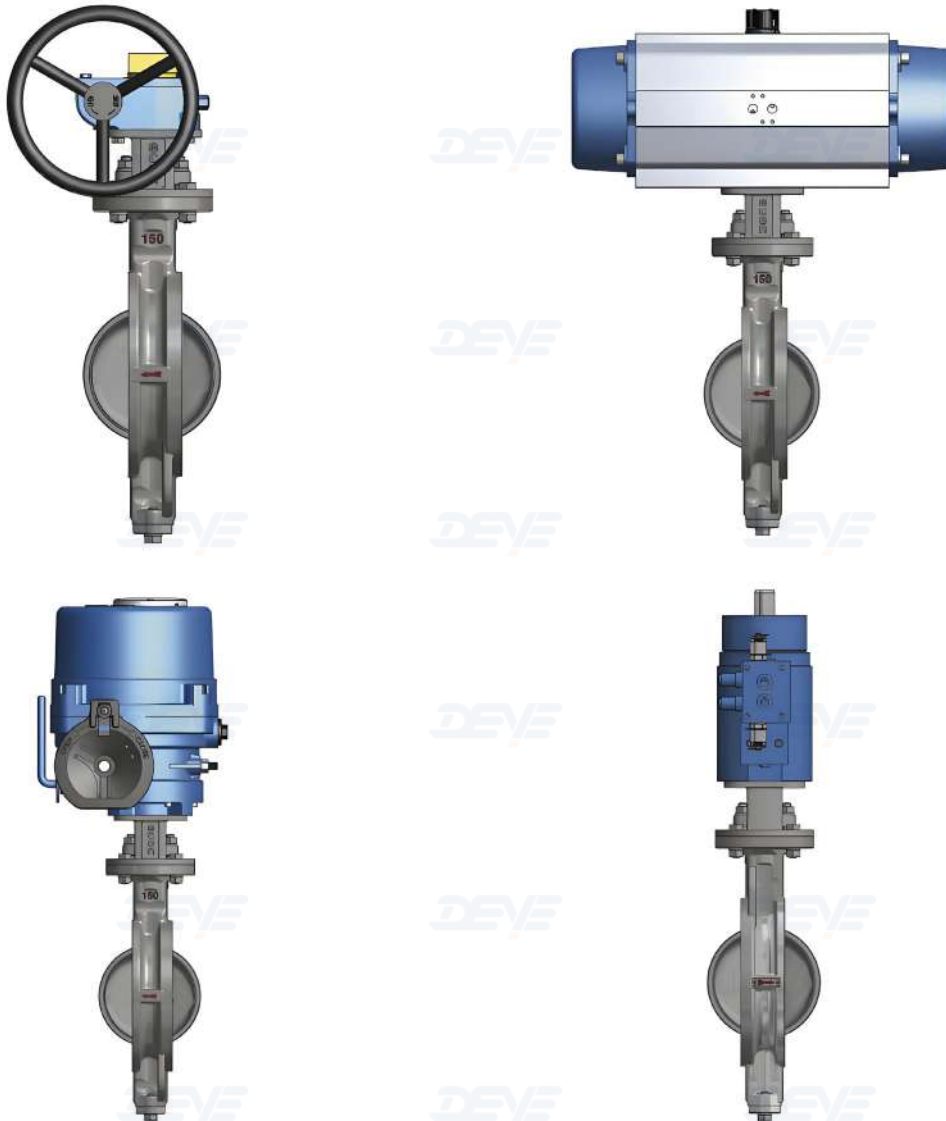
Fugitive Emissions: ISO 15848 Standard

Nominal Pressure	Test Pressure (MPa) at room Temperature			Applicable Temperature	Medium
	Shell Test	High Pressure Seal	Low pressure Seal		
Class 150	2.93	2.07	0.6	-196°C ~425°C	Water, Steam, Coal Gas, Oil and Acid, Alkaline, Salt Corrosive Medium etc
Class 300	7.58	5.52	0.6		
Class 600	15	11.03	0.6		
Class 900	24	17.6	0.6		
Class 1500	37.5	27.5	0.6		

© Material List for main Parts

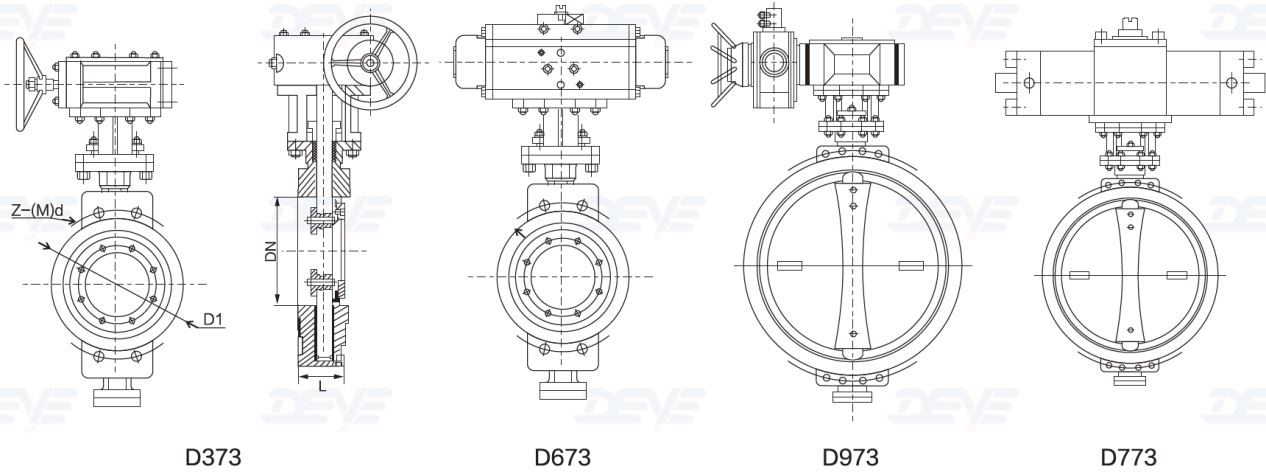
Parts Name	Material
Body	WCB, WC6, CF8, CF8M,CF3M, DUPLEX SS 4A 5A 6A UNS31803 UNS32750
Disc	WCB, WC6, 13CR, CF8, CF8M,CF3M, DUPLEX SS 4A 5A 6A UNS31803 UNS32750
Stem	17-PH, F6A, 2CR13, SS316, SS304, F51, F53, F55, MONEL K400/500
Body Seal	Metal 13cr, SS304, SS316, STL, F51, F53, F55
Disc Seal	Metal to Metal, Laminated Metal /Graphite, Metal/PTFE
Packing	Flexible Graphite, PTFE

© Available valve actuators



The high-Performance Valves are suitable for **gearbox+ handwheel, Pneumatic actuators electric motor Actuators and hydraulic Actuators**

