



CVB VALVES S.R.L.  
VALVES MANUFACTURER

DOUBLE OFFSET BUTTERFLY  
VALVES HP SERIES



# DOUBLE OFFSET BUTTERFLY VALVES HP SERIES

- ***HP SERIES***
- ***ECCENTRIC DISC***
- ***CONTROL VALVES***
- *CVB HP series valves feature a double eccentric disc and an easy-to-be changed PTFE or metal seal ring.*
- *These valves provide flow control with an excellent shutoff against high pressure drops applied in either direction.*
- *Body sizes from 3" through 24" compatible with UNI, DIN, ANSI raised face flanges are available.*

# DOUBLE OFFSET BUTTERFLY VALVES HP SERIES

## MAIN FEATURES

- **BODY**

- type: Wafer, Lug
- sizes: 3" through 24" compatible with UNI, DIN, ANSI flanges.
- face-to-face dimensions: according to ISO 5752, medium series.
- rating: UNI PN 10, 16, 25, 40, 64, 100 ANSI 150, 300, 600  
see relevant table on next page for the complete availability - Take into account that the max pressure and/or temperature can be affected by bearings and seal ring materials.
- construction materials: see relevant tables - Steel bodies can be cast, wrought or forged. Other special materials are available on request (SA352 LCB, AISI 316L, Hastelloy, Monel, Alloy 20).

- **DISC**

- type: double-eccentric design which minimize the contact of disc with seal ring, reducing wear and torque requirements.
- Construction materials: the same as body.
- flow characteristic: linear from 10% through 90% of rate travel.
- rangeability: over 100 - see Cv coefficients table.  
rotation: 90° according to the path shown in fig. 2; 60° for special pneumatic actuators
- action: air-to-open and air-to-close with single-acting actuators. To change action only assembling operations are required.

- **SEAL RING**

- construction: PTFE or metal types are available for any sizes
- Temperature capabilities: PTFE seal ring: max 200 °C.  
metal seal ring: max 375 °C  
The limits vs p are outlined in fig. 4
- shutoff classification: PTFE seal ring: max leakage is according to class VI^  
metal seal ring: class IV^

- **SHAFT**

- construction: made in one piece and pinned sidewise to the disc.
- materials: 17-4-PH, A479 XM 19, AISI 316, AISI 316L

- **BEARINGS**

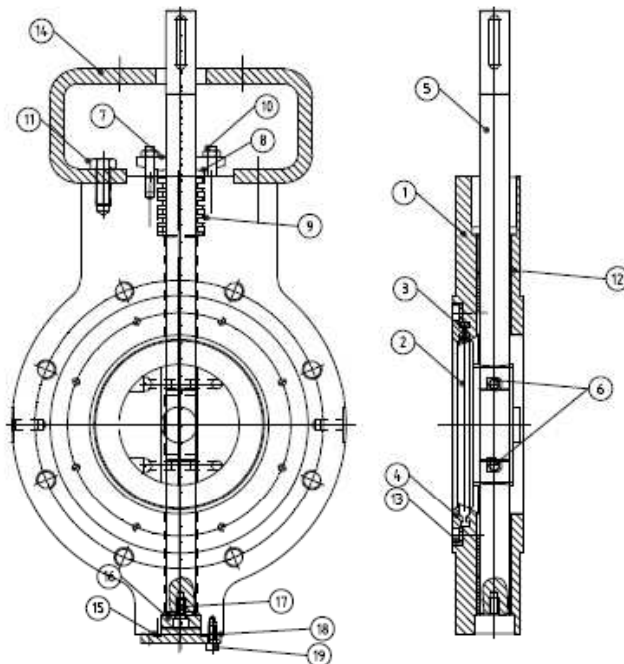
- construction: PTFE-lined or all-metal bushing.
- Temperature capabilities: PTFE-lined bearings may be used up to 250 °C;  
All-metal bearings may be used up to 375 °C.

- **PACKING**

- seal materials: reinforced PTFE split rings and pure graphite rings.
- design: adjustable by follower and two screws.
- Temperature capabilities: graphited PTFE rings: 200 °C;  
pure graphite: no practical limits.

