HIGH PERFORMANCE BUTTERFLY VALVE

■ Standard Production Range

Rating		JIS		ANSI
		10K	20K	Class 150
Size	inch	1 1/2"~40"	1 1/2"~28"	1 1/2"~24"
	mm	40~1000	40~700	40~600
Connection		Wafer type		
Actuator	Manual	Lock lever handle, Worm gear		
	Automatic	Pneumatic double act, Pneumatic single Act(spring-return), Electric Act		

■ Main Materials

Rating	JIS		ANSI
	10K	20K	Class 150
Body	Ductile iron(FCD45) Stainless steel(SCS13, CF8, SCS14, CF8M) Carbon steel(SCPH2, WCB)		
Disc	Stainless steel(SCS13, CF8, SCS14, CF8M)		
Stem	SUS304, SUS316		
Seat	PTFE, RTFE, SUS304, SUS316, etc.		
Glandpacking	PTFE, RTFE, graphite		

■ Seat Material and Working Temperature

Seat Materials	Maximum Working Temperature ℃(℉)
PTFE	160(320)
RTFE	180(356)
MTFE	195(383)

■ Working Pressure and Test Pressure

Working Pressure

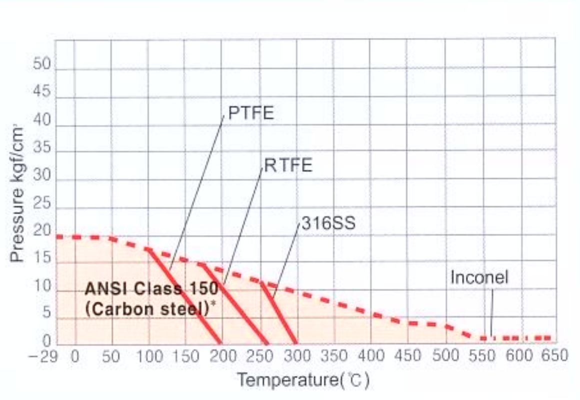
Body	20kgf/cm²	19.6MPa
Seat	20kgf/cm²	19.6MPa

Test Pressure

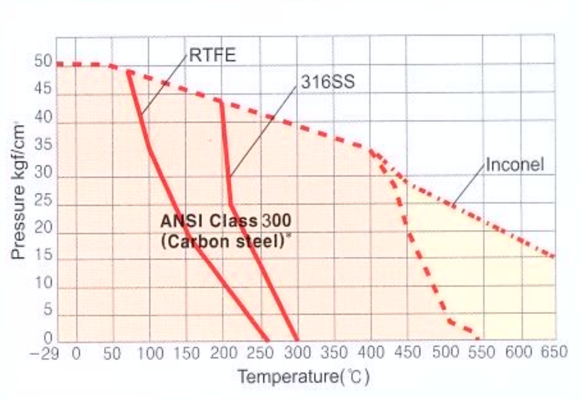
Body	32kgf/cm²	31.36MPa
Seat	24kgf/cm²	23.52MPa

■ Seat Ratings

ANSI Class 150



ANSI Class 300



Notes to SEAT RATINGS ANSI Class 150

Valve sizes larger than 14(350mm)equipped with 304SS or 316SS shafts are rated for maximum differential press of 150 psi(10kgf/cm²).

ANSI Class 300

Maximum differential pressure for valves equipped with 304SS or 316SS shafts is 300 psi(21kgf/cm²).

*Body rating is based on carbon steel.

■ Valve Body Ratings

These are maximum working pressures for bodies only.
The seat ratings shown above determine the practical pressure limitations.

ANSI B16.34(1988)

