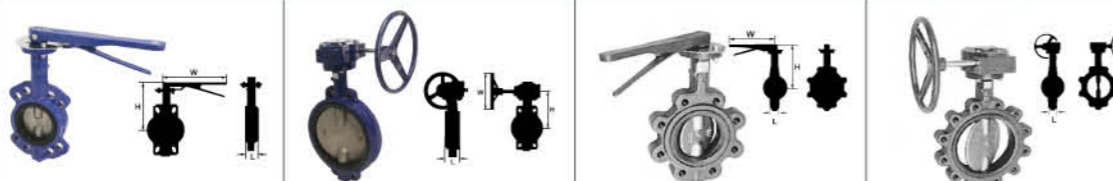


		WAFER			LUG			LUG			LUG		
Fig No.		139			140			142			143		
Item		TGW-Lever Type			TGW-Gear Type			TGL-Leven Type			TGL-Gear Type		
Material and Working Pressure	See(8) Material and Working Pressure												
Appearance													
Dimension		L	H	W	L	H	W	L	H	W	L	H	W
2 inch	50mm	43	193	162	43	198	150	43	193	162	43	198	150
2 1/2	65	46	207	267	46	212	150	46	207	267	46	212	150
3	80	46	213	267	46	218	150	46	213	267	46	218	150
4	100	52	232	267	52	237	150	52	232	267	52	237	150
5	125	56	245	267	56	250	150	56	245	267	56	250	150
6	150	56	258	267	56	263	150	56	258	267	56	263	150
8	200	60	305	361	60	305	300	60	305	361	60	305	300
10	250				68	336	300				68	336	300
12	300				78	380	300				78	380	300
14	350				78	411	300				78	411	300
16	400				102	463	300				102	463	300
18	450				114	485	400				114	485	400
20	500				127	557	300				127	557	300

●TG-Series Butterfly Valve...


- (1) Basic Standard Conforming to JIS B2032(Centric disc &, Shaft positic)
- (2) Face to Face Dimensions Conforming to JIS B2002, ISO 5752-S and BS EN558-1
- (3) Flange Connections Available for JIS-5k · 10k, ASME-125Lb · 150Lb.,BS-PN16
(Please clarify Flange std.on order stage)
JIS-5k is not available for size 350mm and larger
- (4) Design of Connections Wafer and Lug
- (5) Size 50~500mm
- (6) Seat Liner Type for easy maintenance(Not suitable for vacuum)
- (7) Coating Powder Epoxy Coating(Blue Color)
- (8) Material and Working Pressure

Item No.	Parts Material				Working Pressure
	Body	Disc	Seat	Shaft	
TG-1	Cast Iron (Ductile Iron for BS-PN16 size 350mm and larger)	Ductile Iron +Ni-Plated	EPDM	431 S/Steel	Size 300mm & below : 1.18MPa Size 350mm & above : 0.98MPa (1.57MPa for BS-PN16)
TG-2			NBR		
TG-3		304 S/Steel	EPDM		
TG-4			NBR		
TG-5		316 S/Steel	EPDM	431 S/Steel	
TG-6			NBR		
TG-7		ALBC	EPDM		
TG-8			NBR		

(9) Working Temperature

Seat Material	
NBR	EPDM
0~80°C	-10~120°C

- (10) Dewdrops-Proof Insulation is attached between body and actuator on request
- (11) Long Neck Type Sufficient space for insulation