# DOUBLE OFFSET BUTTERFLY VALVES HP SERIES

## ● MATERIAL LISTS



1	Body	CARBON STEEL-STAINLESS STEEL -6mo-DUPLEX-SUPERDUPLEX-ALU_BRONZE-TITANIUM
2	Disc	CARBON STEEL-STAINLESS STEEL -6mo-DUPLEX-SUPERDUPLEX-ALU_BRONZE-TITANIUM
3	Seat Ring	RPTFE+FIBER GLASS / METAL (ss316 or INCONEL 718)
4	Seat Retainer	CARBON STEEL-STAINLESS STEEL -6mo-DUPLEX-SUPERDUPLEX-ALU_BRONZE-TITANIUM
5	Valve Shaft	17-4 PH/NITRONIC50/6mo/DUPLEX/SUPERDUPLEX/MONEL/TITANIUM
6	Disc Pin	17-4 PH/NITRONIC50/6mo/DUPLEX/SUPERDUPLEX/MONEL/TITANIUM
7	Gland Flange	CARBON STEEL-STAINLESS STEEL -6mo-DUPLEX-SUPERDUPLEX-ALU_BRONZE-TITANIUM
8	Gland Bush	CARBON STEEL-STAINLESS STEEL -6mo-DUPLEX-SUPERDUPLEX-ALU_BRONZE-TITANIUM
9	Gland Packing	PTFE or GRAPHOIL
10	Gland Studs / Nuts	B7/2H-B8M/8M - SUPERDUPLEX - TITANIUM
11	Bracket Bolt	B7/2H-B8M/8M - SUPERDUPLEX - TITANIUM
12	Guide Bush	DU RPTFE+GRF / INCONEL 625
13	Retainer Bolt	B8M/8M - SUPERDUPLEX - TITANIUM- INCONEL
14	Mounting Bracket	WCB / SS316
15	Gasket	GRAPHOIL+INCONEL / GRAPHOIL
16	Antiblowout flange	17-4 PH/NITRONIC50/6mo/DUPLEX/SUPERDUPLEX/MONEL/TITANIUM
17	Antiblowout screws	B8M/8M - SUPERDUPLEX - TITANIUM- INCONEL
18	Bottom flange	CARBON STEEL-STAINLESS STEEL -6mo-DUPLEX-SUPERDUPLEX-ALU_BRONZE-TITANIUM
19	Bottom flange screws	B7/2H-B8M/8M - SUPERDUPLEX - TITANIUM
<b>ITEM</b>	<b>PART NAME</b>	<b>MATERIAL</b>

# DOUBLE OFFSET BUTTERFLY VALVES HP SERIES

## • TORQUE VALUES

PTFE SEAT - TORQUE VALUES IN Nm

VALVE SIZE	0 TO 50% Δ P		100% Δ P	
	CLASS 150	CLASS 300	CLASS 150	CLASS 300
50	30	81	35	68
65	34	88	40	80
80	40	79	49	89
100	59	108	69	128
125	85	158	103	196
150	128	236	157	295
200	275	501	314	569
250	334	608	451	814
300	451	814	625	1138
350	638	1148	1207	2178
400	873	1580	1670	2845
450	1126	2080	2100	3826
500	1374	2502	2680	4905
600	2306	4218	3924	7366

- Reinforced PTFE seat: multiply all torque values by factor 1,25
- To sizing the power operators, multiply torque values by a safety factor 1,30 for clean service, however Safety factor must be considered depending on the service conditions.
- Infrequent operation, values to be increase by 20%.
- Torque values allowance +/- 10%

METAL & FIRE SAFE SEAT— TORQUE VALUES IN Nm

VALVE SIZE	0 TO 50% Δ P		100% Δ P	
	CLASS 150	CLASS 300	CLASS 150	CLASS 300
50	74	101	78	110
65	81	146	88	160
80	89	162	93	177
100	108	196	133	245
125	156	300	190	360
150	190	358	241	442
200	373	677	452	824
250	501	903	618	1128
300	913	1648	1236	2237
350	1050	1694	1540	2796
400	1236	2227	1833	3532
450	1897	3061	3002	5445
500	2472	4464	3728	6769
600	3699	6671	5926	10791