ANSI Class	150		300	
Temperature	Carbon steel	316SS	Carbon steel	316SS
℃(℉)	MPa(psi)	MPa(psi)	MPa(psi)	MPa(psi)
-29(-20)to38(100)	2.0(285)	1.9(275)	5.2(740)	5.0(720)
100(200)	1.8(260)	1.7(240)	4.7(675)	4.3(620)
150(300)	1.6(230)	1.5(215)	4.6(655)	3.9(560)
200(400)	1.4(205)	1.4(205)	4.4(635)	3.6(515)
260(500)	1.2(170)	1.2(170)	4.2(600)	3.3(480)
320(600)	1.0(140)	1.0(140)	3.9(560)	3.2(450)
340(650)	0.87(125)	0.87(125)	3.7(535)	3.1(445)
370(700)	0.77(110)	0.77(110)	3.7(535)	3.0(430)
400(750)	0.66(95)	0.66(95)	3.5(505)	3.0(430)
430(800)	0.56(80)	0.56(80)	2.9(415)	2.9(415)
450(850)	0.46(65)	0.46(65)	1.9(275)	2.8(405)
480(900)	0.35(50)	0.35(50)	1.2(170)	2.8(395)
510(950)	0.25(35)	0.25(35)	0.74(150)	2.7(385)
540(1000)	0.14(20)	0.14(20)	0.35(50)	2.6(365)
570(1050)	-	-	-	2.5(360)
590(1100)	-	-	-	2.3(325)
620(1150)	-	-	-	1.9(275)
650(1200)	-	-	-	1.4(205)
Test pressure	3.1(445)	2.9(415)	7.9(1125)	7.7(1100)

■ Allowable Seat Leakage

Soft Seat

Leakage of the soft-seated versions(PTFE, RTFE seated) is ZERO

Pressure-temperature Limition(Soft Seat)

Metal Seat(Class V)

Leakage of metal-seats is in accordance with Class V(Water) of ANSI/FCI 70.2(1976)for allowable seat leakage.

Unit : cc/minute

Size		ΔP(bar)			
inch	mm	10	16	20	25
2	50	0.15	0.24	0.30	0.38
2-1/2	65	0.19	0.03	0.38	0.48
3	80	0.24	0.38	0.48	0.60
4	100	0.30	0.48	0.60	0.75
5	125	0.38	0.60	0.75	0.95
6	150	0.45	0.72	0.90	1.13
8	200	0.60	0.96	1.20	1.50
10	250	0.75	1.20	1.50	1.88
12	300	0.90	1.44	1.80	2.25
14	350	1.05	1.68	2.10	2.63
16	400	1.20	1.92	2.40	3.00
18	450	1.35	2.16	2.70	3.38
20	500	1.50	2.40	3.00	3.75
22	550	1.65	2.64	3.30	4.13
24	600	1.80	2.88	3.60	4.50

Qa(allowable leakage)(cc/minute)=3×10×nominal size(mm)×ΔP(bar) or 0.0075×nominal size(inch)×ΔP(bar)

ΔP=max. differential pressure

Cv-value

ANSI Class 150/300

Size inch	Size mm	Class	Degree of disc rotation(°) 10	20	30	40	50	60	70	80	90
2	50	150~300	2	7	13	21	31	46	64	84	92
2-1/2	65	150~300	4	12	21	35	51	75	105	137	150
3	80	150~300	6	20	36	60	88	132	182	238	260
4	100	150~300	14	36	64	106	162	235	326	414	460
5	125	150~300	22	60	105	175	260	390	540	670	760
6	150	150	40	100	165	265	400	600	805	1025	1150
		300	30	76	125	200	305	460	615	785	880
8	200	150	65	170	290	485	735	1080	1490	1850	2100
		300	60	155	265	440	665	980	1350	1675	1900
10	250	150	100	260	445	735	1120	1680	2270	2850	3200
		300	90	230	390	645	980	1470	1985	2495	2800
12	300	150	150	385	660	1080	1645	2520	3385	4185	4700
		300	130	335	575	945	1435	2200	2955	3650	4100
14	350	150	190	470	810	1335	1950	2850	4060	5105	5800
		300	180	445	770	1265	1850	2705	3850	4840	5500
16	400	150	250	650	1110	1820	2720	3900	5670	7100	8000
		300	235	615	1055	1730	2585	3705	5385	4745	7600
18	450	150	340	850	1460	2265	3520	5300	7400	9280	10500
		300	320	800	1375	2265	3320	5000	6980	8750	9900
20	500	150	430	1100	1940	3200	4800	7000	9900	12390	14000
		300	400	1020	1800	2970	4460	6500	9190	11500	13000
24	600	150	650	1700	2940	4830	7300	10700	14900	18500	21000
		300	605	1580	2730	4485	6780	9940	13840	17180	19500
26	650	150	780	2000	3500	5700	8600	12700	17700	22100	25000
28	700	150	800	2350	4100	6700	10000	14700	20550	25600	29000