		WAFER			LUG			FLANGED								
Fig No.		229			230			231			232			233		
Item		VFW-Lever Type			VFW-Gear Type			VFL-Lever Type			VFL-Gear Type			VFF-Gear Type		
Material and Working Pressure	See(7) Material and Working Pressure															
Appearance																
Designation		L	H	W	L	H	W	L	H	W	L	H	W	L	H	W
1 1/2 inch	40mm	33	181	200	33	157	150	33	181	200	33	157	150			
2	50	43	204	200	43	180	150	43	204	200	43	180	150			
2 1/2	65	46	216	200	46	192	150	46	216	200	46	192	150			
3	80	46	223	200	46	199	150	46	223	200	46	199	150			
4	100	52	242	200	52	218	150	52	242	200	52	218	150			
5	125	56	258	250	56	234	150	56	258	250	56	234	150			
6	150	56	271	250	56	247	150	56	271	250	56	247	150			
8	200	60	308	355	60	282	200	60	308	355	60	282	200			
10	250	68	354	355	68	328	200	68	354	355	68	328	200			
12	300	78	377	355	78	351	200	78	377	355	78	351	200			
14	350				78	370	310				78	370	310			
16	400				102	402	310				102	402	310			
18	450				114	445	400				114	445	400			
20	500				127	479	400				127	479	400	160	479	400
24	600				154	548	400				154	548	400	170	548	400
28	700													165	589	400
30	750													190	713	400
32	800													190	744	400
36	900													203	805	400

●VF-Series Butterfly Valve...

- (1) Basic Standard Conforming to JIS B2032(Centric disc &, Shaft position)
- (2) Face to Face Dimensions Conforming to JIS 2002, ISO 5752-s and BS EN558-1
- (3) Flange Connections Available for JIS-10k, ASME-125Lb · 150Lb.,BS-PN16 (Please clarify Flange Std.on order stage)
- (4) Design of Connections Wafer, Lug and Flange Type
- (5) Size 40~900mm
- (6) Seat Liner Type for easy maintenance(Not suitable for vacuum)
- (7) Material and Working Pressure

Material No.	Parts Material				Working Pressure
	Body	Disc	Seat	Shaft	
VFW-1, VFL-1, VFF-1	Cast Iron	Ductile Iron +Nylon11	EPDM	410 S/Steel	Size 300mm & below:1.57MPa Size 350mm & above:0.98MPa
VFW-2, VFL-2, VFF-2			NBR		
VFW-3, VFL-3, VFF-3		304 S/Steel	EPDM	304 S/Steel	
VFW-4, VFL-4, VFF-4			NBR		
VFW-5, VFL-5, VFF-5		316 S/Steel	EPDM	316 S/Steel	
VFW-6, VFL-6, VFF-6			NBR		
VFW-7, VFL-7, VFF-7	Ductile Iron	Ductile Iron +Nylon11	EPDM	410 S/Steel	
VFW-8, VFL-8, VFF-8			NBR		
VFW-9, VFL-9, VFF-9		304S/Steel	EPDM	304 S/Steel	
VFW-10, VFL-10, VFF-10			NBR		
VFW-11, VFL-11, VFF-11		316 S/Steel	EPDM	316 S/Steel	
VFW-12, VFL-12, VFF-12			NBR		
VFW-13, VFL-13, VFF-13	304 S/Steel	304S/Steel	EPDM	304 S/Steel	
VFW-14, VFL-14, VFF-14			NBR		
VFW-15, VFL-15, VFF-15		316 S/Steel	316 S/Steel	EPDM	
VFW-16, VFL-16, VFF-16				NBR	

(8) Working Temperature

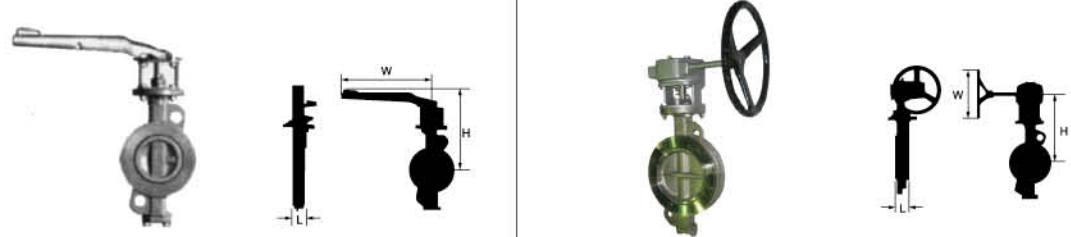
Seat Material					
NBR	EPDM	CR	SILICON	HYPALON	VITON
0~80°C	-10~120°C	0~80°C	-20~180°C	-20~135°C	-18~204°C

