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HP Double Eccentric Butterfly Valve



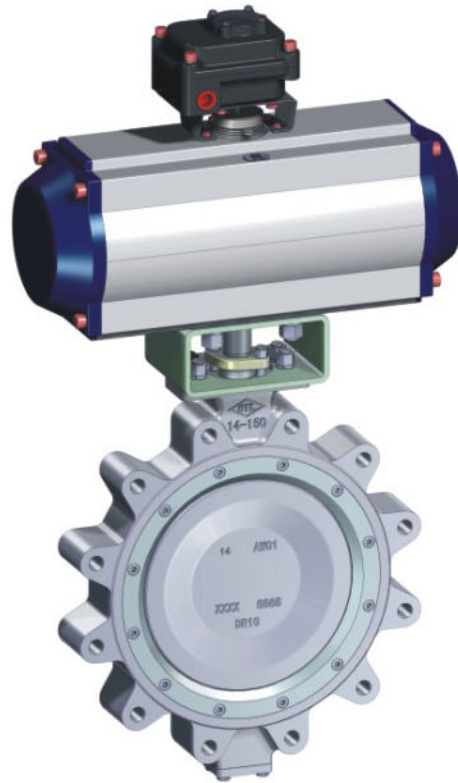
ZHEJIANG BOTELI TECHNOLOGY CO.,LTD.

Technical characteristics



DR series high performance butterfly valve is our own develop and design product.

It has double eccentric disc structure, adopting memory sealing ring wrapped strengthen ring composite structure seat, using flexible sealing technology, eliminating abrasion, plastic deformation, influence of temperature and pressure changes so achieve a reliable seal. This type of valve has the advantages of compact structure, light weight, reliable sealing. Compared with traditional valve, it has convenient installation, convenient maintenance and longer service life. Applicable to the petroleum, nature gas, chemical industry, metallurgy, water heating, electricity industry. Widely used for continuous adjustment or switch operation in automatic control system of production process.



Technical characteristics

Unique seat structure

- Bi-direction elastic seal and zero leakage
- Automatic compensation to the change of temperature and pressure
- Effective sealing pair with large adjustment range
- Long service life, little maintain

Double-eccentric disc design

- Seat and disc are out of touch in whole open process
- No abrasion on up and down position of seat
- Low operate torque

Convenience for seat maintenance

- Take down gland to change seat, no need to disassemble disc and stem.

Meet both cut off and control

- Excellent control characteristic
- Flow curve equal ratio to change
- Wide adjustable range
- Used for control but still with effective sealing

Fireproof structure

- Fireproof valve conform to API607 and BS6755 part 2.

Technical specification

- Structure: Wafer type, Lug type, Double-flange Type
- Class and Size:
 - ANSI CL150 NPS2-NPS60
 - ANSI CL300 NPS3-NPS60
 - ANSI CL600 NPS4-NPS24
- Body material: WCB、CF8M
- Seal Ring: PTFE/Silicone Rubber Strengthen Ring
RPTFE/Silicone Rubber Strengthen Ring
- Face to face: Comply to API609
- Drive operation

2" -8" butterfly valve can be open and close operated with the handwheel, also can be set to partially open.

The locking device on the handwheel locks the disc at any position on 10% space of opening and closing route.

Manual worm gearing can open valve to any intermediate position, also can be operated easily under high pressure difference.

Use secure double acting pneumatic device and electric device, automatic control for valve operation.

In need of proportional control for flow, there's corresponding actuator and positioner can be chose.

Structure feature



■ Gland flange

Exert pressure to Packing gland, preventing external leakage, and completely adjustable.

■ Bearing

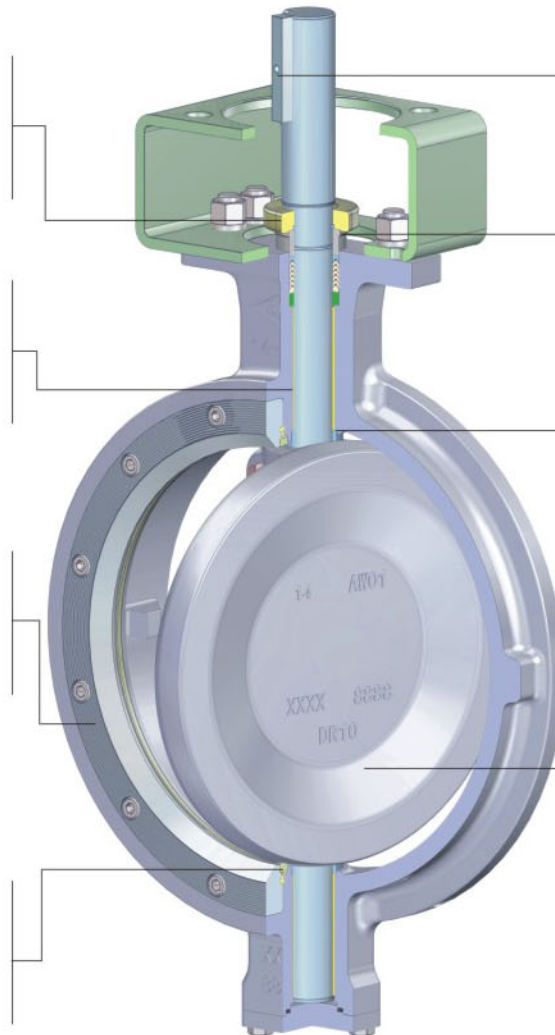
PTFE clad stainless steel bearing centring connect with stem. It is high load, small erosion, low friction factor etc.