◎ Triple Offset Butterfly valves in wafer type



Main Connection Dimensions											AS ME 16.5 – 2013 单位: Unit: mm			
Diameter		150Lb				300Lb				600Lb				
Inch	mm	L1	D1	Z-Md	Hange hde no	L1	D1	Z-Md	Hange hole no	L1	D1	Z-Md	Hange hde no	
2	50	43	120.7	4-φ19	4	43	127	4-(M5/8"-UNC11)	8	43	127	4-(M5/8"-UNC11)	8	
2.5	65	46	139.7	4-φ19	4	46	149.2	4-(M3/4°-UNC10)	8	46	149.2	4-(M3/4"-UNC10)	8	
3	80	48	152.4	4-φ19	4	48	168.3	4-(M3/4"-UNC10)	8	54	168.3	4-(M3/4"-UNC10)	8	
4	100	54	190.5	4-φ19	8	54	200	4-(M3/4"-UNC10)	8	64	215.9	4-(M7/8"-UNC9)	8	
5	125	57	215.9	4-φ22	8	59	235	4-(M3/4"-UNC10)	8	78	266.7	4-(M1"-UN8)	8	
6	150	57	241.3	4-φ22	8	59	269.9	4-(M3/4"-UNC10)	12	78	292.1	4-(M1"-UN8)	12	
8	200	64	298.5	4-φ22	8	73	330.2	4-(M7/8"-UNC9)	12	102	349.2	4-(M1 1/8"-UN8)	12	
10	250	71	362	4-φ25	12	83	387.4	4-(M1"-UN8)	16	117	431.8	4-(M1 1/4"-UN8)	16	
12	300	81	431.8	4-φ25	12	92	450.8	4-(M1 1/8"-UN8)	16	140	489	4-(M1 1/4"-UN8)	20	
14	350	92	476.3	4-φ29	12	117	514.4	4-(M1 1/8"-UN8)	20	155	527	4-(M1 3/8"-UN8)	20	
16	400	102	539.8	4-(M1"-UN8)	16	133	571.5	4-(M1 1/4"-UN8)	20	178	603.2	4-(M1 1/2"-UN8)	20	
18	450	114	577.9	4-(M1 1/8"-UN8)	16	149	628.6	4-(M1 1/4"-UN8)	24	200	654	4-(M1 5/8"-UN8)	20	
20	500	127	635	4-(M1 1/8"-UN8)	20	159	685.8	4-(M1 1/4"-UN8)	24	216	723.9	4-(M1 5/8"-UN8)	24	
24	600	154	749.3	4-(M1 1/4"-UN8)	20	181	812.8	4-(M1 1/2"-UN8)	24	232	838.2	4-(M1 1/2"-UN8)	24	

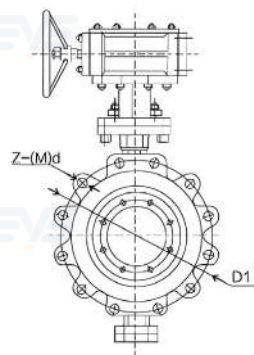
Main Connection Dimensions **ASME B16.47-2011 Series A** Unit:mm

Diameter		150Lb				300Lb				600Lb			
Inch	mm	L1	D1	Z-Md	Hange hole no	L1	D1	Z-Md	Hange hole no	L1	D1	Z-Md	Hange hole no
26	650	165	806.4	4-(M1¼"-UN8)	24	229	876.3	4-(M1 ⅝ "-UN8)	28	229	914.4	8-(M1 ⅞ "-UN8)	28
28	700	165	863.6	4-(M1¼"-UN8)	28	229	939.8	4-(M1 ⅝ "-UN8)	28	229	965.2	8-(M2"-UN8)	28
30	750	190	914.4	4-(M1¼"-UN8)	28	241	997	4-(M1¾"-UN8)	28	241	1022.4	8-(M2"-UN8)	28
32	800	190	977.9	4-(M1½"-UN8)	28	241	1054.1	4-(M1 ⅞ "-UN8)	28	241	1079.5	8-(M2¼"-UN8)	28
36	900	203	1085.8	4-(M1½"-UN8)	32	241	1168.4	8-(M2-UN8)	32	241	1193.8	8-(M2½"-UN8)	28
40	1000	216	1200.2	4-(M1½"-UN8)	36	330	1155.7	8-(M1 ⅝ "-UN8)	32	330	1212.8	8-(M2¼"-UN8)	32
44	1100	254	1314.4	4-(M1½"-UN8)	40	360	1263.6	8-(M1¾"-UN8)	32	360	1333.5	8-(M2½"-UN8)	32
48	1200	254	1422.4	4-(M1½"-UN8)	44	360	1371.6	8-(M1 ⅞ "-UN8)	32	360	1460.5	8-(M2¾"-UN8)	32
52	1300	279	1536.7	4-(M1¾"-UN8)	44	390	1479.6	8-(M2"-UN8)	32	390	1574.8	8-(M3"-UN8)	32
56	1400	279	1651	4-(M1¾"-UN8)	48	390	1600.2	8-(M1¼"-UN8)	28	390	1695.4	8-(M3¼"-UN8)	32
60	1500	318	1759	4-(M1¾"-UN8)	52	440	1701.8	8-(M1¼"-UN8)	32	440	1822.4	8-(M3½"-UN8)	28

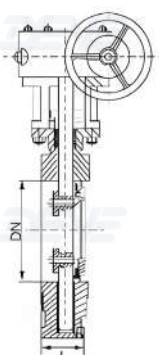
Main Connection Dimensions **ASME B 16.47- 2011 Series B** Unit:mm

Diameter		150Lb				300Lb				600Lb			
Inch	mm	L1	D1	Z-Md	Hange hole no	L1	D1	Z-Md	Hange hole no	L1	D1	Z-Md	Hange hole no
26	650	165	744.5	4-(M3/4"-UNC10)	36	229	803.3	8-(M1¼"-UN8)	28	229	806.4	8-(M1 ⅝ "-UN8)	28
28	700	165	795.3	4-(M3/4"-UNC10)	40	229	857.2	8-(M1¼"-UN8)	28	229	863.6	8-(M1¾"-UN8)	28
30	750	190	846.1	4-(M3/4"-UNC10)	44	241	920.8	8-(M1 ⅝ "-UN8)	28	241	927.1	8-(M1 ⅞ "-UN8)	28
32	800	190	900.1	8-(M3/4"-UNC10)	48	241	977.9	8-(M1½"-UN8)	28	241	984.2	8-(M2-UN8)	28
36	900	203	1009.6	8-(M7/8"-UNC9)	44	241	1089	8-(M1 ⅝ ⅞ "-UN8)	32	241	1104.9	8-(M2¼"-UN8)	28
40	1000	216	1120.8	8-(M1"-UN8)	44	330	1190.6	8-(M1 ⅝ "-UN8)	32				
44	1100	254	1222.4	8-(M1"-UN8)	52	360	1295.4	8-(M1¾"-UN8)	32				
48	1200	254	1335.1	8-(M1"-UN8)	44	360	1416	8-(M1 ⅞ "-UN8)	32				
52	1300	279	1436.7	8-(M1 ⅞ "-UN8)	52	390	1517.6	8-(M1 ⅞ "-UN8)	32				
56	1400	279	1543	8-(M1 ⅞ "-UN8)	60	390	1651	8-(M2¼"-UN8)	28				
60	1500	318	1662.1	8-(M1¼"-UN8)	52	440	1763.7	8-(M2¼"-UN8)	32				

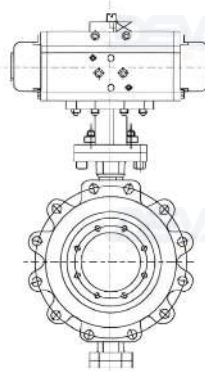
© Triple Offset Butterfly valves in Lug type