Basic Formulas for Cv-value and Flow Data

LIQUIDS

$$Q = \frac{Cv}{1.17}\sqrt{\frac{\Delta P}{G}}$$

STEAM

① $\Delta P < \frac{P_1}{2}$

$$W = \frac{135\,Cv\sqrt{(\Delta P(P_1 = P_2)}}{K}$$

STEAM IN GENERAL

② $\Delta P \geq \frac{P_1}{2}$

$$Q = \frac{236\,Cv\ P_1}{\sqrt{G(273+T)}}$$

GASES

① $\Delta P < \frac{P_1}{2}$

$$Q = 272\,Cv\sqrt{\frac{\Delta P(P_1+P_2)}{G(273+T)}}$$

② $\Delta P \geq \frac{P_1}{2}$

$$W = \frac{11.9\,CvP_1}{K}$$

② $\Delta P \geq \frac{P_1}{2}$

$$Q = \frac{236\,Cv\ P_1}{\sqrt{G(273+T)}}$$

Q : Volume rate of flow(liquid ㎥/h, gas N㎥/h)

W : Volume rate of flow(steam kg/h)

P_1 : Intet pressure(liquid kgf/㎠, gas/steam kgf/㎠, abs.)

P_2 : Outlet pressure(liquid kgf/㎠, gas/steam kgf/㎠, abs.)

ΔP : Pressure drop P_1-P_2(kgf/㎠)

G : Specific gravity of fluid(water=1, air=1)

T : Temperature of fluid(℃)

K : 1+(0.0013×TSH)

TSH(℃)=Total temperature minus saturation temperature

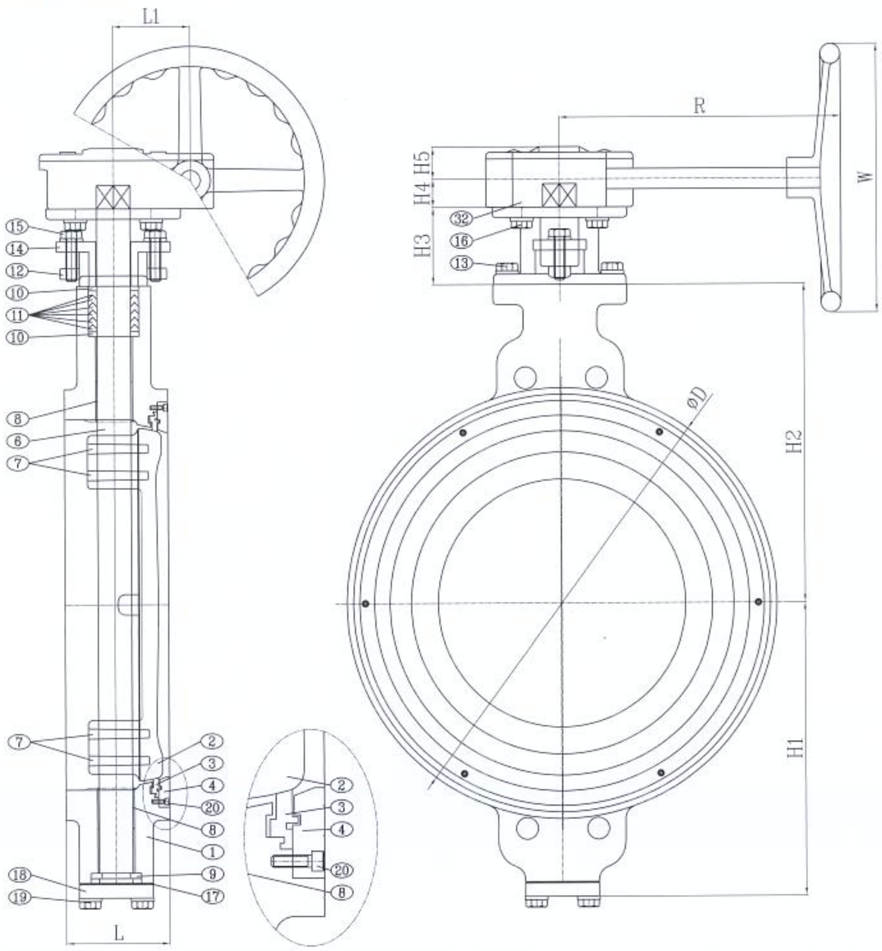
V_1 : Specific volume(㎤/g....P_1)