(9) Available for Pneumatic and Electric Ope. Type

BUTTERFLY VALVE

BUTTERFLY VALVE

WAFER

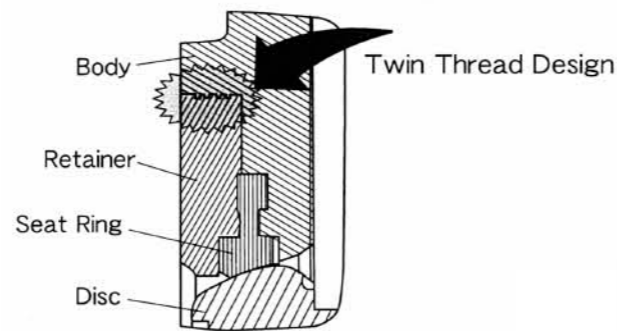
Fig No.	129	130
Item	HPW-Lever Type	HPW-Gear Type
Material	See(7) Material	
Working Pressure	See(8) Working Pressure and Temperature	
Appearance		

Dimension		L	H	W	L	H	W
2 1/2 inch	65mm	46	247	200	46	222	150
3	80	46	272	200	46	247	150
4	100	52	289	250	52	264	150
5	125	56	302	355	56	282	200
6	150	56	317	355	56	297	200
8	200				60	341	310
10	250				68	381	310
12	300				78	443	400
14	350				78	479	400
16	400				102	546	400
18	450				114	571	400
20	500				127	606	400
24	600				154	785	400

●HP Series Butterfly Valve...

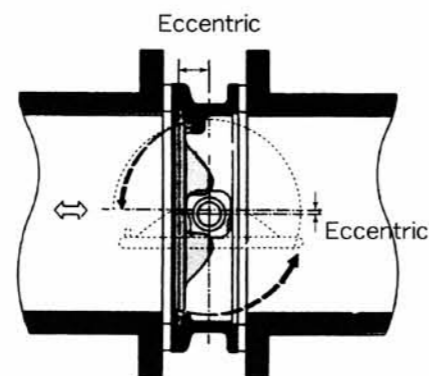
(1) Special Twin Thread Design between body and retainer

- Wider sealing face between flanges
- 100% sealing between retainer and body
- When long time storage, valve is in fully closed position and the seat ring is fixed by retainer, Encapsulated seat will not caused cold flow



(2) Benefit of Double Eccentric Structure

- Longer service life because of few wear and tear
- When the closed position, the force of the disc on the seat ring ensures complete sealing
- Easy operation with less seating torque



- (3) Face to Face Dimensions: Conforming to JIS B2002, ISO 5752-S and BS EN558-1
- (4) Flange Connections: Available for JIS-10k · 16k · 20k and ASME-150Lb. · 300Lb
- (5) Design of Connections: Wafer(Available for Lug Type)
- (6) Size: 50~600mm
- (7) Material

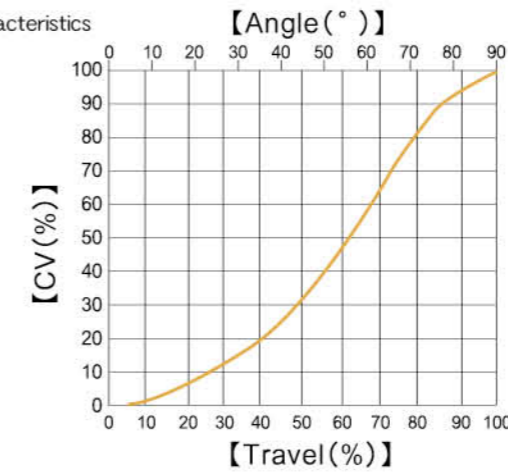
Material No.	Parts Material			
	Body	Disc	※Seat	Shaft
HP-1	304 S/Steel	304 S/Steel	PTFE	304 S/Steel
HP-2	316 S/Steel	316 S/Steel	PTFE	316 S/Steel
HP-3	Cast Steel	304 S/Steel	PTFE	304 S/Steel

※ RPTFE for Temperatur more than 160℃

(8) Working Pressure and Temperature

Temperatur(℃)	Working Pressure(MPa)		Material of Seat
	Size 300mm and below	Size 350mm and adove	
-29~38	1.97	0.99	PTFE
66	1.88	0.94	
93	1.79	0.90	
121	1.69	0.85	
149	1.59	0.80	
177	0.97	0.49	RPTFE
204	0.35	0.18	