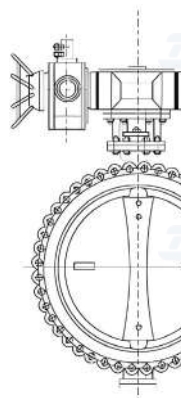
LTD373



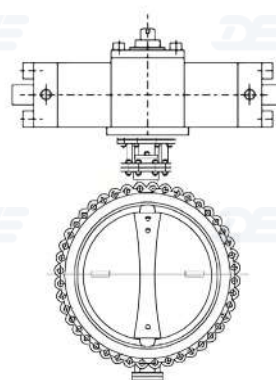
LTD673



LTD973



LTD773

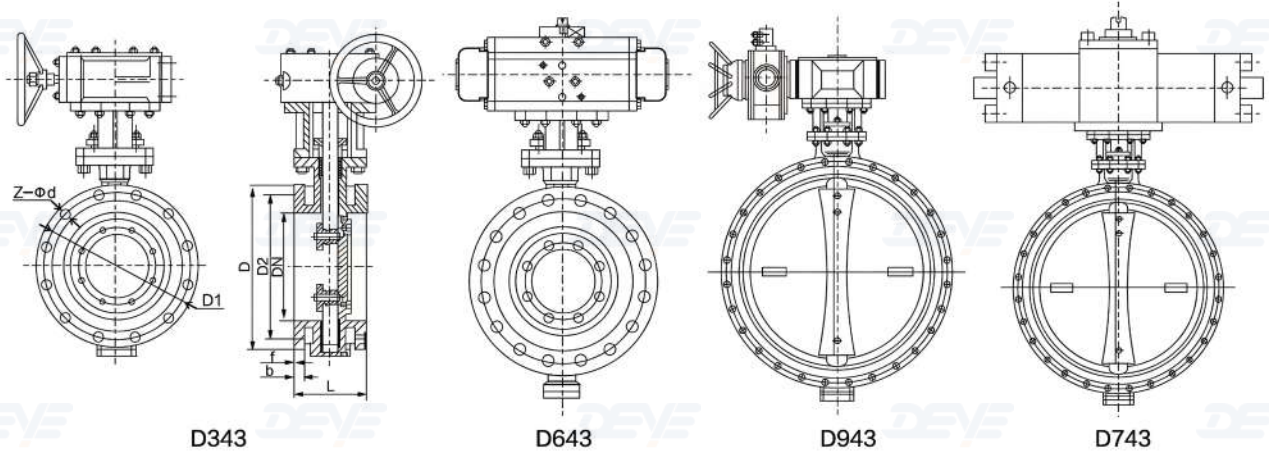


Main Connection Dimensions											AS ME 16.5	Unit: mm
Diameter		150Lb			300Lb			600Lb				
Inch	mm	L1	D1	Z-Md	L1	D1	Z-Md	L1	D1	Z-Md		
2	50	43	120.7	4-(M5/8"-UNC11)	43	127	8-(M5/8"-UNC11)	43	127	8-(M5/8"-UNC11)		
2.5	65	46	139.7	4-(M5/8"-UNC11)	46	149.2	8-(M3/4"-UNC10)	46	149.2	8-(M3/4"-UNC10)		
3	80	48	152.4	4-(M5/8"-UNC11)	48	168.3	8-(M3/4"-UNC10)	54	168.3	8-(M3/4"-UNC10)		
4	100	54	190.5	8-(M5/8"-UNC11)	54	200	8-(M3/4"-UNC10)	64	215.9	8-(M7/8"-UNC9)		
5	125	57	215.9	8-(M3/4"-UNC10)	50	235	8-(M3/4"-UNC10)	78	266.7	8-(M1"-UN8)		
6	150	57	241.3	8-(M3/4"-UNC10)	59	269.9	12-(M3/4"-UNC10)	78	292.1	12-M1"-UN8)		
8	200	64	298.5	8-(M3/4"-UNC10)	73	330.2	12-(M7/8"-UNC9)	102	349.2	12-(M1 1/8"-UN8)		
10	250	71	362	12-(M7/8"-UNC9)	83	387.4	16-(M1"-UN8)	117	431.8	16-(M1 1/4"-UN8)		
12	300	81	431.8	12-(M7/8"-UNC9)	92	450.8	16-(M1 1/8"-UN8)	140	489	20-(M1 1/4"-UN8)		
14	350	92	476.3	12-(M1"-UNC8)	117	514.4	20-(M1 1/8"-UN8)	155	527	20-(M1 3/8"-UN8)		
16	400	102	539.8	16-(M1"-UN8)	133	571.5	20-(M1 1/4"-UN8)	178	603.2	20-(M1 1/2"-UN8)		
18	450	114	577.9	16-(M1 1/8"-UN8)	149	628.6	24-(M1 1/4"-UN8)	200	654	20-(M1 5/8"-UN8)		
20	500	127	635	20-(M1 1/8"-UN8)	159	685.8	24-(M1 1/4"-UN8)	216	723.9	24-(M1 5/8"-UN8)		
24	600	154	749.3	20-(M1 1/4"-UN8)	181	812.8	24-(M1 1/2"-UN8)	232	838.2	24-(M1 7/8"-UN8)		

Main Connection Dimensions											ASME B16 .47 Series A	Unit:mm
Diameter		150Lb			300Lb			600Lb				
Inch	mm	L1	D1	Z-Md	L1	D1	Z-Md	L1	D1	Z-Md		
26	650	165	806.4	24-(M1¼"-UN8)	229	876.3	28-(M1 ⅝"-UN8)	229	914.4	28-(M1 ⅞"-UN8)		
28	700	165	863.6	28-(M1¼"-UN8)	229	939.8	28-(M1 ⅝"-UN8)	229	965.2	28-(M2"-UN8)		
30	750	190	914.4	28-(M1¼"-UN8)	241	997	28-(M1¼"-UN8)	241	1022.4	28-(M2"-UN8)		
32	800	190	977.9	28-(M1½"-UN8)	241	1054.1	28-(M1 ⅞"-UN8)	241	1079.5	28-(M2¼"-UN8)		
36	900	203	1085.8	32-(M1½"-UN8)	241	1188.4	32-(M2"-UN8)	241	1193.8	28-(M2½"-UN8)		
40	1000	216	1200.2	36-(M1½"-UN8)	330	1155.7	32-(M1 ⅝"-UN8)	330	1212.8	32-(M2¼"-UN8)		
44	1100	254	1314.4	40-(M1½"-UN8)	360	1263.6	32-(M1¼"-UN8)	360	1333.5	32-(M2½"-UN8)		
48	1200	254	1422.4	44-(M1½"-UN8)	360	1371.6	32-(M1 ⅞"-UN8)	360	1460.5	32-(M2¾"-UN8)		
52	1300	279	1536.7	44-(M1¾"-UN8)	390	1479.6	32-(M2"-UN8)	390	1574.8	32-(M3"-UN8)		
56	1400	279	1651	48-(M1¾"-UN8)	390	1600.2	28-(M2¼"-UN8)	390	1695.4	32-(M3¼"-UN8)		
60	1500	318	1759	52-(M1¾"-UN8)	440	1701.8	32-(M2¼"-UN8)	440	1822.4	28-(M3½"-UN8)		