V_2 : Specific volume(㎤/g....P_2)

Notes : When $P_2 < \frac{1}{2}P_1$, use $\frac{P_1}{2}$ instead of _P

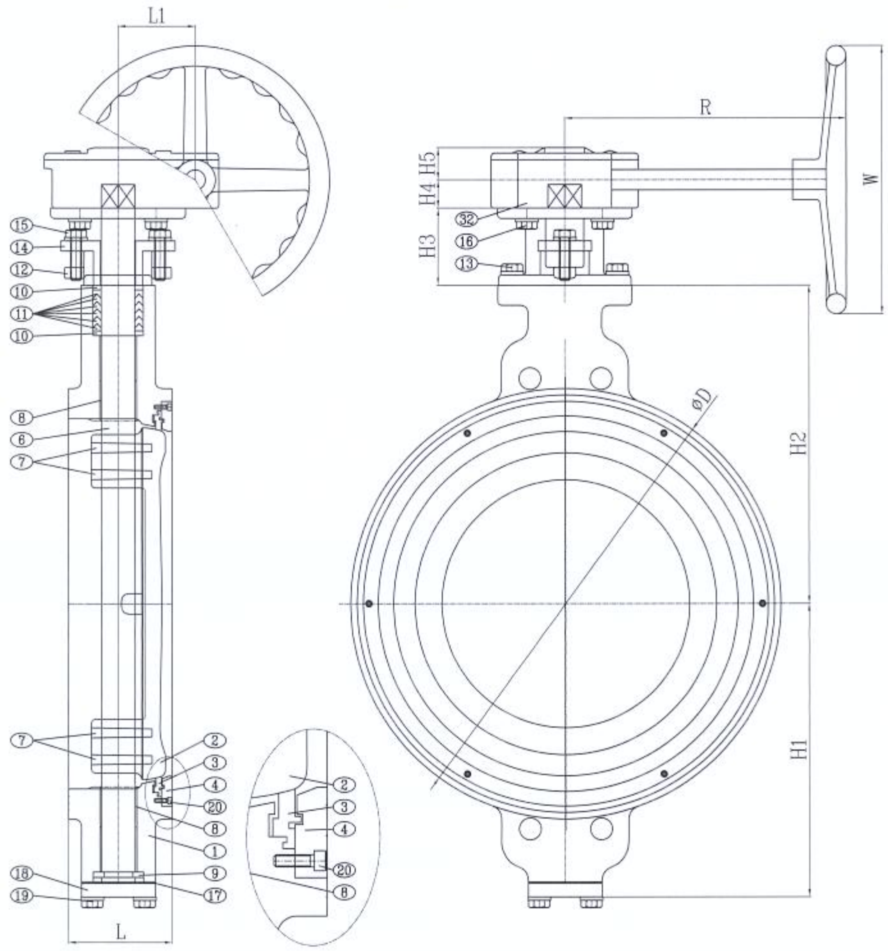
For V_2, use V_2 in accordance with

32	WORM GEAR BOX	1 SET	AL / FCD450	Painted
20	CAP BOLT	2~6	SUS	
19	LOW COVER BOLT	4	CARBON STEEL	Zn. Plate
18	LOW COVER	1	SS400	Painted
17	LOW GASKET	1	ASBESTOS	
16	OPERATOR BOLT	4	CARBON STEEL	Zn. Plate
15	GLAND BOLT	4	CARBON STEEL	Zn. Plate
14	GLAND	1	WCB / FCD450	Painted
13	BRACKET BOLT	4	CARBON STEEL	Zn. Plate
12	BRACKET	1	AL / WCB / FCD450	Painted
11	GLAND PACKING	1 SET	P.T.F.E	
10	PLATE WASHER	2	SUS304 / BRASS	
9	STEM RETAINER	1 SET	SUS304 / BRASS	
8	STEM BEARING	2	DU BUSH	
7	DISK PIN	2~4	SUS	
6	STEM	1	SUS304	
4	CAP	1	SS400 / FCD450	Cr. Plate
3	SEAT	1	M.T.F.E	
2	DISK	1	SCS13	
1	BODY	1	FCD450	Painted
No.	PART NAME	Q'ty	MATERIAL	REMARK