(9) Flow Characteristics



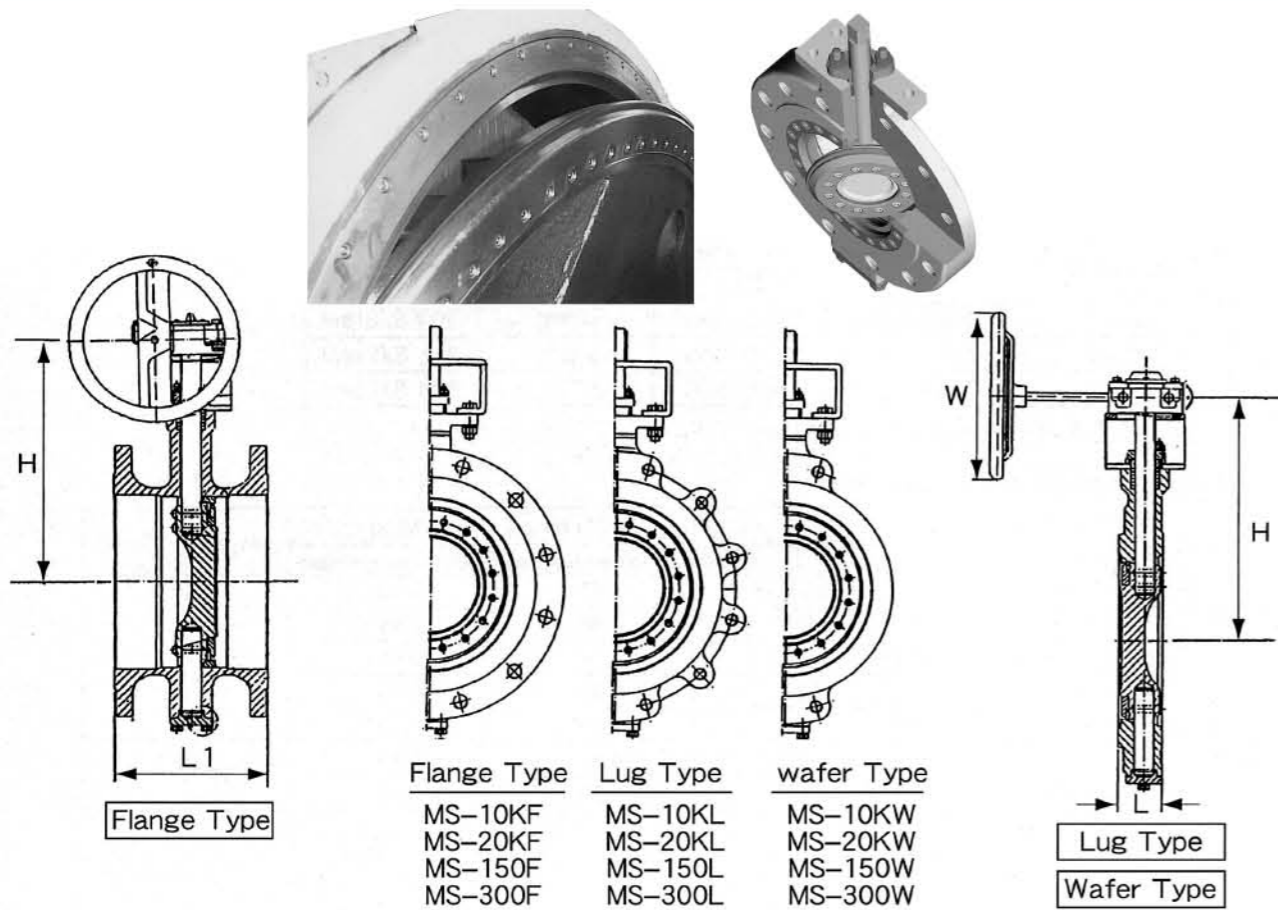
Size	CV	KV
2.5inch 65mm	140	120
3 80	260	222
4 100	420	359
5 125	720	615
6 150	1200	1026
8 200	2000	1709
10 250	3100	2650
12 300	4750	4060
14 350	5850	5000
16 400	8300	7094
18 450	10400	8889
20 500	13800	11795
24 600	22500	19231