Main Connection Dimensions											ASME B16.47 Series B	Unit:mm
Diameter		150Lb			300Lb			600Lb				
Inch	mm	L1	D1	Z-Md	L1	D1	Z-Md	L1	D1	Z-Md		
26	650	165	744.5	36-(M3/4"-UNC10)	229	803.3	32-(M1¼"-UN8)	229	806.4	28-(M1"-UN8)		
28	700	165	795.3	40-(M3/4"-UNC10)	229	857.2	36-(M1¼"-UN8)	229	863.8	28-(M1'-UN8)		
30	750	190	846.1	44-(M3/4"-UNC10)	241	920.8	36-(M1 ⅝"-UN8)	241	927.1	28-(M1'-UN8)		
32	800	190	900.1	48-(M3/4"-UNC10)	241	977.9	32-(M1½"-UN8)	241	984.2	28-(M2"-UN8)		
36	900	203	1009.6	44-(M7/8"-UNC9)	241	1089	32-(M1 ⅝"-UN8)	241	1104.9	28-(M2'-UN8)		
40	1000	216	1120.8	44-(M1"-UN8)	330	1190.6	40-(M1 ⅝"-UN8)					
44	1100	254	1222.4	52-(M1"-UN8)	360	1295.4	40-(M1¼"-UN8)					
48	1200	254	1335.1	44-(M1"-UN8)	360	1416	40-(M1 ⅞"-UN8)					
52	1300	279	1436.7	52-(M1 ⅞"-UN8)	390	1517.6	48-(M1 ⅞"-UN8)					
56	1400	279	1543	60-(M1 ⅞"-UN8)	390	1651	36-(M2¼"-UN8)					
60	1500	318	1662.1	52-(M1¼"-UN8)	440	1763.7	40-(M2¼"-UN8)					

© Triple Offset Butterfly valves in Flanged type



Main Connection Dimensions															ASME 16.5 Unit : mm						
Diameter (mm)		Structural Length		150Lb						300Lb						600Lb					
Inch	mm	L1	L2	D	D1	D2	b	f	Z-φd	D	D1	D2	b	f	Z-φd	D	D1	D2	b	f	Z-φd
2	50	108	150	150	120.7	92.1	19.5	2	4-φ19	165	127	92.1	22.7	2	8-φ19	165	127	92.1	32.4	7	8-φ19
2.5	65	112	170	180	139.7	104.8	22.7	2	4-φ19	190	149.2	104.8	25.9	2	8-φ22	190	149.2	104.8	35.6	7	8-φ22
3	80	114	180	190	152.4	127	24.3	2	4-φ19	210	168.3	127	29	2	8-φ22	210	168.3	127	38.8	7	8-φ22
4	100	127	190	230	190.5	157.2	24.3	2	8-φ19	255	200	157.2	32.2	2	8-φ22	275	215.9	157.2	45.1	7	8-φ25
5	125	140	200	255	215.9	185.7	24.3	2	8-φ22	280	235	185.7	35.4	2	8-φ22	330	266.7	185.7	51.5	7	8-φ29
6	150	140	210	280	241.3	215.9	25.9	2	8-φ22	320	269.9	215.9	37	2	12-φ22	355	292.1	215.9	54.7	7	12-φ29
8	200	152	230	345	298.5	269.9	29	2	8-φ22	380	330.2	269.9	41.7	2	12-φ25	420	349.2	269.9	62.6	7	12-φ32
10	250	165	250	405	362	323.8	30.6	2	12-φ25	445	387.4	323.8	48.1	2	16-φ29	510	431.8	323.8	70.5	7	16-φ35
12	300	178	270	485	431.8	381	32.2	2	12-φ25	520	450.8	381	51.3	2	16-φ32	560	489	381	73.7	7	20-φ35
14	350	190	290	535	476.3	412.8	35.4	2	12-φ29	585	514.4	412.8	54.4	2	20-φ32	605	527	412.8	76.9	7	20-φ38
16	400	216	310	595	539.8	469.9	37	2	16-φ29	650	571.5	469.9	57.6	2	20-φ35	685	603.2	469.9	83.2	7	20-φ41
18	450	222	330	635	577.9	533.4	40.1	2	16-φ32	710	628.6	533.4	60.8	2	24-φ35	745	654	533.4	89.6	7	20-φ44
20	500	229	350	700	635	584.2	43.3	2	20-φ32	775	685.8	584.2	64	2	24-φ35	815	723.9	584.2	95.9	7	24-φ44
24	600	267	390	815	749.3	692.2	48.1	2	20-φ35	915	812.8	692.2	70.3	2	24-φ41	940	838.2	692.2	108.6	7	24-φ51

Main Connection Dimensions ASM E B16 . 47 series A Unit: mm

Diameter (mm)		Structural Length		150Lb						300Lb						600Lb					
Inch	mm	L1	L2	D	D1	D2	b	f	Z-φd	D	D1	D2	b	f	Z-φd	D	D1	D2	b	f	Z-φd
26	650	292	410	870	806.4	749	68.7	2	24-φ35	970	876.3	749	79.8	2	28-φ45	1015	914.4	749	115	7	28-φ51
28	700	292	430	925	863.6	800	71.9	2	28-φ35	1035	939.8	800	86.2	2	28-φ45	1075	965.2	800	118.2	7	28-φ54
30	750	318	450	985	914.4	857	75.1	2	28-φ35	1090	997	857	92.5	2	28-φ48	1130	1022.4	857	121.3	7	28-φ54
32	800	318	470	1060	977.9	914	81.4	2	28-φ41	1150	1054.1	914	98.9	2	28-φ51	1195	1079.5	914	124.5	7	28-φ61
36	900	330	510	1170	1085.8	1022	90.9	2	32-φ41	1270	1168.4	1022	105.2	2	32-φ54	1315	1193.8	1022	130.9	7	28-φ67
40	1000	410	550	1290	1200.2	1124	90.9	2	36-φ41	1240	1155.7	1086	114.8	2	32-φ45	1320	1212.8	1111	165.8	7	32-φ61
44	1100	410	550	1405	1314.4	1245	102.1	2	40-φ41	1355	1263.6	1194	124.3	2	32-φ48	1455	1333.5	1226	180.1	7	32-φ67
48	1200	470	630	1510	1422.4	1359	108.4	2	44-φ41	1465	1371.6	1302	133.8	2	32-φ51	1595	1460.5	1334	196	7	32-φ73
52	1300	470	630	1625	1536.7	1461	116.3	2	44-φ48	1580	1479.6	1410	144.9	2	32-φ54	1720	1574.8	1435	210.2	7	32-φ80
56	1400	530	710	1745	1651	1575	124.3	2	48-φ48	1710	1600.2	1518	154.4	2	28-φ61	1855	1695.4	1543	224.5	7	32-φ86
60	1500	530	710	1855	1759	1676	132.3	2	52-φ48	1810	1701.8	1626	164	2	32-φ61	1995	1822.4	1657	240.4	7	28-φ92

Main Connection Dimensions ASME B 16.47 series B Unit:mm

Diameter (mm)		Structural Length		150Lb						300Lb						600Lb						
Inch	mm	L1	L2	D	D1	D2	b	f	Z-φd	D	D1	D2	b	f	Z-φd	D	D1	D2	b	f	Z-φd	
26	650	292	410	785	744.5	711	41.8	2	36-φ22	865	803.3	737	89.4	2	32-φ36	890	806.4	727	111.2	7	28-φ45	
28	700	292	430	835	795.3	762	45	2	40-φ22	920	857.2	787	89.4	2	36-φ36	950	863.6	784	115.9	7	28-φ48	
30	750	318	450	885	846.1	813	45	2	44-φ22	990	920.8	845	94.1	2	36-φ39	1020	927.1	841	125.5	7	28-φ51	
32	800	318	470	940	900.1	864	46.6	2	48-φ22	1055	977.9	902	103.6	2	32-φ42	1085	984.2	895	130.2	7	28-φ54	
36	900	330	510	1055	1009.6	972	52.9	2	44-φ25	1170	1089	1010	103.6	2	32-φ45	1215	1104.9	1010	146.1	7	28-φ60	
40	1000	410	550	1175	1120.8	1080	56.1	2	44-φ28	1275	1190.6	1114	116.3	2	40-φ45							
44	1100	410	550	1275	1222.4	1181	60.9	2	52-φ28	1385	1295.4	1219	127.5	2	40-φ48							
48	1200	470	630	1390	1335.1	1289	65.6	2	44-φ32	1510	1416	1327	129	2	40-φ51							
52	1300	470	630	1495	1436.7	1391	70.4	2	52-φ32	1615	1517.6	1429	143.3	2	48-φ51							
56	1400	530	710	1600	1543	1492	73.6	2	60-φ32	1765	1651	1537	154.4	2	36-φ60							
60	1500	530	710	1725	1662.1	1600	76.7	2	52-φ35	1880	1763.7	1651	151.3	2	40-φ60							