SIZE		DIMENSION(mm)									
Inch	mm	L	ØD	H1	H2	H3	H4	H5	L1	R	ØW
2	50	43	100	65	92	53	25	20	43	160	120
2 1/2	65	46	123	75	103	53	25	20	43	160	120
3	80	46	132	85	110	53	25	20	43	160	120
4	100	52	157	95	132	52	25	20	43	160	120
5	125	57	185	115	156	71	35	40	73	200	180
6	150	62	220	145	173	71	35	40	73	200	180
8	200	83	277	173	227	72	35	40	73	280	240
10	250	87	337	253	226	72	35	40	73	280	240
12	300	98	380	279	309	76	42	50	115	320	300
14	350	100	410	309	337	76	42	50	115	320	300
16	400	115	475	340	368	76	42	50	115	320	300
18	450	115	534	380	408	76	42	50	115	320	300
20	500	120	583	410	441	76	42	50	115	420	400
22	550	154	642	445	475	115	42	50	115	420	400
24	600	154	175	460	490	115	42	50	115	420	400
26	650	165	742	490	512	115	42	50	115	420	400
28	700	165	800	510	530	115	42	50	115	420	400
30	750	190	862	535	563	140	85	66	145	400	710
32	800	190	912	550	581	140	85	66	145	400	710
34	850	203	960	575	608	140	85	66	145	400	710
36	900	203	1012	620	632	140	87	70	185	454	800
40	1000	216	1116	670	693	140	87	70	185	454	800

No.	PART NAME	Q'ty	MATERIAL	REMARK
32	WORM GEAR BOX	1 SET	AL / FCD450	Painted
20	CAP BOLT	2~6	SUS	
19	LOW COVER BOLT	4	SUS	
18	LOW COVER	1	SUS304	
17	LOW GASKET	1	ASBESTOS	
16	OPERATOR BO LT	4	SUS	
15	GLAND BOLT	4	SUS	
14	GLAND	1	SCS13 / FCD450	/ Painted
13	BRACKET BOLT	4	SUS	
12	BRACKET	1	SCS13 / FCD450	/ Painted
11	GLAND PACKING	1 SET	P.T.F.E	
10	PLATE WASHER	2	SUS304 / BRASS	
9	STEM RETAINER	1 SET	SUS304 / BRASS	
8	STEM BEARING	2	DU BUSH	SUS
7	DISK PIN	2~4	SUS	
6	STEM	1	SUS304	
4	CAP	1	SCS13	
3	SEAT	1	M.T.F.E	
2	DISK	1	SCS13	
1	BODY	1	SCS13	



SIZE		DIMENSION(mm)									
Inch	mm	L	ØD	H1	H2	H3	H4	H5	L1	R	ØW
1 1/2	40	43	86	73	91	53	25	20	43	160	120
2	50	44	100	81	98.	53	25	20	43	160	120
2 1/2	65	46	120	83	109	53	25	20	43	160	120
3	80	46	132	87	113	53	25	20	43	160	120
4	100	52	164	111	129	53	25	20	43	160	120
5	125	57	194	121	152	71	35	40	73	200	180
6	150	59	225	145	173	71	35	40	73	200	180
8	200	64	275	180	227	72	35	40	73	280	240
10	250	72	337	220	265	72	35	40	73	280	240
12	300	96	389	279	309	76	42	50	115	320	300
14	350	93	420	309	337	76	42	50	115	320	300
16	400	115	470	340	368	76	42	50	115	320	300
18	450	115	534	370	408	76	42	50	115	320	300
20	500	120	583	400	441	76	42	50	115	420	400
22	550	154	642	445	475	115	42	50	115	420	400
24	600	154	705	450	490	115	42	50	115	420	400
26	650	165	742	490	512	115	42	50	115	420	400
28	700	165	800	510	530	115	42	50	115	420	400
30	750	190	862	535	563	140	85	66	145	400	710
32	800	190	912	500	581	140	85	66	145	400	710
34	850	203	960	575	608	140	85	66	145	400	710
36	900	203	1012	620	632	140	87	70	185	454	800
40	1000	216	116	670	693	140	87	70	185	454	800