(10) Available for Pneumatic and Electric Ope. Type

(fully open)

BUTTERFLY VALVE

BUTTERFLY VALVE



Flange Type
MS-10KF
MS-20KF
MS-150F
MS-300F

Lug Type
MS-10KL
MS-20KL
MS-150L
MS-300L

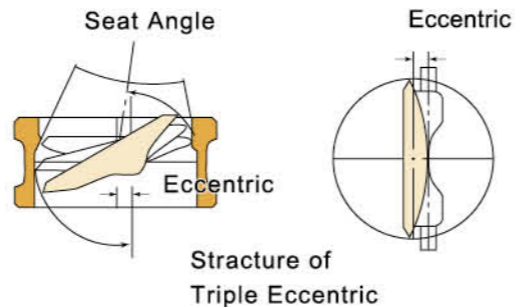
wafer Type
MS-10KW
MS-20KW
MS-150W
MS-300W

Lug Type
Wafer Type

	WAFER			LUG			FLANGED			WAFER			LUG			FLANGED			
Fig. No.	156			160			164			168			171			175			
Item	MS-10KW Gear MS-150W Gear			MS-10KL Gear MS-150L Gear			MS-10KF Gear MS-150F Gear			MS-20KW Gear MS-300W Gear			MS-20KL Gear MS-300L Gear			MS-20KF Gear MS-300F Gear			
Material	See(9) Material																		
Working Pressure	See(8)Working Pressure and Temperature																		
Dimension	L	H	W	L	H	W	L1	H	W	L	H	W	L	H	W	L1	H	W	
3 inch	80mm	47	252	150	47	252	150	180	252	150	48	261	150	48	261	150	180	261	150
4	100	53	271	150	53	271	150	190	271	150	54	283	150	54	283	150	190	283	150
5	125	56	291	150	56	291	150	200	291	150	56	296	250	56	296	250	200	296	250
6	150	56	296	150	56	296	150	210	296	150	61	314	250	61	314	250	210	314	250
8	200	62	328	250	62	328	250	230	328	250	75	349	250	75	349	250	230	349	250
10	250	69	361	250	69	361	250	250	361	250	85	400	400	85	400	400	250	400	400
12	300	79	443	400	79	443	400	270	443	400	94	447	400	94	447	400	270	447	400
14	350	79/92	455	400	79/92	455	400	290	455	400	117	499	400	117	499	400	290	499	400
16	400	102	494	400	102	494	400	310	494	400	133	531	400	133	531	400	310	531	400
18	450	114	574	400	114	574	400	330	574	400	149	577	400	149	577	400	330	577	400
20	500	127	621	400	127	621	400	350	621	400	159	668	400	159	668	400	350	668	400
24	600	154	666	400	154	666	400	390	666	400	181	758	600	181	758	600	390	758	600

●MS-Series Butterfly Valve...

- Benefit of triple Eccentric Structure
 - Suitable for using high Pressure flow
 - Better sealing by metal seat
 - Lower wear and tear of the seat
 - Available to open and close by small torque
 - As result, Sealing of metal seat was realized
- Body Seat is finished by geometrical spherical surface structure
 - Spherical surface processing computer aided machine guarantee the reliable sealing of metal seat butterfly valves
- Available to use for high temperature and pressure



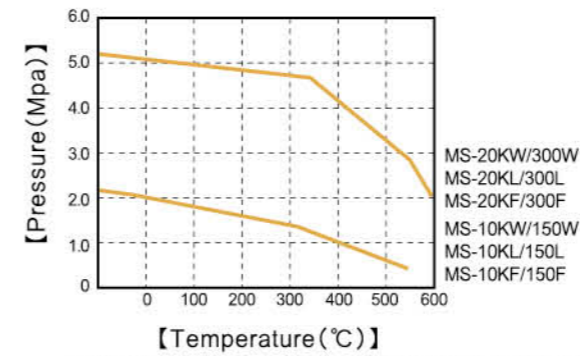
- Basic Std. Metal Seal-Triple Eccentric Structure, conforming to API 609
- Face to Face Dimensions
 - 10KW/10KL/150W/150L : ISO5752 Table5-S
 - 10KF/150F : ISO5752 Table4-L
 - 20KW/20KL/300W/300L : API609 Table2-Class300
 - 20KF/300F : ISO5752 Table4-L