■ Seat gland

Take down gland to change seat, no need to disassemble disc and stem.

■ Seat

Bi-direction sealing seat, elastic strengthen ring inside of seat to provide sealing elasticity.



■ Key

Adopt square key for valve and drive device, it can make malfunction occur in external control point when the torque is too large.

■ Packing gland

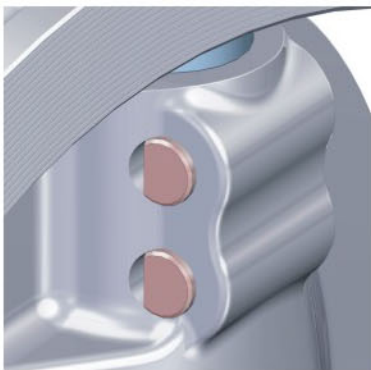
Packing gland and gland flange act independently to prevent packing uneven load.

■ Thrust washer

Keep the center position of disc

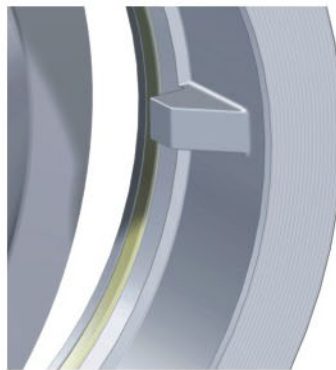
■ Disc

Adopt 360° uninterrupted spherical structure for disc sealing face. Provide maximal flow, minimum fluid resistance and high kv value.



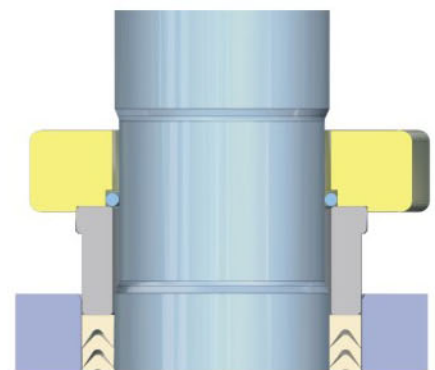
Connection of stem and disc

Unique design for connect pin between stem and disc, tight and reliable pin connection, nice interchangeability.



Route Stopper

Internal limit position design prevents the disc over travel, so as to prolong the service life of seat and reduce the possibility of seat damage.



Blow-out proof stem

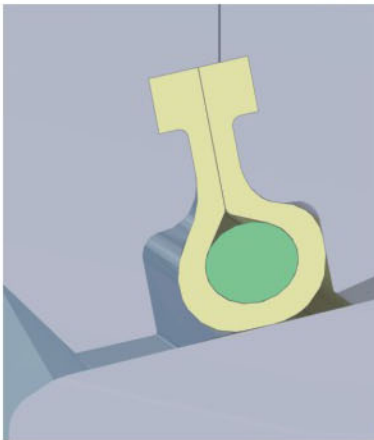
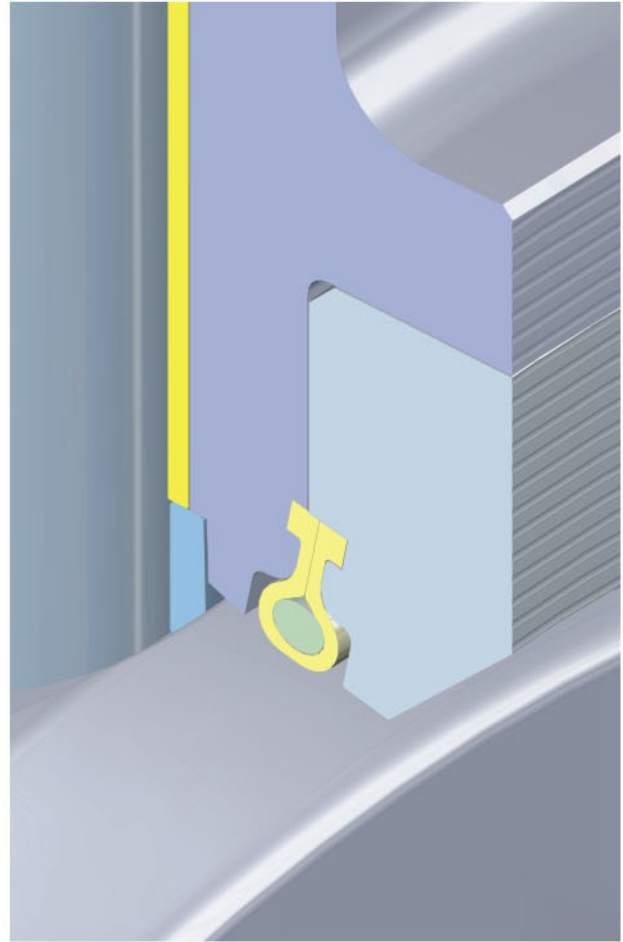
Install a locating ring between groove of stem and packing gland, when stem fractured internally, it can prevent stem blowing out to hurt people.