Engineering Data

© Flow Coefficient(CV Value)

Class 150

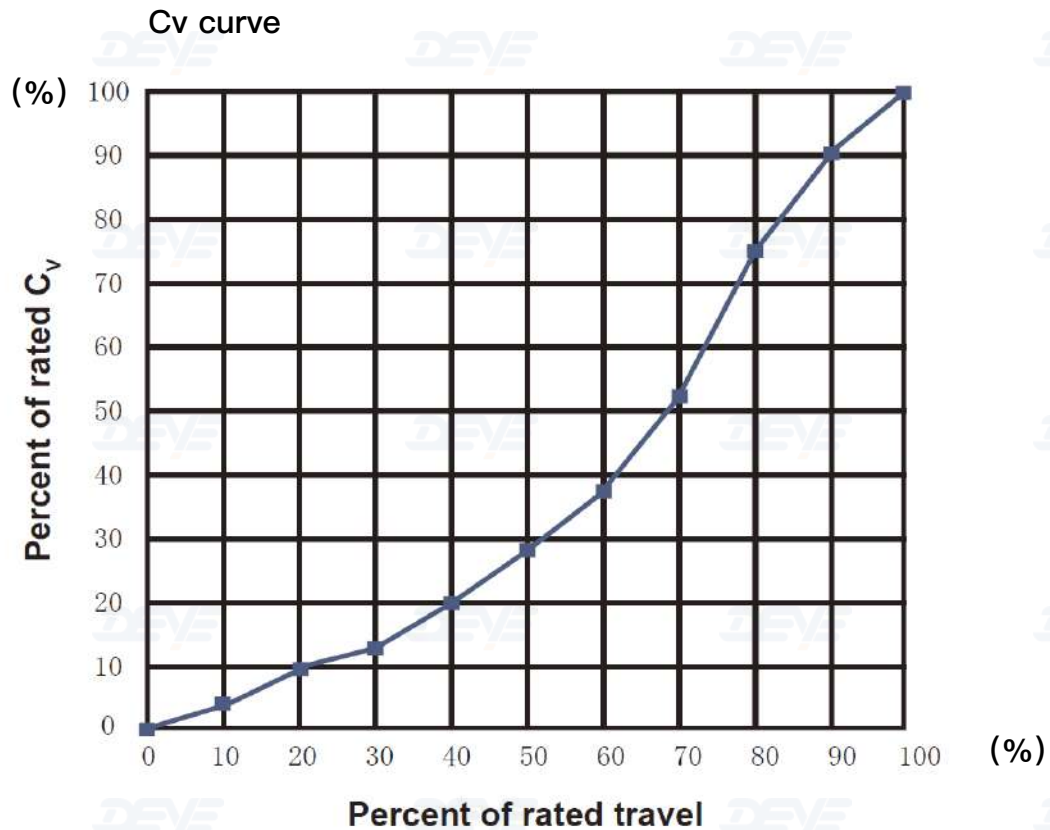
Size		Disc Opening Angle								
in	mm	10°	20°	30°	40°	50°	60°	70°	80°	90°
3"	80	6	16	24	35	51	75	112	144	160
4"	100	12	29	44	64	93	136	203	261	290
6"	150	32	79	119	174	253	371	553	711	790
8"	200	58	146	219	321	467	686	1022	1314	1460
10"	250	101	253	380	557	810	1189	1771	2277	2530
12"	300	159	398	597	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

Class 600

Size		Disc Opening Angle									
in	mm	10°	20°	30°	40°	50°	60°	70°	80°	90°	
3"	80	6	15	23	33	48	71	105	135	150	
4"	100	10	25	38	55	80	118	175	225	250	
6"	150	24	60	90	132	192	282	420	540	600	
8"	200	43	108	162	238	346	508	756	972	1080	
10"	250	68	170	255	374	544	799	1190	1530	1700	
12"	300	101	252	378	554	806	1184	1764	2268	2520	
14"	350	163	407	610	895	1302	1912	2848	3661	4068	
16"	400	215	538	807	1184	1722	2529	3766	4842	5380	
18"	450	299	747	1121	1643	2390	3511	5229	6723	7470	
20"	500	393	982	1473	2160	3142	4615	6874	8838	9820	
24"	600	598	1494	2241	3287	4781	7022	10458	13446	14940	



1. Definition:

CV: The volume of water in gpm at 15° C that will pass through a valve with a pressure drop of 1 PSI.

KV: The volume of water in m³/hr at 15° C that will pass through a valve with a pressure drop of 1 bar.

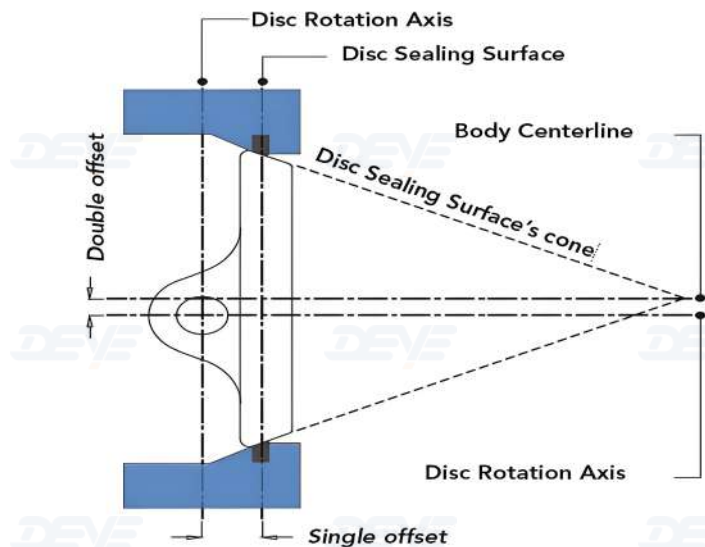
2. Flow direction: vertical to shaft

3. CV = 1.155 KV

Torque Value of the valves

Nominal Size		MPa Nominal pressure						CL		
		0.6	1.0	1.6	2.5	4.0	6.4	150	300	600
DN/mm	NPS/in	N.m Torque/N.m								
50	2	25	29	37	59	83	127	42	92	182
65	2 1/2	29	35	60	82	106	142	69	123	213
80	3	34	57	81	102	148	290	174	271	460
100	4	61	102	141	180	259	526	250	395	834
125	5	104	165	228	289	412	641	283	548	979
150	6	178	250	450	564	790	1060	473	825	2938
200	8	201	400	601	800	1201	1567	674	1503	3616
250	10	353	518	956	1250	1862	2697	983	1887	5649
300	12	635	992	1352	1711	2428	3147	2022	2508	11863
350	14	819	1623	2234	2844	4067	4855	2520	4158	14123
400	16	1047	1944	2842	3738	5533	6473	3175	6271	17061
450	18	1451	2451	3452	4412	6454	13450	4239	7864	21015
500	20	2043	3285	4527	5769	8253	16993	5531	10361	26551
600	24	2779	5548	6018	9495	13443	24586	6011	17559	38415
700	28	3080	6331	6890	14200	22720	—	10440	27923	—
750	30	3230	6723	7700	16552	26483	—	12654	33105	—
800	32	3912	7307	8760	19847	31755	—	14462	39696	—
900	36	5275	8474	9750	26438	36188	—	18078	52877	—
1000	40	6915	11717	13560	35553	44113	—	24179	71105	—
1050	42	8135	15253	16270	40110	51827	—	28457	80219	—
1200	48	12540	20563	23360	48900	61962	—	36155	—	—
1300	52	18300	21806	29977	—	—	—	—	—	—