Note=API609 Table2-Class150 is available for size 350mm of 10KW/10KL/150W/150L
- Flange Connections
 - JIS 10K for 10KW/10KL/10KF
 - JIS 16K and 20K for 20KW/20KL/20KF
 - ASME 150Lb. for 150KW/150KL/150KF
 - ASME 300Lb. for 300KW/300KL/300KF

Wafer,Lug and Flanged
- Design of Connections
- Size 80~600mm
- Material

Material No.	Parts Material			
	Body	Disc	Seat	Shaft
MS-1	304 S/Steel	304 S/Steel	304 S/Steel	630 S/Steel
MS-2	316 S/Steel	316 S/Steel	316 S/Steel	
MS-3	Cast Steel	304 S/Steel	304 S/Steel	

(10) Working pressure and Temperature

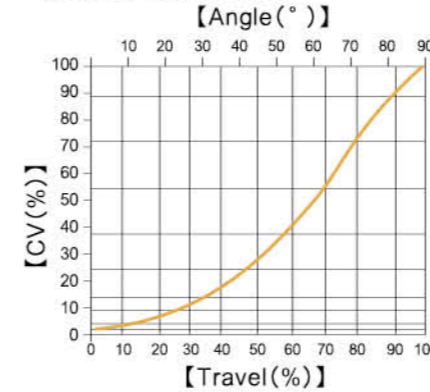


Note:Confirmation is required in case temperature is above 200°C

(11) Seat Leak Rate

- ANSI B16.104 Class IV

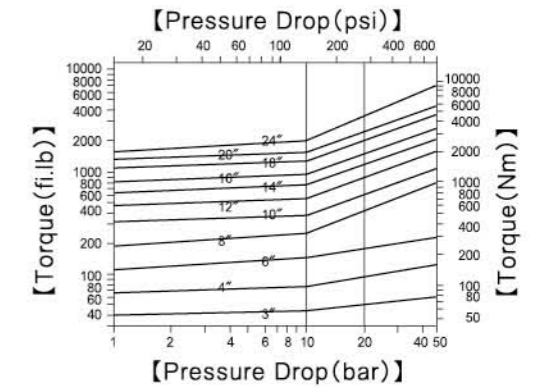
(12) Flow Characteristics



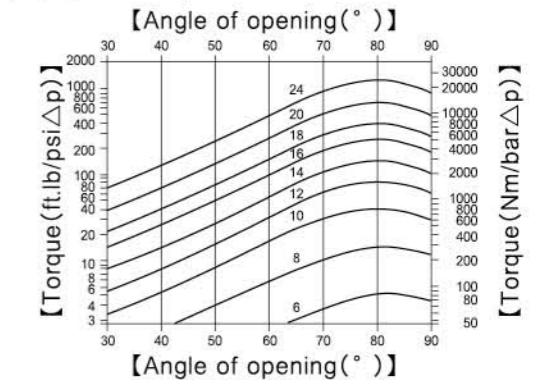
Item Size	MS-10W,150W MS-20KL,150L MS-10KF,150F		MS-20KW,300W MS-20KL,300L MS-20KF,300F	
	inch	mm	CV	KV
3"	80	173	148	173
4"	100	355	303	258
5"	125	655	560	550
6"	150	1040	888	890
8"	200	1980	1692	1520
10"	250	3150	2692	2520
12"	300	4680	4000	3685
14"	350	6388	5460	5195
16"	400	8312	7104	7120
18"	450	10525	8995	9398
20"	500	13053	11156	11350
24"	600	18610	15906	16180

(fully Open)

(13) Closing Torque



(14) Dynamic Torques



- Available for Pneumatic and Electric Ope. Type