Structure feature



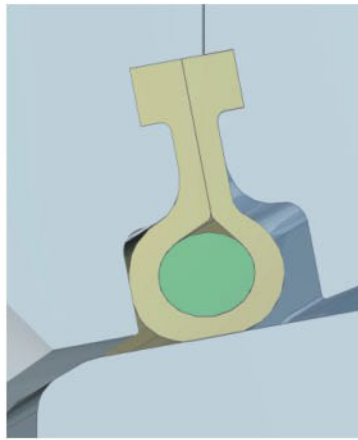
Unique structure of two pieces seats, composed of seat wrap with elastic strengthen ring. This simple and reliable design has many unique advantages:

- Elastic strengthen ring wrapped with seat, insulated medium of pipeline completely.
- The groove in body and seat gland and tooth profile design effectively assured the seat fixed well on the needed position at any time.
- The seat gland connects body by bolt, locked the seat in correct position. Even if there is no counter flange, valve seat also can be reliably fixed.
- Reliable fixed and nice supporting seat rely on the disc and the medium pressure to enhance the sealing ability. When the pipeline pressure increased, the sealing performance is enhanced. When in low pressure or vacuum state, the valve seat also can provide excellent sealing performance through its own memory.
- Zero leakage bi-direction sealing function
- Memory characteristics of seat can adjust itself according to abrasion and temperature change, always maintain a stable sealing
- Quick and easy seat replacement process can be completely finished just by removing the retainer ring, turning the disc to the closed position, replacing the new seat into groove of body. It's simple, fast and does not affect the disc, stem and other parts.



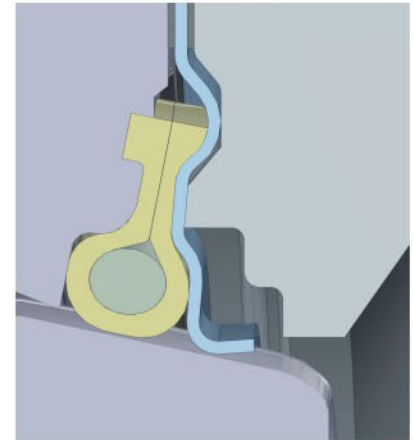
Close the valve, medium flow from left to right.

The seat moves toward the direction of media flow, pressing on the disc, preventing the leakage strictly. The higher of pipeline pressure, the tighter of sealing between seat and disc.