- Reinforced PTFE seat: multiply all torque values by factor 1,25
- To sizing the power operators, multiply torque values by a safety factor 1,30 for clean service, however Safety factor must be considered depending on the service conditions.
- Infrequent operation, values to be increase by 20%.
- Torque values allowance +/- 10%

# DOUBLE OFFSET BUTTERFLY VALVES HP SERIES

## ● FLOW VALUES

FLOW COEFFICIENT  $C_v$  <sup>(1)</sup>

DN in.	DN mm	Cv max 90°	Valve opening <sup>(2)(3)</sup>								
			5°	10°	20°	30°	40°	50°	60°	70°	80°
3	75	130	0.8	5.1	17	32	49	67	89	112	127
4	100	285	1.9	11	38	71	108	147	196	246	279
6	150	730	4.7	29	97	183	277	377	502	631	715
8	200	1780	12	65	206	365	546	768	1067	1397	1660
10	250	3300	22	113	324	527	770	1143	1690	2328	2924
12	300	5000	33	156	466	756	1110	1654	2459	3447	4407
14	350	6700	44	189	591	954	1410	2111	3159	4512	5874
16	400	9100	60	230	756	1216	1810	2725	4106	5983	7935
18	450	11600	76	258	905	1449	2174	3292	4999	7442	10061
20	500	14100	93	272	1028	1638	2480	3780	5790	8821	12163
24	600	21000	138	405	1531	2440	3694	5630	8623	13137	18116

RECOVERY FACTOR  $F_L$

DN in.	DN mm	$F_L$ 90°	Valve opening								
			5°	10°	20°	30°	40°	50°	60°	70°	80°
3	75	0.70	0.96	0.94	0.91	0.87	0.83	0.80	0.76	0.73	0.71
4	100	0.67	0.96	0.94	0.90	0.85	0.81	0.77	0.73	0.69	0.67
6	150	0.65	0.96	0.94	0.89	0.84	0.80	0.75	0.71	0.67	0.65
8	200	0.59	0.95	0.93	0.88	0.83	0.78	0.73	0.68	0.63	0.60
10	250	0.56	0.95	0.93	0.88	0.84	0.80	0.74	0.68	0.62	0.58
12	300	0.52	0.95	0.93	0.87	0.82	0.77	0.71	0.65	0.59	0.54
14	350	0.52	0.95	0.93	0.87	0.83	0.79	0.73	0.66	0.60	0.55
16	400	0.52	0.95	0.93	0.88	0.84	0.79	0.73	0.67	0.60	0.55
18	450	0.52	0.95	0.94	0.88	0.84	0.80	0.74	0.67	0.60	0.55
20	500	0.53	0.95	0.94	0.89	0.85	0.81	0.75	0.69	0.61	0.55
24	600	0.52	0.95	0.94	0.89	0.85	0.81	0.75	0.68	0.61	0.55

COEFFICIENT OF INCIPIENT CAVITATION  $x_{i2}$  <sup>(4)</sup>

DN in.	DN mm	$x_{i2}$ 90°	Valve opening								
			5°	10°	20°	30°	40°	50°	60°	70°	80°
3	75	0.35	0.87	0.83	0.74	0.65	0.57	0.50	0.44	0.38	0.35
4	100	0.29	0.86	0.82	0.71	0.61	0.52	0.45	0.38	0.33	0.30
6	150	0.26	0.85	0.80	0.69	0.58	0.49	0.42	0.35	0.30	0.27
8	200	0.20	0.84	0.78	0.66	0.55	0.46	0.38	0.31	0.25	0.21
10	250	0.17	0.84	0.77	0.66	0.57	0.49	0.39	0.30	0.23	0.19
12	300	0.13	0.83	0.76	0.62	0.53	0.44	0.35	0.26	0.19	0.15
14	350	0.14	0.83	0.77	0.64	0.55	0.46	0.37	0.28	0.20	0.16
16	400	0.14	0.83	0.78	0.64	0.56	0.47	0.38	0.28	0.20	0.16
18	450	0.14	0.83	0.78	0.65	0.57	0.49	0.39	0.29	0.21	0.16
20	500	0.14	0.82	0.79	0.67	0.59	0.51	0.41	0.31	0.22	0.16
24	600	0.14	0.82	0.79	0.66	0.59	0.50	0.40	0.30	0.22	0.16