Double Eccentric Design Series



1st offset :

The eccentric shaft deflected from the center line of sealing surface

2nd offset:

The eccentric shaft deflected from pipe and center line of valve.

The Butterfly valves with double offset design leads to minimal wear and low operating torques.

◎ Seat Construction to ensure the bi-directional flow



The special patented floatable retaining ring and the special designed seat ring ensures a 100% sealing construction, low torques, an increase of the life span and makes the valve 100% bi-directional for the full pressure rating of the valve.

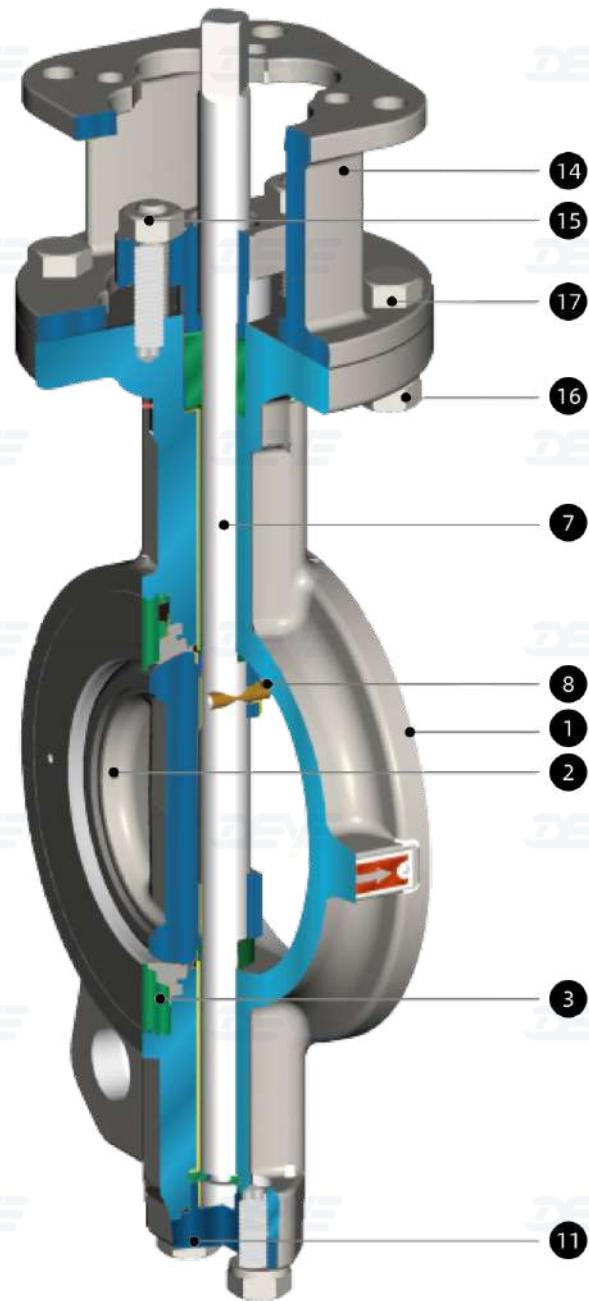
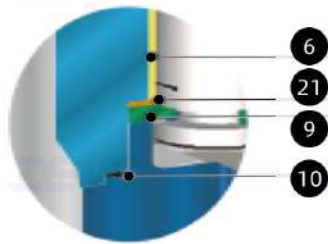
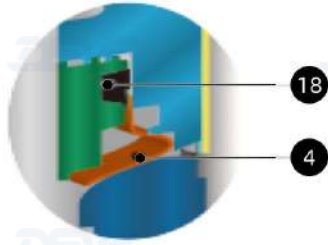
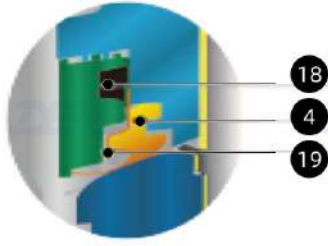
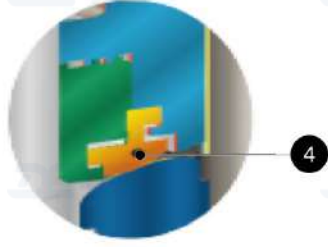
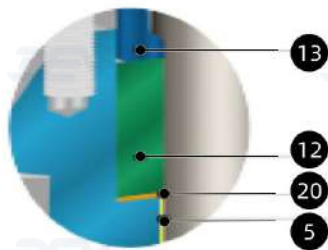
Upper stem bearing and sealing