Close the valve, medium flow from right to left

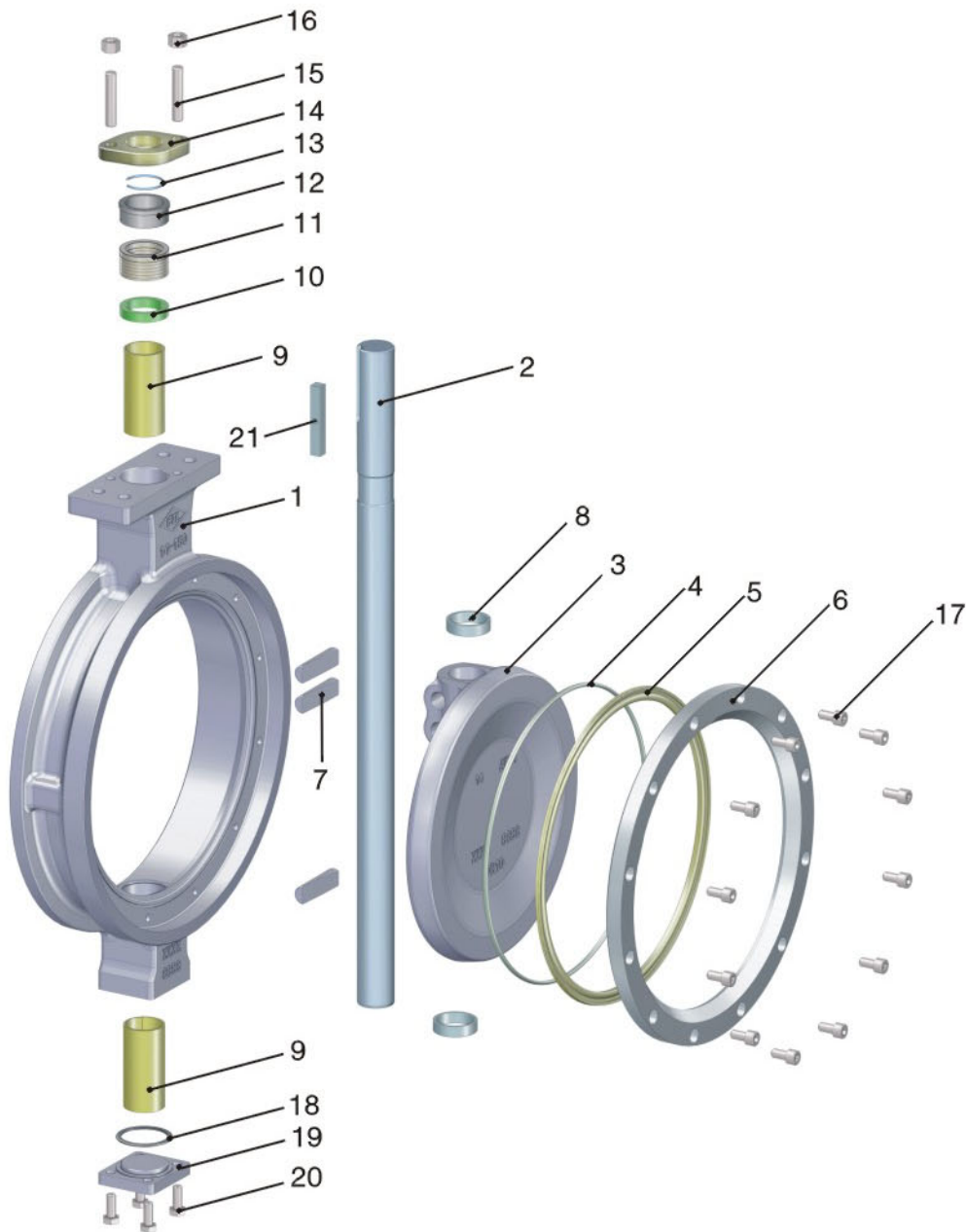
The seat moves along the direction of media flow, close to disc to ensure reliable bi-direction sealing. It has reliable sealing performance from vacuum to high pressure



Fire-safe seat structure

Generally, the elastic seat and metal seat both touch disc at the same time. When the fire occurs, metal seat always keep touch steadily with disc when elastic seat damaged partly or completely. No matter which direction of media flow, it can always provide reliable Seal.