DIFFERENTIAL PRESSURE RATIO FACTOR  $x_T$

DN in.	DN mm	$x_T$ 90°	$x_T$ 10°
3	75	0.32	0.82
4	100	0.29	0.82
6	150	0.27	0.81
8	200	0.23	0.80
10	250	0.20	0.80
12	300	0.17	0.79
14	350	0.18	0.80
16	400	0.18	0.80
18	450	0.18	0.81
20	500	0.18	0.82
24	600	0.18	0.82

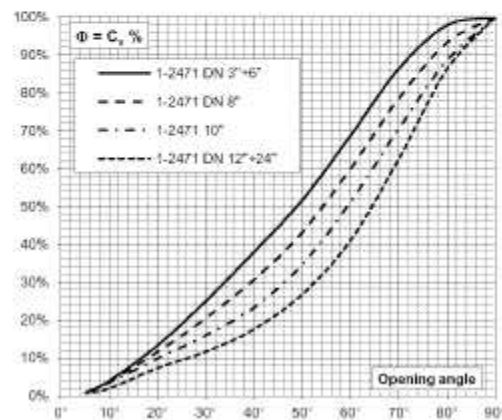
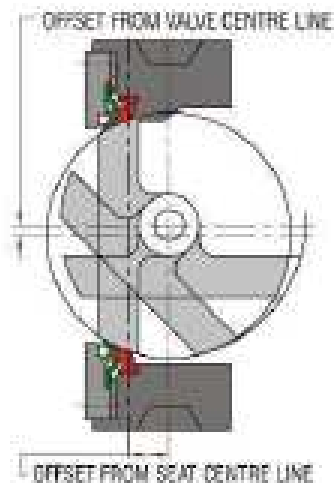


FIGURE 3 - FLOW CHARACTERISTICS

(1)  $C_v$  are expressed in U.S. gallons/min. of water with  $\Delta p=1$  psi  
 (2) Rangeability can be calculated as  $C_v \text{ max}/C_v 5^\circ$   
 (3) Tolerance according to IEC 60534-2-4  
 (4) IEC 60534-8-4

# DOUBLE OFFSET BUTTERFLY VALVES HP SERIES



## DOUBLE OFFSET

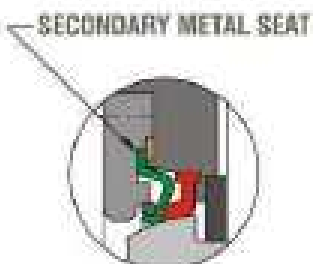
The axis of the disc rotation is double offset to the seat. When the disc rotates it unseats at a small turning angle by its cam effect. This outstanding feature enables:

- Bubble tight shut - off over extended period of service.
- Greatly reduced seat wear.
- Reduced the torque peak experienced with conventional valves.



## SPHERICAL DISC

Double offset shapes the disc portion interested to the contact with the seat as spherical edge which makes the sealing contact perfectly homogeneous uninterrupted and smoothly.

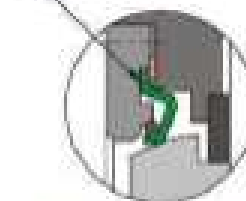


## FIRE SAFE

A secondary lip type, pressure assisted, metal seat gives bi-directional sealing once the PTFE seat burns away after the fire.

Certified by Lloyds Register of Industrial Services. As per API 607 4th Edition.

## METAL SEAT



## HIGH TEMPERATURE SERVICES

Combination of seat and disc materials suitable up to 600 °C ( 1112 °F ) Seat Leakage Rate Classe IV as per FCI 70-2

# DOUBLE OFFSET BUTTERFLY VALVES HP SERIES