Soft seat

Soft seat
Fire Safe

Metal seat

Lower stem bearing and sealing



1. Body

2. Disc

3. Retainer ring

4. Seat

5+6. Bushing

7. Shaft

8. Pin

9. Thrust ring

10. Seal

11. Bottom cover

12. Gland packing

13. Gland

14. Bracket

15. Stud bolt

16. Nut

17. Bolt

18. Gasket

19. Fire safe seat

20+21. Washer

Kv-values class 150,PN16 and PN25 versions

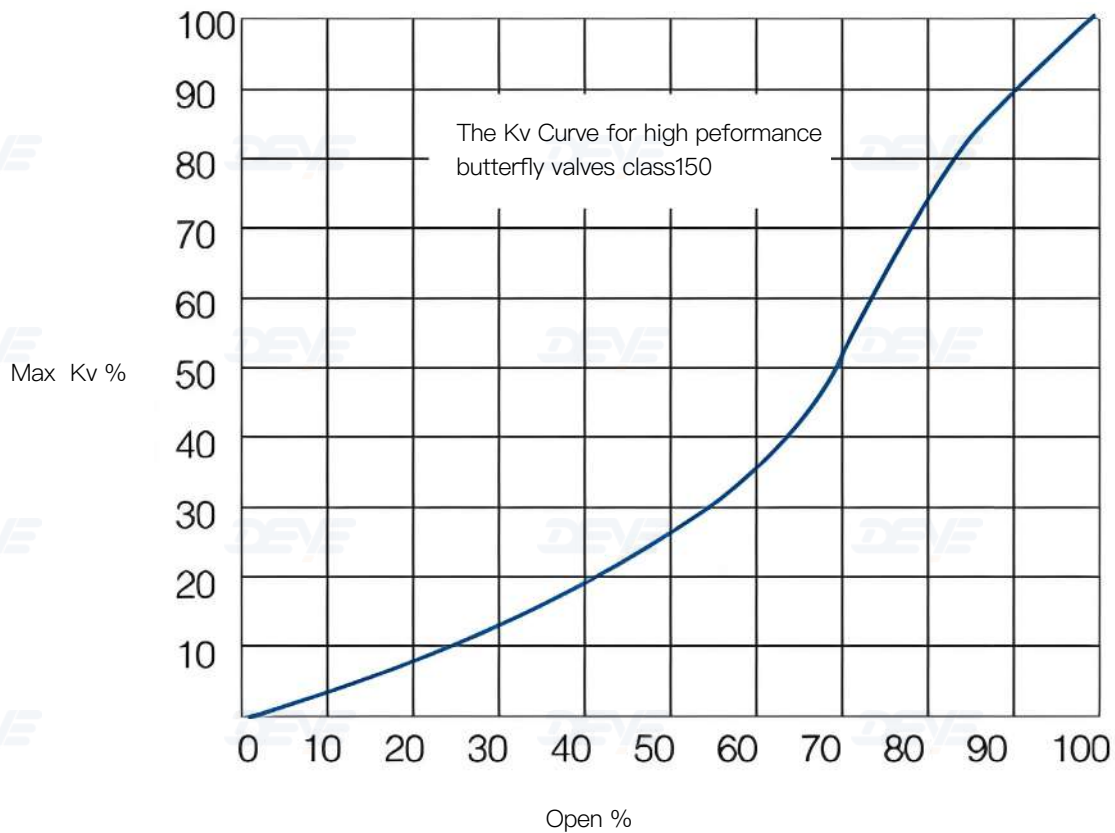
DN	NPS	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
50	2"	3	11	22	34	62	109	132	176	202	138
65	(2V2")	6	20	39	57	106	208	223	298	340	224
80	3"	9	29	59	87	160	280	338	452	516	344
100	4"	10	35	62	95	185	324	360	468	497	530
125	(5")	15	46	92	136	251	438	529	706	805	848
150	6"	21	67	131	195	361	630	761	1.017	1.159	1.189
200	8"	36	119	234	348	472	662	851	1.127	1.254	1.514
250	10"	108	264	426	504	798	1.090	1.427	1.782	2.111	2.307
300	12"	147	359	579	835	1.125	1.518	2.646	2.988	3.329	3.777
350	14"	192	438	689	1.008	1.396	1.938	2.701	3.659	4.636	5.159
400	16"	272	465	780	1.145	1.647	2.150	3.203	4.667	5.957	6.714
450	18"	339	818	1.259	1.765	2.436	3.389	4.685	6.108	7.383	8.091
500	20"	444	1.035	1.586	2.213	3.032	4.276	6.218	7.869	9.525	10.228
600	24"	731	1.610	2.380	3.383	4.758	6.629	9.377	12.477	15.870	17.181

Kv-values class 300,PN40 versions(optional)

DN	NPS	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
65	(2V2")	6	20	39	57	106	185	223	298	340	224
80	3"	9	29	59	87	160	280	338	452	516	344
100	4"	10	35	62	95	185	324	360	468	497	530
125	(5")	15	46	92	136	251	438	529	706	805	848
150	6"	18	58	129	188	303	588	692	822	1.081	1.099
200	8"	29	103	203	319	461	622	839	1.061	1.151	1.411
250	10"	62	184	338	501	695	915	1.242	1.618	2.001	2.156
300	12"	90	257	446	690	1.013	1.436	1.989	2.592	3.301	3.447
350	14"	106	332	586	901	1.321	1.822	2.502	3.308	3.962	4.145
400	16"	212	412	728	1.092	1.594	2.097	2.885	4.348	5.289	5.543
450	18"	268	522	1.060	1.543	2.236	3.012	4.078	5.386	6.733	7.085
500	20"	330	644	1.308	1.905	2.760	3.719	5.369	6.991	8.846	9.499
600	24"	476	927	1.884	2.744	3.976	5.354	7.731	10.067	12.738	13.612

Remark

Kv is the capacity in m³/h for water at 15 – 20°C at a differential pressure of 1 bar.



Typical Flow Characteristics

For control applications a wide variety of actuators and accessories can be provided. At moderate pressure drop conditions, turn down 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 percentage control curve is produced between 15% to 75%.



Double Offset Fire proof Butterfly Valve Torque Value(Reference)

Specifications		Pressure Rating(PSI)									
DN/mm	NPSin	100	150	200	285	300	400	600	740	1200	1480
50	2	-	-	-	-	-	-	-	-	-	-
65	2 1/2"	-	-	-	-	-	-	-	-	-	-
80	3	67	-	87	107	16	134	147	179	215	256
100	4"	71	-	92	113	130	167	198	258	302	371
125	5"	130	-	169	228	-	-	-	-	-	-
150	6"	198	-	297	424	453	511	559	606	698	856
200	8"	463	-	531	593	680	870	1039	1314	1621	1909
250	10"	610	-	815	1037	1129	1297	1424	2271	2700	3175
300	12"	936	-	1328	1780	1907	2121	2288	3576	4221	5011
350	14"	1644	-	1743	1829	2754	3841	4604	5566	6335	7048
400	16"	1896	-	2154	2306	4576	6489	7828	9457	10767	11976
450	18"	2813	-	3017	3220	5491	7813	9439	11411	12993	14451
500	20"	3603	-	3888	4180	7698	11025	13355	16157	18383	20450
600	24"	5722	-	616B	6547	11784	16948	20495	24766	28190	31368
700	28"	6542	8022	-	-	-	-	-	-	-	-
750	30"	11570	10813	12349	13118	25376	37002	45137	-	-	-
800	32"	-	-	-	-	-	-	-	-	-	-
900	36"	16213	15139	17422	18292	-	-	-	-	-	-
1000	40"	-	-	-	-	-	-	-	-	-	-
1050	42"	18869	23727	-	-	-	-	-	-	-	-
1200	48"	33251	34121	36505	38618	-	-	-	-	-	-
1350	54"	-	39375	-	-	-	-	-	-	-	-

PTFE Seat Torque Value(Reference)

Specifications		Pressure Rating(PSI)								
		100	200	285	300	400	600	740	1200	1480
DN/mm	NPSin	Moment/N.M								
50	2	27	33	37	40	48	59	70	83	130
65	2 1/2"	31	39	46	47	55	71	82	95	142
80	3"	43	54	64	66	77	100	115	133	199
100	4"	83	111	134	138	166	222	261	305	333
125	5	125	167	202	208	250	333	391	458	700
150	6"	188	250	304	313	375	500	588	687	718
200	8	363	476	572	589	702	929	1087	1268	1409
250	10"	602	806	980	1010	1215	1623	1909	2236	2882
300	12"	910	1250	1538	1589	1929	2609	3084	3628	4579
350	14"	1052	1411	1715	1767	2127	2844	3346	4824	5357
400	16"	1317	1758	2133	2199	2640	3522	4139	8202	9124
450	18"	1817	2488	3058	3159	3830	5172	6111	9893	11005
500	20"	2501	3346	4065	4191	5037	6726	7910	13099	15569
600	24"	3496	4698	5719	5900	7102	9505	11188	21467	23885
700	28"	4130	6018	6870	8079	10668	15273	18500	—	—
750	30"	4949	6678	8021	9169	12451	18157	22156	—	—
800	32"	5292	7254	8731	—	—	—	—	—	—
900	36"	5982	8406	10151	—	—	—	—	—	—
1000	40"	8344	11208	14515	—	—	—	—	—	—
1050	42"	9525	12609	16698	—	—	—	—	—	—
1150	46"	13117	17873	22406	—	—	—	—	—	—
1200	48"	14914	20506	25260	—	—	—	—	—	—
1300	52"	17395	19896	—	—	—	—	—	—	—
1400	56"	19876	22787	—	—	—	—	—	—	—
1500	60"	21517	—	—	—	—	—	—	—	—
1600	64"	25690	—	—	—	—	—	—	—	—