Breakdown Structure

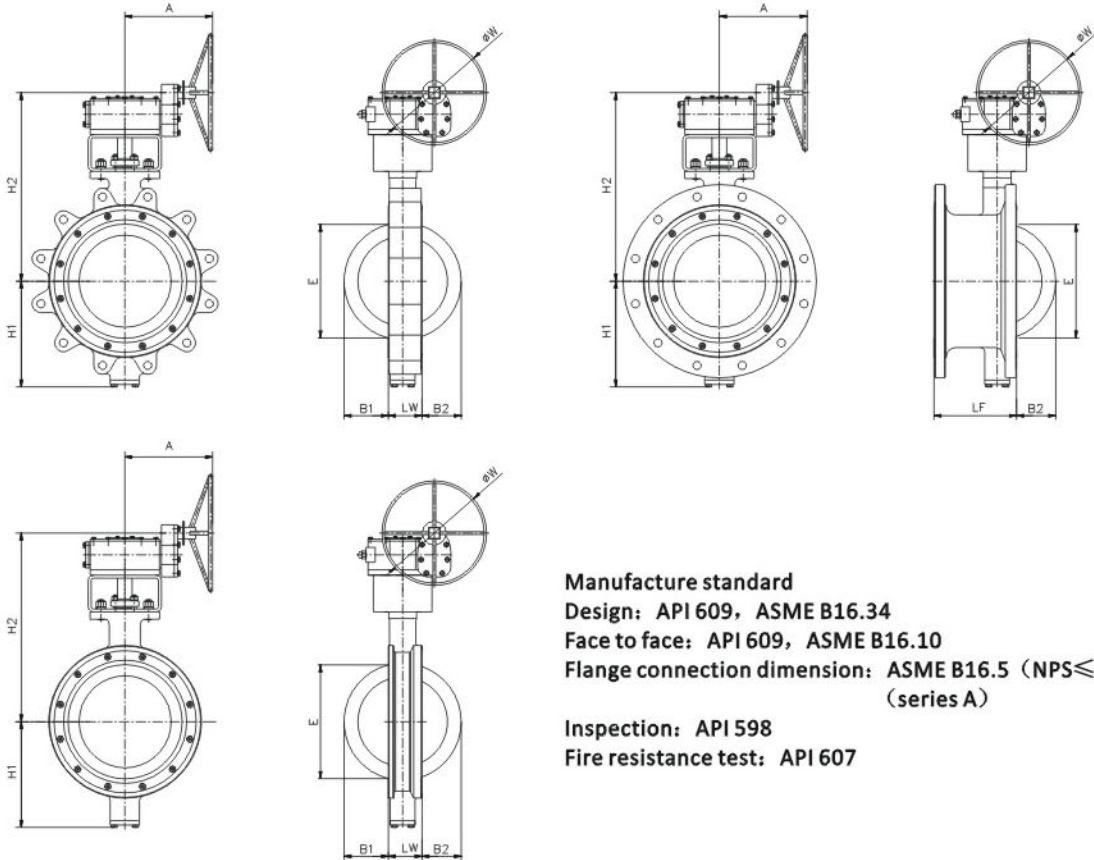


Item	Part name	Material		Item	Part name	Material	
1	Body	A216 WCB	A351 CF8M	12	Packing gland	A276 304	A276 316
2	Stem	A564 630(H1150D)	A564 630(H1150D)	13	Retainer ring	A276 304	A276 316
3	Disc	A351 CF8	A351 CF8M	14	Gland flange	A216 WCB	A351 CF8M
4	Strengthen ring	FPM	FPM	15	Hex. nut	A194 2H	A194 8
5	Sealing Ring	RPTFE	RPTFE	16	Bolt	A193 B7	A193 B8
6	Seat retainer	A105	A105	17	Screw	A193 B8	A193 B8
7	Pin	A564 630(H1150D)	A564 630(H1150D)	18	Spiralwound gasket	304+PTFE	316+PTFE
8	Thrust washer	A276 304	A276 316	19	Bottom cap	A105	F316
9	Bearing	A240 304+PTFE	A240 316+PTFE	20	Hex. bolt	A193 B7	A193 B8
10	packing seat	A276 304	A276 316	21	Key	A576 1045	A576 1045
11	V packing	RPTFE	RPTFE				

Dimensions



Class 150/300/600 Main dimensions



Manufacture standard

Design: API 609, ASME B16.34

Face to face: API 609, ASME B16.10

Flange connection dimension: ASME B16.5 (NPS ≤ 24) / B16.47 (series A)

Inspection: API 598

Fire resistance test: API 607

Class 150 Main dimensions

NPS	LF	LW	H1	H2	B1	B2	E	A	W
2		43	80	171	12	7	48	159	150
2.5		46	95	200	15	11.5	60	159	150
3	114	48	105	201	19.5	15.5	73	159	150
4	127	54	120	223	26	22	96	159	150
5	140	56	135	230	42	32	115	159	150
6	140	57	145	241	50	40	147	159	150
8	152	64	185	298	67	62	193	162	200
10	165	71	220	364	92	78	242	220	350
12	178	81	255	417	110	97	287	229	350
14	190	92	289	452	120	104	318	229	460
16	216	102	329	512	142	123	367	360	600
18	222	114	354	537	158	146	418	402	600
20	229	127	399	661	177	160	465	520	600
24	267	154	455	721	206	203	583	520	600
28	292	165	515	865	275	236	677	543	750
30	318	190	551	897	257	254	700	543	750
32	318	190	580	837	291	284	766	604	750
36	330	203	652	949	335	330	868	604	750
40	410	216	715	997	366	350	955	604	750
42	410	216	740	1023	402	386	1000	643	750
48	470	254	829	1095	464	464	1176	643	750

Dimensions



Class300Main dimensions

NPS	LF	LW	H1	H2	B1	B2	E	A	W
3	114	48	120	210	20	16	74	159	150
4	127	54	145	245	29	24	97	159	150
6	140	59	180	320	51	41	146	162	200
8	152	73	210	370	70	53	194	220	350
10	165	83	245	445	90	71	244	229	460
12	178	92	290	780	110	90	290	360	600
14	190	117	325	525	108	99	318	402	600
16	216	133	365	585	122	116	364	520	600
18	222	149	395	640	141	128	414	520	600
20	229	159	425	735	147	134	456	543	750
24	267	181	505	305	191	182	552	604	750
30	318	241	620	950	232	224	730	643	750
36	330	241	710	1080	309	300	889	660	750
40	410	300	730	1505	339	323	950	754	800
48	470	350	830	1625	442	424	1100	855	800

Class600Main dimensions

NPS	LF	LW	H1	H2	B1	B2	E	A	W
4	190	64	160	265	25	15	97	162	200
6	210	78	230	360	43	39	147	229	350
8	230	102	250	410	53	41	189	360	600
10	250	117	315	480	71	71	233	402	600
12	270	140	345	570	88	78	275	520	600
14	290	155	380	600	92	82	284	520	600
16	310	178	420	650	96	90	316	543	750
18	330	200	470	680	118	109	381	643	750
20	350	216	510	715	127	118	421	643	750
24	390	232	550	820	147	147	510	643	750



Open and close torque



CLASS 150 The unit for open and close torque of actuator is N-M

NPS	< 10.3 Bar		> 10.3–14 Bar		> 14–17.2 Bar		> 17.2–20 Bar	
	Obverse	Reverse	Obverse	Reverse	Obverse	Reverse	Obverse	Reverse
2	14	17	15	20	17	23	18	25
2.5	17	21	20	25	22	29	23	31
3	19	23	22	27	23	31	24	33
4	28	33	31	38	33	43	33	47
5	56	66	66	82	73	96	75	107
6	71	84	79	98	85	113	86	124
8	132	155	144	175	155	200	161	216
10	247	288	374	339	290	387	295	421
12	356	417	407	509	447	600	463	662
14	549	641	602	752	651	865	676	967
16	783	925	920	1149	1027	1373	1068	1526
18	1211	1424	1383	1729	1526	2034	1566	2237
20	1556	1831	1739	2166	1882	2512	1922	2746
24	2507	2949	2815	3519	3051	4078	3132	4475
28	3544	4170	3824	4780	4505	6021	4526	6458
30	4063	4780	4369	5461	5166	6885	5340	7628
32	4577	5390	4963	6204	5858	7810	5980	8543
36	5492	6509	6590	8238	7475	9967	7831	11187
40	6305	7424	7485	9356	8391	11187	8614	12306
42	7221	8441	8543	10679	9687	12916	10272	14543
48	9967	11696	12367	15458	14493	19323	15449	22069

CLASS300

NPS	< 10.3 Bar		> 10.3–24 Bar		> 24–38Bar		> 38–51 Bar	
	Obverse	Reverse	Obverse	Reverse	Obverse	Reverse	Obverse	Reverse
3	19	23	32	40	41	55	51	72
4	28	33	43	55	56	75	72	103
6	87	103	136	169	177	237	216	308
8	163	190	255	319	332	442	380	545
10	288	339	452	566	586	782	720	1028
12	432	509	675	844	878	1170	1068	1526
14	743	875	1090	1363	1393	1861	1566	2237
16	1211	1424	1750	2187	2217	2949	2705	3865
18	1556	1831	2197	2746	2756	3671	3204	4577
20	2075	2441	2990	3732	3763	5014	4343	6204
24	3285	3865	4638	5797	5848	7800	6764	9662
30	6916	8136	10333	12916	13119	17492	14950	21357
36	10287	12102	14645	18306	18306	24408	20645	29493
40	11757	13831	17086	21357	22577	30103	28334	40477
48	12967	15255	22130	27662	32646	43528	41006	58579

CLASS600

NPS	< 10.3 Bar		> 10.3–41.4 Bar		> 41.4–72.4Bar		> 72.4–102 Bar	
	Obverse	Reverse	Obverse	Reverse	Obverse	Reverse	Obverse	Reverse
4	87	98	132	165	163	216	196	278
6	149	175	263	329	355	473	421	596
8	360	421	592	741	782	1038	1007	1440
10	730	854	987	1234	1389	1851	1727	2468
12	1038	1213	1152	1440	2006	2674	2159	3085
14	1224	1440	1975	2468	2550	3393	3085	4422
16	1424	1679	2888	3611	3509	4678	4628	6611
18	1648	1932	3498	4373	4983	6611	6549	9356
20	2166	2543	4638	5797	6712	8950	8848	12611
24	3356	3966	7221	9051	9560	12713	12509	17798

Flow coefficient Kv value



CLASS150

Disc position (angle)

NPS	90	80	70	60	50	40	30	20	10
2	132	108	80	60	70	25	13	6	3
2.5	141	121	88	70	45	27	15	7	3
3	164	158	137	109	77	50	28	12	4
4	333	323	280	222	155	102	56	27	9
5	701	599	444	319	211	130	70	36	15
6	1198	950	666	452	292	193	124	72	31
8	2484	1978	1410	940	607	405	249	147	57
10	3815	3061	2156	1446	932	621	399	222	88
12	5899	4728	3327	2244	1446	958	621	346	137
14	6786	5411	3815	2573	1676	1109	719	399	155
16	8693	6973	4888	3282	2147	1357	905	515	204
18	9315	8072	6174	4524	3123	1970	1047	444	151
20	11977	10379	7806	5767	3993	2501	1357	568	178
24	17742	15169	11355	8490	5891	3442	1952	816	213
28	24839	21202	16146	11977	8250	5056	2750	1153	257
30	28388	24218	18541	13751	9492	5944	3194	1340	284
32	30162	25815	19783	14638	10113	6343	3415	1428	302
36	43026	36460	28122	20582	14549	9049	4817	2005	425
40	55001	48969	39033	29541	21113	13485	7629	3123	595
42	57663	51453	40896	31049	22178	14194	7984	3282	621
48	80728	71768	56509	38679	25815	17742	9758	4081	816