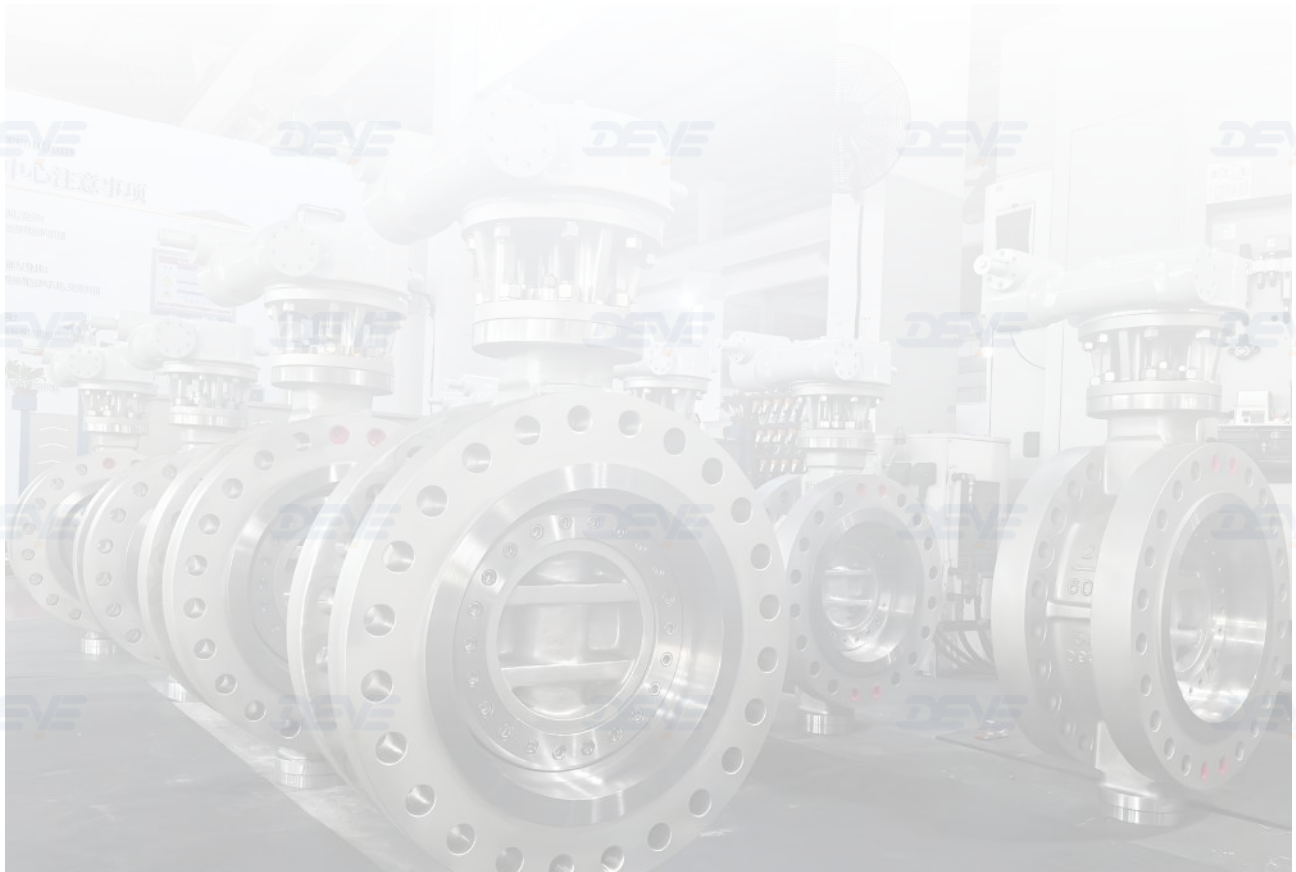
The Possible Fault and Breakdown

See the table below for the common failures:

Failure	Cause analysis	Method of settlement
Leaking outward at The packing	<ol style="list-style-type: none"> 1. The packing is in exceeded use and gets aged 2. Excessive force is used in operation. 3. The eyelet bolt is not tightened. 	<ol style="list-style-type: none"> 1. Replace the aged and injured packing in time, place the connectors turn by turn and let them 300–500 presented. 2. Use normal even operation and do not use bushing or any other ways. 3. Evenly tighten the bolts used to tightly press the packing.
Leaking at the sealing Surface	<ol style="list-style-type: none"> 1. The valve installation direction does not conform to the medium flowing direction. 2. Closing is not in place. 3. The sealing surface of a long time closed valve gets scaled. 4. The sealing surface gets seriously injured 	<ol style="list-style-type: none"> 1. Pay attention to the installation checkup. 2. Make closing in place. 3. Let the valve in crack to have the dirty on the seal flushed out by the high speed fluid. 4. Regrind and thicken the adjusting gasket compensation.
Leaking at the flange Connection	<ol style="list-style-type: none"> 1. The bolts are unevenly tightened. 2. The gasket gets aged and injured. 3. The gasket material does not conform to the required working condition medium. 	<ol style="list-style-type: none"> 1. Evenly tighten the bolts again. 2. Replace it in time. 3. Use correct gasket material and type in accordance with the working condition requirement and, when necessary,ask the manufacturer for help and note the detailed requirement at order.
Damage of handle And handwheel	<ol style="list-style-type: none"> 1. Incorrect use. 2. The fastener gets loosened. 3. Damaged connection between the handle,handwheel and stem. 	<ol style="list-style-type: none"> 1. Never use grip wrench,long lever,impacting tools. 2. Repairand fit it in time. 3. Repair it in time.
Seizure between Worm and gear	<ol style="list-style-type: none"> 1. Dirt gets inlaid to affect the lubrication 2. Improper operation. 	<ol style="list-style-type: none"> 1. Keep it clean and oilit in a fixed period of time. 2. In case of seizure and a heavy resistance during operation,do not go on operation,or damage would get increased.
Electric installation Failure	<ol style="list-style-type: none"> 1. Bad lubrication Foreign matters are available inside of the valve to make the torque exceeded and injured. 2. Electric failure. 	<ol style="list-style-type: none"> 1. Do oiling and keep clean to make the oil tube in good condition,let the packing properly pressed and the foreign matters inside of the valve out in time. 2. Do not let the motor working for over 15min and getting wetted, the power supply shall be kept normal.

Ordering Information

Body Style	Class Rating	Face-to-face	End Detail	Operator
1-Wafer-type	1-Class 150	1-API 609	1-ASME B16.5	BS-Bare Shaft
2-Lug-type	2-Class 300	2-1s0 5752Table 1, col. 13	2-ASME B16.47 Sr.A	GU-Gear Unit
3-Short Pattern (Double-flanged)	3-Class 600	3-1S0 5752Table 1, col. 14	3-ASME B16.47 Sr.B	EA-Electrical Actuator
4-Long Pattern (Double-flanged)	4-Class 900	4-ANSI B16.10	4-Flange ends to EN1092-1	EH-Electro-Hydraulic Actuator
5-Short Pattern (Butt Weld)	5-Class 1500		5-W-Butt-weld as per ASME B16.25	DA-Pneumatic Actuator, Double Acting
				SR-Pneumatic Actuator, Spring Return





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