CLASS300

NPS	90	80	70	60	50	40	30	20	10
3	164	158	137	109	77	50	28	12	4
4	333	323	280	222	155	102	56	27	9
6	887	776	630	470	329	213	123	70	23
8	1774	1526	1206	842	558	359	213	107	42
10	2350	1996	1543	1065	692	452	262	133	54
12	3548	3016	2218	1500	976	630	382	196	81
14	3637	3105	2307	1570	1065	736	435	213	88
16	6919	5802	4036	2634	1633	1029	648	372	160
18	8428	7097	5474	4019	2759	1747	958	390	83
20	9758	8490	6476	4790	3300	2066	1109	470	98
24	15968	13395	10113	7602	5252	3282	1774	736	160
30	25726	21646	16767	12153	7541	5323	2865	1179	257
36	39920	33799	25904	18630	13129	8072	4134	1535	337
42	53227	47904	37259	26614	16855	11533	6654	2307	399
48	73631	65647	51453	36372	23065	15081	8871	3903	709

CLASS600

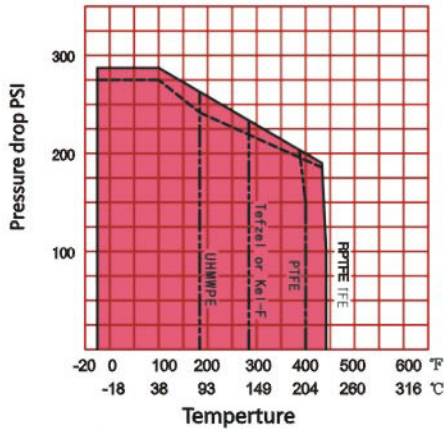
NPS	90	80	70	60	50	40	30	20	10
4	266	239	186	133	84	62	40	27	4
6	764	688	540	383	243	180	116	63	14
8	1331	1198	932	666	425	306	185	70	18
10	1952	1747	1367	976	621	444	266	124	35
12	2750	2475	1925	1375	887	603	355	168	49
14	3460	2928	2129	1393	976	648	372	178	62
16	4436	3726	2573	1686	1065	709	444	222	84
18	5323	4436	3460	2484	1686	1065	586	257	115
20	7097	6121	4702	3460	2395	1508	842	355	127
24	9758	8250	6210	4613	3194	1996	1065	444	160

Rated value of seat

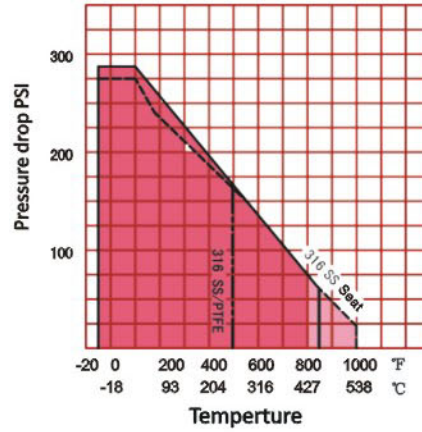


Rated value of seat only refer to seat, it means differential pressure on both sides of disc when the valve is fully closed.
 Rated value of body according to ANSI B16.34

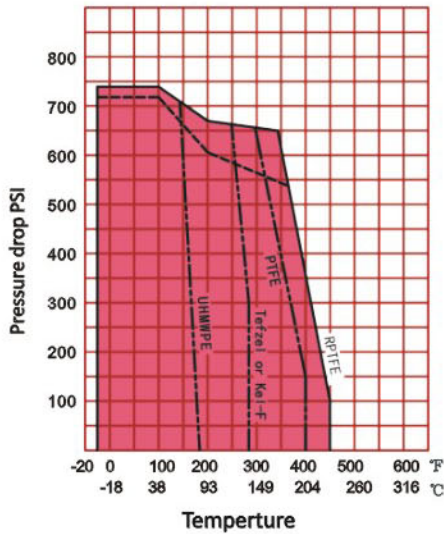
CL150 Soft seat valve



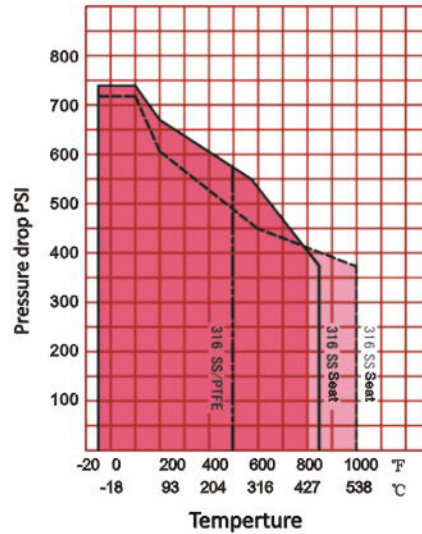
CL150 Fire safe and high temperature valve



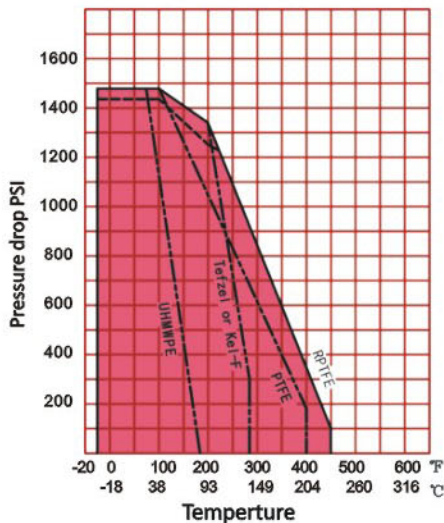
CL300 Soft seat valve



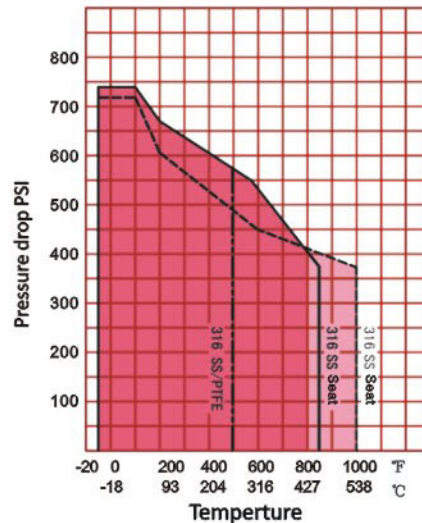
CL300 Fire safe and high temperature valve



CL600 Soft seat valve



CL600 Fire safe and high temperature valve



Carbon steel body, Stainless steel body, type of seat

■ 17-4PH stem ■ Inconel Stem

Application



DR series butterfly valve applied to variety of working conditions, such as corrosive chemicals, water, gas, acid, alkali, hydrocarbons and many other fluids. It has a variety of materials selection and configuration to meet the requirements in different conditions.

Vacuum condition

Standard series valve is recommended to used in vacuum condition under absolute pressure 0.02mm or 20 μ m Hg absolute pressure. As for the vacuum conditions as low as 1×10^{-3} mm or 1μ m Hg absolute pressure, it is recommended to use special valve. After special treatment, it can be used up to 1×10^{-6} mm Hg pressure.

Steam condition

Specially designed standard series valve can be used for high temperature and high pressure conditions. It acts a switch or regulatory role for hot water, condensation water, cooling water pipes. It can reach 10.3bar(150psi) pressure standard for 185°C (366 °F) saturated steam. It is recommended to use the standard RPTFE seat in this application.

Oxygen condition

Standard series valves for the high requirements of the gaseous oxygen condition must be special prepared (cleaning, inspection, installation and test) to ensure the removal of burrs, sharp edges, dirt, grease, carbonization hydrogen or other pollutants. Each valve need to wipe cleanly, coated with polyethylene seal before shipment. Another important feature of the valves used in oxygen conditions is electrostatic which may occurred in the safety conduction. There's a grounding gasket in stem.

Ash and friction condition

Similar conditions such as cement, silt, ash and ash cleaning, carbon (dry or slurry state), slag, industrial waste or residue, glass and silicon, lime slurry, alkali, coal or cocoa flavor, powder metallurgy ore or ore sand, and so on. Under such conditions valve service life depending on flow, pressure difference, temperature difference, solid content, size and hardness of solid, and frequency of use.

Pipeline end condition

Optional pipeline end sealing appl, suitable for full rated pressure pipeline end.ications



Low temperature conditions

There are full cryogenic valves and semi cryogenic valves. Stainless steel body, stainless steel and PCTFE combination seat. The seat is axial direction deformation sealing, ensure the cut off.

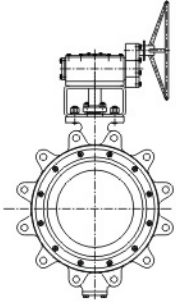
Air conditioning system

It can replace block valve, isolating valve, throttle valve used in humid environment or "balance" flow, also can be used to control water pump inlet and outlet, or for pipeline connection, acting like cut off valve, bypass valve and so on. The temperature is usually not higher than 260°C

Corrosion condition

"Corrosive" usually refers to sodium, potassium, and calcium hydroxide. Amine solution and alkali carbonate can also be placed in the same sort.

In most conditions, corrosive won't corrode heavily to ordinary carbon steel, also will not corrode PTFE or RPTFE seat. So, full carbon steel valves with PTFE seat would be fine. However, there are varieties of operating conditions in corrosive environment, material selection for valve must be sufficient to resist corrosion or meet the purification requirement.



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